

# Switch-mode Power Rectifier

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

### MURB1660CT, NRVUB1660CTT4G

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

#### Features

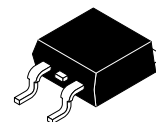
- Package Designed for Power Surface Mount Applications
- Ultrafast 60 Nanosecond Recovery Times
- 175°C Operating Junction Temperature
- Epoxy Meets UL 94 V-0 @ 0.125 in
- High Temperature Glass Passivated Junction
- High Voltage Capability to 600 V
- Low Leakage Specified @ 150°C Case Temperature
- Short Heat Sink Tab Manufactured – Not Sheared!
- Similar in Size to Industrial Standard TO-220 Package
- NRV Prefix 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:

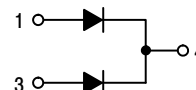
- Case: Epoxy, Molded, Epoxy Meets UL 94 V-0
- Weight: 1.7 Grams (Approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead and Mounting Surface Temperature for Soldering Purposes: 260°C Max. for 10 Seconds
- Device Meets MSL1 Requirements
- ESD Ratings:
  - ◆ Machine Model, C > 400 V
  - ◆ Human Body Model, 3B > 8000 V

\*For additional information on our Pb-Free strategy and soldering details, please download the **onsemi** Soldering and Mounting Techniques Reference Manual, [SOLDERRM/D](#).

## ULTRAFAST RECTIFIER 16 AMPERES, 600 VOLTS



D<sup>2</sup>PAK  
CASE 418B  
STYLE 3



#### MARKING DIAGRAM



A = Assembly Location  
 Y = Year  
 WW = Work Week  
 U1660 = Specific Device Code  
 G = Pb-Free Package  
 AKA = Diode Polarity

#### ORDERING INFORMATION

| Device         | Package                      | Shipping <sup>†</sup> |
|----------------|------------------------------|-----------------------|
| NRVUB1660CTT4G | D <sup>2</sup> PAK (Pb-Free) | 800 / Tape & reel     |

#### DISCONTINUED (Note 1)

| Device        | Package                      | Shipping <sup>†</sup> |
|---------------|------------------------------|-----------------------|
| MURB1660CTG   | D <sup>2</sup> PAK (Pb-Free) | 50 Units/Rail         |
| MURB1660CTT4G | D <sup>2</sup> PAK (Pb-Free) | 800 / Tape & Reel     |

<sup>†</sup>For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification Brochure, [BRD8011/D](#).

1. **DISCONTINUED:** These devices are not recommended for new design. Please contact your **onsemi** representative for information. The most current information on these devices may be available on [www.onsemi.com](http://www.onsemi.com).

# MURB1660CT, NRVUB1660CTT4G

## MAXIMUM RATINGS (Per Leg)

| Rating                                                                                                      | Symbol                          | Value       | Unit             |
|-------------------------------------------------------------------------------------------------------------|---------------------------------|-------------|------------------|
| Peak Repetitive Reverse Voltage<br>Working Peak Reverse Voltage<br>DC Blocking Voltage                      | $V_{RRM}$<br>$V_{RWM}$<br>$V_R$ | 600         | V                |
| Average Rectified Forward Current<br>(Rated $V_R$ , $T_C = 150^\circ\text{C}$ ) Total Device                | $I_{F(AV)}$                     | 8.0<br>16   | A                |
| Peak Repetitive Forward Current<br>(Rated $V_R$ , Square Wave, 20 kHz, $T_C = 150^\circ\text{C}$ )          | $I_{FM}$                        | 16          | A                |
| Non-Repetitive Peak Surge Current<br>(Surge Applied at Rated Load Conditions Halfwave, Single Phase, 60 Hz) | $I_{FSM}$                       | 100         | A                |
| Operating Junction and Storage Temperature Range                                                            | $T_J, T_{stg}$                  | -65 to +175 | $^\circ\text{C}$ |

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.

## THERMAL CHARACTERISTICS (Per Leg)

| Rating                                                           | Symbol          | Value | Unit                      |
|------------------------------------------------------------------|-----------------|-------|---------------------------|
| Maximum Thermal Resistance, Junction-to-Case                     | $R_{\theta JC}$ | 2.0   | $^\circ\text{C}/\text{W}$ |
| Maximum Thermal Resistance, Junction-to-Ambient (Note 1)         | $R_{\theta JA}$ | 50    | $^\circ\text{C}/\text{W}$ |
| Temperature for Soldering Purposes: 1/8" from Case for 5 Seconds | $T_L$           | 260   | $^\circ\text{C}$          |

1. See Chapter 7 for mounting conditions.

## ELECTRICAL CHARACTERISTICS (Per Leg)

| Characteristic                                                                                                                                     | Symbol   | Max          | Unit          |
|----------------------------------------------------------------------------------------------------------------------------------------------------|----------|--------------|---------------|
| Maximum Instantaneous Forward Voltage (Note 2)<br>( $I_F = 8.0$ Amp, $T_C = 150^\circ\text{C}$ )<br>( $I_F = 8.0$ Amp, $T_C = 25^\circ\text{C}$ )  | $V_F$    | 1.20<br>1.50 | V             |
| Maximum Instantaneous Reverse Current (Note 2)<br>(Rated dc Voltage, $T_C = 150^\circ\text{C}$ )<br>(Rated dc Voltage, $T_C = 25^\circ\text{C}$ )  | $i_R$    | 500<br>10    | $\mu\text{A}$ |
| Maximum Reverse Recovery Time<br>( $I_F = 1.0$ Amp, $di/dt = 50$ Amp/ $\mu\text{s}$ )<br>( $I_F = 0.5$ Amp, $I_R = 1.0$ Amp, $I_{REC} = 0.25$ Amp) | $t_{rr}$ | 60<br>50     | 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  $\leq 2.0\%$ .

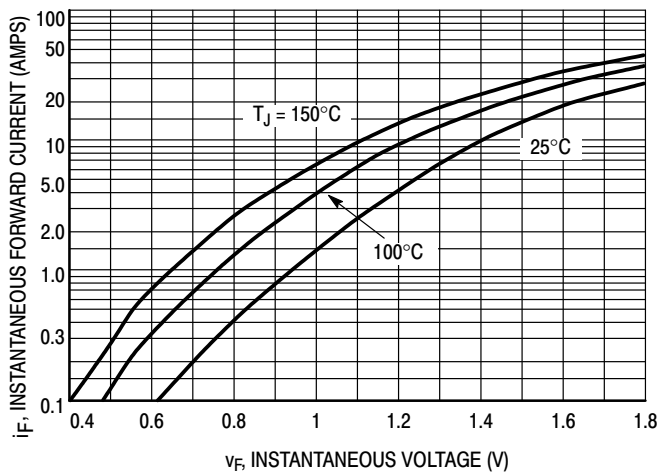


Figure 1. Typical Forward Voltage, Per Leg

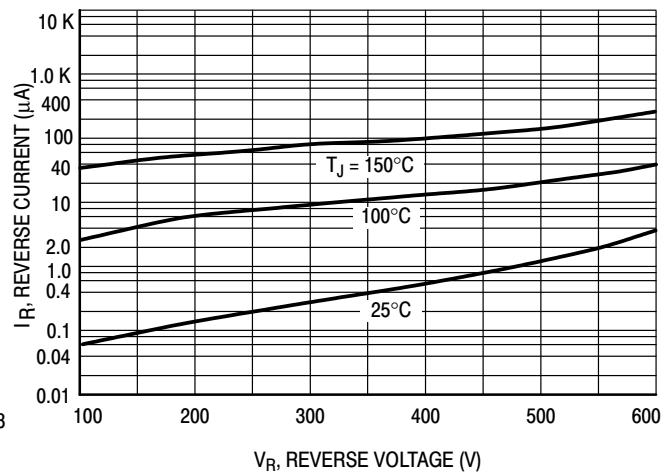


Figure 2. Typical Reverse Current, Per Leg

# MURB1660CT, NRVUB1660CTT4G

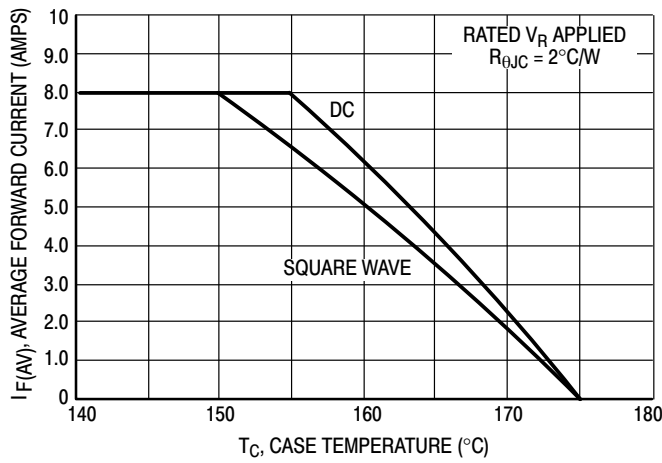


Figure 3. Current Derating, Case, Per Leg

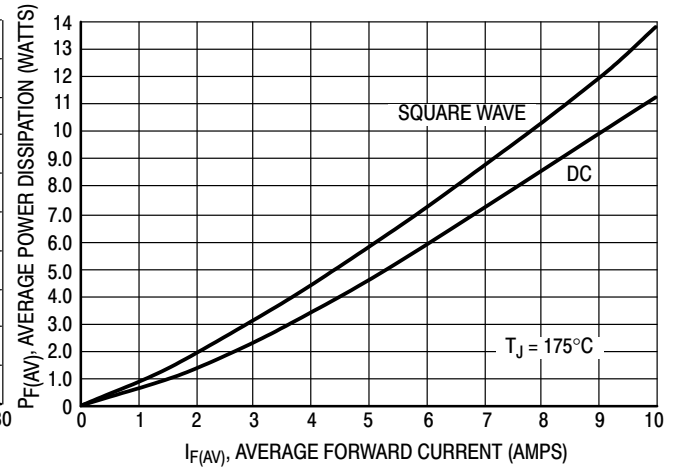


Figure 4. Power Dissipation, Per Leg

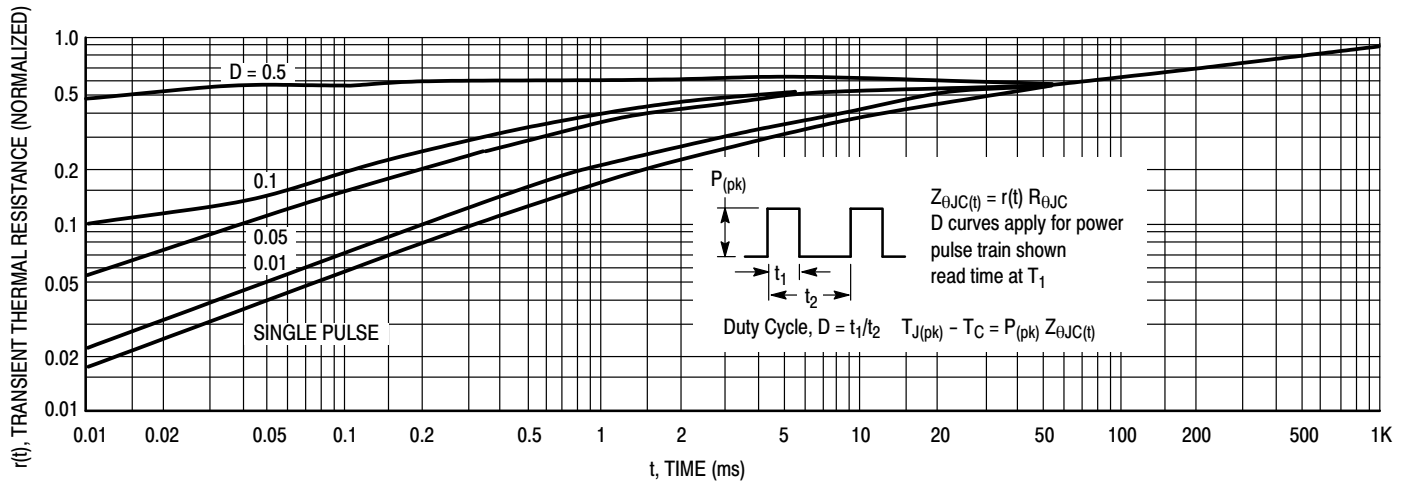


Figure 5. Thermal Response

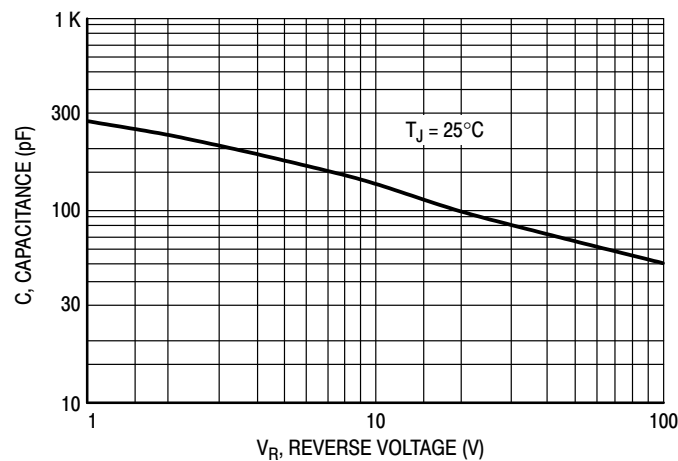
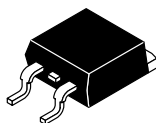


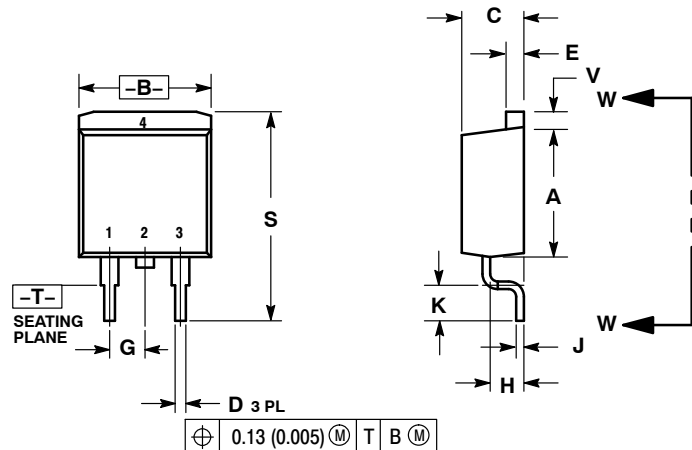
Figure 6. Typical Capacitance, Per Leg



D<sup>2</sup>PAK 3  
CASE 418B-04  
ISSUE L

DATE 17 FEB 2015

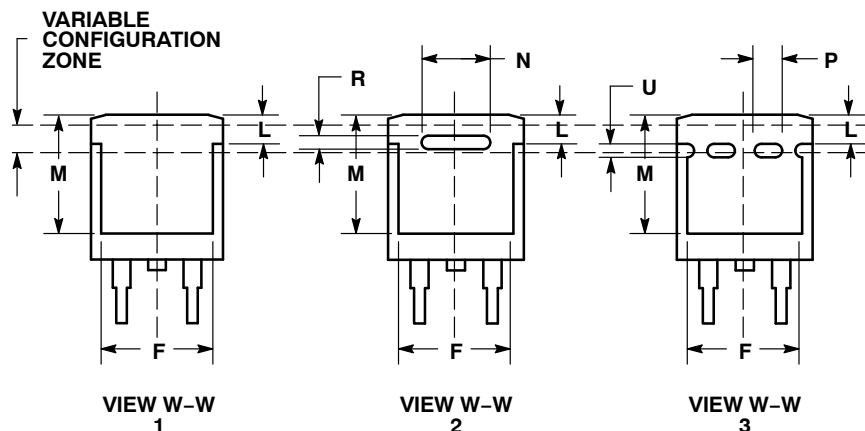
SCALE 1:1



NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. 418B-01 THRU 418B-03 OBSOLETE, NEW STANDARD 418B-04.

| 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  |
| F   | 0.310  | 0.350 | 7.87        | 8.89  |
| 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  |
| L   | 0.052  | 0.072 | 1.32        | 1.83  |
| M   | 0.280  | 0.320 | 7.11        | 8.13  |
| N   | 0.197  | REF   | 5.00        | REF   |
| P   | 0.079  | REF   | 2.00        | REF   |
| R   | 0.039  | REF   | 0.99        | REF   |
| S   | 0.575  | 0.625 | 14.60       | 15.88 |
| V   | 0.045  | 0.055 | 1.14        | 1.40  |



|                                                                       |                                                              |                                                                  |                                                                       |                                                                  |                                                                       |
|-----------------------------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------------------|-----------------------------------------------------------------------|------------------------------------------------------------------|-----------------------------------------------------------------------|
| STYLE 1:<br>PIN 1. BASE<br>2. COLLECTOR<br>3. EMITTER<br>4. COLLECTOR | STYLE 2:<br>PIN 1. GATE<br>2. DRAIN<br>3. SOURCE<br>4. DRAIN | STYLE 3:<br>PIN 1. ANODE<br>2. CATHODE<br>3. ANODE<br>4. CATHODE | STYLE 4:<br>PIN 1. GATE<br>2. COLLECTOR<br>3. EMITTER<br>4. COLLECTOR | STYLE 5:<br>PIN 1. CATHODE<br>2. ANODE<br>3. CATHODE<br>4. ANODE | STYLE 6:<br>PIN 1. NO CONNECT<br>2. CATHODE<br>3. ANODE<br>4. CATHODE |
|-----------------------------------------------------------------------|--------------------------------------------------------------|------------------------------------------------------------------|-----------------------------------------------------------------------|------------------------------------------------------------------|-----------------------------------------------------------------------|

MARKING INFORMATION AND FOOTPRINT ON PAGE 2

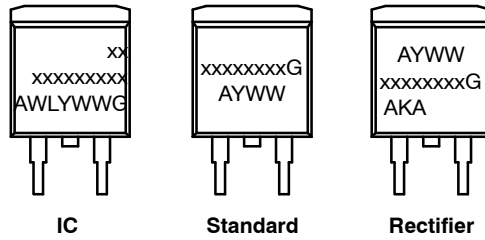
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**D<sup>2</sup>PAK 3**  
CASE 418B-04  
ISSUE L

DATE 17 FEB 2015

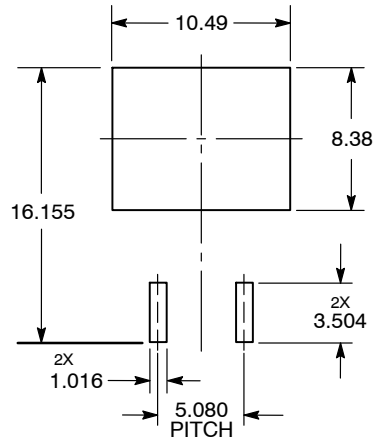
**GENERIC  
MARKING DIAGRAM\***



xx = Specific Device Code  
A = Assembly Location  
WL = Wafer Lot  
Y = Year  
WW = Work Week  
G = Pb-Free Package  
AKA = Polarity Indicator

\*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "•", may or may not be present. Some products may not follow the Generic Marking.

**SOLDERING FOOTPRINT\***



DIMENSIONS: MILLIMETERS

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

|                         |                           |                                                                                                                                                                                     |
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