

# MUR2100E

Preferred Device

## Switch-mode Power Rectifier

### Ultrafast “E” Series with High Reverse Energy Capability

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

#### Features

- 20 mJoules Avalanche Energy Guaranteed
- Excellent Protection Against Voltage Transients in Switching Inductive Load Circuits
- Ultrafast 75 Nanosecond Recovery Time
- 175°C Operating Junction Temperature
- Low Forward Voltage
- Low Leakage Current
- High Temperature Glass Passivated Junction
- These are Pb-Free Devices\*

#### Mechanical Characteristics:

- Case: Epoxy, Molded
- Weight: 0.4 Gram (Approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead Temperature for Soldering Purposes: 260°C Max for 10 Seconds
- Polarity: Cathode Indicated by Polarity Band

#### 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>$V_R$ | 1000                              | V    |
| Average Rectified Forward Current (Note 1)                                                                      | $I_F(AV)$                       | 2.0 @<br>$T_A = 35^\circ\text{C}$ | A    |
| Non-Repetitive Peak Surge Current<br>(Surge applied at rated load conditions,<br>halfwave, single phase, 60 Hz) | $I_{FSM}$                       | 35                                | A    |
| Operating Junction Temperature and<br>Storage Temperature Range                                                 | $T_J, T_{stg}$                  | -65 to<br>+175                    | °C   |

#### THERMAL CHARACTERISTICS

| Characteristic                                     | Symbol          | Value    | Unit |
|----------------------------------------------------|-----------------|----------|------|
| Maximum Thermal Resistance,<br>Junction-to-Ambient | $R_{\theta JA}$ | (Note 3) | °C/W |

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.

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

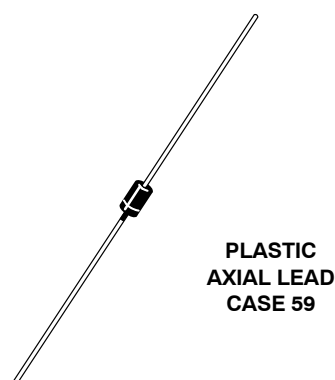
\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.



ON Semiconductor®

<http://onsemi.com>

### ULTRAFAST RECTIFIER 2.0 AMPERES, 1000 VOLTS



#### MARKING DIAGRAM



A = Assembly Location  
Y = Year  
WW = Work Week

▪ = Pb-Free Package

(Note: Microdot may be in either location)

#### ORDERING INFORMATION

| Device      | Package      | Shipping†        |
|-------------|--------------|------------------|
| MUR2100E    | Axial Lead** | 1000 Units/Bag   |
| MUR2100EG   | Axial Lead** | 1000 Units/Bag   |
| MUR2100ERL  | Axial Lead** | 5000/Tape & Reel |
| MUR2100ERLG | Axial Lead** | 5000/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.

\*\*This package is inherently Pb-Free.

Preferred devices are recommended choices for future use and best overall value.

# MUR2100E

## ELECTRICAL CHARACTERISTICS

| Characteristic                                                                                                                                    | Symbol            | Value        | Unit          |
|---------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--------------|---------------|
| Maximum Instantaneous Forward Voltage (Note 2)<br>( $I_F = 2.0$ A, $T_J = 150^\circ\text{C}$ )<br>( $I_F = 2.0$ A, $T_J = 25^\circ\text{C}$ )     | $V_F$             | 1.75<br>2.20 | V             |
| Maximum Instantaneous Reverse Current (Note 2)<br>(Rated dc Voltage, $T_J = 100^\circ\text{C}$ )<br>(Rated dc Voltage, $T_J = 25^\circ\text{C}$ ) | $I_R$             | 600<br>10    | $\mu\text{A}$ |
| Maximum Reverse Recovery Time<br>( $I_F = 1.0$ A, $di/dt = 50$ A/ $\mu\text{s}$ )<br>( $I_F = 0.5$ A, $I_R = 1.0$ A, $I_{\text{REC}} = 0.25$ A)   | $t_{rr}$          | 100<br>75    | ns            |
| Maximum Forward Recovery Time<br>( $I_F = 1.0$ A, $di/dt = 100$ A/ $\mu\text{s}$ , $I_{\text{REC}}$ to 1.0 V)                                     | $t_{fr}$          | 75           | ns            |
| Controlled Avalanche Energy (See Test Circuit in Figure 6)                                                                                        | $W_{\text{AVAL}}$ | 10           | mJ            |

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

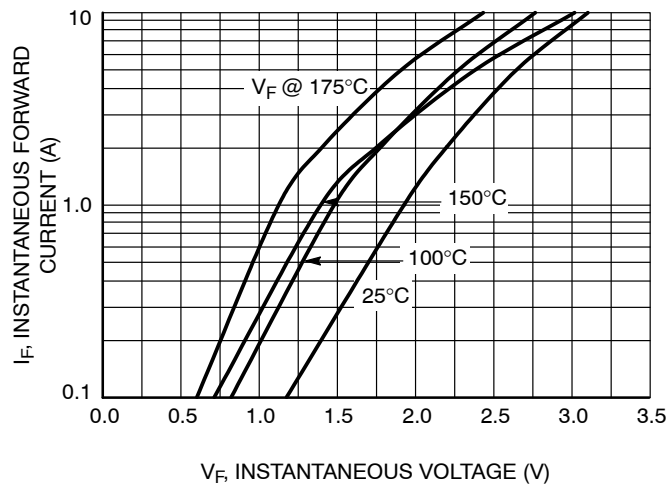


Figure 1. Maximum Forward Voltage

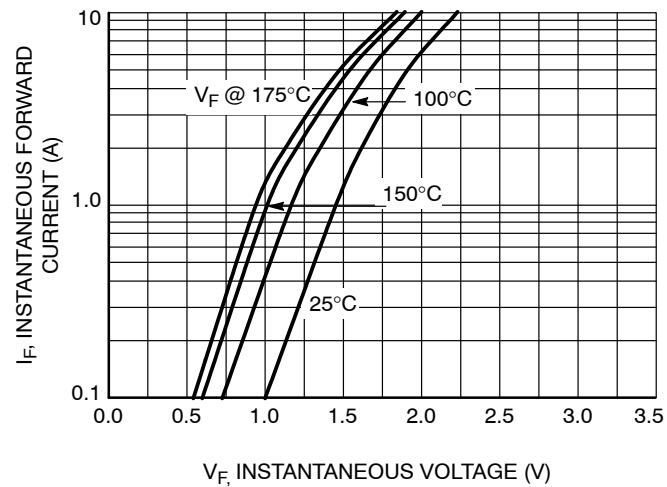
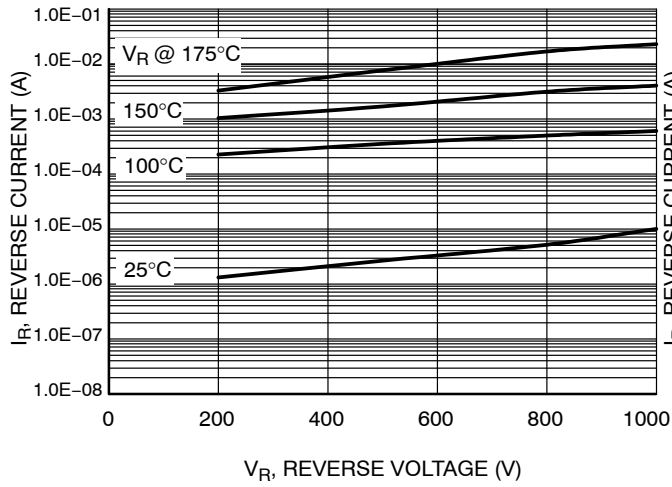
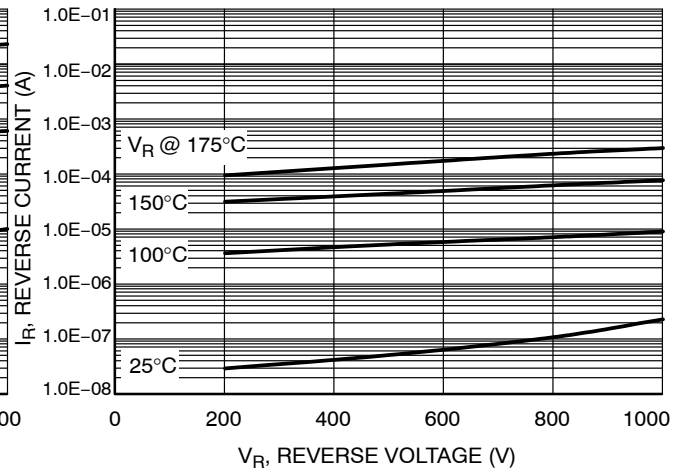


Figure 2. Typical Forward Voltage

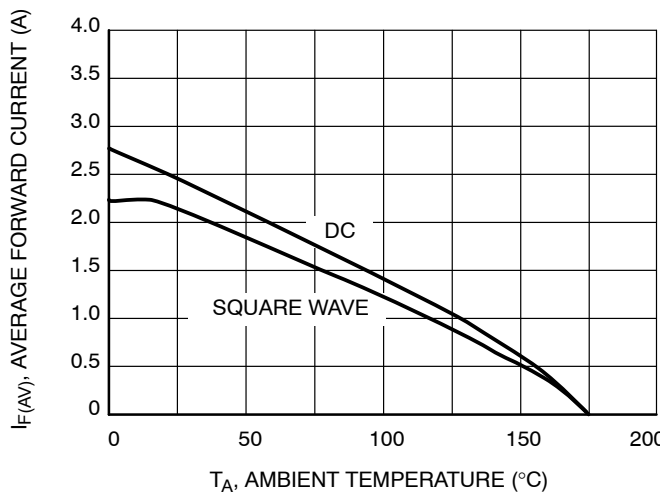
# MUR2100E



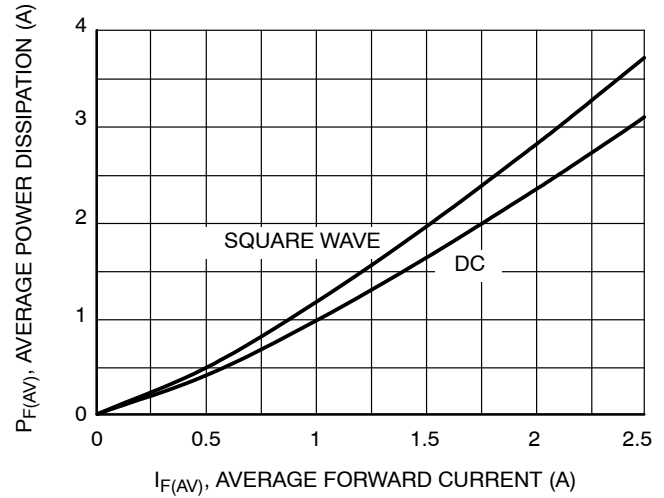
**Figure 3. Maximum Reverse Current**



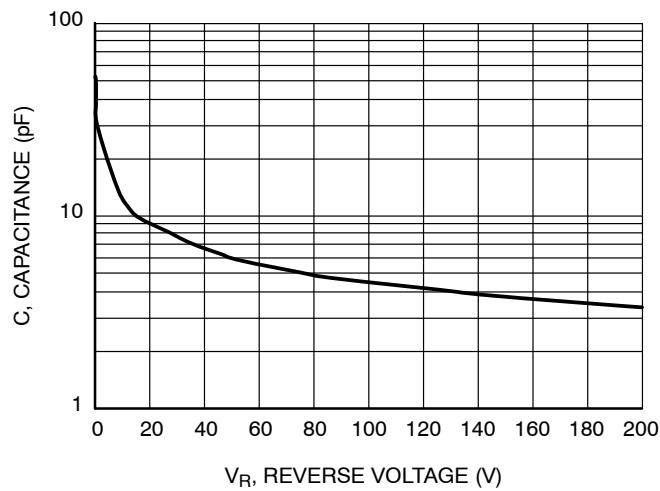
**Figure 4. Typical Reverse Current**



**Figure 5. Current Derating**



**Figure 6. Power Dissipation**



**Figure 7. Typical Capacitance**

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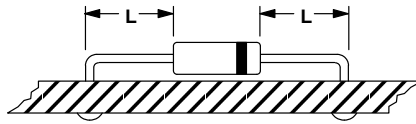
## NOTE 3. – AMBIENT MOUNTING DATA

Data shown for thermal resistance, junction-to-ambient ( $R_{\theta JA}$ ) for the mountings shown is to be used as typical guideline values for preliminary engineering or in case the tie point temperature cannot be measured.

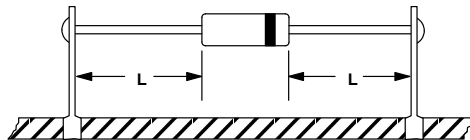
### TYPICAL VALUES FOR $R_{\theta JA}$ IN STILL AIR

| Mounting Method |                 | Lead Length, L |     |     | Units                |
|-----------------|-----------------|----------------|-----|-----|----------------------|
|                 |                 | 1/8            | 1/4 | 1/2 |                      |
| 1               | $R_{\theta JA}$ | 52             | 65  | 72  | $^{\circ}\text{C/W}$ |
| 2               |                 | 67             | 80  | 87  | $^{\circ}\text{C/W}$ |
| 3               |                 | 50             |     |     | $^{\circ}\text{C/W}$ |

#### MOUNTING METHOD 1

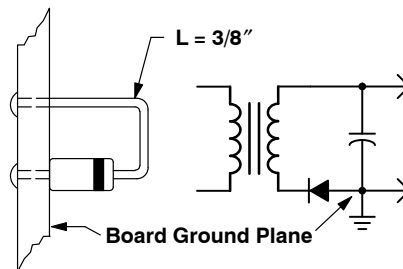


#### MOUNTING METHOD 2



#### Vector Pin Mounting

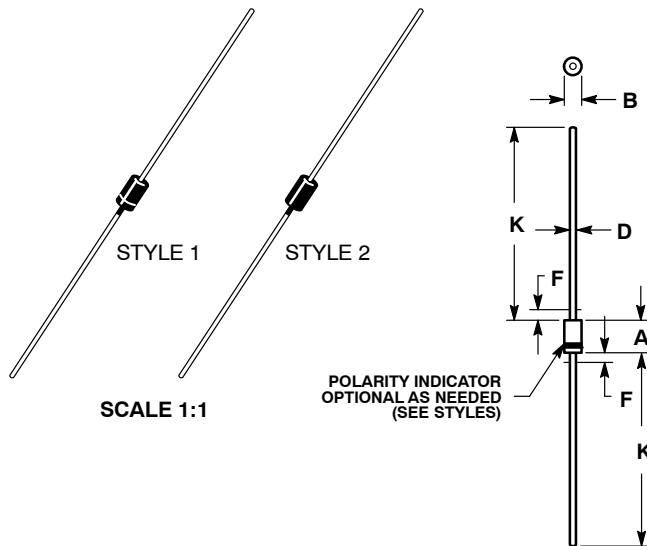
#### MOUNTING METHOD 3



#### P.C. Board with 1-1/2" X 1-1/2" Copper Surface

### AXIAL LEAD CASE 59-10 ISSUE U

DATE 15 FEB 2005



STYLE 1:  
PIN 1: CATHODE (POLARITY BAND)  
2: ANODE

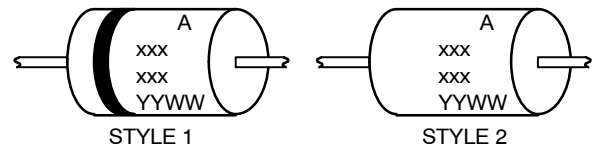
STYLE 2:  
NO POLARITY

#### NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. ALL RULES AND NOTES ASSOCIATED WITH JEDEC DO-41 OUTLINE SHALL APPLY.
4. POLARITY DENOTED BY CATHODE BAND.
5. LEAD DIAMETER NOT CONTROLLED WITHIN F DIMENSION.

| DIM | INCHES |       | MILLIMETERS |      |
|-----|--------|-------|-------------|------|
|     | MIN    | MAX   | MIN         | MAX  |
| A   | 0.161  | 0.205 | 4.10        | 5.20 |
| B   | 0.079  | 0.106 | 2.00        | 2.70 |
| D   | 0.028  | 0.034 | 0.71        | 0.86 |
| F   | ---    | 0.050 | ---         | 1.27 |
| K   | 1.000  | ---   | 25.40       | ---  |

#### GENERIC MARKING DIAGRAM\*



xxx = Specific Device Code  
A = Assembly Location  
YY = Year  
WW = Work Week

\*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.

|                  |             |                                                                                                                                                                                     |
|------------------|-------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
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| DESCRIPTION:     | AXIAL LEAD  | PAGE 1 OF 1                                                                                                                                                                         |

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