

# MURD320, SURD8320, NRVUD320W1

## Switch-mode Power Rectifier

### DPAK Surface Mount Package

These state-of-the-art devices are designed for use in switching power supplies, inverters and as free wheeling diodes.

#### Features

- Ultrafast 35 Nanosecond Recovery Time
- Low Forward Voltage Drop
- Low Leakage
- SURD8, NRVUD Prefixes for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable
- These Devices are Pb-Free and are RoHS Compliant\*

#### Mechanical Characteristics

- Case: Epoxy, Molded
- Weight: 0.4 Gram (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 (> 400 V)
  - ♦ Human Body Model = 3B (> 8 kV)

#### 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>(Rated $V_R$ , $T_C = 158^\circ\text{C}$ )                       | $I_{F(AV)}$                     | 3.0         | A    |
| Peak Repetitive Forward Current<br>(Rated $V_R$ , Square Wave, 20 kHz,<br>$T_C = 158^\circ\text{C}$ ) | $I_{FRM}$                       | 6.0         | A    |
| Non-Repetitive Peak Surge Current<br>(Surge Applied at Rated Load<br>Conditions Halfwave, 60 Hz)      | $I_{FSM}$                       | 75          | A    |
| Operating Junction and Storage<br>Temperature Range   | $T_J, T_{stg}$                  | -65 to +175 | °C   |

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

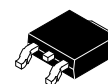
\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.



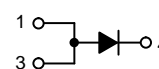
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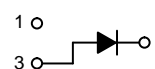
### ULTRAFAST RECTIFIER 3.0 AMPERES, 200 VOLTS



DPAK  
CASE 369C

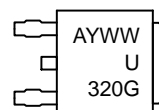


STYLE 3

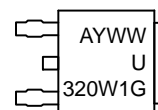


STYLE 8

#### MARKING DIAGRAM



MURD320T4G  
SURD8320T4G



NRVUD320W1G

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

#### ORDERING INFORMATION

| Device        | Package        | Shipping†          |
|---------------|----------------|--------------------|
| MURD320T4G    | DPAK (Pb-Free) | 2500 / Tape & Reel |
| SURD8320T4G   | DPAK (Pb-Free) | 2500 / Tape & Reel |
| NRVUD320W1T4G | 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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## THERMAL CHARACTERISTICS

| Characteristics                                   | Symbol          | Value | Unit                 |
|---|-----------------|-------|----------------------|
| Thermal Resistance – Junction-to-Case             | $R_{\theta JC}$ | 6     | $^{\circ}\text{C/W}$ |
| Thermal Resistance – Junction-to-Ambient (Note 1) | $R_{\theta JA}$ | 80    | $^{\circ}\text{C/W}$ |

1. Rating applies when surface mounted on the minimum pad sizes recommended.

## ELECTRICAL CHARACTERISTICS

| Characteristics   | Symbol   | Value        | Unit          |
|---|----------|--------------|---------------|
| Maximum Instantaneous Forward Voltage Drop (Note 2)<br>( $I_F = 3$ Amps, $T_J = 25^{\circ}\text{C}$ )<br>( $I_F = 3$ Amps, $T_J = 125^{\circ}\text{C}$ )  | $V_F$    | 0.95<br>0.75 | Volts         |
| Maximum Instantaneous Reverse Current (Note 2)<br>( $T_J = 25^{\circ}\text{C}$ , Rated dc Voltage)<br>( $T_J = 125^{\circ}\text{C}$ , Rated dc Voltage)   | $I_R$    | 5<br>500     | $\mu\text{A}$ |
| Maximum Reverse Recovery Time<br>( $I_F = 1$ Amp, $di/dt = 50$ Amps/ $\mu\text{s}$ , $V_R = 30$ V, $T_J = 25^{\circ}\text{C}$ )<br>( $I_F = 0.5$ Amp, $i_R = 1$ Amp, $I_{REC} = 0.25$ A, $V_R = 30$ V, $T_J = 25^{\circ}\text{C}$ ) | $t_{rr}$ | 35<br>25     | ns            |

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

2. Pulse Test: Pulse Width = 300  $\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .

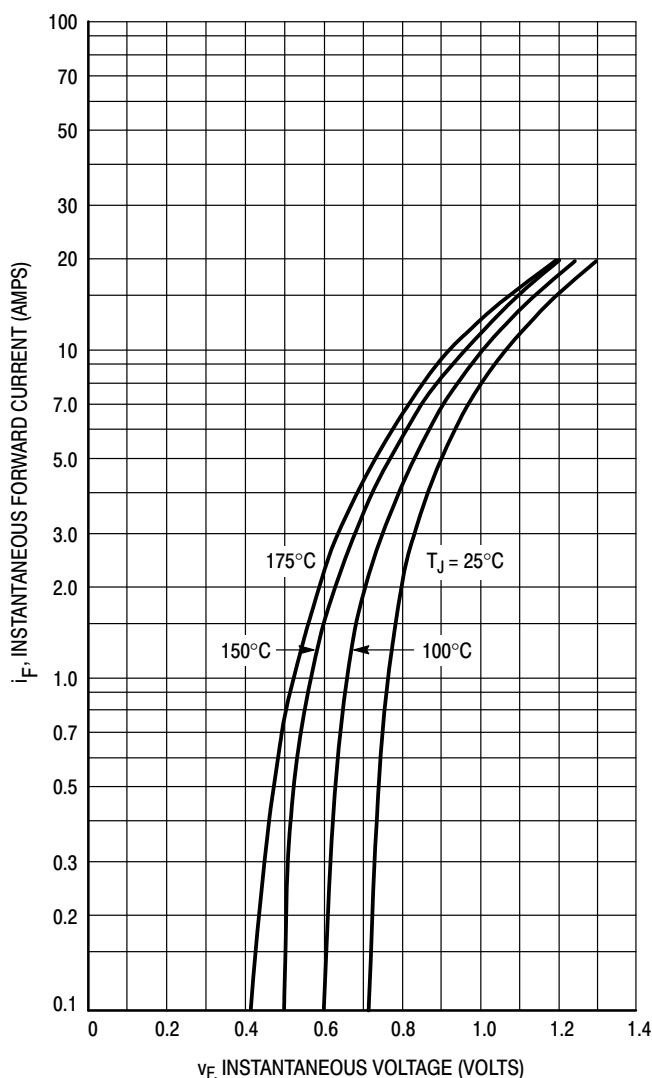


Figure 1. Typical Forward Voltage

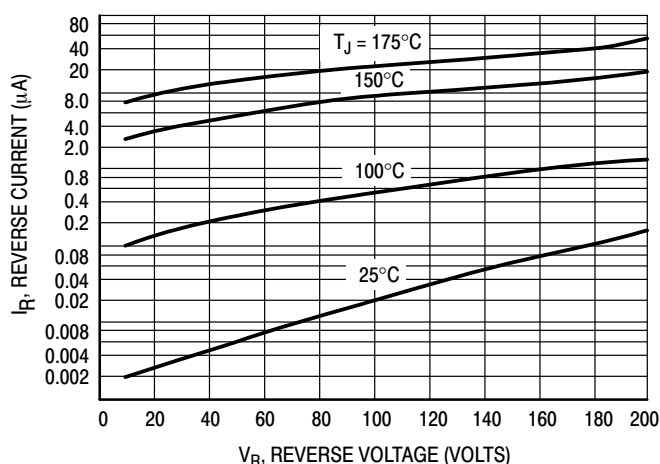


Figure 2. Typical Reverse Current\*

\* The curves shown are typical for the highest voltage device in the voltage grouping. Typical reverse current for lower voltage selections can be estimated from these curves if  $V_R$  is sufficiently below rated  $V_R$ .

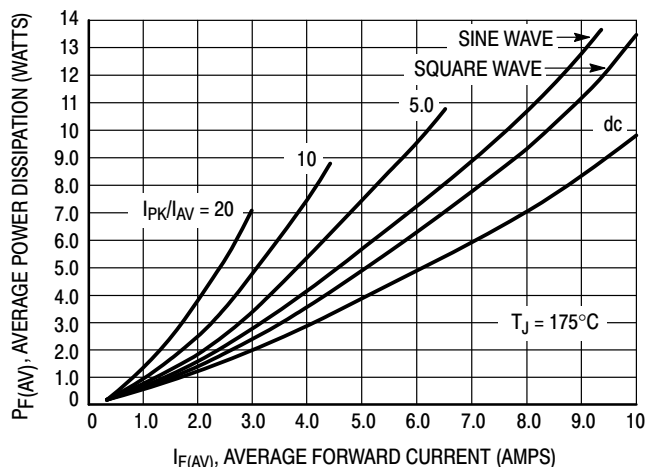


Figure 3. Average Power Dissipation

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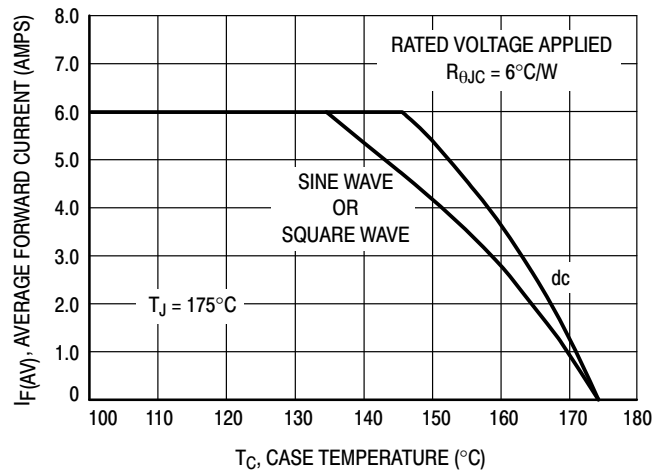


Figure 4. Current Derating, Case

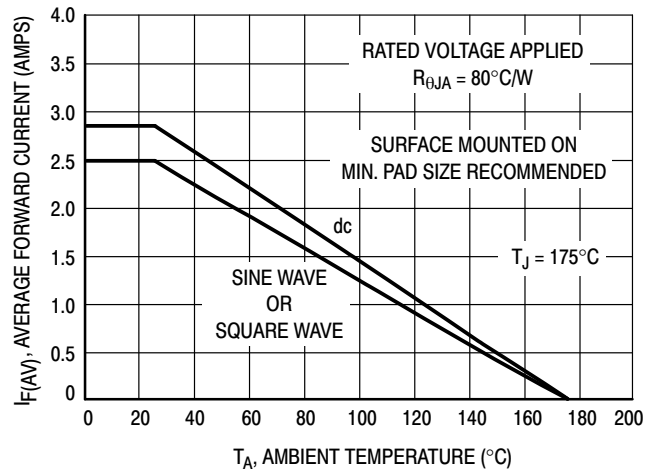


Figure 5. Current Derating, Ambient

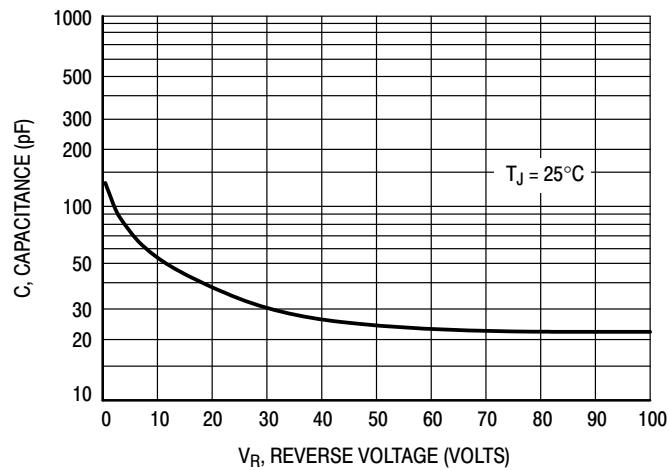
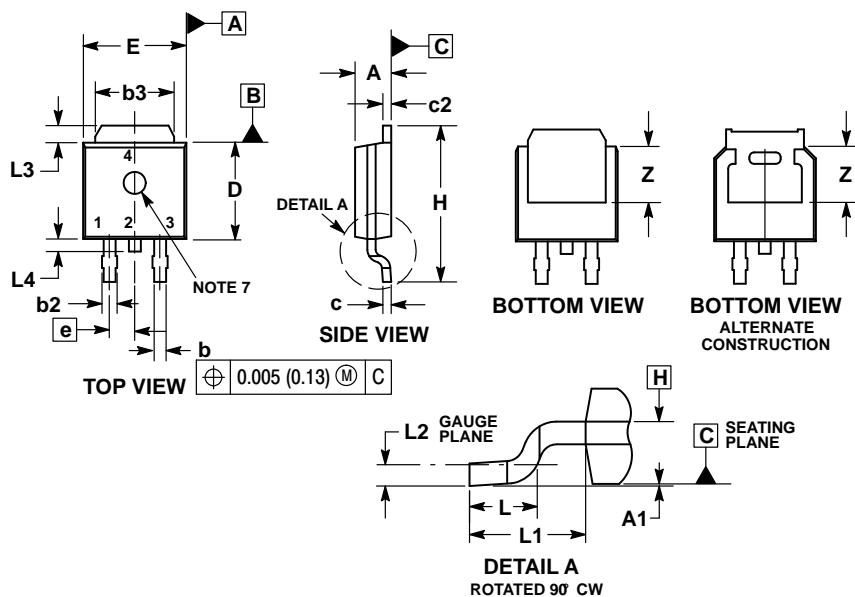


Figure 6. Typical Capacitance

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## PACKAGE DIMENSIONS

### DPAK (SINGLE GAUGE) CASE 369C ISSUE E

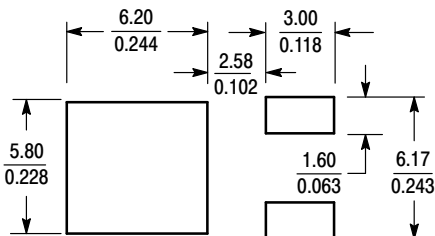


#### NOTES:

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.
7. OPTIONAL MOLD FEATURE.

| 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  | 0.028     | 0.045 | 0.72        | 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  | 0.114 REF |       | 2.90 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 (mm/inches)


#### STYLE 3:

- PIN 1. ANODE
2. CATHODE
3. ANODE
4. CATHODE

#### STYLE 8:

- PIN 1. N/C
2. CATHODE
3. ANODE
4. CATHODE

\*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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