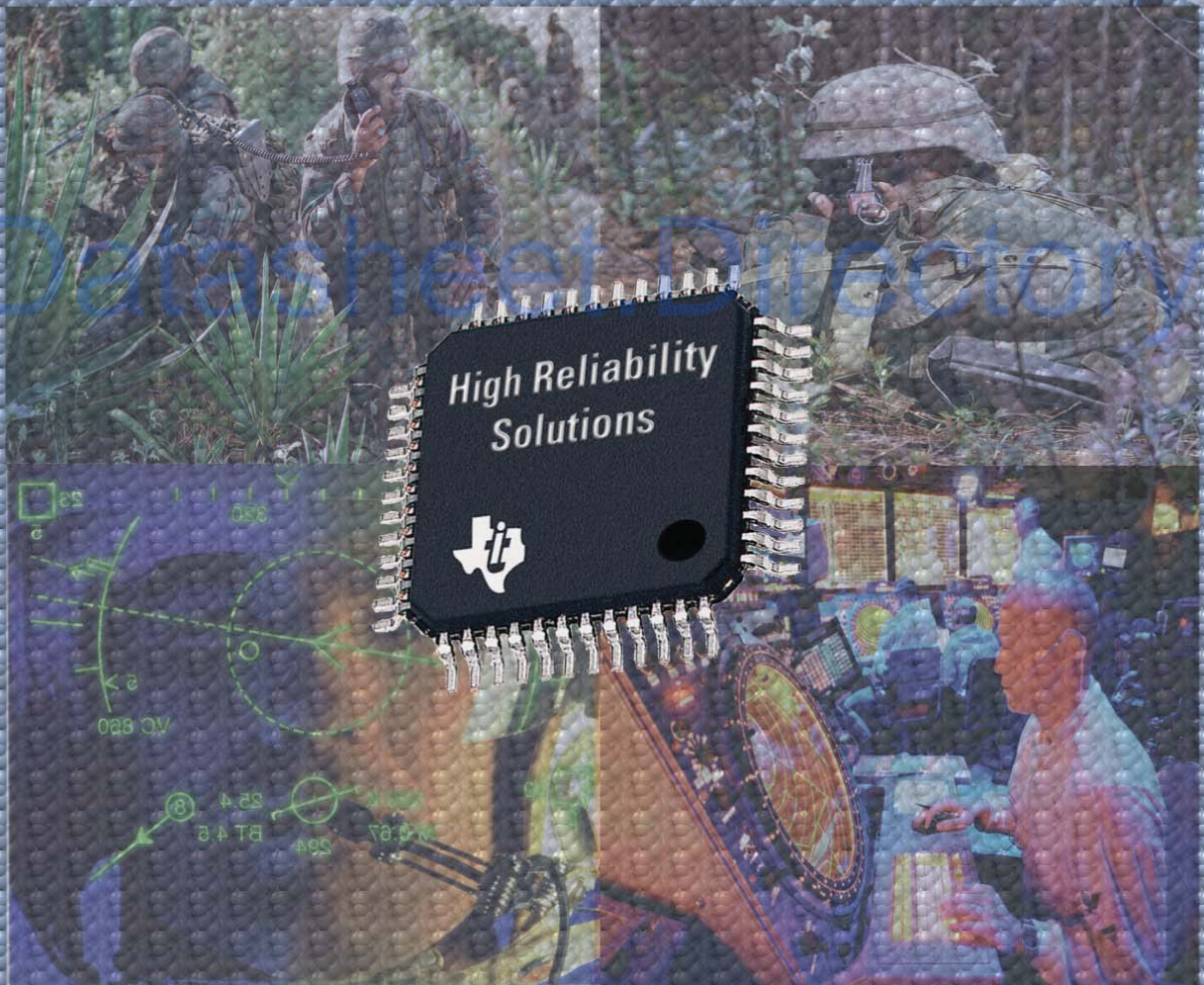


# Military Semiconductors Selection Guide

2004-2005



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If you are working on a program for the military, industrial and/or space end equipments and need a product with extended temperature performance, Texas Instruments can help.

To further support the diverse needs of these markets, TI has been focusing on two new product families. The Enhanced Plastic (EP) product line is available for customers who have decided that a plastic packaged part is appropriate for their application. While not QML-qualified, these EP products can help reduce cost while providing many of the benefits of a QML device.

In addition, a QML Class V product line is available for customers who need devices qualified to Class Level V for space applications.

Each section of this guide is designed to provide you with:

- Key topics to consider
- Product portfolio details
- Table of the key parameters of the devices
- Available resource information

For more information or technical assistance, please see the inside back cover, or visit one of TI's web sites:

[www.ti.com/military](http://www.ti.com/military)

[www.ti.com/ep](http://www.ti.com/ep)

[www.ti.com/space](http://www.ti.com/space)

## Things to Consider

### Use of Enhanced Plastic

**Use of COTS PEMs** — Use of COTS PEMs (commercial-off-the-shelf, plastic encapsulated microcircuits) is growing in military systems. Since COTS PEMs products may not be suitable for all military and aerospace applications, the end-user/OEM (original equipment manufacturer) must determine the suitability for use in their system of any plastic-packaged ICs.

**Cost Effectiveness** — EP products alleviate many of the problems associated with the use of COTS PEMs devices while offering a cost-effective solution for applications that require devices to function outside the limits of the standard commercial environment. In addition, they offer benefits to customers that are not available with the purchase of commercial devices.

Other EP devices based on customer requirements. A feedback form is available for customers who would like to request additional releases at [www.ti.com/sc/docs/general/military/feedback.htm](http://www.ti.com/sc/docs/general/military/feedback.htm)

### EP Website—[www.ti.com/ep](http://www.ti.com/ep)

- Current list of orderable part types
- EP quality and reliability information
- EP brochure
- Q & A
- Press releases
- Web Seminar
- DSCC Vendor Item Drawing (VID) Information
  - VIDs facilitate industry standardization for enhanced plastic products
  - DSCC Website: [www.dscclia.dla.mil](http://www.dscclia.dla.mil)

## EP Portfolio Benefits

- Controlled baseline (one assembly/test site, one fabrication site)
- Enhanced process change notification (process, materials, electrical performance, lead finish, mold compound and manufacturing location)
- Extended temperature performance (may be as great as -55°C to 125°C)
- Stand-alone EP datasheet
- Qualification data
- Customer-driven portfolio
- Enhanced obsolescence management
- Nickel-Palladium-Gold or Tin-Lead lead finishes
- DSCC Vendor Item Drawings
- EP is supplied by multiple semiconductor vendors

## EP Qualification Pedigree

To ensure a device exhibits the best quality and reliability possible for the technology in its rated environment, TI performs additional evaluations before the device is released:

- **Reliability and electromigration checks** are done at maximum recommended operating conditions in the target package.
- **Electrical characterization** is performed over temperature.
- **Package performance** is confirmed over extended temperatures. (Some mold compounds are not suitable for extended temperature.)

## Mechanical Shock-tolerant Package Option

Typically, industry-standard non-hermetic plastic ball grid array (PBGA) packages manufactured with a metal heat spreader/lid for die coverage are not designed to be tolerant of high levels of mechanical shock. For systems that experience significant mechanical shock, additional board/module design effort is required to allow for the use of the typical PBGA. Therefore, TI designed the Mech~Shock package for selected C6000 platform DSPs for use in applications that will encounter high levels of mechanical shock (e.g., missiles and self-guided projectiles/munitions). The Mech~Shock package is a mechanical-shock package embodiment qualified to 20,000 Gs of mechanical shock. Qualification testing is per MIL-STD-883E, Method 2002.3, Test Condition F.

The Mech~Shock package, while non-hermetic, directly addresses the shock stress-environments of system applications that experience severe shock profiles during operation. Mech~Shock packages incorporate a composite (and lighter) heat spreader/lid. The composite heat spreader has equivalent thermal performance to the heavier, solid copper heat spreaders, but the composite lid is less massive. This composite lid is placed on a standard-footprint PBGA substrate and attached with adhesives that have unique, shock-tolerant characteristics. A Mech~Shock package is footprint compatible with the standard commercial package for the same DSP product.

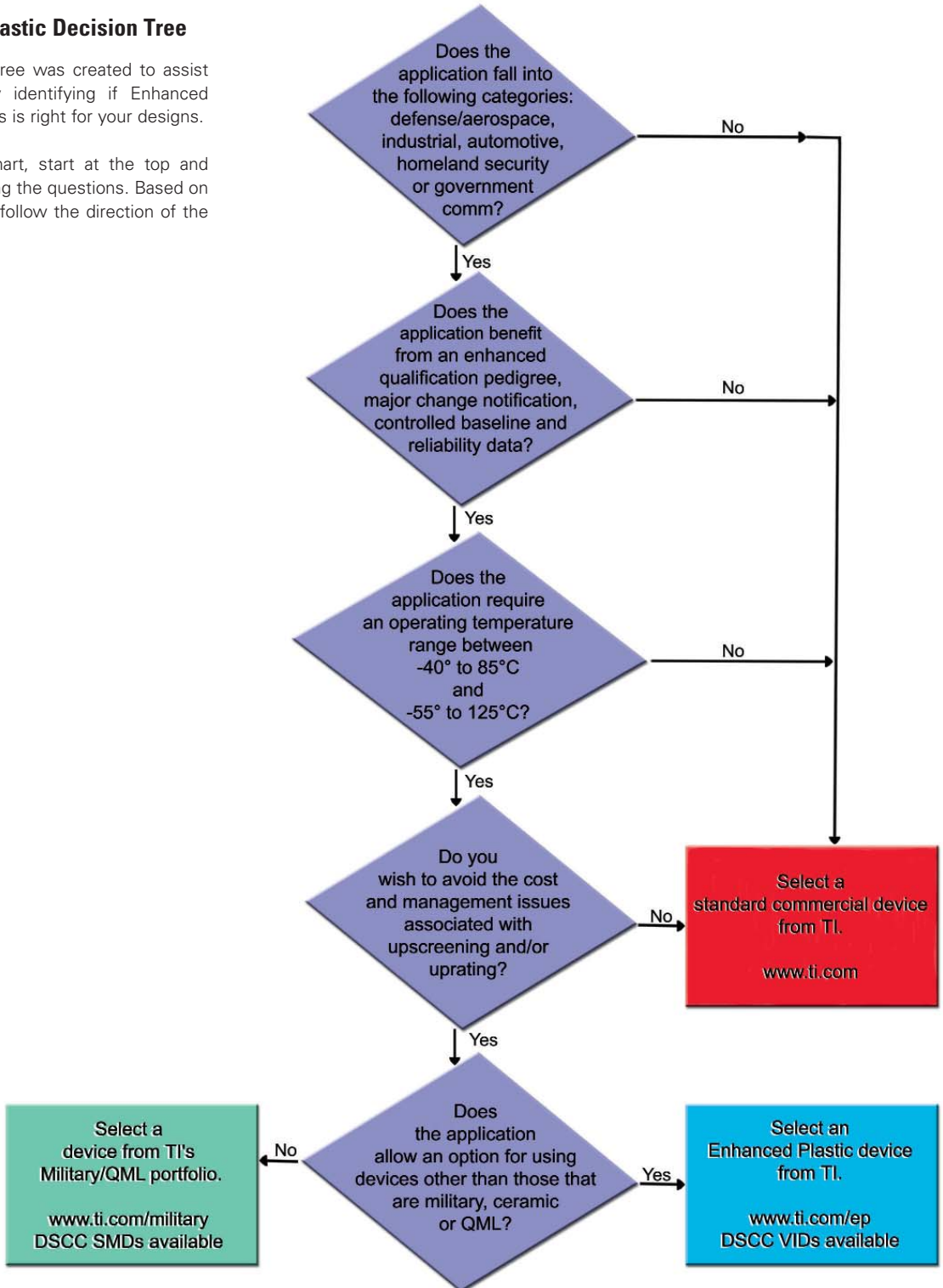
- Lighter than standard BGA
- Resistant to mechanical shock
- TCE match to boards designed for plastic components
- Low-cost DSP
- Suitable for munitions or missiles

# Enhanced Plastic

## Enhanced Plastic Decision Tree

This decision tree was created to assist you in quickly identifying if Enhanced Plastic products is right for your designs.

To use this chart, start at the top and begin answering the questions. Based on your answers, follow the direction of the arrows given.



## Enhanced Plastic Portfolio

A-temp = -40 to 105°C (for DSPs)    I-temp = -40 to 85°C    M-temp = -55 to 125°C    Q-temp = -40 to 125°C    T-temp = -40 to 105°C

### Digital Signal Processors

Family	Device Name	DSCC Vendor Item Drawing	Description	Temp Range
DSP	SM320C32PCM50EP	V62/03616-01XE	320C32, Floating-pt, 50 MFLOPS – EP	M
DSP	SM320C32PCM60EP	V62/03616-02XE	320C32, Floating-pt, 60 MFLOPS – EP	M
DSP	SM320C50PQM66EP	V62/03613-01XE	320C50, Fixed-pt, 33 MIPS – EP	M
DSP	SM320C6201GJCA20EP	V62/04606-01XE	320C6201, Fixed-pt, 1600 MIPS, 200 MHz – EP	A
DSP	SM320C6202GJLA20EP	V62/03640-01XE	320C6202, Fixed-pt, 1600 MIPS, 200 MHz – EP	A
DSP	SM320C6701GJCA12EP	V62/03669-01XE	320C6701, Floating-pt, 720 MFLOPS, 120 MHz – EP	A
DSP	SMC6701MECHGJC16EP	Contact DSCC	320C6701 Floating-pt, 1 GFLOPS, 167 MHz – EP	Comm'l
DSP	SM320C6711DGDPA16EP	Contact DSCC	320C6711, Floating-pt, 1000 MFLOPS, 167 MHz - EP	A
DSP	SM32C6712DGDPA16EP	Contact DSCC	320C6712, Floating-pt, 1000 MFLOPS, 167 MHz - EP	A
DSP	SM32C6713BBDPA20EP	Contact DSCC	320C6713, Floating-pt, 16000/1200 MIPS/MFLOPS, 200 MHz - EP	A
DSP	SM320LC31PQM40EP	V62/03617-01XE	320LC31, Floating-pt, 40 MFLOPS – EP	M
DSP	SM320LF2407APGEMEP	V62/04608-01XE	320LF2407, 16-bit Fixed-pt with Flash, 40 MIPS – EP	M
DSP	SM320VC33GNMM150EP	V62/03610-02YE	320VC33, Floating-point, 150 MFLOPS – EP	M
DSP	SM320VC33PGEA120EP	V62/03610-01XE	320VC33, Floating-point, 120 MFLOPS – EP	A
DSP	SM320VC5409GGU10EP	Contact DSCC	VC5409 Fixed-pt, 100 MIPS – EP	Comm'l
DSP	SM320VC5416GGU16EP	Contact DSCC	VC5416 Fixed-pt, 160 MIPS – EP	Comm'l
DSP	SM320VC5416PGE16EP	Contact DSCC	VC5416 Fixed-pt, 160 MIPS – EP	Comm'l
DSP	SM320VC5421PGE20EP	V62/04607-01XE	VC5421 Fixed-pt, 200 MIPS – EP	Comm'l
DSP	SM32C6414DGLZ50AEP	Contact DSCC	320C6414 Fixed-pt, 4000 MIPS, 500 MHz – EP	A
DSP	SM32C6415DGLZ50AEP	Contact DSCC	320C6415 Fixed-pt, 4000 MIPS, 500 MHz – EP	A
DSP	SM32C6416DGLZ50AEP	Contact DSCC	320C6416 Fixed-pt, 4000 MIPS, 500 MHz w/Vertibi Coprocessor – EP	A
DSP	SM32VC5510AGGWA2EP	V62/04605-01XE	VC5510A Fixed-pt, 400 MIPS, 200 MHz – EP	Comm'l

### Analog

Family	Device Name	DSCC Vendor Item Drawing	Description	Temp Range
1394	TSB12LV01BIPZTEP	V62/03611-01XE	1394 Link Layer Controller – EP	I
1394	TSB12LV26TPZEP	V62/03627-01XE	OHCI-Lynx PCI-Based IEEE 1394 Host Controller – EP	T
1394	TSB12LV32TPZEP	V62/03622-01XE	1394 GP2-Lynx – EP	T
1394	TSB41AB3IPFPEP	V62/03612-01XE	3-Port 400MBPS PHY Transceiver – EP	I
1394	TSB41BA3TPFPEP	V62/03670-01XE	EP 1394b-2002 3-Port Physical Layer – EP	T
1394	TSB43AA82AIPGEEP	Contact DSCC	2-Port High Performance Integrated PHY and Link Layer – EP	I
1394	TSB43AB21AIPDTEP	V62/03637-01XE	EP Integrated 1394a OHCI w/1 port PHY – EP	T
1394	TSB81BA3IPFPEP	V62/04612-01XE	IEEE P1394b Three-Port Cable Transceiver Arbiter – EP	I
1394	TSB82AA2IPGEEP	V62/04611-01XE	IEEE 1394b OHCI-Lynx Controller – EP	I
AMPLIFRS	TLC2272AMDREP	V62/03618-01XA	Dual RRO Op-Amp – EP	M
AMPLIFRS	TLV2462AQDREP	V62/03619-03XA	Dual RRIO Op-Amp – EP	Q
AMPLIFRS	TLV2463AQDREP	V62/03619-04YA	Dual RRIO Op-Amp w/ Shutdown – EP	Q
COMPAR	LM211QDREP	V62/03638-01XE	Single, Strobed Differential Comparator – EP	Q
COMPAR	LM239AQDREP	V62/03672-01XE	Enhanced Plastic Quad Diff Comparator – EP	Q
COMPAR	TLC3702MDREP	V62/03643-01XE	Dual, L/Pwr, Push-Pull Comparator – EP	M
COMPAR	TLV3701QDBVREP	Contact DSCC	Single Nanopower Push-Pull Comparator – EP	Q
DACQ	THS1206MDAREP	V62/03609-01XA	12-Bit, 6 MSPS ADC Quad Ch – EP	M
DACQ	THS1401QPHPEP	V62/03608-01XE	14-Bit, 1 MSPS Single Channel ADC, Diff. Input, DSP/uP IF – EP	Q
DACQ	THS1403QPHPEP	V62/03608-02XE	14-Bit, 3 MSPS Single Ch. ADC, Diff. Input, DSP/uP IF – EP	Q
DACQ	THS1408MPHPEP	V62/03608-03XE	14-Bit, 8 MSPS ADC Single Ch., Diff. Input, DSP/uP IF – EP	M
DACQ	TLC1543QDWREP	V62/04647-01XE	10-Bit A/D W/Serial Output – EP	Q
DACQ	TLC2543QDWREP	V62/03614-01XE	12-Bit ADC W/11 Channels & EOC – EP	Q
DACQ	TLV1548QDBREP	V62/04618-01XE	A/D converter, 10-Bit, 8 Mux Input – EP	Q
DACQ	TLV5618AMDREP	V62/04646-01XE	12-Bit dual D-to-A Converter – EP	M
DACQ	TLV5619QDWREP	V62/03615-01XE	12 Bit CMOS DAC – EP	Q
DACQ	TLV5638MDREP	V62/03628-01XE	12 Bit D/A Converter, Serial Data Out – EP	M
DACQ	TLV5638QDREP	V62/03628-01XE	Low Power Dual 12-Bit DAC W/Ref – EP	Q
DCCONTRL	TPS5120QDBTREP	V62/04645-01XE	Dual Output, Two-Phase Synchronous Buck Controller – EP	Q

## Analog

Family	Device Name	DSCC Vendor Item Drawing	Description	Temp Range
VOLT REG	TPS79325DBVREP	V62/03634-03XE	Ultra Low Noise High PSRR 200 mA – EP	Q
VOLT REG	TPS79333DBVREP	V62/03634-07XE	Ultra Low Noise High PSRR 200 mA – EP	Q
DCCONTRL	TPS54680QPWPREP	V62/04641-01XE	Low Input Voltage 6 A Synchronous Buck Converter – EP	Q
INTRFACE	PCI1520IGHKEP	V62/04613-01XE	EP PC Card Controller – EP	Comm'l
INTRFACE	PCI1520IPDVEP	Contact DSCC	PC Card Controller – EP	I
INTRFACE	SN65LBC176AQDREP	V62/03671-01XE	Differential Bus Transceiver – EP	Q
INTRFACE	SN65LVDS95DGGREP	V62/04643-01XE	LVDS SERDES Transmitter – EP	Comm'l
Op-Amp	TLC2252AQDREP	V62/04682-02XE	Rail-To-Rail Dual Op Amp – EP	Q
Op-Amp	TLC2252QDREP	V62/04682-01XE	Rail-To-Rail Dual Op Amp – EP	Q
Op-Amp	TLC2254AQDREP	V62/04682-04YE	Rail-To-Rail Quad Op Amp – EP	Q
Op-Amp	TLC2254QDREP	V62/04682-03YE	Rail-To-Rail Quad Op Amp – EP	Q
Op-Amp	TLC2274AMDREP	Contact DSCC	Advanced LinCMOS™ Rail-to-Rail Quad Op Amp – EP	M
Op-Amp	TLC2274AMPWREP	Contact DSCC	Advanced LinCMOS™ Rail-to-Rail Quad Op Amp – EP	M
Op-Amp	TLC2274MDREP	Contact DSCC	Advanced LinCMOS™ Rail-to-Rail Quad Op Amp – EP	M
Op-Amp	TLC2274MPWREP	Contact DSCC	Advanced LinCMOS™ Rail-to-Rail Quad Op Amp – EP	M
Op-Amp	TLV2252AQDREP	V62/04651-02UE	Low Voltage Rail-to-Rail Dual Op Amp – EP	Q
Op-Amp	TLV2252QDREP	V62/04651-01UE	Low Voltage Rail-to-Rail Dual Op Amp – EP	Q
Op-Amp	TLV2254AQDREP	V62/04651-04XE	Low Voltage Rail-to-Rail Quad Op Amp – EP	Q
Op-Amp	TLV2254QDREP	V62/04651-03XE	Low Voltage Rail-to-Rail Quad Op Amp – EP	Q
Supervisor	TPS3803-01QDCKREP	V62/04648-01XE	Processor Supervisory Circuit – EP	Q
Supervisor	TPS3803G15QDCKREP	V62/04648-02XE	Processor Supervisory Circuit – EP	Q
Supervisor	TPS3805H33QDCKREP	V62/04648-03XE	Processor Supervisory Circuit – EP	Q
VOLT REG	TLC7701QPWREP	V62/04604-01XE	Supply Voltage Supervisors – EP	Q
VOLT REG	TLC7705QPWREP	V62/04604-02XE	Supply Voltage Supervisors – EP	Q
VOLT REG	TLC7733QPWREP	V62/04604-03XE	Supply Voltage Supervisors – EP	Q
VOLT REG	TPS3307-18MDREP	V62/03629-01XE	Triple Processor Supervisory Circuits – EP	M
VOLT REG	TPS75201QPWPREP	V62/03635-01XE	Fast- Transient-Response 2A LDO – EP	Q
VOLT REG	TPS75215QPWPREP	V62/03635-02XE	Fast-Transient-Response 2A LDO – EP	Q
VOLT REG	TPS75218QPWPREP	V62/03635-03XE	Fast-Transient-Response 2A LDO – EP	Q
VOLT REG	TPS75225QPWPREP	V62/03635-04XE	Fast-Transient-Response 2A LDO – EP	Q
VOLT REG	TPS75233QPWPREP	V62/03635-05XE	Fast-Transient-Response 2A LDO – EP	Q
VOLT REG	TPS75301QPWPREP	V62/03636-06XE	Fast-Transient-Response 1.5A LDO – EP	Q
VOLT REG	TPS75315QPWPREP	V62/03636-07XE	Fast-Transient-Response 1.5A LDO – EP	Q
VOLT REG	TPS75318QPWPREP	V62/03636-08XE	Fast-Transient-Response 1.5A LDO – EP	Q
VOLT REG	TPS75325QPWPREP	V62/03636-09XE	Fast-Transient-Response 1.5A LDO – EP	Q
VOLT REG	TPS75333QPWPREP	V62/03636-10XE	Fast-Transient-Response 1.5A LDO – EP	Q
VOLT REG	TPS76701QPWPREP	V62/03630-01XE	Fast-Transient-Response 1A LDO – EP	Q
VOLT REG	TPS76715QPWPREP	V62/03630-02XE	Fast-Transient-Response 1A LDO – EP	Q
VOLT REG	TPS76718QPWPREP	V62/03630-03XE	Fast-Transient-Response 1A LDO – EP	Q
VOLT REG	TPS76725QPWPREP	V62/03630-04XE	Fast-Transient-Response 1A LDO – EP	Q
VOLT REG	TPS76733QPWPREP	V62/03630-08XE	Fast-Transient-Response 1A LDO – EP	Q
VOLT REG	TPS76750QPWPREP	V62/03630-09XE	Fast-Transient-Response 1A LDO – EP	Q
VOLT REG	TPS76801QPWPREP	V62/03632-01XE	1A Micropower LDO Voltage Regulator – EP	Q
VOLT REG	TPS76815QPWPREP	V62/03632-02XE	1A Micropower LDO Voltage Regulator – EP	Q
VOLT REG	TPS76818QPWPREP	V62/03632-03XE	1A Micropower LDO Voltage Regulator – EP	Q
VOLT REG	TPS76825QPWPREP	V62/03632-04XE	1A Micropower LDO Voltage Regulator – EP	Q
VOLT REG	TPS76833QPWPREP	V62/03632-08XE	1A Micropower LDO Voltage Regulator – EP	Q
VOLT REG	TPS76850QPWPREP	V62/03632-09XE	1A Micropower LDO Voltage Regulator – EP	Q
VOLT REG	TPS77501MPWPREP	V62/03631-01XE	500 mA LDO Voltage Regulator – EP	M
VOLT REG	TPS77515MPWPREP	V62/03631-02XE	500 mA LDO Voltage Regulator – EP	M
VOLT REG	TPS77518MPWPREP	V62/03631-04XE	500 mA LDO Voltage Regulator – EP	M
VOLT REG	TPS77525MPWPREP	V62/03631-05XE	500 mA LDO Voltage Regulator – EP	M
VOLT REG	TPS77533MPWPREP	V62/03631-06XE	500 mA LDO Voltage Regulator – EP	M
VOLT REG	TPS77601QPWPREP	V62/03631-07XE	500 mA LDO Voltage Regulator – EP	Q
VOLT REG	TPS77615QPWPREP	V62/03631-08XE	500 mA LDO Voltage Regulator – EP	Q
VOLT REG	TPS77618QPWPREP	V62/03631-09XE	500 mA LDO Voltage Regulator – EP	Q
VOLT REG	TPS77625QPWPREP	V62/03631-10XE	500 mA LDO Voltage Regulator – EP	Q
VOLT REG	TPS77633QPWPREP	V62/03631-12XE	500 mA LDO Voltage Regulator – EP	Q
VOLT REG	TPS79101DBVREP	V62/03644-01YE	Ultra Low Noise High PSRR 100 mA – EP	Q
VOLT REG	TPS79118DBVREP	V62/03644-02XE	Ultra Low Noise High PSRR 100 mA – EP	Q
VOLT REG	TPS79133DBVREP	V62/03644-03XE	Ultra Low Noise High PSRR 100 mA – EP	Q
VOLT REG	TPS79147DBVREP	V62/03644-04XE	Ultra Low Noise High PSRR 100 mA – EP	Q

## Analog

		DSCC Vendor		Temp Range
Family	Device Name	Item Drawing	Description	
VOLT REG	TPS79301DBVREP	V62/03634-01YE	Ultra Low Noise High PSRR 200 mA – EP	Q
VOLT REG	TPS79318DBVREP	V62/03634-02XE	Ultra Low Noise High PSRR 200 mA – EP	Q
VOLT REG	TPS793475DBVREP	V62/03634-08XE	Ultra Low Noise High PSRR 200 mA – EP	Q
VOLT REG	UC1842AMDREP	Contact DSCC	Current-Mode PWM Controller – EP	M
VOLT REG	UC1843AMDREP	Contact DSCC	Current-Mode PWM Controller – EP	M
VOLT REG	UC1844AMDREP	V62/03625-04XE	Current-Mode PWM Controller – EP	M
VOLT REG	UC1845AMDREP	Contact DSCC	Current-Mode PWM Controller – EP	M
VOLT REG	UC2832TDWEP	V62/03633-01XE	Voltage Regulator – EP	T
VOLT REG	UC2832TDWREP	V62/03633-01XE	Prec Low Dropout Linear Controller – EP	T
VOLT REG	UCC2800QDREP	V62/03624-01XE	Low-Power BiCMOS Current-Mode PWM – EP	Q
VOLT REG	UCC2801QDREP	V62/03624-02XE	Low-Power BiCMOS Current-Mode PWM – EP	Q
VOLT REG	UCC2802QDREP	V62/03624-03XE	Low-Power BiCMOS Current-Mode PWM – EP	Q
VOLT REG	UCC2803QDREP	V62/03624-04XE	Low-Pwr Current-Mode PWM – EP	Q
VOLT REG	UCC2804QDREP	V62/03624-05XE	Low-Power BiCMOS Current-Mode PWM – EP	Q
VOLT REG	UCC2805QDREP	V62/03624-06XE	Transition Mode PFC Controller – EP	Q
VOLT REG	UCC2808AQDR-1EP	V62/04642-01XE	Low-Power Current-Mode Push-Pull PWM – EP	Q
VOLT REG	UCC2808AQDR-2EP	V62/04642-02XE	Low-Power Current-Mode Push-Pull PWM – EP	Q

## Advanced Logic

		DSCC Vendor		Temp Range
Family	Device Name	Item Drawing	Description	
ABT	SN74ABT245BMBDREP	Contact DSCC	Octal Bus Transceiver With 3-State Outputs – EP	M
ABT	SN74ABTH32245MPZEP	V62/03620-01XE	36-Bit Reg Bus Transceiver, 3-St Outputs – EP	M
ABT	SN74ABTH32543MPZEP	V62/03621-01XE	36-Bit Reg Bus Transceiver, 3-St Output – EP	M
ABT	SN74ABT541BIPWREP	Contact DSCC	Octal Buffers/Driver With 3-State Outputs – EP	I
AC	SN74AC04MDREP	V62/04614-01XE	Hex Inverter – EP	M
AC	SN74AC08MDREP	V62/04615-01XE	Quad 2-Input Positive-AND Gate – EP	M
AC	SN74AC11PWREP	Contact DSCC	Triple 3-Input Positive-AND Gate – EP	I
AC	SN74AC244MDWREP	V62/04622-01XE	Octal Buffers/Driver With 3-State Outputs – EP	M
AC	SN74AC32MDREP	V62/04616-01XE	Quad 2-Input Positive-OR Gate – EP	M
AC	SN74AC373MDWREP	V62/04621-01XE	Octal D-Type Transparent Latch With 3-State Outputs – EP	M
AC	SN74AC74MDREP	V62/04617-01XE	Dual Positive-Edge-Triggered D-Type Flip-Flop – EP	M
ACT	SN74ACT16245QDLREP	V62/03601-01XE	16-Bit Bus Transceiver – EP	Q
ACT	SN74ACT16373QDLREP	V62/03602-01XE	16-Bit D-Type Transparent Latch – EP	Q
ACT	SN74ACT16374QDLREP	V62/03603-01XE	16-Bit D-Type Flip-Flop – EP	Q
ACT	SN74ACT244MDWREP	V62/04620-01XE	Octal Buffers/Driver With 3-State Outputs – EP	M
ACT	SN74ACT373MDWREP	V62/04619-01XE	Octal D-Type Transparent Latche With 3-State Outputs – EP	M
ACT	SN74ACT74MDREP	Contact DSCC	Dual Positive-Edge-Triggered D-Type Flip-Flop – EP	M
ADC	TLV1548QDBREP	Contact DSCC	10-Bit 85 kSPS ADC Serial Out, Pgrmable Pwr/PwrDn/Conversion Rate	Q
AHC	SN74AHC00MDREP	V62/03604-01XE	Quad 2-Input Positive-NAND Gate – EP	M
AHC	SN74AHC00MPWREP	V62/03604-01YE	Quad 2-Input Positive-NAND Gate – EP	M
AHC	SN74AHC02MPWREP	V62/03645-01XE	Quad 2-Input Positive-NOR Gate – EP	M
AHC	SN74AHC04MDREP	V62/03646-01YE	Hex Inverter – EP	M
AHC	SN74AHC04MPWREP	V62/03646-01XE	Hex inverter – EP	M
AHC	SN74AHC08MDREP	V62/03647-01YE	Quad 2-Input Positive-AND Gate – EP	M
AHC	SN74AHC08MPWREP	V62/03647-01XE	Quad 2-Input Positive-AND Gate – EP	M
AHC	SN74AHC125MDREP	V62/03648-01YE	Quad Bus Buffer Gate With 3-State – EP	M
AHC	SN74AHC125MPWREP	V62/03648-01XE	Quad Bus Buffer Gate With 3-State – EP	M
AHC	SN74AHC14MDREP	V62/03605-01XE	Hex Schmitt-Trigger Inverter – EP	M
AHC	SN74AHC14MPWREP	V62/03605-01YE	Hex Schmitt-Trigger – EP	M
AHC	SN74AHC244MDWREP	V62/03649-01YE	Octal Buffers/Driver With 3-State Output – EP	M
AHC	SN74AHC244MPWREP	V62/03649-01XE	Octal Buffers/Driver With 3-State Output – EP	M
AHC	SN74AHC245MDWREP	V62/03650-01YE	Octal Bus Transceiver With 3-State Output – EP	M
AHC	SN74AHC245MPWREP	V62/03650-01XE	Octal Bus Transceiver With 3-State Output – EP	M
AHC	SN74AHC32MDREP	V62/03651-01YE	Quad 2-Input Positive-OR Gate – EP	M
AHC	SN74AHC32MPWREP	V62/03651-01XE	Quad 2-Input Positive-OR Gate – EP	M
AHC	SN74AHC74MDREP	V62/03652-01YE	Dual Positive-Edge-Triggered D-Type Flip-Flop – EP	M
AHC	SN74AHC74MPWREP	V62/03652-01XE	Dual Positive-Edge-Triggered D-Type Flip-Flop – EP	M
AHC	SN74AHC74MDREP	V62/03659-01YE	Dual Positive-Edge-Triggered D-Type Flip-Flop – EP	M
AHC	SN74AHC74MPWREP	V62/03659-01XE	Dual Positive-Edge-Triggered D-Type Flip-Flop – EP	M
AHCT	SN74AHCT00MDREP	V62/03653-01YE	Quad 2-input positive-NAND Gate – EP	M
AHCT	SN74AHCT00MPWREP	V62/03653-01XE	Quad 2-input positive-NAND Gate – EP	M

## Advanced Logic

Family	Device Name	DSCC Vendor	Description Item Drawing	Temp Range
AHCT	SN74AHCT08MDREP	V62/03654-01YE	Quad 2-Input Positive-AND Gate – EP	M
AHCT	SN74AHCT08MPWREP	V62/03654-01XE	Quad 2-Input Positive-AND Gate – EP	M
AHCT	SN74AHCT125QDREP	Contact DSCC	Quad Bus Buffer Gate With 3-State Outputs – EP	Q
AHCT	SN74AHCT125QPWREP	Contact DSCC	Quad Bus Buffer Gate With 3-State Outputs – EP	Q
AHCT	SN74AHCT126QDREP	Contact DSCC	Quad Bus Buffer Gate With 3-State Outputs – EP	Q
AHCT	SN74AHCT126QPWREP	Contact DSCC	Quad Bus Buffer Gate With 3-State Outputs – EP	Q
AHCT	SN74AHCT138MDREP	V62/03655-01YE	3-Line to 8-Line Decoder/Demultiplexer – EP	M
AHCT	SN74AHCT138MPWREP	V62/03655-01XE	3-Line to 8-Line Decoder/Demultiplexer – EP	M
AHCT	SN74AHCT14MDREP	V62/03656-01YE	Hex Schmitt-Trigger Inverter – EP	M
AHCT	SN74AHCT14MPWREP	V62/03656-01XE	Hex Schmitt-Trigger Inverter – EP	M
AHCT	SN74AHCT244MDWREP	V62/03657-01YE	Octal Buffer/Driver With 3-State Output – EP	M
AHCT	SN74AHCT244MPWREP	V62/03657-01XE	Octal Buffer/Driver With 3-State Output – EP	M
AHCT	SN74AHCT32MDREP	V62/03658-01YE	Quad 2-Input Positive-OR Gate – EP	M
AHCT	SN74AHCT32MPWREP	V62/03658-01XE	Quad 2-Input Positive-OR Gate – EP	M
ALVC	SN74ALVC00IDREP	Contact DSCC	Quad 2-Input Positive-NAND Gate – EP	I
ALVC	SN74ALVC08IDREP	Contact DSCC	Quad 2-Input Positive-AND Gate – EP	I
HC	SN74HC02QPWREP	Contact DSCC	Quad 2-Input Positive-NOR Gate – EP	Q
HC	CD74HC08QM96EP	Contact DSCC	High Speed CMOS Logic Quad 2-Input AND Gate – EP	Q
HC	SN74HC10QDREP	Contact DSCC	Dual J-K Positive-Edge-Triggered Flip-Flop With Clr & Pre – EP	Q
HC	SN74HC10QPWREP	Contact DSCC	Dual J-K Positive-Edge-Triggered Flip-Flop With Clr & Pre – EP	Q
HC	SN74HC165QDREP	Contact DSCC	8-Bit Parallel-Load Shift Register – EP	Q
HC	SN74HC165QPWREP	Contact DSCC	8-Bit Parallel-Load Shift Register – EP	Q
HC	SN74HC166AIDREP	Contact DSCC	8-Bit Parallel-Load Shift Register – EP	I
HC	SN74HC244MDWREP	V62/03607-01XE	Octal Buffers, Line Driver 3-State Outputs – EP	M
HC	SN74HC244QDWPREP	Contact DSCC	Octal Buffers And Line Driver With 3-State Outputs – EP	Q
HC	SN74HC244QPWREP	Contact DSCC	Octal Buffers And Line Driver With 3-State Outputs – EP	Q
HC	SN74HC253QDREP	Contact DSCC	Dual 4-Line to 1-Line Data Selectors/Multiplexer With 3-State – EP	Q
HC	CD74HC40103QM96EP	Contact DSCC	High Speed CMOS Logic 8-Stage Synchronous Down Counter – EP	Q
HC	CD74HC4017QM96EP	Contact DSCC	High Speed CMOS Decade Cntr/Divider w/10 Decoded Outputs – EP	Q
HC	CD74HC4017QPWREP	Contact DSCC	High Speed CMOS Decade Cntr/Divider w/10 Decoded Outputs – EP	Q
HC	CD74HC4051MM96EP	V62/03606-01XE	High Speed CMOS Logic Analog Multiplexer/Demultiplexer – EP	M
HCT	SN74HCT04IDREP	Contact DSCC	Hex Inverter – EP	I
HCT	SN74HCT244QPWREP	Contact DSCC	Octal Buffer And Line Driver With 3-State Outputs – EP	Q
HCT	CD74HCT574QM96EP	Contact DSCC	High Spd CMOS Octal Pos-Edge-Trig D-Type Flip-Flop w/3-State – EP	Q
HCT	CD74HCT574QPWREP	Contact DSCC	High Spd CMOS Octal Pos-Edge-Trig D-Type Flip-Flop w/3-State – EP	Q
LV	SN74LV04ATPWREP	Contact DSCC	Hex Inverter – EP	T
LV	SN74LV08ATPWREP	V62/03660-01XE	Quad 2-Input Positive-AND Gate – EP	T
LV	SN74LV11ATPWREP	Contact DSCC	Triple 3-Input Positive-AND Gate – EP	T
LV	SN74LV123ATPWREP	V62/03661-01XE	Dual Retriggerable Monostable Multivibrator – EP	T
LV	SN74LV14ATPWREP	V62/03662-01XE	Hex Schmitt-Trigger Inverter – EP	T
LV	SN74LV32ATPWREP	Contact DSCC	Quad 2-Input Positive-OR Gate – EP	T
LV	SN74LV374ATPWREP	V62/03663-01XE	Octal Edge-Triggered D-Type Flip-Flop – EP	T
LV	SN74LV393ATPWREP	Contact DSCC	Dual 4-Bit Binary Counters – EP	T
LV	SN74LV4051ATDREP	V62/03664-01YE	8-Channel Analog Multiplexer/Demultiplexer – EP	T
LV	SN74LV4051ATPWREP	V62/03664-01XE	8-Channel Analog Multiplexer/Demultiplexer – EP	T
LV	SN74LV4052ATDREP	V62/03665-01YE	Dual 4-Channel Analog Multiplexer/Demultiplexer – EP	T
LV	SN74LV4052ATPWREP	V62/03665-01XE	Dual 4-Channel Analog Multiplexer/Demultiplexer – EP	T
LV	SN74LV4053ATDREP	V62/03666-01YE	Triple 2-Channel Analog Multiplexer/Demultiplexer – EP	T
LV	SN74LV4053ATPWREP	V62/03666-01XE	Triple 2-Channel Analog Multiplexer/Demultiplexer – EP	T
LV	SN74LV595AIPWREP	Contact DSCC	8-Bit Shift Register With 3-State Output Register – EP	I
LV	SN74LV86ATPWREP	Contact DSCC	Quad 2-Input Exclusive-OR Gate – EP	T
LVC	CLVC16244AIDGGREP	Contact DSCC	16-Bit Buffer/Driver – EP	I
LVC	SN74LVC00AQDREP	V62/04652-01XE	Quad 2-Input Positive-NAND Gate – EP	Q
LVC	SN74LVC00AQPWREP	V62/04652-01YE	Quad 2-Input Positive-NAND Gate – EP	Q
LVC	SN74LVC04AQDREP	V62/04653-01XE	Hex Inverter – EP	Q
LVC	SN74LVC04AQPWREP	V62/04653-01YE	Hex Inverter – EP	Q
LVC	SN74LVC07AIPWREP	V62/04654-01XE	Hex Buffer/Driver With Open-Drain Outputs – EP	I
LVC	SN74LVC08AQDREP	V62/04655-01XE	Quad 2-Input Positive-AND Gate – EP	Q
LVC	SN74LVC08AQPWREP	V62/04655-01YE	Quad 2-Input Positive-AND Gate – EP	Q
LVC	SN74LVC125AIPWREP	Contact DSCC	Quad Bus Buffer Gate – EP	I
LVC	SN74LVC138AQDREP	V62/04657-01XE	3-Line To 8-Line decoder/Demultiplexer – EP	Q
LVC	SN74LVC138AQPWREP	V62/04657-01YE	3-Line To 8-Line decoder/Demultiplexer – EP	Q



## Advanced Logic

Family	Device Name	DSCC Vendor Item Drawing	Description	Temp Range
LVC	SN74LVC14AQDREP	V62/04658-01XE	Hex Schmitt-Trigger Inverter – EP	Q
LVC	SN74LVC14AQPWREP	V62/04658-01YE	Hex Schmitt-Trigger Inverter – EP	Q
LVC	SN74LVC157AQDREP	V62/04659-01XE	Quad 2-Line To1-Line Data Selector – EP	Q
LVC	SN74LVC157AQPWREP	V62/04659-01YE	Quad 2-Line To1-Line Data Selector – EP	Q
LVC	SN74LVC1G97IDCKREP	V62/03642-01XE	Configurable Multiple Function Gate – EP	I
LVC	SN74LVC1G98IDCKREP	V62/03641-01XE	Configurable Multiple Function Gate – EP	I
LVC	SN74LVC245AIPWREP	Contact DSCC	Octal Bus Transceiver With 3-State Outputs – EP	I
LVC	SN74LVC257AQDREP	V62/04660-01XE	Quad 2-Line to 1-Line Data Selector/Multiplexer – EP	Q
LVC	SN74LVC257AQPWREP	V62/04660-01YE	Quad 2-Line to 1-Line Data Selector/Multiplexer – EP	Q
LVC	SN74LVC32AQDREP	V62/04661-01YE	Quad 2-Input Positive-OR Gate – EP	Q
LVC	SN74LVC32AQPWREP	V62/04661-01XE	Quad 2-Input Positive-OR Gate – EP	Q
LVC	SN74LVC373AQDWPREP	V62/04662-01XE	Octal Xparent D-Type Latch w/3-state Ouputs – EP	Q
LVC	SN74LVC373AQPWREP	V62/04662-01YE	Octal Xparent D-Type Latch w/3-state Ouputs – EP	Q
LVC	SN74LVC374AQDWPREP	V62/04663-01XE	Octal Edge-Triggered D-Type Flip-Flop with 3-state Outputs – EP	Q
LVC	SN74LVC374AQPWREP	V62/04663-01YE	Octal Edge-Triggered D-Type Flip-Flop with 3-state Outputs – EP	Q
LVC	SN74LVC4245AIPWREP	V62/04664-01XE	Octal Bus Transceiver And 3.3-V to 5-V Shifter – EP	I
LVC	SN74LVC540AQDWPREP	Contact DSCC	Octal Buffer/Driver With 3-State Outputs – EP	Q
LVC	SN74LVC540AQPWREP	Contact DSCC	Octal Buffer/Driver With 3-State Outputs – EP	Q
LVC	SN74LVC541AQDWPREP	Contact DSCC	Octal Buffer/Driver With 3-State Outputs – EP	Q
LVC	SN74LVC541AQPWREP	Contact DSCC	Octal Buffer/Driver With 3-State Outputs – EP	Q
LVC	SN74LVC573AQDWPREP	Contact DSCC	Octal Transparent D-Type Latch w/3-state Outputs – EP	Q
LVC	SN74LVC573AQPWREP	Contact DSCC	Octal Transparent D-Type Latch w/3-state Outputs – EP	Q
LVC	SN74LVC574AQDWPREP	Contact DSCC	Octal Edge-Trig D-Type Flip-Flop w/3-state Outputs – EP	Q
LVC	SN74LVC574AQPWREP	Contact DSCC	Octal Edge-Trig D-Type Flip-Flop w/3-state Outputs – EP	Q
LVC	SN74LVC74AQDREP	V62/04669-01XE	Dual Positive-Edge-Trig D-Type Flip-Flops– EP	Q
LVC	SN74LVC74AQPWREP	V62/04669-01YE	Dual Positive-Edge-Trig D-Type Flip-Flop – EP	Q
LVC	SN74LVC86AQDREP	V62/04670-01XE	Quad 2-Input Exclusive-OR Gate – EP	Q
LVC	SN74LVC86AQPWREP	V62/04670-01YE	Quad 2-Input Exclusive-OR Gate – EP	Q
LVC	CLVC1G125IDCKREP	Contact DSCC	Single Bus Buffer Gate With 3-State Outputs - EP	I
LVC	CLVC1G126IDCKREP	Contact DSCC	Single Bus Buffer Gate With 3-State Outputs - EP	I
LVC	SN74LVC1G00IDCKREP	Contact DSCC	Single 2-Input Positive-NAND Gate - EP	I
LVC	SN74LVC1G08IDCKREP	Contact DSCC	Single 2-Input Positive-AND Gate - EP	I
LVC	SN74LVC1G32IDCKREP	Contact DSCC	Single 2-Input Positive-OR Gate - EP	I
LVCH	CLVCH16652AIDGGREP	Contact DSCC	16-Bit Bus Transceiver And Register – EP	I
LVT	SN74LVT125QPWREP	Contact DSCC	3.3-V ABT Quad Bus Buffer With 3-State Outputs – EP	Q
LVT	SN74LVT8980AIDWPREP	V62/03668-01XE	JTAG Embedded Test-Bus Controller – EP	I
LVT	SN74LVT8996AIPWREP	V62/04644-01YE	10-Bit Addr Scan Ports Multidrop-Addressable JTAG TAP Xcvr – EP	I
LVTH	8V182512IDGGREP	Contact DSCC	3.3-V ABT Scan Test Device With 18-Bit Universal Bus Xcvr – EP	I
LVTH	8V18502AIPMREP	Contact DSCC	3.3-V ABT Scan Test Device With 18-Bit Universal Bus Xcvr – EP	I
LVTH	8V18646AIPMREP	Contact DSCC	3.3-V ABT Scan Test Device With 18-Bit Xcvr & Reg – EP	I
LVTH	CLVTH162240IDGGREP	Contact DSCC	3.3-V ABT 16-Bit Buffer/Driver With 3-State Outputs – EP	I
LVTH	CLVTH162244IDGGREP	Contact DSCC	3.3-V ABT 16-Bit Buffer/Driver With 3-State Outputs – EP	I
LVTH	CLVTH162245IDGGREP	Contact DSCC	3.3-V ABT 16-Bit Bus Transceiver With 3-State Outputs – EP	I
LVTH	CLVTH16240IDGGREP	Contact DSCC	3.3-V 16-Bit Buffer/Driver With 3-State Outputs – EP	I
LVTH	CLVTH16244AIDGVREP	Contact DSCC	3.3-V ABT 16-Bit Buffer/Driver, 3-state - EP	I
LVTH	CLVTH16244AIGQLREP	Contact DSCC	3.3-V ABT 16-Bit Buffer/Driver, 3-state - EP	I
LVTH	CLVTH16244AIZQLREP	Contact DSCC	3.3-V ABT 16-Bit Buffer/Driver, 3-state - EP	I
LVTH	CLVTH16244AQDGGREP	Contact DSCC	3.3-V ABT 16-Bit Buffer/Driver, 3-state – EP	Q
LVTH	CLVTH16244AQDLREP	V62/04601-01XE	3.3-V ABT 16-Bit Buffer/Driver, 3-state – EP	Q
LVTH	CLVTH16245AIDGVREP	Contact DSCC	3.3V ABT 16-Bit Bus Transceiver, 3-state - EP	I
LVTH	CLVTH16245AIGQLREP	Contact DSCC	3.3V ABT 16-Bit Bus Transceiver, 3-state - EP	I
LVTH	CLVTH16245AIZQLREP	Contact DSCC	3.3V ABT 16-Bit Bus Transceiver, 3-state - EP	I
LVTH	CLVTH16245AQDGGREP	V62/04602-01YE	3.3V ABT 16-Bit Bus Transceiver,3-state – EP	Q
LVTH	CLVTH16245AQDLREP	V62/04602-01XE	3.3V ABT 16-Bit Bus Transceiver,3-state – EP	Q
LVTH	CLVTH16373IDGGREP	Contact DSCC	3.3-V ABT 16-Bit Transparent D-Type Latch With 3-State Outputs – EP	I
LVTH	CLVTH16373IDLREP	Contact DSCC	3.3-V ABT 16-Bit Transparent D-Type Latch With 3-State Outputs - EP	I
LVTH	CLVTH16373IGQLREP	Contact DSCC	3.3-V ABT 16-Bit Transparent D-Type Latch With 3-State Outputs - EP	I
LVTH	CLVTH16373IZQLREP	Contact DSCC	3.3-V ABT 16-Bit Transparent D-Type Latch With 3-State Outputs - EP	I
LVTH	CLVTH16374IDGGREP	Contact DSCC	3.3-V ABT 16-Bit Edge-Trig D-Type Flip-Flop With 3-State Outputs – EP	I
LVTH	CLVTH16500IDGGREP	Contact DSCC	3.3-V ABT 18-Bit Universal Bus Transceiver With 3-State Outputs – EP	I
LVTH	CLVTH16501IDGGREP	Contact DSCC	3.3-V ABT 18-Bit Universal Bus Transceiver With 3-State Outputs – EP	I
LVTH	CLVTH16543IDGGREP	Contact DSCC	3.3-V ABT 16-Bit Registered Transceiver With 3-State Outputs – EP	I

## Advanced Logic

Advanced Logic				
Family	Device Name	DSCC Vendor Item Drawing	Description	Temp Range
LVTH	CLVTH16646IDGGREP	Contact DSCC	3.3 V ABT 16-Bit Bus Transceiver With 3-State Outputs – EP	I
LVTH	CLVTH16652IDGGREP	V62/04682-02XE	3.3 V ABT 16-Bit Bus Xcvr And Register With 3-State Outputs – EP	I
LVTH	CLVTH16835IDGGREP	Contact DSCC	3.3-V ABT 18-Bit Universal Bus Driver With 3-State Outputs – EP	I
LVTH	CLVTH16952IDGGREP	Contact DSCC	3.3 V ABT 16-Bit Registered Transceiver With 3-State Outputs – EP	I
LVTH	CLVTH32244IGKEREP	Contact DSCC	3.3-V ABT 32-Bit Buffer/Driver With 3-State Outputs – EP	I
LVTH	CLVTH32373IGKEREP	Contact DSCC	3.3-V ABT 32-Bit Transparent D-Type Latch With 3-State Outputs – EP	I
LVTH	CLVTH32374IGKEREP	Contact DSCC	3.3-V ABT 32-Bit Edge-Trig D-Type Flip-Flop With 3-State Outputs – EP	I
LVTH	SN74LVTH1251PWREP	V62/04671-01XE	3.3-V ABT Quad Bus Buffer – EP	I
LVTH	SN74LVTH2401PWREP	V62/04672-01XE	3.3-V ABT Octal Buffer/Driver – EP	I
LVTH	SN74LVTH2411PWREP	V62/04673-01XE	3.3-V ABT Octal Buffer/Driver With 3-State Outputs – EP	I
LVTH	SN74LVTH244AQDBREP	V62/03667-01XE	3.3-V ABT Octal Buffer/Driver, 3-State – EP	Q
LVTH	SN74LVTH244AQPWREP	Contact DSCC	3.3-V ABT Octal Buffer/Driver, 3-State – EP	Q
LVTH	SN74LVTH245AIPWREP	Contact DSCC	3.3-V ABT Octal Bus Transceiver – EP	I
LVTH	SN74LVTH2731PWREP	Contact DSCC	3.3-V ABT Octal D-Type Flip-Flop With Clear – EP	I
LVTH	SN74LVTH3731PWREP	V62/04675-01XE	3.3-V ABT Octal Transparent D-Type Latch With 3-State Outputs – EP	I
LVTH	SN74LVTH3741PWREP	V62/04676-01XE	3.3-V ABT Octal Edge-Trig D-Type Flip-Flop With 3-State Outputs – EP	I
LVTH	SN74LVTH5431PWREP	V62/04677-01XE	3.3-V ABT Octal Registered Transceiver With 3-State Outputs – EP	I
LVTH	SN74LVTH5731PWREP	Contact DSCC	3.3-V ABT Octal Transparent D-Type Latch With 3-State Outputs – EP	I
LVTH	SN74LVTH5741PWREP	Contact DSCC	3.3-V ABT Octal Edge-Trig D-Type Flip-Flop With 3-State Outputs – EP	I
LVTH	SN74LVTH6461PWREP	Contact DSCC	3.3-V ABT Octal Bus Transceiver & Register With 3-State Outputs – EP	I
LVTH	SN74LVTH6521PWREP	Contact DSCC	3.3-V ABT Octal Bus Transceiver & Register With 3-State Outputs – EP	I

## FIFO Memories

FIFO Memories				
Family	Device Name	DSCC Vendor Item Drawing	Description	Temp Range
FIFO	SN74V263PZAEP	V62/03639-01XE	FIFO – EP	M
FIFO	SN74V273PZAEP	V62/03639-02XE	FIFO – EP	M
FIFO	SN74V283PZAEP	V62/03639-03XE	FIFO – EP	M
FIFO	SN74V293PZAEP	V62/03639-04XE	FIFO – EP	M

# EP Vendor Item Drawing Cross Reference (TI to DSCC VID)

## Digital Signal Processors

TI Device Name	DSCC Vendor Item Drawing
SM320C32PCMM50EP	V62/03616-01XE
SM320C32PCMM60EP	V62/03616-02XE
SM320C50PQM66EP	V62/03613-01XE
SM320C6201GJCA20EP	V62/04606-01XE
SM320C6202GJLA20EP	V62/03640-01XE
SM320C6701GJCA12EP	V62/03669-01XE
SM320C6713GDPS20EP	V62/04603-01XE
SM320LC31PQM40EP	V62/03617-01XE
SM320LF2407APGEMEP	V62/04608-01XE
SM320VC33GNMM150EP	V62/03610-02YE
SM320VC33PGEA120EP	V62/03610-01XE
SM320VC5409GGU10EP	V62/04649-01XE
SM320VC5416GGU16EP	V62/04610-01XE
SM320VC5416PGE16EP	V62/04610-01YE
SM320VC5421PGE20EP	V62/04607-01XE
SM32C6414DGLZ50AEP	V62/04609-01XE
SM32C6416DGLZ50AEP	V62/04609-03XE
SM32VC5510AGGWA2EP	V62/04605-01XE

## Analog

TI Device Name	DSCC Vendor Item Drawing
TSB12LV01BIPZTEP	V62/03611-01XE
TSB12LV26TPZEP	V62/03627-01XE
TSB12LV32TPZEP	V62/03622-01XE
TSB41AB31PFPEP	V62/03612-01XE
TSB41BA31PFPEP	V62/03670-01XE
TSB43AA82AIPGEEP	V62/04650-01XE
TSB43AB21AIPDTEP	V62/03637-01XE
TSB81BA31PFPEP	V62/04612-01XE
TSB82AA21PGEEP	V62/04611-01XE
TLC2272AMDREP	V62/03618-01XA
TLV2462AQDREP	V62/03619-03XA
TLV2463AQDREP	V62/03619-04YA
LM211QDREP	V62/03638-01XE
LM239AQDREP	V62/03672-01XE
TLC3702MDREP	V62/03643-01XE
TLV3701QDBVREP	V62/04726-01XE
THS1206MDAREP	V62/03609-01XA
THS1401QPHPEP	V62/03608-01XE
THS1403QPHPEP	V62/03608-02XE
THS1408MPHPEP	V62/03608-03XE
TLC1543QDWREP	V62/04647-01XE
TLC2543QDWREP	V62/03614-01XE
TLV1548QDBREP	V62/04618-01XE
TLV5618AMDREP	V62/04646-01XE
TLV5619QDWREP	V62/03615-01XE
TLV5638MDREP	V62/03628-01XE
TLV5638QDREP	V62/03628-01XE
TPS5120QDBTREP	V62/04645-01XE
TPS54680QPWPREP	V62/04641-01XE
PCI1520IGHKEP	V62/04613-01XE
SN65LBC176AQDREP	V62/03671-01XE
SN65LVD595DGGREP	V62/04643-01XE

## Analog

TI Device Name	DSCC Vendor Item Drawing
TSB12LV01BIPZTEP	V62/03611-01XE
TLC2252AQDREP	V62/04682-02XE
TLC2252QDREP	V62/04682-01XE
TLC2254AQDREP	V62/04682-04YE
TLC2254QDREP	V62/04682-03YE
TLC2274AMDREP	V62/03618-02YA
TLC2274AMPWREP	V62/03618-02UA
TLC2274MDREP	V62/03618-04YA
TLC2274MPWREP	V62/03618-04UA
TLV2252AQDREP	V62/04651-02UE
TLV2252QDREP	V62/04651-01UE
TLV2254AQDREP	V62/04651-04XE
TLV2254QDREP	V62/04651-03XE
TPS3803-01QDCKREP	V62/04648-01XE
TPS3803G15QDCKREP	V62/04648-02XE
TPS3805H33QDCKREP	V62/04648-03XE
TLC7701QPWREP	V62/04604-01XE
TLC7705QPWREP	V62/04604-02XE
TLC7733QPWREP	V62/04604-03XE
TPS3307-18MDREP	V62/03629-01XE
TPS75201QPWPREP	V62/03635-01XE
TPS75215QPWPREP	V62/03635-02XE
TPS75218QPWPREP	V62/03635-03XE
TPS75225QPWPREP	V62/03635-04XE
TPS75233QPWPREP	V62/03635-05XE
TPS75301QPWPREP	V62/03636-06XE
TPS75315QPWPREP	V62/03636-07XE
TPS75318QPWPREP	V62/03636-08XE
TPS75325QPWPREP	V62/03636-09XE
TPS75333QPWPREP	V62/03636-10XE
TPS76701QPWPREP	V62/03630-01XE
TPS76715QPWPREP	V62/03630-02XE
TPS76718QPWPREP	V62/03630-03XE
TPS76725QPWPREP	V62/03630-04XE
TPS76733QPWPREP	V62/03630-08XE
TPS76750QPWPREP	V62/03630-09XE
TPS76801QPWPREP	V62/03632-01XE
TPS76815QPWPREP	V62/03632-02XE
TPS76818QPWPREP	V62/03632-03XE
TPS76825QPWPREP	V62/03632-04XE
TPS76833QPWPREP	V62/03632-08XE
TPS76850QPWPREP	V62/03632-09XE
TPS77501MPWPREP	V62/03631-01XE
TPS77515MPWPREP	V62/03631-02XE
TPS77518MPWPREP	V62/03631-04XE
TPS77525MPWPREP	V62/03631-05XE
TPS77533MPWPREP	V62/03631-06XE
TPS77601QPWPREP	V62/03631-07XE
TPS77615QPWPREP	V62/03631-08XE
TPS77618QPWPREP	V62/03631-09XE
TPS77625QPWPREP	V62/03631-10XE
TPS77633QPWPREP	V62/03631-12XE
TPS79101DBVREP	V62/03644-01YE
TPS79118DBVREP	V62/03644-02XE
TPS79133DBVREP	V62/03644-03XE

## Analog

TI Device Name	DSCC Vendor Item Drawing
TPS79147DBVREP	V62/03644-04XE
TPS79301DBVREP	V62/03634-01YE
TPS79318DBVREP	V62/03634-02XE
TPS79325DBVREP	V62/03634-03XE
TPS79333DBVREP	V62/03634-04XE
TPS793475DBVREP	V62/03634-08XE
UC1844AMDREP	V62/03625-04XE
UC2832TDWEP	V62/03633-01XE
UC2832TDWREP	V62/03633-01XE
UCC2800QDREP	V62/03624-01XE
UCC2801QDREP	V62/03624-02XE
UCC2802QDREP	V62/03624-03XE
UCC2803QDREP	V62/03624-04XE
UCC2804QDREP	V62/03624-05XE
UCC2805QDREP	V62/03624-06XE
UCC2808AQDR-1EP	V62/04642-01XE
UCC2808AQDR-2EP	V62/04642-02XE

## Advanced Logic

TI Device Name	DSCC Vendor Item Drawing
UCC2808AQDR-2EP	V62/04642-02XE
8V185121DGGREP	V62/04730-01XE
8V18502AIPMREP	V62/04729-01XE
8V18646AIPMREP	V62/04731-01XE
CD74HC08QM96EP	V62/04704-01XE
CD74HC40103QM96EP	V62/04702-01XE
CD74HC4017QM96EP	V62/04703-01YE
CD74HC4051MM96EP	V62/03606-01XE
CD74HCT574QM96EP	V62/04739-01XE
CD74HCT574QWREP	V62/04739-01YE
CLVC16244AIDGGREP	V62/04724-01XE
CLVC1G125IDCKREP	V62/04735-01XE
CLVC1G126IDCKREP	V62/04736-01XE
CLVCH16652AIDGGREP	V62/04710-01XE
CLVTH162240IDGGREP	V62/04707-01XE
CLVTH162244IDGGREP	V62/04708-01XE
CLVTH162245IDGGREP	V62/04709-01XE
CLVTH16245AQDGGREP	V62/04602-01YE
CLVTH16245AQLDREP	V62/04602-01XE
CLVTH16373IDGGREP	V62/04712-01XE
CLVTH16374IDGGREP	V62/04711-01XE
CLVTH16500IDGGREP	V62/04713-01XE
CLVTH16501IDGGREP	V62/04714-01XE
CLVTH16543IDGGREP	V62/04715-01XE
CLVTH16646IDGGREP	V62/04716-01XE
CLVTH16652IDGGREP	V62/04682-02XE
CLVTH16835IDGGREP	V62/04717-01XE
CLVTH16952IDGGREP	V62/04718-01XE
CLVTH32244IGKREP	V62/04720-01XE
CLVTH32373IGKREP	V62/04721-01XE
CLVTH32374IGKREP	V62/04722-01XE
SN74ABT541BIPWREP	V62/04700-01XE



# EP Vendor Item Drawing Cross Reference (DSCC VID to TI)

## Digital Signal Processors

TI Device Name	DSCC Vendor Item Drawing
V62/03610-01XE	SM320VC33PGEA120EP
V62/03610-02YE	SM320VC33GNMM150EP
V62/03613-01XE	SM320C50PQM66EP
V62/03616-01XE	SM320C32PCMM50EP
V62/03616-02XE	SM320C32PCMM60EP
V62/03617-01XE	SM320LC31PQM40EP
V62/03640-01XE	SM320C6202GJLA20EP
V62/03669-01XE	SM320C6701GJCA12EP
V62/04603-01XE	SM320C6713GDP20EP
V62/04605-01XE	SM32VC5510AGGWA2EP
V62/04606-01XE	SM320C6201GJCA20EP
V62/04607-01XE	SM320VC5421PGE20EP
V62/04608-01XE	SM320LF2407APGEMEP
V62/04609-01XE	SM32C6414DGLZ50AEP
V62/04609-03XE	SM32C6416DGLZ50AEP
V62/04610-01XE	SM320VC5416GGU16EP
V62/04610-01YE	SM320VC5416PGE16EP
V62/04649-01XE	SM320VC5409GGU10EP

## Analog

TI Device Name	DSCC Vendor Item Drawing
V62/03608-01XE	THS1401QPHPEP
V62/03608-02XE	THS1403QPHPEP
V62/03608-03XE	THS1408MPHPEP
V62/03609-01XA	THS1206MDAREP
V62/03611-01XE	TSB12LV01BIPZTEP
V62/03611-01XE	TSB12LV01BIPZTEP
V62/03612-01XE	TSB41AB31PFPPEP
V62/03614-01XE	TLC2543QDWREP
V62/03615-01XE	TLV5619QDWREP
V62/03618-01XA	TLC2272AMDREP
V62/03618-02UA	TLC2274AMPWREP
V62/03618-02YA	TLC2274AMDREP
V62/03618-04UA	TLC2274MPWREP
V62/03618-04YA	TLC2274MDREP
V62/03619-03XA	TLV2462AQDREP
V62/03619-04YA	TLV2463AQDREP
V62/03622-01XE	TSB12LV32TPZEP
V62/03624-01XE	UCC2800QDREP
V62/03624-02XE	UCC2801QDREP
V62/03624-03XE	UCC2802QDREP
V62/03624-04XE	UCC2803QDREP
V62/03624-05XE	UCC2804QDREP
V62/03624-06XE	UCC2805QDREP
V62/03625-04XE	UC1844AMDREP
V62/03627-01XE	TSB12LV26TPZEP
V62/03628-01XE	TLV5638MDREP
V62/03628-01XE	TLV5638QDREP
V62/03629-01XE	TPS3307-18MDREP
V62/03630-01XE	TPS76701QPWPREP
V62/03630-02XE	TPS76715QPWPREP
V62/03630-03XE	TPS76718QPWPREP
V62/03630-04XE	TPS76725QPWPREP

## Analog

TI Device Name	DSCC Vendor Item Drawing
V62/03630-08XE	TPS76733QPWPREP
V62/03630-09XE	TPS76750QPWPREP
V62/03631-01XE	TPS77501MPWPREP
V62/03631-02XE	TPS77515MPWPREP
V62/03631-04XE	TPS77518MPWPREP
V62/03631-05XE	TPS77525MPWPREP
V62/03631-06XE	TPS77533MPWPREP
V62/03631-07XE	TPS77601QPWPREP
V62/03631-08XE	TPS77615QPWPREP
V62/03631-09XE	TPS77618QPWPREP
V62/03631-10XE	TPS77625QPWPREP
V62/03631-12XE	TPS77633QPWPREP
V62/03632-01XE	TPS76801QPWPREP
V62/03632-02XE	TPS76815QPWPREP
V62/03632-03XE	TPS76818QPWPREP
V62/03632-04XE	TPS76825QPWPREP
V62/03632-08XE	TPS76833QPWPREP
V62/03632-09XE	TPS76850QPWPREP
V62/03633-01XE	UC2832TDWEP
V62/03633-01XE	UC2832TDWREP
V62/03634-01YE	TPS79301DBVREP
V62/03634-02XE	TPS79318DBVREP
V62/03634-03XE	TPS79325DBVREP
V62/03634-07XE	TPS79333DBVREP
V62/03634-08XE	TPS793475DBVREP
V62/03635-01XE	TPS75201QPWPREP
V62/03635-02XE	TPS75215QPWPREP
V62/03635-03XE	TPS75218QPWPREP
V62/03635-04XE	TPS75225QPWPREP
V62/03635-05XE	TPS75233QPWPREP
V62/03636-06XE	TPS75301QPWPREP
V62/03636-07XE	TPS75315QPWPREP
V62/03636-08XE	TPS75318QPWPREP
V62/03636-09XE	TPS75325QPWPREP
V62/03636-10XE	TPS75333QPWPREP
V62/03637-01XE	TSB43AB21AIPDTEP
V62/03638-01XE	LM211QDREP
V62/03643-01XE	TLC3702MDREP
V62/03644-01YE	TPS79101DBVREP
V62/03644-02XE	TPS79118DBVREP
V62/03644-03XE	TPS79133DBVREP
V62/03644-04XE	TPS79147DBVREP
V62/03670-01XE	TSB41BA3TPFPPEP
V62/03671-01XE	SN65LBC176AQDREP
V62/03672-01XE	LM239AQDREP
V62/04604-01XE	TLC7701QPWPREP
V62/04604-02XE	TLC7705QPWPREP
V62/04604-03XE	TLC7733QPWPREP
V62/04611-01XE	TSB82AA21PGEPEP
V62/04612-01XE	TSB81BA31PFPPEP
V62/04613-01XE	PC11520IHKEP
V62/04618-01XE	TLV1548QDBREP
V62/04641-01XE	TPS54680QPWPREP
V62/04642-01XE	UCC2808AQDREP-1EP
V62/04642-02XE	UCC2808AQDREP-2EP

## Analog

TI Device Name	DSCC Vendor Item Drawing
V62/04643-01XE	SN65LVD3950DGGREP
V62/04645-01XE	TPS5120QDBTREP
V62/04646-01XE	TLV5618AMDREP
V62/04647-01XE	TLC1543QDWREP
V62/04648-01XE	TPS3803-01QDCKREP
V62/04648-02XE	TPS3803G15QDCKREP
V62/04648-03XE	TPS3805H33QDCKREP
V62/04650-01XE	TSB43AA82AIPGEEP
V62/04651-01XE	TLV2252QDREP
V62/04651-02UE	TLV2252AQDREP
V62/04648-03XE	TPS3805H33QDCKREP
V62/04650-01XE	TSB43AA82AIPGEEP
V62/04651-01UE	TLV2252QDREP
V62/04651-02UE	TLV2252AQDREP
V62/04651-03XE	TLV2254QDREP
V62/04651-04XE	TLV2254AQDREP
V62/04682-01XE	TLC2252QDREP
V62/04682-02XE	TLC2252AQDREP
V62/04682-03YE	TLC2254QDREP
V62/04682-04YE	TLC2254AQDREP
V62/04726-01XE	TLV3701QDVBREP

## Advanced Logic

TI Device Name	DSCC Vendor Item Drawing
V62/03601-01XE	SN74ACT16245QDLREP
V62/03602-01XE	SN74ACT16373QDLREP
V62/03603-01XE	SN74ACT16374QDLREP
V62/03604-01XE	SN74AHC00MDREP
V62/03604-01YE	SN74AHC00MPWREP
V62/03605-01XE	SN74AHC14MDREP
V62/03605-01YE	SN74AHC14MPWREP
V62/03606-01XE	CD74HC4051MM96EP
V62/03607-01XE	SN74HC244MDWREP
V62/03607-02XE	SN74HC244QDWREP
V62/03607-02YE	SN74HC244QPWREP
V62/03620-01XE	SN74ABTH32245MPZEP
V62/03621-01XE	SN74ABTH32543MPZEP
V62/03641-01XE	SN74LVC16981DCKREP
V62/03642-01XE	SN74LVC16971DCKREP
V62/03645-01XE	SN74AHC02MPWREP
V62/03646-01XE	SN74AHC04MPWREP
V62/03646-01YE	SN74AHC04MDREP
V62/03647-01XE	SN74AHC08MPWREP
V62/03647-01YE	SN74AHC08MDREP
V62/03648-01XE	SN74AHC125MPWREP
V62/03648-01YE	SN74AHC125MDREP
V62/03649-01XE	SN74AHC244MPWREP
V62/03649-01YE	SN74AHC244MDWREP
V62/03650-01XE	SN74AHC245MPWREP
V62/03650-01YE	SN74AHC245MDWREP
V62/03651-01XE	SN74AHC32MPWREP
V62/03651-01YE	SN74AHC32MDREP
V62/03652-01XE	SN74AHC74MPWREP

# EP Vendor Item Drawing Cross Reference (DSCC to TI)

## Advanced Logic

TI Device Name	DSCC Vendor Item Drawing
V62/03652-01YE	SN74AHCT74MDREP
V62/03653-01XE	SN74AHCT00MPWREP
V62/03653-01YE	SN74AHCT00MDREP
V62/03654-01XE	SN74AHCT08MPWREP
V62/03654-01YE	SN74AHCT08MDREP
V62/03655-01XE	SN74AHCT138MPWREP
V62/03655-01YE	SN74AHCT138MDREP
V62/03656-01XE	SN74AHCT14MPWREP
V62/03656-01YE	SN74AHCT14MDREP
V62/03657-01XE	SN74AHCT244MPWREP
V62/03657-01YE	SN74AHCT244MDWREP
V62/03658-01XE	SN74AHCT32MPWREP
V62/03658-01YE	SN74AHCT32MDREP
V62/03659-01XE	SN74AHCT774MPWREP
V62/03659-01YE	SN74AHCT774MDREP
V62/03660-01XE	SN74LV08ATPWREP
V62/03661-01XE	SN74LV123ATPWREP
V62/03662-01XE	SN74LV14ATPWREP
V62/03663-01XE	SN74LV374ATPWREP
V62/03664-01XE	SN74LV4051ATPWREP
V62/03664-01YE	SN74LV4051ATDREP
V62/03665-01XE	SN74LV4052ATPWREP
V62/03665-01YE	SN74LV4052ATDREP
V62/03666-01XE	SN74LV4053ATPWREP
V62/03666-01YE	SN74LV4053ATDREP
V62/03667-01XE	SN74LVTH244AQDBREP
V62/03668-01XE	SN74LVTH8980AIDWREP
V62/04602-01XE	CLVTH16245AQDLREP
V62/04602-01YE	CLVTH16245AQDGGREP
V62/04614-01XE	SN74AC04MDREP
V62/04615-01XE	SN74AC08MDREP
V62/04616-01XE	SN74AC32MDREP
V62/04617-01XE	SN74AC74MDREP
V62/04619-01XE	SN74ACT373MDWREP
V62/04620-01XE	SN74ACT244MDWREP
V62/04621-01XE	SN74AC373MDWREP
V62/04622-01XE	SN74AC244MDWREP
V62/04644-01YE	SN74LVTH8996IPWREP
V62/04652-01XE	SN74LVC00AQDREP
V62/04652-01YE	SN74LVC00AQPWREP
V62/04653-01XE	SN74LVC04AQDREP
V62/04653-01YE	SN74LVC04AQPWREP
V62/04654-01XE	SN74LVC07AIPWREP
V62/04655-01XE	SN74LVC08AQDREP
V62/04655-01YE	SN74LVC08AQPWREP
V62/04656-01XE	SN74LVC125AIPWREP
V62/04657-01XE	SN74LVC138AQDREP
V62/04657-01YE	SN74LVC138AQPWREP
V62/04658-01XE	SN74LVC14AQDREP
V62/04658-01YE	SN74LVC14AQPWREP
V62/04659-01XE	SN74LVC157AQDREP
V62/04659-01YE	SN74LVC157AQPWREP
V62/04660-01XE	SN74LVC257AQDREP
V62/04660-01YE	SN74LVC257AQPWREP

## Advanced Logic

TI Device Name	DSCC Vendor Item Drawing
V62/04661-01XE	SN74LVC32AQPWREP
V62/04661-01YE	SN74LVC32AQDREP
V62/04662-01XE	SN74LVC373AQPWREP
V62/04662-01YE	SN74LVC373AQDREP
V62/04663-01XE	SN74LVC374AQPWREP
V62/04663-01YE	SN74LVC374AQDREP
V62/04664-01XE	SN74LVC4245AIPWREP
V62/04665-01XE	SN74LVC540AQPWREP
V62/04665-01YE	SN74LVC540AQDREP
V62/04666-01XE	SN74LVC541AQPWREP
V62/04666-01YE	SN74LVC541AQDREP
V62/04667-01XE	SN74LVC573AQPWREP
V62/04667-01YE	SN74LVC573AQDREP
V62/04668-01XE	SN74LVC574AQPWREP
V62/04668-01YE	SN74LVC574AQDREP
V62/04669-01XE	SN74LVC74AQPWREP
V62/04670-01XE	SN74LVC86AQDREP
V62/04670-01YE	SN74LVC86AQPWREP
V62/04671-01XE	SN74LVTH125IPWREP
V62/04672-01XE	SN74LVTH240IPWREP
V62/04673-01XE	SN74LVTH241IPWREP
V62/04674-01XE	SN74LVTH273IPWREP
V62/04675-01XE	SN74LVTH373IPWREP
V62/04676-01XE	SN74LVTH374IPWREP
V62/04677-01XE	SN74LVTH543IPWREP
V62/04678-01XE	SN74LVTH573IPWREP
V62/04679-01XE	SN74LVTH574IPWREP
V62/04680-01XE	SN74LVTH646IPWREP
V62/04681-01XE	SN74LVTH652IPWREP
V62/04682-02XE	CLVTH16652IDGGREP
V62/04683-01XE	SN74AHCT125QDREP
V62/04683-01YE	SN74AHCT125QPWREP
V62/04684-01XE	SN74AHCT126QDREP
V62/04684-01YE	SN74AHCT126QPWREP
V62/04685-01XE	SN74ALVC00IDREP
V62/04686-01XE	SN74ALVC08IDREP
V62/04687-02YE	SN74HC02QPWREP
V62/04688-01XE	SN74HC110QDREP
V62/04688-01YE	SN74HC110QPWREP
V62/04689-01XE	SN74HC165QDREP
V62/04689-01YE	SN74HC165QPWREP
V62/04690-01XE	SN74HC166AIDREP
V62/04691-01XE	SN74LV04ATPWREP
V62/04692-01XE	SN74LV11ATPWREP
V62/04693-01XE	SN74LV32ATPWREP
V62/04694-01XE	SN74LV86ATPWREP
V62/04695-01XE	SN74LV393ATPWREP
V62/04696-01XE	SN74LV595AIPWREP
V62/04697-01XE	SN74HCT04IDREP
V62/04698-01XE	SN74HCT244QPWREP
V62/04699-01XE	SN74HC253QDREP
V62/04700-01XE	SN74ABT541BIPWREP
V62/04701-01XE	SN74AC11IPWREP

## Advanced Logic

TI Device Name	DSCC Vendor Item Drawing
V62/04702-01XE	CD74HC40103QM96EP
V62/04703-01XE	CD74HC4017QM96EP
V62/04703-01YE	CD74HC4017QPWREP
V62/04704-01XE	CD74HC08QM96EP
V62/04705-01XE	SN74LVT125QPWREP
V62/04707-01XE	CLVTH162240IDGGREP
V62/04708-01XE	CLVTH162244IDGGREP
V62/04709-01XE	CLVTH162245IDGGREP
V62/04710-01XE	CLVTH16652AIDGGREP
V62/04711-01XE	CLVTH16374IDGGREP
V62/04712-01XE	CLVTH16373IDGGREP
V62/04713-01XE	CLVTH16500IDGGREP
V62/04714-01XE	CLVTH16501IDGGREP
V62/04715-01XE	CLVTH16543IDGGREP
V62/04716-01XE	CLVTH16646IDGGREP
V62/04717-01XE	CLVTH16835IDGGREP
V62/04718-01XE	CLVTH16952IDGGREP
V62/04720-01XE	CLVTH32244IGKEREK
V62/04721-01XE	CLVTH32374IGKEREK
V62/04722-01XE	CLVTH32374IGKEREK
V62/04723-01XE	SN74LVTH245AIPWREP
V62/04724-01XE	CLVC16244AIDGGREP
V62/04729-01XE	8V18502AIPMREP
V62/04730-01XE	8V182512IDGGREP
V62/04731-01XE	8V18646AIPMREP
V62/04733-01XE	SN74LVC1G08IDCKREP
V62/04734-01XE	SN74LVC1G32IDCKREP
V62/04735-01XE	CLVC1G125IDCKREP
V62/04736-01XE	CLVC1G126IDCKREP
V62/04737-01XE	SN74LVC245AIPWREP
V62/04739-01XE	CD74HCT574QM96EP
V62/04739-01YE	CD74HCT574QPWREP

## FIFO Memories

TI Device Name	DSCC Vendor Item Drawing
SN74V263PZAEF	V62/03639-01XE
SN74V273PZAEF	V62/03639-02XE
SN74V283PZAEF	V62/03639-03XE
SN74V293PZAEF	V62/03639-04XE

# QML Class V — Space Products

## Things to Consider

### Use of QML Class V Products

Satellite systems, space flight and exploration requirements continue to outgrow the available space level component technologies. The industry needs greater performance, lower power, higher integration levels and cost-effective solutions. Texas Instruments is supporting the demanding nature of space applications through MIL-PRF-38535 QML Class V products.

Various products from Digital Signal Processors, Power Management, Analog, Mixed-Signal, Digital Logic and ASICs are available or under evaluation for TI's QML Class V line.

TI has an extensive portfolio of Class Q devices that can be released as QML Class V class. If there is some function or technology TI offers that is not currently included in our QML Class V line, contact TI's Space Products Marketing Team at <http://www.ti.com/sc/docs/general/military/feedback.htm> so we can explore the possibilities of working with you on your new opportunities.

## Benefits of TI's QML Class V Products

- Cost-effective solutions
- Short-lead times (compared to Class S)
- Broad product offering
- Customer driven portfolio
- Latest technology
- High performance devices
- Industry's first Class V DSP

## Class V Website—[www.ti.com/space](http://www.ti.com/space)

- Current list of orderable part types
- Potential product releases
- Class V brochure
- Radiation data (including DSP data)
- Partnering and lot sequestering
- Offshore process flow information

## QML Class V Portfolio Overview

Family	Description
<b>Power Supply Products</b>	—Includes voltage regulators, switching power supply controllers, voltage supervisors, virtual ground generators, intelligent power devices and power DMOS arrays
<b>Digital Signal Processors</b>	—High Performance Floating-Point 320C6701, 840 MFLOPS, Ceramic BGA
<b>Analog/Mixed Signal</b>	—Complexity ranges from a low voltage operational amplifier to a high speed, high resolutions analog-to-digital converter. With the integration of the Unitrode Class V product line, the analog portfolio now includes voltage regulators, switching power supply controllers, voltage supervisors, virtual ground generators, intelligent power devices and power DMOS arrays
<b>Digital Logic</b>	—Currently offers AC and HC QML Class V devices. Additional QML Class V releases are planned shortly in the following Logic families: AC, ACT, AHC, AHCT, HC, HCT, LS, LVT and LVC
<b>ASIC</b>	—Potential Class V releases: GS30 (180 nm), GS40 (130 nm), SR40 (95nm)

The screenshot shows the Texas Instruments website interface. At the top, there's a navigation bar with 'Products', 'Applications', and 'Support'. Below that, a search bar and a list of navigation links like 'SEARCH NEWS RELEASES', 'ALL TIME PRESS RELEASES', 'RECENT PUBLISHED PRESS RELEASES', and 'PRESS RELEASE DETAILS'. The main content area features a press release titled 'INDUSTRY'S FIRST QML CLASS V FLOATING-POINT DSP FOR SPACE-BASED APPLICATIONS AVAILABLE FROM TI'. The release text discusses the SMJ320C6701 DSP, its performance benefits for space applications, and its compliance with MIL-PRF-38535. A sidebar on the right contains sections for 'RELATED PRODUCTS' and 'PUBLICATIONS'. At the bottom, there's a section titled 'Features Meet Performance Needs of Space-Based Applications' listing key features like radiation tolerance, instruction cycle time, and clock rate.

## Industry's First Class V Floating-Point DSP for Space Applications

### '6701 Features Meet Performance Needs of Space-Based Applications

- Demonstrated Total Ionizing Radiation Dose Tolerance to 100 krad(Si), no latchup up to 89 MeV, excellent SEU
- 7 ns Instruction Cycle Time
- 140 MHz Clock Rate
- Eight 32-bit Instructions/Cycle
- Up to 840 MFLOPS Performance
- Pin-Compatible with SMJ320C6701 Floating-point DSP and SMJ320C6201 Fixed Point DSP Ceramic Ball Grid Array Package
- Extended Operating Temperature Ranges up to -55°C to 125°C

# QML Class V—Space Products

## Class V Portfolio

### Digital Signal Processors

Family	Parent/Description	Order as DSCC SMD
DSP	SMV320C6701GLPW14, FLOATING POINT, 840 MFLOPS, 429-CBGA	5962-9866101VXA (-55 to 115°C)
DSP	SMV320C6701GLPM14, FLOATING POINT, 840 MFLOPS, 429-CBGA	5962-9866102VXA (-55 to 125°C)

### Advanced Logic

Family	Parent/Description	Order as DSCC SMD
AC	SNV54AC14J, HEX SCHMITT-TRIGGERED INVERTERS	5962-8762401VCA
AC	SNV54AC14W, HEX SCHMITT-TRIGGERED INVERTERS	5962-8762401VDA
AC	SNV54AC244J, NON-INVERTING OCTAL BUFFER/LINE DRIVERS	5962-8755201VRA
AC	SNV54AC244W, NON-INVERTING OCTAL BUFFER/LINE DRIVERS	5962-8755201VSA
AC	SNV54AC245J, OCTAL BUS TRANSCEIVERS	5962-8775801VRA
AC	SNV54AC245W, OCTAL BUS TRANSCEIVERS	5962-8775801VSA
AC	SNV54AC373J, OCTAL TRANSPARENT LATCHES	5962-8755501VRA
AC	SNV54AC373W, OCTAL TRANSPARENT LATCHES	5962-8755501VSA
AC	SNV54AC374J, OCTAL D-TYPE FLIP-FLOPS	5962-8769401VRA
AC	SNV54AC374W, OCTAL D-TYPE FLIP-FLOPS	5962-8769401VSA
AC	SNV54AC74J, DUAL POSITIVE-EDGE-TRIGGERED D-TYPE FLIP-FLOPS	5962-8852001VCA
AC	SNV54AC74W, DUAL POSITIVE-EDGE-TRIGGERED D-TYPE FLIP-FLOPS	5962-8852001VDA
ACT	SNV54ACT04J, HEX INVERTER	5962-8973401VCA
ACT	SNV54ACT04W, HEX INVERTER	5962-8973401VDA
ACT	SNV54ACT244J, NON-INVERTING OCTAL BUFFER/LINE DRIVERS	5962-8776001SRA
ACT	SNV54ACT244W, NON-INVERTING OCTAL BUFFER/LINE DRIVERS	5962-8776001SSA
ACT	SNV54ACT245J, OCTAL BUS TRANSCEIVERS	5962-8766301SRA
ACT	SNV54ACT245W, OCTAL BUS TRANSCEIVERS	5962-8766301SSA
ACT	SNV54ACT373J, OCTAL TRANSPARENT LATCHES	5962-8755601VRA
ACT	SNV54ACT373W, OCTAL TRANSPARENT LATCHES	5962-8755601VSA
ACT	SNV54ACT374J, OCTAL D-TYPE FLIP-FLOPS	5962-8763101VRA
ACT	SNV54ACT374W, OCTAL D-TYPE FLIP-FLOPS	5962-8763101VSA
AHC	SNV54AHC244J, OCTAL BUFFERS/DRIVERS WITH 3-STATE OUTPUTS	5962-9678201VRA
AHC	SNV54AHC244W, OCTAL BUFFERS/DRIVERS WITH 3-STATE OUTPUTS	5962-9678201VSA
AHC	SNV54AHC245J, OCTAL BUS TRANCEIVERS	5962-9681801VRA
AHC	SNV54AHC245W, OCTAL BUS TRANCEIVERS	5962-9681801VSA
AHCT	SNV54AHCT08J, QUADRUPLE 2-INPUT POSITIVE-AND GATES	5962-9682101VCA
AHCT	SNV54AHCT08W, QUADRUPLE 2-INPUT POSITIVE-AND GATES	5962-9682101VDA
AHCT	SNV54AHCT14J, HEX SCHMITT-TRIGGER INVERTERS	5962-9680101VCA
AHCT	SNV54AHCT14W, HEX SCHMITT-TRIGGER INVERTERS	5962-9680101VDA
HC	SNV54HC00J, QUAD 2-INPUT NAND GATE	5962-8403701VCA
HC	SNV54HC00W, QUAD 2-INPUT NAND GATE	5962-8403701VDA
HC	SNV54HC02J, QUADRUPLE 2-INPUT POSITIVE-NOR GATES	5962-8404101VCA
HC	SNV54HC02W, QUADRUPLE 2-INPUT POSITIVE-NOR GATES	5962-8404101VDA
HC	SNV54HC04J, HEX INVERTER	5962-8409801VCA
HC	SNV54HC04W, HEX INVERTER	5962-8409801VDA
HC	SNV54HC08J, QUAD 2-INPUT POSITIVE-AND GATES	5962-8404701VCA
HC	SNV54HC08W, QUAD 2-INPUT POSITIVE-AND GATES	5962-8404701VDA
HC	SNV54HC132J, QUAD 2-INPUT NAND SCHMITT TRIGGER	5962-8984502VCA
HC	SNV54HC132W, QUAD 2-INPUT NAND SCHMITT TRIGGER	5962-8984502VDA
HC	SNV54HC138J, 3-TO 8-LINE DECODER	5962-8406201VEA
HC	SNV54HC138W, 3-TO 8-LINE DECODER	5962-8406201VFA
HC	SNV54HC14J, HEX SCHMITT-TRIGGER	5962-8409101VCA
HC	SNV54HC14W, HEX SCHMITT-TRIGGER	5962-8409101VDA
HC	SNV54HC244J, OCTAL BUFFER/LINE DRIVER	5962-8409601VRA
HC	SNV54HC244W, OCTAL BUFFER/LINE DRIVER	5962-8409601VSA
HC	SNV54HC245J, OCTAL BUS TRANSCEIVERS	5962-8408501VRA
HC	SNV54HC245W, OCTAL BUS TRANSCEIVERS	5962-8408501VSA
HC	SNV54HC32J, QUAD 2-INPUT OR GATE	5962-8404501VCA
HC	SNV54HC32W, QUAD 2-INPUT OR GATE	5962-8404501VDA



## Advanced Logic

Family	Parent/Description	Order as DSCC SMD
HC	SNV54HC373J, OCTAL D-TYPE LATCH	5962-8407201VRA
HC	SNV54HC373W, OCTAL D-TYPE LATCH	5962-8407201VSA
HC	SNV54HC374J, OCTAL D-TYPE FLIP-FLOP	5962-8407101VRA
HC	SNV54HC374W, OCTAL D-TYPE FLIP-FLOP	5962-8407101VSA
HC	SNV54HC573AJ, OCTAL D-TYPE LATCH	5962-8512801VRA
HC	SNV54HC573AW, OCTAL D-TYPE LATCH	5962-8512801VSA
HC	SNV54HC595J, 8-BIT SHIFT REGISTER	5962-8681601VEA
HC	SNV54HC595W, 8-BIT SHIFT REGISTER	5962-8681601VFA
HC	SNV54HC74J, DUAL D-TYPE FLIP-FLOP	5962-8405601VCA
HC	SNV54HC74W, DUAL D-TYPE FLIP-FLOP	5962-8405601VDA
HCT	SNV54HCT04J, HEX INVERTER	5962-8974701VCA
HCT	SNV54HCT04W, HEX INVERTER	5962-8974701VDA
HCT	SNV54HCT244J, OCTAL BUFFER/LINE DRIVER	5962-8513001VRA
HCT	SNV54HCT244W, OCTAL BUFFER/LINE DRIVER	5962-8513001VSA
HCT	SNV54HCT245J, OCTAL BUS TRANSCEIVER	5962-8550601VRA
HCT	SNV54HCT245W, OCTAL BUS TRANSCEIVER	5962-8550601VSA
HCT	SNV54HCT373J, OCTAL D-TYPE LATCH	5962-8686701VRA
HCT	SNV54HCT373W, OCTAL D-TYPE LATCH	5962-8686701VSA
HCT	SNV54HCT374J, OCTAL D-TYPE FLIP-FLOP	5962-8550701VRA
HCT	SNV54HCT374W, OCTAL D-TYPE FLIP-FLOP	5962-8550701VSA
LS	SNV54LS00J, POSITIVE-NAND GATES	JM38510/30001SCA
LS	SNV54LS00W, POSITIVE-NAND GATES	JM38510/30001SDA
LS	SNV54LS02J, QUAD 2-INPUT POSITIVE-NOR GATES	JM38510/30301SCA
LS	SNV54LS02W, QUAD 2-INPUT POSITIVE-NOR GATES	JM38510/30301SDA
LS	SNV54LS04J, HEX INVERTERS	JM38510/30003SCA
LS	SNV54LS04W, HEX INVERTERS	JM38510/30003SDA
LS	SNV54LS08J, QUAD 2-INPUT POSITIVE-AND GATES	JM38510/31004SCA
LS	SNV54LS08W, QUAD 2-INPUT POSITIVE-AND GATES	JM38510/31004SDA
LS	SNV54LS109AJ, DUAL J-K POS-EDGE-TRIG FLIP-FLOPS w/CLR & PRE	JM38510/30109SEA
LS	SNV54LS109AW, DUAL J-K POS-EDGE-TRIG FLIP-FLOPS w/CLR & PRE	JM38510/30109SFA
LS	SNV54LS10J, HEX DRIVERS	JM38510/30005SCA
LS	SNV54LS10W, HEX DRIVERS	JM38510/30005SDA
LS	SNV54LS123J, RETRIGGERABLE MONOSTABLE MULTIVIBRATORS	5962-7603901VEA
LS	SNV54LS123W, RETRIGGERABLE MONOSTABLE MULTIVIBRATORS	5962-7603901VFA
LS	SNV54LS125AJ, QUAD BUS BUFFER GATES WITH 3-STATE OUTPUTS	JM38510/32301SCA
LS	SNV54LS125AW, QUAD BUS BUFFER GATES WITH 3-STATE OUTPUTS	JM38510/32301SDA
LS	SNV54LS138J, 3-LINE TO 8-LINE DECODERS/DEMULPLEXERS	JM38510/30701SEA
LS	SNV54LS138W, 3-LINE TO 8-LINE DECODERS/DEMULPLEXERS	JM38510/30701SFA
LS	SNV54LS139AJ, DUAL 2-LINE TO 4-LINE DECODERS/DEMULPLEXERS	JM38510/30702SEA
LS	SNV54LS139AW, DUAL 2-LINE TO 4-LINE DECODERS/DEMULPLEXERS	JM38510/30702SFA
LS	SNV54LS14J, BCD-TO-DECIMAL DECODERS/DRIVERS	5962-9665801VCA
LS	SNV54LS14W, BCD-TO-DECIMAL DECODERS/DRIVERS	5962-9665801VDA
LS	SNV54LS161AJ, SYNCHRONOUS 4-BIT COUNTERS	5962-7600801VEA
LS	SNV54LS161AW, SYNCHRONOUS 4-BIT COUNTERS	5962-7600801VFA
LS	SNV54LS164J, 8-BIT PARALLEL-OUT SERIAL SHIFT REGISTERS	JM38510/30605SCA
LS	SNV54LS164W, 8-BIT PARALLEL-OUT SERIAL SHIFT REGISTERS	JM38510/30605SDA
LS	SNV54LS165AJ, PARALLEL-LOAD 8-BIT SHIFT REGISTERS	5962-7700601VEA
LS	SNV54LS165AW, PARALLEL-LOAD 8-BIT SHIFT REGISTERS	5962-7700601VFA
LS	SNV54LS173AJ, 4-BIT D-TYPE REGISTERS WITH 3-STATE OUTPUTS	JM38510/36101SEA
LS	SNV54LS173AW, 4-BIT D-TYPE REGISTERS WITH 3-STATE OUTPUTS	JM38510/36101SFA
LS	SNV54LS175J, QUAD D-TYPE FLIP-FLOPS WITH CLEAR	JM38510/30107SEA
LS	SNV54LS175W, QUAD D-TYPE FLIP-FLOPS WITH CLEAR	JM38510/30107SFA
LS	SNV54LS193J, SYNCHRONOUS 4-BIT UP/DOWN BINARY COUNTERS	JM38510/31508SEA
LS	SNV54LS193W, SYNCHRONOUS 4-BIT UP/DOWN BINARY COUNTERS	JM38510/31508SFA
LS	SNV54LS20J, DUAL 4-INPUT POSITIVE-NAND GATES	JM38510/30007SCA
LS	SNV54LS20W, DUAL 4-INPUT POSITIVE-NAND GATES	JM38510/30007SDA
LS	SNV54LS240J, OCTAL BUFFERS/DRIVERS WITH 3-STATE OUTPUTS	5962-7801201VRA
LS	SNV54LS240W, OCTAL BUFFERS/DRIVERS WITH 3-STATE OUTPUTS	5962-7801201VSA
LS	SNV54LS244J, OCTAL BUFFER/DRIVERS WITH 3-STATE OUTPUTS	JM38510/32403SRA
LS	SNV54LS244W, OCTAL BUFFER/DRIVERS WITH 3-STATE OUTPUTS	JM38510/32403SSA
LS	SNV54LS245J, OCTAL BUS TRANSCEIVERS WITH 3-STATE OUTPUTS	5962-8002101VRA
LS	SNV54LS245W, OCTAL BUS TRANSCEIVERS WITH 3-STATE OUTPUTS	5962-8002101VSA
LS	SNV54LS257BJ, QUAD 2-LINE TO 1-LINE DATA SELECTORS/MULTIPLEXERS	5962-7603701VEA

## Advanced Logic

Family	Parent/Description	Order as DSCC SMD
LS	SNV54LS257BW, QUAD 2-LINE TO 1-LINE DATA SELECTORS/MULTIPLEXERS	5962-7603701VFA
LS	SNV54LS26J, QUAD 2-INPUT EXCLUSIVE-NOR GATES w/ 0-C OUTPUTS	5962-7602001VCA
LS	SNV54LS26W, QUAD 2-INPUT EXCLUSIVE-NOR GATES w/ 0-C OUTPUTS	5962-7602001VDA
LS	SNV54LS273J, OCTAL D-TYPE FLIP-FLOPS WITH CLEAR	5962-7801001VRA
LS	SNV54LS273W, OCTAL D-TYPE FLIP-FLOPS WITH CLEAR	5962-7801001VSA
LS	SNV54LS30J, 8-INPUT POSITIVE-NAND GATES	JM38510/30009SCA
LS	SNV54LS30W, 8-INPUT POSITIVE-NAND GATES	JM38510/30009SDA
LS	SNV54LS32J, QUAD 2-INPUT POSITIVE-OR GATES	JM38510/30501SCA
LS	SNV54LS32W, QUAD 2-INPUT POSITIVE-OR GATES	JM38510/30501SDA
LS	SNV54LS367AJ, HEX BUS DRIVERS WITH 3-STATE OUTPUTS	JM38510/32203SEA
LS	SNV54LS367AW, HEX BUS DRIVERS WITH 3-STATE OUTPUTS	JM38510/32203SFA
LS	SNV54LS373J, OCTAL D-TYPE TRANSPARENT LATCHES WITH 3-STATE	JM38510/32502SRA
LS	SNV54LS373W, OCTAL D-TYPE TRANSPARENT LATCHES WITH 3-STATE	JM38510/32502SSA
LS	SNV54LS374J, OCTAL D-TYPE EDGE TRIGGERED FLIP-FLOPS WITH 3-STATE	5962-7801102VRA
LS	SNV54LS374W, OCTAL D-TYPE EDGE TRIGGERED FLIP-FLOPS WITH 3-STATE	5962-7801102VSA
LS	SNV54LS393J, DUAL 4-BIT BINARY COUNTERS	JM38510/32702SCA
LS	SNV54LS393W, DUAL 4-BIT BINARY COUNTERS	JM38510/32702SDA
LS	SNV54LS640J, OCTAL BUS TRANSCEIVERS	5962-8416101VRA
LS	SNV54LS640W, OCTAL BUS TRANSCEIVERS	5962-8416101VSA
LS	SNV54LS670J, 4-BY-4 REGISTER FILES WITH 3-STATE OUTPUTS	5962-7704201VEA
LS	SNV54LS670W, 4-BY-4 REGISTER FILES WITH 3-STATE OUTPUTS	5962-7704201VFA
LS	SNV54LS688J, 8-BIT IDENTITY COMPARATORS	5962-8415301VRA
LS	SNV54LS688W, 8-BIT IDENTITY COMPARATORS	5962-8415301VSA
LS	SNV54LS73AJ, DUAL J-K FLIP-FLOPS WITH CLEAR AND 3-STATE OUTPUTS	5962-9675101VCA
LS	SNV54LS73AW, DUAL J-K FLIP-FLOPS WITH CLEAR AND 3-STATE OUTPUTS	5962-9675101VDA
LS	SNV54LS74AJ, D-TYPE FLIP FLOPS	JM38510/30102SCA
LS	SNV54LS74AW, D-TYPE FLIP FLOPS	JM38510/30102SDA
LS	SNV54LS75J, 4-BIT BISTABLE LATCHES	5962-7601201VEA
LS	SNV54LS75W, 4-BIT BISTABLE LATCHES	5962-7601201VFA
LS	SNV54LS85J, 4-BIT MAGNITUDE COMPARATORS	JM38510/31101SCA
LS	SNV54LS85W, 4-BIT MAGNITUDE COMPARATORS	JM38510/31101SDA
LVC	SNV54LVC00AJ, QUAD 2-INPUT NAND GATE	5962-9753301VCA
LVC	SNV54LVC00AW, QUAD 2-INPUT NAND GATE	5962-9753301VDA
LVC	SNV54LVC14AJ, HEX SCHMITT-TRIG. INVERTER	5962-9761501VCA
LVC	SNV54LVC14AW, HEX SCHMITT-TRIG. INVERTER	5962-9761501VDA
LVC	SNV54LVC374AJ, D-TYPE FLIP-FLOPS	5962-9757401VRA
LVC	SNV54LVC374AW, D-TYPE FLIP-FLOPS	5962-9757401VSA
LVC	SNV54LVC74AJ, D-TYPE FLIP FLOPS	5962-9761601VCA
LVC	SNV54LVC74AW, D-TYPE FLIP FLOPS	5962-9761601VDA
LVC	SNV54LVCH244AJ -- 8 BIT BUS INTERFACE	5962-9754201VRA
LVC	SNV54LVCH244AW -- 8 BIT BUS INTERFACE	5962-9754201VSA
LVC	SNV54LVCH245AJ, OCTAL BUS TRANSCEIVER	5962-9754301VRA
LVC	SNV54LVCH245AW, OCTAL BUS TRANSCEIVER	5962-9754301VSA
LVT	SNV54LVTH162244WD, 16 BIT BUS INTF	5962-9680901VXA
LVT	SNV54LVTH162245WD, 16 BIT BUS INTF	5962-9678001VXA
LVT	SNV54LVTH162373WD, 16BIT BUS INTF	5962-9763801VXA
LVT	SNV54LVTH162374WD, 16 BIT BUS INTF	5962-9854201VXA
LVT	SNV54LVTH16244AWD, 16-BIT BUFFERS/DRIVER	5962-9668501VXA
LVT	SNV54LVTH16245AWD, 16-BIT BUS TRANSCEIVERS	5962-9668601VXA
LVT	SNV54LVTH244AJ, BUS INTERFACE	5962-9584401VRA
LVT	SNV54LVTH244AW 3.3V OCTAL BUFFER/DRIVER	5962-9584401VSA
LVT	SNV54LVTH245AJ, OCTAL BUS TRANSCEIVERS	5962-9564201VRA
LVT	SNV54LVTH245AW, OCTAL BUS TRANSCEIVERS	5962-9564201VSA
LVT	SNV54LVTH574J, D-TYPE FLIP FLOPS	5962-9583201VRA
LVT	SNV54LVTH574W, OCTAL EDGE-TRIGGERED FLIP-FLOPS	5962-9583201VSA

## Power Management

Family	Parent/Description	Order as DSCC SMD
PWR MGMT	UC1525BJQMLV, Regulating Pulse Width Modulators	5962-8951105VEA
PWR MGMT	UC1525BLQMLV, Regulating Pulse Width Modulators	5962-8951105V2A
PWR MGMT	UC1611JQMLV, Quad Schottky Diode Array	5962-9053801VPA
PWR MGMT	UC1611LQMLV, Quad Schottky Diode Array	5962-9053801V2A
PWR MGMT	UC1705JQMLV, HIGH SPEED POWER DRIVER	5962-9579801VPA

## Power Management

Family	Parent/Description	Order as DSCC SMD
PWR MGMT	UC1707JQMLV, Dual Output Driver	5962-8761901VEA
PWR MGMT	UC1707LQMLV, Complementary High Speed Power Drivers	5962-8761901V2A
PWR MGMT	UC1708JEQMLV, NON-INVERTING HIGH SPEED POWER DRIVER	5962-0051401VEA
PWR MGMT	UC1708JQMLV, NON-INVERTING HIGH SPEED POWER DRIVER	5962-0051401VPA
PWR MGMT	UC1708LQMLV, NON-INVERTING HIGH SPEED POWER DRIVER	5962-0051401V2A
PWR MGMT	UC1709JQMLV, Inverting High-Speed MOSFET Drivers	5962-0151201VPA
PWR MGMT	UC1710JQMLV, Compl High Curr MOSFET Drvr	5962-0152001VXA
PWR MGMT	UC1710LQMLV, Complementary High Current MOSFET Driver	5962-0152001VPA
PWR MGMT	UC1823AJQMLV, High Speed PWM	5962-8990502VEA
PWR MGMT	UC1825AJQMLV, High Speed PWM	5962-8768102VEA
PWR MGMT	UC1825ALQMLV, High Speed PWM	5962-8768102V2A
PWR MGMT	UC1825JQMLV, High Speed PWM	5962-8768101VEA
PWR MGMT	UC1825LQMLV, High Speed PWM	5962-8768101V2A
PWR MGMT	UC1832JQMLV, High Speed PWM	5962-9326501VCA
PWR MGMT	UC1832LQMLV, High Speed PWM	5962-9326501V2A
PWR MGMT	UC1834JQMLV, High Efficiency Linear Regulator	5962-8774201VEA
PWR MGMT	UC1834LQMLV, High Efficiency Linear Regulator	5962-8774201V2A
PWR MGMT	UC1842AJQMLV, CUR Mode PWM	5962-8670405VPA
PWR MGMT	UC1842ALQMLV, CUR Mode PWM	5962-8670405VXA
PWR MGMT	UC1842JQMLV, CUR MODE PWM	5962-8670401VPA
PWR MGMT	UC1842LQMLV, CUR Mode PWM	5962-8670401VXA
PWR MGMT	UC1843AJQMLV, CUR Mode PWM	5962-8670406VPA
PWR MGMT	UC1843ALQMLV, CUR Mode PWM	5962-8670406VXA
PWR MGMT	UC1843JQMLV, CUR MODE PWM	5962-8670402VPA
PWR MGMT	UC1843LQMLV, CUR Mode PWM	5962-8670402VXA
PWR MGMT	UC1844AJQMLV, CUR Mode PWM	5962-8670407VPA
PWR MGMT	UC1844ALQMLV, CUR Mode PWM	5962-8670407VXA
PWR MGMT	UC1844JQMLV, CUR MODE PWM	5962-8670403VPA
PWR MGMT	UC1844LQMLV, CUR Mode PWM	5962-8670403VXA
PWR MGMT	UC1845AJQMLV, CUR Mode PWM	5962-8670408VPA
PWR MGMT	UC1845ALQMLV, CUR Mode PWM	5962-8670408V2A
PWR MGMT	UC1845JQMLV, CUR Mode PWM	5962-8670404VPA
PWR MGMT	UC1845LQMLV, CUR Mode PWM	5962-8670404VXA
PWR MGMT	UC1846JQMLV, CUR Mode PWM	5962-8680601VEA
PWR MGMT	UC1846LQMLV, CUR Mode PWM	5962-8680601V2A
PWR MGMT	UC1863JQMLV, Res-Mode Pwr Supply Cont	5962-9203103VEA
PWR MGMT	UC1863LQMLV, Res-Mode Pwr Supply Cont	5962-9203103V2A
PWR MGMT	UC1875JQMLV, Phase Shift Resonant Controller	5962-9455501VRA
PWR MGMT	UC1875LQMLV, Phase Shift Resonant Controller	5962-9455501V3A
PWR MGMT	UC1901JQMLV, Isolated Feedback Gen	5962-8944101VCA
PWR MGMT	UCC1806JQMLV, Low Pwr BICMOS PWM	5962-9457501VEA
PWR MGMT	UCC1806LQMLV, Low Power, Dual Output, Current Mode PWM	5962-9457501V2A

## Comparators

Family	Parent/Description	Order as DSCC SMD
Comparator	QUAD COMPARATOR	5962-7700801VCA

## Amplifiers

Family	Parent/Description	Order as DSCC SMD
AMPLIFRS	LM124JQMLV, QUAD OP AMP	5962-7704301VCA

## Interface

Family	Parent/Description	Order as DSCC SMD
INTERFACE	SNV55LVDS31W, QUAD LVDS TRANSMITTER, ANSI TIA/EIA-644	5962-9762101VFA
INTERFACE	SNV55LVDS32W, QUAD LVDS RECEIVER, ANSI TIA/EIA-644	5962-9762201VFA

## Things to Consider

### Portfolio Overview

TI Military Semiconductor Division offers a strong mixed-signal and analog portfolio. Complexity ranges from a low voltage single Op Amp to a complete graphics backend chip. We manufacture all products on high reliability manufacturing lines. The process/screening levels available include Department of Defense (DoD) and Defense Supply Center Columbus (DSCC) endorsed Standard Microcircuit Drawing (SMD) and MIL-PRF-38535 (QML) comprehending best commercial practices. Mil-temp ceramic and Enhanced Plastic products are also available.

## Product Portfolio

- Data Converters
- Interface
- LCD Drivers
- Power Management
  - PWM Controllers
  - PWM Support
  - Linear Regulation
  - Power Supply Support
- Signal Conditioning
  - Comparators
  - Operational Amplifiers
- Special Functions

## Unitrode Products

- Unitrode's Commercial Business Unit has been integrated into TI's Military Group
- Next generation power and battery management products are now available
- Acquired Unitrode products follow the nomenclature shown below

## Product Nomenclature (Typical Analog Product)

Example: **TLE2022AMJGBEP**

### Prefix—TLE

SNJ	= TI Interface, MIL-PRF-38535 (QML)
SN	= Commercial Processing
TL	= TI Linear Control Circuit
TLC	= TI LinCMOS™
TLE	= TI Excalibur
TLV	= TI Linear Low Voltage
TPIC	= TI Intelligent Power
AD	= Analog Devices™ *
AM	= Advanced Micro Devices™ *
LM	= National Semiconductor™ *
LT	= Linear Technology™ *
OP	= PMI™ *
SE	= Signetics™ *
µA	= Fairchild™ *
THS	= TI High Power
TPS	= TI Power Supply

### Unique Device Designator—2022A

A or B in last position = Upgrade

### Temperature Range—M

M	= -55°C to 125°C (applicable to all TI prefixes except SNJ)
Q	= -40°C to 125°C
I	= -40°C to 85°C
T	= -40°C to 105°C

### Package Type / Pin Count—JG

DA	= Plastic Small Outline Package / 28, 30, 32 or 38
FK	= Ceramic Leadless Chip Carrier / 20 or 28
GA	= Ceramic Pin Grid Array / 84
HFG	= Ceramic Flatpack / 84 or 164
J	= Ceramic DIP / 8, 14, 16, 20 or 28
JG	= Ceramic DIP / 8
U	= Ceramic Flatpack / 10
W	= Ceramic Flatpack / 14 or 16
WD	= Ceramic Flatpack / 56
L	= Ceramic Leadless Chip Carrier / 20 or 28
PHP	= Plastic Quad Flatpack PowerPad / 48
PCE	= Plastic Quad Flatpack / 144 or 160
PWP	= Plastic Power TSSOP / 14, 16, 20, 24 or 28
DW	= Plastic Widebody (30 mil) SOIC / 16, 20, 24 or 28
TCP	= Tape Carrier Package / Custom
PFB	= Plastic Quad Flatpack / 48

### Process Level—B

Blank	= Standard Suffix, Commercial Processing
B	= MIL-PRF-38535 (QML)

### Enhanced Plastic—EP

Select Enhanced Plastic products are available. The part numbers for those devices end in EP. Additional information on EP products can be found on page 3 in this guide.

\* = Second Source

## Product Nomenclature (TI-Unitrode Power Management Products)

Example: **UC1825BJ883BEP**

### Prefix—TLE

UC = Linear Integrated Circuits  
 UCC = BICMOS

### Part Number—1825

First Digit "1" = Military Temperature Range\*  
 First Digit "2" = Industrial Temperature Range\*  
 First Digit "3" = Commercial Temperature Range\*

### Optional Grades—B

A or B = Improved Version

### Process Level—883B

J, JE = Ceramic DIP (300 mil and 600 mil)  
 L, L20 = Ceramic Leadless Chip Carrier (CLCC)

### Enhanced Plastic—EP

Select Enhanced Plastic products are available. The part numbers for those devices end in EP. Additional information on EP products can be found on page 3 in this guide.

\* = Consult individual data sheets for specific temperature ranges on each part.

\*\* = The "883B" designator was retained to be consistent with the original Unitrode naming convention.

## Converters

### Analog-to-Digital Converters

Device	Bits	Analog Input Channels	Supply Voltage Range	Sample Rate	Output Interface Type	V. ref Internal External	Power (TYP)	DNL max +/- LSB	INL max +/- LSB	Package
THS1408M (5962-0051101NXD)	14	1	3.0-3.6 V	8 MSPS	Parallel	Int.	270 mW	1	5	PHP (QML Plastic)
THS1206M (5962-9957701NXD)	12	4	3.0-5.5 V	6 MSPS	Parallel	Int.	186 mW	1	1.8	PWP (QML Plastic)
TLC876M	10	1	4.5-5.2 V	20 MSPS	Parallel	Ext./ Special	107 mW	1	1.6	DW
TLC2543M	12	11	4.5-5.5 V	66 kSPS	Serial	Ext.	12 mW	1	1	J, FK
TLV1548M	10	8	2.7-5.5 V	85 kSPS	Serial	Ext.	4 mW	1	1	J, FK
TLV1543M	10	11	3.0-3.6 V	38 kSPS	Serial	Ext.	8 mW	1	1	J, FK
TLC1542M	10	11	4.5-5.5 V	38 kSPS	Serial	Ext.	12 mW	1	1	J
TLV2548M*	12	8	2.7-5.5 V	200 kSPS	Serial	Int. or Ext.	9.5 mW	1	1	FK

### Digital -to-Analog Converters

Device	Bits	Analog Input Channels	Supply Voltage Range	Sample Rate	Output Interface Type	V. ref Internal External	Power (TYP)	DNL max +/- LSB	INL max +/- LSB	Package
TLV5638M	12	2	2.7-5.5 V	Serial	1 $\mu$ s	Int.	7.5-22 mW	1	4	JG,FK
TLC5618AM	12	2	4.5-5.5 V	Serial	2.5 $\mu$ s	Ext.	9 mW	1	4	JG, FK
TLV5618AM	12	2	2.7-5.5 V	Serial	2.5 $\mu$ s	Ext.	5.4 mW	1	4	JG, FK
AD7524M	8	1	4.8-15.4 V	Parallel	100 $\mu$ s	Ext.	10 mW	0.5	0.5	J, FK
TLV5619M	12	1	2.7-5.5 V	Parallel	1 $\mu$ s	Int.	2.7 mW	0.5	3	J, FK

## Interface (Data Transmission)

### EIA RS422A, CCITT v.11

Drivers/Receivers per Package	Propagation Delay		Icc (mA)	Device Type	Package
	Tpd (ns)				
0/4	35		70	AM26LS32AM	J, FK, W
0/4	35		70	AM26LS33AM	J, FK, W
0/4	35		70	SN55173	J, FK
0/4	27		15	AM26C32M	J, FK, W
0/4	30		20	SN55LBC173	J, FK, W
0/4	30		20	SN55LBC175	J, FK, W
4/0	12		3	AM26C31M	J, FK, W

### EIA/RS 232

Drivers/Receivers per Package	Propagation Delay		Icc (mA)	Device Type	Package
	Tpd (ns)				
0/4	85		26	SN55189A	J, FK, W
4/0	350		34	SN55188	J, FK, W

### Miscellaneous Standards

Drivers/Receivers per Package	Propagation Delay		Icc (mA)	Device Type	Package
	Tpd (ns)				
0/4	85		26	SN55189A	J, FK, W
4/0	350		34	SN55188	J, FK, W
0/4	RS423		15	AM26C32M	J, FK, W
4/0	RS423		3	AM26C31M	J, FK, W
9/9	SCSI		60/45	SN55976A1	WD
0/4	RS423		70	AM26LS32AM	J, FK, W
0/4	RS423		70	AM26LS33AM	J, FK, W
0/4	RS423		20	SN55LBC173	J, FK, W
0/4	RS423		20	SN55LBC175	J, FK, W
0/4	RS423		70	SN55173	J, FK

# Power Management

## Voltage-Mode Pulse Width Modulator (PWM) Controllers

Device	Max Practical Freq	Start-Up Current	Operating Current	Supply Voltage (V)	UVLO: On/Off (V)	Max Duty Cycle (%)	Soft Start	Shutdown	Drive (Sink/Source) (A)	Package	Topology
TLV5001	500 kHz	1.0 mA	20 mA	3.6 to 40	3.0/3.0	Prog.	Yes	No	0.02	8-JG, 20-FK	For, Fly, Buck, Boost
TL1451A	500 kHz	1.3 mA	20 mA	3.6 to 50	2.7/2.6	Prog.	No	No	0.02	16-JG, 20-FK	For, Fly, Buck, Boost
UC1524A	250 kHz	4 mA	5mA	8 to 40	7.5/7	Prog.	Yes	Yes	0.2/0.2	16-J, 20-L	Full, Half Bridge
UC1525	250 kHz	—	14mA	8 to 35	7.0/7.0	Prog.	Yes	Yes	0.2/0.2	16-J, 20-L	Full, Half Bridge
UC1526	250 kHz	—	14 mA	8 to 35	—	Prog.	Yes	Yes	0.2/0.2	18-J, 20-L	Full, Half Bridge
UC1527A	250 kHz	—	14mA	8 to 35	7.0/7.0	Prog.	Yes	Yes	0.2/0.2	16-J, 20-L	Full, Half Bridge

## Current-Mode Pulse Width Modulator (PWM) Controllers

Device	Max Practical Freq	Start-Up Current	Operating Current	Supply Voltage (V)	UVLO: On/Off (V)	Max Duty Cycle (%)	Soft Start	Shutdown	Drive (Sink/Source) (A)	Package	Topology
UCC1800	1 MHz	100 µA	500 µA	7.2 to 15	7.2/6.9	100	Yes	No	1.0/1.0	8-J, 20L	Buck, Boost
UCC1801	1 MHz	100 µA	500 µA	9.4 to 15	9.4/7.4	50	Yes	No	1.0/1.0	8-J, 20L	Buck, Boost
UCC1802	1 MHz	100 µA	500 µA	12.5 to 15	12.5/8.3	100	Yes	No	1.0/1.0	8-J, 20L	Forward, Flyback
UCC1803	1 MHz	100 µA	500 µA	4.1 to 15	4.1/3.6	100	Yes	No	1.0/1.0	8-J, 20L	Buck, Boost
UCC1804	1 MHz	100 µA	500 µA	12.5 to 15	12.5/8.3	50	Yes	No	1.0/1.0	8-J, 20L	Forward, Flyback
UCC1805	1 MHz	100 µA	500 µA	4.1 to 15	4.1/3.6	50	Yes	No	1.0/1.0	8-J, 20L	Forward, Flyback
UCC1806	350 kHz	100 µA	1.4mA	7 to 15	7.5/6.7	Prog.	Yes	Yes	0.5/0.5	16-J, 20L	Full, Half; Push-Pull
UC1842	500 kHz	0.5 mA	11 mA	10 to 30	16.0/10.0	100	No	No	1.0/1.0	8-J, 20L	For, Fly, Buck, Boost
UC1842A	500 kHz	0.3 mA	11 mA	10 to 30	16.0/10.0	100	No	No	1.0/1.0	8-J, 20L	For, Fly, Buck, Boost
UC1843	500 kHz	0.5 mA	11 mA	7.6 to 30	8.4/7.6	100	No	No	1.0/1.0	8-J, 20L	For, Fly, Buck, Boost
UC1843A	500 kHz	0.3 mA	11 mA	7.9 to 30	8.5/7.9	100	No	No	1.0/1.0	8-J, 20L	For, Fly, Buck, Boost
UC1844	500 kHz	0.5 mA	11 mA	10 to 30	16.0/10.0	50	No	No	1.0/1.0	8-J, 20L	For, Fly, Buck, Boost
UC1844A	500 kHz	0.3 mA	11 mA	10 to 30	16.0/10.0	50	No	No	1.0/1.0	8-J, 20L	For, Fly, Buck, Boost
UC1845	500 kHz	0.5 mA	11 mA	7.6 to 30	8.4/7.6	50	No	No	1.0/1.0	8-J, 20L	For, Fly, Buck, Boost
UC1845A	500 kHz	0.3 mA	11 mA	7.9 to 30	8.5/7.9	50	No	No	1.0/1.0	8-J, 20L	For, Fly, Buck, Boost
UC1846	500 kHz	1.5 mA	17mA	8 to 40	7.7/7	Prog.	Yes	No	0.5/0.5	8-J, 20L	Full, Half; Push-Pull

## Voltage and Current Mode Compatible

Device	Max Practical Freq	Start-Up Current	Operating Current	Supply Voltage (V)	UVLO: On/Off (V)	Max Duty Cycle (%)	Soft Start	Shutdown	Drive (Sink/Source) (A)	Package	Topology
UC1823	1 MHz	1.1 mA	22mA	9 to 30	9.2/8.4	Prog.	Yes	No	1.5/1.5	16-J, 10-L	Buck, Boost
UC1823A	1 MHz	1.1 mA	22mA	9 to 22	9.2/8.4	Prog.	Yes	No	1.5/1.5	16-J, 10-L	Buck, Boost
UC1825	1 MHz	1.1 mA	22 mA	9 to 30	9.2/8.4	Prog.	Yes	No	1.5/1.5	16-J, 10-L	Full, Half ; Push-Pull
UC1825A	1 MHz	100 µA	28 mA	9 to 22	16/10	Prog.	Yes	No	2.0/2.0	16-J, 10-L	Full, Half ; Push-Pull

## Soft Switching PWM - Resonant Mode

Device	Max Practical Freq	Start-Up Current	Operating Current	Supply Voltage (V)	UVLO: On/Off (V)	Max Duty Cycle (%)	Soft Start	Shutdown	Drive (Sink/Source) (A)	Package	Topology
UC1895	1 MHz	150 µA	5 mA	11 to 17	11/ 9.0	100	Yes	Yes	0.1/0.1	20-J	Full Bridge
UC1875	1 MHz	150 µA	45 mA	10.7 to 20	10.7/9.3	100	Yes	No	2.0/2.0	20-J, 28-L	Full Bridge

## Power Factor Correction Products

Device	Max Practical Freq	Current Error Amp Bandwidth	Average Current Mode	Worldwide Input Voltage Operation	Output Drive	Startup Current	Under-Voltage Lockout	Enable Input	Multiplier/Divider Feedforward	Package
UC1854	200 kHz	800 kHz	Yes	Yes	1 A	1.5 mA	16 V/10 V	Yes	Yes	16-J
UC1854B	200 kHz	5 Mhz	Yes	Yes	1 A	0.3 mA	10.5 V/10 V	Yes	Yes	16-J

## DC Motor Controllers

Device	Output Clamps Diodes Hall Logic	Output Current per Output	Operating Voltage	Differential Current Sense Amplifier	Current Limit	Package
UC1637	—	0.1 A	±2.5 to ±20 V	—	Yes	18-J (through-hole package and surface-mount package)

## PWM Support Products—Power Drivers

Device	Power Driver	Output Configuration	Enable	Inhibit	Analog Stop	Output Rise Time	Maximum Voltage	Peak Output Current	Package
UC1705	Single	Complementary	—	—	—	60 ns	40 V	1.5 A	8-J, 20-L
UC1706	Dual	Complementary	—	Yes	Yes	130 ns	40 V	1.5 A	16-J, 20-L
UC1707	Dual	Complementary	—	Yes	Yes	50 ns	40 V	1.5 A	16-J, 20-L
UC1708	Dual	Non-Inverting	Yes	—	—	25 ns	35 V	3.0 A	8-J, 16-E, 20-L

## PWM Support Products—Power FET Drivers

Device	Output FEDT Driver	Output Configuration	Peak Rise Time	Maximum Voltage	Output Current	Package
UC1709	Single	Complementary	80 ns	40 V	1.5 A	8-J, 20-L
UC1710	Single	Complementary	35 ns	20 V	6.0 A	8-J

## PWM Supply Support Products

Device	Description	Key Application	Features	Package
UC1611	Quad Schottky	Four diode array for high-current bridges and voltage clamps	Matched, four diode monolithic array High peak current, low forward voltage Parallelable for higher current or lower drop	8-J, 20-L
UC1901	Insolated feedback generator	Amplitude modulation system used to couple a control signal across a voltage isolation barrier	Transformer couples isolated feedback error signal. Low cost alternative to optocouplers. 5-MHz carrier provides fast response capability. Modulator synchronizable to an external clock.	14-J, 20-L

## Linear Regulation Products—Linear Controllers

Device	Type of Output	Maximum Input Voltage	Minimum Output Voltage	Output Drive	Type of Short Circuit Limit	Reference Voltage Accuracy	Special Features	Package
UC1832	Positive	36 V	2.0 V	300 mA	Duty Cycle	2%	Multiple Pins Accessible	14-J, 20-L
UC1834	Adjustable Positive or Negative	40 V	1.5 V/-2.0 V	350 mA	Foldback	3%/4%	—	16-J, 20-L
UC1836	Adjustable Positive	40 V	2.5 V	500 mA	Foldback	2%	Built-in Rsense	8-J

## Power Supply Support Products—Supervisory and Monitor Circuits (SVS)

Device	Attributes	V <sub>CC</sub> (nom) (V)	V <sub>t</sub> (V)	Tolerance	V <sub>IN</sub> (min) (V)	Number of SVS	Complementary Outputs	ICC (max) (mA)	Over Voltage Sense	WDI	Package
TLC7733M	Single	3.3	2.93	2.4	1	1	Yes	0.016	No	No	JG, FK
TLC7705M	Micropower Programmable Delay Single	5	4.55	1.5	1	1	Yes	0.016	No	No	JG, FK, U



### Power Supply Support Products—Quad Line Monitors

Device	Attributes	VIN Range (V)	Window Adjust	Proj Fault Threshold	Prog Time Delay	Current Limit	Power Supply Monitor	Packages
UC1903	Quad	8-40	Yes	Yes	Yes	No	Quad	J, L

### Linear Regulation Products—Military Precision Programmable Voltage References

Device	Attributes	Vref (V)	VO (max) (V)	VO (min) (V)	Tolerance	IZ (min) (mA)	IZ (max) (mA)	Temp Coeff (type) (ppm/degree C)	VI (max) (V)	Package
TL1431	Adjustable Shunt	2.5 V	36	Vref	0.4	1	100	23	36	J6, FK

# Comparators and Operational Amplifiers

## Comparators

Device	Supply Voltage (V)	V <sub>io</sub> (mV) Max	I <sub>ib</sub> (nA) Max	I <sub>ol</sub> (mA)	Response Time (ns) Typ	Package
LM111	4 to 30	4	150	8	165	JG, FK
LM139	4 to 30	9	-300	6	300	JG, FK, W
LM139A	4 to 30	4	-300	6	300	JG, FK, W
LM193	4 to 30	9	-300	6	300	JG, FK
TLC139M	4 to 16	10	30	6	1100	JG, FK, W*
TLC193M	4 to 16	10	30	6	1100	JG, FK*
TLC372M	4 to 16	10	20	6	200	JG, FK, U
TLC374M	4 to 16	10	20	6	200	JG, FK, W*
TLC3702M	4 to 16	10	30	20	1100	JG, FK, U*
TLC3704M	4 to 16	10	30	20	1100	JG, FK, W*
TLV2352M	2 to 8	10	20	6	1400	JG, FK, U
TLV2354M	2 to 8	10	20	6	1400	JG, FK, W

## Operational Amplifiers—High Speed

Device	Supply Voltage (V)	V <sub>io</sub> (mV) Max	I <sub>ib</sub> (nA) Max	A <sub>vd</sub> (V/mv)	B <sub>1</sub> (MHz)	SR (V/μs)	Package
THS4011M	±5/±15	6	25	290	290	310	JG, FK
THS4031M	±5/±15	2	75	100	100	100	JG, FK
THS4051M	±5/±15	8	9	70	70	240	JG, FK
THS4061M	±5/±15	9	9	180	180	400	JG, FK

## Operational Amplifiers—Single

Device	Supply Voltage (V)	V <sub>io</sub> (mV) Max	I <sub>ib</sub> (nA) Max	A <sub>vd</sub> (V/mv)	B <sub>1</sub> (MHz)	SR (V/μs)	Package
LM118	±5/±20	10	150	25	15	70	JG, FK
OP27A	±4/±22	0.06	60	600	8	2.8	JG, FK
OP27C	±4/±22	0.3	150	300	8	2.8	JG
OPA688M	±5	6	1200	1	530	1000	JG
OPA689M	±5	5	1200	1	280	1600	JG
TLC2201M	±4.6/±16	0.1	0.5	45	1.8	2.5	JG, FK
TLC2201AM	±4.6/±16	0.1	0.5	45	1.8	2.5	JG, FK
TLC2652M	±4.4/±16	0.01	0.5	1000	1.9	2.8	J, JG, FK
TLC2652AM	±4.4/±16	0.008	0.5	1000	1.9	2.8	J, JG, FK
TLC2654M	±4.4/±16	0.05	0.5	1000	1.9	2	J, JG, FK
TLC2654AM	±4.4/±16	0.04	0.5	1000	1.9	2	J, JG, FK
TLE2021M	±2/±20	1	70	500	2	0.65	JG, JG
TLE2021AM	±2/±20	0.5	65	500	2	0.65	JG, FK
TLE2021BM	±2/±20	0.2	60	500	2	0.65	JG, FK
TLE2027M	±4/±22	0.2	150	2500	13	2.8	JG, FK
TLE2027AM	±4/±22	0.1	150	3500	13	2.8	JG, FK
TLE2061M	±3.5/±18	6	40	20	2	3.4	JG, FK, U
TLE2061AM	±3.5/±18	3.6	40	20	2	3.4	JG, FK, U
TLE2061BM	±3.5/±18	1.7	40	20	2	3.4	JG
TLE2071M	±2.3/±19	9.2	65	88	10	40	JG, FK, U
TLE2071AM	±2.3/±19	7.2	65	88	10	40	JG, FK, U
TLE2161M	±3.5/±20	6	40	20	6.4	10	JG, FK
TLE2161AM	±3.5/±20	3.6	40	20	6.4	10	JG, FK
TLE2161BM	±3.5/±20	1.7	40	20	6.4	10	JG, FK
TLE2141M	±2/±22	1.7	-1800	20	6	45	JG, FK

## Operational Amplifiers—Single

Device	Supply Voltage (V)	V <sub>io</sub> (mV) Max	I <sub>ib</sub> (nA) Max	A <sub>vd</sub> (V/mv)	B <sub>1</sub> (MHz)	SR (V/μs)	Package
TLE2141AM	±2/±22	1.2	-1800	20	6	45	JG, FK
TLV2460M	±2.7/±6	2.2	14	32	5.2	1.6	JG, FK, U
TLV2460AM	±2.7/±6	1.7	14	32	5.2	1.6	JG, FK, U
TLV2461M	±2.7/±6	2.2	14	32	5.2	1.6	JG, FK, U
TLV2461AM	±2/±6	1.7	14	32	5.2	1.6	JG, FK, U

## Operational Amplifiers—Dual

Device	Supply Voltage (V)	V <sub>io</sub> (mV) Max	I <sub>ib</sub> (nA) Max	A <sub>vd</sub> (V/mv)	B <sub>1</sub> (MHz)	SR (V/μs)	Package
LM158	±1.5/±15	7	300	25	0.6	0.2	JG, FK
LM158A	±1.5/±15	7	300	25	0.6	0.2	JG, FK
LT1013M	±5/±22	0.6	45	250	0.7	0.4	JG, FK
LT1013AM	±5/±22	0.3	30	500	0.7	0.4	JG, FK
MC1558	±5/±15	0.6	1500	25	1	0.5	JG, FK
TLC2202M	±4.6/±16	1	0.5	100	1.9	2.7	JG, FK
TLC2202AM	±4.6/±16	0.75	0.5	100	1.9	2.7	JG, FK
TLC2252M	±4.4/±16	1.75	0.5	10	0.21	0.12	JG, FK, U
TLC2252AM	±4.4/±16	1.0	0.5	10	0.21	0.12	JG, FK, U
TLC2262M	±4.4/±16	3	0.5	50	0.73	0.55	JG, FK, U
TLC2262AM	±4.4/±16	1.5	0.5	50	0.73	0.55	JG, FK, U
TLC2272M	±4.4/±16	3.0	0.1	15	2.18	3.6	JG, FK, U
TLC2272AM	±4.4/±16	1.5	0.1	15	2.18	3.6	JG, FK, U
TLC4502M	±4/±6	100	10	200	4.7	2.5	JG, FK, U
TLC4502AM	±4/±6	50	10	200	4.7	2.5	JG, FK, U
TLE2022M	±2/±20	0.7	90	800	2.8	0.65	JG, FK
TLE2022AM	±2/±20	0.45	90	1000	2.8	0.65	JG, FK
TLE2022BM	±2/±20	0.3	90	1000	2.8	0.65	JG, FK
TLE2062M	±3.5/±18	6	40	20	2	3.4	JG, FK, U
TLE2062AM	±3.5/±18	4	40	20	2	3.4	JG, FK, U
TLE2062BM	±3.5/±18	3	40	20	2	3.4	JG, FK
TLE2072M	±2.3/±19	10.5	60	93	10	40	JG, FK, U
TLE2072AM	±2.3/±19	8	60	93	10	40	JG, FK, U
TLE2082M	±2.3/±20	9.5	60	93	10	40	JG, FK
TLE2082AM	±2.3/±20	6.5	60	93	10	40	JG, FK
TLE2142M	±2/±22	1.6	1.8	20	6	45	JG, FK, U
TLE2142AM	±2/±22	2	1.8	20	6	45	JG, FK, U
TLV2262M	±2.7/±8	3	0.5	50	0.71	0.55	JG, FK, U
TLV2262AM	±2.7/±8	1.5	0.5	50	0.71	0.55	JG, FK, U
TLV2252M	±2.7/±8	1.75	0.5	10	0.2	0.12	JG, FK, U
TLV2252AM	±2.7/±8	1.0	0.5	10	0.2	0.12	JG, FK, U
TLV2422M	±2.7/±10	0.95	0.3	700	0.052	0.02	JG, FK, U
TLV2422AM	±2.7/±10	2.0	0.3	700	0.052	0.02	JG, FK, U
TLV2442M	±2.7/±10	2.5	0.3	750 (typ)	1.75	1.3	JG, FK, U
TLV2442AM	±2.7/±10	1.6	0.3	750 (typ)	1.75	1.3	JG, FK, U
TLV2432M	±2.7/±10	2.5	0.3	950 (typ)	0.55	0.25	JG, FK, U
TLV2432AM	±2.7/±10	2.0	0.3	950 (typ)	0.55	0.25	JG, FK, U
TLV2462M	±2.7/±6	2.2	14	32	5.2	1.6	JG, FK, U
TLV2462AM	±2.7/±6	1.7	14	32	5.2	1.6	JG, FK, U
TLV2463M	±2.7/±6	2.2	14	32	5.2	1.6	JG, FK
TLV2463AM	±2.7/±6	1.7	14	32	5.2	1.6	JG, FK
TLV2772M	±2.5/±5.5	2.5	0.006	20	4.8	9	JG, FK, U
TLV2772AM	±2.5/±5.5	1.6	0.006	20	4.8	9	JG, FK, U
TL062M	±5/±15	9	50	4	1	3.5	JG, FK
TL072M	±5/±15	9	50	15	3	13	JG, FK, U
TL082M	±5/±15	9	50	15	3	13	JG, FK

## Operational Amplifiers—Quad

Device	Supply Voltage (V)	V <sub>io</sub> (mV) Max	I <sub>ib</sub> (nA) Max	A <sub>vd</sub> (V/mv)	B <sub>1</sub> (MHz)	SR (V/μs)	Package
LM124	±1.5/±15	7	300	25	0.6	0.13	J, FK, W
LM124A	±1.5/±15	4	100	25	-	-	J, FK
LM148	±4/±18	6	325	25	1	0.5	J, FK, W
LT1014M	±5/±22	0.55	45	250	0.7	0.4	J, FK
LT1014AM	±5/±22	0.35	30	400	0.7	0.4	J, FK
OPA468MJ	±5	4	13	-	250	750	J, FK
TLC2264M	±4.4/±16	3	0.5	50	0.73	0.55	J, FK, W
TLC2264AM	±4.4/±16	1.5	0.5	50	0.73	0.55	J, FK, W
TLC2274M	±4.4/±16	3.0	0.5	20	2.3	3.6	J, FK, W
TLC2274AM	±4.4/±16	1.5	0.5	20	2.3	3.6	J, FK, W
TLC54M	±4.4/±16	1.75	0.5	10	0.21	0.12	J, FK, W
TLC2254AM	±4.4/±16	1.0	0.5	10	0.21	0.12	J, FK, W
TLE2024M	±2/±20	1.2	90	400	2.8	0.7	J, FK, W
TLE2024AM	±2/±20	0.95	90	800	2.8	0.7	J, FK
TLE2024BM	±2/±20	0.7	90	1000	2.8	0.7	J, FK
TLE2064M	±3.5/±18	8	40	20	2	3.4	J, FK
TLE2064AM	±3.5/±18	6	40	20	2	3.4	J, FK
TLE2064BM	±3.5/±18	4	40	20	2	3.4	J, FK
TLE2074M	±2.3/±19	10.5	60	93	10	40	J, FK, W
TLE2074AM	±2.3/±19	8.5	60	93	10	40	J, FK
TLE2144M	±2/±22	4	1800	20	6	45	J, FK
TLE2144AM	±2/±22	3.2	1800	20	6	45	J, FK
TLV2254M	±2.7/±8	1.75	0.5	10	0.2	0.12	J, FK, W
TLV2254AM	±2.7/±8	1.0	0.5	10	0.2	0.12	J, FK, W
TLV2264M	±2.7/±8	3	0.5	50	0.71	0.55	J, FK, W
TLV2264AM	±2.7/±8	1.5	0.5	50	0.71	0.55	J, FK, W
TL064M	±5/±15	15	50	4	1	3.5	J, FK, W
TL074M	±5/±15	15	50	15	3	13	J, FK, W
TL084M	±5/±15	15	50	15	3	13	J, FK
TLV2464M*	±2.7/±6	2.2	14	32	5.2	1.6	JG, FK, U
TLV2464AM*	±2.7/±6	1.7	14	32	5.2	1.6	JG, FK, U
TLV2465M*	±2.7/±6	2.2	14	32	5.2	1.6	JG, FK, U
TLV2465AM*	±2.7/±6	1.7	14	32	5.2	1.6	JG, FK, U

## Special Functions—Precision Timers

Device	Supply Voltage (V)	Supply Current (mA)	Bandwidth (MHz) Typ	Differential Output Offset (mV)	Log Linearity (30db Sections)	Package
SE555	4.5 to 18	5	±200	Single	10 μs - hours	JG, FK
SE556	4.5 to 18	8	±200	Dual	10 μs - hours	J, FK
TLC555M	2 to 15	0.7	+100/-10	Single	1 μs - hours	JG, FK
TLC556M	2 to 15	1.4	+100/-10	Dual	1 μs - hours	J, FK

## Things to Consider

### TI Military ASIC Benefits

#### *Leading-Edge Technology*

- Utilizing leading-edge commercial technology for military applications
- Utilizing the tools and flows available to the commercial market
- Thermally-enhanced BGA plastic packages
- Multiple processing options

#### *Dedicated Military Supplier*

- Producing military ASICs since 1981
- Comprehending the needs of military program requirements—EMD/LRIP, long life cycles, obsolescence management

#### *Program Support*

- In-house dedicated customer design center
- Design-in excellence methodology targeting:
  - Robust design
  - First pass success
  - Comprehensive design-for-test with high fault coverage ( $\geq 95\%$ )
- Custom support for FPGA to ASIC transition

### International Traffic in Arms Regulations (ITAR)

ITAR was developed to prevent the transfer of U.S. technology, technical data or products to unauthorized parties. ASiCs designed for military applications are subject to ITAR. In support of customer requirements, TI MPD ASIC fully conforms to all the requirements of ITAR.

### Supported Design Tools

#### *Synthesis*

-Synopsys Design Compiler®

#### *Static Timing Analysis*

-Synopsys PrimeTime®

#### *Constraint Validation*

-Magma Blast Logic™

#### *Text Insertion*

-Synopsys (DFT compiler™, TetraMAX™, DC Expert™, BSD Compiler™)  
 -Mentor Graphics (FastScan™, FlexTest™, BSD Architect™, LBIST Architect™), LogicVision icBIST™

#### *Netlist Checker*

Texas Instruments Detector™

## Product Nomenclature

Example: **CF99XXXAGNPM**

**Prefix—CF**

**Unique Device Designator—99XXX**

**Revision Level—A**

**Package Designator—GNP**

Thin Quad Flatpack  
 Plastic Quad Flatpack  
 Plastic Ball Grid Array  
 Generic Ball Grid Array  
 Flip-Chip

**Temperature Indicator—M**

M = -55°C to 125°C  
 A = -40°C to 85°C  
 C = 0°C to 70°C

### **GS30 0.180- $\mu$ m TlmeCell™ Technology**

- 0.18- $\mu$ m drawn (0.15- $\mu$ m effective) CMOS
- 180 nm International Technology Roadmap for Semiconductors (ITRS)
- 75,000 gates/mm<sup>2</sup>
- 1.8-V core supply voltage
- Supports 4 & 5 levels of metallization
- 3.3-V I/O
- Memory compiler for custom memory configurations
- Power dissipation of 0.018  $\mu$ W/MHz/Gate
- Full IEEE 1149.1 (JTAG) support
- Support for subchip layout
- Clock tree synthesis
- Design Support for Synopsys™, Cadence™ and Mentor™ tools

### **GS40 0.110- $\mu$ m TlmeCell™ Technology**

- 0.11- $\mu$ m drawn (0.08- $\mu$ m effective) CMOS
- 130 nm ITRS
- 156,000 gates/mm<sup>2</sup>
- 1.2-V core supply voltage
- Supports 5 & 6 levels of metallization
- 3.3-V I/O
- Memory compiler for custom memory configurations
- Power dissipation of 0.011  $\mu$ W/MHz/Gate
- Full IEEE 1149.1 (JTAG) support
- Support for subchip layout
- Clock tree synthesis
- Design Support for Synopsys™, Cadence™ and Mentor™ tools
- Support for Synopsys Primetime Static Timing Analysis

### **SR40 0.095- $\mu$ m TlmeCell™ Technology**

- 0.095- $\mu$ m drawn (0.065- $\mu$ m effective) CMOS
- 130 nm ITRS
- 113,000 gates/mm<sup>2</sup>
- 1.2-V core supply voltage
- Supports 6 & 7 levels of second generation copper
- 3.3-V I/O
- Memory compiler for custom memory configurations
- Power dissipation of 9 nW/MHz/Gate
- Full IEEE 1149.1 (JTAG) support
- Support for subchip layout
- Clock tree synthesis
- Design Support for Synopsys™, Cadence™ and Mentor™ tools
- Support for Synopsys Primetime Static Timing Analysis

### **ASIC Process Flows** \*Flows can be located on the web by going to the Military homepage: [www.ti.com/military](http://www.ti.com/military)

#### **MIL-PRF-38535 (QML) Flow**

- MIL-PRF-38535 compliant flow
- Performance-based specification
- SMD available through DSCC

#### **Extended Temperature Flow**

- Warranted over appropriate temperature range
  - Military temperature range (-55° C to 125° C)
  - Industrial temperature range (-40° C to 85° C)
  - Commercial temperature range (0° C to 70° C)
- Built to standard TI Flow\*
- No source control drawing (SCD) necessary

#### **Bare Die Flow**

- Warranted over appropriate temperature range
  - Military temperature range (-55° C to 125° C)
  - Industrial temperature range (-40° C to 85° C)
  - Commercial temperature range (0° C to 70° C)
- No SCD necessary

# Digital Signal Processors (DSPs)

## Things to Consider

Texas Instruments is a recognized leader in the field of DSP and DSP product support. Spanning nine product generations, our SMJ320 family of DSP chips offer cost-effective military solutions for computational-intensive applications.

Continuing the tradition of providing leading-edge processing capability to the military, 1998 saw the introduction of the military C6201, and the military versions of the C6201B and C6701 were released in 1Q00. The military C6201B offers 1200 MIPS (Million Instructions Per Second) fixed-point performance. The military C6701 supports up to 1 GFLOPS (billion floating-point operations Per Second). In the third quarter of 2001, we released the military VC33 which offers up to 150 MFLOPS performance in the smallest available package. The C6203 was released in 1Q02. This fixed-point DSP

features 1600 MIPS performance at 200 MHz over the full military temperature range and offers 7M-bit of on-chip SRAM. Continuing our commitment to the military DSP market, TI released the ceramic-packaged C6415 which provides up to 4800 MIPS of processing performance at a 600 MHz clock rate. We also offer a military graphics processor in the 34020A.

In recognition of the continually changing demands of the military market, our DSPs are offered in a variety of processing options including MIL-PRF-38535 (QML Class Q), Enhanced Plastic, and QML Class V for space applications.

## Product Portfolio

- Fixed-Point (C6000)
- Floating-Point (C6000)
- Motor Control (C2000)
- Multi-Processor (C40)

## C6000 Product Benefits

- Performance
- Leading-Edge Technology Roadmaps
- Extensive Third-Party Network
- Compatible Instruction Set Architecture and Packages for Both Fixed- and Floating-Point
- Reduced Design Time
- Seamless Integrated Development Environment
- Design-In Support
- Industry's First Class V DSP

## Product Nomenclature\*

Example: **SMJ320C40GBM40EP**

### Prefix—SMJ

SM = Commercial Processing  
 SMJ = MIL-PRF-38535 (QML Class Q)  
 SMQ = MIL-PRF-38535 (QML Class N)  
 (Order by SMD)

SMP = Production Prototype  
 SMX = Military Preproduction  
 TMS = Commercial Qualified  
 TMP = Commercial Grade  
 SMV = MIL-PRF-38535 QML Class V  
 (Order by SMD)

### 320 DSP Family Designator—320 or 32

### 320 DSP Product Designator—C40

BC = CMOS Boot  
 C = CMOS  
 E = CMOS EPROM  
 F = CMOS FLASH  
 LC = CMOS 3.3 V  
 VC = CMOS 1.5 V / 3.3 V  
 14 = E14 50 = C50 5409 = VC5409  
 15 = C15 62 = C62xx 5421 = VC5421  
 25 = C25 64 = C64xx  
 26 = C26 67 = C67xx  
 30 = C30 80 = C80  
 31 = C31 240 = F240  
 32 = C32 2812 = F2812  
 33 = VC33 5416 = VC5416  
 40 = C40 549 = LC549

### Package Type / Pin Count—GB

JD = CDIP  
 FD/FJ = LCCC  
 GB/GF = CPGA  
 GFA = CFGP  
 GLG/GLP = FC/CSP  
 HFH/HFG = CFP  
 HFP = CFP  
 KGD = KGD  
 PCM/PQ = QFP  
 GNM = FBGA  
 GAD = FC $\mu$ BGA  
 GJC = FC/CSP  
 GJL = FC/CSP  
 GLZ = FCBGA  
 GDP = LQFP  
 PGE = Plastic LQFP  
 GGU = BGA  
 GGW = BGA Microstar  
 PGF = LQFP  
 GHH = PBGA

### Enhanced Plastic—EP

Select Enhanced Plastic products are available. The part numbers for those devices end in EP. Additional information on EP products can be found on page 3 in this guide.

### Speed Designator—GB

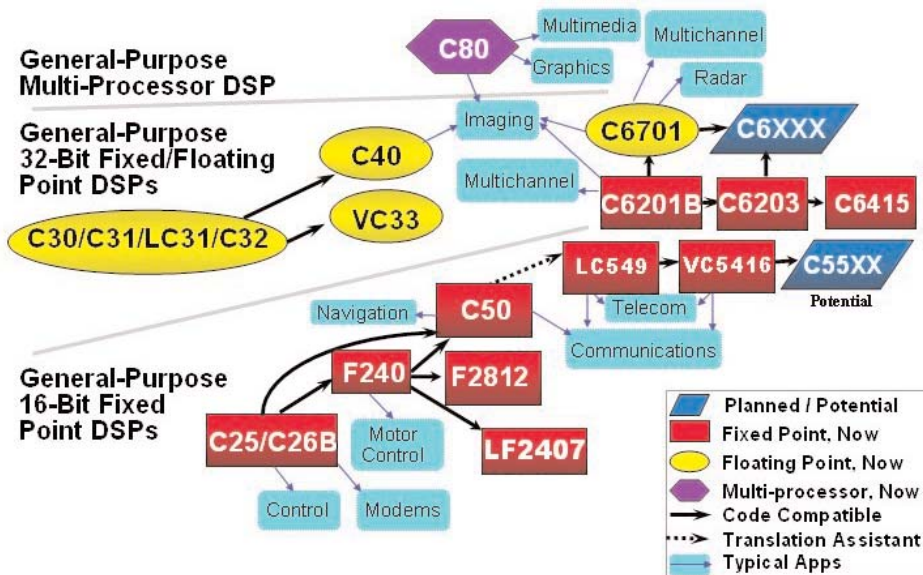
12 = 120 MHz  
 16 = 160 MIPS (VC5416)  
 20 = 200 MIPS (VC5421)  
 33 = 33 MHz  
 40 = 40 MHz  
 50 = 500 MHz (C64xx)  
 60 = 60 MHz (600 MHz C6415)  
 60 = 60 MIPS (C54x)  
 66 = 66 MHz  
 10 = 100 MIPS (C54x)  
 14 = 140 MHz  
 15 = 150 MHz  
 16 = 167 MHz  
 17 = 175 MHz  
 20 = 200 MHz  
 120 = 120 MFLOPS (VC33)  
 150 = 150 MFLOPS (VC33)

### Temperature Range—M

M = -55°C to 125°C  
 A = -40°C to 105°C (C6000)  
 L = 0°C to 70°C  
 W = -55°C to 115°C  
 S = Special Per datasheet  
 Blank = 25°C

\* = Not all speed, package, process, temperature combinations are available.

# Military Digital Signal Processors



Note: Devices in roadmap may be available in Class Q ceramic, Class V ceramic and Enhanced Plastic.

## DSP Development Tools (For a complete description of tools, go to [dspvillage.ti.com](http://dspvillage.ti.com))

Literature Number	Description
<b>Application Notes</b>	
Code Composer Studio™	Real-time analysis and data visualization capabilities
Advanced Code Generation Tools	Extracts code parallelisms
C6000 C Compiler	Offers up to five times the cycle count efficiency of existing fixed-point DSP C compiler
Assembly Optimizer	Provides fine-tuning of assembly code
C5000 C Compiler	Accepts ANSI C source code and C54x assembly language source code
TAP5000	Translation Assistant Program (TAP) helps customers upgrade to higher perf DSPs
Code Composer Simulator	Simulates actual execution of DSP code without DSP chip parallel with hardware
Open Plug-In Architecture	Provides standard open Application Program Interfaces (APIs)
Host-Target Communication	Simplifies each stage of DSP development cycle by extending capabilities of Code Composer IDE
Debugger	Has DSP-specific capabilities and breakpoint to simplify development
Real-Time Analysis	Offers real-time analysis capability with a real time window into target system
Advanced Data Visualization	Enables DSP developers to gain a fast understanding of system and characteristics

## DSPs

Device	Feature Size (µ)	Data Format	Bits	Cycle Time (ns)	Performance	Package/ Pin Count	Compiler
L320C25	1.6	Fixed	16	80/100	12.5/10 MIPS	FD/68, FJ/68, GB/68	C
320C15	2.0	Fixed	16	160/200	6.25/5 MIPS	JD/40, FJ/44	-
320C26B	1.6	Fixed	16	100	10 MIPS	FD/68, GB/68	C
320C30	0.72	Floating	32	40/50	50/40 MFLOPS	GB/181, HFG/196, KGD/181	Ada, C
320E14	2.0	Fixed	16	200	5 MIPS	FJ/68, GB/68	-
320C31	0.72	Floating	32	40/50	50/40 MFLOPS	GFA/141, HFG/132, KGD/132	Ada, C
320C40	0.72	Floating	32	33/40/50	60/50/40 MFLOPS	GF/325, HFH/352, TAB/TBB/324, KGD/325	Ada, C
320C50	0.72	Fixed	16	30/40	33/25 MIPS	GFA/141, HFG/132, KGD/115, PQ/132	C
320C32	0.72	Floating	32	33/40	60/50 MFLOPS	PCM/144	Ada, C
320C80	0.5	Fixed/Floating	16/32	20	250 MIPS/100 MFLOPS	250 MIPS/100 MFLOPS	GF/305, HFH/320
320LC31	0.72	Floating	32	50	40 MFLOPS	KGD/132, PQ/132	Ada, C
320F240	0.72	Fixed	16	50	20 MIPS	HFP/132	C
320C6201B	0.18	Fixed	16	6.7	1200 MIPS	GLP/429	Ada, C
320C6701	0.18	Floating	32	7	840 MFLOPS	GLP/429	Ada, C
320C6203	0.15	Fixed	16	5	1600 MIPS	GLP/429	C
320VC33	0.18	Floating	32	20	150 MFLOPS	GNM/144	C
320C6414-EP	0.12	Fixed	32	2	4000 MIPS	GL2/532	C



# First-In, First-Out Products (FIFOs)

## Things to Consider

### Primary

T1 First, First-Out (FIFO) memory products provide the speed and features necessary to optimize system performance by eliminating the data bottlenecks common between DSPs, high-speed processors, memory devices and Analog Front Ends (AFEs).

### DSP Sync FIFO Benefits

- Optimizes system performance
- Eliminates data bottlenecks between:

- DSPs, high-speed processors, industry-standard buses, memory devices and Analog Front Ends
- Designed for variety of systems including: real-time DSP applications, telecommunications, internetworking, instrumentation and high-bandwidth computing.
- DSP-Sync: Glueless interface with C6x and newer C5x DSPs
- Output Edge Control (OEC): Reduces simultaneous switching noise and package inductance
- Distributed Vcc & GND: Reduces package inductance

- Programmable Flags: Provides design flexibility and control
- Parity Generate & Check: Ensures data integrity in fault-control systems
- Synchronous Retransmit Feature: Provides a user-defined point to transmit data
- Mailbox-Bypass Registers: permits the user to bypass the internal SRAM
- Bus Mapping Feature Sizes data from 36-bits to either 9, 18 or 16
- Byte Swapping Feature: Converts data from Big Endian (Motorola) to Little Endian (Intel). Ideal for mixed systems.

## Product Nomenclature

Example: **SN54ABT36148HFPEP**

### Prefix—SN

SN = Commercial Processing  
SNJ = MIL-PRF-38535 (QML) (Class Q)

### Military Temperature—54

54 = -55°C to 125°C  
74 = 0°C to 70°C

### Technology—ABT

ABT = Advanced BiMOS  
ACT = Advanced CMOS  
LS = Low-Power Schottky  
HC = High Speed CMOS (CMOS Input Levels)  
HCT = High Speed CMOS (TTL Input Levels)

### Circuit Designator—3614

J, JE = Ceramic DIP (300 mil and 600 mil)  
L, L20 = Ceramic Leadless Chip Carrier (CLCC)

### Package Type—3614

J = CDIP  
HFP = CFP  
KGD = KGD  
PCB/PN = QFP  
FK = LCCC  
GB = BGA Microstar

### Enhanced Plastic—EP

Select Enhanced Plastic products are available. The part numbers for those devices end in EP. Additional information on EP products can be found on page 3 in this guide.

## Synchronous FIFOs

Device	Orderable Device	Organization	Technology	Process Level	Pins	Package	DSCC SMD Number
54ABT3614	SN54ABT3614HFP	64 x 36 x 2	BiCMOS	SN	132	HFP	NA
54ABT3614	5962-9560901NXD	64 x 36 x 2	BiCMOS	QML Plastic	120	PCB	5962-9560901NXD
54ABT7819	SNJ54ABT7819GB	512 x 18 x 2	BiCMOS	SNJ	84	GB	5962-9470401QXA
54ACT3632	SN54ACT3632HFP	512 x 36 x 2	CMOS	SN	132	HFP	NA
54ACT3641	SN54ACT3641HFP	1K x 36	CMOS	SN	132	HFP	NA
54ACT3641	5962-9560801NXD	1K x 36	CMOS	QML Plastic	120	PCB	5962-9560801NXD
54ACT7811	SN54ACT7811GB	1K x 18	CMOS	SN	68	GB	NA
54ACT7881	5962-9562701NXD	1K x 18	CMOS	QML Plastic	80	PN	5962-9562701NXD
54ABT3614	SN54ABT3614HFP	64 x 36 x 2	BiCMOS	SN	132	HFP	NA

## Asynchronous FIFOs

Device	Orderable Device	Organization	Technology	Process Level	Pins	Package	DSCC SMD Number
54ABT7820	SNJ54ABT7820GB	512 x 18 x 2	BiCMOS	SNJ	84	GB	5962-9650901QXA
CD54HC40105	CD54HC40105F3A	4 X 16	HCMOS	SNJ	16	J	NA
CD54HCT40105	CD54HCT40105F3A	4 x 16	HCMOS	SNJ	16	J	NA
CD40105	CD40105BF	4 X 16	HCMOS	SN	16	J	NA
CD40105	CD40105BF3A	4 x 16	HCMOS	SNJ	16	J	NA
54ABT7820	SNJ54ABT7820GB	512 x 18 x 2	BiCMOS	SNJ	84	GB	5962-9650901QXA
CD54HC40105	CD54HC40105F3A	4 X 16	HCMOS	SNJ	16	J	NA
CD54HCT40105	CD54HCT40105F3A	4 x 16	HCMOS	SNJ	16	J	NA
CD40105	CD40105BF	4 X 16	HCMOS	SN	16	J	NA

## Things to Consider

Texas Instruments offers a full spectrum of military-grade logic devices to support the rigorous demands of the military and aerospace markets. Standard process options include MIL-PRF-38535 (Class Q) (SNJ prefix) and commercial processing option only (SN prefix). The Military Products Division of Texas Instruments (TI-MPD) is committed to supporting your military and aerospace system requirements and will continue to release new logic devices that leverage TI's most advanced processing technology to create world-class performance.

## Product Nomenclature (CD4000)

**Example:** **CD4XXXXXX**

**Prefix—CD**

**Device Function (up to 5 digits)—4XXXX**

**Supply Voltage—XX**

A = 2 V Max  
B = 18 V Max  
UB = 18 V Max Unbuffered

**Package Designation—X**

F = Ceramic Dual In-Line Package (CDIP)  
K = Ceramic Flatpack  
D = Metal Seal CDIP

**Process Levels—X**

3 = Mil Temp Commercial Processing  
3A = MIL-PRF-38535 (QML)  
B = MIL-M-38510 Electrical (QPL)

## Product Nomenclature

**Example:** **SNJ54ABTH162245WDEP**

**Prefix—SNJ**

SNJ = MIL-PRF-38535 (QML)  
SN = Commercial Processing  
SNV = MIL-PRF-38535 QML Class V  
(Order by SMD)

**Type—54**

**Technology—ABT**

No designator = TTL  
ALS/AS = Advanced Low-Power Schottky Advanced Schottky  
AHC/AHCT = Advanced High Speed CMOS  
HC/HCT = High Speed CMOS  
BCT = BiCMOS  
AC/ACT = Advanced CMOS  
ABT = Advanced BiCMOS  
LVC = Low Voltage CMOS  
LVTH = Low Voltage Advanced CMOS w/ Bus Hold  
CDC = Clock Distribution Circuit  
CBT = Crossbar Bus Switch  
GTL = Gunning Transceiver Logic  
FCT = Fast CMOS Technology  
F = FAST

**Special Features—H**

D = Level Shifting Diode (CBTD)  
H = Bus Hold (LVTH)

**Bus/Scan Options—16**

8 = SCOPE/JTAG  
16 = Widebus  
18 = SCOPE/JTAG Widebus  
32 = Widebus+

**Options—2**

2 = Series-Damping Resistors on Outputs

**Device Function—245**

**Package Type—WD**

PZ = LQFP  
PW = TSSOP  
DW = SOIC  
DL = SSOP  
D = SOIC  
DB = TSSOP  
DGG = TSSOP  
DCK = SOP  
GQL = BGA Microstar Junior  
ZQL = BGA Microstar Junior  
J, JT = CDIP  
W/WD = Ceramic Flatpack  
FK = Leadless Ceramic Chip Carrier  
HV, HT, HFP = Ceramic Quad Flatpack  
GB = Pin Grid Array (PGA)

**Enhanced Plastic—EP**

Select Enhanced Plastic or QML Class V Space products are available. The part numbers for those devices end in EP or QMLV.

Note: For more information on packaging, visit [www.ti.com](http://www.ti.com) > Support > All Support > Packaging

## Product Family Descriptions

### Low Voltage Advanced CMOS-54LVTH

The low-voltage technology (LVTH) product line consists of bus interface functions with bus hold designed to operate at VCC = 3.3 V. These devices feature very low power consumption and provide performance comparable to 5-V advanced BiCMOS technology (ABT). LVT input and output voltage levels are compatible with 5-V TTL levels, making it ideal for mixed level systems.

### Advanced BiCMOS-54ABT

ABT devices offer high speed switching with the benefit of low noise, low power consumption and high output drive current. Based on EPIC-IIB™ BiCMOS design, ABT offers numerous improvements over BiCMOS Technology (BCT) while retaining TTL compatibility.

### BiCMOS -54BCT

A standard bipolar/CMOS process featuring high drive, low noise, low power consumption and TTL compatibility.

### Low Voltage CMOS - 54LV, 54LVC

With a range of functions that includes gates, MSI and octals, LVC gives the designer a solid choice to migrate to low voltage in mid-range applications. This family supports mixed-mode signal operations on all ports (5-V input/output voltage with 3.3-V VCC).

### Advanced CMOS - 54AC, 54ACT

Advanced CMOS devices offer advanced bipolar speed with low power consumption and low noise. Industry standard pinouts allow for ease of design and cross reference.

### Advanced Low-Voltage CMOS - 54ALVC

ALVC (Advanced Low-Voltage CMOS) has typical propagation delays of less than 2 ns, current drive of 24 mA, and static power consumption of 40 µA for bus-interface functions and is the industry standard for speed-critical 3.3-V designs.

### Advanced High-Speed CMOS - 54AC, 54ACT

AHC and AHCT provide the HCMOS user an excellent migration path to upgrade their speed performance in low power / low noise / low drive applications. Standard offerings include both CMOS- (AHC) and TTL- (AHCT) compatible functions.

### High-Speed CMOS - 54HC

Delivers low power and low noise at a low price. The HC family offers CMOS-compatible inputs and the HCT family offers TTL-compatible inputs.

### High-Speed CMOS - 54AHC, 54AHCT

This family features a broad range of functions from gates to complex functions. HCMOS, designed as a replacement for Low-Power Schottky TTL, offers speeds comparable with 54LS but lower power consumption.

### CD4000 Series - CD4

This series of high-voltage CMOS devices comprises a spectrum of functions that ranges from simple gates to complex counters, registers and arithmetic circuits.

### Advanced Bipolar - 54ALS, 54AS, 54F

Advanced Low-Power Schottky and Advanced Schottky combine to provide the designer with a broad range of functions that aid in optimizing designs. The 54ALS, 54AS and 54F families enable a socket-by-socket selection of devices for optimum speed and power.

### Standard TTL - 54LS, 54S, 54

Standard TTL devices offer a large number of general purpose logic functions 54xxx with standard pinouts and standard packaging.

### WideBus™ and WideBus+™ - ABT16, ACT16, LVTH116, ABT32

WideBus devices offer 16-, 18-, and 20-bits of bus interface logic in one space saving package. WideBus+ devices offer 32- and 36-bits of bus interface logic in one package.

### Crossbar Technology - 54CBT

CBT enables a bus-interface device to function as a very fast bus switch, effectively isolating buses when the switch is open and offering very little propagation delay when the switch is closed. CBT devices can also be used as 5-V to 3.3-V translators, allowing designers to mix 5-V or 3.3-V components in the same system.

### SCOPE™ - 54BCT8, 54ABT8, 54ABT18, 54LVTH18

SCOPE devices blend test circuitry with standard logic functions to facilitate testing of complex circuit-board assemblies. In the normal mode, the device is functionally equivalent to the standard device. In the test mode, the test circuitry can be activated via the 4-Wire Test Access Port (TAP) to take snapshot samples of the data appearing at the device pins or to perform a self test on the boundary test cells. These functions are offered in both standard and WideBus packaging, 5 V and 3.3 V compatible.

### FIFO - 54ABT, 54ACT

First-In, First-Out (FIFO) memories can connect data buses operating at different clock rates. These memories offer different flag configurations and different data widths/depths to allow greater system optimization.

### Gunning Transceiver Logic - 54GTL

GTL is a new reduced-voltage switching standard that provides high-speed, point-to-point communications with low power dissipation. TI offers GTL/TTL translators to interface with TTL-based subsystems.

Note: See Enhanced Plastic section for EP logic availability and package options.

Device Descriptions by Function		Device Descriptions by Function		Device Descriptions by Function	
Function	Description	Function	Description	Function	Description
00	Quad 2-input NAND	134	12-input NAND	356	8-Input Mux/Reg, Three State
01	Quad 2-input NAND	136	Quad Exclusive-OR (OC)	365	Hex Buffer
02	Quad 2-input NOR	137	3-to-8 Decoder/Mux	366	Hex Driver
03	Quad 2-input NAND	138	3-to-8 Decoder/Mux	367	Hex Buffer (4-bit & 2-bit)
04	Hex Inverter	139	Dual 3-to-4 Decoder/Mux	368	Hex Driver
04	Unbuffered '04	140	Dual 4-input NAND (50 Ohm)	373	8-bit Latch
04U	Hex Inverter (OC)	145	BCD-to-Decimal Decoder	374	8-bit D-type Flip-Flop
05	Hex Inverter (buffer)	147	10-to-4-Line Priority Encoder	375	4-bit Latch
06	Hex Inverter (buffer)	148	8-to-3 LINE Decoder	377	8-bit D-type Flip-Flop
07	Quad 2-input AND	150	1-of-16 Data Selector / Mux	378	6-bit D-type Flip-Flop
08	Quad 2-input AND	151	1-of-8 Data Selector / Mux	379	4-bit D-type Flip-Flop
09	Triple 3-input NAND	153	Dual 4-to-1 Selector / Mux	381	ALU Function Generator
10	Triple 3-input AND	154	4-to-16 line Dec / Demux	390	Dual Decade Counter
11	Triple 3-input NAND	155	Dual 2-to-4 Decoder	393	Dual 4-bit Counter
12	Hex Schmitt-Trigger	156	Dual 1-to-4 Demux(OC)	396	8-bit Storage Register
14	Triple 3-input AND	157	Quad 2-to-1 Sel / Mux	399	Quad 2-input Mux
15	Hex Inv. Buffer	158	Quad 2-to-1 INV. Sel / Mux	423	Dual Retriggerable Monostable Multivibrator w/ Reset
16	Hex Buffer	161	Sync. 4-bit Binary Counter	480	8-bit Dual Parity Generator / Checker
17	Dual 4-input NAND	162	Sync. BCD Decade Counter/ Synchronous Reset	521	8-bit Identity Comparators
20	Dual 4-input AND	163	Sync. 4-bit Binary Counter	533	8-bit D-Type Transp. Latch
21	Dual 4-input NOR	164	8-bit Shift Register	534	8-bit D-Type Flip Flop
23	Dual 4-input NOR	165	8-bit Shift Register (Serial-In/Parallel Out)	540	8-bit Buffer/Driver
25	Quad 2-input NAND	166	8-bit Shift Register (Serial-In/Parallel Out)	541	8-bit Buffer/Driver
26	Triple 3-input NOR	169	Sync. 4-bit U/D Counter	543	8-bit Reg. Transceiver
27	Quad 2-input NOR	170	4-by-4 Register File	563	8-bit D-Type Transp. Latch
28	8-input NAND	173	Quad D-type Register	564	8-bit D-Type Flip-Flop
30	Quad 2-input OR	174	Hex D-type Flip-Flop w/ Reset	569	4-bit Up/Down Counter
32	Quad 2-input NOR	175	Quad D-type Flip-Flop w/ Reset	573	8-bit Latch
33	Quad 2-input NAND Buffer	177	Binary Counter/Latch	574	8-bit D-Type Flip-Flop
37	Quad 2-input NAND Buffer	180	9-bit Odd/Even Parity Generator	576	8-bit D-Type Flip-Flop
40	Dual 4-input NAND Buffer	181	4-bit ALU	580	8-bit D-Type Transp. Latch
42	4-to-10 BCD-to-Decimal Decoder	182	Look-Ahead Carry Generator	590	8-bit Counter
45	BCD-to-Decimal Decoder	190	Presettable Sync.. BCD Decade w/ U/D Counter	592	8-bit Counter
47	BCD-to-7 Seg. Decoder	192	Sync. U/D BCD Counter	593	8-bit Counter
49	BCD-to-7 Seg. Decoder	193	Sync. U/D Binary Counter	595	8-bit Shift Register
50	Dual AND-Or-Invert (expandable)	194	4-bit Shift Register	597	8-bit Shift Register
51	Dual AND-Or-Invert	195	4-bit Shift Register	598	8-bit Shift Register
54	4-wide AND-Or-Invert	197	4-bit Counter/Latch	620	8-bit Transceiver
64	4-2-3-2 AND-Or-Inverter	221	Dual Monostable MultiVibrator	623	8-bit Transceiver
72	J-K Master-Slave Flip-Flop	222	16K x 4 bipolar FIFO	628	Volt. Contr. Oscillator
73	Dual J-K Flip-Flop w/ Reset	224	16K x 4 bipolar FIFO	629	Volt. Contr. Oscillator
74	Dual D-type Flip-Flop w/ Set/Reset	237	3-to-8-Line Decoder/Mux w/ Address Latches	640	8-bit Transceiver
75	4-bit bistable Latches	238	3-to-8 Line Dec / Demux	645	8-bit Transceiver
76	Dual J-K Flip-Flop	240	8-bit Buffer	646	8-bit Transceiver
83	4-bit Full Adder	241	8-bit Buffer	648	8-bit XCVR & Register
85	4-bit Mag. Comparator	243	4-bit Transceiver	652	8-bit Transceiver
86	Quad Exclusive-OR	244	8-bit Buffer	653	8-bit XCVR & Register
90	Decade Counter	245	8-bit Transceiver	669	Sync. 4-bit Counter
91	8-bit Shift Register	250	16- to 1-line Decoder	670	4-by-4 Register File
92	Divide-by-12 Counter	251	8-input Multiplexer	673	16-bit Shift Register
93	4-bit Binary Counter	253	Dual 4-to-1 Sel / Mux	674	16-bit Shift Register
95	4-bit Shift Register	257	Quad 2-to-1 Sel / Mux	682	8-bit Identity Comparator
96	5-bit Shift Register	258	Quad 2-to-4 Sel / Mux (Inv)	684	8-bit Identity Comparator
97	Sync. 6-bit Bin.Rate MULT	259	8-bit Addressable Latch	688	8-bit Identity Comparator
107	Dual J-K Flip-Flop w/ Reset	260	Dual 5-input NOR	697	Sync. Up/Down Counter
109	Dual J-K Flip-Flop w/ Set/Reset	266	Quad Exclusive-NOR (OC)	756	8-bit Buffer/Driver
112	Dual J-K Flip-Flop w/ Set/Reset	273	Octal D-type Flip-Flop w/ Reset	760	8-bit Buffer (OC)
114	Dual J-K Flip-Flop	279	Quad S-R Latch	804	Hex 2-input NAND Driver
121	Monostable Multivibrators	280	9-bit Odd/Even Parity Gen	805	Hex 2-input NOR Driver
123	Dual '122	283	4-bit Binary Full Adder	808	Hex 2-input AND Driver
124	Dual VCO	286	9-bit Parity Checker / Gen	821	10-bit Interface Flip-Flop
125	Quad Bus Buffer (/OE)	298	Quad 2-input MUX	823	9-bit Interface Flip-Flop
126	Quad Bus Buffer (OE)	299	8-bit Shift Register	825	8-bit Interface Flip-Flop
128	75-Ohm Line Driver	323	8-bit Shift Register	827	10-bit Buffer / Driver
132	Quad NAND Schmitt-Trigger	348	8-to-3 Priority Encoder	832	Hex 2-input OR Driver
133	13-input NAND	354	8-Input Mux/Reg, Three State		

Note: See Enhanced Plastic section for EP logic availability and package options.

### Device Descriptions by Function

Function	Description
841	10-bit D-Type Latch
843	9-bit D-Type Latch
853	8- to 9-bit Parity Transceiver
857	Hex 2- to 1-line Multiplier
867	8-bit Up/Down Counter
869	8-bit Up/Down Counter
873	8-bit D-Type Transparent Latch
874	8-bit D-Type Flip-Flop
885	8-bit Magnitude Comparator
996	8-bit Read-Back Latch
1000	Quad 2-input NAND Buffer
1004	Hex Inverting Driver
1032	Quad 2-input OR Buffer
1034	Hex Non-Invert. Driver
1035	Hex Non-Invert. Driver
1244	8-bit Buffer
1245	8-bit Transceiver
1645	8-bit Transceiver
2240	'240 w/ Output Damping R
2244	'244 w/ Output Damping R
2245	'245 w/ Output Damping R
2827	10-bit MOS Driver
2952	8-bit Transceiver & Register
3614	36-bit x 64 x 2 FIFO
3641	36-bit x 1K FIFO
4002	Dual 4-input NOR
4015	Dual 4-bit Serial-In/Parallel-Out Shift Register
4017	Johnson Decade Counter w/ 10 Decoded Outputs
4020	14-bit Counter
4024	7-bit Counter
4040	12-bit Counter
4046	Phase Lock Loop w/ VCO
4049	Hex Inverting High-to-Low Level Shifter
4050	Hex High-to-Low Level Shifter
4051	8-Channel Analog Mux/Demux
4052	Dual 4-Channel Analog Mux/Demux
4053	Triple 2-Channel Analog Mux/Demux
4059	Prog Divided by "N" Counter
4060	14-Stage Binary Ripple Counter w/ Oscillator
4066	Quad Bilateral Switch
4075	Triple 3-Input OR Gate
4094	8-Stage Shift & Store Bus Reg
4316	Quad Analog Switch
4351	Analog Mux w/ Latch
4514	4-to-16-Line Decoder/Demux w/ Input Latches
841	10-bit D-Type Latch
843	9-bit D-Type Latch
853	8- to 9-bit Parity Transceiver
857	Hex 2- to 1-line Multiplier
867	8-bit Up/Down Counter
841	10-bit D-Type Latch
843	9-bit D-Type Latch
853	8- to 9-bit Parity Transceiver
857	Hex 2- to 1-line Multiplier
867	8-bit Up/Down Counter
869	8-bit Up/Down Counter
873	8-bit D-Type Transparent Latch
874	8-bit D-Type Flip-Flop
885	8-bit Magnitude Comparator
996	8-bit Read-Back Latch
1000	Quad 2-input NAND Buffer
1004	Hex Inverting Driver
1032	Quad 2-input OR Buffer
1034	Hex Non-Invert. Driver
1035	Hex Non-Invert. Driver

### Device Descriptions by Function

Function	Description
2245	'245 w/ Output Damping R
2827	10-bit MOS Driver
2952	8-bit Transceiver & Register
3614	36-bit x 64 x 2 FIFO
3641	36-bit x 1K FIFO
4002	Dual 4-input NOR
4015	Dual 4-bit Serial-In/Parallel-Out Shift Register
4017	Johnson Decade Counter w/ 10 Decoded Outputs
4020	14-bit Counter
4024	7-bit Counter
4040	12-bit Counter
4046	Phase Lock Loop w/ VCO
4049	Hex Inverting High-to-Low Level Shifter
4050	Hex High-to-Low Level Shifter
4051	8-Channel Analog Mux/Demux
4052	Dual 4-Channel Analog Mux/Demux
4053	Triple 2-Channel Analog Mux/Demux
4059	Prog Divided by "N" Counter
4060	14-Stage Binary Ripple Counter w/ Oscillator
4066	Quad Bilateral Switch
4075	Triple 3-Input OR Gate
4094	8-Stage Shift & Store Bus Reg
4316	Quad Analog Switch
4351	Analog Mux w/ Latch
4514	4-to-16-Line Decoder/Demux w/ Input Latches
4520	Dual 4-bit Sync Binary Counter
4538	Dual Precision Monostable Multivibrator
7266	Quad Exclusive NOR
7819	512 x 18 x 2 FIFO
7820	512 x 18 x 2 FIFO
8240	'240 with JTAG
8244	'244 with JTAG
8245	'245 with JTAG
8373	'373 with JTAG
8374	'374 with JTAG
8543	'543 with JTAG
8646	'646 with JTAG
8652	'652 with JTAG
8990	Scan Test Controller
8996	10-bit ASP
8997	Scan Path Linker
16240	16-bit '240
16241	16-bit '241
16244	16-bit '244
16245	16-bit '245
16260	12- to 24-bit Mux D-Latch
16373	16-bit '373
16374	16-bit '374
16543	16-bit '543
16601	18-bit UBT
16640	16-bit '640
16646	16-bit '646
16652	16-bit '652
16823	18-bit '823
16841	20-bit D-type Latch
16952	16-bit Reg. Transceiver
18245	JTAG '16245
18502	JTAG '16502
18646	JTAG '16646
29520	8-bit Identity Comparators
29818	Diagnostic Scan Register
29821	10-bit Bus Interf. Flip-Flop
29823	9-bit Bus Interf. Flip-Flop
32245	36-bit '245
32316	16-bit 3-Port UBE
32501	36-bit UBT

### Device Descriptions by Function

Function	Description
32543	36-bit '543
40103	8-bit Binary Down Counter
40105	4-bits X 16 Words FIFO Register
162244	16-bit '2244
162245	16-bit '2245
162373	3.3 Volt '162373 w/ Output Damping R

### Key

ALU	Arithmetic Logic Unit
ASP	Addressable Scan Ports
C-O	Complementary-Output
FIFO	First-In First-Out Memory
Gen	Generator
Inv	Inverting
Mult	Multiplier
Mux-	Multiplexer
OC	Open Collector Outputs
Reg	Register
Sel	Selector
Sync	Synchronous
XCVR	Transceiver
UBE	Universal Bus Exchanger
UBT	Universal Bus Transceiver
UD	Up/Down
VCO	Voltage-Controlled

Device	BiCMOS			CMOS								BIPOLAR					
	54ABT	54BCT	54LVTH*	54AC	54ACT	54AHC	54AHCT	54FCT	54HC	54HCT	54LVC	54ALS	54AS	54F	54LS	54S	54
00				F, J, W, FK	F	J, W, FK	J, W, FK		F, J, W, FK	F	(A)J,W,FK	(A)J,W,FK	J, W, FK	J, W, FK	J, W, FK	J, W, FK	J, W
01															J, W, FK		J, W
02				F	F	J, W, FK	J, W, FK		F, J, W, FK	F	(A)J,W,FK	(A)J,W,FK	J, W, FK	J, W, FK	J, W, FK	J, W, FK	J, W
03									F, J, FK	F		(B) J, FK			J, W, FK	J, W, FK	
04				F, J, W, FK	F, J, W, FK	J, W, FK	J, W, FK		F, J, W, FK	F, J, FK	A)J,W,FK	(B)J,W,FK	J, W, FK	J, W, FK	J, W, FK	J, W, FK	J, W
U04						J, W, FK			F, J, FK								
05				F	F				J, FK			(A)J,W,FK			J, W, FK	J, W, FK	J, W
06															J, W, FK		J, W, FK
07																	J, W, FK
08				F, J, W, FK	F, J, W, FK	J, W, FK	J, W, FK		F, J, W, FK	F	(A)J,W,FK	J, W, FK	J, W, FK		J, W, FK	J, W, FK	
09												J, FK			J, W, FK	J, W, FK	
10				J, W, FK	J, W, FK				F, J, W, FK	F		(A)J,W,FK	J, W, FK	J, W, FK	J, W, FK	J, W, FK	
11				J, W, FK	J, W, FK				F, J, W, FK	F		(A)J,W,FK	J, W, FK	J, W, FK	J, W, FK	J, W, FK	
12																	J, W
14				J, W, FK		J, W, FK	J, W, FK		F, J, W, FK	F, J, W, FK	J, W, FK				J, W, FK		J, W
15																J, W, FK	
16																	J, W
17																	J
20					F				F, J, W, FK	F		(A)J,W,FK	J, W, FK	J, W, FK	J, W, FK	J, W, FK	
21									F, J, FK			(A)J,W,FK			J, W, FK		
23																	J, W
25																	J, W
26															J, W, FK		
27									F, J, W, FK	F		(A)J,W,FK	J, W, FK	J, W, FK	J, W, FK		
28																	J, W
30									F	F		(A)J,W,FK	J, W, FK	J, W, FK	J, W, FK	J, W, FK	J, W
32				F, J, W, FK	F	J, W, FK	J, W, FK		F, J, W, FK	F	(A)J,W,FK	J,W,FK	J, W, FK	J, W, FK	J, W, FK	J, W, FK	J, W
33												(A)J,FK			J, W		
37															J, W, FK	J, W, FK	
38												(B)J,W,FK			J, W, FK	J, W, FK	J, W
40																	
42									F, J, FK								
45																	J, W
47															J, W, FK		(A) J, W
49															J		
50																	J, W
51															J, W, FK	J, W, FK	J, W
54															J, W, FK		J, W
64																J, W, FK	
72																	J, W
73									F						(A) J, W		
74				F, J, W, FK	F, J, W, FK	J, W, FK	J, W, FK		F, J, W, FK	F	(A)J,W,FK	(A)J,W,FK	(A)J,W,FK	J, W, FK	(A)J,W,FK	J, W, FK	
75									F	F					J, W		
76															(A) J, W		J, W

Device	BiCMOS			CMOS								BIPOLAR					
	54ABT	54BCT	54LVTH*	54AC	54ACT	54AHC	54AHCT	54FCT	54HC	54HCT	54LVC	54ALS	54AS	54F	54LS	54S	54
76															(A) J, W		J, W
83																	
85									F	F					J, W, FK	J, W, FK	
86				J, W, FK	F, J, W, FK	J, W, FK	J, W, FK		F, J, W, FK	F	(A), J, W, FK	J, W, FK	(A), J, W, FK		(A), J, W, FK	J, W, FK	J, W
90															J, W		(A) J, W
91															J, W		
92																	(A) J, W
93															J, W		
95																	(A) J, W
96																	J, W
97																	J
107									F								J
109				F	F				F, J, W, FK	F		(A), J, W, FK	(A), J, W, FK	J, W, FK	(A), J, W, FK		
112				F	F				F, J, W, FK	F		(A), J, W, FK			(A), J, W, FK	J, W, FK	
114																J, W	
121																	J, W
123						A, J, W, FK	J, W, FK		F	F					J, W, FK		J
124															use 629	J, W	
125						J, W, FK	J, W, FK		F, J, FK	F					(A), J, W, FK		
126	J, W, FK	(A), J, W, FK				J, W, FK	J, W, FK		F, J, FK								
128		(A), J, W, FK															J, W, FK
132									F, J, W, FK	F					J, W, FK	J, W, FK	
133												J, W, FK					
134																J, W	
136															J, W, FK		
137												(A), J, W, FK			J, W, FK		
138				F	F	J, W, FK	J, W, FK	L, D	F, J, W, FK	F, J, FK	(A), J, W, FK	(A), J, W, FK	J, W, FK	J, W, FK	J, W, FK	J, W, FK	
139				F	F				F, J, W, FK	F		J, W, FK			(A), J, W, FK	J, W, FK	
140																J, W, FK	
145															J, W, FK		J
147									F								
148									J, W, FK						J, W, FK		J, W
150																	J, W
151					F				F, J, FK	F		J, W, FK			J, W, FK	J, W, FK	
153				F	F				F, J, W, FK	F		J, W, FK		J, W, FK	J, W, FK		J, W
154									F	F							J, W
155															(A) J, W		
156															J, W, FK		
157				F		J, W, FK		L	F, J, W, FK	F	(A), J, W, FK	(A), J, W, FK			J, W, FK		J, W
158										F		J, W, FK			J, W, FK	J, W, FK	
161				F	F				F, J, W, FK			(B), J, W, FK	J, W, FK		(A), J, W, FK		
162									F								
163				F	F			L	F, J, FK	F		(B), J, W, FK			(A), J, W, FK	J, W, FK	J, W
164				F	F				F, J, W, FK	F					J, W, FK		J, W

Device	BiCMOS			CMOS								BIPOLAR					
	54ABT	54BCT	54LVTH*	54AC	54ACT	54AHC	54AHCT	54FCT	54HC	54HCT	54LVC	54ALS	54AS	54F	54LS	54S	54
165									F,J,W,FK	F		J,W,FK			(A)J,W,FK	J,W,FK	
166									F,J,FK	F					(A)J,W,FK		J,W
169												(B)J,W,FK			(B)J,W,FK	J,W,FK	
170															J,W		
173									F	F					(A)J,W,FK		J,W
174					F				F,J,W,FK	F		J,W,FK	J,W,FK		J,W,FK	J,W,FK	
175									F,J,W,FK	F		J,W,FK	(B)J,W,FK		J,W,FK	J,W,FK	
180																	J,W
181															J,W,FK	J,W,FK	
182																J,W,FK	
190									F								
191									F,J,FK	F		(A)J,W,FK			J,W,FK		
192									F								
193									F,J,FK	F		(A)J,W,FK			J,W,FK		
194									F				J,W,FK		(A)J,W,FK	J,W,FK	
195									F,J,FK						(A)J,W,FK		
196																	
197																	J,W
221									F							J,W,FK	J
222																(A)J,FK	
224																(A)J,FK	
237									F								
238									F	J							
240	J,W,FK	J,W,FK	J,W,FK	F,J,W,FK	F,J,W,FK	J,W,FK	J,W,FK	L,D	F,J,W,FK	F,J,FK		(A)J,W,FK	(A)J,W,FK	J,W,FK	J,W,FK	J,W,FK	
241	J,W,FK	J,W,FK			F,J,W,FK				J,FK	F		(C)J,W,FK	(A)J,W,FK	J,W,FK	J,W,FK	J,W,FK	
243									F	F		(A)J,W,FK			J,W,FK		
244	J,W,FK	J,W,FK	J,W,FK	F,J,W,FK	F,J,W,FK	J,W,FK	J,W,FK	L,D	F,J,W,FK	F,J,FK	(A)J,W,FK	(C)J,W,FK	(A)J,W,FK	J,W,FK	J,W,FK	J,W,FK	
245	(A)J,W,FK	J,W,FK*	J,W,FK	F,J,W,FK	F,J,W,FK	J,W,FK	J,W,FK	L,D	F,J,W,FK	F,J,W,FK	(A)J,W,FK	(A)J,W,FK	J,W,FK	J,W,FK	J,W,FK		
250														(A)J,W,FK			
251									F,J,FK	F		J,W,FK			J,W,FK	J,W,FK	
253					F				J,FK			J,W,FK			J,W,FK		
257				F	F				F,J,FK	F	(A)J,W,FK	(A)J,W,FK			(B)J,W,FK	J,W,FK	
258										F		(A)J,W,FK			(B)J,W,FK	J,W,FK	
259									F,J,FK	F		J,W,FK					
260															J,W,FK		
266															J,W,FK		
273	J,W,FK			F	F	J,W,FK		L,D	F,J,W,FK	F		J,W,FK			J,W,FK		
279															(A)J,W,FK		
280				F	F				F	F					J,W,FK	J,W,FK	
283				F	F				F	F				J,W,FK	J,W,FK	J,W,FK	
286													J,W,FK				
297									F								
298															J,W,FK		
299				F	F				F	F		J,W,FK			J,W,FK	J,W,FK	



Device	BiCMOS			CMOS								BIPOLAR					
	54ABT	54BCT	54LVTH*	54AC	54ACT	54AHC	54AHCT	54FCT	54HC	54HCT	54LVC	54ALS	54AS	54F	54LS	54S	54
323					F							J, W, FK			J, W, FK		
348															J, W		
354									FW								
356																	
365									FJ, FK	F					(A) J, W, FK		
366									FJ						(A) J, W, FK		(A) J, W
367									FJ, FK	F					(A) J, W, FK		(A) J, W
368									FJ, FK						A) J, W, FK		
373	J, W, FK	J, W, FK		F, J, W, FK	F, J, W, FK	J, W, FK	J, W, FK	L, D	F, J, W, FK	F, J, W, FK	(A) J, W, FK	J, W, FK	J, W, FK	J, W, FK	J, W, FK	J, W, FK	J, W, FK
374	J, W, FK	J, W, FK		F, J, W, FK	F, J, W, FK	J, W, FK	J, W, FK	L, D	F, J, W, FK	F, J, W, FK	(A) J, W, FK	J, W, FK	J, W, FK	J, W, FK	J, W, FK	J, W, FK	J, W, FK
375															J, W, FK		
377	J, W, FK							L	FJ, FK	F					J, W, FK		
378															J, W, FK		
379															J, W, FK		
381																J, W, FK	
390										F					J, W, FK		
393									FJ, W, FK	F					J, W, FK		
396															J		
399															J, W, FK		
423										F							
480								L	L								
520												J, FK					
521												use 688		J, W, FK			
533	J, W, FK								F	F							
534	J, W, FK								F	F		(A) J, W, FK					
540		J, W, FK			F	J, W, FK	J, W, FK	L, D	F, J, FK	J, FK	(A) J, W, FK				J, W		
541		J, W, FK		F	F	J, W, FK	J, W, FK	D	F, J, W, FK	F, J, FK	(A) J, W, FK	J, W, FK		J, W, FK	J, W, FK		
543	(A), JT, WK, FK	J, W, FK						D									
563									F	F		(A) J, W, FK					
564									F	F		(B) J, W, FK					
569												(A) J, W, FK					
573	J, W, FK	J, W, FK	J, W, FK	F	F, J, W, FK	J, W, FK	J, W, FK	D	F, (A) J, W, FK	F	(A) J, W, FK	(C) J, W, FK	(A) J, W, FK				
574	J, W, FK	J, W, FK	J, W, FK	F, J, W, FK	F	J, W, FK	J, W, FK	L, D	F, J, FK	F	(A) J, W, FK	(B) J, W, FK	J, W, FK				
576												(B) J, W, FK	J, W, FK				
580												(B) J, W, FK					
590									(A), J, FK						J, W, FK		
592															J, W, FK		
593															J, W, FK		
595									J, W, FK						J, W, FK		
597									F						J, W, FK		
598																	
620		(A) J, W, FK															
623	(A) J, W, FK	J, W, FK			F												
628															J		

Device	BiCMOS			CMOS								BIPOLAR					
	54ABT	54BCT	54LVTH*	54AC	54ACT	54AHC	54AHCT	54FCT	54HC	54HCT	54LVC	54ALS	54AS	54F	54LS	54S	54
629															J,W		
640		JT, W, FK							F, J, FK	F		(B) J,W, FK	J,W,FK		J,W,FK		
645									J, FK			(A) J,W, FK	J,W,FK		J,W,FK		
646	(A) J,W, FK	JT, W, FK	JT, W, FK					L	F		(A) J,W, FK	JT, W, FK	JT, W, FK				
648												JT, W, FK					
652	(A) J,W, FK	JT, W, FK									(A) J,W, FK	JT, W, FK					
653												JT, W, FK					
669															J,W,FK		
670									F						J,W,FK		
673															J,W,FK		
674															J,W,FK		
682															J,W,FK		
684															J,W,FK		
688									F, J, W, FK	F		J,W,FK			J,W,FK		
697															J,W,FK		
756													J, W, FK				
760		J, W, FK											J, W, FK				
804												(A) J,W, FK	(B) J,W, FK				
805													(B) J,W, FK				
808													(B) J,W, FK				
821	JT, W, FK												(A) J,W, FK				
823	JT, W, FK												(A) J,W, FK				
825													(A) J,W, FK				
827	JT, W, FK							L									
832												(A) J,W, FK	(B) J,W, FK				
841	JT, W, FK							D									
843	JT, W, FK																
853	JT, W, FK																
857												JT, FK					
867													JT, W, FK				
869													JT, W, FK				
873												(B) J,W, FK					
874												(B) J,W, FK					
885													JT, W, FK				
996												JT, W, FK					
1000													(A) J,W, FK				
1004													(A) J,W, FK				
1032													(A) J,W, FK				
1034												J, W, FK	(A) J,W, FK				
1035												J, W, FK					
1244												(A) J, FK					
1245												(A) J, FK					
1645												use 1245					
2240	J, W, FK	J, W, FK															

Device	BiCMOS			CMOS								BIPOLAR					
	54ABT	54BCT	54LVTH*	54AC	54ACT	54AHC	54AHCT	54FCT	54HC	54HCT	54LVC	54ALS	54AS	54F	54LS	54S	54
2244	J, W, FK	J, W, FK															
2245	J, W, FK																
2827		(A) JT,W, FK															
2952	(A) JT,W, FK																
3614	PCB, HFP																
3641					PN												
4002									F, J, W, FK								
4015									F								
4017									F								
4020									F, J, W, FK	F							
4024									F, J, FK	F							
4040									F, J, W, FK	F							
4046									F	F							
4049									F								
4050									F								
4051									F	F							
4052									F								
4053									F	F							
4059									F								
4060									F	F							
4066									F								
4075									F	F							
4094									F								
4316									F								
4351									F								
4511									F								
4514									F	W							
4520									F								
4538									F	F							
7266									F								
7819	GB																
7820	GB																
8240		(A) JT, FK															
8244		(A) JT, FK															
8245	JT, FK	(A) JT, FK															
8373		(A) JT, FK															
8374		(A) JT, FK															
8543	JT, FK																
8646	JT, FK																
8652	JT, FK																
8990					GB, HV												
8996	JT, FK																
8997					FK												
16240	WD				WD												

Device	BiCMOS			CMOS								BIPOLAR					
	54ABT	54BCT	54LVTH*	54AC	54ACT	54AHC	54AHCT	54FCT	54HC	54HCT	54LVC	54ALS	54AS	54F	54LS	54S	54
16241	WD																
16244	WD		(A) WD		WD												
16245	WD*		(A) WD		WD												
16260	WD																
16373	(A) WD		WD		WD												
16374	(A) WD		WD														
16501	WD																
16543	WD																
16601	WD																
16640	WD																
16646	WD																
16654	WD																
16823	WD																
16841	WD																
16952	WD																
18245	WD																
18502	HV*		HV														
18646	HV*																
29520								D									
29818								L, D									
29821												JT					
29823												JT					
32245	PZ																
32316	HT*																
32501	PZ																
32543	PZ																
40103									F								
40105									F	F							
162244	WD		WD														
162245	WD																
162373			WD														

Note: See Enhanced Plastic section for EP logic availability and package options.

<b>CD4000 Series</b>	
<b>Device</b>	<b>Functional Description</b>
CD4001B	Quad 2-Input NOR Gate
CD4001UB	Quad 2-Input NOR Gate (Unbuffered)
CD4002B	Dual 4-Input NOR Gate
CD4006B	18-Stage Static Shift Register
CD4007UB	Dual Complementary Pair Plus Inverter (Unbuffered)
CD4009UB	Hex Buffer/Converter (Inverting, Unbuffered)
CD4010B	Hex Buffer/Converter (Non-Inverting)
CD4011A	Quad 2-Input NAND Gate
CD4011B	Quad 2-Input NAND Gate
CD4011UB	Quad 2-Input NAND Gate
CD4012B	Dual 4-Input NAND Gate
CD4013B	Dual D-Type Flip-Flop with Set/Reset Capability
CD4014B	8-Stage Static Shift Register
CD4015B	Dual 4-Stage Static Shift Register
CD4016B	Quad Bilateral Switch
CD4017B	Decade Counter/Divider
CD4018B	Presetable Divide-By-N Counter
CD4019B	Quad AND/OR Select Gate
CD4020B	14-Stage Ripple-Carry Binary Counter/Divider
CD4021B	8-Stage Static Shift Register
CD4022B	Divide-By-8 Counter/Divider
CD4023B	Triple 3-Input NAND Gate
CD4024B	7-Stage Ripple-Carry Binary Counter/Divider
CD4025A	Triple 3-Input NOR Gate
CD4025B	Triple 3-Input NOR Gate
CD4027B	Dual J-K Master-Slave Flip-Flop w/ Set/Reset Capability
CD4028B	BCD-to-Decimal Decoder
CD4029B	Presetable Up/Down Counter
CD4030B	Quad Exclusive-OR Gate
CD4031B	64-Stage Static Shift Register
CD4034B	8-Stage Shift Register
CD4035B	4-Stage Parallel-In/Parallel-Out Shift Register
CD4040B	12 Stage Ripple-Carry Binary Counter/Divider
CD4041UB	Quad True/Complement Buffer
CD4042B	Quad Clocked "D" Latch
CD4043B	Quad NOR R/S Latch (3-State Outputs)
CD4044B	Quad NAND R/S Latch (3-State Outputs)
CD4046B	Micropower Phase Lock Loop
CD4047B	Low Power Monostable/Astable Multivibrator
CD4048B	Multi-Function Expandable 8-Input Gate (3-State Outputs)
CD4049UB	Hex Buffer/Converter (Inverting, Unbuffered)
CD4050B	Hex Buffer/Converter (Non-Inverting)
CD4051B	8-Channel Analog Multiplexer /Demultiplexer
CD4052B	4-Channel Analog Multiplexer /Demultiplexer
CD4053B	Triple 2-Channel Analog Multiplexer /Demultiplexer
CD4054B	4-Segment LCD Display Driver
CD4056B	BCD-to-8 Segment LCD Driver
CD4060B	14-Stage Ripple-Carry Binary Counter/Divider & Oscillator
CD4063B	4-Bit Magnitude Comparator
CD4066B	Quad Bilateral Switch
CD4067B	16-Channel Analog Multiplexer /Demultiplexer
CD4068B	8-Input NAND/AND Gate
CD4069UB	Hex Inverter
CD4070B	Quad EXCLUSIVE-OR Gate
CD4071B	Quad 2-Input OR Gate
CD4072B	Dual 4-Input OR Gate
CD4073B	Triple 3-Input AND Gate

<b>CD4000 Series</b>	
<b>Device</b>	<b>Functional Description</b>
CD4075B	Triple 3-Input OR Gate
CD4076B	4-Bit D-Type Register
CD4077B	Quad Exclusive-NOR Gate
CD4078B	8-Input NOR/OR Gate
CD4081B	Quad 2-Input AND Gate
CD4082B	Dual 4-Input AND Gate
CD4085B	Dual 2-Wide 2-Input AND-OR-INVERT Gate
CD4086B	Expandable 4-Wide 2-Input AND-OR-INVERT Gate
CD4089B	Binary Rate Multiplier
CD4093B	Quad 2-Input NAND Schmitt Triggers
CD4094B	8-Stage Shift-and-Store Bus Register
CD4097B	8-Channel Analog Multiplexer/Demultiplexer
CD4098B	Dual Monostable Multivibrator
CD4099B	8-Bit Addressable Latch
CD4502B	Strobed Hex Inverter/Buffer
CD4503B	Hex Buffer (Non-Inverting) (3-State Outputs)
CD4504B	Hex Voltage-Level Shifter (for TTL-to CMOS or CMOS-to-CMOS Operation)
CD4508B	Dual 4-Bit Latch
CD4511B	BCD-to-7-Segment Latch Decoder Drivers
CD4512B	8-Channel Data Selector (3-State Outputs)
CD4514B	4-Bit Latch/4-to-16 Line Decoder (Outputs Lows)
CD4515B	4-Bit Latch/4-to-16 Decoder (Outputs Low)
CD4516B	Presetable 4-Bit Binary Up/Down Counter
CD4517B	Dual 64-Stage Static Shift Register
CD4518B	Dual BCD Up-Counter
CD4520B	Dual Binary Up-Counter
CD4532B	8-Bit Priority Encoder
CD4536B	Programmable Timer
CD4541B	Programmable Timer
CD4555B	Dual 1-of-4 Decoder/Demultiplexer (Outputs High)
CD4556B	Dual 1-of-4 Decoder/Demultiplexer (Outputs Low)
CD4585B	4-Bit Magnitude Comparator
CD4724B	8-Bit Addressable Latch
CD14538B	Dual Precision Monostable Multivibrator
CD40103B	8-Stage Presetable Synchronous Down Counter
CD40105B	4-Bit by 16-Word FIFO Register
CD40106B	Hex Schmitt Triggers
CD40107B	Dual 2-Input NAND Buffer/Driver
CD40109B	Quad Low-to-High Voltage Level Shifter
CD40160B	Sync Programmable 4-Bit Decade Counter w/ Async Clear
CD40161B	Sync Programmable 4-Bit Binary Counter w/ Async Clear
CD40174B	Hex D-Type Flip Flop
CD40175B	Quad D-Type Flip Flop
CD40192B	Presetable BCD Up/Down Counter
CD40193B	Presetable Binary Up/Down Counter
CD40257B	Quad 2-Line-to-1 Line Data Selector /Multiplexer

# Programmable Logic

## Things to Consider

TI offers a variety of programmable logic devices to help bridge the gap between SSI/MSI and LSI/Gate Arrays in military designs. With a single programmable logic device from TI, you can replace up to ten standard logic circuits. Our IMPACT™ and IMPACT-X™ PLDs dissipate less power for the same speed performance.

For military programmable logic devices, we provide DoD and DESC endorsed SMD in accordance with MIL-PRF-38535 (Class Q) while comprehending best commercial practices.

## Programming Information

**TIBPAL16XX-12M, TIBPAL16X-10M, TIBPAL16XX-7M**

It is necessary to reference the PAL programming guide to ensure proper programming of TI PAL devices. This file can be obtained at the following location: [http://www.ti.com/sc/docs/products/military/prog\\_log/palprog.htm](http://www.ti.com/sc/docs/products/military/prog_log/palprog.htm) or by contacting the Product Information Center (PIC) at 972-644-5580. In the event these devices are subjected to the wrong commercial family/pin-out code, it is likely that the security fuse will be blown and the device will then be unprogrammable. If the incorrect commercial family/pin-out code is executed and subsequently

followed with the correct commercial code, the array will read blank for the algorithm.

## Product Nomenclature

**Example: TIBPAL16L8-10MJB**

### Prefix—**TIB**

TIB = IMPACT™

### Product Family Designator—**PAL**

### Number of Array Inputs—**16**

### Output Configuration Designator—**L**

L = Active Low

R = Registered

V = Variable (programmable)

### Number of Outputs in Designated Configuration—**8**

### Performance Designator—**10**

-7 = 7 ns propagation delay

-10 = 10 ns propagation delay

-12 = 12 ns propagation delay

-15 = 15 ns propagation delay

-20 = 20 ns propagation delay

-25 = 25 ns propagation delay

-30 = 30 ns propagation delay

A = Standard power

A-2 = Half power

### Temperature Range—**M**

M = -55°C to 125°C

C = 0°C to 70°C

### Package Type—**J**

J, JT = Ceramic Dual In-Line Package (CDIP)

FK = Leadless Ceramic Chip Carrier (LCCC)

W = Ceramic Flatpack

### Processing—**B**

Blank = Commercial processing

B = MIL-PRF-38535 (QML) (Class Q)

## PAL Product Spectrum\*

Device	Package Type	Speed (Max)	IC (Max)
PAL16L8AM	J, FK, W	30 ns	180 mA
PAL16R8AM	J, FK, W	30 ns	180 mA
PAL16R6AM	J, FK, W	30 ns	180 mA
PAL16R4AM	J, FK, W	30 ns	180 mA
PAL16L8A-2M	J, FK, W	40 ns	90 mA
PAL16R8A-2M	J, FK, W	40 ns	90 mA
PAL16R6A-2M	J, FK, W	40 ns	90 mA
PAL16R4A-2M	J, FK, W	40 ns	90 mA
TIBPAL16L8-20	J, FK, W	20 ns	190 mA
TIBPAL16R8-20	J, FK, W	20 ns	190 mA
TIBPAL16L8-30M	J, FK, W	30 ns	105 mA
TIBPAL16R8-30M	J, FK, W	30 ns	105 mA
TIBPAL16R6-30M	J, FK, W	30 ns	105 mA
TIBPAL16R4-30M	J, FK, W	30 ns	105 mA
TIBPAL20L8-20M	JT, FK, W	20 ns	180 mA
TIBPAL20R8-20M	JT, FK, W	20 ns	180 mA
TIBPAL20R6-20M	JT, FK, W	20 ns	180 mA
TIBPAL20R4-20M	JT, FK, W	20 ns	180 mA
TIBPAL22V10AM	JT, FK, W	30 ns	180 mA
TIBPAL22V10-20M	JT, FK, W	20 ns	200 mA
TIBPAL22VP10-25M	JT, FK, W	25 ns	220 mA

\* TI also offers a complete line of commercial PALS. See <http://www.ti.com/sc/docs/products/proglgc/index.htm> for more information.

# Unpackaged Die/Known Good Die

## Things to Consider Market Needs

Electronic products and systems designed today are smaller and lighter, yet offer ever increasing functionality. Integrated circuit (IC) enhancements enable Multichip Module (MCM) designers to improve performance and incorporate more features without tradeoffs in power consumption and interconnect parasitics. The continuing drive for technology enhancements in automotive, computing, communication, defense and entertainment products places significant demand for utilization of bare die (unpackaged IC's) without sacrificing functionality, ease-of-use and cost.

## Value Provided by TI

TI leadership in IC technology, extraordinary quality initiatives, and our alliance with our strategic partners illustrate TI's capability to fulfill this demand and meet the needs for systems designers, today and tomorrow. Due to the diversity in processing technologies, product life cycles and circuit complexity, there is no single solution for meeting all the processing and testing requirements of bare die. Leading-edge wafer fab technologies and inherent quality are an integral part of TI's core competencies. This allows us to offer a complete set of products in die form and meet the expectations of system designers. Chip Supply, our master die distributor, is available for die value-added

services such as special handling and testing.

TI provides additional value to its existing IC technology and wafer fabrication processes by employing various screening methodologies based on maturity and complexity of the product, as well as customer requirements. Processes employed by TI include dc probe, ac/dc probe at temperature, and full package-level screening including burn-in through the use of special carrier technologies or temporary packages.

## Types of Die Products

The die product offering from TI consists of two types of devices: Known Good Die (KGD) and Probed Die (or Bare Die). KGD devices have been processed to meet the same parameters as the packaged device. KGD is offered in two different temperature ranges-commercial and military. Most TI products can be purchased as probed die. These parts are probed to meet stated datasheet 25°C dc limits.

TI die products are available for commercial, industrial, automotive and military applications. For customer convenience, all FlexSi™ Die options are available through all authorized TI sales channels. Information on die availability, datasheets and die maps is also available through the authorized channels.

## Die Sales

### Master Die Distributor —

*Chip Supply, Inc.*  
[www.chipsupply.com](http://www.chipsupply.com)  
US: (407) 298-7100  
Europe: +44(0)161-633-6627

### Authorized Die Resellers

U.S.—  
*Chip Supply, Inc.*  
[www.chipsupply.com](http://www.chipsupply.com)  
(407) 298-7100  
*Minco Technology Labs*  
[www.mincotech.com](http://www.mincotech.com)  
512) 834-2022

Europe—  
*Eltek* +44(0)1803 834455  
[www.eltek-semi.com](http://www.eltek-semi.com)  
*Ditech* +44(0)1616 263827  
[www.ditech.com.uk](http://www.ditech.com.uk)

### Distributors

U.S./Europe—  
*Avnet Electronics Inc.*  
(800) 332-8638  
[www.avnet.com](http://www.avnet.com)  
*Arrow Electronics Inc.*  
(800) 777-ARROW  
[www.arroweurope.com](http://www.arroweurope.com)  
*Insight Electronics*  
[www.insight-electronics.com](http://www.insight-electronics.com)  
800-677-7716  
Europe—  
*EBV Elektronik*  
<http://www.ebv.com>

## Product Nomenclature

Example: **SMJ320C40KGD<sup>M</sup>40C<sup>H</sup>TH**

### Prefix—**SMJ**

SMJ = MIL-PRF-38535 (QML)  
TMP = Commercial Grade

### 320 DSP Family Designator—**320**

### 320 DSP Product Designator—**C40**

C = CMOS 5.0 V  
30 = C30  
31 = C31  
40 = C40  
50 = C50

### Package Type—**KGD**

### Temperature Range—**M**

M = -55°C to 125°C  
A = -40°C to 85°C  
L = 0°C to 70°C  
S = Special Per Datasheet  
Q = -40°C to 125°C

### Speed Designator—**40**

40 = 40 MHz  
50 = 50 MHz  
60 = 60 MHz

### Current Die Revision (See Datasheet)—**C**

### Temporary Wire Bond (If applicable)—**T**

### Hot Chuck Probe—**H**



## Product Nomenclature (Unpackaged Die - Non DSP)

Example: **MP1TL1431-W**

**Prefix—MP1**

MP1 = Probed Die

**Parent Device—TL1431**

**Die Form—-W**

W = Wafer

D = Die

## Known Good Die Specifications

Specs	Processing Flow	Probed Die Commercial KGD	TMP-SMJ/Military KGD
<b>Multiprobe*</b>	Probe @ 25°C	Hot chuck probe or data driven	Hot chuck probe or data driven
<b>Visual</b>	40x lot acceptance	40x lot acceptance	40x lot acceptance
<b>Test Conditions</b>	—	Datasheet	Datasheet
<b>DC Test</b>	Warranted to datasheet limits at 25°C	Warranted to datasheet limits over the specified operating temperature range	Warranted to datasheet limits over the specified operating temperature range
<b>AC Test</b>	Functionality @ 25°C minimum clock speed	Warranted to datasheet limits over the specified operating temperature range	Warranted to data sheet limits over the specified operating temperature range
<b>Burn-In</b>	No	Data driven	Data driven
<b>Warranty</b>	30 days	Datasheet upon receipt, 30 days	Datasheet upon receipt, 30 days
<b>Certificate of Conformance (C of C)</b>	No	No	Yes
<b>Change Notification</b>	No	Product dependent Contact PIC for details	Yes

\* Probe may be performed on a statistical sample basis.

Note: Contact the Product Information Center (PIC) for process availability by product.

## KGD Product Spectrum\*

Device	Speed	Flow	Die Revision
SMJ320C30KGD40C*	40 MFLOPS	SMJ	8.0
SMJ320C31KGD40C*	40 MFLOPS	SMJ	7.2
SMJ320LC31KGD40C*	40 MFLOPS	SMJ	7.2
TMP320C40KGD60C	60 MFLOPS	TMP	5.2
SMJ320C40KGD40C	40 MFLOPS	SMJ	5.2
SMJ320C50KGD50C*	25 MIPS	SMJ	4.0
SMJ320C50KGD66C*	33 MIPS	SMJ	4.0
TMP320C50KGD40C	20 MIPS	TMP	4.0

\* Contact the Product Information Center (PIC) for process availability by product.

Texas Instruments reserves the right to make changes at any time in order to improve design and supply the best product possible.

# Process Flows

## Things to Consider

Several process flows are available for TI Military Products. The flows are typical and may vary depending on changes to applicable military standards, such as MIL-PRF-38535.

QML products, processed to MIL-PRF-38535 level Q, are offered in three different types:

### JM38510

Processed under MIL-PRF-38535 and electrically tested to the JAN slash sheet

### DSCC/SMD

Processed under MIL-PRF-38535 and electrically tested to the DSCC standard microcircuit drawing.

- SMQ - Processed under MIL-PRF - 38535 Class N (Order by SMD)
- SMV - Processed under MIL-PRF - 38535 Class V (Order by SMD)

### SNJ/SMJ

Processed under MIL-PRF-38535 (Class Q) and electrically tested to the TI data sheet. All QML products are symbolized with the Q quality designator on the top side.

### Enhanced Plastic

Testing and screening of EP products is performed in accordance with the TI data sheet for that device. Configuration control is performed by Texas Instruments. TI processes EP products per "best commercial practices" to the TI internal base-line flow. Processing and screening is documented in the TI Quality System Manual and is in compliance with ISO9001.

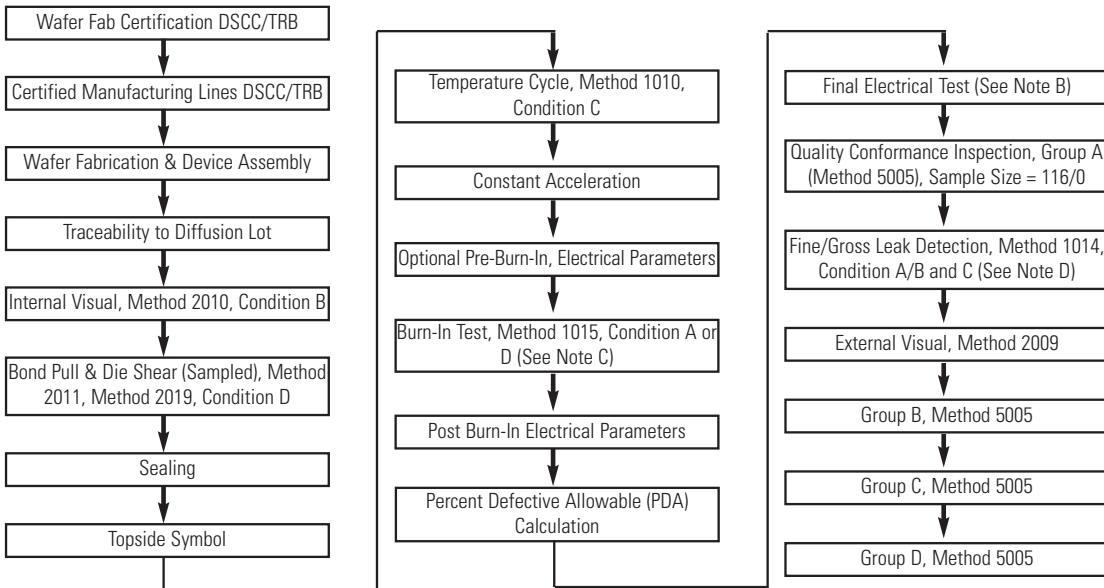
## Process Flows

Process Flows (See Note A)	Description
DSCC/SMD	Standard Microcircuit Drawing products processed to a MIL-PRF-38535 flow. Electricals controlled by SMD/DSCC.
SNJ/SMJ	Products processed to MIL-PRF-38535 Level B for military applications. Electricals controlled by current TI data sheet.
SN/SM	Commercial level ceramic processing. Test flow defined in this section. Electricals defined by current TI data sheet but may not be production tested.
SMX*/SNX*	Experimental products assembled and tested by Military Products prior to qualification. No minimum screening or testing required. Electricals controlled by current TI data sheet.
SMP*/SNP*	Prototype devices representative of production material with military temperature range testing. Shipped prior to completion of qualification testing. Electricals controlled by current TI data sheet.
JAN	Processed per QML MIL-PRF-38535 flow. Electricals controlled by JAN slash sheet.
EP	Processed in compliance with ISO9001. Testing and screening performed in accordance with TI data sheet.

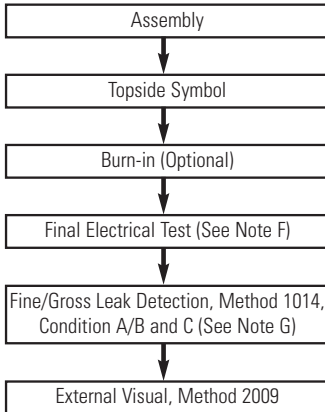
\* These devices have not met or completed TI Military Semiconductors internal qualification requirements. These devices are for prototyping purposes only and standard TI warranties do not apply. Supply of these devices does not constitute a commitment by TI to release them to production.

NOTE A: While TI offers SCDs, it is not the standard or preferred method of procurement.

## QML Processing Flow Covering DSCC, SMD, SNJ, SMJ and JAN (See Note A)



## SN/SM Processing Flow



NOTE A: Per MIL-PRF-38535, if sufficient quality and reliability data is available, the manufacturer, through the QML program and the Technical Review Board may modify, substitute or delete tests.

NOTE B: According to device type, electrical parameters are defined by the slash sheet, DSCC/SMD, or TI data sheet and Method 5004.

NOTE C: Condition A or D at manufacturer's option

NOTE D: Ceramic packages only

NOTE E: Lead finish options must be specified by ordering the DSCC SMD number

NOTE F: Contact the Product Information Center (PIC) for detailed test information.

NOTE G: Ceramic packages only.

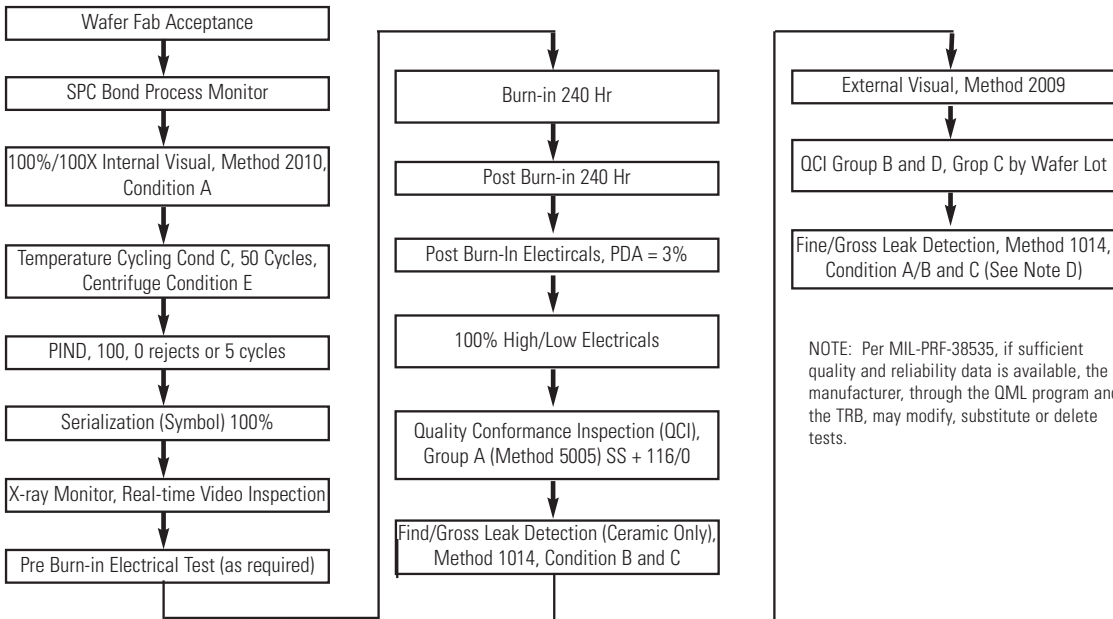
NOTE H: Lead finish may vary. For example, ceramic PGA and ceramic QFP packages may be gold finish. Contact the PIC for detailed information.

### ESD Markings (Optional)

MIL-PRF-38535 ESD Class Designation	Marking	ESD Voltage Range
1	1 Triangle	0 - 1999 V
2	2 Triangles	2000 - 3999 V
3	No Triangles	4000 V

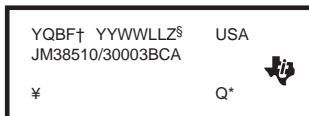
¥ As referred to above, ESD marking is optional.

## Offshore Class V Process Flow (Texas Instruments/Unitrode)

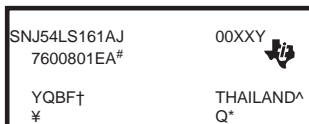


NOTE: Per MIL-PRF-38535, if sufficient quality and reliability data is available, the manufacturer, through the QML program and the TRB, may modify, substitute or delete tests.

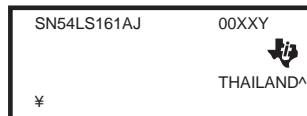
## Symbolization <sup>¶</sup>



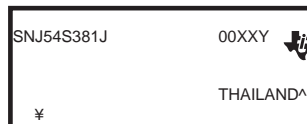
Example: JANB 54LS161A  
Order As: JM38510/3003BCA



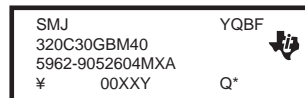
Example: SNJ 54LS161A  
Order As: SNJ54LS161AJ or 7600801EA



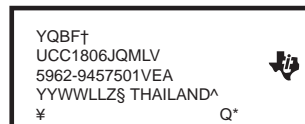
Example: SN 54LS161A  
Order As: SN54LS161AJ



Example: SNJ With No SMD  
Order As: SNJ54S381J



Example: SMJ 320C30GBM40  
Order As: SMJ320C30GBM40  
or 5962-9052604MXA



Example: UCC 1806JQMLV  
Order As: 5962-9457501VEA

□ TI bug is optional

¥ = ESD marking is optional

† YQ = diffusion date,

B = die revision

F = wafer fab code (optional)

§ YYYY = seal date

LL = lot window

Z = B/I split lot

\* Q marking denotes QML-compliant product

# Where TI is an approved source

^ Country of origin may be located on package underside

# Cross Reference Guides

## Things to Consider

TI's Military Semiconductor Division is certified as a MIL-PRF-38535 QML supplier by the Defense Supply Center Columbus (DSCC). DSCC also provides information on JM38510 (JAN) products.

The following pages provide cross references from TI to DSCC, DSCC to TI, TI to JAN, and JAN to TI.

## Product Nomenclature (DSCC)

**Example:** 5962-85155 or 8200501MFA\*

**Drawing Number—**5962-85155 or 82005

**Device—**01

### Device Structure—M

M = Vendor self-certification to the requirements for MIL-STD-883 compliant  
Q = Certification and qualification to the MIL-PRF-38535 (Class Q)  
V = Certification and qualification to the MIL-PRF-38535 (Class V)

### Package—F

A = 14-pin Flatpack (1/4" x 1/4")	I = 10-pin Flatpack	S = 20-pin Flatpack
B = 14-pin Flatpack (3/16" x 1/4")	J = 24-pin DIP	V = 18-pin DIP
C = 14-pin DIP	K = 24-pin Flatpack	W = 22-pin DIP
D = 14-pin Flatpack	L = 24-pin DIP (300 mil)	2 = 20-pad LCC
E = 16-pin DIP	M = 12-pin Can	3 = 28-pad LCC
F = 16-pin Flatpack	P = 8-pin DIP	X = Other packages
G = 8-pin Can	Q = 40-pin DIP	Y = Other packages
H = 10-pin Flatpack	R = 20-pin DIP	

### Lead Finish—A\*

A\* = Solder Dip  
C = Gold Plate  
D = Paladium

## Product Nomenclature

**Example:** JM38510/00104BCA\*

**Process Level—**JM38510/

**Device/Slash Sheet—**00104

**Device Class—**B

### Package Type—C

A = 14-pin Flatpack (1/4" x 1/4")	I = 10-pin Flatpack	S = 20-pin Flatpack
B = 14-pin Flatpack (3/16" x 1/4")	J = 24-pin DIP	V = 18-pin DIP
C = 14-pin DIP	K = 24-pin Flatpack	W = 22-pin DIP
D = 14-pin Flatpack	L = 24-pin DIP (300 mil)	2 = 20-pad LCC
E = 16-pin DIP	M = 12-pin Can	3 = 28-pad LCC
F = 16-pin Flatpack	P = 8-pin DIP	X = Other packages
G = 8-pin Can	Q = 40-pin DIP	Y = Other packages
H = 10-pin Flatpack	R = 20-pin DIP	

\* Solder dip lead finish normally supplied by TI. Lead finish options must be specified by ordering the DSCC SMD number.

### Lead Finish—A\*

A\* = Solder Dip  
C = Gold Plate  
D = Paladium

# DSCC Cross Reference (TI vs. DSCC)

54ABTH32245PZ†	5962-9557701NXD
54ABTH32501PZ†	5962-9557601NXD
54ABTH32543PZ†	5962-9557801NXD
54ABT3614PCB†	5962-9560901NXD
54ABT7819PCB†	5962-9470401QXA
54ABT7820PCB†	5962-9650901QXA
54ACT3641PCB†	5962-9560801NXD
54ACT7881PN†	5962-9562701NXD
AD7524MJB	5962-8770001EA
AM26C31MFKB	5962-9163901Q2A
AM26C31MJB	5962-9163901QEA
AM26C31MWB	5962-9163901QFA
AM26C32MFKB	5962-9164001Q2A
AM26C32MJB	5962-9164001QEA
AM26C32MWB	5962-9164001QFA
AM26LS32AMFKB	5962-7802003M2A
AM26LS32AMJB	5962-7802003MEA
AM26LS32AMWB	5962-7802003MFA
AM26LS33AMFKB	5962-7802004M2A
AM26LS33AMJB	5962-7802004MEA
AM26LS33AMWB	5962-7802004MFA
CD14538BF3A	5962-90555701EA
CD4002BF3A	7704403CA
CD4016BF3A	5962-9064001CA
CD4029BF3A	8101602EA
CD4035BF3A	8101701EA
CD4046BF3A	5962-9466401MEA
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CD4081BF3A	7702402CA
CD4082BF3A	7705902CA
CD4093BF3A	7704602CA
CD4094BF3A	7702501EA
CD4502BF3A	7702002EA
CD4515BF3A	7703201JA
CD4520BF3A	7702301EA
CD4555BF3A	7704701EA
CD4585BF3A	7703702EA
CD54HC00F3A	8403701CA
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CD54HC08F3A	8404701CA
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CD54HC20F3A	8403901CA
CD54HC221F3A	5962-8780501EA
CD54HC237F3A	5962-8860601EA
CD54HC238F3A	5962-8688401EA
CD54HC240F3A	8407401RA
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CD54HC4050F3A	5962-8682001EA
CD54HC4052F3A	5962-8855601EA
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CD54HCT04F3A	5962-8974701CA
CD54HCT08F3A	5962-8688301CA
CD54HCT107F3A	5962-9084901MCA
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CY54FT543TDMB	5962-9222101MLA
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CY54FT138-3LMB	5962-9223306M2X
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CY54FT240-0DMB	5962-9221301MRX
CY54FT240-1DMB	5962-9221303MRX
CY54FT240-3DMB	5962-9221305MRX
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CY54FT374-3LMB	5962-9221806M2X
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CY54FT377-3LMB	5962-9221903M2X
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CY54FT543-0DMB	5962-9222101MLX
CY54FT573-0DMB	5962-9222305MRX
CY54FT574-1DMB	5962-9222203MRX
CY54FT574-3DMB	5962-9222205MRX
CY54FT574-1LMB	5962-9222203M2X
CY54FT646-0LMB	5962-9222301M3X
CY54FT646-3LMB	5962-9222305M3X
CY54FT827-1LMB	5962-9224701M3X
CY54FT29520-1DMB	5962-9220502MLX
CY54FT29520-2DMB	5962-9220504MLX
CY54FT29818-1DMB	5962-9682701QLA
CY54FT29818-1LMB	5962-9682701Q3A

LM124AFKB 77043022A  
 LM124AFKB 77043012A  
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 LM124FK 77043022A  
 LM124FKB 77043012A  
 LM124JB 7704301CA  
 LM124WB 7704301DA  
 LM124JQMLV 5962-7704301VCA  
 LM139AFKB 5962-87739012A  
 LM139AJB 5962-8773901CA  
 LM139AWB 5962-8773901DA  
 LM139FKB 77008012A  
 LM139JQMLV 5962-7700801VCA  
 LM139JB 7700801CA  
 LM139WB 7700801DA  
 LM158AFKB 5962-87710022A  
 LM158AJGB 5962-8771002PA  
 LM158FKB 5962-87710012A  
 LM158JGB 5962-8771001PA  
 LM193FKB 5962-9452601Q2A  
 LM193JGB 5962-9452601QPA  
 LT1013AMFKB 5962-88760012A  
 LT1013AMJGB 5962-8876001PA  
 LT1013MFKB 5962-88760022A  
 LT1013MJGB 5962-8876002PA  
 LT1014AMFKB 5962-89677012A  
 LT1014AMJB 5962-8967701CA  
 LT1014MFKB 5962-89677022A  
 LT1014MJB 5962-8967702CA  
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# DSCC Cross Reference (DSCC vs. TI)

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# JAN Cross Reference (TI vs. JAN)

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# JAN Cross Reference (JAN vs. TI)

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## Notes

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