

# MSRD620CT

## 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

- Pb-Free Packages are Available
- 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-O @ 0.125 in.

#### Mechanical Characteristics

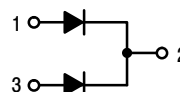
- Case: Epoxy, Molded
- Weight: 0.4 Grams (Approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead and Mounting Surface Temperature for Soldering Purposes: 260°C Max. for 10 Seconds
- Shipped in 75 Units Per Plastic Tube
- Available in 16 mm Tape and Reel, 2500 Units Per Reel, Add “T4” to Suffix Part Number



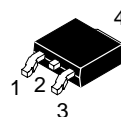
ON Semiconductor®

<http://onsemi.com>

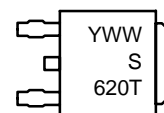
### SOFT ULTRAFAST RECTIFIER 6.0 AMPERES, 200 VOLTS



#### MARKING DIAGRAM



DPAK  
CASE 369C



Y = Year  
WW = Work Week

#### ORDERING INFORMATION

Device	Package	Shipping†
MSRD620CT	DPAK	75 Units/Rail
MSRD620CTG	DPAK (Pb-Free)	75 Units/Rail
MSRD620CTT4	DPAK	2500/Tape & Reel
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	$^\circ\text{C}$

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

## 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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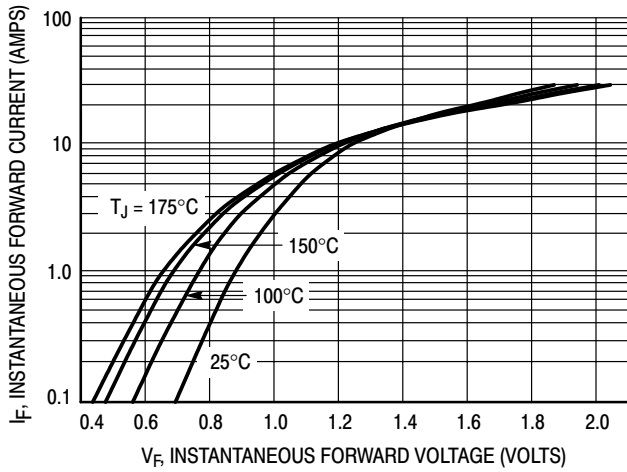


Figure 1. Typical Forward Voltage, Per Leg

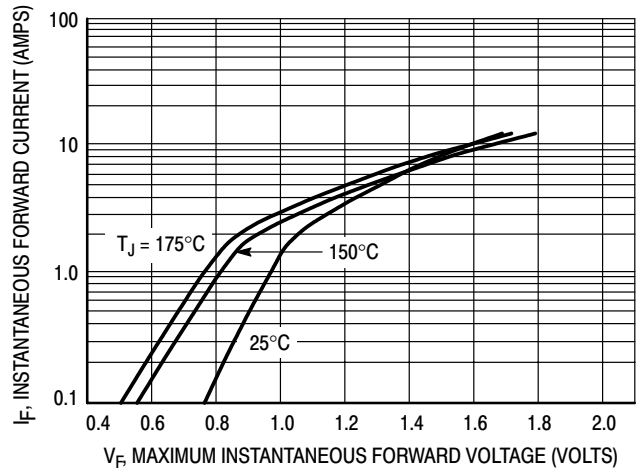


Figure 2. Maximum Forward Voltage, Per Leg

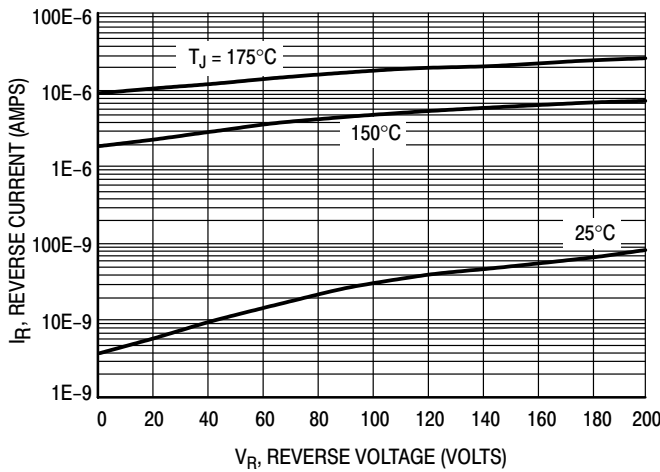


Figure 3. Typical Reverse Current, Per Leg

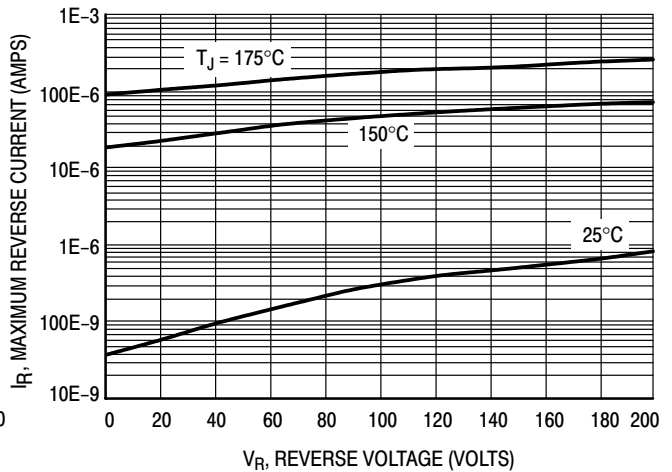


Figure 4. Maximum Reverse Current, Per Leg

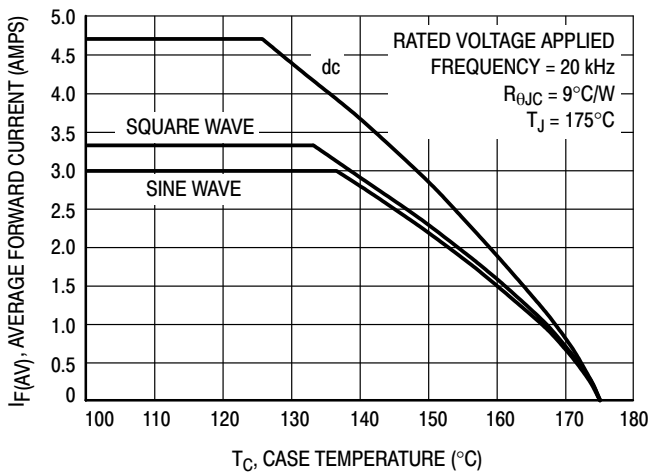


Figure 5. Current Derating, Case (Per Leg)

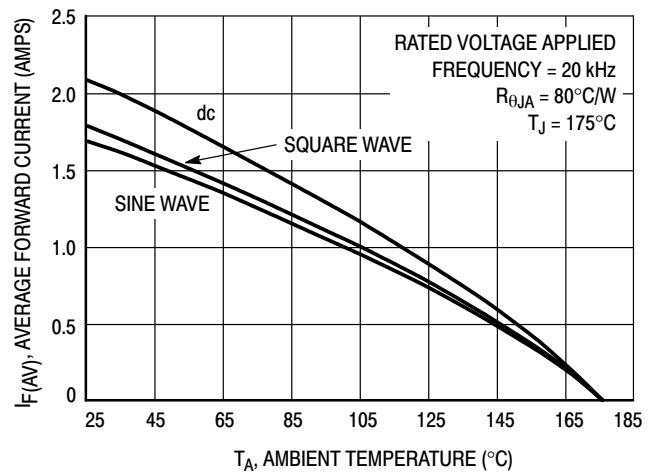


Figure 6. Current Derating, Ambient (Per Leg)

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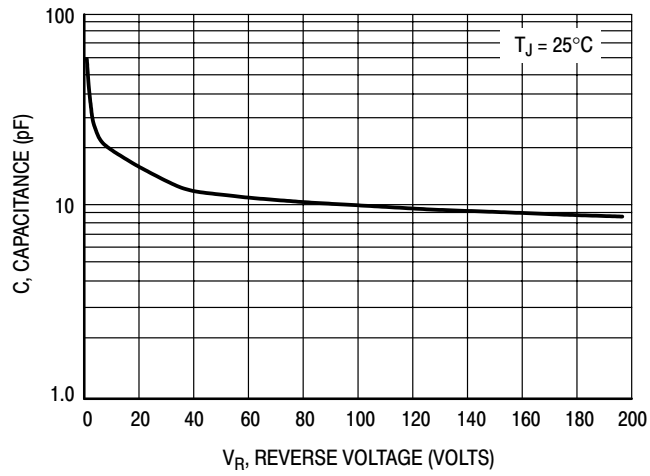


Figure 7. Typical Capacitance (Per Leg)

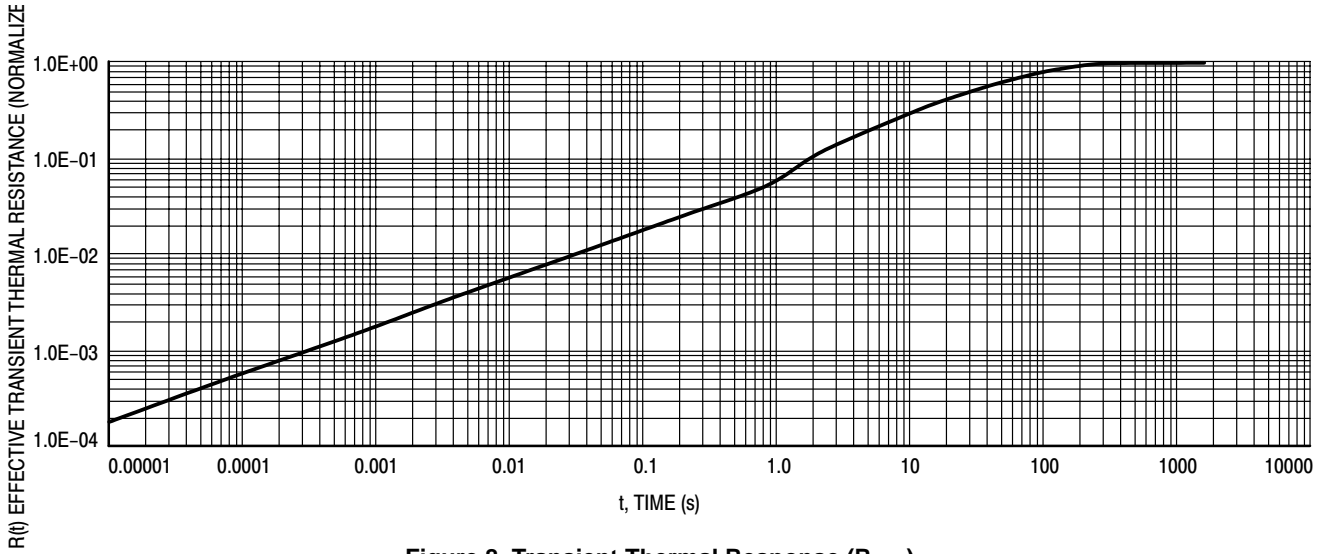


Figure 8. Transient Thermal Response (R<sub>θJA</sub>)

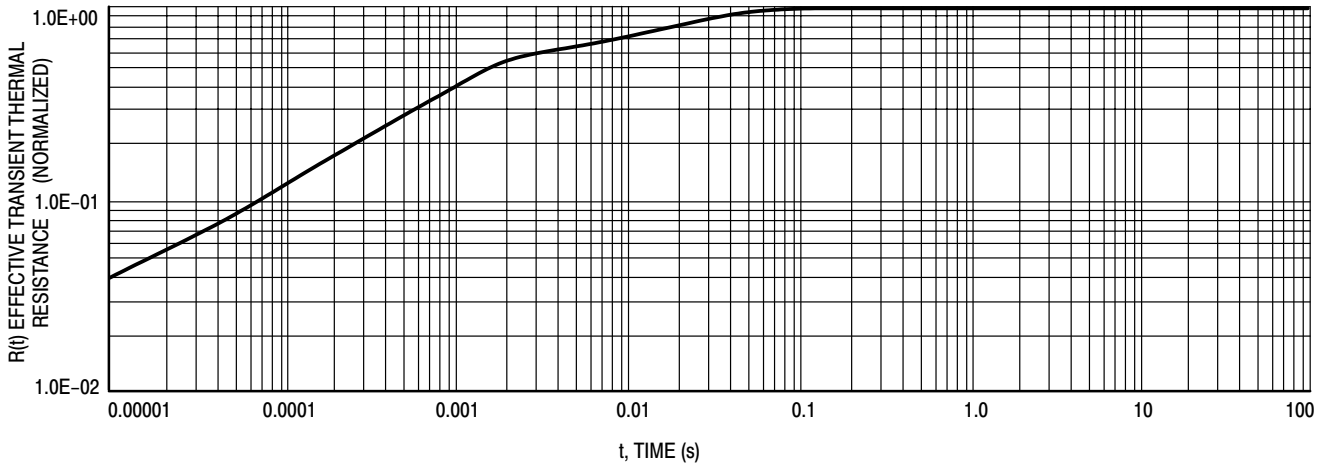
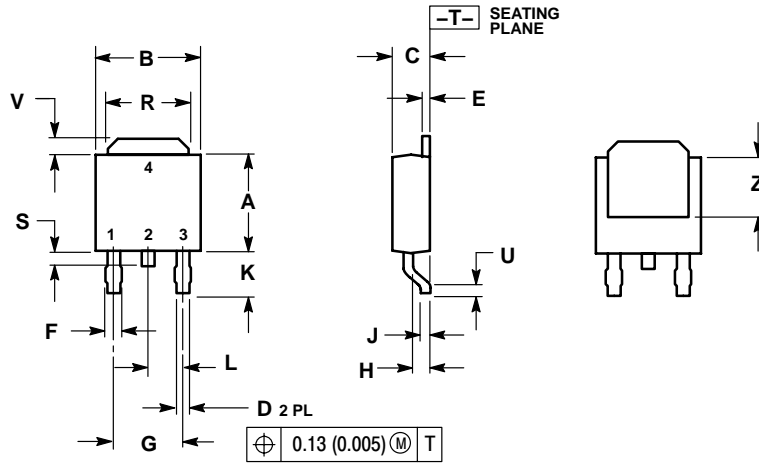


Figure 9. Transient Thermal Response (R<sub>θJC</sub>)

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## PACKAGE DIMENSIONS

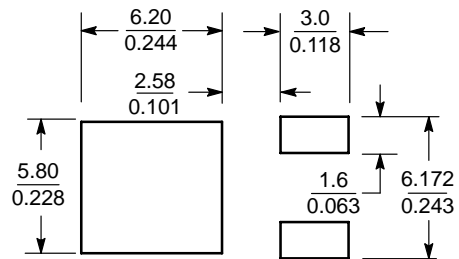
DPAK  
CASE 369C  
ISSUE O



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

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.235	0.245	5.97	6.22
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	0.018	0.023	0.46	0.58
F	0.037	0.045	0.94	1.14
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	0.180	0.215	4.57	5.45
S	0.025	0.040	0.63	1.01
U	0.020	---	0.51	---
V	0.035	0.050	0.89	1.27
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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