SG388/D
Rev. 4, May-2002

Master Components Selector Guide

ON Semiconductor®

Datasheet Directory

ON Semiconductor
Master Components Selector Guide

Analog, Data Management, Standard Logic, Discretes and MOS Power Products

SG388/D
Rev. 4, May–2002

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Table of Contents

Analog ICs

Page
Family Tree 9
Signal Conditioning 10
Power Management 20
Interfaces 69
Special Functions 71
Application Specific Standard Products 72

Data Management Devices

Family Tree 84
Technology Comparison Chart 85
Functional Family Tree 86
Clock Management 86
Data Management 88
Communications 95
Technology Family Tree 96
GigaComm™ 96
Low Voltage ECLinPS Plus™ 96
ECLinPS Plus 96
Low Voltage ECLinPS Lite™ 97
ECLinPS Lite 98
Low Voltage ECLinPS™ 98
ECLinPS 99
MECL 10H™ 100
MECL 10K™ 102
Other 104
Ordering Information 105

Standard Logic Devices

Family Tree 111
Ordering Information 112
Selection by Family
VHC One–Gate 115
HC One–Gate 116
LCX One–Gate 116
LCX 2– and 3–Gates 117
NLAS Analog Switches 117
FST 118
ALVC 118
VCX 119
LCX 119
LVX 120
VHC 121
FACT 123
High Speed CMOS 126
Metal Gate CMOS 129

Discretes

Page
Family Tree 135
MicroIntegration™ 137
Small Signal Transistors, FETs and Diodes 144
TVS/Zeners 167
Bipolar Power Transistors 196
Rectifiers 212
Thyristors, Triggers and Surge Suppressors 226

MOS Power Products

MOS Power Products 239
Part Numbering Nomenclature 240
MOS Power Products Selection by Package
Surface Mount Devices 242
Through–Hole Devices 247
Ignition IGBT Selection
by Package 249
SMARTDISCRETE™ Selection
by Package 250
MOS Power Devices by Application 251
Portable Applications 252
Computing Applications 255
Automotive Applications 257
60 Volt Automotive Portfolio 261
Migration Table 262

What's Changed – Listing of Added and Deleted Devices

Added Devices 267
Deleted Devices 271

Alphanumeric Parts Index

. 275

Alphabetical Subject Index

. 305

NOTE: The **Tape & Reel Specification** information has been moved to its own publication. Please see ON Semiconductor brochure, BRD8011/D, for information on Tape & Reel.

Analog ICs

Table of Contents

FAMILY TREE 9

SIGNAL CONDITIONING 10

Operational Amplifiers 10
Comparators 17
Analog Switches and Multiplexers 19

POWER MANAGEMENT 20

Battery Management 20
Lithium Battery Protection ICs 20
Charge Controllers 20
Overvoltage Charge Protection 20
DC/DC Switching 21
Switching Regulators 21
Switching Controllers 23
CPU DC–DC Controllers 30
AC–DC Switching 31
Switching Power Supply Controllers 31
Off–Line Switching Controllers 34
Very High Voltage Off–Line Switching Regulators 36
Power Factor Controllers 38
Voltage References 40
Linear Voltage Regulators 42
General Purpose Linear Voltage Regulators 42
Low Dropout Linear Voltage Regulators 45
Application Specific Low Dropout Voltage Regulators 53
Supervisory ICs 60
Drivers 63
MOSFET/IGBT Drivers 63
Load/Relay Drivers 63
Display Drivers 63
Smart Drivers 65
Dedicated Power Management Controllers 67

INTERFACES 69

Data Transmission 69
Transistor Arrays 69
Display Drivers 69

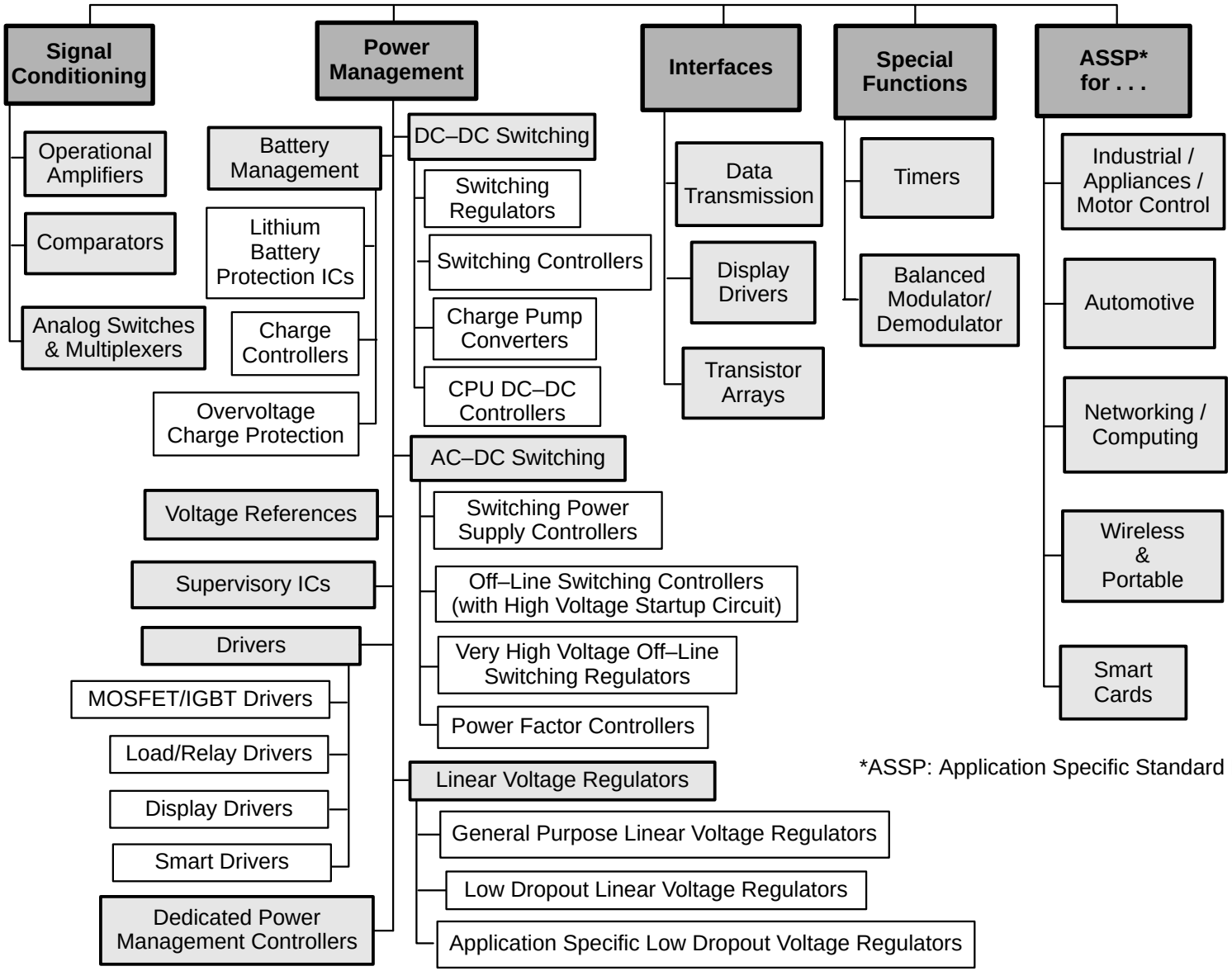
SPECIAL FUNCTIONS 71

Timers 71

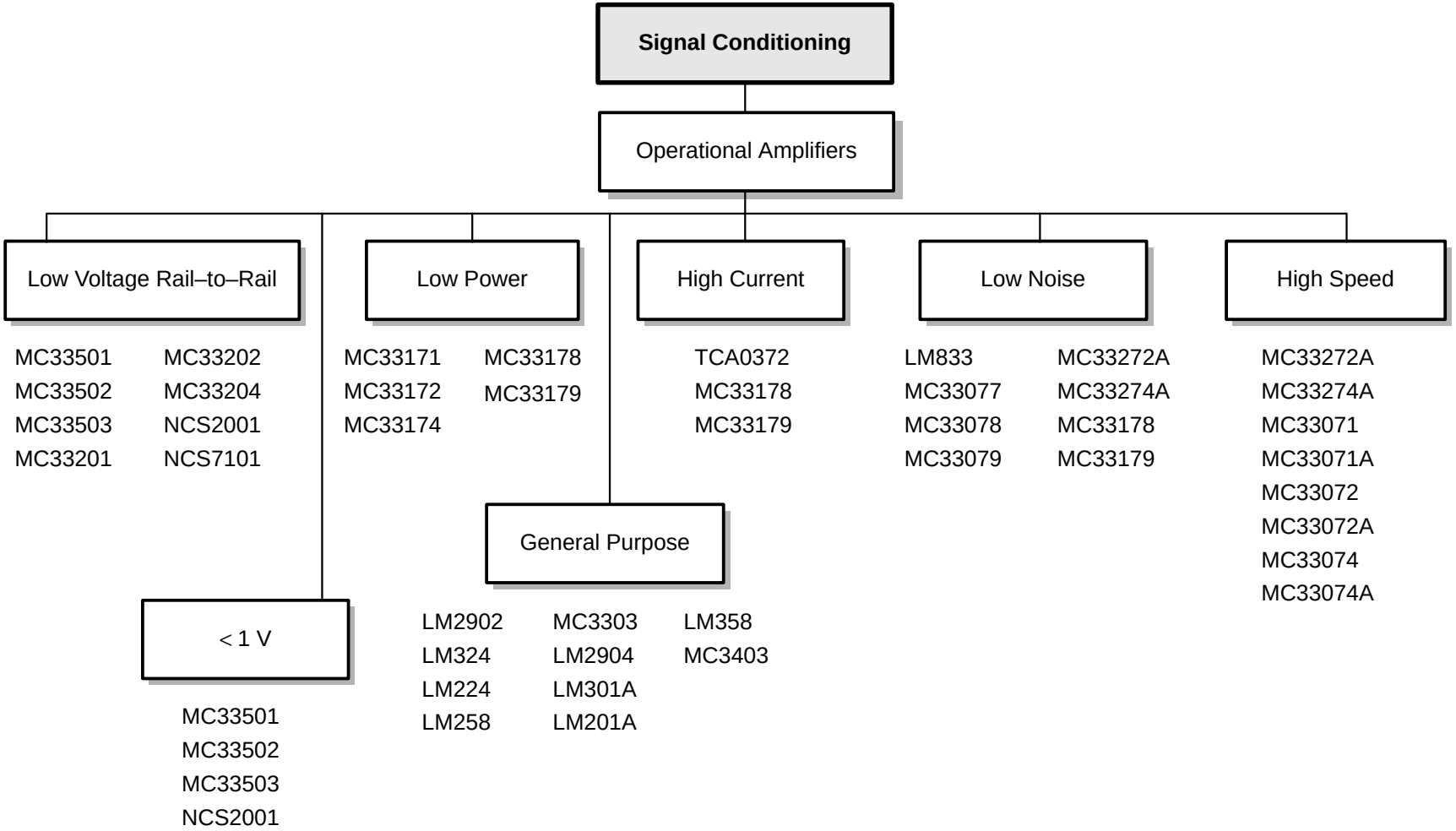
APPLICATION SPECIFIC STANDARD PRODUCTS 72

Industrial/Appliances/Motor Control 73
Automotive 74
Networking/Computing 78
Wireless & Portable 79
Smart Cards 80

ON Semiconductor's Analog Integrated Circuits



*ASSP: Application Specific Standard Products


Signal Conditioning
Operational Amplifiers
Low Voltage Rail–to–Rail
MC33501
MC33502
MC33503
MC33201
MC33202
MC33204
NCS2001
NCS7101
Low Power
MC33171
MC33172
MC33174
MC33178
MC33179
High Current
TCA0372
MC33178
MC33179
Low Noise
LM833
MC33077
MC33078
MC33079
MC33272A
MC33274A
MC33178
MC33179
High Speed
MC33272A
MC33274A
MC33071
MC33071A
MC33072
MC33072A
MC33074
MC33074A
General Purpose
LM2902
LM324
LM224
LM258
MC3303
LM2904
LM301A
LM201A
LM358
MC3403
< 1 V
MC33501
MC33502
MC33503
NCS2001

Single Operational Amplifiers

Device Name	V_{CC} (min) (V)	V_{CC} (max) (V)	GBW (typ) (MHz)	Slew Rate (typ) (V/us)	V_{IO} (max @ 25°C, Vs = 5.0 V) (mV)	I_{IB} (typ) (nA)	I_D (typ) (mA)	Temp Range (°C)	CMR (typ) (dB)	e_n (typical) $\left(nV/\sqrt{Hz}\right)$ @ f = 1.0 kHz	Number of Channels	Supply Type	Package	Description
LM301A	±3.0	±18	1.0	0.5	7.5	70	1.8	0 to 70	90	–	1	Split	DIP–8, SO–8	General Purpose, Non Compensated
LM201A	±3.0	±22	1.0	0.5	2.0	30	1.8	–25 to +85	96	–	1	Split	DIP–8, SO–8	General Purpose, Precision Non Compensated
MC34071	3.0 or ±1.5	44	4.5	13*	5.0	100	1.6	0 to 70	97	32	1	Single, Split	DIP–8, SO–8	High SR, Wide BW, Single Supply, *Av = –1.0
MC34071A	3.0 or ±1.5	44	4.5	13*	3.0	100	1.6	0 to 70	97	32	1	Single, Split	DIP–8, SO–8	High SR, Wide BW, Single Supply, *Av = –1.0
MC33071	3.0 or ±1.5	44	4.5	13*	5.0	100	1.6	–40 to +85	97	32	1	Single, Split	DIP–8, SO–8	High SR, Wide BW, Single Supply, *Av = –1.0
MC33071A	3.0 or ±1.5	44	4.5	13*	3.0	100	1.6	–40 to +85	97	32	1	Single, Split	DIP–8, SO–8	High SR, Wide BW, Single Supply, *Av = –1.0
MC33201	1.8 or ±0.9	12	2.2	1.0	6.0	80	0.9	–40 to +105	90	20	1	Single, Split	DIP–8, SO–8	Low Voltage, Rail–to–Rail
MC33201V	1.8 or ±0.9	12	2.2	1.0	6.0	80	0.9	–55 to +125	90	20	1	Single, Split	DIP–8, SO–8	Low Voltage, Rail–to–Rail, Extended Temp. Range
MC33171	3.0 or ±1.5	44 or ±22	1.8	2.1	4.5	20	0.18	–40 to +85	90	32	1	Single, Split	DIP–8, SO–8	Low Power, Single Supply, Two Voltage Ranges
MC33501	1.0 or ±0.5	7.0 or ±3.5	4 @ Vs = 5	3.0	5.0	0.04 pA	1.2 @ Vs = 1 V	–40 to +105	75	30	1	Single, Split	TSOP–5	One Volt SMARTMOS™, Rail–to–Rail

Single Operational Amplifiers (continued)

Device Name	V_{CC} (min) (V)	V_{CC} (max) (V)	GBW (typ) (MHz)	Slew Rate (typ) (V/us)	V_{IO} (max @ 25°C, Vs = 5.0 V) (mV)	I_{IB} (typ) (nA)	I_D (typ) (mA)	Temp Range (°C)	CMR (typ) (dB)	e_n (typical) $\left(nV/\sqrt{Hz}\right)$ @ f = 1.0 kHz	Number of Channels	Supply Type	Package	Description
MC33503	1.0 or ±0.5	7.0 or ±3.5	4 @ Vs = 5	3.0	5.0	0.04 pA	1.2 @ Vs = 1 V	–40 to +105	75	30	1	Single, Split	TSOP–5	One Volt SMARTMOS, Rail–to–Rail
NCS7101	1.8 or ±0.9	10 or ±5.0	1.0	1.2	7.0	1.0 pA	1.1	–40 to +85	65 (min)	140	1	Single, Split	TSOP–5	Low Voltage, Rail–to–Rail
NCS2001	0.9 or ±0.45	7.0 or ±3.5	1.4	1.6	6.0	10 pA	.80	–40 to +105	70	100	1	Single, Split	TSOP–5, SC70–5	One Volt, CMOS Rail–to–Rail

Dual Operational Amplifiers

Device Name	V_{CC} (min) (V)	V_{CC} (max) (V)	GBW (typ) (MHz)	Slew Rate (typ) (V/us)	V_{IO} (max @ 25°C, Vs = 5.0 V) (mV)	I_{IB} (typ) (nA)	I_D* (typ) (mA)	Temp Range (°C)	CMR (typ) (dB)	e_n (typical) $\left(nV/\sqrt{Hz}\right)$ @ f = 1.0 kHz	Number of Channels	Supply Type	Package	Description
MC34072	3.0 or ±1.5	44 or ±22	4.5	13*	5.0	100	3.2	0 to 70	97	32	2	Single, Split	DIP–8, SO–8	High SR, Wide BW, Single Supply, *Av = –1.0
MC34072A	3.0 or ±1.5	44 or ±22	4.5	13*	3.0	100	3.2	0 to 70	97	32	2	Single, Split	DIP–8, SO–8	High SR, Wide BW, Single Supply, *Av = –1.0
MC34072V	3.0 or ±1.5	44 or ±22	4.5	13*	5.0	100	3.2	–40 to +125	97	32	2	Single, Split	DIP–8, SO–8	High SR, Wide BW, Single Supply, Extended Temp. Range, *Av = –1.0
MC33072	3.0 or ±1.5	44 or ±22	4.5	13*	5.0	100	3.2	–40 to +85	97	32	2	Single, Split	DIP–8, SO–8	High SR, Wide BW, Single Supply, *Av = –1.0
MC33072A	3.0 or ±1.5	44 or ±22	4.5	13*	3.0	100	3.2	–40 to +85	97	32	2	Single, Split	DIP–8, SO–8	High SR, Wide BW, Single Supply, *Av = –1.0
MC33202	1.8 or ±0.9	12 or ±6	2.2	1.0	8.0	80	1.8	–40 to +105	90	20	2	Single, Split	DIP–8, SO–8, Micro8™	Low Voltage, Rail–to–Rail
MC33202V	1.8 or ±0.9	12 or ±6	2.2	1.0	8.0	80	1.8	–55 to +125	90	20	2	Single, Split	DIP–8, SO–8	Low Voltage, Rail–to–Rail, Extended Temp. Range
MC33172	3.0 or ±1.5	44 or ±22	1.8	2.1	4.5	20	0.36	–40 to +85	90	32	2	Single, Split	DIP–8, SO–8	Low Power, Single Supply, Two Voltage Ranges
MC33172V	3.0 or ±1.5	44 or ±22	1.8	2.1	4.5	20	0.36	–40 to +105	90	32	2	Single, Split	SO–8	Low Power, Single Supply, Two Voltage Ranges, Extended Temp. Range
MC33502	1.0	7.0	5.0	3.0	5.0	0.04 pA	3.3	–40 to +105	75	30	2	Single, Split	DIP–8, SO–8	One Volt SMARTMOS, Rail–to–Rail
MC33078	±5.0	±18	16	7.0	2.0	300	4.1	–40 to +85	100	4.5	2	Split	DIP–8, SO–8	Low Noise
MC33178	±2.0	±18	5.0	2.0	3.0	100	.85	–40 to +85	110	7.5	2	Split	DIP–8, SO–8	High Output Current, Low Power, Low Noise
MC33272A	3.0 or ±1.5	36 or ±18	24	10	1 @ Vs = ±15 V 2 @ Vs = 5.0 V	300	4.30	–40 to +85	100	18	2	Single, Split	DIP–8, SO–8	Single Supply, High SR, Low Input Offset Voltage

*I_D typical for total device (all channels)

Dual Operational Amplifiers (continued)

Device Name	V_{CC} (min) (V)	V_{CC} (max) (V)	GBW (typ) (MHz)	Slew Rate (typ) (V/us)	V_{IO} (max @ 25°C, Vs = 5.0 V) (mV)	I_{IB} (typ) (nA)	I_D* (typ) (mA)	Temp Range (°C)	CMR (typ) (dB)	e_n (typical) $\left(nV/\sqrt{Hz}\right)$ @ f = 1.0 kHz	Number of Channels	Supply Type	Package	Description
LM833	±2.5	36	15	7.0	5.0	300	4.0	–40 to +85	100	4.5	2	Single, Split	DIP–8, SO–8	Low Noise
LM358	3.0 or ±1.5	32 or ±18	1.0	0.6	7.0	45	0.7	0 to 70	70	–	2	Single, Split	DIP–8, SO–8, Micro8	Low Noise
LM258	3.0 or ±1.5	32 or ±18	1.0	0.6	5.0	45	0.7	–25 to +85	85	–	2	Single, Split	DIP–8, SO–8, Micro8	Low Noise
LM2904	3.0 or ±1.5	26 or ±13	1.0	0.6	7.0	45	0.7	–40 to +105	70	–	2	Single, Split	DIP–8, SO–8, Micro8	Low Power
LM2904V	3.0 or ±1.5	26 or ±13	1.0	0.6	7.0	45	0.7	–40 to +125	70	–	2	Single, Split	DIP–8, SO–8, Micro8	Low Power
TCA0372	5.0 or ±2.5	40 or ±20	1.4	1.4	15 @ ±15 V	100	5.0	–40 to +125	90	22	2	Single, Split	SOP (12+2+2) DIP–8, DIP–16	Power, High Current
TCA0372B	5.0 or ±2.5	40 or ±20	1.4	1.4	15 @ ±15 V	100	5.0	–40 to +125	90	22	2	Single, Split	DIP–8, SO–16W	Power, High Current
MC33077	±2.5	±18	37	11	1 @ Vs = ±15 V	280	3.5	–40 to +85	107	4.4	2	Split	DIP–8, SO–8	Low Noise

*I_D typical for total device (all channels)

Quad Operational Amplifiers

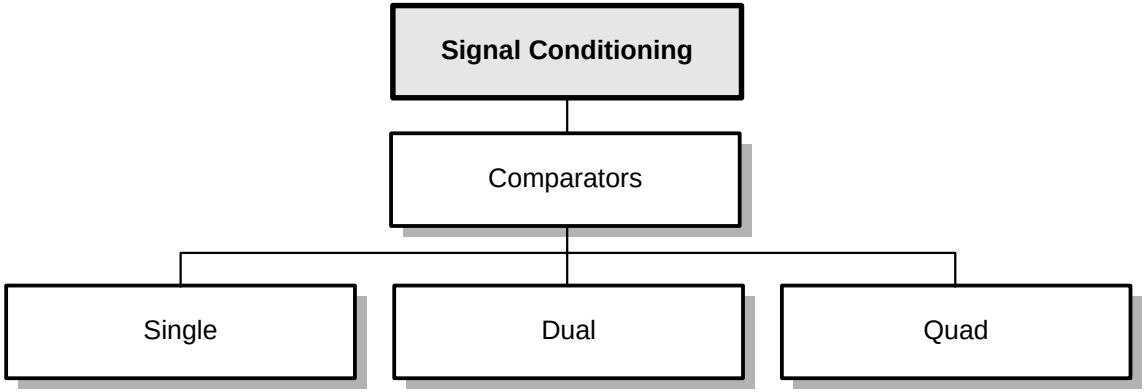
Device Name	V_{CC} (min) (V)	V_{CC} (max) (V)	GBW (typ) (MHz)	Slew Rate (typ) (V/us)	V_{IO} (max @ 25°C, Vs = 5.0 V) (mV)	I_{IB} (typ) (nA)	I_D* (typ) (mA)	Temp Range (°C)	CMR (typ) (dB)	e_n (typical) $\left(nV/\sqrt{Hz}\right)$ @ f = 1.0 kHz	Number of Channels	Supply Type	Package	Description
MC34074	3.0 or ±1.5	44 or ±22	4.5	13*	5.0	100	6.4	0 to 70	97	32	4	Single, Split	DIP–14, SO–14	High SR, Wide BW, Single Supply, *AV = –1.0
MC34074A	3.0 or ±1.5	44 or ±22	4.5	13*	3.0	100	6.4	0 to 70	97	32	4	Single, Split	DIP–14, SO–14	High SR, Wide BW, Single Supply, *AV = –1.0
MC34074V	3.0 or ±1.5	44 or ±22	4.5	13*	5.0	100	6.4	–40 to +125	97	32	4	Single, Split	DIP–14, SO–14	High SR, Wide BW, Single Supply, *AV = –1.0
MC33074	3.0 or ±1.5	44 or ±22	4.5	13*	5.0	100	6.4	–40 to +85	97	32	4	Single, Split	DIP–14, SO–14, TSSOP–14	High SR, Wide BW, Single Supply, *AV = –1.0
MC33074A	3.0 or ±1.5	44 or ±22	4.5	13*	3.0	100	6.4	–40 to +85	97	32	4	Single, Split	DIP–14, SO–14, TSSOP–14	High SR, Wide BW, Single Supply, *AV = –1.0
MC33204	1.8 or ±0.9	12 or ±6.0	2.2	1.0	10	80	3.6	–40 to +105	90	20	4	Single, Split	DIP–14, SO–14, TSSOP–14	Low Voltage, Rail–to–Rail
MC33204V	1.8 or ±0.9	12 or ±6.0	2.2	1.0	10	80	3.6	–55 to +125	90	20	4	Single, Split	DIP–14, SO–14	Low Voltage, Rail–to–Rail, Extended Temp. Range
MC33174	3.0 or ±1.5	44 or ±22	1.8	2.1	4.5	20	0.72	–40 to +85	90	32	4	Single, Split	DIP–14, SO–14, TSSOP–14	Low Power, Single Supply, Two Voltage Ranges
MC33174V	3.0 or ±1.5	44 or ±22	1.8	2.1	4.5	20	0.72	–40 to +105	90	32	4	Single, Split	DIP–14, SO–14	Low Power, Single Supply, Two Voltage Ranges, Extended Temp. Range
MC33079	±5.0	±18	16	7.0	2.5	300	8.4	–40 to +85	100	4.5	4	Split	DIP–14, SO–14	Low Noise

*I_D typical for total device (all channels)

Quad Operational Amplifiers (continued)

Device Name	V_{CC} (min) (V)	V_{CC} (max) (V)	GBW (typ) (MHz)	Slew Rate (typ) (V/us)	V_{IO} (max @ 25°C, Vs = 5.0 V) (mV)	I_{IB} (typ) (nA)	I_D* (typ) (mA)	Temp Range (°C)	CMR (typ) (dB)	e_n (typical) $\left(nV/\sqrt{Hz}\right)$ @ f = 1.0 kHz	Number of Channels	Supply Type	Package	Description
MC33179	±2.0	±18	5.0	2.0	3.0	100	1.7	–40 to +85	110	7.5	4	Split	DIP–14, SO–14	High Output Current, Low Power, Low Noise
MC33274A	3.0 or ±1.5	36 or ±18	24	10	1 @ Vs = ±15 V 2 @ Vs = 5.0 V	300	8.6	–40 to +85	100	18	4	Single, Split	DIP–14, SO–14	Single Supply, High SR, Low Input Offset Voltage
LM324	3.0 ±1.5	32 ±16	1.0	0.6	7.0	90	–	0 to 70	70	–	4	Single, Split	DIP–14, SO–14	Low Power
LM324A	3.0 ±1.5	32 ±16	1.0	0.6	3.0	45	0.7	0 to 70	70	–	4	Single, Split	DIP–14, SO–14	Low Power
LM224	3.0 ±1.5	32 ±16	1.0	0.6	5.0	90	–	–25 to +85	85	–	4	Single, Split	DIP–14, SO–14	Low Power
LM2902	3.0 ±1.5	26 ±13	1.0	0.6	7.0	90	–	–40 to +105	70	–	4	Single, Split	DIP–14, SO–14	Low Power
LM2902V	3.0 ±1.5	26 ±13	1.0	0.6	7.0	90	–	–40 to +125	70	–	4	Single, Split	DIP–14, SO–14	Low Power, Extended Temp. Range
MC3403	3.0 ±1.5	36 ±18	1.0	0.6	10	200	2.8	0 to 70	90	–	4	Single, Split	DIP–14, SO–14	Low Power
MC3303	3.0 ±1.5	36 ±18	1.0	0.6	8.0	200	2.8	–40 to +85	90	–	4	Single, Split	DIP–14, SO–14	Low Power

*I_D typical for total device (all channels)



LM211
LM311
NCS2200*
NCS2201* (w/enable)
NCS2202*
NCS2203* (w/enable)
NCS2300**
NCS2301** (w/enable)
NCS2302**
NCS2303** (w/enable)

LM293
LM393
LM2903

LM239
LM339
LM2901
MC3302

* Q2, 2002
** Q3, 2002

Single Comparators

Device Name	V_{CC} (min)	V_{CC} (max)	V_{IO} (max) (mV)	Iio (max) (nA)	I_{IB} (typ) (nA)	Iq (typ) (mA)	Temp Range (°C)	Response Time (ns)	Supply Type	Number of Channels	Package	Description
LM211	5.0 or ±2.5	36 or ±15	3.0	10	45	2.4	–25 to +85	200	Single Split	1	SO–8	Highly Flexible Voltage
LM311	5.0 or ±2.5	36 or ±15	7.5	50	45	2.4	0 to 70	200	Single Split	1	SO–8 DIP–8	Highly Flexible Voltage

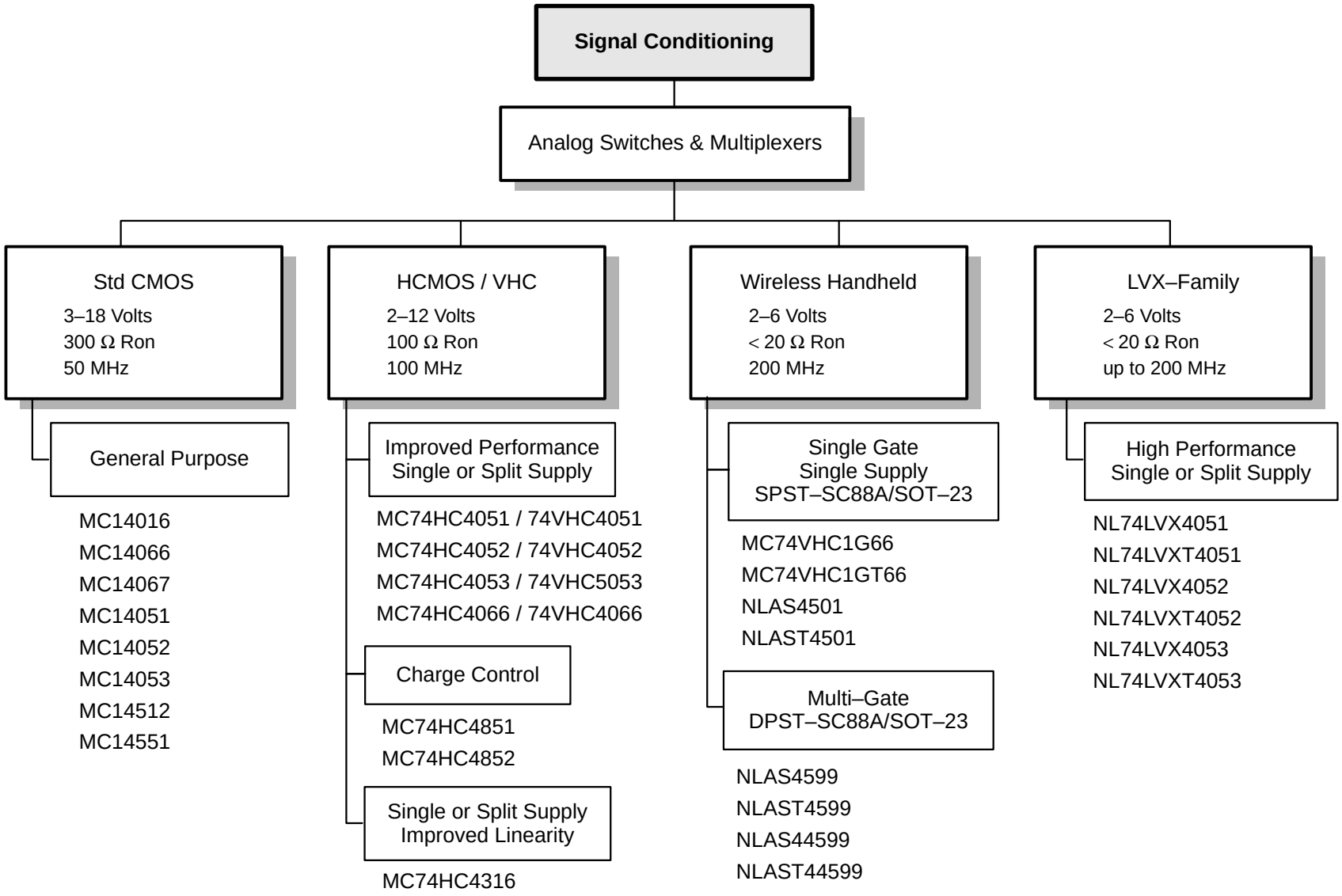
Dual Comparators

Device Name	V_{CC} (min)	V_{CC} (max)	V_{IO} (max) (mV)	Iio (max) (nA)	I_{IB} (typ) (nA)	Iq* (typ) (mA)	Temp Range (°C)	Response Time (ns)	Supply Type	Number of Channels	Package	Description
LM293	2.0 or ±1.0	36 or ±18	5.0	50	25	0.4	–25 to +85	1300	Single Split	2	SO–8	Low Offset Voltage
LM393	2.0 or ±1.0	36 or ±18	5.0	50	25	0.4	0 to 70	1300	Single Split	2	SO–8 DIP–8	Low Offset Voltage
LM2903	2.0 or ±1.0	36 or ±18	7.0	50	25	0.4	–40 to +105	1500	Single Split	2	SO–8 DIP–8	Low Offset Voltage
LM2903V	2.0 or ±1.0	36 or ±18	7.0	50	25	0.4	–40 to +125	1500	Single Split	2	SO–8 DIP–8	Low Offset Voltage

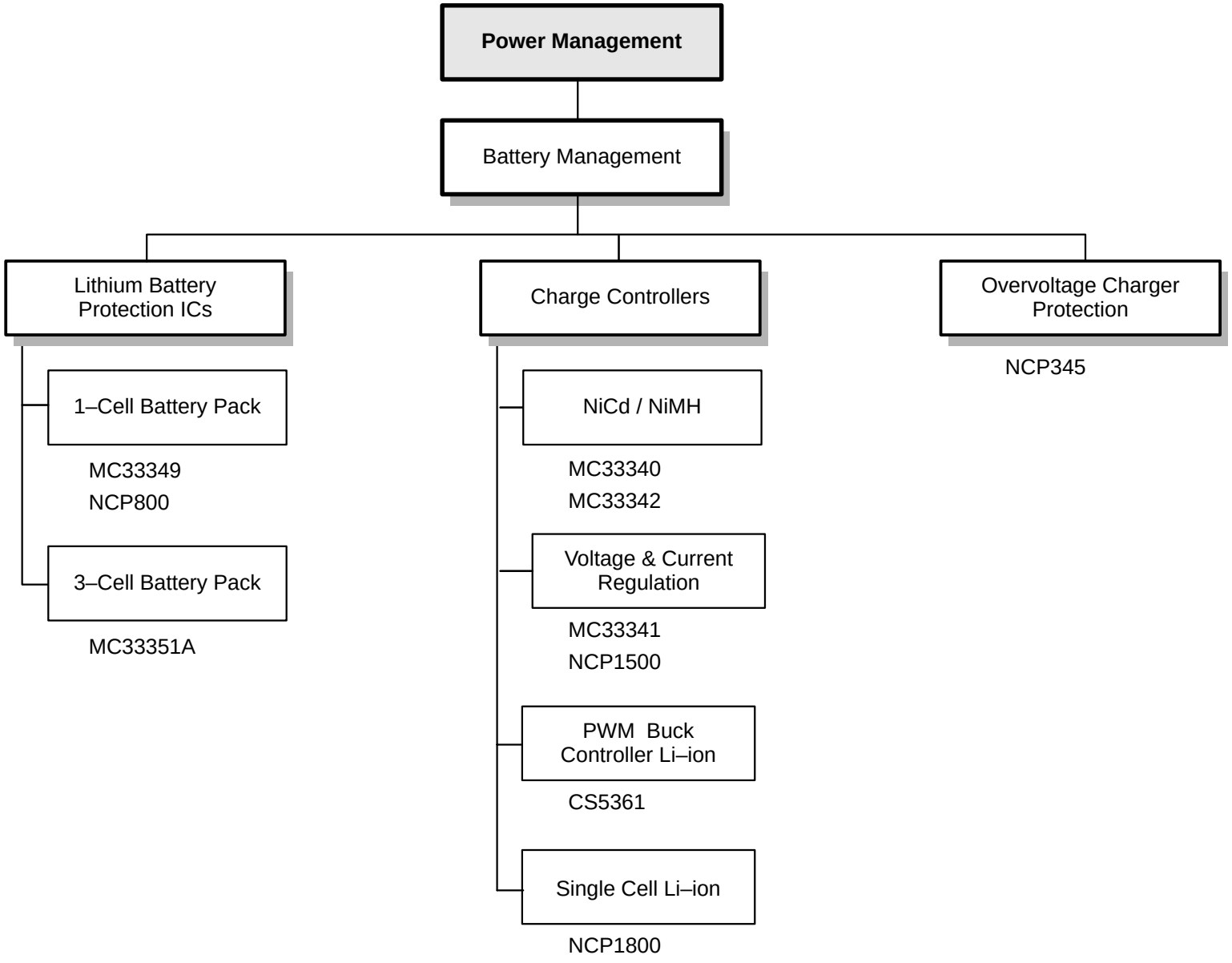
Quad Comparators

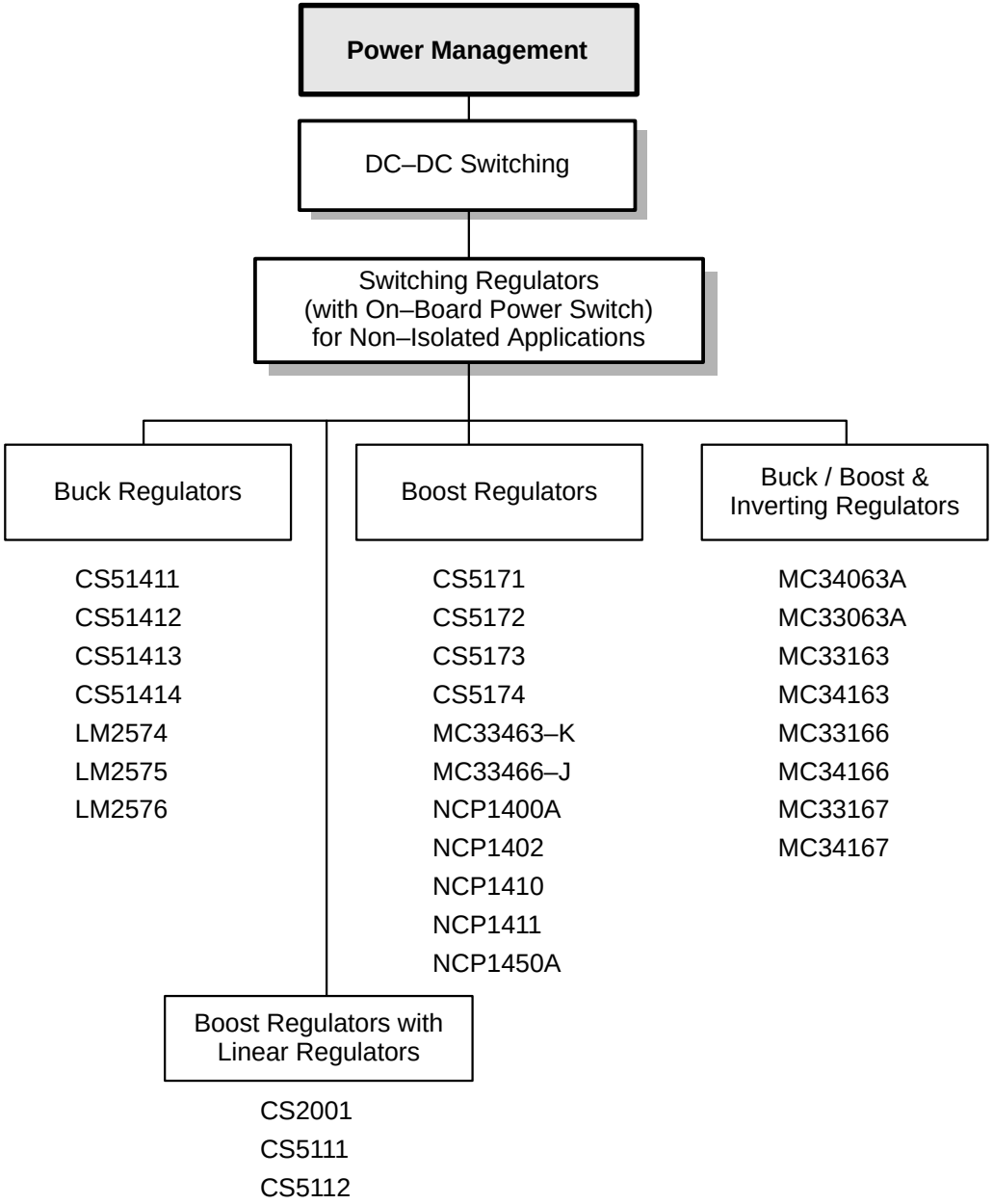
Device Name	V_{CC} (min)	V_{CC} (max)	V_{IO} (max) (mV)	Iio (max) (nA)	I_{IB} (typ) (nA)	Iq* (typ) (mA)	Temp Range (°C)	Response Time (ns)	Supply Type	Number of Channels	Package	Description
LM239	3.0 or ±1.5	36 or ±18	5.0	50	25	0.8	–25 to +85	1300	Single Split	4	SO–14 DIP–14	TTL and CMOS Compatible
LM339	3.0 or ±1.5	36 or ±18	5.0	50	25	0.8	0 to 70	1300	Single Split	4	SO–14 DIP–14	TTL and CMOS Compatible
LM2901	3.0 or ±1.5	36 or ±18	7.0	50	25	0.8	–40 to +105	1300	Single Split	4	SO–14 DIP–14	TTL and CMOS Compatible
LM2901V	3.0 or ±1.5	36 or ±18	7.0	50	25	0.8	–40 to +125	1300	Single Split	4	SO–14 DIP–14	TTL and CMOS Compatible
MC3302	3.0 or ±1.5	30 or ±15	20	100	25	0.8	–40 to +85	1300	Single Split	4	SO–14 DIP–14	TTL and CMOS Compatible

*Iq typical for total device (all channels)



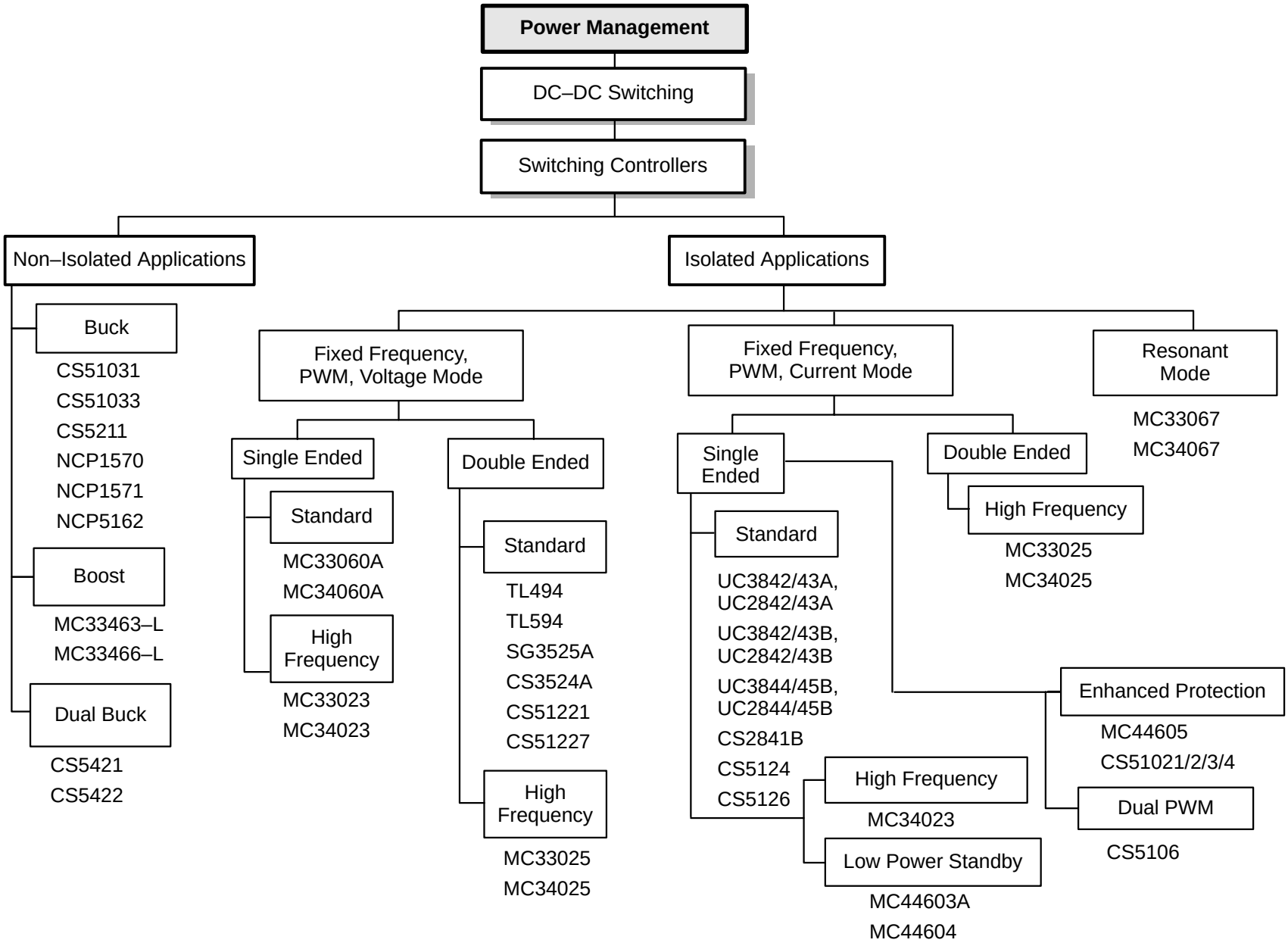
For more information on analog switches, please see the Analog Switch Brochure, BRD8007/D available online at **http://www.onsemi.com**, or from the Literature Distribution Center. For ordering details see back cover.


Power Management
Battery Management
Lithium Battery Protection ICs
Charge Controllers
Overvoltage Charger Protection
NCP345
1–Cell Battery Pack
MC33349
NCP800
3–Cell Battery Pack
MC33351A
NiCd / NiMH
MC33340
MC33342
Voltage & Current Regulation
MC33341
NCP1500
PWM Buck Controller Li–ion
CS5361
Single Cell Li–ion
NCP1800


Power Management
DC–DC Switching
Switching Regulators (with On–Board Power Switch) for Non–Isolated Applications
Buck Regulators
CS51411
CS51412
CS51413
CS51414
LM2574
LM2575
LM2576
Boost Regulators
CS5171
CS5172
CS5173
CS5174
MC33463–K
MC33466–J
NCP1400A
NCP1402
NCP1410
NCP1411
NCP1450A
Buck / Boost & Inverting Regulators
MC34063A
MC33063A
MC33163
MC34163
MC33166
MC34166
MC33167
MC34167
Boost Regulators with Linear Regulators
CS2001
CS5111
CS5112

Low Current Boost/Buck Regulators

I_{out}	Part No.	V_{in}	V_{out}	Frequency	Temp. Range (°C)	Control Method	Package	Features
10 mA	NCP1403	1.5 to 6.0 V	Up to 25 V	0 to 300 kHz	–40 to +85	PFM	SOT23–5	Enable
100 mA	NCP1400A	0.8 to 5.0 V	1.9, 2.5, 2.7, 3.0, 3.3, 5.0 V	180 kHz	–40 to +85	PWM	SOT23–5	Enable
200 mA	NCP1402	0.8 to 5.0 V	1.9, 2.7, 3.0, 3.3, 5.0 V	0 to 180 kHz	–40 to +85	PFM	SOT23–5	Enable
250 mA	NCP1410	1.0 to 5.5 V	1.5 to 5.5 V	0 to 600 kHz	–40 to +85	PFM	Micro8	Synchronous Rectification; Low Battery Detect
250 mA	NCP1411	1.0 to 5.5 V	1.5 to 5.5 V	0 to 600 kHz	–40 to +85	PFM	Micro8	NCP1410 with Anti–Ringing Circuitry; Enable
250 mA	NCP1417	1.0 to 5.5 V	1.5 to 5.5 V	0 to 600 kHz	–40 to +85	PFM	Micro8	NCP1410 with 2 Low Battery Detect
Up to 1.0 A	NCP1450	0.9 to 6.0 V	1.9, 2.7, 3.0, 3.3, 5.0 V	180 kHz	–40 to +85	PWM	SOT23–5	External FET, Enable


Power Management
DC–DC Switching
Switching Controllers
Non–Isolated Applications
Isolated Applications
Buck
CS51031
CS51033
CS5211
NCP1570
NCP1571
NCP5162
Boost
MC33463–L
MC33466–L
Dual Buck
CS5421
CS5422
Fixed Frequency, PWM, Voltage Mode
Single Ended
Standard
MC33060A
MC34060A
High Frequency
MC33023
MC34023
Double Ended
Standard
TL494
TL594
SG3525A
CS3524A
CS51221
CS51227
High Frequency
MC33025
MC34025
Fixed Frequency, PWM, Current Mode
Single Ended
Standard
UC3842/43A, UC2842/43A
UC3842/43B, UC2842/43B
UC3844/45B, UC2844/45B
CS2841B
CS5124
CS5126
High Frequency
MC34023
Low Power Standby
MC44603A
MC44604
Double Ended
High Frequency
MC33025
MC34025
Enhanced Protection
MC44605
CS51021/2/3/4
Dual PWM
CS5106
Resonant Mode
MC33067
MC34067

General Purpose Buck Converters (For Non–Isolated Step–Down Application)

I_{out}	Part No.	V_{in}	V_{out}	Frequency	Temp. Range (°C)	Control Method	Package
0.5 A	LM2574DW–ADJ	4.75 to 40 V	1.23 V to 37 V	Fixed 52 kHz	–40 to +125	Voltage Mode	SO–16
0.5 A	LM2574N–3.3	4.75 to 40 V	Fixed 3.3 V	Fixed 52 kHz	–40 to +125	Voltage Mode	DIP–8
0.5 A	LM2574N–5	7.0 to 40 V	Fixed 5.0 V	Fixed 52 kHz	–40 to +125	Voltage Mode	DIP–8
0.5 A	LM2574N–12	15 to 40 V	Fixed 12 V	Fixed 52 kHz	–40 to +125	Voltage Mode	DIP–8
0.5 A	LM2574N–15	18 to 40 V	Fixed 15 V	Fixed 52 kHz	–40 to +125	Voltage Mode	DIP–8
1.0 A	LM2575D2T–ADJ	8.0 to 40 V	1.23 V to 37 V	Fixed 52 kHz	–40 to +125	Voltage Mode	D^2PAK
1.0 A	LM2575T–ADJ	8.0 to 40 V	1.23 V to 37 V	Fixed 52 kHz	–40 to +125	Voltage Mode	TO–220
1.0 A	LM2575TV–ADJ	8.0 to 40 V	1.23 V to 37 V	Fixed 52 kHz	–40 to +125	Voltage Mode	TO–220
1.0 A	LM2575D2T–3.3	4.75 to 40 V	Fixed 3.3 V	Fixed 52 kHz	–40 to +125	Voltage Mode	D^2PAK
1.0 A	LM2575T–3.3	4.75 to 40 V	Fixed 3.3 V	Fixed 52 kHz	–40 to +125	Voltage Mode	TO–220
1.0 A	LM2575TV–3.3	4.75 to 40 V	Fixed 3.3 V	Fixed 52 kHz	–40 to +125	Voltage Mode	TO–220
1.0 A	LM2575D2T–5	8.0 to 40 V	Fixed 5.0 V	Fixed 52 kHz	–40 to +125	Voltage Mode	D^2PAK
1.0 A	LM2575T–5	8.0 to 40 V	Fixed 5.0 V	Fixed 52 kHz	–40 to +125	Voltage Mode	TO–220
1.0 A	LM2575TV–5	8.0 to 40 V	Fixed 5.0 V	Fixed 52 kHz	–40 to +125	Voltage Mode	TO–220
1.0 A	LM2575D2T–12	15 to 40 V	Fixed 12 V	Fixed 52 kHz	–40 to +125	Voltage Mode	D^2PAK
1.0 A	LM2575T–12	15 to 40 V	Fixed 12 V	Fixed 52 kHz	–40 to +125	Voltage Mode	TO–220
1.0 A	LM2575TV–12	15 to 40 V	Fixed 12 V	Fixed 52 kHz	–40 to +125	Voltage Mode	TO–220
1.0 A	LM2575D2T–15	18 to 40 V	Fixed 15 V	Fixed 52 kHz	–40 to +125	Voltage Mode	D^2PAK
1.0 A	LM2575T–15	18 to 40 V	Fixed 15 V	Fixed 52 kHz	–40 to +125	Voltage Mode	TO–220
1.0 A	LM2575TV–15	18 to 40 V	Fixed 15 V	Fixed 52 kHz	–40 to +125	Voltage Mode	TO–220
3.0 A	LM2576D2T–ADJ	8.0 to 40 V	1.23 V to 37 V	Fixed 52 kHz	–40 to +125	Voltage Mode	D^2PAK
3.0 A	LM2576T–ADJ	8.0 to 40 V	1.23 V to 37 V	Fixed 52 kHz	–40 to +125	Voltage Mode	TO–220
3.0 A	LM2576TV–ADJ	8.0 to 40 V	1.23 V to 37 V	Fixed 52 kHz	–40 to +125	Voltage Mode	TO–220
3.0 A	LM2576D2T–3.3	6.0 to 40 V	Fixed 3.3 V	Fixed 52 kHz	–40 to +125	Voltage Mode	D^2PAK
3.0 A	LM2576T–3.3	6.0 to 40 V	Fixed 3.3 V	Fixed 52 kHz	–40 to +125	Voltage Mode	TO–220
3.0 A	LM2576TV–3.3	6.0 to 40 V	Fixed 3.3 V	Fixed 52 kHz	–40 to +125	Voltage Mode	TO–220
3.0 A	LM2576D2T–5	8.0 to 40 V	Fixed 5.0 V	Fixed 52 kHz	–40 to +125	Voltage Mode	D^2PAK
3.0 A	LM2576T–5	8.0 to 40 V	Fixed 5.0 V	Fixed 52 kHz	–40 to +125	Voltage Mode	TO–220
3.0 A	LM2576TV–5	8.0 to 40 V	Fixed 5.0 V	Fixed 52 kHz	–40 to +125	Voltage Mode	TO–220
3.0 A	MC33166D2T	7.5 to 40 V	> 5.0 V	Fixed 72 kHz	–40 to +85	Voltage Mode	D^2PAK

General Purpose Buck Converters (For Non–Isolated Step–Down Application) (continued)

I_{out}	Part No.	V_{in}	V_{out}	Frequency	Temp. Range (°C)	Control Method	Package
3.0 A	MC33166T	7.5 to 40 V	> 5.0 V	Fixed 72 kHz	–40 to +85	Voltage Mode	TO–220
3.0 A	MC33166TH	7.5 to 40 V	> 5.0 V	Fixed 72 kHz	–40 to +85	Voltage Mode	TO–220
3.0 A	MC33166TV	7.5 to 40 V	> 5.0 V	Fixed 72 kHz	–40 to +85	Voltage Mode	TO–220
3.0 A	MC34166D2T	7.5 to 40 V	> 5.0 V	Fixed 72 kHz	0 to 70	Voltage Mode	D^2PAK
3.0 A	MC34166T	7.5 to 40 V	> 5.0 V	Fixed 72 kHz	0 to 70	Voltage Mode	TO–220
3.0 A	MC34166TH	7.5 to 40 V	> 5.0 V	Fixed 72 kHz	0 to 70	Voltage Mode	TO–220
3.0 A	MC34166TV	7.5 to 40 V	> 5.0 V	Fixed 72 kHz	0 to 70	Voltage Mode	TO–220
3.0 A	LM2576D2T–12	15 to 40 V	Fixed 12 V	Fixed 52 kHz	–40 to +125	Voltage Mode	D^2PAK
3.0 A	LM2576T–12	15 to 40 V	Fixed 12 V	Fixed 52 kHz	–40 to +125	Voltage Mode	TO–220
3.0 A	LM2576TV–12	15 to 40 V	Fixed 12 V	Fixed 52 kHz	–40 to +125	Voltage Mode	TO–220
3.0 A	LM2576D2T–15	18 to 40 V	Fixed 15 V	Fixed 52 kHz	–40 to +125	Voltage Mode	D^2PAK
3.0 A	LM2576T–15	18 to 40 V	Fixed 15 V	Fixed 52 kHz	–40 to +125	Voltage Mode	TO–220
3.0 A	LM2576TV–15	18 to 40 V	Fixed 15 V	Fixed 52 kHz	–40 to +125	Voltage Mode	TO–220
5.0 A	MC33167D2T	7.5 to 40 V	> 5.0 V	Fixed 72 kHz	–40 to +85	Voltage Mode	D^2PAK
5.0 A	MC33167T	7.5 to 40 V	> 5.0 V	Fixed 72 kHz	–40 to +85	Voltage Mode	TO–220
5.0 A	MC33167TH	7.5 to 40 V	> 5.0 V	Fixed 72 kHz	–40 to +85	Voltage Mode	TO–220
5.0 A	MC33167TV	7.5 to 40 V	> 5.0 V	Fixed 72 kHz	–40 to +85	Voltage Mode	TO–220
5.0 A	MC34167D2T	7.5 to 40 V	> 5.0 V	Fixed 72 kHz	0 to 70	Voltage Mode	D^2PAK
5.0 A	MC34167T	7.5 to 40 V	> 5.0 V	Fixed 72 kHz	0 to 70	Voltage Mode	TO–220
5.0 A	MC34167TH	7.5 to 40 V	> 5.0 V	Fixed 72 kHz	0 to 70	Voltage Mode	TO–220
5.0 A	MC34167TV	7.5 to 40 V	> 5.0 V	Fixed 72 kHz	0 to 70	Voltage Mode	TO–220

General Purpose Buck Controllers (For Non–Isolated Step–Down Application)

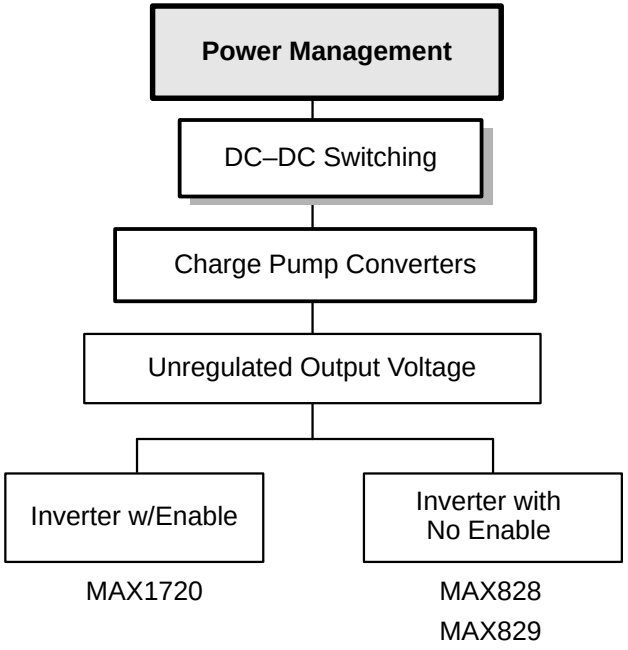
Peak output to MOSFET	Part No.	V_{in}	V_{ref}	Output Current	Frequency	Temp. Range (°C)	Control Method	Package	Remark
1.0 A	CS51031YD8	4.5 to 16 V	1.25 V	by External P MOSFET	max 700 kHz	–40 to +125	Voltage Mode	SO–8	
1.0 A	CS51031GD8	4.5 to 16 V	1.25 V	by External P MOSFET	max 700 kHz	–40 to +125	Voltage Mode	SO–8	
1.0 A	CS51033YD8	3.3 V	1.25 V	by External P MOSFET	max 700 kHz	–40 to +125	Voltage Mode	SO–8	
1.0 A	CS51033GD8	3.3 V	1.25 V	by External P MOSFET	max 700 kHz	0 to 70	Voltage Mode	SO–8	
	CS5211								
1.5 A	NCP1570	11.4 V to 12.6 V	0.985 V	by External N MOSFET	200 kHz	0 to 70	$V^{2®}$ Control	SO–8	
	NCP5162								
–	CS51411E	4.5 V to 40 V	1.276 V	1.5 A	260 kHz	–40 to +85	V^2 Control	SO–8	Synchronization Pin
–	CS51411G	4.5 V to 40 V	1.276 V	1.5 A	260 kHz	0 to 70	V^2 Control	SO–8	Synchronization Pin
–	CS51412E	4.5 V to 40 V	1.276 V	1.5 A	260 kHz	–40 to +85	V^2 Control	SO–8	Bias Pin
–	CS51412G	4.5 V to 40 V	1.276 V	1.5 A	260 kHz	0 to 70	V^2 Control	SO–8	Bias Pin
–	CS51413E	4.5 V to 40 V	1.276 V	1.5 A	520 kHz	–40 to +85	V^2 Control	SO–8	Synchronization Pin
–	CS51413G	4.5 V to 40 V	1.276 V	1.5 A	520 kHz	0 to 70	V^2 Control	SO–8	Synchronization Pin
–	CS51414E	4.5 V to 40 V	1.276 V	1.5 A	520 kHz	–40 to +85	V^2 Control	SO–8	Bias Pin
–	CS51414G	4.5 V to 40 V	1.276 V	1.5 A	520 kHz	0 to 70	V^2 Control	SO–8	Bias Pin

General Purpose Boost Converters (For Non–Isolated Step–Up Applications) (Can also be configured for Boost, Flyback, Forward)

Internal Switch	Part No.	V_{in}	V_{out}	Frequency	Temp. Range (°C)	Package	Remark
1.5 A	CS5171ED8	2.7 V to 30 V	Programmable	Fixed 280 kHz	–40 to +85	SO–8	
1.5 A	CS5171GD8	2.7 V to 30 V	Programmable	Fixed 280 kHz	0 to 70	SO–8	
1.5 A	CS5172ED8	2.7 V to 30 V	Programmable	Fixed 280 kHz	–40 to +85	SO–8	Negative Feedback of CS5171
1.5 A	CS5172GD8	2.7 V to 30 V	Programmable	Fixed 280 kHz	0 to 70	SO–8	Negative Feedback of CS5171
1.5 A	CS5173ED8	2.7 V to 30 V	Programmable	Fixed 560 kHz	–40 to +85	SO–8	
1.5 A	CS5173GD8	2.7 V to 30 V	Programmable	Fixed 560 kHz	0 to 70	SO–8	
1.5 A	CS5174ED8	2.7 V to 30 V	Programmable	Fixed 560 kHz	–40 to +85	SO–8	Negative Feedback of CS5173
1.5 A	CS5174GD8	2.7 V to 30 V	Programmable	Fixed 560 kHz	0 to 70	SO–8	Negative Feedback of CS5173

DC–DC Boost Converters (For Non–Isolated Step–Up Applications)

V_{in}	Part No.	V_{out}	Switch	Frequency	Temp. Range (°C)	Package
0.9 to 8.0 V	MC33466H–30LT1	Fixed 3 V	External	Fixed 100 kHz	–30 to +80	SOT–89
	MC33463H–30LT1			VFM around 100 kHz		
	MC33466H–30JT1		Internal	Fixed 50 kHz		
	MC33463H–30KT1			VFM around 100 kHz		
	MC33466H–33LT1	Fixed 3.3 V	External	Fixed 100 kHz		
	MC33463H–33LT1			VFM around 100 kHz		
	MC33466H–33JT1		Internal	Fixed 50 kHz		
	MC33463H–33KT1			VFM around 100 kHz		
	MC33466H–50LT1	Fixed 5 V	External	Fixed 100 kHz		
	MC33463H–50LT1			VFM around 100 kHz		
	MC33466H–50JT1		Internal	Fixed 50 kHz		
	MC33463H–50KT1			VFM around 100 kHz		


Power Management
DC–DC Switching
Charge Pump Converters
Unregulated Output Voltage
Inverter w/Enable
Inverter with No Enable
MAX1720
MAX828
MAX829

Charge Pump Converters

Output Current (Typ mA)	**Part No.**	**Output Voltage**	**Input Voltage Range** (V)	**Oscillator Frequency** (kHz)	**Quiescent Supply Current*** (Max µA @ 25°C)	**Package**	**Features**
25	MAX828	$V_{out} = -V_{in}$ or $V_{out} = 2\ V_{in}$	1.5 → 5.5	10 / 35	90	SOT–23–5	
25	MAX829	$V_{out} = -V_{in}$ or $V_{out} = 2\ V_{in}$	1.5 → 5.5	12	260	SOT–23–5	
25	MAX1720	$V_{out} = -V_{in}$ or $V_{out} = 2\ V_{in}$	1.5 → 5.5	35	90	TSOP–6	with Enable

*Measured at V_{DD} = 5.0 V at 25°C and no load.

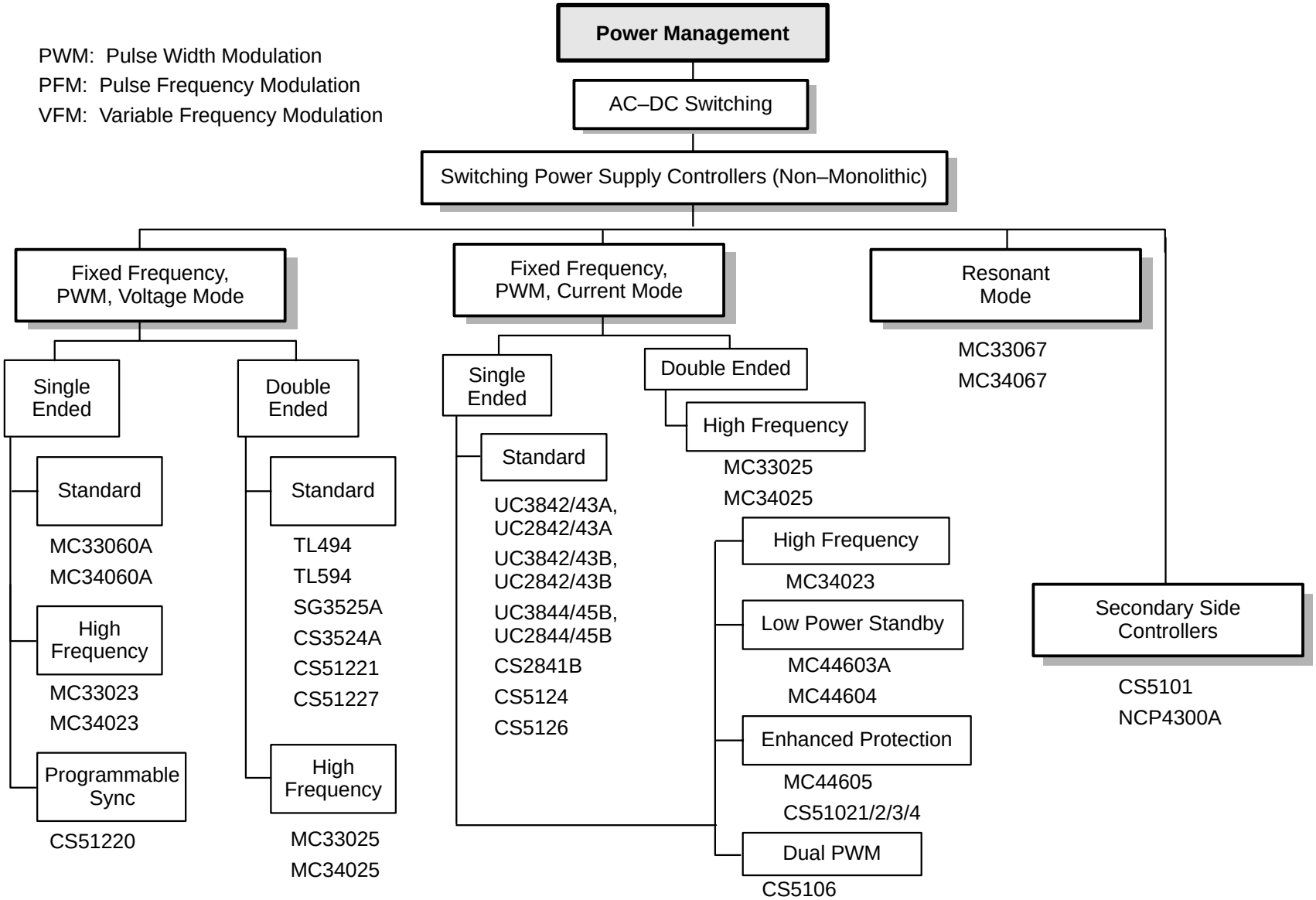
Power Management

DC–DC Switching

CPU DC–DC Controllers

Single Phase w/ DAC for 12 V Only	Single Phase w/ DAC	Single Phase w/ DAC & VRef	Multi–Phase
CS5150H	CS5150H	CS51313	CS5301
CS5151H	CS5151H		CS5302
CS5155H	CS5155H		CS5303
CS5156H	CS5156H		CS5305
CS5161H	CS5157H		CS5307
CS5165H	CS5158		CS5308
CS5166H	CS5159		CS5322
CS51312	CS5160		NCP5322A
	CS5161		CS5323
	CS5165H		CS5332
	CS5166H		
	CS51311		
	MC33470		

PWM: Pulse Width Modulation
PFM: Pulse Frequency Modulation
VFM: Variable Frequency Modulation



Enhanced Current–Mode PWM Controller

Part No.	Package	Features	Application
CS51021AED16	16L SO Narrow	• 75 uA Max. Startup Current (Comparing to 0.5 ~ 1 mA in UC384X) • Fixed Frequency Current–Mode Control up to 1 MHz (500 kHz in UC384X) • Input Voltage Monitor (Under/Over) • Programmable Dual Threshold Current Sense for OCP (Fast and Slow) • LEB (55 ns) Current Sense • Programmable Slope Compensation • Adjustable Soft Start • Programmable Maximum Duty Cycle • Sleep (CS51022/51024)/Bi–directional Sync (CS51021/51023) Options • UVLO Options: (8.25/7.7 V) for CS51021/22/(13/7.7 V) for CS51023/24 • Operating Junction Temperature Range –40°C to +150°C • 50 ns Shutdown Propagation Delay • 1 A FET Driver	More Programmable and Enhanced Features to Replace the General Market of UC384X
CS51022AED16			
CS51023AED16			
CS51024AED16			

Enhanced Voltage–Mode PWM Controller

Part No.	Package	Features	Application
CS51227ED8	8L SO Narrow	• Fixed Frequency Voltage Mode Control with Feedforward • Programmable Volt–Second Clamp • Programmable Frequency (up to 1 MHx) • 1 A FET Driving Capability • Thermal Shutdown • 75 μA, Maximum Startup Current • 150 ns LEB for Over Current Protection • Operate from 5 V Supply – 4.6 V UVLO	DC/DC Converter to have Simple Solution with Feedforward Control Function in a Small SO–8 Package

CS51221ED16	16L SO Narrow	• With Enhanced Features in Addition to CS51227
		  • Bi–directional Synchronization
		  • 3.3 V Reference Voltage Output
		  • Programmable Under and Overvoltage Monitor
		  • Programmable Soft Start
		  • Hiccup Mode Fault Timing
			When more Control Features and Flexibility are wanted

CS51221EN16	16L DIP		

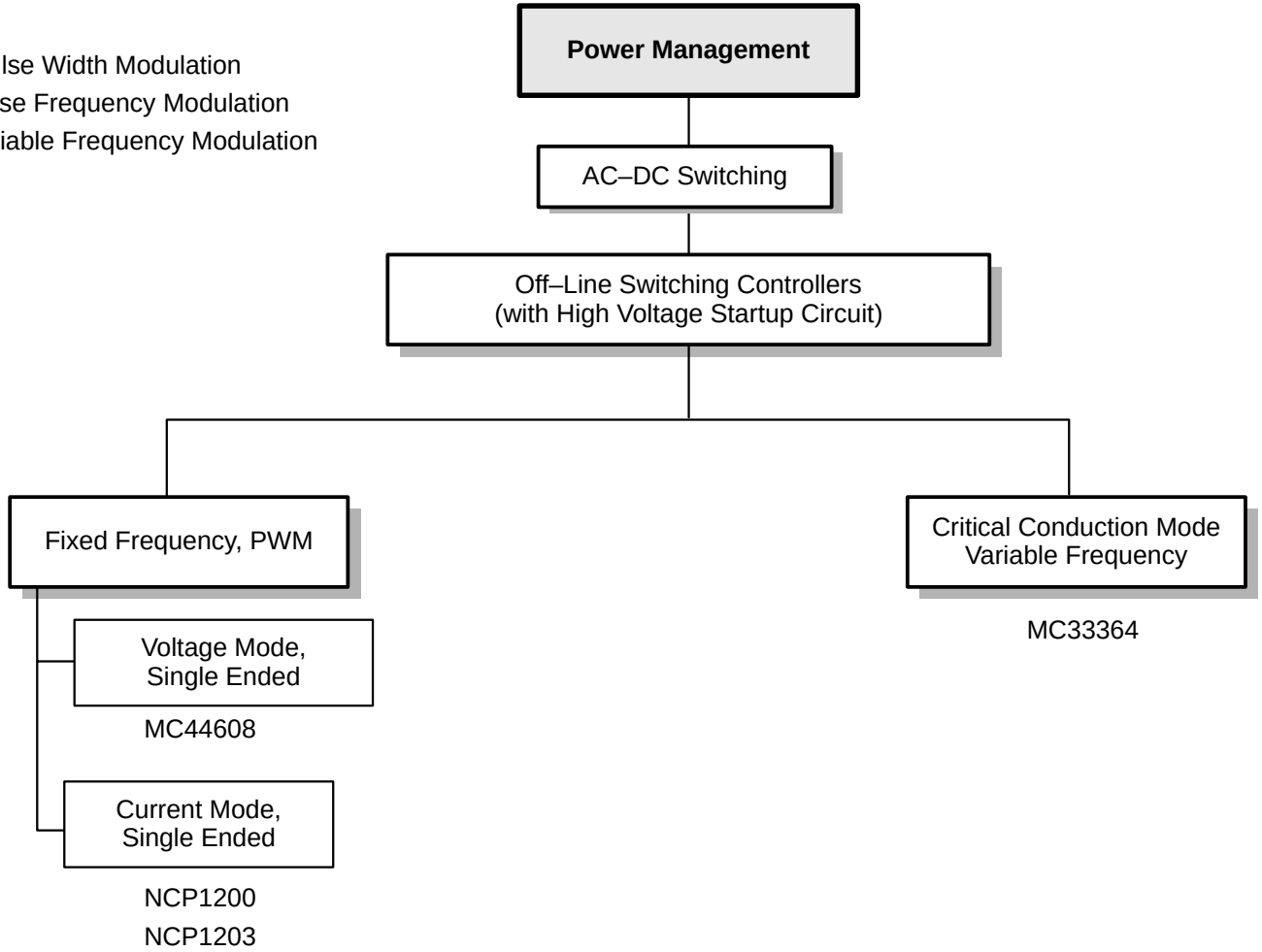
Synchronous Rectification PWM Controller with Auxiliary Output

Part No.	Package	Features	Application
CS5106LSW24	24 Lead SSOP	• Integrated Bootstrap Controller • Synchronous Drivers with Programmable Non–Overlap Time for Main Output • Input OVLO/UVLO • Output Undervoltage Protection with Timer • Under and Overvoltage Shutdown • Enable Lead • Master/Slave Clock Synchronous Frequency Range Detect +25%, –35% • 20 mA 5 V Reference Output • –40°C to +85°C Operating Temperature Range • Auxiliary Drive for Output	Full–Featured High Power Isolated DC/DC Converter with 2 Outputs

Highly Integrated PWM Current–Mode Controller

Part No.	Package	Features	Application
CS5124XD8	8L SO Narrow	• Input UVLO • Direct Optocoupler Interface • Soft–Start Capacitor Pin • LEB (Leading Edge Blanking) for Current Sense (130 ns) • –40°C to +125°C Operating Junction Temperature Range • Thermal Shutdown • Sleep Mode On/Off Pin • CS5124 is 400 kHz with Bias Pin for Startup Circuitry, 195 mV First Current Sense Threshold for Resistor Current Sensing • CS5126 is 200 kHz with Sync Pin, 330 mV First Current Sense Threshold for Current Sense Transformer	Compact Sub 50 W Isolated DC/DC Flyback
CS5126XD8			

PWM: Pulse Width Modulation
PFM: Pulse Frequency Modulation
VFM: Variable Frequency Modulation



Off–Line Controllers (with High Voltage Start–up Circuit)

Part No.	Package	Features	Application
MC33364DR	SO–16	• Critical Conduction Mode Operation to Minimize Inductor Size • No Startup Resistor, Lossless Off–Line Startup • Optional/Adjustable Frequency Clamp to Limit EMI MC33364D: The Internal Frequency Clamp can either Lengthened, Shorted or Eliminated by Biasing the Appropriate Pin MC33364D1: The Internal Frequency Clamp is Fixed at 6.9 µs (Typ) MC33364D2: There is No Internal Frequency Clamp • Leading Edge Blanking (LEB) for Noise Immunity and Prevent False Triggering • Input Under Voltage Lockout with Hysteresis (7.6 V/15 V Typ) • Over Current Limitation, Thermal Shutdown Ability • Restart Delay after Fault	General High–Density Low–Cost AC/DC Application
MC33364D1	SO–8		
MC33364D2	SO–8		
MC44608P40	DIP–8	• 40 kHz, 75kHz, 100 kHz Fixed PWM Frequencies for Different Suffixes • Programmable Sleep Mode during Stand–By Operation • No Startup Resistor, Lossless Off–Line Startup • Input Under Voltage Lockout with Hysteresis • Maximum Duty Cycle Limitation • Over Current Limitation, Over VCC Protection • Over Temperature Protection with Hysteresis (130°C/160°C) • Requires fewer External Components	General Application Requires Sleep Mode Output Power as 1 W
MC44608P75	DIP–8		
MC44608P100	DIP–8		
NCP1200P40	DIP–8	• 40 kHz, 60 kHz, 100 kHz Fixed PWM Frequency • Current–Mode Sleep Capability with Adjustable Peak Skipping Current for Low Level of Audible Noise to Save Power at No Load • Direct Optocoupler Connection for Saving External Components • Direct Line Powered with No Auxiliary Winding and No Startup Resistor are Needed • Internal Output Short–Circuit Protection and LEB	Very Small Power Application (about 10 W) and needs Sleep Mode Function such as Battery Charger
NCP1200D40	SO–8		

PWM: Pulse Width Modulation
PFM: Pulse Frequency Modulation
VFM: Variable Frequency Modulation

Power Management

AC–DC Switching

Very High Voltage Off–Line Switching Regulators (Monolithic) (with On–Board Power Switch)

Fixed Frequency, PWM, Voltage Mode

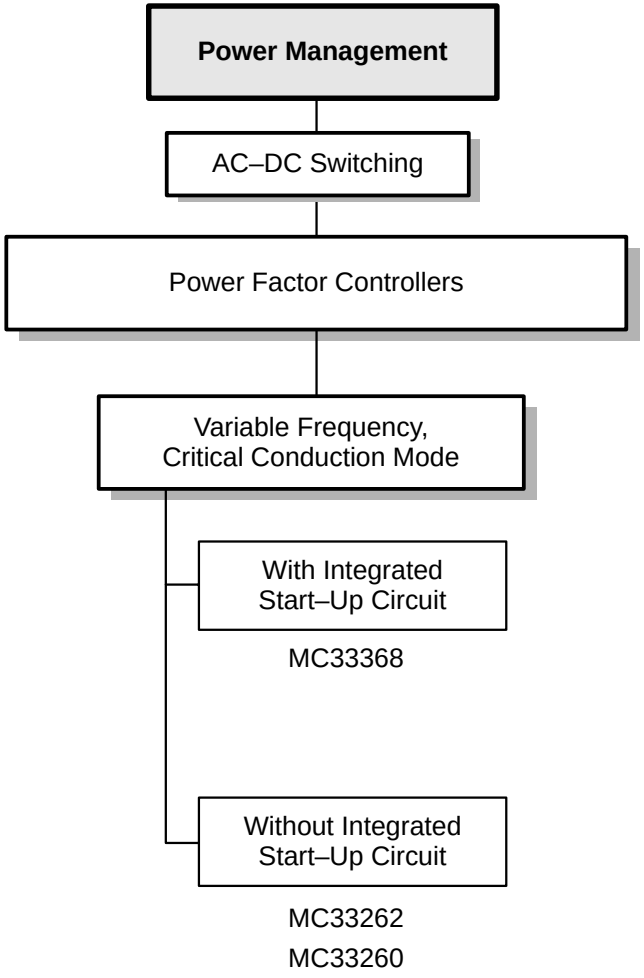
MC33363/A/B
MC33365
MC33362
NCP1000
NCP1001
NCP1002
NCP1050
NCP1051
NCP1052
NCP1053
NCP1054
NCP1055

Very High Voltage Off–Line Switching Regulators with On–Chip Power Switch

This monolithic high voltage switching regulator is specifically designed to operate from a rectified ac line voltage source. Included are an on–chip high voltage power switch, active off–line startup circuitry and a full featured PWM controller with fault protection.

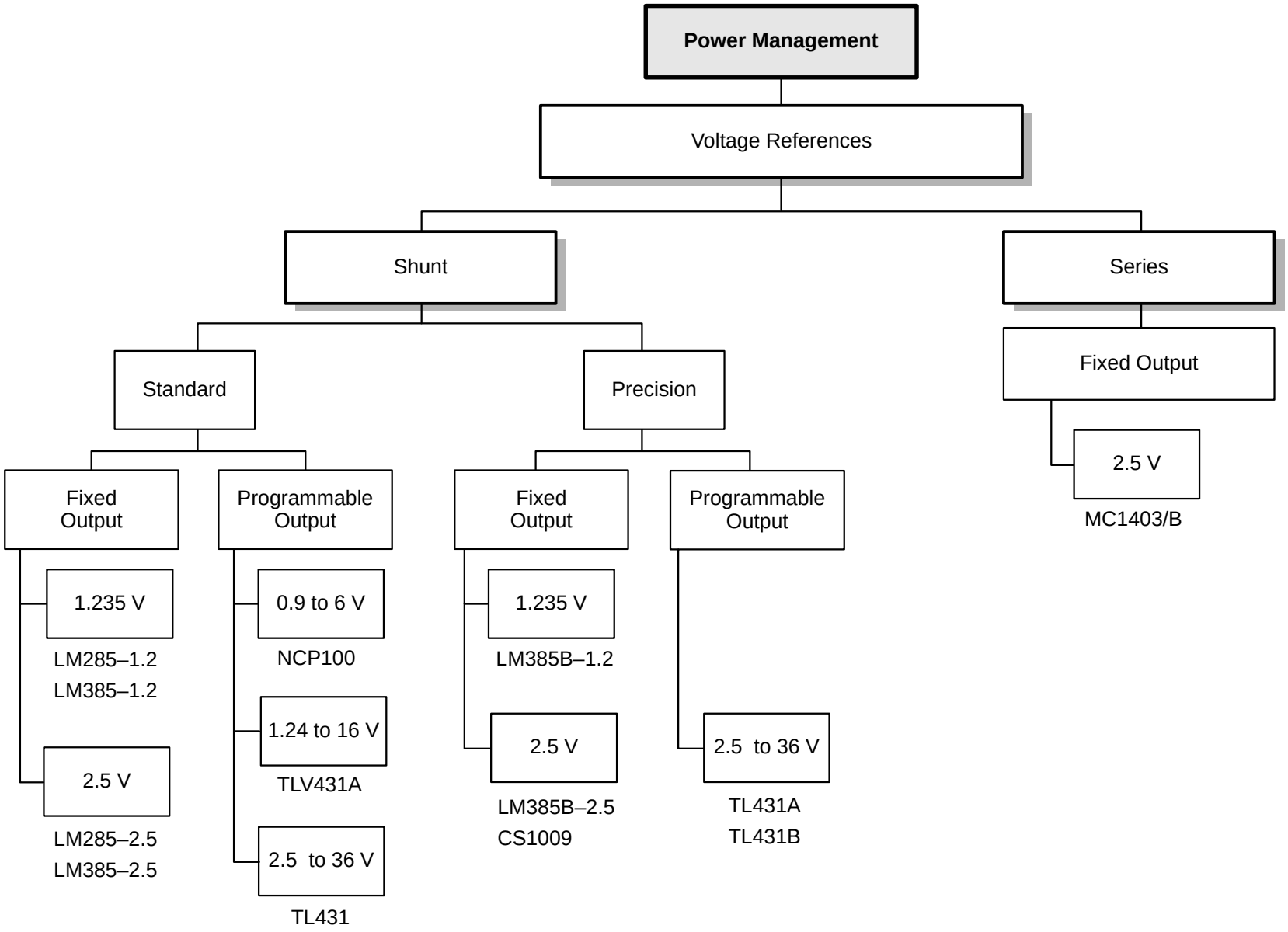
Device	Rectified 85 to 276 VAC Line	Power Switch MOSFET Integrated	Max Drain Voltage	Peak Switch Current	$R_{DS(on)}$ (Typ @ T_J = 25°C)	Max Output Power @ V_{in} = 92 V to 265 VAC See Note	Start–Up	Control Scheme	Oscillator Frequency	Package	Temperature Range	Additional Features
MC33362	120 VAC Operation	Yes	500 V	0.9 A	4.4 Ω	20 W	Active On–Chip 250 V FET	• PWM, Fixed Frequency • Voltage Mode	Adjustable up to 300 kHz	DIP–16 SO–16WB	–25 to +125°C	
MC33363A	Yes	Yes	700 V	0.9 A	7.5 Ω	14 W	Active On–Chip 500 V FET	• PWM, Fixed Frequency • Voltage Mode	Adjustable up to 300 kHz	DIP–16 SO–16WB	–25 to +125°C	
MC33363B	Yes	Yes	700 V	0.72 A	15 Ω	8.0 W	Active On–Chip 450 V FET	• PWM, Fixed Frequency • Voltage Mode	Adjustable up to 300 kHz	DIP–16 SO–16WB	–25 to +125°C	
MC33365	Yes	Yes	700 V	0.72 A	15 Ω	8.0 W	Active On–Chip 450 V FET	• PWM, Fixed Frequency • Voltage Mode	Adjustable up to 300 kHz	DIP–16 SO–16WB	–25 to +125°C	Bulk Capacitor Voltage Sensing Capability to Sense an AC Line Brown–Out

NOTE: Typical output power is dependent upon line voltage range, heatsinking and ambient temperature.


Power Management
AC–DC Switching
Power Factor Controllers
Variable Frequency,
Critical Conduction Mode
With Integrated
Start–Up Circuit
MC33368
Without Integrated
Start–Up Circuit
MC33262
MC33260

Power Factor Controllers

Device	Operating Modes	Switching Frequency	Features	Voltage Reference	Maximum Input Voltage	Temp Range	Package
MC33260	• Voltage Mode • Follower Boost or Fixed Output • Critical Conduction Mode	Free to 500 kHz Fixed Clamp	• Synchronization Capability • Output Current Sense • Output Overvoltage Detect • Input Undervoltage Lockout • Maximum On time Limit	None	16 V	–40°C to 105°C	PDIP–8 SOIC–8
MC33262	• Current Mode • Fixed Output Voltage • Critical Conduction Mode	Free, no Frequency Clamp	• Output Current Sense • Output Overvoltage Detect • Input Undervoltage Lockout • Zero Current Detect	2.5 V +/– 1.4%	30 V	–40°C to 105°C	PDIP–8 SOIC–8
MC34262	• Current Mode • Fixed Output Voltage • Critical Conduction Mode	Free, no Frequency Clamp	• Output Current Sense • Output Overvoltage Detect • Input Undervoltage Lockout • Zero Current Detect	2.5 V +/– 1.4%	30 V	0°C to 85°C	PDIP–8 SOIC–8
MC33368	• Current Mode • Fixed Output Voltage • Critical Conduction Mode	Free, Programmable Frequency Clamp	• True Off–line Start–Up • Output Current Sense • Output Overvoltage Detect • Input Undervoltage Lockout • Zero Current Detect	5.0 V +/– 1.5%	500 V	–25°C to 125°C	SOIC–16

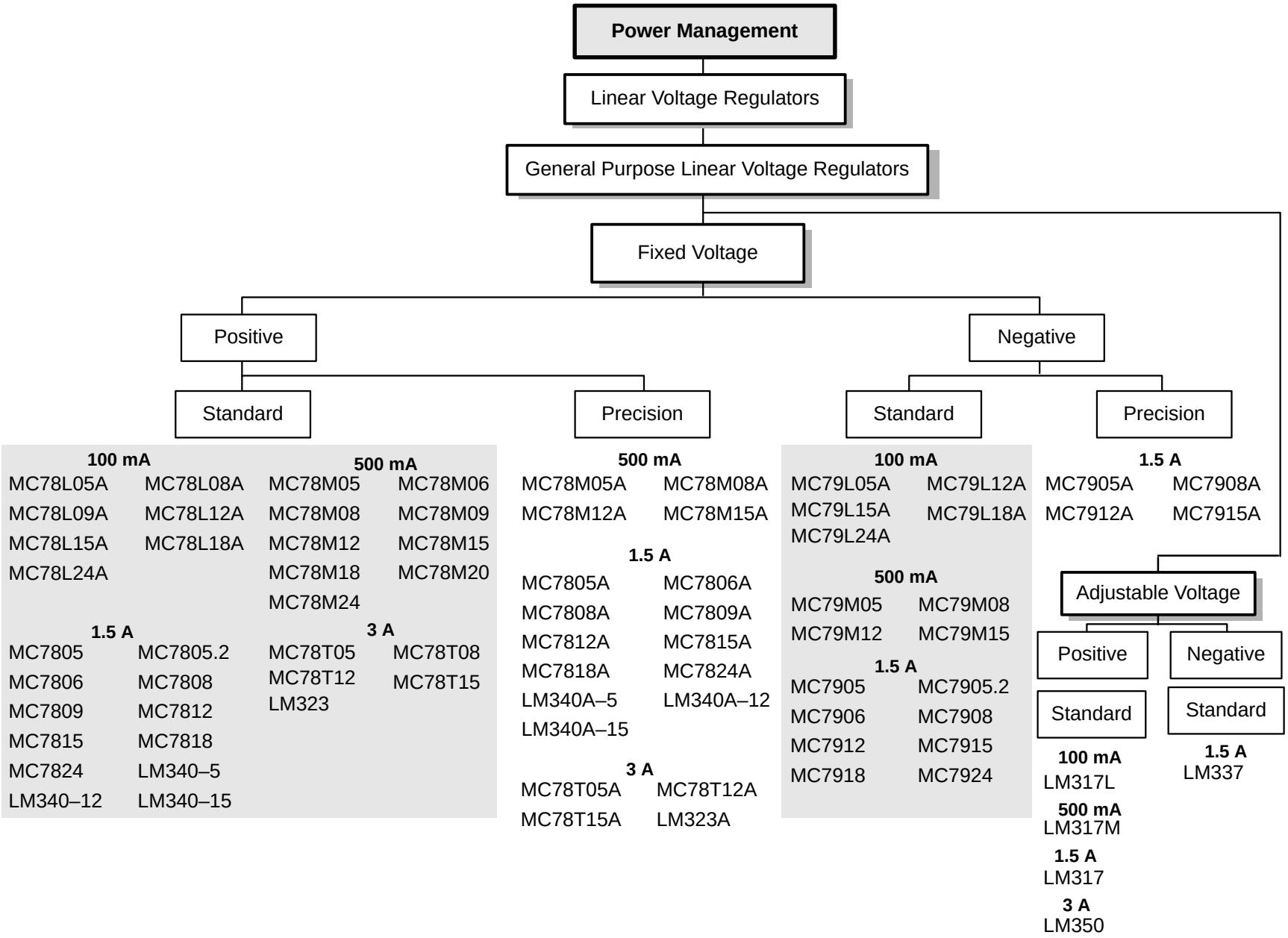

Power Management
Voltage References
Shunt
Series
Standard
Precision
Fixed Output
Fixed Output
2.5 V
MC1403/B
Fixed Output
Programmable Output
Fixed Output
Programmable Output
1.235 V
LM285–1.2
LM385–1.2
2.5 V
LM285–2.5
LM385–2.5
0.9 to 6 V
NCP100
1.24 to 16 V
TLV431A
2.5 to 36 V
TL431
1.235 V
LM385B–1.2
2.5 V
LM385B–2.5
CS1009
2.5 to 36 V
TL431A
TL431B

Series Voltage References

Part Number	Reference Voltage (V)	Tolerance +/– (%)	Typical Temperature Coefficient (ppm/°C)	Typical Quiescent Current (mA)	Package		Operating Temperature Range (°C)
					SO–8	PDIP	
MC1403	2.500	1.0	10	1.200	√	√	0 to +70
MC1403B	2.500	1.0	10	1.200	√	√	–40 to +85

Shunt Voltage References

Part Number	Reference Voltage (V)	Tolerance +/– (%)	Typical Temperature Coefficient (ppm/°C)	Minimum Operating Current (mA)	Package					Operating Temperature Range (°C)
					SO–8	TO–92	Micro8	TSOP–5	PDIP	
LM285–1.2	1.235	1.0	80	0.010	√	√				–40 to +85
LM385–1.2	1.235	2.0	80	0.015	√	√				0 to +70
LM285–2.5	2.500	1.5	80	0.020	√	√				0 to +70
LM385–2.5	2.500	3.0	80	0.020	√	√				0 to +70
LM385B–1.2	1.235	1.0	80	0.020	√	√				0 to +70
LM385B–2.5	2.500	1.5	80	0.020	√	√				0 to +70
CS1009	2.500	0.2	–	–	√	√				–40 to +105
NCP100	Adjustable 0.9 to 6 V	1.0	25	0.100				√		–40 to +85
TLV431A	Adjustable 1.24 to 16 V	1.0	–	0.050		√		√		–40 to +85
TL431C	Adjustable 2.495 to 36 V	2.2	50	0.500	√	√	√		√	0 to +70
TL431I	Adjustable 2.495 to 36 V	2.2	50	0.500	√	√	√		√	–40 to +85
TL431AC	Adjustable 2.495 to 36 V	1.0	50	0.500	√	√	√		√	0 to +70
TL431AI	Adjustable 2.495 to 36 V	1.0	50	0.500	√	√	√		√	–40 to +85
TL431BC	Adjustable 2.495 to 36 V	0.4	50	0.500	√	√	√		√	0 to +70
TL431BI	Adjustable 2.495 to 36 V	0.4	50	0.500	√	√	√		√	–40 to +85


Power Management
Linear Voltage Regulators
General Purpose Linear Voltage Regulators
Fixed Voltage
Positive
Negative
Standard
Precision
Standard
Precision
100 mA
MC78L05A MC78L08A
MC78L09A MC78L12A
MC78L15A MC78L18A
MC78L24A
500 mA
MC78M05 MC78M06
MC78M08 MC78M09
MC78M12 MC78M15
MC78M18 MC78M20
MC78M24
1.5 A
MC7805 MC7805.2
MC7806 MC7808
MC7809 MC7812
MC7815 MC7818
MC7824 LM340–5
LM340–12 LM340–15
3 A
MC78T05 MC78T08
MC78T12 MC78T15
LM323
500 mA
MC78M05A MC78M08A
MC78M12A MC78M15A
1.5 A
MC7805A MC7806A
MC7808A MC7809A
MC7812A MC7815A
MC7818A MC7824A
LM340A–5 LM340A–12
LM340A–15
3 A
MC78T05A MC78T12A
MC78T15A LM323A
100 mA
MC79L05A MC79L12A
MC79L15A MC79L18A
MC79L24A
500 mA
MC79M05 MC79M08
MC79M12 MC79M15
1.5 A
MC7905 MC7905.2
MC7906 MC7908
MC7912 MC7915
MC7918 MC7924
1.5 A
MC7905A MC7908A
MC7912A MC7915A
Adjustable Voltage
Positive
Negative
Standard
Standard
100 mA
LM317L
500 mA
LM317M
1.5 A
LM317
3 A
LM350
1.5 A
LM337

General Purpose Linear Voltage Regulators

		Nominal Output Voltage																Package						Automotive Temperature Rating Available (–40 to +125°C)										
Output Current	**Part Number**	**Positive**	**Negative**	**Adjustable**	**5.0 V**	**5.2V**	**6.0 V**	**8.0 V**	**9.0 V**	**12.0 V**	**15.0 V**	**18.0 V**	**20.0 V**	**24.0 V**	**Tolerance** (%)	**Drop Out Voltage** (Typical)	**Maximum Input Voltage** (Vdc)	**SOP–8**	**DPAK**	**D²PAK**	**SOT–223**	**TO–92**	**TO–220**	**Adjustable**	**5.0 V**	**5.2V**	**6.0 V**	**8.0 V**	**9.0 V**	**12.0 V**	**15.0 V**	**18.0 V**	**20.0 V**	**24.0 V**
100 mA	MC78LxxA Series	√			√			√	√	√	√	√		√	5.0	1.7 V @ 40 mA	5.0 to 18 V Version = 30V 12 to 18 V Version = 35 V 24 V Version = 40 V	√				√			√			√	√ 1.	√	√	√		√
100 mA	MC79LxxA Series		√		√					√	√	√		√	5.0	1.7 V @ 40 mA	–5.0 V Version = –30 V –12 to –18 V Version = –35 V –24 V Version = –40 V	√				√			√					√	√			√ 1.
100 mA	LM317Lxx Series	√		√											4.0	1.9 V @ 100 mA	$V_I – V_O$ = 40 V	√				√		√										
500 mA	MC78Mxx Series	√			√		√	√	√	√	√	√	√	√	4.0	1.9 V @ 500 mA	5.0 to 18 V Version = 35 V 20 to 24 V Version = 40 V		√				√		√		√ 1.	√	√ 1.	√ 1.	√	√ 1.		√ 1.
500 mA	MC78MxxA Series	√			√			√		√	√				2.0	1.9 V @ 500 mA	5.0 to 18 V Version = 35 V 20 to 24 V Version = 40 V		√				√				√	√	√	√				
500 mA	MC79Mxx Series		√		√			√		√	√				4.0	1.1 V @ 500 mA	–35 V		√				√		√			√		√	√			
500 mA	LM317Mxx Series	√		√											4.0	2.1 V @ 500 mA	$V_I – V_O$ = 40 V		√		√		√	√										
500 mA	LM317MxxA Series	√		√											2.0	2.1 V @ 500 mA	$V_I – V_O$ = 40 V		√		√		√											
1.5 A	MC78xx Series	√			√		√	√	√	√	√	√		√	4.0	2.0 V @ 500 mA	5.0 to 18 V Version = 35 V 24 V Version = 40 V			√			√		√		√	√	√ 1.	√	√	√ 1.		√
1.5 A	MC78xxA Series	√			√		√	√	√	√	√	√		√	2.0	2.0 V @ 500 mA	5.0 to 18 V Version = 35 V 24 V Version = 40 V			√ 2.			√											

'xx' indicates nominal voltage

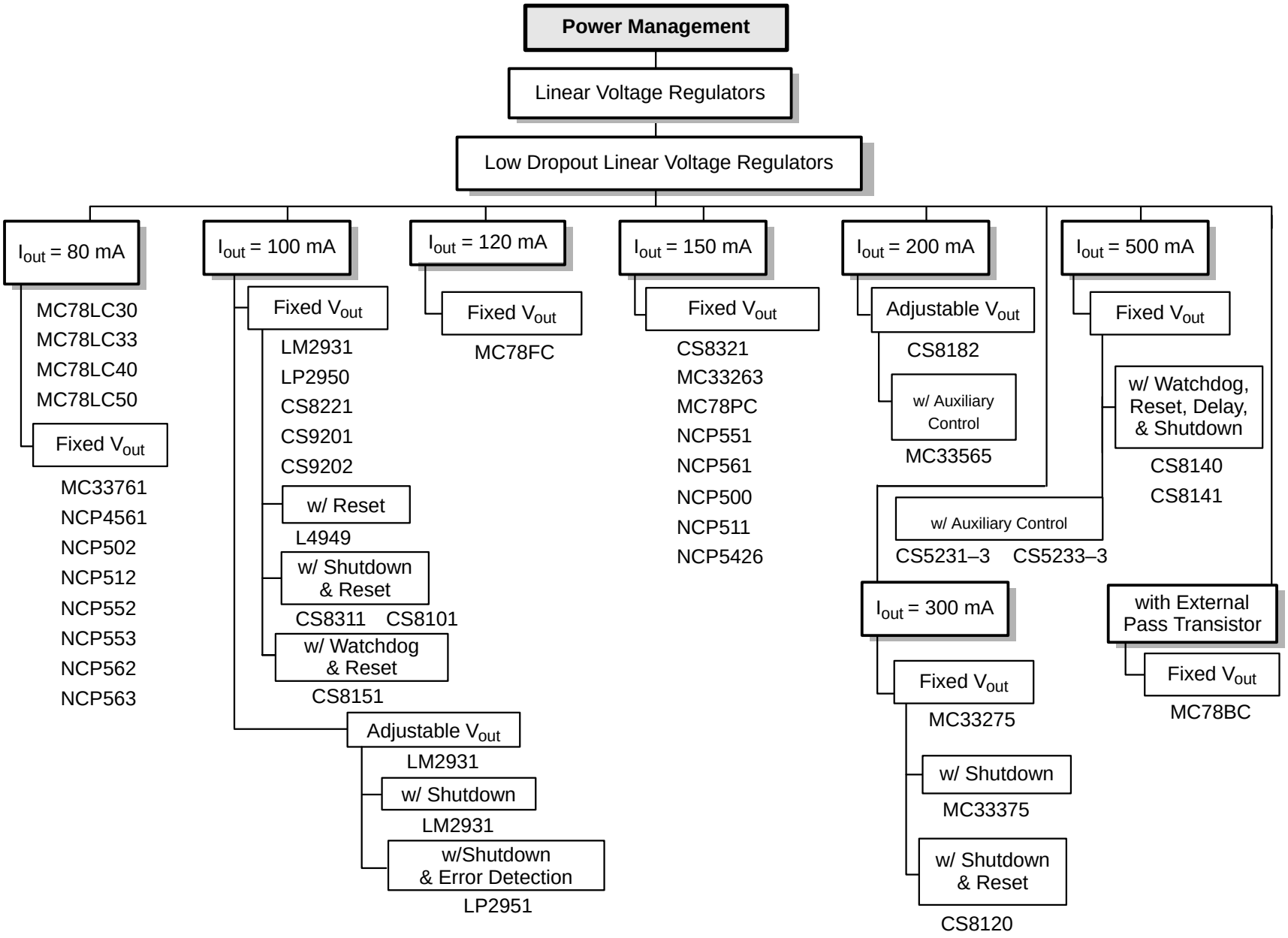
1. Available in select packages only; contact your local ON Semiconductor sales office for information.
2. Available for select voltage options only; contact your local ON Semiconductor sales office for information.

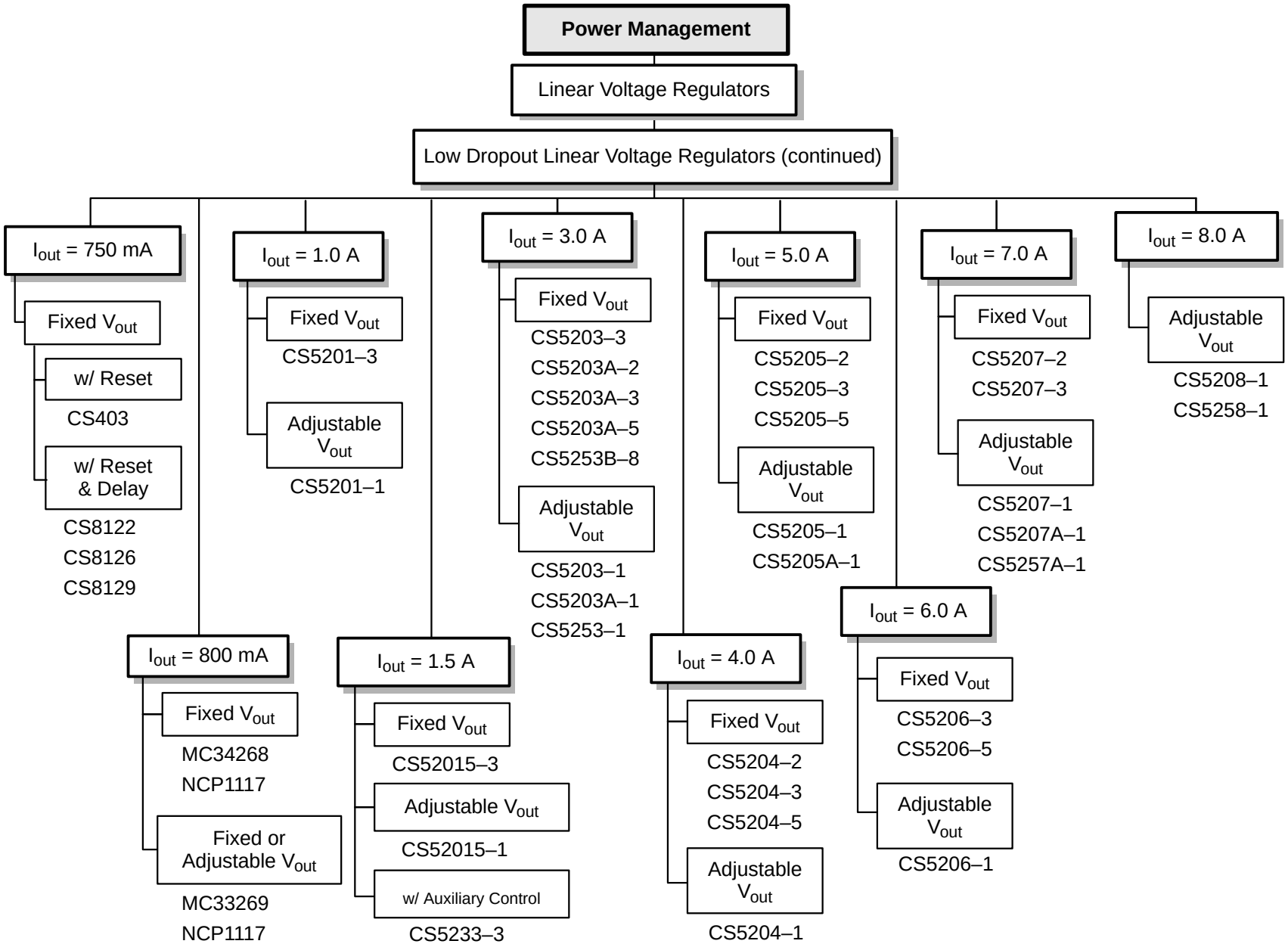
General Purpose Linear Voltage Regulators (continued)

		Nominal Output Voltage																Package						Automotive Temperature Rating Available (–40 to +125°C)										
Output Current	**Part Number**	**Positive**	**Negative**	**Adjustable**	**5.0 V**	**5.2V**	**6.0 V**	**8.0 V**	**9.0 V**	**12.0 V**	**15.0 V**	**18.0 V**	**20.0 V**	**24.0 V**	**Tolerance (%)**	**Drop Out Voltage** (Typical)	**Maximum Input Voltage** (Vdc)	**SOP–8**	**DPAK**	**D²PAK**	**SOT−223**	**TO–92**	**TO–220**	**Adjustable**	**5.0 V**	**5.2V**	**6.0 V**	**8.0 V**	**9.0 V**	**12.0 V**	**15.0 V**	**18.0 V**	**20.0 V**	**24.0 V**
1.5 A	LM340–xx Series	√			√					√	√				4.0	1.75 V @ 1.0 A	35 V						√											
1.5 A	LM340A–xx Series	√			√					√	√				2.0	1.75 V @ 1.0 A	35 V						√											
1.5 A	MC79xx Series		√		√	√	√	√		√	√	√		√	4.0	2.0 V @ 1.0 A	–5.0 to –18 V Version = –35 V –24 V Version = –40 V			√			√		√					√ 3.	√			√ 3.
1.5 A	MC79xxA Series		√		√			√		√	√				2.0	2.0 V @ 1.0 A	–5.0 to –18 V Version = –35 V –24 V Version = –40 V			√ 4.			√											
1.5 A	LM317	√		√											4.0	2.25 V @ 1.5 A	$V_I – V_O$ = 40 V			√			√	√										
1.5 A	LM337		√	√											4.0	2.2 V @ 1.5 A	$V_I – V_O$ = 40 V			√			√	√										
3.0 A	LM323	√			√										4.0	2.0 V @ 3.0 A	20 V						√											
3.0 A	LM323A	√			√										2.0	2.0 V @ 3.0 A	20 V						√											
3.0 A	LM350	√		√											4.0	2.7 V @ 3.0 A	$V_I – V_O$ = 35 V						√	√										
3.0 A	MC78Txx Series	√			√			√		√	√				4.0	2.2 V @ 3.0 A	5.0 to 12 V Version = 35 V 15 V Version = 40 V						√		√					√				
3.0 A	MC78TxxA Series	√			√					√	√				2.0	2.2 V @ 3.0 A	5.0 to 12 V Version = 35 V 15 V Version = 40 V						√		√					√	√			

'xx' indicates nominal voltage

3. Available in select packages only; contact your local ON Semiconductor sales office for information.
4. Available for select voltage options only; contact your local ON Semiconductor sales office for information.


Power Management
Linear Voltage Regulators
Low Dropout Linear Voltage Regulators
Iout = 80 mA
MC78LC30
MC78LC33
MC78LC40
MC78LC50
Fixed Vout
MC33761
NCP4561
NCP502
NCP512
NCP552
NCP553
NCP562
NCP563
Iout = 100 mA
Fixed Vout
LM2931
LP2950
CS8221
CS9201
CS9202
w/ Reset
L4949
w/ Shutdown & Reset
CS8311 CS8101
w/ Watchdog & Reset
CS8151
Adjustable Vout
LM2931
w/ Shutdown
LM2931
w/Shutdown & Error Detection
LP2951
Iout = 120 mA
Fixed Vout
MC78FC
Iout = 150 mA
Fixed Vout
CS8321
MC33263
MC78PC
NCP551
NCP561
NCP500
NCP511
NCP5426
Iout = 200 mA
Adjustable Vout
CS8182
w/ Auxiliary Control
MC33565
w/ Auxiliary Control
CS5231–3 CS5233–3
Iout = 300 mA
Fixed Vout
MC33275
w/ Shutdown
MC33375
w/ Shutdown & Reset
CS8120
Iout = 500 mA
Fixed Vout
w/ Watchdog, Reset, Delay, & Shutdown
CS8140
CS8141
with External Pass Transistor
Fixed Vout
MC78BC


Power Management
Linear Voltage Regulators
Low Dropout Linear Voltage Regulators (continued)
Iout = 750 mA
Fixed Vout
w/ Reset
CS403
w/ Reset & Delay
CS8122
CS8126
CS8129
Iout = 800 mA
Fixed Vout
MC34268
NCP1117
Fixed or Adjustable Vout
MC33269
NCP1117
Iout = 1.0 A
Fixed Vout
CS5201–3
Adjustable Vout
CS5201–1
Iout = 1.5 A
Fixed Vout
CS52015–3
Adjustable Vout
CS52015–1
w/ Auxiliary Control
CS5233–3
Iout = 3.0 A
Fixed Vout
CS5203–3
CS5203A–2
CS5203A–3
CS5203A–5
CS5253B–8
Adjustable Vout
CS5203–1
CS5203A–1
CS5253–1
Iout = 4.0 A
Fixed Vout
CS5204–2
CS5204–3
CS5204–5
Adjustable Vout
CS5204–1
Iout = 5.0 A
Fixed Vout
CS5205–2
CS5205–3
CS5205–5
Adjustable Vout
CS5205–1
CS5205A–1
Iout = 6.0 A
Fixed Vout
CS5206–3
CS5206–5
Adjustable Vout
CS5206–1
Iout = 7.0 A
Fixed Vout
CS5207–2
CS5207–3
Adjustable Vout
CS5207–1
CS5207A–1
CS5257A–1
Iout = 8.0 A
Adjustable Vout
CS5208–1
CS5258–1

Low Dropout Voltage Regulators

		Output Voltage																				Input Voltage		Package															
Output Current	Part Number	Adjustable	1.5 V	1.8 V	2.5 V	2.7 V	2.8 V	2.85 V	3.0 V	3.2 V	3.3 V	3.8 V	4.0 V	4.75 V	5 V	8 V	10 V	12 V	See Note	Tolerance (%)	Drop Out Voltage	Min.	Max.	SC–70	SOT–23	SOT–89	SO–8	SOIC(W)	DIP–8	Micro8	DPAK	D^2PAK	SOT–223	TO–92	TO–220	TSOP–5	TSSOP16	PDIP	Additional Features
–	MC78BCxx								√		√		√		√				5.	2.5	0.1 V @ 100 mA	–	10		√														External Power Transistor
80 mA	MC33761				√		√		√											1.5	0.16 V @ 80 mA	–	12		√													w/ ENABLE, Ultra Low Noise
80 mA	MC78LCxx								√		√		√		√				5.	2.5	0.22 V @ 10 mA	–	10		√	√												Very Low Quiescent Current
80 mA, 80 mA	MC33762				√, √		√, √		√, √											–	0.16 V @ 80 mA, 0.16 V @ 80 mA	–	12							√								Dual, w/ ENABLE, Ultra Low Noise
80 mA	NCP512*		√	√	√	√	√		√		√				√					2.5	250 mV @ 80 mA	–	6.0	√														w/ ENABLE
80 mA	NCP552*		√	√	√	√	√		√		√				√					2.5	100 mV @ 10 mA	–	12	√														w/ ENABLE, Low I_Q
80 mA	NCP4561						√													1.5	0.16 V @ 80 mA	–	12		√													w/ ENABLE, Ultra Low Noise
100 mA	MC33160														√					–	–	–	40															Regulator and Supervisory Circuit in SOP–16L and DIP–16 Packages
100 mA	CS9201														√					2.0	0.4 V @ 100 mA	6.0	26				√											No Cap, 74 V Load Dump Protection
100 mA	CS9202										√									2.0	–	4.5	26				√											No Cap, 74 V Load Dump Protection
100 mA	CS8221														√					2.0	0.4 V @ 100 mA	6.0	26				√					√						–
100 mA	CS8311																√			2.0	0.4 V @ 100 mA	–	26				√											w/ RESET and ENABLE, 60 V Load Dump Protection

5. Output voltages from 2.0 V to 6.0 V, in 0.1 V increments, are available on request.
*Q2, 2001

Low Dropout Voltage Regulators (continued)

		Output Voltage																				Input Voltage		Package															
Output Current	Part Number	Adjustable	1.5 V	1.8 V	2.5 V	2.7 V	2.8 V	2.85 V	3.0 V	3.2 V	3.3 V	3.8 V	4.0 V	4.75 V	5 V	8 V	10 V	12 V	See Note	Tolerance (%)	Drop Out Voltage	Min.	Max.	SC−70	SOT−23	SOT−89	SO−8	SOIC(W)	DIP−8	Micro8	DPAK	D^2PAK	SOT−223	TO−92	TO−220	TSOP−5	TSSOP16	PDIP	Additional Features
100 mA	CS8151														√					2.0	0.4 V @ 100 mA	6.0	26					√				√			√			√	w/ WATCHDOG, RESET, WAKE UP & DELAY, 74 V Load Dump Protection
100 mA	CS8151C														√					1.0	0.4 V @ 100 mA	6.0	26															√	w/ WATCHDOG, RESET, WAKE UP & DELAY, 60 V Load Dump Protection
100 mA	CS8101														√					2.0	0.4 V @ 100 mA	6.0	26				√	√							√				w/ RESET and ENABLE, 60 V Load Dump Protection
100 mA	CS8271	√																		–	0.4 V @ 100 mA	–	30				√											√	w/ ENABLE
100 mA	L4949														√					1.0	0.2 V @ 50 mA	5.0	28				√		√										Power–On Reset, Input Voltage Sense
100 mA	LM2931/A														√					3.8 5.0	0.16 V @ 100 mA	–	40					√				√	√		√	√			–
100 mA	LM2931C/AC	√																		5.0, 2.0	0.16 V @ 100 mA	–	40					√					√		√	√			–
100 mA	LP2950C/AC								√		√				√					1.0/ 0.5	0.38 V @ 100 mA	–	30									√			√				–
100 mA	LP2951C/AC	√							√		√				√					1.0/ 0.5	0.38 V @ 100 mA	–	30					√		√	√								–
120 mA	MC78FCxx								√		√		√		√				6.	2.5	0.5 V @ 40 mA	2.0	10			√														–
150 mA	MC78PCxx			√	√		√		√		√				√					2.0	0.2 V @ 100 mA	–	8.0		√														w/ ENABLE
150 mA	MC33263						√		√	√	√	√	√	√	√					–	0.18 V @ 150 mA	–	12		√														w/ ENABLE, Ultra Low Noise

6. Output voltages from 2.0 V to 6.0 V, in 0.1 V increments, are available on request.
*Q2, 2001

Low Dropout Voltage Regulators (continued)

		Output Voltage																				Input Voltage		Package															
Output Current	Part Number	Adjustable	1.5 V	1.8 V	2.5 V	2.7 V	2.8 V	2.85 V	3.0 V	3.2 V	3.3 V	3.8 V	4.0 V	4.75 V	5 V	8 V	10 V	12 V	See Note	Tolerance (%)	Drop Out Voltage	Min.	Max.	SC–70	SOT–23	SOT–89	SO–8	SOIC(W)	DIP–8	Micro8	DPAK	D²PAK	SOT–223	TO–92	TO–220	TSOP–5	TSSOP16	PDIP	Additional Features
150 mA	CS8321														√					2.0	0.3 V @ 150 mA	–	26									√			Y				45 V Load Dump Protection
150 mA	NCP500			√	√		√		√		√				√					2.5	0.165 V @ 150 mA	–	6.0												√			w/ Shutdown
150 mA	NCP511		√	√	√	√	√		√		√				√					–	0.170 V @ 150 mA	–	6.0												√			w/ Shutdown
150 mA	NCP551		√	√	√	√	√		√		√				√					2.0	44 mV @ 10 mA	–	12												√			w/ Shutdown
200 mA	MC33565										√									2.0	–	4.3	5.5				√												w/ Auxiliary Control
300 mA	MC33275				√				√		√				√					2.0	0.26 V @ 300 mA	–	12				√				√		√						–
300 mA	MC33375			√	√				√		√				√					2.0	0.26 V @ 300 mA	–	12				√					√						w/ ENABLE
300 mA	CS8120														√					4.0	1.0 V @ 200 mA	–	26					√			√			√			√	w/ RESET and ENABLE, 60 V Load Dump Protection
500 mA	CS8140/1														√					4.0	1.25 V @ 500 mA	–	26					√						√			√	w/ ENABLE, RESET and WATCHDOG, 60 V Load Dump Protection
500 mA	CS5231–3										√									2.0	–	–	6				√				√								w/ Auxiliary Control
500 mA	CS5233–3										√									2.0	–	–	6				√												w/ Auxiliary Control and Standby Input

7. Output voltages from 2.0 V to 6.0 V, in 0.1 V increments, are available on request.
*Q2, 2001

Low Dropout Voltage Regulators (continued)

		Output Voltage																				Input Voltage		Package															
Output Current	Part Number	Adjustable	1.5 V	1.8 V	2.5 V	2.7 V	2.8 V	2.85 V	3.0 V	3.2 V	3.3 V	3.8 V	4.0 V	4.75 V	5 V	8 V	10 V	12 V	See Note	Tolerance (%)	Drop Out Voltage	Min.	Max.	SC–70	SOT–23	SOT–89	SO–8	SOIC(W)	DIP–8	Micro8	DPAK	D²PAK	SOT–223	TO–92	TO–220	TSOP–5	TSSOP16	PDIP	Additional Features
750 mA	CS8122														√					2.0	0.35 V @ 500 mA	6.0	26												√				w/ Delayed RESET, 60 V Load Dump Protection
750 mA	CS8126–X														√					3.0	0.35 V @ 500 mA	6.0	26					√				√			√				w/ Delayed RESET, 60 V Load Dump Protection
750 mA	CS8129														√					3.0	0.35 V @ 500 mA	6.0	26					√							√				w/ Delayed RESET, 60 V Load Dump Protection
750 mA	CS403														√					5.0	1.4 V @ 750 mA	–	18												√				w/ RESET
800 mA	MC33269	√									√				√			√		1.0	1.1 V @ 800 mA	–	20				√				√		√		√				–
800 mA	MC34268							√												1.4	1.1 V @ 800 mA	–	15				√				√		√						For SCSI–2 Active Termination
1.0 A	CS5201–1	√																		1.0	1.0 V @ 1.0 A	–	7.0									√	√		√				–
1.0 A	CS5201–3										√									1.5	1.0 V @ 1.0 A	–	7.0									√	√		√				–
1.5 A	CS52015–1	√																		1.0	1.05 V @ 1.5 A	–	7.0									√	√		√				–
1.5 A	CS52015–3										√									1.5	1.05 V @ 1.5 A	–	7.0									√	√		√				–
1.5 A	CS5233–3										√									2.0	–	–	6.0									√							w/ Auxiliary Control and Standby Input

8. Output voltages from 2.0 V to 6.0 V, in 0.1 V increments, are available on request.
*Q2, 2001

Low Dropout Voltage Regulators (continued)

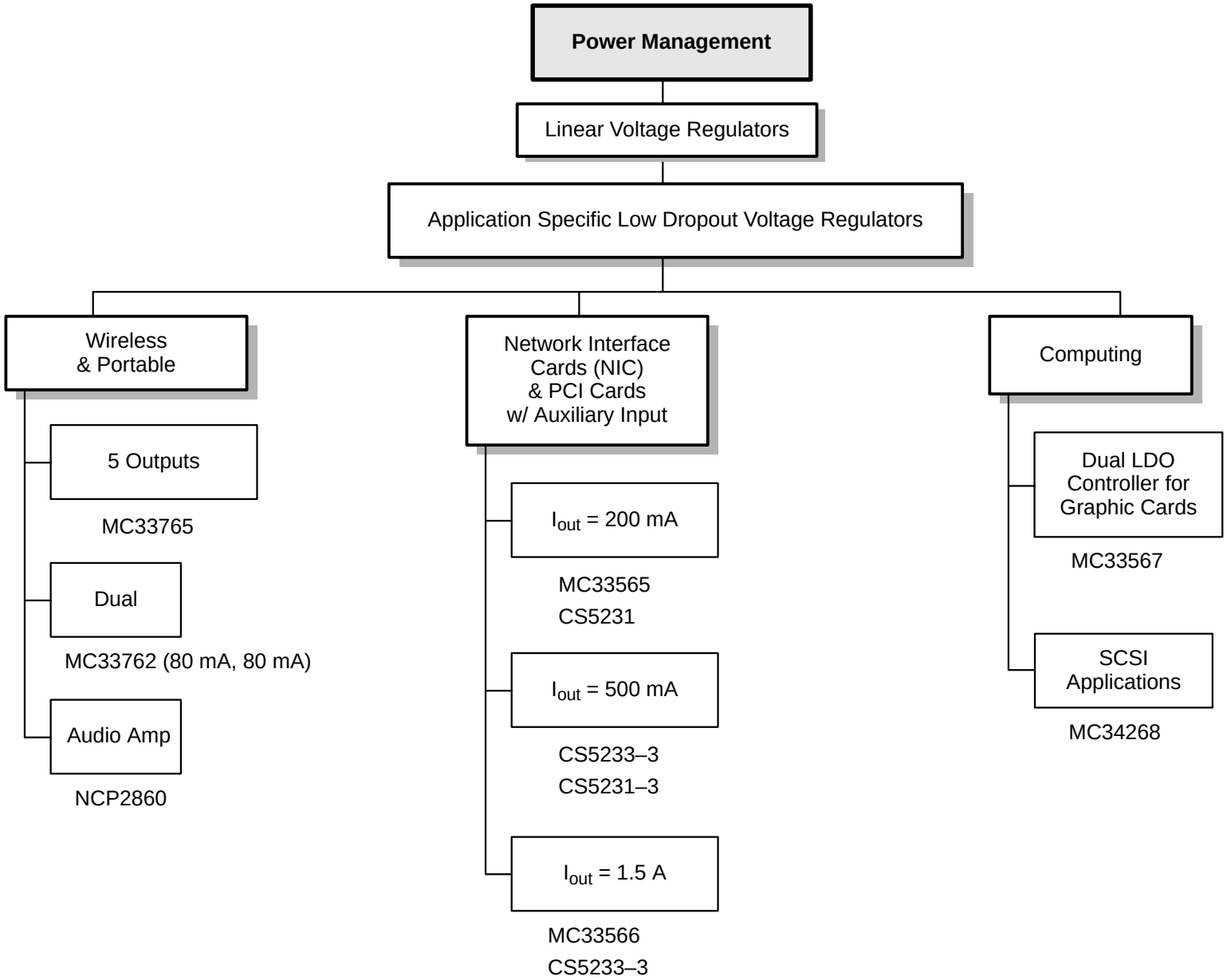
		Output Voltage																				Input Voltage		Package															
Output Current	Part Number	Adjustable	1.5 V	1.8 V	2.5 V	2.7 V	2.8 V	2.85 V	3.0 V	3.2 V	3.3 V	3.8 V	4.0 V	4.75 V	5 V	8 V	10 V	12 V	See Note	Tolerance (%)	Drop Out Voltage	Min.	Max.	SC–70	SOT–23	SOT–89	SO–8	SOIC(W)	DIP–8	Micro8	DPAK	D^2PAK	SOT–223	TO–92	TO–220	TSOP–5	TSSOP16	PDIP	Additional Features
3.0 A	CS5203–1	√																		1.5	1.2 V @ 3.0 A	–	7.0									√			√				–
3.0 A	CS5203–3										√									1.5	1.15 V @ 3.0 A	–	7.0									√							–
3.0 A	CS5203A–X	√	√								√				√					1.0	1.05 V @ 3.0 A	–	17									√			√				–
3.0 A	CS5253–1	√																		1.0	0.4 V @ 3.0 A	–	6.0									√							w/ Control and Sense
3.0 A	CS5253B–8				√															1.5	0.4 V @ 3.0 A	–	6.0									√							–
4.0 A	CS5204–X	√									√				√					1.0	1.1 V @ 4.0 A	–	17									√			√				–
4.0 A	CS5204–2		√																	2.0	1.1 V @ 4.0 A	–	17									√			√				–
5.0 A	CS5205–X	√									√				√					1.0	1.2 V @ 5.0 A	–	17									√			√				–
5.0 A	CS5205–2		√																	2.0	1.2 V @ 5.0 A	–	17									√			√				–
5.0 A	CS5205A–1	√																		1.0	1.15 V @ 5.0 A	–	17									√			√				–
6.0 A	CS5206–X	√									√				√					1.0	1.3 V @ 6.0 A	–	17									√			√				–
7.0 A	CS5207–1	√																		1.5	1.4 V @ 7.0 A	–	17												√				–
7.0 A	CS5207–2		√																	2.0	1.45 V @ 7.0 A	–	17												√				–

9. Output voltages from 2.0 V to 6.0 V, in 0.1 V increments, are available on request.
*Q2, 2001

Low Dropout Voltage Regulators (continued)

		Output Voltage																				Input Voltage		Package															
Output Current	Part Number	Adjustable	1.5 V	1.8 V	2.5 V	2.7 V	2.8 V	2.85 V	3.0 V	3.2 V	3.3 V	3.8 V	4.0 V	4.75 V	5 V	8 V	10 V	12 V	See Note	Tolerance (%)	Drop Out Voltage	Min.	Max.	SC–70	SOT–23	SOT–89	SO–8	SOIC(W)	DIP–8	Micro8	DPAK	D^2PAK	SOT–223	TO–92	TO–220	TSOP–5	TSSOP16	PDIP	Additional Features
7.0 A	CS5207–3										√									2.0	1.4 V @ 7.0 A	–	17									√			√				–
7.0 A	CS5207A–1	√																		1.5	0.96 V @ 7.0 A	–	6.0												√				–
7.0 A	CS5257A–1	√																		1.5	0.35 V @ 7.0 A	–	6.0									√			√				w/ Control and Sense
8.0 A	CS5208–1	√																		1.5	0.96 V @ 8.0 A	–	6.0												√				–
8.0 A	CS5258–1	√																		1.5	0.4 V @ 8.0 A	–	6.0												√				w/ Control and Sense

10. Output voltages from 2.0 V to 6.0 V, in 0.1 V increments, are available on request.
*Q2, 2001


Power Management
Linear Voltage Regulators
Application Specific Low Dropout Voltage Regulators
Wireless & Portable
5 Outputs
MC33765
Dual
MC33762 (80 mA, 80 mA)
Audio Amp
NCP2860
Network Interface Cards (NIC) & PCI Cards w/ Auxiliary Input
I_{out} = 200 mA
MC33565
CS5231
I_{out} = 500 mA
CS5233–3
CS5231–3
I_{out} = 1.5 A
MC33566
CS5233–3
Computing
Dual LDO Controller for Graphic Cards
MC33567
SCSI Applications
MC34268

Wireless Portable

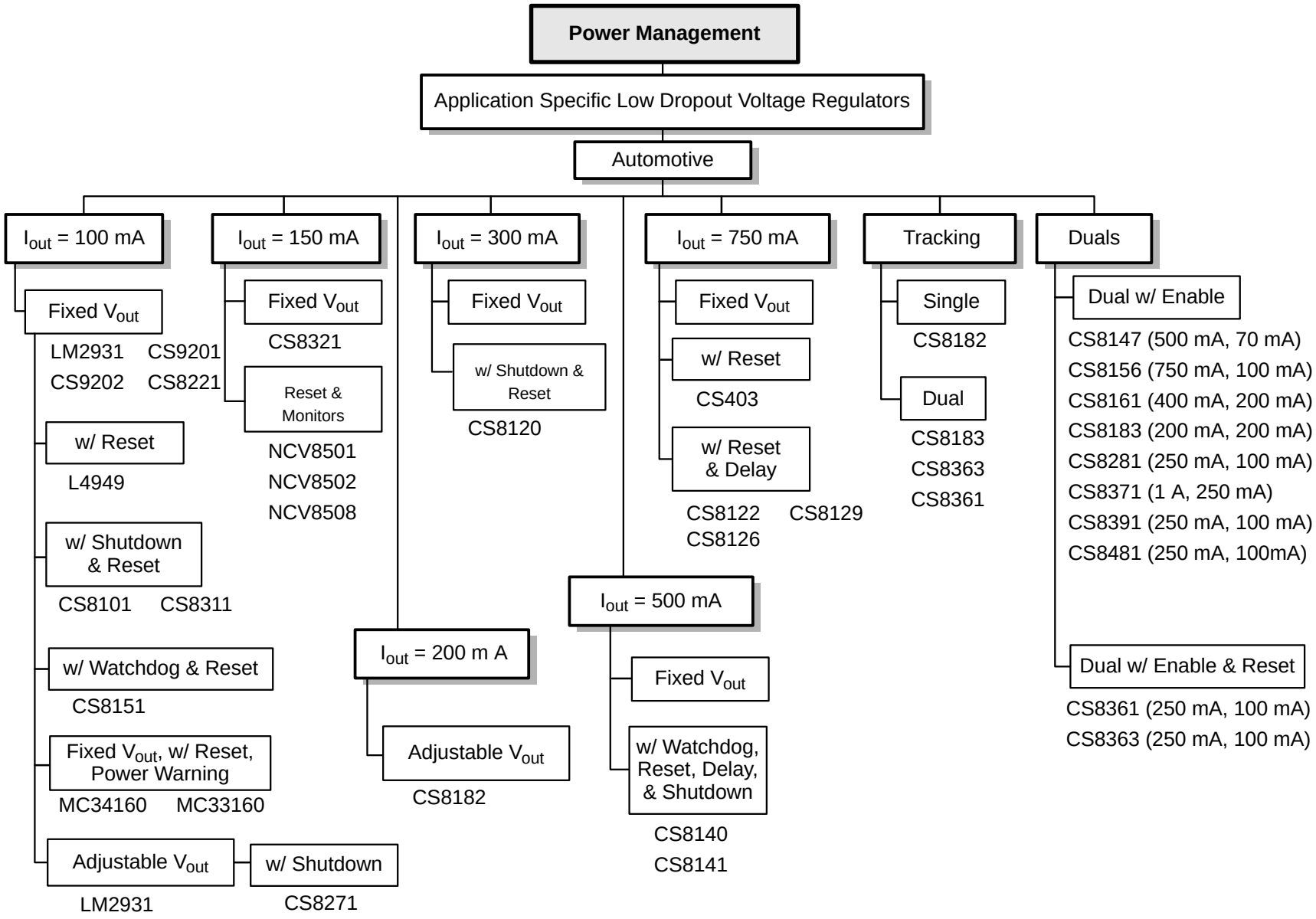
		Output Voltage											Input Voltage		Package												
Output Current	Part Number	Adjustable	1.5 V	1.8 V	2.5 V	2.8 V	2.85 V	3.0 V	3.2 V	3.3 V	Tolerance (%)	Drop Out Voltage	Min.	Max.	SOT−23	SOT−89	SO−8	SOIC(W)	DIP−8	Micro8	DPAK	D²PAK	SOT−223	TO−92	TO−220	TSSOP16	PDIP	Additional Features
80 mA, 80 mA	MC33762				√, √	√, √		√, √			–	0.16 V @ 80 mA, 0.16 V @ 80 mA	–	12						√								Dual, Ultra Low Noise, 1 V ON/OFF Control, No External Cap
–	MC33765					√					3.0	0.17 V @ 150 mA	3.0	5.3												√		5 Outputs, Ultra Low Noise

NIC & PCI Cards

		Output Voltage											Input Voltage		Package													
Output Current	Part Number	Adjustable	1.5 V	1.8 V	2.5 V	2.8 V	2.85 V	3.0 V	3.2 V	3.3 V	Tolerance (%)	Drop Out Voltage	Min.	Max.	SOT−23	SOT−89	SO−8	SOIC(W)	DIP−8	Micro8	DPAK	D²PAK	SOT−223	TO−92	TO−220	TSSOP16	PDIP	Additional Features
200 mA	MC33565									√	2.0	–	4.3	5.5			√											w/ Auxiliary Control
500 mA	CS5231–3									√	2.0	–	–	6.0			√					√						w/ Auxiliary Control
1.2 A	MC33566									√	–	–	4.35	5.5								√						w/ Auxiliary Control
1.5 A	CS5233–3									√	2.0	–	–	6.0			√					√						w/ Auxiliary Control

Computing

		Output Voltage											Input Voltage		Package													
Output Current	Part Number	Adjustable	1.2 V	1.515 V	1.818 V	2.3 V	2.525 V	2.8 V	2.85 V	3.0 V	3.2 V	3.3 V	Tolerance (%)	Drop Out Voltage	Min.	Max.	SOT−23	SOT−89	SO−8	SOIC(W)	DIP−8	Micro8	DPAK	D²PAK	SOT−223	TO−92	TO−220	TSSOP16	PDIP	Additional Features
800 mA	MC34268								√				1.4	1.1 V @ 800 mA	–	15			√				√		√					For SCSI–2 Active Termination
–	MC33567–1			√	√								2.5	–	–	12.5			√											Dual, External Pass Transistor
–	MC33567–2						√, √						–	–	–	–			√											Dual, External Pass Transistor
–	MC33567–3		√			√							–	–	–	–			√											Dual, External Pass Transistor


Power Management
Application Specific Low Dropout Voltage Regulators
Automotive
I_{out} = 100 mA
Fixed V_{out}
LM2931 CS9201
CS9202 CS8221
w/ Reset
L4949
w/ Shutdown & Reset
CS8101 CS8311
w/ Watchdog & Reset
CS8151
Fixed V_{out}, w/ Reset, Power Warning
MC34160 MC33160
Adjustable V_{out}
LM2931
w/ Shutdown
CS8271
I_{out} = 150 mA
Fixed V_{out}
CS8321
Reset & Monitors
NCV8501
NCV8502
NCV8508
I_{out} = 200 m A
Adjustable V_{out}
CS8182
I_{out} = 300 mA
Fixed V_{out}
w/ Shutdown & Reset
CS8120
I_{out} = 500 mA
Fixed V_{out}
w/ Watchdog, Reset, Delay, & Shutdown
CS8140
CS8141
I_{out} = 750 mA
Fixed V_{out}
w/ Reset
CS403
w/ Reset & Delay
CS8122 CS8129
CS8126
Tracking
Single
CS8182
Dual
CS8183
CS8363
CS8361
Duals
Dual w/ Enable
CS8147 (500 mA, 70 mA)
CS8156 (750 mA, 100 mA)
CS8161 (400 mA, 200 mA)
CS8183 (200 mA, 200 mA)
CS8281 (250 mA, 100 mA)
CS8371 (1 A, 250 mA)
CS8391 (250 mA, 100 mA)
CS8481 (250 mA, 100mA)
Dual w/ Enable & Reset
CS8361 (250 mA, 100 mA)
CS8363 (250 mA, 100 mA)

Automotive

		Output Voltage																		Input Voltage		Package														
Output Current	Part Number	Adjustable	1.5 V	1.8 V	2.5 V	2.8 V	2.85 V	3.0 V	3.2 V	3.3 V	3.8 V	4.0 V	4.75 V	5 V	8 V	10 V	12 V	14.0 V	Tolerance (%)	Drop Out Voltage	Min.	Max.	SOT–23	SOT–89	SO–8	SOIC(W)	DIP–8	Micro8	DPAK	D^2PAK	SOT–223	TO–92	TO–220	TSSOP16	PDIP	Additional Features
100 mA	MC33160													√					–	–	–	40														Regulator and Supervisory Circuit in SOP–16L and DIP–16 Packages
100 mA	CS9201													√					2.0	0.4 V @ 100 mA	6.0	26			√										No Cap
100 mA	CS9202									√									2.0	0.4 V @ 100 mA	4.5	26			√										No Cap
100 mA	CS8221													√					2.0	0.4 V @ 100 mA	6.0	26			√					√					–
100 mA	CS8311															√			2.0	0.4 V @ 100 mA	–	26			√										w/ RESET and ENABLE, 60 V Load Dump Protection
100 mA	CS8151													√					2.0	0.4 V @ 100 mA	6.0	26				√				√			√		√	w/ WATCHDOG, RESET, WAKE UP and DELAY, 74 V Load Dump Protection
100 mA	CS8101													√					2.0	0.4 V @ 100 mA	6.0	26			√	√							√			uPower w/ RESET and ENABLE, 60 V Load Dump Protection
100 mA	CS8271	√																	–	0.4 V @ 100 mA	–	30			√										√	uPower with ENABLE
100 mA	L4949													√					1.0	0.2 V @ 50 mA	5.0	28			√		√									Power–On Reset, Input Voltage Sense

Automotive (continued)

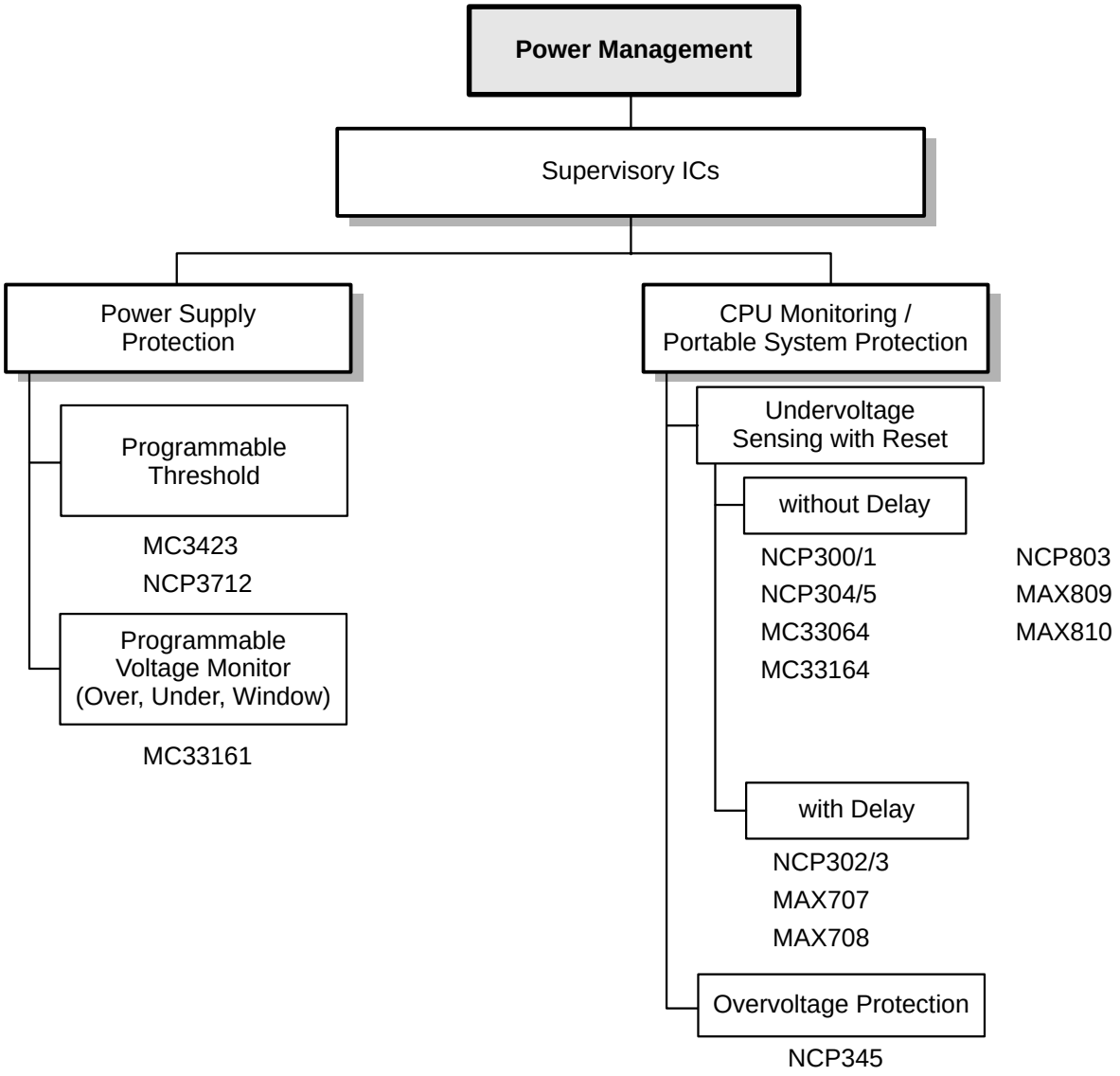
		Output Voltage																		Input Voltage		Package													
Output Current	Part Number	Adjustable	1.5 V	1.8 V	2.5 V	2.8 V	2.85 V	3.0 V	3.2 V	3.3 V	3.8 V	4.0 V	4.75 V	5 V	8 V	10 V	12 V	See Note	Tolerance (%)	Drop Out Voltage	Min.	Max.	SOT−23	SOT−89	SO−8	SOIC(W)	DIP−8	Micro8	DPAK	D^2PAK	SOT−223	TO−92	TO−220	TSSOP16	PDIP	Additional Features
100 mA	LM2931/A													√					3.8, 5.0	0.16 V @ 100 mA	–	40			√				√	√		√	√			60 V Load Dump Protection
100 mA	LM2931C/AC	√																	5.0, 2.0	0.16 V @ 100 mA	–	40			√					√		√	√			60 V Load Dump Protection
150 mA	CS8321													√					2.0	0.3 V @ 150 mA	–	26								√			√			uPower w/ 45 V Load Dump Protection
300 mA	CS8120													√					4.0	1.0 V @ 200 mA	–	26				√				√			√		√	w/ RESET and ENABLE, 60 V Load Dump Protection
500 mA	CS8140/1													√					4.0	1.25 V @ 500 mA	–	26				√							√		√	w/ ENABLE, RESET and WATCHDOG, 60 V Load Dump Protection
750 mA	CS8122													√					2.0	0.35 V @ 500 mA	6.0	26											√			w/ Delayed RESET, 60 V Load Dump Protection
750 mA	CS8126–1													√					3.0	0.35 V @ 500 mA	6.0	26				√				√			√			w/ Delayed RESET, 60 V Load Dump Protection
750 mA	CS8129													√					3.0	0.35 V @ 500 mA	6.0	26				√							√			w/ Delayed RESET, 60 V Load Dump Protection

Automotive (continued)

		Output Voltage																		Input Voltage		Package													
Output Current	Part Number	Adjustable	1.5 V	1.8 V	2.5 V	2.8 V	2.85 V	3.0 V	3.2 V	3.3 V	3.8 V	4.0 V	4.75 V	5 V	8 V	10 V	12 V	See Note	Tolerance (%)	Drop Out Voltage	Min.	Max.	SOT−23	SOT−89	SO−8	SOIC(W)	DIP−8	Micro8	DPAK	D^2PAK	SOT−223	TO−92	TO−220	TSSOP16	PDIP	Additional Features
100 mA, 250 mA	CS8361	√												√					2.0	0.4 V @ 100 mA, 0.4 V @ 250 mA	6.0	26				√				√						Dual, uPower w/ RESET and ENABLE
100 mA, 250 mA	CS8363	√								√									2.0	0.4 V @ 100 mA, 0.4 V @ 250 mA	6.0	26								√						Dual, uPower w/ RESET and ENABLE
250 mA, 100 mA	CS8481									√				√					3.0	–, 0.4 V @ 100 mA	–	30								√						Dual, w/ ENABLE
250 mA, 100 mA	CS8391													√, √					3.0	0.4 V @ 250 mA, 0.4 V @ 100 mA	–	45								√						Dual, w/ ENABLE
250 mA, 100 mA	CS8281													√, √					3.0	0.4 V @ 250 mA, 0.4 V @ 100 mA	6.0	26								√						Dual, w/ ENABLE
400 mA, 200 mA	CS8161													√			√		5.0, 2.0	0.35 V @ 400 mA, 0.35 V @ 200 mA	6.0	26											√			Dual, w/ ENABLE
500 mA, 70 mA	CS8147													√		√			5.0, 3.0	0.5 V @ 500 mA, 1.5 V @ 70 mA	6.0	26											√			Dual, w/ ENABLE

Automotive (continued)

		Output Voltage																		Input Voltage		Package													
Output Current	Part Number	Adjustable	1.5 V	1.8 V	2.5 V	2.8 V	2.85 V	3.0 V	3.2 V	3.3 V	3.8 V	4.0 V	4.75 V	5 V	8 V	10 V	12 V	See Note	Tolerance (%)	Drop Out Voltage	Min.	Max.	SOT−23	SOT−89	SO−8	SOIC(W)	DIP−8	Micro8	DPAK	D^2PAK	SOT−223	TO−92	TO−220	TSSOP16	PDIP	Additional Features
750 mA, 100 mA	CS8156													√			√		5.0, 2.0	0.6 V @ 750 mA, 0.6 V @ 100 mA	6.0	26											√			Dual, w/ ENABLE
1.0 A, 250 mA	CS8371													√	√				5.0, 5.0	1.5 V @ 1.0 A, 2.5 V @ 250 mA	–	16											√			Dual, Independent ENABLEs, NO CAP


Power Management
Supervisory ICs
Power Supply Protection
CPU Monitoring / Portable System Protection
Programmable Threshold
MC3423
NCP3712
Programmable Voltage Monitor (Over, Under, Window)
MC33161
Undervoltage Sensing with Reset
without Delay
NCP300/1
NCP304/5
MC33064
MC33164
NCP803
MAX809
MAX810
with Delay
NCP302/3
MAX707
MAX708
Overvoltage Protection
NCP345

Supervisory

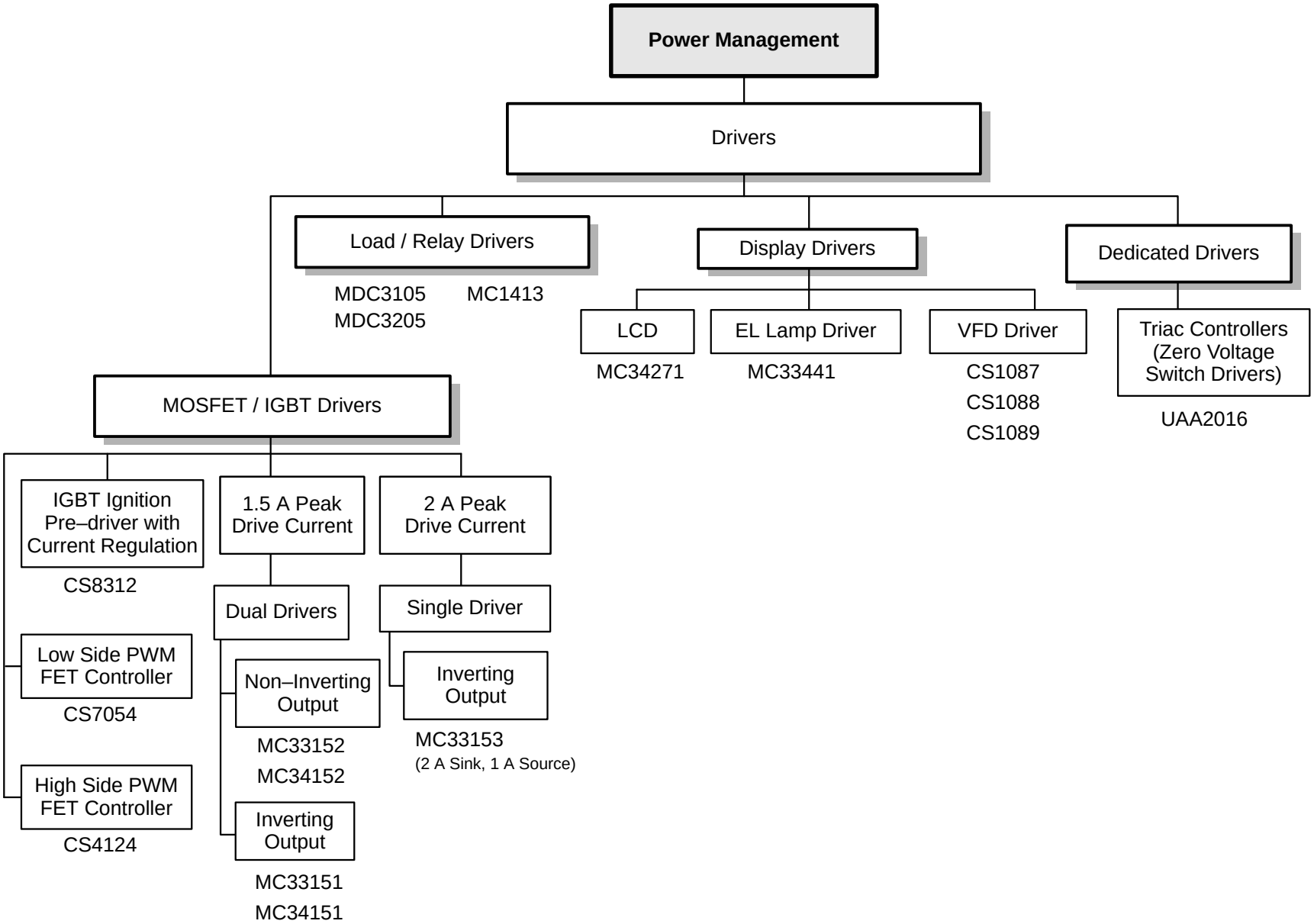
Description	Typical Threshold Voltage (V_{th}) (V)	Supply Voltage Range (V)	Typical Supply Current (µA)	Maximum Supply Current (µA)	Threshold Hysteresis (Typ) (mV)	Operating Temp. Range (°C)	Package	Description	Time Delay (Typ)
MAX809	4.63, 4.38, 4.00, 3.08, 2.93, 2.63 *	1.0 to 5.5	24	60	–	–40 to +85	SOT23	3–Pin Microprocessor Reset Monitors	240 msec
MAX810	4.63, 4.38, 3.08, 2.93, 2.63 *	1.0 to 5.5	24	60	–	–40 to +85	SOT23	3–Pin Microprocessor Reset Monitors	240 msec
MC33064	4.60	1.0 to 6.5	390	500	20	–40 to +85	SO–8, Micro8, TO–92	Undervoltage Sensing Circuit	Ext. Capacitor Dependent
MC34064	4.60	1.0 to 6.5	390	500	20	0 to +70	SO–8, Micro8, TO–92	Undervoltage Sensing Circuit	Ext. Capacitor Dependent
MC33161	1.27	2.0 to 40 (Pos Sensing) 4.0 to 40 (Neg Sensing)	560	900	25	–40 to +85	SO–8, DIP–8	Universal Voltage Monitor	Ext. Capacitor Dependent
MC34161	1.27	2.0 to 40 (Pos Sensing) 4.0 to 40 (Neg Sensing)	560	900	25	0 to +70	SO–8, DIP–8	Universal Voltage Monitor	Ext. Capacitor Dependent
MC33164	2.71 (V_{in} Increasing) 2.65 (V_{in} Decreasing)	1.0 to 10	24	40	60	–40 to +125	SO–8, Micro8, TO–92	Micropower Undervoltage Sensing Circuits	Ext. Capacitor Dependent
MC34164	2.71 (V_{in} Increasing) 2.65 (V_{in} Decreasing)	1.0 to 10	24	40	60	0 to +70	SO–8, Micro8, TO–92	Micropower Undervoltage Sensing Circuits	Ext. Capacitor Dependent
MC3423	2.6	4.5 to 40	6.0 mA	10 mA	–	0 to +70	SO–8, DIP–8	Overvoltage Crowbar Sensing Circuit	0.5 µsec
NCP300/1	0.9, 1.8, 2.0, 2.7, 3.0, 4.5, 4.7	0.8 to 10	0.20 to 0.34*	1.2 to 1.4*	45 to 235 Depends on Threshold Voltage	–40 to +125	TSOP–5	Voltage Detector Series NCP300–CMOS, NCP301–Open Drain	High to Low 45–97* µsec Low to High 77–130* µsec

*Voltages from 1.6 to 4.9 V by steps of 0.1 V are available upon request.

Supervisory (continued)

Description	**Typical Threshold Voltage** (V_{th}) (V)	**Supply Voltage Range** (V)	**Typical Supply Current** (µA)	**Maximum Supply Current** (µA)	**Threshold Hysteresis** (Typ) (mV)	**Operating Temp. Range** (°C)	**Package**	**Description**	**Time Delay** (Typ)
NCP302/3	0.9, 1.8, 2.0, 2.7, 3.0, 4.5, 4.7	0.8 to 10	0.20 to 0.34*	1.2 to 1.4*	45 to 235 Depends on Threshold Voltage	–40 to +125	TSOP–5	Voltage Detector Series with Programmable Delay NCP302–CMOS, NCP303–Open Drain	Ext. Capacitor Dependent
NCP304/5	0.9, 1.8, 2.0, 2.7, 3.0, 4.5, 4.7	0.8 to 10	0.8 to 1.1*	3.0 to 3.9*	45 to 235 Depends on Threshold Voltage	–40 to +125	SC–82AB	Voltage Detector Series NCP304–CMOS, NCP305–Open Drain	High to Low 10–18* µsec Low to High 6–21* µsec
NCP345	6.85	3.0 to 25	750	1000	100	–40 to +85	TSOP–5	Overvoltage Protection IC	10 µsec

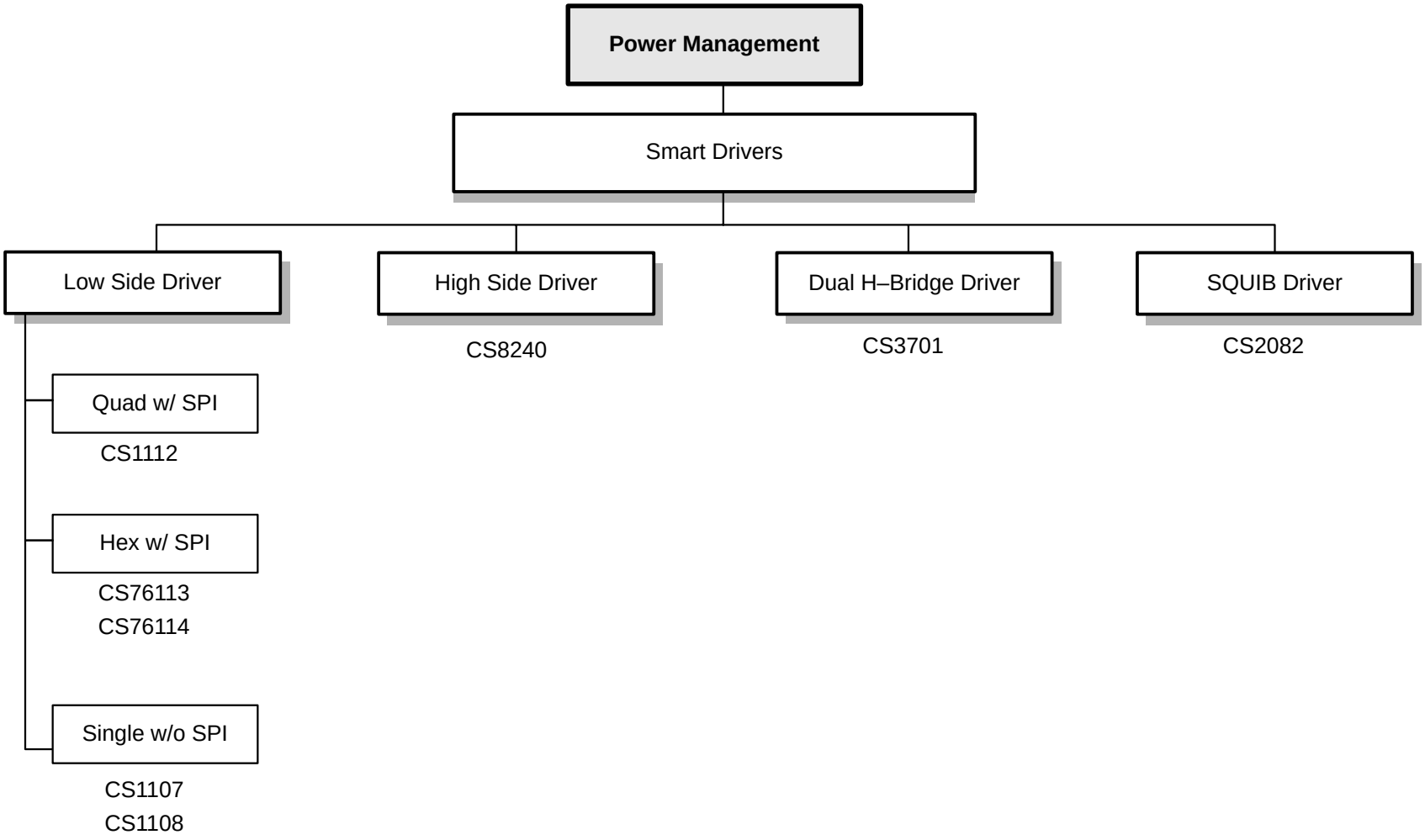
*Depends on the voltage threshold of the part


Power Management
Drivers
Load / Relay Drivers
MDC3105
MDC3205
MC1413
Display Drivers
LCD
MC34271
EL Lamp Driver
MC33441
VFD Driver
CS1087
CS1088
CS1089
Dedicated Drivers
Triac Controllers (Zero Voltage Switch Drivers)
UAA2016
MOSFET / IGBT Drivers
IGBT Ignition Pre–driver with Current Regulation
CS8312
Low Side PWM FET Controller
CS7054
High Side PWM FET Controller
CS4124
1.5 A Peak Drive Current
Dual Drivers
Non–Inverting Output
MC33152
MC34152
Inverting Output
MC33151
MC34151
2 A Peak Drive Current
Single Driver
Inverting Output
MC33153
(2 A Sink, 1 A Source)

MOSFET/IGBT Drivers

Part No.	Configuration	Peak Output Current (A)	Output Resistance (R_H/R_L) (Max Ω @ 25°C)	Max Supply Voltage (V)	Input/Output Delay (t_{D1}, t_{D2})* (nsec)	Package
CS4124	High–Side PWM FET Controller	0.300	–	30	1000/1000	DIP–16
CS7054	Low–Side PWM FET Controller	0.400	–	30	1000/1000	DIP–14
CS8312	IGBT Ignition Pre–Driver with Current Regulation	5 mA	–	12	30/30 (µs)	DIP–8, SO–8
MC33153	Single, Inverting Protection Circuits for IGBTs	1.0 A (source) 2.0 A (sink)	– –	20	300/300	DIP–8, SO–8
MC33151	Dual, Inverting Extended Operating Temp.	1.5	–	20	100/100	DIP–8, SO–8
MC34151	Dual, Inverting	1.5	–	20	100/100	DIP–8, SO–8
MC33152	Dual, Non–Inverting Extended Operating Temp.	1.5	–	20	120/120	DIP–8, SO–8
MC34152	Dual, Non–Inverting	1.5	–	20	120/120	DIP–8, SO–8

*t_{D1} = delay time from input low–to–high transition to output transition. t_{D2} = delay time from input high–to–low transition to output transition.

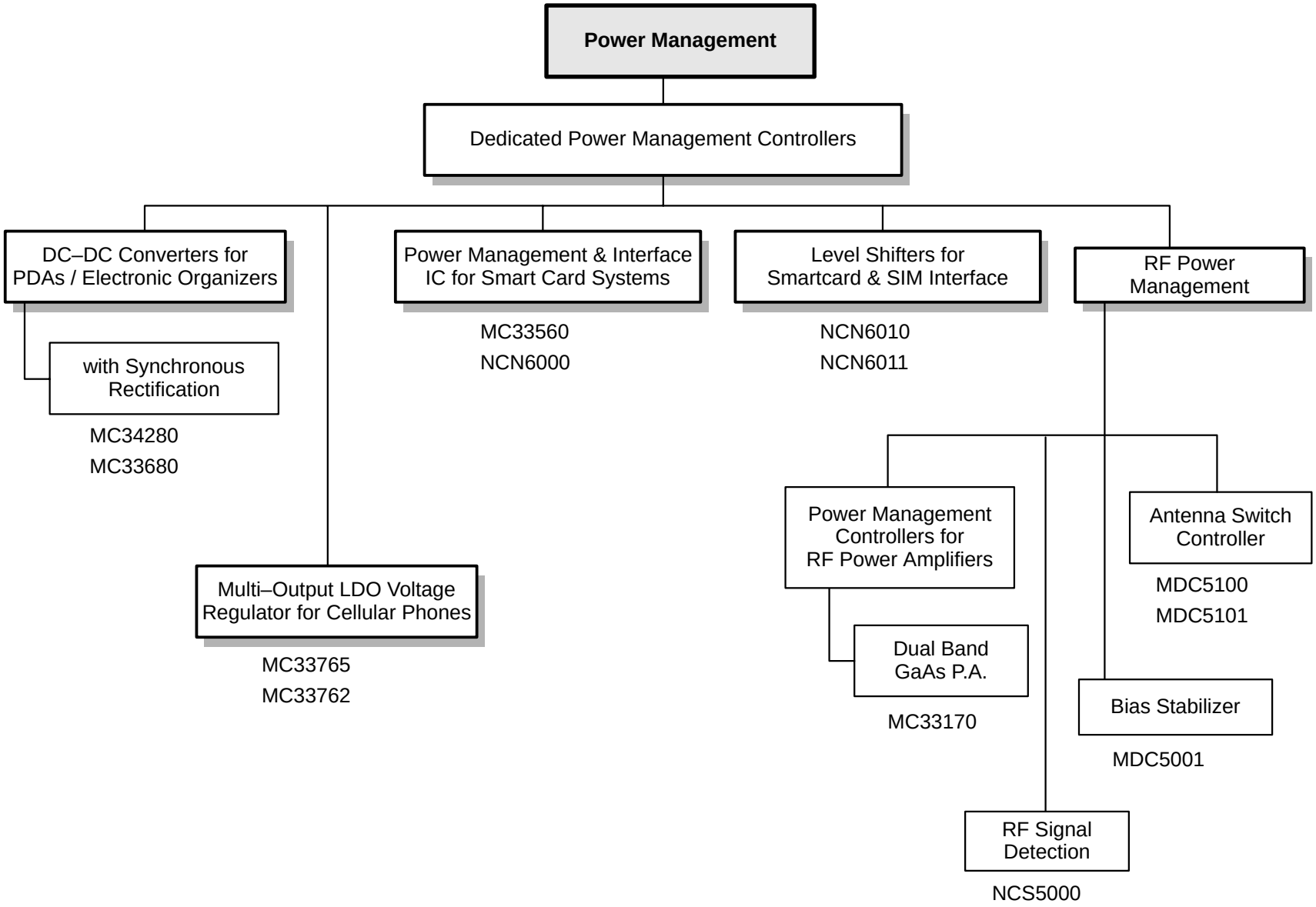

Power Management
Smart Drivers
Low Side Driver
High Side Driver
CS8240
Dual H–Bridge Driver
CS3701
SQUIB Driver
CS2082
Quad w/ SPI
CS1112
Hex w/ SPI
CS76113
CS76114
Single w/o SPI
CS1107
CS1108

Smart Drivers (High–Side, Low–Side & H–Bridge)

Part		Output		Features								Protection				
Number	Description	Current	$R_{DS(on)}$ @ 25°C	On–Chip Flyback Diode	Active Output Clamp	Parallel Inputs	Serial Interface	Fault Reporting	Undervoltage Lockout	Open Load Detection	Power On Reset	Current Limit	Over Voltage	Over Temperature	Low Duty Cycle Over Current Mode	Peak Transient
CS1107	Low–Side Single Relay Driver	350 mA		√	√			√		√		√		√	√	40 V
CS1108	Low–Side Single Lamp Driver	350 mA		√				√		√		√		√	√	40 V
CS1112	Low–Side Quad Power Output Driver		1.0 Ω	√	√	√	√	√	√	√	√	√	√		√	60 V
CS3701	Configurable Dual H–Bridge Driver	500 mA		√		√		√				√	√	√	√	45 V
CS76113/4	Low–Side Hex Power Output Driver		0.75 Ω	√	√	√	√	√	√	√	√	√	√		√	45 V
CS8240	High–Side Driver	500 mA		√								√	√	√		60 V

Squib Drivers

Part Number	Output			Features								Protection		
	Number of Outputs	Loop	$R_{DS(on)}$ @ 25°C	Battery Potential Monitor	Firing Potential Monitor	Squib Resistance Measurement	Short to Ground Monitor	Short to Battery Monitor	Safing Sensor Detection	Serial Interface	Power On Reset	Current Limit	Over Temperature	Peak Transient
CS2082	2	Dual	750 mΩ	√	√	√	√	√	√	√	√	√	√	60 V


Power Management
Dedicated Power Management Controllers
DC–DC Converters for PDAs / Electronic Organizers
with Synchronous Rectification
MC34280
MC33680
Power Management & Interface IC for Smart Card Systems
MC33560
NCN6000
Level Shifters for Smartcard & SIM Interface
NCN6010
NCN6011
RF Power Management
Multi–Output LDO Voltage Regulator for Cellular Phones
MC33765
MC33762
Power Management Controllers for RF Power Amplifiers
Dual Band GaAs P.A.
MC33170
Antenna Switch Controller
MDC5100
MDC5101
Bias Stabilizer
MDC5001
RF Signal Detection
NCS5000

Brushless DC Motor Controllers

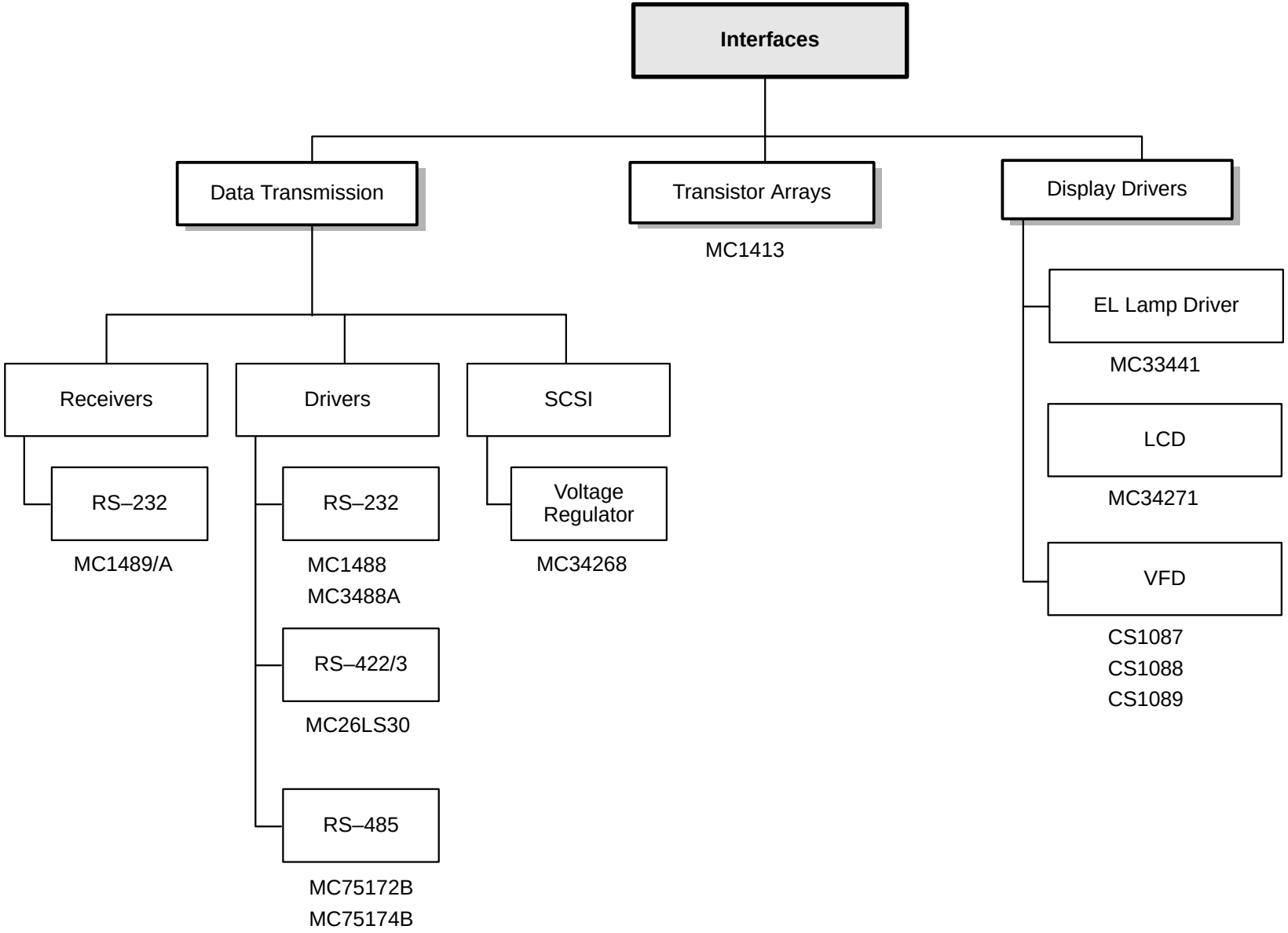
Device	Operating Voltage Range (V)		Undervoltage Lockout	Internal Thermal Shutdown	Fwd/Rev Control	Sensor Electrical Phasing	Output Enable	Output Drivers		6.25 V Reference Output	Current Sense Comparator Input(s)	Error Amplifier	$\overline{\text{FAULT}}$ Output	Separate Drive V_C	Brake Input	Package
	V_{CC}	V_C						Totem Pole (Bottom)	Open Collector (Top)							
MC33033	10 – 30	–	√	√	√	60°/300° and 120°/240°	√	√	√	√	Noninv. Only	√	–	–	–	DIP–20, SO–20L
MC33035	10 – 40	10 – 30	√	√	√		√	√	√	√	Noninv. and Inv.	√	√	√	√	DIP–24, SO–24L

Air Core Motor Drivers/Gauge Drivers

Part Number	Gauges Driven		Input			Output		Features			Protection			
	Major	Minor	Freq.	PWM	SPI	Current	Method	Return to Zero	UVLO	Regulator Output	Current Limit	Over Voltage	Over Temp.	Peak Transient
CS4121	1		√			33 mA	Differential			√		√		60 V
CS4122	1	2	√		√	80 mA	Differential				√	√	√	18 V
CS8190	1		√			33 mA	Differential	√	√			√		60 V
CS8191	1		√			55 mA	Differential				√	√		60 V

Stepper Motor Drivers/Odometer Drivers

Part Number	Input		Modes		Output		Features			Protection		
	Sine	Square	+1	+2	Current	Method	UVLO	Buffered Speed Output	On–Chip Flyback Diodes	Current Limit	Over Voltage	Peak Transient
CS4161	√	√	√	√	85 mA	Differential	√		√	√	√	60 V
CS8441	√	√	√	√	85 mA	Differential			√	√	√	60 V


Interfaces
Data Transmission
Transistor Arrays
MC1413
Display Drivers
EL Lamp Driver
MC33441
LCD
MC34271
VFD
CS1087
CS1088
CS1089
Receivers
RS–232
MC1489/A
Drivers
RS–232
MC1488
MC3488A
RS–422/3
MC26LS30
RS–485
MC75172B
MC75174B
SCSI
Voltage Regulator
MC34268

Data Transmission

Line Receivers – EIA Standard

S = Single Ended D = Differential	Type of Output	t_{prop} Delay Time Max (ns)	Party Line Operation	Strobe or Enable	Power Supplies (V)	Device	Suffix/ Package	Receivers Per Package	Companion Drivers	Comments
S	R (Note 11.)	85	–	–	+5.0	MC1489 MC1489A	DIP–16, SO–16	4	MC1488 MC14C88B	EIA–232–D

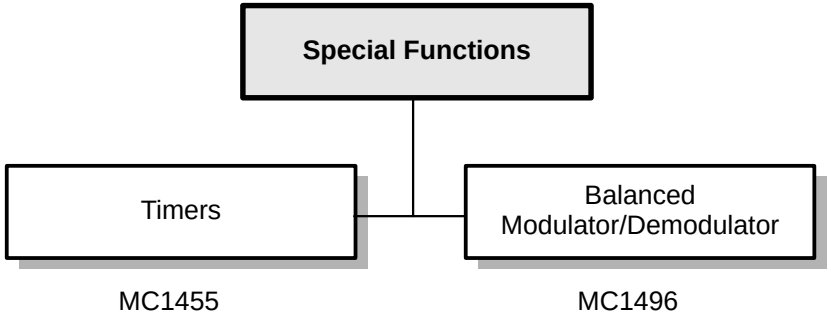
11. R = Resistor Pull–up, TP = Totem–pole output.

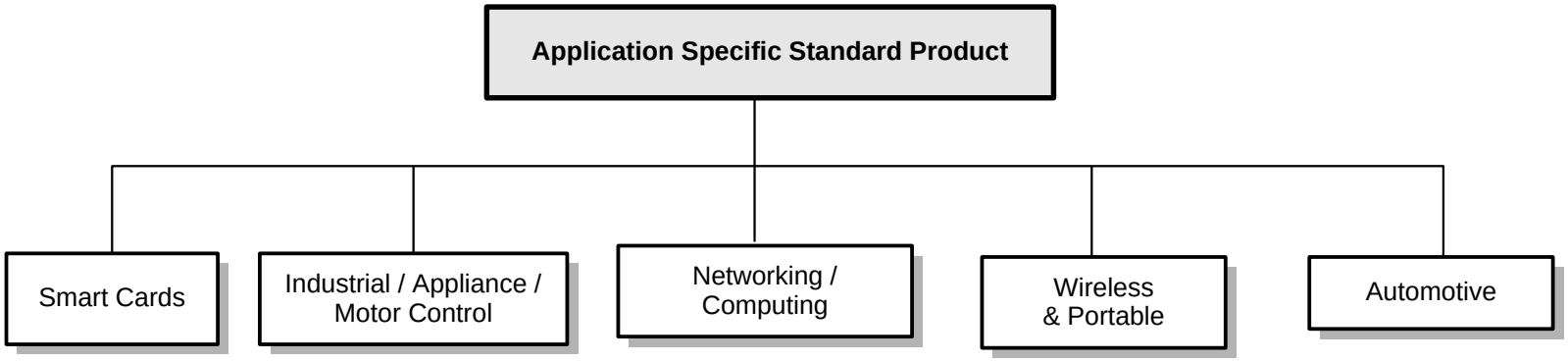
Line Drivers – EIA Standard

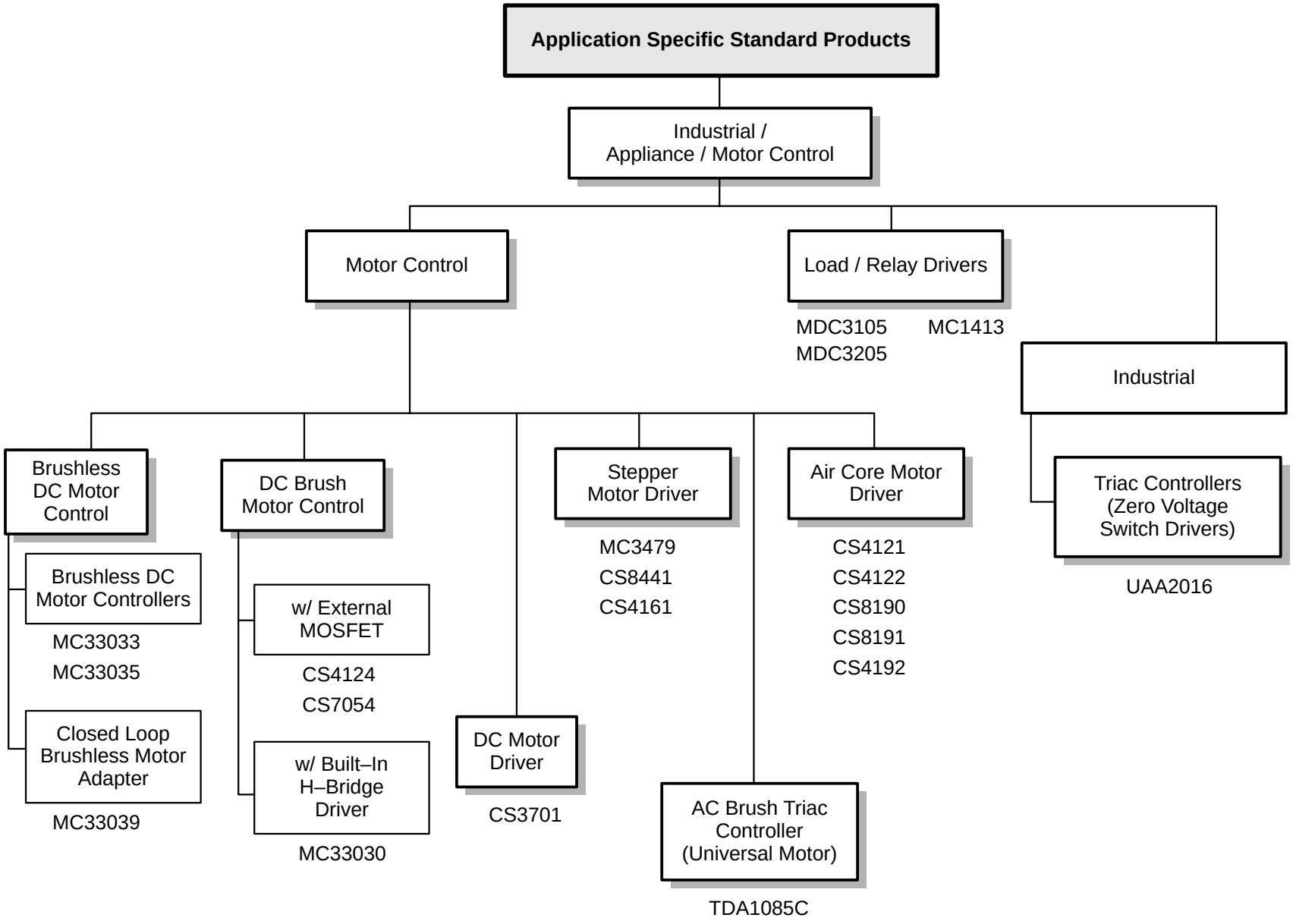
Output Current Capability (mA)	t_{prop} Delay Time Max (ns)	S = Single Ended D = Differential	Party Line Operation	Strobe or Enable	Power Supplies (V)	Device	Suffix/ Package	Receivers Per Package	Companion Drivers	Comments
85	35	D	√	√	+5.0	MC75174B MC75172B	SO–20L	4	–	EIA–485
10	350	S	–		±9.0 to ±12	MC1488	DIP–8, SO–8		MC1489 MC1489A	EIA–232–D
60	300	S/D		EIA–422 √ EIA–423 –	±5.0	MC26LS30	SO–16	4 (423) 2 (422)	–	EIA–422 or EIA–423 Switchable

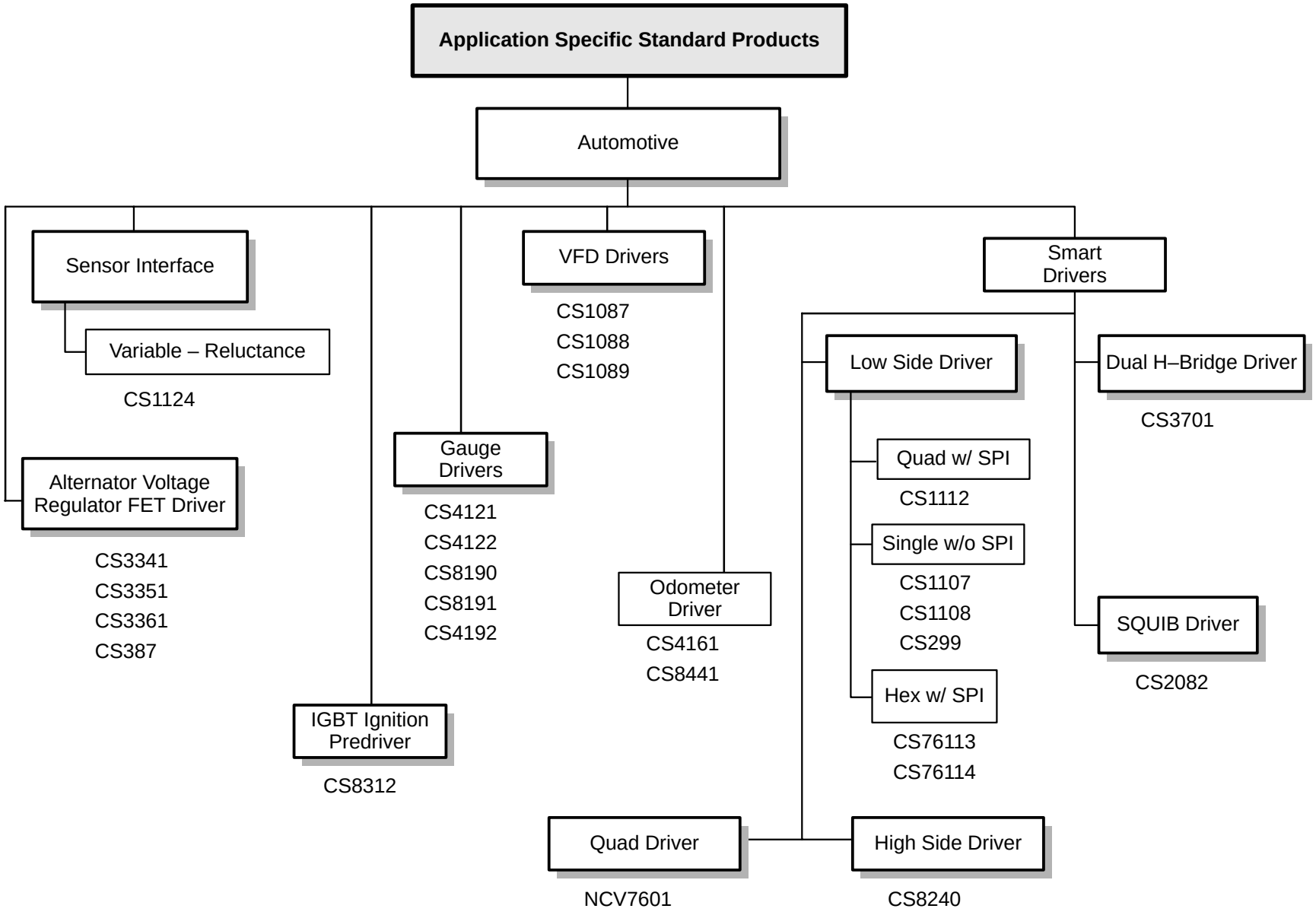
Peripheral Drivers

Output Current Capability (mA)	Input Capability	Propagation Delay Time Max (µs)	Output Clamp Diode	Off State Voltage Max (V)	Device	Drivers Per Package	Suffix/ Package	Logic Function
500	TTL, 5.0 V CMOS	1.0	√	50	MC1413B	7	DIP–16, SO–16	Invert


Special Functions
Timers
Balanced Modulator/Demodulator
MC1455
MC1496


Application Specific Standard Product
Smart Cards
Industrial / Appliance / Motor Control
Networking / Computing
Wireless & Portable
Automotive


Application Specific Standard Products
Industrial / Appliance / Motor Control
Motor Control
Load / Relay Drivers
MDC3105
MDC3205
MC1413
Industrial
Brushless DC Motor Control
Brushless DC Motor Controllers
MC33033
MC33035
Closed Loop Brushless Motor Adapter
MC33039
DC Brush Motor Control
w/ External MOSFET
CS4124
CS7054
w/ Built–In H–Bridge Driver
MC33030
DC Motor Driver
CS3701
Stepper Motor Driver
MC3479
CS8441
CS4161
AC Brush Triac Controller (Universal Motor)
TDA1085C
Air Core Motor Driver
CS4121
CS4122
CS8190
CS8191
CS4192
Triac Controllers (Zero Voltage Switch Drivers)
UAA2016


Application Specific Standard Products
Automotive
Sensor Interface
Variable – Reluctance
CS1124
Alternator Voltage Regulator FET Driver
CS3341
CS3351
CS3361
CS387
IGBT Ignition Predriver
CS8312
Gauge Drivers
CS4121
CS4122
CS8190
CS8191
CS4192
VFD Drivers
CS1087
CS1088
CS1089
Odometer Driver
CS4161
CS8441
Smart Drivers
Low Side Driver
Quad w/ SPI
CS1112
Single w/o SPI
CS1107
CS1108
CS299
Hex w/ SPI
CS76113
CS76114
Dual H–Bridge Driver
CS3701
SQUIB Driver
CS2082
Quad Driver
NCV7601
High Side Driver
CS8240

Smart Drivers (High–Side, Low–Side & H–Bridge)

Part		Output		Features								Protection				
Number	Description	Current	$R_{DS(on)}$ @ 25°C	On–Chip Flyback Diode	Active Output Clamp	Parallel Inputs	Serial Interface	Fault Reporting	Undervoltage Lockout	Open Load Detection	Power On Reset	Current Limit	Over Voltage	Over Temperature	Low Duty Cycle Over Current Mode	Peak Transient
CS1107	Low–Side Single Relay Driver	350 mA		√	√			√		√		√		√	√	40 V
CS1108	Low–Side Single Lamp Driver	350 mA		√				√		√		√		√	√	40 V
CS1112	Low–Side Quad Power Output Driver		1.0 Ω	√	√	√	√	√	√	√	√	√	√		√	60 V
CS3701	Configurable Dual H–Bridge Driver	500 mA		√		√		√				√	√	√	√	45 V
CS76113/4	Low–Side Hex Power Output Driver		0.75 Ω	√	√	√	√	√	√	√	√	√	√		√	45 V
CS8240	High–Side Driver	500 mA		√								√	√	√		60 V

Squib Drivers

Part Number	Output			Features								Protection		
	Number of Outputs	Loop	$R_{DS(on)}$ @ 25°C	Battery Potential Monitor	Firing Potential Monitor	Squib Resistance Measurement	Short to Ground Monitor	Short to Battery Monitor	Safing Sensor Detection	Serial Interface	Power On Reset	Current Limit	Over Temperature	Peak Transient
CS2082	2	Dual	750 mΩ	√	√	√	√	√	√	√	√	√	√	60 V

Vacuum Fluorescent Drivers

Part Number	Outputs							Interface		Features					Protection
	Anodes			Grids								Dimming			
	Count	Current	Voltage (Typ)	Count	Current	Voltage (Typ)	Type	SPI	Data Out	Power On Reset	Low Iq	PWM Input Pin	Serial Input Bits	Multiplex	Max Voltage
CS1087/9	23 6	2 mA 20 mA	0.3 V 0.3 V	3	50 mA	0.5 V	Push–Pull Push–Pull	√	√	√	√	√		Triplex	18 V
CS1088	25 6	2 mA 20 mA	0.3 V 0.3 V	3	50 mA	0.5 V	Push–Pull Push–Pull	√		√	√	√		Triplex	18 V

Sensor Interface

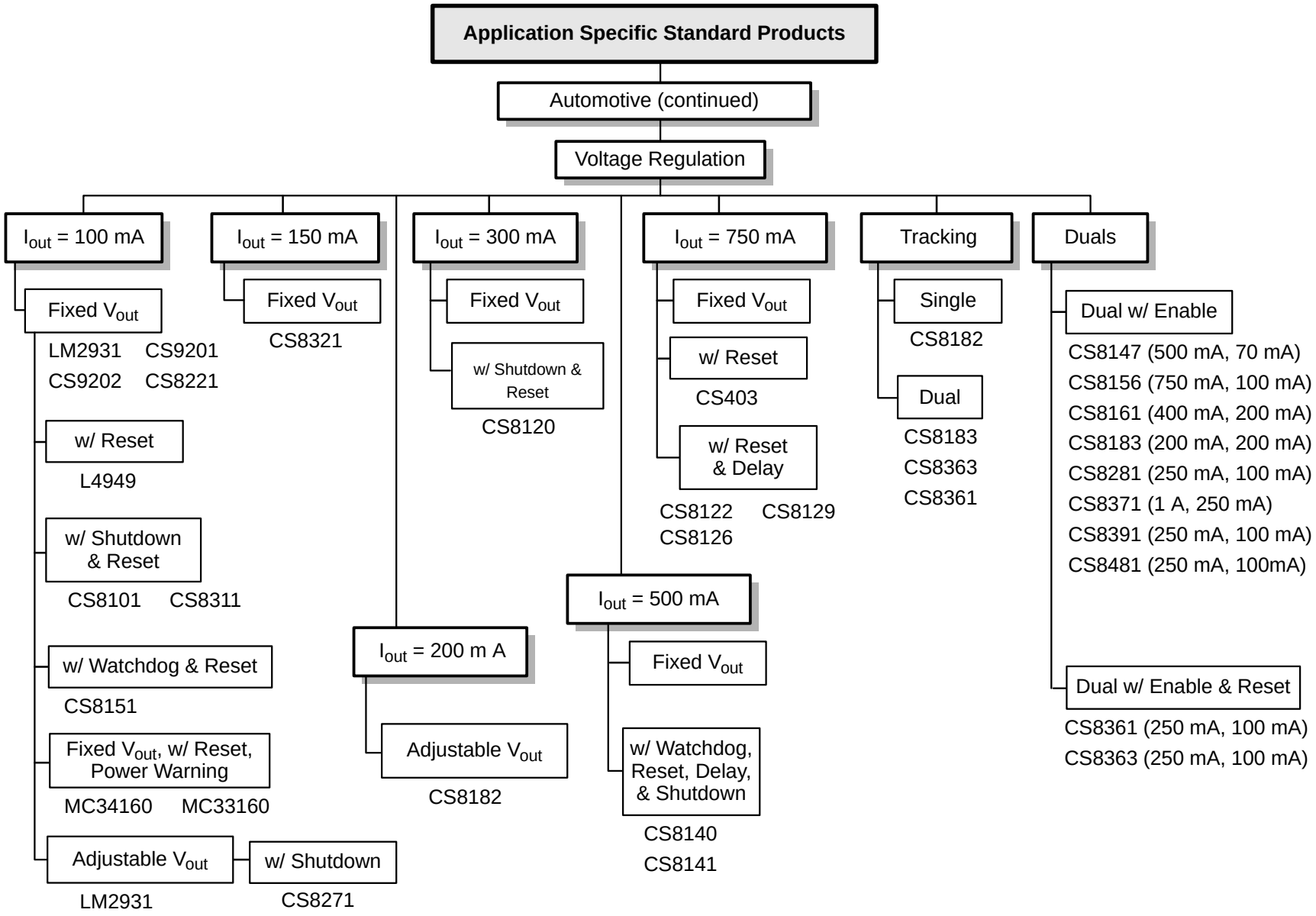
Part		Features					
Number	Description	Channels	Hysteresis	Programmable Trip Level	Trimming Method	Active Input Clamps	V_{CC} Max
CS1124	Variable–Reluctance Sensor Interface IC	2	±160 mV	√	N/A	√	7.0 V

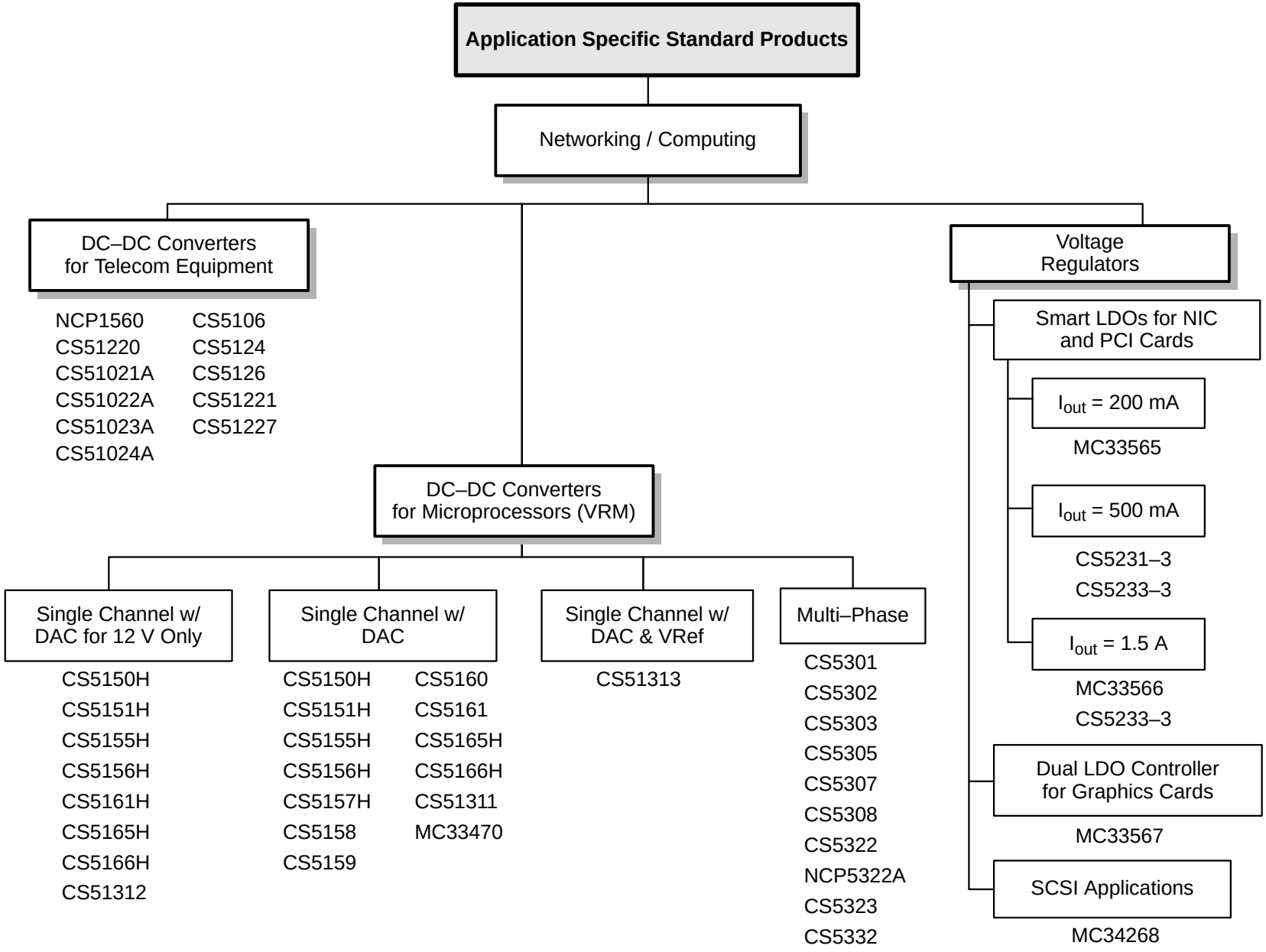
Air Core Motor Drivers/Gauge Drivers

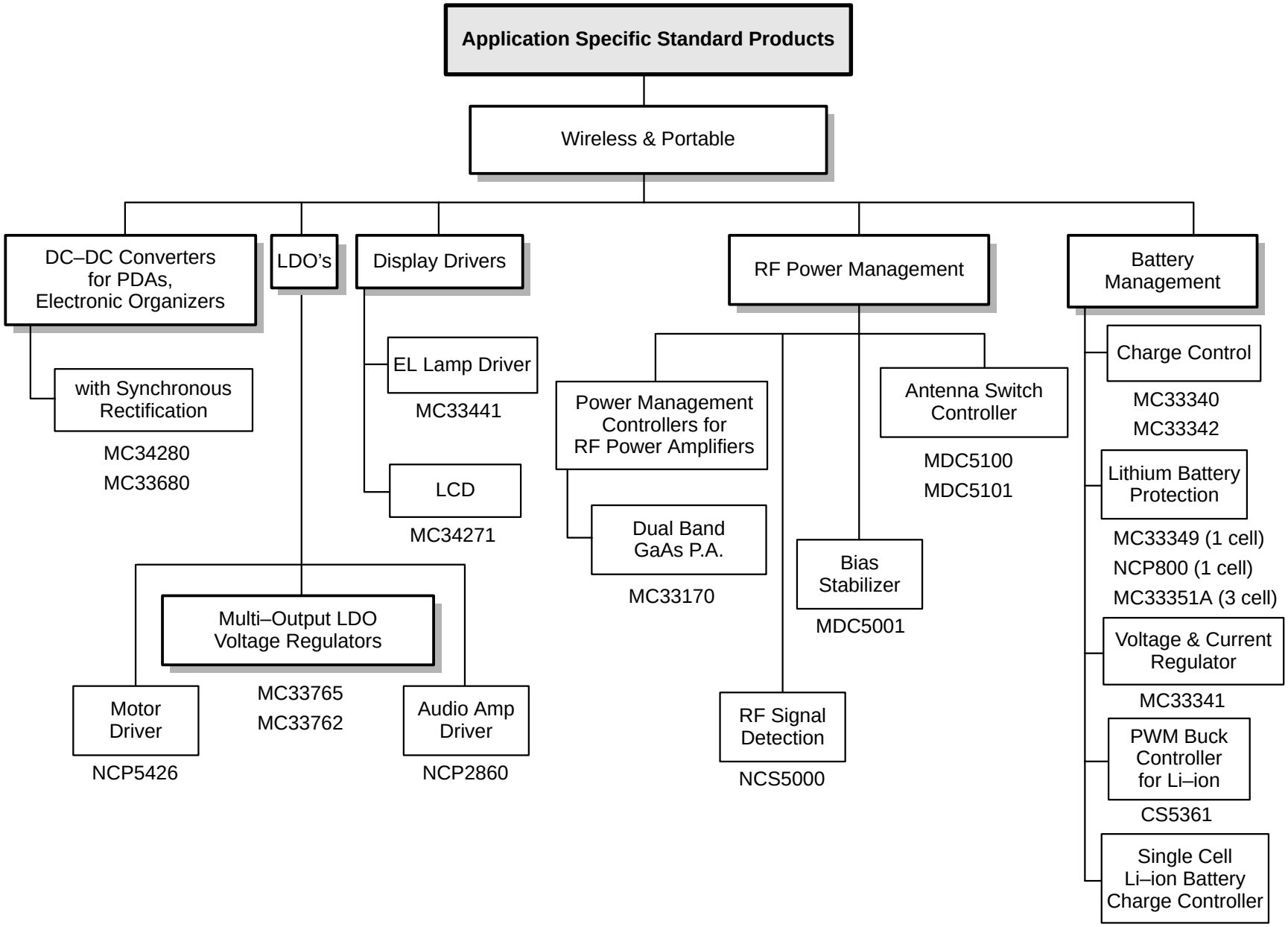
Part Number	Gauges Driven		Input			Output		Features			Protection			
	Major	Minor	Freq.	PWM	SPI	Current	Method	Return to Zero	UVLO	Regulator Output	Current Limit	Over Voltage	Over Temp.	Peak Transient
CS4121	1		√			33 mA	Differential			√		√		60 V
CS4122	1	2	√		√	80 mA	Differential				√	√	√	18 V
CS8190	1		√			33 mA	Differential	√	√			√		60 V
CS8191	1		√			55 mA	Differential				√	√		60 V

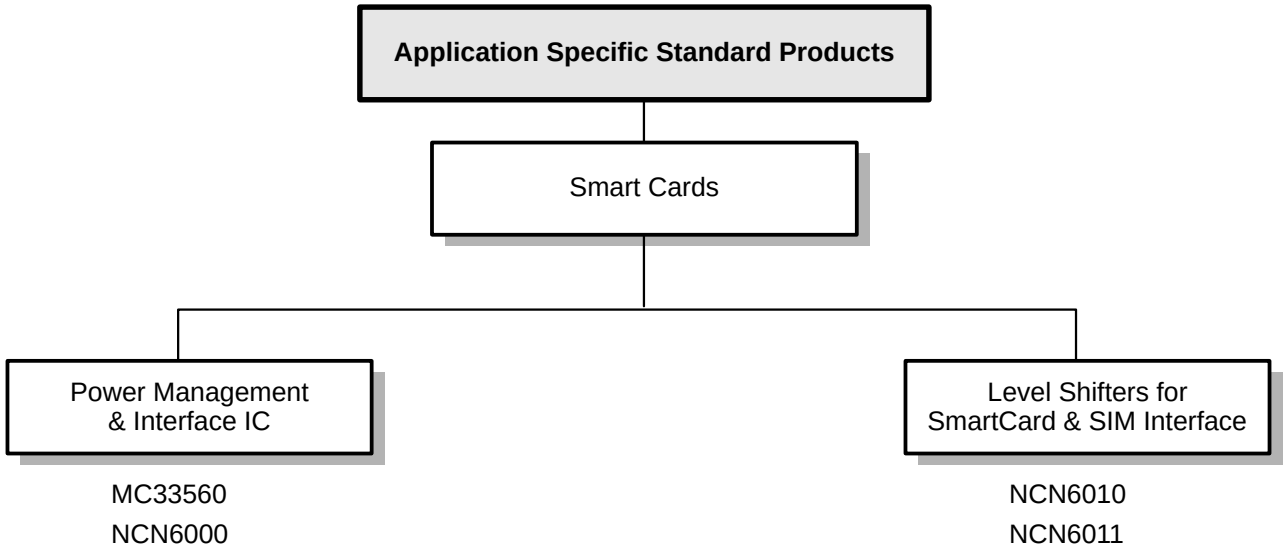
Stepper Motor Drivers/Odometer Drivers

Part Number	Input		Modes		Output		Features			Protection		
	Sine	Square	+1	+2	Current	Method	UVLO	Buffered Speed Output	On–Chip Flyback Diodes	Current Limit	Over Voltage	Peak Transient
CS4161	√	√	√	√	85 mA	Differential	√		√	√	√	60 V
CS8441	√	√	√	√	85 mA	Differential			√	√	√	60 V


Application Specific Standard Products
Automotive (continued)
Voltage Regulation
I_{out} = 100 mA
Fixed V_{out}
LM2931 CS9201
CS9202 CS8221
w/ Reset
L4949
w/ Shutdown & Reset
CS8101 CS8311
w/ Watchdog & Reset
CS8151
Fixed V_{out}, w/ Reset, Power Warning
MC34160 MC33160
Adjustable V_{out}
LM2931
w/ Shutdown
CS8271
I_{out} = 150 mA
Fixed V_{out}
CS8321
I_{out} = 300 mA
Fixed V_{out}
w/ Shutdown & Reset
CS8120
I_{out} = 200 m A
Adjustable V_{out}
CS8182
I_{out} = 750 mA
Fixed V_{out}
w/ Reset
CS403
w/ Reset & Delay
CS8122 CS8129
CS8126
I_{out} = 500 mA
Fixed V_{out}
w/ Watchdog, Reset, Delay, & Shutdown
CS8140
CS8141
Tracking
Single
CS8182
Dual
CS8183
CS8363
CS8361
Duals
Dual w/ Enable
CS8147 (500 mA, 70 mA)
CS8156 (750 mA, 100 mA)
CS8161 (400 mA, 200 mA)
CS8183 (200 mA, 200 mA)
CS8281 (250 mA, 100 mA)
CS8371 (1 A, 250 mA)
CS8391 (250 mA, 100 mA)
CS8481 (250 mA, 100mA)
Dual w/ Enable & Reset
CS8361 (250 mA, 100 mA)
CS8363 (250 mA, 100 mA)


Application Specific Standard Products
Networking / Computing
DC–DC Converters for Telecom Equipment
NCP1560
CS51220
CS51021A
CS51022A
CS51023A
CS51024A
CS5106
CS5124
CS5126
CS51221
CS51227
DC–DC Converters for Microprocessors (VRM)
Single Channel w/ DAC for 12 V Only
CS5150H
CS5151H
CS5155H
CS5156H
CS5161H
CS5165H
CS5166H
CS51312
Single Channel w/ DAC
CS5150H
CS5151H
CS5155H
CS5156H
CS5157H
CS5158
CS5159
CS5160
CS5161
CS5165H
CS5166H
CS51311
MC33470
Single Channel w/ DAC & VRef
CS51313
Multi–Phase
CS5301
CS5302
CS5303
CS5305
CS5307
CS5308
CS5322
NCP5322A
CS5323
CS5332
Voltage Regulators
Smart LDOs for NIC and PCI Cards
Iout = 200 mA
MC33565
Iout = 500 mA
CS5231–3
CS5233–3
Iout = 1.5 A
MC33566
CS5233–3
Dual LDO Controller for Graphics Cards
MC33567
SCSI Applications
MC34268


Application Specific Standard Products
Wireless & Portable
DC–DC Converters for PDAs, Electronic Organizers
with Synchronous Rectification
MC34280
MC33680
LDO's
Multi–Output LDO Voltage Regulators
MC33765
MC33762
Motor Driver
NCP5426
Audio Amp Driver
NCP2860
Display Drivers
EL Lamp Driver
MC33441
LCD
MC34271
RF Power Management
Power Management Controllers for RF Power Amplifiers
Dual Band GaAs P.A.
MC33170
Bias Stabilizer
MDC5001
RF Signal Detection
NCS5000
Antenna Switch Controller
MDC5100
MDC5101
Battery Management
Charge Control
MC33340
MC33342
Lithium Battery Protection
MC33349 (1 cell)
NCP800 (1 cell)
MC33351A (3 cell)
Voltage & Current Regulator
MC33341
PWM Buck Controller for Li–ion
CS5361
Single Cell Li–ion Battery Charge Controller


Application Specific Standard Products
Smart Cards
Power Management
& Interface IC
MC33560
NCN6000
Level Shifters for
SmartCard & SIM Interface
NCN6010
NCN6011

Data Management Devices

Data Management Devices

In Brief . . .

ON Semiconductor is a global leader in high–performance clock and data management solutions – high speed digital circuits based on our easy–to–use Emitter Coupled Logic (ECL) technologies.

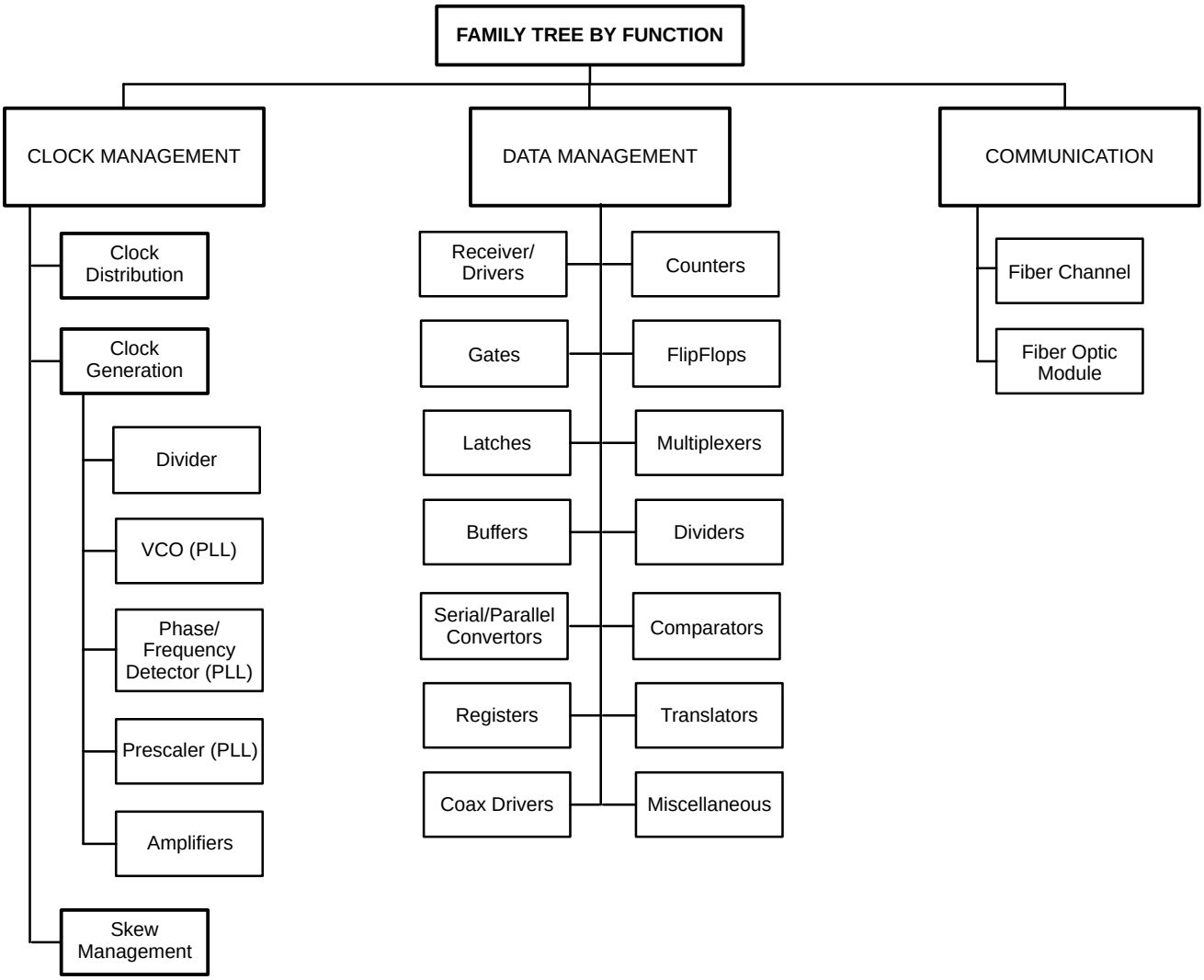
The company designs, develops and supplies high–performance data management, advanced clock management and communication ASSPs for critical broadband communications equipment, including fiber optic modules, metropolitan area networks (MAN), wide area networks (WAN), enterprise computing, automated test equipment (ATE) and storage area networks (SAN).

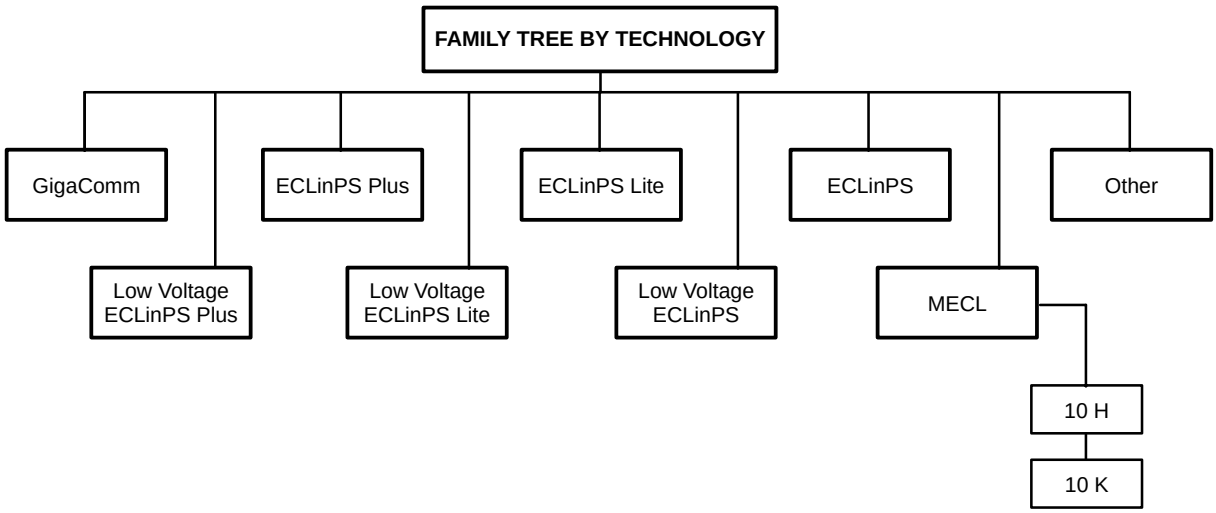
ON Semiconductor is creating new semiconductor process technologies that employ deep sub–micron technology optimized for performance in fiber optic systems such as SONET OC–192/SDH STM–64 and supporting high speed equipment. Combining innovative design, silicon germanium (SiGe) process technology and flip chip BGA packaging, our newest family of GigaComm™ ICs deliver 10 Gbps with margin to spare.

The company's strategic vision, operational excellence, rich intellectual capabilities and knowledge of customer needs have made it a key enabler in meeting the requirements of high bandwidth equipment. ON Semiconductor sells products in die, wafer and fully packaged forms in addition to providing foundry services.

Visit us at **www.onsemi.com/broadband** for the most up–to–date information on our broad portfolio of products.

	Page
Family Tree	84
Technology Comparison Chart	85
Functional Family Tree	86
Clock Management	86
Data Management	88
Communications	95
Technology Family Tree	96
GigaComm™	96
Low Voltage ECLinPS Plus™	96
ECLinPS Plus	96
Low Voltage ECLinPS Lite™	97
ECLinPS Lite	98
Low Voltage ECLinPS™	98
ECLinPS	99
MECL 10H™	100
MECL 10K™	102
Other	104
Ordering Information	105


FAMILY TREE BY FUNCTION
CLOCK MANAGEMENT
DATA MANAGEMENT
COMMUNICATION
Clock Distribution
Clock Generation
Divider
VCO (PLL)
Phase/ Frequency Detector (PLL)
Prescaler (PLL)
Amplifiers
Skew Management
Receiver/ Drivers
Gates
Latches
Buffers
Serial/Parallel Convertors
Registers
Coax Drivers
Counters
FlipFlops
Multiplexers
Dividers
Comparators
Translators
Miscellaneous
Fiber Channel
Fiber Optic Module


FAMILY TREE BY TECHNOLOGY
GigaComm
ECLinPS Plus
ECLinPS Lite
ECLinPS
Other
Low Voltage ECLinPS Plus
Low Voltage ECLinPS Lite
Low Voltage ECLinPS
MECL
10 H
10 K

Technology Comparison Chart

Parameters	**GigaComm (SiGe)** NBSGxxx	**Low–Voltage ECLinPS Plus** MC10/ 100LVEPxxx	**ECLinPS Plus** MC10/ 100EPxxx	**Low–Voltage ECLinPS Lite** MC10/ 100LVELxxx	**ECLinPS Lite** MC10/ 100ELxxx	**Low–Voltage ECLinPS** MC10/ 100LVExxx	**ECLinPS** MC10/ 100Exxx	**MECL 10/100H** MC10/ 100Hxxx	**MECL 10K** (Note 1) MC10xxx	**Unit**
Supply Voltage	2.5/3.3	2.5/3.3	3.3/5.0	3.3	5.0	3.3	5.0	5.2	5.2	V
Supply Current	25	24	24	18	18	18	18	17	17	mA
Toggle Frequency	＞12	＞4	＞4	2.5	2.0	1.1	1.1	0.350	0.125	GHz
Propagation Delay (Note 2)	150	220	220	275	275	300	300	1000	2000	ps
Output Rise/Fall Times	40	130	130	200	200	375	375	1000	2000	ps
Operating Temp Range	–40 to +85	–40 to +85	–40 to +85	–40 to +85	–40 to +85	–40 to +85	0 to +85	0 to +75	–30 to +85	°C
Package Type	FCBGA (Note 3)	SOIC, TSSOP, TQFP	SOIC, TSSOP, TQFP	SOIC, TSSOP	SOIC, TSSOP	PLCC, TQFP	PLCC, TQFP	DIP, PLCC	DIP, PLCC	–
Wafer/Die	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	–

1. MECL 10K not recommended for new designs.
2. Differential line receiver/driver as baseline.
3. 4x4/16x16 Flip–Chip Ball Grid Array.

Functional Family Tree

CLOCK MANAGEMENT

Device	Short Description	Voltage (V)	Operating Frequency (GHz)	Package
Clock Distribution				
NBSG11	2.5V/3.3V SiGe 1:2 Differential Clock Driver with RSECL Outputs	2.5, 3.3	10	FCBGA–16
NBSG14	2.5V/3.3V SiGe 1:4 Differential Clock Driver with RSECL Outputs	2.5, 3.3	10	FCBGA–16
NBSG111	2.5V / 3.3V SiGe 1:10 Differential Clock Driver with RSECL Outputs	2.5, 3.3	6	FCBGA–49
MC100LVEP14	2.5V / 3.3V 1:5 Differential ECL/PECL/HSTL Clock Driver	2.5, 3.3	3	TSSOP–20
MC100LVEP111	2.5V / 3.3V 1:10 Differential ECL/PECL/HSTL Clock Driver	2.5, 3.3	3	LQFP–32
MC100LVEP210	2.5V / 3.3V 1:5 Dual Differential ECL/PECL/HSTL Clock Driver	2.5, 3.3	3	LQFP–32
MC10/100EP11	3.3V / 5V ECL 1:2 Differential Fanout Buffer	3.3, 5	3	SOIC–8, TSSOP–8
MC10/100LVEP11	2.5V / 3.3V ECL 1:2 Differential Fanout Buffer	2.5, 3.3	2.8	SOIC–8, TSSOP–8
MC10/100EL11	5V ECL 1:2 Differential Fanout Buffer	5	2	SOIC–8, TSSOP–8
MC100EP14	5V 1:5 Differential ECL/PECL/HSTL Clock Driver	3.3, 5	2	TSSOP–20
MC100LVEL11	3.3V ECL 1:2 Differential Fanout Buffer	3.3	2	SOIC–8, TSSOP–8
MC10/100E111	5V ECL 1:9 Differential Clock Driver	5	1.5	PLCC–28
MC100LVE111	3.3V ECL 1:9 Differential Clock Driver	3.3	1.5	PLCC–28
MC100LVE210	3.3V ECL Dual 1:4, 1:5 Differential Fanout Buffer	3.3	1.5	PLCC–28
MC100LVE222	Low–Voltage 1:15 Differential ÷1/÷2 ECL/PECL Clock Driver	3.3	1.5	TQFP–52
MC100LVE310	3.3V ECL 2:8 Differential Fanout Buffer	3.3	1.5	PLCC–28
MC100EL13	Dual 1:3 Fanout Buffer	5	1	SOIC–20
MC100EL14	5V ECL 1:5 Clock Distribution Chip	5	1	SOIC–20
MC10/100EL15	1:4 Clock Distribution Chip	5	1	SOIC–16
MC100E210	5V ECL Dual 1:4, 1:5 Differential Fanout Buffer	5	1	PLCC–28
MC10/100E211	5V ECL 1:6 Differential Clock Distribution Chip	5	1	PLCC–28
MC100E310	2:8 Differential Fanout Buffer	5	1	PLCC–28
MC100EP210S	2.5V 1:5 Dual Differential LVDS Clock Driver	2.5	1	LQFP–32
MC100LVEL13	3.3V ECL Dual 1:3 Fanout Buffer	3.3	1	SOIC–20
MC100LVEL14	3.3V ECL 1:5 Clock Distribution Chip	3.3	1	SOIC–20
MC10E411	5V ECL 1:9 Differential PECL/NECL RAMBus Clock Buffer	5	–	PLCC–28
MC10/100H640	68030/040 PECL to TTL Clock Driver	5	0.135	PLCC–28
MC10/100H641	Single Supply PECL to TTL 1:9 Clock Driver	5	0.065	PLCC–28
MC10/100H642	68030/040 PECL to TTL Clock Driver	5	0.1	PLCC–28
MC10/100H643	Dual Supply ECL to TTL 1:8 Clock Driver	–5 and 5	0.1	PLCC–28
MC10/100H644	68030/040 PECL to TTL Clock Driver	5	0.135	PLCC–20
MC10H645	1:9 TTL Clock Driver	5	0.08	PLCC–28
MC10/100H646	PECL/TTL–TTL 1:8 Distribution Chip	5	0.08	PLCC–28

CLOCK MANAGEMENT (continued)

Device	Short Description	Voltage (V)	Operating Frequency (GHz)	Package
Clock Generation – Dividers				
MC10/100EP32	3.3V / 5V ECL ÷2 Divider	3.3, 5	4	SOIC–8, TSSOP–8
MC10/100EP33	3.3V / 5V ECL ÷4 Divider	3.3, 5	4	SOIC–8, TSSOP–8
MC10/100EL33	5V ECL ÷4 Divider	5	4	SOIC–8, TSSOP–8
MC100LVEL33	3.3V ECL ÷4 Divider	3.3	4	SOIC–8, TSSOP–8
MC10/100EL32	5V ECL ÷2 Divider	5	3	SOIC–8, TSSOP–8
MC100LVEL32	3.3V ECL ÷2 Divider	3.3	2.6	SOIC–8, TSSOP–8
MC100LVE222	Low–Voltage 1:15 Differential ÷1/÷2 ECL/PECL Clock Driver	3.3	1.5	TQFP–52
MC100LVEL37	3.3V ECL 1:4 ÷1/÷2 Clock Fanout Buffer	3.3	1.2	SOIC–20
MC100LVEL38	3.3V ECL ÷2, ÷4/6 Clock Generator Chip	3.3	1.2	SOIC–20
MC10/100EP139	3.3V / 5V ECL ÷2/4, ÷4/5/6 Clock Generation Chip	3.3, 5	1	SOIC–20, TSSOP–20
MC10/100EL34	5V ECL ÷2, ÷4, ÷8 Clock Generation Chip	5	1	SOIC–16
MC100EL38	5V ECL ÷2, ÷4/6 Clock Generation Chip	5	1	SOIC–20
MC100EL39	5V ECL ÷2/4, ÷4/6 Clock Generation Chip	5	1	SOIC–20
MC100LVEL39	3.3V ECL ÷2/4, ÷4/6 Clock Generation Chip	3.3	1	SOIC–20
Clock Generation – VCO (PLL)				
MC100EL1648	5V ECL Voltage Controlled Oscillator	5	1.1	SOIC–8, TSSOP–8, SOIC EIAJ–14
Clock Generation – Phase/Frequency Detectors (PLL)				
MC100EP140	3.3V ECL Phase–Frequency Detector	3.3	2.1	SOIC–8
MC100EP40	3.3V / 5V ECL Differential Phase–Frequency Detector	3.3, 5	2	SOIC–20, TSSOP–20
MCH/K12140	Phase Frequency Detector	5	0.8	SOIC–8
MC100LVEL40	3.3/5V ECL Differential Phase–Frequency Detector	3.3, 5	0.25	SOIC–20
Clock Generation – Prescaler (PLL)				
MC12095	2.5 GHz Low Power Prescaler With Stand–By Mode	2.7 / 5.5	2.5	SOIC–8
MC12026A	1.1 GHz Dual Modulus Prescaler	5	1.1	SOIC–8
MC12080	1.1 GHz Prescaler	5	1.1	SOIC–8
MC12093	÷2, ÷4, ÷8 1.1 GHz Low Power Prescaler with Stand–By Mode	2.7 / 5.5	1.1	SOIC–8
Clock Generation – Amplifiers				
MC100EP16VB	3.3V / 5V ECL Differential Receiver/Driver with High and Low Gain	3.3, 5	3	SOIC–8, TSSOP–8
MC100EP16VC	3.3V / 5V ECL Differential Receiver/Driver with High Gain and Enable Output	3.3, 5	3	SOIC–8, TSSOP–8
Skew Management				
MC10/100EP195	3.3V/5V ECL Programmable Delay Chip	3.3, 5	2.5	LQFP–32
MC10/100E195	5V ECL Programmable Delay Chip	5	1	PLCC–28
MC10/100E196	5V ECL Programmable Delay Chip	5	1	PLCC–28

DATA MANAGEMENT

Device	Short Description	Voltage (V)	Operating Frequency (GHz)	Package
Receiver/Drivers				
NBSG16	2.5V/3.3V SiGe Differential Receiver/Driver with RSECL Outputs	2.5, 3.3	12	FCBGA–16
NBSG16VS	2.5V / 3.3V SiGe Differential Receiver/Driver with Variable Output Swing	2.5, 3.3	12	FCBGA–16
MC10/100LVEP16	2.5V / 3.3V ECL Differential Receiver/Driver	2.5, 3.3	4	SOIC–8, TSSOP–8
MC10/100EP16	3.3 V / 5V ECL Differential Receiver/Driver	3.3, 5	4	SOIC–8, TSSOP–8
MC100EP16F	3.3V / 5V ECL Differential Receiver/Driver With Reduced Output Swing	3.3, 5	4	SOIC–8, TSSOP–8
MC100EP16VS	3.3V / 5V ECL Differential Receiver/Driver with Variable Output Swing	3.3, 5	4	SOIC–8, TSSOP–8
MC100EP16VT	3.3V / 5V ECL Differential Receiver/Driver with Variable Output Swing and Internal Input Termination	3.3, 5	4	SOIC–8, TSSOP–8
MC10/100EP16T	3.3V / 5V ECL Differential Receiver/Driver with Internal Termination	3.3, 5	3	SOIC–8, TSSOP–8
MC10/100EP16VA	3.3V / 5V ECL Differential Receiver/Driver with High Gain	3.3, 5	3	SOIC–8, TSSOP–8
MC100EP16VB	3.3V / 5V ECL Differential Receiver/Driver with High and Low Gain	3.3, 5	3	SOIC–8, TSSOP–8
MC100EP16VC	3.3V / 5V ECL Differential Receiver/Driver with High Gain and Enable Output	3.3, 5	3	SOIC–8, TSSOP–8
MC10/100EP17	3.3V / 5V ECL Quad Differential Driver/Receiver	3.3, 5	3	SOIC–20, TSSOP–20
MC10/100EP116	3.3V / 5V Hex Differential Line Receiver / Driver	3.3, 5	3	LQFP–32
MC100LVEL16	3.3V ECL Differential Receiver	3.3	2.5	SOIC–8, TSSOP–8
MC100LVEL17	3.3V ECL Quad Differential Receiver	3.3	2.5	SOIC–20
MC10/100EL16	5V ECL Differential Receiver	5	2	SOIC–8, TSSOP–8
MC100EL17	5V ECL Quad Differential Receiver	5	2	SOIC–20
MC10/100E116	Quint Differential Line Receiver	5	1.1	PLCC–28
MC10/100E416	5V ECL Quint Differential Line Receiver	5	1.1	PLCC–28
MC10H115	Quad Line Receiver	–5	0.25	CDIP–16, PDIP–16, PLCC–20
MC10H116	Triple Line Receiver	–5	0.25	SOIC–16, CDIP–16, PDIP–16, PLCC–20
MC10H330	Quad MSTR	–5	0.25	PDIP–24, PLCC–28
MC10H332	Dual Bus Driver/Receiver	–5	0.25	CDIP–20, PDIP–20, PLCC–20
MC10H334	Quad Bus Driver/Receiver Translator	–5	0.25	CDIP–20, PDIP–20, PLCC–20
Counters				
MC10/100EP016	3.3V / 5V ECL 8–Bit Synchronous Binary Up Counter	3.3, 5	3	LQFP–32
MC10/100E137	5V ECL 8–Bit Ripple Counter	5	2.2	PLCC–28
MC10/100E136	5V ECL 6–Bit Universal Up/Down Counter	5	0.55	PLCC–28
MC10/100E016	5V ECL 8–Bit Synchronous Binary Up Counter	5	0.7	PLCC–28
MC10H016	4–Bit Binary Counter	–5	0.2	CDIP–16, PDIP–16, PLCC–20
MC10H136	Universal Hexidecimal Counter	–5	0.25	CDIP–16, PDIP–16, PLCC–20

DATA MANAGEMENT (continued)

Device	Short Description	Voltage (V)	Operating Frequency (GHz)	Package
Gates – OR/NOR				
MC10/100EP01	3.3V / 5V ECL 4–Input OR/NOR	3.3, 5	3	SOIC–8, TSSOP–8
MC10/100EP101	3.3V / 5V ECL Quad 4–Input OR/NOR	3.3, 5	3	LQFP–32
MC10/100EL01	5V ECL 4–Input OR/NOR	5	2	SOIC–8, TSSOP–8
MC10/100EL12	5V ECL Low Impedance Driver	5	2	SOIC–8, TSSOP–8
MC100LVEL01	3.3V ECL 4–Input OR/NOR	3.3	2	SOIC–8, TSSOP–8
MC100LVEL12	3.3V ECL Low Impedance Driver	3.3	2	SOIC–8, TSSOP–8
MC10/100E101	5V ECL Quad 4–Input OR/NOR Gate	5	2	PLCC–28
MC10H100	Quad 2–Input NOR Gate With Strobe	–5	0.25	CDIP–16, PDIP–16
MC10H101	Quad OR/NOR Gate	–5	0.25	CDIP–16, PDIP–16, PLCC–20
MC10H102	Quad 2–Input NOR Gate	–5	0.25	CDIP–16, PDIP–16, PLCC–20
MC10H103	Quad 2–Input OR Gate	–5	0.25	CDIP–16, PDIP–16, PLCC–20
MC10H105	Triple 2–3–2–Input OR/NOR Gate	–5	0.25	CDIP–16, PDIP–16, PLCC–20
MC10H106	Triple 4–3–3–Input NOR Gate	–5	0.25	CDIP–16, PDIP–16, PLCC–20
MC10H109	Dual 4–5–Input OR/NOR Gate	–5	0.25	CDIP–16, PDIP–16, PLCC–20
MC10H209	Dual 4–5–Input OR/NOR	–5	0.25	CDIP–16, PDIP–16, PLCC–20
MC10H210	3–Input 3–Output OR Gate	–5	0.25	CDIP–16, PDIP–16, PLCC–20
MC10H211	Dual 3–Input 3–Output NOR Gate	–5	0.25	CDIP–16, PDIP–16, PLCC–20
Gates – AND/NAND				
MC10/100EP05	3.3V / 5V 2–Input Differential AND/NAND	3.3, 5	3	SOIC–8, TSSOP–8
MC10/100EP105	3.3V / 5V ECL Quad 2–Input Differential AND/NAND	3.3, 5	3	LQFP–32
MC10/100EL04	5V ECL 2–Input AND/NAND	5	2	SOIC–8, TSSOP–8
MC10/100EL05	5V ECL 2–Input Differential AND/NAND	5	2	SOIC–8, TSSOP–8
MC100LVEL05	3.3V ECL 2–Input Differential AND/NAND	3.3	2	SOIC–8, TSSOP–8
MC10/100E104	5V ECL Quint 2–Input AND/NAND Gate	5	2	PLCC–28
MC10/100E404	5V ECL Quad Differential AND/NAND	5	2	PLCC–28
MC10H104	Quad 2–Input AND Gate	–5	0.25	CDIP–16, PDIP–16, PLCC–20
Gates – XOR/XNOR				
MC10/100EP08	3.3V / 5V Differential 2–Input XOR/XNOR	3.3, 5	3	SOIC–8, TSSOP–8
MC10/100EL07	5V ECL 2–Input XOR/XNOR	5	2	SOIC–8, TSSOP–8
MC10/100E107	5V ECL Quint 2–Input XOR/XNOR Gate	5	2	PLCC–28
MC10H107	Triple 2–Input XOR/XNOR Gate	–5	0.25	SOIC–16, CDIP–16, PDIP–16, PLCC–20
MC10H113	Quad XOR Gate	–5	0.25	CDIP–16, PDIP–16, PLCC–20

DATA MANAGEMENT (continued)

Device	Short Description	Voltage (V)	Operating Frequency (GHz)	Package
Gates – Complex				
MC10H117	Dual 2–Wide 2–3–Input OR–AND/OR–AND–Invert Gate	–5	0.25	CDIP–16, PDIP–16, PLCC–20
MC10H121	4–Wide OR–AND/OR–ANDbar Gate	–5	0.25	CDIP–16, PDIP–16, PLCC–20
Flip–Flops				
MC10/100EP52	3.3V / 5V ECL Differential Data and Clock D Flip–Flop	3.3, 5	4	SOIC–8, TSSOP–8
MC10/100EP29	3.3V / 5V ECL Dual Differential Data and Clock D Flip–Flop With Set and Reset	3.3, 5	3	TSSOP–20
MC10/100EP31	3.3V / 5V ECL D Flip Flop with Set and Reset	3.3, 5	3	SOIC–8, TSSOP–8
MC10/100EP35	3.3V / 5V ECL JK Flip Flop	3.3, 5	3	SOIC–8, TSSOP–8
MC10/100EP51	3.3V / 5V ECL D Flip Flop with Reset and Differential Clock	3.3, 5	3	SOIC–8, TSSOP–8
MC10/100EP131	3.3V / 5V ECL Quad D Flip Flop with Set, Reset, and Differential Clock	3.3, 5	3	LQFP–32
MC100LVEL31	3.3V ECL D–Type Flip–Flop with Set and Reset	3.3	2.9	SOIC–8, TSSOP–8
MC10/100EL31	5V ECL D–Type Flip–Flop with Set and Reset	5	2.8	SOIC–8, TSSOP–8
MC10/100EL51	5V ECL Differential Clock D Flip–Flop	5	2.8	SOIC–8, TSSOP–8
MC100LVEL51	3.3V ECL Differential Clock D Flip–Flop	3.3	2.8	SOIC–8, TSSOP–8
MC10/100EL35	5V ECL JK Flip–Flop	5	2.2	SOIC–8, TSSOP–8
MC10/100EL52	5V ECL Differential Data and Clock D Flip–Flop	5	2	SOIC–8, TSSOP–8
MC100EL30	5V ECL Triple D Flip–Flop with Set and Reset	5	1.2	SOIC–20
MC100LVEL30	3.3V ECL Triple D–Type Flip–Flop with Set and Reset	3.3	1.2	SOIC–20
MC100EL29	5V ECL Dual Differential Data and Clock D Flip–Flop With Set and Reset	5	1.1	SOIC–20
MC100LVEL29	3.3V ECL Dual Differential Data and Clock D–Type Flip–Flop with Set and Reset	3.3	1.1	SOIC–20
MC10/100E131	5V ECL 4–Bit D–Type Flip–Flop	5	1.1	PLCC–28
MC10/100E431	5V ECL 3–Bit Differential Flip–Flop	5	1.1	PLCC–28
MC10H131	Dual Type D Master–Slave Flip–Flop	–5	0.25	CDIP–16, PDIP–16, PLCC–20
MC10H135	Dual J–K Master–Slave Flip–Flop	–5	0.25	CDIP–16, PDIP–16, PLCC–20
Latches				
MC10/100E150	5V ECL 6–Bit D Latch	5	–	PLCC–28
MC10/100E154	5V ECL 5–Bit 2:1 Mux Latch	5	–	PLCC–28
MC10/100E155	5V ECL 6–Bit 2:1 Mux Latch	5	–	PLCC–28
MC10/100E156	5V ECL 3–Bit 4:1 Mux–Latch	5	–	PLCC–28
MC10/100E175	5V ECL 9–Bit Latch With Parity	5	–	PLCC–28
MC10H130	Dual Latch	–5	0.25	CDIP–16, PDIP–16, PLCC–20
MC10H173	Quad 2–Input Multiplexer/Latch	–5	0.25	CDIP–16, PDIP–16, PLCC–20
MC10H175	Quint Latch	–5	0.25	CDIP–16, PDIP–16, PLCC–20
MC10E1651	Dual High Performance Comparator	5	1	CDIP–16, PLCC–20
MC10E1652	5V ECL Dual ECL Output Comparator With Latch	5	1	PLCC–20

DATA MANAGEMENT (continued)

Device	Short Description	Voltage (V)	Operating Frequency (GHz)	Package
Latches (continued)				
MC10H334	Quad Bus Driver/Receiver with Transmit and Receiver Latches	–5	–	CDIP–20, PLCC–20
MC10/100H602	9–Bit Latch TTL/ECL Translator	–5 and 5	–	PLCC–28
MC10/100H603	9–Bit Latch ECL/TTL Translator	–5 and 5	–	PLCC–28
MC10H681	Hex ECL/TTL Transceiver with Latches	–5 and 5	–	PLCC–28
Multiplexers – 2:1				
MC10/100EP56	3.3V / 5V ECL Dual Differential 2:1 Multiplexer	3.3, 5	3	SOIC–20, TSSOP–20
MC10/100EP58	3.3V / 5V ECL 2:1 Multiplexer	3.3, 5	3	SOIC–8, TSSOP–8
MC10/100E154	5V ECL 5–Bit 2:1 Mux Latch	5	1	PLCC–28
MC10/100E155	5V ECL 6–Bit 2:1 Mux Latch	5	1	PLCC–28
MC10/100E167	5V ECL 6–Bit 2:1 Mux–Register	5	1	PLCC–28
MC10H158	Quad 2–Input Multiplexer (Non–Inverting)	–5	0.25	CDIP–16, PDIP–16, PLCC–20
MC10H159	Quad 2–Input Multiplexer (Inverting)	–5	0.25	CDIP–16, PDIP–16, PLCC–20
MC10H173	Quad 2–Input Multiplexer/Latch	–5	0.25	CDIP–16, PDIP–16, PLCC–20
MC100EL56	5V ECL Dual Differential 2:1 Multiplexer	5	–	SOIC–20
MC10/100EL58	5V ECL 2:1 Multiplexer	5	–	SOIC–8, TSSOP–8
MC100EL59	5V ECL Triple 2:1 Multiplexer	5	–	SOIC–20
MC100LVEL56	3.3V ECL Dual Differential 2:1 Multiplexer	3.3	–	SOIC–20
MC100LVEL58	3.3V ECL 2:1 Multiplexer	3.3	–	SOIC–8, TSSOP–8
MC100LVEL59	3.3V ECL Triple 2:1 Multiplexer	3.3	–	SOIC–20
MC10/100E157	5V ECL Quad 2:1 Multiplexer	5	–	PLCC–28
MC10/100E158	5V ECL 5–Bit 2:1 Multiplexer	5	–	PLCC–28
MC10/100E457	5V ECL Triple Differential 2:1 Multiplexer	5	–	PLCC–28
Multiplexers – 4:1				
MC10/100EP57	3.3V / 5V ECL 4:1 Differential Multiplexer	3.3, 5	2	TSSOP–20
MC10/100E156	5V ECL 3–Bit 4:1 Mux–Latch	5	1	PLCC–28
MC10H174	Dual 4:1 Multiplexer	–5	0.25	CDIP–16, PDIP–16, PLCC–20
MC10/100EL57	5V ECL 4:1 Differential Multiplexer	5	–	SOIC–16
MC10/100E171	5V ECL 3–Bit 4:1 Multiplexer	5	–	PLCC–28
Multiplexers – Others				
MC10/100E163	5V ECL 2–Bit 8:1 Multiplexer	5	–	PLCC–28
MC10/100E164	5V ECL 16:1 Multiplexer	5	–	PLCC–28
MC100LVE164	3.3V ECL 16:1 Multiplexer	3.3	–	LQFP–32
MC10H164	8–Line Multiplexer	–5	0.25	CDIP–16, PDIP–16, PLCC–20
MC10H330	Quad MSTR	–5	0.25	PDIP–24, PLCC–28
MC10H332	Dual Bus Driver/Receiver	–5	0.25	CDIP–20, PDIP–20, PLCC–20

DATA MANAGEMENT (continued)

Device	Short Description	Voltage (V)	Operating Frequency (GHz)	Package
Buffers				
MC10/100E112	5V ECL Quad Driver	5	–	PLCC–28
MC10/100E122	5V ECL 9–Bit Buffer	5	–	PLCC–28
MC10H188	Hex Buffer with Enable	–5	0.25	CDIP–16, PDIP–16, PLCC–20
MC10H189	Hex Inverter with Enable	–5	0.25	CDIP–16, PDIP–16, PLCC–20
Dividers				
MC10/100EP32	3.3V / 5V ECL ÷2 Divider	3.3, 5	4	SOIC–8, TSSOP–8
MC10/100EP33	3.3V / 5V ECL Divide by 4 Divider	3.3, 5	4	SOIC–8, TSSOP–8
MC10/100EP33	3.3V / 5V ECL Divide by 4 Divider	3.3, 5	4	SOIC–8, TSSOP–8
MC10/100EL33	5V ECL Divide by 4 Divider	5	4	SOIC–8, TSSOP–8
MC100LVEL33	3.3V ECL Divide by 4 Divider	3.3	4	SOIC–8, TSSOP–8
MC10/100EL32	5V ECL Divide by 2 Divider	5	3	SOIC–8, TSSOP–8
MC100LVEL32	3.3V ECL ÷2 Divider	3.3	2.6	SOIC–8, TSSOP–8
MC100LVEL37	3.3V ECL 1:4 ÷1/÷2 Clock Fanout Buffer	3.3	1.2	SOIC–20
MC100LVEL38	3.3V ECL ÷2, ÷4/6 Clock Generator Chip	3.3	1.2	SOIC–20
MC10/100EP139	3.3V / 5V ECL ÷2/4, ÷4/5/6 Clock Generation Chip	3.3, 5	1	SOIC–20, TSSOP–20
MC10/100EL34	5V ECL Divide by 2, Divide by 4, Divide by 8 Clock Generation Chip	5	1	SOIC–16
MC100EL38	5V ECL Divide by 2, Divide by 4/6 Clock Generation Chip	5	1	SOIC–20
MC100EL39	5V ECL Divide by 2/4, Divide by 4/6 Clock Generation Chip	5	1	SOIC–20
MC100LVEL39	3.3V ECL ÷2/4, ÷4/6 Clock Generation Chip	3.3	1	SOIC–20
Serial/Parallel Converters				
MC10/100EP446	3.3V / 5V ECL 8–Bit Differential Parallel/Serial Converter	3.3, 5	3.4	LQFP–32
MC10/100EP445	3.3V / 5V ECL 8–Bit Serial/Parallel Converter	3.3, 5	2.5	LQFP–32
MC10/100E445	5V ECL 4–Bit Serial/Parallel Converter	5	2	PLCC–28
MC10/100E446	5V ECL 4–Bit Parallel/Serial Converter	5	1.6	PLCC–28
MC10/100E141	5V ECL 8–Bit Shift Register	5	0.7	PLCC–28
MC10/100E142	5V ECL 9–Bit Shift Register	5	0.7	PLCC–28
MC10/100E143	5V ECL 9–Bit Hold Register	5	0.7	PLCC–28
MC10H141	4–Bit Universal Shift Register	–5	–	CDIP–16, PDIP–16, PLCC–20
Comparators				
MC10E1651	Dual High Performance Comparator	5	1	CDIP–16, PLCC–20
MC10E1652	5V ECL Dual ECL Output Comparator With Latch	5	1	PLCC–20
MC10H166	5–Bit Magnitude Comparator	–5	0.25	CDIP–16, PDIP–16, PLCC–20
MC10/100E166	5V ECL 9–Bit Magnitude Comparator	5	–	PLCC–28

DATA MANAGEMENT (continued)

Device	Short Description	Voltage (V)	Operating Frequency (GHz)	Package
Registers				
MC100EP451	3.3V / 5V ECL 6–Bit Differential Register with Master Reset	3.3, 5	3	LQFP–32
MC100EP142	3.3V / 5V ECL 9–Bit Shift Register	3.3, 5	2	LQFP–32
MC10/100E151	5V ECL 6–Bit D Register	5	1.1	PLCC–28
MC10/100E451	5V ECL 6–Bit D Register Differential Data and Clock	5	1.1	PLCC–28
MC10/100E452	5V ECL 5–Bit Differential Register	5	1.1	PLCC–28
MC10/100E167	5V ECL 6–Bit 2:1 Mux–Register	5	1	PLCC–28
MC100E241	5V ECL 8–Bit Scannable Register	5	0.9	PLCC–28
MC10/100E141	5V ECL 8–Bit Shift Register	5	0.7	PLCC–28
MC10/100E142	5V ECL 9–Bit Shift Register	5	0.7	PLCC–28
MC10/100E143	5V ECL 9–Bit Hold Register	5	0.7	PLCC–28
MC10H141	4–Bit Universal Shift Register	–5	–	CDIP–16, PDIP–16, PLCC–20
MC10H176	Hex D–Type Master–Slave Flip–Flop	–5	–	CDIP–16, PDIP–16, PLCC–20
MC10H186	Hex D Master–Slave Flip–Flop with Reset	–5	–	CDIP–16, PDIP–16, PLCC–20

Device	Short Description	Input Level	Output Level	Package
Translators				
MC10H352	Quad CMOS To ECL Translator	CMOS	PECL	PDIP–20, PLCC–20
MC100EP90	3.3V / 5V Triple ECL Input to LVPECL/PECL Output Translator	ECL	PECL, LVPECL	TSSOP–20
MC100EPT25	Differential LVECL/ECL to LVTTL Translator	ECL	LVTTL	SOIC–8, TSSOP–8
MC100EL90	–3.3V / –5V Triple ECL Input to PECL Output Translator	ECL	PECL	SOIC–20
MC10/100ELT25	Differential –5V ECL To TTL Translator	ECL	TTL	SOIC–8, TSSOP–8
MC100LVEL90	–3.3V/–5V Triple ECL Input to LVPECL Output Translator	ECL	LVPECL	SOIC–20
MC10H125	Quad ECL to TTL Translator	ECL	TTL	CDIP–16, PDIP–16, PLCC–20
MC10/100H601	9–Bit ECL–TTL Translator	ECL	TTL	PLCC–28
MC10/100H603	9–Bit Latch ECL/TTL Translator	ECL	TTL	PLCC–28
MC10/100H605	Registered Hex ECL/TTL Translator	ECL	TTL	PLCC–28
MC10/100H643	Dual Supply ECL to TTL 1:8 Clock Driver	ECL	TTL	PLCC–28
MC10/100H680	4–Bit Differential ECL Bus/TTL Bus Transceiver	ECL	TTL	PLCC–28
MC100EPT21	Differential LVPECL to LVTTL Translator	LVPECL	LVTTL	SOIC–8, TSSOP–8
MC100EPT23	3.3V Dual Differential LVPECL to LVTTL Translator	LVPECL	LVTTL	SOIC–8, TSSOP–8
MC100EPT26	1:2 Fanout Differential LVPECL to LVTTL Translator	LVPECL	LVTTL	SOIC–8, TSSOP–8
MC100LVELT23	3.3V Dual Differential LVPECL to LVTTL Translator	LVPECL	LVTTL	SOIC–8, TSSOP–8
MC100EP210S	2.5V 1:5 Dual Differential LVDS Clock Driver	LVPECL, LVDS	LVDS	LQFP–32
MC100EL91	3.3V / 5V Triple LVPECL /PECL Input to –5V ECL Output Translator	LVPECL, PECL	ECL	SOIC–20
MC100LVEL91	3.3V/5V Triple LVPECL / PECL Input to –3.3V ECL Output Translator	LVPECL, PECL	ECL	SOIC–20

DATA MANAGEMENT (continued)

Device	Short Description	Input Level	Output Level	Package
Translators (continued)				
MC100EPT20	3.3V LVTTL/LVCMOS to Differential LVPECL Translator	LVTTL, LVCMOS	LVPECL	SOIC–8, TSSOP–8
MC100EPT22	Dual LVTTL/LVto Differential LVPECL Translator	LVTTL, LVCMOS	LVPECL	SOIC–8
MC100EPT24	3.3V LVTTL/LVCMOS to Differential LVECL Translator	LVTTL, LVCMOS	LVECL	SOIC–8, TSSOP–8
MC100LVELT22	3.3V Dual LVTTL/LVCMOS to Differential LVPECL Translator	LVTTL, LVCMOS	LVPECL	SOIC–8, TSSOP–8
MC10/100ELT21	5V Differential PECL To TTL Translator	PECL	TTL	SOIC–8, TSSOP–8
MC100ELT23	5V Dual Differential PECL to TTL Translator	PECL	TTL	SOIC–8, TSSOP–8
MC10H350	PECL To TTL Translator	PECL	TTL	CDIP–16, PDIP–16, PLCC–20
MC10/100H607	Registered Hex PECL/TTL Translator	PECL	TTL	PLCC–28
MC10/100H640	68030/040 PECL to TTL Clock Driver	PECL	TTL	PLCC–28
MC10/100H641	Single Supply PECL to TTL 1:9 Clock Driver	PECL	TTL	PLCC–28
MC10/100H642	68030/040 PECL to TTL Clock Driver	PECL	TTL	PLCC–28
MC10/100H644	68030/040 PECL to TTL Clock Driver	PECL	TTL	PLCC–20
MC100LVEL92	5V Triple PECL Input to LVPECL Output Translator	PECL	LVPECL	SOIC–20
MC10/100ELT28	5V TTL to Differential PECL and Differential PECL to TTL Translator	PECL, TTL	TTL, PECL	SOIC–8, TSSOP–8
MC100H646	PECL/TTL–TTL 1:8 Distribution Chip	PECL, TTL	TTL	PLCC–28
MC10/100ELT20	5V TTL To Differential PECL Translator	TTL	PECL	SOIC–8, TSSOP–8
MC10/100ELT22	5V Dual TTL to Differential PECL Translator	TTL	PECL	SOIC–8, TSSOP–8
MC10/100ELT24	5V TTL to Differential ECL Translator	TTL	ECL	SOIC–8, TSSOP–8
MC10H124	Quad TTL to ECL Translator	TTL	ECL	CDIP–16, PDIP–16, PLCC–20
MC10H424	Quad TTL–ECL Translator	TTL	ECL	CDIP–16, PDIP–16, PLCC–20
MC10/100H600	9–Bit TTL–ECL Translator	TTL	ECL	PLCC–28
MC10/100H602	9–Bit Latch TTL/ECL Translator	TTL	ECL	PLCC–28
MC10/100H604	Registered Hex TTL/ECL Translator	TTL	ECL	PLCC–28
MC10/100H606	Registered Hex TTL/PECL Translator	TTL	PECL	PLCC–28
MC10H351	TTL, NMOS To ECL Translator	TTL, CMOS	PECL	CDIP–20, PDIP–20, PLCC–20

Device	Short Description	Voltage (V)	Operating Frequency (GHz)	Package
Coax Drivers				
MC10SX1190	Fibre Channel Coaxial Cable Driver and Loop Resiliency Circuit	3.3, 5	2.5	TSSOP–20
MC10SX1189	Fibre Channel Coaxial Cable Driver and Loop Resiliency Circuit	5	–	SOIC–16
MC10EP89	3.3V / 5V ECL Coaxial Cable Driver	3.3, 5	2	SOIC–8, TSSOP–8
MC10EL89	5V ECL Coaxial Cable Driver	5	1.5	SOIC–8, TSSOP–8
Miscellaneous				
MC10/100E112	5V ECL Quad Driver	5	–	PLCC–28
MC10/100E160	5V ECL 12–Bit Parity Generator/Checker	5	–	PLCC–28
MC10/100E166	5V ECL 9–Bit Magnitude Comparator	5	–	PLCC–28

DATA MANAGEMENT (continued)

Device	Short Description	Voltage (V)	Operating Frequency (GHz)	Package
Miscellaneous (continued)				
MC10E212	5V ECL 3–Bit Scannable Registered Address Driver	5	–	PLCC–28
MC100SX1230	CMI Coder/Decoder	5	0.7	PLCC–28
MC10E197	5V ECL Data Separator	5	0.05	PLCC–28
MC10E411	5V ECL 1:9 Differential PECL/NECL RAMBus Clock Buffer	5	–	PLCC–28
MC10H123	Triple 4–3–3–Input Bus Driver	–5	–	CDIP–16, PDIP–16, PLCC–20
MC10H160	12–Bit Parity Generator–Checker	–5	–	CDIP–16, PDIP–16, PLCC–20
MC10H161	Binary to 1–8 Decoder (Low)	–5	0.25	CDIP–16, PDIP–16, PLCC–20
MC10H162	Binary to 1–8 Decoder (High)	–5	0.25	CDIP–16, PDIP–16, PLCC–20
MC10H165	8 Input Priority Encoder	–5	–	CDIP–16, PDIP–16, PLCC–20
MC10H166	5–Bit Magnitude Comparator	–5	0.25	CDIP–16, PDIP–16, PLCC–20
MC10H171	Dual Binary 1–4 Decoder (Low)	–5	0.25	PDIP–16, PLCC–20
MC10H172	Dual Binary 1–4–Decoder (High)	–5	0.25	CDIP–16, PDIP–16, PLCC–20
MC10H179	Look–Ahead Carry Block	–5	–	CDIP–16, PDIP–16, PLCC–20
MC10H180	Dual 2–Bit Adder/Subtractor	–5	–	PDIP–16, PLCC–20
MC10H181	4–Bit Arithmetic Logic Unit/Function Generator	–5	–	PDIP–24, PLCC–28
MC10SX1130	LED Driver	5	0.3	SOIC–16

COMMUNICATIONS

Device	Short Description	Voltage (V)	Operating Frequency (GHz)	Package
Fibre Channel				
MC10SX1190	Fibre Channel Coaxial Cable Driver and Loop Resiliency Circuit	3.3, 5	2.5	TSSOP–20
MC10SX1189	Fibre Channel Coaxial Cable Driver and Loop Resiliency Circuit	5	–	SOIC–16
Fiber Optic Module				
NBSG16VS	2.5V / 3.3V SiGe Differential Receiver/Driver with Variable Output Swing	2.5, 3.3	12	FCBGA–16
MC10/100EP16	3.3 V / 5V ECL Differential Receiver/Driver	3.3, 5	4	SOIC–8, TSSOP–8
MC100EP16F	3.3V / 5V ECL Differential Receiver/Driver With Reduced Output Swing	3.3, 5	4	SOIC–8, TSSOP–8
MC100EP16VS	3.3V / 5V ECL Differential Receiver/Driver with Variable Output Swing	3.3, 5	4	SOIC–8, TSSOP–8
MC100EP16VT	3.3V / 5V ECL Differential Receiver/Driver with Variable Output Swing and Internal Input Termination	3.3, 5	4	SOIC–8, TSSOP–8
MC10/100EP16T	3.3V / 5V ECL Differential Receiver/Driver with Internal Termination	3.3, 5	3	SOIC–8, TSSOP–8
MC10SX1130	LED Driver	5	0.3	SOIC–16

Technology Family Tree

Device	Short Description	Package
GigaComm		
NBSG11	2.5V/3.3V SiGe 1:2 Differential Clock Driver with RSECL Outputs	FCBGA–16
NBSG16	2.5V/3.3V SiGe Differential Receiver/Driver with RSECL Outputs	FCBGA–16
NBSG16VS	2.5V / 3.3V SiGe Differential Receiver/Driver with Variable Output Swing	FCBGA–16
NBSG14	2.5V/3.3V SiGe 1:4 Differential Clock Driver with RSECL Outputs	FCBGA–16
NBSG111	2.5V / 3.3V SiGe 1:10 Differential Clock Driver with RSECL Outputs	FCBGA–49
Low Voltage ECLinPS Plus		
MC10/100LVEP11	2.5V / 3.3V ECL 1:2 Differential Fanout Buffer	SOIC–8, TSSOP–8
MC100LVEP14	2.5V / 3.3V 1:5 Differential ECL/PECL/HSTL Clock Driver	TSSOP–20
MC10/100LVEP16	2.5V / 3.3V ECL Differential Receiver/Driver	SOIC–8, TSSOP–8
MC100LVEP111	2.5V / 3.3V 1:10 Differential ECL/PECL/HSTL Clock Driver	LQFP–32
MC100LVEP210	2.5V / 3.3V 1:5 Dual Differential ECL/PECL/HSTL Clock Driver	LQFP–32
ECLinPS Plus		
MC10/100EP01	3.3V / 5V ECL 4–Input OR/NOR	SOIC–8, TSSOP–8
MC10/100EP05	3.3V / 5V 2–Input Differential AND/NAND	SOIC–8, TSSOP–8
MC10/100EP08	3.3V / 5V Differential 2–Input XOR/XNOR	SOIC–8, TSSOP–8
MC10/100EP11	3.3V / 5V ECL 1:2 Differential Fanout Buffer	SOIC–8, TSSOP–8
MC100EP14	5V 1:5 Differential ECL/PECL/HSTL Clock Driver	TSSOP–20
MC10/100EP16	3.3 V / 5V ECL Differential Receiver/Driver	SOIC–8, TSSOP–8
MC100EP16F	3.3V / 5V ECL Differential Receiver/Driver With Reduced Output Swing	SOIC–8, TSSOP–8
MC10/100EP16T	3.3V / 5V ECL Differential Receiver/Driver with Internal Termination	SOIC–8, TSSOP–8
MC10/100EP16VA	3.3V / 5V ECL Differential Receiver/Driver with High Gain	SOIC–8, TSSOP–8
MC100EP16VB	3.3V / 5V ECL Differential Receiver/Driver with High and Low Gain	SOIC–8, TSSOP–8
MC100EP16VC	3.3V / 5V ECL Differential Receiver/Driver with High Gain and Enable Output	SOIC–8, TSSOP–8
MC100EP16VS	3.3V / 5V ECL Differential Receiver/Driver with Variable Output Swing	SOIC–8, TSSOP–8
MC100EP16VT	3.3V / 5V ECL Differential Receiver/Driver with Variable Output Swing and Internal Input Termination	SOIC–8, TSSOP–8
MC10/100EP17	3.3V / 5V ECL Quad Differential Driver/Receiver	SOIC–20, TSSOP–20
MC10/100EP29	3.3V / 5V ECL Dual Differential Data and Clock D Flip–Flop With Set and Reset	TSSOP–20
MC10/100EP31	3.3V / 5V ECL D Flip Flop with Set and Reset	SOIC–8, TSSOP–8
MC10/100EP32	3.3V / 5V ECL ÷2 Divider	SOIC–8, TSSOP–8
MC10/100EP33	3.3V / 5V ECL Divide by 4 Divider	SOIC–8, TSSOP–8
MC10/100EP35	3.3V / 5V ECL JK Flip Flop	SOIC–8, TSSOP–8
MC100EP40	3.3V / 5V ECL Differential Phase–Frequency Detector	TSSOP–20
MC10/100EP51	3.3V / 5V ECL D Flip Flop with Reset and Differential Clock	SOIC–8, TSSOP–8
MC10/100EP52	3.3V / 5V ECL Differential Data and Clock D Flip–Flop	SOIC–8, TSSOP–8
MC10/100EP56	3.3V / 5V ECL Dual Differential 2:1 Multiplexer	SOIC–20, TSSOP–20
MC10/100EP57	3.3V / 5V ECL 4:1 Differential Multiplexer	TSSOP–20
MC10/100EP58	3.3V / 5V ECL 2:1 Multiplexer	SOIC–8, TSSOP–8
MC10EP89	3.3V / 5V ECL Coaxial Cable Driver	SOIC–8, TSSOP–8
MC10/100EP90	3.3V / 5V Triple ECL Input to LVPECL/PECL Output Translator	TSSOP–20
MC10/100EP016	3.3V / 5V ECL 8–Bit Synchronous Binary Up Counter	LQFP–32
MC10/100EP101	3.3V / 5V ECL Quad 4–Input OR/NOR	LQFP–32
MC10/100EP105	3.3V / 5V ECL Quad 2–Input Differential AND/NAND	LQFP–32
MC10/100EP116	3.3V / 5V Hex Differential Line Receiver / Driver	LQFP–32
MC10/100EP131	3.3V / 5V ECL Quad D Flip Flop with Set, Reset, and Differential Clock	LQFP–32

Device	Short Description	Package
ECLinPS Plus (continued)		
MC10/100EP139	3.3V / 5V ECL ÷2/4, ÷4/5/6 Clock Generation Chip	SOIC–20, TSSOP–20
MC100EP140	3.3V ECL Phase–Frequency Detector	SOIC–8
MC10/100EP142	3.3V / 5V ECL 9–Bit Shift Register	LQFP–32
MC10/100EP195	3.3V/5V ECL Programmable Delay Chip	LQFP–32
MC100EP196	3.3V/5V ECL Programmable Delay Chip	LQFP–32
MC100EP210S	2.5V 1:5 Dual Differential LVDS Clock Driver	LQFP–32
MC10/100EP445	3.3V / 5V ECL 8–Bit Serial/Parallel Converter	LQFP–32
MC10/100EP446	3.3V / 5V ECL 8–Bit Differential Parallel/Serial Converter	LQFP–32
MC10/100EP451	3.3V / 5V ECL 6–Bit Differential Register with Master Reset	LQFP–32
MC10/100EPT20	3.3V LVTTL/LVCMOS to Differential LVPECL Translator	SOIC–8, TSSOP–8
MC100EPT21	Differential LVPECL to LVTTL Translator	SOIC–8, TSSOP–8
MC100EPT22	Dual LVTTL/LVto Differential LVPECL Translator	SOIC–8
MC100EPT23	3.3V Dual Differential LVPECL to LVTTL Translator	SOIC–8, TSSOP–8
MC100EPT24	3.3V LVTTL/LVCMOS to Differential LVECL Translator	SOIC–8, TSSOP–8
MC100EPT25	Differential LVECL/ECL to LVTTL Translator	SOIC–8, TSSOP–8
MC100EPT26	1:2 Fanout Differential LVPECL to LVTTL Translator	SOIC–8, TSSOP–8
Low Voltage ECLinPS Lite		
MC100LVEL01	3.3V ECL 4–Input OR/NOR	SOIC–8, TSSOP–8
MC100LVEL05	3.3V ECL 2–Input Differential AND/NAND	SOIC–8, TSSOP–8
MC100LVEL11	3.3V ECL 1:2 Differential Fanout Buffer	SOIC–8, TSSOP–8
MC100LVEL12	3.3V ECL Low Impedance Driver	SOIC–8, TSSOP–8
MC100LVEL13	3.3V ECL Dual 1:3 Fanout Buffer	SOIC–20
MC100LVEL14	3.3V ECL 1:5 Clock Distribution Chip	SOIC–20
MC100LVEL16	3.3V ECL Differential Receiver	SOIC–8, TSSOP–8
MC100LVEL17	3.3V ECL Quad Differential Receiver	SOIC–20
MC100LVEL29	3.3V ECL Dual Differential Data and Clock D–Type Flip–Flop with Set and Reset	SOIC–20
MC100LVEL30	3.3V ECL Triple D–Type Flip–Flop with Set and Reset	SOIC–20
MC100LVEL31	3.3V ECL D–Type Flip–Flop with Set and Reset	SOIC–8, TSSOP–8
MC100LVEL32	3.3V ECL ÷2 Divider	SOIC–8, TSSOP–8
MC100LVEL33	3.3V ECL Divide by 4 Divider	SOIC–8, TSSOP–8
MC100LVEL37	3.3V ECL 1:4 ÷1/÷2 Clock Fanout Buffer	SOIC–20
MC100LVEL38	3.3V ECL ÷2, ÷4/6 Clock Generator Chip	SOIC–20
MC100LVEL39	3.3V ECL ÷2/4, ÷4/6 Clock Generation Chip	SOIC–20
MC100LVEL40	3.3/5V ECL Differential Phase–Frequency Detector	SOIC–20
MC100LVEL51	3.3V ECL Differential Clock D Flip–Flop	SOIC–8, TSSOP–8
MC100LVEL56	3.3V ECL Dual Differential 2:1 Multiplexer	SOIC–20
MC100LVEL58	3.3V ECL 2:1 Multiplexer	SOIC–8, TSSOP–8
MC100LVEL59	3.3V ECL Triple 2:1 Multiplexer	SOIC–20
MC100LVEL90	–3.3V/–5V Triple ECL Input to LVPECL Output Translator	SOIC–20
MC100LVEL91	3.3V/5V Triple LVPECL / PECL Input to –3.3V ECL Output Translator	SOIC–20
MC100LVEL92	5V Triple PECL Input to LVPECL Output Translator	SOIC–20
MC100LVELT22	3.3V Dual LVTTL/LVCMOS to Differential LVPECL Translator	SOIC–8, TSSOP–8
MC100LVELT23	3.3V Dual Differential LVPECL to LVTTL Translator	SOIC–8, TSSOP–8

Device	Short Description	Package
ECLinPS Lite		
MC10/100EL01	5V ECL 4–Input OR/NOR	SOIC–8, TSSOP–8
MC10/100EL04	2–Input AND/NAND	SOIC–8, TSSOP–8
MC10/100EL05	5V ECL 2–Input Differential AND/NAND	SOIC–8, TSSOP–8
MC10/100EL07	5V ECL 2–Input XOR/XNOR	SOIC–8, TSSOP–8
MC10/100EL11	5V ECL 1:2 Differential Fanout Buffer	SOIC–8, TSSOP–8
MC10/100EL12	5V ECL Low Impedance Driver	SOIC–8, TSSOP–8
MC100EL13	Dual 1:3 Fanout Buffer	SOIC–20
MC100EL14	5V ECL 1:5 Clock Distribution Chip	SOIC–20
MC10/100EL15	1:4 Clock Distribution Chip	SOIC–16
MC10/100EL16	5V ECL Differential Receiver	SOIC–8, TSSOP–8
MC100EL17	5V ECL Quad Differential Receiver	SOIC–20
MC100EL29	5V ECL Dual Differential Data and Clock D Flip–Flop With Set and Reset	SOIC–20
MC100EL30	5V ECL Triple D Flip–Flop with Set and Reset	SOIC–20
MC10/100EL31	5V ECL D–Type Flip–Flop with Set and Reset	SOIC–8, TSSOP–8
MC10/100EL32	5V ECL Divide by 2 Divider	SOIC–8, TSSOP–8
MC10/100EL33	5V ECL Divide by 4 Divider	SOIC–8, TSSOP–8
MC10/100EL34	5V ECL Divide by 2, Divide by 4, Divide by 8 Clock Generation Chip	SOIC–16
MC10/100EL35	5V ECL JK Flip–Flop	SOIC–8, TSSOP–8
MC100EL38	5V ECL Divide by 2, Divide by 4/6 Clock Generation Chip	SOIC–20
MC100EL39	5V ECL Divide by 2/4, Divide by 4/6 Clock Generation Chip	SOIC–20
MC10/100EL51	5V ECL Differential Clock D Flip–Flop	SOIC–8, TSSOP–8
MC10/100EL52	5V ECL Differential Data and Clock D Flip–Flop	SOIC–8, TSSOP–8
MC100EL56	5V ECL Dual Differential 2:1 Multiplexer	SOIC–20
MC10/100EL57	5V ECL 4:1 Differential Multiplexer	SOIC–16
MC10/100EL58	5V ECL 2:1 Multiplexer	SOIC–8, TSSOP–8
MC100EL59	5V ECL Triple 2:1 Multiplexer	SOIC–20
MC10EL89	5V ECL Coaxial Cable Driver	SOIC–8, TSSOP–8
MC100EL90	–3.3V / –5V Triple ECL Input to PECL Output Translator	SOIC–20
MC100EL91	3.3V / 5V Triple LVPECL /PECL Input to –5V ECL Output Translator	SOIC–20
MC100EL1648	5V ECL Voltage Controlled Oscillator	SOIC–8, TSSOP–8, SOIC EIAJ–14
MC10/100ELT20	5V TTL To Differential PECL Translator	SOIC–8, TSSOP–8
MC10/100ELT21	5V Differential PECL To TTL Translator	SOIC–8, TSSOP–8
MC10/100ELT22	5V Dual TTL to Differential PECL Translator	SOIC–8, TSSOP–8
MC100ELT23	5V Dual Differential PECL to TTL Translator	SOIC–8, TSSOP–8
MC10/100ELT24	5V TTL to Differential ECL Translator	SOIC–8, TSSOP–8
MC10/100ELT25	Differential –5V ECL To TTL Translator	SOIC–8, TSSOP–8
MC10/100ELT28	5V TTL to Differential PECL and Differential PECL to TTL Translator	SOIC–8, TSSOP–8
Low Voltage ECLinPS		
MC100LVE111	3.3V ECL 1:9 Differential Clock Driver	PLCC–28
MC100LVE164	3.3V ECL 16:1 Multiplexer	LQFP–32
MC100LVE210	3.3V ECL Dual 1:4, 1:5 Differential Fanout Buffer	PLCC–28
MC100LVE222	Low–Voltage 1:15 Differential ÷1/÷2 ECL/PECL Clock Driver	LQFP–52
MC100LVE310	3.3V ECL 2:8 Differential Fanout Buffer	PLCC–28

Device	Short Description	Package
ECLinPS		
MC10/100E016	5V ECL 8–Bit Synchronous Binary Up Counter	PLCC–28
MC10/100E101	5V ECL Quad 4–Input OR/NOR Gate	PLCC–28
MC10/100E104	5V ECL Quint 2–Input AND/NAND Gate	PLCC–28
MC10/100E107	5V ECL Quint 2–Input XOR/XNOR Gate	PLCC–28
MC10/100E111	5V ECL 1:9 Differential Clock Driver	PLCC–28
MC10/100E112	5V ECL Quad Driver	PLCC–28
MC10/100E116	Quint Differential Line Receiver	PLCC–28
MC10/100E122	5V ECL 9–Bit Buffer	PLCC–28
MC10/100E131	4–Bit D–Type Flip–Flop	PLCC–28
MC10/100E136	5V ECL 6–Bit Universal Up/Down Counter	PLCC–28
MC10/100E137	5V ECL 8–Bit Ripple Counter	PLCC–28
MC10/100E141	5V ECL 8–Bit Shift Register	PLCC–28
MC10/100E142	5V ECL 9–Bit Shift Register	PLCC–28
MC10/100E143	5V ECL 9–Bit Hold Register	PLCC–28
MC10/100E150	5V ECL 6–Bit D Latch	PLCC–28
MC10/100E151	5V ECL 6–Bit D Register	PLCC–28
MC10/100E154	5V ECL 5–Bit 2:1 Mux Latch	PLCC–28
MC10/100E155	5V ECL 6–Bit 2:1 Mux Latch	PLCC–28
MC10/100E156	5V ECL 3–Bit 4:1 Mux–Latch	PLCC–28
MC10/100E157	5V ECL Quad 2:1 Multiplexer	PLCC–28
MC10/100E158	5V ECL 5–Bit 2:1 Multiplexer	PLCC–28
MC10/100E160	5V ECL 12–Bit Parity Generator/Checker	PLCC–28
MC10/100E163	5V ECL 2–Bit 8:1 Multiplexer	PLCC–28
MC10/100E164	5V ECL 16:1 Multiplexer	PLCC–28
MC10/100E166	5V ECL 9–Bit Magnitude Comparator	PLCC–28
MC10/100E167	5V ECL 6–Bit 2:1 Mux–Register	PLCC–28
MC10/100E171	5V ECL 3–Bit 4:1 Multiplexer	PLCC–28
MC10/100E175	5V ECL 9–Bit Latch With Parity	PLCC–28
MC10/100E195	5V ECL Programmable Delay Chip	PLCC–28
MC10/100E196	5V ECL Programmable Delay Chip	PLCC–28
MC10E197	5V ECL Data Separator	PLCC–28
MC100E210	5V ECL Dual 1:4, 1:5 Differential Fanout Buffer	PLCC–28
MC10/100E211	5V ECL 1:6 Differential Clock Distribution Chip	PLCC–28
MC10E212	5V ECL 3–Bit Scannable Registered Address Driver	PLCC–28
MC100E241	5V ECL 8–Bit Scannable Register	PLCC–28
MC100E310	2:8 Differential Fanout Buffer	PLCC–28
MC10/100E404	5V ECL Quad Differential AND/NAND	PLCC–28
MC10E411	5V ECL 1:9 Differential PECL/NECL RAMBus Clock Buffer	PLCC–28
MC10/100E416	5V ECL Quint Differential Line Receiver	PLCC–28
MC10/100E431	5V ECL 3–Bit Differential Flip–Flop	PLCC–28
MC10/100E445	5V ECL 4–Bit Serial/Parallel Converter	PLCC–28
MC10/100E446	5V ECL 4–Bit Parallel/Serial Converter	PLCC–28
MC10/100E451	5V ECL 6–Bit D Register Differential Data and Clock	PLCC–28
MC10/100E452	5V ECL 5–Bit Differential Register	PLCC–28
MC10/100E457	5V ECL Triple Differential 2:1 Multiplexer	PLCC–28
MC10E1651	Dual High Performance Comparator	CDIP–16, PLCC–20
MC10E1652	5V ECL Dual ECL Output Comparator With Latch	PLCC–20

Device	Short Description	Package
MECL 10H		
MC10H016	4–Bit Binary Counter	CDIP–16, PDIP–16, PLCC–20
MC10H100	Quad 2–Input NOR Gate With Strobe	CDIP–16, PDIP–16, PLCC–20
MC10H101	Quad OR/NOR Gate	CDIP–16, PDIP–16, PLCC–20
MC10H102	Quad 2–Input NOR Gate	CDIP–16, PDIP–16, PLCC–20
MC10H103	Quad 2–Input OR Gate	CDIP–16, PDIP–16, PLCC–20
MC10H104	Quad 2–Input AND Gate	CDIP–16, PDIP–16, PLCC–20
MC10H105	Triple 2–3–2–Input OR/NOR Gate	CDIP–16, PDIP–16, PLCC–20
MC10H106	Triple 4–3–3–Input NOR Gate	CDIP–16, PDIP–16, PLCC–20
MC10H107	Triple 2–Input XOR/XNOR Gate	SOIC–16, CDIP–16, PDIP–16, PLCC–20
MC10H109	Dual 4–5–Input OR/NOR Gate	CDIP–16, PDIP–16, PLCC–20
MC10H113	Quad XOR Gate	CDIP–16, PDIP–16, PLCC–20
MC10H115	Quad Line Receiver	CDIP–16, PDIP–16, PLCC–20
MC10H116	Triple Line Receiver	SOIC–16, CDIP–16, PDIP–16, PLCC–20
MC10H117	Dual 2–Wide 2–3–Input OR–AND/OR–AND–Invert Gate	CDIP–16, PDIP–16, PLCC–20
MC10H121	4–Wide OR–AND/OR–ANDbar Gate	CDIP–16, PDIP–16, PLCC–20
MC10H123	Triple 4–3–3–Input Bus Driver	CDIP–16, PDIP–16, PLCC–20
MC10H124	Quad TTL to ECL Translator	CDIP–16, PDIP–16, PLCC–20
MC10H125	Quad ECL to TTL Translator	CDIP–16, PDIP–16, PLCC–20
MC10H130	Dual Latch	CDIP–16, PDIP–16, PLCC–20
MC10H131	Dual Type D Master–Slave Flip–Flop	CDIP–16, PDIP–16, PLCC–20
MC10H135	Dual J–K Master–Slave Flip–Flop	CDIP–16, PDIP–16, PLCC–20
MC10H136	Universal Hexidecimal Counter	CDIP–16, PDIP–16, PLCC–20
MC10H141	4–Bit Universal Shift Register	CDIP–16, PDIP–16, PLCC–20
MC10H158	Quad 2–Input Multiplexer (Non–Inverting)	CDIP–16, PDIP–16, PLCC–20
MC10H159	Quad 2–Input Multiplexer (Inverting)	CDIP–16, PDIP–16, PLCC–20
MC10H160	12–Bit Parity Generator–Checker	CDIP–16, PDIP–16, PLCC–20
MC10H161	Binary to 1–8 Decoder (Low)	CDIP–16, PDIP–16, PLCC–20
MC10H162	Binary to 1–8 Decoder (High)	CDIP–16, PDIP–16, PLCC–20
MC10H164	8–Line Multiplexer	CDIP–16, PDIP–16, PLCC–20

Device	Short Description	Package
MECL 10H (continued)		
MC10H165	8 Input Priority Encoder	CDIP–16, PDIP–16, PLCC–20
MC10H166	5–Bit Magnitude Comparator	CDIP–16, PDIP–16, PLCC–20
MC10H171	Dual Binary 1–4 Decoder (Low)	PDIP–16, PLCC–20
MC10H172	Dual Binary 1–4–Decoder (High)	CDIP–16, PDIP–16, PLCC–20
MC10H173	Quad 2–Input Multiplexer/Latch	CDIP–16, PDIP–16, PLCC–20
MC10H174	Dual 4:1 Multiplexer	CDIP–16, PDIP–16, PLCC–20
MC10H175	Quint Latch	CDIP–16, PDIP–16, PLCC–20
MC10H176	Hex D–Type Master–Slave Flip–Flop	CDIP–16, PDIP–16, PLCC–20
MC10H179	Look–Ahead Carry Block	CDIP–16, PDIP–16, PLCC–20
MC10H180	Dual 2–Bit Adder/Subtractor	CDIP–16, PDIP–16, PLCC–20
MC10H181	4–Bit Arithmetic Logic Unit/Function Generator	PDIP–16, PLCC–20
MC10H186	Hex D Master–Slave Flip–Flop with Reset	CDIP–16, PDIP–16, PLCC–20
MC10H188	Hex Buffer with Enable	CDIP–16, PDIP–16, PLCC–20
MC10H189	Hex Inverter with Enable	CDIP–16, PDIP–16, PLCC–20
MC10H209	Dual 4–5–Input OR/NOR	CDIP–16, PDIP–16, PLCC–20
MC10H210	3–Input 3–Output OR Gate	CDIP–16, PDIP–16, PLCC–20
MC10H211	Dual 3–Input 3–Output NOR Gate	CDIP–16, PDIP–16, PLCC–20
MC10H330	Quad MSTR	PDIP–24, PLCC–28
MC10H332	Dual Bus Driver/Receiver	CDIP–20, PDIP–20, PLCC–20
MC10H334	Quad Bus Driver/Receiver with Transmit and Receiver Latches	CDIP–20, PDIP–20, PLCC–20
MC10H350	To TTL Translator	CDIP–16, PDIP–16, PLCC–20
MC10H351	TTL, NMOS To ECL Translator	CDIP–20, PDIP–20, PLCC–20
MC10H352	Quad CMOS To ECL Translator	PDIP–20, PLCC–20
MC10H424	Quad TTL–ECL Translator	CDIP–16, PDIP–16, PLCC–20
MC10/100H600	9–Bit TTL–ECL Translator	PLCC–28
MC10/100H601	9–Bit ECL–TTL Translator	PLCC–28
MC10/100H602	9–Bit Latch TTL/ECL Translator	PLCC–28
MC10/100H603	9–Bit Latch ECL/TTL Translator	PLCC–28
MC10/100H604	Registered Hex TTL/ECL Translator	PLCC–28
MC10/100H605	Registered Hex ECL/TTL Translator	PLCC–28
MC10/100H606	Registered Hex TTL/PECL Translator	PLCC–28
MC10/100H607	Registered Hex PECL/TTL Translator	PLCC–28
MC10/100H640	68030/040 PECL to TTL Clock Driver	PLCC–28
MC10/100H641	Single Supply PECL to TTL 1:9 Clock Driver	PLCC–28

Device	Short Description	Package
MECL 10H (continued)		
MC10/100H642	68030/040 PECL to TTL Clock Driver	PLCC–28
MC10/100H643	Dual Supply ECL to TTL 1:8 Clock Driver	PLCC–28
MC10/100H644	68030/040 PECL to TTL Clock Driver	PLCC–20
MC10H645	1:9 TTL Clock Driver	PLCC–28
MC10/100H646	PECL/TTL–TTL 1:8 Distribution Chip	PLCC–28
MC10/100H680	4–Bit Differential ECL Bus/TTL Bus Transceiver	PLCC–28
MC10/100H681	Hex ECL/TTL Transceiver with Latches	PLCC–28

Device	Short Description	Identical Replacement	Similar Replacement	Package
MECL 10K The MECL 10K family is not recommended for new designs				
MC10101	Quad OR/NOR Gate	MC10H101	–	CDIP–16, PDIP–16, PLCC–20
MC10102	Quad 2–Input NOR Gate	MC10H102	–	CDIP–16, PDIP–16, PLCC–20
MC10103	Quad 2–Input OR Gate	MC10H103	–	CDIP–16, PDIP–16, PLCC–20
MC10104	Quad 2–Input AND Gate	MC10H104	–	CDIP–16, PDIP–16, PLCC–20
MC10105	Triple 2–3–2–Input OR/NOR Gate	MC10H105	–	CDIP–16, PDIP–16, PLCC–20
MC10106	Triple 4–3–3–Input NOR Gate	MC10H106	–	CDIP–16, PDIP–16, PLCC–20
MC10107	Triple 2–Input XOR/XNOR Gate	MC10H107	–	CDIP–16, PDIP–16, PLCC–20
MC10109	Dual 4–5–Input OR/NOR Gate	MC10H109	–	CDIP–16, PDIP–16, PLCC–20
MC10110	Dual 3–Input/3–Output OR Gate	–	–	CDIP–16, PDIP–16
MC10111	Dual 3–Input/3–Output NOR Gate	–	–	CDIP–16, PDIP–16
MC10113	Quad XOR Gate	MC10H113	–	CDIP–16, PDIP–16, PLCC–20
MC10114	Triple Line Receiver	–	MC10H115	CDIP–16, PDIP–16, PLCC–20
MC10115	Quad Line Receiver	MC10H115	–	CDIP–16, PDIP–16, PLCC–20
MC10116	Triple Line Receiver	MC10H116	–	CDIP–16, PDIP–16, PLCC–20
MC10117	Dual 2–Wide 2–3–Input OR–AND/OR–AND–Invert Gate	MC10H117	–	CDIP–16, PDIP–16, PLCC–20
MC10121	4–Wide OR–AND/OR–AND–Invert Gate	MC10H121	–	CDIP–16, PDIP–16, PLCC–20
MC10123	Triple 4–3–3–Input Bus Driver	MC10H123	–	CDIP–16, PDIP–16, PLCC–20
MC10124	Quad TTL to ECL Translator	MC10H124	–	CDIP–16, PDIP–16, PLCC–20
MC10125	Quad ECL to TTL Translator	MC10H125	–	CDIP–16, PDIP–16, PLCC–20
MC10131	Dual D–Type Master–Slave Flip–Flop	MC10H131	–	CDIP–16, PDIP–16, PLCC–20
MC10135	Dual J–K Master–Slave Flip–Flop	MC10H135	–	CDIP–16, PDIP–16, PLCC–20

Device	Short Description	Identical Replacement	Similar Replacement	Package
MECL 10K (continued) The MECL 10K family is not recommended for new designs				
MC10136	Universal Hexadecimal Counter	MC10H136	–	CDIP–16, PDIP–16, PLCC–20
MC10138	Bi–Quinary Counter	–	MC10H016	CDIP–16, PDIP–16, PLCC–20
MC10141	4–Bit Universal Shift Register	MC10H141	–	CDIP–16, PDIP–16, PLCC–20
MC10153	Quad Latch	–	MC10H175	PDIP–16, PLCC–20
MC10158	Quad 2–Input Multiplexer (Non–Inverting)	MC10H158	–	CDIP–16, PDIP–16, PLCC–20
MC10159	Quad 2–Input Multiplexer (Inverting)	MC10H159	–	CDIP–16, PDIP–16, PLCC–20
MC10161	Binary to 1–8 Decoder (Low)	MC10H161	–	CDIP–16, PDIP–16, PLCC–20
MC10162	Binary to 1–8 Decoder (High)	MC10H162	–	CDIP–16, PDIP–16, PLCC–20
MC10164	8–Line Multiplexer	MC10H164	–	CDIP–16, PDIP–16, PLCC–20
MC10166	5–Bit Magintude Comparator	–	–	CDIP–16, PDIP–16, PLCC–20
MC10171	Dual Binary to 1:4 Decoder (Low)	MC10H171	–	CDIP–16, PDIP–16, PLCC–20
MC10173	Quad 2–Input Multiplexer/Latch	MC10H173	–	CDIP–16, PDIP–16, PLCC–20
MC10174	Dual 4:1 Multiplexer	MC10H174	–	CDIP–16, PDIP–16, PLCC–20
MC10175	Quint Latch	MC10H175	–	CDIP–16, PDIP–16, PLCC–20
MC10176	Hex D–Type Master–Slave Flip–Flop	MC10H176	–	CDIP–16, PDIP–16, PLCC–20
MC10178	Binary Counter	–	MC10H016	CDIP–16, PDIP–16
MC10186	Hex D–Type Master–Slave Flip–Flop with Reset	MC10H186	–	CDIP–16, PDIP–16, PLCC–20
MC10188	Hex Buffer with Enable	MC10H188	–	CDIP–16, PDIP–16, PLCC–20
MC10189	Hex Inverter with Enable	MC10H189	–	CDIP–16, PDIP–16, PLCC–20
MC10192	Quad Bus Driver	–	–	CDIP–16, PDIP–16, PLCC–20
MC10195	Hex Inverter/Buffer	–	–	CDIP–16, PDIP–16, PLCC–20
MC10197	Hex AND Gate	–	MC10H104	CDIP–16, PDIP–16, PLCC–20
MC10198	Monostable Multivibrator	–	–	CDIP–16, PDIP–16, PLCC–20
MC10216	High Speed Triple Line Receiver	–	MC10H115	CDIP–16, PDIP–16, PLCC–20
MC10231	High Speed Dual Type D–Type Master–Slave Flip–Flop	–	MC10H131	CDIP–16, PDIP–16, PLCC–20

Device	Short Description	Package
Other		
MC100SX1230	CMI Coder/Decoder	PLCC–28
MC10SX1130	LED Driver	SOIC–16
MC10SX1189	Fibre Channel Coaxial Cable Driver and Loop Resiliency Circuit	SOIC–16
MC10SX1190	Fibre Channel Coaxial Cable Driver and Loop Resillency Circuit	TSSOP–20
MC12026A	1.1 GHz Dual Modulus Prescaler	SOIC–8
MC12080	1.1 GHz Prescaler	SOIC–8
MC12093	÷2, ÷4, ÷8 1.1 GHz Low Power Prescaler with Stand–By Mode	SOIC–8
MC12095	2.5 GHz Low Power Prescaler With Stand–By Mode	SOIC–8
MCH/K12140	Phase Frequency Detector	SOIC–8

Ordering Information
Device Nomenclatures

GigaComm (Silicon Germanium)

NB XX YYY ZZ

Circuit Identifier
- NB = Fully Qualified
- PB = Pre–production

Family Type
- SG = GigaComm SiGe

Function Type
- 2–3 Numeric/Alpha Digit Denoting Function

Package Type
- BA = Flip Chip BGA

ECLinPS Families

MC WWW XX YYY ZZ

Circuit Identifier
- NB/MC = Fully Qualified
- PB/XC = Pre–production

Temperature Compensation
- 10 – No Temperature Compensation
- 100 – Temperature Compensation

ECL Family Identifier
- E = ECLinPS
- EL = ECLinPS Lite
- ELT = ECLinPS Lite Translator
- EP = ECLinPS Plus
- EPT = ECLinPS Plus Translator
- LVE = Low Voltage ECLinPS
- LVEL = Low Voltage ECLinPS Lite
- LVEP = Low Voltage ECLinPS Plus

Function Type
- 2–3 Numeric/Alpha Digit Denoting Function

Package Type
- D = SOIC
- DW = Wide Body SOIC
- DT = TSSOP
- FA = LQFP
- FN = PLCC
- L = Ceramic Dip

MECL 10K and 10/100H

MC WWW YYY ZZ

Circuit Identifier
- MC = Fully Qualified
- XC = Pre–production

Temperature Compensation
- 10/10H – No Temperature Compensation
- 100H – Temperature Compensation

Function Type
- 2–3 Numeric Digit Denoting Function

Package Type
- FN = PLCC
- L = Ceramic DIP
- P = Plastic DIP

Standard Logic Devices

Standard Logic Devices

In Brief . . .

This selector guide is a quick reference to ON Semiconductor's offering of exciting new Minigate™ products as well as the traditional standard logic integrated circuits. ON Semiconductor continues to increase the breadth of its portfolio offering in the MiniGate™ arena, and continues to offer the traditional industry standard IC Logic families that have become the foundation for a multitude of legacy electronic systems. The company's standard logic portfolio provides designers with a wide selection of voltages and speed/drive combinations to meet their application needs.

The **MiniGate** family of devices takes advantage of ON Semiconductor's world class discrete micropackaging manufacturing technology to enable best–in–class products. The technologies offered in the MiniGate family are direct "relatives" of the standard IC Logic products, designed and manufactured in the same CMOS based technology. These include Analog Switch, LCX, VHC and HC technologies, with the majority of the popular functions available in these different families in industry standard 5, 6 and 8 pin packages.

The traditional industry standard Logic IC offerings consist of families considered part of the high performance logic arena, families in the low voltage standard logic arena (<5.0 V) and families in the high voltage standard logic arena (5.0 V and greater). In the high performance arena, ON Semiconductor offers the **FST** (Fast Switch Technology) that consists of 13 part numbers covering the most popular designer needs. This family represents ON Semiconductor's initial offering to service the Telecom market, specifically in areas requiring hot swappable components.

In the low voltage standard logic arena, ON Semiconductor offers the following families:

VCX: This is the fastest, lowest voltage logic family offered by ON Semiconductor. 10 devices in all are offered, with 5 of the most popular functions, as well as 5 enhanced devices with a bus hold option. It is specified at 1.65 V to 3.6 V, is offered in the industry standard 48 pin TSSOP package and is specifically well suited for networking/communication equipment applications, demanding high speed and low power.

	Page
Family Tree	111
Ordering Information	112
Selection by Family	
VHC One–Gate	115
HC One–Gate	116
LCX One–Gate	116
LCX Two– and Three–Gates	117
NLAS Analog Switches	117
FST	118
ALVC	118
VCX	119
LCX	119
LVX	120
VHC	121
FACT	123
High Speed CMOS	126
Metal Gate CMOS	129

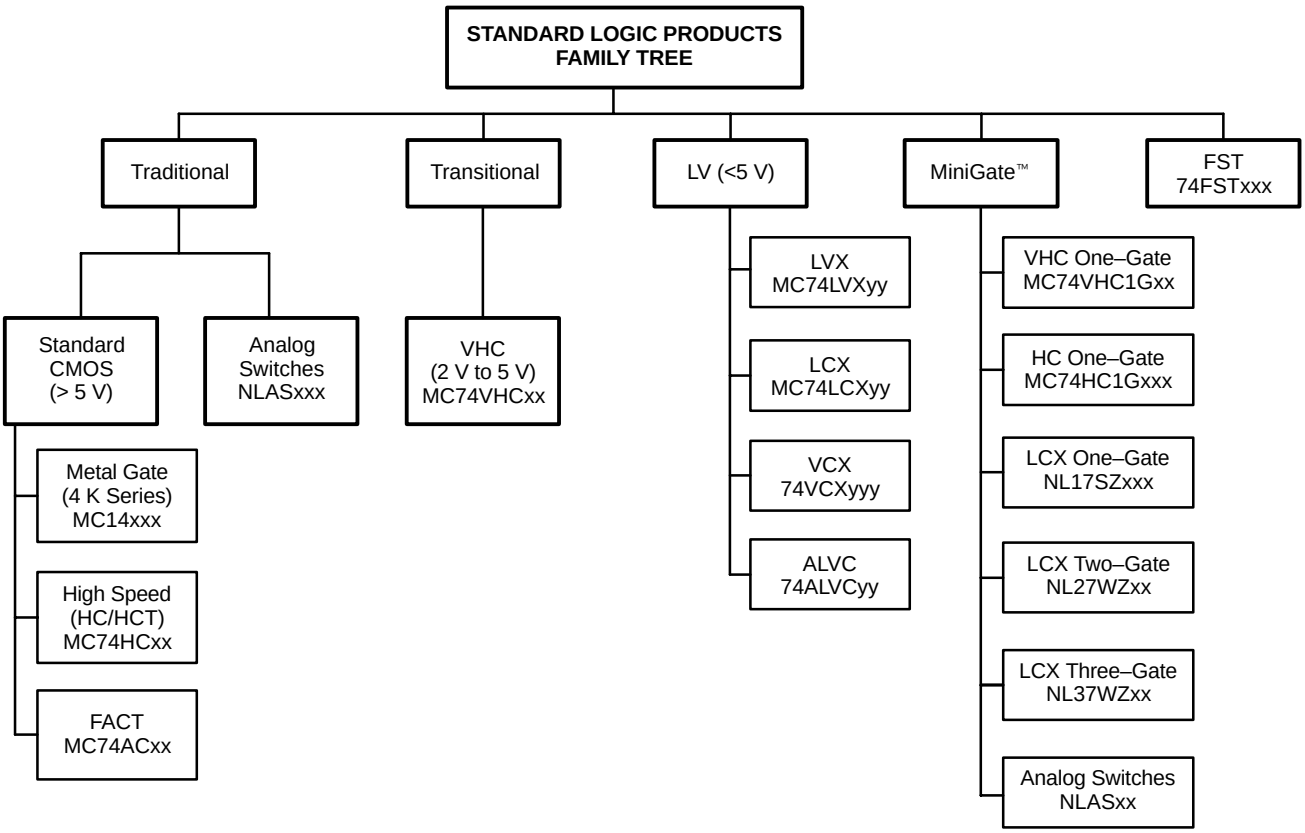
ALVC: This is a similar family to VCX, with some additional family specific specifications. Again, 10 devices in all are offered, with 5 of the most popular functions, as well as 5 enhanced devices with a bus hold option. It is specified at 1.65 V to 3.6 V, is offered in the industry standard 48 pin TSSOP package and is specifically well suited for networking/communication equipment applications, demanding high speed and low power.

LCX: LCX is fast becoming the industry "workhorse" product family in 3.0 V applications. This family features 5.0 V tolerant inputs and outputs and is especially suited for mixed–voltage, high–end, advanced workstation designs, as well as for low–power portable applications.

LVX: LVX is specified from 2.0 V to 3.6 V and is similar tin performance to VHC, but with lower output drive. It too has over voltage tolerant (OVT) inputs to 7.0 V, allowing the interface of 5.0 V systems to 3.0 V systems. This family is available in industry standard JEDEC SOIC, EIAJ SOIC, and the popular TSSOP packages. It is specified at –55 to +125°C.

VHC: This “5.0 V to 3.0 V transitional family” is specified at 2.0 V to 5.5 V. When operating at supply voltages below 5.0 V, this family features 5.0 V tolerant inputs to support 3.0 V to 5.0 V mixed voltage system designs. Low power, low switching noise and fast switching speeds make this family perfect for low power, low cost applications. The VHCT functions offer TTL level compatibility with CMOS low power performance. VHCT accepts TTL level inputs and delivers full swing (4.5 V to 5.5 V) outputs. The supply voltage range for VHCT is VCC = 4.5 V – 5.5 V. The temperature range for this family is also –55 to +125°C and is also available in the same packages as LVX family.

There are 3 families offered in the more mature 5.0 V and greater operating voltage arena. **FACT** (AC/ACT), **High Speed** (HC/HCT) and **Metal Gate** (14000 series), remain as the legacy logic families. These families, although past the maturity stage in the industry product life cycle, continue to find new applications and will remain industry standards for many more years.


STANDARD LOGIC PRODUCTS FAMILY TREE
Traditional
Transitional
LV (<5 V)
MiniGate™
FST 74FSTxxx
Standard CMOS (> 5 V)
Analog Switches NLASxxx
VHC (2 V to 5 V) MC74VHCxx
Metal Gate (4 K Series) MC14xxx
High Speed (HC/HCT) MC74HCxx
FACT MC74ACxx
LVX MC74LVXyy
LCX MC74LCXyy
VCX 74VCXyyy
ALVC 74ALVCyy
VHC One–Gate MC74VHC1Gxx
HC One–Gate MC74HC1Gxxx
LCX One–Gate NL17SZxxx
LCX Two–Gate NL27WZxx
LCX Three–Gate NL37WZxx
Analog Switches NLASxx

Ordering Information
Device Nomenclatures

New Logic Products

NL WWWWW XXXXXX YYYY

ON Semiconductor Logic Product

Product Family
- AS = Analog Switch
- 17SZ = LCX One–Gate
- 27WZ = LCX Two–Gate
- 37 WZ = LCX Three–Gate

Function Type

Package & Tape/Reel Options
- D = SOIC Narrow
- DW = SOIC Wide
- DT = TSOP/TSSOP
- DF = SC88
- MN = QFN
- US = US8
- T2 = 7″ Reel, Embossed Tape 3000 pcs
- R2, R = 13″ Reel, Embossed Tape 2500 pcs
- EL = 13″ Reel, Embossed Tape 2000 pcs

FST

74FST XXXX ZZZZ

Circuit Identifier

Function Type

Package & Tape/Reel Options
- D = SOIC Narrow
- DW = SOIC Wide
- DT = TSSOP
- QS = QSOP
- R, R2 = 13″ Reel, Embossed Tape 2500 pcs

ALVC

74ALVC YYYYY ZZZZ

Circuit Identifier

Function Type

Package Type
- DT = TSSOP
- R2 = 13″ Reel, Embossed Tape 2500 pcs

VCX

74VCX YYYYY ZZZZ

Circuit Identifier

Function Type

Package Type
- DT = TSSOP
- R2 = 13″ Reel, Embossed Tape 2500 pcs

LCX

MC74LCX YYY ZZZZ

Circuit Identifier

Function Type

Package Type
- D = SOIC Narrow
- DW = SOIC Wide
- M = SOEIAJ
- DT = TSSOP
- R2 = 13″ Reel, Embossed Tape 2500 pcs
- EL = 13″ Reel, Embossed Tape 2000 pcs

LVX

MC74LVX YYY ZZZZ

Circuit Identifier

Function Type

Package Type
- D = SOIC Narrow
- DW = SOIC Wide
- M = SOEIAJ
- DT = TSSOP
- R2 = 13″ Reel, Embossed Tape 2500 pcs
- EL = 13″ Reel, Embossed Tape 2000 pcs

Very High Speed CMOS

MC74 XXXX YYY ZZZZ

Circuit Identifier

Product Family
- VHC = Very High Speed CMOS
- VHCT = Very High Speed CMOS, TTL Compatible Inputs

Function Type

Package Type
- D = SOIC Narrow
- DW = SOIC Wide
- M = SOEIAJ
- DT = TSSOP
- R2 = 13″ Reel, Embossed Tape 2500 pcs
- EL = 13″ Reel, Embossed Tape 2000 pcs

FACT

MC WWWWW XXX YYYY

Circuit Identifier

Product Family
- 74AC = FACT
- 74ACT = FACT TTL Compatible

Package & Tape/Reel Options
- N = Plastic DIP
- D = SOIC Narrow
- DW = SOIC Wide
- M = SOEIAJ
- DT = TSSOP
- R2 = 13″ Reel, Embossed Tape 2500 pcs
- EL = 13″ Reel, Embossed Tape 2000 pcs

Function Type

High Speed CMOS

MC74 WWW XXXX A YYYY

Circuit Identifier

Product Family
- HC = Buffered High Speed CMOS
- HCT = High Speed CMOS TTL Compatible
- HCU = Unbuffered High Speed CMOS

Function Type

See page 132

Package Type
- N = Plastic PDIP
- D = SOIC Narrow
- DW = SOIC Wide
- F = SOEIAJ
- DT = TSSOP
- R2 = 13″ Reel, Embossed Tape 2500 pcs
- EL = 13″ Reel, Embossed Tape 2000 pcs

Metal Gate Logic

MC 14XXX YY ZZZZ

Circuit Identifier

Function Type

Identifier
- B (or Blank) = Buffered Outputs
- UB = Unbuffered Outputs

Package & Tape/Reel Options
- CP = Plastic DIP
- D = SOIC Narrow
- DW = SOIC Wide
- F = SOEIAJ
- DT = TSSOP
- R2 = 13″ Reel, Embossed Tape 2500 pcs
- EL = 13″ Reel, Embossed Tape 2000 pcs

VHC One–Gate

Ordering Suffixes: TSOP5 = DTT1, SC88A = DFT2 (available in T & R only)				
Part Number	**Description**	**Surface Mount Packages**	**Temperature**	**Operating Voltage**
MC74VHC1G00	2–Input NAND Gate	TSOP–5, SC–88A	–55 to +125	2.0 to 5.5 V
MC74VHC1GT00	2–Input NAND Gate (TTL Compatible)	TSOP–5, SC–88A	–55 to +125	2.0 to 5.5 V
MC74VHC1G01	2–Input NAND Gate (Open Drain)	TSOP–5, SC–88A	–55 to +125	2.0 to 5.5 V
MC74VHC1G02	2–Input NOR Gate	TSOP–5, SC–88A	–55 to +125	2.0 to 5.5 V
MC74VHC1GT02	2–Input NOR Gate (TTL Compatible)	TSOP–5, SC–88A	–55 to +125	2.0 to 5.5 V
MC74VHC1G03	2–Input NAND Gate (Open Drain)	TSOP–5, SC–88A	–55 to +125	2.0 to 5.5 V
MC74VHC1G04	Inverter	TSOP–5, SC–88A	–55 to +125	2.0 to 5.5 V
MC74VHC1GT04	Inverter (TTL Compatible)	TSOP–5, SC–88A	–55 to +125	2.0 to 5.5 V
MC74VHC1GU04	Inverter (Unbuffered)	TSOP–5, SC–88A	–55 to +125	2.0 to 5.5 V
MC74VHC1G05	Inverter w/Open–Drain Output	TSOP–5, SC–88A	–55 to +125	2.0 to 5.5 V
MC74VHC1G07	Buffer w/Open–Drain Output	TSOP–5, SC–88A	–55 to +125	2.0 to 5.5 V
MC74VHC1G08	2–Input AND Gate	TSOP–5, SC–88A	–55 to +125	2.0 to 5.5 V
MC74VHC1GT08	2–Input AND Gate (TTL Compatible)	TSOP–5, SC–88A	–55 to +125	2.0 to 5.5 V
MC74VHC1G09	2–Input AND Gate (Open Drain)	TSOP–5, SC–88A	–55 to +125	2.0 to 5.5 V
MC74VHC1G14	Schmitt Trigger–Inverter	TSOP–5, SC–88A	–55 to +125	2.0 to 5.5 V
MC74VHC1GT14	Schmitt Trigger Inverter (TTL Compatible)	TSOP–5, SC–88A	–55 to +125	2.0 to 5.5 V
MC74VHC1G32	2–Input OR Gate	TSOP–5, SC–88A	–55 to +125	2.0 to 5.5 V
MC74VHC1GT32	2–Input OR Gate (TTL Compatible)	TSOP–5, SC–88A	–55 to +125	2.0 to 5.5 V
MC74VHC1G50	Buffer	TSOP–5, SC–88A	–55 to +125	2.0 to 5.5 V
MC74VHC1GT50	Buffer (TTL Compatible)	TSOP–5, SC–88A	–55 to +125	2.0 to 5.5 V
MC74VHC1G66	Analog Switch	TSOP–5, SC–88A	–55 to +125	2.0 to 5.5 V
MC74VHC1GT66	Analog Switch	TSOP–5, SC–88A	–55 to +125	2.0 to 5.5 V
MC74VHC1G86	2–Input Exclusive–OR Gate	TSOP–5, SC–88A	–55 to +125	2.0 to 5.5 V
MC74VHC1GT86	2–Input Exclusive–OR Gate (TTL Compatible)	TSOP–5, SC–88A	–55 to +125	2.0 to 5.5 V
MC74VHC1G125	Bus Buffer (3–state)	TSOP–5, SC–88A	–55 to +125	2.0 to 5.5 V
MC74VHC1GT125	Bus Buffer Gate (3–state) (TTL Compatible)	TSOP–5, SC–88A	–55 to +125	2.0 to 5.5 V
MC74VHC1G126	Bus Buffer (3–state)	TSOP–5, SC–88A	–55 to +125	2.0 to 5.5 V
MC74VHC1GT126	Bus Buffer Gate (3–state) (TTL Compatible)	TSOP–5, SC–88A	–55 to +125	2.0 to 5.5 V
MC74VHC1G132	Quad 2–Input Schmitt NAND Gate	TSOP–5, SC–88A	–55 to +125	2.0 to 5.5 V
MC74VHC1G135	2–Input NAND Schmitt–Trigger with Open Drain Output	TSOP–5, SC–88A	–55 to +125	2.0 to 5.5 V

HC One–Gate

Ordering Suffixes: TSOP5 = DTT1, SC88A = DFT2 (available in T & R only)

Part Number	Description	Surface Mount Packages	Temperature	Operating Voltage
MC74HC1G00	2–Input NAND Gate	TSOP–5, SC–88A	–55 to +125	2.0 to 6.0 V
MC74HC1G02	2–Input Positive–NOR Gate	TSOP–5, SC–88A	–55 to +125	2.0 to 6.0 V
MC74HC1G04	Inverter	TSOP–5, SC–88A	–55 to +125	2.0 to 6.0 V
MC74HC1G08	2–Input AND Gate	TSOP–5, SC–88A	–55 to +125	2.0 to 6.0 V
MC74HC1G14	Inverter with Schmitt Trigger Input	TSOP–5, SC–88A	–55 to +125	2.0 to 6.0 V
MC74HC1G32	2–Input OR Gate	TSOP–5, SC–88A	–55 to +125	2.0 to 6.0 V
MC74HC1GU04	Inverter (Unbuffered)	TSOP–5, SC–88A	–55 to +125	2.0 to 6.0 V

MiniGate™ Analog Switches

Ordering Suffixes: TSOP5/6 = DTT1, SC88/A = DFT2, US = US8 (available in T & R only), DT = TSSOP Rail, DTR2 = TSSOP T & R, MN = QFN Rail, MNR2 = QFN T & R

Part Number	Description	Pins	Surface Mount Packages	Temperature	Operating Voltage
NLAS323	SPST, Pos/Pos Enable Analog Switch	8	US8	–40 to +85	2.0 to 5.5 V
NLAS324	SPST, Neg/Neg Enable Analog Switch	8	US8	–40 to +85	2.0 to 5.5 V
NLAS325	SPST, Pos/Neg Enable Analog Switch	8	US8	–40 to +85	2.0 to 5.5 V
NLAS1053	2:1 Multiplexer w/Enable Analog Switch	6	TSOP–6, SC–88	–40 to +85	2.0 to 5.5 V
NLAS4501	SPST, NO Analog Switch	5	TSOP–5, SC–88A	–40 to +85	2.0 to 5.5 V
NLAST4501	SPST, NO Analog Switch, TTL Compatible Inputs	5	TSOP–5, SC–88A	–40 to +85	2.0 to 5.5 V
NLAS4599	SPDT Analog Switch	6	TSOP–6, SC–88	–40 to +125	2.0 to 5.5 V
NLAST4599	SPDT Analog Switch, TTL Compatible Inputs	6	TSOP–6, SC–88	–40 to +125	2.0 to 5.5 V
NLAS44599	Quad DPDT Analog Switch	16	QFN, TSSOP16	–40 to +85	2.0 to 5.5 V
NLAST44599	Quad DPDT Analog Switch, TTL Compatible Inputs	16	QFN,TSSOP16	–40 to +85	2.0 to 5.5 V

LCX One–Gates

Ordering Suffixes: TSOP5 = DTT1, SC88A = DFT2, US = US8 (available in T & R only)

Part Number	Description	Surface Mount Packages	Temperature	Operating Voltage
NL17SZ00	NAND Gate	TSOP–5, SC–88A	–40 to +85	2.3 to 5.5 V
NL17SZ02	NOR Gate	TSOP–5, SC–88A	–40 to +85	2.3 to 5.5 V
NL17SZ04	Inverter	TSOP–5, SC–88A	–40 to +85	2.3 to 5.5 V
NL17SZ06	Inverter w/Open Drain Outputs	TSOP–5, SC–88A	–40 to +85	2.3 to 5.5 V
NL17SZ07	Non–Inverter Buffer w/Open Drain Outputs	TSOP–5, SC–88A	–40 to +85	2.3 to 5.5 V
NL17SZ08	2–Input AND Gate	TSOP–5, SC–88A	–40 to +85	2.3 to 5.5 V
NL17SZ14	Schmidt–Trigger Inverter	TSOP–5, SC–88A	–40 to +85	2.3 to 5.5 V
NL17SZ16	Buffer	TSOP–5, SC–88A	–40 to +85	2.3 to 5.5 V
NL17SZ17	NonInverting Schmitt Trigger Buffer	TSOP–5, SC–88A	–40 to +85	2.3 to 5.5 V
NL17SZ32	OR Gate	TSOP–5, SC–88A	–40 to +85	2.3 to 5.5 V
NL17SZ74	D Flip Flop	US8	–40 to +85	2.3 to 5.5 V
NL17SZ86	Exclusive OR Gate	TSOP–5, SC–88A	–40 to +85	2.3 to 5.5 V
NL17SZ125	Noninverting TriState Buffer	TSOP–5, SC–88A	–40 to +85	2.3 to 5.5 V
NL17SZ126	TriState Buffer	TSOP–5, SC–88A	–40 to +85	2.3 to 5.5 V
NL17SZU04	Dual Inverter–Unbuffered	TSOP–5, SC–88A	–40 to +85	2.3 to 5.5 V

LCX Two–Gates & Three–Gates

Ordering Suffixes: TSOP5/6 = DTT1, SC88/A = DFT2, US = US8 (available in T & R only)

Part Number	Description	Surface Mount Packages	Temperature	Operating Voltage
NL27WZ00	Dual NAND Gate	US8	–40 to +85	2.3 to 5.5 V
NL27WZ02	Dual NOR Gate	US8	–40 to +85	2.3 to 5.5 V
NL27WZ04	Dual Inverter	TSOP–6, SC–88	–40 to +85	2.3 to 5.5 V
NL27WZ06	Dual Inverter w/Open Drain Outputs	TSOP–6, SC–88	–40 to +85	2.3 to 5.5 V
NL27WZ07	Dual Non–Inverting Buffer w/Open Drain Outputs	TSOP–6, SC–88	–40 to +85	2.3 to 5.5 V
NL27WZ08	Dual AND Gate	US8	–40 to +85	2.3 to 5.5 V
NL27WZ14	Dual Schmitt–Trigger Inverter	TSOP–6, SC–88	–40 to +85	2.3 to 5.5 V
NL27WZ16	Dual Buffer	TSOP–6, SC–88	–40 to +85	2.3 to 5.5 V
NL27WZ32	Dual OR Gate	US8	–40 to +85	2.3 to 5.5 V
NL27WZ86	Dual Exclusive OR Gate	US8	–40 to +85	2.3 to 5.5 V
NL27WZ125	Dual Noninverting TriState Buffer	US8	–40 to +85	2.3 to 5.5 V
NL27WZ126	Dual TriState Buffer	US8	–40 to +85	2.3 to 5.5 V
NL27WZU04	Dual Inverter–Unbuffered	TSOP–6, SC–88	–40 to +85	2.3 to 5.5 V
NL37WZ04	Triple Inverter	US8	–40 to +85	2.3 to 5.5 V
NL37WZ06	Triple Inverter w/Open Drain Outputs	US8	–40 to +85	2.3 to 5.5 V
NL37WZ07	Triple Non–Inverter Buffer w/Open Drain Outputs	US8	–40 to +85	2.3 to 5.5 V
NL37WZ14	Triple Schmidt–Trigger Inverter	US8	–40 to +85	2.3 to 5.5 V
NL37WZ16	Triple Buffer	US8	–40 to +85	2.3 to 5.5 V
NL37WZ17	Triple NonInverting Schmitt Trigger Buffer	US8	–40 to +85	2.3 to 5.5 V

NLAS Analog Switches

Ordering Suffixes: D = SOIC Rail, DR2 = SOIC T & R, DT = TSSOP Rail, DTR2 = TSSOP T & R, QS = QSOP Rail, QSR = QSOP T & R

Part Number	Description	Surface Mount Packages	Temperature	Operating Voltage
NLAS4051	Single Pole Analog Switch	SOIC16, TSSOP16, QSOP16	–40 to +85	2.0 to 5.5 V
NLAS4052	Double Pole Analog Switch	SOIC16, TSSOP16, QSOP16	–40 to +85	2.0 to 5.5 V
NLAS4053	Triple Single Pole Analog Switch	SOIC16, TSSOP16, QSOP16	–40 to +85	2.0 to 5.5 V
NLAS4066	Quad Mux/Demux Analog Switch	SOIC14, TSSOP14, QSOP14	–40 to +85	2.0 to 5.5 V
NLAST4051	Single Pole Analog Switch, TTL Compatible	SOIC16, TSSOP16, QSOP16	–40 to +85	2.0 to 5.5 V
NLAST4052	Double Pole Analog Switch, TTL Compatible	SOIC16, TSSOP16, QSOP16	–40 to +85	2.0 to 5.5 V
NLAST4053	Triple Single Pole Analog Switch, TTL Compatible	SOIC16, TSSOP16, QSOP16	–40 to +85	2.0 to 5.5 V
NLAST4066	Quad Mux/Demux Analog Switch, TTL Compatible	SOIC14, TSSOP14, QSOP14	–40 to +85	2.0 to 5.5 V

FST

Ordering Suffixes: D = SOIC Rail, DR2 = SOIC T & R, DW = SOICW Rail, DWR2 = SOICW T & R, DT = TSSOP Rail, DTR2 = TSSOP T & R, QS = QSOP Rail, QSR = QSOP T & R

Part Number	Description	Surface Mount Packages	Temperature	Operating Voltage
74FST3125	4–Bit Low Enable Bus Switch	SOIC14, TSSOP14, QSOP14	–40 to +85	2.0 to 6.0 V
74FST3126	4–Bit High Enable Bus Switch	SOIC14, TSSOP14, QSOP14	–40 to +85	2.0 to 6.0 V
74FST3244	8–Bit Low Enable Bus Switch	SOIC20W, TSSOP20, QSOP20	–40 to +85	2.0 to 6.0 V
74FST3245	8–Bit High Enable Bus Switch	SOIC20W, TSSOP20, QSOP20	–40 to +85	2.0 to 6.0 V
74FST3251	Mux/Demux Bus Switch	SOIC16, TSSOP16, QSOP16	–40 to +85	2.0 to 6.0 V
74FST3253	Dual 4:1 Multiplexer	SOIC16, TSSOP16, QSOP16	–40 to +85	2.0 to 6.0 V
74FST3257	Quad 2:1 Multiplexer	SOIC16, TSSOP16, QSOP16	–40 to +85	2.0 to 6.0 V
74FST3345	8–Bit Dual Output Enable Bus Switch	SOIC20W, TSSOP20, QSOP20	–40 to +85	2.0 to 6.0 V
74FST3383	10–Bit Low Power, Low Enable Bus Switch	SOIC24W, TSSOP24, QSOP24	–40 to +85	2.0 to 6.0 V
74FST3384	10–Bit Low Power, High Enable Bus Switch	SOIC24W, TSSOP24, QSOP24	–40 to +85	2.0 to 6.0 V
74FST3400	4–Bit, 4–Port Bus Switch	SOIC24W, TSSOP24, QSOP24	–40 to +85	2.0 to 6.0 V
74FST3861	10–Bit FET Bus Switch	SOIC24W, TSSOP24, QSOP24	–40 to +85	2.0 to 6.0 V
74FST6800	10–Bit Bus Switch w/ Precharged Outputs	SOIC24W, TSSOP24, QSOP24	–40 to +85	2.0 to 6.0 V

ALVC

Ordering Suffixes: DT = TSSOP Rail, DTR = TSSOP T & R

Part Number	Description	Surface Mount Packages	Temperature	Operating Voltage
74ALVC16240	16–Bit Bus Buffer (3–state/Inverted)	TSSOP–48	–40 to +85	1.65 to 3.6 V
74ALVC16244	16–Bit Bus Buffer (3–state)	TSSOP–48	–40 to +85	1.65 to 3.6 V
74ALVC16245	16–Bit Bus Transceiver (3–state)	TSSOP–48	–40 to +85	1.65 to 3.6 V
74ALVC16373	16–Bit D–type Latch (3–state)	TSSOP–48	–40 to +85	1.65 to 3.6 V
74ALVC16374	16–Bit D–type Flip–Flop (3–state)	TSSOP–48	–40 to +85	1.65 to 3.6 V
74ALVCH16240	16–Bit Bus Buffer (3–state/Inverted, Bus Hold)	TSSOP–48	–40 to +85	1.65 to 3.6 V
74ALVCH16244	16–Bit Bus Buffer (3–state, Bus Hold)	TSSOP–48	–40 to +85	1.65 to 3.6 V
74ALVCH16245	16–Bit Bus Transceiver (3–state, Bus Hold)	TSSOP–48	–40 to +85	1.65 to 3.6 V
74ALVCH16373	16–Bit D–type Latch (3–state, Bus Hold)	TSSOP–48	–40 to +85	1.65 to 3.6 V
74ALVCH16374	16–Bit D–type Flip–Flop (3–state, Bus Hold)	TSSOP–48	–40 to +85	1.65 to 3.6 V

VCX

Ordering Suffixes: DT = TSSOP Rail, DTR = TSSOP T & R

Part Number	Description	Surface Mount Packages	Temperature	Operating Voltage
74VCX16240	16–Bit Bus Buffer (3–state/Inverted)	TSSOP–48	–40 to +85	1.65 to 3.6 V
74VCX16244	16–Bit Bus Buffer (3–state)	TSSOP–48	–40 to +85	1.65 to 3.6 V
74VCX16245	16–Bit Bus Transceiver (3–state)	TSSOP–48	–40 to +85	1.65 to 3.6 V
74VCX16373	16–Bit D–type Latch (3–state)	TSSOP–48	–40 to +85	1.65 to 3.6 V
74VCX16374	16–Bit D–type Flip–Flop (3–state)	TSSOP–48	–40 to +85	1.65 to 3.6 V
74VCXH16240	16–Bit Bus Buffer (3–state/Inverted, Bus Hold)	TSSOP–48	–40 to +85	1.65 to 3.6 V
74VCXH16244	16–Bit Bus Buffer (3–state, Bus Hold)	TSSOP–48	–40 to +85	1.65 to 3.6 V
74VCXH16245	16–Bit Bus Transceiver (3–state, Bus Hold)	TSSOP–48	–40 to +85	1.65 to 3.6 V
74VCXH16373	16–Bit D–type Latch (3–state, Bus Hold)	TSSOP–48	–40 to +85	1.65 to 3.6 V
74VCXH16374	16–Bit D–type Flip–Flop (3–state, Bus Hold)	TSSOP–48	–40 to +85	1.65 to 3.6 V

LCX

Ordering Suffixes: D = SOIC Rail, DR2 = SOIC T & R, DW = SOICW Rail, DWR2 = SOICW T & R, DT = TSSOP Rail, DTR2 = TSSOP T & R, M = SOEIAJ Rail, MEL = SOEIAJ T & R

Part Number	Description	Surface Mount Packages	Temperature	Operating Voltage
MC74LCX00	Quad 2–Input NAND Gate	SO–14, TSSOP–14, EIAJ–14	–40 to +85	2.0 to 3.6 V
MC74LCX02	Quad 2–Input Positive–NOR Gate	SO–14, TSSOP–14, EIAJ–14	–40 to +85	2.0 to 3.6 V
MC74LCX04	Hex Inverter	SO–14, TSSOP–14, EIAJ–14	–40 to +85	2.0 to 3.6 V
MC74LCXU04	Hex Inverter (Unbuffered)	SO–14, TSSOP–14, EIAJ–14	–40 to +85	2.0 to 3.6 V
MC74LCX06	Hex Inverter w/Open–Drain Output	SO–14, TSSOP–14, EIAJ–14	–40 to +85	2.0 to 3.6 V
MC74LCX07	Hex Buffer w/Open–Drain Output	SO–14, TSSOP–14, EIAJ–14	–40 to +85	2.0 to 3.6 V
MC74LCX08	Quad 2–Input AND Gate	SO–14, TSSOP–14, EIAJ–14	–40 to +85	2.0 to 3.6 V
MC74LCX14	Hex Schmitt Trigger	SO–14, TSSOP–14, EIAJ–14	–40 to +85	2.0 to 3.6 V
MC74LCX32	Quad 2–Input OR Gate	SO–14, TSSOP–14, EIAJ–14	–40 to +85	2.0 to 3.6 V
MC74LCX74	Dual D Flip–Flop w/Preset and Clear	SO–14, TSSOP–14, EIAJ–14	–40 to +85	2.0 to 3.6 V
MC74LCX86	Quad Exclusive–OR Gate	SO–14, TSSOP–14, EIAJ–14	–40 to +85	2.0 to 3.6 V
MC74LCX125	Quad Bus Buffer (3–state)	SO–14, TSSOP–14, EIAJ–14	–40 to +85	2.0 to 3.6 V
MC74LCX138	3–to–8 Line Decoder/Demultiplexer	SO–16, TSSOP–16, EIAJ–16	–40 to +85	2.0 to 3.6 V
MC74LCX139	Dual 2–to–4 Line Decoder/Demultiplexer	SO–16, TSSOP–16, EIAJ–16	–40 to +85	2.0 to 3.6 V
MC74LCX157	Quad 2–Channel Multiplexer	SO–16, TSSOP–16, EIAJ–16	–40 to +85	2.0 to 3.6 V
MC74LCX158	Quad 2–to–1 Data Selector/Multiplexer	SO–16, TSSOP–16, EIAJ–16	–40 to +85	2.0 to 3.6 V
MC74LCX240	Octal Bus Buffer (3–state/Inverted)	SO–20W, TSSOP–20, EIAJ–20	–40 to +85	2.0 to 3.6 V
MC74LCX244	Octal Bus Buffer (3–state)	SO–20W, TSSOP–20, EIAJ–20	–40 to +85	2.0 to 3.6 V

LCX (continued)

Ordering Suffixes: D = SOIC Rail, DR2 = SOIC T & R, DW = SOICW Rail, DWR2 = SOICW T & R, DT = TSSOP Rail, DTR2 = TSSOP T & R, M = SOEIAJ Rail, MEL = SOEIAJ T & R

Part Number	Description	Surface Mount Packages	Temperature	Operating Voltage
MC74LCX245	Octal Bus Transceiver (3–state)	SO–20W, TSSOP–20, EIAJ–20	–40 to +85	2.0 to 3.6 V
MC74LCX257	Quad 2–Line To 1–Line Data Selectors/Multiplexer (3–state)	SO–20W, TSSOP–20, EIAJ–20	–40 to +85	2.0 to 3.6 V
MC74LCX258	Quad 2–Line To 1–Line Data Selectors/Multiplexer (3–state)	SO–16, TSSOP–16, EIAJ–16	–40 to +85	2.0 to 3.6 V
MC74LCX373	Octal D–type Latch (3–state)	SO–20W, TSSOP–20, EIAJ–20	–40 to +85	2.0 to 3.6 V
MC74LCX374	Octal D–type Flip–Flop (3–state)	SO–20W, TSSOP–20, EIAJ–20	–40 to +85	2.0 to 3.6 V
MC74LCX540	Octal Bus Buffer (3–state/Inverted)	SO–20W, TSSOP–20, EIAJ–20	–40 to +85	2.0 to 3.6 V
MC74LCX541	Octal Bus Buffer (3–state)	SO–20W, TSSOP–20, EIAJ–20	–40 to +85	2.0 to 3.6 V
MC74LCX573	Octal D–type Latch (3–state)	SO–20W, TSSOP–20, EIAJ–20	–40 to +85	2.0 to 3.6 V
MC74LCX574	Octal D–type Flip–Flop (3–state)	SO–20W, TSSOP–20, EIAJ–20	–40 to +85	2.0 to 3.6 V
MC74LCX16240	16–Bit Bus Buffer (3–state/Inverted)	TSSOP–48	–40 to +85	2.0 to 3.6 V
MC74LCX16244	16–Bit Bus Buffer (3–state)	TSSOP–48	–40 to +85	2.0 to 3.6 V
MC74LCX16245	16–Bit Bus Transceiver (3–state)	TSSOP–48	–40 to +85	2.0 to 3.6 V
MC74LCX16373	16–Bit D–type Latch (3–state)	TSSOP–48	–40 to +85	2.0 to 3.6 V
MC74LCX16374	16–Bit D–type Flip–Flop (3–state)	TSSOP–48	–40 to +85	2.0 to 3.6 V
MC74LCX16374	16–Bit D–type Flip–Flop (3–state)	TSSOP–48	–40 to +85	2.0 to 3.6 V

LVX

Ordering Suffixes: D = SOIC Rail, DR2 = SOIC T & R, DW = SOICW Rail, DWR2 = SOICW T & R, DT = TSSOP Rail, DTR2 = TSSOP T & R, M = SOEIAJ Rail, MEL = SOEIAJ T & R

Part Number	Description	Surface Mount Packages	Temperature	Operating Voltage
MC74LVX00	Quad 2–Input NAND Gate	SO–14, TSSOP–14, EIAJ–14	–40 to +85	2.0 to 3.6 V
MC74LVX02	Quad 2–Input Positive–NOR Gate	SO–14, TSSOP–14, EIAJ–14	–40 to +85	2.0 to 3.6 V
MC74LVX04	Hex Inverter	SO–14, TSSOP–14, EIAJ–14	–40 to +85	2.0 to 3.6 V
MC74LVX08	Quad 2–Input AND Gate	SO–14, TSSOP–14, EIAJ–14	–40 to +85	2.0 to 3.6 V
MC74LVX14	Hex Schmitt Trigger	SO–14, TSSOP–14, EIAJ–14	–40 to +85	2.0 to 3.6 V
MC74LVX32	Quad 2–Input OR Gate	SO–14, TSSOP–14, EIAJ–14	–40 to +85	2.0 to 3.6 V
MC74LVX50	Hex Buffer	SO–14, TSSOP–14, EIAJ–14	–40 to +85	2.0 to 3.6 V
MC74LVX74	Dual D Flip–Flop w/Preset and Clear	SO–14, TSSOP–14, EIAJ–14	–40 to +85	2.0 to 3.6 V
MC74LVX86	Quad Exclusive–OR Gate	SO–14, TSSOP–14, EIAJ–14	–40 to +85	2.0 to 3.6 V
MC74LVX125	Quad Bus Buffer (3–state)	SO–14, TSSOP–14, EIAJ–14	–40 to +85	2.0 to 3.6 V
MC74LVX126	Quad Bus Buffer (3–state)	SO–14, TSSOP–14, EIAJ–14	–40 to +85	2.0 to 3.6 V
MC74LVX132	Quad 2–Input Schmitt NAND Gate	SO–14, TSSOP–14, EIAJ–14	–40 to +85	2.0 to 3.6 V
MC74LVX138	3–to–8 Line Decoder/Demultiplexer	SO–16, TSSOP–16, EIAJ–16	–40 to +85	2.0 to 3.6 V
MC74LVX139	Dual 2–to–4 Line Decoder/Demultiplexer	SO–16, TSSOP–16, EIAJ–16	–40 to +85	2.0 to 3.6 V
MC74LVX157	Quad 2–Channel Multiplexer	SO–16, TSSOP–16, EIAJ–16	–40 to +85	2.0 to 3.6 V
MC74LVX240	Octal Bus Buffer (3–state/Inverted)	SO–20W, TSSOP–20, EIAJ–20	–40 to +85	2.0 to 3.6 V

LVX (continued)

Ordering Suffixes: D = SOIC Rail, DR2 = SOIC T & R, DW = SOICW Rail, DWR2 = SOICW T & R, DT = TSSOP Rail, DTR2 = TSSOP T & R, M = SOEIAJ Rail, MEL = SOEIAJ T & R

Part Number	Description	Surface Mount Packages	Temperature	Operating Voltage
MC74LVX244	Octal Bus Buffer (3–state)	SO–20W, TSSOP–20, EIAJ–20	–40 to +85	2.0 to 3.6 V
MC74LVX245	Octal Bus Transceiver (3–state)	SO–20W, TSSOP–20, EIAJ–20	–40 to +85	2.0 to 3.6 V
MC74LVX257	Quad 2–Line to 1–Line Data Selectors/Multiplexer (3–state)	SO–14, TSSOP–14, EIAJ–14	–40 to +85	2.0 to 3.6 V
MC74LVX259	8–Bit Addressable Latch	SO–16, TSSOP–16, EIAJ–16	–40 to +85	2.0 to 3.6 V
MC74LVX373	Octal D–type Latch (3–state)	SO–20W, TSSOP–20, EIAJ–20	–40 to +85	2.0 to 3.6 V
MC74LVX374	Octal D–type Flip–Flop (3–state)	SO–20W, TSSOP–20, EIAJ–20	–40 to +85	2.0 to 3.6 V
MC74LVX540	Octal Bus Buffer (3–state/Inverted)	SO–20W, TSSOP–20, EIAJ–20	–40 to +85	2.0 to 3.6 V
MC74LVX541	Octal Bus Buffer (3–state)	SO–20W, TSSOP–20, EIAJ–20	–40 to +85	2.0 to 3.6 V
MC74LVX573	Octal D–type Latch (3–state)	SO–20W, TSSOP–20, EIAJ–20	–40 to +85	2.0 to 3.6 V
MC74LVX574	Octal D–type Flip–Flop (3–state)	SO–20W, TSSOP–20, EIAJ–20	–40 to +85	2.0 to 3.6 V
MC74LVXC3245	Octal Dual Supply Bus Transceiver	SO–24W, TSSOP–24	–40 to +85	2.0 to 3.6 V
MC74LVX4051	8–to–1 Channel Analog Multiplexer	SO–16, TSSOP–16, EIAJ–16	–40 to +85	2.0 to 3.6 V
MC74LVXT4051	8–to–1 Channel Analog Multiplexer (TTL Compatible Inputs)	SO–16, TSSOP–16, EIAJ–16	–40 to +85	2.0 to 3.6 V
MC74LVX4052	Dual 4 Channel Analog Multiplexer	SO–16, TSSOP–16, EIAJ–16	–40 to +85	2.0 to 3.6 V
MC74LVXT4052	Dual 4 Channel Analog Multiplexer (TTL Compatible Inputs)	SO–16, TSSOP–16, EIAJ–16	–40 to +85	2.0 to 3.6 V
MC74LVX4053	Triple 2 Channel Analog Multiplexer	SO–16, TSSOP–16, EIAJ–16	–40 to +85	2.0 to 3.6 V
MC74LVXT4053	Triple 2 Channel Analog Multiplexer (TTL Compatible Inputs)	SO–16, TSSOP–16, EIAJ–16	–40 to +85	2.0 to 3.6 V
MC74LVX4066	Quad Analog Switch	SO–14, TSSOP–14, EIAJ–14	–40 to +85	2.0 to 3.6 V
MC74LVXT4066	Quad Analog Switch (TTL Compatible Inputs)	SO–14, TSSOP–14, EIAJ–14	–40 to +85	2.0 to 3.6 V
MC74LVX4245	Octal Dual Supply Bus Transceiver	SO–24W, TSSOP–24	–40 to +85	2.0 to 3.6 V
MC74LVX8051	8–to–1 Channel Analog Multiplexer	SO–16, TSSOP–16, EIAJ–16	–40 to +85	2.0 to 3.6 V
MC74LVXT8051	8–to–1 Channel Analog Multiplexer (TTL Compatible Inputs)	SO–16, TSSOP–16, EIAJ–16	–40 to +85	2.0 to 3.6 V
MC74LVX8053	Triple 2 Channel Analog Multiplexer	SO–16, TSSOP–16, EIAJ–16	–40 to +85	2.0 to 3.6 V
MC74LVXT8053	Triple 2 Channel Analog Multiplexer (TTL Compatible Inputs)	SO–16, TSSOP–16, EIAJ–16	–40 to +85	2.0 to 3.6 V

VHC

Ordering Suffixes: D = SOIC Rail, DR2 = SOIC T & R, DW = SOICW Rail, DWR2 = SOICW T & R, DT = TSSOP Rail, DTR2 = TSSOP T & R, M = SOEIAJ Rail, MEL = SOEIAJ T & R

Part Number	Description	Surface Mount Packages	Temperature	Operating Voltage
MC74VHC00	Quad 2–Input NAND Gate	SO–14, TSSOP–14, EIAJ–14	–55 to +125	2.0 to 5.5 V
MC74VHCT00A	Quad 2–Input NAND Gate (TTL Compatible)	SO–14, TSSOP–14, EIAJ–14	–55 to +125	2.0 to 5.5 V
MC74VHC02	Quad 2–Input Positive–NOR Gate	SO–14, TSSOP–14, EIAJ–14	–55 to +125	2.0 to 5.5 V
MC74VHCT02A	Quad 2–Input Positive–NOR Gate (TTL Compatible)	SO–14, TSSOP–14, EIAJ–14	–55 to +125	2.0 to 5.5 V
MC74VHC04	Hex Inverter	SO–14, TSSOP–14, EIAJ–14	–55 to +125	2.0 to 5.5 V
MC74VHCT04A	Hex Inverter (TTL Compatible)	SO–14, TSSOP–14, EIAJ–14	–55 to +125	2.0 to 5.5 V
MC74VHCU04	Hex Inverter (Unbuffered)	SO–14, TSSOP–14, EIAJ–14	–55 to +125	2.0 to 5.5 V
MC74VHC08	Quad 2–Input AND Gate	SO–14, TSSOP–14, EIAJ–14	–55 to +125	2.0 to 5.5 V
MC74VHCT08A	Quad 2–Input AND Gate (TTL Compatible)	SO–14, TSSOP–14, EIAJ–14	–55 to +125	2.0 to 5.5 V
MC74VHC14	Hex Schmitt Trigger	SO–14, TSSOP–14, EIAJ–14	–55 to +125	2.0 to 5.5 V

VHC (continued)

Ordering Suffixes: D = SOIC Rail, DR2 = SOIC T & R, DW = SOICW Rail, DWR2 = SOICW T & R, DT = TSSOP Rail, DTR2 = TSSOP T & R, M = SOEIAJ Rail, MEL = SOEIAJ T & R

Part Number	Description	Surface Mount Packages	Temperature	Operating Voltage
MC74VHCT14A	Hex Schmitt Trigger Inverter (TTL Compatible)	SO–14, TSSOP–14, EIAJ–14	–55 to +125	2.0 to 5.5 V
MC74VHC32	Quad 2–Input OR Gate	SO–14, TSSOP–14, EIAJ–14	–55 to +125	2.0 to 5.5 V
MC74VHCT32A	Quad 2–Input OR Gate (TTL Compatible)	SO–14, TSSOP–14, EIAJ–14	–55 to +125	2.0 to 5.5 V
MC74VHC50	Hex Buffer	SO–14, TSSOP–14, EIAJ–14	–55 to +125	2.0 to 5.5 V
MC74VHCT50A	Hex Buffer (TTL Compatible)	SO–14, TSSOP–14, EIAJ–14	–55 to +125	2.0 to 5.5 V
MC74VHC74	Dual D Flip–Flop w/Preset and Clear	SO–14, TSSOP–14, EIAJ–14	–55 to +125	2.0 to 5.5 V
MC74VHCT74A	Dual D Flip–Flop w/Preset and Clear (TTL Compatible)	SO–14, TSSOP–14, EIAJ–14	–55 to +125	2.0 to 5.5 V
MC74VHC86	Quad Exclusive–OR Gate	SO–14, TSSOP–14, EIAJ–14	–55 to +125	2.0 to 5.5 V
MC74VHCT86A	Quad 2–Input Exclusive–OR Gate (TTL Compatible)	SO–14, TSSOP–14, EIAJ–14	–55 to +125	2.0 to 5.5 V
MC74VHC125	Quad Bus Buffer (3–state)	SO–14, TSSOP–14, EIAJ–14	–55 to +125	2.0 to 5.5 V
MC74VHCT125A	Quad Bus Buffer Gate (3–state) (TTL Compatible)	SO–14, TSSOP–14, EIAJ–14	–55 to +125	2.0 to 5.5 V
MC74VHC126	Quad Bus Buffer (3–state)	SO–14, TSSOP–14, EIAJ–14	–55 to +125	2.0 to 5.5 V
MC74VHCT126A	Quad Bus Buffer Gate (3–state) (TTL Compatible)	SO–14, TSSOP–14, EIAJ–14	–55 to +125	2.0 to 5.5 V
MC74VHC132	Quad 2–Input Schmitt NAND Gate	SO–14, TSSOP–14, EIAJ–14	–55 to +125	2.0 to 5.5 V
MC74VHCT132A	Quad 2–Input Schmitt NAND Gate	SO–14, TSSOP–14, EIAJ–14	–55 to +125	2.0 to 5.5 V
MC74VHC138	3–to–8 Line Decoder/Demultiplexer	SO–16, TSSOP–16, EIAJ–16	–55 to +125	2.0 to 5.5 V
MC74VHCT138A	3–to–8 Line Decoder (TTL Compatible)	SO–16, TSSOP–16, EIAJ–16	–55 to +125	2.0 to 5.5 V
MC74VHC139	Dual 2–to–4 Line Decoder/Demultiplexer	SO–16, TSSOP–16, EIAJ–16	–55 to +125	2.0 to 5.5 V
MC74VHCT139A	Dual 2–to–4 Line Decoder/DeMultiplexer (TTL Compatible)	SO–16, TSSOP–16, EIAJ–16	–55 to +125	2.0 to 5.5 V
MC74VHC157	Quad 2–Channel Multiplexer	SO–16, TSSOP–16, EIAJ–16	–55 to +125	2.0 to 5.5 V
MC74VHCT157A	Quad 2–to–1 Data Selector/Multiplexer (TTL Compatible)	SO–16, TSSOP–16, EIAJ–16	–55 to +125	2.0 to 5.5 V
MC74VHC240	Octal Bus Buffer (3–state/Inverted)	SO–20W, TSSOP–20, EIAJ–20	–55 to +125	2.0 to 5.5 V
MC74VHCT240A	Octal Bus Buffer (3–state/Inverted) (TTL Compatible)	SO–20W, TSSOP–20, EIAJ–20	–55 to +125	2.0 to 5.5 V
MC74VHC244	Octal Bus Buffer (3–state)	SO–20W, TSSOP–20, EIAJ–20	–55 to +125	2.0 to 5.5 V
MC74VHCT244A	Octal Bus Buffer (3–state) (TTL Compatible)	SO–20W, TSSOP–20, EIAJ–20	–55 to +125	2.0 to 5.5 V
MC74VHC245	Octal Bus Transceiver (3–state)	SO–20W, TSSOP–20, EIAJ–20	–55 to +125	2.0 to 5.5 V
MC74VHCT245A	Octal Bus Transceiver (3–state) (TTL Compatible)	SO–20W, TSSOP–20, EIAJ–20	–55 to +125	2.0 to 5.5 V
MC74VHC257	Quad 2–Line To 1–Line Data Selectors/Multiplexer (3–state)	SO–14, TSSOP–14, EIAJ–14	–55 to +125	2.0 to 5.5 V
MC74VHCT257A	Quad 2–To–1 Data Selectors/Mux (3–state) (TTL Compatible)	SO–14, TSSOP–14, EIAJ–14	–55 to +125	2.0 to 5.5 V
MC74VHC259	8–Bit Addressable Latch	SO–14, TSSOP–14, EIAJ–14	–55 to +125	2.0 to 5.5 V
MC74VHCT259A	8–Bit Addressable Latch (TTL Compatible)	SO–14, TSSOP–14, EIAJ–14	–55 to +125	2.0 to 5.5 V
MC74VHC373	Octal D–type Latch (3–state)	SO–20W, TSSOP–20, EIAJ–20	–55 to +125	2.0 to 5.5 V
MC74VHCT373A	Octal D–type Latch (3–state) (TTL Compatible)	SO–20W, TSSOP–20, EIAJ–20	–55 to +125	2.0 to 5.5 V
MC74VHC374	Octal D–type Flip–Flop (3–state)	SO–20W, TSSOP–20, EIAJ–20	–55 to +125	2.0 to 5.5 V
MC74VHCT374A	Octal D–type Flip–Flop (3–state) (TTL Compatible)	SO–20W, TSSOP–20, EIAJ–20	–55 to +125	2.0 to 5.5 V
MC74VHC540	Octal Bus Buffer (3–state/Inverted)	SO–20W, TSSOP–20, EIAJ–20	–55 to +125	2.0 to 5.5 V
MC74VHCT540A	Octal Bus Buffer (3–state/Inverted) (TTL Compatible)	SO–20W, TSSOP–20, EIAJ–20	–55 to +125	2.0 to 5.5 V
MC74VHC541	Octal Bus Buffer (3–state)	SO–20W, TSSOP–20, EIAJ–20	–55 to +125	2.0 to 5.5 V

VHC (continued)

Ordering Suffixes: D = SOIC Rail, DR2 = SOIC T & R, DW = SOICW Rail, DWR2 = SOICW T & R, DT = TSSOP Rail, DTR2 = TSSOP T & R, M = SOEIAJ Rail, MEL = SOEIAJ T & R

Part Number	Description	Surface Mount Packages	Temperature	Operating Voltage
MC74VHCT541A	Octal Bus Buffer (3–state) (TTL Compatible)	SO–20W, TSSOP–20, EIAJ–20	–55 to +125	2.0 to 5.5 V
MC74VHC573	Octal D–type Latch (3–state)	SO–20W, TSSOP–20, EIAJ–20	–55 to +125	2.0 to 5.5 V
MC74VHCT573A	Octal D–type Latch (3–state) (TTL Compatible)	SO–20W, TSSOP–20, EIAJ–20	–55 to +125	2.0 to 5.5 V
MC74VHC574	Octal D–type Flip–Flop (3–state)	SO–20W, TSSOP–20, EIAJ–20	–55 to +125	2.0 to 5.5 V
MC74VHCT574A	Octal D–type Flip–Flop (3–state) (TTL Compatible)	SO–20W, TSSOP–20, EIAJ–20	–55 to +125	2.0 to 5.5 V
MC74VHC4051	8–to–1 Channel Analog Multiplexer	SO–16, TSSOP–16, EIAJ–16	–55 to +125	2.0 to 5.5 V
MC74VHC4052	Dual 4 Channel Analog Multiplexer	SO–16, TSSOP–16, EIAJ–16	–55 to +125	2.0 to 5.5 V
MC74VHC4053	Triple 2 Channel Analog Multiplexer	SO–16, TSSOP–16, EIAJ–16	–55 to +125	2.0 to 5.5 V
MC74VHC4066	Quad Analog Switch	SO–14, TSSOP–14, EIAJ–14	–55 to +125	2.0 to 5.5 V
MC74VHC4316	Quad Analog Switch w/Translator	SO–16, TSSOP–16, EIAJ–16	–55 to +125	2.0 to 5.5 V

FACT

Ordering Suffixes: N = PDIP Rail, D = SOIC Rail, DR2 = SOIC T & R, DW = SOICW Rail, DWR2 = SOICW T & R, DT = TSSOP Rail, DTR2 = TSSOP T & R, M = SOEIAJ Rail, MEL = SOEIAJ T & R

Part Number	Description	Dual–In–Line Packages	Surface Mount Packages	Temperature	Operating Voltage
MC74AC00	Quad 2–Input NAND Gate	DIP–14	SO–14, TSSOP–14, EIAJ–14	–40 to +85	2.0 to 6.0 V
MC74ACT00	Quad 2–Input NAND Gate (TTL Compatible)	DIP–14	SO–14, TSSOP–14, EIAJ–14	–40 to +85	4.5 to 5.5 V
MC74AC02	Quad 2–Input Positive–NOR Gate	DIP–14	SO–14, TSSOP–14, EIAJ–14	–40 to +85	2.0 to 6.0 V
MC74ACT02	Quad 2–Input Positive–NOR Gate (TTL Compatible)	DIP–14	SO–14, TSSOP–14, EIAJ–14	–40 to +85	4.5 to 5.5 V
MC74AC04	Hex Inverter	DIP–14	SO–14, TSSOP–14, EIAJ–14	–40 to +85	4.5 to 5.5 V
MC74ACT04	Hex Inverter (TTL Compatible)	DIP–14	SO–14, TSSOP–14, EIAJ–14	–40 to +85	4.5 to 5.5 V
MC74AC05	Hex Inverter w/Open–Drain Output	DIP–14	SO–14, TSSOP–14, EIAJ–14	–40 to +85	2.0 to 6.0 V
MC74ACT05	Hex Inverter w/Open–Drain Output (TTL Compatible)	DIP–14	SO–14, TSSOP–14, EIAJ–14	–40 to +85	4.5 to 5.5 V
MC74AC08	Quad 2–Input AND Gate	DIP–14	SO–14, TSSOP–14, EIAJ–14	–40 to +85	2.0 to 6.0 V
MC74ACT08	Quad 2–Input AND Gate (TTL Compatible)	DIP–14	SO–14, TSSOP–14, EIAJ–14	–40 to +85	4.5 to 5.5 V
MC74AC10	Triple 3–Input NAND Gate	DIP–14	SO–14, TSSOP–14, EIAJ–14	–40 to +85	2.0 to 6.0 V
MC74ACT10	Triple 3–Input NAND Gate (TTL Compatible)	DIP–14	SO–14, TSSOP–14, EIAJ–14	–40 to +85	4.5 to 5.5 V
MC74AC11	Triple 3–Input AND Gate	DIP–14	SO–14, TSSOP–14, EIAJ–14	–40 to +85	2.0 to 6.0 V
MC74ACT11	Triple 3–Input AND Gate (TTL Compatible)	DIP–14	SO–14, TSSOP–14, EIAJ–14	–40 to +85	4.5 to 5.5 V
MC74AC14	Hex Schmitt Trigger	DIP–14	SO–14, TSSOP–14, EIAJ–14	–40 to +85	2.0 to 6.0 V
MC74ACT14	Hex Schmitt Trigger Inverter (TTL Compatible)	DIP–14	SO–14, TSSOP–14, EIAJ–14	–40 to +85	4.5 to 5.5 V
MC74AC20	Dual 4–Input NAND Gate	DIP–14	SO–14, TSSOP–14, EIAJ–14	–40 to +85	2.0 to 6.0 V

FACT (continued)

Ordering Suffixes: N = PDIP Rail, D = SOIC Rail, DR2 = SOIC T & R, DW = SOICW Rail, DWR2 = SOICW T & R, DT = TSSOP Rail, DTR2 = TSSOP T & R, M = SOEIAJ Rail, MEL = SOEIAJ T & R

Part Number	Description	Dual–In–Line Packages	Surface Mount Packages	Temperature	Operating Voltage
MC74ACT20	Dual 4–Input NAND Gate (TTL Compatible)	DIP–14	SO–14, TSSOP–14, EIAJ–14	–40 to +85	4.5 to 5.5 V
MC74AC32	Quad 2–Input OR Gate	DIP–14	SO–14, TSSOP–14, EIAJ–14	–40 to +85	2.0 to 6.0 V
MC74ACT32	Quad 2–Input OR Gate (TTL Compatible)	DIP–14	SO–14, TSSOP–14, EIAJ–14	–40 to +85	4.5 to 5.5 V
MC74AC74	Dual D Flip–Flop w/Preset and Clear	DIP–14	SO–14, TSSOP–14, EIAJ–14	–40 to +85	2.0 to 6.0 V
MC74ACT74	Dual D Flip–Flop w/Preset and Clear (TTL Compatible)	DIP–14	SO–14, TSSOP–14, EIAJ–14	–40 to +85	4.5 to 5.5 V
MC74AC86	Quad Exclusive–OR Gate	DIP–14	SO–14, TSSOP–14, EIAJ–14	–40 to +85	2.0 to 6.0 V
MC74ACT86	Quad 2–Input Exclusive–OR Gate (TTL Compatible)	DIP–14	SO–14, TSSOP–14, EIAJ–14	–40 to +85	4.5 to 5.5 V
MC74AC125	Quad Bus Buffer (3–state)	DIP–16	SO–16, TSSOP–16, EIAJ–16	–40 to +85	2.0 to 6.0 V
MC74ACT125	Quad Bus Buffer Gate (3–state) (TTL Compatible)	DIP–14	SO–14, TSSOP–14, EIAJ–14	–40 to +85	4.5 to 5.5 V
MC74AC132	Quad 2–Input NAND Gate (Schmitt–Trigger)	DIP–14	SO–14, TSSOP–14, EIAJ–14	–40 to +85	2.0 to 6.0 V
MC74ACT132	Quad 2–Input NAND Gate (Schmitt–Trigger, TTL Compatible)	DIP–14	SO–14, TSSOP–14, EIAJ–14	–40 to +85	4.5 to 5.5 V
MC74AC138	3–to–8 Line Decoder/Demultiplexer	DIP–16	SO–16, TSSOP–16, EIAJ–16	–40 to +85	2.0 to 6.0 V
MC74ACT138	3–to–8 Line Decoder (TTL Compatible)	DIP–16	SO–16, TSSOP–16, EIAJ–16	–40 to +85	4.5 to 5.5 V
MC74AC139	Dual 2–to–4 Line Decoder/Demultiplexer	DIP–16	SO–16, TSSOP–16, EIAJ–16	–40 to +85	2.0 to 6.0 V
MC74ACT139	Dual 2–to–4 Line Decoder/DeMultiplexer (TTL Compatible)	DIP–16	SO–16, TSSOP–16, EIAJ–16	–40 to +85	4.5 to 5.5 V
MC74AC157	Quad 2–Channel Multiplexer	DIP–16	SO–16, TSSOP–16, EIAJ–16	–40 to +85	2.0 to 6.0 V
MC74ACT157	Quad 2–to–1 Data Selector/Multiplexer (TTL Compatible)	DIP–16	SO–16, TSSOP–16, EIAJ–16	–40 to +85	4.5 to 5.5 V
MC74AC161	Synchronous Binary Counter w/Asynchronous Clear	DIP–16	SO–16, TSSOP–16, EIAJ–16	–40 to +85	2.0 to 6.0 V
MC74ACT161	Synchronous Binary Counter w/Asynchronous Clear	DIP–16	SO–16, TSSOP–16, EIAJ–16	–40 to +85	4.5 to 5.5 V
MC74AC163	Synchronous Binary Counter w/Synchronous Clear	DIP–16	SO–16, TSSOP–16, EIAJ–16	–40 to +85	2.0 to 6.0 V
MC74ACT163	Synchronous Binary Counter w/Synchronous Clear	DIP–16	SO–16, TSSOP–16, EIAJ–16	–40 to +85	4.5 to 5.5 V
MC74AC240	Octal Bus Buffer (3–state/Inverted)	DIP–20	SO–20W, TSSOP–20, EIAJ–20	–40 to +85	2.0 to 6.0 V
MC74ACT240	Octal Bus Buffer (3–state/Inverted) (TTL Compatible)	DIP–20	SO–20W, TSSOP–20, EIAJ–20	–40 to +85	4.5 to 5.5 V
MC74ACT241	Octal Bus Buffer (3–state/Non–inverted) (TTL Compatible)	DIP–20	SO–20W, TSSOP–20, EIAJ–20	–40 to +85	4.5 to 5.5 V
MC74AC244	Octal Bus Buffer (3–state)	DIP–20	SO–20W, TSSOP–20, EIAJ–20	–40 to +85	2.0 to 6.0 V
MC74ACT244	Octal Bus Buffer (3–state) (TTL Compatible)	DIP–20	SO–20W, TSSOP–20, EIAJ–20	–40 to +85	4.5 to 5.5 V

FACT (continued)

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Part Number	Description	Dual–In–Line Packages	Surface Mount Packages	Temperature	Operating Voltage
MC74AC245	Octal Bus Transceiver (3–state)	DIP–20	SO–20W, TSSOP–20, EIAJ–20	–40 to +85	2.0 to 6.0 V
MC74ACT245	Octal Bus Transceiver (3–state) (TTL Compatible)	DIP–20	SO–20W, TSSOP–20, EIAJ–20	–40 to +85	4.5 to 5.5 V
MC74AC253	Dual 4–Input Multiplexer w/3–State Outputs	DIP–16	SO–16, TSSOP–16, EIAJ–16	–40 to +85	2.0 to 6.0 V
MC74ACT253	Dual 4–Input Multiplexer w/3–State Outputs	DIP–16	SO–16, TSSOP–16, EIAJ–16	–40 to +85	4.5 to 5.5 V
MC74AC257	Quad 2–Line To 1–Line Data Selectors/Multiplexer (3–state)	DIP–16	SO–16, TSSOP–16, EIAJ–16	–40 to +85	2.0 to 6.0 V
MC74ACT257	Quad 2–To–1 Data Selectors/Mux (3–state) (TTL Compatible)	DIP–16	SO–16, TSSOP–16, EIAJ–16	–40 to +85	4.5 to 5.5 V
MC74AC259	8–Bit Addressable Latch	DIP–16	SO–16, TSSOP–16, EIAJ–16	–40 to +85	2.0 to 6.0 V
MC74ACT259	8–Bit Addressable Latch	DIP–16	SO–16, TSSOP–16, EIAJ–16	–40 to +85	4.5 to 5.5 V
MC74AC273	Octal D–Type Flip–Flop	DIP–20	SO–20W, TSSOP–20, EIAJ–20	–40 to +85	2.0 to 6.0 V
MC74ACT273	Octal D–Type Flip–Flop w/Clear (TTL Compatible)	DIP–20	SO–20W, TSSOP–20, EIAJ–20	–40 to +85	4.5 to 5.5 V
MC74AC299	8–bit PIPO Shift Register	DIP–20	SO–20W, TSSOP–20, EIAJ–20	–40 to +85	2.0 to 6.0 V
MC74ACT299	8–bit PIPO Shift Register	DIP–20	SO–20W, TSSOP–20, EIAJ–20	–40 to +85	4.5 to 5.5 V
MC74AC373	Octal D–type Latch (3–state)	DIP–20	SO–20W, TSSOP–20, EIAJ–20	–40 to +85	2.0 to 6.0 V
MC74ACT373	Octal D–type Latch (3–state) (TTL Compatible)	DIP–20	SO–20W, TSSOP–20, EIAJ–20	–40 to +85	4.5 to 5.5 V
MC74AC374	Octal D–type Flip–Flop (3–state)	DIP–20	SO–20W, TSSOP–20, EIAJ–20	–40 to +85	2.0 to 6.0 V
MC74ACT374	Octal D–type Flip–Flop (3–state) (TTL Compatible)	DIP–20	SO–20W, TSSOP–20, EIAJ–20	–40 to +85	4.5 to 5.5 V
MC74AC377	Octal D–type Flip–Flop w/Data Enable (3–state)	DIP–20	SO–20W, TSSOP–20, EIAJ–20	–40 to +85	2.0 to 6.0 V
MC74ACT377	Octal D–type Flip–Flop w/Data Enable (3–state) (TTL Compatible)	DIP–20	SO–20W, TSSOP–20, EIAJ–20	–40 to +85	4.5 to 5.5 V
MC74AC540	Octal Bus Buffer (3–state/Inverted)	DIP–20	SO–20W, TSSOP–20, EIAJ–20	–40 to +85	2.0 to 6.0 V
MC74ACT540	Octal Bus Buffer (3–state/Inverted) (TTL Compatible)	DIP–20	SO–20W, TSSOP–20, EIAJ–20	–40 to +85	4.5 to 5.5 V
MC74AC541	Octal Bus Buffer (3–state)	DIP–20	SO–20W, TSSOP–20, EIAJ–20	–40 to +85	2.0 to 6.0 V
MC74ACT541	Octal Bus Buffer (3–state) (TTL Compatible)	DIP–20	SO–20W, TSSOP–20, EIAJ–20	–40 to +85	4.5 to 5.5 V
MC74ACT564	Octal D–Type Latch w/3–State Outputs (TTL Compatible)	DIP–20	SO–20W, TSSOP–20, EIAJ–20	–40 to +85	4.5 to 5.5 V
MC74AC573	Octal D–type Latch (3–state)	DIP–20	SO–20W, TSSOP–20, EIAJ–20	–40 to +85	2.0 to 6.0 V
MC74ACT573	Octal D–type Latch (3–state) (TTL Compatible)	DIP–20	SO–20W, TSSOP–20, EIAJ–20	–40 to +85	4.5 to 5.5 V
MC74AC574	Octal D–type Flip–Flop (3–state)	DIP–20	SO–20W, TSSOP–20, EIAJ–20	–40 to +85	2.0 to 6.0 V

FACT (continued)

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Part Number	Description	Dual–In–Line Packages	Surface Mount Packages	Temperature	Operating Voltage
MC74ACT574	Octal D–type Flip–Flop (3–state) (TTL Compatible)	DIP–20	SO–20W, TSSOP–20, EIAJ–20	–40 to +85	4.5 to 5.5 V
MC74ACT640	Octal Bus Transceiver (Inverting, 3–state) (TTL Compatible)	DIP–20	SO–20W, TSSOP–20, EIAJ–20	–40 to +85	4.5 to 5.5 V
MC74AC646	Octal Bus Transceiver/Register (3–state)	DIP–24	SO–24W, TSSOP–24, EIAJ–24	–40 to +85	2.0 to 6.0 V
MC74ACT646	Octal Bus Transceiver/Register (3–state) (TTL Compatible)	DIP–24	SO–24W, TSSOP–24, EIAJ–24	–40 to +85	4.5 to 5.5 V
MC74AC652	Octal Bus Transceiver/Register (3–state)	DIP–24	SO–24W, TSSOP–24, EIAJ–24	–40 to +85	2.0 to 6.0 V
MC74ACT652	Octal Bus Transceiver/Register (3–state) (TTL Compatible)	DIP–24	SO–24W, TSSOP–24, EIAJ–24	–40 to +85	4.5 to 5.5 V
MC74AC4040	12–Stage Binary Ripple Counter	DIP–16	SO–16, TSSOP–16, EIAJ–16	–40 to +85	2.0 to 6.0 V

High Speed CMOS

Ordering Suffixes: N = PDIP Rail, D = SOIC Rail, DR2 = SOIC T & R, DW = SOICW Rail, DWR2 = SOICW T & R, DT = TSSOP Rail, DTR2 = TSSOP T & R, F = SOEIAJ Rail, FEL = SOEIAJ T & R

Part Number	Description	Dual–In–Line Packages	Surface Mount Packages	Temperature	Operating Voltage
MC74HC00A	Quad 2–Input NAND Gate	DIP–14	SO–14, TSSOP–14, EIAJ–14	–55 to +125	2.0 to 6.0 V
MC74HC02A	Quad 2–Input Positive–NOR Gate	DIP–14	SO–14, TSSOP–14, EIAJ–14	–55 to +125	2.0 to 6.0 V
MC74HC03A	Quad 2–Input NAND Gate (Open Drain)	DIP–14	SO–14, TSSOP–14, EIAJ–14	–55 to +125	2.0 to 6.0 V
MC74HC04A	Hex Inverter	DIP–14	SO–14, TSSOP–14, EIAJ–14	–55 to +125	2.0 to 6.0 V
MC74HCT04A	Hex Inverter (TTL Compatible)	DIP–14	SO–14, TSSOP–14, EIAJ–14	–55 to +125	4.5 to 5.5 V
MC74HCU04A	Hex Inverter (Unbuffered)	DIP–14	SO–14, TSSOP–14, EIAJ–14	–55 to +125	2.0 to 6.0 V
MC74HC08A	Quad 2–Input AND Gate	DIP–14	SO–14, TSSOP–14, EIAJ–14	–55 to +125	2.0 to 6.0 V
MC74HC14A	Hex Schmitt Trigger	DIP–14	SO–14, TSSOP–14, EIAJ–14	–55 to +125	2.0 to 6.0 V
MC74HCT14A	Hex Schmitt Trigger Inverter (TTL Compatible)	DIP–14	SO–14, TSSOP–14, EIAJ–14	–55 to +125	4.5 to 5.5 V
MC74HC32A	Quad 2–Input OR Gate	DIP–14	SO–14, TSSOP–14, EIAJ–14	–55 to +125	2.0 to 6.0 V
MC74HC74A	Dual D Flip–Flop w/Preset and Clear	DIP–14	SO–14, TSSOP–14, EIAJ–14	–55 to +125	2.0 to 6.0 V
MC74HCT74A	Dual D Flip–Flop w/ Preset and Clear (TTL Compatible)	DIP–14	SO–14, TSSOP–14, EIAJ–14	–55 to +125	4.5 to 5.5 V
MC74HC86A	Quad Exclusive–OR Gate	DIP–14	SO–14, TSSOP–14, EIAJ–14	–55 to +125	2.0 to 6.0 V
MC74HC125A	Quad Bus Buffer (3–state)	DIP–14	SO–14, TSSOP–14, EIAJ–14	–55 to +125	2.0 to 6.0 V
MC74HC126A	Quad Bus Buffer (3–state)	DIP–14	SO–14, TSSOP–14, EIAJ–14	–55 to +125	2.0 to 6.0 V
MC74HC132A	Quad 2–Input Schmitt NAND Gate	DIP–14	SO–14, TSSOP–14, EIAJ–14	–55 to +125	2.0 to 6.0 V

High Speed CMOS (continued)

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Part Number	Description	Dual–In–Line Packages	Surface Mount Packages	Temperature	Operating Voltage
MC74HC138A	3–to–8 Line Decoder/Demultiplexer	DIP–16	SO–16, TSSOP–16, EIAJ–16	–55 to +125	2.0 to 6.0 V
MC74HCT138A	Dual 2–to–4 Line Decoder/Demultiplexer	DIP–16	SO–16, TSSOP–16, EIAJ–16	–55 to +125	4.5 to 5.5 V
MC74HC139A	Dual 1–of–4 Decoder/Demultiplexer	DIP–16	SO–16, TSSOP–16, EIAJ–16	–55 to +125	2.0 to 6.0 V
MC74HC157A	Quad 2–Channel Multiplexer	DIP–16	SO–16, TSSOP–16, EIAJ–16	–55 to +125	2.0 to 6.0 V
MC74HC161A	Synchronous Binary Counter w/Asynchronous Clear	DIP–16	SO–16, TSSOP–16, EIAJ–16	–55 to +125	2.0 to 6.0 V
MC74HC163A	Synchronous Binary Counter w/Synchronous Clear	DIP–16	SO–16, TSSOP–16, EIAJ–16	–55 to +125	2.0 to 6.0 V
MC74HC164A	8–bit SIPO Shift Register	DIP–14	SO–14, TSSOP–14, EIAJ–14	–55 to +125	2.0 to 6.0 V
MC74HC165A	8–bit PISO Shift Register	DIP–16	SO–16, TSSOP–16, EIAJ–16	–55 to +125	2.0 to 6.0 V
MC74HC174A	Hex D Flip–Flop w/Clear	DIP–16	SO–16, TSSOP–16, EIAJ–16	–55 to +125	2.0 to 6.0 V
MC74HC175	Quad D Flip–Flop w/Clear	DIP–16	SO–16, TSSOP–16, EIAJ–16	–55 to +125	2.0 to 6.0 V
MC74HC175A	Quad D Flip–Flop w/Clear	DIP–16	SO–16, TSSOP–16, EIAJ–16	–55 to +125	2.0 to 6.0 V
MC74HC240A	Octal Bus Buffer (3–state/Inverted)	DIP–20	SO–20W, TSSOP–20, EIAJ–20	–55 to +125	2.0 to 6.0 V
MC74HC244A	Octal Bus Buffer (3–state)	DIP–20	SO–20W, TSSOP–20, EIAJ–20	–55 to +125	2.0 to 6.0 V
MC74HCT244A	Octal Bus Buffer (3–state) (TTL Compatible)	DIP–20	SO–20W, TSSOP–20, EIAJ–20	–55 to +125	4.5 to 5.5 V
MC74HC245A	Octal Bus Transceiver (3–state)	DIP–20	SO–20W, TSSOP–20, EIAJ–20	–55 to +125	2.0 to 6.0 V
MC74HCT245A	Octal Bus Transceiver (3–state) (TTL Compatible)	DIP–20	SO–20W, TSSOP–20, EIAJ–20	–55 to +125	4.5 to 5.5 V
MC74HC273A	Octal D–Type Flip–Flop	DIP–20	SO–20W, TSSOP–20, EIAJ–20	–55 to +125	2.0 to 6.0 V
MC74HCT273A	Octal D–Type Flip–Flop w/Clear (TTL Compatible)	DIP–20	SO–20W, TSSOP–20, EIAJ–20	–55 to +125	4.5 to 5.5 V
MC74HC373A	Octal D–type Latch (3–state)	DIP–20	SO–20W, TSSOP–20, EIAJ–20	–55 to +125	2.0 to 6.0 V
MC74HCT373A	Octal D–type Latch (3–state) (TTL Compatible)	DIP–20	SO–20W, TSSOP–20, EIAJ–20	–55 to +125	4.5 to 5.5 V
MC74HC374A	Octal D–type Flip–Flop (3–state)	DIP–20	SO–20W, TSSOP–20, EIAJ–20	–55 to +125	2.0 to 6.0 V
MC74HCT374A	Octal D–type Flip–Flop (3–state) (TTL Compatible)	DIP–20	SO–20W, TSSOP–20, EIAJ–20	–55 to +125	4.5 to 5.5 V
MC74HC390A	Dual Binary Counter w/ +2 +5 Sections	DIP_16	SO–16, TSSOP–16, EIAJ–16	–55 to +125	2.0 to 6.0 V
MC74HC393	Dual Binary Counter	DIP–14	SO–14, TSSOP–14, EIAJ–14	–55 to +125	2.0 to 6.0 V
MC74HC393A	Dual 4–Stage Binary Ripple Counter	DIP–14	SO–14, TSSOP–14, EIAJ–14	–55 to +125	2.0 to 6.0 V
MC74HC540A	Octal Bus Buffer (3–state/Inverted)	DIP–20	SO–20W, TSSOP–20, EIAJ–20	–55 to +125	2.0 to 6.0 V

High Speed CMOS (continued)

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Part Number	Description	Dual–In–Line Packages	Surface Mount Packages	Temperature	Operating Voltage
MC74HC541A	Octal Bus Buffer (3–state)	DIP–20	SO–20W, TSSOP–20, EIAJ–20	–55 to +125	2.0 to 6.0 V
MC74HCT541A	Octal Bus Buffer (3–state) (TTL Compatible)	DIP–20	SO–20W, TSSOP–20, EIAJ–20	–55 to +125	4.5 to 5.5 V
MC74HC573A	Octal D–type Latch (3–state)	DIP–20	SO–20W, TSSOP–20, EIAJ–20	–55 to +125	2.0 to 6.0 V
MC74HCT573A	Octal D–type Latch (3–state) (TTL Compatible)	DIP–20	SO–20W, TSSOP–20, EIAJ–20	–55 to +125	4.5 to 5.5 V
MC74HC574A	Octal D–type Flip–Flop (3–state)	DIP–20	SO–20W, TSSOP–20, EIAJ–20	–55 to +125	2.0 to 6.0 V
MC74HCT574A	Octal D–type Flip–Flop (3–state) (TTL Compatible)	DIP–20	SO–20W, TSSOP–20, EIAJ–20	–55 to +125	4.5 to 5.5 V
MC74HC589A	8–Bit Shift Register	DIP–16	SO–16, TSSOP–16, EIAJ–16	–55 to +125	2.0 to 6.0 V
MC74HC595A	8–Bit Shift Register/Latch (3–state)	DIP–16	SO–16, TSSOP–16, EIAJ–16	–55 to +125	2.0 to 6.0 V
MC74HC4020A	14–Stage Binary Ripple Counter	DIP–16	SO–16, TSSOP–16, EIAJ–16	–55 to +125	2.0 to 6.0 V
MC74HC4040A	12–Stage Binary Ripple Counter	DIP–16	SO–16, TSSOP–16, EIAJ–16	–55 to +125	2.0 to 6.0 V
MC74HC4046A	Phase Lock Loop	DIP–16	SO–16, TSSOP–16, EIAJ–16	–55 to +125	2.0 to 6.0 V
MC74HC4051	8–to–1 Channel Analog Multiplexer	DIP–16	SO–16, TSSOP–16, EIAJ–16	–55 to +125	2.0 to 6.0 V
MC74HC4051A	8–to–1 Channel Analog Multiplexer	DIP–16	SO–16, TSSOP–16, EIAJ–16	–55 to +125	2.0 to 6.0 V
MC74HC4052	Dual 4 Channel Analog Multiplexer	DIP–16	SO–16, TSSOP–16, EIAJ–16	–55 to +125	2.0 to 6.0 V
MC74HC4052A	Dual 4 Channel Analog Multiplexer	DIP–16	SO–16, TSSOP–16, EIAJ–16	–55 to +125	2.0 to 6.0 V
MC74HC4053	Triple 2 Channel Analog Multiplexer	DIP–16	SO–16, TSSOP–16, EIAJ–16	–55 to +125	2.0 to 6.0 V
MC74HC4053A	Triple 2 Channel Analog Multiplexer	DIP–16	SO–16, TSSOP–16, EIAJ–16	–55 to +125	2.0 to 6.0 V
MC74HC4060A	14–Stage Binary Ripple Counter w/Oscillator	DIP–16	SO–16, TSSOP–16, EIAJ–16	–55 to +125	2.0 to 6.0 V
MC74HC4066	Quad Analog Switch	DIP–14	SO–14, TSSOP–14, EIAJ–14	–55 to +125	2.0 to 6.0 V
MC74HC4066A	Quad Analog Switch	DIP–14	SO–14, TSSOP–14, EIAJ–14	–55 to +125	2.0 to 6.0 V
MC74HC4316	Quad Analog Switch w/Translator	DIP–16	SO–16, TSSOP–16, EIAJ–16	–55 to +125	2.0 to 6.0 V
MC74HC4316A	Quad Analog Switch w/Translator	DIP–16	SO–16, TSSOP–16, EIAJ–16	–55 to +125	2.0 to 6.0 V
MC74HC4538A	Dual Re–triggerable Precision Monostable Multivibrator	DIP–16	SO–16, TSSOP–16, EIAJ–16	–55 to +125	2.0 to 6.0 V
MC74HC4851A	8–to–1 Channel Analog Multiplexer w/Inj Current Control	DIP–16	SO–16, TSSOP–16, EIAJ–16	–55 to +125	2.0 to 6.0 V
MC74HC4852A	Dual 4 Channel Analog Multiplexer w/Inj Current Control	DIP–16	SO–16, TSSOP–16, EIAJ–16	–55 to +125	2.0 to 6.0 V

Metal Gate CMOS

Ordering Suffixes: CP = PDIP Rail, D = SOIC Rail, DR2 = SOIC T & R, DW = SOICW Rail, DWR2 = SOICW T & R, DT = TSSOP Rail, DTR2 = TSSOP T & R, F = SOEIAJ Rail, FEL = SOEIAJ T & R

Part Number	Description	Dual–In–Line Packages	Surface Mount Packages	Temperature	Operating Voltage
MC14001B	Quad 2–Input NOR Gate	DIP–14	SO–14, TSSOP–14, EIAJ–14	–55 to +125	–0.5 to +18 V
MC14001UB	Quad 2–Input NOR Gate Unbuffered	DIP–14	SO–14	–55 to +125	–0.5 to +18 V
MC14007UB	Dual Complementary Pair plus Inverter	DIP–14	SO–14, TSSOP–14, EIAJ–14	–55 to +125	–0.5 to +18 V
MC14008B	4–Bit Full Adder	DIP–16	SO–16, EIAJ–16	–55 to +125	–0.5 to +18 V
MC14011B	Quad 2–Input NAND Gate	DIP–14	SO–14, TSSOP–14, EIAJ–14	–55 to +125	–0.5 to +18 V
MC14011UB	Quad 2–Input NAND Gate Unbuffered	DIP–14	SO–14	–55 to +125	–0.5 to +18 V
MC14012B	Dual 4–Input NAND Gate	DIP–14	SO–14, EIAJ–14	–55 to +125	–0.5 to +18 V
MC14013B	Dual D Flip–Flop	DIP–14	SO–14, TSSOP–14, EIAJ–14	–55 to +125	–0.5 to +18 V
MC14014B	8–Bit Static Shift Register	DIP–16	SO–16, EIAJ–16	–55 to +125	–0.5 to +18 V
MC14015B	Dual 4–Bit Static Shift Register	DIP–16	SO–16, TSSOP–16, EIAJ–16	–55 to +125	–0.5 to +18 V
MC14016B	Quad Analog Switch/Multiplexer	DIP–14	SO–14, TSSOP–14, EIAJ–14	–55 to +125	–0.5 to +18 V
MC14017B	Decade Counter	DIP–16	SO–16, EIAJ–16	–55 to +125	–0.5 to +18 V
MC14018B	Presettable Divide–by–N Counter	DIP–16	SO–16, EIAJ–16	–55 to +125	–0.5 to +18 V
MC14020B	14–Bit Binary Counter	DIP–16	SO–16, TSSOP–16, EIAJ–16	–55 to +125	–0.5 to +18 V
MC14021B	8–Bit Static Shift Register	DIP–16	SO–16, TSSOP–16, EIAJ–16	–55 to +125	–0.5 to +18 V
MC14022B	Octal Counter	DIP–16	SO–16	–55 to +125	–0.5 to +18 V
MC14023B	Triple 3–Input NAND Gate	DIP–14	SO–14, TSSOP–14, EIAJ–14	–55 to +125	–0.5 to +18 V
MC14024B	7–Stage Ripple Counter	DIP–14	SO–14, EIAJ–14	–55 to +125	–0.5 to +18 V
MC14025B	Triple 3–Input NOR Gate	DIP–14	SO–14, EIAJ–14	–55 to +125	–0.5 to +18 V
MC14027B	Dual J–K Flip–Flop	DIP–16	SO–16, EIAJ–16	–55 to +125	–0.5 to +18 V
MC14028B	BCD–to–Decimal/Binary–to–Octal Decoder	DIP–16	SO–16, EIAJ–16	–55 to +125	–0.5 to +18 V
MC14029B	Presettable Binary/BCD Up/Down Counter	DIP–16	SO–16, EIAJ–16	–55 to +125	–0.5 to +18 V
MC14040B	12–Stage Ripple–Carry Binary Counter/Divider	DIP–16	SO–16, TSSOP–16, EIAJ–16	–55 to +125	–0.5 to +18 V
MC14042B	Quad Clocked D–Latch	DIP–16	SO–16, EIAJ–16	–55 to +125	–0.5 to +18 V
MC14043B	Quad NOR R–S Latch	DIP–16	SO–16, EIAJ–16	–55 to +125	–0.5 to +18 V
MC14044B	Quad NAND R–S Latch	DIP–16	SO–16, EIAJ–16	–55 to +125	–0.5 to +18 V
MC14046B	Phase–Locked Loop	DIP–16	SO–16W,EIAJ–16	–55 to +125	–0.5 to +18 V
MC14049B	Hex Inverter	DIP–16	SO–16, TSSOP–16, EIAJ–16	–55 to +125	–0.5 to +18 V
MC14049UB	Hex Inverter Unbuffered	DIP–16	SO–16, TSSOP–16, EIAJ–16	–55 to +125	–0.5 to +18 V
MC14050B	Hex Buffer	DIP–16	SO–16, TSSOP–16, EIAJ–16	–55 to +125	–0.5 to +18 V
MC14051B	8–Channel Analog Multiplexer/Demultiplexer	DIP–16	SO–16, TSSOP–16, EIAJ–16	–55 to +125	–0.5 to +18 V
MC14052B	Dual 4–Channel Analog Multiplexer/Demultiplexer	DIP–16	SO–16, TSSOP–16, EIAJ–16	–55 to +125	–0.5 to +18 V

Metal Gate CMOS (continued)

Ordering Suffixes: CP = PDIP Rail, D = SOIC Rail, DR2 = SOIC T & R, DW = SOICW Rail, DWR2 = SOICW T & R, DT = TSSOP Rail, DTR2 = TSSOP T & R, F = SOEIAJ Rail, FEL = SOEIAJ T & R

Part Number	Description	Dual–In–Line Packages	Surface Mount Packages	Temperature	Operating Voltage
MC14053B	Triple 2–Channel Analog Multiplexer/Demultiplexer	DIP–16	SO–16, TSSOP–16, EIAJ–16	–55 to +125	–0.5 to +18 V
MC14054B	14–Stage Binary Ripple Counter and Oscillator	DIP–16	SO–16, TSSOP–16, EIAJ–16	–55 to +125	–0.5 to +18 V
MC14066B	Quad Analog Switch	DIP–14	SO–14, TSSOP–14, EIAJ–14	–55 to +125	–0.5 to +18 V
MC14067B	16–Channel Analog Multiplexer/Demultiplexer	DIP–24	SO–24W, TSSOP–24	–55 to +125	–0.5 to +18 V
MC14069UB	Hex Inverter	DIP–14	SO–14, TSSOP–14, EIAJ–14	–55 to +125	–0.5 to +18 V
MC14070B	Quad 2–Input Exclusive–OR Gate	DIP–14	SO–14, EIAJ–14	–55 to +125	–0.5 to +18 V
MC14071B	Quad 2–Input OR Gate	DIP–14	SO–14, TSSOP–14, EIAJ–14	–55 to +125	–0.5 to +18 V
MC14073B	Triple 3–Input AND Gate	DIP–14	SO–14, TSSOP–14, EIAJ–14	–55 to +125	–0.5 to +18 V
MC14076B	Quad D–Type Register w/3–State Outputs	DIP–24	SO–24	–55 to +125	–0.5 to +18 V
MC14077B	Quad 2–Input Exclusive–NOR Gate	DIP–14	SO–14, EIAJ–14	–55 to +125	–0.5 to +18 V
MC14081B	Quad 2–Input AND Gate	DIP–14	SO–14, TSSOP–14, EIAJ–14	–55 to +125	–0.5 to +18 V
MC14082B	Dual 4–Input AND Gate	DIP–14	SO–14, TSSOP–14, EIAJ–14	–55 to +125	–0.5 to +18 V
MC14093B	Quad 2–Input Schmitt Trigger NAND	DIP–14	SO–14, TSSOP–14, EIAJ–14	–55 to +125	–0.5 to +18 V
MC14094B	8–Stage Shift/Store Register w/3–State Outputs	DIP–16	SO–16, TSSOP–16, EIAJ–16	–55 to +125	–0.5 to +18 V
MC14099B	8–Bit Addressable Latch	DIP–16	SO–16W	–55 to +125	–0.5 to +18 V
MC14106B	Hex Schmitt Trigger	DIP–14	SO–14, TSSOP–14	–55 to +125	–0.5 to +18 V
MC14174B	Hex D Flip–Flop	DIP–16	SO–16, EIAJ–16	–55 to +125	–0.5 to +18 V
MC14175B	Quad D Flip–Flop	DIP–16	SO–16, EIAJ–16	–55 to +125	–0.5 to +18 V
MC14490	Hex Contact Bounce Eliminator	DIP–16	SO–16W, EIAJ–16	–55 to +125	–0.5 to +18 V
MC14503B	Hex 3–State Buffer	DIP–16	SO–16, EIAJ–16	–55 to +125	–0.5 to +18 V
MC14504B	TTL or CMOS to CMOS Hex Level Shifter	DIP–16	SO–16, TSSOP–16, EIAJ–16	–55 to +125	–0.5 to +18 V
MC14511B	BCD–to–7 Segment Latch/Decoder/Driver	DIP–16	SO–16, SO–16W, EIAJ–16	–55 to +125	–0.5 to +18 V
MC14512B	8–Channel Data Selector	DIP–16	SO–16, EIAJ–16	–55 to +125	–0.5 to +18 V
MC14513B	BCD–to–7 Segment Latch/Decoder/Driver w/Ripple Blanking	DIP–18	N/A	–55 to +125	–0.5 to +18 V
MC14514B	4–Bit Transparent Latch/4–to–16 Line Decoder (High)	DIP–24	SO–24W	–55 to +125	–0.5 to +18 V
MC14515B	4–Bit Transparent Latch/4–to–16 Line Decoder (Low)	DIP–24	SO–24W	–55 to +125	–0.5 to +18 V
MC14516B	Presettable Binary Up/Down Counter	DIP–16	SO–16, EIAJ–16	–55 to +125	–0.5 to +1 8V
MC14517B	Dual 64–Bit Static Shift Register	DIP–16	SO–16W	–55 to +125	–0.5 to +18 V
MC14518B	Dual BCD Up Counter	DIP–16	SO–16W, EIAJ–16	–55 to +125	–0.5 to +18 V
MC14520B	Dual Binary Up Counter	DIP–16	SO–16W, EIAJ–16	–55 to +125	–0.5 to +18 V
MC14521B	24–Stage Frequency Divider	DIP–16	SO–16, EIAJ–16	–55 to +125	–0.5 to +18 V
MC14526B	Presettable 4–Bit Binary Down Counter	DIP–16	SO–16W, EIAJ–16	–55 to +125	–0.5 to +18 V
MC14528B	Dual Monostable Multivibrator	DIP–16	SO–16, EIAJ–16	–55 to +125	–0.5 to +18 V

Metal Gate CMOS (continued)

Ordering Suffixes: CP = PDIP Rail, D = SOIC Rail, DR2 = SOIC T & R, DW = SOICW Rail, DWR2 = SOICW T & R, DT = TSSOP Rail, DTR2 = TSSOP T & R, F = SOEIAJ Rail, FEL = SOEIAJ T & R

Part Number	Description	Dual–In–Line Packages	Surface Mount Packages	Temperature	Operating Voltage
MC14532B	8–Bit Priority Encoder	DIP–16	SO–16, EIAJ–16	–55 to +125	–0.5 to +18 V
MC14536B	Programmable Timer	DIP–16	SO–16W, EIAJ–16	–55 to +125	–0.5 to +18 V
MC14538B	Dual Precision Monostable Multivibrator	DIP–16	SO–16, TSSOP–16, EIAJ–16	–55 to +125	–0.5 to +18 V
MC14541B	Programmable Oscillator/Timer	DIP–16	SO–16, TSSOP–16, EIAJ–16	–55 to +125	–0.5 to +18 V
MC14543B	BCD–to–7 Segment Latch/Decoder/Driver for LCD	DIP–16	SO–16, EIAJ–16	–55 to +125	–0.5 to +18 V
MC14549B	Successive Approximation Register	DIP–16	SO–16W	–55 to +125	–0.5 to +18 V
MC14551B	Quad 2–Channel Analog Multiplexer/Demultiplexer	DIP–16	SO–16, EIAJ–16	–55 to +125	–0.5 to +18 V
MC14553B	3–Digit BCD Counter	DIP–16	SO–16W	–55 to +125	–0.5 to +18 V
MC14555B	Dual Binary to 1–of–4 Decoder (Active High Outputs)	DIP–16	SO–16, EIAJ–16	–55 to +125	–0.5 to +18 V
MC14556B	Dual Binary to 1–or–4 Decoder/Demultiplexer	DIP–16	SO–16, EIAJ–16	–55 to +125	–0.5 to +18 V
MC14557B	1–to–64 Bit Variable Length Shift Register	DIP–16	SO–16W, EIAJ–16	–55 to +125	–0.5 to +18 V
MC14559B	Successive Approximation Register	DIP–16	SO–16W	–55 to +125	–0.5 to +18 V
MC14562B	128–Bit Static Shift Register	DIP–14	N/A	–55 to +125	–0.5 to +18 V
MC14569B	Programmable Dual 4–Bit Binary/BCD Down Converter	DIP–16	SO–16W, TSSOP–16	–55 to +125	–0.5 to +18 V
MC14572UB	Hex Gate Unbuffered	DIP–16	SO–16, EIAJ–16	–55 to +125	–0.5 to +18 V
MC14584B	Hex Schmitt Trigger	DIP–14	SO–14, TSSOP–14, EIAJ–14	–55 to +125	–0.5 to +18 V
MC14585B	4–Bit Magnitude Comparator	DIP–16	SO–16, EIAJ–16	–55 to +125	–0.5 to +18 V
MC14598B	8–Bit Bus–Compatible Addressable Latch	DIP–18	N/A	–55 to +125	–0.5 to +18 V

High–Speed CMOS Product Designation Definitions

HC vs. HCT

ON Semiconductor's High–Speed CMOS product family, intended to give the designer an alternative to LSTTL. HSCMOS, with the faster speed advantage over metal–gate CMOS (MC14000 series) and the lower power consumption advantage over LSTTL, is an optimum choice for midrange designs. With the availability of high–speed CMOS microprocessors and memories, the ability to design a 100% CMOS system is possible.

HCT devices offer a short–term solution to the TTL/NMOS–to–CMOS interface problem. To achieve this interface capability, some CMOS advantages had to be compromised. These compromises include power consumption, operating voltage range, and noise immunity.

In most cases HCT devices are drop–in replacements of TTL devices with significant advantages over the TTL devices. However, in some cases, an equivalent HCT device may not replace a TTL device without some form of circuit modification.

Designers can use HCT devices to perform logic level conversions only. In newer designs, the designer wants all the advantages of a true CMOS system and designs using only HC devices.

"A" versus "Non–A"

"A" Versus "Non–A" — ON Semiconductor has a device performance enhancement program for the High–Speed CMOS family. This is indicated by an "A" suffix on the device identification. Some of the characteristics of this "A" enhancement program are improved design, a better quality process, faster performing AC propagation delays and enhancements to various DC characteristics.

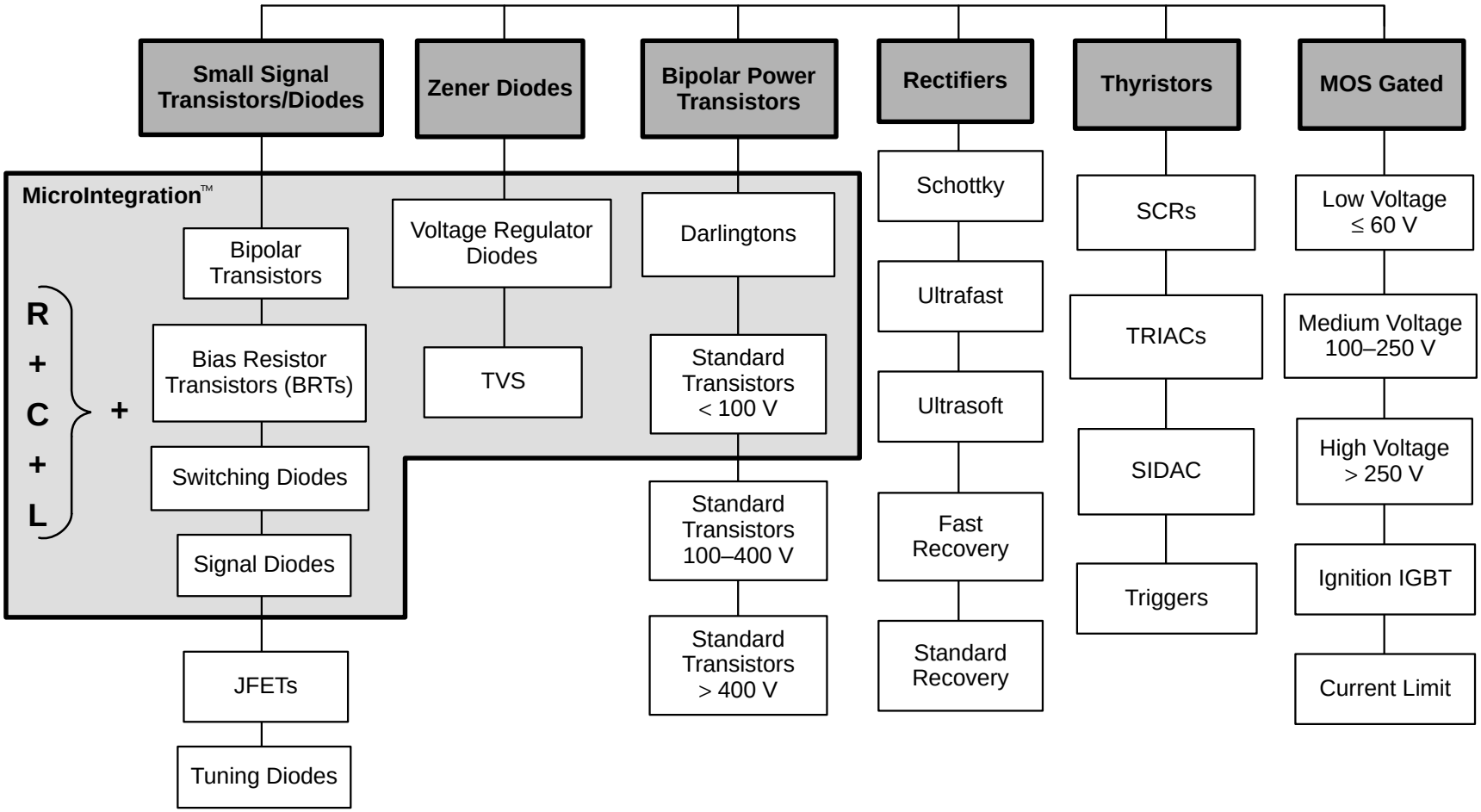
The old "Non–A" process was a 5 micron process that was modified to run a 3.5 micron family. The new "A" process is a true 3 micron process and gives better process control, with improved performance and quality.

Please see the specific device data sheet for "A" designation parameters.

Discretes

MicroIntegration™
Small Signal
TVS/Zeners
Bipolar
Rectifiers
Thyristors

Discrete Products Family Tree



MicroIntegration™

In Brief . . .

MicroIntegration is an Integrated Circuit which combines diodes, transistors, capacitors, inductors, resistors or combinations thereof, into a single package, providing space and component count reduction.

With the increasing demand for enhanced functionality and reduced size, MicroIntegration provides “value added’’ flexibility for the customer. ON Semiconductor has the complete infrastructure to combine many functions into a single package solution.

The demand for this integration is especially strong in computing, wireless, networking and portable applications.

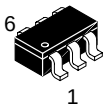
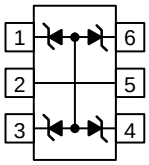
MicroIntegration results in enhanced performance:

- Reduction in Overall Size
- Reduced Number of Components
- Fewer Board Insertions
- Increased Parametric Stability
- Improved Solder Reliability
- Simplified Procurement Activity
- Lower Overall System Cost

Page
MicroIntegration Focus Areas
Transient Voltage Suppression (TVS) 138
Filter Circuits 141
Drive Circuits 143

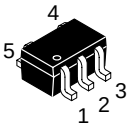
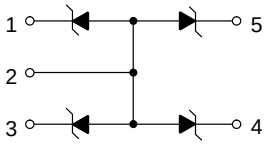
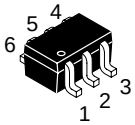
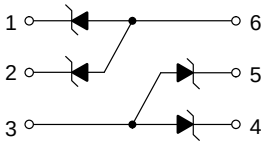
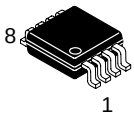
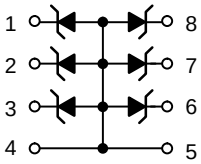
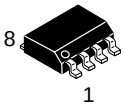
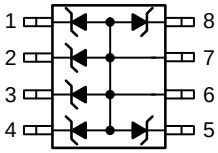
TVS Protection – Arrays in Surface Mount

- DF6A, MMQA Series: ESD Rating of Class 3 (>16 kV) per HBM
- SRDA05–6R2, NUP6101DMR2, MSQA, SMS Series: IEC 61000–4–2 (ESD) 15 kV (air) 8 kV (contact)
- IEC 61000–4–4 (EFT) 40 Amps (5/50 ns)
- IEC 61000–4–5 (lightning) 23 Amps (8/20 μs)
- All products are Flammability Rating of UL 94 V–0

Device	Breakdown Voltage				Max Reverse Leakage Current		Capacitance (pF) @ 0 V, 1.0 MHz		Max Reverse Surge Current	Max Reverse Voltage @ I_{PP} (Clamping Voltage)	Peak Power Rating (8x20 μsec) (Note 1)
		V_{BR} (V)		@ I_T	I_R	V_{RWM}					
	Min	Nom	Max	(mA)	(μA)	(V)	Typ	Max	I_{PP} (A)	V_C (V)	Watts
 CASE 318F–03 STYLE 1 SC–74 PLASTIC 											
MMQA5V6T1	5.32	5.6	5.88	1.0	2.0	3.0	–	–	3.0	8.0	150
MMQA6V2T1,T3	5.89	6.2	6.51	1.0	0.7	4.0	–	–	2.66	9.0	150
MMQA6V8T1	6.46	6.8	7.14	1.0	0.5	4.3	–	–	2.45	9.8	150
MMQA12VT1	11.4	12	12.6	1.0	0.075	9.1	–	–	1.39	17.3	150
MMQA13VT1,T3	12.4	13	13.7	1.0	0.075	9.8	–	–	1.29	18.6	150
MMQA15VT1	14.3	15	15.8	1.0	0.075	11	–	–	1.1	21.7	150
MMQA18VT1	17.1	18	18.9	1.0	0.075	14	–	–	0.923	26	150
MMQA20VT1,T3	19	20	21	1.0	0.075	15	–	–	0.84	28.6	150
MMQA21VT1	20	21	22.1	1.0	0.075	16	–	–	0.792	30.3	150
MMQA22VT1	20.9	22	23.1	1.0	0.075	17	–	–	0.758	31.7	150
MMQA24VT1	22.8	24	25.2	1.0	0.075	18	–	–	0.694	34.6	150
MMQA27VT1	25.7	27	28.4	1.0	0.075	21	–	–	0.615	39	150
MMQA30VT1	28.5	30	31.5	1.0	0.075	23	–	–	0.554	43.3	150
MMQA33VT1,T3	31.4	33	34.7	1.0	0.075	25	–	–	0.504	48.6	150
SMS05T1	6.0	–	7.2	1.0	20	5.0	–	400	23	15.5	350
SMS12T1	13.3	–	15	1.0	1.0	12	–	150	15	23	350
SMS15T1	11.7	–	18.5	1.0	1.0	15	–	125	12	29	350
SMS24T1	26.7	–	32	1.0	1.0	24	–	75	8.0	44	350

1. Surge waveform 8 x 20 μsec except for MMQA Series (10 x 1000 μsec).

TVS Protection – Arrays in Surface Mount (continued)

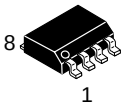
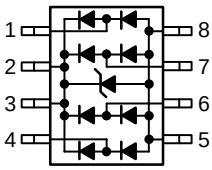
Device	Breakdown Voltage				Max Reverse Leakage Current		Capacitance (pF) @ 0 V, 1.0 MHz		Max Reverse Surge Current	Max Reverse Voltage @ I_{PP} (Clamping Voltage)	Peak Power Rating (8x20 μsec) (Note 2)
		V_{BR} (V)		@ I_T	I_R	V_{RWM}					
	Min	Nom	Max	(mA)	(μA)	(V)	Typ	Max	I_{PP} (A)	V_C (V)	Watts
 CASE 419A–02 SC–88A (SOT–353) 											
MSQA6V1W5T2	6.1	6.6	7.2	1.0	1.0	3.0	90	–	–	–	150
 CASE 419B–02 SC–88 (SOT–363) 											
DF6A6.8FUT1	6.4	6.8	7.2	1.0	1.0	5.0	40	–	7.0	11.4	75
 CASE 846A–02 Micro8™ 											
NUP6101DMR2	6.0	–	–	1.0	20	5.0	–	400*	5.0	11	300
 CASE 751–07 SO–8 											
SMDA05–6R2	6.0	–	–	1.0	20	5.0	–	400*	5.0	11	300

2. Surge waveform 8 x 20 μsec except for MMQA Series (10 x 1000 μsec).

*C_j = Between I/O pins and ground

TVS Protection – Low–Capacitance Surface Mount for USB 2.0 and 1.1

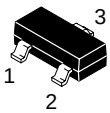
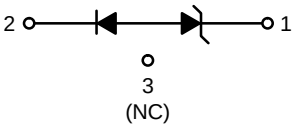
- ESD Protection Meeting IEC 61000–4–2, 4–4, 4–5
- Flammability Rating UL 94 V–0

Device	Breakdown Voltage				Max Reverse Leakage Current		Capacitance* (pF) @ 0 V, 1.0 MHz		Max Reverse Surge Current	Max Reverse Voltage @ I_{PP} (Clamping Voltage)	Peak Power Rating (8x20 μsec)
		V_{BR} (V)		@ I_T	I_R	V_{RWM}					
	Min	Nom	Max	(mA)	(μA)	(V)	Typ	Max	I_{PP} (A)	V_C (V)	Watts
 CASE 751–07 SO–8 											
USB 2.0											
NUP4201DR2	6.0	–	–	1.0	10	5.0	2.5	5.0	10	12	500
USB 1.1											
SRDA05–4R2	6.0	–	–	1.0	10	5.0	4.0	7.5	10	12	500

*C_j = Between I/O pins

TVS Protection – Low–Capacitance Surface Mount for High Speed Data Lines

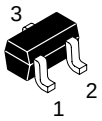
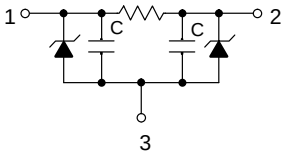
- ESD Protection Meeting IEC 61000–4–2, 4–4, 4–5
- Flammability Rating UL 94 V–0

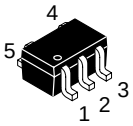
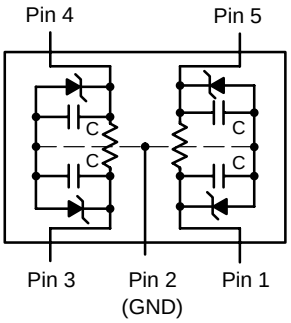
Device	Breakdown Voltage				Max Reverse Leakage Current		Capacitance (pF) @ 0 V, 1.0 MHz		Max Reverse Surge Current	Max Reverse Voltage @ I_{PP} = 5 A (Clamping Voltage)	Peak Power Rating (8x20 μsec)
		V_{BR} (V)		@ I_T	I_R	V_{RWM}					
	Min	Nom	Max	(mA)	(μA)	(V)	Typ	Max	I_{PP} (A)	V_C (V)	Watts
 CASE 318–09 STYLE 26 SOT–23 											
SL05T1	6.0	–	8.0	1.0	20	5.0	3.5	5.0	17	11	300
SL15T1	16.7	–	18.5	1.0	1.0	15	3.5	5.0	10	30	300
SL24T1	26.7	–	29	1.0	1.0	24	3.5	5.0	5.0	55	300

Filter Circuits

NZT Series and NZMM7V0T4:

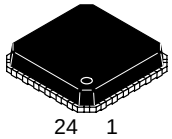
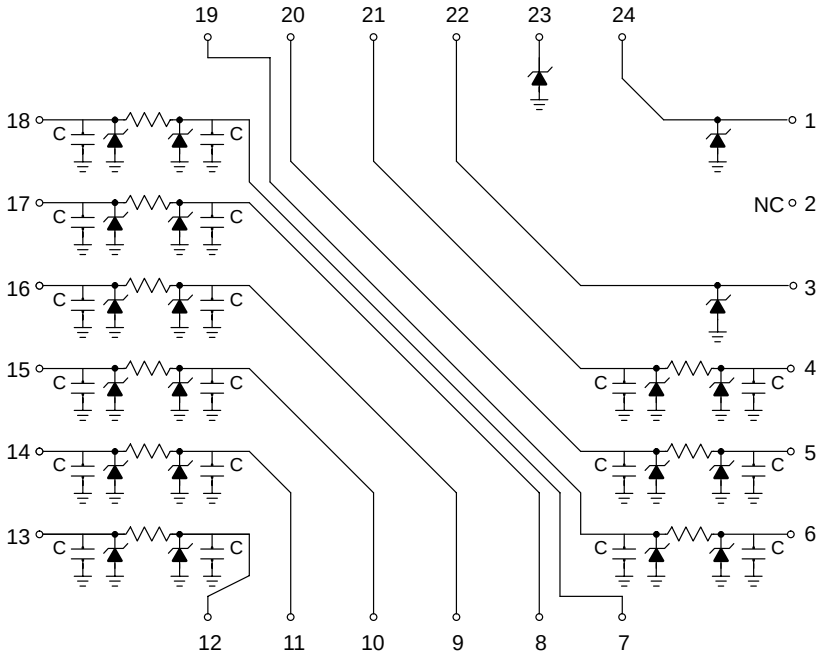
- EMI/RFI Bi–Directional “Pi” Low–Pass Filters
- ESD Protection meets IEC 61000–4–2
- Flammability Rating UL 94 V–0

Device	V_{BR} (V)			@ I_T	Max Reverse Leakage Current		Capacitance (pF) @ 0 V, 1.0 MHz (Note 3)		Resistor (Ω)		Cutoff Frequency (Note 4)
					I_R	V_{RWM}					
	Min	Nom	Max	(mA)	(μA)	(V)	Min	Max	Min	Max	Typ (MHz)
 CASE 463–01 SC–75 PLASTIC 											
NZF220TT1	6.0	–	8.0	1.0	1.0	3.0	17.6	26.4	90	110	220

 CASE 419A–02 SC–88A 											
NZF220DFT1	6.0	–	8.0	1.0	1.0	3.0	17.6	26.4	90	110	220

3. Zener/Resistor Array Line Capacitance for NZT220TT1and NZT220DFT1. (C = Effective TVs’ Junction Capacitance).
4. S21 Measurement (50 Ω Source and 50 Ω Lead Termination).

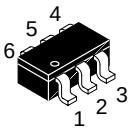
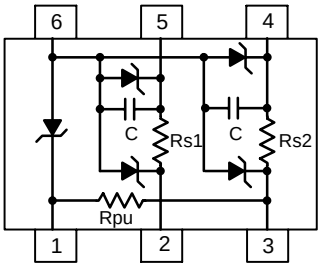
Filter Circuits (continued)

Device	V_{BR} (V)			@ I_T	Max Reverse Leakage Current		Capacitance (pF) @ 0 V, 1.0 MHz (Note 5)		Resistor (Ω)		Cutoff Frequency (Note 6)
					I_R	V_{RWM}					
	Min	Nom	Max	(mA)	(μA)	(V)	Min	Max	Min	Max	Typ (MHz)
 CASE 485F–01 24 PIN MLF 											
NZMM7V0T4	6.0	–	8.0	1.0	1.0	3.0	17.6	26.4	90	110	220

5. Zener/Resistor Array Line Capacitance for NZT220TT1and NZT220DFT1. (C = Effective TVs' Junction Capacitance).
6. S21 Measurement (50 Ω Source and 50 Ω Lead Termination)

STF202–22:

- Provides USB Line Termination, Filtering, and ESD Protection
- Bi–Directional EMI Filtering
- IEC 61000–4–2 ESD Protection for USB Port
- ESD Ratings: Machine Model = C
  Human Body Model = 3B

Device	V_{BR} (V)			@ I_T	Max Reverse Leakage Current		Capacitance (pF) @ 0 V, 1.0 MHz (Note 7)		Resistor (Ω)		Cutoff Frequency
					I_R	V_{RWM}					
	Min	Nom	Max	(mA)	(μA)	(V)	Min	Max	Min	Max	Typ (MHz)
 CASE 318G–02 TSOP–6 											
STF202–22T1	6.0	–	8.0	1.0	1.0* 5.0*	3.3 5.25	Typical = 68		R_S: 20 R_{up}: 1350	24 1650	

7. Measured at 25°C, V_R = 0 V, F = 1 MHz, Pins 2, 3, 4 or 5 to GND with Pin 1 also grounded.

*I_R @ V_{RWM} = 5.25 V (V_{BUS} to GND)
I_R @ V_{RWM} = 3.3 V (I/O Pin)

High Current Digital Transistors (Bias Resistor Transistors)

Device	Polarity	$V_{(BR)CEO}$	I_C A Max	h_{FE} Min	$V_{CE(sat)}$ Max	R1 Ω	R2 Ω	Package
NSB9435T1	PNP	30	3.0	125	.21	–	10K	SOT–223 Case 318E–04

Devices listed in ***bold italic*** are ON Semiconductor preferred devices.

Combinational Digital Transistors (Bias Resistor Transistors)

Device	Type	$V_{(BR)CEO}$	I_C mA Max	Q1	Q2	Package
NSTB60BDW1T1	NPN/PNP Combination	50	150	2SA1774	MUN5234	SC–88 Case 419B–02
UMA4NT1	Dual Common Emitter	50	100	MUN5211	MUN5211	SC–88A, SOT–353 SC70–5 Case 419A–02
UMA6NT1	Dual Common Emitter	50	100	MUN5212	MUN5212	
UMC2NT1	Dual Common Base Collector	50	100	MUN5211	MUN5211	
UMC3NT1	Dual Common Base Collector	50	100	4.7K/10K	MUN5213	
UMC5NT1	Dual Common Base Collector	50	100	MUN2240	MUN2240	

Devices listed in ***bold italic*** are ON Semiconductor preferred devices.

Small–Signal

Bipolar Transistors, JFETs, and Diodes

In Brief . . .

This section highlights semiconductors that are the most popular and have a history of high usage for most applications.

It covers a wide range of Small–Signal semi–conductors. A large selection of bipolar transistors, JFETs and diodes are available for surface mount and insertion assembly technology.

Small–Signal Package Cross–Reference Table

EIAJ	IEC	JEDEC	Other
	SOT–23		SST3
SC–59	SOT–346		SMT3. MPAK
SC–70	SOT–323		UMT3, CMPAK
SC–75, SC–90	SOT–416		EMT3, SMPAK
SC–89	SOT–490		EMT3
SC–74	SOT–457	**TSOP6**	SMT6, SC–59–6, SOT–23–6
SC–74A		**TSOP5**	SMT5, SC–59–5, SOT–23–5
SC–88	SOT–363		UMT6, SC–70–6
SC–88A	SOT–353		UMT5, SC–70–5
SC–77	**SOD–123**		SMD2
SC–76	**SOD–323**		UMD2, URP
SC–79	**SOD–523**		EMD2, UFP
SC–62	**SOT–89**		MPT3, UPAK
SC–73	**SOT–223**		
SC–43	SOT–54	**TO–92**	SPT
	SOT–563		EMT6, SOT–666
	SOT–553		EMT5, SOT–665
SO–16			

BOLD denotes an ON Semiconductor package name.

Page

Bipolar Transistors
- General–Purpose Transistors 145
- General–Purpose Multiple Transistors 150
- Low Noise and Good h_{FE} Linearity 150
- Darlington Transistors 151
- High Current Transistors 152
- High Voltage Transistors 154
- RF Transistors 155
- Switching Transistors 155
- Multiple Switching Transistors 156
- Digital Transistors (Bias Resistor Transistors – BRTs) 157
- Low Saturation Voltage Transistors 160

Junctional Field–Effect Transistors – JFETs
- Low–Frequency/Low–Noise 161
- High–Frequency Amplifiers 161
- Switches and Choppers 162

Tuning and Switching Diodes
- Abrupt Junction Tuning Diodes 163
- Hyper–Abrupt Junction Tuning Diodes 163
- Schottky Diodes 164
- Pin Switching Diodes 165
- General Purpose Signal & Switching Diodes 165

Bipolar Transistors

General–Purpose Transistors

NPN	PNP	$V_{(BR)CEO}$	I_C mA Max	h_{FE} Min	h_{FE} Max	f_T MHz Min	NF dB Max	Package
–	MPSL51	100	600	40	250	60	–	TO–226AA, TO–92 Case 29–11
BC449	–	100	300	50	460	100	–	
BC449A	–	100	300	120	220	100	–	
BC447	–	80	500	50	460	100	–	
MPS8099	***MPS8599***	80	500	100	300	150	–	
MPSA06	***MPSA56***	80	500	100	–	100	–	
2N4410	–	80	250	60	400	60	–	
–	MPS6729	80	500	50	250	–	–	
BC546	–	65	100	120	450	150	10	
BC546B	BC556B	65	100	180	450	150	10	
BC487	–	60	500	60	400	–	–	
BC487B	BC488B	60	500	160	400	–	–	
MPSA05	MPSA55	60	500	100	–	100	–	
–	***MPS2907A***	60	600	100	300	200	–	
–	***2N5087***	50	50	250	800	40	2.0	
BC182	BC212	50	100	120	500	200 (Typ)	10	
BC182A	–	50	100	120	260	200	10	
BC182B	BC212B	50	100	200	500	200	10	
BC237	–	45	100	120	800	150	10	
BC237A	–	45	100	120	220	150	10	
BC237B	BC307B	45	100	200	460	150	10	
BC237C	BC307C	45	100	380	800	150	10	
BC337	BC327	45	800	100	630	210 (Typ)	–	
BC337–16	BC327–16	45	800	100	250	260 (Typ)	–	
BC337–25	BC327–25	45	800	160	400	260 (Typ)	–	
BC337–40	BC327–40	45	800	250	630	260 (Typ)	–	
BC550C	BC560C	45	100	380	800	250 (Typ)	2.5	
–	BC557	45	100	120	800	150	10	
BC547A	BC557A	45	100	120	220	150	10	
BC547B	BC557B	45	100	180	450	150	10	
BC547C	BC557C	45	100	380	800	150	10	
MPSA18	–	45	200	500	–	100	1.5	
MPSA20	–	40	100	40	400	125	–	
MPS2222A	–	40	600	100	300	300	–	
2N4401	***2N4403***	40	600	100	300	200	–	
MPS6602	***MPS6652***	40	1000	50	–	100	–	
2N3904	***2N3906***	40	200	100	300	250	5.0	

Devices listed in ***bold italic*** are ON Semiconductor preferred devices.

Bipolar Transistors

General–Purpose Transistors

NPN	PNP	$V_{(BR)CEO}$	I_C mA Max	h_{FE} Min	h_{FE} Max	f_T MHz Min	NF dB Max	Package
BC489	BC490	80	1000	60	400	200/150 (Typ)	0.3/0.5	TO–226AA, TO–92 Case 29–11
BC639	BC640	80	500	40	160	60	0.5	
BC489A	BC490A	80	1000	100	250	100	0.5	
BC489B	BC490B	80	1000	160	400	100	0.5	
BC639–16	BC640–16	80	1000	100	250	60	0.5	
MPS651	***MPS751***	60	2000	75	–	75	0.5	
BC637	BC638	60	500	40	160	–	0.5	
BC635	BC636	45	500	40	250	200/150 (Typ)	–	
MPS3904	***MPS3906***	40	200	100	300	250	5.0	
BC548B	BC558B	30	100	200	450	300 (Typ)	10	
BC548C	BC558C	30	100	420	800	300	10	
–	BC213	30	100	80	–	200	10	
MPS2222	–	30	600	100	300	250	–	
2N5088	–	30	50	350	–	50	3.0	
2N5089	–	25	50	450	–	50	2.0	
BC238B	–	25	100	200	460	150	10	
BC238C	–	25	100	380	800	150	10	
BC239C	–	25	100	380	800	150	4.0	
BC338–25	–	25	800	160	400	150	–	
MPS4124	–	25	200	120	360	170	5.0	
–	MPS4126	25	200	120	360	170	4.0	
MPS5172	–	25	100	100	500	–	–	
MPS6521	MPS6523	25	100	300	600	–	3.0	
BC368	BC369	20	1000	60	–	65	0.5	
–	MPS6729	80	500	50	250	–	–	**TO–226AE** (1–WATT) **TO–92** **Case 29–10**
MPSW06	***MPSW56***	80	500	80	–	50	–	
MPSW05	MPSW55	60	500	60	–	50	250	
MPSW01A	***MPSW51A***	40	1000	50	–	50	–	
MPSW01	MPSW51	30	1000	50	–	50	–	

Devices listed in ***bold italic*** are ON Semiconductor preferred devices.

Bipolar Transistors

General–Purpose Transistors

NPN	PNP	$V_{(BR)CEO}$	I_C mA Max	h_{FE} Min	h_{FE} Max	f_T MHz Min	NF dB Max	Package
–	BSS63LT1	100	100	30	–	50	–0.25	
BSS64LT1	–	80	100	20	–	60	0.15	
MMBTA06LT1	***MMBTA56LT1***	80	500	100	–	100	–	
BC846ALT1	–	65	100	110	220	100	10	
BC846BLT1	–	65	100	200	450	100	10	
–	***BC856ALT1***	65	100	125	250	100	10	
–	***BC856BLT1***	65	100	220	475	100	10	
–	***MMBT2907ALT1***	60	600	100	300	200	–	
MMBT2484LT1	–	60	50	250	–	–	3.0	
MMBT6428LT1	–	50	200	250	–	100	3.0 (Typ)	
–	***MMBT5087LT1***	50	50	250	–	40	2.0	
MMBT6429LT1	–	45	200	500	–	100	3.0 (Typ)	
BC817–16LT1	–	45	500	100	250	100	–	
BC817–25LT1	–	45	500	160	400	100	–	
BC817–40LT1	–	45	500	250	600	100	–	
–	BC807–16LT1	45	500	100	250	100	–	
–	***BC807–25LT1***	45	500	160	400	100	–	
–	***BC807–40LT1***	45	500	250	600	100	–	
BC847ALT1	–	45	100	110	220	100	10	
BC847BLT1	–	45	100	200	450	100	10	
BC847CLT1	–	45	100	420	800	100	10	
BC850BLT1	–	45	100	200	450	100	4.0	
BC850CLT1	–	45	100	420	800	100	4.0	**TO–236AB, SOT–23**
–	***BC857ALT1***	45	100	125	250	100	10	**Case 318–08**
–	***BC857BLT1***	45	100	220	475	100	10	
–	***BC857CLT1***	45	100	420	800	100	10	
MMBT2222ALT1	–	40	600	100	300	300	4.0	
MMBT3904LT1	–	40	200	100	300	200	5.0	
–	***MMBT3906LT1***	40	200	100	300	250	4.0	
MMBT4401LT1	–	40	600	100	300	250	–	
–	***MMBT4403LT1***	40	600	100	300	200	–	
BC848ALT1	–	30	100	110	220	100	10	
BC848BLT1	–	30	100	200	450	100	10	
BC848CLT1	–	30	100	420	800	100	10	
BC849BLT1	–	30	100	200	450	100	4.0	
BC849CLT1	–	30	100	420	800	100	4.0	
–	***BC858ALT1***	30	100	125	250	100	10	
–	***BC858BLT1***	30	100	220	475	100	10	
–	***BC858CLT1***	30	100	420	800	100	10	
–	***BC859BLT1***	30	100	220	475	100	4.0	
–	***BC859CLT1***	30	100	420	800	100	4.0	
MMBT5088LT1	–	30	50	300	900	5	3.0	
MMBT5089LT1	–	25	50	400	1200	50	2.0	
MMBT4124LT1	–	25	200	120	360	300	5.0	

Devices listed in ***bold italic*** are ON Semiconductor preferred devices.

Bipolar Transistors

General–Purpose Transistors

NPN	PNP	$V_{(BR)CEO}$	I_C mA Max	h_{FE} Min	h_{FE} Max	f_T MHz Min	NF dB Max	Package
MSD601–RT1	–	50	100	210	340	–	–	SC–59 Case 318D–04
MSD601–ST1	–	50	100	290	460	–	–	
MSD602–RT1	–	50	500	120	240	–	–	
MSC2712GT1	–	50	100	200	400	–	–	
–	***MSA1162GT1***	50	100	200	400	–	–	
–	***MSA1162YT1***	50	100	120	240	–	–	
–	***MSB710–RT1***	50	500	120	240	–	–	
–	***MSB709–RT1***	45	100	210	340	–	–	
MSD1328–RT1	–	20	500	200	350	–	–	
MSD1328–ST1	–	20	500	300	500	–	–	
MMBTA06WT1	***MMBTA56WT1***	80	500	100	–	100	–	SC–70, SOT–323 Case 419–04
BC846AWT1	–	65	100	110	220	100	10	
BC846BWT1	–	65	100	200	450	100	10	
–	***BC856AWT1***	65	100	125	250	100	10	
–	***BC856BWT1***	65	100	220	475	100	10	
–	***MMBT2907AWT1***	60	600	100	–	200	–	
MSD1819A–RT1	–	50	100	210	340	–	–	
BC847AWT1	–	45	100	110	220	100	10	
BC847BWT1	–	45	100	200	450	100	10	
BC847CWT1	–	45	100	420	800	100	4.0	
–	***BC857BWT1***	45	100	220	475	100	10	
–	***BC857CWT1***	45	100	420	800	100	10	
–	***MSB1218A–RT1***	45	100	210	340	–	–	
MMBT2222AWT1	–	40	600	100	300	300	4.0	
MMBT3904WT1	–	40	200	100	300	300	5.0	
–	***MMBT3906WT1***	40	200	100	300	250	4.0	
BC848AWT1	–	30	100	110	220	100	10	
BC848BWT1	–	30	100	200	450	100	10	
BC848CWT1	–	30	100	420	800	100	4.0	
–	***BC858AWT1***	30	100	110	220	100	10	
–	***BC858BWT1***	30	100	200	450	100	10	
MSC3930–BT1	–	20	30	70	140	150	–	
2SC4617	–	50	100	120	560	180 (Typ)	–	SOT–416, SC–75, SC–90 Case 463–01
–	***2SA1774***	50	100	120	560	140 (Typ)	–	
BC847BTT1	–	45	100	200	450	100	10	
BC847CTT1	–	45	100	420	800	100	4.0	
–	***BC857BTT1***	45	100	220	475	100	10	
–	***BC857CTT1***	45	100	420	800	100	10	
MMBT3904TT1	–	40	200	100	300	300	5.0	
–	***MMBT3906TT1***	40	200	100	300	250	4.0	
MMBT2222ATT1	–	40	600	100	300	300	4.0	

Devices listed in ***bold italic*** are ON Semiconductor preferred devices.

Bipolar Transistors

General–Purpose Transistors

NPN	PNP	$V_{(BR)CEO}$	I_C mA Max	h_{FE} Min	h_{FE} Max	f_T MHz Min	NF dB Max	Package
BCP56T1	***BCP53T1***	80	1000	40	250	50 (Typ)	–	SOT–223 Case 318E–04
BCP56–10T1	***BCP53–10T1***	80	1000	63	160	50 (Typ)	–	
BCP56–16T1	***BCP53–16T1***	80	1000	100	250	50 (Typ)	–	
–	***PZT2907AT1***	60	600	100	300	200	–	
PZT651T1	***PZT751T1***	60	2000	75	–	75	–	
PZT2222AT1	–	40	600	100	300	300	–	
BCP68T1	***BCP69T1***	25	1000	85	375	60 (Typ)	–	
BCX56–10R1	–	80	1000	63	160	130 (Typ)	–	SOT–89 Case 1213–02

Devices listed in ***bold italic*** are ON Semiconductor preferred devices.

Bipolar Transistors

General–Purpose Multiple Transistors

Device	Type	$V_{(BR)CEO}$	I_C mA Max	h_{FE} Min	h_{FE} Max	f_T MHz Min	NF dB Max	Package
BC846BDW1T1	Dual NPN	65	100	200	450	100	10	SC–88, SOT–363 Case 419B–02
BC856BDW1T1	Dual PNP	65	100	220	475	100	10	
BC846BPDW1T1	Dual Complimentary	65	100	200	475	100	10	
BC847BDW1T1	Dual NPN	45	100	200	290	100	10	
BC847CDW1T1	Dual NPN	45	100	420	520	100	4.0	
BC857BDW1T1	Dual PNP	45	100	220	290	100	10	
BC857CDW1T1	Dual PNP	45	100	420	520	100	10	
BC847BPDW1T1	Dual Complimentary	45	100	200	290	100	10	
BC847CPDW1T1	Dual Complimentary	45	100	420	520	100	4.0/10	
MBT3904DW1T1	Dual NPN	40	200	100	300	300	5.0	
MBT3906DW1T1	Dual PNP	40	200	100	300	250	4.0	
MBT3946DW1T1	Dual Complimentary	40	200	100	300	250	5.0/4.0	
MBT2222ADW1T1	Dual NPN	40	600	100	300	300	4.0	
BC848BDW1T1	Dual NPN	30	100	200	290	100	10	
BC848CDW1T1	Dual NPN	30	100	420	250	100	4.0	
BC858BDW1T1	Dual PNP	30	100	220	290	100	10	
BC858CDW1T1	Dual PNP	30	100	420	520	100	10	
BC848BPDW1T1	Dual Complimentary	30	100	200	290	100	10	
BC848CPDW1T1	Dual Complimentary	30	100	420	520	100	4.0/10	
MMPQ2222A	Quad NPN	40	500	100	300	200	–	SO–16 Case 751B–05
MMPQ2369	Quad NPN	15	500	40	–	450	–	
MMPQ3467	Quad PNP	40	1000	20	–	190 (Typ)	–	
MMPQ3904	Quad NPN	40	200	75	–	250	–	
MMPQ3906	Quad PNP	40	200	75	–	200	–	
MMPQ6700	Quad Complimentary	40	200	70	–	200	–	

Devices listed in ***bold italic*** are ON Semiconductor preferred devices.

Bipolar Transistors

Low Noise and Good h_{FE} Linearity

NPN	PNP	$V_{(BR)CEO}$	I_C mA Max	h_{FE} Min	h_{FE} Max	f_T MHz Min	NF dB Max	Package
–	***2N5087***	50	50	250	800	40	2.0	TO–226AA, TO–92 Case 29–11 (Note 1)
BC550C	BC560C	45	100	380	800	250 (Typ)	2.5	
MPSA18	–	45	200	500	–	100	1.5	
2N5088	–	30	50	350	–	50	3.0	
2N5089	–	25	50	450	–	50	2.0	
MPS6521	MPS6523	25	100	300	600	–	3.0	
MMBT2484LT1	–	60	50	250	–	–	3.0	TO–236AB, SOT–23 Case 318–08
MMBT6428LT1	–	50	200	250	–	100	3.0 (Typ)	
–	***MMBT5087LT1***	50	50	250	–	40	2.0	
MMBT6429LT1	–	45	200	500	–	100	3.0 (Typ)	
MMBT5088LT1	–	30	50	300	900	5	3.0	
MMBT5089LT1	–	25	50	400	–	50	2.0	

Devices listed in ***bold italic*** are ON Semiconductor preferred devices.
1. N_F: Noise Figure at R_S = 2.0 kΩ, I_C = 200 μA, V_{CE} = 5.0 Volts. f = 30 Hz to 15 kHz.

Bipolar Transistors

Darlington Transistors

NPN	PNP	$V_{(BR)CEO}$	I_C mA Max	h_{FE} Min	h_{FE} Max	f_T MHz Min	NF dB Max	Package
MPSW45A	–	50	1000	25K	150K	100	1.5	**TO–226AE** (1–WATT) **TO–92** **Case 29–10**
MPSW45	–	40	1000	25K	150K	100	1.5	
–	MPSW63	30	500	10K	–	125	1.5	
–	***MPSW64***	30	1000	20K	–	125	1.5	
MPSW13	–	30	1000	10K	–	125	1.5	
MPSW14	–	30	1000	20K	–	125	1.5	
MPSA29	–	100	500	10K	–	125	1.5	**TO–226AA, TO–92** **Case 29–11**
BC372	–	100	1000	10K	160K	100	1.1	
BC373	–	80	1000	10K	160K	100	1.1	
MPSA27	MPSA77	60	500	10K	–	–	1.5	
BC618	–	55	1000	10K	50K	150	1.1	
–	MPSA75	40	500	10K	–	–	1.5	
2N6427	–	40	500	20K	200K	–	1.5	
2N6426	–	40	500	30K	300K	125	1.5	
MPSA14	***MPSA64***	30	500	20K	–	125	1.5	
MPSA13	MPSA63	30	500	10K	–	125	1.5	
BC517	–	30	1000	30K	–	200 (Typ)	1.0	
MMBTA14LT1	***MMBTA64LT1***	30	300	20K	–	125	–	**TO–236AB, SOT–23** **Case 318–08**
BSP52T1	–	80	1000	2000	–	–	–	**SOT–223** **Case 318E–04**

Devices listed in ***bold italic*** are ON Semiconductor preferred devices.

Bipolar Transistors

High Current Transistors (≥ 500 mA)

NPN	PNP	$V_{(BR)CEO}$	I_C mA Max	h_{FE} Min	h_{FE} Max	f_T MHz Min	NF dB Max	Package
–	MPSL51	100	600	40	250	60	–	TO–226AA, TO–92 Case 29–11
BC489	BC490	80	1000	60	400	200/150 (Typ)	0.3/0.5	
BC639	BC640	80	500	40	160	60	0.5	
BC489A	BC490A	80	1000	100	250	100	0.5	
BC489B	BC490B	80	1000	160	400	100	0.5	
BC639–16	BC640–16	80	1000	100	250	60	0.5	
BC447	–	80	500	50	460	100	–	
MPS8099	***MPS8599***	80	500	100	300	150	–	
MPSA06	***MPSA56***	80	500	100	–	100	–	
–	MPS6729	80	500	50	250	–	–	
MPS651	***MPS751***	60	2000	75	–	75	0.5	
BC637	BC638	60	500	40	160	–	0.5	
BC487	–	60	500	60	400	–	–	
BC487B	BC488B	60	500	160	400	–	–	
MPSA05	MPSA55	60	500	100	–	100	–	
–	***MPS2907A***	60	600	100	300	200	–	
BC635	BC636	45	500	40	250	200/150 (Typ)	–	
BC337	BC327	45	800	100	630	210 (Typ)	–	
BC337–16	BC327–16	45	800	100	250	260 (Typ)	–	
BC337–25	BC327–25	45	800	160	400	260 (Typ)	–	
BC337–40	BC327–40	45	800	250	630	260 (Typ)	–	
MPS2222A	–	40	600	100	300	300	–	
2N4401	***2N4403***	40	600	100	300	200	–	
MPS6602	***MPS6652***	40	1000	50	–	100	–	
MPS2222	–	30	600	100	300	250	–	
BC338–25	–	25	800	160	400	150	–	
BC368	BC369	20	1000	60	–	65	0.5	
–	MPS6729	80	500	50	250	–	–	TO–226AE (1–WATT) TO–92 Case 29–10
MPSW06	***MPSW56***	80	500	80	–	50	–	
MPSW05	MPSW55	60	500	60	–	50	250	
MPSW01A	***MPSW51A***	40	1000	50	–	50	–	
MPSW01	MPSW51	30	1000	50	–	50	–	
MMBTA06LT1	***MMBTA56LT1***	80	500	100	–	100	–	TO–236AB, SOT–23 Case 318–08
–	***MMBT2907ALT1***	60	600	100	300	200	–	
MMBT2222ALT1	–	40	600	100	300	300	4.0	
MMBT4401LT1	–	40	600	100	300	250	–	
–	***MMBT4403LT1***	40	600	100	300	200	–	
BCP56T1	***BCP53T1***	80	1000	40	250	50 (Typ)	–	SOT–223 Case 318E–04
BCP56–10T1	***BCP53–10T1***	80	1000	63	160	50 (Typ)	–	
BCP56–16T1	***BCP53–16T1***	80	1000	100	250	50 (Typ)	–	
–	***PZT2907AT1***	60	600	100	300	200	–	
PZT651T1	***PZT751T1***	60	2000	75	–	75	–	
PZT2222AT1	–	40	600	100	300	300	–	
BCP68T1	***BCP69T1***	25	1000	85	375	60 (Typ)	–	

Devices listed in ***bold italic*** are ON Semiconductor preferred devices.

Bipolar Transistors

High Current Transistors (≥ 500 mA)

NPN	PNP	$V_{(BR)CEO}$	I_C mA Max	h_{FE} Min	h_{FE} Max	f_T MHz Min	NF dB Max	Package
MMBT2222ATT1	–	40	600	100	300	300	4.0	**SOT–416, SC–75, SC–90 Case 463–01**
–	***NSL35TT1***	35	1000	100	–	–	–	
–	***NSL12TT1***	12	1000	100	–	–	–	
–	***NSL5TT1***	5.0	1000	100	–	–	–	
BCX56–10R1	–	80	1000	63	160	130 (Typ)	–	**SOT–89 Case 1213–02**
–	***MMBT2907AWT1***	60	600	100	–	200	–	**SC–70, SOT–323 Case 419–04**
MMBT2222AWT1	–	40	600	100	300	300	4.0	

Devices listed in ***bold italic*** are ON Semiconductor preferred devices.

Bipolar Transistors

High Voltage Transistors (> 100 V)

NPN	PNP	$V_{(BR)CEO}$	I_C mA Max	h_{FE} Min	h_{FE} Max	f_T MHz Min	NF dB Max	Package
–	BF493S	350	500	40	–	50	20	**TO–226AE** (1–WATT) **TO–92** **Case 29–10**
MPSW42	–	300	500	40	–	50	0.5	
–	***MPSW92***	300	500	25	–	50	0.5	
BF393	–	300	500	40	–	50	–	
2N5551	–	160	600	80	250	100	8.0	
–	***2N5401***	150	600	60	240	100	8.0	
2N6517	***2N6520***	350	500	30	200	40	–	**TO–226AA, TO–92** **Case 29–11**
MPSA42	–	300	500	40	–	50	0.5	
–	***MPSA92***	300	500	40	–	50	0.5	
BF422	BF423	250	500	50	–	60	–	
2N5550	–	160	600	80	–	100	0.15	
2N6515	–	250	500	50	300	40	0.3	
MMBT6517LT1	–	350	500	15	–	40	–	**TO–236AB, SOT–23** **Case 318–08**
–	***MMBT6520LT1***	350	500	15	–	40	–	
MMBTA42LT1	–	300	500	40	–	50	–	
–	***MMBTA92LT1***	300	500	25	–	50	–	
MMBT5551LT1	–	160	600	80	250	–	–	
–	***MMBT5401LT1***	150	500	50	–	100	8.0	
PZTA96ST1	–	450	500	50	150	–	–	**SOT–223** **Case 318E–04**
BSP19AT1	–	350	1000	40	–	70	–	
PZTA42T1	***PZTA92T1***	300	500	40	–	50	–	
–	***BSP16T1***	300	1000	30	150	15	–	
BF720T1	***BF721T1***	250	100	50	–	60	–	
MSD42WT1	–	300	150	40	–	–	–	**SC–70, SOT–323** **Case 419–04**
–	***MSB92WT1***	300	500	25	–	50	–	
–	***MSB92AWT1***	300	500	120	200	50	–	

Devices listed in ***bold italic*** are ON Semiconductor preferred devices.

Bipolar Transistors

RF Transistors

NPN	PNP	$V_{(BR)CEO}$	I_C mA Max	h_{FE} Min	h_{FE} Max	f_T MHz Min	Cap pF Max	Package
MPSH10	–	25	–	60	–	650	C_{RB} = 0.65	TO–226AA, TO–92 Case 29–11
BF959	–	20	100	40	–	600	C_{RE} = 0.65 (Typ)	
MPSH17	–	15	–	25	250	800	C_{CB} = 0.9	
MPS918	–	15	50	20	–	600	C_{OBO} = 1.7	
MPS5179	–	12	50	25	250	900	C_{CB} = 1.0	
MPS3563	–	12	50	20	200	600	C_{OBO} = 1.7	
MMBTH10LT1	–	25	–	60	–	650	C_{CB} = 0.7	TO–236AB, SOT–23 Case 318–08
MMBTH10–4LT1	–	25	–	120	240	800	C_{CB} = 0.7	
MMBT918LT1	–	15	50	20	–	600	C_{OBO} = 1.7	
MSD2714AT1	–	25	–	90	180	650	C_{CB} = 0.7	SC–59 Case 318D–04
MSC2295–BT1	–	20	30	70	140	150	C_{RE} = 1.5	
MSC2295–CT1	–	20	30	110	220	150	C_{RE} = 1.5	
MSC3130T1	–	10	50	75	400	1400	–	

Devices listed in ***bold italic*** are ON Semiconductor preferred devices.

Bipolar Transistors

Switching Transistors

NPN	PNP	$V_{(BR)CEO}$	I_C mA Max	h_{FE} Min	h_{FE} Max	f_T MHz Min	T_{off} ns Max	Package
–	P2N2907A	60	600	100	300	200	110	TO–226AA, TO–92 Case 29–11
–	***MPS2907A***	60	600	100	300	200	110	
2N4401	***2N4403***	40	600	100	300	200	–	
2N3904	***2N3906***	40	200	100	300	250	300	
P2N2222A	–	40	600	100	300	300	285	
MPS2222A	–	40	600	100	300	300	285	
MPS3904	***MPS3906***	40	200	100	300	250	300	
MPS3646	–	15	300	30	120	350	28	
MPS2369	–	15	200	40	120	–	18	
MPS2369A	–	15	200	40	120	–	18	
–	***MMBT2907ALT1***	60	600	100	300	200	100	TO–236AB, SOT–23 Case 318–08
MMBT2222ALT1	–	40	600	100	300	300	285	
MMBT3904LT1	–	40	200	100	300	300	250	
–	***MMBT3906LT1***	40	200	100	300	250	300	
MMBT4401LT1	–	40	600	100	300	250	255	
–	***MMBT4403LT1***	40	600	100	300	200	255	
MMBT2369LT1	–	15	200	40	120	–	18	
MMBT2369ALT1	–	15	200	40	120	–	18	
–	***MMBT3640LT1***	12	80	30	120	500	35	
–	***MMBT2907AWT1***	60	600	100	300	200	100	SC–70, SOT–323 Case 419–04
MMBT3904WT1	–	40	200	100	300	300	250	
–	***MMBT3906WT1***	40	200	100	300	250	300	
MMBT2222AWT1	–	40	600	100	300	300	285	
MMBT4401WT1	–	40	600	100	300	250	255	
–	***MMBT4403WT1***	40	600	100	300	200	255	

Devices listed in ***bold italic*** are ON Semiconductor preferred devices.

Bipolar Transistors

Switching Transistors

NPN	PNP	$V_{(BR)CEO}$	I_C mA Max	h_{FE}		f_T MHz Min	T_{off} ns Max	Package
				Min	Max			
MMBT3904TT1	–	40	200	100	300	300	250	
–	***MMBT3906TT1***	40	200	100	300	250	300	**SOT–416, SC–75, SC–90 Case 463–01**
MMBT2222ATT1	–	40	600	100	300	300	285	

Devices listed in ***bold italic*** are ON Semiconductor preferred devices.

Bipolar Transistors

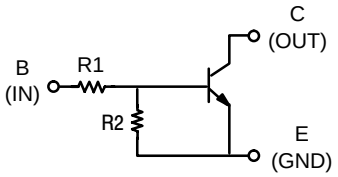
Multiple Switching Transistors

Device	Type	$V_{(BR)CEO}$	I_C mA Max	h_{FE}		f_T MHz Min	T_{off} ns Max	Package
				Min	Max			
MBT3904DW1T1	Dual NPN	40	200	100	300	300	250	
MBT3906DW1T1	Dual PNP	40	200	100	300	250	300	
MBT3946DW1T1	Dual Complimentary	40	200	100	300	250	250/300	**SC–88, SOT–363 Case 419B–02**
MBT2222ADW1T1	Dual NPN	40	600	100	300	300	285	
MMPQ3904	Quad NPN	40	200	75	–	250	136 (Typ)	
MMPQ3906	Quad PNP	40	200	75	–	200	155 (Typ)	
MMPQ6700	Quad Complimentary	40	200	70	–	200	155 (Typ)	**SO–16 Case 751B–05**
MMPQ2369	Quad NPN	15	500	40	–	450	15 (Typ)	

Devices listed in ***bold italic*** are ON Semiconductor preferred devices.

Bipolar Transistors

Digital Transistors (Bias Resistor Transistors)



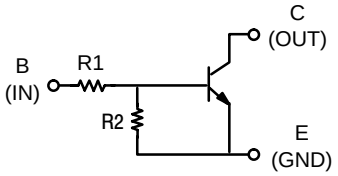
These devices include bias resistors on the semiconductor chip with the transistor. See the BRT diagram for orientation of resistors.

NPN	PNP	$V_{(BR)CEO}$	I_C mA Max	h_{FE} Min	R1 Ω	R2 Ω	Package
MUN2211T1	***MUN2111T1***	50	100	35	10K	10K	SC–59 Case 318D–04
MUN2212T1	***MUN2112T1***	50	100	60	22K	22K	
MUN2213T1	***MUN2113T1***	50	100	80	47K	47K	
MUN2214T1	***MUN2114T1***	50	100	80	10K	47K	
MUN2215T1	***MUN2115T1***	50	100	160	10K	∞	
MUN2216T1	***MUN2116T1***	50	100	160	4.7K	∞	
MUN2230T1	***MUN2130T1***	50	100	3.0	1.0K	1.0K	
MUN2231T1	***MUN2131T1***	50	100	8.0	2.2K	2.2K	
MUN2232T1	***MUN2132T1***	50	100	15	4.7K	4.7K	
MUN2233T1	***MUN2133T1***	50	100	80	4.7K	47K	
MUN2234T1	***MUN2134T1***	50	100	80	22K	47K	
MUN2236T1	***MUN2136T1***	50	100	80	100K	100K	
MUN2237T1	***MUN2137T1***	50	100	80	47K	22K	
MUN2240T1	***MUN2140T1***	50	100	160	47K	∞	
MUN2241T1	–	50	100	160	100K	∞	
DTC144TT1	***DTA144TT1***	50	100	160	47K	∞	
MMUN2211LT1	***MMUN2111LT1***	50	100	35	10K	10K	TO–236AB, SOT–23 Case 318–08
MMUN2212LT1	***MMUN2112LT1***	50	100	60	22K	22K	
MMUN2213LT1	***MMUN2113LT1***	50	100	80	47K	47K	
MMUN2214LT1	***MMUN2114LT1***	50	100	80	10K	47K	
MMUN2215LT1	***MMUN2115LT1***	50	100	160	10K	∞	
MMUN2216LT1	***MMUN2116LT1***	50	100	160	4.7K	∞	
MMUN2230LT1	***MMUN2130LT1***	50	100	3.0	1.0K	1.0K	
MMUN2231LT1	***MMUN2131LT1***	50	100	8.0	2.2K	2.2K	
MMUN2232LT1	***MMUN2132LT1***	50	100	15	4.7K	4.7K	
MMUN2233LT1	***MMUN2133LT1***	50	100	80	4.7K	47K	
MMUN2234LT1	***MMUN2134LT1***	50	100	80	22K	47K	
MMUN2235LT1	–	50	100	80	2.2K	47K	
MMUN2238LT1	–	50	100	160	2.2K	∞	
MMUN2241LT1	–	50	100	160	100K	∞	
MUN5211T1	***MUN5111T1***	50	100	35	10K	10K	SC–70, SOT–323 Case 419–04
MUN5212T1	***MUN5112T1***	50	100	60	22K	22K	
MUN5213T1	***MUN5113T1***	50	100	80	47K	47K	
MUN5214T1	***MUN5114T1***	50	100	80	10K	47K	
MUN5215T1	***MUN5115T1***	50	100	160	10K	∞	
MUN5216T1	***MUN5116T1***	50	100	160	4.7K	∞	
MUN5230T1	***MUN5130T1***	50	100	3.0	1.0K	1.0K	
MUN5231T1	***MUN5131T1***	50	100	8.0	2.2K	2.2K	
MUN5232T1	***MUN5132T1***	50	100	15	4.7K	4.7K	
MUN5233T1	***MUN5133T1***	50	100	80	4.7K	47K	
MUN5234T1	***MUN5134T1***	50	100	80	22K	47K	
MUN5235T1	***MUN5135T1***	50	100	80	2.2K	47K	
MUN5236T1	***MUN5136T1***	50	100	80	100K	100K	
MUN5237T1	***MUN5137T1***	50	100	80	47K	22K	

Devices listed in ***bold italic*** are ON Semiconductor preferred devices.

Bipolar Transistors

Digital Transistors (Bias Resistor Transistors)

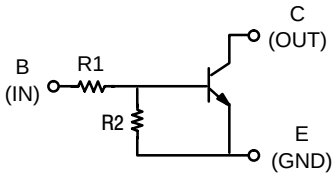


These devices include bias resistors on the semiconductor chip with the transistor. See the BRT diagram for orientation of resistors.

NPN	PNP	$V_{(BR)CEO}$	I_C mA Max	h_{FE} Min	R1 Ω	R2 Ω	Package
DTC114EET1	***DTA114EET1***	50	100	35	10K	10K	**SOT–416, SC–75, SC–90 Case 463–01**
DTC124EET1	***DTA124EET1***	50	100	60	22K	22K	
DTC144EET1	***DTA144EET1***	50	100	80	47K	47K	
DTC114YET1	***DTA114YET1***	50	100	80	10K	47K	
DTC114TET1	***DTA114TET1***	50	100	160	10K	∞	
DTC143TET1	***DTA143TET1***	50	100	160	4.7K	∞	
DTC123EET1	***DTA123EET1***	50	100	8.0	2.2K	2.2K	
DTC143EET1	***DTA143EET1***	50	100	15	4.7K	4.7K	
DTC143ZET1	***DTA143ZET1***	50	100	80	4.7K	4.7K	
DTC124XET1	***DTA124XET1***	50	100	80	22K	47K	
DTC123JET1	***DTA123JET1***	50	100	80	2.2K	47K	
DTC115EET1	***DTA115EET1***	50	100	80	100K	100K	
DTC144WET1	***DTA144WET1***	50	100	80	47K	22K	

Devices listed in ***bold italic*** are ON Semiconductor preferred devices.

Dual Digital Transistors (Bias Resistor Transistors)

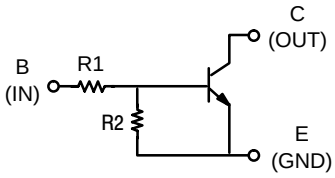


These devices include bias resistors on the semiconductor chip with the transistor. See the BRT diagram for orientation of resistors.

NPN	PNP	$V_{(BR)CEO}$	I_C mA Max	h_{FE} Min	R1 Ω	R2 Ω	Package
MUN5211DW1T1	***MUN5111DW1T1***	50	100	35	10K	10K	SC–88, SOT–363 Duals Case 419B–02
MUN5212DW1T1	***MUN5112DW1T1***	50	100	60	22K	22K	
MUN5213DW1T1	***MUN5113DW1T1***	50	100	80	47K	47K	
MUN5214DW1T1	***MUN5114DW1T1***	50	100	80	10K	47K	
MUN5215DW1T1	***MUN5115DW1T1***	50	100	160	10K	∞	
MUN5216DW1T1	***MUN5116DW1T1***	50	100	160	4.7K	∞	
MUN5230DW1T1	***MUN5130DW1T1***	50	100	3.0	1.0K	1.0K	
MUN5231DW1T1	***MUN5131DW1T1***	50	100	8.0	2.2K	2.2K	
MUN5232DW1T1	***MUN5132DW1T1***	50	100	15	4.7K	4.7K	
MUN5233DW1T1	***MUN5133DW1T1***	50	100	80	4.7K	47K	
MUN5234DW1T1	***MUN5134DW1T1***	50	100	80	22K	47K	
MUN5235DW1T1	***MUN5135DW1T1***	50	100	80	2.2K	47K	
MUN5236DW1T1	***MUN5136DW1T1***	50	100	80	100K	100K	
MUN5237DW1T1	***MUN5137DW1T1***	50	100	80	47K	22K	

Devices listed in ***bold italic*** are ON Semiconductor preferred devices.

Combinational Digital Transistors (Bias Resistor Transistors)



These devices include bias resistors on the semiconductor chip with the transistor. See the BRT diagram for orientation of resistors.

Device	Type	$V_{(BR)CEO}$	I_C mA Max	h_{FE} Min	Q1	Q2	Package
MUN5311DW1T1	Dual Complimentary	50	100	35	MUN5211	MUN5111	SC–88, SOT–363 Case 419B–02
MUN5312DW1T1		50	100	60	MUN5212	MUN5112	
MUN5313DW1T1		50	100	80	MUN5213	MUN5113	
MUN5314DW1T1		50	100	80	MUN5214	MUN5114	
MUN5315DW1T1		50	100	160	MUN5215	MUN5115	
MUN5316DW1T1		50	100	160	MUN5216	MUN5116	
MUN5330DW1T1		50	100	3.0	MUN5230	MUN5130	
MUN5331DW1T1		50	100	8.0	MUN5231	MUN5131	
MUN5332DW1T1		50	100	15	MUN5232	MUN5132	
MUN5333DW1T1		50	100	80	MUN5233	MUN5133	
MUN5334DW1T1		50	100	80	MUN5234	MUN5134	
MUN5335DW1T1		50	100	80	MUN5235	MUN5135	
UMA4NT1	Dual Common Emitter	50	100	160	MUN5211	MUN5211	SC–88A, SOT–353 SC70–5 Case 419A–02
UMA6NT1	Dual Common Emitter	50	100	160	MUN5212	MUN5212	
UMC2NT1	Dual Common Base Collector	50	100	60	MUN5211	MUN5211	
UMC3NT1	Dual Common Base Collector	50	100	35	4.7K/10K	MUN5213	
UMC5NT1	Dual Common Base Collector	50	100	20	MUN2240	MUN2240	

Devices listed in ***bold italic*** are ON Semiconductor preferred devices.

Bipolar Transistors

Low Saturation Voltage Transistors

NPN	PNP	$V_{(BR)CEO}$	I_C mA Max	h_{FE} Min	h_{FE} Max	f_T MHz Min	$V_{CE(sat)}$ Max	Package
MMBT489LT1	–	30	1000	300	900	100	0.20	
–	***MMBT589LT1***	30	1000	100	300	100	0.25	**TO–236AB, SOT–23 Case 318–08**
–	***MBT35200MT1***	35	2000	100	400	100	0.15	
–	***MMBT6589T1***	30	1000	100	300	100	0.25	**TSOP–6 Single Case 318G–02**
–	***NSL35TT1***	35	1000	100	–	–	0.37	
–	***NSL12TT1***	12	1000	100	–	–	0.35	**SOT–416, SC–75, SC–90 Case 463–01**
–	***NSL5TT1***	5.0	1000	100	–	–	–	

Devices listed in ***bold italic*** are ON Semiconductor preferred devices.

Junctional Field–Effect Transistors

JFETs

Low–Frequency/Low–Noise

N–Channel	P–Channel	$R_e\|Y_{fs}\|$ @ 1 kHz mmho Min	$R_e\|Y_{os}\|$ @ 1 kHz µmho Max	C_{iss} pF Max	C_{rss} pF Max	V_{GSS} V_{GDO} Volts Min	$V_{GS(off)}$ Volts Min	$V_{GS(off)}$ Volts Max	I_{DSS} mA Min	I_{DSS} mA Max	Package
2N3819	–	3.0	–	–	–	25	0.5	8.0	2.0	20	TO–226AA, TO–92 Case 29–11
2N5457	–	1.0	50	7.0	3.0	25	0.5	6.0	1.0	5.0	
2N5458	–	1.5	50	7.0	3.0	25	1.0	7.0	2.0	9.0	
–	***2N5460***	1.0	75	7.0	2.0	40	0.75	6.0	1.0	5.0	
–	***2N5461***	1.5	75	7.0	2.0	40	1.0	7.5	2.0	9.0	
–	***2N5462***	2.0	75	7.0	2.0	40	1.8	9.0	4.0	16	
BF245A	–	3.0	–	–	–	30	0.5	8.0	2.0	6.5	
BF245B	–	3.0	–	–	–	30	0.5	8.0	6.0	15	
BF256A	–	4.5	–	–	–	30	0.5	7.5	3.0	7.0	
–	***MMBF5460LT1***	1.0	75	7.0	2.0	40	0.8	6.0	1.0	5.0	TO–236AB, SOT–23 Case 318–08
BFR30LT1	–	1.0	40	5.0	1.5	25	–	5.0	4.0	10	
BFR31LT1	–	1.5	20	5.0	1.5	25	–	2.5	1.0	5.0	

Devices listed in ***bold italic*** are ON Semiconductor preferred devices.

High–Frequency Amplifiers

N–Channel	$R_e\|Y_{fs}\|$ mmho Min	$R_e\|Y_{os}\|$ µmho Max	C_{iss} pF Max	C_{rss} pF Max	NF dB Max	V_{GSS} V_{GDO} Volts Min	$V_{GS(off)}$ Volts Min	$V_{GS(off)}$ Volts Max	I_{DSS} mA Min	I_{DSS} mA Max	Package
MPF102	1.6	200	7.0	3.0	–	25	–	8.0	2.0	20	TO–226AA, TO–92 Case 29–11
2N5486	3.5	100	5.0	1.0	4.0	25	2.0	6.0	8.0	20	
J309	12 (Typ)	250 (Typ)	7.5	2.5	1.5 (Typ)	25	1.0	4.0	12	30	
J310	12 (Typ)	250 (Typ)	7.5	2.5	1.5 (Typ)	25	2.0	6.5	24	60	
MMBF5457LT1	1.0	50	7.0	3.0	4.0	25	0.5	6.0	1.0	5.0	TO–236AB, SOT–23 Case 318–08
MMBF5484LT1	3.0	50	5.0	1.0	3.0	25	0.3	3.0	1.0	5.0	
MMBFJ309LT1	10	250	5.0	2.5	4.0	25	1.0	4.0	12	30	
MMBFJ310LT1	8.0	250	5.0	2.5	4.0	25	2.0	6.5	24	60	
MMBFU310LT1	10	250	5.0	2.5	4.0	25	2.5	6.0	24	60	
MMBF4416LT1	4.5	50	4.0	0.8	2.0	30	–	6.0	5.0	15	

Devices listed in ***bold italic*** are ON Semiconductor preferred devices.

Junctional Field–Effect Transistors (continued)

JFETs (continued)

Switches and Choppers

N–Channel	P–Channel	$R_{DS(on)}$ Ω Max	C_{iss} pF Max	C_{rss} pF Max	V_{GSS} V_{GDO} Volts Min	$V_{GS(off)}$ Volts		I_{DSS} mA		t_{on} ns Max	t_{off} ns Max	Package
						Min	Max	Min	Max			
J112	–	50	28	5.0	35	1.0	5.0	5.0	–	–	–	TO–226AA, TO–92 Case 29–11
MPF4392	–	60	10	3.5	30	–	–	25	75	15	35	
2N5639	–	60	10	4.0	30	–	8.0 (Typ)	25	–	–	–	
MPF4393	–	100	10	3.5	30	–	12 (Typ)	5.0	30	15	55	
J110	–	18	–	–	25	0.5	4.0	10	–	–	–	
2N5555	–	150	5.0	1.2	25	–	–	15	–	5.0	15	
2N5638	–	30	10	4.0	30	–	–	50	–	4.0	5.0	
J111	–	30	28	5.0	35	3.0	10	20	–	–	–	
J113	–	100	28	5.0	35	0.5	3.0	2.0	–	–	–	
MPF4856	–	25	18	8.0	40	4.0	10	50	–	6.0	25	
BSR58LT1	–	60	28	5.0	40	0.8	4.0	8.0	80	–	–	TO–236AB, SOT–23 Case 318–08
MMBF4391LT1	–	30	10	3.5	30	4.0	10	50	150	–	–	
MMBF4392LT1	–	60	10	3.5	30	2.0	5.0	25	75	–	–	
MMBF4393LT1	–	100	10	3.5	30	0.5	3.0	5.0	30	–	–	
–	***MMBFJ175LT1***	125	11	5.5	30	3.0	6.0	7.0	60	–	–	
–	***MMBFJ177LT1***	300	–	–	30	0.8	2.5	1.5	20	–	–	

Devices listed in ***bold italic*** are ON Semiconductor preferred devices.

Tuning and Switching Diodes

Tuning Diodes – Abrupt Junction

Device	V_R Volts	C_T @ V_R = 4.0 V, 1.0 MHz			Cap Ratio Min	Q @ 4.0 V 50 MHz Typ	Package
		pF Min	pF Nominal	pF Max			
MV2101	30	6.1	6.8	7.5	2.5	450	TO–226AC, TO–92 2–Lead Case 182–06
MV2105	30	13.5	15	16.5	2.5	400	
MV2109	30	29.7	33	36.3	2.5	200	
LV2205	25	13	–	17	2.0	200	
LV2209	25	26.4	–	39.6	2.5	150	
MMBV2105LT1	30	13.5	15	16.5	2.5	400	TO–236AB, SOT–23 Case 318–08
MMBV2107LT1	30	19.8	22	24.2	2.5	350	
MMBV2109LT1	30	29.7	33	36.3	2.5	200	
MMBV2101LT1	30	6.1	6.8	7.5	2.5	450	
MMBV2103LT1	30	9.0	10	11	2.5	400	
MMBV2108LT1	30	24.3	–	29.7	2.5	200	
MMBV3102LT1	30	20	–	25	4.5	200	
MMVL2101T1	30	6.1	6.8	7.5	2.5	400 (Min)	SOD–323 Case 477–02
MMVL2105T1	30	13.5	15	16.5	2.5	350 (Min)	

Devices listed in ***bold italic*** are ON Semiconductor preferred devices.

Tuning Diodes – Hyper–Abrupt Junction

Device	V_R Volts	C_T (f = 1.0 MHz)			Cap Ratio			Q 3.0 V Min	Type	Package
		pF Min	pF Max	Volts	Min	Max	Volts			
MV209	30	26	32	3.0	5.0	6.5	3.0/25	200	Single	TO–226AC, TO–92 2–Lead Case 182–06
MV104	32	37	42	3.0	2.5	2.8	–	100	Single	
MMBV105GLT1	30	1.5	2.8	25	4.0	6.5	3.0/25	200	Single	TO–236AB, SOT–23 Case 318–08
MMBV109LT1	30	26	32	3.0	5.0	6.5	3.0/25	200	Single	
MMBV409LT1	20	26	32	3.0	1.5	1.9	3.0/8.0	200	Single	
MMBV809LT1	20	4.5	6.1	2.0	1.8	2.6	2.0/8.0	300	Single	
MMBV432LT1	14	43	48	2.0	1.5	2.0	–	100@ 2.0V	Single	
MMBV609LT1	20	26	32	3.0	1.8	2.4	3/8	250	Dual Common Cathode	
MMVL105GT1	30	1.5	2.8	25	4.0	6.5	3.0/25	200	Single	SOD–323 Case 477–02
MMVL809T1	20	4.5	6.1	2	1.8	2.6	2.0/8.0	300	Single	
MMVL3102T1	30	20	25	3	4.5	–	3.0/25	200	Single	
MMVL109T1	30	26	32	3	5.0	6.5	3.0/25	200	Single	
MMVL409T1	20	26	32	3	1.5	1.9	3.0/8.0	200	Single	

Devices listed in ***bold italic*** are ON Semiconductor preferred devices.

Schottky Diodes

Device	V_R Volts	C_T @ V		V_F Volts Max	I_R @ V		Type	Package
		pF Max	Volts		nA Max	Volts		
MBD701	70	1.0	20	1.0	200	35	Single	TO–226AC, TO–92 2–Lead Case 182–06
MBD301	30	1.5	15	0.6	200	25	Single	
MBD101	7.0	1.0	0	0.6	250	3.0	Single	
BAT54T1	30	10	1.0	0.4	2000	25	Single	SOD–123 Case 425–04
MMSD301T1	30	1.5	15	0.6	200	25	Single	
MMSD701T1	70	1.0	20	1.0	200	35	Single	
BAT54HT1	30	10	1.0	0.4	2000	25	Single	SOD–323 Case 477–02
MMDL101T1	7	1.0	0	0.6	250	3.0	Single	
MMDL301T1	30	1.5	15	0.6	200	25	Single	
MMDL770T1	70	1.0	20	1.0	200	35	Single	
RB751V40T1	30	2.5	1.0	0.37	500	30	Single	
BAS40LT1	40	5.0	1.0	0.5	1000	25	Single	TO–236AB, SOT–23 Case 318–08
BAS40–04LT1	40	5.0	1.0	0.5	1000	25	Dual Series	
BAS40–06LT1	40	5.0	1.0	0.5	1000	25	Dual Common Anode	
BAS70LT1	70	2.0	0	0.75	100	50	Single	
BAS70–04LT1	70	2.0	0	0.75	100	50	Dual Series	
BAT54LT1	30	10	1.0	0.4	2000	25	Single	
BAT54ALT1	30	10	1.0	0.4	2000	25	Dual Common Anode	
BAT54SLT1	30	10	1.0	0.4	2000	25	Dual Series	
MMBD701LT1	70	1.0	20	1.0	200	35	Single	
MMBD301LT1	30	1.5	15	0.6	200	25	Single	
MMBD101LT1	7.0	1.0	0	0.6	250	3.0	Single	
MMBD452LT1	30	1.5	15	0.6	200	25	Dual Series	
MMBD352LT1	7.0	1.0	0	0.6	250	3.0	Dual Series	
MMBD353LT1	7.0	1.0	0	0.6	250	3.0	Dual Series	
MMBD354LT1	7.0	1.0	0	0.6	250	3.0	Dual Common Cathode	
MMBD355LT1	7.0	1.0	0	0.6	250	3.0	Dual Common Anode	
BAT54WT1	30	10	1.0	0.4	2000	25	Single	SC–70, SOT–323 Case 419–04
BAT54SWT1	30	10	1.0	0.4	2000	25	Dual Series	
MMBD330T1	30	1.5	15	0.6	200	25	Single	
MMBD770T1	70	1.0	20	1.0	200	35	Single	
MMBD717LT1	20	2.5	1.0	0.37	1000	10	Dual Common Anode	
MMBD352WT1	7.0	1.0	0	0.6	250	3.0	Dual Series	
MBD54DWT1	30	1.0	0	0.32	2000	25	Dual Series	SC–88, SOT–363 Case 419B–02
MBD330DWT1	30	1.5	0	0.4	200	25	Dual Series	
MBD770DWT1	70	1.0	0	0.5	200	35	Dual Series	
MBD110DWT1	7.0	1.0	0	0.6	250	3.0	Dual Series	
NSR15TW1T2	15	1.0	0	0.415	50	1.0	Triple	

Devices listed in ***bold italic*** are ON Semiconductor preferred devices.

Switching Diodes

PIN Switching Diodes

Device	V_R Volts Min	C_T @ V		Resistance Ω Max	I_R μA Max	Type	Package
		pF Max	Volts				
MPN3700	200	1.0	20	1.0	0.1	Single	TO–226AC, TO–92 2–Lead Case 182–06
MPN3404	20	2.0	15	0.85	0.1	Single	
MSD6100	100	1.5	0.0	–	0.1	Dual Common Cathode	TO–226AA, TO–92 Case 29–11
MSD6150	70	8.0	0.0	–	0.1	Dual Common Anode	
MMBV3700LT1	200	1.0	20	1.0	0.1	Single	TO–236AB, SOT–23 Case 318–08
MMBV3401LT1	35	1.0	20	0.7	0.1	Single	
MMVL3700T1	200	1.0	20	1.0	0.1	Single	SOD–323 Case 477–02
MMVL3401T1	35	1.0	20	0.7	0.1	Single	

Devices listed in ***bold italic*** are ON Semiconductor preferred devices.

General–Purpose Signal and Switching Diodes

Device	V_R Min Volts	I_R Max μA	V_F		C_T Max pF	t_{rr} Max ns	Type	Package
			Min Volts	Max Volts				
BAS21LT1	250	0.1	–	1.0	5.0	50	Single	TO–236AB, SOT–23 Case 318–08
BAS21SLT1	250	0.1	–	1.0	5.0	50	Dual Series	
MMBD914LT1	100	5.0	–	1.0	4.0	4.0	Single	
BAS16LT1	75	1.0	–	1.0	2.0	6.0	Single	
MMBD6050LT1	70	0.1	0.85	1.1	2.5	4.0	Single	
BAL99LT1	70	2.5	–	1.0	1.5	6.0	Single	
BAS116LT1	75	0.005	–	0.9	2.0	3000	Single	
MMBD7000LT1	100	1.0	0.75	1.1	1.5	4.0	Dual Series	
MMBD2836LT1	75	0.1	–	1.0	4.0	4.0	Dual Common Anode	
MMBD2838LT1	75	0.1	–	1.0	4.0	4.0	Dual Common Cathode	
BAV70LT1	70	5.0	–	1.0	1.5	6.0	Dual Common Cathode	
BAV99LT1	70	2.5	–	1.0	1.5	4.0	Dual Series	
BAW56LT1	70	2.5	–	1.0	2.0	6.0	Dual Common Anode	
MMBD6100LT1	70	0.1	0.85	1.1	2.5	4.0	Dual Common Cathode	
BAV74LT1	50	0.1	–	1.0	2.0	4.0	Dual Common Cathode	
MMBD2835LT1	35	0.1	–	1.0	4.0	4.0	Dual Common Anode	
MMBD2837LT1	35	0.1	–	1.0	4.0	4.0	Dual Common Cathode	
BAV199LT1	70	0.005	–	0.9	2.0	3000	Dual Series	
BAS20LT1	200	0.1	–	1.0	5.0	50	Single	
BAS19LT1	120	0.1	–	1.0	5.0	50	Single	

General–Purpose Signal and Switching Diodes

Device	V_R Min Volts	I_R Max µA	V_F Min Volts	V_F Max Volts	C_T Max pF	t_{rr} Max ns	Type	Package
M1MA151AT1	40	0.1	–	1.2	2.0	3.0	Single	**SC–59 Case 318D–04**
M1MA151KT1	40	0.1	–	1.2	2.0	3.0	Single	
M1MA152AT1	80	0.1	–	1.2	2.0	3.0	Single	
M1MA152KT1	80	0.1	–	1.2	2.0	3.0	Single	
M1MA151WAT1	40	0.1	–	1.2	15	10	Dual Common Anode	
M1MA151WKT1	40	0.1	–	1.2	2.0	3.0	Dual Common Cathode	
M1MA152WAT1	80	0.1	–	1.2	15	10	Dual Common Anode	
M1MA152WKT1	80	0.1	–	1.2	2.0	3.0	Dual Common Cathode	
BAS16WT1	75	1.0		1.25	2.0	6.0	Single	**SC–70, SOT–323 Case 419–04**
M1MA141KT1	40	0.1		1.2	2.0	3.0	Single	
M1MA142KT1	80	0.1		1.2	2.0	3.0	Single	
M1MA174T1	100	5.0		1.0	4.0	4.0	Single	
M1MA142WKT1	80	0.1	–	1.2	2.0	3.0	Dual Common Cathode	
M1MA142WAT1	80	0.1	–	1.2	15	10	Dual Common Anode	
BAW56WT1	70	2.5	–	1.0	2.0	6.0	Dual Common Anode	
BAV70WT1	70	5.0	–	1.0	1.5	6.0	Dual Common Cathode	
BAV99WT1	70	2.5	–	1.0	1.5	6.0	Dual Series	
BAV99RWT1	70	2.5	–	1.0	1.5	6.0	Dual Series	
M1MA141WKT1	40	0.1	–	1.2	2.0	3.0	Dual Common Cathode	
M1MA141WAT1	40	0.1	–	1.2	15	10	Dual Common Anode	
DAP202U	–	0.1	–	1.2	3.5	10	Dual Common Anode	
MMSD914T1	100	5.0	–	1.0	4.0	4.0	Single	**SOD–123 Case 425–04**
MMSD71RKT1	80	0.5	–	1.2	2.0	4.0	Single	
MMSD103T1	250	100	–	1.0	5.0	50	Single	
MMSD4148T1	100	5.0	–	1.0	4.0	4.0	Single	
BAS16HT1	75	1.0	–	1.0	2.0	6.0	Single	**SOD–323 Case 477–02**
BAS20HT1	200	0.1			5.0	50	Single	
BAS21HT1	250	0.1	–	1.0	5.0	50	Single	
MMDL914T1	100	5.0	–	1.0	4.0	4.0	Single	
MMDL6050T1	70	0.1	0.85	1.1	2.5	4.0	Single	
BAS16TT1	75	1.0	–	1.0	2.0	6.0	Single	**SOT–416, SC–75, SC–90 Case 463–01**
DA121TT1	80	1.0			2.0	6.0	Single	
DAP222	80	0.1	–	1.2	3.5	4.0	Dual Common Anode	
BAW56TT1	70	2.5	–	1.0	2.0	6.0	Dual Common Anode	
DAN222	80	0.1	–	1.2	3.5	4.0	Dual Common Cathode	
BAV70TT1	70	5.0	–	1.0	1.5	6.0	Dual Common Cathode	

Devices listed in ***bold italic*** are ON Semiconductor preferred devices.

TVS/Zeners
Transient Voltage Suppressors (TVS)
Zener Regulator Diodes

In Brief . . .

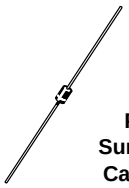
ON Semiconductor's standard TVS (Transient Voltage Suppressors) and Zener diodes comprise the largest inventoried line in the industry. Continuous development of improved manufacturing techniques have resulted in computerized diffusion and test, as well as critical process controls learned from surface–sensitive MOS fabrication. The resulting higher yields have lowered the factory costs. Check the following features for application to your specific requirements:

- Wide selection of package materials and styles:
  - Plastic (Surmetic) for low cost, mechanical ruggedness
  - Glass for high reliability, low cost
  - Surface Mount packages for state of the art designs
- Steady State Power Dissipation from 0.25 to 5.0 Watts
- Breakdown voltages from 1.8 to 400 Volts in approximately 10% steps
- Transient Voltage Suppression Protection from 24 to 1500 Watts with Working Peak Reverse Voltage from 5.0 to 214 Volts
- ESD protection devices
- Special selection of electrical characteristics available at low cost due to high–volume lines (check your ON Semiconductor sales representative for special quotations)
- UL Recognition on many TVS device types
- Tape and Reel options available on all axial leaded and surface mount types
- Many TVS are offered as bidirectional (clipper devices)
- Standard Zener tolerance is ± 5.0%

	Page
Zener Diodes	168
Axial Leaded	168
Surface Mount	170
TVS (Transient Voltage Suppressors)	174
Axial Leaded	174
500 Watt	174
600 Watt	176
1500 Watt	178
Surface Mount Packages	181
175 Watt (Powermite)	181
400 Watt (SMA)	182
600 Watt (SMB)	184
1500 Watt (SMC)	189
Multiple Device Packages	191
Duals	191
Quads	193

Zener Diodes — Regulation in Axial Leads

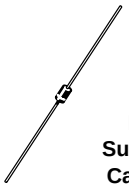
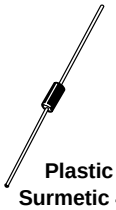
Table 1. Axial Leaded — 3, 5 Watt

Nominal Zener Breakdown Voltage	3 Watt Cathode = Polarity Band		5 Watt Cathode =Polarity Band
Volts	 **Plastic Surmetic 30 Case 59-10 (DO-41)**		 **Plastic Surmetic 40 Case 17**
1.8			
2.0			
2.2			
2.4			
2.5			
2.7			
2.8			
3.0			
3.3		1N5913B	1N5333B
3.6	MZP4729A	1N5914B	1N5334B
3.9	MZP4730A	1N5915B	1N5335B
4.3	MZP4731A	1N5916B	1N5336B
4.7	MZP4732A	1N5917B	1N5337B
5.1	MZP4733A	***1N5918B***	1N5338B
5.6	MZP4734A	1N5919B	1N5339B
6.0			1N5340B
6.2	MZP4735A	***1N5920B***	1N5341B
6.8	MZP4736A	1N5921B	1N5342B
7.5	MZP4737A	1N5922B	1N5343B
8.2	MZP4738A	1N5923B	1N5344B
8.7			1N5345B
9.1	MZP4739A	1N5924B	1N5346B
10	MZP4740A	1N5925B	1N5347B
11	MZP4741A	1N5926B	1N5348B
12		1N5927B	1N5349B
13	MZP4743A	1N5928B	1N5350B
14			1N5351B
15	MZP4744A	***1N5929B***	1N5352B
16	MZP4745A	1N5930B	1N5353B
17			1N5354B
18	***MZP4746A***	1N5931B	1N5355B
19			1N5356B
20	MZP4747A	1N5932B	1N5357B
22	MZP4748A	1N5933B	1N5358B
24	***MZP4749A***	1N5934B	1N5359B

Devices listed in **bold**, ***italic*** are ON Semiconductor preferred devices.

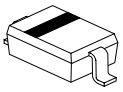
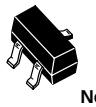
Zener Diodes — Regulation in Axial Leads (continued)

Table 1. Axial Leaded — 3, 5 Watt (continued)

Nominal Zener Breakdown Voltage	3 Watt Cathode = Polarity Band		5 Watt Cathode = Polarity Band
Volts	 **Plastic Surmetic 30 Case 59-10 (DO-41)**		 **Plastic Surmetic 40 Case 17**
25			1N5360B
27	MZP4750A	1N5935B	1N5361B
28			1N5362B
30	***MZP4751A***	***1N5936B***	1N5363B
33		1N5937B	1N5364B
36		1N5938B	1N5365B
39		1N5939B	1N5366B
43		1N5940B	1N5367B
47		1N5941B	1N5368B
51		1N5942B	1N5369B
56		1N5943B	1N5370B
60			1N5371B
62		1N5944B	1N5372B
68		1N5945B	1N5373B
75		1N5946B	1N5374B
82		1N5947B	1N5375B
87			1N5376B
91		1N5948B	1N5377B
100		1N5949B	1N5378B
110		1N5950B	1N5379B
120		1N5951B	1N5380B
130		1N5952B	1N5381B
140			1N5382B
150		1N5953B	1N5383B
160		1N5954B	1N5384B
170			1N5385B
180	1M180ZS5	***1N5955B***	1N5386B
190			1N5387B
200	1M200ZS5	1N5956B	1N5388B
220			
240			
270			
300			
330			
360			
400			

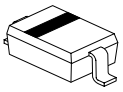
Zener Diodes — Regulation in Surface Mount

Table 2. Surface Mount Packages — .2, .225, .5 Watt

Nominal Zener Break–down Voltage	200 mW	225 mW		500 mW		
	SOD–323	SOT-23		SOD-123		
Volts	 Case 477 Style 1	 Anode Cathode No Connection Plastic Case 318 TO-236AB		Plastic Case 425, Style 1		
1.8					MMSZ4678T1	
2.0					MMSZ4679T1	
2.2					MMSZ4680T1	
2.4	MM3Z2V4T1	BZX84C2V4LT1	MMBZ5221BLT1	MMSZ2V4T1	MMSZ4681T1	MMSZ5221BT1
2.5			MMBZ5222BLT1			MMSZ5222BT1
2.7	MM3Z2V7T1	BZX84C2V7LT1	MMBZ5223BLT1	MMSZ2V7T1	MMSZ4682T1	MMSZ5223BT1
2.8			MMBZ5224BLT1			MMSZ5224BT1
3.0	MM3Z3V0T1	BZX84C3V0LT1	MMBZ5225BLT1	MMSZ3V0T1	MMSZ4683T1	MMSZ5225BT1
3.3	MM3Z3V3T1	BZX84C3V3LT1	MMBZ5226BLT1	MMSZ3V3T1	MMSZ4684T1	MMSZ5226BT1
3.6	MM3Z3V6T1	BZX84C3V6LT1	MMBZ5227BLT1	MMSZ3V6T1	MMSZ4685T1	MMSZ5227BT1
3.9	MM3Z3V9T1	BZX84C3V9LT1	MMBZ5228BLT1	MMSZ3V9T1	MMSZ4686T1	MMSZ5228BT1
4.3	MM3Z4V3T1	BZX84C4V3LT1	MMBZ5229BLT1	MMSZ4V3T1	MMSZ4687T1	MMSZ5229BT1
4.7	MM3Z4V7T1	BZX84C4V7LT1	MMBZ5230BLT1	MMSZ4V7T1	MMSZ4688T1	MMSZ5230BT1
5.1	MM3Z5V1T1	BZX84C5V1LT1	MMBZ5231BLT1	MMSZ5V1T1	MMSZ4689T1	MMSZ5231BT1
5.6	MM3Z5V6T1	BZX84C5V6LT1	MMBZ5232BLT1	MMSZ5V6T1	MMSZ4690T1	MMSZ5232BT1
6.0			MMBZ5233BLT1			MMSZ5233BT1
6.2	MM3Z6V2T1	BZX84C6V2LT1	MMBZ5234BLT1	MMSZ6V2T1	MMSZ4691T1	MMSZ5234BT1
6.8	MM3Z6V8T1	BZX84C6V8LT1	MMBZ5235BLT1	MMSZ6V8T1	MMSZ4692T1	MMSZ5235BT1
7.5	MM3Z7V5T1	BZX84C7V5LT1	MMBZ5236BLT1	MMSZ7V5T1	MMSZ4693T1	MMSZ5236BT1
8.2	MM3Z8V2T1	BZX84C8V2LT1	MMBZ5237BLT1	MMSZ8V2T1	MMSZ4694T1	MMSZ5237BT1
8.7			MMBZ5238BLT1		MMSZ4695T1	MMSZ5238BT1
9.1	MM3Z9V1T1	BZX84C9V1LT1	MMBZ5239BLT1	MMSZ9V1T1	MMSZ4696T1	MMSZ5239BT1
10	MM3Z10VT1	BZX84C10LT1	MMBZ5240BLT1	MMSZ10T1	MMSZ4697T1	MMSZ5240BT1
11	MM3Z11VT1	BZX84C11LT1	MMBZ5241BLT1	MMSZ11T1	MMSZ4698T1	MMSZ5241BT1
12	MM3Z12VT1	BZX84C12LT1	MMBZ5242BLT1	MMSZ12T1	MMSZ4699T1	MMSZ5242BT1
13	MM3Z13VT1	BZX84C13LT1	MMBZ5243BLT1	MMSZ13T1	MMSZ4700T1	MMSZ5243BT1
14			MMBZ5244BLT1		MMSZ4701T1	MMSZ5244BT1
15	MM3Z15VT1	BZX84C15LT1	MMBZ5245BLT1	MMSZ15T1	MMSZ4702T1	MMSZ5245BT1
16	MM3Z16VT1	BZX84C16LT1	MMBZ5246BLT1	MMSZ16T1	MMSZ4703T1	MMSZ5246BT1
17			MMBZ5247BLT1		MMSZ4704T1	MMSZ5247BT1
18	MM3Z18VT1	BZX84C18LT1	MMBZ5248BLT1	MMSZ18T1	MMSZ4705T1	MMSZ5248BT1
19			MMBZ5249BLT1		MMSZ4706T1	MMSZ5249BT1
20	MM3Z20VT1	BZX84C20LT1	MMBZ5250BLT1	MMSZ20T1	MMSZ4707T1	MMSZ5250BT1
22	MM3Z22VT1	BZX84C22LT1	MMBZ5251BLT1	MMSZ22T1	MMSZ4708T1	MMSZ5251BT1
24	MM3Z24VT1	BZX84C24LT1	MMBZ5252BLT1	MMSZ24T1	MMSZ4709T1	MMSZ5252BT1
25			MMBZ5253BLT1		MMSZ4710T1	MMSZ5253BT1
27	MM3Z27VT1	BZX84C27LT1	MMBZ5254BLT1	MMSZ27T1	MMSZ4711T1	MMSZ5254BT1
28			MMBZ5255BLT1		MMSZ4712T1	MMSZ5255BT1
30	MM3Z30VT1	BZX84C30LT1	MMBZ5256BLT1	MMSZ30T1	MMSZ4713T1	MMSZ5256BT1
33	MM3Z33VT1	BZX84C33LT1	MMBZ5257BLT1	MMSZ33T1	MMSZ4714T1	MMSZ5257BT1

Zener Diodes — Regulation in Surface Mount (continued)

Table 2. Surface Mount Packages — .2, .225, .5 Watt (continued)

Nominal Zener Break–down Voltage	200 mW	225 mW		500 mW		
	SOD–323	SOT-23		SOD-123		
Volts	 Case 477 Style 1	Plastic Case 318 TO-236AB		Plastic Case 425, Style 1		
36	MM3Z36VT1	BZX84C36LT1	MMBZ5258BLT1	MMSZ36T1	MMSZ4715T1	MMSZ5258BT1
39	MM3Z39VT1	BZX84C39LT1	MMBZ5259BLT1	MMSZ39T1	MMSZ4716T1	MMSZ5259BT1
43	MM3Z43VT1	BZX84C43LT1	MMBZ5260BLT1	MMSZ43T1	MMSZ4717T1	MMSZ5260BT1
47	MM3Z47VT1	BZX84C47LT1	MMBZ5261BLT1	MMSZ47T1		MMSZ5261BT1
51	MM3Z51VT1	BZX84C51LT1	MMBZ5262BLT1	MMSZ51T1		MMSZ5262BT1
56	MM3Z56VT1	BZX84C56LT1	MMBZ5263BLT1	MMSZ56T1		MMSZ5263BT1
60			MMBZ5264BLT1			MMSZ5264BT1
62	MM3Z62VT1	BZX84C62LT1	MMBZ5265BLT1	MMSZ62T1		MMSZ5265BT1
68	MM3Z68VT1	BZX84C68LT1	MMBZ5266BLT1	MMSZ68T1		MMSZ5266BT1
75	MM3Z75VT1	BZX84C75LT1	MMBZ5267BLT1	MMSZ75T1		MMSZ5267BT1
82			MMBZ5268BLT1			MMSZ5268BT1
87			MMBZ5269BLT1			MMSZ5269BT1
91			MMBZ5270BLT1			MMSZ5270BT1
100						
110						
120						
130						
150						
160						
180						
200						

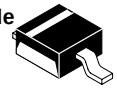
Zener Diodes — Regulation in Surface Mount (continued)

Table 3. Surface Mount Packages — 1.5, 3 Watt

Nominal Zener Break–down Voltage	1.5 Watt SMA	3 Watt POWERMITE™	3 Watt SMB
Volts	 Plastic Case 403B Cathode = Notch	Cathode Anode Plastic Case 457	 Plastic Case 403A
1.8			
2.0			
2.2			
2.4			
2.5			
2.7			
2.8			
3.0			
3.3	1SMA5913BT3		1SMB5913BT3
3.6	1SMA5914BT3		1SMB5914BT3
3.9	1SMA5915BT3		1SMB5915BT3
4.3	1SMA5916BT3		1SMB5916BT3
4.7	1SMA5917BT3		1SMB5917BT3
5.1	1SMA5918BT3		1SMB5918BT3
5.6	1SMA5919BT3		1SMB5919BT3
6.0			
6.2	1SMA5920BT3	1PMT5920BT3	1SMB5920BT3
6.8	1SMA5921BT3	1PMT5921BT3	1SMB5921BT3
7.5	1SMA5922BT3	1PMT5922BT3	1SMB5922BT3
8.2	1SMA5923BT3	1PMT5923BT3	1SMB5923BT3
8.7			
9.1	1SMA5924BT3	1PMT5924BT3	1SMB5924BT3
10	1SMA5925BT3	1PMT5925BT3	1SMB5925BT3
11	1SMA5926BT3		1SMB5926BT3
12	1SMA5927BT3	1PMT5927BT3	1SMB5927BT3
13	1SMA5928BT3		1SMB5928BT3
14		1PMT5929BT3	1SMB5929BT3
15	1SMA5929BT3		
16	1SMA5930BT3	1PMT5930BT3	1SMB5930BT3
17			
18	1SMA5931BT3	1PMT5931BT3	1SMB5931BT3
19			
20	1SMA5932BT3		1SMB5932BT3
22	1SMA5933BT3	1PMT5933BT3	1SMB5933BT3
24	1SMA5934BT3	1PMT5934BT3	1SMB5934BT3
25			
27	1SMA5935BT3	1PMT5935BT3	1SMB5935BT3
28			
30	1SMA5936BT3	1PMT5936BT3	1SMB5936BT3
33	1SMA5937BT3		1SMB5937BT3

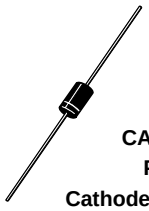
Zener Diodes — Regulation in Surface Mount (continued)

Table 3. Surface Mount Packages — 1.5, 3 Watt (continued)

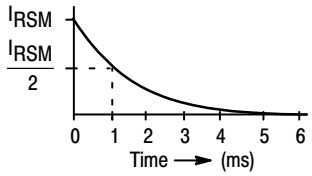
Nominal Zener Break–down Voltage	1.5 Watt SMA	3 Watt POWERMITE	3 Watt SMB
Volts	 Plastic Case 403B Cathode = Notch	Cathode  Anode Plastic Case 457	 Plastic Case 403A
36	1SMA5938BT3		1SMB5938BT3
39	1SMA5939BT3	1PMT5939BT3	1SMB5939BT3
43	1SMA5940BT3		1SMB5940BT3
47	1SMA5941BT3	1PMT5941BT3	1SMB5941BT3
51	1SMA5942BT3		1SMB5942BT3
56	1SMA5943BT3		1SMB5943BT3
60			
62	1SMA5944BT3		1SMB5944BT3
68	1SMA5945BT3		1SMB5945BT3
75			1SMB5946BT3
82			1SMB5947BT3
87			
91			1SMB5948BT3
100			1SMB5949BT3
110			1SMB5950BT3
120			1SMB5951BT3
130			1SMB5952BT3
150			1SMB5953BT3
160			1SMB5954BT3
180			1SMB5955BT3
200			1SMB5956BT3

TVS — in Axial Leads

Table 4. Peak Power Dissipation, *500 Watts* @ 1 ms Surge
Case 59-09 — MiniMOSORB™



CASE 59–09 (MiniMOSORB™)
PLASTIC
Cathode = Polarity Band



Surge Current Characterisitcs

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted) V_F = 3.5 V Max, I_F = 35 A Pulse (except bidirectional devices).

Working Peak Reverse Voltage V_{RWM} (Volts)	Device	Breakdown Voltage V_{BR} (Volts) Min	Breakdown Voltage V_{BR} (Volts) Max	Breakdown Voltage @ I_T Pulse (mA)	Maximum Reverse Leakage @ V_{RWM} I_R (μA)	Maximum Reverse Surge Current I_{RSM} (Amps)	Maximum Reverse Voltage @ I_{RSM} (Clamping Voltage) V_{RSM} (Volts)
5	***SA5.0A***	6.4	7	10	600	54.3	9.2
6	***SA6.0A***	6.67	7.37	10	600	48.5	10.3
6.5	SA6.5A	7.22	7.98	10	400	44.7	11.2
7	SA7.0A	7.78	8.6	10	150	41.7	12
7.5	SA7.5A	8.33	9.21	1	50	38.8	12.9
8	SA8.0A	8.89	9.83	1	25	36.7	13.6
8.5	SA8.5A	9.44	10.4	1	5	34.7	14.4
9	SA9.0A	10	11.1	1	1	32.5	15.4
10	SA10A	11.1	12.3	1	1	29.4	17
11	***SA11A***	12.2	13.5	1	1	27.4	18.2
12	***SA12A***	13.3	14.7	1	1	25.1	19.9
13	SA13A	14.4	15.9	1	1	23.2	21.5
14	SA14A	15.6	17.2	1	1	21.5	23.2
15	***SA15A***	16.7	18.5	1	1	20.6	24.4
16	SA16A	17.8	19.7	1	1	19.2	26
17	SA17A	18.9	20.9	1	1	18.1	27.6
18	SA18A	20	22.1	1	1	17.2	29.2
20	SA20A	22.2	24.5	1	1	15.4	32.4
22	SA22A	24.4	26.9	1	1	14.1	35.5
24	SA24A	26.7	29.5	1	1	12.8	38.9
26	SA26A	28.9	31.9	1	1	11.9	42.1
28	SA28A	31.1	34.4	1	1	11	45.4
30	SA30A	33.3	36.8	1	1	10.3	48.4
33	SA33A	36.7	40.6	1	1	9.4	53.3

For bidirectional types use CA suffix, ***SA6.5CA, SA12CA, SA13CA and SA15CA*** are ON Semiconductor preferred devices.
Bi–directional devices have cathode polarity band on each end. (Consult factory for availability).

TVS — in Axial Leads (continued)

Table 4. Peak Power Dissipation, 500 Watts @ 1 ms Surge
Case 59-09 — MiniMOSORB (continued)

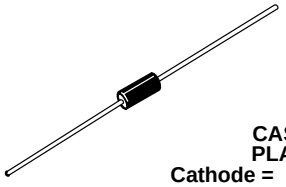
ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted) V_F = 3.5 V Max, I_F = 35 A Pulse (except bidirectional devices).

Working Peak Reverse Voltage V_{RWM} (Volts)	Device	Breakdown Voltage V_{BR} (Volts) Min	Breakdown Voltage V_{BR} (Volts) Max	Breakdown Voltage @ I_T Pulse (mA)	Maximum Reverse Leakage @ V_{RWM} I_R (μA)	Maximum Reverse Surge Current I_{RSM} (Amps)	Maximum Reverse Voltage @ I_{RSM} (Clamping Voltage) V_{RSM} (Volts)
36	SA36A	40	44.2	1	1	8.6	58.1
40	SA40A	44.4	49.1	1	1	7.8	64.5
43	SA43A	47.8	52.8	1	1	7.2	69.4
45	SA45A	50	55.3	1	1	6.9	72.7
48	SA48A	53.3	58.9	1	1	6.5	77.4
51	SA51A	56.7	62.7	1	1	6.1	82.4
54	SA54A	60	66.3	1	1	5.7	87.1
58	SA58A	64.4	71.2	1	1	5.3	93.6
60	SA60A	66.7	73.7	1	1	5.2	96.8
64	SA64A	71.1	78.6	1	1	4.9	103
70	SA70A	77.8	86	1	1	4.4	113
75	SA75A	83.3	92.1	1	1	4.1	121
78	SA78A	86.7	95.8	1	1	4	126
85	SA85A	94.4	104	1	1	3.6	137
90	***SA90A***	100	111	1	1	3.4	146
100	SA100A	111	123	1	1	3.1	162
110	SA110A	122	135	1	1	2.8	177
120	SA120A	133	147	1	1	2.5	193
130	SA130A	144	159	1	1	2.4	209
150	SA150A	167	185	1	1	2.1	243
160	SA160A	178	197	1	1	1.9	259
170	SA170A	189	209	1	1	1.8	275

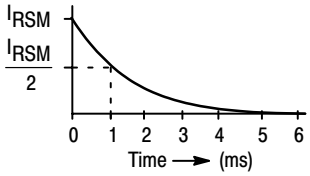
For bidirectional types use CA suffix, ***SA18CA*** and ***SA24CA*** are ON Semiconductor preferred devices.
Bi–directional devices have cathode polarity band on each end. (Consult factory for availability).

TVS — in Axial Leads (continued)

Table 5. Peak Power Dissipation, 600 Watts @ 1 ms Surge
Case 17 — Surmetic 40



CASE 17
PLASTIC
Cathode = Polarity Band



Surge Current Characterisitcs

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted) V_F = 3.5 V Max, I_F = 50 A Pulse (except bidirectional devices).

Breakdown Voltage V_{BR} (Volts) Nom	Breakdown Voltage @ I_T Pulse (mA)	Device	Working Peak Reverse Voltage V_{RWM} (Volts)	Maximum Reverse Leakage @ V_{RWM} I_R (μA)	Maximum Reverse Surge Current I_{RSM} (Amps)	Maximum Reverse Voltage @ I_{RSM} (Clamping Voltage) V_{RSM} (Volts)
6.8	10	***P6KE6.8A***	5.8	1000	57	10.5
7.5	10	P6KE7.5A	6.4	500	53	11.3
8.2	10	P6KE8.2A	7.02	200	50	12.1
9.1	1	P6KE9.1A	7.78	50	45	13.4
10	1	P6KE10A	8.55	10	41	14.5
11	1	P6KE11A	9.4	5	38	15.6
12	1	P6KE12A	10.2	5	36	16.7
13	1	P6KE13A	11.1	5	33	18.2
15	1	***P6KE15A***	12.8	5	28	21.2
16	1	P6KE16A	13.6	5	27	22.5
18	1	P6KE18A	15.3	5	24	25.2
20	1	P6KE20A	17.1	5	22	27.7
22	1	P6KE22A	18.8	5	20	30.6
24	1	P6KE24A	20.5	5	18	33.2
27	1	P6KE27A	23.1	5	16	37.5
30	1	P6KE30A	25.6	5	14.4	41.4
33	1	P6KE33A	28.2	5	13.2	45.7
36	1	P6KE36A	30.8	5	12	49.9
39	1	P6KE39A	33.3	5	11.2	53.9
43	1	P6KE43A	36.8	5	10.1	59.3
47	1	P6KE47A	40.2	5	9.3	64.8
51	1	P6KE51A	43.6	5	8.6	70.1
56	1	P6KE56A	47.8	5	7.8	77
62	1	P6KE62A	53	5	7.1	85
68	1	P6KE68A	58.1	5	6.5	92
75	1	P6KE75A	64.1	5	5.8	103
82	1	P6KE82A	70.1	5	5.3	113
91	1	P6KE91A	77.8	5	4.8	125
100	1	P6KE100A	85.5	5	4.4	137
110	1	P6KE110A	94	5	4	152
120	1	P6KE120A	102	5	3.6	165
130	1	P6KE130A	111	5	3.3	179

For bidirectional types use CA suffix, ***P6KE7.5CA*** and ***P6KE11CA*** are ON Semiconductor preferred devices.

TVS — in Axial Leads (continued)

Table 5. Peak Power Dissipation, 600 Watts @ 1 ms Surge
Case 17 — Surmetic 40 (continued)

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted) V_F = 3.5 V Max, I_F = 50 A Pulse (except bidirectional devices).

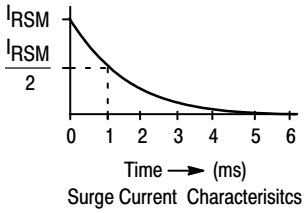
Breakdown Voltage V_{BR} (Volts) Nom	Breakdown Voltage @ I_T Pulse (mA)	Device	Working Peak Reverse Voltage V_{RWM} (Volts)	Maximum Reverse Leakage @ V_{RWM} I_R (μA)	Maximum Reverse Surge Current I_{RSM} (Amps)	Maximum Reverse Voltage @ I_{RSM} (Clamping Voltage) V_{RSM} (Volts)
150	1	P6KE150A	128	5	2.9	207
160	1	P6KE160A	136	5	2.7	219
170	1	P6KE170A	145	5	2.6	234
180	1	P6KE180A	154	5	2.4	246
200	1	P6KE200A	171	5	2.2	274

For bidirectional types use CA suffix. Bi–directional devices have cathode polarity band on each end. (Consult factory for availability).

TVS — in Axial Leads (continued)

Table 6. Peak Power Dissipation, 1500 Watts @ 1 ms Surge
Case 41A — MOSORB™

CASE 41A
PLASTIC
Cathode = Polarity Band



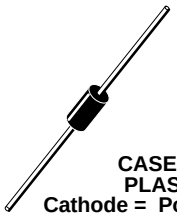
ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted) V_F = 3.5 V Max, I_F = 100 A Pulse)
(C suffix denotes standard back to back bidirectional versions. Test both polarities)

Max Reverse Stand-Off Voltage V_{RWM} (Volts)	JEDEC Device	Device	Breakdown Voltage V_{BR} Volts Min	Breakdown Voltage @ I_T Pulse (mA)	Maximum Reverse Leakage @ V_{RWM} I_R (μA)	Maximum Reverse Surge Current I_{RSM} (Volts)	Maximum Reverse Voltage @ I_{RSM} (Clamping Voltage) V_{RSM} (Volts)	Clamping Voltage(9) Peak Pulse Current @ I_{pp1} = 1 A V_{C1} (Volts max)	Clamping Voltage(9) Peak Pulse Current @ I_{pp2} = 10 A V_{C2} (Volts max)
5	***1N5908***		6	1	300	120	8.5	7.6 @ 30 A	8 @ 60 A
5	***1N6373***	***ICTE-5***/MPTE-5	6	1	300	160	9.4	7.1	7.5
8	1N6374	ICTE-8/MPTE-8	9.4	1	25	100	15	11.3	11.5
8	1N6382	ICTE-8C/MPTE-8C	9.4	1	25	100	15	11.4	11.6
10	1N6375	ICTE-10/MPTE-10	11.7	1	2	90	16.7	13.7	14.1
10	1N6383	ICTE-10C/MPTE-10C	11.7	1	2	90	16.7	14.1	14.5
12	1N6376	ICTE-12/MPTE-12	14.1	1	2	70	21.2	16.1	16.5
12	1N6384	ICTE-12C/MPTE-12C	14.1	1	2	70	21.2	16.7	17.1
15	1N6377	ICTE-15/MPTE-15	17.6	1	2	60	25	20.1	20.6
15	1N6385	ICTE-15C/MPTE-15C	17.6	1	2	60	25	20.8	21.4
18	1N6378	ICTE-18/MPTE-18	21.2	1	2	50	30	24.2	25.2
18	1N6386	ICTE-18C/MPTE-18C	21.2	1	2	50	30	24.8	25.5
22	1N6379	ICTE-22/MPTE-22	25.9	1	2	40	37.5	29.8	32
22	1N6387	ICTE-22C/MPTE-22C	25.9	1	2	40	37.5	30.8	32
36	1N6380	ICTE-36/MPTE-36	42.4	1	2	23	65.2	50.6	54.3
36	1N6388	ICTE-36C/MPTE-36C	42.4	1	2	23	65.2	50.6	54.3
45	1N6381	ICTE-45/MPTE-45	52.9	1	2	19	78.9	63.3	70
45	1N6389	ICTE-45C/MPTE-45C	52.9	1	2	19	78.9	63.3	70

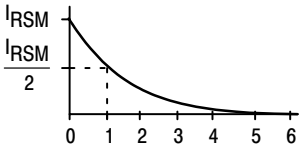
1N6382 thru 1N6389 and C suffix ICTE/MPTE device types are bidirectional. Bi–directional devices have cathode polarity band on each end. All other device types are unidirectional only. (Consult factory for availability)

TVS — in Axial Leads (continued)

Table 7. Peak Power Dissipation, 1500 Watts @ 1 ms Surge
Case 41A – MOSORB



CASE 41A
PLASTIC
Cathode = Polarity Band



Surge Current Characterisitcs

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted) V_F = 3.5 V Max, I_F = 100 A Pulse

Breakdown Voltage V_{BR} Volts Nom	Breakdown Voltage @ I_T Pulse (mA)	JEDEC Device	Device	Working Peak Reverse Voltage V_{RWM} (Volts)	Maximum Reverse Leakage @ V_{RWM} I_R (μA)	Maximum Reverse Surge Current I_{RSM} (Amps)	Maximum Reverse Voltage @ I_{RSM} (Clamping Voltage) V_{RSM} (Volts)
6.8	10	***1N6267A***	1.5KE6.8A	5.8	1000	143	10.5
7.5	10	1N6268A	1.5KE7.5A	6.4	500	132	11.3
8.2	10	1N6269A	1.5KE8.2A	7.02	200	124	12.1
9.1	1	1N6270A	1.5KE9.1A	7.78	50	112	13.4
10	1	1N6271A	1.5KE10A	8.55	10	103	14.5
11	1	1N6272A	1.5KE11A	9.4	5	96	15.6
12	1	1N6273A	1.5KE12A	10.2	5	90	16.7
13	1	1N6274A	1.5KE13A	11.1	5	82	18.2
15	1	***1N6275A***	1.5KE15A	12.8	5	71	21.2
16	1	1N6276A	1.5KE16A	13.6	5	67	22.5
18	1	1N6277A	1.5KE18A	15.3	5	59.5	25.2
20	1	1N6278A	1.5KE20A	17.1	5	54	27.7
22	1	1N6279A	***1.5KE22A***	18.8	5	49	30.6
24	1	***1N6280A***	1.5KE24A	20.5	5	45	33.2
27	1	***1N6281A***	1.5KE27A	23.1	5	40	37.5
30	1	***1N6282A***	1.5KE30A	25.6	5	36	41.4
33	1	***1N6283A***	1.5KE33A	28.2	5	33	45.7
36	1	1N6284A	1.5KE36A	30.8	5	30	49.9
39	1	***1N6285A***	***1.5KE39A***	33.3	5	28	53.9
43	1	1N6286A	1.5KE43A	36.8	5	25.3	59.3
47	1	1N6287A	1.5KE47A	40.2	5	23.2	64.8
51	1	***1N6288A***	1.5KE51A	43.6	5	21.4	70.1
56	1	1N6289A	1.5KE56A	47.8	5	19.5	77
62	1	1N6290A	1.5KE62A	53	5	17.7	85
68	1	1N6291A	1.5KE68A	58.1	5	16.3	92
75	1	1N6292A	1.5KE75A	64.1	5	14.6	103
82	1	1N6293A	1.5KE82A	70.1	5	13.3	113
91	1	1N6294A	1.5KE91A	77.8	5	12	125
100	1	1N6295A	1.5KE100A	85.5	5	11	137
110	1	1N6296A	1.5KE110A	94	5	9.9	152
120	1	1N6297A	1.5KE120A	102	5	9.1	165
130	1	1N6298A	1.5KE130A	111	5	8.4	179

For bidirectional types use CA suffix on 1.5KE series only. Bi–directional devices have cathode polarity band on each end. (Consult factory for availability) 1N6267-6303A series do not have CA option since the CA is not included in EIA Registration.

TVS — in Axial Leads (continued)

Table 7. Peak Power Dissipation, 1500 Watts @ 1 ms Surge
Case 41A – MOSORB (continued)

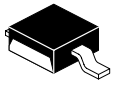
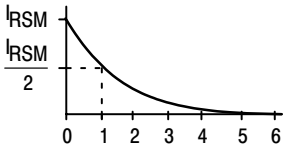
ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted) V_F = 3.5 V Max, I_F = 100 A Pulse							
Breakdown Voltage							
V_{BR} Volts	**@ I_T Pulse (mA)**	**JEDEC Device**	**Device**	**Working Peak Reverse Voltage V_{RWM} (Volts)**	**Maximum Reverse Leakage @ V_{RWM} I_R (μA)**	**Maximum Reverse Surge Current I_{RSM} (Amps)**	**Maximum Reverse Voltage @ I_{RSM} (Clamping Voltage) V_{RSM} (Volts)**
Nom							
150	1	1N6299A	1.5KE150A	128	5	7.2	207
160	1	1N6300A	1.5KE160A	136	5	6.8	219
170	1	1N6301A	1.5KE170A	145	5	6.4	234
180	1	1N6302A	1.5KE180A	154	5	6.1	246
200	1	1N6303A	1.5KE200A	171	5	5.5	274
220	1		1.5KE220A	185	5	4.6	328
250	1		1.5KE250A	214	5	5	344

For bidirectional types use CA suffix. Bi–directional devices have cathode polarity band on each end. (Consult factory for availability).
1N6267-6303A series do not have CA option since the CA is not included in EIA Registration.

TVS — in Surface Mount

Table 8. 1PMT Series Unidirectional Overvoltage Transient Suppressors, 175 Watts Peak Power @ 1 ms Surge (10 x 1000 μs)

ELECTRICAL CHARACTERISTICS (T_L = 30°C unless otherwise noted) (V_F = 1.25 Volts @ 200 mA)

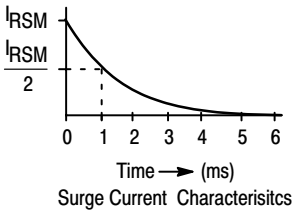
Device	Marking	V_{RWM} (V)	V_{BR} @ I_T (V) (Note 2)			I_T	I_R @ V_{RWM}	V_C @ I_{PP}	I_{PP} (A)
		(Note 1)	Min	Nom	Max	(mA)	(μA)	(V)	(Note 3)
		POWERMITE CASE 457–04 PLASTIC				 Surge Current Characterisitcs			
1PMT5.0AT3	MKE	5.0	6.4	6.7	7.0	10	800	9.2	19
1PMT7.0AT3	MKM	7.0	7.78	8.2	8.6	10	500	12	14.6
1PMT12AT3	MLE	12	13.3	14	14.7	1.0	5.0	19.9	8.8
1PMT16AT3	MLP	16	17.8	18.75	19.7	1.0	5.0	26	7.0
1PMT18AT3	MLT	18	20	21	22.1	1.0	5.0	29.2	6.0
1PMT22AT3	MLX	22	24.4	25.6	26.9	1.0	5.0	35.5	4.9
1PMT24AT3	MLZ	24	26.7	28.1	29.5	1.0	5.0	38.9	4.5
1PMT26AT3	MME	26	28.9	30.4	31.9	1.0	5.0	42.1	4.2
1PMT28AT3	MMG	28	31.1	32.8	34.4	1.0	5.0	45.4	3.9
1PMT30AT3	MMK	30	33.3	35.1	36.8	1.0	5.0	48.4	3.6
1PMT33AT3	MMM	33	36.7	38.7	40.6	1.0	5.0	53.3	3.3
1PMT36AT3	MMP	36	40	42.1	44.2	1.0	5.0	58.1	3.0
1PMT40AT3	MMR	40	44.4	46.8	49.1	1.0	5.0	64.5	2.7
1PMT48AT3	MMX	48	53.3	56.1	58.9	1.0	5.0	77.4	2.3
1PMT51AT3	MMZ	51	56.7	59.7	62.7	1.0	5.0	82.4	2.1
1PMT58AT3	MNG	58	64.4	67.8	71.2	1.0	5.0	93.6	1.9

1. A transient suppressor is normally selected according to the Working Peak Reverse Voltage (V_{RWM}) which should be equal to or greater than the DC or continuous peak operating voltage level.
2. V_{BR} measured at pulse test current I_T at ambient temperature of 25°C.
3. 10 x 1000 μs exponential decay surge waveform.

TVS — in Surface Mount (continued)

Table 9. 1SMA Series Unidirectional Overvoltage Transient Suppressors; 400 Watts Peak Power @ 1 ms Surge (10 x 1000 μs)

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted) (V_F = 3.5 Volts @ I_F = 40 A for all types) (Note 4)

Device	Working Peak Reverse Voltage V_{RWM} (Volts)	Breakdown Voltage		Maximum Reverse Voltage @ I_{RSM} (Clamping Voltage) V_C (Volts)	Maximum Reverse Surge Current I_{PP} (Amps)	Maximum Reverse Leakage @ V_{RWM} I_R (μA)	Device Marking
		V_{BR} Volts (Min)	I_T mA				
		SMA CASE 403B–01 PLASTIC			 Surge Current Characterisitcs		
1SMA5.0AT3	5.0	6.4	10	9.2	43.5	400	QE
1SMA6.0AT3	6.0	6.67	10	10.3	38.8	400	QG
1SMA6.5AT3	6.5	7.22	10	11.2	35.7	250	QK
1SMA7.0AT3	7.0	7.78	10	12.0	33.3	250	QM
1SMA7.5AT3	7.5	8.33	1	12.9	31.0	50	QP
1SMA8.0AT3	8.0	8.89	1	13.6	29.4	25	QR
1SMA8.5AT3	8.5	9.44	1	14.4	27.8	5.0	QT
1SMA9.0AT3	9.0	10	1	15.4	26.0	2.5	QV
1SMA10AT3	10	11.1	1	17.0	23.5	2.5	QX
1SMA11AT3	11	12.2	1	18.2	22.0	2.5	QZ
1SMA12AT3	12	13.3	1	19.9	20.1	2.5	RE
1SMA13AT3	13	14.4	1	21.5	18.6	2.5	RG
1SMA14AT3	14	15.6	1	23.2	17.2	2.5	RK
1SMA15AT3	15	16.7	1	24.4	16.4	2.5	RM
1SMA16AT3	16	17.8	1	26.0	15.4	2.5	RP
1SMA17AT3	17	18.9	1	27.6	14.5	2.5	RR
1SMA18AT3	18	20	1	29.2	13.7	2.5	RT
1SMA20AT3	20	22.2	1	32.4	12.3	2.5	RV
1SMA22AT3	22	24.4	1	35.5	11.3	2.5	RX
1SMA24AT3	24	26.7	1	38.9	10.3	2.5	RZ
1SMA26AT3	26	28.9	1	42.1	9.5	2.5	SE
1SMA28AT3	28	31.1	1	45.4	8.8	2.5	SG
1SMA30AT3	30	33.3	1	48.4	8.3	2.5	SK
1SMA33AT3	33	36.7	1	53.3	7.5	2.5	SM
1SMA36AT3	36	40	1	58.1	6.9	2.5	SP
1SMA40AT3	40	44.4	1	64.5	6.2	2.5	SR
1SMA43AT3	43	47.8	1	69.4	5.8	2.5	ST
1SMA45AT3	45	50	1	72.2	5.5	2.5	SV
1SMA48AT3	48	53.3	1	77.4	5.2	2.5	SX
1SMA51AT3	51	56.7	1	82.4	4.9	2.5	SZ
1SMA54AT3	54	60	1	87.1	4.6	2.5	TE
1SMA58AT3	58	64.4	1	93.6	4.8	2.5	TG
1SMA60AT3	60	66.7	1	96.8	4.1	2.5	TK
1SMA64AT3	64	71.1	1	103.0	3.9	2.5	TM
1SMA70AT3	70	77.8	1	113.0	3.5	2.5	TP
1SMA75AT3	75	83.3	1	121.0	3.3	2.5	TR
1SMA78AT3	78	86.7	1	126.0	3.2	2.5	TS

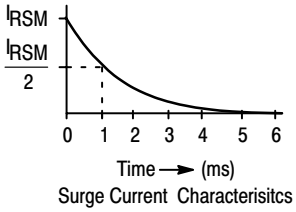
4. 1/2 sine wave (or equivalent square pulse, PW = 8.3 ms, duty cycle = 4 pulses per minute.

A transient suppressor is normally selected according to the reverse Working Peak Reverse Voltage (V_{RWM}) which should be equal to or greater than the DC or continuous peak operating voltage level.

TVS — in Surface Mount (continued)

Table 10. 1SMA Series Bidirectional Zener Overvoltage Transient Suppressors; 400 Watts Peak Power @ 1 ms Surge (10 x 1000 μs)

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

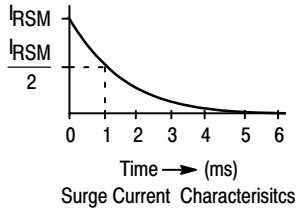
Device	Working Peak Reverse Voltage V_{RWM} (Volts)	Breakdown Voltage		Maximum Reverse Voltage @ I_{RSM} (Clamping Voltage) V_C (Volts)	Maximum Reverse Surge Current I_{PP} (Amps)	Maximum Reverse Leakage @ V_{RWM} I_R (μA)	Device Marking
		V_{BR} Volts (Min)	I_T mA				
		SMA CASE 403B–01 PLASTIC			 Surge Current Characterisitcs		
1SMA10CAT3	10	11.1	1	17.0	23.5	2.5	QXC
1SMA11CAT3	11	12.2	1	18.2	22.0	2.5	QZC
1SMA12CAT3	12	13.3	1	19.9	20.1	2.5	REC
1SMA13CAT3	13	14.4	1	21.5	18.6	2.5	RGC
1SMA14CAT3	14	15.6	1	23.2	17.2	2.5	RKC
1SMA15CAT3	15	16.7	1	24.4	16.4	2.5	RMC
1SMA16CAT3	16	17.8	1	26.0	15.4	2.5	RPC
1SMA17CAT3	17	18.9	1	27.6	14.5	2.5	RRC
1SMA18CAT3	18	20	1	29.2	13.7	2.5	RTC
1SMA20CAT3	20	22.2	1	32.4	12.3	2.5	RVC
1SMA22CAT3	22	24.4	1	35.5	11.3	2.5	RXC
1SMA24CAT3	24	26.7	1	38.9	10.3	2.5	RZC
1SMA26CAT3	26	28.9	1	42.1	9.5	2.5	SEC
1SMA28CAT3	28	31.1	1	45.4	8.8	2.5	SGC
1SMA30CAT3	30	33.3	1	48.4	8.3	2.5	SKC
1SMA33CAT3	33	36.7	1	53.3	7.5	2.5	SMC
1SMA36CAT3	36	40	1	58.1	6.9	2.5	SPC
1SMA40CAT3	40	44.4	1	64.5	6.2	2.5	SRC
1SMA43CAT3	43	47.8	1	69.4	5.8	2.5	STC
1SMA45CAT3	45	50	1	72.2	5.5	2.5	SVC
1SMA48CAT3	48	53.3	1	77.4	5.2	2.5	SXC
1SMA51CAT3	51	56.7	1	82.4	4.9	2.5	SZC
1SMA54CAT3	54	60	1	87.1	4.6	2.5	TEC
1SMA58CAT3	58	64.4	1	93.6	4.3	2.5	TGC
1SMA60CAT3	60	66.7	1	96.8	4.1	2.5	TKC
1SMA64CAT3	64	71.1	1	103.0	3.9	2.5	TMC
1SMA70CAT3	70	77.8	1	113.0	3.5	2.5	TPC
1SMA75CAT3	75	83.3	1	121.0	3.3	2.5	TRC
1SMA78CAT3	78	86.7	1	126.0	3.2	2.5	TSC

A transient suppressor is normally selected according to the reverse Working Peak Reverse Voltage (V_{RWM}) which should be equal to or greater than the DC or continuous peak operating voltage level.

TVS — in Surface Mount (continued)

Table 11. 1SMB Series Unidirectional Overvoltage Transient Suppressors; 600 Watts Peak Power @ 1ms Surge (10 x 1000 μs)

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted) (V_F = 3.5 V Max @ I_F = 30 A) (Note 5)

Device	Working Peak Reverse Voltage V_{RWM} Volts	Breakdown Voltage V_{BR} @ I_T Volts Min	Breakdown Voltage V_{BR} @ I_T mA	Maximum Clamping Voltage V_C @ I_{pp} Volts	Peak Pulse Current I_{pp} Amps	Maximum Reverse Leakage @ V_R I_R μA	Device Marking
		SMB CASE 403A PLASTIC		 Surge Current Characterisitcs			
1SMB5.0AT3	***5.0***	***6.40***	***10***	***9.2***	***65.2***	***800***	***KE***
1SMB6.0AT3	***6.0***	***6.67***	***10***	***10.3***	***58.3***	***800***	***KG***
1SMB6.5AT3	6.5	7.22	10	11.2	53.6	500	KK
1SMB7.0AT3	7.0	7.78	10	12.0	50.0	200	KM
1SMB7.5AT3	7.5	8.33	1.0	12.9	46.5	100	KP
1SMB8.0AT3	8.0	8.89	1.0	13.6	44.1	50	KR
1SMB8.5AT3	8.5	9.44	1.0	14.4	41.7	10	KT
1SMB9.0AT3	9.0	10.0	1.0	15.4	39.0	5.0	KV
1SMB10AT3	10	11.1	1.0	17.0	35.3	5.0	KX
1SMB11AT3	11	12.2	1.0	18.2	33.0	5.0	KZ
1SMB12AT3	12	13.3	1.0	19.9	30.2	5.0	LE
1SMB13AT3	13	14.4	1.0	21.5	27.9	5.0	LG
1SMB14AT3	14	15.6	1.0	23.2	25.8	5.0	LK
1SMB15AT3	15	16.7	1.0	24.4	24.0	5.0	LM
1SMB16AT3	16	17.8	1.0	26.0	23.1	5.0	LP
1SMB17AT3	17	18.9	1.0	27.6	21.7	5.0	LR
1SMB18AT3	18	20.0	1.0	29.2	20.5	5.0	LT
1SMB20AT3	20	22.2	1.0	32.4	18.5	5.0	LV
1SMB22AT3	***22***	***24.4***	***1.0***	***35.5***	***16.9***	***5.0***	***LX***
1SMB24AT3	24	26.7	1.0	38.9	15.4	5.0	LZ
1SMB26AT3	26	28.9	1.0	42.1	14.2	5.0	ME
1SMB28AT3	28	31.1	1.0	45.4	13.2	5.0	MG
1SMB30AT3	30	33.3	1.0	48.4	12.4	5.0	MK
1SMB33AT3	33	36.7	1.0	53.3	11.3	5.0	MM
1SMB36AT3	36	40.0	1.0	58.1	10.3	5.0	MP
1SMB40AT3	40	44.4	1.0	64.5	9.3	5.0	MR
1SMB43AT3	43	47.8	1.0	69.4	8.6	5.0	MT
1SMB45AT3	45	50.0	1.0	72.7	8.3	5.0	MV
1SMB48AT3	48	53.3	1.0	77.4	7.7	5.0	MX
1SMB51AT3	51	56.7	1.0	82.4	7.3	5.0	MZ
1SMB54AT3	54	60.0	1.0	87.1	6.9	5.0	NE
1SMB58AT3	***58***	***64.4***	***1.0***	***93.6***	***6.4***	***5.0***	***NG***
1SMB60AT3	60	66.7	1.0	96.8	6.2	5.0	NK
1SMB64AT3	64	71.1	1.0	103	5.8	5.0	NM
1SMB70AT3	70	77.8	1.0	113	5.3	5.0	NP
1SMB75AT3	75	83.3	1.0	121	4.9	5.0	NR
1SMB78AT3	78	86.7	1.0	126	4.7	5.0	NT
1SMB85AT3	85	94.4	1.0	137	4.4	5.0	NV
1SMB90AT3	90	100	1.0	146	4.1	5.0	NX
1SMB100AT3	100	111	1.0	162	3.7	5.0	NZ

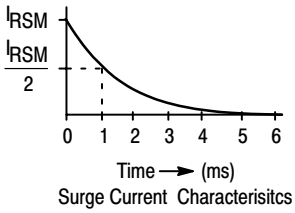
5. 1/2 sine wave (or equivalent square pulse, PW = 8.3 ms, duty cycle = 4 pulses per minute.

A transient suppressor is normally selected according to the reverse Working Peak Reverse Voltage (V_{RWM}) which should be equal to or greater than the DC or continuous peak operating voltage level.

TVS — in Surface Mount (continued)

Table 11. 1SMB Series Unidirectional Overvoltage Transient Suppressors; 600 Watts Peak Power @ 1 ms Surge (10 x 1000 μs) (continued)

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted) (V_F = 3.5 V Max @ I_F = 30 A) (Note 6)

Device	Working Peak Reverse Voltage V_{RWM} Volts	Breakdown Voltage V_{BR} @ I_T Volts Min	Breakdown Voltage V_{BR} @ I_T mA	Maximum Clamping Voltage V_C @ I_{pp} Volts	Peak Pulse Current I_{pp} Amps	Maximum Reverse Leakage @ V_R I_R μA	Device Marking
		SMB CASE 403A PLASTIC		 Surge Current Characterisitcs			
1SMB110AT3	110	122	1.0	177	3.4	5.0	PE
1SMB120AT3	120	133	1.0	193	3.1	5.0	PG
1SMB130AT3	130	144	1.0	209	2.9	5.0	PK
1SMB150AT3	150	167	1.0	243	2.5	5.0	PM
1SMB160AT3	160	178	1.0	259	2.3	5.0	PP
1SMB170AT3	170	189	1.0	275	2.2	5.0	PR

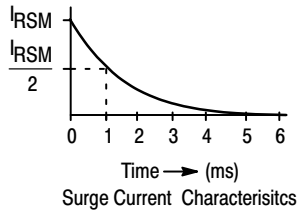
6. 1/2 sine wave (or equivalent square pulse, PW = 8.3 ms, duty cycle = 4 pulses per minute.

A transient suppressor is normally selected according to the reverse Working Peak Reverse Voltage (V_{RWM}) which should be equal to or greater than the DC or continuous peak operating voltage level.

TVS — in Surface Mount (continued)

Table 12. 1SMB Series Bidirectional Overvoltage Transient Suppressors; 600 Watts Peak Power @ 1ms Surge (10 x 1000 μs)

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted).

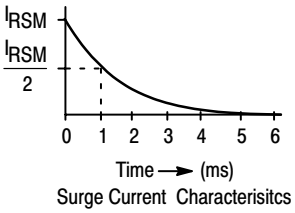
Device	Working Peak Reverse Voltage V_{RWM} Volts	Breakdown Voltage V_{BR} @ I_T Volts Min	Breakdown Voltage V_{BR} @ I_T mA	Maximum Clamping Voltage V_C @ I_{pp} Volts	Peak Pulse Current I_{pp} Amps	Maximum Reverse Leakage @ V_R I_R μA	Device Marking
		SMB CASE 403A PLASTIC					
1SMB10CAT3	10	11.1	1.0	17.0	35.3	5.0	KXC
1SMB11CAT3	11	12.2	1.0	18.2	33.0	5.0	KZC
1SMB12CAT3	12	13.3	1.0	19.9	30.2	5.0	LEC
1SMB13CAT3	13	14.4	1.0	21.5	27.9	5.0	LGC
1SMB14CAT3	14	15.6	1.0	23.2	25.8	5.0	LKC
1SMB15CAT3	***15***	***16.7***	***1.0***	***24.4***	***24.0***	***5.0***	***LMC***
1SMB16CAT3	16	17.8	1.0	26.0	23.1	5.0	LPC
1SMB17CAT3	17	18.9	1.0	27.6	21.7	5.0	LRC
1SMB18CAT3	18	20.0	1.0	29.2	20.5	5.0	LTC
1SMB20CAT3	20	22.2	1.0	32.4	18.5	5.0	LVC
1SMB22CAT3	22	24.4	1.0	35.5	16.9	5.0	LXC
1SMB24CAT3	24	26.7	1.0	38.9	15.4	5.0	LZC
1SMB26CAT3	26	28.9	1.0	42.1	14.2	5.0	MEC
1SMB28CAT3	28	31.1	1.0	45.4	13.2	5.0	MGC
1SMB30CAT3	30	33.3	1.0	48.4	12.4	5.0	MKC
1SMB33CAT3	33	36.7	1.0	53.3	11.3	5.0	MMC
1SMB36CAT3	36	40.0	1.0	58.1	10.3	5.0	MPC
1SMB40CAT3	40	44.4	1.0	64.5	9.3	5.0	MRC
1SMB43CAT3	43	47.8	1.0	69.4	8.6	5.0	MTC
1SMB45CAT3	45	50.0	1.0	72.7	8.3	5.0	MVC
1SMB48CAT3	48	53.3	1.0	77.4	7.7	5.0	MXC
1SMB51CAT3	51	56.7	1.0	82.4	7.3	5.0	MZC
1SMB54CAT3	54	60.0	1.0	87.1	6.9	5.0	NEC
1SMB58CAT3	58	64.4	1.0	93.6	6.4	5.0	NGC
1SMB60CAT3	60	66.7	1.0	96.8	6.2	5.0	NKC
1SMB64CAT3	64	71.1	1.0	103	5.8	5.0	NMC
1SMB70CAT3	70	77.8	1.0	113	5.3	5.0	NPC
1SMB75CAT3	75	83.3	1.0	121	4.9	5.0	NRC
1SMB78CAT3	78	86.7	1.0	126	4.7	5.0	NTC

A transient suppressor is normally selected according to the reverse Working Peak Reverse Voltage (V_{RWM}) which should be equal to or greater than the DC or continuous peak operating voltage level.

TVS — in Surface Mount (continued)

Table 13. P6SMB Series Unidirectional Overvoltage Transient Suppressors; 600 Watts Peak Power @ 1 ms Surge (10 x 1000 μs)

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted) (V_F = 3.5 V Max, I_F = 50 A for all types) (Note 7)

Device	Breakdown Voltage V_{BR} @ I_T Volts				Working Peak Reverse Voltage V_{RWM} Volts	Maximum Reverse Leakage @ V_{RWM} I_R μA	Maximum Reverse Surge Current I_{PP} Amps	Maximum Reverse Voltage @ I_{PP} (Clamping Voltage) V_C Volts	Maximum Temperature Coefficient of V_{BR} %/°C	Device Marking
	Min	Nom	Max	mA						
SMB CASE 403A PLASTIC							 Surge Current Characterisitcs			
P6SMB6.8AT3	***6.45***	***6.8***	***7.14***	***10***	***5.8***	***1000***	***57***	***10.5***	***0.057***	***6V8A***
P6SMB7.5AT3	***7.13***	***7.5***	***7.88***	***10***	***6.4***	***500***	***53***	***11.3***	***0.061***	***7V5A***
P6SMB8.2AT3	7.79	8.2	8.61	10	7.02	200	50	12.1	0.065	8V2A
P6SMB9.1AT3	8.65	9.1	9.55	1	7.78	50	45	13.4	0.068	9V1A
P6SMB10AT3	***9.5***	***10***	***10.5***	***1***	***8.55***	***10***	***41***	***14.5***	***0.073***	***10A***
P6SMB11AT3	10.5	11	11.6	1	9.4	5	38	15.6	0.075	11A
P6SMB12AT3	11.4	12	12.6	1	10.2	5	36	16.7	0.078	12A
P6SMB13AT3	***12.4***	***13***	***13.7***	***1***	***11.1***	***5***	***33***	***18.2***	***0.081***	***13A***
P6SMB15AT3	***14.3***	***15***	***15.8***	***1***	***12.8***	***5***	***28***	***21.2***	***0.084***	***15A***
P6SMB16AT3	***15.2***	***16***	***16.8***	***1***	***13.6***	***5***	***27***	***22.5***	***0.086***	***16A***
P6SMB18AT3	***17.1***	***18***	***18.9***	***1***	***15.3***	***5***	***24***	***25.2***	***0.088***	***18A***
P6SMB20AT3	***19***	***20***	***21***	***1***	***17.1***	***5***	***22***	***27.7***	***0.09***	***20A***
P6SMB22AT3	***20.9***	***22***	***23.1***	***1***	***18.8***	***5***	***20***	***30.6***	***0.092***	***22A***
P6SMB24AT3	22.8	24	25.2	1	20.5	5	18	33.2	0.094	24A
P6SMB27AT3	***25.7***	***27***	***28.4***	***1***	***23.1***	***5***	***16***	***37.5***	***0.096***	***27A***
P6SMB30AT3	***28.5***	***30***	***31.5***	***1***	***25.6***	***5***	***14.4***	***41.4***	***0.097***	***30A***
P6SMB33AT3	31.4	33	34.7	1	28.2	5	13.2	45.7	0.098	33A
P6SMB36AT3	***34.2***	***36***	***37.8***	***1***	***30.8***	***5***	***12***	***49.9***	***0.099***	***36A***
P6SMB39AT3	***37.1***	***39***	***41***	***1***	***33.3***	***5***	***11.2***	***53.9***	***0.1***	***39A***
P6SMB43AT3	40.9	43	45.2	1	36.8	5	10.1	59.3	0.101	43A
P6SMB47AT3	44.7	47	49.4	1	40.2	5	9.3	64.8	0.101	47A
P6SMB51AT3	***48.5***	***51***	***53.6***	***1***	***43.6***	***5***	***8.6***	***70.1***	***0.102***	***51A***
P6SMB56AT3	53.2	56	58.8	1	47.8	5	7.8	77	0.103	56A
P6SMB62AT3	58.9	62	65.1	1	53	5	7.1	85	0.104	62A
P6SMB68AT3	64.6	68	71.4	1	58.1	5	6.5	92	0.104	68A
P6SMB75AT3	71.3	75	78.8	1	64.1	5	5.8	103	0.105	75A
P6SMB82AT3	77.9	82	86.1	1	70.1	5	5.3	113	0.105	82A
P6SMB91AT3	86.5	91	95.5	1	77.8	5	4.8	125	0.106	91A
P6SMB100AT3	95	100	105	1	85.5	5	4.4	137	0.106	100A
P6SMB110AT3	105	110	116	1	94	5	4	152	0.107	110A
P6SMB120AT3	114	120	126	1	102	5	3.6	165	0.107	120A
P6SMB130AT3	124	130	137	1	111	5	3.3	179	0.107	130A
P6SMB150AT3	143	150	158	1	128	5	2.9	207	0.108	150A
P6SMB160AT3	***152***	***160***	***168***	***1***	***136***	***5***	***2.7***	***219***	***0.108***	***160A***
P6SMB170AT3	162	170	179	1	145	5	2.6	234	0.108	170A
P6SMB180AT3	171	180	189	1	154	5	2.4	246	0.108	180A
P6SMB200AT3	190	200	210	1	171	5	2.2	274	0.108	200A

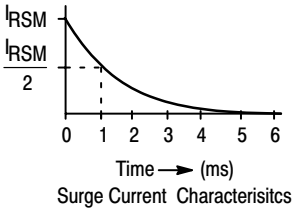
7. 1/2 sine wave (or equivalent square pulse, PW = 8.3 ms, duty cycle = 4 pulses per minute.

A transient suppressor is normally selected according to the reverse Working Peak Reverse Voltage (V_{RWM}) which should be equal to or greater than the DC or continuous peak operating voltage level.

TVS — in Surface Mount (continued)

Table 14. P6SMB Series Bidirectional Overvoltage Transient Suppressors; 600 Watts Peak Power @ 1 ms Surge (10 x 1000 μs)

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)

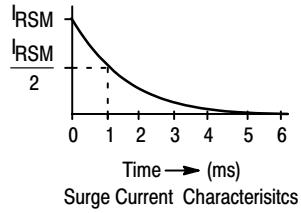
Device	Breakdown Voltage V_{BR} @ I_T Volts Min	Nom	Max	mA	Working Peak Reverse Voltage V_{RWM} Volts	Maximum Reverse Leakage @ V_{RWM} I_R μA	Maximum Reverse Surge Current I_{PP} Amps	Maximum Reverse Voltage @ I_{PP} (Clamping Voltage) V_C Volts	Maximum Temperature Coefficient of V_{BR} %/°C	Device Marking
		SMB CASE 403A PLASTIC					 Surge Current Characterisitcs			
P6SMB11CAT3	10.5	11	11.6	1	9.4	5	38	15.6	0.075	11C
P6SMB12CAT3	11.4	12	12.6	1	10.2	5	36	16.7	0.078	12C
P6SMB13CAT3	12.4	13	13.7	1	11.1	5	33	18.2	0.081	13C
P6SMB15CAT3	14.3	15	15.8	1	12.8	5	28	21.2	0.084	15C
P6SMB16CAT3	15.2	16	16.8	1	13.6	5	27	22.5	0.086	16C
P6SMB18CAT3	17.1	18	18.9	1	15.3	5	24	25.2	0.088	18C
P6SMB20CAT3	19	20	21	1	17.1	5	22	27.7	0.09	20C
P6SMB22CAT3	20.9	22	23.1	1	18.8	5	20	30.6	0.092	22C
P6SMB24CAT3	22.8	24	25.2	1	20.5	5	18	33.2	0.094	24C
P6SMB27CAT3	25.7	27	28.4	1	23.1	5	16	37.5	0.096	27C
P6SMB30CAT3	28.5	30	31.5	1	25.6	5	14.4	41.4	0.097	30C
P6SMB33CAT3	***31.4***	***33***	***34.7***	***1***	***28.2***	***5***	***13.2***	***45.7***	***0.098***	***33C***
P6SMB36CAT3	34.2	36	37.8	1	30.8	5	12	49.9	0.099	36C
P6SMB39CAT3	37.1	39	41	1	33.3	5	11.2	53.9	0.1	39C
P6SMB43CAT3	40.9	43	45.2	1	36.8	5	10.1	59.3	0.101	43C
P6SMB47CAT3	44.7	47	49.4	1	40.2	5	9.3	64.8	0.101	47C
P6SMB51CAT3	48.5	51	53.6	1	43.6	5	8.6	70.1	0.102	51C
P6SMB56CAT3	53.2	56	58.8	1	47.8	5	7.8	77	0.103	56C
P6SMB62CAT3	58.9	62	65.1	1	53	5	7.1	85	0.104	62C
P6SMB68CAT3	64.6	68	71.4	1	58.1	5	6.5	92	0.104	68C
P6SMB75CAT3	71.3	75	78.8	1	64.1	5	5.8	103	0.105	75C
P6SMB82CAT3	77.9	82	86.1	1	70.1	5	5.3	113	0.105	82C
P6SMB91CAT3	86.5	91	95.5	1	77.8	5	4.8	125	0.106	91C

A transient suppressor is normally selected according to the reverse Working Peak Reverse Voltage (V_{RWM}) which should be equal to or greater than the DC or continuous peak operating voltage level.

TVS — in Surface Mount (continued)

Table 15. 1SMC Series Unidirectional Overvoltage Transient Suppressors; 1500 Watts Peak Power @ 1 ms Surge (10 x 1000 μs)

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted) (V_F = 3.5 V Max @ I_F = 100 A) (Note 8)

Device	Working Peak Reverse Voltage V_R Volts	Breakdown Voltage* V_{BR} @ I_T Volts Min	mA	Maximum Clamping Voltage V_C @ I_{pp} Volts	Peak Pulse Current I_{pp} Amps	Maximum Reverse Leakage @ V_R I_R μA	Device Marking
		SMC CASE 403B PLASTIC		 Surge Current Characterisitcs			
1SMC5.0AT3	5.0	6.40	10	9.2	163.0	1000	GDE
1SMC6.0AT3	6.0	6.67	10	10.3	145.6	1000	GDG
1SMC6.5AT3	6.5	7.22	10	11.2	133.9	500	GDK
1SMC7.0AT3	7.0	7.78	10	12.0	125.0	200	GDM
1SMC7.5AT3	7.5	8.33	1.0	12.9	116.3	100	GDP
1SMC8.0AT3	8.0	8.89	1.0	13.6	110.3	50	GDR
1SMC8.5AT3	8.5	9.44	1.0	14.4	104.2	20	GDT
1SMC9.0AT3	9.0	10.0	1.0	15.4	97.4	10	GDV
1SMC10AT3	10	11.1	1.0	17.0	88.2	5.0	GDX
1SMC11AT3	11	12.2	1.0	18.2	82.4	5.0	GDZ
1SMC12AT3	12	13.3	1.0	19.9	75.3	5.0	GEE
1SMC13AT3	13	14.4	1.0	21.5	69.7	5.0	GEG
1SMC14AT3	14	15.6	1.0	23.2	64.7	5.0	GEK
1SMC15AT3	15	16.7	1.0	24.4	61.5	5.0	GEM
1SMC16AT3	16	17.8	1.0	26.0	57.7	5.0	GEP
1SMC17AT3	17	18.9	1.0	27.6	53.3	5.0	GER
1SMC18AT3	18	20.0	1.0	29.2	51.4	5.0	GET
1SMC20AT3	20	22.2	1.0	32.4	46.3	5.0	GEV
1SMC22AT3	22	24.4	1.0	35.5	42.2	5.0	GEX
1SMC24AT3	24	26.7	1.0	38.9	38.6	5.0	GEZ
1SMC26AT3	26	28.9	1.0	42.1	35.6	5.0	GFE
1SMC28AT3	28	31.1	1.0	45.4	33.0	5.0	GFG
1SMC30AT3	30	33.3	1.0	48.4	31.0	5.0	GFK
1SMC33AT3	33	36.7	1.0	53.3	28.1	5.0	GFM
1SMC36AT3	36	40.0	1.0	58.1	25.8	5.0	GFP
1SMC40AT3	40	44.4	1.0	64.5	23.2	5.0	GFR
1SMC43AT3	43	47.8	1.0	69.4	21.6	5.0	GFT
1SMC45AT3	45	50.0	1.0	72.7	20.6	5.0	GFV
1SMC48AT3	48	53.3	1.0	77.4	19.4	5.0	GFX
1SMC51AT3	51	56.7	1.0	82.4	18.2	5.0	GFZ
1SMC54AT3	54	60.0	1.0	87.1	17.2	5.0	GGE
1SMC58AT3	***58***	***64.4***	***1.0***	***93.6***	***16.0***	***5.0***	***GGG***
1SMC60AT3	60	66.7	1.0	96.8	15.5	5.0	GGK
1SMC64AT3	64	71.1	1.0	103	14.6	5.0	GGM
1SMC70AT3	70	77.8	1.0	113	13.3	5.0	GGP
1SMC75AT3	75	83.3	1.0	121	12.4	5.0	GGR
1SMC78AT3	78	86.7	1.0	126	11.4	5.0	GGT

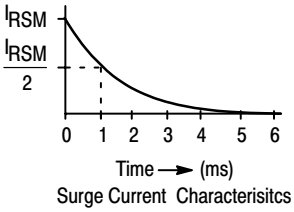
8. 1/2 sine wave (or equivalent square pulse, PW = 8.3 ms, duty cycle = 4 pulses per minute.

A transient suppressor is normally selected according to the reverse Working Peak Reverse Voltage (V_{RWM}) which should be equal to or greater than the DC or continuous peak operating voltage level.

TVS — in Surface Mount (continued)

Table 16. 1.5 SMC Series Unidirectional Overvoltage Transient Suppressors; 1500 Watts Peak Power @ 1 ms Surge (10 x 1000 μs)

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted) (V_F = 3.5 V Max, I_F = 100 A for all types) (Note 9)

Device	Breakdown Voltage V_{BR} @ I_T Volts Min	Nom	Max	mA	Working Peak Reverse Voltage V_{RWM} Volts	Maximum Reverse Leakage @ V_{RWM} I_R μA	Maximum Reverse Surge Current I_{PP} Amps	Maximum Reverse Voltage @ I_{PP} (Clamping Voltage) V_C Volts	Maximum Temperature Coefficient of V_{BR} %/°C	Device Marking
	SMC CASE 403 PLASTIC						 Surge Current Characterisitcs			
1.5SMC6.8AT3	6.45	6.8	7.14	10	5.8	1000	143	10.5	0.057	6V8A
1.5SMC7.5AT3	7.13	7.5	7.88	10	6.4	500	132	11.3	0.061	7V5A
1.5SMC8.2AT3	7.79	8.2	8.61	10	7.02	200	124	12.1	0.065	8V2A
1.5SMC9.1AT3	8.65	9.1	9.55	1	7.78	50	112	13.4	0.068	9V1A
1.5SMC10AT3	9.5	10	10.5	1	8.55	10	103	14.5	0.073	10A
1.5SMC11AT3	10.5	11	11.6	1	9.4	5	96	15.6	0.075	11A
1.5SMC12AT3	11.4	12	12.6	1	10.2	5	90	16.7	0.078	12A
1.5SMC13AT3	12.4	13	13.7	1	11.1	5	82	18.2	0.081	13A
1.5SMC15AT3	***14.3***	***15***	***15.8***	***1***	***12.8***	***5***	***71***	***21.2***	***0.084***	***15A***
1.5SMC16AT3	15.2	16	16.8	1	13.6	5	67	22.5	0.086	16A
1.5SMC18AT3	17.1	18	18.9	1	15.3	5	59.5	25.2	0.088	18A
1.5SMC20AT3	19	20	21	1	17.1	5	54	27.7	0.09	20A
1.5SMC22AT3	20.9	22	23.1	1	18.8	5	49	30.6	0.092	22A
1.5SMC24AT3	***22.8***	***24***	***25.2***	***1***	***20.5***	***5***	***45***	***33.2***	***0.094***	***24A***
1.5SMC27AT3	25.7	27	28.4	1	23.1	5	40	37.5	0.096	27A
1.5SMC30AT3	28.5	30	31.5	1	25.6	5	36	41.4	0.097	30A
1.5SMC33AT3	***31.4***	***33***	***34.7***	***1***	***28.2***	***5***	***33***	***45.7***	***0.098***	***33A***
1.5SMC36AT3	***34.2***	***36***	***37.8***	***1***	***30.8***	***5***	***30***	***49.9***	***0.099***	***36A***
1.5SMC39AT3	***37.1***	***39***	***41***	***1***	***33.3***	***5***	***28***	***53.9***	***0.1***	***39A***
1.5SMC43AT3	***40.9***	***43***	***45.2***	***1***	***36.8***	***5***	***25.3***	***59.3***	***0.101***	***43A***
1.5SMC47AT3	***44.7***	***47***	***49.4***	***1***	***40.2***	***5***	***23.2***	***64.8***	***0.101***	***47A***
1.5SMC51AT3	48.5	51	53.6	1	43.6	5	21.4	70.1	0.102	51A
1.5SMC56AT3	53.2	56	58.8	1	47.8	5	19.5	77	0.103	56A
1.5SMC62AT3	58.9	62	65.1	1	53	5	17.7	85	0.104	62A
1.5SMC68AT3	64.6	68	71.4	1	58.1	5	16.3	92	0.104	68A
1.5SMC75AT3	***71.3***	***75***	***78.8***	***1***	***64.1***	***5***	***14.6***	***103***	***0.105***	***75A***
1.5SMC82AT3	77.9	82	86.1	1	70.1	5	13.3	113	0.105	82A
1.5SMC91AT3	86.5	91	95.5	1	77.8	5	12	125	0.106	91A

9. 1/2 sine wave (or equivalent square pulse, PW = 8.3 ms, duty cycle = 4 pulses per minute.

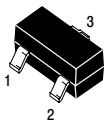
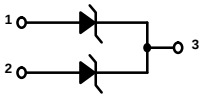
A transient suppressor is normally selected according to the reverse Working Peak Reverse Voltage (V_{RWM}) which should be equal to or greater than the DC or continuous peak operating voltage level.

Multiple TVS — Duals in Surface Mount

MMBZ15VDLT1 — Common Cathode Series

Table 17. SOT–23 Bipolar Zener Overvoltage Transient Suppressor; 40 Watts Peak Power (10 x 1000 μs)

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)
BIDIRECTIONAL (Circuit tied to Pins 1 and 2)
(V_F = 0.9 V Max @ I_F = 10 mA)

Device	Breakdown Voltage				Reverse Voltage Working Peak V_{RWM} (V)	Max Reverse Leakage Current I_R (nA)	Max Reverse Surge Current I_{PP} (A)	Max Reverse Voltage @ I_{PP} (Clamping Voltage) V_C (V)	Maximum Temperature Coefficient of V_{BR} (mV/°C)
	V_{BR} (Note 10) (V)			@ I_T (mA)					
	Min	Nom	Max						
 CASE 318–08 TO–236AB LOW PROFILE SOT–23 									
MMBZ15VDLT1	14.3	15	15.8	1.0	12.8	100	1.9	21.2	12

(V_F = 1.1 V Max @ I_F = 200 mA)

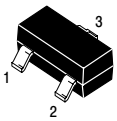
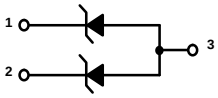
MMBZ27VCLT1	25.65	27	28.35	1.0	22	50	1.0	38	26

10. V_{BR} measured at pulse test current I_T at an ambient temperature of 25°C.

MMBZ5V6ALT1 — Common Anode Series

Table 18. SOT–23 Dual Zener Overvoltage Transient Suppressor; 24 Watts Peak Power (10 x 1000 μs)

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)
UNIDIRECTIONAL (Circuit tied to Pins 1 and 3 or Pins 2 and 3)
(V_F = 0.9 V Max @ I_F = 10 mA)

Device	Breakdown Voltage				Max Reverse Leakage Current		Max Zener Impedance (Note 12)			Max Reverse Surge Current I_{PP} (A)	Max Reverse Voltage @ I_{PP} (Clamping Voltage) V_C (V)	Max Temp Coefficient of V_{BR} (mV/°C)
	V_{BR} (Note 11) (V)			@ I_T (mA)	I_R @ V_R (μA)	(V)	Z_{ZT} @ I_{ZT} (Ω)	(mA)	Z_{ZK} @ I_{ZK} (Ω) (mA)			
	Min	Nom	Max									
 CASE 318–08 STYLE 12 LOW PROFILE SOT–23 PLASTIC 												
MMBZ5V6ALT1	5.32	5.6	5.88	20	5.0	3.0	11	1600	0.25	3.0	8.0	1.26
MMBZ6V2ALT1	5.89	6.2	6.51	1.0	0.5	3.0	—	—	—	2.76	8.7	2.80

(V_F = 1.1 V Max @ I_F = 200 mA)

MMBZ6V8ALT1	6.46	6.8	7.14	1.0	0.5	4.5	—	—	—	2.5	9.6	3.40
MMBZ9V1ALT1	8.65	9.1	9.56	1.0	0.3	6.0	—	—	—	1.7	14	7.50
MMBZ10VALT1	9.50	10	10.5	1.0	0.3	6.5	–	–	–	1.7	14.2	7.50

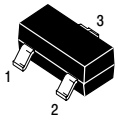
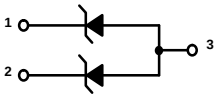
11. V_{BR} measured at pulse test current I_T at an ambient temperature of 25°C.
12. Z_{ZT} and Z_{ZK} are measured by dividing the AC voltage drop across the device by the AC current supplied. The specified limits are $I_{Z(AC)}$ = 0.1 $I_{Z(DC)}$, with AC frequency = 1 kHz.

Multiple TVS — Duals in Surface Mount (continued)

MMBZ5V6ALT1 — Common Anode Series (continued)

Table 19. SOT–23 Dual Zener Overvoltage Transient Suppressor; 40 Watts Peak Power (10 x 1000 μs)

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)
UNIDIRECTIONAL (Circuit tied to Pins 1 and 3 or Pins 2 and 3)
(V_F = 1.1 V Max @ I_F = 200 mA)

Device	Breakdown Voltage				Reverse Voltage Working Peak V_{RWM} (Volts)	Max Reverse Leakage Current I_R (nA)	Max Reverse Surge Current I_{PP} (A)	Max Reverse Voltage @ I_{PP} (Clamping Voltage) V_C (V)	Maximum Temperature Coefficient of V_{BR} (mV/°C)
	V_{BR} (Note 13) (V)			@ I_T (mA)					
	Min	Nom	Max						
 CASE 318–08 STYLE 12 LOW PROFILE SOT–23 PLASTIC									
MMBZ12VALT1	11.40	12	12.60	1.0	8.5	200	2.35	17	7.50
MMBZ15VALT1	14.25	15	15.75	1.0	12.0	50	1.9	21	12.30
MMBZ18VALT1	17.10	18	18.90	1.0	14.5	50	1.6	25	15.30
MMBZ20VALT1	19.00	20	21.00	1.0	17.0	50	1.4	28	17.20
MMBZ27VALT1	25.65	27	28.35	1.0	22.0	50	1.0	40	24.30
MMBZ33VALT1	31.35	33	34.65	1.0	26.0	50	0.87	46	30.40

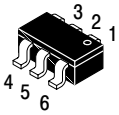
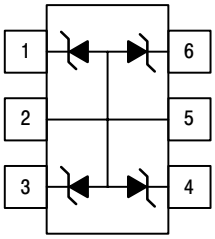
13. V_{BR} measured at pulse test current I_T at an ambient temperature of 25°C.

Multiple TVS — Quads in Surface Mount

MMQA Series

Table 20. SC–74 Quad Transient Voltage Suppressor; 24 Watts Peak Power (10 x 1000 μs), 150 Watts Peak Power (8.0 x 20 μs)

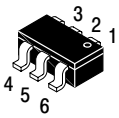
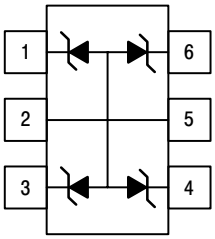
ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)
UNIDIRECTIONAL (Circuit tied to pins 1, 2, and 5; Pins 2, 3, and 5; Pins 2, 4, and 5; or Pins 2, 5, and 6)
(V_F = 0.9 V Max @ I_F = 10 mA)

	Breakdown Voltage				Max Reverse Leakage Current		Max Zener Impedance	Max Reverse Surge Current	Max Reverse Voltage @ I_{PP} (Clamping Voltage)	Max Temp Coefficient of V_Z
		V_{ZT} (V)		@ I_{ZT}	I_R	V_{RWM}				
Device	**Min**	**Nom**	**Max**	**(mA)**	**(nA)**	**(V)**	**Z_{ZT} @ I_{ZT} (Ω) (mA)**	**I_{PP} (A)**	**V_C (V)**	**(mV/°C)**
 **CASE 318F-02 STYLE 1 SC-74 PLASTIC** 										
MMQA5V6T1	5.32	5.6	5.88	1.0	2000	3.0	400	3.0	8.0	1.26
MMQA6V2T1,T3	5.89	6.2	6.51	1.0	700	4.0	300	2.66	9.0	10.6
MMQA6V8T1	6.46	6.8	7.14	1.0	500	4.3	300	2.45	9.8	10.9
MMQA12VT1	11.4	12	12.6	1.0	75	9.1	80	1.39	17.3	14
MMQA13VT1,T3	12.4	13	13.7	1.0	75	9.8	80	1.29	18.6	15
MMQA15VT1	14.3	15	15.8	1.0	75	11	80	1.1	21.7	16
MMQA18VT1	17.1	18	18.9	1.0	75	14	80	0.923	26	19
MMQA20VT1,T3	19	20	21	1.0	75	15	80	0.84	28.6	20.1
MMQA21VT1	20	21	22.1	1.0	75	16	80	0.792	30.3	21
MMQA22VT1	20.9	22	23.1	1.0	75	17	80	0.758	31.7	22
MMQA24VT1	22.8	24	25.2	1.0	75	18	100	0.694	34.6	25
MMQA27VT1	25.7	27	28.4	1.0	75	21	125	0.615	39	28
MMQA30VT1	28.5	30	31.5	1.0	75	23	150	0.554	43.3	32
MMQA33VT1,T3	31.4	33	34.7	1.0	75	25	200	0.504	48.6	37

Multiple TVS — Quads in Surface Mount (continued)

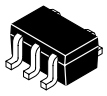
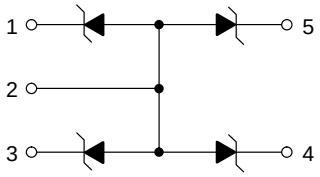
Table 21. SC–74 Quad Transient Voltage Suppressor; 40 Watts Peak Power (10 x 1000 μs), 350 Watts Peak Power (8.0 x 20 μs)

ELECTRICAL CHARACTERISTICS (T_A = 25°C unless otherwise noted)
UNIDIRECTIONAL (Circuit tied to pins 1, 2, and 5; Pins 2, 3, and 5; Pins 2, 4, and 5; or Pins 2, 5, and 6)
(V_F = 0.9 V Max @ I_F = 10 mA)

	Breakdown Voltage				Max Reverse Leakage Current		Max Reverse Surge Current 8 x 20 μs	Max Reverse Voltage @ I_{PP} (Clamping Voltage)	Max Reverse Surge Current 10 x 1000 μs	Max Reverse Voltage @ I_{PP} (Clamping Voltage)
		V_{ZT} (V)		@ I_{ZT}	I_R	V_{RWM}				
Device	**Min**	**Nom**	**Max**	**(mA)**	**(μA)**	**(V)**	**I_{PP} (A)**	**V_C (V)**	**I_{PP} (A)**	**V_C (V)**
 **CASE 318F-02 STYLE 1 SC-74 PLASTIC** 										
SMS05T1	6.0	6.6	7.2	–	20	5.0	23	15.5	5.0	9.8
SMS12T1	13.3	14.2	15	1 μA	12	5.0	19	15	23	1.25
SMS15T1	16.7	17.6	18.5	1 μA	15	5.0	24	12	29	1.25
SMS24T1	26.7	29.3	32	1 μA	24	5.0	40	0	44	1.25

MSQA6V1W5

Table 22. SC–88A/SOT–353 Quad Array for ESD Protection; 150 Watts (8.0 x 20 μs)

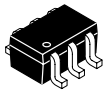
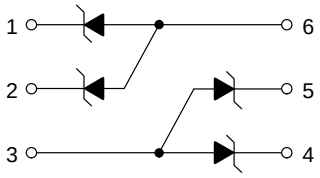
Device	Breakdown Voltage V_{BR} @ 1.0 mA (Volts)			Leakage Current I_R @ V_{RWM} = 3.0 V	Typical Capacitance @ 0 V Bias	Max V_F @ I_F = 200 mA
	Min	**Nom**	**Max**	**(μA)**	**(pF)**	**(V)**
 **CASE 419A SC–88A/SOT–353** 						
MSQA6V1W5	6.1	6.6	7.2	1.0	90	1.25

NOTE: Contact ON Semiconductor Sales for additional voltages.

Multiple TVS — Quads in Surface Mount (continued)

DF6A6.8FU

Table 23. SC–88 Quad Array for ESD Protection

Device	Breakdown Voltage V_{BR} @ 1.0 mA (Volts)			Maximum Leakage Current I_R @ V_{RWM} = 5 V	Typical Capacitance @ 0 V Bias	Max V_F @ I_F = 10 mA
	Min	Nom	Max	(μA)	(pF)	(V)
 CASE 419B SC–88 (SOT–363) PLASTIC 						
DF6A6.8FU	6.4	6.8	7.2	1.0	40	1.25

NOTE: Contact ON Semiconductor Sales for additional voltages.

Bipolar Power Transistors

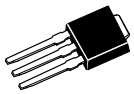
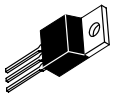
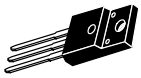
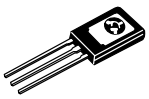
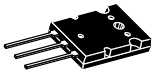
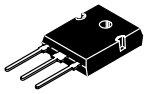
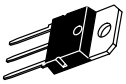
In Brief . . .

ON Semiconductor's broad line of Bipolar Power Transistors includes discrete and Darlington transistors in a variety of packages from the popular surface mount DPAK at 1.75 watts to the 250 watt TO-3. We now have transistors in SO–8 (Dual Transistors) and SOT–223. We have a broad line of Electronic Lamp Ballast Transistors, in the BUL Series and MJD18002D2T4, MJE18002, and MJE18004D24. New products include low $V_{CE(sat)}$ devices in surface mount SOT–223 package, MMJT9435T1/MMJT9410T1 and in the SO–8 package (Dual Transistors), MMDJ3N03BJTR2/MMDJ3P03BJTR2. We also have a broad line of high performance Audio Output Transistors in TO–3, TO–264 and new products in the Isolated Hole Plastic TO–247 package. The new TO–247 devices are designated MJW21191/2/3/4/5/6 and high f_T, MJW3281A/1302A. These have excellent high voltage FBSOA performance. ON Semiconductor has a commitment to quality and total customer satisfaction.

	Page
Bipolar Power Transistors	197
Selection by Package	197
Plastic TO–220AB	198
Plastic TO–218	201
Plastic (Isolated TO-220 Type)	202
Large Plastic TO-264	202
Plastic TO–225AA Type (Formerly TO–126 Type)	203
DPAK – Surface Mount Power Packages	205
Metal TO–204AA (Formerly TO–3), TO–204AE	206
Plastic TO–247	208
D^2PAK	208
SOT–223	208
Audio	209
Electronic Lamp Ballasts	210

BIPOLAR POWER TRANSISTORS SELECTOR GUIDE

SELECTION BY PACKAGE

Package		I_C Range (Amps)	V_{CE} Range (Volts)	P_D (Watts)
	TO-204AA (TO-3)	4.0-30	40-250	115-250
	TO-204AE (TO–3)	30–60	60-120	150-300
	**DPAK**	0.5-10	40-450	12.5-20
	DPAK	0.5-10	40-450	12.5-20
	**TO-220AB**	0.5-15	60-400	30-125
	**Isolated TO-220 Type**	1.0-12	60-450	20-45
	**TO-225AA (TO-126 Type)**	0.3-5.0	25-400	12.5-40
	SOT–223	3.0	30	2.0 (Note 1)
	SO–8	3.0	30	2.0 (Note 2)
	**TO-264**	15-16	200-250	250
	D^2PAK	5.0–8.0	80–450	50–65
	**TO–247**	8.0–16	150–250	200
	**TO–218**	5.0–10	60–350	125–150

1. Tested on 1″ sq. FR4 Board
2. Tested on 1″ sq., 2 oz. copper

Plastic TO–220AB

I_C Cont Amps Max	$V_{CEO(sus)}$ Volts Min (Note 7)	Device Type NPN	Device Type PNP	h_{FE} Min/Max	@ I_C Amp	Resistive Switching t_s µs Max	Resistive Switching t_f µs Max	Resistive Switching @ I_C Amp	f_T MHz Min	P_D (Case) Watts @ 25°C
1.0	80	TIP29B	TIP30B	15/75	1.0	0.6 typ	0.3 typ	1.0	3.0	30
	100	TIP29C	TIP30C	15/75	1.0	0.6 typ	0.3 typ	1.0	3.0	30
	250	TIP47		30/150	0.3	2.0 typ	0.18 typ	0.3	10	40
	300	TIP48	MJE5730	30/150	0.3	2.0 typ	0.18 typ	0.3	10	40
	350		***MJE5731***	30/150	0.3	2.0 typ	0.18 typ	0.3	10	40
	400	***TIP50***	***MJE5731A*** (Note 6)	30/150	0.3	2.0 typ	0.18 typ	0.3	10	40
2.0	60	TIP110 (Note 4)	TIP115 (Note 4)	500 min	2.0	1.7 typ	1.3 typ	2.0	25 (Note 3)	50
	80	TIP111 (Note 4)	TIP116 (Note 4)	500 min	2.0	1.7 typ	1.3 typ	2.0	25 (Note 3)	50
	100	***TIP112*** (Note 4)	***TIP117*** (Note 4)	500 min	2.0	1.7 typ	1.3 typ	2.0	25 (Note 3)	50
	400/700	***BUL44***		14/36	0.4	2.75 (Note 5)	0.175 (Note 5)	1.0	13 typ	50
	450/1000	***BUX85***		30	0.1	3.5	1.4	1.0	4.0	50
		MJE18002		14/34	0.2	3.0 (Note 5)	0.17 (Note 5)	1.0	12 typ	40
3.0	60	TIP31A	TIP32A	25 min	1.0	0.6 typ	0.3 typ	1.0	3.0	40
	80	***TIP31B***	***TIP32B***	25 min	1.0	0.6 typ	0.3 typ	1.0	3.0	40
	100	BD241C	BD242C	25 min	1.0				3.0	40
		TIP31C	***TIP32C***	25 min	1.0	0.6 typ	0.3 typ	1.0	3.0	40
4.0	80	***D44C12***	***D45C12***	40/120	0.2			1.0	40 typ	30
	400/700	***MJE13005***		6/30	3.0	3.0	0.7	3.0	4.0	60
5.0	60	TIP120 (Note 4)	TIP125 (Note 4)	1k min	3.0	1.5 typ	1.5 typ	3.0	4.0 (Note 3)	65
	80	TIP121 (Note 4)	TIP126 (Note 4)	1k min	3.0	1.5 typ	1.5 typ	3.0	4.0 (Note 3)	65
	100	***TIP122*** (Note 4)	***TIP127*** (Note 4)	1k min	3.0	1.5 typ	1.5 typ	4.0	4.0 (Note 3)	75
	250	2N6497		10/75	2.5	1.8	0.8	2.5	5.0	80
	400/700	***BUL45***		14/34	0.3	1.7 (Note 5)	0.15 (Note 5)	1.0	12 typ	75
		BUL45D2		22 min	0.8			1.0	13 typ	75
	450/1000	***MJE18004***		14/34	0.3	1.7	0.15	1.0	13	75
		MJE18004D2*								

3. $|h_{FE}|$ @ 1.0 MHz
4. Darlington
5. Switching tests performed with special application simulator circuit. See data sheet for details.
6. V_{CEO} = 375 V
7. When 2 voltages are given, the format is $V_{CEO(sus)}/V_{CES}$.

*D2 suffix indicates transistor with built in C–E freewheeling diode and antisaturation network.

Devices listed in **bold**, ***italic*** are ON Semiconductor preferred devices.

Plastic TO–220AB (continued)

I_C Cont Amps Max	$V_{CEO(sus)}$ Volts Min (Note 11)	Device Type NPN	Device Type PNP	h_{FE} Min/Max	@ I_C Amp	Resistive Switching t_s µs Max	Resistive Switching t_f µs Max	Resistive Switching @ I_C Amp	f_T MHz Min	P_D (Case) Watts @ 25°C
6.0	60	TIP41A	TIP42A	15/75	3.0	0.4 typ	0.15 typ	3.0	3.0	65
	80	TIP41B	TIP42B	15/75	3.0	0.4 typ	0.15 typ	3.0	3.0	65
		BD243B	***BD244B***	15 min	3.0	0.4 typ	0.15 typ	3.0	3.0	65
	100	***BD243C***	***BD244C***	15 min	3.0	0.4 typ	0.15 typ	3.0	3.0	65
		TIP41C	***TIP42C***	15/75	3.0	0.4 typ	0.15 typ	3.0	3.0	65
	400/700	***BUL146***		14/34	0.5	1.75 (Note 10)	0.15 (Note 10)	3.0	14 typ	100
	450/1000	***MJE18006***		14/34	0.5	3.2 (Note 10)	0.13 (Note 10)	3.0	14 typ	100
7.0	30	2N6288	2N6111	30/150	3.0	0.4 typ	0.15 typ	3.0	4.0	40
	50		2N6109	30/150	2.5	0.4 typ	0.15 typ	3.0	4.0	40
	70	2N6292	2N6107	30/150	2.0	0.4 typ	0.15 typ	3.0	4.0	40
	150	BU407		30 min	1.5		0.75	5.0	10	60
	200	***BU406***		30 min	1.5		0.75	5.0	10	60
8.0	60	2N6043 (Note 9)	2N6040 (Note 9)	1k/10k	4.0	1.5 typ	1.5 typ	3.0	4.0 (Note 8)	75
		TIP100 (Note 9)	TIP105 (Note 9)	1k/20k	3.0	1.5 typ	1.5 typ	3.0	4.0 (Note 8)	80
	80	***BDX53B*** (Note 9)	***BDX54B*** (Note 9)	750 min	3.0				4.0 (Note 8)	60
		TIP101 (Note 9)	***TIP106*** (Note 9)	1k/20k	3.0	1.5 typ	1.5 typ	3.0	4.0 (Note 8)	80
	100	***2N6045*** (Note 9)	***2N6042*** (Note 9)	1k/10k	3.0	1.5 typ	1.5 typ	3.0	4.0 (Note 8)	75
		BDX53C (Note 9)	***BDX54C*** (Note 9)	750 min	3.0					
		TIP102 (Note 9)	***TIP107*** (Note 9)	1k/20k	3.0	1.5 typ	1.5 typ	3.0	4.0 (Note 8)	80
	120	MJE15028	MJE15029	20 min	4.0				30	50
	150	***MJE15030***	***MJE15031***	20 min	4.0				30	50
	250	***MJE15032***	***MJE15033***	10 min	2.0				30	50
	300/600	MJE5740 (Note 9)		200 min	4.0	8.0 typ	2.0 typ	6.0	4.0	80
	300		MJE5850	15 min	2.0	2.0	0.5	4.0		80
	350		***MJE5851***	15 min	2.0	2.0	0.5	4.0		80
	400	***MJE5742*** (Note 9)		200 min	4.0	8.0 typ	2.0 typ	6.0		80
		MJE13007		5/30	5.0	3.0	0.7	5.0		80
			MJE5852	15 min	2.0	2.0	0.5	4.0		80

8. $|h_{FE}|$ @ 1.0 MHz
9. Darlington
10. Switching tests performed with special application simulator circuit. See data sheet for details.
11. When 2 voltages are given, the format is $V_{CEO(sus)}/V_{CES}$.

Plastic TO–220AB (continued)

I_C Cont Amps Max	$V_{CEO(sus)}$ Volts Min (Note 15)	Device Type		h_{FE} Min/Max	@ I_C Amp	Resistive Switching			f_T MHz Min	P_D (Case) Watts @ 25°C
		NPN	PNP			t_s µs Max	t_f µs Max	@ I_C Amp		
8.0	400/700	***BUL147***		14/34	1.0	2.5 (Note 14)	0.18 (Note 14)	2.0	14 typ	125
	450/1000	***MJE18008***		16/34	1.0	2.75 (Note 14)	0.18 (Note 14)	2.0	13 typ	125
10	60	D44H8	D45H8	40 min	4.0					50
		MJE3055T	***MJE2955T***	20/70	4.0					75
		2N6387 (Note 13)	***2N6667*** (Note 13)	1k/20k	5.0				20 (Note 12)	65
	80	***BDX33B*** (Note 13)	***BDX34B*** (Note 13)	750 min	3.0				3.0	70
		BD809	***BD810***	15 min	4.0				1.5	90
		2N6388 (Note 13)	***2N6668*** (Note 13)	1k/20k	5.0				20 (Note 12)	65
		D44H11	***D45H11***	40 min	4.0	0.5 typ	0.14 typ	5.0	50 typ	50
	100	***BDX33C*** (Note 13)	***BDX34C*** (Note 13)	750 min	3.0				3.0	70
12	400/700	***MJE13009***		6/30	8.0	3.0	0.7	8.0	4.0	100
15	60	2N6487	2N6490	20/150	5.0	0.6 typ	0.3 typ	5.0	5.0	75
	80	***2N6488***	***2N6491***	20/150	5.0	0.6 typ	0.3 typ	5.0	5.0	75
		D44VH10	***D45VH10***	20 min	4.0	0.5	0.09	8.0	50 typ	83
	100	***BDW42*** (Note 13)	***BDW47*** (Note 13)	1k min	5.0	1.0 typ	1.5 typ	5.0	4.0	85

12. $|h_{FE}|$ @ 1.0 MHz
13. Darlington
14. Switching tests performed with special application simulator circuit. See data sheet for details.
15. When 2 voltages are given, the format is $V_{CEO(sus)}/V_{CES}$.

Plastic TO–218 Type

I_C Cont Amps Max	$V_{CEO(sus)}$ Volts Min (Note 18)	Device Type		h_{FE} Min/Max	@ I_C Amp	Resistive Switching			f_T MHz Min	P_D (Case) Watts @ 25°C
		NPN	PNP			t_s µs Max	t_f µs Max	@ I_C Amp		
10	60	TIP140 (Note 17)	TIP145 (Note 17)	500 min	10	2.5 typ	2.5 typ	5.0	4.0 (Note 16)	125
		TIP141 (Note 17)	TIP146 (Note 17)	500 min	10	2.5 typ	2.5 typ	5.0	4.0 (Note 16)	125
	100	***BDV65B*** (Note 17)	***BDV64B*** (Note 17)	1k min	5.0					125
		TIP33C		20/100	3.0				3.0	80
		TIP142 (Note 17)	***TIP147*** (Note 17)	500 min	10	2.5 typ	2.5 typ	5.0	4.0 (Note 16)	125
	350	BU323Z (Note 17)		500/3400	5.0			6.0		150
15	60	***TIP3055***	***TIP2955***	5 min	10				2.5	80
	150	MJH11018 (Note 17)	MJH11017 (Note 17)	400/15k	10				3.0	150
	200	MJH11020 (Note 17)	MJH11019 (Note 17)	400/15k	10				3.0	150
	250	***MJH11022*** (Note 17)	***MJH11021*** (Note 17)	400/15k	10				3.0	150
16	160	***MJE4343***	***MJE4353***	15 min	8.0	1.2 typ	1.2 typ	8.0	1.0	125
20	100	***MJH6284*** (Note 17)	***MJH6287*** (Note 17)	750/18k	10				4.0	125
25	60	TIP35A	TIP36A	15/75	15	0.6 typ	0.3 typ	10	3.0	125
	100	***TIP35C***	***TIP36C***	15/75	15	0.6 typ	0.3 typ	10	3.0	125

16. $|h_{FE}|$ @ 1.0 MHz
17. Darlington
18. When 2 voltages are given, the format is $V_{CEO(sus)}/V_{CES}$.

Plastic (Isolated TO-220 Type)

I_CCont Amps Max	$V_{CEO(sus)}$ Volts Min	V_{CES} Volts Min	Device Type		h_{FE} Min/Max	@ I_C Amp	Resistive Switching			f_T MHz Min	P_D (Case) Watts @ 25°C
			NPN	PNP			t_s µs Max	t_f µs Max	@ I_C Amp		
1.0	250		***MJF47***		30/150	0.3	2.0 typ	0.17 typ	0.3	10	28
3.0	100		***MJF31C***	***MJF32C***	10 min	1.0	0.6	0.3	1.0	3.0	28
5.0	100		***MJF122*** (Note 20)	***MJF127*** (Note 20)	2000 min	3.0	1.5 typ	1.5 typ	3.0	4.0 (Note 19)	28
	450	1000	***MJF18004***		14/34	0.3	1.7 (Note 21)	0.15 (Note 21)	1.0	13 typ	35
6.0	400	700	***BUL146F***		14/34	0.5	2.5 (Note 21)	0.15 (Note 21)	3.0	14 typ	40
8.0	150		***MJF15030***	***MJF15031***	40 min	3.0	1.0 typ	0.15 typ	3.0	30	35
	450	1000	***MJF18008***		16/34	1.0	2.75 (Note 21)	0.18 (Note 21)	2.0	13 typ	45
10	60		***MJF3055***	***MJF2955***	20/100	4.0				2.0	40
	80		***MJF44H11***	***MJF45H11***	40/100	4.0	0.5 typ	0.14 typ	5.0	40	35
	100		***MJF6388*** (Note 20)	***MJF6668*** (Note 20)	3k/20k	3.0	1.5 typ	1.5 typ		20 (Note 19)	40

Large Plastic TO-264

I_CCont Amps Max	$V_{CEO(sus)}$ Volts Min	Device Type		h_{FE} Min/Max	@ I_C Amp	Resistive Switching			f_T MHz Min	P_D (Case) Watts @ 25°C
		NPN	PNP			t_s µs Max	t_f µs Max	@ I_C Amp		
15	200	***MJL3281A***	***MJL1302A***	60/175	5.0				30 typ	200
16	250	***MJL21194***	***MJL21193***	25/75	8.0				4.0	200
		MJL21196	***MJL21195***	25/75	8.0				4.0	200

19. $|h_{FE}|$ @ 1.0 MHz
20. Darlington
21. Switching tests performed with special application simulator circuit. See data sheet for details.

Plastic TO–225AA Type (Formerly TO–126 Type)

I_C Cont Amps Max	$V_{CEO(sus)}$ Volts Min	Device Type		h_{FE} Min/Max	@ I_C Amp	Resistive Switching			f_T MHz Min	P_D (Case) Watts @ 25°C
		NPN	PNP			t_s µs Max	t_f µs Max	@ I_C Amp		
0.3	350	***MJE3439***		40/160	0.02				15	15
0.5	200	***MJE344***		30/300	0.05				15	20.8
	250	2N5655		30/250	0.1	3.5 typ	0.24 typ	0.1	10	20
	300	***MJE340***	***MJE350***	30/240	0.05					20.8
	350	***2N5657***		30/250	0.1	3.5 typ	0.24 typ	0.1	10	20
		BD159		30/240	0.05					20
1.0	40	2N4921	2N4918	20/100	0.5	0.6 typ	0.3 typ	0.5	3.0	30
	60	2N4922	2N4919	20/100	0.5	0.6 typ	0.3 typ	0.5	3.0	30
	80	***2N4923***	***2N4920***	20/100	0.5	0.6 typ	0.3 typ	0.5	3.0	30
1.5	45	BD135	BD136	40/250	0.15					12.5
	60	BD137	BD138	40/250	0.15					12.5
	80	***BD139***	***BD140***	40/250	0.15					12.5
	400	***MJE13003*** (Note 24)		5/25	1.0	4.0	0.7	1.0	5.0	40
2.0	80	***BD237***	***BD238***	25 min	1.0				3.0	25
	100	***MJE270*** (Notes 23 & 24)	***MJE271*** (Notes 23 & 24)	1.5k min	0.12				6.0	15
3.0	60	MJE181	MJE171	50/250	0.1	0.6 typ	0.12 typ	0.1	50	12.5
	80	***BD179***	***BD180***	40/250	0.15					25
		MJE182	***MJE172***	50/250	0.1	0.6 typ	0.12 typ	0.1	50	12.5
	500	***BUH51*** (Note 24)		8.0 min	1.0					50
4.0	40	***MJE521***	***MJE371***	40 min	1.0					40
	45	***BD437***	***BD438***	40 min	2.0				3.0	36
	60	***BD439***	***BD440***	25 min	2.0				3.0	36
		BD677 (Note 23)	***BD678*** (Note 23)	750 min	1.5					40
		BD677A (Note 23)	***BD678A*** (Note 23)	750 min	1.5					40
		BD787	***BD788***	20 min	2.0				50	15
		2N5191	***2N5194***	25/100	1.5	0.4 typ	0.4 typ	1.5	2.0	40
		MJE800 (Note 23)	***MJE700*** (Note 23)	750 min	1.5				1.0 (Note 22)	40
		2N6038 (Note 23)	***2N6035*** (Note 23)	750/18k	2.0	1.7 typ	1.2 typ	2.0	25	40

22. $|h_{FE}|$ @ 1.0 MHz
23. Darlington
24. Case 77, Style 3

Plastic TO–225AA Type (Formerly TO–126 Type) (continued)

I_C Cont Amps Max	$V_{CEO(sus)}$ Volts Min	Device Type		h_{FE} Min/Max	@ I_C Amp	Resistive Switching			f_T MHz Min	P_D (Case) Watts @ 25°C
		NPN	PNP			t_s µs Max	t_f µs Max	@ I_C Amp		
4.0	80	***2N5192***	***2N5195***	25/100	1.5	0.4 typ	0.4 typ	1.5	2.0	40
		BD441	***BD442***	15 min	2.0				3.0	36
		BD679 (Note 26)	***BD680*** (Note 26)	750 min	1.5					40
		BD679A (Note 26)	***BD680A*** (Note 26)	750 min	2.0					40
		MJE802 (Note 26)	MJE702 (Note 26)	750 min	1.5				1.0 (Note 25)	40
		MJE803 (Note 26)	***MJE703*** (Note 26)	750 min	2.0				1.0 (Note 25)	40
		2N6039 (Note 26)	***2N6036*** (Note 26)	750/18k	2.0	1.7 typ	1.2 typ	2.0	25	40
	100	***BD681*** (Note 26)	***BD682*** (Note 26)	750 min	1.5					40
		MJE243	***MJE253***	40/120	0.2	0.15 typ	0.07 typ	2.0	40	15
5.0	25	***MJE200***	***MJE210***	45/180	2	0.13 typ	0.035 typ	2.0	65	15

25. $|h_{FE}|$ @ 1.0 MHz
26. Darlington
27. Case 77, Style 3

DPAK – Surface Mount Power Packages

I_C Cont Amps Max	$V_{CEO(sus)}$ Volts Min	Device Type		h_{FE} Min/Max	@ I_C Amp	Resistive Switching			f_T MHz Min	P_D (Case) Watts @ 25°C
		NPN	PNP			t_s µs Max	t_f µs Max	@ I_C Amp		
0.5	300	***MJD340T4***	***MJD350T4***	30/240	0.05					15
1.0	250	MJD47T4		30/150	0.3	2.0	0.2	0.3	10	15
	400	***MJD50T4***		30/150	0.3	2.0	0.2	0.3	10	15
2.0	100	***MJD112T4*** (Note 29)	***MJD117T4*** (Note 29)	1000 min	2.0	1.7	1.3	2.0	25 (Note 28)	20
	450	***MJD18002D2T4***		6.0 min	2.0	1.0 typ	0.15 typ	1.0	13 typ	25
3.0	40	MJD31T4	MJD32T4	10 min	1.0	0.6	0.3	1.0	3.0	15
	100	***MJD31CT4***	***MJD32CT4***	10 min	1.0	0.6	0.3	1.0	3.0	15
4.0	80	***MJD6039T4*** (Note 29)	***MJD6036T4*** (Note 29)	1k/2k	2.0	1.7	1.2	2.0	25	20
	100	***MJD243T4***	***MJD253T4***	40/180	0.2	0.16	0.04	1.0	40	12.5
5.0	25	***MJD200T4***	***MJD210T4***	45/180	2.0	0.15	0.04	2.0	65	12.5
6.0	100	***MJD41CT4***	***MJD42CT4***	15/75	3.0	0.4	0.15	3.0	3.0	20
8.0	80	***MJD44H11T4***	***MJD45H11T4***	40 min	4.0	0.5	0.14	5.0	50 typ	20
	100	***MJD122T4*** (Note 29)	***MJD127T4*** (Note 29)	1k/2k	4.0	1.5	2.0	4.0	4 (Note 28)	20
10	60	***MJD3055T4***	***MJD2955T4***	20/100	4.0	1.5	1.5	3.0	2.0	20
	80	***MJD44ET4*** (Note 29)		1k min	5.0	2.0	0.5	10		20

28. $|h_{FE}|$ @ 1.0 MHz
29. Darlington

Metal TO–204AA (Formerly TO–3)

I_C Cont Amps Max	$V_{CEO(sus)}$ Volts Min (Note 32)	Device Type NPN	Device Type PNP	h_{FE} Min/Max	@ I_C Amp	Resistive Switching t_s µs Max	Resistive Switching t_f µs Max	Resistive Switching @ I_C Amp	f_T MHz Min	P_D (Case) Watts @ 25°C
4.0	250	***MJ15020***	***MJ15021***	30 min	1.0				20	150
10	140	2N3442		20/70	4.0					117
	250	***MJ15011***	***MJ15012***	20/100	2.0					200
12	100		***2N6052*** (Note 31)	750/18k	6.0	1.6 typ	1.5 typ	6.0	4.0 (Note 30)	150
15	60	***2N3055***	***MJ2955***	20/70	4.0	0.7 typ	0.3 typ	4.0	2.5	115
		2N3055A		20/70	4.0				0.8	115
	120	***MJ15015***	***MJ15016***	20/70	4.0	0.7 typ	0.3 typ	4.0	1.0	180
	140	MJ15001	MJ15002	25/150	4.0				2.0	200
	250	***MJ11022*** (Note 31)	***MJ11021*** (Note 31)	100 min	15				3.0 (Note 30)	175
16	140	***2N3773***	2N6609	15/60	8.0	1.1 typ	1.5 typ	8.0	4.0	150
		2N5631	2N6031	15/60	8.0	1.2 typ	1.2 typ	8.0	1.0	200
	200	MJ15022	MJ15023	15/60	8.0				5.0	250
	250	***MJ15024***	***MJ15025***	15/60	8.0				5.0	250
		MJ21194	***MJ21193***	25/75	8.0				4.0	250
		MJ21196	***MJ21195***	25/75	8.0				4.0	250
20	60	***2N3772***		15/60	10				2.0	150
	90	2N5038		20/100	12	1.5	0.5	12	60	140
	100	***2N6284*** (Note 31)	***2N6287*** (Note 31)	750/18k	10	2.5 typ	2.5 typ	10	4.0 (Note 30)	160
	140	***MJ15003***	***MJ15004***	25/150	5.0				2.0	250
25	60	2N5885	2N5883	20/100	10	1.0	0.8	10	4.0	200
	80	***2N5886***	***2N5884***	20/100	10	1.0	0.8	10	4.0	200
	100	2N6338		30/120	10	1.0	0.25	10	40	200
	150	***2N6341***		30/120	10	1.0	0.25	10	40	200

30. $|h_{FE}|$ @ 1.0 MHz
31. Darlington
32. When 2 voltages are given, the format is $V_{CEO(sus)}/V_{CES}$.

Metal TO–204AA (Formerly TO–3) (continued)

I_C Cont Amps Max	$V_{CEO(sus)}$ Volts Min (Note 35)	Device Type		h_{FE} Min/Max	@ I_C Amp	Resistive Switching			f_T MHz Min	P_D (Case) Watts @ 25°C
		NPN	PNP			t_s µs Max	t_f µs Max	@ I_C Amp		
30	40	***2N3771***		15/60	15				2.0	150
	60	2N5302		15/60	15	2.0	1.0	10	2.0	200
		MJ11012 (Note 34)		1k min	20				4.0 (Note 33)	200
	100	***MJ802***	***MJ4502***	25/100	7.5				2.0	200
	120	***MJ11016*** (Note 34)	***MJ11015*** (Note 34)	1k min	20				4.0 (Note 33)	200
	250	***MJ11022*** (Note 34)	***MJ11021*** (Note 34)	400/15k	10				3.0 (Note 33)	200
40	200	BUV21 (Note 36)		10 min	25	1.8	0.4	25	8.0	150
	250	***BUV22*** (Note 36)		10 min	20	1.1	0.35	20	8.0	250
50	80	***2N5686*** (Note 36)	***2N5684*** (Note 36)	15/60	25	0.5 typ	0.3 typ	25	2.0	300
	120	***MJ11032*** (Note 34 & 36)	***MJ11033*** (Note 34 & 36)	400 min	50					300
60	80	***MJ14002*** (Note 36)	***MJ14003*** (Note 36)	15/100	50					300

33. $|h_{FE}|$ @ 1.0 MHz
34. Darlington
35. When 2 voltages are given, the format is $V_{CEO(sus)}/V_{CES}$.
36. Case 197A–03 (TO–204AE)

Isolated Mounting Hole – Plastic TO–247

I_C Cont Amps Max	$V_{CEO(sus)}$ Volts Min	Device Type		h_{FE} Min/Max	@ I_C Amp	Inductive Switching			f_T MHz Min	P_D (Case) Watts @ 25°C
		NPN	PNP			t_s µs Max	t_f µs Max	@ I_C Amp		
8.0	150	MJW21192	MJW21191	15 min	8.0				4.0	100
15	230	MJW3281A	MJW1302A	60/175	5.0				30	200
16	250	MJW21194	MJW21193	20/60	8.0				4.0	200
		MJW21196	MJW21195	20/60	8.0				4.0	200

D^2PAK

I_C Cont Amps Max	$V_{CEO(sus)}$ Volts Min	Device Type		h_{FE} Min/Max	@ I_C Amp	Inductive Switching			f_T MHz Min	P_D (Case) Watts @ 25°C
		NPN	PNP			t_s µs Max	t_f µs Max	@ I_C Amp		
5.0	450/1000	MJB18004D2T4		6.0	2.0	2.4	0.175	2.5	13 typ	75
6.0	100		MJB42CT4	15/75	3.0				3.0	65
8.0	80	MJB44H11T4	MJB45H11T4	40/100	4.0	0.5 typ	0.14	5.0	40	50
10	350	BUB323Z		500/3400	5.0	(Note 37)			2.0	75

SOT–223

I_C Cont Amps Max	$V_{CEO(sus)}$ Volts Min	Device Type		h_{FE} Min/Max	@ I_C Amp	Inductive Switching			f_T MHz Min	P_D (Case) Watts @ 25°C
		NPN	PNP			t_s µs Max	t_f µs Max	@ I_C Amp		
0.5	30		MMJT350T1	30/240	0.05					0.8
3.0	30	MMJT9410T1	MMJT9435T1	50	1.0					0.8

SO–8 (Dual Transistors)

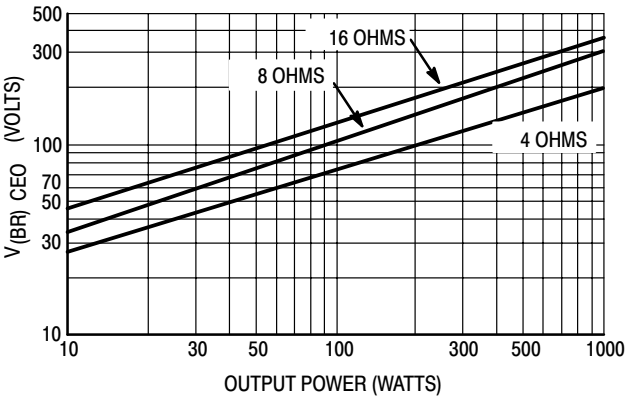
I_C Cont Amps Max	$V_{CEO(sus)}$ Volts Min	Device Type		h_{FE} Min/Max	@ I_C Amp	Inductive Switching			f_T MHz Min	P_D (Case) Watts @ 25°C
		NPN	PNP			t_s µs Max	t_f µs Max	@ I_C Amp		
3.0	30	MMDJ3N03BJTR2	MMDJ3P03BJTR2	50	1.0				30	2.0

37. Switching test performed with special application circuit.

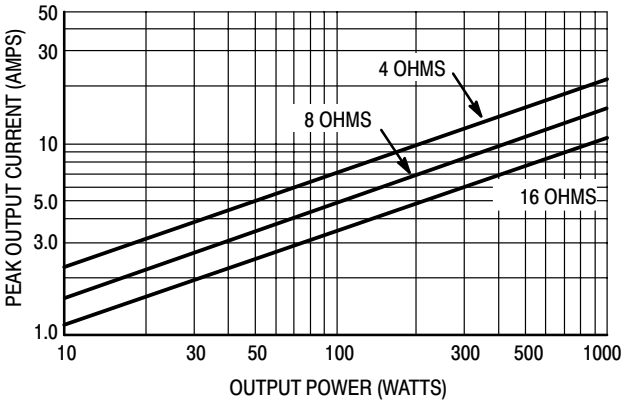
Audio

GENERAL DESIGN CURVES FOR POWER AUDIO OUTPUT STAGES

$V_{(BR)CEO}$ Required on Output and Driver Transistor versus Output Power for 4, 8 and 18 Ohm Loads



Output Transistor Peak Collector Current versus Output Power for 4, 8 and 16 Ohm Loads



Another important parameter that must be considered before selecting the output transistors is the safe–operating area these devices must withstand. For a complete discussion see Application Note AN485.

Recommended Power Transistors for Audio/Servo Loads

RMS Power Output	NPN	PNP	Case	P_D Watts @ 25°C	V_{CEO}	h_{FE} @ Min/Max	I_C Amps	f_T MHz Typ	ISB Volts/Amps
To 25 W	MJE15030	MJE15031	TO–220	50	150	20 min	4.0	30	14/3.6
	MJE15032	MJE15033	TO–220	50	250	50 min	1.0	30	50/1.0
25 to 50 W	2N3055A	MJ2955A	TO–204	120	120	20/70	4.0	3.0	60/2.0
	MJ15001	MJ15002	TO–204	200	140	25/150	4.0	3.0	40/5.0
50 to 100 W	MJ15015	MJ15016	TO–204	180	120	20/70	4.0	3.0	60/3.0
	MJ15003	MJ15004	TO–204	250	140	25/150	5.0	3.0	100/1.0
	MJ15020	MJ15021	TO–204	150	250	30 min	1.0	30	50/3.0
Over 100 W	MJ15024	MJ15025	TO–204	250	250	15/60	8.0	4.0	80/2.2
	MJL3281A	MJL1302A	340G–02	150	200	60/175	7.0	30	40/4.0
	MJ21194	MJ21193	TO–204	250	250	25/75	8.0	4.0	100/2.0
	MJL21194	MJL21193	340G–02	200	200	25/75	8.0	4.0	100/2.0
	MJL21196	MJL21195	340G–02	200	200	25/75	8.0	4.0	100/2.0
	MJW21192	MJW21191	340K–01	100	150	15 min	4.0	4.0	50/3.0
	MJW21194	MJW21193	340K–01	200	250	20/60	8.0	4.0	50/4.0
	MJW21196	MJW21195	340K–01	200	250	25/60	8.0	4.0	50/4.0
	MJW3281A	MJW1302A	340K–01	200	200	60/175	5.0	30	50/4.0

The Power Transistors shown are provided for reference only and show device capability. The final choice of the Power Transistors used is left to the circuit designer and depends upon the particular safe–operating area required and the mounting and heat sinking configuration used.

Bipolar Power Transistors for Electronic Lamp Ballasts

Plastic TO–220AB

I_CCont Amps Max	$V_{CEO(sus)}$ Volts Min	V_{CES} Volts Min	Device Type	I_C Operating Amps	h_{FE} min @ I_C Operating V_{CE} = 1.0 V	Inductive Switching @ I_C Operating T_{si} Min/Max (μs)	P_D (Case) Watts @ 25°C
2.0	400	700	BUL44	0.8	10	2.6 / 3.8	50
	450	1000	MJE18002	1.0	6.0	/ 2.75	50
4.0	500	800	BUH50	2.0	8.0 typ	/ 2.5	50
5.0	400	700	BUL45	2.0	7.0	2.6 / 3.8	75
	400	700	BUL45D2*	2.0	10	1.95 / 2.25	75
	450	1000	MJE18004	2.0	6.0	/ 2.5	75
	450	1000	MJE18004D2*	2.0	6.0	2.1 / 2.4	75
6.0	400	700	BUL146	3.0	8.0	2.6 / 3.8	100
	450	1000	MJE18006	3.0	6.0	/ 3.2	100
8.0	400	700	BUL147	4.5	8.0	2.6 / 3.8	125
	450	1000	MJE18008	4.5	6.0	/ 3.2	125
10	400	700	BUH100	5.0	10 typ	/ 3.0	100
15	400	700	BUH150	10	8.0 typ	/ 2.75	150

BUHXXX Series are specified for Halogen applications.
*D2 suffix indicates transistor with built in C–E freewheeling diode and antisaturation network.

Bipolar Power Transistors for Electronic Lamp Ballasts

Case 221D-02 is UL RECOGNIZED for its isolation feature. Case 221D-02 has been evaluated to 3500 volts RMS. Actual isolation rating depends on specific mounting position and maintaining required strike and creepage distances.

Plastic (Isolated TO-220 Type)

I_C Cont Amps Max	$V_{CEO(sus)}$ Volts Min	V_{CES} Volts Min	Device Type	I_C Operating Amps	h_{FE} min @ I_C Operating V_{CE} = 1.0 V	Inductive Switching @ I_C Operating T_{si} Min/Max (µs)	P_D (Case) Watts @ 25°C
5.0	450	1000	MJF18004	2.0	6.0	/ 2.5	35
6.0	400	700	BUL146F	3.0	8.0	2.6 / 3.8	40
8.0	450	1000	MJF18008	4.5	6.0	/ 3.2	45

Surface Mount Power Packages – DPAK

I_C Cont Amps Max	$V_{CEO(sus)}$ Volts Min	V_{CES} Volts Min	Device Type	I_C Operating Amps	h_{FE} min @ I_C Operating V_{CE} = 1.0 V	Inductive Switching @ I_C Operating T_{si} Min/Max (µs)	P_D (Case) Watts @ 25°C
2.0	400	700	BUD44D2–1*	0.8	20 typ	2.05 / 2.35	25

Surface Mount Power Packages – DPAK

I_C Cont Amps Max	$V_{CEO(sus)}$ /V_{CES} Volts Min	Device Type		h_{FE} Min/Max	@ I_C Amp	Inductive Switching			f_T MHz Min	P_D (Case) Watts @ 25°C
		NPN	PNP			t_s µs Max	t_f µs Max	@ I_C Amp		
2.0	450/1000	MJD18002D2T4		6.0	1.0	1.2	0.150	1.0 A	13 typ	25

D^2PAK

I_C Cont Amps Max	$V_{CEO(sus)}$ /V_{CES} Volts Min	Device Type		h_{FE} Min/Max	@ I_C Amp	Inductive Switching			f_T MHz Min	P_D (Case) Watts @ 25°C
		NPN	PNP			t_s µs Max	t_f µs Max	@ I_C Amp		
5.0	450/1000	MJB18004D2T4		6.0	2.0	2.4	0.175	2.5 A	13 typ	75

Plastic TO–225AA Type (Formerly TO–126 Type)

I_C Cont Amps Max	$V_{CEO(sus)}$ Volts Min	V_{CES} Volts Min	Device Type	I_C Operating Amps	h_{FE} min @ I_C Operating V_{CE} = 1.0 V	Inductive Switching @ I_C Operating T_{si} Min/Max (µs)	P_D (Case) Watts @ 25°C
1.5	400	700	MJE13003 (Note 38)	1.0	6.0 typ	/ 3.0	40
3.0	500	800	BUH51 (Note 38)	1.0	8.0	/ 3.75	50

38. Case 77, Style 3
BUHXXX Series are specified for Halogen applications.
*D2 suffix indicates transistor with built in C–E freewheeling diode and antisaturation network.

Rectifiers

In Brief . . .

Continuing investment in research and development for discrete products has created a rectifier manufacturing facility that matches the precision and versatility of the most advanced integrated circuits. As a result, ON Semiconductor's silicon rectifiers span all high tech applications with quality levels capable of passing the most stringent environmental tests . . . including those for automotive under–hood applications.

Product Highlights:

- Surface Mount Devices – A major thrust has been the development and introduction of a broad range of power rectifiers, Schottky and Ultrafast, 1/2 amp to 40 amp, 10 to 600 volts.
- Application Specific Rectifiers –
  - – Schottky rectifiers having lower forward voltage drop (0.3 to 0.6 volts) for use in low voltage SMPS outputs and as "OR"ing diodes.
  - – MEGAHERTZ™ series for high frequency power supplies and power factor correction.
  - – Ultrasoft rectifiers for high speed rectification.
  - – Energy rated rectifiers with guaranteed energy handling capability.
  - – Automotive transient suppressors.
- Ultrafast rectifiers having reverse recovery times as low as 25 ns to complement the Schottky devices for higher voltage requirements in high frequency applications.
- A wide variety of package options to match virtually any potential requirement.

The rectifier selector section that follows has generally been arranged by package and technology. The individual tables have been sorted by voltage and current with the package types for the devices listed shown above each table. The Application Specific Rectifiers are also included in their respective tables.

	Page
Rectifier Numbering System	213
Application Specific Rectifiers	214
Low V_F Schottky	214
MEGAHERTZ	214
NEW UltraSoft Rectifiers	214
Energy Rated Rectifiers	214
Automotive Transient Suppressors	214
SCHOTTKY Rectifiers	215
Surface Mount Schottky	215
Axial Lead Schottky	216
TO–220 Type Schottky	217
TO–218 Types and TO–247 Schottky	218
POWERTAP II Schottky	219
NEW UltraSoft Rectifiers	220
Ultrafast Rectifiers	220
Surface Mount Ultrafast	220
Axial Lead Ultrafast	221
TO–220 Type Ultrafast	222
TO–218 Types and TO–247 Ultrafast	222
POWERTAP II Ultrafast	223
Fast Recovery Rectifiers/General Purpose Rectifiers	223

RECTIFIER NUMBERING SYSTEM

PART NUMBER KEY **XXX X** **XX** **XX** **XX X** **XX**

PREFIX (TYPE DESIGNATOR)
- F = FULLY ISOLATED
- A = SURFACE MT (SMA)
- S = SURFACE MT (SMB/SMC)
- D = DPAK
- B = D^2PAK
- H = MEGAHERTZ™
- M = POWERMITE®
- P = POWERTAP™

I_O

V_R (X10 EXCEPT SCHOTTKY)

SUFFIX (DUAL DESIGNATOR)
- R = REVERSE
- L = LOW V_F
- E = ENERGY RATED (MUR)
- = LOW LEAKAGE (MBR)

PACKAGING DESIGNATOR*

PREFIX KEY

MUR	=	ULTRA FAST RECTIFIER
MBR	=	(SCHOTTKY) BARRIER RECTIFIER
MR	=	STANDARD & FAST RECOVERY
MSR	=	ULTRASOFT

SUFFIX KEY

CT	=	CENTER TAP (DUAL) TO–220, POWERTAP™, DPAK, D^2PAK
PT	=	CENTER TAP (DUAL) TO–218 PACKAGE
WT	=	CENTER TAP (DUAL) TO–247
–1	=	STRAIGHT LEAD D^2PAK

EXAMPLE:	MUR	30	20	WT
	ULTRAFAST	30 AMP	200 V	CENTER TAP (DUAL) TO–247
EXAMPLE:	MBR	30	45	WT
	SCHOTTKY	30 AMP	45 V	CENTER TAP (DUAL) TO–247

*For available packaging options consult Sales Office or see Data Sheet.

Application Specific Rectifiers

Table 1. Low V_F Schottky Rectifiers

Device	I_O Amps	V_{RRM} (Volts)	V_F @ Rated I_O and T_C = 25°C Volts (Max)	I_R @ Rated V_{RRM} mAmps (Max)	Package
MBR0520LT1, T3	0.5	20	0.33	0.25	SOD–123
MBRM110LT1, T3★	1.0	10	0.365	0.5	POWERMITE®
MBRA210LT3★	2.0	10	0.350	0.7	SMA
MBRS130LT3	1.0	30	0.395	1.0	SMB
MBRS410LT3★	4.0	10	0.330	5.0	SMC
MBRD835L	8.0	35	0.41	1.4	DPAK
MBRD1035CTL	10	35	0.41	6.0	DPAK
MBR2030CTL	20	30	0.48	5.0	TO-220
MBRB2535CTL	25	35	0.41	10	D^2PAK
MBR2535CTL	25	35	0.41	5.0	TO-220
MBRB2515L	25	15	0.42	15	D^2PAK
MBR2515L	25	15	0.42	15	TO-220
MBRB3030CTL	30	30	0.51	5.0	D^2PAK
MBR4015LWT	40	15	0.42	5.0	TO-247
MBRP20030CTL	200	30	0.52	5.0	POWERTAP II
MBRP20035L	200	35	0.57	10	POWERTAP III
MBRP30035L	300	35	0.57	10	POWERTAP III
MBRP40045CTL	400	45	0.57	10	POWERTAP II
MBRP400100CTL	400	100	0.83	6.0	POWERTAP II
MBRP60035CTL	600	35	0.57	10	POWERTAP II

Table 2. MEGAHERTZ™ Rectifiers

Device	I_O Amps	V_{RRM} (Volts)	Maximum		t_{rr} (Nanosecond)
			V_F @ Rated I_O and Temp. (Volts)	I_R @ Rated V_{RRM} (mAmps)	
MURH840CT/MURHB840CT	8.0	400	2.2	0.01	28
MURH860CT	8.0	600	2.8	0.01	35
MURHB860CT	8.0	600	2.8	0.01	35
MURHF860CT	8.0	600	2.8	0.01	35

Table 3. UltraSoft Rectifiers (For High Speed Rectification)

Device	I_O Amps	V_{RRM} (Volts)	Max V_F @ I_F (Volts)	Max t_{rr} (ηSec)	T_JMax (°C)
MSRD620CT	6.0	200	1.35 @ 6.0 A	55	175
MSR860	8.0	600	1.7 @ 8.0 A	120	150
MSR1560	15	600	1.8 @ 15 A	45	150

Table 4. Energy Rated Rectifiers

Device	I_O Amps	V_{RRM} (Volts)	Max V_F @ Rated unless Noted (Volts)	I_R @ V_{RRM} (μA)	Waval (M_J)
MUR180E	1.0	800	1.75	10	10
MUR1100E	1.0	1000	1.75	10	10
MUR480E	4.0	800	1.85	25	20
MUR4100E	4.0	1000	1.85	25	20
MUR880E	8.0	800	1.8	25	20
MUR8100E	8.0	1000	1.8	25	20

Table 5. Automotive Transient Suppressors

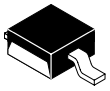
Device	I_O Amps	V_{RRM} (Volts)	Max V_F @ I_F (Volts)	I_{RSM} Amps	T_JMax (°C)
MR2535L	6.0	20	1.1 @ 100 A	62 @ 10 mS	175
MR2835S	32	23	1.1 @ 100 A	62 @ 10 mS	175
MR3227N, P	32	18	1.18 @ 100 A	90 @ 10 mS	200
MR4027N, P	40	18	1.1 @ 100 A	110 @ 10 mS	200
MR4045N, P	40	30	1.1 @ 100 A	55 @ 10 mS	200

★New Product

All devices listed are ON Semiconductor preferred devices

SCHOTTKY Rectifiers

Table 6. Surface Mount Schottky Rectifiers

V_{RRM} (Volts)	I_O (Note 1) (Amperes)	I_O Rating Condition	Device	Max V_F @ i_F T_C = 25°C (Volts)	I_{FSM} (Amperes)	T_J Max (°C)	Max I_R (Note 2) T_J = 25°C (mA)	Max I_R (Note 3) (mA)	Package
20	0.5	T_L = 90°C	***MBR0520LT1*** ***MBR0520LT3***	0.310 @ 0.1 A 0.385 @ 0.5 A	5.0	125	.075 @ 10 V .250 @ 20 V	5.0 @ 10 V 8.0 @ 20 V	**CASE 425-04** (SOD-123) Cathode = Band
30	0.5	T_L = 100°C	***MBR0530T1*** ***MBR0530T3***	0.375 @ 0.1 A 0.430 @ 0.5 A	5.0	125	.020 @ 15 V .130 @ 30 V	–	
40	0.5	T_L = 110°C	***MBR0540T1*** ***MBR0540T3***	0.53 @ 0.5 A	5.0	150	.010 @ 20 V .020 @ 40 V	–	
30	1.0	T_L = 65°C	***MBR130T1★***	0.45 @ 0.7 A	5.5	125	0.01	–	
10	1.0	T_C = 130°C	***MBRM110ET1★*** ***MBRM110ET3★***	0.505 @ 1.0 A	50	150	0.1	–	**CASE 457–04** (POWERMITE®)  Cathode = Polarity Band
10	1.0	T_C = 135°C	***MBRM110LT1★*** ***MBRM110LT3★***	0.365 @ 1.0 A	50	125	0.5	10 @ 100°C	
20	1.0	T_C = 130°C	***MBRM120ET1*** ***MBRM120ET3***	0.455 @ 0.1 A 0.530 @ 1.0 A	50	150	0.010 @ 20 V	1.6 @ 20 V	
20	1.0	$T_{tab} \leq$ 100°C	***MBRM120LT1*** ***MBRM120LT3***	0.36 @ 0.1 A 0.45 @ 1.0 A	50	125	0.4 @ 20 V	N/A	
30	1.0	T_C = 135°C	***MBRM130LT1★*** ***MBRM130LT3★***	0.45 @ 1.0 A	50	125	1.0	N/A	
40	1.0	$T_{tab} \leq$ 100°C	***MBRM140T1*** ***MBRM140T3***	0.39 @ 0.1 A 0.55 @ 1.0 A	50	125	0.5 @ 40 V	N/A	
10	2.0	T_L = 110°C	***MBRA210LT3★***	0.350 @ 2.0 A	230	125	0.70	60	**CASE 403B–02** (SMA) **CASE 403D–02** (SMA) Cathode = Band or Notch
10	2.0	T_C = 125°C	***MBRA210ET3★***	0.500 @ 2.0 A	150	150	0.015	0.200	
20	1.0	T_L = 110°C	***MBRA120LT3★***	0.395 @ 1.0 A	40	125	0.2	6.0	
20	1.0	T_C = 125°C	***MBRA120ET3★***	0.530 @ 1.0 A	40	150	0.010	1.6	
30	1.0	$T_C \leq$ 105°C	***MBRA130LT3***	0.41 @ 1.0 A 0.47 @ 2.0 A	25	125	1.0 @ 30 V 0.4 @ 15 V	25 @ 30 V	
40	1.0	$T_C \leq$ 100°C	***MBRA140T3***	0.60 @ 1.0 A 0.73 @ 2.0 A	25	125	1.0 @ 40 V 0.2 @ 20 V	25 @ 40 V	
60	1.0	T_C = 105°C	***MBRA160T3★***	0.510 @ 1.0 A	30	125	0.2	10	
60	1.0	T_C = 105°C	***SS16★***	0.510 @ 1.0 A	30	125	0.2	10	
20	1.0	T_L = 115°C	***MBRS120T3***	0.55 @ 1.0 A	40	125	1.0	10	**CASE 403A-03** (SMB) Cathode = Polarity Band
30	1.0	T_L = 120°C	***MBRS130LT3***	0.395 @ 1.0 A	40	125	1.0	10	
30	1.0	T_L = 115°C	***MBRS130T3***	0.55 @ 1.0 A	40	125	1.0	10	
40	1.0	T_L = 115°C	***MBRS140T3***	0.6 @ 1.0 A	40	125	1.0	10	
40	1.0	T_C = 110°C	***MBRS140LT3***	0.5 @ 1.0 A	40	125	0.4	10	
90	1.0	T_L = 120°C	***MBRS190T3***	0.75 @ 1.0 A	50	125	0.5	5.0	
100	1.0	T_L = 120°C	***MBRS1100T3***	0.75 @ 1.0 A	40	150	0.5	5.0	
40	1.5	T_C = 100°C	***MBRS1540T3***	0.46 @ 1.5 A	40	125	0.8	5.7	
40	2.0	$T_C \leq$ 95°C	***MBRS240LT3***	0.43 @ 2.0 A 0.53 @ 4.0 A	25	125	2.0 @ 40 V 0.5 @ 20 V	60 @ 40 V 40 @ 20 V	
40	2.0	T_C = 103°C	***MBRS2040LT3***	0.43 @ 2.0 A 0.50 @ 4.0 A	70	125	0.80 @ 40 V 0.10 @ 20 V	20 @ 40 V 6.0 @ 20 V	
60	2.0	T_L = 95°C	***MBRS260T3★***	0.63 @ 2.0 A	40	125	0.2	10 @ 125°C	
60	2.0	T_L = 95°C	***SS26★***	0.63 @ 2.0 A	40	125	0.2	10 @ 125°C	
10	4.0	T_L = 110°C	***MBRS410LT3★***	0.33 @ 4.0 A	150	125	5.0	200	**CASE 403-03** (SMC) Cathode = Notch
10	4.0	T_L = 130°C	***MBRS410ET3★***	0.50 @ 4.0 A	250	150	0.050	2.0	
20	3.0	T_L = 100°C	***MBRS320T3***	0.50 @ 3.0 A	80	125	2.0	20	
30	3.0	T_L = 100°C	***MBRS330T3***	0.50 @ 3.0 A	80	125	2.0	20	
40	3.0	T_L = 100°C	***MBRS340T3***	0.525 @ 3.0 A	80	125	2.0	20	
60	3.0	T_L = 100°C	***MBRS360T3***	0.74 @ 3.0 A	80	125	0.5	20	
100	3.0	T_L = 100°C	***MBRS3100T3★***	0.79 @ 3.0 A	130	150	0.05	5.0 @ 125°C	

1. I_O is total device current capability.
2. V_{RRM} unless noted
3. V_{RRM}, T_J = 100°C unless noted

★New Product

All devices listed are ON Semiconductor preferred devices

SCHOTTKY Rectifiers (continued)

Table 6. Surface Mount Schottky Rectifiers (continued)

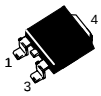
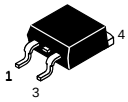
V_{RRM} (Volts)	I_O (Note 4) (Amperes)	I_O Rating Condition	Device	Max V_F @ i_F T_C = 25°C (Volts)	I_{FSM} (Amperes)	T_J Max (°C)	Max I_R (Note 5) T_J = 25°C (mA)	Max I_R (Note 6) (mA)	Package	
20	3.0	T_C = 125°C	***MBRD320T4***	0.60 @ 3.0 A	75	150	0.2	20 @ 125°C	**CASE 369A-13** (DPAK) 	"CT" Suffix **Non-"CT" Suffix**
30	3.0	T_C = 125°C	***MBRD330T4***	0.60 @ 3.0 A	75	150	0.2	20 @ 125°C		
40	3.0	T_C = 125°C	***MBRD340T4***	0.60 @ 3.0 A	75	150	0.2	20 @ 125°C		
50	3.0	T_C = 125°C	***MBRD350T4***	0.60 @ 3.0 A	75	150	0.2	20 @ 125°C		
60	3.0	T_C = 125°C	***MBRD360T4***	0.60 @ 3.0 A	75	150	0.2	20 @ 125°C		
20	6.0	T_C = 130°C	***MBRD620CTT4***	0.70 @ 3.0 A	75	150	0.1	15 @ 125°C		
30	6.0	T_C = 130°C	***MBRD630CTT4***	0.70 @ 3.0 A	75	150	0.1	15 @ 125°C		
40	6.0	T_C = 130°C	***MBRD640CTT4***	0.70 @ 3.0 A	75	150	0.1	15 @ 125°C		
50	6.0	T_C = 130°C	***MBRD650CTT4***	0.70 @ 3.0 A	75	150	0.1	15 @ 125°C		
60	6.0	T_C = 130°C	***MBRD660CTT4***	0.70 @ 3.0 A	75	150	0.1	15 @ 125°C		
35	8.0	T_C = 100°C	***MBRD835L***	0.40 @ 3.0 A 0.51 @ 8.0 A	100	125	1.4	35		
35	10	T_C = 90°C	***MBRD1035CTL***	0.49 @ 10 A	100	125	2.0	130 @ 125°C		
10	15	T_C = 135°C	***MBRB1045★***	0.84 @ 20 A	150	150	0.1	15 @ 125°C	**CASE 418B-04** (D^2PAK) 	"CT" Suffix **Non-"CT" Suffix**
45	15	T_C = 105°C	***MBRB1545CT***	0.84 @ 15 A	150	150	0.1	15 @ 125°C		
60	20	T_C = 110°C	***MBRB2060CT***	0.95 @ 20 A	150	150	0.15	150 @ 125°C		
100	20	T_C = 110°C	***MBRB20100CT***	0.85 @ 10 A 0.95 @ 20 A	150	150	0.1	6.0 @ 125°C		
200	20	T_C = 125°C	***MBRB20200CT***	1.0 @ 20 A	150	150	1.0	50 @ 125°C		
15	25	T_C = 90°C	***MBRB2515L***	0.45 @ 25 A	150	100	15	200 @ 70°C		
35	25	T_C = 110°C	***MBRB2535CTL***	0.47 @ 12.5 A 0.55 @ 25 A	150	125	10	500 @ 125°C		
45	25	T_C = 130°C	***MBRB2545CT***	0.82 @ 30 A	150	150	0.2	40 @ 125°C		
30	30	T_C = 115°C	***MBRB3030CT***	0.54 @ 15 A 0.67 @ 30 A	300	150	1.2	145 @ 150°C 46 @ 10 V, 150°C		
30	30	T_C = 95°C	***MBRB3030CTL***	0.45 @ 15 A 0.51 @ 30 A	150	125	2.0	195 @ 125°C 75 @ 10 V, 125°C		
30	40	T_C = 110°C	***MBRB4030***	0.46 @ 20 A 0.55 @ 40 A	300	150	1.0	150 @ 125°C		

Table 7. Axial Lead Schottky Rectifiers

V_{RRM} (Volts)	I_O (Amperes)	I_O Rating Condition	Device	Max V_F @ i_F T_C = 25°C (Volts)	I_{FSM} (Amperes)	T_J Max (°C)	Max I_R (Note 5) T_L = 25°C (mA)	Max I_R (Note 6) T_L (mA)	Package
20	1.0	T_A = 55°C $R_{\theta JA}$ = 80°C/W	***1N5817***	0.45 @ 1.0 A	25	125	1.0	10	**CASE 59–10 (DO–41) Plastic** Cathode = Polarity Band
30	1.0	T_A = 55°C $R_{\theta JA}$ = 80°C/W	***1N5818***	0.55 @ 1.0 A	25	125	1.0	10	
40	1.0	T_A = 55°C $R_{\theta JA}$ = 80°C/W	***1N5819***	0.60 @ 1.0 A	25	125	1.0	10	
50	1.0	T_A = 55°C	***MBR150***	0.75 @ 1.0 A	25	150	0.5	5.0	
60	1.0	T_A = 55°C $R_{\theta JA}$ = 80°C/W	***MBR160***	0.75 @ 1.0 A	25	150	0.5	5.0	
100	1.0	T_A = 120°C $R_{\theta JA}$ = 50°C/W	***MBR1100***	0.79 @ 1.0 A	50	150	0.5	5.0	
60	3.0	T_L = 125°C	***MBR3060★***	0.62 @ 3.0 A	125	150	0.150	10	**CASE 59–09 (DO–15)**

4. I_O is total device current capability.
5. V_{RRM} unless noted
6. V_{RRM}, T_J = 100°C unless noted

★New Product

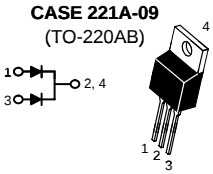
All devices listed are ON Semiconductor preferred devices

SCHOTTKY Rectifiers (continued)

Table 7. Axial Lead Schottky Rectifiers (continued)

V_{RRM} (Volts)	I_O (Amperes)	I_O Rating Condition	Device	Max V_F @ i_F T_C = 25°C (Volts)	I_{FSM} (Amperes)	T_J Max (°C)	Max I_R (Note 7) T_L = 25°C (mA)	Max I_R (Note 8) T_L (mA)	Package
20	3.0	T_A = 76°C $R_{\theta JA}$ = 28°C/W	***1N5820***	0.457 @ 3.0 A	80	125	2.0	20	**CASE 267-05 (DO–201AD) Plastic** Cathode = Polarity Band
30	3.0	T_A = 71°C $R_{\theta JA}$ = 28°C/W	***1N5821***	0.500 @ 3.0 A	80	125	2.0	20	
40	3.0	T_A = 61°C $R_{\theta JA}$ = 28°C/W	***1N5822***	0.525 @ 3.0 A	80	125	2.0	20	
35	8.0	T_L = 75°C	***MBR835★***	0.55 @ 8.0 A	140	125	1.0	50 @ 100°C	
40	8.0	T_L = 75°C	***MBR840★***	0.55 @ 8.0 A	140	125	1.0	50 @ 100°C	
45	8.0	T_L = 75°C	***MBR845★***	0.55 @ 8.0 A	140	125	1.0	50 @ 100°C	
40	3.0	T_A = 65°C $R_{\theta JA}$ = 28°C/W	***MBR340***	0.600 @ 3.0 A	80	150	0.6	20	
50	3.0	T_A = 65°C	***MBR350RL***	0.600 @ 3.0 A	80	150	0.6	20	
60	3.0	T_A = 65°C $R_{\theta JA}$ = 28°C/W	***MBR360RL***	0.740 @ 3.0 A	80	150	0.6	20	
100	3.0	T_A = 100°C $R_{\theta JA}$ = 28°C/W	***MBR3100***	0.79 @ 3.0 A	150	150	0.6	20	
45	8.0	T_L= 75°C	***805Q045N★***	0.55 @ 8.0 A	140	125	1.0	50	

Table 8. TO-220 and D²PAK Thru–Hole Schottky Rectifiers

V_{RRM} (Volts)	I_O (Amperes)	I_O Rating Condition	Device	Max V_F @ i_F T_C = 25°C (Volts)	I_{FSM} (Amperes)	T_J Max (°C)	Max I_R (Note 7) T_C = 25°C (mA)	Max I_R (Note 8) (mA)	Package
15	40	T_C = 105°C	***MBR4015CTL★***	0.54 @ 40 A	150	125	10	100 @ 125°C	**CASE 221A-09** (TO-220AB) 
35	15	T_C = 105°C	***MBR1535CT***	0.84 @ 15 A	150	150	0.1	15 @ 125°C	
45	15	T_C = 105°C	***MBR1545CT***	0.84 @ 15 A	150	150	0.1	15 @ 125°C	
100	16	T_C = 133°C	***MBR16100CT***	0.84 @ 16 A	150	175	0.1	5.0 @ 125°C	
30	20	T_C = 137°C	***MBR2030CTL***	0.52 @ 10 A 0.58 @ 20 A	150	150	5.0	40	
45	20	T_C = 135°C	***MBR2045CT***	0.84 @ 20 A	150	150	0.1	15 @ 125°C	
60	20	T_C = 133°C	***MBR2060CT***	0.85 @ 10 A 0.95 @ 20 A	150	150	0.1	6.0 @ 125°C	
80	20	T_C = 133°C	***MBR2080CT***	0.95 @ 20 A	150	150	0.1	6.0 @ 125°C	
90	20	T_C = 133°C	***MBR2090CT***	0.95 @ 20 A	150	150	0.1	6.0 @ 125°C	
100	20	T_C = 133°C	***MBR20100CT***	0.85 @ 10 A 0.95 @ 20 A	150	150	0.1	6.0 @ 125°C	
200	20	T_C = 125°C	***MBR20200CT***	1.0 @ 20 A	150	150	1.0	50 @ 125°C	
35	25	T_C = 95°C	***MBR2535CTL***	0.55 @ 25 A	150	125	5.0	500 @ 125°C	
45	25	T_C = 130°C	***MBR2545CT***	0.82 @ 30 A	150	150	0.2	40 @ 125°C	
45	30	T_C = 130°C	***MBR3045ST***	0.76 @ 30 A	150	150	0.2	40 @ 125°C	
45	15	T_C = 105°C	***MBR1545CTP★***	0.84 @ 15 A	150	150	0.1	15 @ 125°C	
45	20	T_C = 135°C	***MBR2045CTP★***	0.84 @ 20 A	150	150	0.1	15 @ 125°C	
45	25	T_C = 130°C	***MBR2545CTP★***	0.82 @ 30 A	150	150	0.2	40 @ 125°C	
100	20	T_C = 133°C	***MBR20100CTP★***	0.95 @ 20 A	150	150	0.1	6.0 @ 125°C	
200	20	T_C = 125°C	***MBR20200CTP★***	1.0 @ 20 A	150	150	1.0	50 @ 125°C	

7. V_{RRM} unless noted
8. V_{RRM}, T_J = 100°C unless noted

★New Product

All devices listed are ON Semiconductor preferred devices

SCHOTTKY Rectifiers (continued)

Table 8. TO-220 and D²PAK Thru–Hole Schottky Rectifiers (continued)

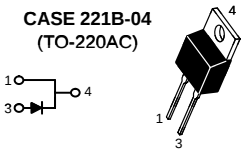
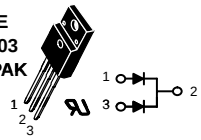
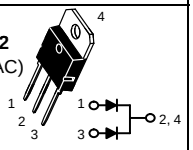
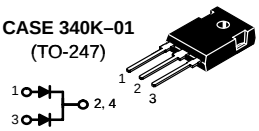
V_{RRM} (Volts)	I_O (Amperes)	I_O Rating Condition	Device	Max V_F @ i_F T_C = 25°C (Volts)	I_{FSM} (Amperes)	T_J Max (°C)	Max I_R (Note 9) T_C = 25°C (mA)	Max I_R (Note 10) (mA)	Package
35	7.5	T_C = 105°C	***MBR735***	0.84 @ 15 A	150	150	0.1	15 @ 125°C	CASE 221B-04 (TO-220AC) 
45	7.5	T_C = 105°C	***MBR745***	0.84 @ 15 A	150	150	0.1	15 @ 125°C	
35	10	T_C = 135°C	***MBR1035***	0.84 @ 20 A	150	150	0.1	15 @ 125°C	
45	10	T_C = 135°C	***MBR1045***	0.84 @ 20 A	150	150	0.1	15 @ 125°C	
60	10	T_C = 133°C	***MBR1060***	0.80 @ 10 A	150	150	0.1	6.0 @ 125°C	
90	10	T_C = 133°C	***MBR1090***	0.70 @ 10 A	150	150	0.1	6.0 @ 125°C	
100	10	T_C = 133°C	***MBR10100***	0.80 @ 10 A	150	150	0.1	6.0 @ 125°C	
35	16	T_C = 125°C	***MBR1635***	0.63 @ 16 A	150	150	0.2	40 @ 125°C	
45	16	T_C = 125°C	***MBR1645***	0.63 @ 16 A	150	150	0.2	40 @ 125°C	
15	25	T_C = 90°C	***MBR2515L***	0.45 @ 25 A	150	100	15	200 @ 70°C	
60	20	T_C = 133°C	***MBRF2060CT***	0.95 @ 20 A	150	150	0.15	15 @ 125°C	CASE 221D-03 FULL PAK 
100	20	T_C = 133°C	***MBRF20100CT***	0.95 @ 20 A	150	150	0.15	15 @ 125°C	
200	20	T_C = 125°C	***MBRF20200CT***	1.0 @ 20 A	150	150	1.0	50 @ 125°C	
45	25	T_C = 125°C	***MBRF2545CT***	0.82 @ 25 A	150	150	0.2	40 @ 125°C	

Table 9. TO-218 and TO-247 Schottky Rectifiers

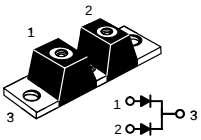
V_{RRM} (Volts)	I_O (Amperes)	I_O Rating Condition	Device	Max V_F @ i_F T_C = 25°C (Volts)	I_{FSM} (Amperes)	T_J Max (°C)	Max I_R (Note 9) T_C = 25°C (mA)	Max I_R (Note 10) (mA)	Package
45	30	T_C = 105°C	***MBR3045PT***	0.76 @ 30 A	200	150	1.0	100 @ 125°C	CASE 340D-02 (TO-218AC) 
45	40	T_C = 125°C	***MBR4045PT***	0.70 @ 20 A 0.80 @ 40 A	400	150	1.0	50	
45	60	T_C = 125°C	***MBR6045PT***	0.62 @ 30 A 0.75 @ 60 A	500	150	1.0	50	
45	30	T_C = 105°C	***MBR3045WT***	0.76 @ 30 A	200	150	1.0	100 @ 125°C	CASE 340K–01 (TO-247) 
15	40	T_C = 125°C	***MBR4015LWT***	0.42 @ 20 A 0.50 @ 40 A	400	150	5.0	150 @ 75°C	
45	40	T_C = 125°C	***MBR4045WT***	0.70 @ 20 A 0.80 @ 40 A	400	150	1.0	50	
45	60	T_C = 125°C	***MBR6045WT***	0.62 @ 30 A 0.75 @ 60 A	500	150	1.0	50	

9. V_{RRM} unless noted
10. V_{RRM}, T_J = 100°C unless noted

Indicates UL Recognized — File #E69369

SCHOTTKY Rectifiers (continued)

Table 10. POWERTAP™ II Schottky Rectifiers

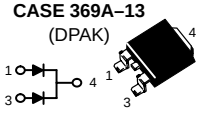
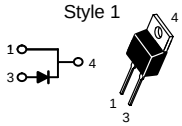
V_{RRM} (Volts)	I_O (Note 11) (Amperes)	I_O Rating Condition	Device	Max V_F @ i_F T_C = 25°C (Volts)	I_{FSM} (Amperes)	T_J Max (°C)	Max I_R (Note 12) T_C = 25°C (mA)	Max I_R (Note 13) (mA)	Package
30	200	T_C = 125°C	***MBRP20030CTL***	0.52 @ 100 A 0.60 @ 200 A	1500	150	5	—	**CASE 357C-03** POWERTAP™  Cathode = Mounting Plate Anode = Terminal
30	400	T_C = 100°C	***MBRP40030CTL★***	0.50 @ 200 A	1500	150	20	1000 @ 100°C	
35	600	T_C = 100°C	***MBRP60035CTL***	0.57 @ 300 A	4000	150	10	250	
45	200	T_C = 125°C	***MBRP20045CT***	0.78 @ 100 A	1500	175	0.5	50 @ 125°C	
45	300	T_C = 120°C	***MBRP30045CT***	0.70 @ 150 A 0.82 @ 300 A	2500	175	0.8	75 @ 125°C	
45	400	T_C = 100°C	***MBRP40045CTL***	0.57 @ 200 A	2500	150	10	—	
60	200	T_C = 125°C	***MBRP20060CT***	0.800 @ 100 A	1500	175	0.5	50 @ 125°C	
60	300	T_C = 120°C	***MBRP30060CT***	0.79 @ 150 A 0.89 @ 300 A	2500	175	0.8	75 @ 125°C	
100	400	T_C = 100°C	***MBRP400100CTL***	0.83 @ 200 A	2500	150	6	—	

11. I_O is total device current capability.
12. V_{RRM} unless noted
13. V_{RRM}, T_J = 100°C unless noted

★New Product

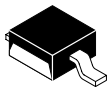
NEW UltraSoft Rectifiers

Table 11. UltraSoft Rectifiers (For High Speed Rectification)

V_{RRM} (Volts)	I_O (Note 14) (Amperes)	I_O Rating Condition	Device	Max V_F @ i_F T_C = 29°C (Volts)	t_{rr} (ηSec)	T_J Max (°C)	Max I_R (Note 15) T_C = 25°C (μA)	Max I_R (Note 16) (μA)	Package
200	6.0	T_C = 137°C	***MSRD620CT★***	1.2 @ 6.0 A	55	175	5.0	200 @ 100°C	**CASE 369A–13** (DPAK) 
600	8.0	T_C = 125°C	***MSR860***	1.7 @ 8.0 A	120	150	10	1000	**CASE 221B–04** Style 1 
600	15	T_C = 125°C	***MSR1560***	1.8 @ 15 A	45	150	15	5000	

Ultrafast Rectifiers

Table 12. Surface Mount Ultrafast Rectifiers

V_{RRM} (Volts)	I_O (Note 14) (Amperes)	I_O Rating Condition	Device	Max t_{rr} (ns)	Max V_F @ i_F T_C = 25°C (Volts)	I_{FSM} (Amperes)	T_J Max (°C)	Max I_R (Note 15) T_J = 25°C (μA)	Max I_R (Note 16) (μA) Package	Package
50	1.0	T_L = 95°C	***MURM105T1★*** ***UPR5TR7★*** ***MURM105T3★*** ***UPR5TR13★***	30	0.830 @ 1.0 A	50	150	2.0	50 @ 100°C	**CASE 457–04** (POWERMITE®) Cathode = Polarity Band 
100	1.0	T_L = 95°C	***MURM110T1★*** ***UPR10TR7★*** ***MURM110T3★*** ***UPR10TR13★***	30	0.830 @ 1.0 A	50	150	2.0	50 @ 100°C	
50	1.0	T_L = 155°C	***MURA105T3★***	30	0.875 @ 1.0 A	50	175	2.0	50	**CASE 403B–02** (SMA) Cathode = Band
100	1.0	T_L = 155°C	***MURA110T3★***	30	0.875 @ 1.0 A	50	175	2.0	50	
150	1.0	T_L = 155°C	***MURA115T3★***	35	0.875 @ 1.0 A	40	175	2.0	50	
200	1.0	T_L = 155°C	***MURA120T3★***	35	0.875 @ 1.0 A	40	175	2.0	50	
300	1.0	T_L = 150°C	***MURA130T3★***	65	1.1 @ 1.0 A	35	175	5.0	150	
400	1.0	T_L = 150°C	***MURA140T3★***	65	1.1 @ 1.0 A	35	175	5.0	150	
600	1.0	T_L = 145°C	***MURA160T3★***	75	1.25 @ 1.0 A	30	175	5.0	150	
50	1.0	T_L = 155°C	***MURS105T3***	35	0.875 @ 1.0 A	40	175	2.0	50	**CASE 403A–03** (SMB) Cathode = Polarity Band
100	1.0	T_L = 155°C	***MURS110T3***	35	0.875 @ 1.0 A	40	175	2.0	50	
150	1.0	T_L = 155°C	***MURS115T3***	35	0.875 @ 1.0 A	40	175	2.0	50	
200	1.0	T_L = 155°C	***MURS120T3***	35	0.875 @ 1.0 A	40	175	2.0	50	
400	1.0	T_L = 150°C	***MURS140T3***	75	1.25 @ 1.0 A	35	175	5.0	150	
600	1.0	T_L = 150°C	***MURS160T3***	75	1.25 @ 1.0 A	35	175	5.0	150	
200	2.0	T_L = 145°C	***MURS220T3***	35	0.95 @ 2.0 A	40	175	2.0	50	
300	2.0	T_L = 125°C	***MURS230T3***	65	1.30 @ 2.0 A	35	175	5.0	150	
400	2.0	T_L = 125°C	***MURS240T3***	65	1.30 @ 2.0 A	35	175	5.0	150	
600	2.0	T_L = 125°C	***MURS260T3***	75	1.45 @ 2.0 A	35	175	5.0	150	
200	3.0	T_L = 140°C	***MURS320T3***	35	0.875 @ 3.0 A	75	175	5.0	15	**CASE 403–03** (SMC) Cathode = Notch
400	3.0	T_L = 130°C	***MURS340T3***	75	1.25 @ 3.0 A	75	175	10	250	
600	3.0	T_L = 130°C	***MURS360T3***	75	1.25 @ 3.0 A	75	175	10	250	

14. I_O is total device current capability.
15. V_{RRM} unless noted
16. V_{RRM}, T_J = 150°C unless noted

★New Product

Ultrafast Rectifiers (continued)

Table 12. Surface Mount Ultrafast Rectifiers (continued)

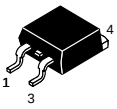
V_{RRM} (Volts)	I_O (Note 17) (Amperes)	I_O Rating Condition	Device	Max t_{rr} (ns)	Max V_F @ i_F T_C = 25°C (Volts)	I_{FSM} (Amperes)	T_J Max (°C)	Max I_R (Note 18) T_J = 25°C (μA)	Max I_R (Note 19) (μA) Package	Package
200	6.0	T_L = 140°C	***MURD620CT***	35	1.0 @ 3.0 A	50	175	5.0	250 @ 125°C	DPAK "CT" Suffix
200	3.0	T_C = 158°C	***MURD320***	35	.95 @ 3.0 A	75	175	5.0	500 @ 125°C	
400	8.0	T_L = 120°C	***MURHB840CT***	28	2.2 @ 4.0 A	100	175	10	500	D^2PAK  Non-"CT" Suffix
600	8.0	T_L = 120°C	***MURHB860CT***	35	2.8 @ 4.0 A	100	175	10	500	
200	16	T_L = 150°C	***MURB1620CT***	35	0.975 @ 8.0 A	100	175	5.0	250	
600	16	T_L = 150°C	***MURB1660CT***	60	1.5 @ 8.0 A	100	175	10	500	

Table 13. Axial Lead Ultrafast Rectifiers

V_{RRM} (Volts)	I_O (Amperes)	I_O Rating Condition	Device	Max t_{rr} (ns)	Max V_F @ i_F T_C = 25°C (Volts)	I_{FSM} (Amperes)	T_J Max (°C)	Max I_R (Note 18) T_J = 25°C (μA)	Max I_R (Note 19) (μA)	Package
50	1.0	T_A = 130°C	***MUR105***	35	0.875 @ 1.0 A	35	175	2.0	50	**CASE 59-10 (DO–41)** Plastic Cathode = Polarity Band
100	1.0	T_A = 130°C	***MUR110***	35	0.875 @ 1.0 A	35	175	2.0	50	
150	1.0	T_A = 130°C	***MUR115***	35	0.875 @ 1.0 A	35	175	2.0	50	
200	1.0	T_A = 130°C $R_{\theta JA}$ = 50°C/W	***MUR120***	35	0.875 @ 1.0 A	35	175	2.0	50	
300	1.0	T_A = 120°C	***MUR130***	75	1.25 @ 1.0 A	35	175	5.0	150	
400	1.0	T_A = 120°C	***MUR140***	75	1.25 @ 1.0 A		175	5.0	150	
600	1.0	T_A = 120°C $R_{\theta JA}$ = 50°C/W	***MUR160***	75	1.25 @ 1.0 A	35	175	5.0	150	
800	1.0	T_A = 95°C $R_{\theta JA}$ = 50°C/W	***MUR180E***	100	1.75 @ 1.0 A	35	175	10	600 @ 100°C	
1000	1.0	T_A = 95°C $R_{\theta JA}$ = 50°C/W	***MUR1100E***	100	1.75 @ 1.0 A	35	175	10	600 @ 100°C	
200	2.0	T_A = 90°C	***MUR220***	35	0.95 @ 2.0 A	35	175	2.0	50	
400	2.0	T_A = 85°C	***MUR240***	65	1.3 @ 2.0 A	35	175	5.0	150	
600	2.0	T_A = 60°C	***MUR260***	75	1.35 @ 2.0 A	35	175	5.0	150	
1000	2.0	T_A = 35°C	***MUR2100E***	100	2.2 @ 2.0 A	35	175	10	600 @ 100°C	
50	4.0	T_A = 80°C	***MUR405***	35	0.89 @ 4.0 A	125	175	5.0	150	**CASE 267-05 (DO–201AD)** Plastic Cathode = Polarity Band
100	4.0	T_A = 80°C	***MUR410***	35	0.89 @ 4.0 A	125	175	5.0	150	
150	4.0	T_A = 80°C	***MUR415***	35	0.89 @ 4.0 A	125	175	5.0	150	
200	4.0	T_A = 80°C $R_{\theta JA}$ = 28°C/W	***MUR420***	25	0.890 @ 4.0 A	125	175	5.0	150	
400	4.0	T_A = 40°C	***MUR440***	75	1.28 @ 4.0 A	70	175	10	250	
600	4.0	T_A = 40°C $R_{\theta JA}$ = 28°C/W	***MUR460***	75	1.28 @ 4.0 A	70	175	10	250	
800	4.0	T_A = 35°C $R_{\theta JA}$ = 28°C/W	***MUR480E***	100	1.85 @ 4.0 A	70	175	25	900 @ 100°C	
1000	4.0	T_A = 35°C $R_{\theta JA}$ = 28°C/W	***MUR4100E***	100	1.85 @ 4.0 A	70	175	25	900 @ 100°C	

17. I_O is total device current capability.
18. V_{RRM} unless noted
19. V_{RRM}, T_J = 150°C unless noted

★New Product

Ultrafast Rectifiers (continued)

Table 14. TO-220 Ultrafast and MEGAHERTZ™ Rectifiers

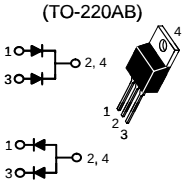
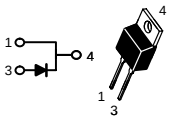
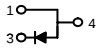
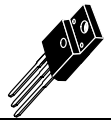
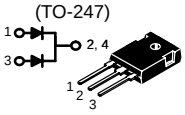
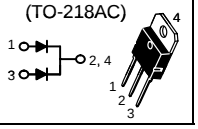
V_{RRM} (Volts)	I_O (Note 20) (Amperes)	I_O Rating Condition	Device	Max t_{rr} (ns)	Max V_F @ i_F T_C = 25°C (Volts)	I_{FSM} (Amperes)	T_J Max (°C)	Max I_R (Note 21) T_C = 25°C (μA)	Max I_R (Note 22) (μA)	Package
200	6.0	T_C = 130°C	***MUR620CT***	35	0.975 @ 3.0 A	75	175	5.0	250	**CASE 221A-09** (TO-220AB)  **MUR1620CTR Only**
400	8.0	T_C = 120°C	***MURH840CT***	28	2.2 @ 4.0 A	100	175	10	500	
600	8.0	T_C = 120°C	***MURH860CT***	35	2.8 @ 4.0 A	100	175	10	500	
100	16	T_C = 150°C	***MUR1610CT***	35	0.975 @ 8.0 A	100	175	5.0	250	
150	16	T_C = 150°C	***MUR1615CT***	35	0.975 @ 8.0 A	100	175	5.0	250	
200	16	T_C = 150°C	***MUR1620CT***	35	0.975 @ 8.0 A	100	175	5.0	250	
200	16	T_C = 160°C	***MUR1620CTR***	85	1.2 @ 8.0 A	100	175	5.0	500	
400	16	T_C = 150°C	***MUR1640CT***	60	1.30 @ 8.0 A	100	175	10	500	
600	16	T_C = 150°C	***MUR1660CT***	60	1.5 @ 8.0 A	100	175	10	500	
50	8.0	T_C = 150°C	***MUR805***	35	0.975 @ 8.0 A	100	175	5.0	250	**CASE 221B-04** (TO-220AC)   **MUR2020R Only**
100	8.0	T_C = 150°C	***MUR810***	35	0.975 @ 8.0 A	100	175	5.0	250	
150	8.0	T_C = 150°C	***MUR815***	35	0.975 @ 8.0 A	100	175	5.0	250	
200	8.0	T_C = 150°C	***MUR820***	35	0.975 @ 8.0 A	100	175	5.0	250	
400	8.0	T_C = 150°C	***MUR840***	60	1.30 @ 8.0 A	100	175	10	500	
600	8.0	T_C = 150°C	***MUR860***	60	1.50 @ 8.0 A	100	175	10	500	
800	8.0	T_C = 150°C	***MUR880E***	75	1.80 @ 8.0 A	100	175	25	500 @ 100°C	
100	15	T_C = 150°C	***MUR1510***	35	1.05 @ 15 A	200	175	10	500	
150	15	T_C = 150°C	***MUR1515***	35	1.05 @ 15 A	200	175	10	500	
200	15	T_C = 150°C	***MUR1520***	35	1.05 @ 15 A	200	175	10	500	
400	15	T_C = 150°C	***MUR1540***	60	1.25 @ 15 A	150	175	10	500	
600	15	T_C = 145°C	***MUR1560***	60	1.50 @ 15 A	150	175	10	1000	
200	20	T_C = 125°C	***MUR2020R***	95	1.10 @ 20 A	250	175	50	1000	
1000	8.0	T_C = 150°C	***MUR8100E***	75	1.80 @ 8.0 A	100	175	25	500 @ 100°C	
200	16	T_C = 150°C	***MURF1620CT***	25	0.975 @ 8.0 A	100	150	5.0	250	**CASE 221D-03** 
600	16	T_C = 150°C	***MURF1660CT***	60	1.5 @ 8.0 A	100	150	10	500	
600	8.0	$T_C \leq$ 120°C	***MURHF860CT*** ★	35	2.8 @ 4.0 A	100	150	10	500	

Table 15. TO-218 and TO-247 Ultrafast Rectifiers

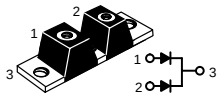
V_{RRM} (Volts)	I_O (Amperes)	I_O Rating Condition	Device	Max t_{rr} (ns)	Max V_F @ i_F T_C = 25°C (Volts)	I_{FSM} (Amperes)	T_J Max (°C)	Max I_R (Note 21) T_J = 25°C (μA)	Max I_R (Note 22) (mA)	Package
200	30	T_C = 145°C	***MUR3020WT***	35	1.05 @ 15 A	200	175	10	0.5	**CASE 340K–01** (TO-247) 
600	30	T_C = 145°C	***MUR3060WT***	60	1.70 @ 15 A	150	175	10	1.0	
200	30	T_C = 150°C	***MUR3020PT***	35	1.05 @ 15 A	200	175	10	0.5	**CASE 340D-02** (TO-218AC) 
400	30	T_C = 150°C	***MUR3040PT***	60	1.25 @ 15 A	150	175	10	0.5	
600	30	T_C = 145°C	***MUR3060PT***	60	1.50 @ 15 A	150	175	10	1.0	

20. I_O is total device current capability.
21. V_{RRM} unless noted
22. V_{RRM}, T_J = 150°C unless noted
★New Product

Indicates UL Recognized — File #E69369

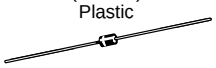
Ultrafast Rectifiers (continued)

Table 16. POWERTAP™ II Ultrafast Rectifiers

V_{RRM} (Volts)	I_O (Note 23) (Amperes)	I_O Rating Condition	Device	Max t_{rr} (ns)	Max V_F @ i_F T_C = 25°C (Volts)	I_{FSM} (Amperes)	T_J Max (°C)	Max I_R (Note 24) T_J = 25°C (μA)	Max I_R (Note 25) (mA)	Package
200	200	T_C = 130°C	***MURP20020CT***	50	1.00 @ 100 A	800	175	150	1 @ 125°C	**CASE 357C-03** POWERTAP™  Cathode = Mounting Plate Anode = Terminal
400	200	T_C = 100°C	***MURP20040CT***	75	1.30 @ 100 A	800	175	50	0.5 @ 125°C	

Fast Recovery Rectifiers/General-Purpose Rectifiers

Table 17. Fast Recovery Rectifiers/General Purpose Rectifiers

V_{RRM} (Volts)	I_O (Amperes)	I_O Rating Condition	Device	Max V_F @ i_F T_J = 25°C (Volts)	Max t_{rr} (ns)	I_{FSM} (Amperes)	T_J Max (°C)	Max I_R (Note 24) T_J = 25°C (μA)	Max I_R (Note 26) (μA)	Package
400	1.5	T_L = 118°C	***MRS1504T3***	1.04 @ 1.5 A	–	50	150	1.0	340	**CASE 403A-03 SMB**
300	1.0	T_L = 150°C	***MRA4003T3*** ★	1.1 @ 1.0 A	–	30	175	10	50	**CASE 403B-01 SMA** Cathode = Notch
400	1.0	T_L = 150°C	***MRA4004T3*** ★	1.1 @ 1.0 A	–	30	175	10	50	
600	1.0	T_L = 150°C	***MRA4005T3*** ★	1.1 @ 1.0 A	–	30	175	10	50	
800	1.0	T_L = 150°C	***MRA4006T3*** ★	1.1 @ 1.0 A	–	30	175	10	50	
1000	1.0	T_L = 150°C	***MRA4007T3*** ★	1.1 @ 1.0 A	–	30	175	10	50	
50	1.0	T_A = 75°C	***1N4001RL***	1.1 @ 1.0 A	–	30	150	10	50	**CASE 59-10** (DO–41) Plastic  Cathode = Polarity Band
100	1.0	T_A = 75°C	***1N4002RL***	1.1 @ 1.0 A	–	30	150	10	50	
200	1.0	T_A = 75°C	***1N4003RL***	1.1 @ 1.0 A	–	30	150	10	50	
400	1.0	T_A = 75°C	***1N4004RL***	1.1 @ 1.0 A	–	30	150	10	50	
600	1.0	T_A = 75°C	***1N4005RL***	1.1 @ 1.0 A	–	30	150	10	50	
800	1.0	T_A = 75°C	***1N4006RL***	1.1 @ 1.0 A	–	30	150	10	50	
1000	1.0	T_A = 75°C	***1N4007RL***	1.1 @ 1.0 A	–	30	150	10	50	
50	1.0	T_A = 75°C	***1N4933RL***	1.2 @ 1.0 A	200	30	150	5.0	100	
100	1.0	T_A = 75°C	***1N4934RL***	1.2 @ 1.0 A	200	30	150	5.0	100	
200	1.0	T_A = 75°C	***1N4935RL***	1.2 @ 1.0 A	200	30	150	5.0	100	
400	1.0	T_A = 75°C	***1N4936RL***	1.2 @ 1.0 A	200	30	150	5.0	100	
600	1.0	T_A = 75°C	***1N4937RL***	1.2 @ 1.0 A	200	30	150	5.0	100	

23. I_O is total device current capability.
24. V_{RRM} unless noted
25. V_{RRM}, T_J = 150°C unless noted
26. V_{RRM}, T_J = 100°C unless noted

★New Product

Fast Recovery Rectifiers/General-Purpose Rectifiers (continued)

Table 17. Fast Recovery Rectifiers/General Purpose Rectifiers (continued)

V_{RRM} (Volts)	I_O (Amperes)	I_O Rating Condition	Device	Max V_F @ i_F T_J = 25°C (Volts)	Max t_{rr} (ns)	I_{FSM} (Amperes)	T_J Max (°C)	Max I_R (Note 27) T_J = 25°C (μA)	Max I_R (Note 28) (μA)	Package
50	3.0	T_L = 105°C	***1N5400RL***	1.0 @ 3.0 A	–	200	150	10	100 @ 150°C	**CASE 267-05** (DO–201AD) Plastic Cathode = Polarity Band
100	3.0	T_L = 105°C	***1N5401RL***	1.0 @ 3.0 A	–	200	150	10	100 @ 150°C	
200	3.0	T_L = 105°C	***1N5402RL***	1.0 @ 3.0 A	–	200	150	10	100 @ 150°C	
400	3.0	T_L = 105°C	***1N5404RL***	1.0 @ 3.0 A	–	200	150	10	100 @ 150°C	
600	3.0	T_L = 105°C	***1N5406RL***	1.0 @ 3.0 A	–	200	150	10	100 @ 150°C	
800	3.0	T_L = 105°C	***1N5407RL***	1.0 @ 3.0 A	–	200	150	10	100 @ 150°C	
1000	3.0	T_L = 105°C	***1N5408RL***	1.0 @ 3.0 A	–	200	150	10	100 @ 150°C	
200	3.0	T_A = 80°C	***MR852RL***	1.25 @ 3.0 A	200	100	150	10	200 @ 80°C	
400	3.0	T_A = 80°C	***MR854RL***	1.25 @ 3.0 A	200	100	150	10	250 @ 80°C	
600	3.0	T_A = 80°C	***MR856RL***	1.25 @ 3.0 A	200	100	150	10	300 @ 80°C	
50	6.0	T_A = 60°C $R_{\theta JA}$ = 25°C/W	***MR750RL***	1.25 @ 100 A	–	400	175	25	1000	**CASE 194-04** Plastic Cathode indicated by diode symbol
100	6.0	T_A = 60°C $R_{\theta JA}$ = 25°C/W	***MR751RL***	1.25 @ 100 A	–	400	175	25	1000	
200	6.0	T_A = 60°C $R_{\theta JA}$ = 25°C/W	***MR752RL***	1.25 @ 100 A	–	400	175	25	1000	
400	6.0	T_A = 60°C $R_{\theta JA}$ = 25°C/W	***MR754RL***	1.25 @ 100 A	–	400	175	25	1000	
600	6.0	T_A = 60°C $R_{\theta JA}$ = 25°C/W	***MR756RL***	1.25 @ 100 A	–	400	175	25	1000	
1000	6.0	T_A = 60°C $R_{\theta JA}$ = 25°C/W	***MR760RL***	1.25 @ 100 A	–	400	175	25	1000	
200	25	T_C = 150°C	***MR2502***	1.18 @ 78.5 A	–	400	175	100	500	**CASE 193-04** Plastic Cathode = Polarity Band
400	25	T_C = 150°C	***MR2504***	1.18 @ 78.5 A	–	400	175	100	500	
1000	25	T_C = 150°C	***MR2510***	1.18 @ 78.5 A	–	400	175	100	500	
250	32	T_C = 150°C	***TRA3225***	1.15 @ 100 A	–	500	175	20	250	
250	25	T_C = 150°C	***TRA2525***	1.18 @ 100 A	–	400	175	10	250	

27. V_{RRM} unless noted
28. V_{RRM}, T_J = 100°C unless noted

Table 18. Overvoltage Transient Suppressors

V_{RRM} (Volts)	V_{BR} (Note 29) (Volts)	V_{BR} (Volts)	I_O (Amperes)	Device	Max V_F T_J = 25°C (Volts)	I_{FSM} (Amperes)	T_J Max (°C)	I_{RSM} (Amperes)	Max I_R (Note 35) (μA)	Package
23	24–32	40 (Note 32)	6 T_L = 125°C	***MR2520L***	1.25 I_F = 100A	400	175	58 (Note 33)	50	**CASE 194–04** Plastic Cathode = Diode Symbol
20	24–32	40 (Note 30)	6 T_C = 125°C	***MR2535L***	1.1 I_F = 100A	600	175	62 (Note 33)	0.2	
20	24–32	40 (Note 31)	32 T_C = 150°C	***TRA2532***	1.18 I_F = 100A	500	175	80 (Note 33)	10	**CASE 193-04** Plastic Cathode = Polarity Band
23	24–32	40 (Note 31)	32 T_C = 150°C	***MR2835S***	1.1 I_F = 100A	400	175	62 (Note 33)	5.0 @ 20 V	**CASE 460–02** Top Can Cathode = Terminal
18	20–27	37 (Note 31) 35 (Note 32)	32 T_C = 185°C	***MR3227N*** and ***MR3227P***	1.18 I_F = 100A	400	200	90 (Note 33) 40 (Note 34)	1.0 @ 16 V	**CASE 193A–02** Button Can N = Anode to Case P = Cathode to Case
18	20–27	37 (Note 31) 35 (Note 32)	40 T_C = 185°C	***MR4027N*** and ***MR4027P***	1.1 I_F = 100A	500	200	110 (Note 33) 50 (Note 34)	1.0 @ 16 V	
30	34–45	55 (Note 31) 53 (Note 32)	40 T_C = 185°C	***MR4045N*** and ***MR4045P***	1.1 I_F = 100A	500	200	55 (Note 33) 25 (Note 34)	1.0 @ 28 V	

29. At Ir = 100 mA, 25°C
30. At Ir = 90 A, Tc = 150°C, PW = 80 μS
31. At Ir = 80 A, Tc = 85°C, PW = 80 μS
32. At Ir = 80 A, Tc = 25°C, PW = 80 μS
33. Time Constant = 10 mS, 25°C
34. Time Constant = 80 mS, 25°C
35. At V_{RRM}, T_j = 25°C unless noted

Thyristors, Triggers and Surge Suppressors

In Brief . . .

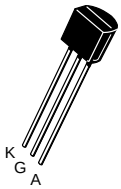
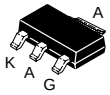
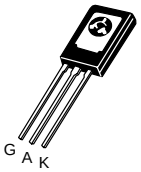
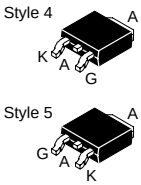
ON Semiconductor's broad line of Thyristors includes . . .

- A full line of Silicon Controlled Rectifiers (SCR's) covering a forward current range of 0.8 to 25 amps and blocking voltages from 30 volts to 800 volts. Available in a choice of six different plastic packages in both through hole and surface mount, for space saving requirements.
- An extensive line of Triacs (bidirectional devices) from 0.6 to 16 amps with blocking voltages from 200 to 800 volts. Like the SCR's, the Triacs are available in a choice of six different plastic packages.
- A new line of Thyristor Surge Suppressors in the surface mount SMB package covering surge currents of 50 and 100 amps, with break over voltages from 80 to 400 volts.
- Trigger devices, including Sidacs and PUT's (Programmable Unijunction Transistors). Trigger devices are available in both the axial lead and TO–92 packages.

	Page
SCRs: Silicon Controlled Rectifiers	227
TRIACs	230
Surge Suppressors and Triggers	235

SCRs

Silicon Controlled Rectifiers

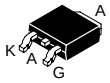
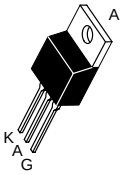
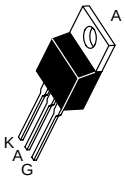
								
On–State RMS Current IT(RMS) (Amps)	**Blocking Voltage VDRM, VRRM (Volts)**	**TO–92** (Note 1) **(TO–226AA)** Case 029 Style 10	**SOT–223** Case 318E Style 10	**TO–225AA (TO–126)** Case 077 Style 2	**D–PAK** Case 369A Style 4 & 5	**Surge Current ITSM (Amps) 60 Hz**	**Max IGT (mA)**	**Max VGT (Volts)**
0.8	30	**2N5060**				10	0.2	0.8
	60	**2N5061**						
	100	**2N5062**						
	200	**2N5064**						
0.8	100	**MCR100–3**				10	0.2	0.8
	200	**MCR100–4**						
	400	**MCR100–6**						
	600	**MCR100–8**						
0.8	200		**MCR08BT1**			8.0	0.2	0.8
	600		**MCR08MT1**					
1.5	400	**MCR22–6**				15	0.2	0.8
	600	**MCR22–8**						
4.0	200			**C106B**		20	0.2	0.8
	400			**C106D**				
	400			**C106D1**				
	600			**C106M**				
	600			**C106M1**				
4.0	400			**MCR106–6**		25	0.2	1.0
	600			**MCR106–8**				
4.0	100				**MCR703AT4** (Note 2)	25	0.1	0.8
	200				**MCR704AT4** (Note 2)			
	400				**MCR706AT4** (Note 2)			
	600				**MCR708AT4** (Note 2)			
4.0	400				**MCR716T4** (Note 3)	25	0.1	0.8
	600				**MCR718T4** (Note 3)			

1. See TO–92 data sheets for complete device suffix packaging ordering options.
   RLRA, RLRE, RL, & RL1 suffixes: Radial Tape and Reel
   RLRM & ZL1 suffixes: Radial Tape and Ammo Pack
2. Denotes pkg style 5
3. Denotes pkg style 4

Lead Identification
A = Anode
K = Cathode
G = Gate

Shaded devices denote sensitive gate SCR's

SCRs (continued)

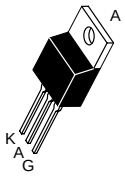
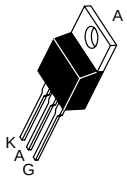
							
On–State RMS Current IT(RMS) (Amps)	**Blocking Voltage VDRM, VRRM (Volts)**	**D–PAK** Case 369A Style 4	**TO–220AB** Case 221A–09 Style 3	**TO–220AB** Case 221A–07 Style 3	**Surge Current ITSM (Amps) 60 Hz**	**Max IGT (mA)**	**Max VGT (Volts)**
8.0	600	**MCR8DCMT4**			80	15	1.0
	800	**MCR8DCNT4**					
8.0	400		**MCR8SD**		80	0.2	1.0
	600		**MCR8SM**				
	800		**MCR8SN**				
8.0	600		**MCR8M**		80	15	1.0
	800		**MCR8N**				
8.0	600	**MCR8DSMT4**			90	0.2	1.0
	800	**MCR8DSNT4**					
8.0	100			**MCR72–3**	100	0.2	1.5
	400			**MCR72–6**			
	600			**MCR72–8**			
8.0	50			**MCR218–2**	100	25	1.5
	200			**MCR218–4**			
	400			**MCR218–6**			
8.0	400				100	25	1.5
	800						
10	400		**MCR12LD**		100	8.0	0.8
	600		**MCR12LM**				
	800		**MCR12LN**				
12	600	**MCR12DSMT4**			100	0.2	1.0
	800	**MCR12DSNT4**					
12	600	**MCR12DCMT4**			100	20	1.0
	800	**MCR12DCNT4**					
12	400		**MCR12D**		100	20	1.0
	600		**MCR12M**				
	800		**MCR12N**				
12	50			**MCR68–2**	100	30	1.5

UL logo indicates UL Recognized File #E69369

Shaded devices denote sensitive gate SCR's

Lead Identification
A = Anode
K = Cathode
G = Gate

SCRs (continued)

						
On–State RMS Current IT(RMS) (Amps)	**Blocking Voltage VDRM, VRRM (Volts)**	**TO–220AB** Case 221A–09 Style 3	**TO–220AB** Case 221A–07 Style 3	**Surge Current ITSM (Amps) 60 Hz**	**Max IGT (mA)**	**Max VGT (Volts)**
12	50		**2N6394**	100	30	1.5
	100		**2N6395**			
	400		**2N6397**			
	800		**2N6399**			
16	800	**MCR16N**		160	20	1.0
16	50		**2N6400**	160	30	1.5
	100		**2N6401**			
	200		**2N6402**			
	400		**2N6403**			
	600		**2N6404**			
	800		**2N6405**			
25	400	**MCR25D**		300	30	1.0
	600	**MCR25M**				
	800	**MCR25N**				
25	50		**2N6504**	300	30	1.5
	100		**2N6505**			
	400		**2N6507**			
	600		**2N6508**			
	800		**2N6509**			
25	50		**MCR69–2**	300	30	1.5
	100		**MCR69–3**			
25	600			300	40	1.5
	800					

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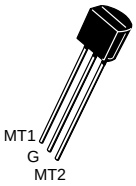
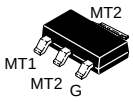
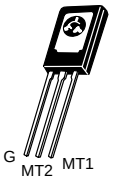
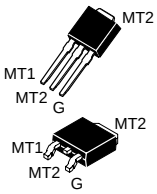
Lead Identification
A = Anode
K = Cathode
G = Gate

TRIACs (Bidirectional Devices)

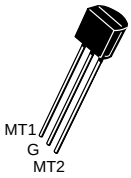
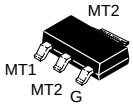
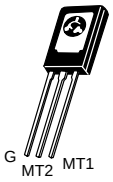
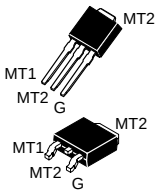
										
							Max IGT (mA)			
On–State RMS Current IT(RMS) (Amps)	**Blocking Voltage VDRM, VRRM (Volts)**	**TO–92** (Note 4) **(TO–226AA)** Case 029 Style 12	**SOT–223** Case 318E Style 11	**TO–225AA (TO–126)** Case 077 Style 5	**D–PAK** Case 369A Style 6	**Surge Current ITSM (Amps) 60 Hz**	**Q1**	**Q2**	**Q3**	**Q4**
0.6	600	**MAC97–8**				8.0	10	10	10	10
	200	**MAC97A4**					5.0	5.0	5.0	7.0
	400	**MAC97A6**					5.0	5.0	5.0	7.0
	600	**MAC97A8**					5.0	5.0	5.0	7.0
0.8	400	**MAC997A6**				8.0	5.0	5.0	5.0	7.0
		MAC997B6					3.0	3.0	3.0	5.0
	600	**MAC997A8**					5.0	5.0	5.0	7.0
		MAC997B8					3.0	3.0	3.0	5.0
0.8	200		**MAC08BT1**			8.0	10	10	10	10
	600		**MAC08MT1**							
2.5	200			**T2322B**		25	10	10	10	10
4.0	200			**2N6071A**		30	5.0	5.0	5.0	10
				2N6071B			3.0	3.0	3.0	5.0
	400			**2N6073A**			5.0	5.0	5.0	10
				2N6073B			3.0	3.0	3.0	5.0
	600			**2N6075A**			5.0	5.0	5.0	10
				2N6075B			3.0	3.0	3.0	5.0
4.0	600				**MAC4DLMT4** (Note 5)	40	3.0	3.0	3.0	5.0
					MAC4DLM–1 (Note 6)					
4.0	600				**MAC4DHMT4** (Note 5)	40	5.0	5.0	5.0	10
					MAC4DHM–1 (Note 6)					

4. See TO–92 data sheets for complete device suffix packaging ordering options.
   RLRA, RLRE, RL, & RL1 suffixes: Radial Tape and Reel
   RLRM & ZL1 suffixes: Radial Tape and Ammo Pack
5. Denotes SMT package
6. Denotes straight lead package

Lead Identification
MT1 = Main Terminal 1
MT2 = Main Terminal 2
G = Gate

Shaded devices denote sensitive gate Triacs

TRIACs (Bidirectional Devices) (continued)

										
							Max IGT (mA)			
On–State RMS Current IT(RMS) (Amps)	**Blocking Voltage VDRM, VRRM (Volts)**	**TO–92** (Note 7) **(TO–226AA)** Case 029 Style 12	**SOT–223** Case 318E Style 11	**TO–225AA (TO–126)** Case 077 Style 5	**D–PAK** Case 369A Style 6	**Surge Current ITSM (Amps) 60 Hz**	**Q1**	**Q2**	**Q3**	**Q4**
4.0	600				**MAC4DSMT4** (Note 8)	40	10	10	10	–
					MAC4DSMT–1 (Note 9)					
	800				**MAC4DSNT4** (Note 8)					
					MAC4DSN–1 (Note 9)					
4.0	600				**MAC4DCMT4** (Note 8)	40	35	35	35	–
					MAC4DCM–1 (Note 9)					
	800				**MAC4DCNT4** (Note 8)					
					MAC4DCN–1 (Note 9)					

7. See TO–92 data sheets for complete device suffix packaging ordering options.
   RLRA, RLRE, RL, & RL1 suffixes: Radial Tape and Reel
   RLRM & ZL1 suffixes: Radial Tape and Ammo Pack
8. Denotes SMT package
9. Denotes straight lead package

Lead Identification
MT1 = Main Terminal 1
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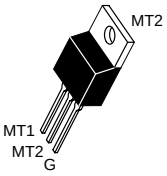
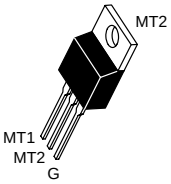
G = Gate

TRIACs (Bidirectional Devices) (continued)

								
					Max IGT (mA)			
On–State RMS Current IT(RMS) (Amps)	**Blocking Voltage VDRM, VRRM (Volts)**	**TO–220AB** Case 221A–09 Style 4	**TO–220AB** Case 221A–07 Style 4	**Surge Current ITSM (Amps) 60 Hz**	**Q1**	**Q2**	**Q3**	**Q4**
6.0	400		**T2500D**	60	25	60	25	60
8.0	400	**MAC8SD**		70	5.0	5.0	5.0	–
	600	**MAC8SM**						
	800	**MAC8SN**						
8.0	400	**MAC8D**		80	35	35	35	–
	600	**MAC8M**						
	800	**MAC8N**						
8.0	400	**MAC9D**		80	50	50	50	–
	600	**MAC9M**						
	800	**MAC9N**						
8.0	200		**MAC228A4**	80	5.0	5.0	5.0	10
	400		**MAC228A6**					
	600		**MAC228A8**					
	800		**MAC228A10**					
8.0	600			80	10	10	10	20
	800							
8.0	600		**2N6344**	100	50	75	50	75
	800		**2N6349**					
8.0	400		**T2800D**	100	25	60	25	60
8.0	400			100	50	50	50	75
	800							

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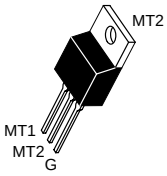
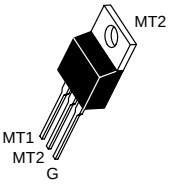
Shaded devices denote sensitive gate Triacs

Lead Identification
MT1 = Main Terminal 1
MT2 = Main Terminal 2
G = Gate

TRIACs (Bidirectional Devices) (continued)

								
					Max IGT (mA)			
On–State RMS Current IT(RMS) (Amps)	**Blocking Voltage VDRM, VRRM (Volts)**	**TO–220AB** Case 221A–09 Style 4	**TO–220AB** Case 221A–07 Style 4	**Surge Current ITSM (Amps) 60 Hz**	**Q1**	**Q2**	**Q3**	**Q4**
10	600		**MAC210A8**	100	50	50	50	75
	800		**MAC210A10**					
10	600			100	50	50	50	75
	800							
12	600	**MAC12SM**		90	5.0	5.0	5.0	–
	800	**MAC12SN**						
12	400	**MAC12HCD**		100	50	50	50	–
	600	**MAC12HCM**						
	800	**MAC12HCN**						
12	400	**MAC12D**		100	35	35	35	–
	600	**MAC12M**						
	800	**MAC12N**						
12	600		**MAC212A8**	100	50	50	50	75
	800		**MAC212A10**					
12	400			100	50	50	50	75
	600							
	800							
12	600		**2N6344A**	100	50	75	50	75
	600		**2N6348A**					
	800		**2N6349A**					
15	400	**MAC15SD**		120	5.0	5.0	5.0	–
	600	**MAC15SM**						
	800	**MAC15SN**						
15	600	**MAC15M**		150	35	35	35	–
	800	**MAC15N**						

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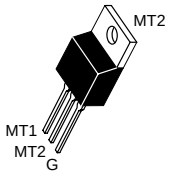
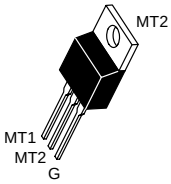
Shaded devices denote sensitive gate Triacs

Lead Identification
MT1 = Main Terminal 1
MT2 = Main Terminal 2
G = Gate

TRIACs (Bidirectional Devices) (continued)

								
					Max IGT (mA)			
On–State RMS Current IT(RMS) (Amps)	**Blocking Voltage VDRM, VRRM (Volts)**	**TO–220AB** Case 221A–09 Style 4	**TO–220AB** Case 221A–07 Style 4	**Surge Current ITSM (Amps) 60 Hz**	**Q1**	**Q2**	**Q3**	**Q4**
15	600		**MAC15–8**	150	50	50	50	–
	800		**MAC15–10**		50	50	50	–
	400		**MAC15A6**		50	50	50	75
	600		**MAC15A8**		50	50	50	75
	800		**MAC15A10**		50	50	50	75
15	400			150	50	50	50	75
	600							
	800							
16	600	**MAC16M**		150	50	50	50	–
	800	**MAC16N**						
16	400	**MAC16CD**		150	35	35	35	–
	600	**MAC16CM**						
	800	**MAC16CN**						
16	400	**MAC16HCD**		150	50	50	50	–
	600	**MAC16HCM**						
	800	**MAC16HCN**						

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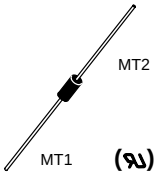
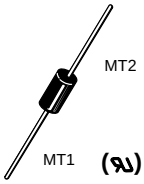
Lead Identification
MT1 = Main Terminal 1
MT2 = Main Terminal 2
G = Gate

Surge Suppressors and Triggers

Thyristor Surge Suppressors (Bidirectional Devices)

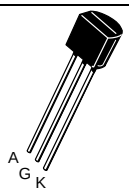
Surge Current IPPS1 10 x 1000 μsec (Amps)	**Maximum Off–State Voltage (Volts)**	**SMB** Case 403C	**Maximum Breakover Voltage VBO (Volts)**	**Minimum Holding Current IH (mA)**	**General Description**
50	62	**MMT05B64T3**	80	175	These Thyristor Surge Protection devices prevent overvoltage damage to sensitive circuits by lightening, induction, and power line crossing. They are breakover triggered crowbar protectors with turn off occurring when the surge current falls below the holding current value.
	170	**MMT05B230T3**	265	175	
	200	**MMT05B260T3**	320	175	
	270	**MMT05B310T3**	365	175	
100	170	**MMT10B230T3**	265	175	
	200	**MMT10B260T3**	320	175	
	270	**MMT10B310T3**	365	175	
	300	**MMT10B350T3**	400	175	

High Voltage Bidirectional Triggers: Sidacs

					
On–State RMS Current IT(RMS) (Amps)	**DO–41** Case 059A	**Surmetic 50** Case 267 Style 2	**Breakover Voltage Range VBO (Volts)**	**Surge Current ITSM (Amps) 60 Hz**	**General Description**
0.9	**MKP1V120RL**		110–130	4.0	High voltage trigger devices similar in operation to triacs. Upon reaching the breakover voltage in either direction, the devices switch to a low voltage on state.
	MKP1V130RL		120–140		
	MKP1V160, RL		150–170		
	MKP1V240, RL		220–250		
1.0		**MKP3V120, RL**	110–130	20	
		MKP3V240, RL	220–250		

Surge Suppressors and Triggers (continued)

Thyristor Triggers: Programmable Unijunction Transistors (PUT's)

					
IP			**IV**		
RG = 10K ohm (μ Amps max.)	**RG = 1M ohm (μ Amps max.)**	**TO–92** (Note 10) **(TO–226AA)** Case 029 Style 16	**RG = 10K ohm (μ Amps min.)**	**RG = 1M ohm (μ Amps max.)**	**General Description**
5.0	2.0	**2N6027**	70	50	Similar to unijunction transistors, except that IP, IV, and intrinsic voltage are programmable (adjustable) by means of external voltage divider.
1.0	0.15	**2N6028**	25	25	

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10. See TO–92 data sheets for complete device suffix packaging ordering options.
    RLRA, RLRE, RL, & RL1 suffixes: Radial Tape and Reel
    RLRM & ZL1 suffixes: Radial Tape and Ammo Pack

Lead Identification: Suppressor/Sidac
MT1 = Main Terminal 1
MT2 = Main Terminal 2

Lead Identification: PUT
A = Anode
K = Cathode
G = Gate

MOS Power Products

MOS Power Products

In Brief . . .

The main focus of the MOS Power Division of ON Semiconductor is on low and medium voltage products, 8 to 250 volts, for the automotive, computing, portable, and telecom markets with an emphases on SMARTDISCRETES™* and integrated solutions**. Since our last publication we have released new products in each of our focus markets:

- In automotive, we offer a new 60 V portfolio using TMOS™ VII technology and GEN III, IGBT's.
- In computing, we have released a 30–volt H3DE planar technology offering best of class switching verses $R_{DS\ (ON)}$ performance.
- The HD3E technology is also introduced in our portable portfolio offering improved $R_{DS\ (ON)}$ performance in both N and P channel devices.
- Telecom new products focus is on the 100 to 200 volt range in DPAK and D^2PAK packages.

We continue to shrink our package outlines with the introduction of our new leadless devices – ChipFET™, SO–8LL, Micro8™LL, FPIB–16, and QFN. New products start with the letter N, for ON Semiconductor products, while legacy products start with the letter M. If there is a SMARTDISCRETE, integrated multi–chip solution or new product concept you would like to discuss, please contact MOS Power marketing at 602–244–5142.

*SMARTDISCRETE is the integration of several functions into the same package. Features such as voltage sense, current sense and overload protection, are available in this family of products.

**Integrated Solutions are multi–chip modules integrating multiple MOSFETs and analog chips to provide maximum functionality in minimum space.

	Page
MOS Power Products	239
Part Numbering Nomenclature	240
MOS Power Products Selection by Package	
Surface Mount Devices	242
Through–Hole Devices	247
Ignition IGBT Selection by Package	249
SMARTDISCRETE™ Selection by Package	250
MOS Power Devices by Application	251
Portable Applications	252
Computing Applications	255
Automotive Applications	257
60 Volt Automotive Portfolio	261
Migration Table	262

Part Numbering Nomenclatures

New MOS Power Device Naming Conventions

N T Q S 15 N 06

N R V W XX Y ZZ

Circuit Identifier
- N = ON Semiconductor

Technology
- T = TMOS™
- I = SMARTDISCRETE™
- G = IGBT

Package Type
- P = Plastic TO–220
- D = DPAK
- B = D^2PAK
- M = SO–8 (D, S)
- L = SO–8 Leadless
- F = SOT–223
- Q = TSSOP–8 (D, S)
- T = Micro8™ (D, S)
- R = SOT–23
- G = TSOP–6 (D, S)
- S = SC–70
- H = ChipFET™
- J = SC–88
- E = SC–75
- X = Leadless SC Package

Voltage * 10

Channel Type
- P = P–Channel
- N = N–Channel
- C = Complementary

Current Rating

Configuration
(Optional)
- D = Dual
- S = Single

Old MOS Power Device Naming Conventions
SO–8, Micro8, SOT–223 & TSOP–6

M M SF 4 P 01 HD R1

M M TTTT V W XX YY ZZ

Circuit Identifier

TMOS
- M = Miniature

Package Type
- DF = Dual FET (SO–8)
- SF = Single FET (SO–8)
- FT = FET Transistor (SOT–223)
- MTSF = Single FET (Micro8)
- MTDF = Dual FET (Micro8)
- MGSF = TSOP–6, SOT–23

Current Rating

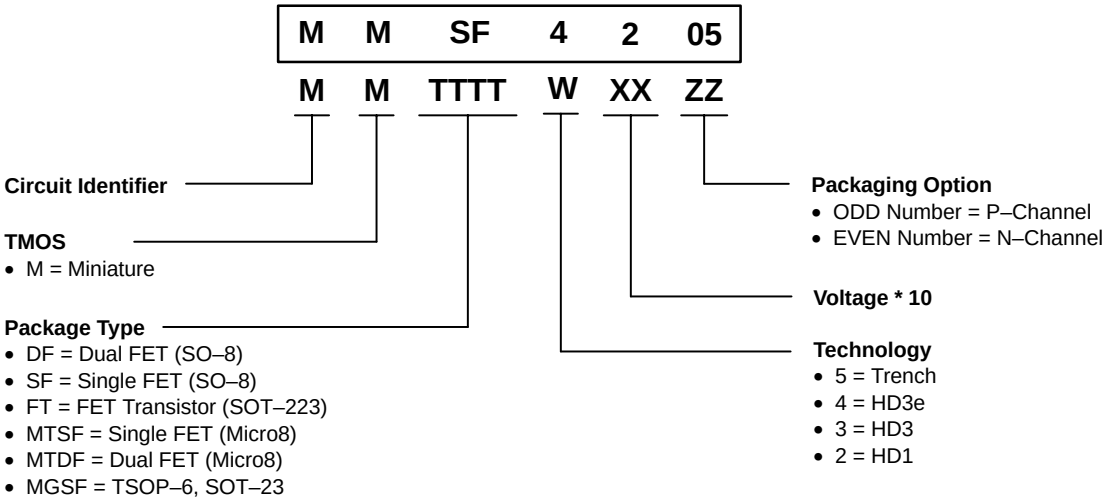
Packaging Option
- R1, R2 = MiniMOS Tape & Reel
- T1, T3 = SOT–223 Tape & Reel

Option Suffix
- L = Logic Level
- E = Energy Rated
- V = TMOS V™
- Z = ESD
- HD = High Cell Density

Voltage * 10

Channel Type
- P = P–Channel
- N = N–Channel
- C = Complementary

Old MOS Power Device Naming Conventions – Other



Surface Mount Devices

V_{DSS}	$R_{DS(on)}$ (10V)	$R_{DS(on)}$ (4.5V)	$R_{DS(on)}$ (2.5V/2.7V*)	$R_{DS(on)}$ (1.8V)	I_D (cont) Amps	P_D (Watts) Max	Device	Configuration
SOT–23 – Case 318 (See individual data sheets for specific case number.)								
N Channel								
20	1.000	1.400			0.3	0.225	**MMBF0201NL**	Single N–Channel
	0.090	0.130			0.75	0.4	**MGSF1N02L**	Single N–Channel
		0.085	0.115		1.75	0.4	**MGSF2N02EL**	Single N–Channel
		0.085	0.115		0.75	0.4	**MGSF1N02EL**	Single N–Channel
30	0.100	0.145			0.75	0.4	**MGSF1N03L**	Single N–Channel
50		3.500	7.000		0.2	0.225	**BSS138L**	Single N–Channel
60	7.500				0.115	0.225	**2N7002L**	Single N–Channel
	5.000				0.5	0.225	**MMBF170L**	Single N–Channel
100	6.000				0.17	0.225	**BSS123L**	Single N–Channel
P Channel								
20	1.400	3.500			0.3	0.225	**MMBF0202PL**	Single P–Channel
	0.350	0.500			0.75	0.4	**MGSF1P02L**	Single P–Channel
		0.260	0.500		0.75	0.4	**MGSF1P02EL**	Single P–Channel
	0.175	0.280			1.30	2.00	**MGSF2P02HD**	Single P–Channel
		0.260	0.500		0.75	0.4	**NTR1P02L**	Single P–Channel
50		10.000			0.13	0.225	**BSS84L**	Single P–Channel
ChipFET™ – Case 1206A								
N Channel								
20		0.075	0.013		4.20	1.10	**NTHD5904**	Dual N–Channel
		0.030	0.045		7.20	1.30	**NTHS5404**	Single N–Channel
30	0.085	0.143			3.90	1.10	**NTHD5902**	Dual N–Channel
	0.035	0.055			6.70	1.30	**NTHS5402**	Single N–Channel
P Channel								
8		0.090	0.130	0.180	4.1	1.1	**NTHD5905**	Dual P–Channel
		0.035	0.047	0.062	7.1	1.3	**NTHS5445**	Single P–Channel
20		0.155	0.260		2.90	1.10	**NTHD5903**	Dual P–Channel
		0.065	0.110		4.70	1.30	**NTHS5443**	Single P–Channel
		0.060	0.083		5.30	1.30	**NTHS5441**	Single P–Channel
TSOP–6 – Case 318G								
N Channel								
20		0.045	0.055		5.80	1.60	**NTGS3446**	Single N–Channel
P Channel								
12		0.075	0.095*		3.30	2.00	**NTGS3433**	Single P–Channel
20		0.090	0.135		3.30	2.00	**NTGS3441**	Single P–Channel
		0.065	0.100		4.40	2.00	**NTGS3443**	Single P–Channel
30	0.100	0.170			3.50	2.00	**NTGS3455**	Single P–Channel
Micro8™ Leadless (Case TBD)								
N Channel								
20		0.026	0.031	0.039	9	1.5	***NTLTD7900Z***	Single N–Channel

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Surface Mount Devices

V_{DSS}	$R_{DS(on)}$ (10V)	$R_{DS(on)}$ (4.5V)	$R_{DS(on)}$ (2.5V/2.7V*)	$R_{DS(on)}$ (1.8V)	I_D (cont) Amps	P_D (Watts) Max	Device	Configuration
Micro8™ – Case 846A								
N Channel								
20		0.040	0.05*		6.1	1.79	**MTSF3N02HD**	Single N–Channel
30	0.120	0.160			2	1.25	**MTDF1N03HD**	Dual N–Channel
	0.040	0.060			5.7	1.79	**MTSF3N03HD**	Single N–Channel
P Channel								
20		0.160	0.19*		1.8	1.8	**MTSF1P02HD**	Single P–Channel
		0.160	0.25*		1.45	1.25	**NTTD1P02**	Dual P–Channel
		0.090	0.13*		2.4	0.78	**NTTS2P02**	Single P–Channel
30	0.085	0.135			2.5	1.79	**NTTS2P03**	Single P–Channel
TSSOP–8 – Case 948S								
N Channel								
20		0.030	0.040		5.8	1.6	**NTQD6866**	Dual N–Channel
		0.022	0.030		6.15	0.94	**NTQD6968**	Dual N–Channel
P Channel								
20		0.021	0.029*		6.2	1.05	***NTQS6463***	Single P–Channel
SO–8 Leadless (Case TBD)								
N Channel								
28	0.0065				60	75	***NTHMSN60N03–6***	Single N–Channel
SO–8 (MiniMOS™) – Case 751								
N Channel								
20	0.100	0.200			3.6	2	**MMDF2N02E**	Dual N–Channel
	0.090	0.100			3.8	2	**MMDF3N02HD**	Dual N–Channel
		0.045	0.055*		4	2.5	**NTMS4N01**	Single N–Channel
		0.035	0.048*	0.049	6.5	2	**NTMD6N02**	Dual N–Channel
		0.027		0.035	7	2	**MMDF7N02Z**	Dual N–Channel
30	0.070	0.075			4.1	2	**MMDF3N03HD**	Dual N–Channel
	0.035	0.050			6	2	**MMDF6N03HD**	Dual N–Channel
	0.023	0.028			7	2.5	**NTMS7N03**	Single N–Channel
	0.013	0.020			11.5	2.5	**MMSF3300**	Single N–Channel
40	0.080	0.100			3.4	2	**MMDF3N04HD**	Dual N–Channel
50	0.300	0.500			1.5	2	**MMDF1N05E**	Dual N–Channel
60		0.130			3.3	2	**MMDF3N06VL**	Dual N–Channel
80		0.200					***NTMD3N08L***	Dual N–Channel
P Channel								
12		0.045	0.055*		5.1	2.5	**NTMS4P01**	Single P–Channel
16		0.100	0.150		2.3	0.71	**NTMD2P01**	Dual P–Channel
20	0.250	0.400			2.5	2	**MMDF2P02E**	Dual P–Channel
	0.160	0.180			3.3	2	**MMDF2P02HD**	Dual P–Channel
	0.075	0.095			5.6	2.5	**MMSF3P02HD**	Single P–Channel
		0.033		0.048	5.4	2.5	**NTMS5P02**	Single P–Channel
		0.033		0.050	7.8	2	**NTMD6P02**	Dual P–Channel

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Surface Mount Devices

V_{DSS}	$R_{DS(on)}$ (10V)	$R_{DS(on)}$ (4.5V)	$R_{DS(on)}$ (2.5V/2.7V*)	$R_{DS(on)}$ (1.8V)	I_D (cont) Amps	P_D (Watts) Max	Device	Configuration
SO–8 (MiniMOS™) – Case 751								
P Channel								
20		0.014		0.020	10	2.5	**NTMS10P02**	Single P–Channel
30	0.085	0.115			3.05	2.5	**NTMS3P03**	Single P–Channel
	0.085	0.125			3.05	2	**NTMD3P03**	Dual P–Channel
Complementary N/P								
20	0.100/ 0.250	0.200/ 0.400			3.6	2	**MMDF2C02E**	Complementary
	0.090/ 0.160	0.100/ 0.180			3.8	2	**MMDF2C02HD**	Complementary
25	0.100/ 0.210	0.160/ 0.375			3.0/2.0	1.8	**MMDF1300**	Complementary
30	0.070/ 0.200	0.075/ 0.300			4.1	2	**MMDF2C03HD**	Complementary
SO–8 FETKY™ – Case 751								
N Channel								
30	0.035	0.050			6	2	**MMDFS6N303**	N–Channel/Schottky
P Channel								
20	0.160	0.180			3.3	2	**MMDFS2P102**	P–Channel/Schottky
		0.090	0.130	0.150	2.4	2	**NTMSD2P102L**	P–Channel/Schottky
	0.085	0.125			3	2	**NTMSD3P102**	P–Channel/Schottky
30	0.085	0.125			3.05	2	**NTMSD3P303**	P–Channel/Schottky
SOT–223 – Case 318E								
N Channel								
20		0.150			1.60	0.80	**MMFT2N02EL**	Single N–Channel
60	1.700				0.30	0.80	**MMFT960**	Single N–Channel
		0.175			2.00	2.10	**NTF3055L175**	Single N–Channel
	0.160				2.00	2.10	**NTF3055–160**	Single N–Channel
		0.140			1.50	2.00	**MMFT3055VL**	Single N–Channel
	0.130				1.70	2.00	**MMFT3055V**	Single N–Channel
		0.120			3.00	2.10	**NTF3055L108**	Single N–Channel
	0.110				3.00	2.10	**NTF3055–100**	Single N–Channel
200	14.000				0.25	0.80	**MMFT107**	Single N–Channel
240	6.000		10.000		0.70	1.50	**MMFT2406**	Single N–Channel
P Channel								
30	0.100	0.150			5	3.13	**NTF5P03**	Single P–Channel
	0.100				5.20	3.13	**MMFT5P03HD**	Single P–Channel
60	0.300				1.20	0.80	**MMFT2955E**	Single P–Channel

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Surface Mount Devices

V_{DSS}	$R_{DS(on)}$ (10V)	$R_{DS(on)}$ (4.5V)	$R_{DS(on)}$ (2.5V/2.7V*)	$R_{DS(on)}$ (1.8V)	I_D (cont) Amps	P_D (Watts) Max	Device	Configuration
DPAK – Case 369A (TO–252)								
N Channel								
25	0.014	0.024			30	75	***NTD30N02***	Single N–Channel
	0.006	0.009			80	75	***NTD80N02***	Single N–Channel
28	0.0075				60	75	**NTD60N03**	Single N–Channel
30		0.035			20	74	**MTD20N03HDL**	Single N–Channel
		0.027			20	74	**NTD20N03L27**	Single N–Channel
	0.010				30	96	**MTD3302**	Single N–Channel
	0.010	0.013			20	75	**NTD4302**	Single N–Channel
60		0.180			12	48	**MTD3055VL**	Single N–Channel
		0.170			12	28.5	**NTD3055L170**	Single N–Channel
	0.150				12	48	**MTD3055V**	Single N–Channel
	0.150				12	28.8	**NTD3055–150**	Single N–Channel
		0.104			12	36	**NTD3055L104**	Single N–Channel
		0.102			15	48	**NTD15N06L**	Single N–Channel
	0.094				12	36	**NTD3055–094**	Single N–Channel
	0.092				15	48	**NTD15N06**	Single N–Channel
		0.062			18	55	**NTD18N06L**	Single N–Channel
	0.060				18	55	**NTD18N06**	Single N–Channel
		0.048			20	60	**NTD20N06L**	Single N–Channel
	0.046				20	60	**NTD20N06**	Single N–Channel
	0.045				20	40	**MTD20N06HD**	Single N–Channel
		0.045			20	40	**MTD20N06HDL**	Single N–Channel
		0.045			24	62.5	**NTD24N06L**	Single N–Channel
	0.038				24	62.5	**NTD24N06**	Single N–Channel
		0.028			32	60	**NTD32N06L**	Single N–Channel
	0.026				32	60	**NTD32N06**	Single N–Channel
100		0.220			10	40	**MTD10N10EL**	Single N–Channel
	0.165				12	47	**NTD12N10**	Single N–Channel
200	1.200				4	40	**MTD4N20E**	Single N–Channel
	0.70				6	50	**MTD6N20E**	Single N–Channel
P Channel								
30		0.099			19	75	**MTD20P03HDL**	Single P–Channel
60	0.450				5	40	**MTD5P06V**	Single P–Channel
	0.200				12	60	**MTD2955V**	Single P–Channel
		0.175			15	72	**MTD20P06HDL**	Single P–Channel
100	0.660				6	50	**MTD6P10E**	Single P–Channel
D^2PAK – Case 418B (TO–264)								
N Channel								
25		0.009			75	125	**MTB75N03HDL**	Single N–Channel
	0.0058				90	160	***NTB90N02***	Single N–Channel
28	0.0068				80	150	***NTB85N03***	Single N–Channel

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V_{DSS}	$R_{DS(on)}$ (10V)	$R_{DS(on)}$ (4.5V)	$R_{DS(on)}$ (2.5V/2.7V*)	$R_{DS(on)}$ (1.8V)	I_D (cont) Amps	P_D (Watts) Max	Device	Configuration
D^2PAK – Case 418B (TO–264)								
N Channel								
30	0.0093	0.0125			74	80	**NTB4302**	Single N–Channel
		0.009			75	150	**NTB75N03L09**	Single N–Channel
	0.007				75	150	**MTB1306**	Single N–Channel
	0.0065				75	150	**NTB75N03–006**	Single N–Channel
40	0.0045				100	150	***NTB100N04***	Single N–Channel
50	0.010				75	125	**MTB75N05HD**	Single N–Channel
60		0.100			15	48.4	**NTB18N06L**	Single N–Channel
	0.090				15	48.4	**NTB18N06**	Single N–Channel
		0.065			22	60	**NTB22N06L**	Single N–Channel
	0.060				22	60	**NTB22N06**	Single N–Channel
		0.050			30	90	**MTB30N06VL**	Single N–Channel
		0.048			27	88.2	**NTB27N06L**	Single N–Channel
		0.046			30	88.2	**NTB30N06L**	Single N–Channel
	0.042				30	88.2	**NTB30N06**	Single N–Channel
	0.040				32	90	**MTB36N06V**	Single N–Channel
		0.028			45	120	**NTB45N06L**	Single N–Channel
	0.026				45	120	**NTB45N06**	Single N–Channel
		0.016			60	121	**NTB60N06L**	Single N–Channel
	0.014				60	125	**MTB60N06HD**	Single N–Channel
	0.014				60	121	**NTB60N06**	Single N–Channel
		0.012			75	142	**NTB75N06L**	Single N–Channel
	0.010				75	125	**MTB75N06HD**	Single N–Channel
	0.010				75	142	**NTB75N06**	Single N–Channel
100	0.030				55	178	**NTB52N10**	Single N–Channel
	0.040				40	169	**MTB40N10E**	Single N–Channel
	0.165				13	54	**NTB13N10**	Single N–Channel
150	0.050				39	178	**NTB35N15**	Single N–Channel
	0.070				29	125	**MTB29N15E**	Single N–Channel
200	0.081				30	178	**NTB30N20**	Single N–Channel
P Channel								
30		0.025			50	125	**MTB50P03HDL**	Single P–Channel
60	0.120				23	90	**MTB23P06V**	Single P–Channel
	0.080				30	125	**MTB30P06V**	Single P–Channel

FBIP16 (Case TBD)

N Channel								
30	0.009	0.011			20	62	***NTH4302***	Quad N–Channel

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Through–Hole Devices

V_{DSS}	$R_{DS(on)}$ (10V)	$R_{DS(on)}$ (4.5V)	$R_{DS(on)}$ (2.5V/2.7V*)	$R_{DS(on)}$ (1.8V)	I_D (cont) Amps	P_D (Watts) Max	Device	Configuration
TO–92 – Case 29–11								
N Channel								
35	1.400				2	1	**MPF930**	Single N–Channel
	1.400				2	1	**MPF930A**	Single N–Channel
60	7.500				0.15	0.4	**VN2222LL**	Single N–Channel
	5.000	6.000			0.2	0.35	**2N7000**	Single N–Channel
	5.000				0.5	0.35	**BS170**	Single N–Channel
	1.700				2	1	**MPF960**	Single N–Channel
	1.200	3.3 Vgs = 5 V			0.2	0.35	**VN0300L**	Single N–Channel
90	2.000				2	1	**MPF990**	Single N–Channel
200	14.000		28.000		0.25	0.35	**BS107**	Single N–Channel
			10.000		0.25	0.35	**BS108**	Single N–Channel
	6.000				0.25	0.35	**BS107A**	Single N–Channel
240	10.000		10.000		0.2	0.35	**VN2410L**	Single N–Channel
	6.000		10.000		0.2	0.35	**VN2406L**	Single N–Channel
TO–220AB – Case 221A (See individual data sheets for specific case number.)								
N Channel								
25		0.009			75	150	**MTP75N03HDL**	Single N–Channel
30	0.0093	0.0125			74	80	**NTP4302**	Single N–Channel
		0.009			75	150	**NTP75N03L09**	Single N–Channel
	0.007	0.009			75	150	**MTP1306**	Single N–Channel
	0.0065				75	150	**NTP75N03–06**	Single N–Channel
50	0.010				75	150	**MTP75N05HD**	Single N–Channel
60		0.180			12	48	**MTP3055VL**	Single N–Channel
	0.150				12	48	**MTP3055V**	Single N–Channel
	0.120				15	55	**MTP15N06V**	Single N–Channel
		0.100			15	48.4	**NTP18N06L**	Single N–Channel
	0.090				15	48.4	**NTP18N06**	Single N–Channel
		0.085			15	60	**MTP15N06VL**	Single N–Channel
		0.065			22	60	**NTP22N06L**	Single N–Channel
	0.060				22	60	**NTP22N06**	Single N–Channel
		0.050			30	90	**MTP30N06VL**	Single N–Channel
		0.048			27	88.2	**NTP27N06L**	Single N–Channel
	0.046				27	88	**NTP27N06**	Single N–Channel
		0.046			30	88.2	**NTP30N06L**	Single N–Channel
	0.042				30	88.2	**NTP30N06**	Single N–Channel
	0.040				32	90	**MTP36N06V**	Single N–Channel
	–	0.032			42	125	**MTP50N06VL**	Single N–Channel
	0.028				42	125	**MTP50N06V**	Single N–Channel
	–	0.028			45	120	**NTP45N06L**	Single N–Channel

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Through–Hole Devices

V_{DSS}	$R_{DS(on)}$ (10V)	$R_{DS(on)}$ (4.5V)	$R_{DS(on)}$ (2.5V/2.7V*)	$R_{DS(on)}$ (1.8V)	I_D (cont) Amps	P_D (Watts) Max	Device	Configuration
TO–220AB – Case 221A (See individual data sheets for specific case number.)								
N Channel								
60	0.026				45	120	**NTP45N06**	Single N–Channel
	–	0.025			52	165	**MTP52N06VL**	Single N–Channel
	0.022				52	165	**MTP52N06V**	Single N–Channel
	–	0.016			60	136	**NTP60N06L**	Single N–Channel
	0.014				60	150	**MTP60N06HD**	Single N–Channel
	0.014				60	136	**NTP60N06**	Single N–Channel
		0.012			75	142	**NTP75N06L**	Single N–Channel
	0.010				75	150	**MTP75N06HD**	Single N–Channel
	0.010				75	142	**NTP75N06**	Single N–Channel
100		0.220			10	40	**MTP10N10EL**	Single N–Channel
	0.165				13	54	**NTP13N10**	Single N–Channel
	0.030				55	178	**NTP52N10**	Single N–Channel
150	0.070				29	125	**MTP29N15E**	Single N–Channel
	0.050				39	178	**NTP35N15**	Single N–Channel
200	0.700				7	50	**MTP7N20E**	Single N–Channel
	0.081				30	178	**NTP30N20**	Single N–Channel
P Channel								
30		0.025			50	125	**MTP50P03HDL**	Single P–Channel
60	0.200				12	60	**MTP2955V**	Single P–Channel
	0.120				23	90	**MTP23P06V**	Single P–Channel
	0.080				30	125	**MTP30P06V**	Single P–Channel
100	0.300				12	75	**MTP12P10**	Single P–Channel
200	1.000				6	75	**MTP6P20E**	Single P–Channel
TO–247 (Isolated Mounting Hole) – Case 340K								
N Channel								
200	0.075				32	180	**MTW32N20E**	Single N–Channel
TO–264 – Case 340G								
N Channel								
100	0.011				100	300	**MTY100N10E**	Single N–Channel
	0.011				100	300	***NTY100N10E***	Single N–Channel

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Ignition IGBTs – Insulated Gate Bipolar Transistors

V_{DSS}	Max $V_{CE(on)}$ (Volts) Min		I_C (pulse) Amps	I_D (cont) Amps	P_D (Watts) Max	Device	Configuration
	4.0 V I_C = 6.0 A	4.5 V I_C = 10.0 A					
DPAK – Case 369A (TO–252)							
410 V (Clamped)	1.8	2.2	50	15	107	**NGD15N41CL**	
D^2PAK – Case 418B (TO–264)							
410 V (Clamped)						**NGB15N41CL**	
400 V (Clamped)	1.6	1.9	50	15	150	**MGB15N40CL**	
350 V (Clamped)	1.6	1.9	50	15	150	**MGB15N35CL**	
	1.6	1.8	50	19	166	**MGB19N35CL**	
TO–220AB – Case 221A (See individual data sheets for specific case number.)							
410 V (Clamped)						***NGP15N41CL***	
400 V (Clamped)	1.6	1.9	50	15	150	**MGP15N40CL**	
350 V (Clamped)	1.6	1.9	50	15	150	**MGP15N35CL**	
	1.6	1.8	50	19	166	**MGP19N35CL**	

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SMARTDISCRETES™

V_{DSS}	$R_{DS(on)}$ (10V)	$R_{DS(on)}$ (5.0V)	$R_{DS(on)}$ (4.5V)	$R_{DS(on)}$ (2.7V)	Function	P_D (Watts) Max	Device	Config.
SO–8 (MiniMOS™) – Case 751								
30 V	0.05				Current Mirror, ESD Protect	20	***NIMD6302R2***	
SOT–223 – Case 318E								
40 (Clamped)	0.125	0.15			Current Limit, Temperature Limit	1.7	***NIF62514***	
DPAK – Case 369A (TO–252)								
62 (Clamped)			0.75		Current Limit, ESD	40	**MLD1N06CLT4**	
D^2PAK – Case 418B (TO–264)								
40 V			0.02		Temp Sense, ESD, Overvolt Protect	115	***NIB6404*–5L**	
TO–220AB – Case 221A (See individual data sheets for specific case number.)								
62 (Clamped)			0.75		Current Limit, ESD	40	**MLP1N06CL**	
			0.40		Current Limit, ESD	40	**MLP2N06CL**	
FBIP16 (Case TBD)								
30 V	0.09				Quad FET		***NTH4302***	

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MOS Power Devices by Application

MOS Power Devices for Portable Applications

V_{DSS}	$R_{DS(on)}$ (10V)	$R_{DS(on)}$ (4.5V)	$R_{DS(on)}$ (2.5V/2.7V*)	$R_{DS(on)}$ (1.8V)	I_D (cont) Amps	P_D (Watts) Max	Device	Configuration	Application(s)
SOT–23 – Case 318									
N Channel									
20	1.000	1.400			0.3	0.225	**MMBF0201NL**	Single N–Channel	Various
	0.090	0.130			0.75	0.4	**MGSF1N02L**	Single N–Channel	Power Switch
		0.085	0.115		0.75	0.4	**MGSF1N02EL**	Single N–Channel	Power Switch
60	7.500				0.115	0.225	**2N7002L**	Single N–Channel	Power Switch
P Channel									
20	1.400	3.500			0.3	0.225	**MMBF0202PL**	Single P–Channel	Various
	0.350	0.500			0.75	0.4	**MGSF1P02L**	Single P–Channel	Power Switch
		0.260	0.500		0.75	0.4	**MGSF1P02EL**	Single P–Channel	Power Switch
	0.175	0.280			1.30	2.00	**MGSF2P02HD**	Single P–Channel	Power Switch
		0.260	0.500		0.75	0.4	***NTR1P02L***	Single P–Channel	Power Switch
ChipFET™ – Case 1206A									
N Channel									
20		0.075	0.013		4.20	1.10	**NTHD5904**	Dual N–Channel	Various
P Channel									
8		0.090	0.130	0.180	4.1	1.1	**NTHD5905**	Dual P–Channel	Various
		0.035	0.047	0.062	7.1	1.3	**NTHS5445**	Single P–Channel	Various
20		0.155	0.260		2.90	1.10	**NTHD5903**	Dual P–Channel	Power Switch
		0.065	0.110		4.70	1.30	**NTHS5443**	Single P–Channel	Power Amp/ Charge Control
		0.060	0.083		5.30	1.30	**NTHS5441**	Single P–Channel	Power Amp/ Charge Control
TSOP–6 – Case 318G									
N Channel									
20		0.045	0.055		5.80	1.60	**NTGS3446**	Single N–Channel	Various
P Channel									
12		0.075	0.095*		3.30	2.00	**NTGS3433**	Single P–Channel	Power Switch
20		0.090	0.135		3.30	2.00	**NTGS3441**	Single P–Channel	Power Amplifier/ Charge Control
		0.065	0.100		4.40	2.00	**NTGS3443**	Single P–Channel	Power Amplifier/ Charge Control
30	0.100	0.170			3.50	2.00	**NTGS3455**	Single P–Channel	Power Switch
Micro8™ Leadless (Case TBD)									
N Channel									
20		0.026	0.031	0.039	9	1.5	***NTLTD7900Z***	Single N–Channel	Battery Management

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MOS Power Devices for Portable Applications

V_{DSS}	$R_{DS(on)}$ (10V)	$R_{DS(on)}$ (4.5V)	$R_{DS(on)}$ (2.5V/2.7V*)	$R_{DS(on)}$ (1.8V)	I_D (cont) Amps	P_D (Watts) Max	Device	Configuration	Application(s)
Micro8™ – Case 846A									
N Channel									
20		0.040	0.050*		6.1	1.79	**MTSF3N02HD**	Single N–Channel	Various
P Channel									
20		0.160	0.190*		1.8	1.8	**MTSF1P02HD**	Single P–Channel	Power Switch/ Power Amplifier
		0.160	0.250*		1.45	1.25	**NTTD1P02**	Dual P–Channel	Power Switch
		0.090	0.130*		2.4	0.78	**NTTS2P02**	Single P–Channel	Power Switch/ Power Amplifier
TSSOP–8 – Case 948S									
N Channel									
20		0.030	0.040		5.8	1.6	**NTQD6866**	Dual N–Channel	Battery Management
		0.022	0.030		6.15	0.94	**NTQD6968**	Dual N–Channel	Battery Management
P Channel									
20		0.021	0.029*		6.2	1.05	***NTQS6463***	Single P–Channel	Various
SO–8 (MiniMOS™) – Case 751									
N Channel									
20	0.100	0.200			3.6	2	**MMDF2N02E**	Dual N–Channel	Various
	0.090	0.100			3.8	2	**MMDF3N02HD**	Dual N–Channel	Various
		0.045	0.055*		4	2.5	**NTMS4N01**	Single N–Channel	Various
		0.035	0.048*	0.049	6.5	2	**NTMD6N02**	Dual N–Channel	Various
		0.027		0.035	7	2	**MMDF7N02Z**	Dual N–Channel	Battery Management
P Channel									
12		0.045	0.055*		5.1	2.5	**NTMS4P01**	Single P–Channel	Various
16		0.100	0.150		2.3	0.71	**NTMD2P01**	Dual P–Channel	Various
20	0.250	0.400			2.5	2	**MMDF2P02E**	Dual P–Channel	Power Switch
	0.160	0.180			3.3	2	**MMDF2P02HD**	Dual P–Channel	Power Amplifier
	0.075	0.095			5.6	2.5	**MMSF3P02HD**	Single P–Channel	Power Amplifier
		0.033		0.048	5.4	2.5	**NTMS5P02**	Single P–Channel	Various
		0.033		0.050	7.8	2	**NTMD6P02**	Dual P–Channel	Various
		0.014		0.020	10	2.5	**NTMS10P02**	Single P–Channel	Various
Complementary N/P Channel									
20	0.100/ 0.250	0.200/ 0.400			3.6	2	**MMDF2C02E**	Complementary	Various
	0.090/ 0.160	0.100/ 0.180			3.8	2	**MMDF2C02HD**	Complementary	Various
		0.024/ 0.074			7	2	***NTMD7C02***	Complementary	Various

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MOS Power Devices for Portable Applications

V_{DSS}	$R_{DS(on)}$ (10V)	$R_{DS(on)}$ (4.5V)	$R_{DS(on)}$ (2.5V/2.7V*)	$R_{DS(on)}$ (1.8V)	I_D (cont) Amps	P_D (Watts) Max	Device	Configuration	Application(s)
SO–8 FETKY™ – Case 751									
P Channel									
20	0.160	0.180			3.3	2	**MMDFS2P102**	P–Channel/Schottky	Charger Control
		0.090	0.130	0.150	2.4	2	**NTMSD2P102L**	P–Channel/Schottky	Charger Control
	0.085	0.125			3	2	**NTMSD3P102**	P–Channel/Schottky	Various
SOT–223 – Case 318E									
N Channel									
20		0.150			1.60	0.80	**MMFT2N02EL**	Single N–Channel	Various

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MOS Power Devices for Computing Applications

V_{DSS}	$R_{DS(on)}$ (10V)	$R_{DS(on)}$ (4.5V)	$R_{DS(on)}$ (2.5V/2.7V*)	$R_{DS(on)}$ (1.8V)	I_D (cont) Amps	P_D (Watts) Max	Device	Configuration	Application(s)
ChipFET™ – Case 1206A									
N Channel									
20		0.030	0.045		7.20	1.30	**NTHS5404**	Single N–Channel	Various
30	0.085	0.143			3.90	1.10	**NTHD5902**	Dual N–Channel	Various
	0.035	0.055			6.70	1.30	**NTHS5402**	Single N–Channel	Various
SO–8 (MiniMOS™) – Case 751									
N Channel									
30	0.070	0.075			4.1	2	**MMDF3N03HD**	Dual N–Channel	Various
	0.035	0.050			6	2	**MMDF6N03HD**	Dual N–Channel	NOTEBOOK DDR
	0.023	0.028			7	2.5	***NTMS7N03***	Single N–Channel	NOTEBOOK DDR
	0.013	0.020			11.5	2.5	**MMSF3300**	Single N–Channel	NOTEBOOK DDR, VRM
P Channel									
30	0.085	0.115			3.05	2.5	**NTMS3P03**	Single P–Channel	Various
	0.085	0.125			3.05	2	**NTMD3P03**	Dual P–Channel	Various
SO–8 FETKY™ – Case 751									
P Channel									
30	0.085	0.125			3.05	2	**NTMSD3P303**	P–Channel/Schottky	Various
DPAK – Case 369A (TO–252)									
N Channel									
25	0.014	0.024			30	75	***NTD30N02***	Single N–Channel	Various
	0.006	0.009			30	75	***NTD80N02***	Single N–Channel	Various
28	0.0075	0.009			60	75	**NTD60N03**	Single N–Channel	VRM
30		0.035			20	74	**MTD20N03HDL**	Single N–Channel	Various
		0.027			20	74	**NTD20N03L27**	Single N–Channel	Various
	0.010				30	96	**MTD3302**	Single N–Channel	Various
	0.010	0.013			20	75	**NTD4302**	Single N–Channel	VRM
60		0.062			18	55	**NTD18N06L**	Single N–Channel	DDR
	0.060				18	55	**NTD18N06**	Single N–Channel	DDR
D^2PAK – Case 418B (TO–264)									
N Channel									
25	0.0058				90	160	***NTB90N02***	Single N–Channel	Various
30	0.0093	0.0125			74	80	**NTB4302**	Single N–Channel	VRM
		0.009			75	150	**NTB75N03L09**	Single N–Channel	VRM
	0.007				75	150	**MTB1306**	Single N–Channel	VRM
	0.0065				75	150	**NTB75N03–06**	Single N–Channel	VRM
60		0.100			15	48.4	**NTB18N06L**	Single N–Channel	DDR
	0.090				15	48.4	**NTB18N06**	Single N–Channel	DDR

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MOS Power Devices for Computing Applications

V_{DSS}	$R_{DS(on)}$ (10V)	$R_{DS(on)}$ (4.5V)	$R_{DS(on)}$ (2.5V/2.7V*)	$R_{DS(on)}$ (1.8V)	I_D (cont) Amps	P_D (Watts) Max	Device	Configuration	Application(s)
TO–220AB – Case 221A (See individual data sheets for specific case number.)									
N Channel									
25		0.009			75	150	**MTP75N03HDL**	Single N–Channel	VRM
30	0.0093	0.0125			74	80	**NTP4302**	Single N–Channel	VRM
		0.009			75	150	**NTP75N03L09**	Single N–Channel	VRM
	0.007	0.009			75	150	**MTP1306**	Single N–Channel	VRM
	0.0065				75	150	**NTP75N03–06**	Single N–Channel	VRM
60	0.090				15	48.4	**NTP18N06**	Single N–Channel	DDR

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MOS Power Devices for Automotive Applications

V_{DSS}	$R_{DS(on)}$ (10V)	$R_{DS(on)}$ (4.5V)	$R_{DS(on)}$ (2.5V)	$R_{DS(on)}$ (1.8V)	I_D (cont) Amps	P_D (Watts) Max	Device	Configuration
SOT–23 – Case 318 (See individual data sheets for specific case number.)								
N Channel								
50		3.500	7.000		0.2	0.225	**BSS138L**	Single N–Channel
60	7.500				0.115	0.225	**2N7002L**	Single N–Channel
	5.000				0.5	0.225	**MMBF170L**	Single N–Channel
100	6.000				0.17	0.225	**BSS123L**	Single N–Channel
P Channel								
50		10.000			0.13	0.225	**BSS84L**	Single P–Channel
TO–92 – Case 29–11								
N Channel								
60	7.500				0.15	0.4	**VN2222LL**	Single N–Channel
	5.000	6.000			0.2	0.35	**2N7000**	Single N–Channel
	5.000				0.5	0.35	**BS170**	Single N–Channel
	1.700				2	1	**MPF960**	Single N–Channel
	1.200	3.300			0.2	0.35	**VN0300L**	Single N–Channel
90	2.000				2	1	**MPF990**	Single N–Channel
200	14.000		28.000		0.25	0.35	**BS107**	Single N–Channel
			10.000		0.25	0.35	**BS108**	Single N–Channel
	6.000				0.25	0.35	**BS107A**	Single N–Channel
240	10.000		10.000		0.2	0.35	**VN2410L**	Single N–Channel
	6.000		10.000		0.2	0.35	**VN2406L**	Single N–Channel
SO–8 (MiniMOS™) – Case 751								
N Channel								
60		0.130			3.3	2	**MMDF3N06VL**	Dual N–Channel
80		0.200					***NTMD3N08L***	Dual N–Channel
SOT–223 – Case 318E								
N Channel								
60		0.175			2.00	2.10	**NTF3055L175**	Single N–Channel
	0.160				2.00	2.10	**NTF3055–160**	Single N–Channel
		0.140			1.50	2.00	**MMFT3055VL**	Single N–Channel
	0.130				1.70	2.00	**MMFT3055V**	Single N–Channel
		0.120			3.00	2.10	**NTF3055L108**	Single N–Channel
	0.110				3.00	2.10	**NTF3055–100**	Single N–Channel
200	14.000				0.25	0.80	**MMFT107**	Single N–Channel
P Channel								
60	0.300				1.20	0.80	**MMFT2955E**	Single P–Channel
	0.300				1.20	0.80	**MMFT2955E**	Single P–Channel

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MOS Power Devices for Automotive Applications

V_{DSS}	$R_{DS(on)}$ (10V)	$R_{DS(on)}$ (4.5V)	$R_{DS(on)}$ (2.5V)	$R_{DS(on)}$ (1.8V)	I_D (cont) Amps	P_D (Watts) Max	Device	Configuration
DPAK – Case 369A (TO–252)								
N Channel								
60		0.180			12	48	**MTD3055VL**	Single N–Channel
		0.170			12	28.5	**NTD3055L170**	Single N–Channel
	0.150				12	48	**MTD3055V**	Single N–Channel
	0.150				12	28.8	**NTD3055–150**	Single N–Channel
		0.104			12	36	**NTD3055L104**	Single N–Channel
		0.102			15	48	**NTD15N06L**	Single N–Channel
	0.094				12	36	**NTD3055–094**	Single N–Channel
	0.092				15	48	**NTD15N06**	Single N–Channel
		0.062			18	55	**NTD18N06L**	Single N–Channel
	0.060				18	55	**NTD18N06**	Single N–Channel
		0.048			20	60	**NTD20N06L**	Single N–Channel
	0.046				20	60	**NTD20N06**	Single N–Channel
	0.045				20	40	**MTD20N06HD**	Single N–Channel
		0.045			20	40	**MTD20N06HDL**	Single N–Channel
		0.045			24	62.5	**NTD24N06L**	Single N–Channel
	0.038				24	62.5	**NTD24N06**	Single N–Channel
		0.028			32	60	**NTD32N06L**	Single N–Channel
	0.026				32	60	**NTD32N06**	Single N–Channel
100		0.220			10	40	**MTD10N10EL**	Single N–Channel
	0.165				12	47	**NTD12N10**	Single N–Channel
200	1.200				4	40	**MTD4N20E**	Single N–Channel
	0.070				6	50	**MTD6N20E**	Single N–Channel
P Channel								
60	0.450				5	40	**MTD5P06V**	Single P–Channel
	0.200				12	60	**MTD2955V**	Single P–Channel
		0.175			15	72	**MTD20P06HDL**	Single P–Channel
100	0.660				6	50	**MTD6P10E**	Single P–Channel
D^2PAK – Case 418B (TO–264)								
N Channel								
40	0.0045				100	150	***NTB100N04***	Single N–Channel
50	0.010				75	125	**MTB75N05HD**	Single N–Channel
60		0.100			15	48.4	**NTB18N06L**	Single N–Channel
	0.090				15	48.4	**NTB18N06**	Single N–Channel
		0.065			22	60	**NTB22N06L**	Single N–Channel
	0.060				22	60	**NTB22N06**	Single N–Channel
		0.050			30	90	**MTB30N06VL**	Single N–Channel
		0.048			27	88.2	**NTB27N06L**	Single N–Channel
		0.046			30	88.2	**NTB30N06L**	Single N–Channel
	0.042				30	88.2	**NTB30N06**	Single N–Channel
	0.040				32	90	**MTB36N06V**	Single N–Channel

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MOS Power Devices for Automotive Applications

V_{DSS}	$R_{DS(on)}$ (10V)	$R_{DS(on)}$ (4.5V)	$R_{DS(on)}$ (2.5V)	$R_{DS(on)}$ (1.8V)	I_D (cont) Amps	P_D (Watts) Max	Device	Configuration
D^2PAK – Case 418B (TO–264)								
N Channel								
60		0.028			45	120	**NTB45N06L**	Single N–Channel
	0.026				45	120	**NTB45N06**	Single N–Channel
		0.016			60	121	**NTB60N06L**	Single N–Channel
	0.014				60	125	**MTB60N06HD**	Single N–Channel
	0.014				60	121	**NTB60N06**	Single N–Channel
		0.012			75	142	**NTB75N06L**	Single N–Channel
	0.010				75	125	**MTB75N06HD**	Single N–Channel
	0.010				75	142	**NTB75N06**	Single N–Channel
100	0.030				55	178	**NTB52N10**	Single N–Channel
	0.165				13	54	**NTB13N10**	Single N–Channel
	0.040				40	169	**MTB40N10E**	Single N–Channel
150	0.070				29	125	**MTB29N15E**	Single N–Channel
	0.050				39	178	**NTB35N15**	Single N–Channel
200	0.081				30	178	**NTB30N20**	Single N–Channel
P Channel								
60	0.120				23	90	**MTB23P06V**	Single P–Channel
	0.080				30	125	**MTB30P06V**	Single P–Channel
TO–220AB – Case 221A (See individual data sheets for specific case number.)								
N Channel								
50	0.010				75	150	**MTP75N05HD**	Single N–Channel
60		0.180			12	48	**MTP3055VL**	Single N–Channel
	0.150				12	48	**MTP3055V**	Single N–Channel
	0.120				15	55	**MTP15N06V**	Single N–Channel
		0.100			15	48.4	**NTP18N06L**	Single N–Channel
	0.090				15	48.4	**NTP18N06**	Single N–Channel
		0.085			15	60	**MTP15N06VL**	Single N–Channel
		0.065			22	60	**NTP22N06L**	Single N–Channel
	0.060				22	60	**NTP22N06**	Single N–Channel
		0.050			30	90	**MTP30N06VL**	Single N–Channel
		0.048			27	88.2	**NTP27N06L**	Single N–Channel
	0.046				27	88	**NTP27N06**	Single N–Channel
		0.046			30	88.2	**NTP30N06L**	Single N–Channel
	0.042				30	88.2	**NTP30N06**	Single N–Channel
	0.040				32	90	**MTP36N06V**	Single N–Channel
		0.032			42	125	**MTP50N06VL**	Single N–Channel
	0.028				42	125	**MTP50N06V**	Single N–Channel
		0.028			45	120	**NTP45N06L**	Single N–Channel
	0.026				45	120	**NTP45N06**	Single N–Channel
		0.025			52	165	**MTP52N06VL**	Single N–Channel
	0.022				52	165	**MTP52N06V**	Single N–Channel

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MOS Power Devices for Automotive Applications

V_{DSS}	$R_{DS(on)}$ (10V)	$R_{DS(on)}$ (4.5V)	$R_{DS(on)}$ (2.5V)	$R_{DS(on)}$ (1.8V)	I_D (cont) Amps	P_D (Watts) Max	Device	Configuration
TO–220AB – Case 221A (See individual data sheets for specific case number.)								
N Channel								
60		0.016			60	136	**NTP60N06L**	Single N–Channel
	0.014				60	150	**MTP60N06HD**	Single N–Channel
	0.014				60	136	**NTP60N06**	Single N–Channel
		0.012			75	142	**NTP75N06L**	Single N–Channel
	0.010				75	150	**MTP75N06HD**	Single N–Channel
	0.010				75	142	**NTP75N06**	Single N–Channel
100		0.220			10	40	**MTP10N10EL**	Single N–Channel
	0.165				13	54	**NTP13N10**	Single N–Channel
	0.030				55	178	**NTP52N10**	Single N–Channel
150	0.070				29	125	**MTP29N15E**	Single N–Channel
	0.050				39	178	**NTP35N15**	Single N–Channel
200	0.700				7	50	**MTP7N20E**	Single N–Channel
	0.081				30	178	**NTP30N20**	Single N–Channel
P Channel								
60	0.200				12	60	**MTP2955V**	Single P–Channel
	0.120				23	90	**MTP23P06V**	Single P–Channel
	0.080				30	125	**MTP30P06V**	Single P–Channel
100	0.300				12	75	**MTP12P10**	Single P–Channel
200	1.000				6	75	**MTP6P20E**	Single P–Channel
TO–247 (Isolated Mounting Hole) – Case 340K								
N Channel								
200	0.075				32	180	**MTW32N20E**	Single N–Channel

Devics listed in ***italics*** are planned and may not be active. For current information, please contact your ON Semiconductor representative or visit our website at **www.onsemi.com**.

60 Volt Automotive Portfolio

Device	$R_{DS(on)}$ (mOhms)	Best Thermal Match	$R_{DS(on)}$ (mOhms)		Most Cost Effective Cross	$R_{DS(on)}$ (mOhms)	
SOT–223 – Case 318E							
MMFT3055V	130	NTF3055–100	100	60X75	NTF3055–160	160	56X56
MMFT3055VL	140	NTF3055L108	108	60X75	NTF3055L175	175	56X56
DPAK – Case 369A (TO–252)							
MTD3055VL	180	NTD3055L104	104	60X75	NTD3055L170	170	56X56
MTD3055V	150	NTD15N06	92	60X75	NTD3055–150	150	56X56
MTD15N06VL	85	NTD18N06L	62	82X82	NTD15N06L	102	60X75
MTD15N06V	120	NTD18N06	60	82X82	NTD15N06	92	60X75
MTD20N06HDL	45	NTD24N06L	45	90x115	NTD20N06L	48	80X110
MTD20N06HD	45	NTD24N06	42	102X140	NTD20N06	46	80X110
TO–220AB – Case 221A (See individual data sheets for specific case number.)							
MTP3055VL	180	NTP18N06L	102	60X75	NTD3055L175–1	170	56X56
MTP3055V	150	NTP18N06	92	60X75	NTD3055160–1	150	56X56
MTP15N06VL	85	NTP22N06L	65	82X82	NTD18N06L–1	102	60X75
MTP15N06V	120	NTP18N06	92	60X75	NTD15N06–1	92	60X75
MTP15N05EL	100	NTP22N06L	65	82X82	NTP18N06L	102	60X75
MTP20N06V	85	NTP22N06	60	80X110	NTP18N06	92	60X75
MTP30N06VL	50	NTP30N06L	46	90x115	NTP27N06L	48	80X110
MTP36N06V	40	NTP45N06	26	102X140	NTP30N06	42	90X115
MTP50N06VL	32	NTP45N06L	28	102X140			
MTP50N06V	28	NTP45N06	26	102X140			
MTP52N06VL	25	NTP60N06L	16	160X160	NTP45N06L	28	102X140
MTP52N06V	22	NTP60N06	14	160X160	NTP45N06	26	102X140
MTP60N06HD	14	NTP60N06	14	160X160	NTP75N06	10	170227
MTP75N06HD	10	NTP75N06	9.5	170227			
MTP75N05HD	9.5	NTP75N06	9.5	170227			
NOTE 1: Smallest die in TO–220 is 60x75 *Straight Lead DPAK							
D^2PAK – Case 418B (TO–264)							
MTB15N06VL	85	NTB22N06L	65	82X82	NTB18N06L	102	60X75
MTB15N06V	120	NTB18N06	92	60X75			
MTB30N06VL	50	NTB30N06L	46	90x115	NTB27N06L	48	80X110
MTB36N06V	40	NTB45N06	26	102X140	NTP30N06	42	90x115
MTB50N06VL	32	NTB45N06L	28	102X140			
MTB50N06V	28	NTB45N06	26	102X140			
MTB55N06Z	16	NTB60N06	14	160X160	NTB45N06	26	102X140
MTB52N06VL	25	NTB60N06L	16	160X160	NTB45N06L	28	102X140
MTB52N06V	22	NTB60N06	14	160X160	NTB45N06	26	102X140
MTB60N06HD	14	NTB60N06	14	160X160			
MTB75N06HD	10	NTB75N06	10	170227			
MTB75N05HD	9.5	NTB75N06	10	170227			

Migration List

Migration parts are parts that are equivalent to older versions built in new technologies. In some cases the migration parts have a cost advantage, in other cases they have a performance advantage and in some cases both.

Migration Table

Part ID	Part Status	Migration Part	Part Status	Migration Part	Part Status
MGSF1P02ELT1	Active	NTR1P02LT1	12/25/01		
MGSF1P02ELT3	Active	NTR1P02LT3	12/25/01		
MGSF3433VT1	Not Recommended	NTGS3433T1	Active		
MGSF3441VT1	Active	NTGS3441T1	Active		
MGSF3441XT1	End of Life	NTGS3441T1	Active		
MGSF3455VT1	Not Recommended	NTGS3455T1	Active		
MMDF2P03HDR2	Active	NTMD3P03R2	Active		
MMDF4207R2	Not Recommended	NTMD6P02R2	Active		
MMDF4N01HDR2	End of Life	NTMD6N02R2	Active		
MMDF4P03HDR2	Active	NTMD3P03R2	Active		
MMDF6N02HDR2	Active	NTMD6N02R2	Active		
MMDF2P01HDR2	End of Life	NTMD2P01R2	Active		
MMDFS2P102R2	Active	NTMSD3P102R2	Active	NTMSD2P102LR2	Active
MMDFS3P303R2	Active	NTMSD3P303R2	Active		
MMFT3055ELT1	End of Life	NTF3055L108T1	Active	NTF3055L175T1	Active
MMFT3055ET1	Active	NTF3055–100T1	Active	NTF3055–160T1	Active
MMFT3055VLT1	Active	NTF3055L108T1	Active	NTF3055L175T1	Active
MMFT3055VLT1–LF	Intro Pending	NTF3055L108T1LF	TBD	NTF3055L175T1LF	TBD
MMFT3055VLT3	Active	NTF3055L108T3	Active	NTF3055L175T3	Active
MMFT3055VLT3–LF	Active	NTF3055L108T3LF	Active	NTF3055L175T3LF	Active
MMFT3055VT1	Active	NTF3055–100T1	Active	NTF3055–160T1	Active
MMFT3055VT1–LF	Intro Pending	NTF3055–100T1LF	TBD	NTF3055–160T1LF	TBD
MMFT3055VT3	Active	NTF3055–100T3	Active	NTF3055–160T3	Active
MMFT3055VT3–LF	Intro Pending	NTF3055–100T3LF	Active	NTF3055–160T3LF	Active
MMFT5P03HDT3	Active	NTF5P03T3	Active		
MMSF3P03HDR2	End of Life	NTMS3P03R2	Active		
MMSF4205R2	Not Recommended	NTMS10P02R2	Active		
MMSF4N01HDR2	End of Life	NTMS4N01R2	Active		
MMSF4P01HDR2	End of Life	NTMS4P01R2	Active		
MMSF5N02HDR2	End of Life	NTMS4N01R2	Active		
MMSF5N03HDR2	End of Life	NTMS7N03R2	Active		
MMSF5P02HDR2	Active	NTMS5P02R2	Active		
MMSF7N03HDR2	End of Life	NTMS7N03R2	Active		
MTB10N10E	Purged	NTB13N10	Active		
MTB1306	Active	NTB75N03L09	Active	NTB75N03–06	TBD
MTB1306T4	Active	NTB75N03L09	Active		
MTB15N06V	End of Life	NTB22N06	Active	NTB18N06	Active
MTB15N06VT4	End of Life	NTB22N06T4	Active	NTB18N06T4	Active
MTB20N20E	End of Life	NTB30N20	Active		
MTB20N20ET4	End of Life	NTB30N20T4	Active		

Migration Table

Part ID	Part Status	Migration Part	Part Status	Migration Part	Part Status
MTB30N06VL	Active	NTB30N06L	Active		
MTB30N06VLT4	Active	NTB30N06LT4	Active		
MTB33N10E	Not Recommended	NTB33N10	TBD		
MTB33N10ET4	Active	NTB33N10T4	TBD		
MTB50N06ET4	End of Life	NTB45N06T4	Active		
MTB50N06V	Active	NTB45N06	Active		
MTB50N06VL	Active	NTB45N06L	Active		
MTB50N06VLT4	Active	NTB45N06LT4	Active		
MTB50N06VT4	Active	NTB45N06T4	Active		
MTB60N06HD	Active	NTB60N06	Active		
MTB60N06HDT4	Active	NTB60N06T4	Active		
MTB75N03HDL	Active	NTB75N03L09	Active		
MTB75N03HDLT4	Active	NTB75N03L09T4	Active		
MTB75N06HD	Active	NTB75N06	Active		
MTB75N06HDT4	Active	NTB75N06T4	Active		
MTD15N06V	Active	NTD18N06	Active	NTD15N06	Active
MTD15N06V1	Active	NTD18N06–001	Active	NTD15N06–001	Active
MTD15N06VL	Active	NTD18N06L	Active	NTD15N06L	Active
MTD15N06VL1	Active	NTD18N06L–001	Active	NTD15N06L–001	Active
MTD15N06VLT4	Active	NTD18N06LT4	Active	NTD15N06LT4	Active
MTD15N06VT4	Active	NTD18N06T4	Active	NTD15N06T4	Active
MTD20N03HDL	Active	NTD20N03L27	Active		
MTD20N03HDL1	Active	NTD20N03L27–001	Active		
MTD20N03HDLT4	Active	NTD20N03L27T4	Active		
MTD20N06HD	Active	NTD24N06	Active		
MTD20N06HD1	Not Recommended	NTD24N06–001	Active		
MTD20N06HDL	Active	NTD24N06L	Active		
MTD20N06HDL1	Active	NTD24N06L–001	Active		
MTD20N06HDLT4	Active	NTD24N06LT4	Active		
MTD20N06HDT4	Active	NTD24N06T4	Active		
MTD20N06V	Active	NTD20N06	Active		
MTD20N06VT4	Active	NTD20N06T4	Active		
MTD3055ELT4	Active	NTD3055L104T4	Active	NTD3055L170T4	Active
MTD3055ET4	End of Life	NTD3055–094T4	Active	NTD3055–150T4	Active
MTD3055V	Active	NTD3055–094	Active	NTD3055–150	Active
MTD3055V1	Active	NTD3055–094–1	Active	NTD3055–150–1	Active
MTD3055VL	Active	NTD3055L104	Active	NTD3055L170	Active
MTD3055VL1	Active	NTD3055L104–001	Active	NTD3055L170–001	Active
MTD3055VLT4	Active	NTD3055L104T4	Active	NTD3055L170T4	Active
MTD3055VT4	Active	NTD3055–094T4	Active	NTD3055–150T4	Active
MTD3302	Active	NTD4302	Active		
MTD3302T4	Active	NTD4302T4	Active		
MTD4N20E	Active	NTD4N20	TBD		
MTD4N20E1	Active	NTD4N20–1	TBD		

Migration Table

Part ID	Part Status	Migration Part	Part Status	Migration Part	Part Status
MTD4N20ET4	Active	NTD4N20T4	TBD		
MTD6N15	Not Recommended	NTD6N15	TBD		
MTD6N15T4	Active	NTD6N15T4	TBD		
MTD9N10E	End of Life	NTD12N10	Active		
MTD9N10E1	End of Life	NTD12N10–001	Active		
MTD9N10ET4	End of Life	NTD12N10T4	Active		
MTDF1P02HDR2	Active	NTTD1P02R2	Active		
MTP10N10E	End of Life	NTP13N10	Active		
MTP1306	Active	NTP75N03L09	Active	NTP75N03–006	Active
MTP15N06V	Active	NTP22N06	Active	NTP18N06	Active
MTP15N06VL	Active	NTP22N06L	Active	NTP18N06L	Active
MTP20N06V	End of Life	NTP27N06	Active		
MTP20N15E	Not Recommended	NTP20N15	TBD		
MTP20N20E	End of Life	NTP30N20	Active		
MTP30N06VL	Active	NTP30N06L	Active		
MTP33N10E	Not Recommended	NTP33N10	TBD		
MTP50N06V	Active	NTP45N06	Active		
MTP50N06VL	Active	NTP45N06L	Active		
MTP60N06HD	Active	NTP60N06	Active		
MTP75N03HDL	Active	NTP75N03L09	Active		
MTP75N05HD	Active	NTP75N06	Active		
MTP75N06HD	Active	NTP75N06	Active		
MTSF2P02HDR2	Active	NTTS2P02R2	Active		
MTSF2P03HDR2	Active	NTTS2P03R2	Active		
MTW35N15E	End of Life	NTP35N15	Active	NTB35N15	Active
MTW45N10E	End of Life	NTP52N10	Active	NTB52N10	Active
MTY100N10E	Active	NTY100N10	1/3/02		
STB60N06HDT4	Active	NTB60N06	Active		
STB75N05HDT4	Active	NTB75N06	Active		
STB75N06HDT4	Active	NTB75N06	Active		
STD9N10ET4	End of Life	NTD12N10	Active		

What’s Changed

Listing of Added and Deleted Devices

Added/Updated Listings

The following devices have been added since the last publication of this selector guide. Although many of these devices are new products, others may reflect changes in packaging, offerings, and manufacturing, or are not new devices.

2N3819
2N6052
2N6487
2N6488
2N6490
2N6491
2N7002L
74ALVC16240
74ALVC16244
74ALVC16245
74ALVC16373
74ALVC16374
74ALVCH16240
74ALVCH16244
74ALVCH16245
74ALVCH16373
74ALVCH16374
74FST3125
74FST3126
74FST3244
74FST3245
74FST3251
74FST3253
74FST3257
74FST3345
74FST3383
74FST3384
74FST3400
74FST3861
74FST6800
805Q045N
BAS19LT1
BAS20LT1
BAS21SLT1
BC449A
BC490A
BC635
BC640–16
BC846BDW1T1
BC846BPDW1T1
BC846BWT1
BC847CWT1
BC848CWT1
BC849BLT1
BC850BLT1
BC850CLT1
BC856AWT1
BC856BDW1T1
BC857CLT1
BC857CWT1
BC859BLT1
BC859CLT1
BCP53–10T1
BCP53–16T1
BCP56–10T1
BCP56–16T1
BCX56–10R1
BDW42
BDW47
BDX34C
BFR31LT1
BSR58LT1
BSS84L
BUB323Z
CS299
CS3341
CS3351
CS3361
CS3701
CS387
CS5206
CS5211
CS5305
CS5307
CS5308
CS5422
CS76113
CS76114
D44VH10
D45VH10
DF6A6.8FUT1
DTA114EET1
DTA114TET1
DTA114YET1
DTA115EET1
DTA123EET1
DTA123JET1
DTA124EET1
DTA124XET1
DTA143EET1
DTA143TET1
DTA143ZET1
DTA144EET1
DTA144TT1
DTA144WET1
DTC114EET1
DTC114TET1
DTC114YET1
DTC115EET1
DTC123EET1
DTC123JET1
DTC124EET1
DTC124XET1
DTC143EET1
DTC143TET1
DTC143ZET1
DTC144EET1
DTC144TT1
DTC144WET1
LM285
LM2902V
MAC97A4
MAX707
MAX708
MBD101
MBD54DWT1
MBR3060
MBRA120ET3
MBRA120LT3
MBRA160T3
MBRA210ET3
MBRA210LT3
MBRD650CTT4
MBRM110ET1
MBRM110LT1
MBRM120ET1
MBRM120LT1
MBRM130LT1
MBRM140T1
MBRS260T3
MBRS3100T3
MBRS410ET3
MBRS410LT3
MBT2222ADW1T1
MBT3946DW1T1
MC10/100EP142
MC10/100EP445
MC10/100EP446
MC10/100EP451
MC10/100EP90
MC10/100EPT20
MC10/100H646
MC100EL91
MC100EP142
MC100EP16VB
MC100EP16VC
MC100EP196
MC100EP451
MC100LVEL40
MC100SX1230
MC10110
MC10111
MC10166
MC10E197
MC10H141
MC10H681
MC12026A
MC12080
MC12093
MC12095
MC33172V
MC33174V
MC33363
MC33463

Added/Updated Listings

MC33466
MCH/K12140
MGSF1P02L
MGSF2N02EL
MGSF2P02HD
MGSF3433VT1
MGSF3441VT1
MGSF3441XT1
MGSF3455VT1
MJE13009
MMBD452LT1
MMBD717LT1
MMBT2369ALT1
MMBT2369LT1
MMBT3640LT1
MMBT4124LT1
MMBT4401WT1
MMBT4403WT1
MMBT489LT1
MMBT5088LT1
MMBTA06WT1
MMBTA56WT1
MMBTH10–4LT1
MMDF2P03HDR2
MMDF4207R2
MMDF4N01HDR2
MMDF4P03HDR2
MMDF6N02HDR2
MMDFS2P102
MMDFS3P303R2
MMDL770T1
MMFT3055ELT1
MMFT3055ET1
MMFT3055VL
MMFT3055VLT1–LF
MMFT3055VLT3–LF
MMFT3055VT1
MMFT3055VT1–LF
MMFT3055VT3
MMFT3055VT3–LF
MMFT5P03HD
MMPQ2222A
MMPQ2369
MMPQ3467
MMPQ3904
MMPQ3906
MMPQ6700
MMSD701T1
MMSF3P03HDR2
MMSF4205R2
MMSF4N01HDR2
MMSF4P01HDR2
MMSF5P02HDR2
MMT05B64T3
MMT10B350T3
MMUN2235LT1
MMUN2238LT1
MMUN2241LT1
MPS3906
MPS5172
MPS6729
MPS8599
MR750RL
MR751RL
MR752RL
MR754RL
MR756RL
MR760RL
MR852RL
MR854RL
MR856RL
MSA1162GT1
MSA1162YT1
MSB92AWT1
MSB92WT1
MSC2712GT1
MSD1328–ST1
MSD2714AT1
MSD42WT1
MSQA6V1W5T2
MTB10N10E
MTB1306T4
MTB15N06V
MTB15N06VL
MTB15N06VT4
MTB20N20ET4
MTB30N06VLT4
MTB33N10E
MTB33N10ET4
MTB50N06ET4
MTB50N06VLT4
MTB50N06VT4
MTB60N06HDT4
MTB75N03HDLT4
MTB75N06HDT4
MTD10N10EL
MTD15N06V1
MTD15N06VL1
MTD15N06VLT4
MTD15N06VT4
MTD20N03HDL1
MTD20N03HDLT4
MTD20N06HD1
MTD20N06HDL1
MTD20N06HDLT4
MTD20N06HDT4
MTD20N06V
MTD20N06VT4
MTD3055ELT4
MTD3055ET4
MTD3055V1
MTD3055VL1
MTD3055VLT4
MTD3055VT4
MTD3302T4
MTD4N20E1
MTD4N20ET4
MTD6N15
MTD6N15T4
MTD9N10E1
MTD9N10ET4
MTDF1P02HDR2
MTP15N05EL
MTP30P06V
MTP33N10E
MTSF1P02HD
MTSF2P03HDR2
MTY100N10E
MUN2136T1
MUN2137T1
MUN2140T1
MUN2236T1
MUN2237T1
MUN2240T1
MUN2241T1
MUN5335DW1T1
MUR105
MUR110
MUR115
MUR130
MUR140
MUR2100E
MUR220
MUR240
MUR260
MUR405
MUR410
MUR415
MUR440
MURM105T1
MURM105T3
MURM110T1
MURM110T3
MV2101
NBSG11
NBSG111
NBSG14
NBSG16
NBSG16VS
NCP1000
NCP1001
NCP1002
NCP1050
NCP1051
NCP1052
NCP1053
NCP1054
NCP1055
NCP1203
NCP1400A
NCP1403
NCP1410
NCP1411
NCP1417
NCP1450
NCP1450A
NCP1500
NCP1570
NCP1571
NCP1800

Added/Updated Listings

NCP2860
NCP3712
NCP502
NCP512
NCP5162
NCP5322A
NCP5426
NCP553
NCP561
NCP562
NCP563
NCP803
NCS2202
NCS2203
NCS2302
NCS2303
NCV7601
NCV8501
NCV8502
NCV8508
NGB15N41CL
NGP15N41CL
NIF62514
NSB9435T1
NSL12TT1
NSL35TT1
NSL5TT1
NSR15TW1T2
NSTB60BDW1T1
NTB100N04
NTB13N10
NTB18N06
NTB18N06L
NTB18N06T4
NTB22N06
NTB22N06L
NTB22N06T4
NTB27N06L
NTB30N06
NTB30N06L
NTB30N06LT4
NTB30N20
NTB30N20T4
NTB33N10
NTB33N10T4
NTB35N15
NTB4302
NTB45N06LT4
NTB45N06T4
NTB52N10
NTB60N06
NTB60N06L
NTB60N06T4
NTB75N03–006
NTB75N03L09T4
NTB75N06
NTB75N06L
NTB75N06T4
NTB85N03
NTB90N02
NTD12N10
NTD12N10–001
NTD12N10T4
NTD15N06
NTD15N06–001
NTD15N06–1
NTD15N06L
NTD15N06L–001
NTD15N06LT4
NTD15N06T4
NTD18N06
NTD18N06–001
NTD18N06L
NTD18N06L–001
NTD18N06L–1
NTD18N06LT4
NTD18N06T4
NTD20N03L27–001
NTD20N03L27T4
NTD20N06L
NTD20N06T4
NTD24N06
NTD24N06–001
NTD24N06L
NTD24N06L–001
NTD24N06LT4
NTD24N06T4
NTD3055–094–1
NTD3055–094T4
NTD3055–150
NTD3055–150–1
NTD3055–150T4
NTD3055160–1
NTD3055L104–001
NTD3055L104T4
NTD3055L170
NTD3055L170–001
NTD3055L170T4
NTD3055L175–1
NTD30N02
NTD4302T4
NTD4N20
NTD4N20T4
NTD60N03
NTD6N15
NTD6N15T4
NTD80N02
NTF3055–100
NTF3055–100T1
NTF3055–100T1LF
NTF3055–100T3
NTF3055–100T3LF
NTF3055–160
NTF3055–160T1
NTF3055–160T1LF
NTF3055–160T3
NTF3055–160T3LF
NTF3055L108
NTF3055L108T1
NTF3055L108T1LF
NTF3055L108T3
NTF3055L108T3LF
NTF3055L175
NTF3055L175T1
NTF3055L175T1LF
NTF3055L175T3
NTF3055L175T3LF
NTF5P03
NTF5P03T3
NTGS3441
NTGS3443
NTGS3455
NTH4302
NTHMSN60N03–6
NTLTD7900Z
NTMD2P01
NTMD2P01R2
NTMD3N08L
NTMD3P03
NTMD6N02
NTMD6P02
NTMS10P02
NTMS3P03
NTMS4N01
NTMS4P01
NTMS5P02
NTMS7N03
NTMS7N03R2
NTMSD2P102L
NTMSD3P102
NTMSD3P303
NTP13N10
NTP18N06
NTP18N06L
NTP20N15
NTP22N06
NTP22N06L
NTP27N06L
NTP30N06
NTP30N06L
NTP30N20
NTP33N10
NTP35N15
NTP4302
NTP52N10
NTP60N06
NTP60N06L
NTP75N03–006
NTP75N06
NTP75N06L
NTQD6968
NTR1P02L
NTR1P02LT1
NTR1P02LT3
NTTD1P02
NTTS2P02
NTTS2P03
NTY100N10
NTY100N10E
NUP4201DR2

Added/Updated Listings

NUP6101DMR2
NZF220DFT1
NZF220TT1
NZMM7V0T4
RB751V40T1
SL05T1
SL15T1
SL24T1
SMDA05–6R2
SMS05T1
SMS12T1
SMS15T1
SMS24T1
SS16
SS26
STB60N06HDT4
STB75N05HDT4
STB75N06HDT4
STD9N10ET4
STF202–22
TCA0372B
UC2842A
UC2842B
UC2843A
UC2843B
UC2844B
UC2845B
UC3842A
UC3842B
UC3843A
UC3843B
UC3844B
UC3845B
UMA4NT1
UMA6NT1
UMC2NT1
UMC3NT1
UMC5NT1
UPR10TR13
UPR10TR7
UPR5TR13
UPR5TR7

Deleted Listings

The following devices were deleted since the last publication of this selector guide.
Please note that not all items on this list have been discontinued by ON Semiconductor. Some devices reflect packaging, offering and manufacturing changes and still may be offered under different part numbers. Please check the complete device listing beginning on page 276 to verify if a device is still offered.

2N5485	CS51414G	DTA114YRLRM	DTC114YRLRM
2N6283	CS5150/H	DTA114YRLRP	DTC114YRLRP
2N6286	CS5171ED8	DTA123E	DTC123E
2N6519	CS5171GD8	DTA123ERLRA	DTC123ERLRA
2N7002LT1/T3	CS5172ED8	DTA123ERLRM	DTC123ERLRM
74VCX162240	CS5172GD8	DTA123ERLRP	DTC123ERLRP
74VCX162244	CS5173ED8	DTA124E	DTC124E
74VCX162373	CS5173GD8	DTA124ERLRA	DTC124ERLRA
74VCX162374	CS5174ED8	DTA124ERLRM	DTC124ERLRM
74VCXR162245	CS5174GD8	DTA124ERLRP	DTC124ERLRP
BC214	CS5206–1	DTA143E	DTC143E
BC308B	CS5206–3	DTA143ERLRA	DTC143ERLRA
BSS84LT1	CS5206–5	DTA143ERLRM	DTC143ERLRM
BUV20	CS5206–X	DTA143ERLRP	DTC143ERLRP
BUV60	CS5210–1	DTA143T	DTC143T
C122B1	CS52510–1	DTA143TRLRA	DTC143TRLRA
C122F1	CS8121	DTA143TRLRM	DTC143TRLRM
CA3059	CS8125	DTA143TRLRP	DTC143TRLRP
CS1087/9	CS8126–1	DTA143Z	DTC143Z
CS51021A/2A/3A/4A	CS8126–X	DTA143ZRLRA	DTC143ZRLRA
CS51021AED16	CS8127	DTA143ZRLRM	DTC143ZRLRM
CS51022AED16	CS8128	DTA143ZRLRP	DTC143ZRLRP
CS51023AED16	CS8135	DTA144E	DTC144E
CS51024AED16	CS8140/1	DTA144ERLRA	DTC144ERLRA
CS51031GD8	CS8171	DTA144ERLRM	DTC144ERLRM
CS51031YD8	CS8251	DTA144ERLRP	DTC144ERLRP
CS51033GD8	CS8351	DTB113E	DTD113E
CS51033YD8	CS8352	DTB113ERLRA	DTD113ERLRA
CS5106LSW24	D44H10	DTB113ERLRM	DTD113ERLRM
CS51221ED16	D45H10	DTB113ERLRP	DTD113ERLRP
CS51221EN16	DTA114E	DTC114E	LM2574DW–ADJ
CS51227ED8	DTA114ERLRA	DTC114ERLRA	LM2574N–12
CS5124XD8	DTA114ERLRM	DTC114ERLRM	LM2574N–15
CS5126XD8	DTA114ERLRP	DTC114ERLRP	LM2574N–3.3
CS51411E	DTA114T	DTC114T	LM2574N–5
CS51411G	DTA114TRLRA	DTC114TRLRA	LM2575D2T–12
CS51412E	DTA114TRLRM	DTC114TRLRM	LM2575D2T–15
CS51412G	DTA114TRLRP	DTC114TRLRP	LM2575D2T–3.3
CS51413E	DTA114Y	DTC114Y	LM2575D2T–5
CS51413G	DTA114YRLRA	DTC114YRLRA	LM2575D2T–ADJ

Deleted Listings

LM2575T–12
LM2575T–15
LM2575T–3.3
LM2575T–5
LM2575T–ADJ
LM2575TV–12
LM2575TV–15
LM2575TV–3.3
LM2575TV–5
LM2575TV–ADJ
LM2576D2T–12
LM2576D2T–15
LM2576D2T–3.3
LM2576D2T–5
LM2576D2T–ADJ
LM2576T–12
LM2576T–15
LM2576T–3.3
LM2576T–5
LM2576T–ADJ
LM2576TV–12
LM2576TV–15
LM2576TV–3.3
LM2576TV–5
LM2576TV–ADJ
LM285–1.2
LM285–2.5
LM2901V
LM2903V
LM2904V
LM2931/A
LM2931C/AC
LM2935
LM308A
LM317LxxSeries
LM317MxxASeries
LM317MxxSeries
LM323A
LM324A
LM348
LM75
LP2950C/AC
LP2951C/AC
M78T15A
MAC15A10FP
MAC15A6FP
MAC15A8FP
MAC16D
MAC210A10FP
MAC210A8FP
MAC212A10FP
MAC212A6FP
MAC212A8FP
MAC218A10FP
MAC218A6FP
MAC223A10
MAC223A10FP
MAC223A6
MAC223A6FP
MAC223A8
MAC223A8FP
MAC224A10
MAC224A4
MAC224A6
MAC224A8
MAC229A10FP
MAC229A8FP
MAC320A8FP
MAC4M
MAC4N
MAC4SM
MAC4SN
MAC97A–4
MAX1617
MAX6501
MAX6502
MAX803
MBR4015WT
MC100E211
MC100E212
MC100E256
MC100E336
MC100E337
MC100EL37
MC100ELT26
MC100EP809
MC1066
MC10E193
MC10E241
MC10E256
MC10E310
MC10E336
MC10E337
MC10EL37
MC10ELT26
MC10EP14
MC10EP196
MC10H118
MC10H119
MC1121
MC1403/B
MC1403B
MC1413B
MC1458
MC1489/A
MC1489A
MC1494
MC1495
MC1741
MC1741C
MC33065–H/–L
MC33071A
MC33072A
MC33074A
MC33076
MC33102
MC33166D2T
MC33166T
MC33166TH
MC33166TV
MC33167D2T
MC33167T
MC33167TH
MC33167TV
MC33201V
MC33202V
MC33204V
MC33261
MC33263–2.8
MC33263–3
MC33263–3.2
MC33263–3.3
MC33263–3.8
MC33263–4
MC33263–4.75
MC33263–5
MC33264
MC33267
MC33363/A/B
MC33364D1
MC33364D2
MC3346
MC33463–K
MC33463–L
MC33463H–30KT1
MC33463H–30LT1
MC33463H–33KT1
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MC33463H–50KT1
MC33463H–50LT1
MC33466–J
MC33466–L
MC33466H–30JT1
MC33466H–30LT1
MC33466H–33JT1
MC33466H–33LT1
MC33466H–50JT1
MC33466H–50LT1
MC33468SN–20ATR
MC3348A
MC33567–1
MC33567–2
MC33567–3
MC3358
MC3364D
MC33761–2.5
MC33761–2.8
MC33761–3.0
MC34065–H/–L
MC34071A
MC34072A
MC34072V
MC34074A
MC34074V
MC34166D2T
MC34166T
MC34166TH
MC34166TV
MC34167D2T
MC34167T

Deleted Listings

MC34167TH
MC34167TV
MC3425
MC34261
MC3456
MC3458
MC44608P100
MC44608P40
MC44608P75
MC623
MC642
MC74
MC74AC109
MC74AC151
MC74AC153
MC74AC174
MC74AC175
MC74ACT109
MC74ACT151
MC74ACT153
MC74ACT174
MC74ACT175
MC74ACT323
MC74LCX646
MC74LCX652
MC74LVX393
MC74LVX595
MC74VHC393
MC74VHC595
MC74VHCT393A
MC74VHCT595
MC7660
MC7662
MCCS142235
MCCS142236
MCR218–10FP
MCR218–6FP
MCR225–10FP
MCR225–8FP
MCR264–4
MCR264–6
MCR264–8
MCR265–10
MCR265–4
MCR265–6
MCR265–8
MGSF3442VT1
MGSF3454VT1
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MKP1V240RL
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MMBF2201NT1
MMBF2202PT1
MMBT2131T1
MMBT2132T1
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MMDF3N06HDR2
MMDF5N02ZR2
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MMQA5V6T3
MMQA6V8T3
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MMSF10N03ZR2
MMSF1308R2
MMSF1310R2
MMSF2P02ER2
MMSF7N03ZR2
MPS2111
MPS2112
MR750
MR751
MR752
MR754
MR756
MR760
MR852
MR854
MR856
MSRP10040
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MTD1302
MTD30P06V
MTDF1N02HDR2
MTDF2N06HDR2
MTP1302
MTP27N10E
MTP2P50E
MTP40N10E
MTP5P06V
MTW32N25E
MTY55N20E
MUR10120E
MUR10150E
MUR5150E
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NCP1200P40
NCP1232
NCP1400
NCP1729
NCP4413
NCP4414
NCP4420
NCP4421
NCP4422
NCP4423
NCP4424
NCP4425
NCP4429
NCP550
NCP6332
NCP6332/3/4
NCP6333
NCP6334
NCP708
NCP7662
NCP817
NCT47
NCV85083
NCV85085
NTUD01N02
SG3526
SN74LS00
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SN74LS05
SN74LS08
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SN74LS123
SN74LS125A
SN74LS126A
SN74LS132
SN74LS138
SN74LS139
SN74LS14
SN74LS145
SN74LS147
SN74LS148
SN74LS151
SN74LS153
SN74LS156
SN74LS157
SN74LS161A
SN74LS163A
SN74LS164
SN74LS165
SN74LS166
SN74LS174
SN74LS175
SN74LS193
SN74LS194A
SN74LS195A
SN74LS221
SN74LS240
SN74LS244
SN74LS245
SN74LS247
SN74LS251
SN74LS253
SN74LS258B
SN74LS259
SN74LS260
SN74LS273
SN74LS280
SN74LS283
SN74LS298
SN74LS299
SN74LS32
SN74LS365A
SN74LS367A
SN74LS368A
SN74LS373

Deleted Listings

SN74LS374	SN74LS641	SN74LS85	TL431C
SN74LS377	SN74LS642	SN74LS86	TL431I
SN74LS38	SN74LS670	T2500D	uA78S40
SN74LS393	SN74LS682	TIP34C	UC2842/3/4/5A
SN74LS42	SN74LS684	TL431AC	UC2842/3/4/5B
SN74LS47	SN74LS688	TL431AI	UC3842/3/4/5A
SN74LS541	SN74LS74A	TL431BC	UC3842/3/4/5B
SN74LS640	SN74LS76A	TL431BI	

Alphanumeric Parts Index

Alphabetical Parts Listing

Device Number	Page
1.5KE100A	179
1.5KE10A	179
1.5KE110A	179
1.5KE11A	179
1.5KE120A	179
1.5KE12A	179
1.5KE130A	179
1.5KE13A	179
1.5KE150A	180
1.5KE15A	179
1.5KE160A	180
1.5KE16A	179
1.5KE170A	180
1.5KE180A	180
1.5KE18A	179
1.5KE200A	180
1.5KE20A	179
1.5KE220A	180
1.5KE22A	179
1.5KE24A	179
1.5KE250A	180
1.5KE27A	179
1.5KE30A	179
1.5KE33A	179
1.5KE36A	179
1.5KE39A	179
1.5KE43A	179
1.5KE47A	179
1.5KE51A	179
1.5KE56A	179
1.5KE6.8A	179
1.5KE62A	179
1.5KE68A	179
1.5KE7.5A	179
1.5KE75A	179
1.5KE8.2A	179
1.5KE82A	179
1.5KE9.1A	179
1.5KE91A	179
1.5SMC10AT3	190
1.5SMC11AT3	190
1.5SMC12AT3	190
1.5SMC13AT3	190
1.5SMC15AT3	190
1.5SMC16AT3	190
1.5SMC18AT3	190
1.5SMC20AT3	190

Device Number	Page
1.5SMC22AT3	190
1.5SMC24AT3	190
1.5SMC27AT3	190
1.5SMC30AT3	190
1.5SMC33AT3	190
1.5SMC36AT3	190
1.5SMC39AT3	190
1.5SMC43AT3	190
1.5SMC47AT3	190
1.5SMC51AT3	190
1.5SMC56AT3	190
1.5SMC6.8AT3	190
1.5SMC62AT3	190
1.5SMC68AT3	190
1.5SMC7.5AT3	190
1.5SMC75AT3	190
1.5SMC8.2AT3	190
1.5SMC82AT3	190
1.5SMC9.1AT3	190
1.5SMC91AT3	190
1M180ZS5	169
1M200ZS5	169
1N4001RL	223
1N4002RL	223
1N4003RL	223
1N4004RL	223
1N4005RL	223
1N4006RL	223
1N4007RL	223
1N4933RL	223
1N4934RL	223
1N4935RL	223
1N4936RL	223
1N4937RL	223
1N5333B	168
1N5334B	168
1N5335B	168
1N5336B	168
1N5337B	168
1N5338B	168
1N5339B	168
1N5340B	168
1N5341B	168
1N5342B	168
1N5343B	168
1N5344B	168
1N5345B	168

Device Number	Page
1N5346B	168
1N5347B	168
1N5348B	168
1N5349B	168
1N5350B	168
1N5351B	168
1N5352B	168
1N5353B	168
1N5354B	168
1N5355B	168
1N5356B	168
1N5357B	168
1N5358B	168
1N5359B	168
1N5360B	169
1N5361B	169
1N5362B	169
1N5363B	169
1N5364B	169
1N5365B	169
1N5366B	169
1N5367B	169
1N5368B	169
1N5369B	169
1N5370B	169
1N5371B	169
1N5372B	169
1N5373B	169
1N5374B	169
1N5375B	169
1N5376B	169
1N5377B	169
1N5378B	169
1N5379B	169
1N5380B	169
1N5381B	169
1N5382B	169
1N5383B	169
1N5384B	169
1N5385B	169
1N5386B	169
1N5387B	169
1N5388B	169
1N5400RL	224
1N5401RL	224
1N5402RL	224
1N5404RL	224

Alphabetical Parts Listing

Device Number	Page
1N5406RL	224
1N5407RL	224
1N5408RL	224
1N5817	216
1N5818	216
1N5819	216
1N5820	217
1N5821	217
1N5822	217
1N5908	178
1N5913B	168
1N5914B	168
1N5915B	168
1N5916B	168
1N5917B	168
1N5918B	168
1N5919B	168
1N5920B	168
1N5921B	168
1N5922B	168
1N5923B	168
1N5924B	168
1N5925B	168
1N5926B	168
1N5927B	168
1N5928B	168
1N5929B	168
1N5930B	168
1N5931B	168
1N5932B	168
1N5933B	168
1N5934B	168
1N5935B	169
1N5936B	169
1N5937B	169
1N5938B	169
1N5939B	169
1N5940B	169
1N5941B	169
1N5942B	169
1N5943B	169
1N5944B	169
1N5945B	169
1N5946B	169
1N5947B	169
1N5948B	169
1N5949B	169

Device Number	Page
1N5950B	169
1N5951B	169
1N5952B	169
1N5953B	169
1N5954B	169
1N5955B	169
1N5956B	169
1N6267A	179
1N6268A	179
1N6269A	179
1N6270A	179
1N6271A	179
1N6272A	179
1N6273A	179
1N6274A	179
1N6275A	179
1N6276A	179
1N6277A	179
1N6278A	179
1N6279A	179
1N6280A	179
1N6281A	179
1N6282A	179
1N6283A	179
1N6284A	179
1N6285A	179
1N6286A	179
1N6287A	179
1N6288A	179
1N6289A	179
1N6290A	179
1N6291A	179
1N6292A	179
1N6293A	179
1N6294A	179
1N6295A	179
1N6296A	179
1N6297A	179
1N6298A	179
1N6299A	180
1N6300A	180
1N6301A	180
1N6302A	180
1N6303A	180
1N6373	178
1N6374	178
1N6375	178

Device Number	Page
1N6376	178
1N6377	178
1N6378	178
1N6379	178
1N6380	178
1N6381	178
1N6382	178
1N6383	178
1N6384	178
1N6385	178
1N6386	178
1N6387	178
1N6388	178
1N6389	178
1PMT12AT3	181
1PMT16AT3	181
1PMT18AT3	181
1PMT22AT3	181
1PMT24AT3	181
1PMT26AT3	181
1PMT28AT3	181
1PMT30AT3	181
1PMT33AT3	181
1PMT36AT3	181
1PMT40AT3	181
1PMT48AT3	181
1PMT5.0AT3	181
1PMT51AT3	181
1PMT58AT3	181
1PMT5920BT3	172
1PMT5921BT3	172
1PMT5922BT3	172
1PMT5923BT3	172
1PMT5924BT3	172
1PMT5925BT3	172
1PMT5927BT3	172
1PMT5929BT3	172
1PMT5930BT3	172
1PMT5931BT3	172
1PMT5933BT3	172
1PMT5934BT3	172
1PMT5935BT3	172
1PMT5936BT3	172
1PMT5939BT3	173
1PMT5941BT3	173
1PMT7.0AT3	181
1SMA10AT3	182

Alphabetical Parts Listing

Device Number	Page
1SMA10CAT3	183
1SMA11AT3	182
1SMA11CAT3	183
1SMA12AT3	182
1SMA12CAT3	183
1SMA13AT3	182
1SMA13CAT3	183
1SMA14AT3	182
1SMA14CAT3	183
1SMA15AT3	182
1SMA15CAT3	183
1SMA16AT3	182
1SMA16CAT3	183
1SMA17AT3	182
1SMA17CAT3	183
1SMA18AT3	182
1SMA18CAT3	183
1SMA20AT3	182
1SMA20CAT3	183
1SMA22AT3	182
1SMA22CAT3	183
1SMA24AT3	182
1SMA26AT3	182
1SMA26CAT3	183
1SMA28AT3	182
1SMA28CAT3	183
1SMA30AT3	182
1SMA30CAT3	183
1SMA33AT3	182
1SMA33CAT3	183
1SMA36AT3	182
1SMA36CAT3	183
1SMA40AT3	182
1SMA40CAT3	183
1SMA43AT3	182
1SMA43CAT3	183
1SMA45AT3	182
1SMA45CAT3	183
1SMA48AT3	182
1SMA48CAT3	183
1SMA5.0AT3	182
1SMA51AT3	182
1SMA51CAT3	183
1SMA54AT3	182
1SMA54CAT3	183
1SMA58AT3	182
1SMA58CAT3	183

Device Number	Page
1SMA5913BT3	172
1SMA5914BT3	172
1SMA5915BT3	172
1SMA5916BT3	172
1SMA5917BT3	172
1SMA5918BT3	172
1SMA5919BT3	172
1SMA5920BT3	172
1SMA5921BT3	172
1SMA5922BT3	172
1SMA5923BT3	172
1SMA5924BT3	172
1SMA5925BT3	172
1SMA5926BT3	172
1SMA5927BT3	172
1SMA5928BT3	172
1SMA5929BT3	172
1SMA5930BT3	172
1SMA5931BT3	172
1SMA5932BT3	172
1SMA5933BT3	172
1SMA5934BT3	172
1SMA5935BT3	172
1SMA5936BT3	172
1SMA5937BT3	172
1SMA5938BT3	173
1SMA5939BT3	173
1SMA5940BT3	173
1SMA5941BT3	173
1SMA5942BT3	173
1SMA5943BT3	173
1SMA5944BT3	173
1SMA5945BT3	173
1SMA6.0AT3	182
1SMA6.5AT3	182
1SMA60AT3	182
1SMA60CAT3	183
1SMA64AT3	182
1SMA64CAT3	183
1SMA7.0AT3	182
1SMA7.5AT3	182
1SMA70AT3	182
1SMA70CAT3	183
1SMA75AT3	182
1SMA75CAT3	183
1SMA78AT3	182
1SMA78CAT3	183

Device Number	Page
1SMA8.0AT3	182
1SMA8.5AT3	182
1SMA9.0AT3	182
1SMB100AT3	184
1SMB10AT3	184
1SMB10CAT3	186
1SMB110AT3	185
1SMB11AT3	184
1SMB11CAT3	186
1SMB120AT3	185
1SMB12AT3	184
1SMB12CAT3	186
1SMB130AT3	185
1SMB13AT3	184
1SMB13CAT3	186
1SMB14AT3	184
1SMB14CAT3	186
1SMB150AT3	185
1SMB15AT3	184
1SMB15CAT3	186
1SMB160AT3	185
1SMB16AT3	184
1SMB16CAT3	186
1SMB170AT3	185
1SMB17AT3	184
1SMB17CAT3	186
1SMB18AT3	184
1SMB18CAT3	186
1SMB20AT3	184
1SMB20CAT3	186
1SMB22AT3	184
1SMB22CAT3	186
1SMB24AT3	184
1SMB24CAT3	186
1SMB26AT3	184
1SMB26CAT3	186
1SMB28AT3	184
1SMB28CAT3	186
1SMB30AT3	184
1SMB30CAT3	186
1SMB33AT3	184
1SMB33CAT3	186
1SMB36AT3	184
1SMB36CAT3	186
1SMB40AT3	184
1SMB40CAT3	186
1SMB43AT3	184

Alphabetical Parts Listing

Device Number	Page
1SMB43CAT3	186
1SMB45AT3	184
1SMB45CAT3	186
1SMB48AT3	184
1SMB48CAT3	186
1SMB5.0AT3	184
1SMB51AT3	184
1SMB51CAT3	186
1SMB54AT3	184
1SMB54CAT3	186
1SMB58AT3	184
1SMB58CAT3	186
1SMB5913BT3	172
1SMB5914BT3	172
1SMB5915BT3	172
1SMB5916BT3	172
1SMB5917BT3	172
1SMB5918BT3	172
1SMB5919BT3	172
1SMB5920BT3	172
1SMB5921BT3	172
1SMB5922BT3	172
1SMB5923BT3	172
1SMB5924BT3	172
1SMB5925BT3	172
1SMB5926BT3	172
1SMB5927BT3	172
1SMB5928BT3	172
1SMB5929BT3	172
1SMB5930BT3	172
1SMB5931BT3	172
1SMB5932BT3	172
1SMB5933BT3	172
1SMB5934BT3	172
1SMB5935BT3	172
1SMB5936BT3	172
1SMB5937BT3	172
1SMB5938BT3	173
1SMB5939BT3	173
1SMB5940BT3	173
1SMB5941BT3	173
1SMB5942BT3	173
1SMB5943BT3	173
1SMB5944BT3	173
1SMB5945BT3	173
1SMB5946BT3	173
1SMB5947BT3	173

Device Number	Page
1SMB5948BT3	173
1SMB5949BT3	173
1SMB5950BT3	173
1SMB5951BT3	173
1SMB5952BT3	173
1SMB5953BT3	173
1SMB5954BT3	173
1SMB5955BT3	173
1SMB5956BT3	173
1SMB6.0AT3	184
1SMB6.5AT3	184
1SMB60AT3	184
1SMB60CAT3	186
1SMB64AT3	184
1SMB64CAT3	186
1SMB7.0AT3	184
1SMB7.5AT3	184
1SMB70AT3	184
1SMB70CAT3	186
1SMB75AT3	184
1SMB75CAT3	186
1SMB78AT3	184
1SMB78CAT3	186
1SMB8.0AT3	184
1SMB8.5AT3	184
1SMB85AT3	184
1SMB9.0AT3	184
1SMB90AT3	184
1SMC10AT3	189
1SMC11AT3	189
1SMC12AT3	189
1SMC13AT3	189
1SMC14AT3	189
1SMC15AT3	189
1SMC16AT3	189
1SMC17AT3	189
1SMC18AT3	189
1SMC20AT3	189
1SMC22AT3	189
1SMC24AT3	189
1SMC26AT3	189
1SMC28AT3	189
1SMC30AT3	189
1SMC33AT3	189
1SMC36AT3	189
1SMC40AT3	189
1SMC43AT3	189

Device Number	Page
1SMC45AT3	189
1SMC48AT3	189
1SMC5.0AT3	189
1SMC51AT3	189
1SMC54AT3	189
1SMC58AT3	189
1SMC6.0AT3	189
1SMC6.5AT3	189
1SMC60AT3	189
1SMC64AT3	189
1SMC7.0AT3	189
1SMC7.5AT3	189
1SMC70AT3	189
1SMC75AT3	189
1SMC78AT3	189
1SMC8.0AT3	189
1SMC8.5AT3	189
1SMC9.0AT3	189
2N3055	206
2N3055A	206, 209
2N3442	206
2N3771	207
2N3772	206
2N3773	206
2N3819	161
2N3904	145, 155
2N3906	145, 155
2N4401	145, 152, 155
2N4403	145, 152, 155
2N4410	145
2N4918	203
2N4919	203
2N4920	203
2N4921	203
2N4922	203
2N4923	203
2N5038	206
2N5060	227
2N5061	227
2N5062	227
2N5064	227
2N5087	145, 150
2N5088	146, 150
2N5089	146, 150
2N5191	203
2N5192	204
2N5194	203

Alphabetical Parts Listing

Device Number	Page
2N5195	204
2N5302	207
2N5401	154
2N5457	161
2N5458	161
2N5460	161
2N5461	161
2N5462	161
2N5486	161
2N5550	154
2N5551	154
2N5555	162
2N5631	206
2N5638	162
2N5639	162
2N5655	203
2N5657	203
2N5684	207
2N5686	207
2N5883	206
2N5884	206
2N5885	206
2N5886	206
2N6027	236
2N6028	236
2N6031	206
2N6035	203
2N6036	204
2N6038	203
2N6039	204
2N6040	199
2N6042	199
2N6043	199
2N6045	199
2N6052	206
2N6071A	230
2N6071B	230
2N6073A	230
2N6073B	230
2N6075A	230
2N6075B	230
2N6107	199
2N6109	199
2N6111	199
2N6284	206
2N6287	206
2N6288	199

Device Number	Page
2N6292	199
2N6338	206
2N6341	206
2N6344	232
2N6344A	233
2N6348A	233
2N6349	232
2N6349A	233
2N6387	200
2N6388	200
2N6394	229
2N6395	229
2N6397	229
2N6399	229
2N6400	229
2N6401	229
2N6402	229
2N6403	229
2N6404	229
2N6405	229
2N6426	151
2N6427	151
2N6487	200
2N6488	200
2N6490	200
2N6491	200
2N6497	198
2N6504	229
2N6505	229
2N6507	229
2N6508	229
2N6509	229
2N6515	154
2N6517	154
2N6520	154
2N6609	206
2N6667	200
2N6668	200
2N7000	247, 257
2N7002L	242, 252, 257
2SA1774	148
2SC4617	148
74ALVC16240	118
74ALVC16244	118
74ALVC16245	118
74ALVC16373	118
74ALVC16374	118

Device Number	Page
74ALVCH16240	118
74ALVCH16244	118
74ALVCH16245	118
74ALVCH16373	118
74ALVCH16374	118
74FST3125	118
74FST3126	118
74FST3244	118
74FST3245	118
74FST3251	118
74FST3253	118
74FST3257	118
74FST3345	118
74FST3383	118
74FST3384	118
74FST3400	118
74FST3861	118
74FST6800	118
74VCX16240	119
74VCX16244	119
74VCX16245	119
74VCX16373	119
74VCX16374	119
74VCXH16240	119
74VCXH16244	119
74VCXH16245	119
74VCXH16373	119
74VCXH16374	119
805Q045N	217
BAL99LT1	165
BAS116LT1	165
BAS16HT1	166
BAS16LT1	165
BAS16TT1	166
BAS16WT1	166
BAS19LT1	165
BAS20HT1	166
BAS20LT1	165
BAS21HT1	166
BAS21LT1	165
BAS21SLT1	165
BAS40–04LT1	164
BAS40–06LT1	164
BAS40LT1	164
BAS70–04LT1	164
BAS70LT1	164
BAT54ALT1	164

Alphabetical Parts Listing

Device Number	Page
BAT54HT1	164
BAT54LT1	164
BAT54SLT1	164
BAT54SWT1	164
BAT54T1	164
BAT54WT1	164
BAV199LT1	165
BAV70LT1	165
BAV70TT1	166
BAV70WT1	166
BAV74LT1	165
BAV99LT1	165
BAV99RWT1	166
BAV99WT1	166
BAW56LT1	165
BAW56TT1	166
BAW56WT1	166
BC182	145
BC182A	145
BC182B	145
BC212	145
BC212B	145
BC213	146
BC237	145
BC237A	145
BC237B	145
BC237C	145
BC238B	146
BC238C	146
BC239C	146
BC307B	145
BC307C	145
BC327	145, 152
BC327–16	145, 152
BC327–25	145, 152
BC327–40	145, 152
BC337	145, 152
BC337–16	145, 152
BC337–25	145, 152
BC337–40	145, 152
BC338–25	146, 152
BC368	146, 152
BC369	146, 152
BC372	151
BC373	151
BC447	145, 152
BC449	145

Device Number	Page
BC449A	145
BC487	145, 152
BC487B	145, 152
BC488B	145, 152
BC489	146, 152
BC489A	146, 152
BC489B	146, 152
BC490	146, 152
BC490A	146, 152
BC490B	146, 152
BC517	151
BC546	145
BC546B	145
BC547A	145
BC547B	145
BC547C	145
BC548B	146
BC548C	146
BC550C	145, 150
BC556B	145
BC557	145
BC557A	145
BC557B	145
BC557C	145
BC558B	146
BC558C	146
BC560C	145, 150
BC618	151
BC635	146, 152
BC636	146, 152
BC637	146, 152
BC638	146, 152
BC639	146, 152
BC639–16	146, 152
BC640	146, 152
BC640–16	146, 152
BC807–16LT1	147
BC807–25LT1	147
BC807–40LT1	147
BC817–16LT1	147
BC817–25LT1	147
BC817–40LT1	147
BC846ALT1	147
BC846AWT1	148
BC846BDW1T1	150
BC846BLT1	147
BC846BPDW1T1	150

Device Number	Page
BC846BWT1	148
BC847ALT1	147
BC847AWT1	148
BC847BDW1T1	150
BC847BLT1	147
BC847BPDW1T1	150
BC847BTT1	148
BC847BWT1	148
BC847CDW1T1	150
BC847CLT1	147
BC847CPDW1T1	150
BC847CTT1	148
BC847CWT1	148
BC848ALT1	147
BC848AWT1	148
BC848BDW1T1	150
BC848BLT1	147
BC848BPDW1T1	150
BC848BWT1	148
BC848CDW1T1	150
BC848CLT1	147
BC848CPDW1T1	150
BC848CWT1	148
BC849BLT1	147
BC850BLT1	147
BC850CLT1	147
BC856ALT1	147
BC856AWT1	148
BC856BDW1T1	150
BC856BLT1	147
BC856BWT1	148
BC857ALT1	147
BC857BDW1T1	150
BC857BLT1	147
BC857BTT1	148
BC857BWT1	148
BC857CDW1T1	150
BC857CLT1	147
BC857CTT1	148
BC857CWT1	148
BC858ALT1	147
BC858AWT1	148
BC858BDW1T1	150
BC858BLT1	147
BC858BWT1	148
BC858CDW1T1	150
BC858CLT1	147

Alphabetical Parts Listing

Device Number	Page
BC859BLT1	147
BC859CLT1	147
BCP53–10T1	149, 152
BCP53–16T1	149, 152
BCP53T1	149, 152
BCP56–10T1	149, 152
BCP56–16T1	149, 152
BCP56T1	149, 152
BCP68T1	149, 152
BCP69T1	149, 152
BCX56–10R1	149, 153
BD135	203
BD136	203
BD137	203
BD138	203
BD139	203
BD140	203
BD159	203
BD179	203
BD180	203
BD237	203
BD238	203
BD241C	198
BD242C	198
BD243B	199
BD243C	199
BD244B	199
BD244C	199
BD437	203
BD438	203
BD439	203
BD440	203
BD441	204
BD442	204
BD677	203
BD677A	203
BD678	203
BD678A	203
BD679	204
BD679A	204
BD680	204
BD680A	204
BD681	204
BD682	204
BD787	203
BD788	203
BD809	200

Device Number	Page
BD810	200
BDV64B	201
BDV65B	201
BDW42	200
BDW47	200
BDX33B	200
BDX33C	200
BDX34B	200
BDX34C	200
BDX53B	199
BDX53C	199
BDX54B	199
BDX54C	199
BF245A	161
BF245B	161
BF256A	161
BF393	154
BF422	154
BF423	154
BF493S	154
BF720T1	154
BF721T1	154
BF959	155
BFR30LT1	161
BFR31LT1	161
BS107	247, 257
BS107A	247, 257
BS108	247, 257
BS170	247, 257
BSP16T1	154
BSP19AT1	154
BSP52T1	151
BSR58LT1	162
BSS123L	242, 257
BSS138L	242, 257
BSS63LT1	147
BSS64LT1	147
BSS84L	242, 257
BU323Z	201
BU406	199
BU407	199
BUB323Z	208
BUD44D2–1	211
BUH100	210
BUH150	210
BUH50	210
BUH51	203, 211

Device Number	Page
BUL146	199, 210
BUL146F	202, 211
BUL147	200, 210
BUL44	198, 210
BUL45	198, 210
BUL45D2	198, 210
BUV21	207
BUV22	207
BUX85	198
BZX84C10LT1	170
BZX84C11LT1	170
BZX84C12LT1	170
BZX84C13LT1	170
BZX84C15LT1	170
BZX84C16LT1	170
BZX84C18LT1	170
BZX84C20LT1	170
BZX84C22LT1	170
BZX84C24LT1	170
BZX84C27LT1	170
BZX84C2V4LT1	170
BZX84C2V7LT1	170
BZX84C30LT1	170
BZX84C33LT1	170
BZX84C36LT1	171
BZX84C39LT1	171
BZX84C3V0LT1	170
BZX84C3V3LT1	170
BZX84C3V6LT1	170
BZX84C3V9LT1	170
BZX84C43LT1	171
BZX84C47LT1	171
BZX84C4V3LT1	170
BZX84C4V7LT1	170
BZX84C51LT1	171
BZX84C56LT1	171
BZX84C5V1LT1	170
BZX84C5V6LT1	170
BZX84C62LT1	171
BZX84C68LT1	171
BZX84C6V2LT1	170
BZX84C6V8LT1	170
BZX84C75LT1	171
BZX84C7V5LT1	170
BZX84C8V2LT1	170
BZX84C9V1LT1	170
C106B	227

Alphabetical Parts Listing

Device Number	Page
C106D	227
C106D1	227
C106M	227
C106M1	227
CS1009	40, 41
CS1087	63, 69, 74, 76
CS1088	63, 69, 74, 76
CS1089	63, 69, 74, 76
CS1107	65, 66, 74, 75
CS1108	65, 66, 74, 75
CS1112	65, 66, 74, 75
CS1124	74, 76
CS2001	21
CS2082	65, 66, 74, 75
CS2841B	23, 31
CS299	74
CS3341	74
CS3351	74
CS3361	74
CS3524A	23, 31
CS3701	65, 66, 73, 74, 75
CS387	74
CS403	46, 50, 55, 77
CS4121	68, 73, 74, 76
CS4122	68, 73, 74, 76
CS4124	63, 64, 73
CS4161	68, 73, 74, 76
CS4192	73, 74
CS5101	31
CS51021A	32, 78
CS51022A	32, 78
CS51023A	32, 78
CS51024A	32, 78
CS51031	23, 26
CS51033	23, 26
CS5106	23, 31, 33, 78
CS5111	21
CS5112	21
CS51220	31, 78
CS51221	23, 31, 32, 78
CS51227	23, 31, 32, 78
CS5124	23, 31, 33, 78
CS5126	23, 31, 33, 78
CS51311	30, 78
CS51312	30, 78
CS51313	30, 78
CS51411	21, 26

Device Number	Page
CS51412	21, 26
CS51413	21, 26
CS51414	21, 26
CS5150H	30, 78
CS5151H	30, 78
CS5155H	30, 78
CS5156H	30, 78
CS5157H	30, 78
CS5158	30, 78
CS5159	30, 78
CS5160	30, 78
CS5161	30, 78
CS5161H	30, 78
CS5165H	30, 78
CS5166H	30, 78
CS5171	21, 27
CS5172	21, 27
CS5173	21, 27
CS5174	21, 27
CS5201–1	46, 50
CS5201–3	46, 50
CS52015–1	46, 50
CS52015–3	46, 50
CS5203–1	46, 51
CS5203–3	46, 51
CS5203A	46, 51
CS5204–1	46
CS5204–2	46, 51
CS5204–3	46
CS5204–5	46
CS5204–X	51
CS5205–1	46
CS5205–2	46, 51
CS5205–3	46
CS5205–5	46
CS5205–X	51
CS5205A–1	46, 51
CS5206	46, 51
CS5207–1	46, 51
CS5207–2	46, 51
CS5207–3	46, 52
CS5207A–1	46, 52
CS5208–1	46, 52
CS5211	23, 26
CS5231–3	45, 49, 53, 54, 78
CS5233–3	45, 46, 49, 50, 53, 54, 78

Device Number	Page
CS5253–1	46, 51
CS5253B–8	46, 51
CS5257A–1	46, 52
CS5258–1	46, 52
CS5301	30, 78
CS5302	30, 78
CS5303	30, 78
CS5305	30, 78
CS5307	30, 78
CS5308	30, 78
CS5322	30, 78
CS5323	30, 78
CS5332	30, 78
CS5361	20, 79
CS5421	23
CS5422	23
CS7054	63, 64, 73
CS76113	65, 66, 74, 75
CS76114	65, 66, 74, 75
CS8101	45, 48, 55, 56, 77
CS8120	45, 49, 55, 57, 77
CS8122	46, 50, 55, 57, 77
CS8126	46, 50, 55, 57, 77
CS8129	46, 50, 55, 57, 77
CS8140	45, 49, 55, 57, 77
CS8141	45, 49, 55, 57, 77
CS8147	55, 58, 77
CS8151	45, 48, 55, 56, 77
CS8151C	48
CS8156	55, 59, 77
CS8161	55, 58, 77
CS8182	45, 55, 77
CS8183	55, 77
CS8190	68, 73, 74, 76
CS8191	68, 73, 74, 76
CS8221	45, 47, 55, 56, 77
CS8240	65, 66, 74, 75
CS8271	48, 55, 56, 77
CS8281	55, 58, 77
CS8311	45, 47, 55, 56, 77
CS8312	63, 64, 74
CS8321	45, 49, 55, 57, 77
CS8361	55, 58, 77
CS8363	55, 58, 77
CS8371	55, 59, 77
CS8391	55, 58, 77

Alphabetical Parts Listing

Device Number	Page
CS8441	68, 73, 74, 76
CS8481	55, 58, 77
CS9201	45, 47, 55, 56, 77
CS9202	45, 47, 55, 56, 77
D44C12	198
D44H11	200
D44H8	200
D44VH10	200
D45C12	198
D45H11	200
D45H8	200
D45VH10	200
DA121TT1	166
DAN222	166
DAP202U	166
DAP222	166
DF6A6.8FU	195
DF6A6.8FUT1	139
DTA114EET1	158
DTA114TET1	158
DTA114YET1	158
DTA115EET1	158
DTA123EET1	158
DTA123JET1	158
DTA124EET1	158
DTA124XET1	158
DTA143EET1	158
DTA143TET1	158
DTA143ZET1	158
DTA144EET1	158
DTA144TT1	157
DTA144WET1	158
DTC114EET1	158
DTC114TET1	158
DTC114YET1	158
DTC115EET1	158
DTC123EET1	158
DTC123JET1	158
DTC124EET1	158
DTC124XET1	158
DTC143EET1	158
DTC143TET1	158
DTC143ZET1	158
DTC144EET1	158
DTC144TT1	157
DTC144WET1	158
ICTE–10	178

Device Number	Page
ICTE–10C	178
ICTE–12	178
ICTE–12C	178
ICTE–15	178
ICTE–15C	178
ICTE–18	178
ICTE–18C	178
ICTE–22	178
ICTE–22C	178
ICTE–36	178
ICTE–36C	178
ICTE–45	178
ICTE–45C	178
ICTE–5	178
ICTE–8	178
ICTE–8C	178
J110	162
J111	162
J112	162
J113	162
J309	161
J310	161
JFETs	161
L4949	45, 48, 55, 56, 77
LM201A	10, 11
LM211	17, 18
LM224	10, 16
LM239	17, 18
LM2574	21, 24
LM2575	21, 24
LM2576	21, 24, 25
LM258	10, 14
LM285	40, 41
LM2901	17, 18
LM2902	10, 16
LM2902V	16
LM2903	17, 18
LM2904	10, 14
LM293	17, 18
LM2931	45, 48, 55, 57, 77
LM301A	10, 11
LM311	17, 18
LM317	42, 44
LM317L	42, 43
LM317M	42, 43
LM323	42, 44
LM324	10, 16

Device Number	Page
LM337	42, 44
LM339	17, 18
LM340 Series	42, 44
LM350	42, 44
LM358	10, 14
LM385	40, 41
LM393	17, 18
LM833	10, 14
LP2950	45, 48
LP2951	45, 48
LV2205	163
LV2209	163
LVX	120, 121
M1MA141KT1	166
M1MA141WAT1	166
M1MA141WKT1	166
M1MA142KT1	166
M1MA142WAT1	166
M1MA142WKT1	166
M1MA151AT1	166
M1MA151KT1	166
M1MA151WAT1	166
M1MA151WKT1	166
M1MA152AT1	166
M1MA152KT1	166
M1MA152WAT1	166
M1MA152WKT1	166
M1MA174T1	166
MAC08BT1	230
MAC08MT1	230
MAC12D	233
MAC12HCD	233
MAC12HCM	233
MAC12HCN	233
MAC12M	233
MAC12N	233
MAC12SM	233
MAC12SN	233
MAC15–10	234
MAC15–8	234
MAC15A10	234
MAC15A6	234
MAC15A8	234
MAC15M	233
MAC15N	233
MAC15SD	233
MAC15SM	233

Alphabetical Parts Listing

Device Number	Page
MAC15SN	233
MAC16CD	234
MAC16CM	234
MAC16CN	234
MAC16HCD	234
MAC16HCM	234
MAC16HCN	234
MAC16M	234
MAC16N	234
MAC210A10	233
MAC210A8	233
MAC212A10	233
MAC212A8	233
MAC228A10	232
MAC228A4	232
MAC228A6	232
MAC228A8	232
MAC4DCM–1	231
MAC4DCMT4	231
MAC4DCN–1	231
MAC4DCNT4	231
MAC4DHM–1	230
MAC4DHMT4	230
MAC4DLM–1	230
MAC4DLMT4	230
MAC4DSMT–1	231
MAC4DSMT4	231
MAC4DSN–1	231
MAC4DSNT4	231
MAC8D	232
MAC8M	232
MAC8N	232
MAC8SD	232
MAC8SM	232
MAC8SN	232
MAC97–8	230
MAC97A4	230
MAC97A6	230
MAC97A8	230
MAC997A6	230
MAC997A8	230
MAC997B6	230
MAC997B8	230
MAC9D	232
MAC9M	232
MAC9N	232
MAX1720	28, 29

Device Number	Page
MAX707	60
MAX708	60
MAX809	60, 61
MAX810	60, 61
MAX828	28, 29
MAX829	28, 29
MBD101	164
MBD110DWT1	164
MBD301	164
MBD330DWT1	164
MBD54DWT1	164
MBD701	164
MBD770DWT1	164
MBR0520LT1	214, 215
MBR0520LT3	214, 215
MBR0530T1	215
MBR0530T3	215
MBR0540T1	215
MBR0540T3	215
MBR10100	218
MBR1035	218
MBR1045	218
MBR1060	218
MBR1090	218
MBR1100	216
MBR130T1	215
MBR150	216
MBR1535CT	217
MBR1545CT	217
MBR1545CTP	217
MBR160	216
MBR16100CT	217
MBR1635	218
MBR1645	218
MBR20100CT	217
MBR20100CTP	217
MBR20200CT	217
MBR20200CTP	217
MBR2030CTL	214
MBR2030CTL	217
MBR2045CT	217
MBR2045CTP	217
MBR2060CT	217
MBR2080CT	217
MBR2090CT	217
MBR2515L	214, 218
MBR2535CTL	214, 217

Device Number	Page
MBR2545CT	217
MBR2545CTP	217
MBR3045PT	218
MBR3045ST	217
MBR3045WT	218
MBR3060	216
MBR3100	217
MBR340	217
MBR350RL	217
MBR360RL	217
MBR4015CTL	217
MBR4015LWT	214, 218
MBR4045PT	218
MBR4045WT	218
MBR6045PT	218
MBR6045WT	218
MBR735	218
MBR745	218
MBR835	217
MBR840	217
MBR845	217
MBRA120ET3	215
MBRA120LT3	215
MBRA130LT3	215
MBRA140T3	215
MBRA160T3	215
MBRA210ET3	215
MBRA210LT3	214, 215
MBRB1045	216
MBRB1545CT	216
MBRB20100CT	216
MBRB20200CT	216
MBRB2060CT	216
MBRB2515L	214, 216
MBRB2535CTL	214, 216
MBRB2545CT	216
MBRB3030CT	216
MBRB3030CTL	214
MBRB3030CTL	216
MBRB4030	216
MBRD1035CTL	214
MBRD1035CTL	216
MBRD320T4	216
MBRD330T4	216
MBRD340T4	216
MBRD350T4	216
MBRD360T4	216

Alphabetical Parts Listing

Device Number	Page
MBRD620CTT4	216
MBRD630CTT4	216
MBRD640CTT4	216
MBRD650CTT4	216
MBRD660CTT4	216
MBRD835L	214
MBRD835L	216
MBRF20100CT	218
MBRF20200CT	218
MBRF2060CT	218
MBRF2545CT	218
MBRM110ET1	215
MBRM110ET3	215
MBRM110LT1	214, 215
MBRM110LT3	214, 215
MBRM120ET1	215
MBRM120ET3	215
MBRM120LT1	215
MBRM120LT3	215
MBRM130LT1	215
MBRM130LT3	215
MBRM140T1	215
MBRM140T3	215
MBRP20030CTL	214, 219
MBRP20035L	214
MBRP20045CT	219
MBRP20060CT	219
MBRP30035L	214
MBRP30045CT	219
MBRP30060CT	219
MBRP400100CTL	214
MBRP400100CTL	219
MBRP40030CTL	219
MBRP40045CTL	214, 219
MBRP60035CTL	214, 219
MBRS1100T3	215
MBRS120T3	215
MBRS130LT3	214
MBRS130LT3	215
MBRS130T3	215
MBRS140LT3	215
MBRS140T3	215
MBRS1540T3	215
MBRS190T3	215
MBRS2040LT3	215
MBRS240LT3	215
MBRS260T3	215

Device Number	Page
MBRS3100T3	215
MBRS320T3	215
MBRS330T3	215
MBRS340T3	215
MBRS360T3	215
MBRS410ET3	215
MBRS410LT3	214, 215
MBT2222ADW1T1	150, 156
MBT35200MT1	160
MBT3904DW1T1	150, 156
MBT3906DW1T1	150, 156
MBT3946DW1T1	150, 156
MC10/100E016	88, 99
MC10/100E101	89, 99
MC10/100E104	89, 99
MC10/100E107	89, 99
MC10/100E111	86, 99
MC10/100E112	92, 94, 99
MC10/100E116	88, 99
MC10/100E122	92, 99
MC10/100E131	90, 99
MC10/100E136	88, 99
MC10/100E137	88, 99
MC10/100E141	92, 93, 99
MC10/100E142	92, 93, 99
MC10/100E143	92, 93, 99
MC10/100E150	90, 99
MC10/100E151	93, 99
MC10/100E154	90, 91, 99
MC10/100E155	90, 91, 99
MC10/100E156	90, 91, 99
MC10/100E157	91, 99
MC10/100E158	91, 99
MC10/100E160	94, 99
MC10/100E163	91, 99
MC10/100E164	91, 99
MC10/100E166	92, 94, 99
MC10/100E167	91, 93, 99
MC10/100E171	91, 99
MC10/100E175	90, 99
MC10/100E195	87, 99
MC10/100E196	87, 99
MC10/100E211	86, 99
MC10/100E404	89, 99
MC10/100E416	88, 99
MC10/100E431	90, 99
MC10/100E445	92, 99

Device Number	Page
MC10/100E446	92, 99
MC10/100E451	93, 99
MC10/100E452	93, 99
MC10/100E457	91, 99
MC10/100EL01	89, 98
MC10/100EL04	89, 98
MC10/100EL05	89, 98
MC10/100EL07	89, 98
MC10/100EL11	86, 98
MC10/100EL12	89, 98
MC10/100EL15	86, 98
MC10/100EL16	88, 98
MC10/100EL31	90, 98
MC10/100EL32	87, 92, 98
MC10/100EL33	87, 92, 98
MC10/100EL34	87, 92, 98
MC10/100EL35	90, 98
MC10/100EL51	90, 98
MC10/100EL52	90, 98
MC10/100EL57	91, 98
MC10/100EL58	91, 98
MC10/100ELT20	94, 98
MC10/100ELT21	94, 98
MC10/100ELT22	94, 98
MC10/100ELT24	94, 98
MC10/100ELT25	93, 98
MC10/100ELT28	94, 98
MC10/100EP01	89, 96
MC10/100EP016	88, 96
MC10/100EP05	89, 96
MC10/100EP08	89, 96
MC10/100EP101	89, 96
MC10/100EP105	89, 96
MC10/100EP11	86, 96
MC10/100EP116	88, 96
MC10/100EP131	90, 96
MC10/100EP139	87, 92, 97
MC10/100EP142	97
MC10/100EP16	88, 95, 96
MC10/100EP16T	88, 95, 96
MC10/100EP16VA	88, 96
MC10/100EP17	88, 96
MC10/100EP195	87, 97
MC10/100EP29	90, 96
MC10/100EP31	90, 96
MC10/100EP32	87, 92, 96
MC10/100EP33	87, 92, 96

Alphabetical Parts Listing

Device Number	Page
MC10/100EP35	90, 96
MC10/100EP445	92, 97
MC10/100EP446	92, 97
MC10/100EP451	97
MC10/100EP51	90, 96
MC10/100EP52	90, 96
MC10/100EP56	91, 96
MC10/100EP57	91, 96
MC10/100EP58	91, 96
MC10/100EP90	96
MC10/100EPT20	97
MC10/100H600	94, 101
MC10/100H601	93, 101
MC10/100H602	91, 94, 101
MC10/100H603	91, 93, 101
MC10/100H604	94, 101
MC10/100H605	93, 101
MC10/100H606	94, 101
MC10/100H607	94, 101
MC10/100H640	86, 94, 101
MC10/100H641	86, 94, 101
MC10/100H642	86, 94, 102
MC10/100H643	86, 93, 102
MC10/100H644	86, 94, 102
MC10/100H646	86, 102
MC10/100H680	93, 102
MC10/100H681	102
MC10/100LVEP11	86, 96
MC10/100LVEP16	88, 96
MC100E210	86, 99
MC100E241	93, 99
MC100E310	86, 99
MC100EL13	86, 98
MC100EL14	86, 98
MC100EL1648	87, 98
MC100EL17	88, 98
MC100EL29	90, 98
MC100EL30	90, 98
MC100EL38	87, 92, 98
MC100EL39	87, 92, 98
MC100EL56	91, 98
MC100EL59	91, 98
MC100EL90	93, 98
MC100EL91	93, 98
MC100ELT23	94, 98
MC100EP14	86, 96
MC100EP140	87, 97

Device Number	Page
MC100EP142	93
MC100EP16F	88, 95, 96
MC100EP16VB	87, 88, 96
MC100EP16VC	87, 88, 96
MC100EP16VS	88, 95, 96
MC100EP16VT	88, 95, 96
MC100EP196	97
MC100EP210S	86, 93, 97
MC100EP40	87, 96
MC100EP451	93
MC100EP90	93
MC100EPT20	94
MC100EPT21	93, 97
MC100EPT22	94, 97
MC100EPT23	93, 97
MC100EPT24	94, 97
MC100EPT25	93, 97
MC100EPT26	93, 97
MC100H646	94
MC100LVE111	86, 98
MC100LVE164	91, 98
MC100LVE210	86, 98
MC100LVE222	86, 87, 98
MC100LVE310	86, 98
MC100LVEL01	89, 97
MC100LVEL05	89, 97
MC100LVEL11	86, 97
MC100LVEL12	89, 97
MC100LVEL13	86, 97
MC100LVEL14	86, 97
MC100LVEL16	88, 97
MC100LVEL17	88, 97
MC100LVEL29	90, 97
MC100LVEL30	90, 97
MC100LVEL31	90, 97
MC100LVEL32	87, 92, 97
MC100LVEL33	87, 92, 97
MC100LVEL37	87, 92, 97
MC100LVEL38	87, 92, 97
MC100LVEL39	87, 92, 97
MC100LVEL40	87, 97
MC100LVEL51	90, 97
MC100LVEL56	91, 97
MC100LVEL58	91, 97
MC100LVEL59	91, 97
MC100LVEL90	93, 97
MC100LVEL91	93, 97

Device Number	Page
MC100LVEL92	94, 97
MC100LVELT22	94, 97
MC100LVELT23	93, 97
MC100LVEP111	86, 96
MC100LVEP14	86, 96
MC100LVEP210	86, 96
MC100SX1230	95, 104
MC10101	102
MC10102	102
MC10103	102
MC10104	102
MC10105	102
MC10106	102
MC10107	102
MC10109	102
MC10110	102
MC10111	102
MC10113	102
MC10114	102
MC10115	102
MC10116	102
MC10117	102
MC10121	102
MC10123	102
MC10124	102
MC10125	102
MC10131	102
MC10135	102
MC10136	103
MC10138	103
MC10141	103
MC10153	103
MC10158	103
MC10159	103
MC10161	103
MC10162	103
MC10164	103
MC10166	103
MC10171	103
MC10173	103
MC10174	103
MC10175	103
MC10176	103
MC10178	103
MC10186	103
MC10188	103
MC10189	103

Alphabetical Parts Listing

Device Number	Page
MC10192	103
MC10195	103
MC10197	103
MC10198	103
MC10216	103
MC10231	103
MC10E1651	90, 92, 99
MC10E1652	90, 92, 99
MC10E197	95, 99
MC10E212	95, 99
MC10E411	86, 95, 99
MC10EL89	94, 98
MC10EP89	94, 96
MC10H016	88, 100
MC10H100	89, 100
MC10H101	89, 100
MC10H102	89, 100
MC10H103	89, 100
MC10H104	89, 100
MC10H105	89, 100
MC10H106	89, 100
MC10H107	89, 100
MC10H109	89, 100
MC10H113	89, 100
MC10H115	88, 100
MC10H116	88, 100
MC10H117	90, 100
MC10H121	90, 100
MC10H123	95, 100
MC10H124	94, 100
MC10H125	93, 100
MC10H130	90, 100
MC10H131	90, 100
MC10H135	90, 100
MC10H136	88, 100
MC10H141	92, 93, 100
MC10H158	91, 100
MC10H159	91, 100
MC10H160	95, 100
MC10H161	95, 100
MC10H162	95, 100
MC10H164	91, 100
MC10H165	95, 101
MC10H166	92, 95, 101
MC10H171	95, 101
MC10H172	95, 101
MC10H173	90, 91, 101

Device Number	Page
MC10H174	91, 101
MC10H175	90, 101
MC10H176	93, 101
MC10H179	95, 101
MC10H180	95, 101
MC10H181	95, 101
MC10H186	93, 101
MC10H188	92, 101
MC10H189	92, 101
MC10H209	89, 101
MC10H210	89, 101
MC10H211	89, 101
MC10H330	88, 91, 101
MC10H332	88, 91, 101
MC10H334	88, 91, 101
MC10H350	94, 101
MC10H351	94, 101
MC10H352	93, 101
MC10H424	94, 101
MC10H645	86, 102
MC10H681	91
MC10SX1130	95, 104
MC10SX1189	94, 95, 104
MC10SX1190	94, 95, 104
MC12026A	87, 104
MC12080	87, 104
MC12093	87, 104
MC12095	87, 104
MC14001B	129
MC14001UB	129
MC14007UB	129
MC14008B	129
MC14011B	129
MC14011UB	129
MC14012B	129
MC14013B	129
MC14014B	129
MC14015B	129
MC14016	19
MC14016B	129
MC14017B	129
MC14018B	129
MC14020B	129
MC14021B	129
MC14022B	129
MC14023B	129
MC14024B	129

Device Number	Page
MC14025B	129
MC14027B	129
MC14028B	129
MC14029B	129
MC1403	40, 41
MC14040B	129
MC14042B	129
MC14043B	129
MC14044B	129
MC14046B	129
MC14049B	129
MC14049UB	129
MC14050B	129
MC14051	19
MC14051B	129
MC14052	19
MC14052B	129
MC14053	19
MC14053B	130
MC14054B	130
MC14066	19
MC14066B	130
MC14067	19
MC14067B	130
MC14069UB	130
MC14070B	130
MC14071B	130
MC14073B	130
MC14076B	130
MC14077B	130
MC14081B	130
MC14082B	130
MC14093B	130
MC14094B	130
MC14099B	130
MC14106B	130
MC1413	63, 69, 70, 73
MC14174B	130
MC14175B	130
MC14490	130
MC14503B	130
MC14504B	130
MC14511B	130
MC14512	19
MC14512B	130
MC14513B	130
MC14514B	130

Alphabetical Parts Listing

Device Number	Page
MC14515B	130
MC14516B	130
MC14517B	130
MC14518B	130
MC14520B	130
MC14521B	130
MC14526B	130
MC14528B	130
MC14532B	131
MC14536B	131
MC14538B	131
MC14541B	131
MC14543B	131
MC14549B	131
MC1455	71
MC14551	19
MC14551B	131
MC14553B	131
MC14555B	131
MC14556B	131
MC14557B	131
MC14559B	131
MC14562B	131
MC14569B	131
MC14572UB	131
MC14584B	131
MC14585B	131
MC14598B	131
MC1488	69, 70
MC1489	69, 70
MC1496	71
MC26LS30	69, 70
MC3302	17, 18
MC33023	23, 31
MC33025	23, 31
MC3303	10, 16
MC33030	73
MC33033	68, 73
MC33035	68, 73
MC33039	73
MC33060A	23, 31
MC33063A	21
MC33064	60, 61
MC33067	23, 31
MC33071	10, 11
MC33072	10, 13
MC33074	10, 15

Device Number	Page
MC33077	10, 14
MC33078	10, 13
MC33079	10, 15
MC33151	63, 64
MC33152	63, 64
MC33153	63, 64
MC33160	47, 55, 56, 77
MC33161	60, 61
MC33163	21
MC33164	60, 61
MC33166	21, 24, 25
MC33167	21, 25
MC33170	67, 79
MC33171	10, 11
MC33172	10, 13
MC33172V	13
MC33174	10, 15
MC33174V	15
MC33178	10, 13
MC33179	10, 16
MC33201	10, 11
MC33202	10, 13
MC33204	10, 15
MC33260	38, 39
MC33262	38, 39
MC33263	45, 48
MC33269	46, 50
MC33272A	10, 13
MC33274A	10, 16
MC33275	45, 49
MC33340	20, 79
MC33341	20, 79
MC33342	20, 79
MC33349	20, 79
MC33351A	20, 79
MC33362	36, 37
MC33363	36
MC33363A	36, 37
MC33363B	36, 37
MC33364	34, 35
MC33365	36, 37
MC33368	38, 39
MC33375	45, 49
MC33441	63, 69, 79
MC33463	21, 23, 27
MC33466	21, 23, 27
MC33470	30, 78

Device Number	Page
MC33501	10, 11
MC33502	10, 13
MC33503	10, 12
MC33560	67, 80
MC33565	45, 49, 53, 54, 78
MC33566	53, 54, 78
MC33567	53, 54, 78
MC33680	67, 79
MC33761	45, 47
MC33762	47, 53, 54, 67, 79
MC33765	53, 54, 67, 79
MC34023	23, 31
MC34025	23, 31
MC3403	10, 16
MC34060A	23, 31
MC34063A	21
MC34064	61
MC34067	23, 31
MC34071	11
MC34072	13
MC34074	15
MC34151	63, 64
MC34152	63, 64
MC34160	55, 77
MC34161	61
MC34163	21
MC34164	61
MC34166	21, 25
MC34167	21, 25
MC3423	60, 61
MC34262	39
MC34268	46, 50, 53, 54, 69, 78
MC34271	63, 69, 79
MC34280	67, 79
MC3479	73
MC3488A	69
MC44603A	23, 31
MC44604	23, 31
MC44605	23, 31
MC44608	34, 35
MC74AC00	123
MC74AC02	123
MC74AC04	123
MC74AC05	123
MC74AC08	123
MC74AC10	123

Alphabetical Parts Listing

Device Number	Page
MC74AC11	123
MC74AC125	124
MC74AC132	124
MC74AC138	124
MC74AC139	124
MC74AC14	123
MC74AC157	124
MC74AC161	124
MC74AC163	124
MC74AC20	123
MC74AC240	124
MC74AC244	124
MC74AC245	125
MC74AC253	125
MC74AC257	125
MC74AC259	125
MC74AC273	125
MC74AC299	125
MC74AC32	124
MC74AC373	125
MC74AC374	125
MC74AC377	125
MC74AC4040	126
MC74AC540	125
MC74AC541	125
MC74AC573	125
MC74AC574	125
MC74AC646	126
MC74AC652	126
MC74AC74	124
MC74AC86	124
MC74ACT00	123
MC74ACT02	123
MC74ACT04	123
MC74ACT05	123
MC74ACT08	123
MC74ACT10	123
MC74ACT11	123
MC74ACT125	124
MC74ACT132	124
MC74ACT138	124
MC74ACT139	124
MC74ACT14	123
MC74ACT157	124
MC74ACT161	124
MC74ACT163	124
MC74ACT20	124

Device Number	Page
MC74ACT240	124
MC74ACT241	124
MC74ACT244	124
MC74ACT245	125
MC74ACT253	125
MC74ACT257	125
MC74ACT259	125
MC74ACT273	125
MC74ACT299	125
MC74ACT32	124
MC74ACT373	125
MC74ACT374	125
MC74ACT377	125
MC74ACT540	125
MC74ACT541	125
MC74ACT564	125
MC74ACT573	125
MC74ACT574	126
MC74ACT640	126
MC74ACT646	126
MC74ACT652	126
MC74ACT74	124
MC74ACT86	124
MC74HC00A	126
MC74HC02A	126
MC74HC03A	126
MC74HC04A	126
MC74HC08A	126
MC74HC125A	126
MC74HC126A	126
MC74HC132A	126
MC74HC138A	127
MC74HC139A	127
MC74HC14A	126
MC74HC157A	127
MC74HC161A	127
MC74HC163A	127
MC74HC164A	127
MC74HC165A	127
MC74HC174A	127
MC74HC175	127
MC74HC175A	127
MC74HC1G00	116
MC74HC1G02	116
MC74HC1G04	116
MC74HC1G08	116
MC74HC1G14	116

Device Number	Page
MC74HC1G32	116
MC74HC1GU04	116
MC74HC240A	127
MC74HC244A	127
MC74HC245A	127
MC74HC273A	127
MC74HC32A	126
MC74HC373A	127
MC74HC374A	127
MC74HC390A	127
MC74HC393	127
MC74HC393A	127
MC74HC4020A	128
MC74HC4040A	128
MC74HC4046A	128
MC74HC4051	128
MC74HC/VHC4051	19
MC74HC4051A	128
MC74HC4052	128
MC74HC/VHC4052	19
MC74HC4052A	128
MC74HC4053	128
MC74HC/VHC4053	19
MC74HC4053A	128
MC74HC4060A	128
MC74HC4066	128
MC74HC/VHC4066	19
MC74HC4066A	128
MC74HC4316	19, 128
MC74HC4316A	128
MC74HC4538A	128
MC74HC4851	19
MC74HC4851A	128
MC74HC4852	19
MC74HC4852A	128
MC74HC540A	127
MC74HC541A	128
MC74HC573A	128
MC74HC574A	128
MC74HC589A	128
MC74HC595A	128
MC74HC74A	126
MC74HC86A	126
MC74HCT04A	126
MC74HCT138A	127
MC74HCT14A	126
MC74HCT244A	127

Alphabetical Parts Listing

Device Number	Page
MC74HCT245A	127
MC74HCT273A	127
MC74HCT373A	127
MC74HCT374A	127
MC74HCT541A	128
MC74HCT573A	128
MC74HCT574A	128
MC74HCT74A	126
MC74HCU04A	126
MC74LCX00	119
MC74LCX02	119
MC74LCX04	119
MC74LCX06	119
MC74LCX07	119
MC74LCX08	119
MC74LCX125	119
MC74LCX138	119
MC74LCX139	119
MC74LCX14	119
MC74LCX157	119
MC74LCX158	119
MC74LCX16240	120
MC74LCX16244	120
MC74LCX16245	120
MC74LCX16373	120
MC74LCX16374	120
MC74LCX240	119
MC74LCX244	119
MC74LCX245	120
MC74LCX257	120
MC74LCX258	120
MC74LCX32	119
MC74LCX373	120
MC74LCX374	120
MC74LCX540	120
MC74LCX541	120
MC74LCX573	120
MC74LCX574	120
MC74LCX74	119
MC74LCX86	119
MC74LCXU04	119
MC74LVX00	120
MC74LVX02	120
MC74LVX04	120
MC74LVX08	120
MC74LVX125	120
MC74LVX126	120

Device Number	Page
MC74LVX132	120
MC74LVX138	120
MC74LVX139	120
MC74LVX14	120
MC74LVX157	120
MC74LVX240	120
MC74LVX244	121
MC74LVX245	121
MC74LVX257	121
MC74LVX259	121
MC74LVX32	120
MC74LVX373	121
MC74LVX374	121
MC74LVX4051	121
MC74LVX4052	121
MC74LVX4053	121
MC74LVX4066	121
MC74LVX4245	121
MC74LVX50	120
MC74LVX540	121
MC74LVX541	121
MC74LVX573	121
MC74LVX574	121
MC74LVX74	120
MC74LVX8051	121
MC74LVX8053	121
MC74LVX86	120
MC74LVXC3245	121
MC74LVXT4051	121
MC74LVXT4052	121
MC74LVXT4053	121
MC74LVXT4066	121
MC74LVXT8051	121
MC74LVXT8053	121
MC74VHC00	121
MC74VHC02	121
MC74VHC04	121
MC74VHC08	121
MC74VHC125	122
MC74VHC126	122
MC74VHC132	122
MC74VHC138	122
MC74VHC139	122
MC74VHC14	121
MC74VHC157	122
MC74VHC1G00	115
MC74VHC1G01	115

Device Number	Page
MC74VHC1G02	115
MC74VHC1G03	115
MC74VHC1G04	115
MC74VHC1G06	115
MC74VHC1G07	115
MC74VHC1G08	115
MC74VHC1G09	115
MC74VHC1G125	115
MC74VHC1G126	115
MC74VHC1G132	115
MC74VHC1G135	115
MC74VHC1G14	115
MC74VHC1G32	115
MC74VHC1G50	115
MC74VHC1G66	19, 115
MC74VHC1G86	115
MC74VHC1GT00	115
MC74VHC1GT02	115
MC74VHC1GT04	115
MC74VHC1GT08	115
MC74VHC1GT125	115
MC74VHC1GT126	115
MC74VHC1GT14	115
MC74VHC1GT32	115
MC74VHC1GT50	115
MC74VHC1GT66	19, 115
MC74VHC1GT86	115
MC74VHC1GU04	115
MC74VHC240	122
MC74VHC244	122
MC74VHC245	122
MC74VHC257	122
MC74VHC259	122
MC74VHC32	122
MC74VHC373	122
MC74VHC374	122
MC74VHC4051	123
MC74VHC4052	123
MC74VHC4053	123
MC74VHC4066	123
MC74VHC4316	123
MC74VHC50	122
MC74VHC540	122
MC74VHC541	122
MC74VHC573	123
MC74VHC574	123
MC74VHC74	122

Alphabetical Parts Listing

Device Number	Page
MC74VHC86	122
MC74VHCT00A	121
MC74VHCT02A	121
MC74VHCT04A	121
MC74VHCT08A	121
MC74VHCT125A	122
MC74VHCT126A	122
MC74VHCT132A	122
MC74VHCT138A	122
MC74VHCT139A	122
MC74VHCT14A	122
MC74VHCT157A	122
MC74VHCT240A	122
MC74VHCT244A	122
MC74VHCT245A	122
MC74VHCT257A	122
MC74VHCT259A	122
MC74VHCT32A	122
MC74VHCT373A	122
MC74VHCT374A	122
MC74VHCT50A	122
MC74VHCT540A	122
MC74VHCT541A	123
MC74VHCT573A	123
MC74VHCT574A	123
MC74VHCT74A	122
MC74VHCT86A	122
MC74VHCU04	121
MC75172B	69, 70
MC75174B	69, 70
MC7800 Series	42, 43
MC78BC00 Series	45, 47
MC78FC00 Series	45, 48
MC78L00A Series	42, 43
MC78LC00 Series	45, 47
MC78M00 Series	42, 43
MC78PC00 Series	45, 48
MC78T00 Series	42, 44
MC7900 Series	42, 44
MC79L00 Series	42, 43
MC79M00 Series	42, 43
MCH/K12140	87, 104
MCR08BT1	227
MCR08MT1	227
MCR100–3	227
MCR100–4	227
MCR100–6	227

Device Number	Page
MCR100–8	227
MCR106–6	227
MCR106–8	227
MCR12D	228
MCR12DCMT4	228
MCR12DCNT4	228
MCR12DSMT4	228
MCR12DSNT4	228
MCR12LD	228
MCR12LM	228
MCR12LN	228
MCR12M	228
MCR12N	228
MCR16N	229
MCR218–2	228
MCR218–4	228
MCR218–6	228
MCR22–6	227
MCR22–8	227
MCR25D	229
MCR25M	229
MCR25N	229
MCR68–2	228
MCR69–2	229
MCR69–3	229
MCR703AT4	227
MCR704AT4	227
MCR706AT4	227
MCR708AT4	227
MCR716T4	227
MCR718T4	227
MCR72–3	228
MCR72–6	228
MCR72–8	228
MCR8DCMT4	228
MCR8DCNT4	228
MCR8DSMT4	228
MCR8DSNT4	228
MCR8M	228
MCR8N	228
MCR8SD	228
MCR8SM	228
MCR8SN	228
MDC3105	63, 73
MDC3205	63, 73
MDC5001	67, 79
MDC5100	67, 79

Device Number	Page
MDC5101	67, 79
MGB15N35CL	249
MGB15N40CL	249
MGB19N35CL	249
MGP15N35CL	249
MGP15N40CL	249
MGP19N35CL	249
MGSF1N02EL	242, 252
MGSF1N02L	242, 252
MGSF1N03L	242
MGSF1P02EL	242, 252
MGSF1P02ELT1	262
MGSF1P02ELT3	262
MGSF1P02L	242, 252
MGSF2N02EL	242
MGSF2P02HD	242, 252
MGSF3433VT1	262
MGSF3441VT1	262
MGSF3441XT1	262
MGSF3455VT1	262
MJ11012	207
MJ11015	207
MJ11016	207
MJ11021	206, 207
MJ11022	206, 207
MJ11032	207
MJ11033	207
MJ14002	207
MJ14003	207
MJ15001	206, 209
MJ15002	206, 209
MJ15003	206, 209
MJ15004	206, 209
MJ15011	206
MJ15012	206
MJ15015	206, 209
MJ15016	206, 209
MJ15020	206, 209
MJ15021	206, 209
MJ15022	206
MJ15023	206
MJ15024	206, 209
MJ15025	206, 209
MJ21193	206, 209
MJ21194	206, 209
MJ21195	206
MJ21196	206

Alphabetical Parts Listing

Device Number	Page
MJ2955	206
MJ2955A	209
MJ4502	207
MJ802	207
MJB18004D2T4	208, 211
MJB42CT4	208
MJB44H11T4	208
MJB45H11T4	208
MJD112T4	205
MJD117T4	205
MJD122T4	205
MJD127T4	205
MJD18002D2T4	205, 211
MJD200T4	205
MJD210T4	205
MJD243T4	205
MJD253T4	205
MJD2955T4	205
MJD3055T4	205
MJD31CT4	205
MJD31T4	205
MJD32CT4	205
MJD32T4	205
MJD340T4	205
MJD350T4	205
MJD41CT4	205
MJD42CT4	205
MJD44ET4	205
MJD44H11T4	205
MJD45H11T4	205
MJD47T4	205
MJD50T4	205
MJD6036T4	205
MJD6039T4	205
MJE13003	203, 211
MJE13005	198
MJE13007	199
MJE13009	200
MJE15028	199
MJE15029	199
MJE15030	199, 209
MJE15031	199, 209
MJE15032	199, 209
MJE15033	199, 209
MJE171	203
MJE172	203
MJE18002	198, 210

Device Number	Page
MJE18004	198, 210
MJE18004D2	198, 210
MJE18006	199, 210
MJE18008	200, 210
MJE181	203
MJE182	203
MJE200	204
MJE210	204
MJE243	204
MJE253	204
MJE270	203
MJE271	203
MJE2955T	200
MJE3055T	200
MJE340	203
MJE3439	203
MJE344	203
MJE350	203
MJE371	203
MJE4343	201
MJE4353	201
MJE521	203
MJE5730	198
MJE5731	198
MJE5731A	198
MJE5740	199
MJE5742	199
MJE5850	199
MJE5851	199
MJE5852	199
MJE700	203
MJE702	204
MJE703	204
MJE800	203
MJE802	204
MJE803	204
MJF122	202
MJF127	202
MJF15030	202
MJF15031	202
MJF18004	202, 211
MJF18008	202, 211
MJF2955	202
MJF3055	202
MJF31C	202
MJF32C	202
MJF44H11	202

Device Number	Page
MJF45H11	202
MJF47	202
MJF6388	202
MJF6668	202
MJH11017	201
MJH11018	201
MJH11019	201
MJH11020	201
MJH11021	201
MJH11022	201
MJH6284	201
MJH6287	201
MJL1302A	202, 209
MJL21193	202, 209
MJL21194	202, 209
MJL21195	202, 209
MJL21196	202, 209
MJL3281A	202, 209
MJW1302A	208, 209
MJW21191	208, 209
MJW21192	208, 209
MJW21193	208, 209
MJW21194	208, 209
MJW21195	208, 209
MJW21196	208, 209
MJW3281A	208, 209
MKP1V120RL	235
MKP1V130RL	235
MKP1V160	235
MKP1V160RL	235
MKP3V120	235
MKP3V120RL	235
MKP3V240	235
MKP3V240RL	235
MLD1N06CLT4	250
MLP1N06CL	250
MLP2N06CL	250
MM3Z10VT1	170
MM3Z11VT1	170
MM3Z12VT1	170
MM3Z13VT1	170
MM3Z15VT1	170
MM3Z16VT1	170
MM3Z18VT1	170
MM3Z20VT1	170
MM3Z22VT1	170
MM3Z24VT1	170

Alphabetical Parts Listing

Device Number	Page
MM3Z27VT1	170
MM3Z2V4T1	170
MM3Z2V7T1	170
MM3Z30VT1	170
MM3Z33VT1	170
MM3Z36VT1	171
MM3Z39VT1	171
MM3Z3V0T1	170
MM3Z3V3T1	170
MM3Z3V6T1	170
MM3Z3V9T1	170
MM3Z43VT1	171
MM3Z47VT1	171
MM3Z4V3T1	170
MM3Z4V7T1	170
MM3Z51VT1	171
MM3Z56VT1	171
MM3Z5V1T1	170
MM3Z62VT1	171
MM3Z68VT1	171
MM3Z6V2T1	170
MM3Z6V8T1	170
MM3Z75VT1	171
MM3Z7V5T1	170
MM3Z8V2T1	170
MM3Z9V1T1	170
MMBD101LT1	164
MMBD2835LT1	165
MMBD2836LT1	165
MMBD2837LT1	165
MMBD2838LT1	165
MMBD301LT1	164
MMBD330T1	164
MMBD352LT1	164
MMBD352WT1	164
MMBD353LT1	164
MMBD354LT1	164
MMBD355LT1	164
MMBD452LT1	164
MMBD6050LT1	165
MMBD6100LT1	165
MMBD7000LT1	165
MMBD701LT1	164
MMBD717LT1	164
MMBD770T1	164
MMBD914LT1	165
MMBF0201NL	242, 252

Device Number	Page
MMBF0202PL	242, 252
MMBF170L	242, 257
MMBF4391LT1	162
MMBF4392LT1	162
MMBF4393LT1	162
MMBF4416LT1	161
MMBF5457LT1	161
MMBF5460LT1	161
MMBF5484LT1	161
MMBFJ175LT1	162
MMBFJ177LT1	162
MMBFJ309LT1	161
MMBFJ310LT1	161
MMBFU310LT1	161
MMBT2222ALT1	147, 152, 155
MMBT2222ATT1	148, 153, 156
MMBT2222AWT1	148, 153, 155
MMBT2369ALT1	155
MMBT2369LT1	155
MMBT2484LT1	147, 150
MMBT2907ALT1	147, 152, 155
MMBT2907AWT1	148, 153, 155
MMBT3640LT1	155
MMBT3904LT1	147, 155
MMBT3904TT1	148, 156
MMBT3904WT1	148, 155
MMBT3906LT1	147, 155
MMBT3906TT1	148, 156
MMBT3906WT1	148, 155
MMBT4124LT1	147
MMBT4401LT1	147, 152, 155
MMBT4401WT1	155
MMBT4403LT1	147, 152, 155
MMBT4403WT1	155
MMBT489LT1	160
MMBT5087LT1	147, 150
MMBT5088LT1	147, 150
MMBT5089LT1	147, 150
MMBT5401LT1	154
MMBT5551LT1	154
MMBT589LT1	160
MMBT6428LT1	147, 150
MMBT6429LT1	147, 150
MMBT6517LT1	154
MMBT6520LT1	154
MMBT6589T1	160
MMBT918LT1	155

Device Number	Page
MMBTA06LT1	147, 152
MMBTA06WT1	148
MMBTA14LT1	151
MMBTA42LT1	154
MMBTA56LT1	147, 152
MMBTA56WT1	148
MMBTA64LT1	151
MMBTA92LT1	154
MMBTH10–4LT1	155
MMBTH10LT1	155
MMBV105GLT1	163
MMBV109LT1	163
MMBV2101LT1	163
MMBV2103LT1	163
MMBV2105LT1	163
MMBV2107LT1	163
MMBV2108LT1	163
MMBV2109LT1	163
MMBV3102LT1	163
MMBV3401LT1	165
MMBV3700LT1	165
MMBV409LT1	163
MMBV432LT1	163
MMBV609LT1	163
MMBV809LT1	163
MMBX5260BLT1	171
MMBX5261BLT1	171
MMBX5262BLT1	171
MMBX5263BLT1	171
MMBX5264BLT1	171
MMBX5265BLT1	171
MMBX5266BLT1	171
MMBX5267BLT1	171
MMBX5268BLT1	171
MMBX5269BLT1	171
MMBX5270BLT1	171
MMBZ10VALT1	191
MMBZ12VALT1	192
MMBZ15VALT1	192
MMBZ15VDLT1	191
MMBZ18VALT1	192
MMBZ20VALT1	192
MMBZ27VALT1	192
MMBZ27VCLT1	191
MMBZ33VALT1	192
MMBZ5221BLT1	170
MMBZ5222BLT1	170

Alphabetical Parts Listing

Device Number	Page
MMBZ5223BLT1	170
MMBZ5224BLT1	170
MMBZ5225BLT1	170
MMBZ5226BLT1	170
MMBZ5227BLT1	170
MMBZ5228BLT1	170
MMBZ5229BLT1	170
MMBZ5230BLT1	170
MMBZ5231BLT1	170
MMBZ5232BLT1	170
MMBZ5233BLT1	170
MMBZ5234BLT1	170
MMBZ5235BLT1	170
MMBZ5236BLT1	170
MMBZ5237BLT1	170
MMBZ5238BLT1	170
MMBZ5239BLT1	170
MMBZ5240BLT1	170
MMBZ5241BLT1	170
MMBZ5242BLT1	170
MMBZ5243BLT1	170
MMBZ5244BLT1	170
MMBZ5245BLT1	170
MMBZ5246BLT1	170
MMBZ5247BLT1	170
MMBZ5248BLT1	170
MMBZ5249BLT1	170
MMBZ5250BLT1	170
MMBZ5251BLT1	170
MMBZ5252BLT1	170
MMBZ5253BLT1	170
MMBZ5254BLT1	170
MMBZ5255BLT1	170
MMBZ5256BLT1	170
MMBZ5257BLT1	170
MMBZ5258BLT1	171
MMBZ5259BLT1	171
MMBZ5V6ALT1	191, 192
MMBZ6V2ALT1	191
MMBZ6V8ALT1	191
MMBZ9V1ALT1	191
MMDF1300	244
MMDF1N05E	243
MMDF2C02E	244, 253
MMDF2C02HD	244, 253
MMDF2C03HD	244
MMDF2N02E	243, 253

Device Number	Page
MMDF2P01HDR2	262
MMDF2P02E	243, 253
MMDF2P02HD	243, 253
MMDF2P03HDR2	262
MMDF3N02HD	243, 253
MMDF3N03HD	243, 255
MMDF3N04HD	243
MMDF3N06VL	243, 257
MMDF4207R2	262
MMDF4N01HDR2	262
MMDF4P03HDR2	262
MMDF6N02HDR2	262
MMDF6N03HD	243, 255
MMDF7N02Z	243, 253
MMDFS2P102	244, 254
MMDFS2P102R2	262
MMDFS3P303R2	262
MMDFS6N303	244
MMDJ3N03BJTR2	208
MMDJ3P03BJTR2	208
MMDL101T1	164
MMDL301T1	164
MMDL6050T1	166
MMDL770T1	164
MMDL914T1	166
MMFT107	244, 257
MMFT2406	244
MMFT2955E	244, 257
MMFT2N02EL	244, 254
MMFT3055ELT1	262
MMFT3055ET1	262
MMFT3055V	244, 257, 261
MMFT3055VL	244, 257, 261
MMFT3055VLT1	262
MMFT3055VLT1–LF	262
MMFT3055VLT3	262
MMFT3055VLT3–LF	262
MMFT3055VT1	262
MMFT3055VT1–LF	262
MMFT3055VT3	262
MMFT3055VT3–LF	262
MMFT5P03HD	244
MMFT5P03HDT3	262
MMFT960	244
MMJT350T1	208
MMJT9410T1	208
MMJT9435T1	208

Device Number	Page
MMPQ2222A	150
MMPQ2369	150, 156
MMPQ3467	150
MMPQ3904	150, 156
MMPQ3906	150, 156
MMPQ6700	150, 156
MMQA12VT1	138, 193
MMQA13VT1	138, 193
MMQA13VT3	138, 193
MMQA15VT1	138, 193
MMQA18VT1	138, 193
MMQA20VT1	138, 193
MMQA20VT3	138, 193
MMQA21VT1	138, 193
MMQA22VT1	138, 193
MMQA24VT1	138, 193
MMQA27VT1	138, 193
MMQA30VT1	138, 193
MMQA33VT1	138, 193
MMQA33VT3	138, 193
MMQA5V6T1	138, 193
MMQA6V2T1	138, 193
MMQA6V2T3	138, 193
MMQA6V8T1	138, 193
MMSD103T1	166
MMSD301T1	164
MMSD4148T1	166
MMSD701T1	164
MMSD71RKT1	166
MMSD914T1	166
MMSF3300	243, 255
MMSF3P02HD	243, 253
MMSF3P03HDR2	262
MMSF4205R2	262
MMSF4N01HDR2	262
MMSF4P01HDR2	262
MMSF5N02HDR2	262
MMSF5N03HDR2	262
MMSF5P02HDR2	262
MMSF7N03HDR2	262
MMSZ10T1	170
MMSZ11T1	170
MMSZ12T1	170
MMSZ13T1	170
MMSZ15T1	170
MMSZ16T1	170
MMSZ18T1	170

Alphabetical Parts Listing

Device Number	Page
MMSZ20T1	170
MMSZ22T1	170
MMSZ24T1	170
MMSZ27T1	170
MMSZ2V4T1	170
MMSZ2V7T1	170
MMSZ30T1	170
MMSZ33T1	170
MMSZ36T1	171
MMSZ39T1	171
MMSZ3V0T1	170
MMSZ3V3T1	170
MMSZ3V6T1	170
MMSZ3V9T1	170
MMSZ43T1	171
MMSZ4678T1	170
MMSZ4679T1	170
MMSZ4680T1	170
MMSZ4681T1	170
MMSZ4682T1	170
MMSZ4683T1	170
MMSZ4684T1	170
MMSZ4685T1	170
MMSZ4686T1	170
MMSZ4687T1	170
MMSZ4688T1	170
MMSZ4689T1	170
MMSZ4690T1	170
MMSZ4691T1	170
MMSZ4692T1	170
MMSZ4693T1	170
MMSZ4694T1	170
MMSZ4695T1	170
MMSZ4696T1	170
MMSZ4697T1	170
MMSZ4698T1	170
MMSZ4699T1	170
MMSZ4700T1	170
MMSZ4701T1	170
MMSZ4702T1	170
MMSZ4703T1	170
MMSZ4704T1	170
MMSZ4705T1	170
MMSZ4706T1	170
MMSZ4707T1	170
MMSZ4708T1	170
MMSZ4709T1	170

Device Number	Page
MMSZ4710T1	170
MMSZ4711T1	170
MMSZ4712T1	170
MMSZ4713T1	170
MMSZ4714T1	170
MMSZ4715T1	171
MMSZ4716T1	171
MMSZ4717BT1	171
MMSZ47T1	171
MMSZ4V3T1	170
MMSZ4V7T1	170
MMSZ51T1	171
MMSZ5221BT1	170
MMSZ5222BT1	170
MMSZ5223BT1	170
MMSZ5224BT1	170
MMSZ5225BT1	170
MMSZ5226BT1	170
MMSZ5227BT1	170
MMSZ5228BT1	170
MMSZ5229BT1	170
MMSZ5230BT1	170
MMSZ5231BT1	170
MMSZ5232BT1	170
MMSZ5233BT1	170
MMSZ5234BT1	170
MMSZ5235BT1	170
MMSZ5236BT1	170
MMSZ5237BT1	170
MMSZ5238BT1	170
MMSZ5239BT1	170
MMSZ5240BT1	170
MMSZ5241BT1	170
MMSZ5242BT1	170
MMSZ5243BT1	170
MMSZ5244BT1	170
MMSZ5245BT1	170
MMSZ5246BT1	170
MMSZ5247BT1	170
MMSZ5248BT1	170
MMSZ5249BT1	170
MMSZ5250BT1	170
MMSZ5251BT1	170
MMSZ5252BT1	170
MMSZ5253BT1	170
MMSZ5254BT1	170
MMSZ5255BT1	170

Device Number	Page
MMSZ5256BT1	170
MMSZ5257BT1	170
MMSZ5258BT1	171
MMSZ5259BT1	171
MMSZ5260BT1	171
MMSZ5261BT1	171
MMSZ5262BT1	171
MMSZ5263BT1	171
MMSZ5264BT1	171
MMSZ5265BT1	171
MMSZ5266BT1	171
MMSZ5267BT1	171
MMSZ5268BT1	171
MMSZ5269BT1	171
MMSZ5270BT1	171
MMSZ56T1	171
MMSZ5V1T1	170
MMSZ5V6T1	170
MMSZ62T1	171
MMSZ68T1	171
MMSZ6V2T1	170
MMSZ6V8T1	170
MMSZ75T1	171
MMSZ7V5T1	170
MMSZ8V2T1	170
MMSZ9V1T1	170
MMT05B230T3	235
MMT05B260T3	235
MMT05B310T3	235
MMT05B64T3	235
MMT10B230T3	235
MMT10B260T3	235
MMT10B310T3	235
MMT10B350T3	235
MMUN2111LT1	157
MMUN2112LT1	157
MMUN2113LT1	157
MMUN2114LT1	157
MMUN2115LT1	157
MMUN2116LT1	157
MMUN2130LT1	157
MMUN2131LT1	157
MMUN2132LT1	157
MMUN2133LT1	157
MMUN2134LT1	157
MMUN2211LT1	157
MMUN2212LT1	157

Alphabetical Parts Listing

Device Number	Page
MMUN2213LT1	157
MMUN2214LT1	157
MMUN2215LT1	157
MMUN2216LT1	157
MMUN2230LT1	157
MMUN2231LT1	157
MMUN2232LT1	157
MMUN2233LT1	157
MMUN2234LT1	157
MMUN2235LT1	157
MMUN2238LT1	157
MMUN2241LT1	157
MMVL105GT1	163
MMVL109T1	163
MMVL2101T1	163
MMVL2105T1	163
MMVL3102T1	163
MMVL3401T1	165
MMVL3700T1	165
MMVL409T1	163
MMVL809T1	163
MPF102	161
MPF4392	162
MPF4393	162
MPF4856	162
MPF930	247
MPF930A	247
MPF960	247, 257
MPF990	247, 257
MPN3404	165
MPN3700	165
MPS2222	146, 152
MPS2222A	145, 152, 155
MPS2369	155
MPS2369A	155
MPS2907A	145, 152, 155
MPS3563	155
MPS3646	155
MPS3904	146, 155
MPS3906	146, 155
MPS4124	146
MPS4126	146
MPS5172	146
MPS5179	155
MPS651	146, 152
MPS6521	146, 150
MPS6523	146, 150

Device Number	Page
MPS6602	145, 152
MPS6652	145, 152
MPS6729	145, 146, 152
MPS751	146, 152
MPS8099	145, 152
MPS8599	145, 152
MPS918	155
MPSA05	145, 152
MPSA06	145, 152
MPSA13	151
MPSA14	151
MPSA18	145, 150
MPSA20	145
MPSA27	151
MPSA29	151
MPSA42	154
MPSA55	145, 152
MPSA56	145, 152
MPSA63	151
MPSA64	151
MPSA75	151
MPSA77	151
MPSA92	154
MPSH10	155
MPSH17	155
MPSL51	145, 152
MPSW01	146, 152
MPSW01A	146, 152
MPSW05	146, 152
MPSW06	146, 152
MPSW13	151
MPSW14	151
MPSW42	154
MPSW45	151
MPSW45A	151
MPSW51	146, 152
MPSW51A	146, 152
MPSW55	146, 152
MPSW56	146, 152
MPSW63	151
MPSW64	151
MPSW92	154
MPTE–10	178
MPTE–10C	178
MPTE–12	178
MPTE–12C	178
MPTE–15	178

Device Number	Page
MPTE–15C	178
MPTE–18	178
MPTE–18C	178
MPTE–22	178
MPTE–22C	178
MPTE–36	178
MPTE–36C	178
MPTE–45	178
MPTE–45C	178
MPTE–5	178
MPTE–8	178
MPTE–8C	178
MPX4729A	168
MR2502	224
MR2504	224
MR2510	224
MR2520L	225
MR2535L	214, 225
MR2835S	214, 225
MR3227N	214, 225
MR3227P	214, 225
MR4027N	214, 225
MR4027P	214, 225
MR4045N	214, 225
MR4045P	214, 225
MR750RL	224
MR751RL	224
MR752RL	224
MR754RL	224
MR756RL	224
MR760RL	224
MR852RL	224
MR854RL	224
MR856RL	224
MRA4003T3	223
MRA4004T3	223
MRA4005T3	223
MRA4006T3	223
MRA4007T3	223
MRS1504T3	223
MSA1162GT1	148
MSA1162YT1	148
MSB1218A–RT1	148
MSB709–RT1	148
MSB710–RT1	148
MSB92AWT1	154
MSB92WT1	154

Alphabetical Parts Listing

Device Number	Page
MSC2295–BT1	155
MSC2295–CT1	155
MSC2712GT1	148
MSC3130T1	155
MSC3930–BT1	148
MSD1328–RT1	148
MSD1328–ST1	148
MSD1819A–RT1	148
MSD2714AT1	155
MSD42WT1	154
MSD601–RT1	148
MSD601–ST1	148
MSD602–RT1	148
MSD6100	165
MSD6150	165
MSQA6V1W5	194
MSQA6V1W5T2	139
MSR1560	214, 220
MSR860	214, 220
MSRD620CT	214, 220
MTB10N10E	262
MTB1306	246, 255, 262
MTB1306T4	262
MTB15N06V	261, 262
MTB15N06VL	261
MTB15N06VT4	262
MTB20N20E	262
MTB20N20ET4	262
MTB23P06V	246, 259
MTB29N15E	246, 259
MTB30N06VL	246, 258, 261, 263
MTB30N06VLT4	263
MTB30P06V	246, 259
MTB33N10E	263
MTB33N10ET4	263
MTB36N06V	246, 258, 261
MTB40N10E	246, 259
MTB50N06ET4	263
MTB50N06V	261, 263
MTB50N06VL	261, 263
MTB50N06VLT4	263
MTB50N06VT4	263
MTB50P03HDL	246
MTB52N06V	261
MTB52N06VL	261
MTB55N06Z	261

Device Number	Page
MTB60N06HD	246, 259, 261, 263
MTB60N06HDT4	263
MTB75N03HDL	245, 263
MTB75N03HDLT4	263
MTB75N05HD	246, 258, 261
MTB75N06HD	246, 259, 261, 263
MTB75N06HDT4	263
MTD10N10EL	245, 258
MTD15N06V	261, 263
MTD15N06V1	263
MTD15N06VL	261, 263
MTD15N06VL1	263
MTD15N06VLT4	263
MTD15N06VT4	263
MTD20N03HDL	245, 255, 263
MTD20N03HDL1	263
MTD20N03HDLT4	263
MTD20N06HD	245, 258, 261, 263
MTD20N06HD1	263
MTD20N06HDL	245, 258, 261, 263
MTD20N06HDL1	263
MTD20N06HDLT4	263
MTD20N06HDT4	263
MTD20N06V	263
MTD20N06VT4	263
MTD20P03HDL	245
MTD20P06HDL	245, 258
MTD2955V	245, 258
MTD3055ELT4	263
MTD3055ET4	263
MTD3055V	245, 258, 261, 263
MTD3055V1	263
MTD3055VL	245, 258, 261, 263
MTD3055VL1	263
MTD3055VLT4	263
MTD3055VT4	263
MTD3302	245, 255, 263
MTD3302T4	263
MTD4N20E	245, 258, 263
MTD4N20E1	263
MTD4N20ET4	264
MTD5P06V	245, 258

Device Number	Page
MTD6N15	264
MTD6N15T4	264
MTD6N20E	245, 258
MTD6P10E	245, 258
MTD9N10E	264
MTD9N10E1	264
MTD9N10ET4	264
MTDF1N03HD	243
MTDF1P02HDR2	264
MTP10N10E	264
MTP10N10EL	248, 260
MTP12P10	248, 260
MTP1306	247, 256, 264
MTP15N05EL	261
MTP15N06V	247, 259, 261, 264
MTP15N06VL	247, 259, 261, 264
MTP20N06V	261, 264
MTP20N15E	264
MTP20N20E	264
MTP23P06V	248, 260
MTP2955V	248, 260
MTP29N15E	248, 260
MTP3055V	247, 259, 261
MTP3055VL	247, 259, 261
MTP30N06VL	247, 259, 261, 264
MTP30P06V	248, 260
MTP33N10E	264
MTP36N06V	247, 259, 261
MTP50N06V	247, 259, 261, 264
MTP50N06VL	247, 259, 261, 264
MTP50P03HDL	248
MTP52N06V	248, 259, 261
MTP52N06VL	248, 259, 261
MTP60N06HD	248, 260, 261, 264
MTP6P20E	248, 260
MTP75N03HDL	247, 256, 264
MTP75N05HD	247, 259, 261, 264
MTP75N06HD	248, 260, 261, 264
MTP7N20E	248, 260
MTSF1P02HD	243, 253

Alphabetical Parts Listing

Device Number	Page
MTSF2P02HDR2	264
MTSF2P03HDR2	264
MTSF3N02HD	243, 253
MTSF3N03HD	243
MTW32N20E	248, 260
MTW35N15E	264
MTW45N10E	264
MTY100N10E	248, 264
MUN2111T1	157
MUN2112T1	157
MUN2113T1	157
MUN2114T1	157
MUN2115T1	157
MUN2116T1	157
MUN2130T1	157
MUN2131T1	157
MUN2132T1	157
MUN2133T1	157
MUN2134T1	157
MUN2136T1	157
MUN2137T1	157
MUN2140T1	157
MUN2211T1	157
MUN2212T1	157
MUN2213T1	157
MUN2214T1	157
MUN2215T1	157
MUN2216T1	157
MUN2230T1	157
MUN2231T1	157
MUN2232T1	157
MUN2233T1	157
MUN2234T1	157
MUN2236T1	157
MUN2237T1	157
MUN2240T1	157
MUN2241T1	157
MUN5111DW1T1	159
MUN5111T1	157
MUN5112DW1T1	159
MUN5112T1	157
MUN5113DW1T1	159
MUN5113T1	157
MUN5114DW1T1	159
MUN5114T1	157
MUN5115DW1T1	159
MUN5115T1	157

Device Number	Page
MUN5116DW1T1	159
MUN5116T1	157
MUN5130DW1T1	159
MUN5130T1	157
MUN5131DW1T1	159
MUN5131T1	157
MUN5132DW1T1	159
MUN5132T1	157
MUN5133DW1T1	159
MUN5133T1	157
MUN5134DW1T1	159
MUN5134T1	157
MUN5135DW1T1	159
MUN5135T1	157
MUN5136DW1T1	159
MUN5136T1	157
MUN5137DW1T1	159
MUN5137T1	157
MUN5211DW1T1	159
MUN5211T1	157
MUN5212DW1T1	159
MUN5212T1	157
MUN5213DW1T1	159
MUN5213T1	157
MUN5214DW1T1	159
MUN5214T1	157
MUN5215DW1T1	159
MUN5215T1	157
MUN5216DW1T1	159
MUN5216T1	157
MUN5230DW1T1	159
MUN5230T1	157
MUN5231DW1T1	159
MUN5231T1	157
MUN5232DW1T1	159
MUN5232T1	157
MUN5233DW1T1	159
MUN5233T1	157
MUN5234DW1T1	159
MUN5234T1	157
MUN5235DW1T1	159
MUN5235T1	157
MUN5236DW1T1	159
MUN5236T1	157
MUN5237DW1T1	159
MUN5237T1	157
MUN5311DW1T1	159

Device Number	Page
MUN5312DW1T1	159
MUN5313DW1T1	159
MUN5314DW1T1	159
MUN5315DW1T1	159
MUN5316DW1T1	159
MUN5330DW1T1	159
MUN5331DW1T1	159
MUN5332DW1T1	159
MUN5333DW1T1	159
MUN5334DW1T1	159
MUN5335DW1T1	159
MUR105	221
MUR110	221
MUR1100E	214, 221
MUR115	221
MUR120	221
MUR130	221
MUR140	221
MUR1510	222
MUR1515	222
MUR1520	222
MUR1540	222
MUR1560	222
MUR160	221
MUR1610CT	222
MUR1615CT	222
MUR1620CT	222
MUR1620CTR	222
MUR1640CT	222
MUR1660CT	222
MUR180E	214, 221
MUR2020R	222
MUR2100E	221
MUR220	221
MUR240	221
MUR260	221
MUR3020PT	222
MUR3020WT	222
MUR3040PT	222
MUR3060PT	222
MUR3060WT	222
MUR405	221
MUR410	221
MUR4100E	214, 221
MUR415	221
MUR420	221
MUR440	221

Alphabetical Parts Listing

Device Number	Page
MUR460	221
MUR480E	214, 221
MUR620CT	222
MUR805	222
MUR810	222
MUR8100E	214, 222
MUR815	222
MUR820	222
MUR840	222
MUR860	222
MUR880E	214, 222
MURA105T3	220
MURA110T3	220
MURA115T3	220
MURA120T3	220
MURA130T3	220
MURA140T3	220
MURA160T3	220
MURB1620CT	221
MURB1660CT	221
MURD320	221
MURD620CT	221
MURF1620CT	222
MURF1660CT	222
MURH840CT	214, 222
MURH860CT	214, 222
MURHB840CT	214, 221
MURHB860CT	214
MURHB860CT	221
MURHF860CT	214, 222
MURM105T1	220
MURM105T3	220
MURM110T1	220
MURM110T3	220
MURP20020CT	223
MURP20040CT	223
MURS105T3	220
MURS110T3	220
MURS115T3	220
MURS120T3	220
MURS140T3	220
MURS160T3	220
MURS220T3	220
MURS230T3	220
MURS240T3	220
MURS260T3	220
MURS320T3	220

Device Number	Page
MURS340T3	220
MURS360T3	220
MV104	163
MV209	163
MV2101	163
MV2105	163
MV2109	163
MZP4730A	168
MZP4731A	168
MZP4732A	168
MZP4733A	168
MZP4734A	168
MZP4735A	168
MZP4736A	168
MZP4737A	168
MZP4738A	168
MZP4739A	168
MZP4740A	168
MZP4741A	168
MZP4743A	168
MZP4744A	168
MZP4745A	168
MZP4746A	168
MZP4747A	168
MZP4748A	168
MZP4749A	168
MZP4750A	169
MZP4751A	169
NBSG11	86, 96
NBSG111	86, 96
NBSG14	86, 96
NBSG16	88, 96
NBSG16VS	88, 95, 96
NCN6000	67, 80
NCN6010	67, 80
NCN6011	67, 80
NCP100	40, 41
NCP1000	36
NCP1001	36
NCP1002	36
NCP1050	36
NCP1051	36
NCP1052	36
NCP1053	36
NCP1054	36
NCP1055	36
NCP1117	46

Device Number	Page
NCP1200	34, 35
NCP1203	34
NCP1400A	21, 22
NCP1402	21, 22
NCP1403	22
NCP1410	21, 22
NCP1411	21, 22
NCP1417	22
NCP1450	22
NCP1450A	21
NCP1500	20
NCP1560	78
NCP1570	23, 26
NCP1571	23
NCP1800	20
NCP2860	53, 79
NCP300	60, 61
NCP301	60, 61
NCP302	60, 62
NCP303	60, 62
NCP304	60, 62
NCP305	60, 62
NCP345	20, 60, 62
NCP3712	60
NCP4300A	31
NCP4561	45, 47
NCP500	45, 49
NCP502	45
NCP511	45, 49
NCP512	45, 47
NCP5162	23, 26
NCP5322A	30, 78
NCP5426	45, 79
NCP551	45, 49
NCP552	45, 47
NCP553	45
NCP561	45
NCP562	45
NCP563	45
NCP800	20, 79
NCP803	60
NCS2001	10, 12
NCS2200	17
NCS2201	17
NCS2202	17
NCS2203	17
NCS2300	17

Alphabetical Parts Listing

Device Number	Page
NCS2301	17
NCS2302	17
NCS2303	17
NCS5000	67, 79
NCS7101	10, 12
NCV7601	74
NCV8501	55
NCV8502	55
NCV8508	55
NGB15N41CL	249
NGD15N41CL	249
NGP15N41CL	249
NIB6404–5L	250
NIF62514	250
NIMD6302R2	250
NL27WZ04	116, 117
NL27WZ06	116, 117
NL27WZ07	116, 117
NL27WZ14	116, 117
NL27WZ16	116, 117
NL27WZU04	116, 117
NL74LVX4051	19
NL74LVX4052	19
NL74LVX4053	19
NL74LVXT4051	19
NL74LVXT4052	19
NL74LVXT4053	19
NLAS44599	19, 116
NLAS4501	19, 116, 117
NLAS4599	19, 116, 117
NLAST44599	19, 116
NLAST4501	19, 116, 117
NLAST4599	19, 116, 117
NSB9435T1	143
NSL12TT1	153, 160
NSL35TT1	153, 160
NSL5TT1	153, 160
NSR15TW1T2	164
NSTB60BDW1T1	143
NTB100N04	246, 258
NTB13N10	246, 259, 262
NTB18N06	246, 255, 258, 261, 262
NTB18N06L	246, 255, 258, 261
NTB18N06T4	262
NTB22N06	246, 258, 262
NTB22N06L	246, 258, 261

Device Number	Page
NTB22N06T4	262
NTB27N06L	246, 258, 261
NTB30N06	246, 258
NTB30N06L	246, 258, 261, 263
NTB30N06LT4	263
NTB30N20	246, 259, 262
NTB30N20T4	262
NTB33N10	263
NTB33N10T4	263
NTB35N15	246, 259, 264
NTB4302	246, 255
NTB45N06	246, 259, 261, 263
NTB45N06L	246, 259, 261, 263
NTB45N06LT4	263
NTB45N06T4	263
NTB52N10	246, 259, 264
NTB60N06	246, 259, 261, 263, 264
NTB60N06L	246, 259, 261
NTB60N06T4	263
NTB75N03–006	246
NTB75N03–06	255, 262
NTB75N03L09	246, 255, 262, 263
NTB75N03L09T4	263
NTB75N06	246, 259, 261, 263, 264
NTB75N06L	246, 259
NTB75N06T4	263
NTB85N03	245
NTB90N02	245, 255
NTD12N10	245, 258, 264
NTD12N10–001	264
NTD12N10T4	264
NTD15N06	245, 258, 261, 263
NTD15N06–001	263
NTD15N06–1	261
NTD15N06L	245, 258, 261, 263
NTD15N06L–001	263
NTD15N06LT4	263
NTD15N06T4	263
NTD18N06	245, 255, 258, 261, 263
NTD18N06–001	263

Device Number	Page
NTD18N06L	245, 255, 258, 261, 263
NTD18N06L–001	263
NTD18N06L–1	261
NTD18N06LT4	263
NTD18N06T4	263
NTD20N03L27	245, 255, 263
NTD20N03L27–001	263
NTD20N03L27T4	263
NTD20N06	245, 258, 261, 263
NTD20N06L	245, 258, 261
NTD20N06T4	263
NTD24N06	245, 258, 261, 263
NTD24N06–001	263
NTD24N06L	245, 258, 261, 263
NTD24N06L–001	263
NTD24N06LT4	263
NTD24N06T4	263
NTD3055–094	245, 258, 263
NTD3055–094–1	263
NTD3055–094T4	263
NTD3055–150	245, 258, 261, 263
NTD3055–150–1	263
NTD3055–150T4	263
NTD3055160–1	261
NTD3055L104	245, 258, 261, 263
NTD3055L104–001	263
NTD3055L104T4	263
NTD3055L170	245, 258, 261, 263
NTD3055L170–001	263
NTD3055L170T4	263
NTD3055L175–1	261
NTD30N02	245, 255
NTD32N06	245, 258
NTD32N06L	245, 258
NTD4302	245, 255, 263
NTD4302T4	263
NTD4N20	263
NTD4N20T4	264
NTD60N03	245, 255
NTD6N15	264
NTD6N15T4	264

Alphabetical Parts Listing

Device Number	Page
NTD80N02	245, 255
NTF3055–100	244, 257, 261
NTF3055–100T1	262
NTF3055–100T1LF	262
NTF3055–100T3	262
NTF3055–100T3LF	262
NTF3055–160	244, 257, 261
NTF3055–160T1	262
NTF3055–160T1LF	262
NTF3055–160T3	262
NTF3055–160T3LF	262
NTF3055L108	244, 257, 261
NTF3055L108T1	262
NTF3055L108T1LF	262
NTF3055L108T3	262
NTF3055L108T3LF	262
NTF3055L175	244, 257, 261
NTF3055L175T1	262
NTF3055L175T1LF	262
NTF3055L175T3	262
NTF3055L175T3LF	262
NTF5P03	244
NTF5P03T3	262
NTGS3433	242, 252
NTGS3433T1	262
NTGS3441	242, 252
NTGS3441T1	262
NTGS3443	242, 252
NTGS3446	242, 252
NTGS3455	242, 252
NTGS3455T1	262
NTH4302	246, 250
NTHD5902	242, 255
NTHD5903	242, 252
NTHD5904	242, 252
NTHD5905	242, 252
NTHMSN60N03–6	243
NTHS5402	242, 255
NTHS5404	242, 255
NTHS5441	242, 252
NTHS5443	242, 252
NTHS5445	242, 252
NTLTD7900Z	242, 252
NTMD2P01	243, 253
NTMD2P01R2	262
NTMD3N08L	243, 257
NTMD3P03	244, 255

Device Number	Page
NTMD3P03R2	262
NTMD6N02	243, 253
NTMD6N02R2	262
NTMD6P02	243, 253
NTMD6P02R2	262
NTMD7C02	253
NTMS10P02	244, 253
NTMS10P02R2	262
NTMS3P03	244, 255
NTMS3P03R2	262
NTMS4N01	243, 253
NTMS4N01R2	262
NTMS4P01	243, 253
NTMS4P01R2	262
NTMS5P02	243, 253
NTMS5P02R2	262
NTMS7N03	243, 255
NTMS7N03R2	262
NTMSD2P102L	244, 254
NTMSD2P102LR2	262
NTMSD3P102	244, 254
NTMSD3P102R2	262
NTMSD3P303	244, 255
NTMSD3P303R2	262
NTP13N10	248, 260, 264
NTP18N06	247, 256, 259, 261, 264
NTP18N06L	247, 259, 261, 264
NTP20N15	264
NTP22N06	247, 259, 261, 264
NTP22N06L	247, 259, 261, 264
NTP27N06	247, 259, 264
NTP27N06L	247, 259, 261
NTP30N06	247, 259, 261
NTP30N06L	247, 259, 261, 264
NTP30N20	248, 260, 264
NTP33N10	264
NTP35N15	248, 260, 264
NTP4302	247, 256
NTP45N06	248, 259, 261, 264
NTP45N06L	247, 259, 261, 264
NTP52N10	248, 260, 264

Device Number	Page
NTP60N06	248, 260, 261, 264
NTP60N06L	248, 260, 261
NTP75N03–006	264
NTP75N03–06	247, 256
NTP75N03L09	247, 256, 264
NTP75N06	248, 260, 261, 264
NTP75N06L	248, 260
NTQD6866	243, 253
NTQD6968	243, 253
NTQS6463	243, 253
NTR1P02L	242, 252
NTR1P02LT1	262
NTR1P02LT3	262
NTTD1P02	243, 253
NTTD1P02R2	264
NTTS2P02	243, 253
NTTS2P02R2	264
NTTS2P03	243
NTTS2P03R2	264
NTY100N10	264
NTY100N10E	248
NUP4201DR2	140
NUP6101DMR2	139
NZF220DFT1	141
NZF220TT1	141
NZMM7V0T4	142
P2N2222A	155
P2N2907A	155
P6KE100A	176
P6KE10A	176
P6KE110A	176
P6KE11A	176
P6KE11CA	176
P6KE120A	176
P6KE12A	176
P6KE130A	176
P6KE13A	176
P6KE150A	177
P6KE15A	176
P6KE160A	177
P6KE16A	176
P6KE170A	177
P6KE180A	177
P6KE18A	176

Alphabetical Parts Listing

Device Number	Page
P6KE200A	177
P6KE20A	176
P6KE22A	176
P6KE24A	176
P6KE27A	176
P6KE30A	176
P6KE33A	176
P6KE36A	176
P6KE39A	176
P6KE43A	176
P6KE47A	176
P6KE51A	176
P6KE56A	176
P6KE6.8A	176
P6KE62A	176
P6KE68A	176
P6KE7.5A	176
P6KE7.5CA	176
P6KE75A	176
P6KE8.2A	176
P6KE82A	176
P6KE9.1A	176
P6KE91A	176
P6SMB100AT3	187
P6SMB10AT3	187
P6SMB110AT3	187
P6SMB11AT3	187
P6SMB11CAT3	188
P6SMB120AT3	187
P6SMB12AT3	187
P6SMB12CAT3	188
P6SMB130AT3	187
P6SMB13AT3	187
P6SMB13CAT3	188
P6SMB150AT3	187
P6SMB15AT3	187
P6SMB15CAT3	188
P6SMB160AT3	187
P6SMB16AT3	187
P6SMB16CAT3	188
P6SMB170AT3	187
P6SMB180AT3	187
P6SMB18AT3	187
P6SMB18CAT3	188
P6SMB200AT3	187
P6SMB20AT3	187
P6SMB20CAT3	188

Device Number	Page
P6SMB22AT3	187
P6SMB22CAT3	188
P6SMB24AT3	187
P6SMB24CAT3	188
P6SMB27AT3	187
P6SMB27CAT3	188
P6SMB30AT3	187
P6SMB30CAT3	188
P6SMB33AT3	187
P6SMB33CAT3	188
P6SMB36AT3	187
P6SMB36CAT3	188
P6SMB39AT3	187
P6SMB39CAT3	188
P6SMB43AT3	187
P6SMB43CAT3	188
P6SMB47AT3	187
P6SMB47CAT3	188
P6SMB51AT3	187
P6SMB51CAT3	188
P6SMB56AT3	187
P6SMB56CAT3	188
P6SMB6.8AT3	187
P6SMB62AT3	187
P6SMB62CAT3	188
P6SMB68AT3	187
P6SMB68CAT3	188
P6SMB7.5AT3	187
P6SMB75AT3	187
P6SMB75CAT3	188
P6SMB8.2AT3	187
P6SMB82AT3	187
P6SMB82CAT3	188
P6SMB9.1AT3	187
P6SMB91AT3	187
P6SMB91CAT3	188
PZT2222AT1	149, 152
PZT2907AT1	149, 152
PZT651T1	149, 152
PZT751T1	149, 152
PZTA42T1	154
PZTA92T1	154
RB751V40T1	164
SA100A	175
SA10A	174
SA110A	175
SA11A	174

Device Number	Page
SA120A	175
SA12A	174
SA12CA	174
SA130A	175
SA13A	174
SA13CA	174
SA14A	174
SA150A	175
SA15A	174
SA15CA	174
SA160A	175
SA16A	174
SA170A	175
SA17A	174
SA18A	174
SA18CA	175
SA20A	174
SA22A	174
SA24A	174
SA24CA	175
SA26A	174
SA28A	174
SA30A	174
SA33A	174
SA36A	175
SA40A	175
SA43A	175
SA45A	175
SA48A	175
SA5.0A	174
SA51A	175
SA54A	175
SA58A	175
SA6.0A	174
SA6.5A	174
SA6.5CA	174
SA60A	175
SA64A	175
SA7.0A	174
SA7.5A	174
SA70A	175
SA75A	175
SA78A	175
SA8.0A	174
SA8.5A	174
SA85A	175
SA9.0A	174

Alphabetical Parts Listing

Device Number	Page
SA90A	175
SG3525A	23, 31
SL05T1	140
SL15T1	140
SL24T1	140
SMDA05–6R2	139
SMS05T1	138, 194
SMS12T1	138, 194
SMS15T1	138, 194
SMS24T1	138, 194
SS16	215
SS26	215
STB60N06HDT4	264
STB75N05HDT4	264
STB75N06HDT4	264
STD9N10ET4	264
STF202–22	142
T2322B	230
T2800D	232
TCA0372	10, 14
TCA0372B	14
TDA1085C	73
TIP100	199
TIP101	199
TIP102	199
TIP105	199
TIP106	199
TIP107	199
TIP110	198
TIP111	198
TIP112	198
TIP115	198
TIP116	198
TIP117	198
TIP120	198
TIP121	198

Device Number	Page
TIP122	198
TIP125	198
TIP126	198
TIP127	198
TIP140	201
TIP141	201
TIP142	201
TIP145	201
TIP146	201
TIP147	201
TIP2955	201
TIP29B	198
TIP29C	198
TIP3055	201
TIP30B	198
TIP30C	198
TIP31A	198
TIP31B	198
TIP31C	198
TIP32A	198
TIP32B	198
TIP32C	198
TIP33C	201
TIP35A	201
TIP35C	201
TIP36A	201
TIP36C	201
TIP41A	199
TIP41B	199
TIP41C	199
TIP42A	199
TIP42B	199
TIP42C	199
TIP47	198
TIP48	198
TIP50	198

Device Number	Page
TL431	40
TL431A	40, 41
TL431B	40, 41
TL494	23, 31
TL594	23, 31
TLV431A	40, 41
TRA2525	224
TRA2532	225
TRA3225	224
UAA2016	63, 73
UC2842A	23, 31
UC2842B	23, 31
UC2843A	23, 31
UC2843B	23, 31
UC2844B	23, 31
UC2845B	23, 31
UC3842A	23, 31
UC3842B	23, 31
UC3843A	23, 31
UC3843B	23, 31
UC3844B	23, 31
UC3845B	23, 31
UMA4NT1	143, 159
UMA6NT1	143, 159
UMC2NT1	143, 159
UMC3NT1	143, 159
UMC5NT1	143, 159
UPR10TR13	220
UPR10TR7	220
UPR5TR13	220
UPR5TR7	220
VN0300L	247, 257
VN2222LL	247, 257
VN2406L	247, 257
VN2410L	247, 257

Alphabetical Subject Index

Alphabetical Subject Index

A

AC–DC Switching 31
Air Core Motor Drivers/Gauge Drivers 68, 76
ALVC 118
Analog ICs 5
Analog Switches and Multiplexers 19
Application Specific Low Dropout Voltage Regulators . . . 53, 55
Application Specific Standard Product 72
Audio/Servo Loads, Bipolar Power Transistors 209
Automotive 56, 74, 77

B

Battery Management 20
Bias Resistor Transistors 143
Bias Resistor Transistors (BRTs) 157
Bias Resistor Transistors – Combinational 143, 159
Bias Resistor Transistors – Duals 159
Bipolar Power Transistors 196
Bipolar Power Transistors for Electronic Lamp Ballasts 210
Bipolar Power Transistors Selector Guide 197
Bipolar Transistors 145
  Bias Resistor Transistors 143
  Bias Resistor Transistors (BRTs) 157
  Bias Resistor Transistors – Combinational 143, 159
  Bias Resistor Transistors – Duals 159
  Combinational Digital Transistors 143, 159
  Darlington Transistors 151
  Digital Transistors 157
  Dual Digital Transistors 159
  General–Purpose Multiple Transistors 150
  General–Purpose Transistors 145
  High Current Digital Transistors 143
  High Current Transistors (> 500 mA) 152
  High Voltage Transistors (> 100 V) 154
  Low Noise and Good hFE Linearity 150
  Low Saturation Voltage Transistors 160
  Multiple Switching Transistors 156
  RF Transistors 155
  Switching Transistors 155
Bipolar, Selection by Package 197
Boost Converters (General Purpose) 27
Brushless DC Motor Controllers 68
Buck Controllers (General Purpose) 26
Buck Converters (General Purpose) 24

C

Charge Pump Converters 28, 29
Combinational Digital Transistors 143, 159
Comparators 17
Computing 54

D

D2PAK, Bipolar Power Transistors 197, 208, 211
D2PAK, Schottky, Rectifiers 214, 216
D2PAK, Surface Mount Ultrafast, Rectifiers 221
Darlington Transistors 151
Data Management Devices 81, 83
Data Transmission 70
DC–DC Boost Converters 27
DC–DC CPU Controllers 30
DC–DC Switching 21, 23
Dedicated Power Management Controllers 67
Device Nomenclatures, Broadband 240
Device Nomenclatures, Data Management 105
Device Nomenclatures, Logic 112
Digital Transistors 157
Discrete Products Family Tree 135
Discretes 133
DO–41, Bidirectional Trigger, Thyristors 235
DPAK, Bipolar Power Transistors 197
DPAK, Schottky, Rectifiers 214, 216
DPAK, SCRs, Thyristors 227, 228
DPAK, Surface Mount Ultrafast, Rectifiers 221
DPAK, Surface Mount, Bipolar Power Transistors 197, 205, 211
DPAK, TRIACs, Thyristors 230, 231
DPAK, UltraSoft, Rectifiers 220
Drivers 63
Dual Comparators 18
Dual Digital Transistors 159
Dual Operational Amplifiers 13

E

ECLinPS Families 105
Enhanced Current–Mode PWM Controller 32
Enhanced Voltage–Mode PWM Controller 32

F

FACT 123, 124, 125, 126
Filter Circuits 141, 142
FST 118
Full Pak, Schottky, Rectifiers 218

G

General Purpose Boost Converters 27
General Purpose Buck Controllers 26
General Purpose Buck Converters 24
General Purpose Linear Voltage Regulators 42, 43
General–Purpose Multiple Transistors 150
General–Purpose Signal and Switching Diodes 165
General–Purpose Transistors 145
GigaComm (Silicon Germanium) 105

H

HC One–Gate 116
High Current Digital Transistors 143
High Current Transistors (> 500 mA) 152
High Speed CMOS 126, 127, 128
High Voltage Transistors (> 100 V) 154
Highly Integrated PWM Current–Mode Controller 33

I

Industrial, Appliance, Motor Control 73
Interfaces 69

J

JFETs, Switches and Choppers 162
JFETs, Small Signal 161
Junctional Field–Effect Transistors, Small Signal 161

L

LCX 119, 120
LCX One–Gates 116
LCX Two–Gates & Three–Gates 117
Line Drivers – EIA Standard 70
Line Receivers – EIA Standard 70
Linear Voltage Regulators 42
Linear Voltage Regulators (General Purpose) 43
Low Dropout Linear Voltage Regulators 46
Low Dropout Voltage Regulators 45
Low Dropout Voltage Regulators Table 47
Low Noise and Good hFE Linearity 150
Low Saturation Voltage Transistors 160

M

MECL 10K and 10/100H 106
MEGAHERTZ, Rectifiers 214, 222
Metal Gate CMOS 129, 130, 131
MicroIntegration 137
MiniMOSORB, Axial Leaded, TVS 174
MiniGate Analog Switches 116
MOS Power Products 237, 239
MOSFET/IGBT Drivers 64
MOSORB, Axial Leaded, TVS 178, 179
Multiple Switching Transistors 156
Multiple TVS – Duals in Surface Mount 191
Multiple TVS – Quads in Surface Mount 193, 194, 195

N

Networking, Computing 78
NIC & PCI Cards 54
NLAS Analog Switches 117

O

Off–Line Controllers 35
Off–Line Switching Controllers
(with High Voltage Startup Circuit) 34
ON Semiconductor’s Analog Integrated Circuits 9
Operational Amplifiers 10
Ordering Information, Data Management 105
Ordering Information, Logic 112

P

Package Cross–Reference Table 144
Peripheral Drivers 70
PIN Switching Diodes 165
Plastic TO–247, Bipolar Power Transistors 208
Power Factor Controllers 38, 39
Power Management 20
POWERMITE, Schottky, Rectifiers 215, 220
Powermite, Schottky, Rectifiers 214
Powermit, Surface Mount, TVS 181
Powermite, Surface Mount, Zener 172
POWERTAP II, Schottky, Rectifiers 214, 219
POWERTAP II, Ultrafast, Rectifiers 223
POWERTAP III, Schottky, Rectifiers 214

Q

Quad Comparators 18
Quad Operational Amplifiers 15

R

Recommended Power Transistors for Audio/Servo Loads . . . 209
Rectifier Numbering System . . . 213
Rectifiers . . . 212
Rectifiers, Application Specific . . . 214
Rectifiers, Automotive Transient Suppressors . . . 214
Rectifiers, Axial Lead Schottky . . . 216
Rectifiers, Axial Lead Ultrafast . . . 221
Rectifiers, Energy Rated . . . 214
Rectifiers, Fast Recovery . . . 223, 224
Rectifiers, General Purpose . . . 223, 224
Rectifiers, Overvoltage Transient Suppressors . . . 225
Rectifiers, Schottky . . . 214
Rectifiers, Surface Mount . . . 220
Rectifiers, Ultrafast . . . 220, 221, 222, 223
Rectifiers, UltraSoft . . . 214, 220
RF Transistors . . . 155

S

SC–59
- Bias Resistor Transistors . . . 157
- General Purpose Transistors . . . 148
- RF Transistors . . . 155

SC–59, Quads in Surface Mount, TVS . . . 193, 194
SC–70
- Bias Resistor Transistors . . . 157
- High Voltage Transistors . . . 154
- Schottky Diodes . . . 164
- Switching Transistors . . . 155

SC–75
- Bias Resistor Transistors . . . 158
- General Purpose Transistors . . . 148
- High Current Transistors . . . 153, 160
- Switching Transistors . . . 156

SC–88
- Bias Resistor Transistors . . . 143, 159
- Schottky Diodes . . . 164
- Switching Transistors . . . 156

SC–88 (SOT–363), Quads in Surface Mount, TVS . . . 195
SC–88A, Bias Resistor Transistors . . . 143, 159
SC–88A/SOT–353, Quads in Surface Mount, TVS . . . 194
SC–90
- Bias Resistor Transistors . . . 158
- General Purpose Transistors . . . 148
- High Current Transistors . . . 153, 160
- Switching Transistors . . . 156

SC70–5, Bias Resistor Transistors . . . 143, 159
Schottky Diodes . . . 164
Schottky Rectifiers . . . 215
Schottky Rectifiers, Surface Mount . . . 215
Sensor Interface . . . 76
Series Voltage References . . . 41
Shunt Voltage References . . . 41

S (continued)

Signal Conditioning . . . 10
Silicon Controlled Rectifiers . . . 227
Single Comparators . . . 18
Single Operational Amplifiers . . . 11
SMA, Fast Recovery/General Purpose, Rectifiers . . . 223
SMA, Schottky, Rectifiers . . . 214, 215, 220
SMA, Surface Mount, TVS . . . 182, 183
SMA, Surface Mount, Zener . . . 172
Small–Signal Devices . . . 144
- Bipolar Transistors . . . 145
- Bipolar Trasistors . . . 144
- Diodes . . . 144
- JFETs . . . 144
- JFETs – Junctional Field–Effect Transistors . . . 161
- Tuning and Switching Diodes . . . 163

Smart Cards . . . 80
Smart Drivers . . . 65, 75
Smart Drivers Table . . . 66
SMB, Fast Recovery/General Purpose, Rectifiers . . . 223
SMB, Schottky, Rectifiers . . . 214, 215, 220
SMB, Surface Mount, TVS . . . 184, 185, 186, 187, 188
SMB, Surface Mount, Zener . . . 172
SMB, Surge Suppressor, Thyristors . . . 235
SMC, Schottky, Rectifiers . . . 214, 215
SMC, Surface Mount Ultrafast, Rectifiers . . . 220
SMC, Surface Mount, TVS . . . 189, 190
SO–8, Bipolar Power Transistors . . . 197, 208
SOD–123, Schottky Diodes . . . 164
SOD–123, Schottky, Rectifiers . . . 214, 215
SOD–123, Surface Mount, Zener . . . 170
SOD–323, Schottky Diodes . . . 164
SOD–323, Surface Mount, Zener . . . 170
SOT–223
- Bias Resistor Transistors . . . 143
- Darlington Transistors . . . 151
- High Current Transistors . . . 149, 152
- High Voltage Transistors . . . 154

SOT–223, Bipolar Power Transistors . . . 197, 208
SOT–223, SCRs, Thyristors . . . 227
SOT–223, TRIACs, Thyristors . . . 230, 231
SOT–23
- Bias Resistor Transistors . . . 157
- Darlington Transistors . . . 151
- High Current Transistors . . . 152
- High Voltage Transistors . . . 154
- JFET Switches and Choppers . . . 162
- JFETs – High Frequency Amplifiers . . . 161
- JFETs – Low Frequency/Low Noise . . . 161
- Low Saturation Voltage Transistors . . . 160
- RF Transistors . . . 155
- Schottky Diodes . . . 164
- Switching Transistors . . . 155
- Tuning Diodes – Abrupt Junction . . . 163

SOT–23 (TO–236AB), Surface Mount, TVS . . . 191

S (continued)

SOT–23 (TO–236AB), Surface Mount, Zener 170
SOT–23, Surface Mount, TVS 191, 192
SOT–323
Bias Resistor Transistors 157
High Voltage Transistors 154
Schottky Diodes 164
Switching Transistors 155
SOT–353, Bias Resistor Transistors 143, 159
SOT–363
Bias Resistor Transistors 159
Schottky Diodes 164
Switching Transistors 156
SOT–416
Bias Resistor Transistors 158
High Current Transistors 153, 160
Switching Transistors 156
Special Functions 71
Squib Drivers 66, 75
Standard Logic Devices 107, 109
Stepper Motor Drivers/Odometer Drivers 68, 76
Supervisory 61
Supervisory ICs 60
Surge Suppressors and Triggers, Thyristors 235
Surmetic 30 (DO–41), Axial Leaded, Zener 168
Surmetic 40, Axial Leaded, TVS 176
Surmetic 40, Axial Leaded, Zener 168
Surmetic 50, Bidirectional Trigger, Thyristors 235
Switches and Choppers 162
Switching Controllers 23
Switching Diodes 165
Switching Power Supply Controllers (Non–Monolithic) 31
Switching Regulators (with On–Board Power Switch) for Non–Isolated Applications 21
Switching Transistors 155
Synchronous Rectification PWM Controller with Auxiliary Output 33

T

Thyristor High Voltage Bidirectional Triggers: Sidacs 235
Thyristor Surge Suppressors 235
Thyristor Triggers: Programmable Unijunction Transistors 236
Thyristors, Triggers and Surge Suppressors 226
TO–204AA (TO–3), Bipolar Power Transistors 197
TO–204AA, TO–204AE, Metal, Bipolar Power Transistors 206
TO–204AE, Bipolar Power Transistors 197
TO–218, Bipolar Power Transistors 197
TO–218, Plastic, Bipolar Power Transistors 201
TO–218, Schottky, Rectifiers 218
TO–218, Ultrafast, Rectifiers 222
TO–218AC, Schottky, Rectifiers 218

T (continued)

TO–218AC, Ultrafast, Rectifiers 222
TO–220 (Isolated), Bipolar Power Transistors 197
TO–220 (Isolated), Plastic, Bipolar Power Transistors 202, 211
TO–220 and D2PAK, Schottky, Rectifiers 217
TO–220, Schottky, Rectifiers 214
TO–220, Ultrafast, Rectifiers 222
TO–220AB, Bipolar Power Transistors 197
TO–220AB, Plastic, Bipolar Power Transistors 198, 210
TO–220AB, Schottky, Rectifiers 217
TO–220AB, SCRs, Thyristors 228, 229
TO–220AB, TRIACs, Thyristors 232, 233, 234
TO–220AB, Ultrafast, Rectifiers 222
TO–220AC, Schottky, Rectifiers 218
TO–220AC, Ultrafast, Rectifiers 222
TO–225AA (TO–126), Bipolar Power Transistors 197
TO–225AA (TO–126), SCRs, Thyristors 227
TO–225AA (TO–126), TRIACs, Thyristors 230, 231
TO–225AA, Plastic, Bipolar Power Transistors . . . 203, 204, 211
TO–226AA 145, 146
Darlington Transistors 151
High Current Transistors 152
High Voltage Transistors 154
JFET Switches and Choppers 162
JFETs – High Frequency Amplifiers 161
JFETs – Low Frequency/Low Noise 161
Low Noise and Good hFE Linearity Transistors 150
RF Transistors 155
Switching Transistors 155
TO–226AA (TO–92), SCRs, Thyristors 227
TO–226AA (TO–92), TRIACs, Thyristors 230, 231
TO–226AA (TO–92), Trigger, Thyristor 236
TO–226AC, Tuning Diodes – Abrupt Junction 163
TO–226AC, 2–Lead
Schottky Diodes 164
Tuning Diodes – Abrupt Junction 163
TO–226AE (1–WATT) 154
Darlington Transistors 151
High Current Transistors 152
TO–236AB
Bias Resistor Transistors 157
Darlington Transistors 151
General Purpose Transistors 147, 150
High Current Transistors 152
High Voltage Transistors 154
JFET Switches and Choppers 162
JFETs – High Frequency Amplifiers 161
JFETs – Low Frequency/Low Noise 161
Low Saturation Voltage Transistors 160
RF Transistors 155
Schottky Diodes 164
Switching Transistors 155
Tuning Diodes – Abrupt Junction 163
TO–247, Bipolar Power Transistors 197

T (continued)

TO–247, Schottky, Rectifiers 214, 218
TO–247, Ultrafast, Rectifiers 222
TO–264, Bipolar Power Transistors 197
TO–264, Plastic, Bipolar Power Transistors 202
TO–92 . . . . . 145, 146
Darlington Transistors 151
High Current Transistors 152
High Voltage Transistors 154
JFET Switches and Choppers 162
JFETs – High Frequency Amplifiers 161
JFETs – Low Frequency/Low Noise 161
Low Noise and Good hFE Linearity Transistors 150
RF Transistors 155
Switching Transistors 155
Tuning Diodes – Abrupt Junction 163
TO–92, 2–Lead
Schottky Diodes 164
Tuning Diodes – Abrupt Junction 163
TRIACs (Bidirectional Devices), Thyristors 230
TSOP–6, Low Saturation Voltage Transistors 160
Tuning and Switching Diodes 163
General–Purpose Signal and Switching Diodes 165
Schottky Diodes 164
Switching Diodes 165
Tuning Diodes – Abrupt Junction 163
Tuning Diodes – Hyper–Abrupt Junction 163
Tuning Diodes, Abrupt Junction, Small Signal 163
Tuning Diodes, Hyper–Abrupt Junction, Small Signal 163
TVS – in Axial Leads 174
TVS – in Surface Mount 181
TVS Protection – Arrays in Surface Mount 138, 139
TVS Protection – Low–Capacitance Surface Mount for High Speed Data Lines 140
TVS Protection – Low–Capacitance Surface Mount for USB 2.0 and 1.1 140
TVS/Zeners 167

U

USB Protection 140

V

Vacuum Fluorescent Drivers 76
VCX 119
Very High Voltage Off–Line Switching Regulators (Monolithic) (with On–Board Power Switch) 36
Very High Voltage Off–Line Switching Regulators with On–Chip Power Switch 37
VHC 121, 122, 123
VHC One–Gate 115
Voltage References 40

W

Wireless & Portable 79
Wireless Portable 54

Z

Zener Diodes – Regulation in Axial Leads 168
Zener Diodes – Regulation in Surface Mount 170
Zener Regulator Diodes 167

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