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# MUR405, MUR410, MUR415, MUR420, MUR440, MUR460

## SWITCHMODE™ Power Rectifiers

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

### Features

- Ultrafast 25 ns, 50 ns and 75 ns 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, 500 per Bag
- Available in Tape and Reel, 1500 per Reel, by Adding a “RLG” Suffix to the Part Number
- MUR460 available in Fan Fold Ammo Pak, 1000 per Box, by adding a “FFG” suffix to the part number
- These are Pb−Free Packages*

### Mechanical Characteristics:

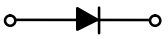
- Case: Epoxy, Molded
- Weight: 1.1 Gram (Approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead Temperature for Soldering Purposes: 260°C Max. for 10 Seconds
- Polarity: Cathode indicated by Polarity Band

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

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**http://onsemi.com**

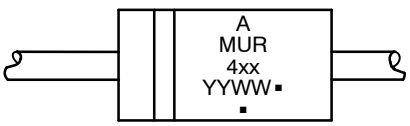
**ULTRAFAST RECTIFIERS**
**4.0 AMPERES, 50−600 VOLTS**





**AXIAL LEAD**
**CASE 267**
**STYLE 1**

### MARKING DIAGRAM




A = Assembly Location
MUR4xx = Device Number
x = 05, 10, 15, 20, 40, 60
YY = 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 3 of this data sheet.

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## MAXIMUM RATINGS

| Rating | Symbol | MUR 405 | MUR 410 | MUR 415 | MUR 420 | MUR 440 | MUR 460 | Unit |
|---|---|---|---|---|---|---|---|---|
| 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 | 400 | 600 | V |
| Average Rectified Forward Current (Square Wave)<br>(Mounting Method #3 Per Note 2) | $I_{F(AV)}$ | 4.0 @ $T_A$ = 80°C | | | | 4.0 @ $T_A$ = 40°C | | A |
| Nonrepetitive Peak Surge Current<br>(Surge applied at rated load conditions, half wave, single phase, 60 Hz) | $I_{FSM}$ | 125 | | | | 110 | | A |
| Operating Junction Temperature & Storage Temperature | $T_J$, $T_{stg}$ | −65 to +175 | | | | | | °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 | MUR 405 | MUR 410 | MUR 415 | MUR 420 | MUR 440 | MUR 460 | Unit |
|---|---|---|---|---|---|---|---|---|
| Maximum Thermal Resistance, Junction−to−Ambient | $R_{\theta JA}$ | See Note 2 | | | | | | °C/W |

## ELECTRICAL CHARACTERISTICS

| Rating | Symbol | MUR 405 | MUR 410 | MUR 415 | MUR 420 | MUR 440 | MUR 460 | Unit |
|---|---|---|---|---|---|---|---|---|
| Maximum Instantaneous Forward Voltage (Note 1)<br>($i_F$ = 3.0 A, $T_J$ = 150°C)<br>($i_F$ = 3.0 A, $T_J$ = 25°C)<br>($i_F$ = 4.0 A, $T_J$ = 25°C) | $v_F$ | | 0.71<br>0.88<br>0.89 | | | | 1.05<br>1.25<br>1.28 | V |
| Maximum Instantaneous Reverse Current (Note 1)<br>(Rated dc Voltage, $T_J$ = 150°C)<br>(Rated dc Voltage, $T_J$ = 25°C) | $i_R$ | | 150<br>5 | | | | 250<br>10 | 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) | $t_{rr}$ | | 35<br>25 | | | | 75<br>50 | ns |
| Maximum Forward Recovery Time<br>($I_F$ = 1.0 A, di/dt = 100 A/μs, Recovery to 1.0 V) | $t_{fr}$ | | 25 | | | | 50 | ns |
| Controlled Avalanche Energy (Maximum) | $W_{aval}$ | | | | 5 | | | mJ |

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

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## ORDERING INFORMATION

| Device | Package | Shipping† |
|---|---|---|
| MUR405G | Axial Lead* | 500 Units / Bag |
| MUR410G | Axial Lead* | |
| MUR410RLG | Axial Lead* | 1500 / Tape & Reel |
| MUR415G | Axial Lead* | 500 Units / Bag |
| MUR415RLG | Axial Lead* | 1500 / Tape & Reel |
| MUR420G | Axial Lead* | 500 Units / Bag |
| MUR420RLG | Axial Lead* | 1500 / Tape & Reel |
| MUR440G | Axial Lead* | 500 Units / Bag |
| MUR440RLG | Axial Lead* | 1500 / Tape & Reel |
| MUR460G | Axial Lead* | 500 Units / Bag |
| MUR460FFG | Axial Lead* | 1000 Units / Box |
| MUR460RLG | Axial Lead* | 1500 / Tape & Reel |

†For information on tape and reel and ammo pak specifications, including part orientation, tape sizes and box dimensions, please refer to our Tape and Reel Packaging Specifications Brochure, BRD8011/D.

*These packages are inherently Pb−Free.

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## MUR405, MUR410, MUR415, MUR420

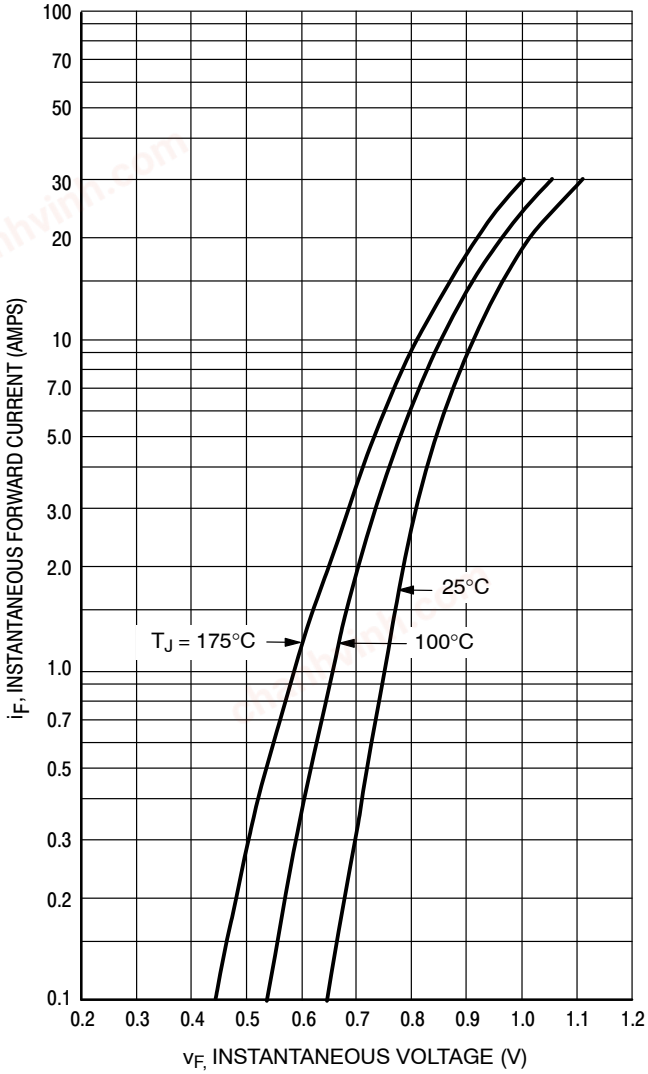



**Figure 1. Typical Forward Voltage**

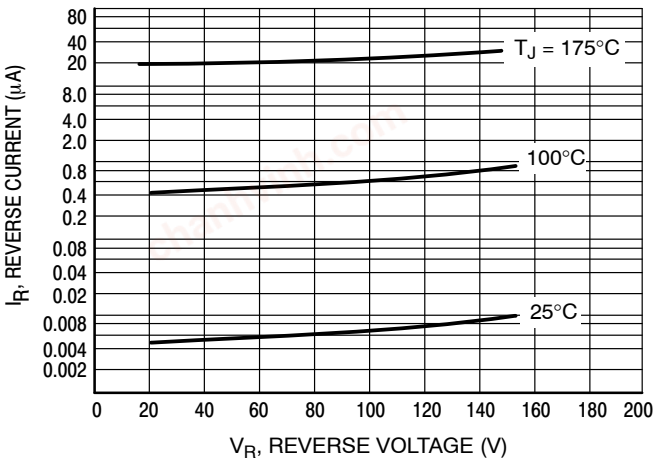



**Figure 2. Typical Reverse Current**

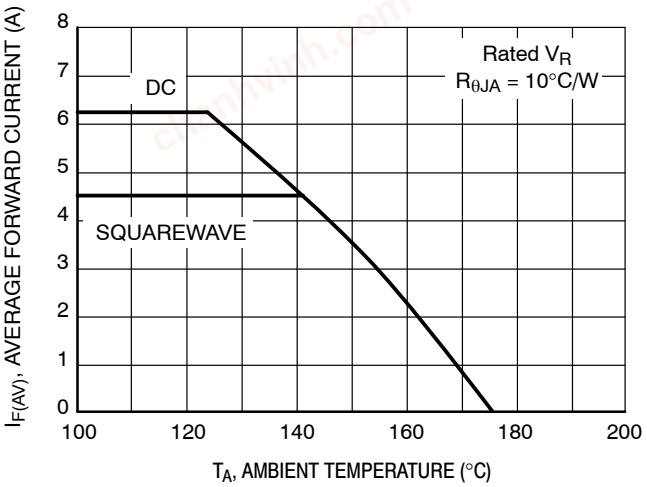



**Figure 3. Current Derating (Mounting Method #3 Per Note 2)**

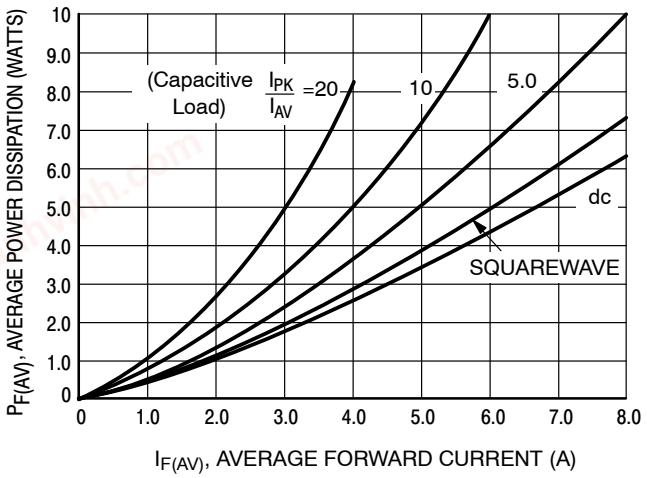



**Figure 4. Power Dissipation**

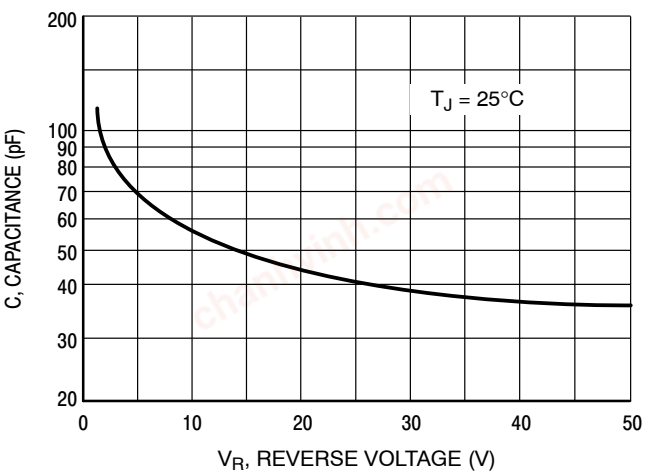



**Figure 5. Typical Capacitance**

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**MUR440, MUR460**

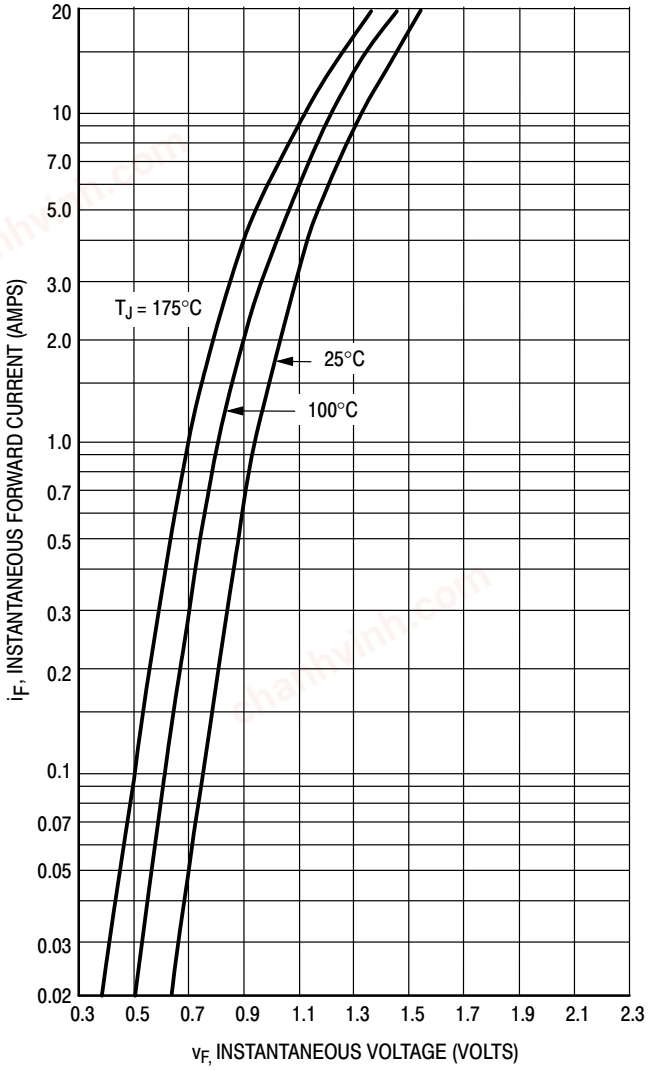



**Figure 6. Typical Forward Voltage**

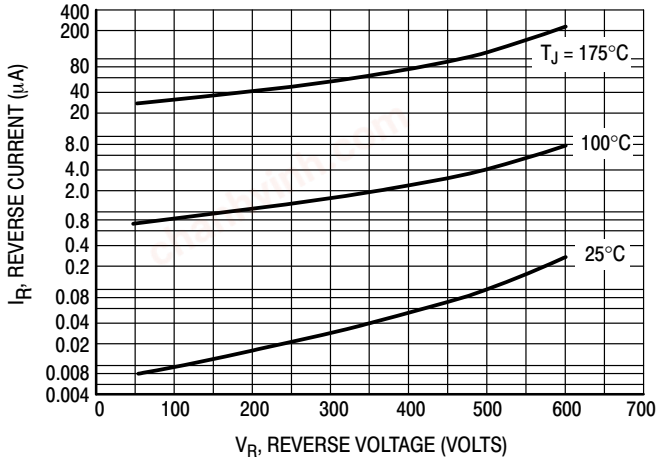



**Figure 7. Typical Reverse Current**

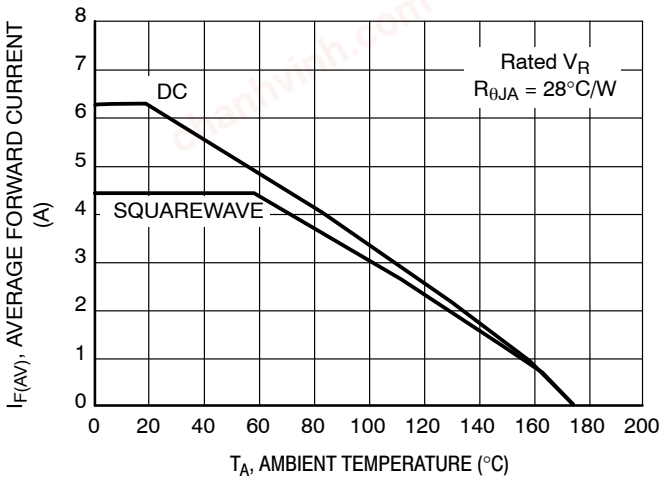



**Figure 8. Current Derating (Mounting Method #3 Per Note 2)**

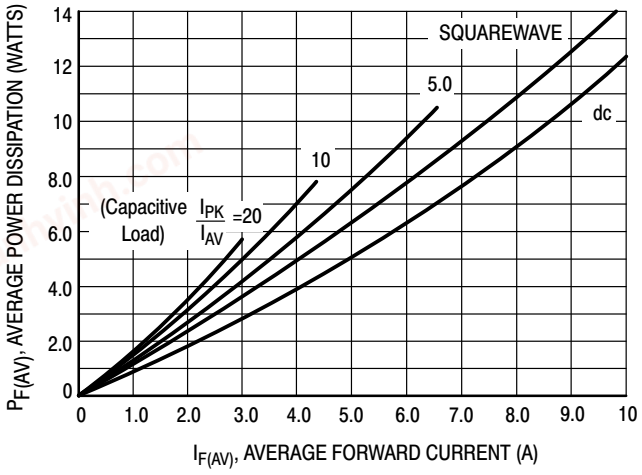



**Figure 9. Power Dissipation**

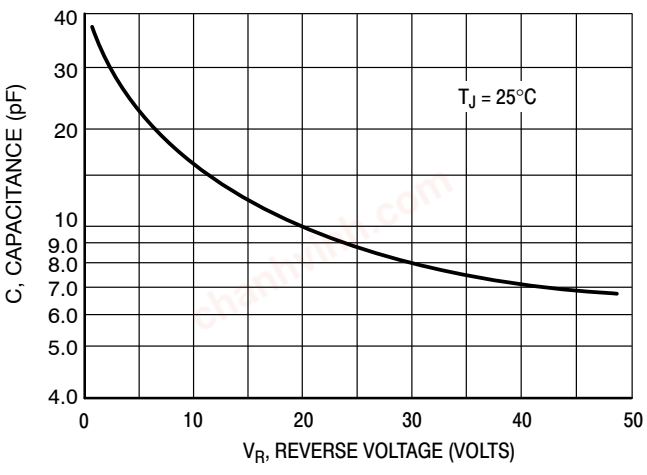



**Figure 10. Typical Capacitance**

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## NOTE 2 — AMBIENT MOUNTING DATA

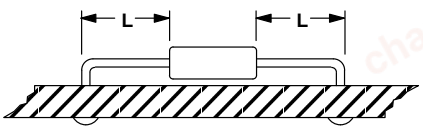
Data shown for thermal resistance junction−to−ambient ($R_{\theta JA}$) for the mountings shown is to be used as typical guideline values for preliminary engineering or in case the tie point temperature cannot be measured.

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

| Mounting Method | | Lead Length, L (IN) | | | | Units |
|---|---|---|---|---|---|---|
| | | 1/8 | 1/4 | 1/2 | 3/4 | |
| 1 | $R_{\theta JA}$ | 50 | 51 | 53 | 55 | °C/W |
| 2 | | 58 | 59 | 61 | 63 | °C/W |
| 3 | | 28 | | | | °C/W |

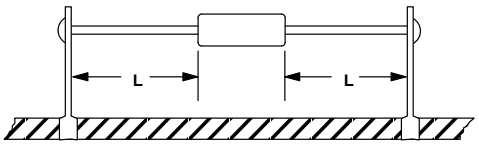
**MOUNTING METHOD 1**

**P.C. Board Where Available Copper Surface area is small.**



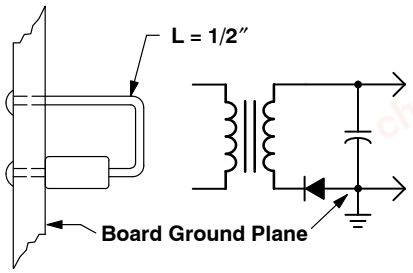

**MOUNTING METHOD 2**

**Vector Push−In Terminals T−28**




**MOUNTING METHOD 3**

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

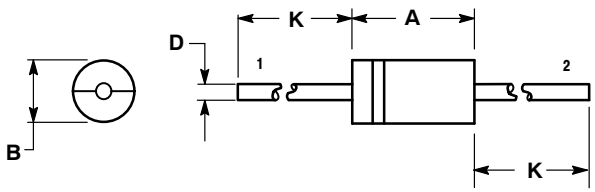


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# MUR405, MUR410, MUR415, MUR420, MUR440, MUR460

## PACKAGE DIMENSIONS

**AXIAL LEAD**
CASE 267−03
(DO−201AD)
ISSUE G




NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

| | INCHES | | MILLIMETERS | |
|---|---|---|---|---|
| DIM | MIN | MAX | MIN | MAX |
| A | 0.287 | 0.374 | 7.30 | 9.50 |
| B | 0.189 | 0.209 | 4.80 | 5.30 |
| D | 0.047 | 0.051 | 1.20 | 1.30 |
| K | 1.000 | --- | 25.40 | --- |

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

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