

# MUR3020WTG, MUR3040WTG, MUR3060WTG

## Switch Mode Power Rectifiers

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

### Features

- Ultrafast 35 and 60 Nanosecond Recovery Time
- 175°C Operating Junction Temperature
- Popular TO-247 Package
- High Voltage Capability to 600 V
- Low Forward Drop
- Low Leakage Specified @ 150°C Case Temperature
- Current Derating Specified @ Both Case and Ambient Temperatures
- Epoxy Meets UL 94 V-0 @ 0.125 in
- High Temperature Glass Passivated Junction
- These Devices are Pb-Free, Halogen Free/BFR Free and are RoHS Compliant\*

### Mechanical Characteristics:

- Case: Epoxy, Molded
- Weight: 4.3 Grams (Approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead Temperature for Soldering Purposes: 260°C Max. for 10 Seconds
- Shipped 30 Units Per Plastic Tube

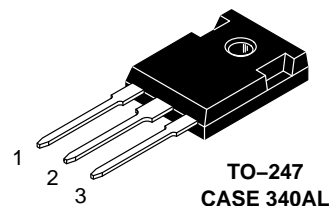
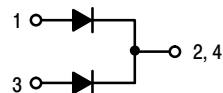
\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.



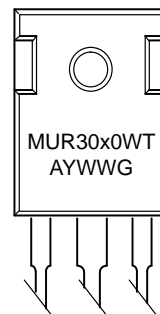
ON Semiconductor®

<http://onsemi.com>

## ULTRAFAST RECTIFIERS 30 AMPERES, 200-600 VOLTS



### MARKING DIAGRAM



MUR30x0WT = Device Code  
 x = 2, 4 or 6  
 A = Assembly Location  
 Y = Year  
 WW = Work Week  
 G = Pb-Free Package

### ORDERING INFORMATION

| Device     | Package             | Shipping      |
|------------|---------------------|---------------|
| MUR3020WTG | TO-247<br>(Pb-Free) | 30 Units/Rail |
| MUR3040WTG | TO-247<br>(Pb-Free) | 30 Units/Rail |
| MUR3060WTG | TO-247<br>(Pb-Free) | 30 Units/Rail |

# MUR3020WTG, MUR3040WTG, MUR3060WTG

## MAXIMUM RATINGS (Per Leg)

| Rating   | Symbol                          | MUR3020WT    | MUR3040WT | MUR3060WT | Unit |
|--|---------------------------------|--------------|-----------|-----------|------|
| Peak Repetitive Reverse Voltage<br>Working Peak Reverse Voltage<br>DC Blocking Voltage                   | $V_{RRM}$<br>$V_{RWM}$<br>$V_R$ | 200          | 400       | 600       | V    |
| Average Rectified Forward Current @ 145°C<br>Total Device  | $I_{F(AV)}$                     | 15<br>30     |           |           | A    |
| Peak Repetitive Surge Current<br>(Rated $V_R$ , Square Wave, 20 kHz, $T_C = 145^\circ\text{C}$ )         | $I_{FM}$                        | 30           |           |           | A    |
| Nonrepetitive Peak Surge Current (Surge applied at rated load conditions, halfwave, single phase, 60 Hz) | $I_{FSM}$                       | 200          | 150       | 150       | A    |
| Operating Junction 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 (Per Leg)

| Rating   | Symbol                             | MUR3020WT | MUR3040WT | MUR3060WT | Unit |
|--|------------------------------------|-----------|-----------|-----------|------|
| Maximum Thermal Resistance,<br>- Junction-to-Case<br>- Junction-to-Ambient | $R_{\theta JC}$<br>$R_{\theta JA}$ | 1.5<br>40 |           |           | °C/W |

## ELECTRICAL CHARACTERISTICS (Per Leg)

| Rating  | Symbol   | MUR3020WT    | MUR3040WT    | MUR3060WT  | Unit          |
|---|----------|--------------|--------------|------------|---------------|
| Maximum Instantaneous Forward Voltage (Note 1)<br>( $I_F = 15$ Amp, $T_C = 150^\circ\text{C}$ )<br>( $I_F = 15$ Amp, $T_C = 25^\circ\text{C}$ )   | $V_F$    | 0.85<br>1.05 | 1.12<br>1.25 | 1.4<br>1.7 | V             |
| Maximum Instantaneous Reverse Current (Note 1)<br>(Rated DC Voltage, $T_J = 150^\circ\text{C}$ )<br>(Rated DC Voltage, $T_J = 25^\circ\text{C}$ ) | $i_R$    | 500<br>10    | 500<br>10    | 1000<br>10 | $\mu\text{A}$ |
| Maximum Reverse Recovery Time ( $i_F = 1.0$ A, $di/dt = 50$ Amps/ $\mu\text{s}$ )   | $t_{rr}$ | 35           | 60           | 60         | ns            |
| Typical Peak Reverse Recovery Current<br>( $i_F = 1.0$ A, $di/dt = 50$ A/ $\mu\text{s}$ )   | $I_{RM}$ | 0.7          |              |            | A             |

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.

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

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## MUR3020WT

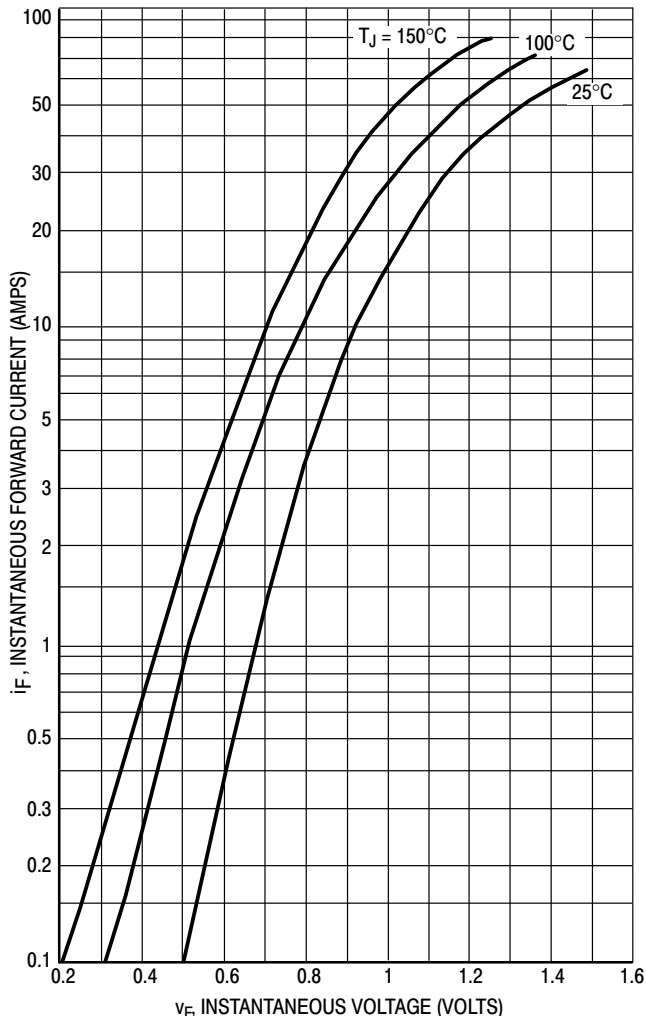
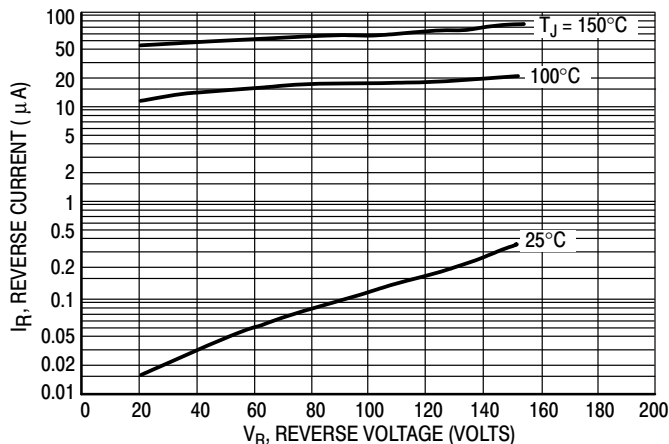


Figure 1. Typical Forward Voltage (Per Leg)



\*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 2. Typical Reverse Current (Per Leg)\*

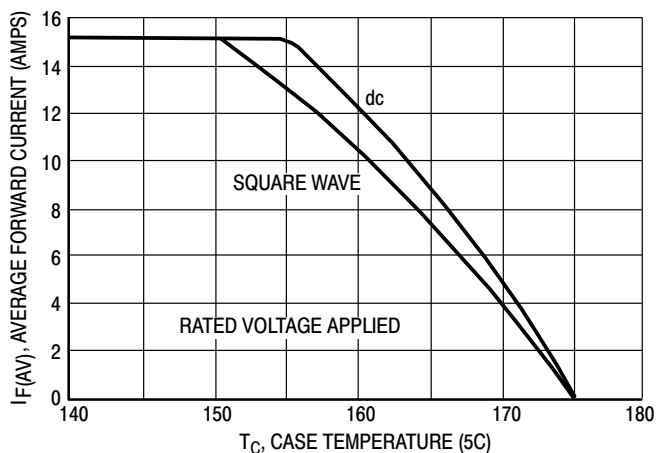


Figure 3. Current Derating, Case (Per Leg)

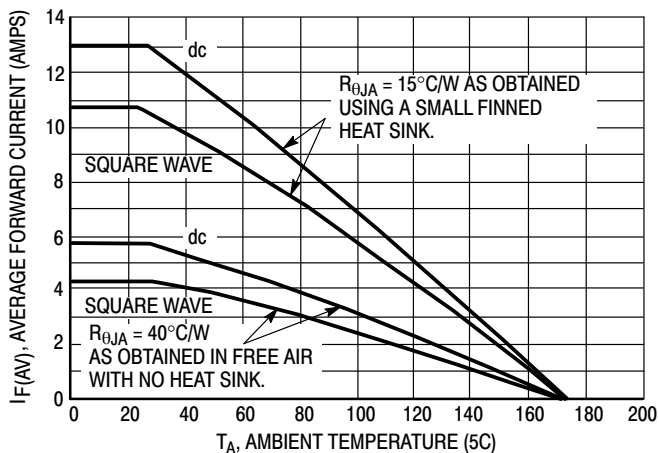


Figure 4. Current Derating, Ambient (Per Leg)

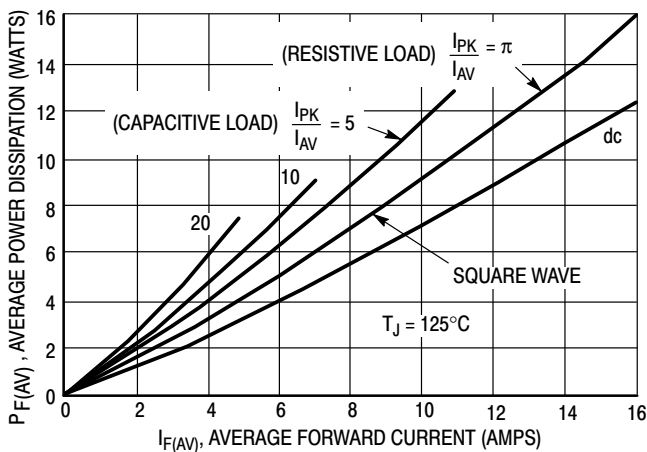


Figure 5. Power Dissipation (Per Leg)

# MUR3020WTG, MUR3040WTG, MUR3060WTG

## MUR3040WTG

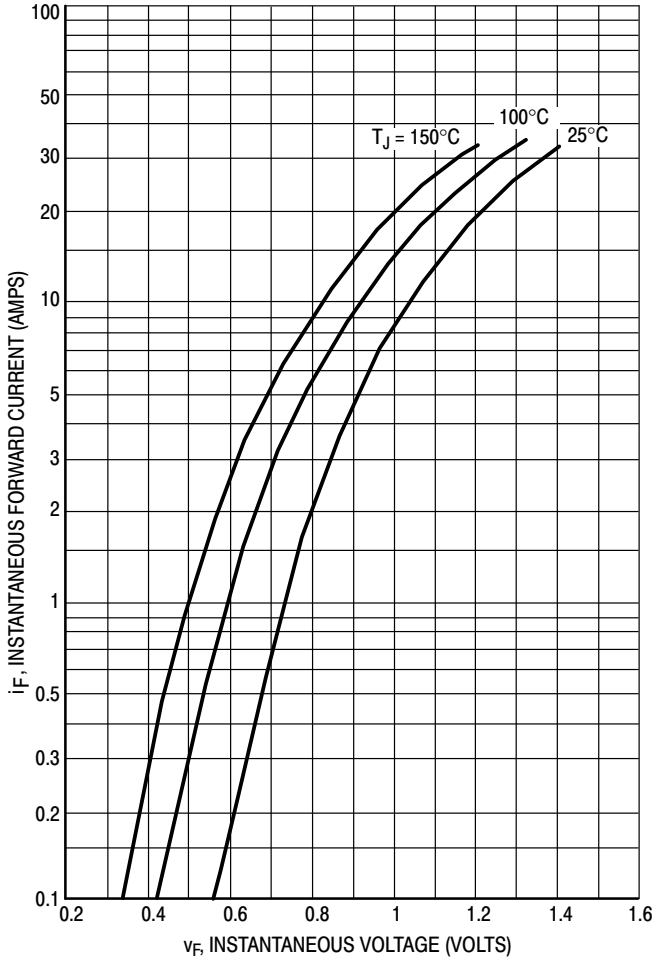
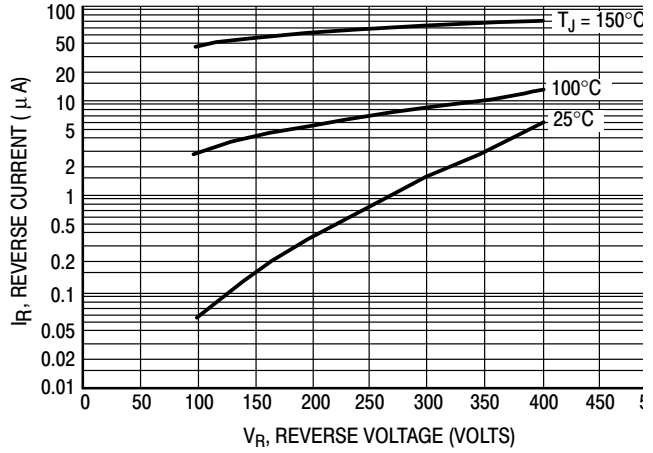


Figure 6. Typical Forward Voltage (Per Leg)



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

Figure 7. Typical Reverse Current (Per Leg)\*

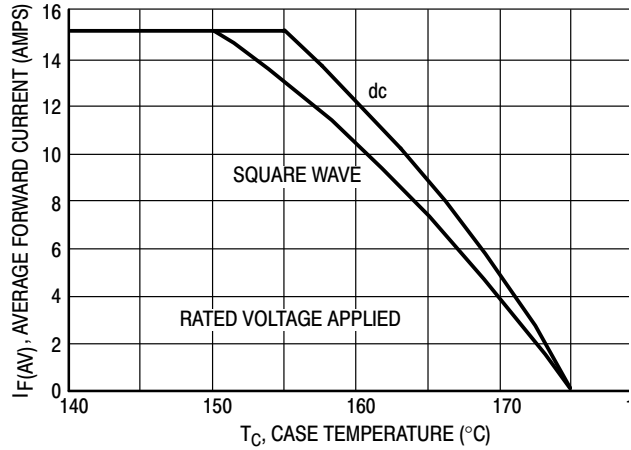


Figure 8. Current Derating, Case (Per Leg)

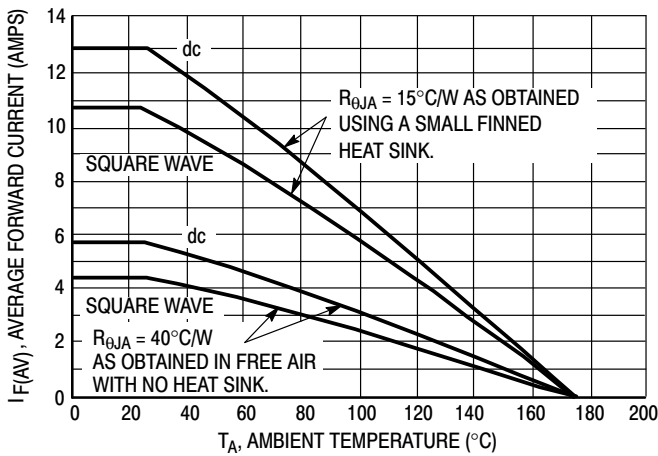


Figure 9. Current Derating, Ambient (Per Leg)

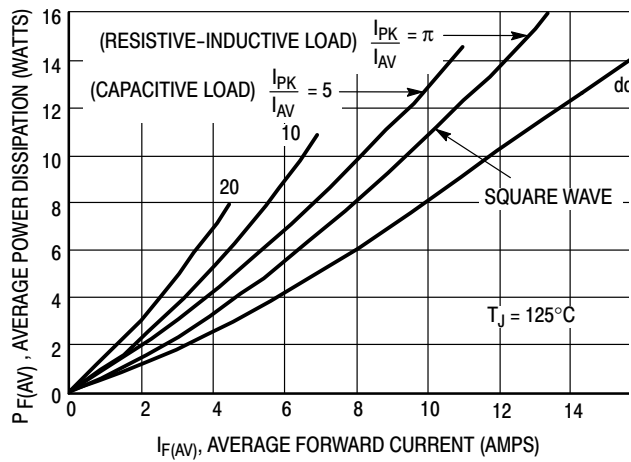


Figure 10. Power Dissipation (Per Leg)

# MUR3020WTG, MUR3040WTG, MUR3060WTG

## MUR3060WT

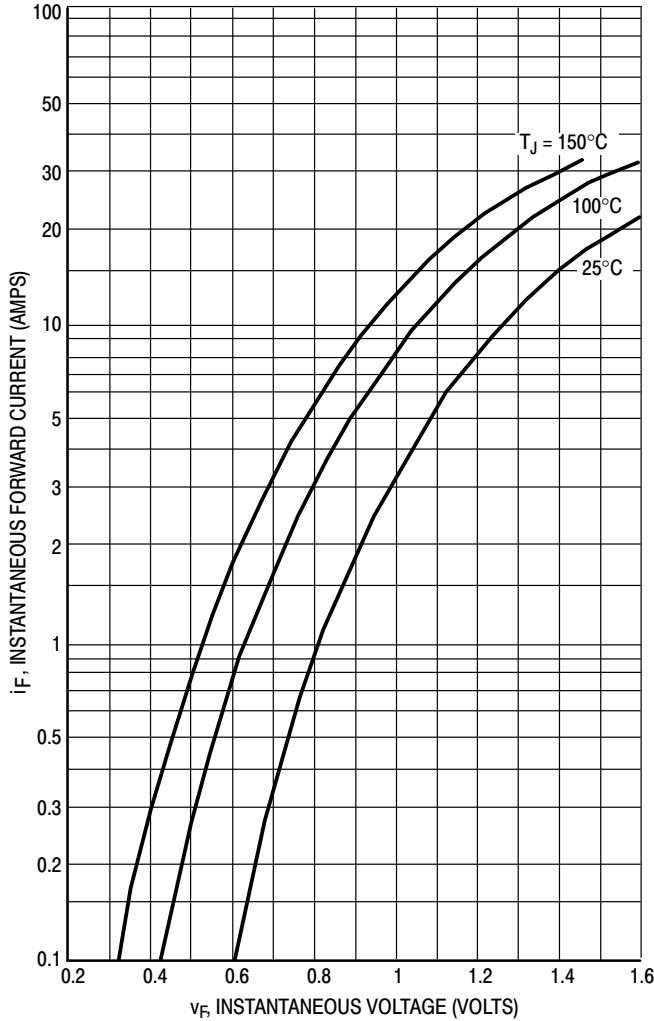
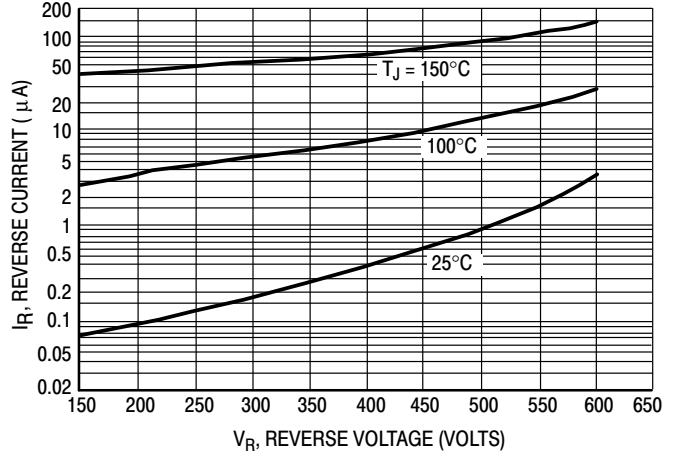


Figure 11. Typical Forward Voltage (Per Leg)



\*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 12. Typical Reverse Current (Per Leg)\*

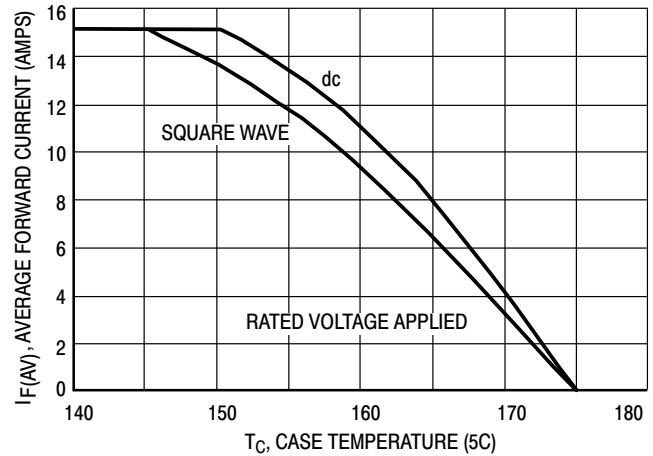


Figure 13. Current Derating, Case (Per Leg)

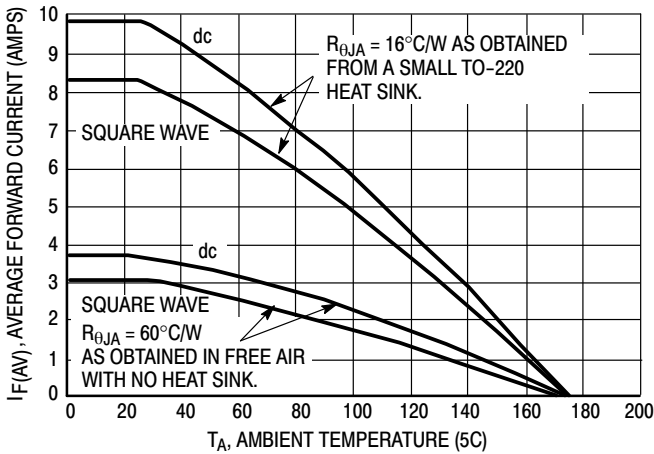


Figure 14. Current Derating, Ambient (Per Leg)

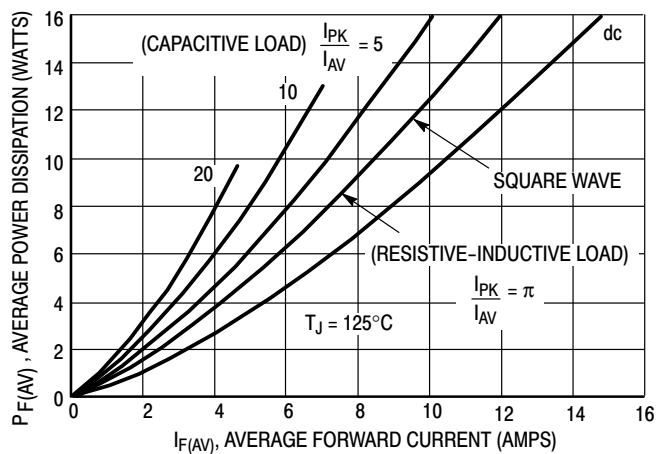


Figure 15. Power Dissipation (Per Leg)

# MUR3020WTG, MUR3040WTG, MUR3060WTG

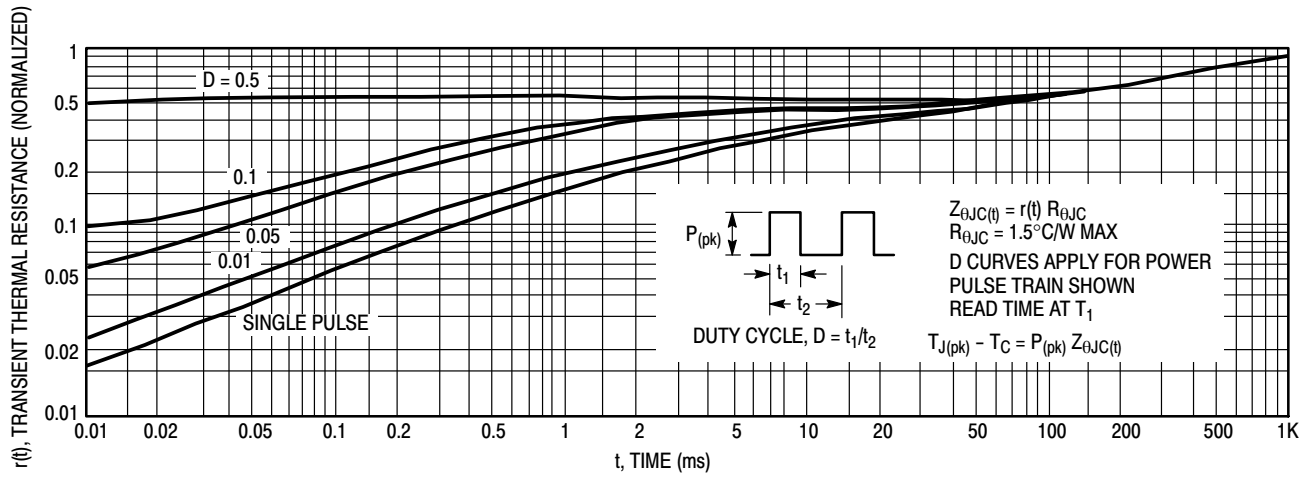


Figure 16. Thermal Response

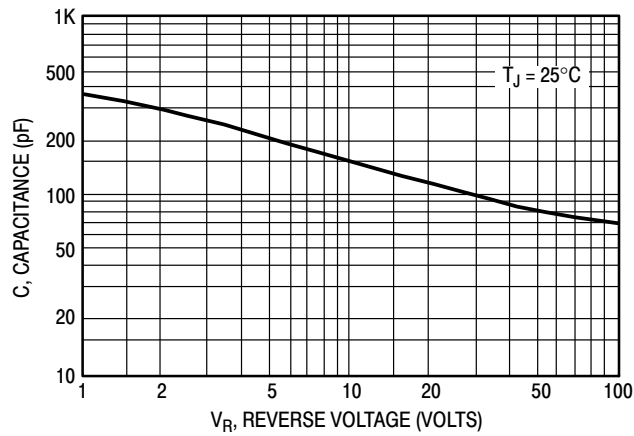
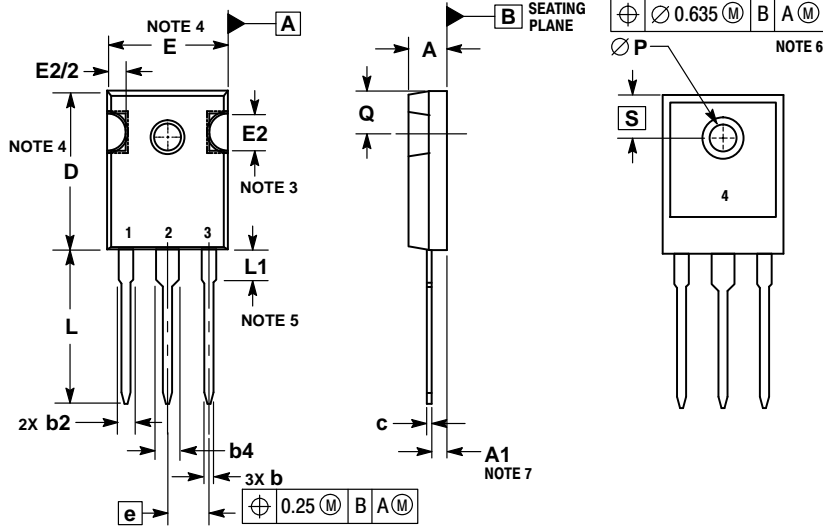


Figure 17. Typical Capacitance (Per Leg)

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## PACKAGE DIMENSIONS

### TO-247 CASE 340AL ISSUE A



#### NOTES:

1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. SLOT REQUIRED, NOTCH MAY BE ROUNDED.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH. MOLD FLASH SHALL NOT EXCEED 0.13 PER SIDE. THESE DIMENSIONS ARE MEASURED AT THE OUTERMOST EXTREME OF THE PLASTIC BODY.
5. LEAD FINISH IS UNCONTROLLED IN THE REGION DEFINED BY L1.
6.  $\varnothing P$  SHALL HAVE A MAXIMUM DRAFT ANGLE OF 1.5° TO THE TOP OF THE PART WITH A MAXIMUM DIAMETER OF 3.91.
7. DIMENSION A1 TO BE MEASURED IN THE REGION DEFINED BY L1.

| MILLIMETERS |             |
|-------------|-------------|
| DIM         | MIN MAX     |
| A           | 4.70 5.30   |
| A1          | 2.20 2.60   |
| b           | 1.00 1.40   |
| b2          | 1.65 2.35   |
| b4          | 2.60 3.40   |
| c           | 0.40 0.80   |
| D           | 20.30 21.40 |
| E           | 15.50 16.25 |
| E2          | 4.32 5.49   |
| e           | 5.45 BSC    |
| L           | 19.80 20.80 |
| L1          | 3.50 4.50   |
| P           | 3.55 3.65   |
| Q           | 5.40 6.20   |
| S           | 6.15 BSC    |

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