

# MSRD620CTG

## SWITCHMODE Soft Ultrafast Recovery Power Rectifier

### Plastic DPAK Package

State-of-the-art geometry features epitaxial construction with glass passivation and metal overlay contact. Ideally suited for low voltage, high frequency switching power supplies, free wheeling diode and polarity protection diodes.

#### Features

- Soft Ultrafast Recovery (35 ns typ)
- Highly Stable Oxide Passivated Junction
- Matched Dual Die Construction – May Be Paralleled for High Current Output
- Short Heat Sink Tab Manufactured – Not Sheared
- Epoxy Meets UL 94 V-0 @ 0.125 in.
- These Devices are Pb-Free and are RoHS Compliant

#### Mechanical Characteristics

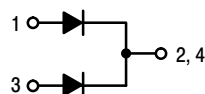
- Case: Epoxy, Molded
- Weight: 0.4 Grams (Approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead and Mounting Surface Temperature for Soldering Purposes: 260°C Max. for 10 Seconds



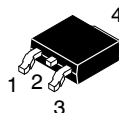
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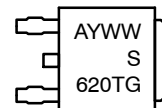
### SOFT ULTRAFAST RECTIFIER 6.0 AMPERES, 200 VOLTS



#### MARKING DIAGRAM



DPAK  
CASE 369C



A = Assembly Location  
Y = Year  
WW = Work Week  
G = Pb-Free Package

#### ORDERING INFORMATION

Device	Package	Shipping†
MSRD620CTG	DPAK (Pb-Free)	75 Units/Rail
MSRD620CTT4G	DPAK (Pb-Free)	2500/Tape & Reel

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

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## MAXIMUM RATINGS

Rating	Symbol	Value	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	$V_{RRM}$ $V_{RWM}$ $V_R$	200	V
Average Rectified Forward Current (At Rated $V_R$ , $T_C = 137^\circ\text{C}$ )	$I_O$	3.0 6.0	A
Peak Repetitive Forward Current (At Rated $V_R$ , Square Wave, 20 kHz, $T_C = 138^\circ\text{C}$ )	$I_{FRM}$	6.0	A
Non-Repetitive Peak Surge Current (Surge Applied at Rated Load Conditions, Halfwave, Single Phase, 60 Hz)	$I_{FSM}$	50	A
Storage / Operating Case Temperature	$T_{stg}, T_C$	-55 to +175	$^\circ\text{C}$
Operating Junction Temperature	$T_J$	-55 to +175	$^\circ\text{C}$

Stresses exceeding Maximum Ratings may damage the device. Maximum Ratings are stress ratings only. Functional operation above the Recommended Operating Conditions is not implied. Extended exposure to stresses above the Recommended Operating Conditions may affect device reliability.

## THERMAL CHARACTERISTICS

Rating	Symbol	Value	Unit
Thermal Resistance – Junction-to-Case Per Leg	$R_{\theta JC}$	9.0	$^\circ\text{C}/\text{W}$
Thermal Resistance – Junction-to-Ambient Per Leg	$R_{\theta JA}$	80	$^\circ\text{C}/\text{W}$

## ELECTRICAL CHARACTERISTICS

Rating	Symbol	Value	Unit
Maximum Instantaneous Forward Voltage (Note 1) (See Figure 2) Per Leg ( $I_F = 3.0\text{ A}$ ) ( $I_F = 6.0\text{ A}$ )	$V_F$	$T_J = 25^\circ\text{C}$ 1.15 $T_J = 150^\circ\text{C}$ 1.05 1.35 1.30	V
Maximum Instantaneous Reverse Current (See Figure 4) Per Leg ( $V_R = 200\text{ V}$ ) ( $V_R = 100\text{ V}$ )	$I_R$	$T_J = 25^\circ\text{C}$ 5.0 $T_J = 150^\circ\text{C}$ 2.0 200 100	$\mu\text{A}$
Maximum Reverse Recovery Time (Note 2) Per Leg ( $V_R = 30\text{ V}$ , $I_F = 1.0\text{ A}$ , $di/dt = 50\text{ A}/\mu\text{s}$ ) ( $V_R = 30\text{ V}$ , $I_F = 3.0\text{ A}$ , $di/dt = 50\text{ A}/\mu\text{s}$ )	$t_{rr}$	45 55	ns
Maximum Peak Reverse Recovery Current Per Leg ( $V_R = 30\text{ V}$ , $I_F = 1.0\text{ A}$ , $di/dt = 50\text{ A}/\mu\text{s}$ ) ( $V_R = 30\text{ V}$ , $I_F = 3.0\text{ A}$ , $di/dt = 50\text{ A}/\mu\text{s}$ )	$I_{RM}$	2.0 3.0	A

1. Pulse Test: Pulse Width  $\leq 250\ \mu\text{s}$ , Duty Cycle  $\leq 2\%$ .
2.  $t_{rr}$  measured projecting from 25% of  $I_{RM}$  to ground.

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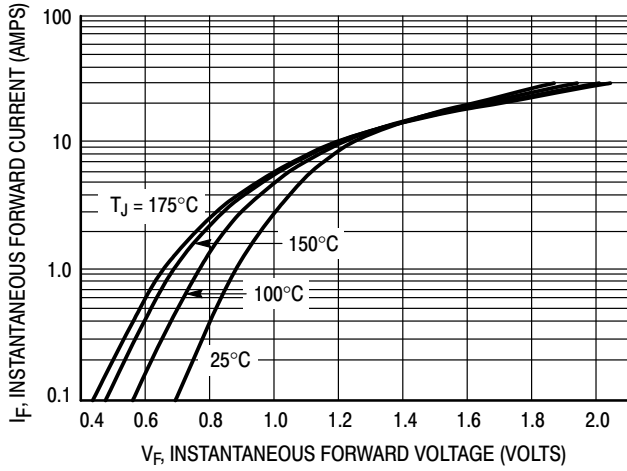


Figure 1. Typical Forward Voltage, Per Leg

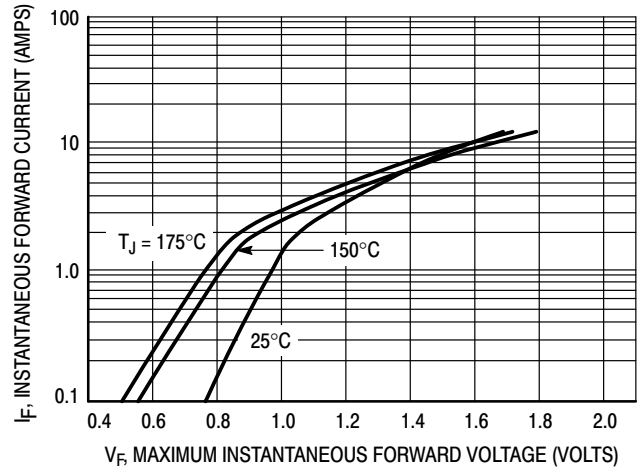


Figure 2. Maximum Forward Voltage, Per Leg

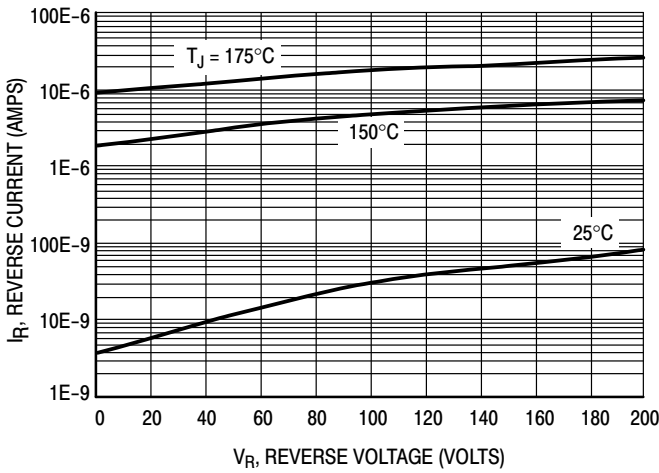


Figure 3. Typical Reverse Current, Per Leg

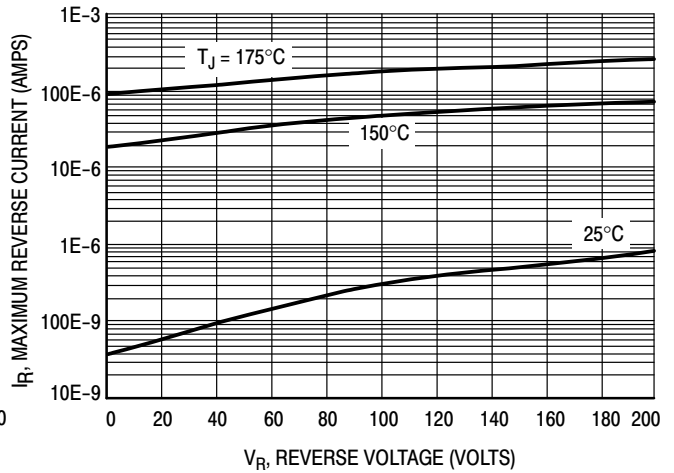


Figure 4. Maximum Reverse Current, Per Leg

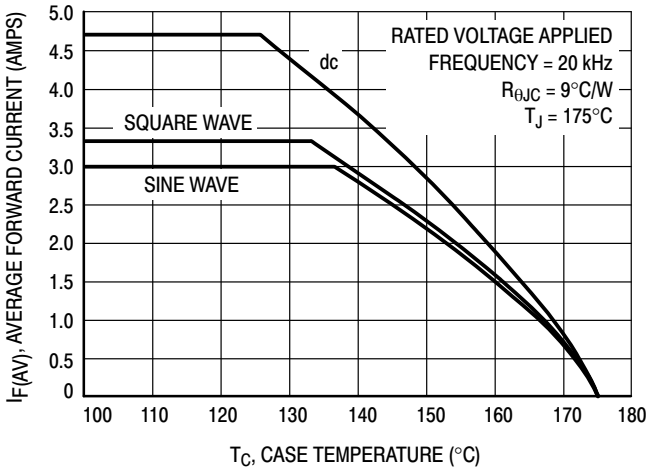


Figure 5. Current Derating, Case (Per Leg)

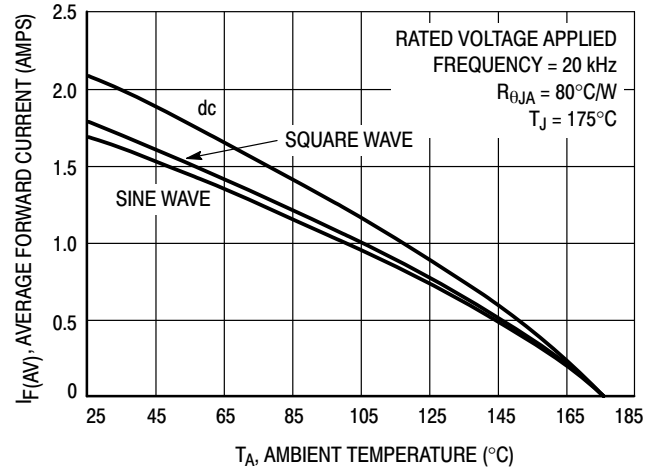


Figure 6. Current Derating, Ambient (Per Leg)

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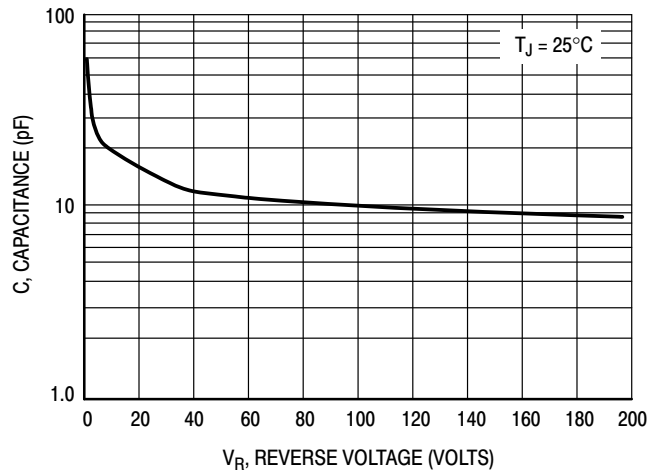


Figure 7. Typical Capacitance (Per Leg)

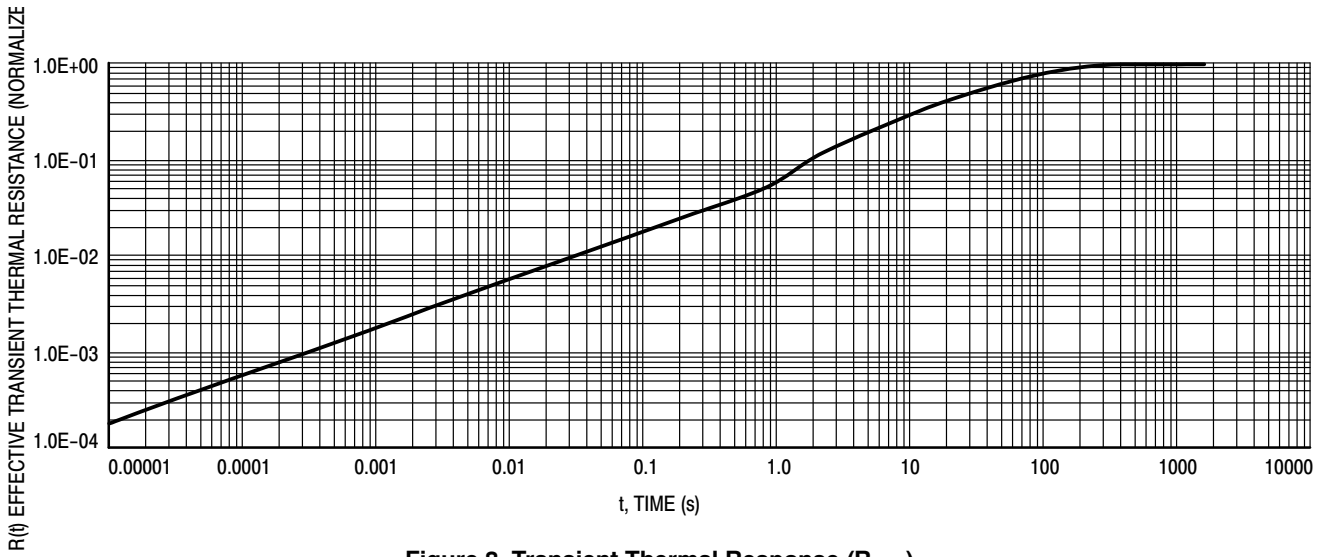


Figure 8. Transient Thermal Response ( $R_{\theta JA}$ )

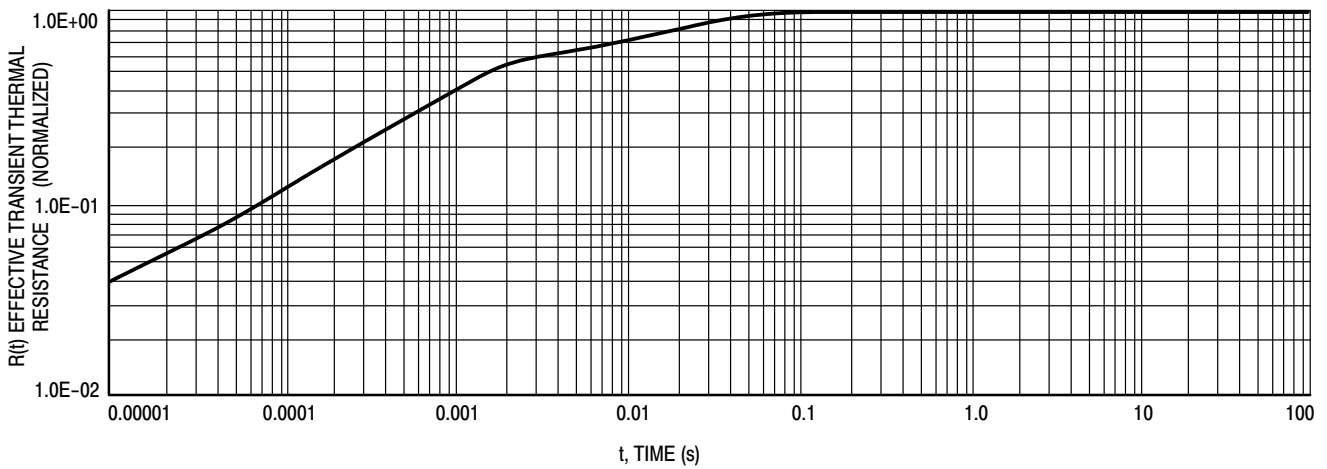
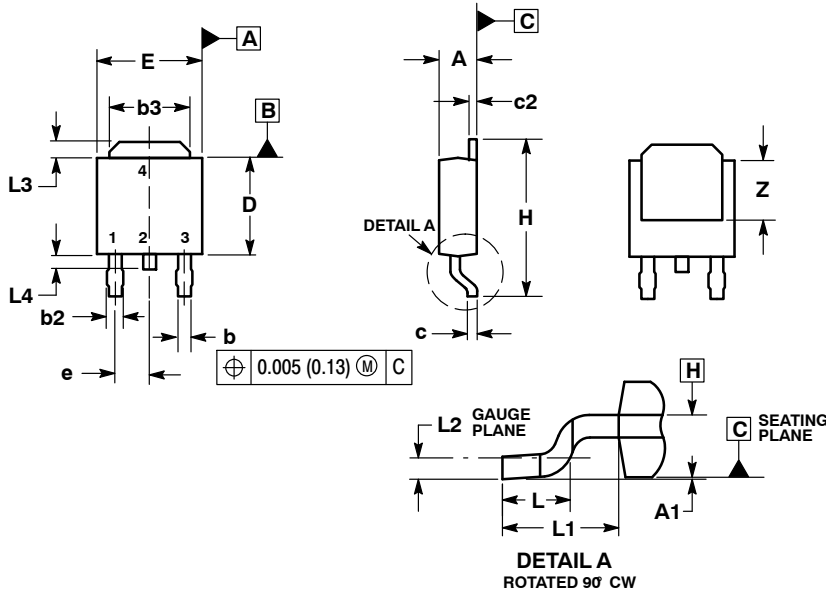


Figure 9. Transient Thermal Response ( $R_{\theta JC}$ )

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## PACKAGE DIMENSIONS

### DPAK (SINGLE GAUGE) CASE 369C-01 ISSUE D

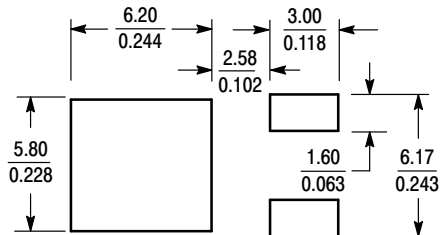


**NOTES:**

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: INCHES.
3. THERMAL PAD CONTOUR OPTIONAL WITHIN DIMENSIONS b3, L3 and Z.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR BURRS. MOLD FLASH, PROTRUSIONS, OR GATE BURRS SHALL NOT EXCEED 0.006 INCHES PER SIDE.
5. DIMENSIONS D AND E ARE DETERMINED AT THE OUTERMOST EXTREMES OF THE PLASTIC BODY.
6. DATUMS A AND B ARE DETERMINED AT DATUM PLANE H.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.086	0.094	2.18	2.38
A1	0.000	0.005	0.00	0.13
b	0.025	0.035	0.63	0.89
b2	0.030	0.045	0.76	1.14
c	0.018	0.024	0.46	0.61
c2	0.018	0.024	0.46	0.61
D	0.235	0.245	5.97	6.22
E	0.250	0.265	6.35	6.73
e	0.090 BSC		2.29 BSC	
H	0.370	0.410	9.40	10.41
L	0.055	0.070	1.40	1.78
L1	0.108 REF		2.74 REF	
L2	0.020 BSC		0.51 BSC	
L3	0.035	0.050	0.89	1.27
L4	---	0.040	---	1.01
Z	0.155	---	3.93	---

### SOLDERING FOOTPRINT\*



SCALE 3:1  $\left(\frac{\text{mm}}{\text{inches}}\right)$

\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.

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