# Switch-mode™ Power Rectifiers

## MUR105, MUR110, MUR115, MUR120, MUR130, MUR140, MUR160

The MUR120 series of SWITCHMODE power rectifiers are designed for use in switching power supplies, inverters and as free wheeling diodes.

### Features

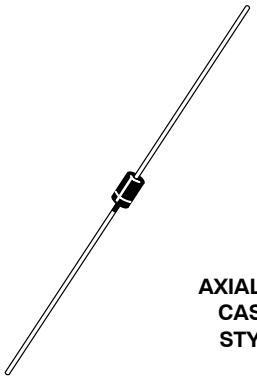
- Ultrafast 25, 50 and 75 Nanosecond Recovery Times
- 175 °C Operating Junction Temperature
- Low Forward Voltage
- Low Leakage Current
- High Temperature Glass Passivated Junction
- Reverse Voltage to 600 V
- Shipped in Plastic Bags; 1,000 per Bag
- Available Tape and Reel; 5,000 per Reel, by adding a “RL” Suffix to the Part Number
- 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

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

**ULTRAFAST RECTIFIERS**
**1.0 AMPERE, 50 – 600 VOLTS**



**AXIAL LEAD**
**CASE 59**
**STYLE 1**

### MARKING DIAGRAM


| | |
|---|---|
| A | = Assembly Location |
| MUR1xx | = Specific Device Code |
| Y | = Year |
| WW | = Work Week |
| ▪ | = Pb-Free Package |

(Note: Microdot may be in either location)

### ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 6 of this data sheet.

## MAXIMUM RATINGS

| Rating | Symbol | MUR | | | | | | | Unit |
|---|---|---|---|---|---|---|---|---|---|
| | | 105 | 110 | 115 | 120 | 130 | 140 | 160 | |
| Peak Repetitive Reverse Voltage<br>Working Peak Reverse Voltage<br>DC Blocking Voltage | $V_{RRM}$<br>$V_{RWM}$<br>$V_R$ | 50 | 100 | 150 | 200 | 300 | 400 | 600 | V |
| Average Rectified Forward Current<br>(Square Wave Mounting Method #3 Per Note 2) | $I_{F(AV)}$ | 1.0 @ $T_A$ = 130 °C | | | | 1.0 @ $T_A$ = 120 °C | | | A |
| Nonrepetitive Peak Surge Current<br>(Surge applied at rated load conditions, halfwave, single phase, 60 Hz) | $I_{FSM}$ | 35 | | | | | | | A |
| Operating Junction Temperature and Storage Temperature | $T_J$, $T_{stg}$ | −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.

## THERMAL CHARACTERISTICS

| Characteristic | Symbol | Max | Unit |
|---|---|---|---|
| Maximum Thermal Resistance, Junction-to-Ambient | $R_{\theta JA}$ | Note 2 | °C/W |

## ELECTRICAL CHARACTERISTICS

| Characteristic | Symbol | Value | | Unit |
|---|---|---|---|---|
| Maximum Instantaneous Forward Voltage (Note 1)<br>($i_F$ = 1.0 Amp, $T_J$ = 150 °C)<br>($i_F$ = 1.0 Amp, $T_J$ = 25 °C) | $v_F$ | <br>0.710<br>0.875 | <br>1.05<br>1.25 | V |
| Maximum Instantaneous Reverse Current (Note 1)<br>(Rated DC Voltage, $T_J$ = 150 °C)<br>(Rated DC Voltage, $T_J$ = 25 °C) | $i_R$ | <br>50<br>2.0 | <br>150<br>5.0 | μA |
| Maximum Reverse Recovery Time<br>($I_F$ = 1.0 A, di/dt = 50 A/μs)<br>($I_F$ = 0.5 A, $i_R$ = 1.0 A, $I_{REC}$ = 0.25 A) | $t_{rr}$ | <br>35<br>25 | <br>75<br>50 | ns |
| Maximum Forward Recovery Time<br>($I_F$ = 1.0 A, di/dt = 100 A/μs, $I_{REC}$ to 1.0 V) | $t_{fr}$ | 25 | 50 | ns |
| Typical Peak Reverse Recovery Current<br>($I_F$ = 1.0 A, di/dt = 50 A/μs) | $I_{RM}$ | 0.85 | | A |

1. Pulse Test: Pulse Width = 300 μs, Duty Cycle ≤ 2.0%.

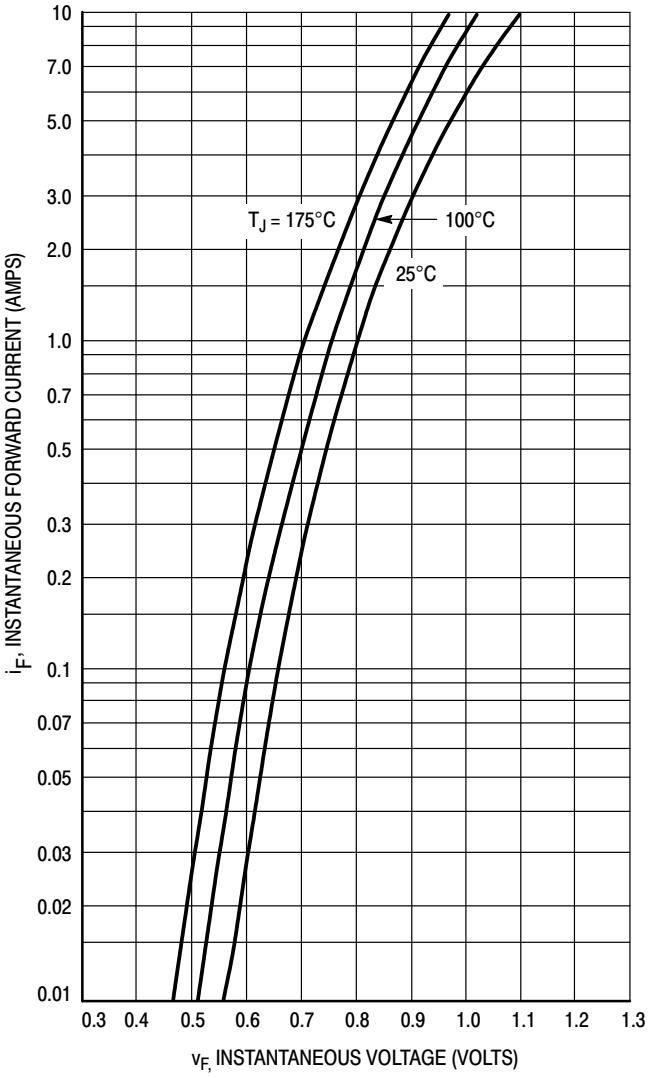



**Figure 1. Typical Forward Voltage**

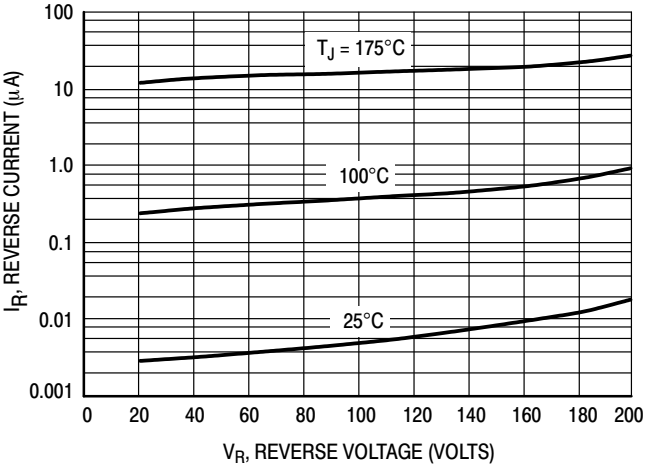



**Figure 2. Typical Reverse Current***

* 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 same curves if $V_R$ is sufficiently below rated $V_R$.

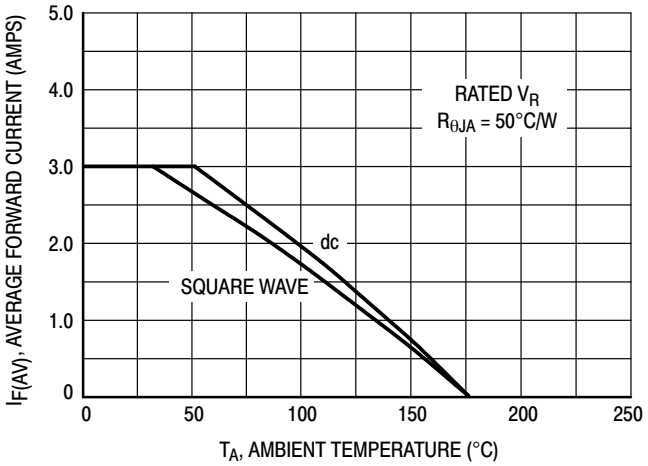



**Figure 3. Current Derating (Mounting Method #3 Per Note 1)**

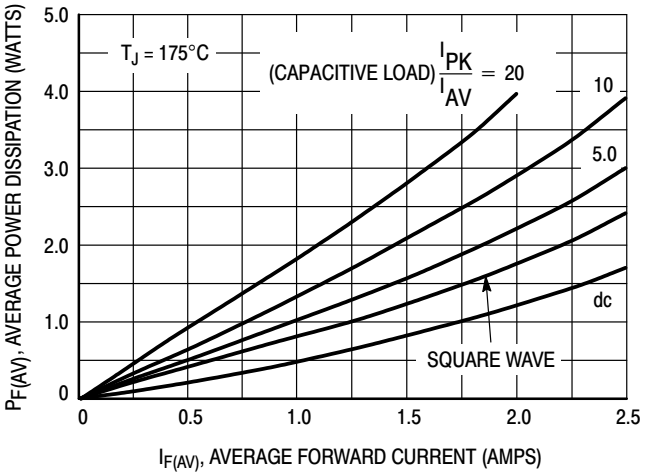



**Figure 4. Power Dissipation**

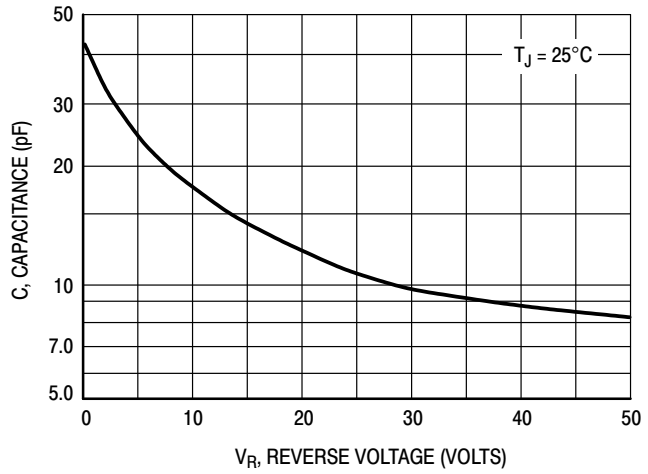



**Figure 5. Typical Capacitance**

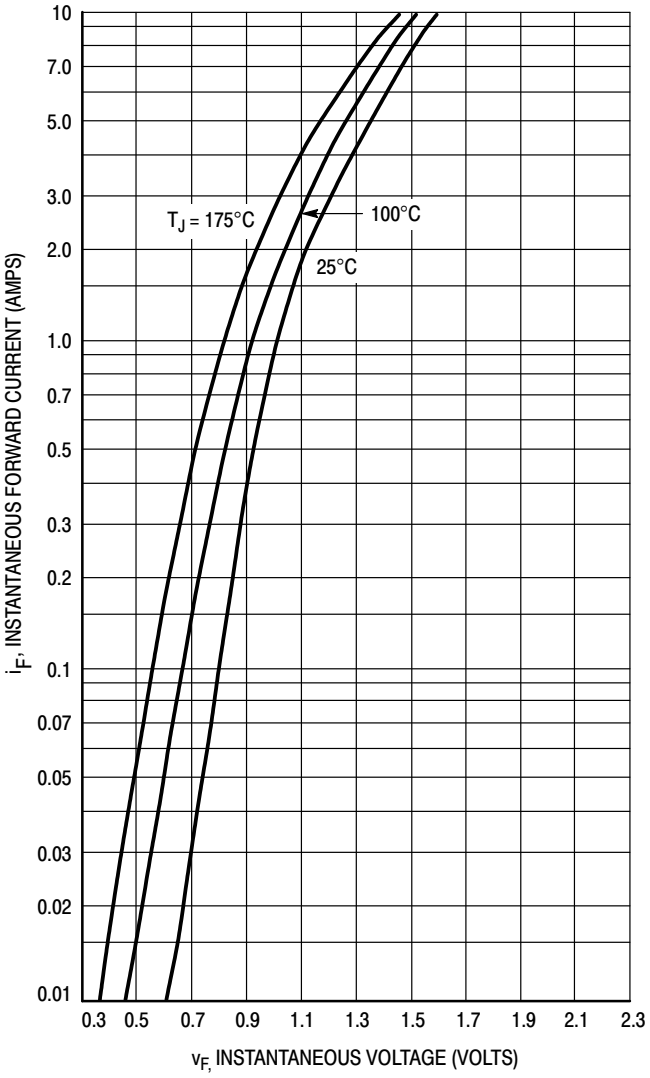



**Figure 6. Typical Forward Voltage**

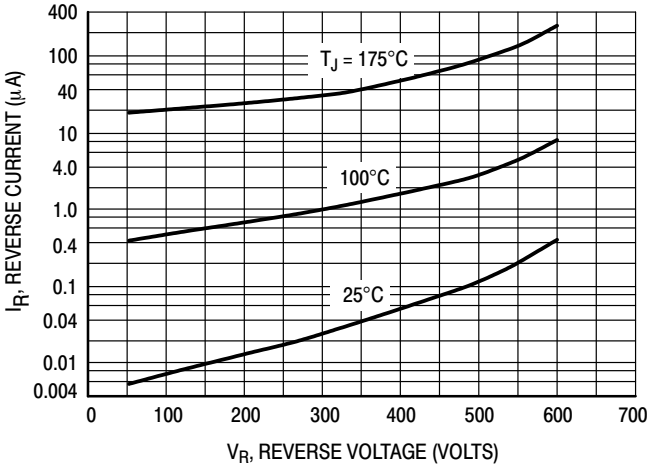



**Figure 7. Typical Reverse Current***

* 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 same curves if $V_R$ is sufficiently below rated $V_R$.

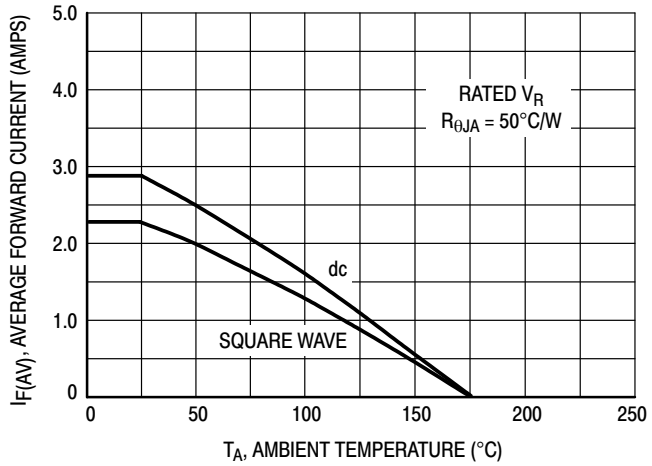



**Figure 8. Current Derating (Mounting Method #3 Per Note 2)**

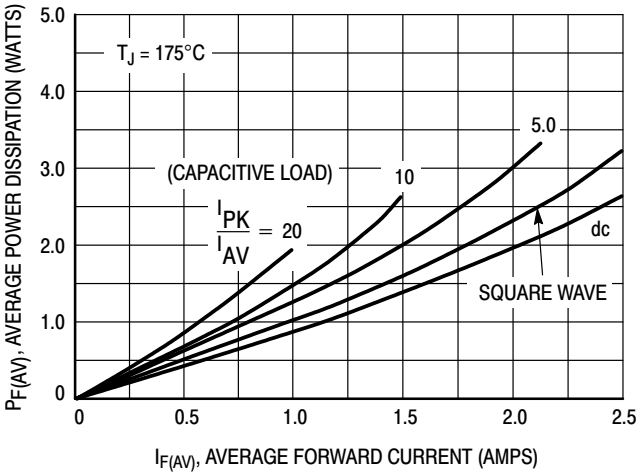



**Figure 9. Power Dissipation**

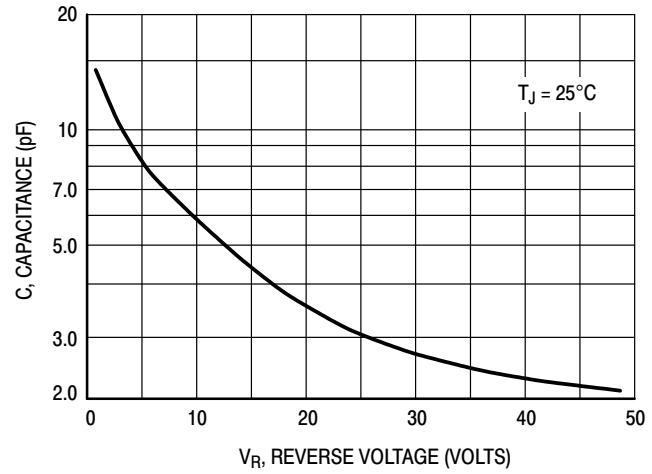



**Figure 10. Typical Capacitance**

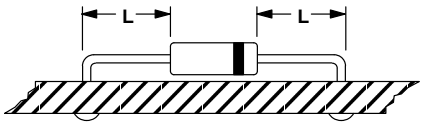
## NOTE 2. — AMBIENT MOUNTING DATA

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.

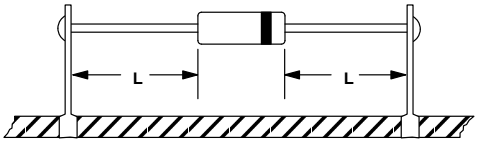
**TYPICAL VALUES FOR $R_{\theta JA}$ IN STILL AIR**

| Mounting Method | | Lead Length, L (in.) | | | Units |
|---|---|---|---|---|---|
| | | 1/8 | 1/4 | 1/2 | |
| 1 | $R_{\theta JA}$ | 52 | 65 | 72 | °C/W |
| 2 | | 67 | 80 | 87 | °C/W |
| 3 | | 50 | | | °C/W |

**MOUNTING METHOD 1**

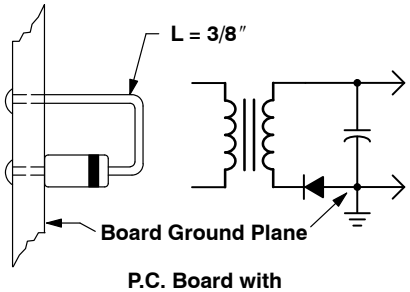



**MOUNTING METHOD 2**




**Vector Pin Mounting**

**MOUNTING METHOD 3**




**P.C. Board with**
**1−1/2″ X 1−1/2″ Copper Surface**

## ORDERING INFORMATION

| Device | Marking | Package | Shipping† |
|---|---|---|---|
| MUR110G | MUR110 | Axial Lead* | 1000 Units / Bag |
| MUR120G | MUR120 | Axial Lead* | 1000 Units / Bag |
| MUR120RLG | MUR120 | Axial Lead* | 5000 Units / Tape & Reel |
| MUR140RLG | MUR140 | Axial Lead* | 5000 Units / Tape & Reel |
| MUR160G | MUR160 | Axial Lead* | 1000 Units / Bag |
| MUR160RLG | MUR160 | Axial Lead* | 5000 Units / Tape & Reel |

**DISCONTINUED** (Note 2)

| Device | Marking | Package | Shipping† |
|---|---|---|---|
| MUR105 | MUR105 | Axial Lead* | 1000 Units / Bag |
| MUR105G | MUR105 | Axial Lead* | 1000 Units / Bag |
| MUR105RL | MUR105 | Axial Lead* | 5000 Units / Tape & Reel |
| MUR105RLG | MUR105 | Axial Lead* | 5000 Units / Tape & Reel |
| MUR110 | MUR110 | Axial Lead* | 1000 Units / Bag |
| MUR110RL | MUR110 | Axial Lead* | 5000 Units / Tape & Reel |
| MUR110RLG | MUR110 | Axial Lead* | 5000 Units / Tape & Reel |
| MUR115 | MUR115 | Axial Lead* | 1000 Units / Bag |
| MUR115G | MUR115 | Axial Lead* | 1000 Units / Bag |
| MUR115RL | MUR115 | Axial Lead* | 5000 Units / Tape & Reel |
| MUR115RLG | MUR115 | Axial Lead* | 5000 Units / Tape & Reel |
| MUR120 | MUR120 | Axial Lead* | 1000 Units / Bag |
| MUR120RL | MUR120 | Axial Lead* | 5000 Units / Tape & Reel |
| MUR130 | MUR130 | Axial Lead* | 1000 Units / Bag |
| MUR130G | MUR130 | Axial Lead* | 1000 Units / Bag |
| MUR130RL | MUR130 | Axial Lead* | 5000 Units / Tape & Reel |
| MUR130RLG | MUR130 | Axial Lead* | 5000 Units / Tape & Reel |
| MUR140 | MUR140 | Axial Lead* | 1000 Units / Bag |
| MUR140G | MUR140 | Axial Lead* | 1000 Units / Bag |
| MUR140RL | MUR140 | Axial Lead* | 5000 Units / Tape & Reel |
| MUR160 | MUR160 | Axial Lead* | 1000 Units / Bag |
| MUR160RL | MUR160 | Axial Lead* | 5000 Units / 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.

* NLV Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q100 Qualified and PPAP Capable.

2. **DISCONTINUED:** This device is not available. Please contact your **onsemi** representative for information. The most current information on this device may be available on www.onsemi.com.

* This package is inherently Pb−Free.

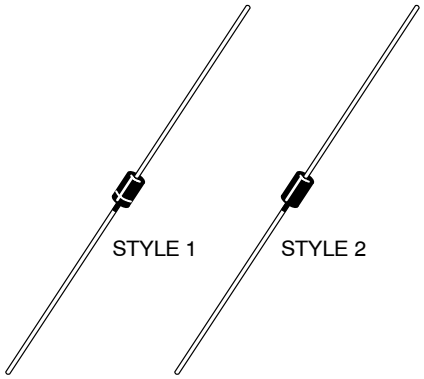
## REVISION HISTORY

| Revision | Description of Changes | Date |
|---|---|---|
| 12 | MUR105, MUR105G, MUR105RL, MUR105RLG, MUR110, MUR110RL, MUR110RLG, MUR115, MUR115G, MUR115RL , MUR115RLG, MUR120, MUR120RL, MUR130, MUR130G, MUR130RL, MUR130RLG, MUR140, MUR140G, MUR140RL, MUR160, MUR160RL OPN Marked as Discontinued + Rebranded the Data Sheet to **onsemi** format | 9/8/2025 |

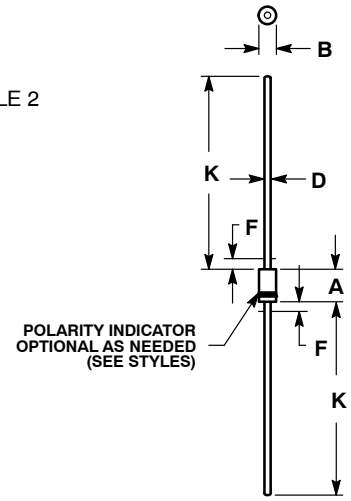
This document has undergone updates prior to the inclusion of this revision history table. The changes tracked here only reflect updates made on the noted approval dates.

**AXIAL LEAD**
CASE 59−10
ISSUE U

DATE 15 FEB 2005




**SCALE 1:1**



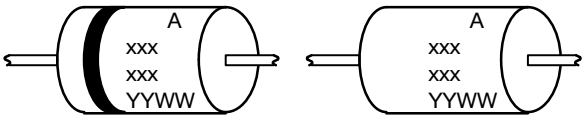

NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. ALL RULES AND NOTES ASSOCIATED WITH JEDEC DO−41 OUTLINE SHALL APPLY
4. POLARITY DENOTED BY CATHODE BAND.
5. LEAD DIAMETER NOT CONTROLLED WITHIN F DIMENSION.

| | INCHES | | MILLIMETERS | |
|---|---|---|---|---|
| DIM | 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 | −−− |

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

STYLE 2:
NO POLARITY

**GENERIC MARKING DIAGRAM***




STYLE 1 STYLE 2

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. Some products may not follow the Generic Marking.

| | | | |
|---|---|---|---|
| **DOCUMENT NUMBER:** | **98ASB42045B** | Electronic versions are uncontrolled except when accessed directly from the Document Repository. Printed versions are uncontrolled except when stamped “CONTROLLED COPY” in red. | |
| **DESCRIPTION:** | **AXIAL LEAD** | | **PAGE 1 OF 1** |

## ADDITIONAL INFORMATION

**TECHNICAL PUBLICATIONS**:
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