

# MBRB1045

Preferred Device

## SWITCHMODE™ Power Rectifier

### D<sup>2</sup>PAK Surface Mount Power Package

The D<sup>2</sup>PAK Power Rectifier employs the Schottky Barrier principle in a large metal-to-silicon power diode. State-of-the-art geometry features epitaxial construction with oxide passivation and metal overlay contact. Ideally suited for use in low voltage, high frequency switching power supplies, free wheeling diodes, and polarity protection diodes. These state-of-the-art devices have the following features:

- Guardring for Stress Protection
- Low Forward Voltage
- 150°C Operating Junction Temperature
- Epoxy Meets UL94, VO at 1/8"
- Short Heat Sink Tab Manufactured — Not Sheared!
- Similar in Size to the Industry Standard TO-220 Package

#### Mechanical Characteristics

- Case: Epoxy, Molded
- Weight: 1.7 grams (approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead and Mounting Surface Temperature for Soldering Purposes: 260°C Max. for 10 Seconds
- Shipped 50 units per plastic tube
- Available in 24 mm Tape and Reel, 800 units per 13" reel by adding a "T4" suffix to the part number
- Marking: MBRB1045

#### MAXIMUM RATINGS

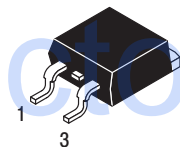
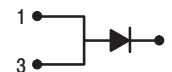
Rating	Symbol	Value	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	$V_{RRM}$ $V_{RWM}$ $V_R$	45	Volts
Average Rectified Forward Current (Rated $V_R$ ) $T_C = 135^\circ\text{C}$	$I_{F(AV)}$	10	Amps
Peak Repetitive Forward Current (Rated $V_R$ , Square Wave, 20 kHz) $T_C = 135^\circ\text{C}$	$I_{FRM}$	20	Amps
Nonrepetitive Peak Surge Current (Surge applied at rated load conditions halfwave, single phase, 60 Hz)	$I_{FSM}$	150	Amps
Operating Junction and Storage Temperature Range	$T_J, T_{Stg}$	-65 to +150	°C
Voltage Rate of Change (Rated $V_R$ )	dv/dt	10000	V/ $\mu\text{s}$



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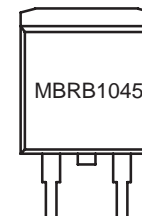
<http://onsemi.com>

### SCHOTTKY BARRIER RECTIFIER 10 AMPERES 45 VOLTS



D<sup>2</sup>PAK  
CASE 418B  
PLASTIC

#### MARKING DIAGRAM



MBRB1045 = Device Code

#### ORDERING INFORMATION

Device	Package	Shipping
MBRB1045	D <sup>2</sup> PAK	50 Units/Tube
MBRB1045T4	D <sup>2</sup> PAK	800/Tape & Reel

Preferred devices are recommended choices for future use and best overall value.

# MBRB1045

## THERMAL CHARACTERISTICS

Characteristic	Symbol	Value	Unit
Thermal Resistance — Junction to Case (Note 1.)	$R_{\theta JC}$	1.0	$^{\circ}\text{C}/\text{W}$
— Junction to Ambient (Note 1.)	$R_{\theta JA}$	34	$^{\circ}\text{C}/\text{W}$

## ELECTRICAL CHARACTERISTICS

Maximum Instantaneous Forward Voltage (Note 2.) ( $I_F = 10$ Amps, $T_J = 125^{\circ}\text{C}$ ) ( $I_F = 20$ Amps, $T_J = 125^{\circ}\text{C}$ ) ( $I_F = 20$ Amps, $T_J = 25^{\circ}\text{C}$ )	$V_F$	0.57 0.72 0.84	Volts
Maximum Instantaneous Reverse Current (Note 2.) (Rated dc Voltage, $T_J = 125^{\circ}\text{C}$ ) (Rated dc Voltage, $T_J = 25^{\circ}\text{C}$ )	$I_R$	15 0.1	mA

1. When mounted using minimum recommended pad size on FR-4 board.
2. Pulse Test: Pulse Width = 300  $\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$

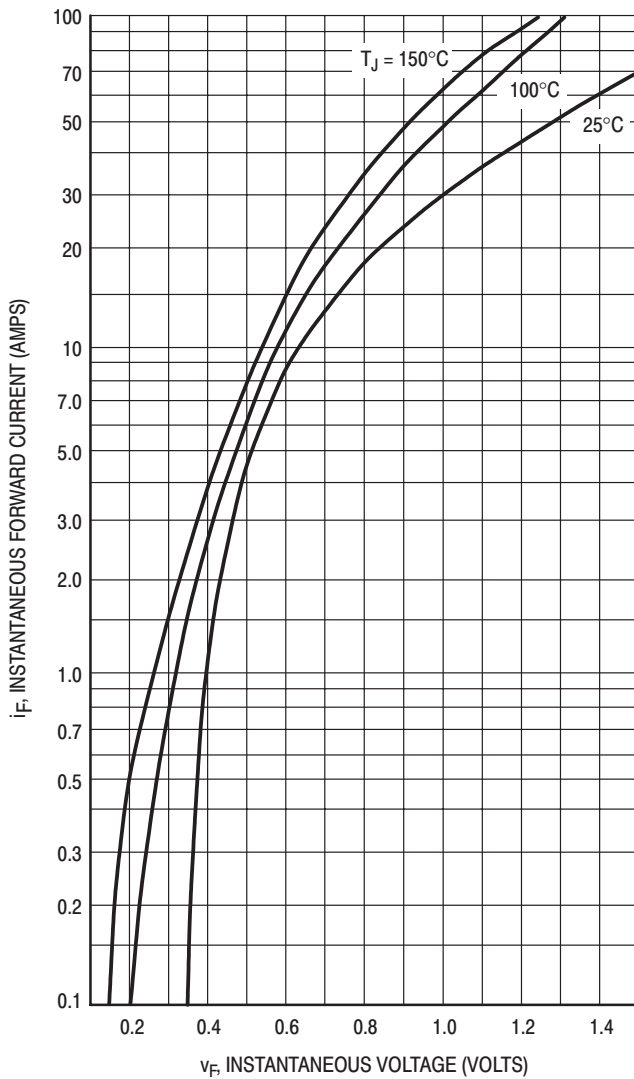


Figure 1. Maximum Forward Voltage

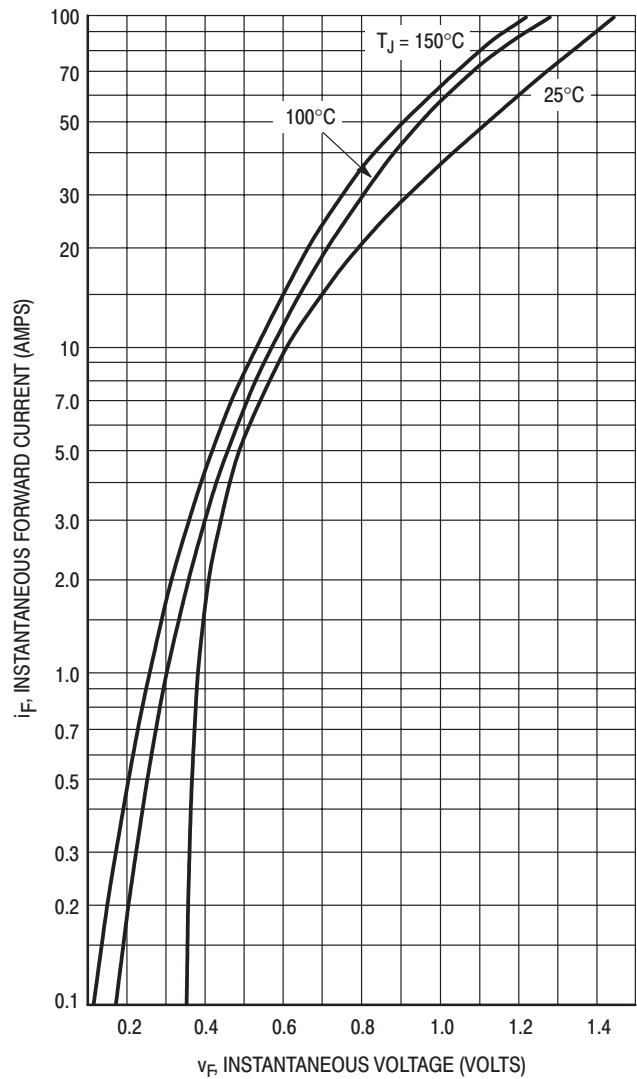


Figure 2. Typical Forward Voltage

# MBRB1045

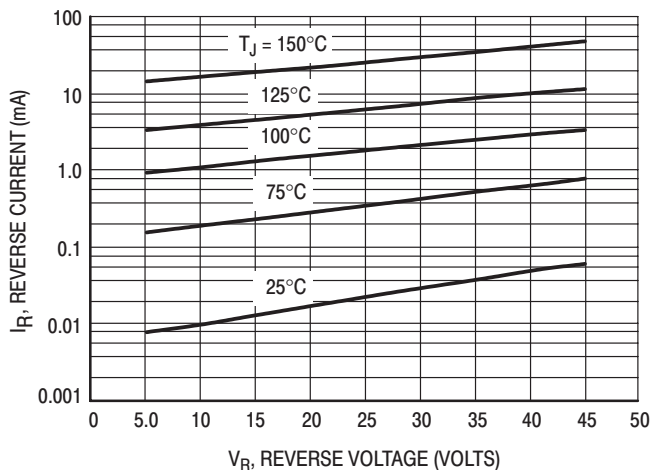


Figure 3. Maximum Reverse Current

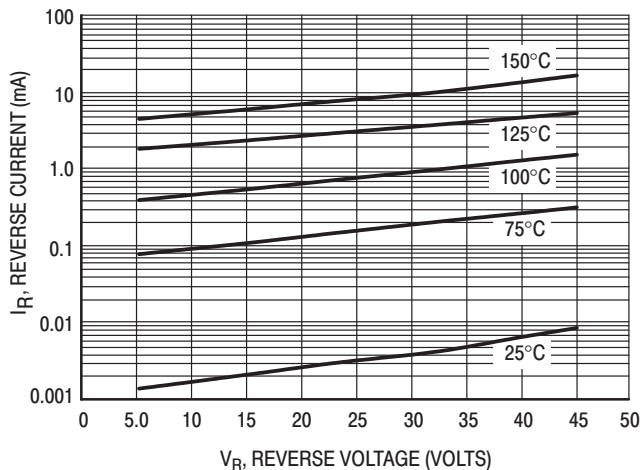


Figure 4. Typical Reverse Current

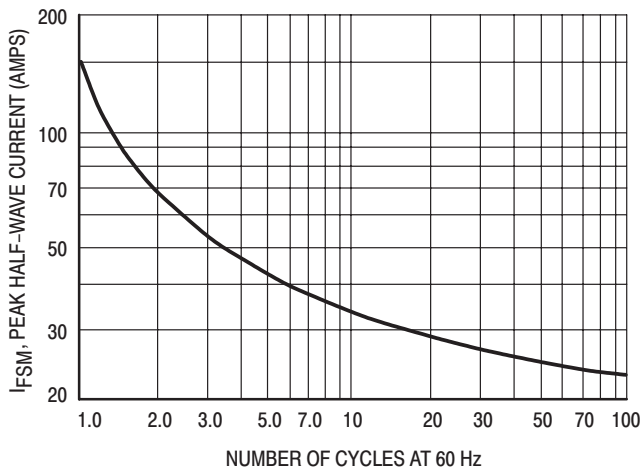


Figure 8. Maximum Surge Capability

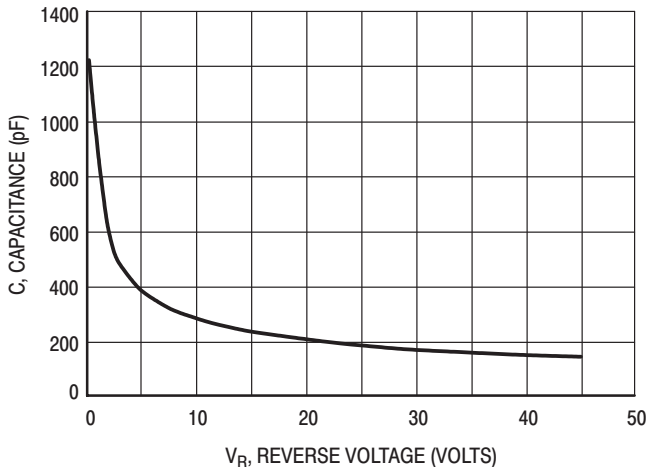


Figure 5. Typical Capacitance

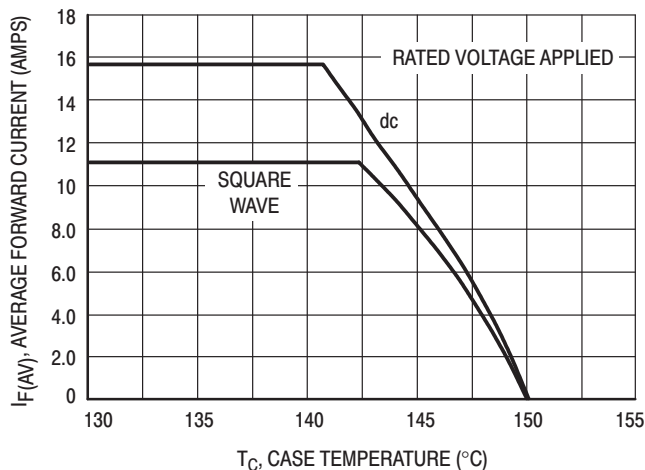


Figure 6. Current Derating, Case,  $R_{\theta JC} = 1.0 \text{ } ^\circ\text{C/W}$

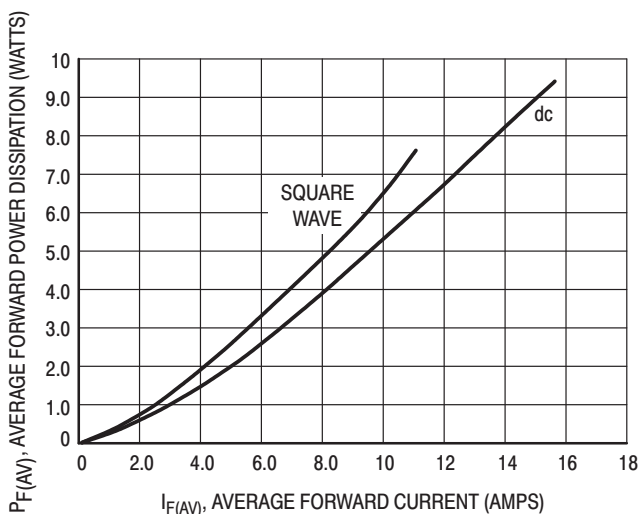
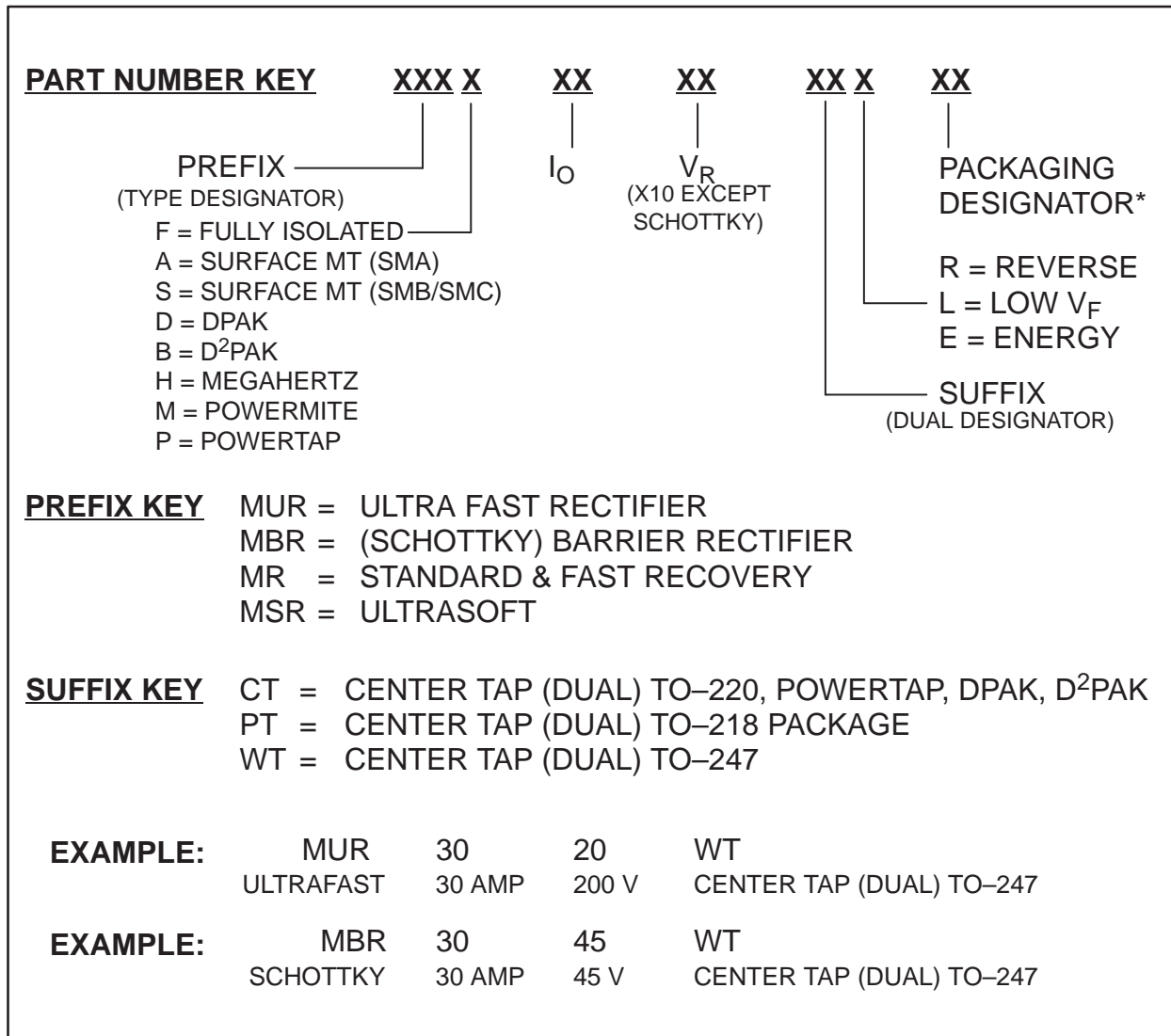


Figure 7. Forward Power Dissipation

# RECTIFIER NUMBERING SYSTEM



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

## Application Specific Rectifiers

Table 1. Low  $V_F$  Schottky Rectifiers

Device	$I_O$ (Amps)	$V_{RRM}$ (Volts)	$V_F$ @ Rated $I_O$ and $T_C = 25^\circ\text{C}$ Volts (Max)	$I_R$ @ Rated $V_{RRM}$ mAmps (Max)	Package
<i>MBR0520LT1, T3</i>	0.5	20	0.33	0.25	SOD-123
<i>MBRS130LT3</i>	1	30	0.395	1	SMB
<i>MBRD835L</i>	8	35	0.41	1.4	DPAK
<i>MBRD1035CTL</i>	10	35	0.41	6	DPAK
<i>MBR2030CTL</i>	20	30	0.48	5	TO-220
<i>MBRB2535CTL</i>	25	35	0.41	10	D <sup>2</sup> PAK
<i>MBR2535CTL</i>	25	35	0.41	5	TO-220
<i>MBRB2515L</i>	25	15	0.42	15	D <sup>2</sup> PAK
<i>MBR2515L</i>	25	15	0.42	15	TO-220
<i>MBRB3030CTL</i>	30	30	0.51	5	D <sup>2</sup> PAK
<i>MBR4015LWT</i>	40	15	0.42	5	TO-247
<i>MBRP20030CTL</i>	200	30	0.52	5	POWERTAP II
<i>MBRP20035L</i>	200	35	0.57	10	POWERTAP III
<i>MBRP30035L</i>	300	35	0.57	10	POWERTAP III
<i>MBRP40045CTL</i>	400	45	0.57	10	POWERTAP II
<i>MBRP400100CTL</i>	400	100	0.83	6	POWERTAP II
<i>MBRP60035CTL</i>	600	35	0.57	10	POWERTAP II

Table 2. MEGAHERTZ™ Rectifiers

Device	$I_O$ (Amps)	$V_{RRM}$ (Volts)	Maximum		$t_{rr}$ (Nanosecond)
			$V_F$ @ Rated $I_O$ and Temp. (Volts)	$I_R$ @ Rated $V_{RRM}$ (mAmps)	
<i>MURH840CT/MURHB840CT</i>	8	400	1.7	0.01	28
<i>MURH860CT</i>	8	600	2.0	0.01	35
<i>MURHB860CT</i>	8	600	2.0	0.01	35
<i>MURHF860CT</i>	8	600	2.0	0.01	35

Table 3. UltraSoft Rectifiers (For High Speed Rectification)

Device	$I_O$ (Amps)	$V_{RRM}$ (Volts)	Max $V_F$ @ $I_F$ (Volts)	Max $t_{rr}$ (nSec)	$T_{JMax}$ ( $^\circ\text{C}$ )
<i>MSRP10040</i>	100	400	1.75 @ 100 A	75	150
<i>MSRD620CT</i>	6	200	1.2 @ 6.0 A	55	150
<i>MSR860</i>	8	600	1.7 @ 8.0 A	120	150
<i>MSR1560</i>	15	600	1.8 @ 15 A	45	150

Table 4. Energy Rated Rectifiers

Device	$I_O$ (Amps)	$V_{RRM}$ (Volts)	Max $V_F$ @ Rated unless Noted (Volts)	$I_R$ @ $V_{RRM}$ (mAmps)	$W_{aval}$ (M <sub>J</sub> )
<i>MUR180E</i>	1.0	800	1.75	10	10
<i>MUR1100E</i>	1.0	1000	1.75	10	10
<i>MUR480E</i>	4.0	800	1.75	25	20
<i>MUR4100E</i>	4.0	1000	1.75	25	20
<i>MUR880E</i>	8.0	800	1.8	25	20
<i>MUR8100E</i>	8.0	1000	1.8	25	20
<i>MUR10120E</i>	10	1200	2.2 @ 6.5 A	100	20
<i>MUR10150E</i>	10	1500	2.5 @ 6.5 A	100	20
<i>MUR5150E</i>	5.0	1500	2.4	50	20

Table 5. Automotive Transient Suppressors

Device	$I_O$ (Amps)	$V_{RRM}$ (Volts)	Max $V_F$ @ $I_F$ (Volts)	$I_{RSM}$ (Amps)	$T_{JMax}$ ( $^\circ\text{C}$ )
<i>MR2535L</i>	6.0	20	1.1 @ 100 A	62 @ 10 mS	175
<i>MR2835S</i>	32	23	1.1 @ 100 A	62 @ 10 mS	175
<i>MR3227N, P</i>	32	18	1.18 @ 100 A	90 @ 10 mS	200
<i>MR4027N, P</i>	40	18	1.1 @ 100 A	110 @ 10 mS	200
<i>MR4045N, P</i>	40	30	1.1 @ 100 A	55 @ 10 mS	200

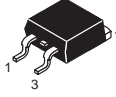
## SCHOTTKY Rectifiers

Table 6. Surface Mount Schottky Rectifiers

$V_{RRM}$ (Volts)	$I_O^{(1)}$ (Amperes)	$I_O$ Rating Condition	Device	Max $V_F$ @ $i_F$ $T_C = 25^\circ\text{C}$ (Volts)	$I_{FSM}$ (Amperes)	$T_J$ Max ( $^\circ\text{C}$ )	Max $I_R^{(2)}$ $T_J = 25^\circ\text{C}$ (mA)	Max $I_R^{(3)}$ (mA)	Package
20	0.5	$T_L = 90^\circ\text{C}$	<i>MBR0520LT1</i> <i>MBR0520LT3</i>	0.310 @ 0.1 A 0.385 @ 0.5 A	5	125	.075 @ 10 V .250 @ 20 V	5 @ 10 V 8 @ 20 V	<b>CASE 425-04</b> (SOD-123) Cathode = Band 
30	0.5	$T_L = 100^\circ\text{C}$	<i>MBR0530T1</i> <i>MBR0530T3</i>	0.375 @ 0.1 A 0.430 @ 0.5 A	5	125	.020 @ 15 V .130 @ 30 V	-	
40	0.5	$T_L = 110^\circ\text{C}$	<i>MBR0540T1</i> <i>MBR0540T3</i>	0.53 @ 0.5 A	5	150	.010 @ 20 V .020 @ 40 V	-	
20	1	$T_C = 130^\circ\text{C}$	<i>MBRM120ET3</i>	0.455 @ 0.1 A 0.530 @ 1.0 A	50	150	0.010 @ 20 V	1.6 @ 20 V	<b>CASE 457-04</b> (POWERMITE®) 
20	1	$T_{tab} \leq 100^\circ\text{C}$	<i>MBRM120LT3</i>	0.36 @ 0.1 A 0.45 @ 1 A	50	125	0.4 @ 20 V	N/A	
30	1	$T_C = 135^\circ\text{C}$	<i>MBRM130LT3*</i>	0.45 @ 1.0 A	50	125	1	N/A	
40	1	$T_{tab} \leq 100^\circ\text{C}$	<i>MBRM140T3</i>	0.39 @ 0.1 A 0.55 @ 1 A	50	125	0.5 @ 40 V	N/A	
30	1	$T_C \leq 105^\circ\text{C}$	<i>MBRA130LT3</i>	0.41 @ 1 A 0.47 @ 2 A	25	125	1.0 @ 30 V 0.4 @ 15 V	25 @ 30 V	<b>CASE 403B-01</b> (SMA) Cathode = Notch or Polarity Band 
40	1	$T_C \leq 100^\circ\text{C}$	<i>MBRA140T3</i>	0.60 @ 1 A 0.73 @ 2 A	25	125	0.5 @ 40 V 0.1 @ 20 V	10 @ 40 V	
20	1	$T_L = 115^\circ\text{C}$	<i>MBRS120T3</i>	0.55 @ 1.0 A	40	125	1	10	<b>CASE 403-03</b> (SMB) Cathode = Notch or Polarity Band 
30	1	$T_L = 120^\circ\text{C}$	<i>MBRS130LT3</i>	0.395 @ 1.0 A	40	125	1	10	
30	1	$T_L = 115^\circ\text{C}$	<i>MBRS130T3</i>	0.55 @ 1.0 A	40	125	1	10	
40	1	$T_L = 115^\circ\text{C}$	<i>MBRS140T3</i>	0.6 @ 1.0 A	40	125	1	10	
40	1	$T_C = 110^\circ\text{C}$	<i>MBRS140LT3</i>	0.5 @ 1.0 A	40	125	0.4	10	
90	1	$T_L = 120^\circ\text{C}$	<i>MBRS190T3</i>	0.75 @ 1.0 A	50	125	0.5	5	
100	1	$T_L = 120^\circ\text{C}$	<i>MBRS1100T3</i>	0.75 @ 1.0 A	40	150	0.5	5	
40	1.5	$T_C = 100^\circ\text{C}$	<i>MBRS1540T3</i>	0.46 @ 1.5 A	40	125	0.8	5.7	
40	2	$T_C \leq 95^\circ\text{C}$	<i>MBRS240LT3</i>	0.43 @ 2 A 0.53 @ 4 A	25	125	2.0 @ 40 V 0.5 @ 20 V	60 @ 40 V 40 @ 20 V	
40	2	$T_C = 103^\circ\text{C}$	<i>MBRS2040LT3</i>	0.43 @ 2 A 0.50 @ 4 A	70	125	0.80 @ 40 V 0.10 @ 20 V	20 @ 40 V 6.0 @ 20 V	
20	3	$T_L = 100^\circ\text{C}$	<i>MBRS320T3</i>	0.50 @ 3.0 A	80	125	2	20	<b>CASE 403A-03</b> (SMC) Cathode = Notch 
30	3	$T_L = 100^\circ\text{C}$	<i>MBRS330T3</i>	0.50 @ 3.0 A	80	125	2	20	
40	3	$T_L = 100^\circ\text{C}$	<i>MBRS340T3</i>	0.525 @ 3.0 A	80	125	2	20	
60	3	$T_L = 100^\circ\text{C}$	<i>MBRS360T3</i>	0.74 @ 3.0 A	80	125	0.5	20	<b>CASE 369A-13</b> (DPAK)  1  4 3  4 "CT" Suffix  1  4 3  4 Non-"CT" Suffix
20	3	$T_C = 125^\circ\text{C}$	<i>MBRD320T4</i>	0.60 @ 3.0 A	75	150	0.2	20 @ 125 $^\circ\text{C}$	
30	3	$T_C = 125^\circ\text{C}$	<i>MBRD330T4</i>	0.60 @ 3.0 A	75	150	0.2	20 @ 125 $^\circ\text{C}$	
40	3	$T_C = 125^\circ\text{C}$	<i>MBRD340T4</i>	0.60 @ 3.0 A	75	150	0.2	20 @ 125 $^\circ\text{C}$	
50	3	$T_C = 125^\circ\text{C}$	<i>MBRD350T4</i>	0.60 @ 3.0 A	75	150	0.2	20 @ 125 $^\circ\text{C}$	
60	3	$T_C = 125^\circ\text{C}$	<i>MBRD360T4</i>	0.60 @ 3.0 A	75	150	0.2	20 @ 125 $^\circ\text{C}$	
20	6	$T_C = 130^\circ\text{C}$	<i>MBRD620CTT4</i>	0.70 @ 3.0 A	75	150	0.1	15 @ 125 $^\circ\text{C}$	
30	6	$T_C = 130^\circ\text{C}$	<i>MBRD630CTT4</i>	0.70 @ 3.0 A	75	150	0.1	15 @ 125 $^\circ\text{C}$	
40	6	$T_C = 130^\circ\text{C}$	<i>MBRD640CTT4</i>	0.70 @ 3.0 A	75	150	0.1	15 @ 125 $^\circ\text{C}$	
50	6	$T_C = 130^\circ\text{C}$	<i>MBRD650CTT4</i>	0.70 @ 3.0 A	75	150	0.1	15 @ 125 $^\circ\text{C}$	
60	6	$T_C = 130^\circ\text{C}$	<i>MBRD660CTT4</i>	0.70 @ 3.0 A	75	150	0.1	15 @ 125 $^\circ\text{C}$	
35	8	$T_C = 100^\circ\text{C}$	<i>MBRD835L</i>	0.40 @ 3.0 A 0.51 @ 8.0 A	100	125	1.4	35	
35	10	$T_C = 90^\circ\text{C}$	<i>MBRD1035CTL</i>	0.49 @ 10 A	100	125	2	130 @ 125 $^\circ\text{C}$	

## SCHOTTKY Rectifiers

Table 6. Surface Mount Schottky Rectifiers (continued)

V <sub>RRM</sub> (Volts)	I <sub>O</sub> <sup>(1)</sup> (Amperes)	I <sub>O</sub> Rating Condition	Device	Max V <sub>F</sub> @ i <sub>F</sub> T <sub>C</sub> = 25°C (Volts)	I <sub>FSM</sub> (Amperes)	T <sub>J</sub> Max (°C)	Max I <sub>R</sub> <sup>(2)</sup> T <sub>J</sub> = 25°C (mA)	Max I <sub>R</sub> <sup>(3)</sup> (mA)	Package
10	45	T <sub>C</sub> = 135°C	<i>MBRB1045*</i>	0.84 @ 20 A	150	150	0.1	15 @ 125°C	<p><b>CASE 418B-03</b> (D<sup>2</sup>PAK)</p>  <p>1 3 4</p> <p>"CT" Suffix</p> <p>1 3 4</p> <p>Non-"CT" Suffix</p>
45	15	T <sub>C</sub> = 105°C	<i>MBRB1545CT</i>	0.84 @ 15 A	150	150	0.1	15 @ 125°C	
60	20	T <sub>C</sub> = 110°C	<i>MBRB2060CT</i>	0.95 @ 20 A	150	150	0.15	150 @ 125°C	
100	20	T <sub>C</sub> = 110°C	<i>MBRB20100CT</i>	0.85 @ 10 A 0.95 @ 20 A	150	150	0.1	6 @ 125°C	
200	20	T <sub>C</sub> = 125°C	<i>MBRB20200CT</i>	1.0 @ 20 A	150	150	1	50 @ 125°C	
15	25	T <sub>C</sub> = 90°C	<i>MBRB2515L</i>	0.45 @ 25 A	150	100	15	200 @ 70°C	
35	25	T <sub>C</sub> = 110°C	<i>MBRB2535CTL</i>	0.47 @ 12.5 A 0.55 @ 25 A	150	125	10	500 @ 125°C	
45	25	T <sub>C</sub> = 130°C	<i>MBRB2545CT</i>	0.82 @ 30 A	150	150	0.2	40 @ 125°C	
30	30	T <sub>C</sub> = 115°C	<i>MBRB3030CT</i>	0.54 @ 15 A 0.67 @ 30 A	300	150	1.2	145 @ 150°C 46 @ 10 V, 150°C	
30	30	T <sub>C</sub> = 95°C	<i>MBRB3030CTL</i>	0.45 @ 15 A 0.51 @ 30 A	150	125	2	195 @ 125°C 75 @ 10 V, 125°C	
30	40	T <sub>C</sub> = 110°C	<i>MBRB4030</i>	0.46 @ 20 A 0.55 @ 40 A	300	150	1	150 @ 125°C	

(1) I<sub>O</sub> is total device current capability.



(2) V<sub>RRM</sub> unless noted

(3) V<sub>RRM</sub>, T<sub>J</sub> = 100°C unless noted

★New Product

All devices listed are ON Semiconductor preferred devices

Table 7. Axial Lead Schottky Rectifiers

V <sub>RRM</sub> (Volts)	I <sub>O</sub> (Amperes)	I <sub>O</sub> Rating Condition	Device	Max V <sub>F</sub> @ i <sub>F</sub> T <sub>C</sub> = 25°C (Volts)	I <sub>FSM</sub> (Amperes)	T <sub>J</sub> Max (°C)	Max I <sub>R</sub> <sup>(2)</sup> T <sub>L</sub> = 25°C (mA)	Max I <sub>R</sub> <sup>(3)</sup> T <sub>L</sub> (mA)	Package
20	1	T <sub>A</sub> = 55°C R <sub>θJA</sub> = 80°C/W	<i>1N5817</i>	0.45 @ 1.0 A	25	125	1	10	<p><b>CASE 59-04</b> Plastic</p>  <p>Cathode = Polarity Band</p>
30	1	T <sub>A</sub> = 55°C R <sub>θJA</sub> = 80°C/W	<i>1N5818</i>	0.55 @ 1.0 A	25	125	1	10	
40	1	T <sub>A</sub> = 55°C R <sub>θJA</sub> = 80°C/W	<i>1N5819</i>	0.60 @ 1.0 A	25	125	1	10	
50	1	T <sub>A</sub> = 55°C	<i>MBR150</i>	0.75 @ 1.0 A	25	150	0.5	5	
60	1	T <sub>A</sub> = 55°C R <sub>θJA</sub> = 80°C/W	<i>MBR160</i>	0.75 @ 1.0 A	25	150	0.5	5	
100	1	T <sub>A</sub> = 120°C R <sub>θJA</sub> = 50°C/W	<i>MBR1100</i>	0.79 @ 1.0 A	50	150	0.5	5	
20	3	T <sub>A</sub> = 76°C R <sub>θJA</sub> = 28°C/W	<i>1N5820</i>	0.457 @ 3.0 A	80	125	2	20	<p><b>CASE 267-03</b> Plastic</p>  <p>Cathode = Polarity Band</p>
30	3	T <sub>A</sub> = 71°C R <sub>θJA</sub> = 28°C/W	<i>1N5821</i>	0.500 @ 3.0 A	80	125	2	20	
40	3	T <sub>A</sub> = 61°C R <sub>θJA</sub> = 28°C/W	<i>1N5822</i>	0.525 @ 3.0 A	80	125	2	20	
40	3	T <sub>A</sub> = 65°C R <sub>θJA</sub> = 28°C/W	<i>MBR340</i>	0.600 @ 3.0 A	80	150	0.6	20	
50	3	T <sub>A</sub> = 65°C	<i>MBR350RL</i>	0.600 @ 3.0 A	80	150	0.6	20	
60	3	T <sub>A</sub> = 65°C R <sub>θJA</sub> = 28°C/W	<i>MBR360RL</i>	0.740 @ 3.0 A	80	150	0.6	20	
100	3	T <sub>A</sub> = 100°C R <sub>θJA</sub> = 28°C/W	<i>MBR3100</i>	0.79 @ 3.0 A	150	150	0.6	20	

(2) V<sub>RRM</sub> unless noted

(3) V<sub>RRM</sub>, T<sub>J</sub> = 100°C unless noted

**Table 8. TO-220 Thru-Hole Schottky Rectifiers**

V <sub>R</sub> RM (Volts)	I <sub>O</sub> (Amperes)	I <sub>O</sub> Rating Condition	Device	Max V <sub>F</sub> @ i <sub>F</sub> T <sub>C</sub> = 25°C (Volts)	I <sub>FSM</sub> (Amperes)	T <sub>J</sub> Max (°C)	Max I <sub>R</sub> <sup>(2)</sup> T <sub>C</sub> = 25°C (mA)	Max I <sub>R</sub> <sup>(3)</sup> (mA)	Package
35	15	T <sub>C</sub> = 105°C	<i>MBR1535CT</i>	0.84 @ 15 A	150	150	0.1	15 @ 125°C	<b>CASE 221A-09</b> (TO-220AB) 
45	15	T <sub>C</sub> = 105°C	<i>MBR1545CT</i>	0.84 @ 15 A	150	150	0.1	15 @ 125°C	
100	16	T <sub>C</sub> = 133°C	<i>MBR16100CT</i>	0.84 @ 16 A	150	175	0.1	5 @ 125°C	
30	20	T <sub>C</sub> = 137°C	<i>MBR2030CTL</i>	0.52 @ 10 A 0.58 @ 20 A	150	150	5	40	
45	20	T <sub>C</sub> = 135°C	<i>MBR2045CT</i>	0.84 @ 20 A	150	150	0.1	15 @ 125°C	
60	20	T <sub>C</sub> = 133°C	<i>MBR2060CT</i>	0.85 @ 10 A 0.95 @ 20 A	150	150	0.1	6 @ 125°C	
80	20	T <sub>C</sub> = 133°C	<i>MBR2080CT</i>	0.95 @ 20 A	150	150	0.1	6 @ 125°C	
90	20	T <sub>C</sub> = 133°C	<i>MBR2090CT</i>	0.95 @ 20 A	150	150	0.1	6 @ 125°C	
100	20	T <sub>C</sub> = 133°C	<i>MBR20100CT</i>	0.85 @ 10 A 0.95 @ 20 A	150	150	0.1	6 @ 125°C	
200	20	T <sub>C</sub> = 125°C	<i>MBR20200CT</i>	1.0 @ 20 A	150	150	1	50 @ 125°C	
35	25	T <sub>C</sub> = 95°C	<i>MBR2535CTL</i>	0.55 @ 25 A	150	125	5	500 @ 125°C	<b>CASE 221B-04</b> (TO-220AC) 
45	25	T <sub>C</sub> = 130°C	<i>MBR2545CT</i>	0.82 @ 30 A	150	150	0.2	40 @ 125°C	
45	30	T <sub>C</sub> = 130°C	<i>MBR3045ST</i>	0.76 @ 30 A	150	150	0.2	40 @ 125°C	
35	7.5	T <sub>C</sub> = 105°C	<i>MBR735</i>	0.84 @ 15 A	150	150	0.1	15 @ 125°C	
45	7.5	T <sub>C</sub> = 105°C	<i>MBR745</i>	0.84 @ 15 A	150	150	0.1	15 @ 125°C	
35	10	T <sub>C</sub> = 135°C	<i>MBR1035</i>	0.84 @ 20 A	150	150	0.1	15 @ 125°C	
45	10	T <sub>C</sub> = 135°C	<i>MBR1045</i>	0.84 @ 20 A	150	150	0.1	15 @ 125°C	
60	10	T <sub>C</sub> = 133°C	<i>MBR1060</i>	0.80 @ 10 A	150	150	0.1	6 @ 125°C	
90	10	T <sub>C</sub> = 133°C	<i>MBR1090</i>	0.70 @ 10 A	150	150	0.1	6 @ 125°C	
100	10	T <sub>C</sub> = 133°C	<i>MBR10100</i>	0.80 @ 10 A	150	150	0.1	6 @ 125°C	
35	16	T <sub>C</sub> = 125°C	<i>MBR1635</i>	0.63 @ 16 A	150	150	0.2	40 @ 125°C	<b>CASE 221D-02</b> <b>FULL PAK</b> 
45	16	T <sub>C</sub> = 125°C	<i>MBR1645</i>	0.63 @ 16 A	150	150	0.2	40 @ 125°C	
15	25	T <sub>C</sub> = 90°C	<i>MBR2515L</i>	0.45 @ 25 A	150	100	15	200 @ 70°C	
60	20	T <sub>C</sub> = 133°C	Ⓜ <i>MBRF2060CT</i>	0.95 @ 20 A	150	150	0.15	15 @ 125°C	
100	20	T <sub>C</sub> = 133°C	Ⓜ <i>MBRF20100CT</i>	0.95 @ 20 A	150	150	0.15	15 @ 125°C	
200	20	T <sub>C</sub> = 125°C	Ⓜ <i>MBRF20200CT</i>	1.0 @ 20 A	150	150	1	50 @ 125°C	
45	25	T <sub>C</sub> = 125°C	Ⓜ <i>MBRF2545CT</i>	0.82 @ 25 A	150	150	0.2	40 @ 125°C	

<sup>(2)</sup>V<sub>R</sub>RM unless noted

<sup>(3)</sup>V<sub>R</sub>RM, T<sub>J</sub> = 100°C unless noted

Ⓜ Indicates UL Recognized – File #E69369

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

V <sub>R</sub> RM (Volts)	I <sub>O</sub> (Amperes)	I <sub>O</sub> Rating Condition	Device	Max V <sub>F</sub> @ i <sub>F</sub> T <sub>C</sub> = 25°C (Volts)	I <sub>FSM</sub> (Amperes)	T <sub>J</sub> Max (°C)	Max I <sub>R</sub> <sup>(2)</sup> T <sub>C</sub> = 25°C (mA)	Max I <sub>R</sub> <sup>(3)</sup> (mA)	Package
45	30	T <sub>C</sub> = 105°C	<i>MBR3045PT</i>	0.76 @ 30 A	200	150	1	100 @ 125°C	<b>CASE 340D-02</b> (TO-218AC) 
45	40	T <sub>C</sub> = 125°C	<i>MBR4045PT</i>	0.70 @ 20 A 0.80 @ 40 A	400	150	1	50	
45	60	T <sub>C</sub> = 125°C	<i>MBR6045PT</i>	0.62 @ 30 A 0.75 @ 60 A	500	150	1	50	
25	50	T <sub>C</sub> = 125°C	<i>MBR5025L</i>	0.54 @ 30 A 0.62 @ 50 A	300	150	0.5	60	<b>CASE 340E-02</b> (TO-218) 
45	30	T <sub>C</sub> = 105°C	<i>MBR3045WT</i>	0.76 @ 30 A	200	150	1	100 @ 125°C	<b>CASE 340K-01</b> (TO-247) 
15	40	T <sub>C</sub> = 125°C	<i>MBR4015LWT</i>	0.42 @ 20 A 0.50 @ 40 A	400	100	5	150 @ 75°C	
45	40	T <sub>C</sub> = 125°C	<i>MBR4045WT</i>	0.70 @ 20 A 0.80 @ 40 A	400	150	1	50	
45	60	T <sub>C</sub> = 125°C	<i>MBR6045WT</i>	0.62 @ 30 A 0.75 @ 60 A	500	150	1	50	

<sup>(2)</sup>V<sub>R</sub>RM unless noted

<sup>(3)</sup>V<sub>R</sub>RM, T<sub>J</sub> = 100°C unless noted



**Table 10. POWERTAP II Schottky Rectifiers**

V <sub>RRM</sub> (Volts)	I <sub>O</sub> <sup>(1)</sup> (Amperes)	I <sub>O</sub> Rating Condition	Device	Max V <sub>F</sub> @ i <sub>F</sub> T <sub>C</sub> = 25°C (Volts)	I <sub>FSM</sub> (Amperes)	T <sub>J</sub> Max (°C)	Max I <sub>R</sub> (2) T <sub>C</sub> = 25°C (mA)	Max I <sub>R</sub> (3) (mA)	Package
30	200	T <sub>C</sub> = 125°C	<i>MBRP20030CTL</i>	0.52 @ 100 A 0.60 @ 200 A	1500	150	5	-	<p><b>CASE 357C-03 POWER TAP™</b></p> <p>Cathode = Mounting Plate Anode = Terminal</p>
30	400	T <sub>C</sub> = 100°C	<i>MBRP40030CTL*</i>	0.50 @ 200 A	1500	150	20	1000 @ 100°C	
35	600	T <sub>C</sub> = 100°C	<i>MBRP60035CTL</i>	0.57 @ 300 A	4000	150	10	250	
45	200	T <sub>C</sub> = 125°C	<i>MBRP20045CT</i>	0.78 @ 100 A	1500	150	0.5	50 @ 125°C	
45	300	T <sub>C</sub> = 120°C	<i>MBRP30045CT</i>	0.70 @ 150 A 0.82 @ 300 A	2500	150	0.8	75 @ 125°C	
45	400	T <sub>C</sub> = 100°C	<i>MBRP40045CTL</i>	0.57 @ 200 A	2500	150	10	-	
60	200	T <sub>C</sub> = 125°C	<i>MBRP20060CT</i>	0.800 @ 100 A	1500	150	0.5	50 @ 125°C	
60	300	T <sub>C</sub> = 120°C	<i>MBRP30060CT</i>	0.79 @ 150 A 0.89 @ 300 A	2500	150	0.8	75 @ 125°C	
100	400	T <sub>C</sub> = 100°C	<i>MBRP400100CTL</i>	0.83 @ 200 A	2500	150	6	-	

<sup>(1)</sup>I<sub>O</sub> is total device current capability.

<sup>(2)</sup>V<sub>RRM</sub> unless noted

<sup>(3)</sup>V<sub>RRM</sub>, T<sub>J</sub> = 100°C unless noted

**Table 11. POWERTAP III Schottky Rectifiers**

V <sub>RRM</sub> (Volts)	I <sub>O</sub> <sup>(1)</sup> (Amperes)	I <sub>O</sub> Rating Condition	Device	Max V <sub>F</sub> @ i <sub>F</sub> T <sub>C</sub> = 25°C (Volts)	I <sub>FSM</sub> (Amperes)	T <sub>J</sub> Max (°C)	Max I <sub>R</sub> (2) T <sub>C</sub> = 25°C (μA)	Max I <sub>R</sub> (3) (μA) T <sub>J</sub> = 100°C	Package
35	200	T <sub>C</sub> = 100°C	<i>MBRP20035L</i>	0.57 @ 200 A	2000	150	10	250	<p><b>CASE 357D-01 POWER TAP™</b></p>
	300	T <sub>C</sub> = 100°C	<i>MBRP30035L</i>	0.57 @ 300 A	3000	150	10	250	

<sup>(1)</sup>I<sub>O</sub> is total device current capability.

★New Product

<sup>(2)</sup>V<sub>RRM</sub> unless noted

<sup>(3)</sup>V<sub>RRM</sub>, T<sub>J</sub> = 100°C unless noted

**NEW UltraSoft Rectifiers**

**Table 12. UltraSoft Rectifiers (For High Speed Rectification)**

V <sub>RRM</sub> (Volts)	I <sub>O</sub> <sup>(1)</sup> (Amperes)	I <sub>O</sub> Rating Condition	Device	Max V <sub>F</sub> @ i <sub>F</sub> T <sub>C</sub> = 29°C (Volts)	t <sub>rr</sub> (ηSec)	T <sub>J</sub> Max (°C)	Max I <sub>R</sub> (2) T <sub>C</sub> = 25°C (μA)	Max I <sub>R</sub> (3) (μA) T <sub>J</sub> = 150°C	Package
200	6	T <sub>C</sub> = 145°C	<i>MSRD620CT*</i>	1.2 @ 6.0 A	55	150	5	200	<p><b>CASE 369A-13 (DPAK)</b></p>
600	8	T <sub>C</sub> = 125°C	<i>MSR860</i>	1.7 @ 8.0 A	120	150	10 μA	1000	<p><b>CASE 221B-04 Style 1</b></p>
600	15	T <sub>C</sub> = 125°C	<i>MSR1560</i>	1.8 @ 15 A	45	150	15	5000	
400	100	T <sub>C</sub> = 100°C	<i>MSRP10040*</i>	1.75 @ 100 A	75	150	100	500	<p><b>CASE 357D-01 POWER TAP™</b></p>

<sup>(1)</sup>I<sub>O</sub> is total device current capability.





★New Product

<sup>(2)</sup>V<sub>RRM</sub> unless noted

<sup>(3)</sup>V<sub>RRM</sub>, T<sub>J</sub> = 150°C unless noted

## Ultrafast Rectifiers

Table 13. Surface Mount Ultrafast Rectifiers

V <sub>R</sub> RM (Volts)	I <sub>O</sub> <sup>(1)</sup> (Amperes)	I <sub>O</sub> Rating Condition	Device	Max t <sub>rr</sub> (ns)	Max V <sub>F</sub> @ i <sub>F</sub> T <sub>C</sub> = 25°C (Volts)	I <sub>FSM</sub> (Amperes)	T <sub>J</sub> Max (°C)	Max I <sub>R</sub> <sup>(2)</sup> T <sub>J</sub> = 25°C (μA)	Max I <sub>R</sub> <sup>(4)</sup> (μA) Package	Package
50	1	T <sub>L</sub> = 155°C	<i>MURS105T3</i>	35	0.875 @ 1.0 A	40	175	2	50	<b>SMB</b> Cathode = Polarity Band 
100	1	T <sub>L</sub> = 155°C	<i>MURS110T3</i>	35	0.875 @ 1.0 A	40	175	2	50	
150	1	T <sub>L</sub> = 155°C	<i>MURS115T3</i>	35	0.875 @ 1.0 A	40	175	2	50	
200	1	T <sub>L</sub> = 155°C	<i>MURS120T3</i>	35	0.875 @ 1.0 A	40	175	2	50	
400	1	T <sub>L</sub> = 150°C	<i>MURS140T3</i>	75	1.25 @ 1.0 A	35	175	5	150	
600	1	T <sub>L</sub> = 150°C	<i>MURS160T3</i>	75	1.25 @ 1.0 A	35	175	5	150	
200	2	T <sub>C</sub> = 145°C	<i>MURS220T3</i>	35	0.95 @ 2.0 A	40	175	2	50	
300	2	T <sub>C</sub> = 125°C	<i>MURS230T3</i>	65	1.15 @ 2.0 A	35	175	5	150	
400	2	T <sub>C</sub> = 125°C	<i>MURS240T3</i>	65	1.15 @ 2.0 A	35	175	5	150	
600	2	T <sub>C</sub> = 125°C	<i>MURS260T3</i>	75	1.15 @ 2.0 A	35	175	5	150	
400	3	T <sub>L</sub> = 130°C	<i>MURS320T3</i>	35	0.875 @ 3.0 A	75	175	5	15	<b>SMC</b> Cathode = Notch 
400	3	T <sub>L</sub> = 130°C	<i>MURS340T3</i>	75	1.25 @ 3.0 A	75	175	10	250	
600	3	T <sub>L</sub> = 130°C	<i>MURS360T3</i>	75	1.25 @ 3.0 A	75	175	10	250	
200	6	T <sub>L</sub> = 145°C	<i>MURD620CT</i>	35	1.0 @ 3.0 A	63	175	5	250 @ 125°C	<b>DPAK</b>  1 2 3 4 1 3 4 "CT" Suffix
200	3	T <sub>C</sub> = 158°C	<i>MURD320</i>	35	.95 @ 3.0 A	75	175	5	500 @ 125°C	
400	8	T <sub>L</sub> = 120°C	<i>MURHB840CT</i>	28	2.2 @ 4.0 A	100	175	10	500	<b>D<sup>2</sup>PAK</b>  1 2 3 4 1 3 4 Non-"CT" Suffix
600	8	T <sub>L</sub> = 120°C	<i>MURHB860CT</i>	35	2.8 @ 4.0 A	100	175	10	500	
200	16	T <sub>L</sub> = 150°C	<i>MURB1620CT</i>	35	0.975 @ 8.0 A	100	175	5	250	
600	16	T <sub>C</sub> = 150°C	<i>MURB1660CT</i>	60	1.5 @ 8.0 A	100	175	10	500	


<sup>(1)</sup>I<sub>O</sub> is total device current capability.

<sup>(2)</sup>V<sub>R</sub>RM unless noted

<sup>(4)</sup>V<sub>R</sub>RM, T<sub>J</sub> = 150°C unless noted

★New Product

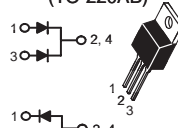
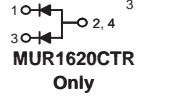
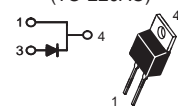

**Table 14. Axial Lead Ultrafast Rectifiers**

V <sub>R</sub> RM (Volts)	I <sub>O</sub> (Amperes)	I <sub>O</sub> Rating Condition	Device	Max t <sub>rr</sub> (ns)	Max V <sub>F</sub> @ i <sub>F</sub> T <sub>C</sub> = 25°C (Volts)	I <sub>FSM</sub> (Amperes)	T <sub>J</sub> Max (°C)	Max I <sub>R</sub> <sup>(2)</sup> T <sub>J</sub> = 25°C (μA)	Max I <sub>R</sub> <sup>(4)</sup> (μA)	Package
50	1	T <sub>A</sub> = 130°C	<i>MUR105</i>	35	0.875 @ 1.0 A	35	175	2	50	 <p><b>CASE 59-04</b> Plastic Cathode = Polarity Band</p>
100	1	T <sub>A</sub> = 130°C	<i>MUR110</i>	35	0.875 @ 1.0 A	35	175	2	50	
150	1	T <sub>A</sub> = 130°C	<i>MUR115</i>	35	0.875 @ 1.0 A	35	175	2	50	
200	1	T <sub>A</sub> = 130°C R <sub>θJA</sub> = 50°C/W	<i>MUR120</i>	25	0.875 @ 1.0 A	35	175	2	50	
300	1	T <sub>A</sub> = 120°C	<i>MUR130</i>	75	1.25 @ 1.0 A	35	175	5	150	
400	1	T <sub>A</sub> = 120°C	<i>MUR140</i>	75	1.25 @ 1.0 A	35	175	5	150	
600	1	T <sub>A</sub> = 120°C R <sub>θJA</sub> = 50°C/W	<i>MUR160</i>	50	1.25 @ 1.0 A	35	175	5	150	
800	1	T <sub>A</sub> = 95°C	<i>MUR180E</i>	100	1.75 @ 1.0 A	35	175	10	600	
1000	1	T <sub>A</sub> = 95°C R <sub>θJA</sub> = 50°C/W	<i>MUR1100E</i>	75	1.75 @ 1.0 A	35	175	10	600 @ 100°C	
200	2	T <sub>A</sub> = 90°C	<i>MUR220</i>	35	0.95 @ 2.0 A	35	175	2	50	
400	2	T <sub>A</sub> = 85°C	<i>MUR240</i>	65	1.15 @ 2.0 A	35	175	5	150	
600	2	T <sub>A</sub> = 60°C	<i>MUR260</i>	75	1.35 @ 2.0 A	35	175	5	150	
1000	2	T <sub>A</sub> = 35°C	<i>MUR2100E</i>	100	2.2 @ 2.0 A	35	175	10	600	
50	4	T <sub>A</sub> = 80°C	<i>MUR405</i>	35	0.89 @ 2.0 A	125	175	5	150	
100	4	T <sub>A</sub> = 80°C	<i>MUR410</i>	35	0.89 @ 2.0 A	125	175	5	150	
150	4	T <sub>A</sub> = 80°C	<i>MUR415</i>	35	0.89 @ 2.0 A	125	175	5	150	
200	4	T <sub>A</sub> = 80°C R <sub>θJA</sub> = 28°C/W	<i>MUR420</i>	25	0.875 @ 3.0 A	125	175	5	150	
400	4	T <sub>A</sub> = 40°C	<i>MUR440</i>	75		75	175	10	250	
600	4	T <sub>A</sub> = 40°C R <sub>θJA</sub> = 28°C/W	<i>MUR460</i>	50	1.25 @ 3.0 A	70	175	10	250	
800	4	T <sub>A</sub> = 35°C	<i>MUR480E</i>	100	1.75 @ 3.0 A	70	175	25	900 @ 100°C	
1000	4	T <sub>A</sub> = 35°C R <sub>θJA</sub> = 28°C/W	<i>MUR4100E</i>	75	1.75 @ 3.0 A	70	175	25	900 @ 100°C	

<sup>(2)</sup>V<sub>R</sub>RM unless noted

<sup>(4)</sup>V<sub>R</sub>RM, T<sub>J</sub> = 150°C unless noted

Table 15. TO-220 Ultrafast and MEGAHERTZ™ Rectifiers

V <sub>RRM</sub> (Volts)	I <sub>O</sub> <sup>(1)</sup> (Amperes)	I <sub>O</sub> Rating Condition	Device	Max t <sub>rr</sub> (ns)	Max V <sub>F</sub> @ i <sub>F</sub> T <sub>C</sub> = 25°C (Volts)	I <sub>FSM</sub> (Amperes)	T <sub>J</sub> Max (°C)	Max I <sub>R</sub> <sup>(2)</sup> T <sub>C</sub> = 25°C (μA)	Max I <sub>R</sub> <sup>(4)</sup> (μA)	Package	
200	6	T <sub>C</sub> = 130°C	<i>MUR620CT</i>	35	0.975 @ 3.0 A	75	175	5	250	<b>CASE 221A-09</b> (TO-220AB) 	
400	8	T <sub>C</sub> = 120°C	<i>MURH840CT</i>	28	2.0 @ 4.0 A	100	175	10	500		
600	8	T <sub>C</sub> = 120°C	<i>MURH860CT</i>	35	2.8 @ 4.0 A	100	175	10	500		
100	16	T <sub>C</sub> = 150°C	<i>MUR1610CT</i>	35	0.975 @ 8.0 A	100	175	5	250		
150	16	T <sub>C</sub> = 150°C	<i>MUR1615CT</i>	35	0.975 @ 8.0 A	100	175	5	250		
200	16	T <sub>C</sub> = 150°C	<i>MUR1620CT</i>	35	0.975 @ 8.0 A	100	175	5	250		
200	16	T <sub>C</sub> = 160°C	<i>MUR1620CTR</i>	85	1.2 @ 8.0 A	100	175	5	500		
400	16	T <sub>C</sub> = 150°C	<i>MUR1640CT</i>	60	1.30 @ 8.0 A	100	175	10	250		
600	16	T <sub>C</sub> = 150°C	<i>MUR1660CT</i>	60	1.5 @ 8.0 A	100	175	10	500		
<b>MUR1620CTR Only</b>											
50	8	T <sub>C</sub> = 150°C	<i>MUR805</i>	35	0.975 @ 8.0 A	100	175	5	250	<b>CASE 221B-04</b> (TO-220AC) 	
100	8	T <sub>C</sub> = 150°C	<i>MUR810</i>	35	0.975 @ 8.0 A	100	175	5	250		
150	8	T <sub>C</sub> = 150°C	<i>MUR815</i>	35	0.975 @ 8.0 A	100	175	5	250		
200	8	T <sub>C</sub> = 150°C	<i>MUR820</i>	35	0.975 @ 8.0 A	100	175	5	250		
400	8	T <sub>C</sub> = 150°C	<i>MUR840</i>	50	1.30 @ 8.0 A	100	175	10	500		
600	8	T <sub>C</sub> = 150°C	<i>MUR860</i>	50	1.50 @ 8.0 A	100	175	10	500		
800	8	T <sub>C</sub> = 175°C	<i>MUR880E</i>	75	1.80 @ 8.0 A	100	175	25	500 @ 100°C		
100	15	T <sub>C</sub> = 150°C	<i>MUR1510</i>	35	1.05 @ 15 A	200	175	10	500		
150	15	T <sub>C</sub> = 150°C	<i>MUR1515</i>	35	1.05 @ 15 A	200	175	10	500		
200	15	T <sub>C</sub> = 150°C	<i>MUR1520</i>	35	1.05 @ 15 A	200	175	10	500		
400	15	T <sub>C</sub> = 150°C	<i>MUR1540</i>	60	1.25 @ 15 A	150	175	10	500		
600	15	T <sub>C</sub> = 145°C	<i>MUR1560</i>	60	1.50 @ 15 A	150	175	10	1000		
200	20	T <sub>C</sub> = 125°C	<i>MUR2020R</i>	95	1.10 @ 20 A	250	175	50	1000		
1000	8	T <sub>C</sub> = 150°C	<i>MUR8100E</i>	75	1.80 @ 8.0 A	100	175	25	500 @ 100°C		
1200	10	T <sub>C</sub> = 125°C	<i>MUR10120E</i>	175	2.2 @ 6.5 A	100	125	100	1000 @ 125°C		
1500	10	T <sub>C</sub> = 125°C	<i>MUR10150E</i>	175	2.4 @ 6.5 A	100	125	100	1000 @ 125°C		
1500	5	T <sub>C</sub> = 100°C	<i>MUR5150E</i>	175	2.4 @ 5 A	100	125	50	500 @ 125°C		
200	16	T <sub>C</sub> = 150°C	 <i>MURF1620CT</i>	25	0.975 @ 8.0 A	100	150	5	250		<b>CASE 221D-02</b> 
600	16	T <sub>C</sub> = 150°C	<i>MURF1660CT</i>	60	1.5 @ 8.0 A	100	175	10	500		
600	8	T <sub>C</sub> ≤ 120°C	<i>MURHF860CT</i> ★	35	2.8 @ 4.0 A	100	175	10	500		

(1) I<sub>O</sub> is total device capability

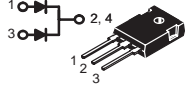
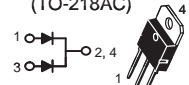

(2) V<sub>RRM</sub> unless noted

(4) V<sub>RRM</sub>, T<sub>J</sub> = 150°C unless noted

 Indicates UL Recognized – File #E69369

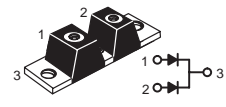
★ New Product

**Table 16. TO-218 and TO-247 Ultrafast Rectifiers**

V <sub>RRM</sub> (Volts)	I <sub>O</sub> (Amperes)	I <sub>O</sub> Rating Condition	Device	Max t <sub>rr</sub> (ns)	Max V <sub>F</sub> @ i <sub>F</sub> T <sub>C</sub> = 25°C (Volts)	I <sub>FSM</sub> (Amperes)	T <sub>J</sub> Max (°C)	Max I <sub>R</sub> <sup>(2)</sup> T <sub>J</sub> = 25°C (μA)	Max I <sub>R</sub> <sup>(4)</sup> (mA)	Package
200	30	T <sub>C</sub> = 145°C	<i>MUR3020WT</i>	35	1.05 @ 15 A	150	175	10	0.5	<b>CASE 340K-01</b> (TO-247) 
600	30	T <sub>C</sub> = 145°C	<i>MUR3060WT</i>	60	1.70 @ 15 A	150	175	10	1	
200	30	T <sub>C</sub> = 150°C	<i>MUR3020PT</i>	35	1.12 @ 15 A	200	175	10	0.5	<b>CASE 340D-02</b> (TO-218AC) 
400	30	T <sub>C</sub> = 150°C	<i>MUR3040PT</i>	60	1.12 @ 15 A	150	175	10	0.5	
600	30	T <sub>C</sub> = 145°C	<i>MUR3060PT</i>	60	1.20 @ 15 A	150	175	10	1	<b>CASE 340E-02</b> (TO-218) 
400	30	T <sub>C</sub> = 70°C	<i>MUR3040</i>	100	1.5 @ 30 A	300	175	35	6 @ 100°C	
800	30	T <sub>C</sub> = 70°C	<i>MUR3080</i>	110	1.90 @ 30 A	300	175	100	5 @ 100°C	
400	60	T <sub>C</sub> = 70°C	<i>MUR6040</i>	100	1.50 @ 60 A	600	175	60	10 @ 100°C	

(1) I<sub>O</sub> is total device capability  
 (2) V<sub>RRM</sub> unless noted  
 (4) V<sub>RRM</sub>, T<sub>J</sub> = 150°C unless noted






**Table 17. POWER TAP II Ultrafast Rectifiers**

V <sub>RRM</sub> (Volts)	I <sub>O</sub> <sup>(1)</sup> (Amperes)	I <sub>O</sub> Rating Condition	Device	Max t <sub>rr</sub> (ns)	Max V <sub>F</sub> @ i <sub>F</sub> T <sub>C</sub> = 25°C (Volts)	I <sub>FSM</sub> (Amperes)	T <sub>J</sub> Max (°C)	Max I <sub>R</sub> <sup>(2)</sup> T <sub>J</sub> = 25°C (μA)	Max I <sub>R</sub> <sup>(4)</sup> (mA)	Package
200	200	T <sub>C</sub> = 130°C	<i>MURP20020CT</i>	50	1.00 @ 100 A	800	175	150	1 @ 125°C	<b>CASE 357C-03</b> POWER TAP™  Cathode = Mounting Plate Anode = Terminal
400	200	T <sub>C</sub> = 100°C	<i>MURP20040CT</i>	50	1.30 @ 100 A	800	175	50	0.5 @ 125°C	

(1) I<sub>O</sub> is total device current capability. (4) V<sub>RRM</sub>, T<sub>J</sub> = 150°C unless noted  
 (2) V<sub>RRM</sub> unless noted ★ New Product

## Fast Recovery Rectifiers/General-Purpose Rectifiers

Table 18. Fast Recovery Rectifiers/General Purpose Rectifiers

V <sub>RRM</sub> (Volts)	I <sub>O</sub> (Amperes)	I <sub>O</sub> Rating Condition	Device	Max V <sub>F</sub> @ I <sub>F</sub> T <sub>J</sub> = 25°C (Volts)	Max t <sub>rr</sub> (ns)	I <sub>FSM</sub> (Amperes)	T <sub>J</sub> Max (°C)	Max I <sub>R</sub> <sup>(2)</sup> T <sub>J</sub> = 25°C (μA)	Max I <sub>R</sub> <sup>(3)</sup> (μA)	Package
400	1.5	T <sub>L</sub> = 118°C	<i>MRS1504T3</i>	1.04 @ 1.5 A	-	50	150	1	340	CASE 403A-03 SMB 
300	1	T <sub>L</sub> = 150°C	<i>MRA4003T3</i> ★	1.1 @ 1.0 A	-	30	175	10	50	CASE 403B-01 SMA  Cathode = Notch
400	1	T <sub>L</sub> = 150°C	<i>MRA4004T3</i> ★	1.1 @ 1.0 A	-	30	175	10	50	
600	1	T <sub>L</sub> = 150°C	<i>MRA4005T3</i> ★	1.1 @ 1.0 A	-	30	175	10	50	
800	1	T <sub>L</sub> = 150°C	<i>MRA4006T3</i> ★	1.1 @ 1.0 A	-	30	175	10	50	
1000	1	T <sub>L</sub> = 150°C	<i>MRA4007T3</i> ★	1.1 @ 1.0 A	-	30	175	10	50	
50	1	T <sub>A</sub> = 75°C	<i>1N4001RL</i>	1.1 @ 1.0 A	-	30	150	10	50	CASE 59-03 <sup>(7)</sup> Plastic  Cathode = Polarity Band
100	1	T <sub>A</sub> = 75°C	<i>1N4002RL</i>	1.1 @ 1.0 A	-	30	150	10	50	
200	1	T <sub>A</sub> = 75°C	<i>1N4003RL</i>	1.1 @ 1.0 A	-	30	150	10	50	
400	1	T <sub>A</sub> = 75°C	<i>1N4004RL</i>	1.1 @ 1.0 A	-	30	150	10	50	
600	1	T <sub>A</sub> = 75°C	<i>1N4005RL</i>	1.1 @ 1.0 A	-	30	150	10	50	
800	1	T <sub>A</sub> = 75°C	<i>1N4006RL</i>	1.1 @ 1.0 A	-	30	150	10	50	
1000	1	T <sub>A</sub> = 75°C	<i>1N4007RL</i>	1.1 @ 1.0 A	-	30	150	10	50	
50	1	T <sub>A</sub> = 75°C	<i>1N4933RL</i>	1.2 @ 1.0 A	200	30	150	5	100	
100	1	T <sub>A</sub> = 75°C	<i>1N4934RL</i>	1.2 @ 1.0 A	200	30	150	5	100	
200	1	T <sub>A</sub> = 75°C	<i>1N4935RL</i>	1.2 @ 1.0 A	200	30	150	5	100	
400	1	T <sub>A</sub> = 75°C	<i>1N4936RL</i>	1.2 @ 1.0 A	200	30	150	5	100	
600	1	T <sub>A</sub> = 75°C	<i>1N4937RL</i>	1.2 @ 1.0 A	200	30	150	5	100	
50	3	T <sub>L</sub> = 105°C	<i>1N5400RL</i>	1.2 @ 9.4 A	-	200	150	10	500 @ 150°C	
100	3	T <sub>L</sub> = 105°C	<i>1N5401RL</i>	1.2 @ 9.4 A	-	200	150	10	500 @ 150°C	
200	3	T <sub>L</sub> = 105°C	<i>1N5402RL</i>	1.2 @ 9.4 A	-	200	150	10	500 @ 150°C	
400	3	T <sub>L</sub> = 105°C	<i>1N5404RL</i>	1.2 @ 9.4 A	-	200	150	10	500 @ 150°C	
600	3	T <sub>L</sub> = 105°C	<i>1N5406RL</i>	1.2 @ 9.4 A	-	200	150	10	500 @ 150°C	
800	3	T <sub>L</sub> = 105°C	<i>1N5407RL</i>	1.2 @ 9.4 A	-	200	150	10	500 @ 150°C	
1000	3	T <sub>L</sub> = 105°C	<i>1N5408RL</i>	1.2 @ 9.4 A	-	200	150	10	500 @ 150°C	
200	3	T <sub>A</sub> = 80°C <sup>(8)</sup>	<i>MR852RL</i>	1.25 @ 3.0 A	200	100	150	10	150	
400	3	T <sub>A</sub> = 80°C <sup>(8)</sup>	<i>MR854RL</i>	1.25 @ 3.0 A	200	100	150	10	150	
600	3	T <sub>A</sub> = 80°C <sup>(8)</sup>	<i>MR856RL</i>	1.25 @ 3.0 A	200	100	150	10	150	
50	6	T <sub>A</sub> = 60°C R <sub>θJA</sub> = 25°C/W	<i>MR750RL</i>	1.25 @ 100 A	-	400	175	25	1000	CASE 194-04 Plastic  Cathode indicated by diode symbol
100	6	T <sub>A</sub> = 60°C R <sub>θJA</sub> = 25°C/W	<i>MR751RL</i>	1.25 @ 100 A	-	400	175	25	1000	
200	6	T <sub>A</sub> = 60°C R <sub>θJA</sub> = 25°C/W	<i>MR752RL</i>	1.25 @ 100 A	-	400	175	25	1000	
400	6	T <sub>A</sub> = 60°C R <sub>θJA</sub> = 25°C/W	<i>MR754RL</i>	1.25 @ 100 A	-	400	175	25	1000	
600	6	T <sub>A</sub> = 60°C R <sub>θJA</sub> = 25°C/W	<i>MR756RL</i>	1.25 @ 100 A	-	400	175	25	1000	
1000	6	T <sub>A</sub> = 60°C R <sub>θJA</sub> = 25°C/W	<i>MR760RL</i>	1.25 @ 100 A	-	400	175	25	1000	
200	25	T <sub>C</sub> = 150°C	<i>MR2502</i>	1.18 @ 78.5 A	-	400	175	100	500	CASE 193-04 Plastic  Cathode = Polarity Band
400	25	T <sub>C</sub> = 150°C	<i>MR2504</i>	1.18 @ 78.5 A	-	400	175	100	500	
1000	25	T <sub>C</sub> = 150°C	<i>MR2510</i>	1.18 @ 78.5 A	-	400	175	100	500	
250	32	T <sub>C</sub> = 150°C	<i>TRA3225</i>	1.15 @ 100 A	-	500	175	10	250	
250	25	T <sub>C</sub> = 150°C	<i>TRA2525</i>	1.18 @ 100 A	-	400	175	10	250	

<sup>(2)</sup>V<sub>RRM</sub> unless noted

<sup>(3)</sup>V<sub>RRM</sub>, T<sub>J</sub> = 100°C unless noted





<sup>(7)</sup>Package Size: 0.120" max diameter by 0.260" length.

<sup>(8)</sup>Must be derated for reverse power dissipation. See data sheet.

<sup>(9)</sup>Overvoltage Transient Suppressor: 24–32 volts avalanche voltage.

★ New Product

**Table 19. Overvoltage Transient Suppressors**

V <sub>RRM</sub> (Volts)	V <sub>BR</sub> <sup>(1)</sup> (Volts)	V <sub>BR</sub> (Volts)	I <sub>O</sub> (Amperes)	Device	Max V <sub>F</sub> T <sub>J</sub> = 25°C (Volts)	I <sub>FSM</sub> (Amperes)	T <sub>J</sub> Max (°C)	I <sub>RSM</sub> (Amperes)	Max I <sub>P</sub> <sup>(7)</sup> (μA)	Package
23	24-32	40 <sup>(4)</sup>	6 T <sub>L</sub> = 125°C	<b>MR2520L</b>	1.25 I <sub>F</sub> = 100A	400	175	58 <sup>(5)</sup>	10	<b>CASE 194-04</b> Plastic  Cathode = Diode Symbol
20	24-32	40 <sup>(2)</sup>	6 T <sub>C</sub> = 125°C	<b>MR2535L</b>	1.1 I <sub>F</sub> = 100A	400	175	62 <sup>(5)</sup>	0.2	
20	24-32	40 <sup>(3)</sup>	32 T <sub>C</sub> = 150°C	<b>TRA2532</b>	1.18 I <sub>F</sub> = 100A	500	175	80 <sup>(5)</sup>	10	<b>CASE 193-04</b> Plastic  Cathode = Polarity Band
23	24-32	40 <sup>(3)</sup>	32 T <sub>C</sub> = 150°C	<b>MR2835S</b>	1.1 I <sub>F</sub> = 100A	400	175	62 <sup>(5)</sup>	5 @ 20 V	<b>CASE 460-02</b> Top Can  Cathode = Terminal
18	20-27	37 <sup>(3)</sup> 35 <sup>(4)</sup>	32 T <sub>C</sub> = 185°C	<b>MR3227N</b> and <b>MR3227P</b>	1.18 I <sub>F</sub> = 100A	400	200	90 <sup>(5)</sup> 40 <sup>(6)</sup>	1 @ 16 V	<b>CASE 193A-02</b> Button Can  N = Anode to Case P = Cathode to Case
18	20-27	37 <sup>(3)</sup> 35 <sup>(4)</sup>	40 T <sub>C</sub> = 185°C	<b>MR4027N</b> and <b>MR4027P</b>	1.1 I <sub>F</sub> = 100A	500	200	110 <sup>(5)</sup> 50 <sup>(6)</sup>	1 @ 16 V	
30	34-45	55 <sup>(3)</sup> 53 <sup>(4)</sup>	40 T <sub>C</sub> = 185°C	<b>MR4045N</b> and <b>MR4045P</b>	1.1 I <sub>F</sub> = 100A	500	200	55 <sup>(5)</sup> 25 <sup>(6)</sup>	1 @ 28 V	

(1)At I<sub>r</sub> = 100 mA, 25°C

(2)At I<sub>r</sub> = 90 A, T<sub>c</sub> = 150°C, PW = 80 μS

(3)At I<sub>r</sub> = 80 A, T<sub>c</sub> = 85°C, PW = 80 μS

(4)At I<sub>r</sub> = 80 A, T<sub>c</sub> = 25°C, PW = 80 μS

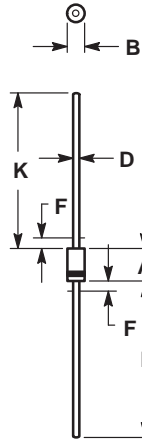
(5)Time Constant = 10 mS, 25°C

(6)Time Constant = 80 mS, 25°C

(7)At V<sub>RRM</sub>, T<sub>J</sub> = 25°C unless noted

# Package Outline Dimensions

## GLASS/PLASTIC DO-41 CASE 59-03 ISSUE M

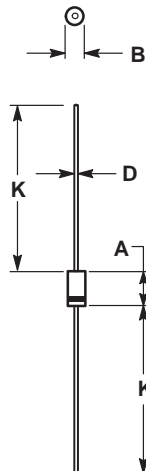


### NOTES:

1. ALL RULES AND NOTES ASSOCIATED WITH JEDEC DO-41 OUTLINE SHALL APPLY.
2. POLARITY DENOTED BY CATHODE BAND.
3. LEAD DIAMETER NOT CONTROLLED WITHIN F DIMENSION.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	4.07	5.20	0.160	0.205
B	2.04	2.71	0.080	0.107
D	0.71	0.86	0.028	0.034
F	---	1.27	---	0.050
K	27.94	---	1.100	---

## MINI MOSORB CASE 59-04 ISSUE M



### NOTES:

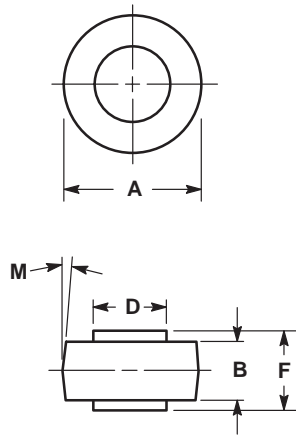
1. ALL RULES AND NOTES ASSOCIATED WITH JEDEC DO-41 OUTLINE SHALL APPLY.
2. POLARITY DENOTED BY CATHODE BAND.
3. LEAD DIAMETER NOT CONTROLLED WITHIN F DIMENSION.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	5.97	6.60	0.235	0.260
B	2.79	3.05	0.110	0.120
D	0.76	0.86	0.030	0.034
K	27.94	---	1.100	---



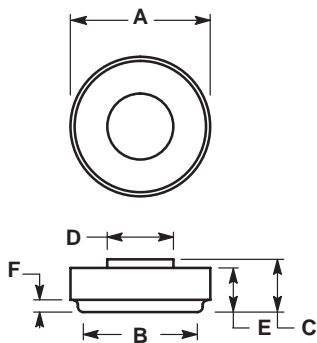
PACKAGE OUTLINE DIMENSIONS (continued)

**MICRODE BUTTON**  
CASE 193-04  
ISSUE J



DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	8.43	8.69	0.332	0.342
B	4.19	4.45	0.165	0.175
D	5.54	5.64	0.218	0.222
F	5.94	6.25	0.234	0.246
M	5°NOM		5°NOM	

**CAN BUTTON**  
CASE 193A-02  
ISSUE A

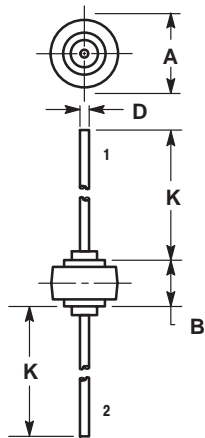


- NOTES:  
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.  
2. CONTROLLING DIMENSION: MILLIMETER.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	11.4	11.6	0.449	0.457
B	9.3	9.7	0.366	0.382
C	4.3	4.9	0.169	0.193
D	5.4	5.6	0.213	0.220
E	3.6	4.2	0.142	0.165
F	1.0	2.0	0.039	0.079

PACKAGE OUTLINE DIMENSIONS (continued)

AXIAL LEAD BUTTON  
CASE 194-04  
ISSUE F

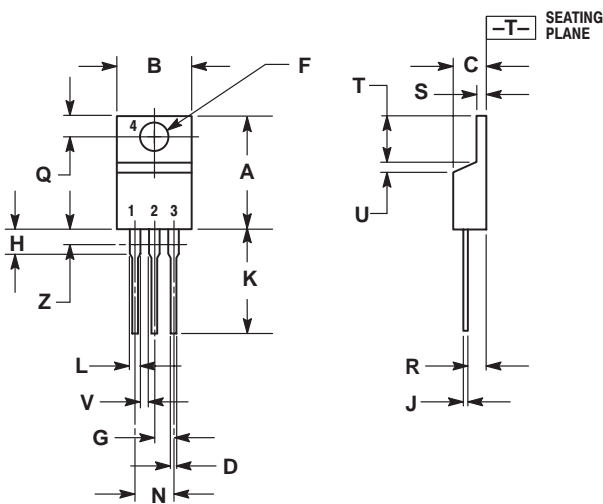


NOTES:  
1. CATHODE SYMBOL ON PACKAGE.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	8.43	8.69	0.332	0.342
B	5.94	6.25	0.234	0.246
D	1.27	1.35	0.050	0.053
K	25.15	25.65	0.990	1.010

STYLE 1:  
PIN 1. CATHODE  
2. ANODE

TO-220 THREE-LEAD  
TO-220  
CASE 221A-09  
ISSUE AA



NOTES:  
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.  
2. CONTROLLING DIMENSION: INCH.  
3. DIMENSION Z DEFINES A ZONE WHERE ALL BODY AND LEAD IRREGULARITIES ARE ALLOWED.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.570	0.620	14.48	15.75
B	0.380	0.405	9.66	10.28
C	0.160	0.190	4.07	4.82
D	0.025	0.035	0.64	0.88
F	0.142	0.147	3.61	3.73
G	0.095	0.105	2.42	2.66
H	0.110	0.155	2.80	3.93
J	0.018	0.025	0.46	0.64
K	0.500	0.562	12.70	14.27
L	0.045	0.060	1.15	1.52
N	0.190	0.210	4.83	5.33
Q	0.100	0.120	2.54	3.04
R	0.080	0.110	2.04	2.79
S	0.045	0.055	1.15	1.39
T	0.235	0.255	5.97	6.47
U	0.000	0.050	0.00	1.27
V	0.045	---	1.15	---
Z	---	0.080	---	2.04

STYLE 1:  
PIN 1. BASE  
2. COLLECTOR  
3. EMITTER  
4. COLLECTOR

STYLE 2:  
PIN 1. BASE  
2. EMITTER  
3. COLLECTOR  
4. EMITTER

STYLE 3:  
PIN 1. CATHODE  
2. ANODE  
3. GATE  
4. ANODE

STYLE 4:  
PIN 1. MAIN TERMINAL 1  
2. MAIN TERMINAL 2  
3. GATE  
4. MAIN TERMINAL 2

STYLE 5:  
PIN 1. GATE  
2. DRAIN  
3. SOURCE  
4. DRAIN

STYLE 6:  
PIN 1. ANODE  
2. CATHODE  
3. ANODE  
4. CATHODE

STYLE 7:  
PIN 1. CATHODE  
2. ANODE  
3. CATHODE  
4. ANODE

STYLE 8:  
PIN 1. CATHODE  
2. ANODE  
3. EXTERNAL TRIP/DELAY  
4. ANODE

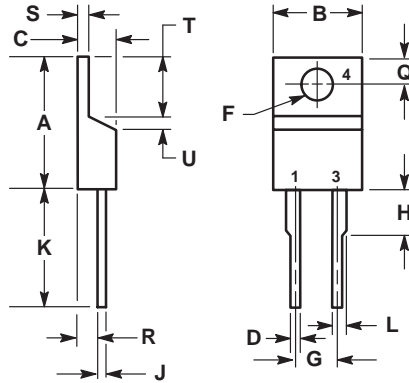
STYLE 9:  
PIN 1. GATE  
2. COLLECTOR  
3. EMITTER  
4. COLLECTOR

STYLE 10:  
PIN 1. GATE  
2. SOURCE  
3. DRAIN  
4. SOURCE

STYLE 11:  
PIN 1. DRAIN  
2. SOURCE  
3. GATE  
4. SOURCE

PACKAGE OUTLINE DIMENSIONS (continued)

TO-220 TWO-LEAD  
CASE 221B-04  
ISSUE D



NOTES:  
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.  
2. CONTROLLING DIMENSION: INCH.

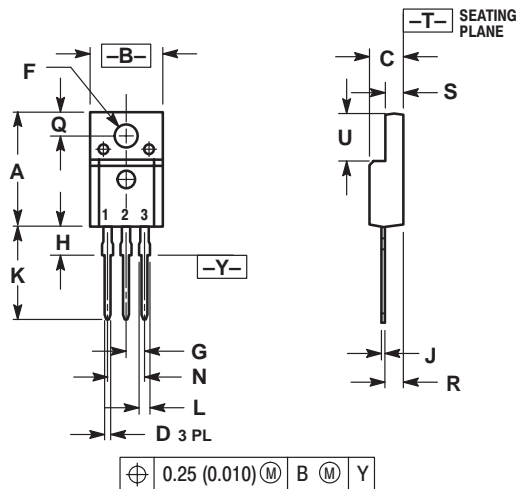
DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.595	0.620	15.11	15.75
B	0.380	0.405	9.65	10.29
C	0.160	0.190	4.06	4.82
D	0.025	0.035	0.64	0.89
F	0.142	0.147	3.61	3.73
G	0.190	0.210	4.83	5.33
H	0.110	0.130	2.79	3.30
J	0.018	0.025	0.46	0.64
K	0.500	0.562	12.70	14.27
L	0.045	0.060	1.14	1.52
Q	0.100	0.120	2.54	3.04
R	0.080	0.110	2.04	2.79
S	0.045	0.055	1.14	1.39
T	0.235	0.255	5.97	6.48
U	0.000	0.050	0.00	1.27

STYLE 1:  
PIN 1. CATHODE  
2. N/A  
3. ANODE  
4. CATHODE

STYLE 2:  
PIN 1. ANODE  
2. N/A  
3. CATHODE  
4. ANODE

TO-220 FULLPACK TRANSISTOR  
CASE 221D-02  
ISSUE D

SCALE 1:1



NOTES:  
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.  
2. CONTROLLING DIMENSION: INCH.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.621	0.629	15.78	15.97
B	0.394	0.402	10.01	10.21
C	0.181	0.189	4.60	4.80
D	0.026	0.034	0.67	0.86
F	0.121	0.129	3.08	3.27
G	0.100	BSC	2.54	BSC
H	0.123	0.129	3.13	3.27
J	0.018	0.025	0.46	0.64
K	0.500	0.562	12.70	14.27
L	0.045	0.060	1.14	1.52
N	0.200	BSC	5.08	BSC
Q	0.126	0.134	3.21	3.40
R	0.107	0.111	2.72	2.81
S	0.096	0.104	2.44	2.64
U	0.259	0.267	6.58	6.78

STYLE 1:  
PIN 1. GATE  
2. DRAIN  
3. SOURCE

STYLE 2:  
PIN 1. BASE  
2. COLLECTOR  
3. EMITTER

STYLE 3:  
PIN 1. ANODE  
2. CATHODE  
3. ANODE

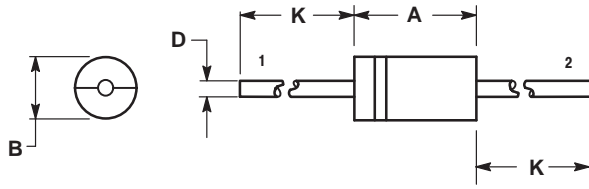
STYLE 4:  
PIN 1. CATHODE  
2. ANODE  
3. CATHODE

STYLE 5:  
PIN 1. CATHODE  
2. ANODE  
3. GATE

STYLE 6:  
PIN 1. MT 1  
2. MT 2  
3. GATE

PACKAGE OUTLINE DIMENSIONS (continued)

AXIAL LEAD  
CASE 267-03  
ISSUE G



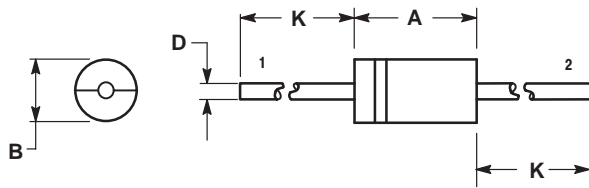
- NOTES:  
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.  
2. CONTROLLING DIMENSION: INCH.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.370	0.380	9.40	9.65
B	0.190	0.210	4.83	5.33
D	0.048	0.052	1.22	1.32
K	1.000	---	25.40	---

STYLE 1:  
PIN 1. CATHODE (POLARITY BAND)  
2. ANODE

STYLE 2:  
NO POLARITY

AXIAL LEAD  
CASE 267-05  
ISSUE G



- NOTES:  
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.  
2. CONTROLLING DIMENSION: INCH.

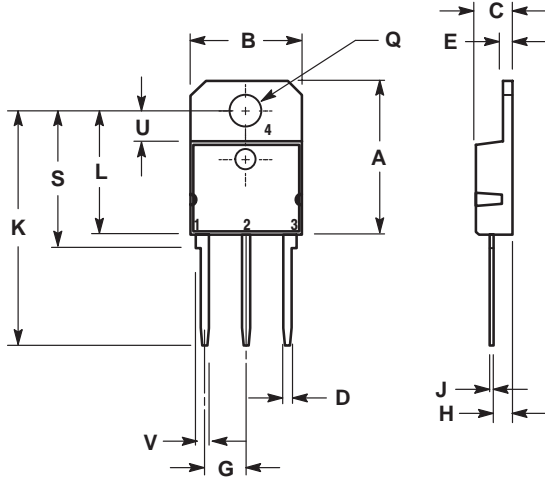
DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.287	0.374	7.30	9.50
B	0.189	0.209	4.80	5.30
D	0.047	0.051	1.20	1.30
K	1.000	---	25.40	---

STYLE 1:  
PIN 1. CATHODE (POLARITY BAND)  
2. ANODE

STYLE 2:  
NO POLARITY

PACKAGE OUTLINE DIMENSIONS (continued)

TO-218 THREE LEAD  
TO-218  
CASE 340D-02  
ISSUE B



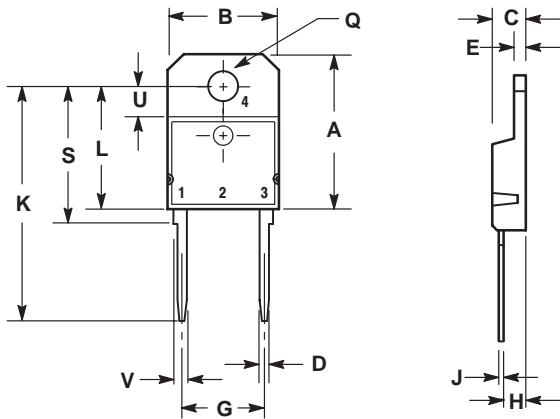
STYLE 1:  
PIN 1. BASE  
2. COLLECTOR  
3. EMITTER  
4. COLLECTOR

STYLE 2:  
PIN 1. ANODE  
2. CATHODE  
3. ANODE  
4. CATHODE

NOTES:  
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.  
2. CONTROLLING DIMENSION: MILLIMETER.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	---	20.35	---	0.801
B	14.70	15.20	0.579	0.598
C	4.70	4.90	0.185	0.193
D	1.10	1.30	0.043	0.051
E	1.17	1.37	0.046	0.054
G	5.40	5.55	0.213	0.219
H	2.00	3.00	0.079	0.118
J	0.50	0.78	0.020	0.031
K	31.00 REF		1.220 REF	
L	---	16.20	---	0.638
Q	4.00	4.10	0.158	0.161
S	17.80	18.20	0.701	0.717
U	4.00 REF		0.157 REF	
V	1.75 REF		0.069	

TO-218 TWO LEAD  
TO-218  
CASE 340E-02  
ISSUE A



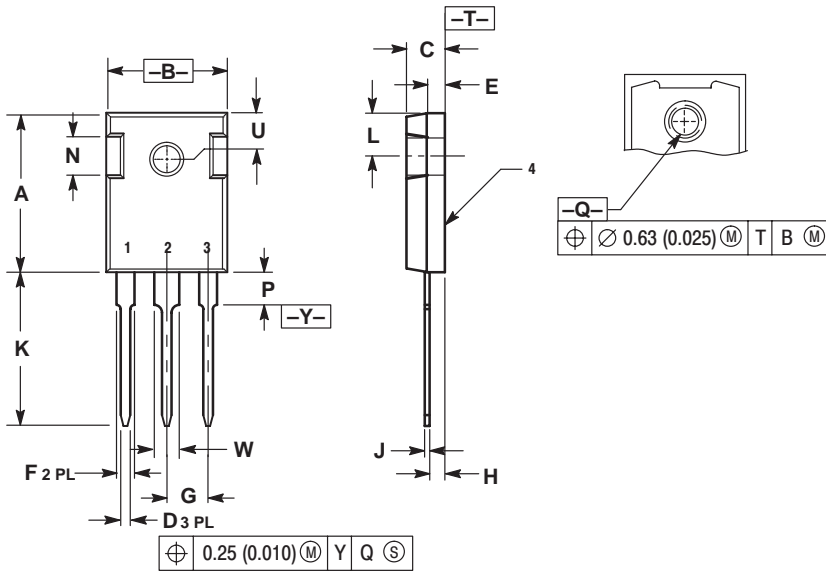
NOTES:  
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.  
2. CONTROLLING DIMENSION: MILLIMETER.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	---	20.35	---	0.801
B	14.70	15.20	0.579	0.598
C	4.70	4.90	0.185	0.193
D	1.10	1.30	0.043	0.051
E	1.17	1.37	0.046	0.054
G	10.80	11.10	0.425	0.437
H	2.00	3.00	0.079	0.118
J	0.50	0.78	0.020	0.031
K	31.00 REF		1.220 REF	
L	---	16.20	---	0.638
Q	4.00	4.10	0.158	0.161
S	17.80	18.20	0.701	0.717
U	4.00 REF		0.157 REF	
V	1.75 REF		0.069	

STYLE 1:  
PIN 1. CATHODE  
3. ANODE  
4. CATHODE

PACKAGE OUTLINE DIMENSIONS (continued)

TO-247  
CASE 340L-02  
ISSUE D



- NOTES:  
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.  
2. CONTROLLING DIMENSION: MILLIMETER.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	20.32	21.08	0.800	0.830
B	15.75	16.26	0.620	0.640
C	4.70	5.30	0.185	0.209
D	1.00	1.40	0.040	0.055
E	2.20	2.60	0.087	0.102
F	1.65	2.13	0.065	0.084
G	5.45 BSC		0.215 BSC	
H	1.50	2.49	0.059	0.098
J	0.40	0.80	0.016	0.031
K	20.06	20.83	0.790	0.820
L	5.40	6.20	0.212	0.244
N	4.32	5.49	0.170	0.216
P	---	4.50	---	0.177
Q	3.55	3.65	0.140	0.144
U	6.15 BSC		0.242 BSC	
W	2.87	3.12	0.113	0.123

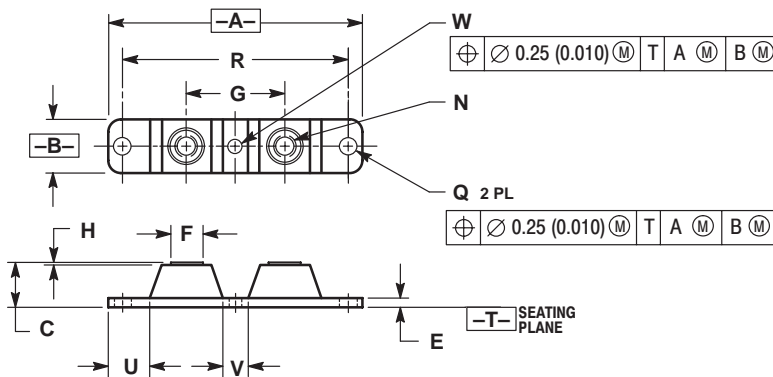
STYLE 1:  
PIN 1. GATE  
2. DRAIN  
3. SOURCE  
4. DRAIN

STYLE 2:  
PIN 1. ANODE  
2. CATHODE (S)  
3. ANODE 2  
4. CATHODES (S)

STYLE 3:  
PIN 1. BASE  
2. COLLECTOR  
3. EMITTER  
4. COLLECTOR

STYLE 4:  
PIN 1. GATE  
2. COLLECTOR  
3. EMITTER  
4. COLLECTOR

POWERTAP II  
CASE 357C-03  
ISSUE E

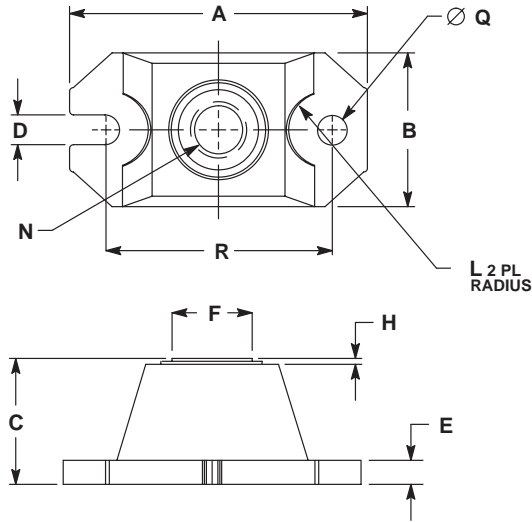


- NOTES:  
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.  
2. CONTROLLING DIMENSION: INCH.  
3. TERMINAL PENETRATION: 5.97 (0.235) MAXIMUM.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	3.450	3.635	87.63	92.33
B	0.700	0.810	17.78	20.57
C	0.615	0.640	15.63	16.26
E	0.120	0.130	3.05	3.30
F	0.435	0.445	11.05	11.30
G	1.370	1.380	34.80	35.05
H	0.007	0.030	0.18	0.76
N	1/4-20UNC-2B		1/4-20UNC-2B	
Q	0.270	0.285	6.86	7.23
R	31.50 BSC		80.01 BSC	
U	0.600	0.630	15.24	16.00
V	0.330	0.375	8.39	9.52
W	0.170	0.190	4.32	4.82

PACKAGE OUTLINE DIMENSIONS (continued)

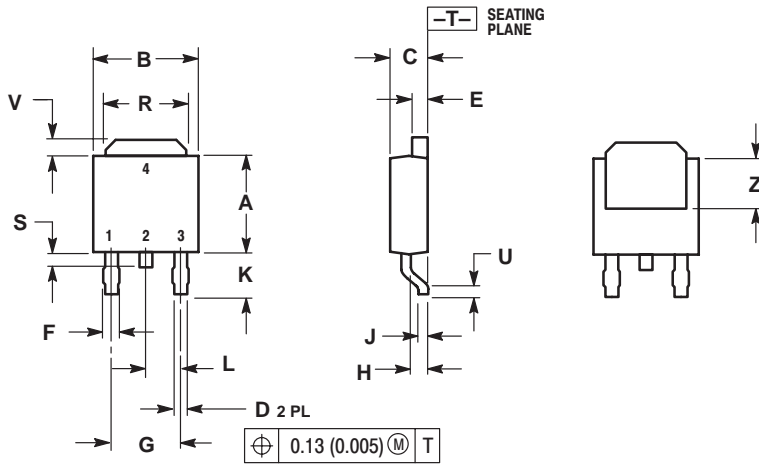
POWERTAP III  
CASE 357D-01  
ISSUE A



- NOTES:  
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.  
2. CONTROLLING DIMENSION: INCH.  
3. TERMINAL PENETRATION: 5.97 (0.235) MAXIMUM.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	1.520	1.560	38.61	39.62
B	0.783	0.813	19.89	20.65
C	0.615	0.635	15.62	16.13
D	0.152	0.162	3.86	4.11
E	0.120	0.130	3.05	3.30
F	0.435	0.445	11.05	11.30
H	0.007	0.030	0.18	0.76
L	0.210	0.230	5.33	5.84
N	1/4-20UNC-2B	1/4-20UNC-2B		
Q	0.152	0.162	3.86	4.11
R	1.175	1.195	29.85	30.35

DPAK  
CASE 369A-13  
ISSUE AA



- NOTES:  
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.  
2. CONTROLLING DIMENSION: INCH.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.235	0.250	5.97	6.35
B	0.250	0.265	6.35	6.73
C	0.086	0.094	2.19	2.38
D	0.027	0.035	0.69	0.88
E	0.033	0.040	0.84	1.01
F	0.037	0.047	0.94	1.19
G	0.180 BSC		4.58 BSC	
H	0.034	0.040	0.87	1.01
J	0.018	0.023	0.46	0.58
K	0.102	0.114	2.60	2.89
L	0.090 BSC		2.29 BSC	
R	0.175	0.215	4.45	5.46
S	0.020	0.050	0.51	1.27
U	0.020	---	0.51	---
V	0.030	0.050	0.77	1.27
Z	0.138	---	3.51	---

STYLE 1:  
PIN 1. BASE  
2. COLLECTOR  
3. EMITTER  
4. COLLECTOR

STYLE 2:  
PIN 1. GATE  
2. DRAIN  
3. SOURCE  
4. DRAIN

STYLE 3:  
PIN 1. ANODE  
2. CATHODE  
3. ANODE  
4. CATHODE

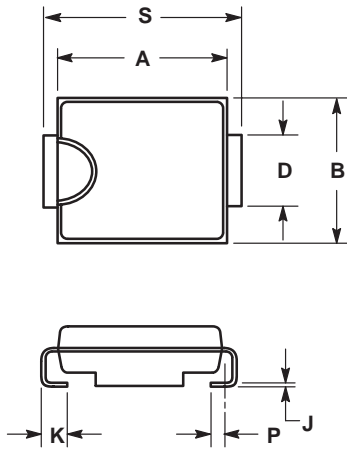
STYLE 4:  
PIN 1. CATHODE  
2. ANODE  
3. GATE  
4. ANODE

STYLE 5:  
PIN 1. GATE  
2. ANODE  
3. CATHODE  
4. ANODE

STYLE 6:  
PIN 1. MT1  
2. MT2  
3. GATE  
4. MT2

PACKAGE OUTLINE DIMENSIONS (continued)

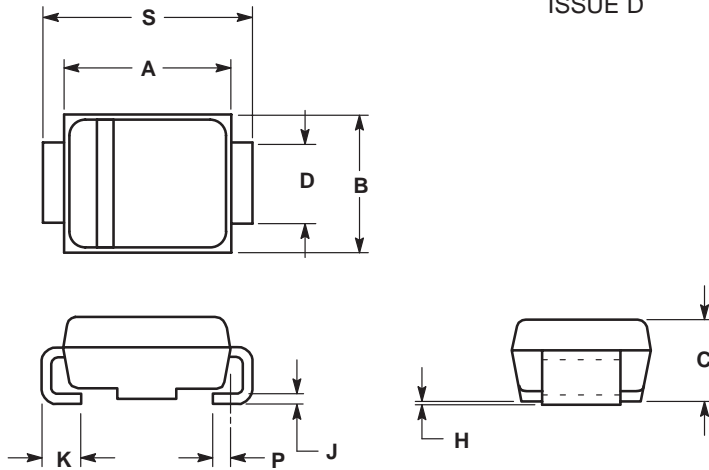
**SMC**  
CASE 403-03  
ISSUE B



- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
  2. CONTROLLING DIMENSION: INCH.
  3. D DIMENSION SHALL BE MEASURED WITHIN DIMENSION P.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.260	0.280	6.60	7.11
B	0.220	0.240	5.59	6.10
C	0.075	0.095	1.90	2.41
D	0.115	0.121	2.92	3.07
H	0.0020	0.0060	0.051	0.152
J	0.006	0.012	0.15	0.30
K	0.030	0.050	0.76	1.27
P	0.020 REF		0.51 REF	
S	0.305	0.320	7.75	8.13

**SMB**  
D0-214AA  
CASE 403A-03  
ISSUE D



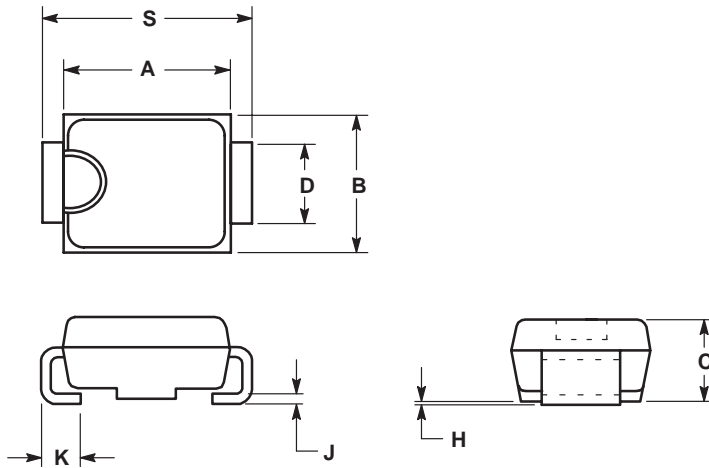
- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
  2. CONTROLLING DIMENSION: INCH.
  3. D DIMENSION SHALL BE MEASURED WITHIN DIMENSION P.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.160	0.180	4.06	4.57
B	0.130	0.150	3.30	3.81
C	0.075	0.095	1.90	2.41
D	0.077	0.083	1.96	2.11
H	0.0020	0.0060	0.051	0.152
J	0.006	0.012	0.15	0.30
K	0.030	0.050	0.76	1.27
P	0.020 REF		0.51 REF	
S	0.205	0.220	5.21	5.59



PACKAGE OUTLINE DIMENSIONS (continued)

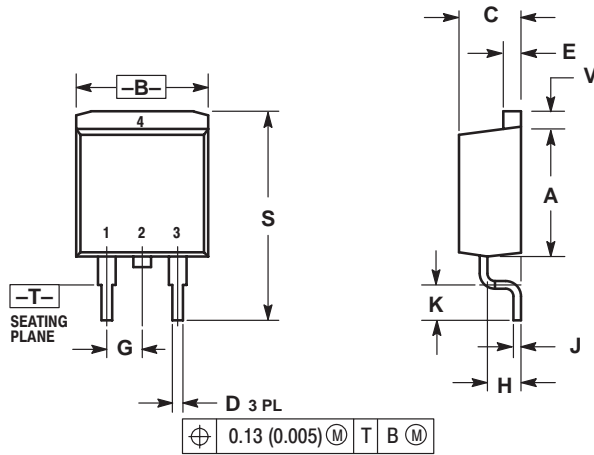
**SMB**  
CASE 403B-01  
ISSUE O



- NOTES:  
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.  
2. CONTROLLING DIMENSION: INCH.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.160	0.180	4.06	4.57
B	0.090	0.115	2.29	2.92
C	0.075	0.105	1.91	2.67
D	0.050	0.064	1.27	1.63
H	0.004	0.008	0.10	0.20
J	0.006	0.016	0.15	0.41
K	0.030	0.060	0.76	1.52
S	0.190	0.220	4.83	5.59

**D<sup>2</sup>PAK**  
CASE 418B-03  
ISSUE D



- NOTES:  
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.  
2. CONTROLLING DIMENSION: INCH.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.340	0.380	8.64	9.65
B	0.380	0.405	9.65	10.29
C	0.160	0.190	4.06	4.83
D	0.020	0.035	0.51	0.89
E	0.045	0.055	1.14	1.40
G	0.100 BSC		2.54 BSC	
H	0.080	0.110	2.03	2.79
J	0.018	0.025	0.46	0.64
K	0.090	0.110	2.29	2.79
S	0.575	0.625	14.60	15.88
V	0.045	0.055	1.14	1.40

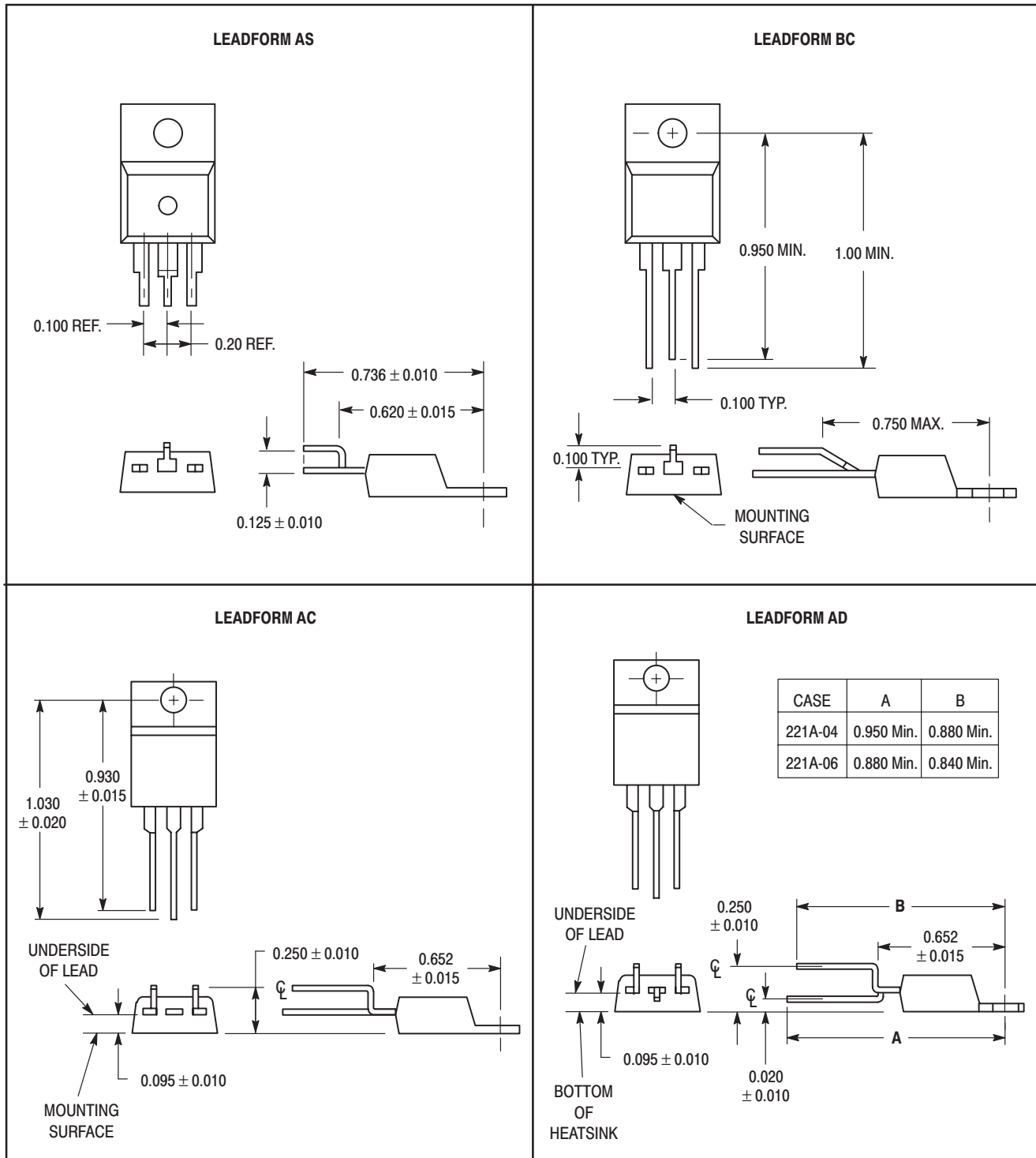
STYLE 1:  
PIN 1. BASE  
2. COLLECTOR  
3. EMITTER  
4. COLLECTOR

STYLE 2:  
PIN 1. GATE  
2. DRAIN  
3. SOURCE  
4. DRAIN

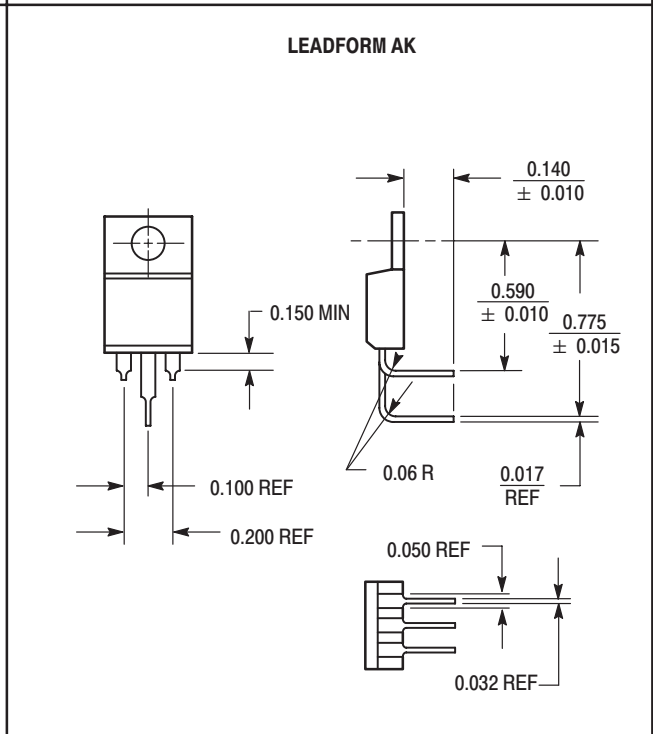
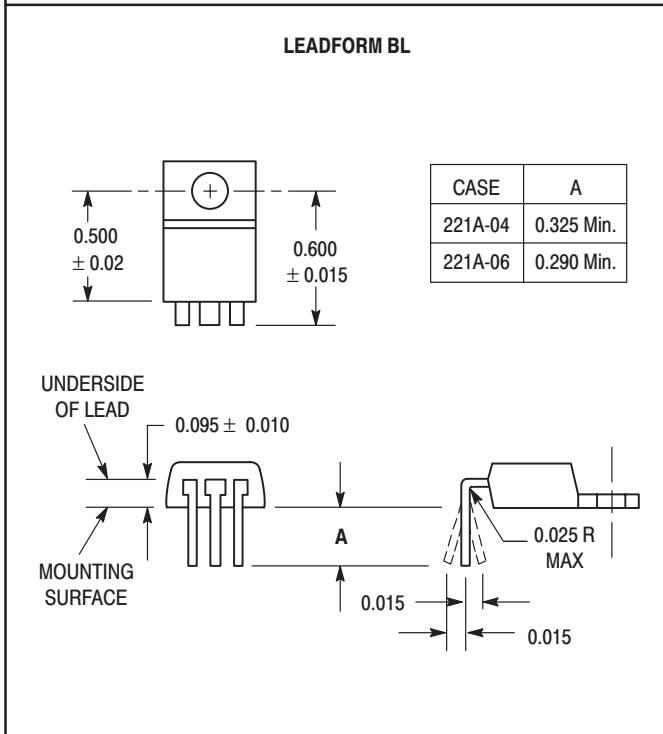
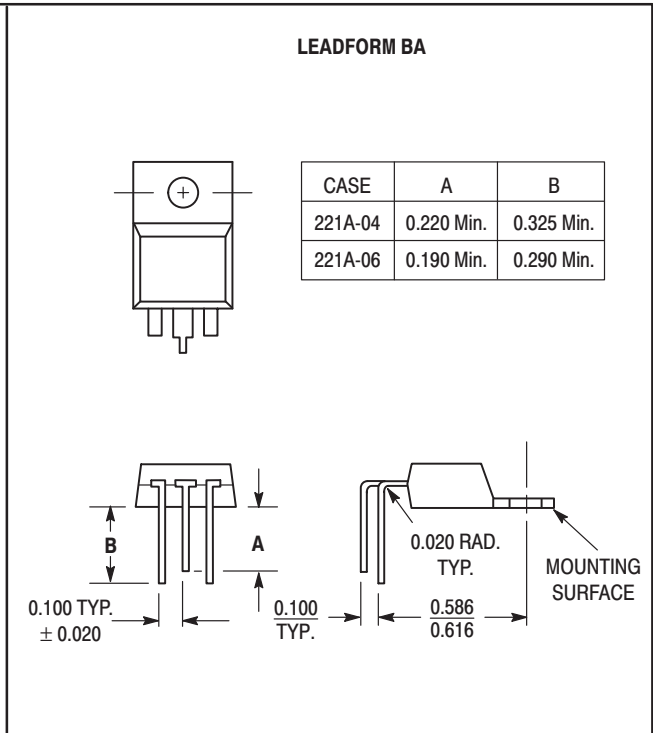
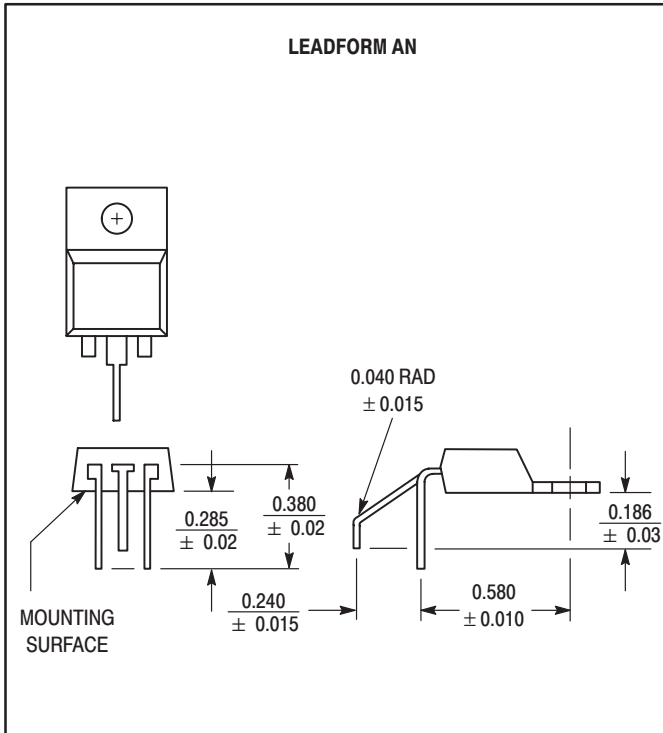
STYLE 3:  
PIN 1. ANODE  
2. CATHODE  
3. ANODE  
4. CATHODE

# Leadform Options — TO-220 (Case 221A)

- Leadform options require assignment of a special part number before ordering.
- Contact your local ON Semiconductor representative for special part number and pricing.
- 10,000 piece minimum quantity orders are required.
- Leadform orders are non-cancellable after processing.
- Leadforms apply to both ON Semiconductor Case 221A-04 and 221A-06 except as noted.

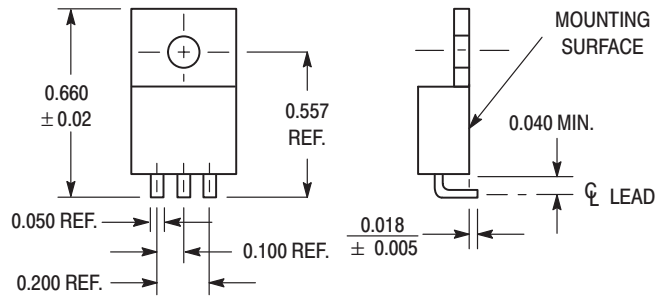


# TO-220 Leadform Options (continued)

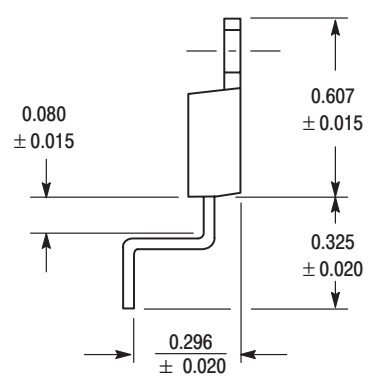


# TO-220 Leadform Options (continued)

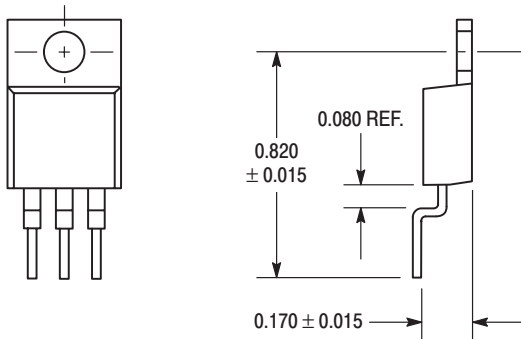
**LEADFORM AF**



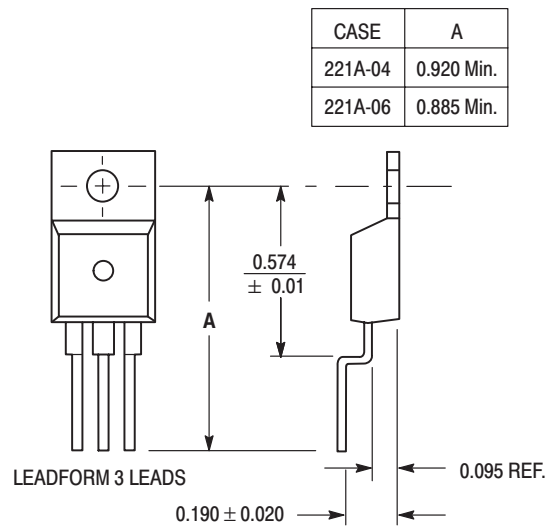
**LEADFORM BS**



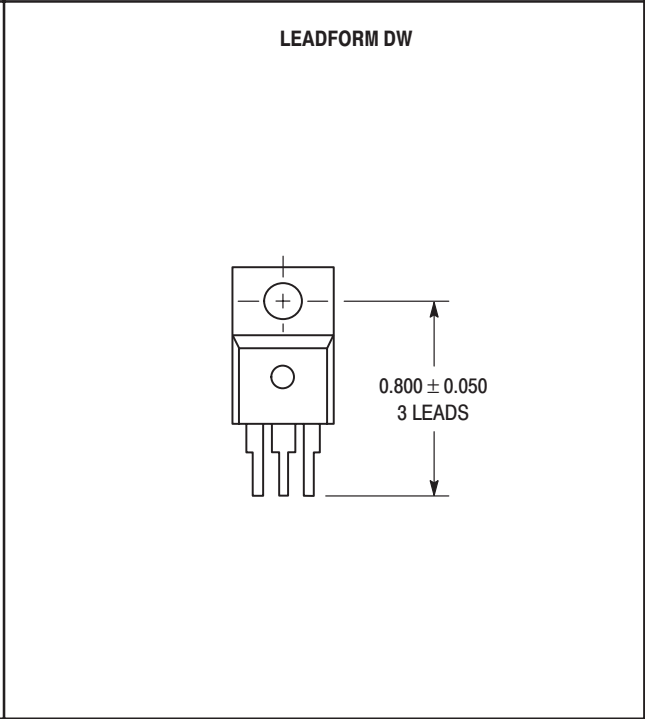
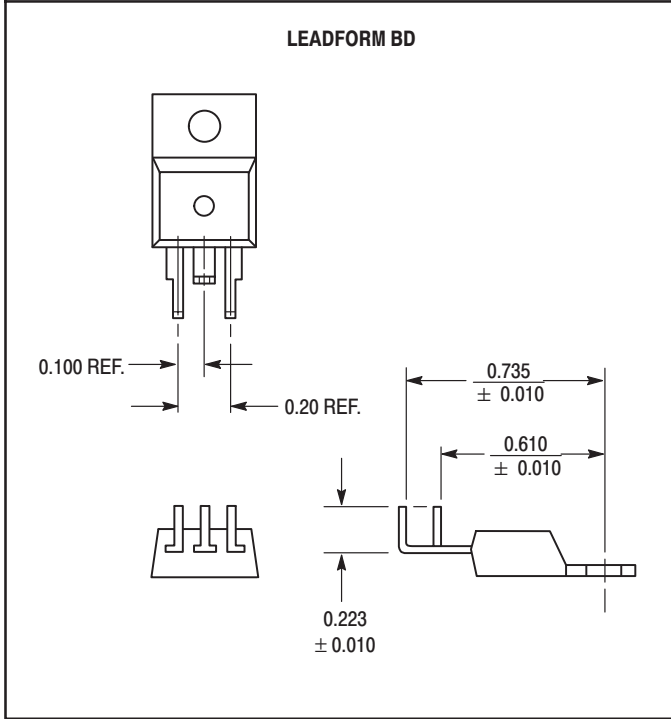
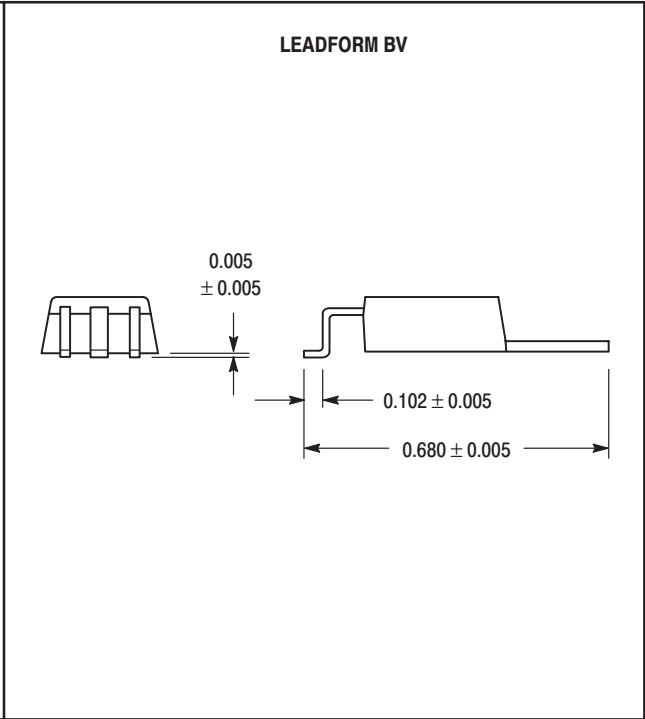
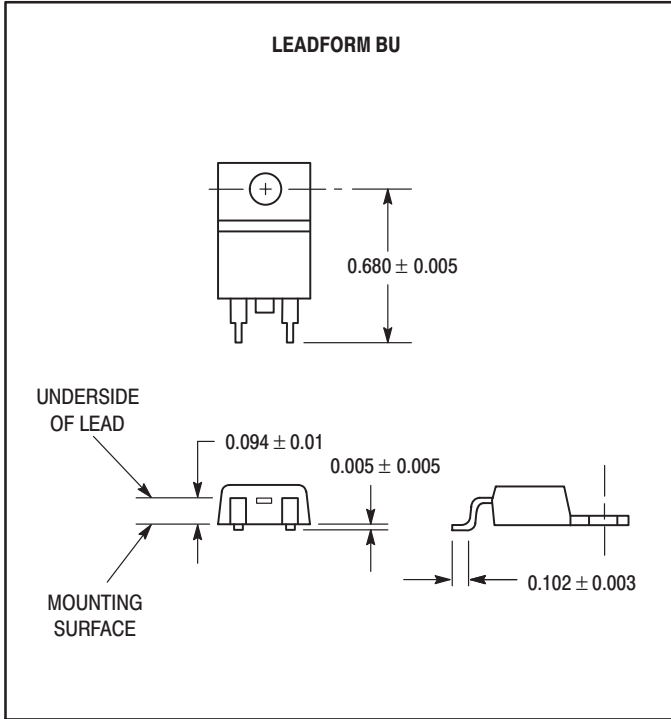
**LEADFORM BR**



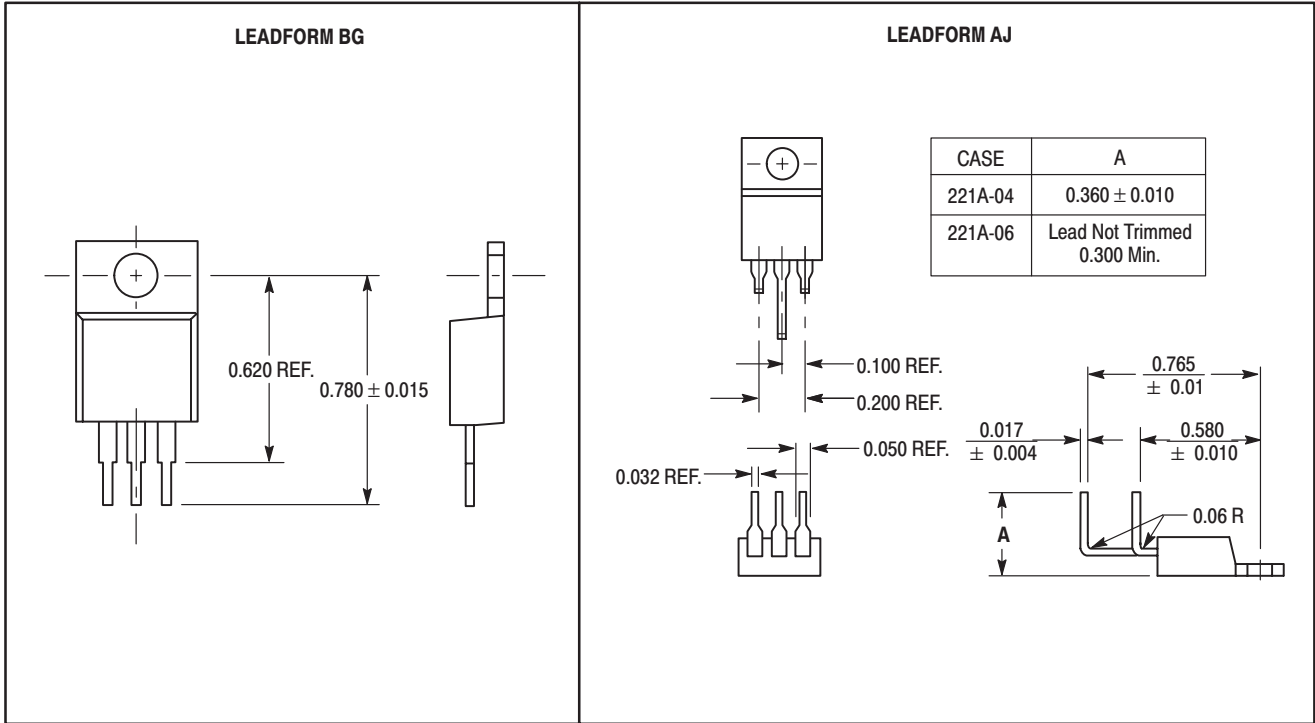
**LEADFORM AU**



# TO-220 Leadform Options (continued)



# TO-220 Leadform Options (continued)



# INFORMATION FOR USING SURFACE MOUNT PACKAGES

## RECOMMENDED FOOTPRINTS FOR SURFACE MOUNTED APPLICATIONS

Surface mount board layout is a critical portion of the total design. The footprint for the semiconductor packages must be the correct size to ensure proper solder connection

interface between the board and the package. With the correct pad geometry, the packages will self align when subjected to a solder reflow process.

### POWER DISSIPATION FOR A SURFACE MOUNT DEVICE

The power dissipation for a surface mount device is a function of the drain/collector pad size. These can vary from the minimum pad size for soldering to a pad size given for maximum power dissipation. Power dissipation for a surface mount device is determined by  $T_{J(max)}$ , the maximum rated junction temperature of the die,  $R_{\theta JA}$ , the thermal resistance from the device junction to ambient, and the operating temperature,  $T_A$ . Using the values provided on the data sheet,  $P_D$  can be calculated as follows:

$$P_D = \frac{T_{J(max)} - T_A}{R_{\theta JA}}$$

The values for the equation are found in the maximum ratings table on the data sheet. Substituting these values into the equation for an ambient temperature  $T_A$  of 25°C, one can calculate the power dissipation of the device. For example, for a SOT-223 device,  $P_D$  is calculated as follows.

$$P_D = \frac{150^\circ\text{C} - 25^\circ\text{C}}{156^\circ\text{C/W}} = 800 \text{ milliwatts}$$

The 156°C/W for the SOT-223 package assumes the use of the recommended footprint on a glass epoxy printed circuit board to achieve a power dissipation of 800 milliwatts. There are other alternatives to achieving higher power dissipation from the surface mount packages. One is to increase the area of the drain/collector pad. By increasing the area of the drain/collector pad, the power dissipation can be increased. Although the power dissipation can almost be doubled with this method, area is taken up on the printed circuit board which can defeat the purpose of using surface mount technology. For example, a graph of  $R_{\theta JA}$  versus drain pad area is shown in Figures 1, 2 and 3.

Another alternative would be to use a ceramic substrate or an aluminum core board such as Thermal Clad™. Using a board material such as Thermal Clad, an aluminum core board, the power dissipation can be doubled using the same footprint.

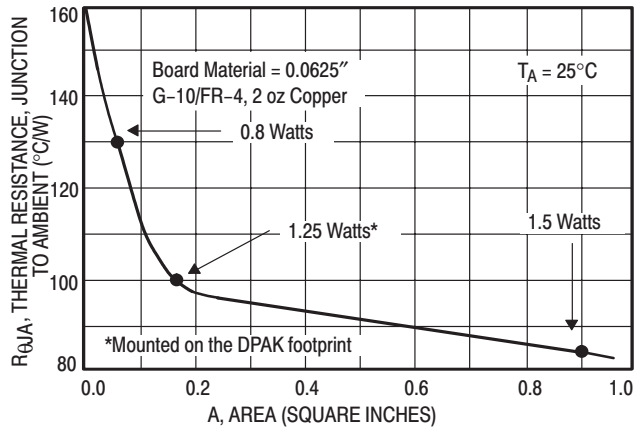


Figure 1. Thermal Resistance versus Drain Pad Area for the SOT-223 Package (Typical)

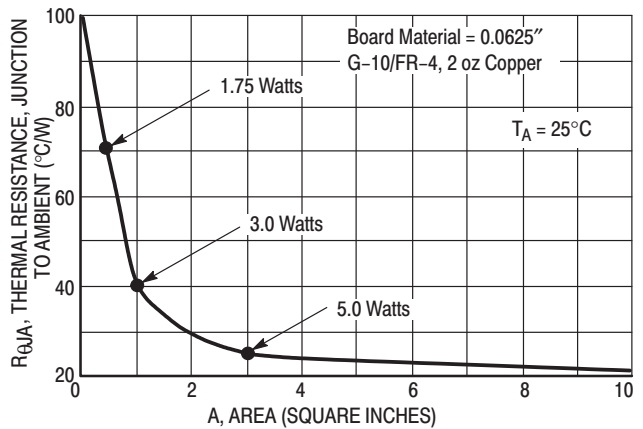


Figure 2. Thermal Resistance versus Drain Pad Area for the DPAK Package (Typical)

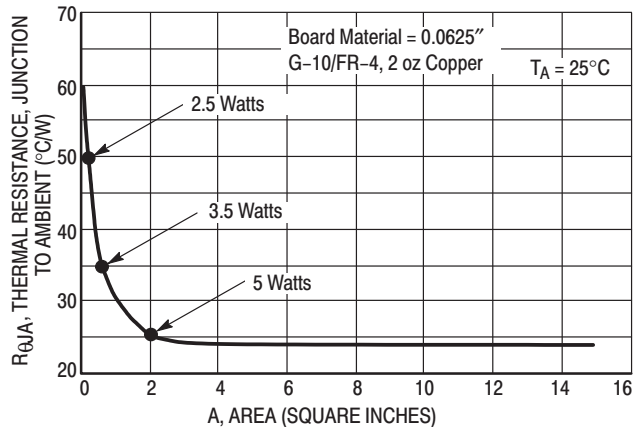


Figure 3. Thermal Resistance versus Drain Pad Area for the D<sup>2</sup>PAK Package (Typical)

## SOLDER STENCIL GUIDELINES

Prior to placing surface mount components onto a printed circuit board, solder paste must be applied to the pads. Solder stencils are used to screen the optimum amount. These stencils are typically 0.008 inches thick and may be made of brass or stainless steel. For packages such as the SC-59, SC-70/SOT-323, SOD-123, SOT-23, SOT-143, SOT-223, SO-8, SO-14, SO-16, and SMB/SMC diode packages, the stencil opening should be the same as the pad size or a 1:1 registration. This is not the case with the DPAK and D<sup>2</sup>PAK packages. If a 1:1 opening is used to screen solder onto the drain pad, misalignment and/or “tombstoning” may occur due to an excess of solder. For these two packages, the opening in the stencil for the paste should be approximately 50% of the tab area. The opening for the leads is still a 1:1 registration. Figure 4 shows a typical stencil for the DPAK and D<sup>2</sup>PAK packages. The

pattern of the opening in the stencil for the drain pad is not critical as long as it allows approximately 50% of the pad to be covered with paste.

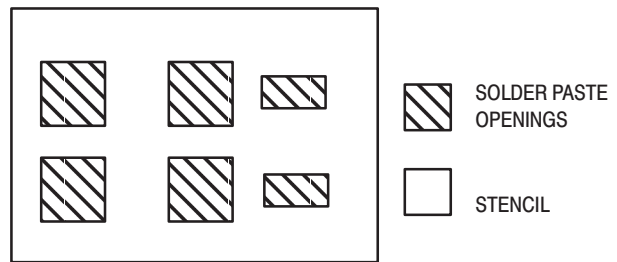


Figure 4. Typical Stencil for DPAK and D<sup>2</sup>PAK Packages

## SOLDERING PRECAUTIONS

The melting temperature of solder is higher than the rated temperature of the device. When the entire device is heated to a high temperature, failure to complete soldering within a short time could result in device failure. Therefore, the following items should always be observed in order to minimize the thermal stress to which the devices are subjected.

- Always preheat the device.
- The delta temperature between the preheat and soldering should be 100°C or less.\*
- When preheating and soldering, the temperature of the leads and the case must not exceed the maximum temperature ratings as shown on the data sheet. When using infrared heating with the reflow soldering method, the difference should be a maximum of 10°C.
- The soldering temperature and time should not exceed 260°C for more than 10 seconds.
- When shifting from preheating to soldering, the maximum temperature gradient shall be 5°C or less.

- After soldering has been completed, the device should be allowed to cool naturally for at least three minutes. Gradual cooling should be used since the use of forced cooling will increase the temperature gradient and will result in latent failure due to mechanical stress.
- Mechanical stress or shock should not be applied during cooling.

\* Soldering a device without preheating can cause excessive thermal shock and stress which can result in damage to the device.

\* Due to shadowing and the inability to set the wave height to incorporate other surface mount components, the D<sup>2</sup>PAK is not recommended for wave soldering.



## TYPICAL SOLDER HEATING PROFILE

For any given circuit board, there will be a group of control settings that will give the desired heat pattern. The operator must set temperatures for several heating zones and a figure for belt speed. Taken together, these control settings make up a heating “profile” for that particular circuit board. On machines controlled by a computer, the computer remembers these profiles from one operating session to the next. Figure 5 shows a typical heating profile for use when soldering a surface mount device to a printed circuit board. This profile will vary among soldering systems, but it is a good starting point. Factors that can affect the profile include the type of soldering system in use, density and types of components on the board, type of solder used, and the type of board or substrate material being used. This profile shows temperature versus time. The line on the graph shows the

actual temperature that might be experienced on the surface of a test board at or near a central solder joint. The two profiles are based on a high density and a low density board. The Vitronics SMD310 convection/infrared reflow soldering system was used to generate this profile. The type of solder used was 62/36/2 Tin Lead Silver with a melting point between 177–189°C. When this type of furnace is used for solder reflow work, the circuit boards and solder joints tend to heat first. The components on the board are then heated by conduction. The circuit board, because it has a large surface area, absorbs the thermal energy more efficiently, then distributes this energy to the components. Because of this effect, the main body of a component may be up to 30 degrees cooler than the adjacent solder joints.

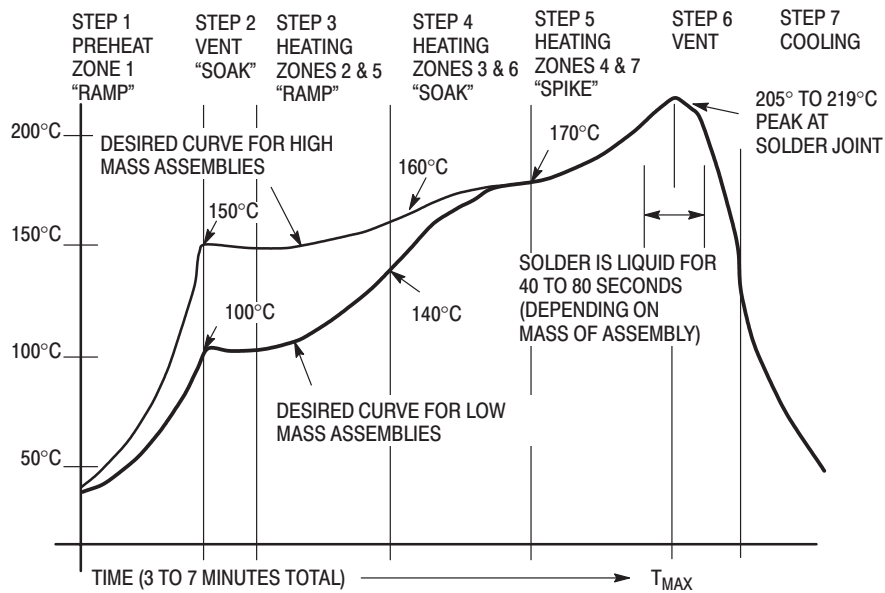
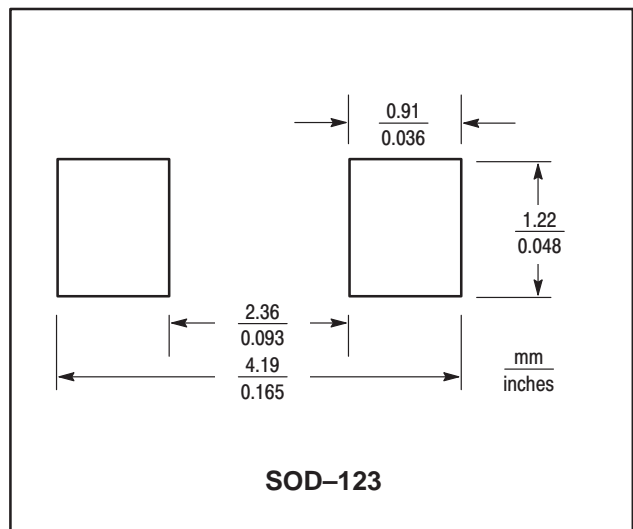
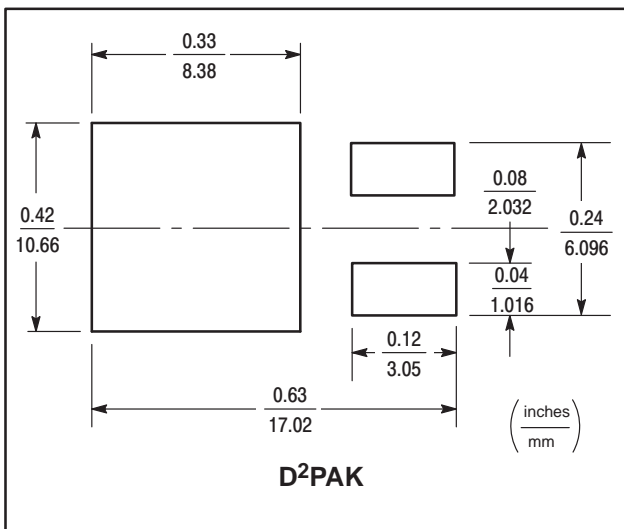
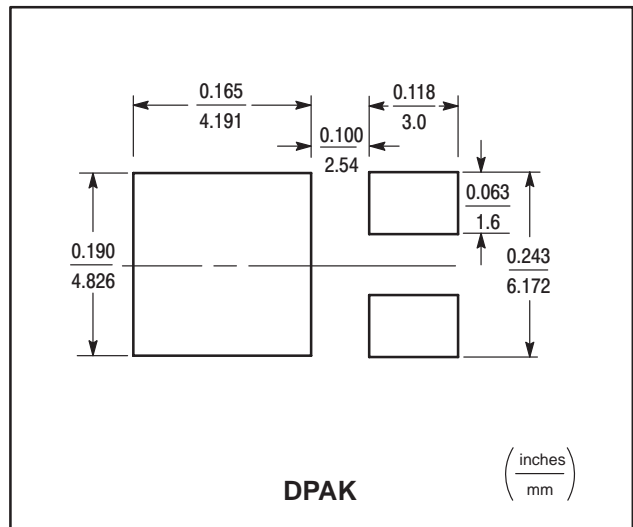
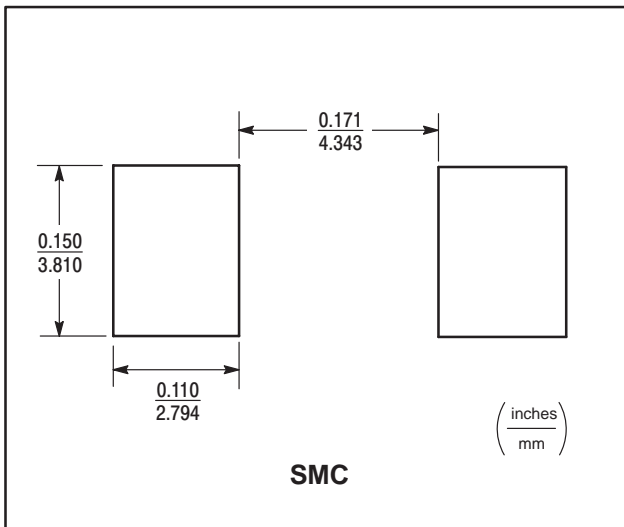
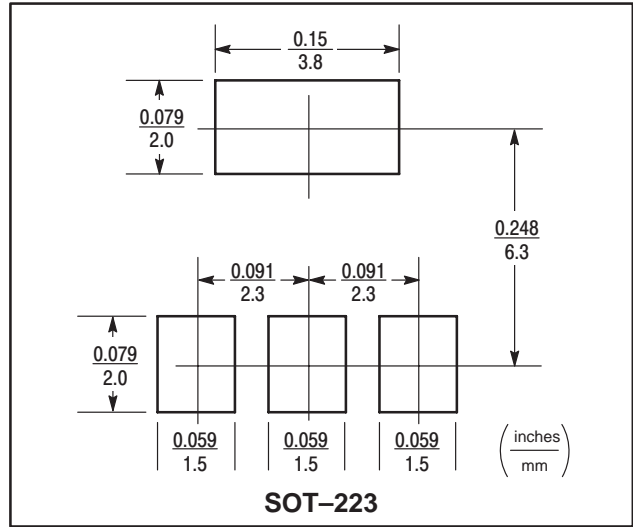
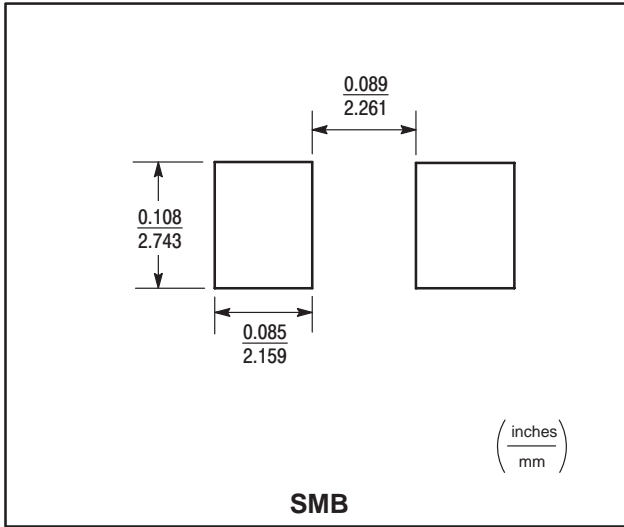
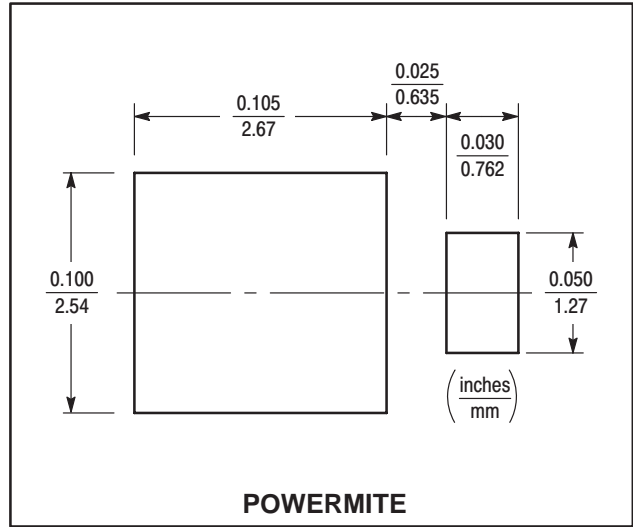
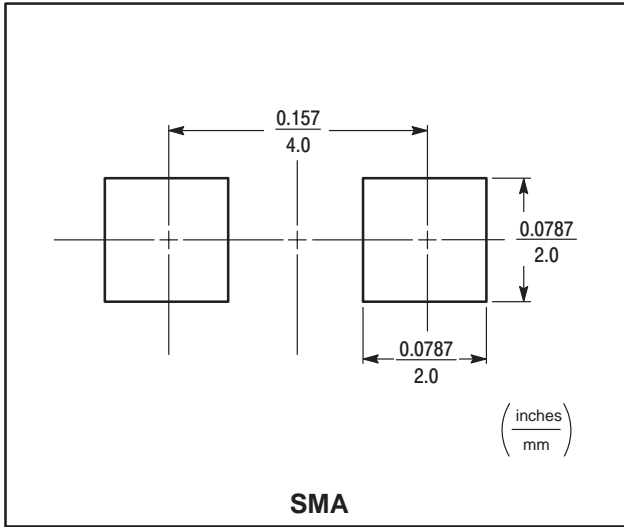


Figure 5. Typical Solder Heating Profile

# Footprints for Soldering



# Footprints for Soldering

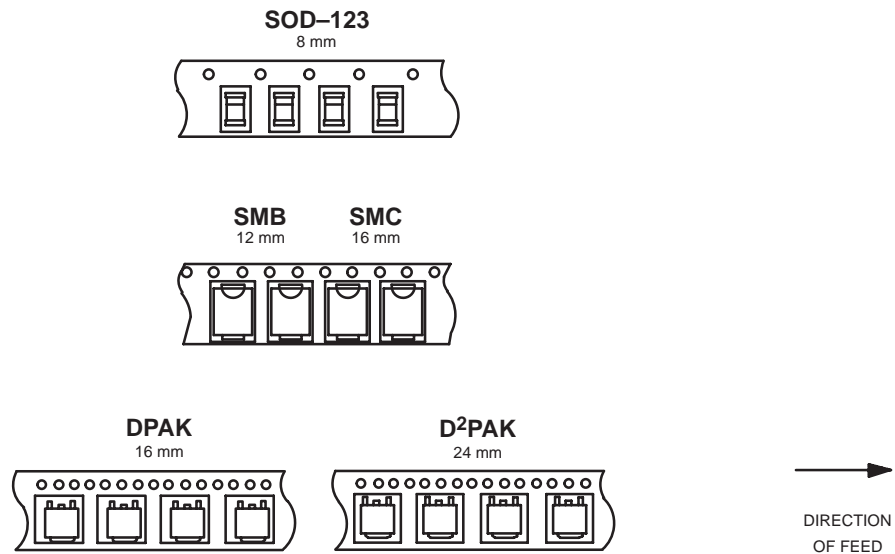


# Tape and Reel Specifications and Packaging Specifications

Embossed Tape and Reel is used to facilitate automatic pick and place equipment feed requirements. The tape is used as the shipping container for various products and requires a minimum of handling. The antistatic/conductive tape provides a secure cavity for the product when sealed with the “peel-back” cover tape.

- Two Reel Sizes Available (7” and 13”)
- Used for Automatic Pick and Place Feed Systems
- Minimizes Product Handling
- EIA 481, -1, -2
- SOD-123 in 8 mm Tape
- SMB in 12 mm Tape
- DPAK, SMC in 16 mm Tape
- D<sup>2</sup>PAK in 24 mm Tape

Use the standard device title and add the required suffix as listed in the option table on the following page. Note that the individual reels have a finite number of devices depending on the type of product contained in the tape. Also note the minimum lot size is one full reel for each line item, and orders are required to be in increments of the single reel quantity.

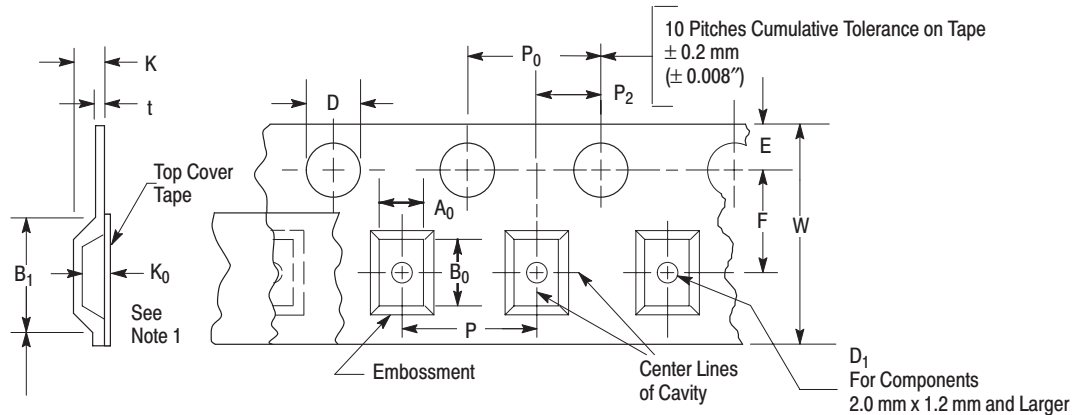


## EMBOSSED TAPE AND REEL ORDERING INFORMATION

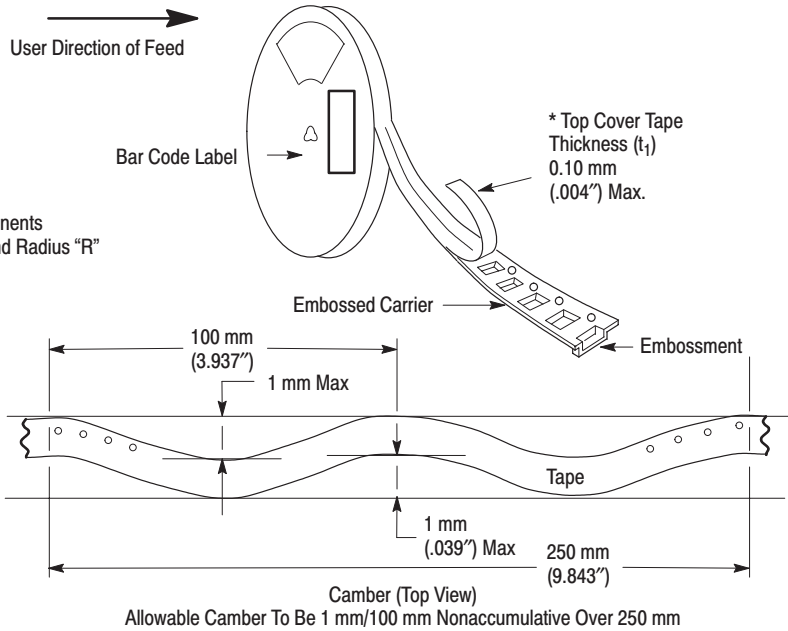
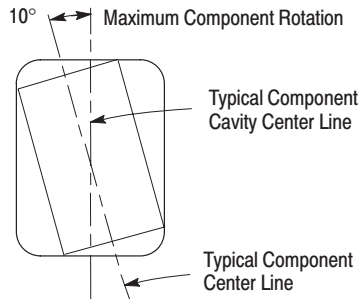
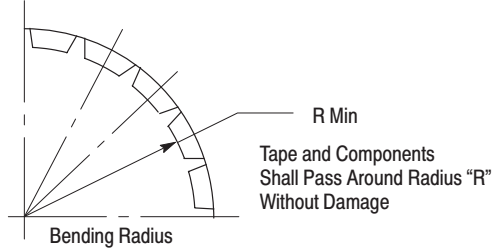
Package	Tape Width (mm)	Pitch mm (inch)	Reel Size mm (inch)	Devices Per Reel and Minimum Order Quantity	Device Suffix
DPAK	16	8.0 ± 0.1 (.315 ± .004)	330 (13)	2,500	T4
D <sup>2</sup> PAK	24	16.0 ± 0.1 (.630 ± .004)	330 (13)	800	T4
SMB	12	8.0 ± 0.1 (.315 ± .004)	330 (13)	2,500	T3
SMC	16	8.0 ± 0.1 (.315 ± .004)	330 (13)	2,500	T3
SOD-123	8 8	4.0 ± 0.1 (.157 ± .004)	178 (7) 330 (13)	3,000 10,000	T1 T3

# EMBOSSSED TAPE AND REEL DATA FOR DISCRETES

## CARRIER TAPE SPECIFICATIONS



For Machine Reference Only  
 Including Draft and RADII  
 Concentric Around  $B_0$



### DIMENSIONS

Tape Size	$B_1$ Max	D	$D_1$	E	F	K	$P_0$	$P_2$	R Min	T Max	W Max
8 mm	4.55 mm (.179")	1.5+0.1 mm -0 (.059+0.004" -0.0)	1.0 Min (.039")	1.75±0.1 mm (.069±.004")	3.5±0.05 mm (.138±.002")	2.4 mm Max (.094")	4.0±0.1 mm (.157±.004")	2.0±0.1 mm (.079±.002")	25 mm (.98")	0.6 mm (.024")	8.3 mm (.327")
12 mm	8.2 mm (.323")		1.5 mm Min (.060")		5.5±0.05 mm (.217±.002")	6.4 mm Max (.252")					12±.30 mm (.470±.012")
16 mm	12.1 mm (.476")				7.5±0.10 mm (.295±.004")	7.9 mm Max (.311")					16.3 mm (.642")
24 mm	20.1 mm (.791")				11.5±0.1 mm (.453±.004")	11.9 mm Max (.468")					24.3 mm (.957")

Metric dimensions govern — English are in parentheses for reference only.

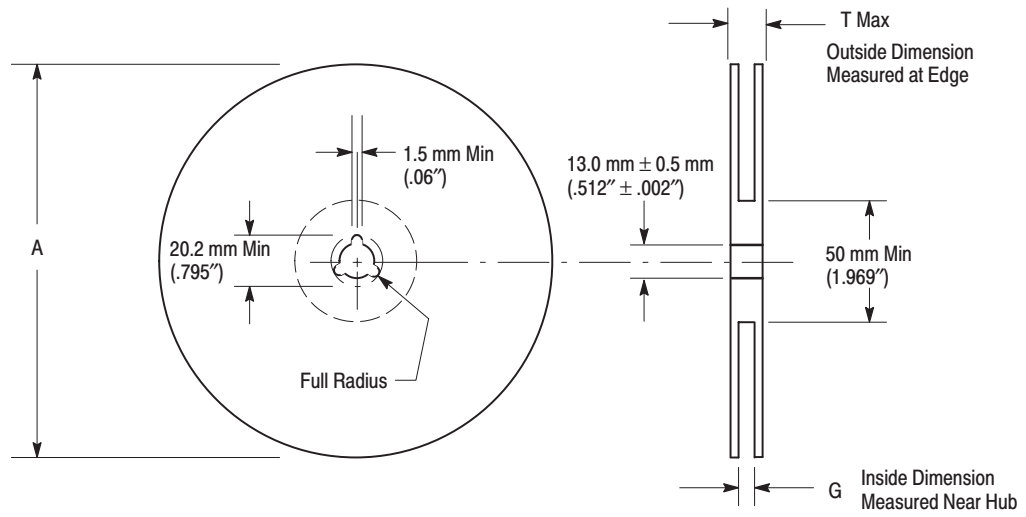
NOTE 1:  $A_0$ ,  $B_0$ , and  $K_0$  are determined by component size. The clearance between the components and the cavity must be within .05 mm min. to .50 mm max.,

the component cannot rotate more than 10° within the determined cavity.

NOTE 2: If  $B_1$  exceeds 4.2 mm (.165) for 8 mm embossed tape, the tape may not feed through all tape feeders.

NOTE 3: Pitch information is contained in the Embossed Tape and Reel Ordering Information on pg. 6-3.

## EMBOSSED TAPE AND REEL DATA FOR DISCRETES



Size	A Max	G	T Max
8 mm	330 mm (12.992")	8.4 mm + 1.5 mm, -0.0 (.33" + .059", -0.00)	14.4 mm (.56")
12 mm	330 mm (12.992")	12.4 mm + 2.0 mm, -0.0 (.49" + .079", -0.00)	18.4 mm (.72")
16 mm	360 mm (14.173")	16.4 mm + 2.0 mm, -0.0 (.646" + .078", -0.00)	22.4 mm (.882")
24 mm	360 mm (14.173")	24.4 mm + 2.0 mm, -0.0 (.961" + .070", -0.00)	30.4 mm (1.197")

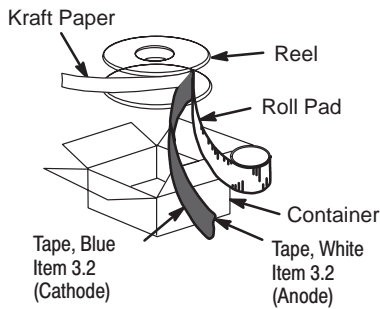
### Reel Dimensions

Metric Dimensions Govern — English are in parentheses for reference only

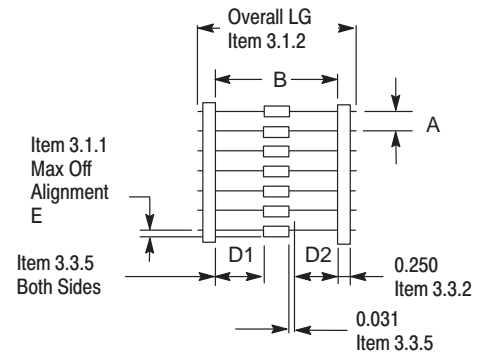
## LEAD TAPE PACKAGING STANDARDS FOR AXIAL-LEAD COMPONENTS

Case Type	Product Category	Device Title Suffix	MPQ Quantity Per Reel (Item 3.3.7)	Component Spacing A Dimension	Tape Spacing B Dimension	Reel Dimension C	Reel Dimension D (Max)	Max Off Alignment E
Case 17-02	Surmetic 40 & 600 Watt TVS	RL	4000	0.2 +/- 0.015	2.062 +/- 0.059	3	14	0.047
Case 41A-02	1500 Watt TVS	RL4	1500	0.4 +/- 0.02	2.062 +/- 0.059	3	14	0.047
Case 51-02	DO-7 Glass (For Reference only)	RL	3000	0.2 +/- 0.02	2.062 +/- 0.059	3	14	0.047
Case 59-03	DO-41 Glass & DO-41 Surmetic 30	RL	6000	0.2 +/- 0.015	2.062 +/- 0.059	3	14	0.047
	Rectifier							
Case 59-04	500 Watt TVS	RL	5000	0.2 +/- 0.02	2.062 +/- 0.059	3	14	0.047
	Rectifier							
Case 194-04	110 Amp TVS (Automotive)	RL	800	0.4 +/- 0.02	1.875 +/- 0.059	3	14	0.047
	Rectifier							
Case 267-02	Rectifier	RL	1500	0.4 +/- 0.02	2.062 +/- 0.059	3	14	0.047
Case 299-02	DO-35 Glass	RL	5000	0.2 +/- 0.02	2.062 +/- 0.059	3	14	0.047

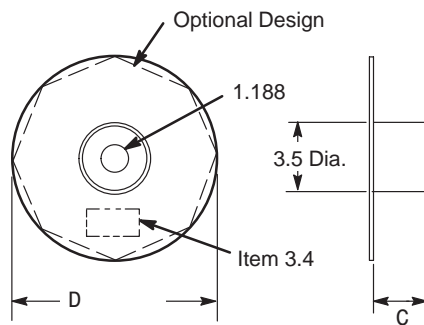
**Table 1. Packaging Details (all dimensions in inches)**



**Figure 1. Reel Packing**



**Figure 2. Component Spacing**



**Figure 3. Reel Dimensions**





## Index and Cross Reference

The following table represents an index and cross reference guide for all rectifier devices which are either manufactured directly by ON Semiconductor or for which ON Semiconductor manufactures a suitable equivalent. Where the ON Semiconductor part number differs from the industry part number, the ON Semiconductor device is a form, fit and function replacement for the industry type number – however, subtle differences in characteristics and/or specifications may exist. The part numbers listed in this Cross Reference are in computer sort.

Industry Part Number	ON Semiconductor Nearest Replacement	ON Semiconductor Similar Replacement	Page	Industry Part Number	ON Semiconductor Nearest Replacement	ON Semiconductor Similar Replacement	Page
10BF10	MURS110T3		286	182NQ030		MBRP20035L	280
10BF20	MURS120T3		286	182NQ030R		MBRP20035L	280
10BF40	MURS140T3		286	1N2069,A	1N4003		447
10BF60	MURS160T3		286	1N2070,A	1N4004		447
10BF80		MURS160T3	286	1N2071,A	1N4005		447
10BQ015		MBRS120T3	64	1N3611		1N4003	447
10BQ030	MBRS130T3		70	1N3611GP		1N4003	447
10BQ040	MBRS140T3		73	1N3612		1N4004	447
10BQ060		MBRS1100T3	80	1N3612GP		1N4004	447
10BQ100	MBRS1100T3		80	1N3613		1N4005	447
10CTF10		MUR840	370	1N3613GP		1N4005	447
10CTF20		MUR840	370	1N3614		1N4006	447
10CTF30		MUR840	370	1N3614GP		1N4006	447
10CTF40		MUR840	370	1N3957		1N4007	447
10DL1		1N4934	452	1N3957GP		1N4007	447
10DL2		1N4935	452	1N4001	1N4001		447
10MQ040N	MBRA140T3		61	1N4001GP		1N4001	447
10TQ030		MBR1035	207	1N4002	1N4002		447
10TQ035	MBR1035		207	1N4002GP		1N4002	447
10TQ040		MBR1045	207	1N4003	1N4003		447
10TQ045	MBR1045		207	1N4003GP		1N4003	447
11DQ03		1N5818	146	1N4004	1N4004		447
11DQ04		1N5819	146	1N4004GP		1N4004	447
11DQ05		MBR150	152	1N4005	1N4005		447
11DQ06		MBR160	152	1N4005GP		1N4005	447
11DQ09		MBR1100	156	1N4006	1N4006		447
11DQ10		MBR1100	156	1N4006GP		1N4006	447
12CTQ030		MBR1535CT	174	1N4007	1N4007		447
12CTQ035		MBR1535CT	174	1N4007GP		1N4007	447
12CTQ035S		MBRB1545CT	116	1N4245		1N4003	447
12CTQ040		MBR1545CT	174	1N4245GP		1N4003	447
12CTQ040S		MBRB1545CT	116	1N4246		1N4004	447
12CTQ045		MBR1545CT	174	1N4246GP		1N4004	447
12CTQ045S		MBRB1545CT	116	1N4247		1N4005	447
12CWQ03FN		MBRD1035CTL	108	1N4247GP		1N4005	447
12TQ035		MBR1635	215	1N4248		1N4006	447
12TQ035S		MBRB1545CT	116	1N4248GP		1N4006	447
12TQ040		MBR1645	215	1N4249		1N4007	447
12TQ040S		MBRB1545CT	116	1N4249GP		1N4007	447
12TQ045		MBR1645	215	1N4383GP		1N4003RL	447
12TQ045S		MBRB1545CT	116	1N4384GP		1N4004RL	447
15CTQ035	MBR1535CT		174	1N4385GP		1N4005RL	447
15CTQ035S		MBRB1545CT	116	1N4585GP		1N4006RL	447
15CTQ040		MBR1545CT	174	1N4586GP		1N4007RL	447
15CTQ040S		MBRB1545CT	116	1N4934	1N4934		452
15CTQ045	MBR1545CT		174	1N4934GP		1N4934	452
15CTQ045S	MBRB1545CT		116	1N4935	1N4935		452
180NQ035		MBRP20035L	280	1N4935GP		1N4935	452
181NQ035		MBRP20035L	280	1N4936	1N4936		452

Industry Part Number	ON Semiconductor Nearest Replacement	ON Semiconductor Similar Replacement	Page
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1N4942		1N4935	452
1N4942GP		1N4935	452
1N4943		1N4936	452
1N4944		1N4936	452
1N4944GP		1N4936	452
1N4945		1N4937	452
1N4946		1N4937	452
1N4946GP		1N4937	452
1N5185		MR852	454
1N5185GP		MR852	454
1N5186		MR852	454
1N5186GP		MR852	454
1N5187		MR852	454
1N5187GP		MR852	454
1N5188		MR856	454
1N5188GP		MR856	454
1N5189		MR856	454
1N5189GP		MR856	454
1N5190		MR856	454
1N5190GP		MR856	454
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1N5391GP		1N4001RL	447
1N5391S		1N4001RL	447
1N5392		1N4002RL	447
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1N5394GP		1N4004RL	447
1N5395		1N4004RL	447
1N5395GP		1N4004RL	447
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1N5397S		1N4005RL	447
1N5398		1N4006RL	447
1N5398GP		1N4006RL	447
1N5398S		1N4006RL	447
1N5399		1N4007RL	447
1N5399GP		1N4007RL	447
1N5399S		1N4007RL	447
1N5401	1N5401		449
1N5402	1N5402		449
1N5403		1N5404	449
1N5404	1N5404		449
1N5405		1N5406	449
1N5406	1N5406		449
1N5415		MR852	454
1N5416		MR852	454

Industry Part Number	ON Semiconductor Nearest Replacement	ON Semiconductor Similar Replacement	Page
1N5417		MR852	454
1N5418		MR856	454
1N5419		MR856	454
1N5420		MR856	454
1N5614		1N4003	447
1N5615		1N4935	452
1N5615GP		1N4935	452
1N5616		1N4004	447
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1N5618		1N4005	447
1N5619		1N4937	452
1N5619GP		1N4937	452
1N5620		1N4006	447
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VSK13	MBR1545CT		174
VSK130		1N5818	146
VSK14	MBR1545CT		174
VSK140		1N5819	146
VSK2004	MBRP20060CT		270
VSK2020	MBR2045CT		184
VSK2035	MBR2045CT		184
VSK2045	MBR2045CT		184
VSK2420	MBR2545CT		198
VSK2435	MBR2545CT		198
VSK2445	MBR2545CT		198
VSK320	MBR340		165
VSK330	MBR340		165
VSK340	MBR340		165
VSK62	MBR745		204
VSK63	MBR745		204
VSK64	MBR745		204
VSK920		MBR1545CT	174
VSK935		MBR1545CT	174
VSK945		MBR1545CT	174