

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:

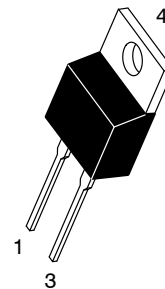
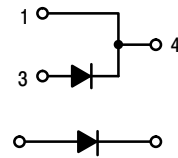
- Case: Epoxy, Molded
- Weight: 1.9 Grams (Approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead Temperature for Soldering Purposes: 260°C Max. for 10 Seconds



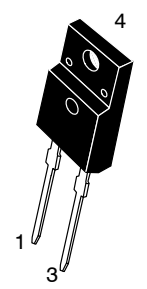
ON Semiconductor®

<http://onsemi.com>

ULTRAFAST RECTIFIERS 15 AMPERES, 100–600 VOLTS

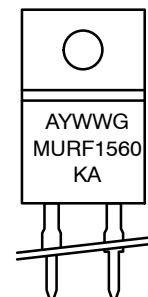


TO-220AC
CASE 221B
STYLE 1



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.

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MAXIMUM RATINGS

| Rating | Symbol | MUR | | | | | Unit |
|---|---------------------------------|--------------------------------|------|------|--------------------------------|------|------------------|
| | | 1510 | 1515 | 1520 | 1540 | 1560 | |
| Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage | V_{RRM} V_{RWM} 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 Junction-to-Case Junction-to-Ambient | $R_{\theta JC}$ $R_{\theta JA}$ | 1.5 73 | $^\circ\text{C/W}$ |
| MURF1560: Thermal Resistance Junction-to-Case Junction-to-Ambient | $R_{\theta JC}$ $R_{\theta JA}$ | 4.25 75 | $^\circ\text{C/W}$ |

ELECTRICAL CHARACTERISTICS

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

1. Pulse Test: Pulse Width = 300 μs , Duty Cycle $\leq 2.0\%$.

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MUR1510, MUR1515, MUR1520

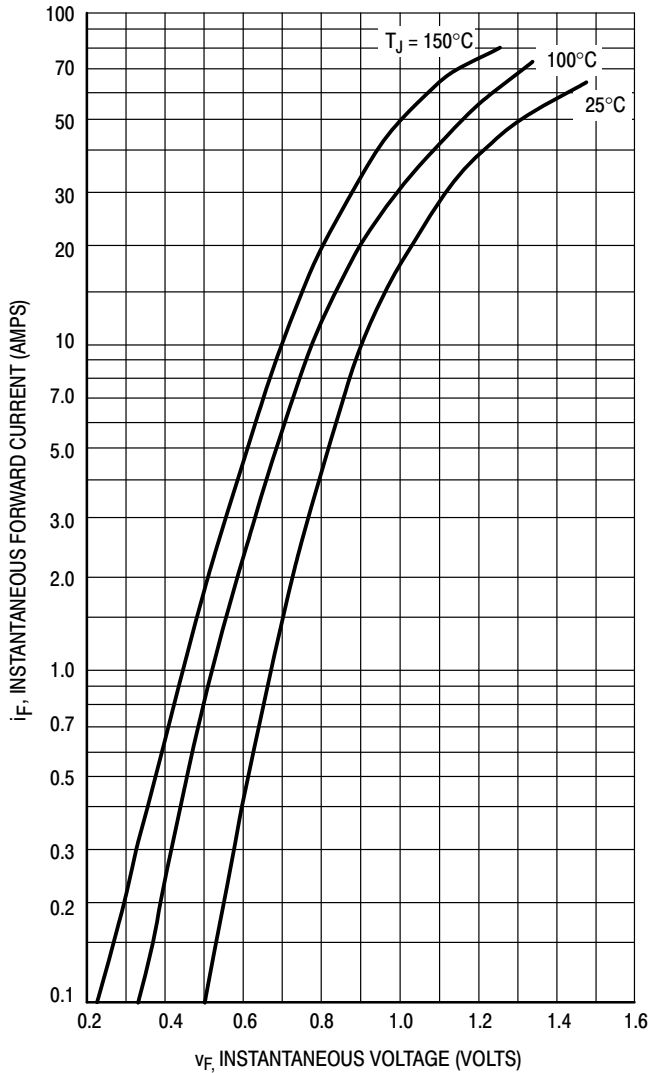


Figure 1. Typical Forward Voltage

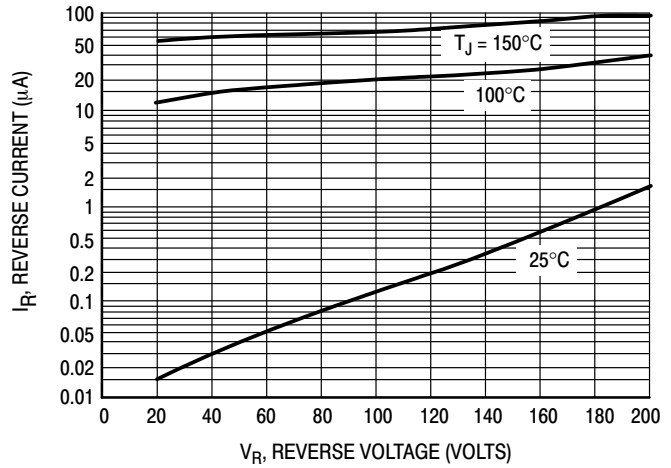


Figure 2. Typical Reverse Current

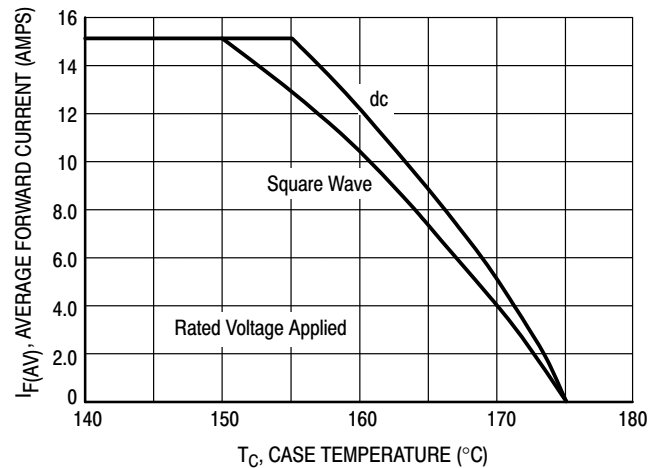


Figure 3. Current Derating, Case

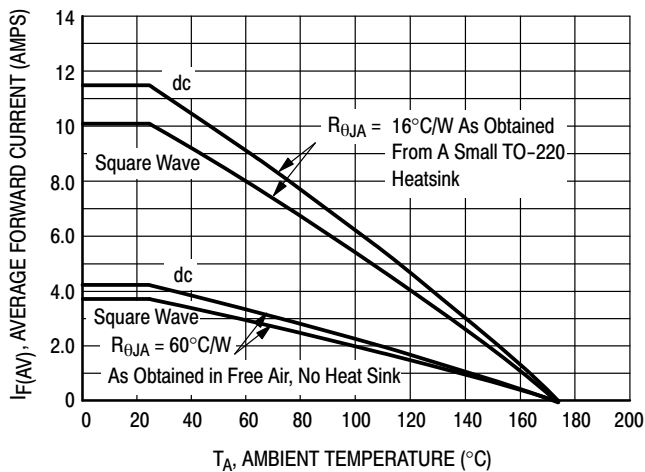


Figure 4. Current Derating, Ambient

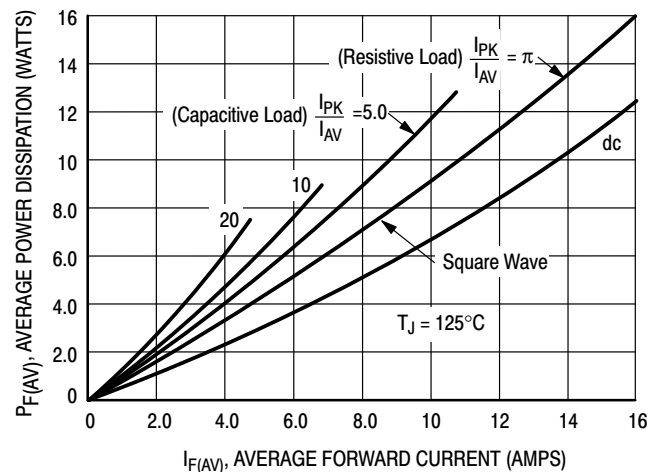


Figure 5. Power Dissipation

MUR1540

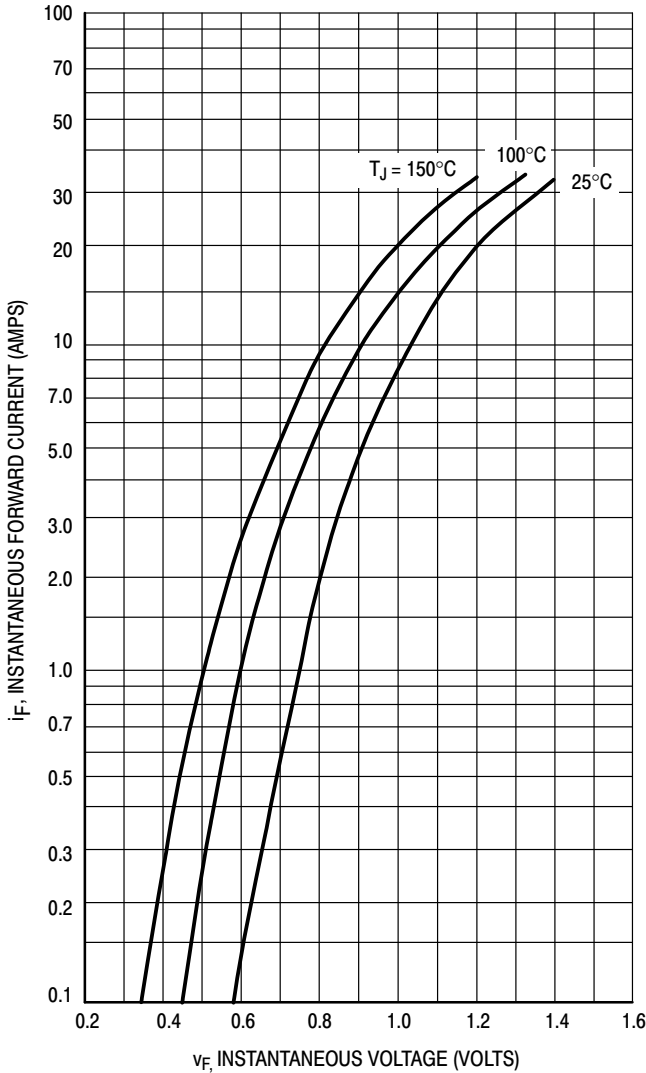


Figure 6. Typical Forward Voltage

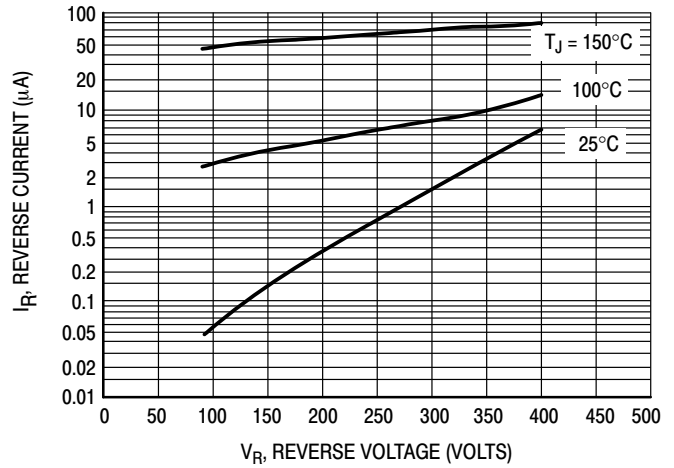


Figure 7. Typical Reverse Current

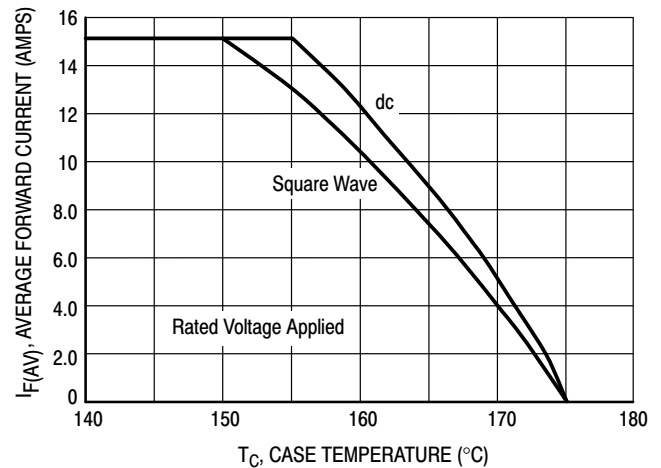


Figure 8. Current Derating, Case

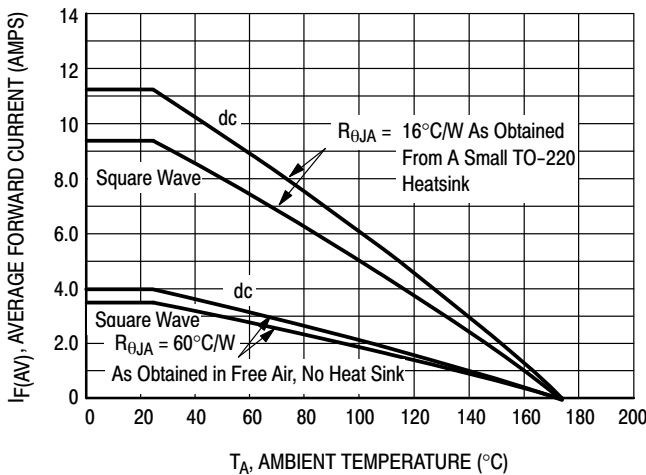


Figure 9. Current Derating, Ambient

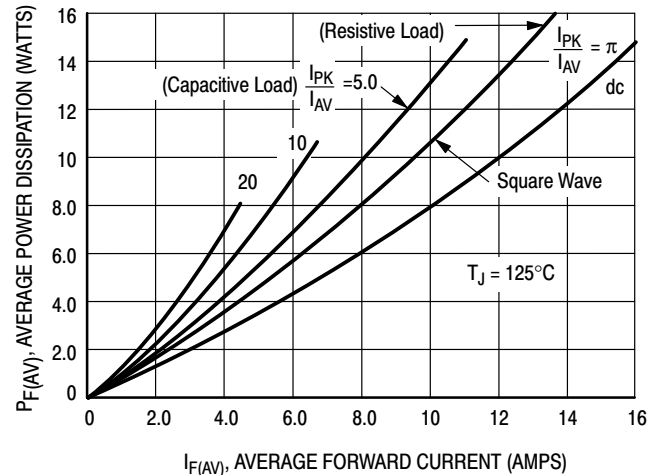


Figure 10. Power Dissipation

MUR1510, MUR1515, MUR1520, MUR1540, MUR1560, MURF1560

MUR1560, MURF1560

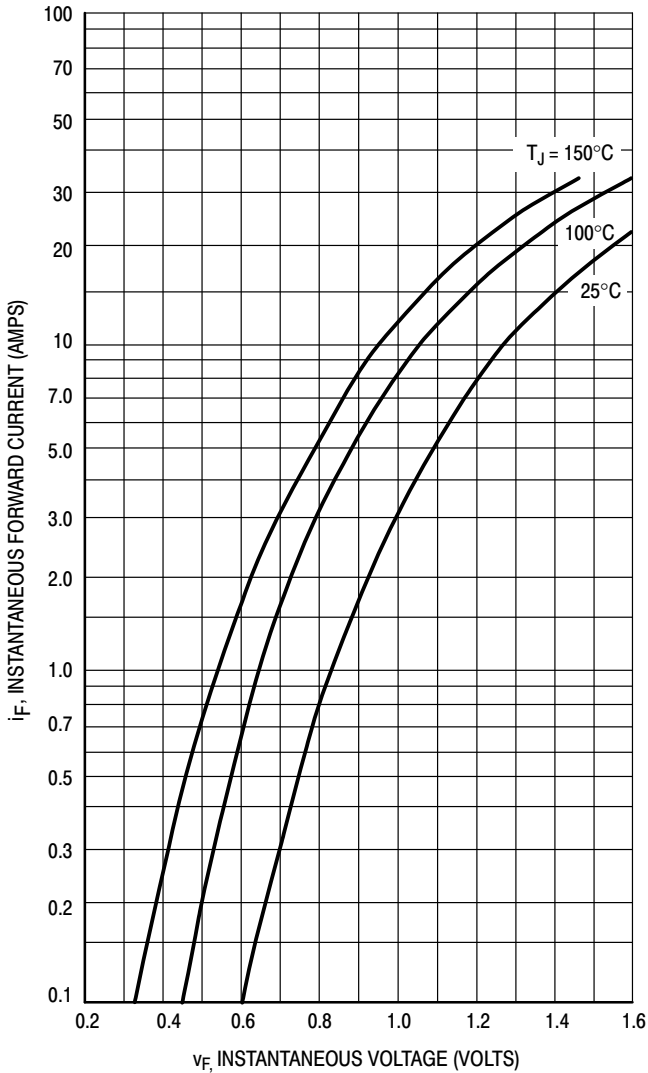


Figure 11. Typical Forward Voltage

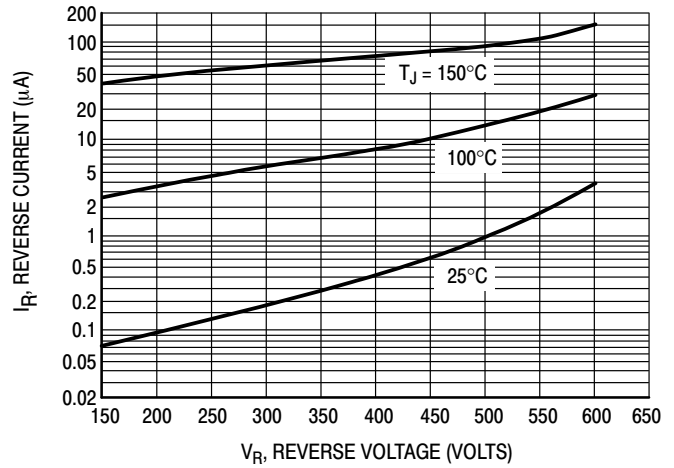


Figure 12. Typical Reverse Current

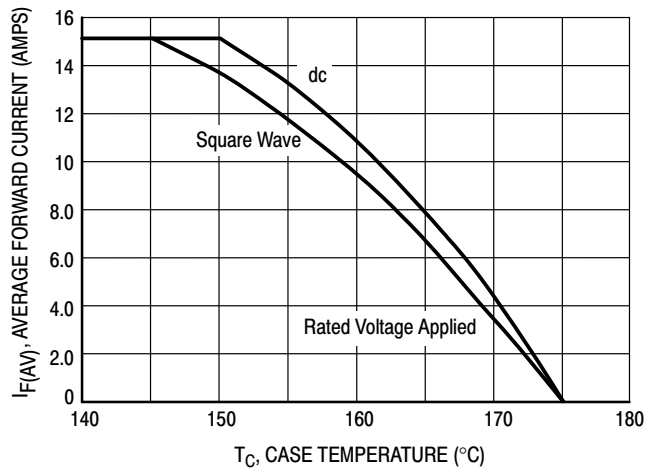


Figure 13. Current Derating, Case

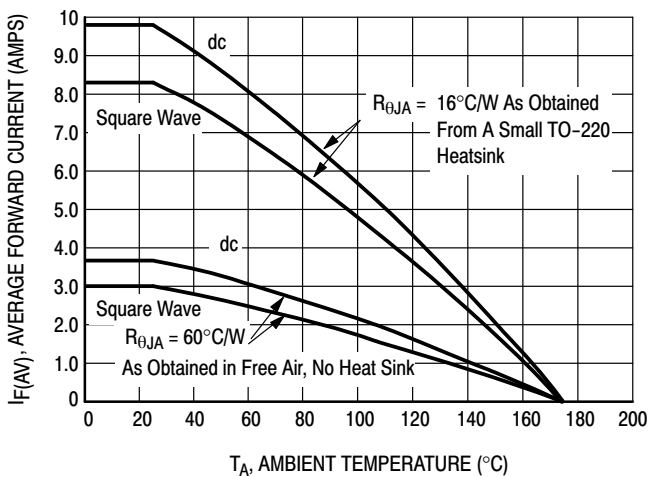


Figure 14. Current Derating, Ambient

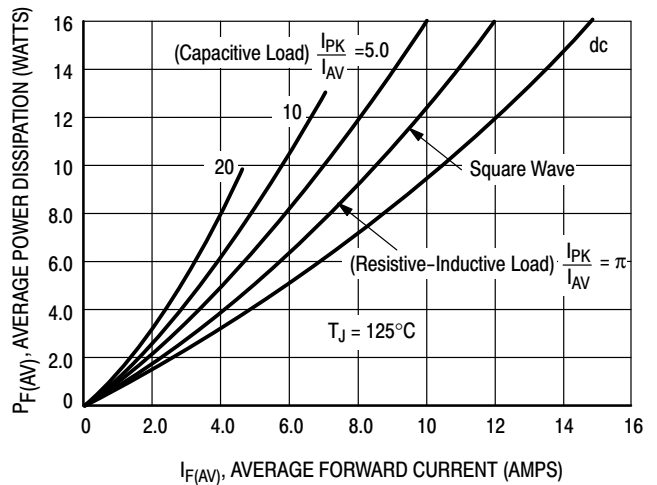


Figure 15. Power Dissipation

MUR1510, MUR1515, MUR1520, MUR1540, MUR1560, MURF1560

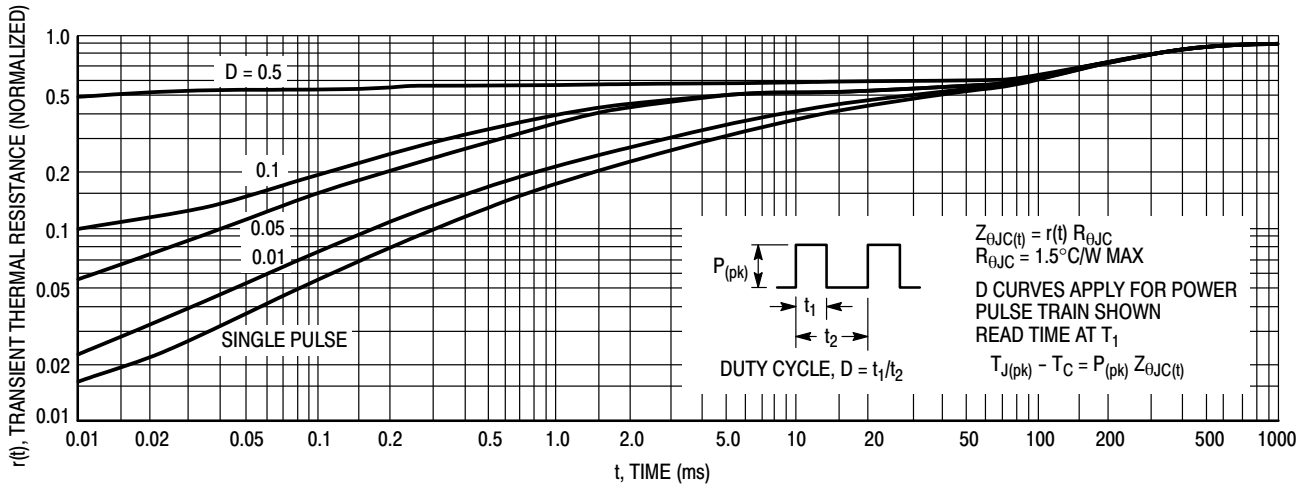


Figure 16. Thermal Response

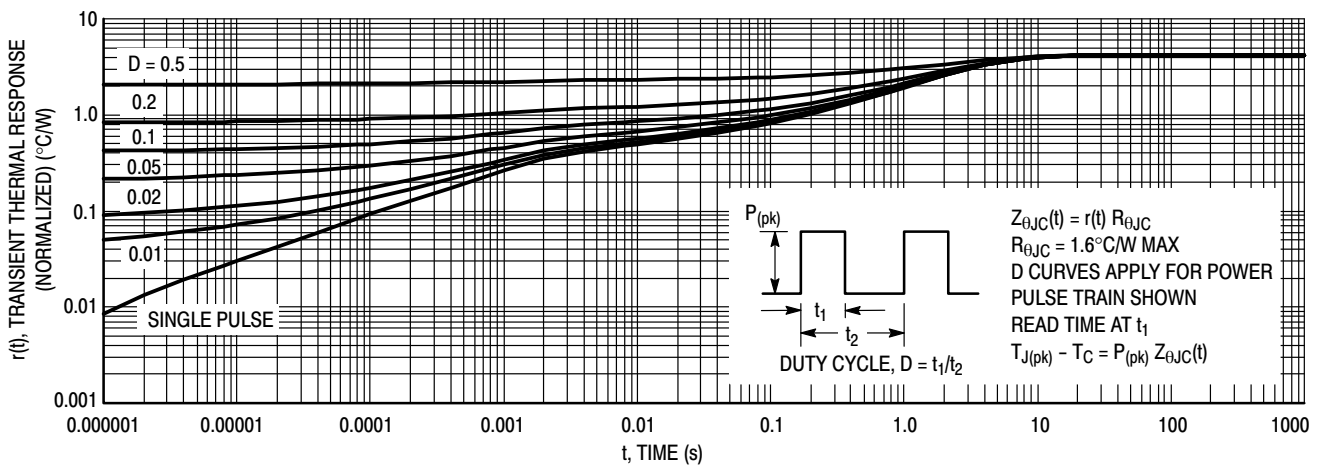


Figure 17. Thermal Response, (MURF1560) Junction-to-Case ($R_{\theta JC}$)

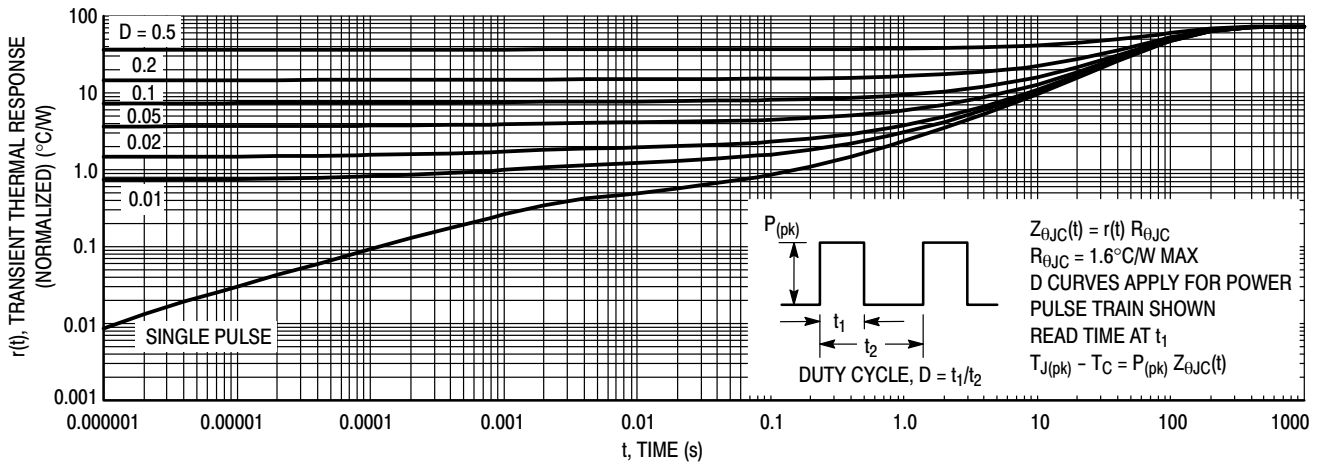


Figure 18. Thermal Response, (MURF1560) Junction-to-Ambient ($R_{\theta JA}$)

MUR1510, MUR1515, MUR1520, MUR1540, MUR1560, MURF1560

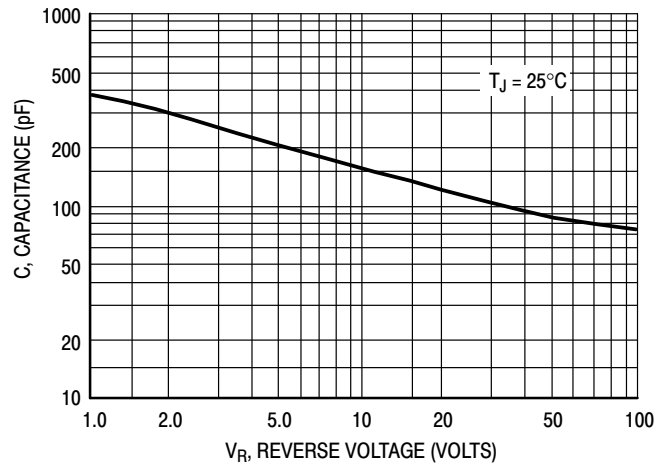


Figure 19. Typical Capacitance

ORDERING INFORMATION

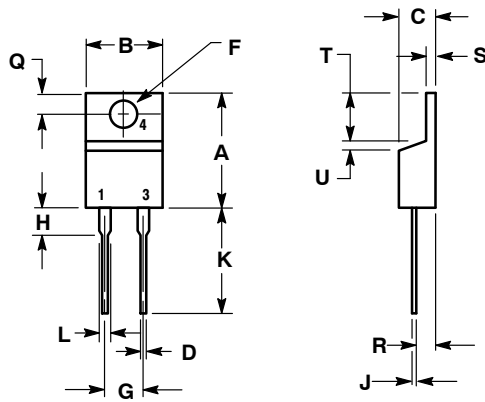
| Device | Package | Shipping [†] |
|-----------|-----------------------|-----------------------|
| MUR1510 | TO-220AC | 50 Units / Rail |
| MUR1510G | TO-220AC (Pb-Free) | |
| MUR1515 | TO-220AC | |
| MUR1515G | TO-220AC (Pb-Free) | |
| MUR1520 | TO-220AC | |
| MUR1520G | TO-220AC (Pb-Free) | |
| MUR1540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

[†]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.

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PACKAGE DIMENSIONS

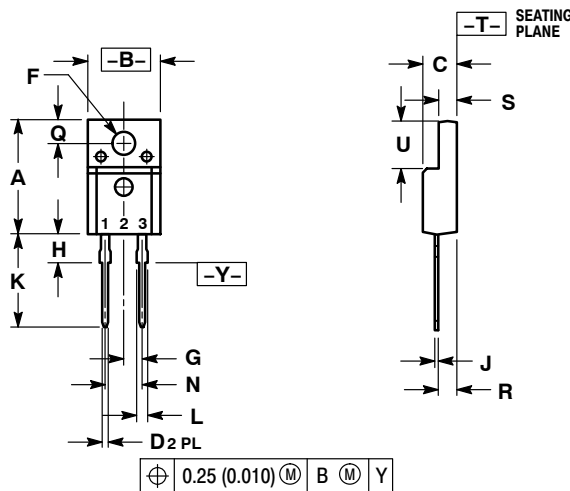
TO-220 TWO-LEAD CASE 221B-04 ISSUE E



- 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
2. N/A
3. ANODE

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