

# MUR805, MUR810, MUR815, MUR820, MUR840, MUR860, MURF860

Preferred Devices

## SWITCHMODE™ Power Rectifiers

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

### Features

- Ultrafast 25 and 50 Nanosecond Recovery Time
- 175°C Operating Junction Temperature
- Epoxy Meets UL 94 V-0 @ 0.125 in
- Low Forward Voltage
- Low Leakage Current
- Reverse Voltage to 600 V
- Pb-Free Packages are Available\*

### Mechanical Characteristics:

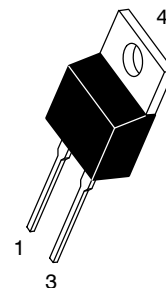
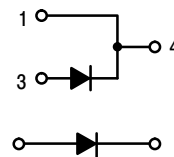
- Case: Epoxy, Molded
- Weight: 1.9 Grams (Approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead Temperature for Soldering Purposes: 260°C Max for 10 Seconds



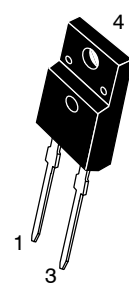
ON Semiconductor®

<http://onsemi.com>

## ULTRAFAST RECTIFIERS 8.0 AMPERES, 50–600 VOLTS

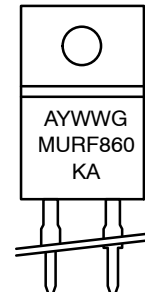
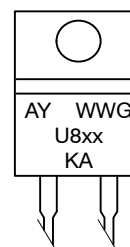


TO-220AC  
CASE 221B  
PLASTIC



TO-220 FULLPAK  
CASE 221E  
STYLE 1

### MARKING DIAGRAMS



A = Assembly Location  
Y = Year  
WW = Work Week  
U8XX = Device Code  
xx = 05, 10, 15, 20, 40, or 60  
G = Pb-Free Package  
KA = Diode Polarity

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

### ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 7 of this data sheet.

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

# MUR805, MUR810, MUR815, MUR820, MUR840, MUR860, MURF860

## MAXIMUM RATINGS

| Rating                                                                                                     | Symbol                          | MUR         |     |     |     |     |     | Unit             |
|------------------------------------------------------------------------------------------------------------|---------------------------------|-------------|-----|-----|-----|-----|-----|------------------|
|                                                                                                            |                                 | 805         | 810 | 815 | 820 | 840 | 860 |                  |
| 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<br>Total Device, (Rated $V_R$ ), $T_C = 150^\circ\text{C}$               | $I_{F(AV)}$                     | 8.0         |     |     |     |     |     | A                |
| Peak Repetitive Forward Current<br>(Rated $V_R$ , Square Wave, 20 kHz), $T_C = 150^\circ\text{C}$          | $I_{FM}$                        | 16          |     |     |     |     |     | A                |
| Nonrepetitive Peak Surge Current<br>(Surge applied at rated load conditions halfwave, single phase, 60 Hz) | $I_{FSM}$                       | 100         |     |     |     |     |     | A                |
| Operating Junction Temperature and Storage Temperature Range                                               | $T_J, T_{stg}$                  | -65 to +175 |     |     |     |     |     | $^\circ\text{C}$ |

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  |     |     |     |     |     | Unit |
|-----------------------------------------------------|-----------------|------|-----|-----|-----|-----|-----|------|
|                                                     |                 | 805  | 810 | 815 | 820 | 840 | 860 |      |
| Maximum Thermal Resistance, Junction-to-Case        | $R_{\theta JC}$ | 3.0  |     |     |     | 2.0 |     | °C/W |
| Thermal Resistance, Junction-to-Case<br>MURF860     | $R_{\theta JC}$ | 4.75 |     |     |     |     |     | °C/W |
| Thermal Resistance, Junction-to-Ambient             | $R_{\theta JA}$ | 73   |     |     |     |     |     | °C/W |
| Thermal Resistance, Junction-to-Ambiente<br>MURF860 | $R_{\theta JA}$ | 75   |     |     |     |     |     | °C/W |

## ELECTRICAL CHARACTERISTICS

| Rating                                                                                                                                                                       | Symbol   | MUR            |     |     |     |              |              | Unit          |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|----------------|-----|-----|-----|--------------|--------------|---------------|
|                                                                                                                                                                              |          | 805            | 810 | 815 | 820 | 840          | 860          |               |
| Maximum Instantaneous Forward Voltage (Note 1)<br>( $I_F = 8.0\text{ A}$ , $T_C = 150^\circ\text{C}$ )<br>( $I_F = 8.0\text{ A}$ , $T_C = 25^\circ\text{C}$ )                | $V_F$    | 0.895<br>0.975 |     |     |     | 1.00<br>1.30 | 1.20<br>1.50 | V             |
| Maximum Instantaneous Reverse Current (Note 1)<br>(Rated DC Voltage, $T_J = 150^\circ\text{C}$ )<br>(Rated DC Voltage, $T_J = 25^\circ\text{C}$ )                            | $i_R$    | 250<br>5.0     |     |     |     | 500<br>10    |              | $\mu\text{A}$ |
| Maximum Reverse Recovery Time<br>( $I_F = 1.0\text{ A}$ , $di/dt = 50\text{ A}/\mu\text{s}$ )<br>( $I_F = 0.5\text{ A}$ , $i_R = 1.0\text{ A}$ , $I_{REC} = 0.25\text{ A}$ ) | $t_{rr}$ | 35<br>25       |     |     |     | 60<br>50     |              | ns            |

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

# MUR805, MUR810, MUR815, MUR820, MUR840, MUR860, MURF860

## MUR805, MUR810, MUR815, MUR820

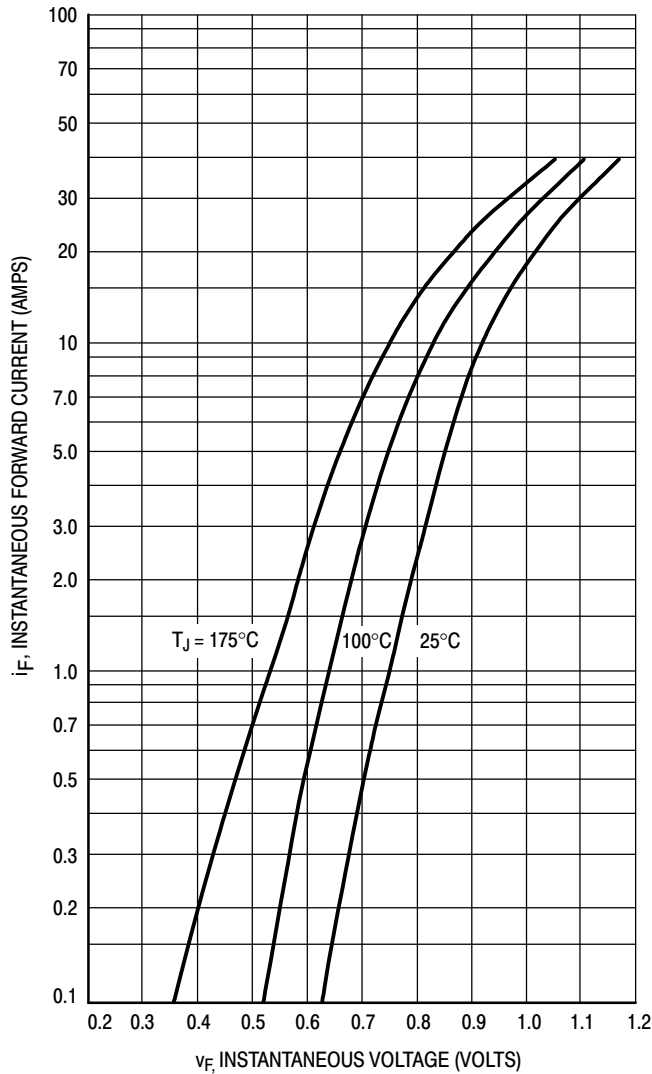


Figure 1. Typical Forward Voltage

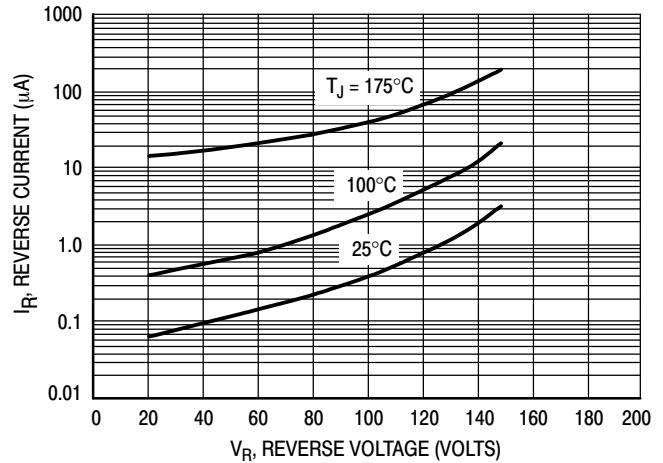


Figure 2. Typical Reverse Current\*

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

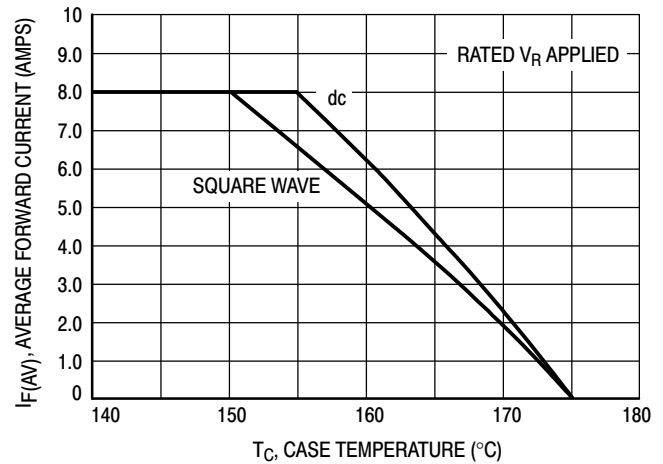


Figure 3. Current Derating, Case

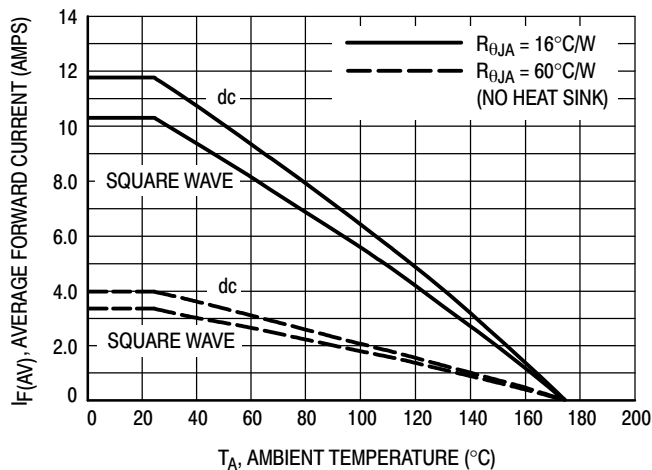


Figure 4. Current Derating, Ambient

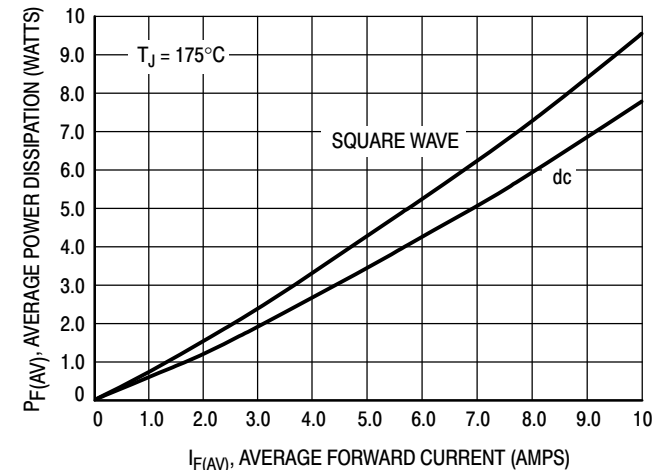


Figure 5. Power Dissipation

MUR840

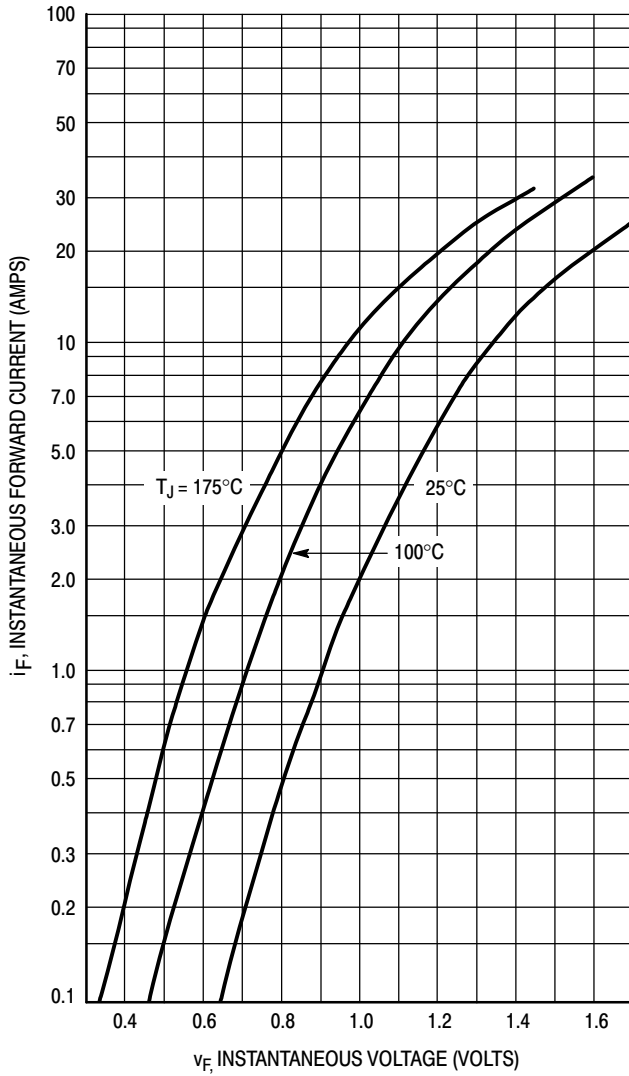


Figure 6. Typical Forward Voltage

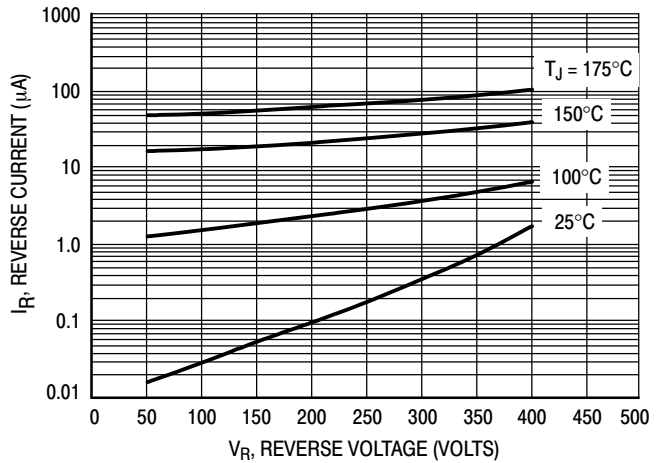


Figure 7. Typical Reverse Current\*

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

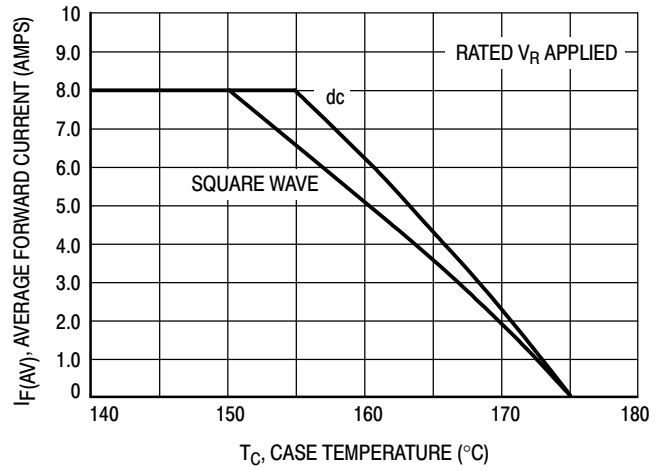


Figure 8. Current Derating, Case

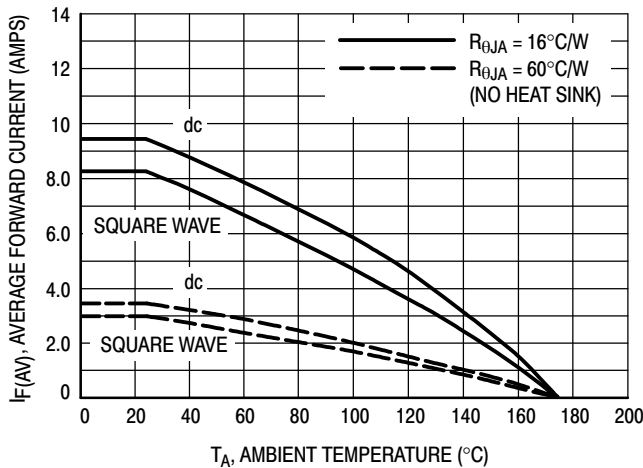


Figure 9. Current Derating, Ambient

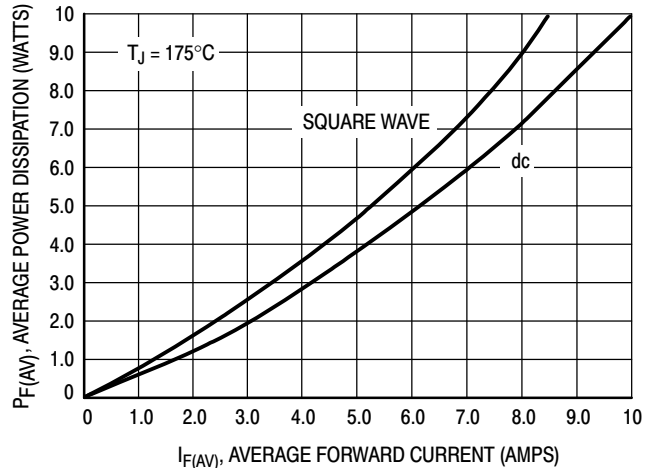


Figure 10. Power Dissipation

MUR860, MURF860

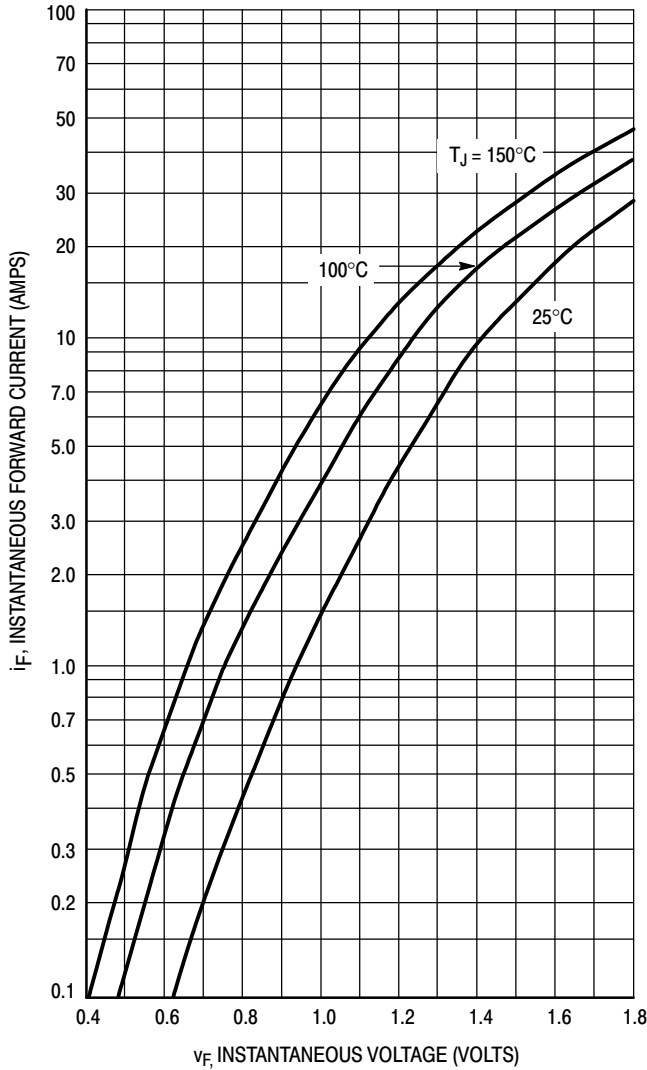


Figure 11. Typical Forward Voltage

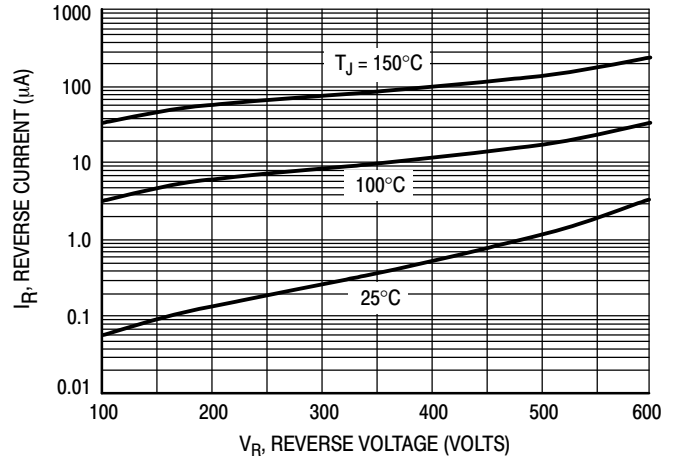


Figure 12. Typical Reverse Current\*

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

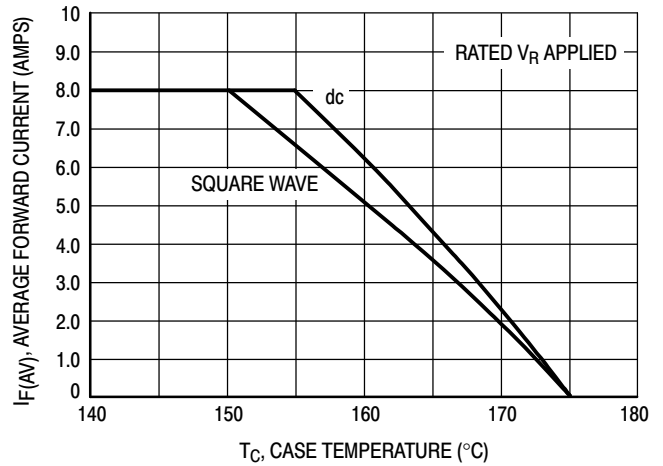


Figure 13. Current Derating, Case

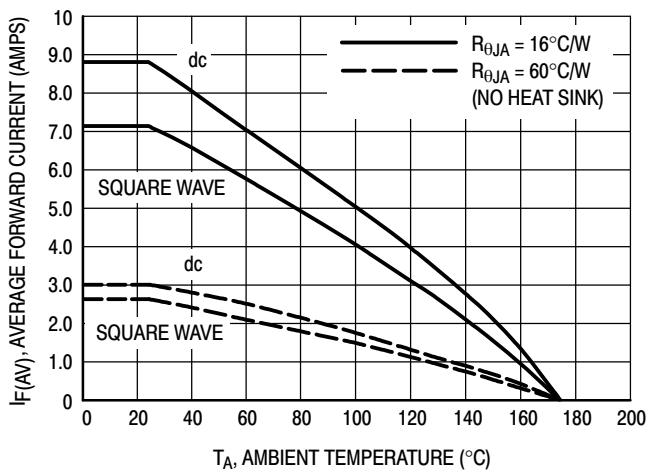


Figure 14. Current Derating, Ambient

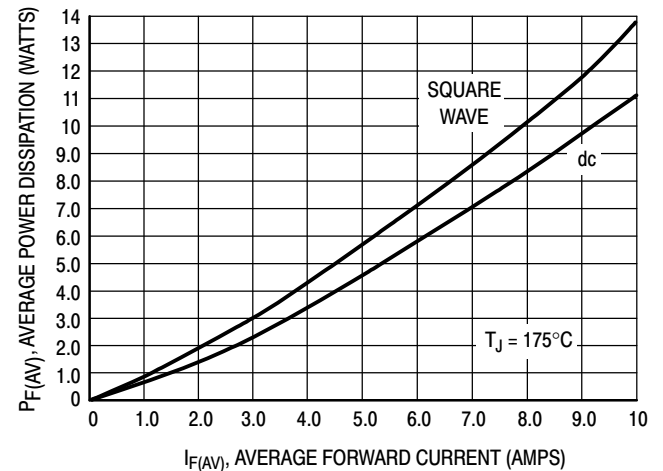
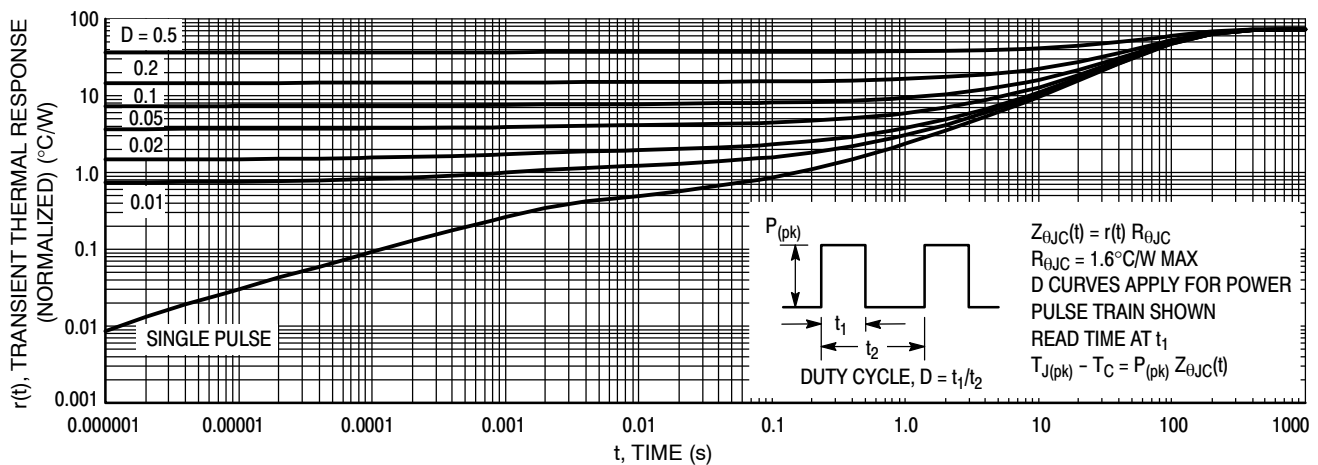
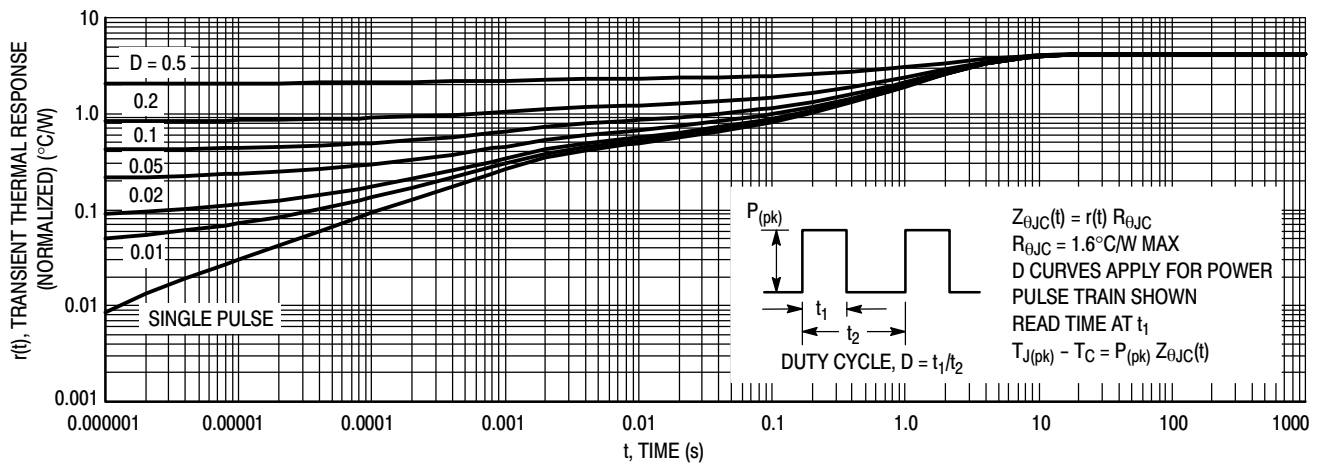
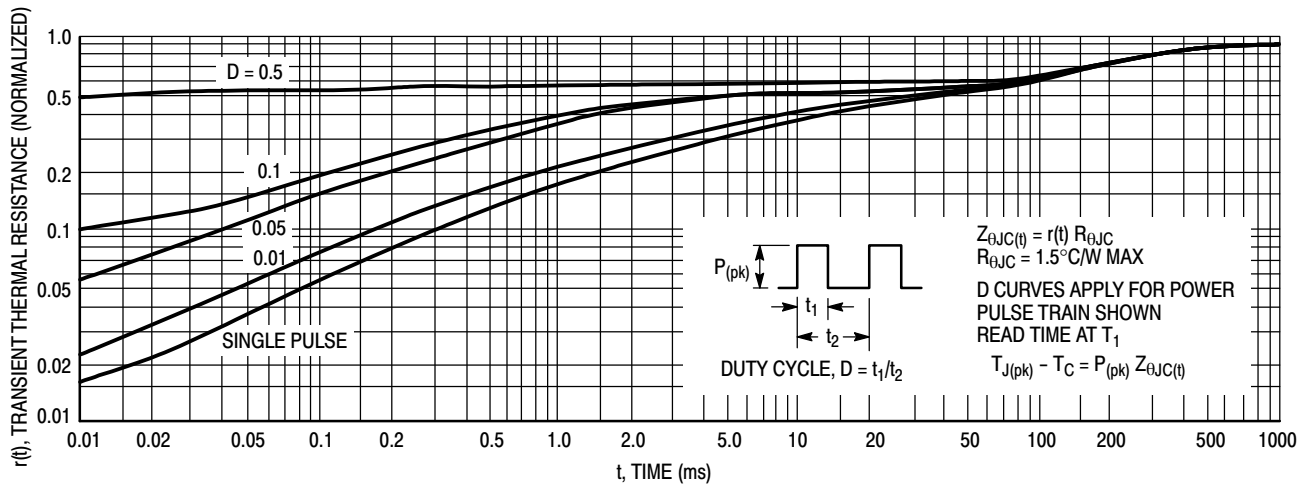
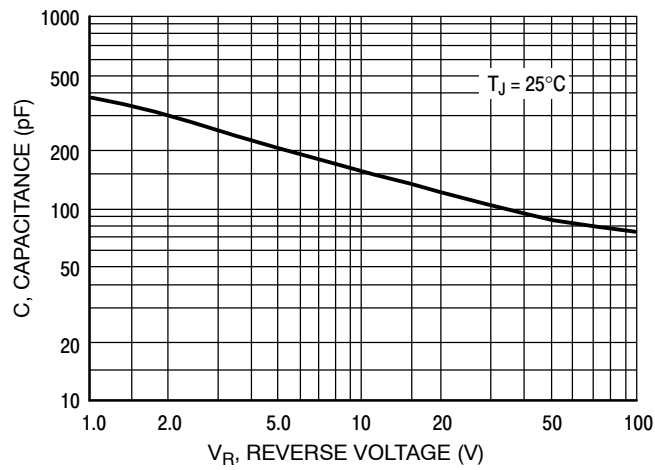


Figure 15. Power Dissipation

# MUR805, MUR810, MUR815, MUR820, MUR840, MUR860, MURF860



# MUR805, MUR810, MUR815, MUR820, MUR840, MUR860, MURF860



**Figure 19. Typical Capacitance**

## ORDERING INFORMATION

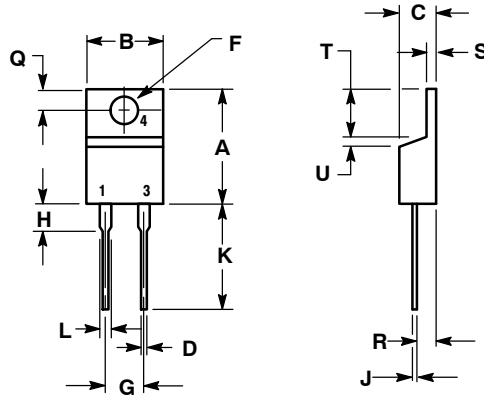
| Device   | Package            | Shipping <sup>†</sup> |
|----------|--------------------|-----------------------|
| MUR805   | TO-220AC           | 50 Units / Rail       |
| MUR805G  | TO-220AC (Pb-Free) |                       |
| MUR810   | TO-220AC           |                       |
| MUR810G  | TO-220AC (Pb-Free) |                       |
| MUR815   | TO-220AC           |                       |
| MUR815G  | TO-220AC (Pb-Free) |                       |
| MUR820   | TO-220AC           |                       |
| MUR820G  | TO-220AC (Pb-Free) |                       |
| MUR840   | TO-220AC           |                       |
| MUR840G  | TO-220AC (Pb-Free) |                       |
| MUR860   | TO-220AC           |                       |
| MUR860G  | TO-220AC (Pb-Free) |                       |
| MURF860G | TO-220FP (Pb-Free) |                       |

<sup>†</sup>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.

# MUR805, MUR810, MUR815, MUR820, MUR840, MUR860, MURF860

## PACKAGE DIMENSIONS

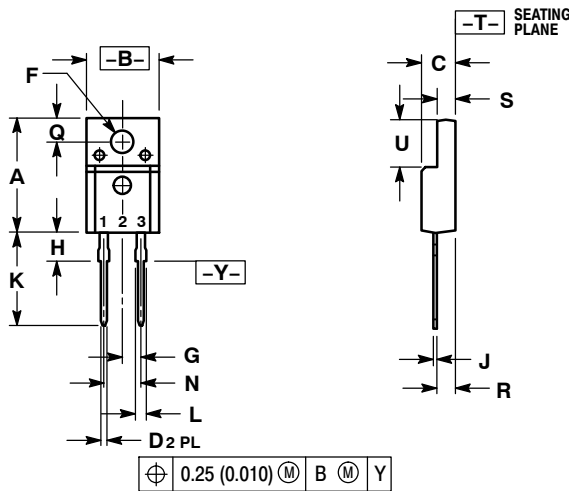
### TO-220AC TWO-LEAD CASE 221B-04 ISSUE E



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

| DIM | INCHES |       | MILLIMETERS |       |
|-----|--------|-------|-------------|-------|
|     | MIN    | MAX   | MIN         | MAX   |
| A   | 0.595  | 0.620 | 15.11       | 15.75 |
| B   | 0.380  | 0.405 | 9.65        | 10.29 |
| C   | 0.160  | 0.190 | 4.06        | 4.82  |
| D   | 0.025  | 0.035 | 0.64        | 0.89  |
| F   | 0.142  | 0.161 | 3.61        | 4.09  |
| G   | 0.190  | 0.210 | 4.83        | 5.33  |
| H   | 0.110  | 0.130 | 2.79        | 3.30  |
| J   | 0.014  | 0.025 | 0.36        | 0.64  |
| K   | 0.500  | 0.562 | 12.70       | 14.27 |
| L   | 0.045  | 0.060 | 1.14        | 1.52  |
| Q   | 0.100  | 0.120 | 2.54        | 3.04  |
| R   | 0.080  | 0.110 | 2.04        | 2.79  |
| S   | 0.045  | 0.055 | 1.14        | 1.39  |
| T   | 0.235  | 0.255 | 5.97        | 6.48  |
| U   | 0.000  | 0.050 | 0.000       | 1.27  |

### TO-220 FULLPAK, 2-LEAD CASE 221E-01 ISSUE A



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

| DIM | INCHES    |       | MILLIMETERS |       |
|-----|-----------|-------|-------------|-------|
|     | MIN       | MAX   | MIN         | MAX   |
| A   | 0.617     | 0.633 | 15.67       | 16.07 |
| B   | 0.392     | 0.408 | 9.96        | 10.36 |
| C   | 0.177     | 0.193 | 4.50        | 4.90  |
| D   | 0.024     | 0.039 | 0.60        | 1.00  |
| F   | 0.121     | 0.129 | 3.08        | 3.28  |
| G   | 0.100 BSC |       | 2.54 BSC    |       |
| H   | 0.117     | 0.133 | 2.98        | 3.38  |
| J   | 0.018     | 0.025 | 0.45        | 0.64  |
| K   | 0.499     | 0.562 | 12.68       | 14.27 |
| L   | 0.045     | 0.060 | 1.14        | 1.52  |
| N   | 0.200 BSC |       | 5.08 BSC    |       |
| Q   | 0.122     | 0.138 | 3.10        | 3.50  |
| R   | 0.101     | 0.117 | 2.56        | 2.96  |
| S   | 0.092     | 0.108 | 2.34        | 2.74  |
| U   | 0.255     | 0.271 | 6.48        | 6.88  |

- STYLE 1:
1. CATHODE
  2. N/A
  3. ANODE

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