

# MUR1510, MUR1515, MUR1520, MUR1540, MUR1560, MURF1560

Preferred Devices

## 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 35 and 60 Nanosecond Recovery Time
- 175°C Operating Junction Temperature
- High Voltage Capability to 600 V
- Low Forward Drop
- Low Leakage Specified @ 150°C Case Temperature
- Current Derating Specified @ Both Case and Ambient Temperatures
- Pb-Free Packages are Available\*

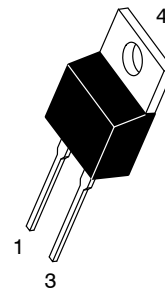
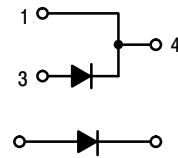
### Mechanical Characteristics:

- 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

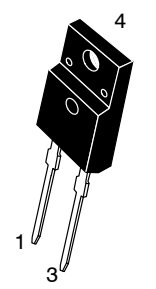


ON Semiconductor®

## ULTRAFAST RECTIFIERS 15 AMPERES, 100–600 VOLTS

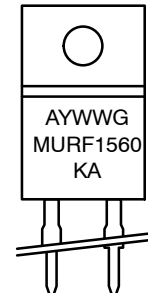
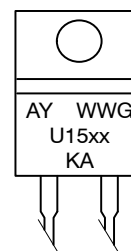


TO-220AC  
CASE 221B  
STYLE 1



TO-220 FULLPAK  
CASE 221E  
STYLE 1

### MARKING DIAGRAMS



- A = Assembly Location
- Y = Year
- WW = Work Week
- G = Pb-Free Package
- U15xx = Device Code  
xx = 10, 15, 20, 40 or 60
- KA = Diode Polarity

### 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.

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

# MUR1510, MUR1515, MUR1520, MUR1540, MUR1560, MURF1560

## MAXIMUM RATINGS

| Rating  | Symbol                          | MUR                            |      |      |                                |      | Unit             |
|---|---------------------------------|--------------------------------|------|------|--------------------------------|------|------------------|
|   |                                 | 1510                           | 1515 | 1520 | 1540                           | 1560 |                  |
| Peak Repetitive Reverse Voltage<br>Working Peak Reverse Voltage<br>DC Blocking Voltage                  | $V_{RRM}$<br>$V_{RWM}$<br>$V_R$ | 100                            | 150  | 200  | 400                            | 600  | V                |
| Average Rectified Forward Current (Rated $V_R$ )  | $I_{F(AV)}$                     | 15 @ $T_C = 150^\circ\text{C}$ |      |      | 15 @ $T_C = 145^\circ\text{C}$ |      | A                |
| Peak Rectified Forward Current (Rated $V_R$ , Square Wave, 20 kHz)                                      | $I_{FRM}$                       | 30 @ $T_C = 150^\circ\text{C}$ |      |      | 30 @ $T_C = 145^\circ\text{C}$ |      | A                |
| Nonrepetitive Peak Surge Current (Surge applied at rated load conditions halfwave, single phase, 60 Hz) | $I_{FSM}$                       | 200                            |      |      | 150                            |      | 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

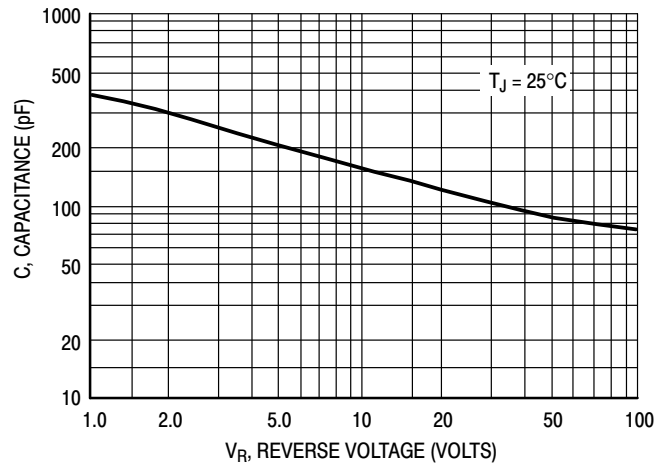
| Parameter   | Symbol                             | Value      | Unit               |
|---|------------------------------------|------------|--------------------|
| MUR1510 Series: Thermal Resistance<br>Junction-to-Case<br>Junction-to-Ambient | $R_{\theta JC}$<br>$R_{\theta JA}$ | 1.5<br>73  | $^\circ\text{C/W}$ |
| MURF1560: Thermal Resistance<br>Junction-to-Case<br>Junction-to-Ambient       | $R_{\theta JC}$<br>$R_{\theta JA}$ | 4.25<br>75 | $^\circ\text{C/W}$ |

## ELECTRICAL CHARACTERISTICS

| Characteristic  | Symbol   | 1510 | 1515         | 1520 | 1540         | 1560         | Unit          |
|---|----------|------|--------------|------|--------------|--------------|---------------|
| Maximum Instantaneous Forward Voltage (Note 1)<br>( $i_F = 15\text{ A}$ , $T_C = 150^\circ\text{C}$ )<br>( $i_F = 15\text{ A}$ , $T_C = 25^\circ\text{C}$ ) | $V_F$    |      | 0.85<br>1.05 |      | 1.12<br>1.25 | 1.20<br>1.50 | V             |
| Maximum Instantaneous Reverse Current (Note 1)<br>(Rated DC Voltage, $T_C = 150^\circ\text{C}$ )<br>(Rated DC Voltage, $T_C = 25^\circ\text{C}$ )           | $i_R$    |      | 500<br>10    |      | 500<br>10    | 1000<br>10   | $\mu\text{A}$ |
| Maximum Reverse Recovery Time<br>( $I_F = 1.0\text{ A}$ , $di/dt = 50\text{ A}/\mu\text{s}$ )   | $t_{rr}$ |      | 35           |      |              | 60           | ns            |

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

# MUR1510, MUR1515, MUR1520, MUR1540, MUR1560, MURF1560



**Figure 19. Typical Capacitance**

## ORDERING INFORMATION

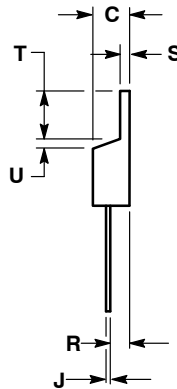
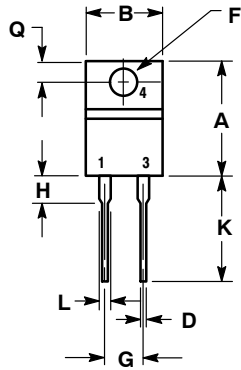
| Device    | Package               | Shipping <sup>†</sup> |
|-----------|-----------------------|-----------------------|
| MUR1510   | TO-220AC              | 50 Units / Rail       |
| MUR1510G  | TO-220AC<br>(Pb-Free) |                       |
| MUR1515   | TO-220AC              |                       |
| MUR1515G  | TO-220AC<br>(Pb-Free) |                       |
| MUR1520   | TO-220AC              |                       |
| MUR1520G  | TO-220AC<br>(Pb-Free) |                       |
| MUR1540   | TO-220AC              |                       |
| MUR1540G  | TO-220AC<br>(Pb-Free) |                       |
| MUR1560   | TO-220AC              |                       |
| MUR1560G  | TO-220AC<br>(Pb-Free) |                       |
| MURF1560G | TO-220FP<br>(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.

# MUR1510, MUR1515, MUR1520, MUR1540, MUR1560, MURF1560

## PACKAGE DIMENSIONS

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

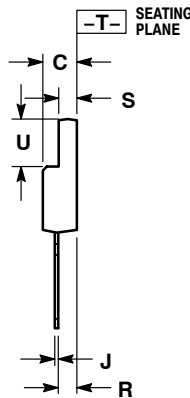
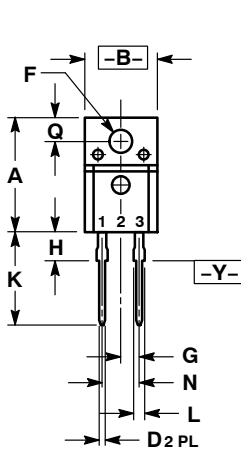


NOTES:

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:

- PIN 1. CATHODE
- N/A
- ANODE

|          |              |                   |   |                   |   |
|----------|--------------|-------------------|---|-------------------|---|
| $\oplus$ | 0.25 (0.010) | $\textcircled{M}$ | B | $\textcircled{M}$ | Y |
|----------|--------------|-------------------|---|-------------------|---|