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# MSRD620CTRG, MSRD620CTT4RG, SSRD8620CTRG, SSRD8620CTT4RG

## SWITCHMODE Soft Ultrafast Recovery Reverse Polarity Power Rectifier

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

### Features

- Soft Ultrafast Recovery
- 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.
- AEC-Q101 Qualified and PPAP Capable
- SSRD8 Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements
- All Packages are Pb-Free\*

### Mechanical Characteristics

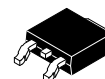
- Case: Epoxy, Molded
- Weight: 0.4 Grams (Approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead and Mounting Surface Temperature for Soldering Purposes: 260°C Max. for 10 Seconds
- ESD Ratings:
  - ◆ Machine Model = C
  - ◆ Human Body Model = 2



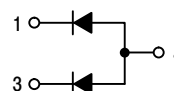
**ON Semiconductor®**

<http://onsemi.com>

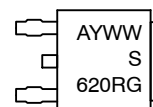
## SOFT ULTRAFAST REVERSE POLARITY RECTI- FIER 6.0 AMPERES, 200 VOLTS



**DPAK  
CASE 369C**



### MARKING DIAGRAM



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

### ORDERING INFORMATION

| Device         | Package        | Shipping†           |
|----------------|----------------|---------------------|
| MSRD620CTRG    | DPAK (Pb-Free) | 75 Units/Rail       |
| SSRD8620CTRG   | DPAK (Pb-Free) | 75 Units/Rail       |
| MSRD620CTT4RG  | DPAK (Pb-Free) | 2,500 / Tape & Reel |
| SSRD8620CTT4RG | DPAK (Pb-Free) | 2,500 / 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.

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

## MSRD620CTRG, MSRD620CTT4RG, SSRD8620CTRG, SSRD8620CTT4RG

### MAXIMUM RATINGS

| Rating  | Symbol                          | Value       | Unit             |
|---|---------------------------------|-------------|------------------|
| Peak Repetitive Reverse Voltage<br>Working Peak Reverse Voltage<br>DC Blocking Voltage                                      | $V_{RRM}$<br>$V_{RWM}$<br>$V_R$ | 200         | V                |
| Average Rectified Forward Current<br>(At Rated $V_R$ , $T_C = 162^\circ\text{C}$ )<br>Per Leg<br>Per Package                | $I_O$                           | 3.0<br>6.0  | A                |
| Non-Repetitive Peak Surge Current<br>(Surge Applied at Rated Load Conditions, Halfwave, Single Phase, 60 Hz)<br>Per Package | $I_{FSM}$                       | 45          | A                |
| Storage/Operating Case Temperature  | $T_{stg}, T_C$                  | -65 to +175 | $^\circ\text{C}$ |
| Operating Junction Temperature  | $T_J$                           | -65 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 (Note 1)<br>Per Leg    | $R_{\theta JC}$ | 5.0   | $^\circ\text{C/W}$ |
| Thermal Resistance – Junction-to-Ambient (Note 1)<br>Per Leg | $R_{\theta JA}$ | 60    | $^\circ\text{C/W}$ |
| Thermal Resistance – Junction-to-Ambient (Note 2)<br>Per Leg | $R_{\theta JA}$ | 166   | $^\circ\text{C/W}$ |

1. Mounted with 700 mm<sup>2</sup> copper pad size (approximately 1 in<sup>2</sup>) 1 oz FR4 board.
2. Mounted with pad size approximately 46 mm<sup>2</sup> copper, 1 oz FR4 board.

### ELECTRICAL CHARACTERISTICS

| Rating  | Symbol   | Value                    |                           | Unit          |
|---|----------|--------------------------|---------------------------|---------------|
| Maximum Instantaneous Forward Voltage (Note 3)<br>Per Leg<br>( $I_F = 3.0\text{ A}$ )<br>( $I_F = 6.0\text{ A}$ )                       | $V_F$    | $T_J = 25^\circ\text{C}$ | $T_J = 125^\circ\text{C}$ | V             |
|   |          | 1.15<br>1.30             | 0.95<br>1.15              |               |
| Maximum Instantaneous Reverse Current (Note 3)<br>Per Leg<br>( $V_R = 200\text{ V}$ )   | $I_R$    | $T_J = 25^\circ\text{C}$ | $T_J = 125^\circ\text{C}$ | $\mu\text{A}$ |
|   |          | 1.0                      | 200                       |               |
| Maximum Reverse Recovery Time (Note 4)<br>Per Leg<br>( $V_R = 30\text{ V}$ , $I_F = 1.0\text{ A}$ , $di/dt = 50\text{ A}/\mu\text{s}$ ) | $t_{rr}$ | 75                       |                           | ns            |

3. Pulse Test: Pulse Width  $\leq 380\text{ }\mu\text{s}$ , Duty Cycle  $\leq 2\%$ .
4.  $t_{rr}$  measured projecting from 25% of  $I_{RM}$  to ground.

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## TYPICAL CHARACTERISTICS

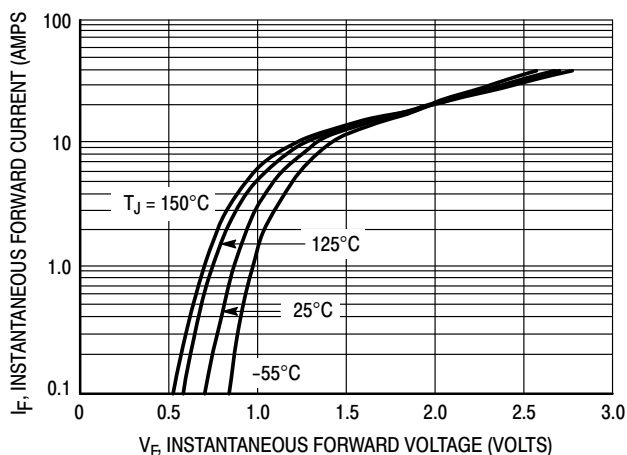


Figure 1. Typical Forward Voltage, Per Leg

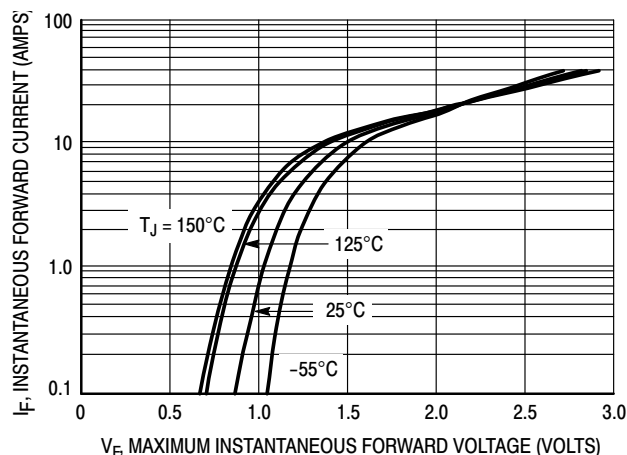


Figure 2. Maximum Forward Voltage, Per Leg

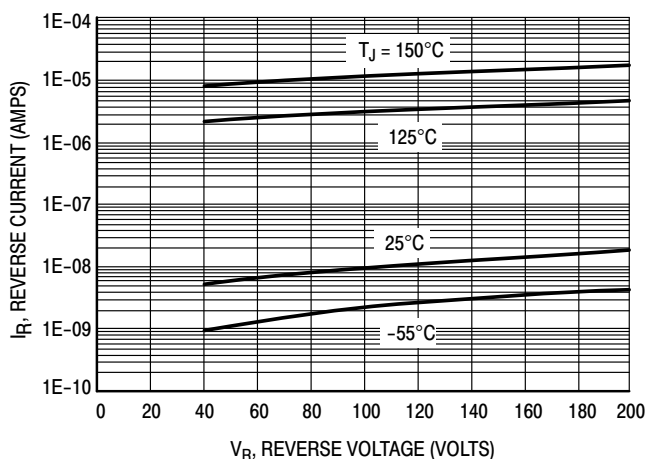


Figure 3. Typical Reverse Current, Per Leg

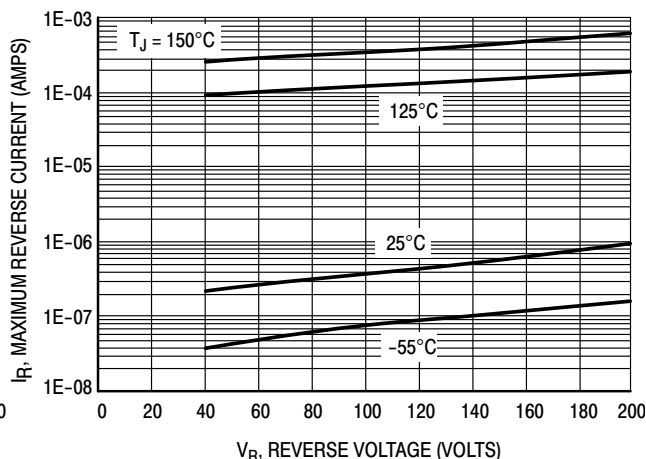


Figure 4. Maximum Reverse Current, Per Leg

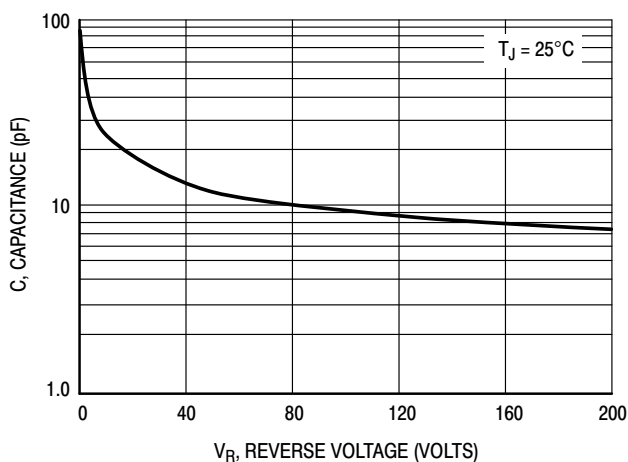


Figure 5. Typical Capacitance

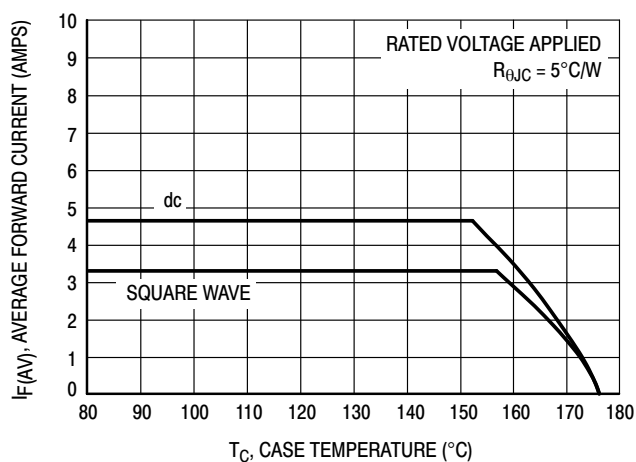
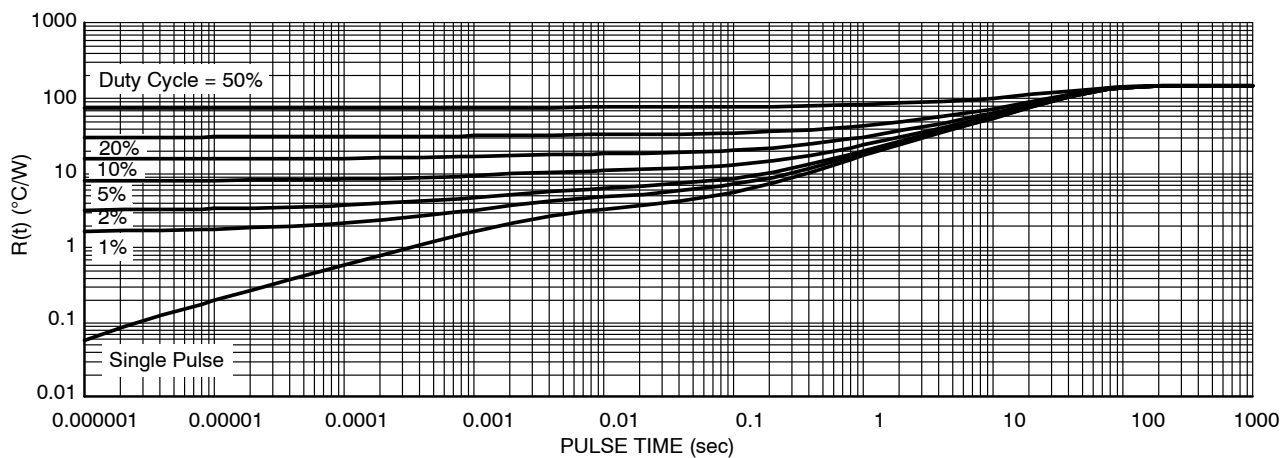


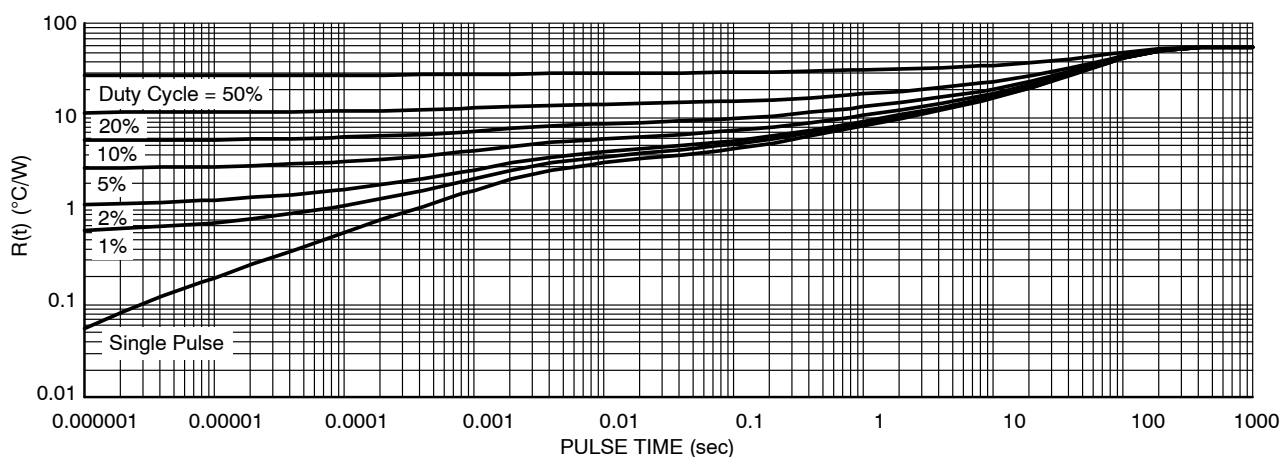
Figure 6. Typical Current Derating, Case (Per Leg)

**MSRD620CTRG, MSRD620CTT4RG, SSRD8620CTRG, SSRD8620CTT4RG**

**TYPICAL CHARACTERISTICS**



**Figure 7. Thermal Response, Junction-to-Ambient (46 mm² pad)**



**Figure 8. Thermal Response, Junction-to-Ambient (1 in² pad)**

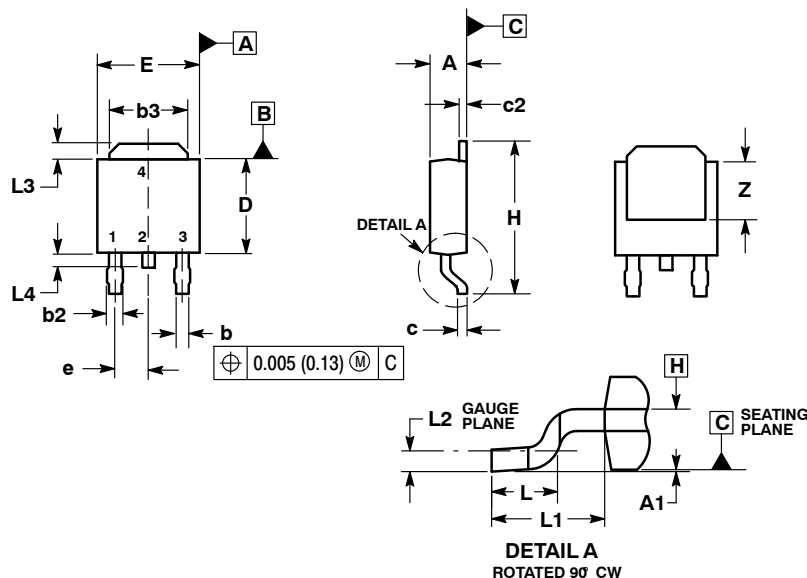
## MSRD620CTRG, MSRD620CTT4RG, SSRD8620CTRG, SSRD8620CTT4RG

### PACKAGE DIMENSIONS

#### DPAK (SINGLE GAUGE)

CASE 369C-01

ISSUE D

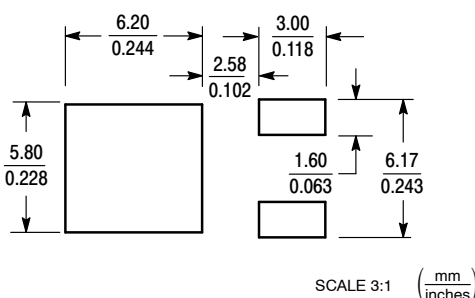


#### NOTES:

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  |
| b3  | 0.180     | 0.215 | 4.57        | 5.46  |
| 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\*



\*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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