

MUR1610CT, MUR1615CT, MUR1620CT, MUR1640CT, MUR1660CT

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 Times
- 175°C Operating Junction Temperature
- Popular TO-220 Package
- Epoxy Meets UL 94 V-0 @ 0.125 in
- High Temperature Glass Passivated Junction
- High Voltage Capability to 600 V
- Low Leakage Specified @ 150°C Case Temperature
- Current Derating @ 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

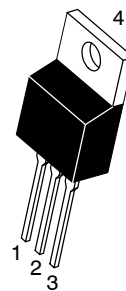
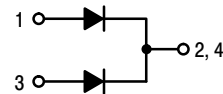
*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.



ON Semiconductor®

<http://onsemi.com>

ULTRAFAST RECTIFIERS 16 AMPERES, 100-600 VOLTS



TO-220AB
CASE 221A
PLASTIC

MARKING DIAGRAM



A = Assembly Location
Y = Year
WW = Work Week
U16xx = Device Code
xx = 10, 15, 20, 40 or 60
G = Pb-Free Package
KA = Diode Polarity

ORDERING INFORMATION

See detailed ordering and shipping information in the package dimensions section on page 6 of this data sheet.

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MAXIMUM RATINGS

| Rating | Symbol | MUR16 | | | | | Unit |
|--|---------------------------------|-------------|------|------|------|------|------------------|
| | | 10CT | 15CT | 20CT | 40CT | 60CT | |
| 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 Total Device, (Rated V_R), $T_C = 150^\circ\text{C}$ | $I_{F(AV)}$ | 8.0 16 | | | | | A |
| Peak Rectified Forward Current (Rated V_R , Square Wave, 20 kHz), $T_C = 150^\circ\text{C}$ | I_{FM} | 16 | | | | | A |
| Nonrepetitive Peak Surge Current (Surge applied at rated load conditions halfwave, single phase, 60 Hz) | I_{FSM} | 100 | | | | | A |
| Operating Junction Temperature and Storage Temperature | 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 (Per Diode Leg)

| Parameter | Symbol | Value | | Unit |
|--|-----------------|-------|-----|---------------------------|
| Maximum Thermal Resistance, Junction-to-Case | $R_{\theta JC}$ | 3.0 | 2.0 | $^\circ\text{C}/\text{W}$ |

ELECTRICAL CHARACTERISTICS (Per Diode Leg)

| Characteristic | Symbol | 1620 | 1640 | 1660 | Unit |
|--|----------|----------------|--------------|--------------|---------------|
| Maximum Instantaneous Forward Voltage (Note 1) ($I_F = 8.0\text{ A}$, $T_C = 150^\circ\text{C}$) ($I_F = 8.0\text{ A}$, $T_C = 25^\circ\text{C}$) | V_F | 0.895 0.975 | 1.00 1.30 | 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 | 250 5.0 | 500 10 | | μA |
| Maximum Reverse Recovery Time ($I_F = 1.0\text{ A}$, $di/dt = 50\text{ A}/\mu\text{s}$) ($I_F = 0.5\text{ A}$, $I_R = 1.0\text{ A}$, $I_{REC} = 0.25\text{ A}$) | t_{rr} | 35 25 | 60 50 | | ns |

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

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MUR1610CT, MUR1615CT, MUR1620CT

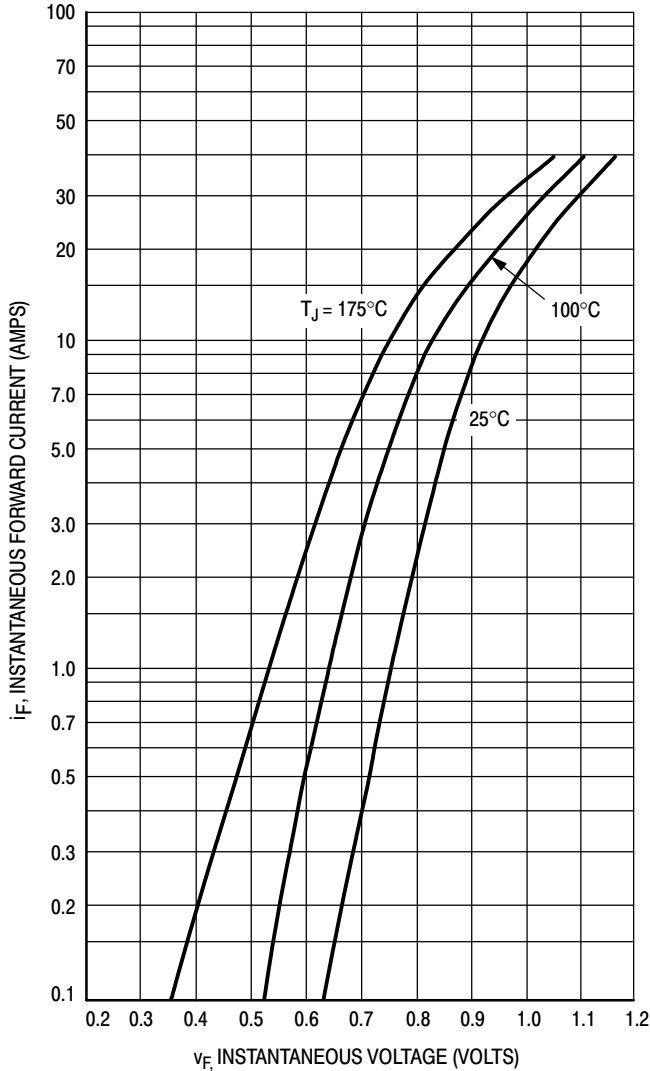


Figure 1. Typical Forward Voltage, Per Leg

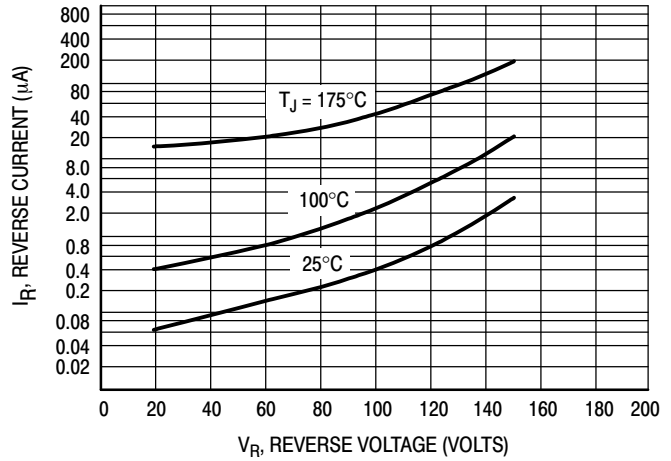


Figure 2. Typical Reverse Current, Per Leg*

* 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 .

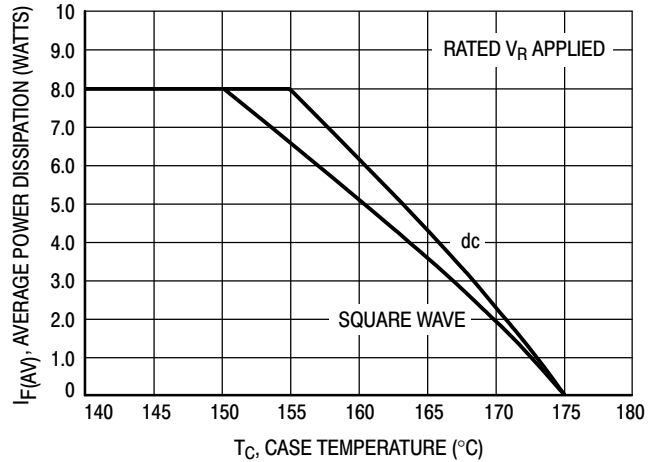


Figure 3. Current Derating, Case, Per Leg

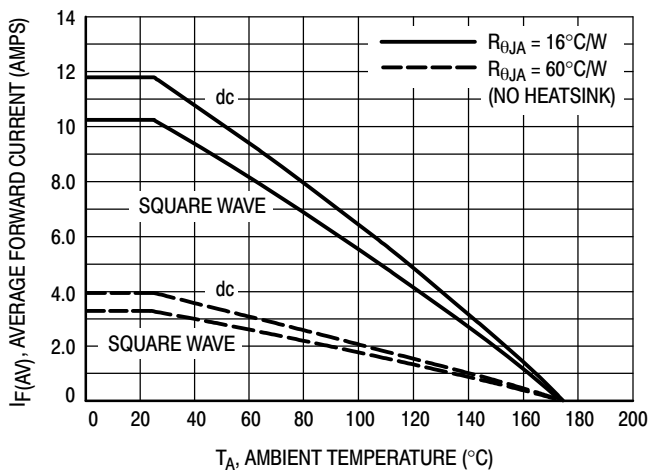


Figure 4. Current Derating, Ambient, Per Leg

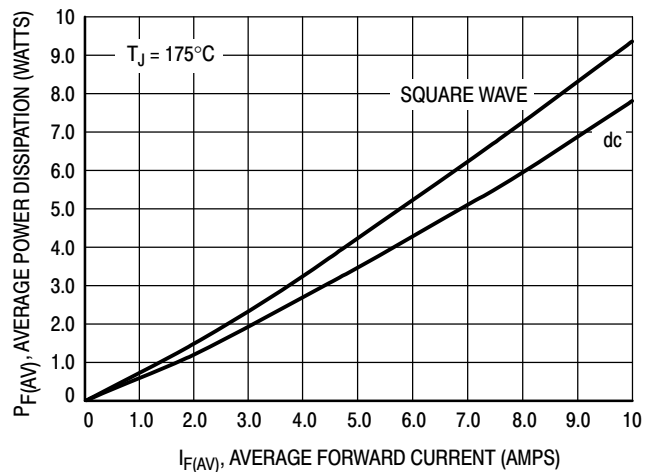


Figure 5. Power Dissipation, Per Leg

MUR1640CT

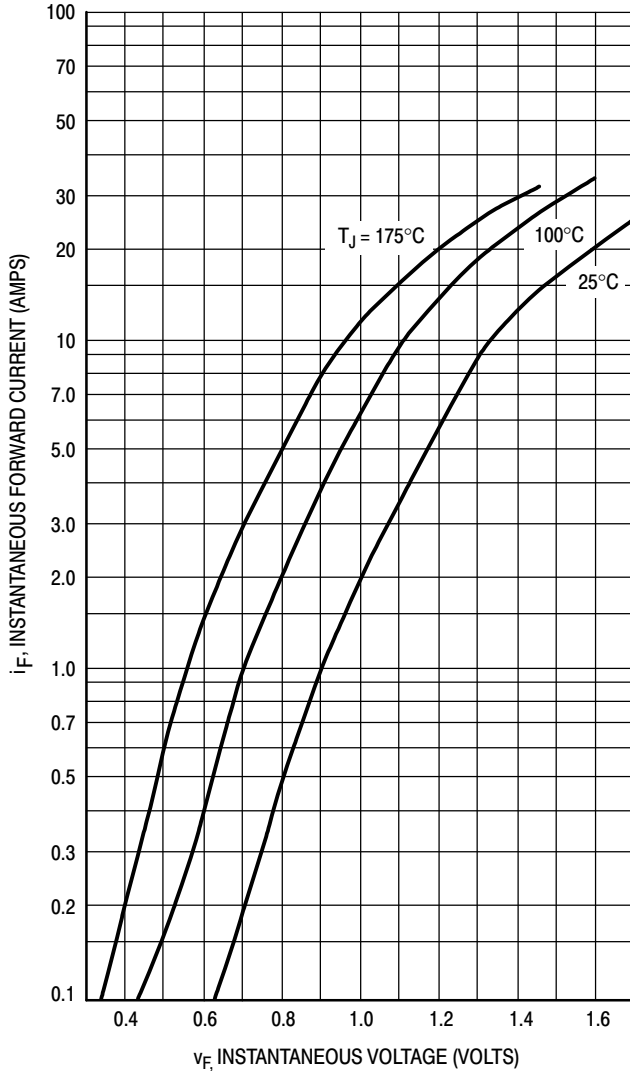


Figure 6. Typical Forward Voltage, Per Leg

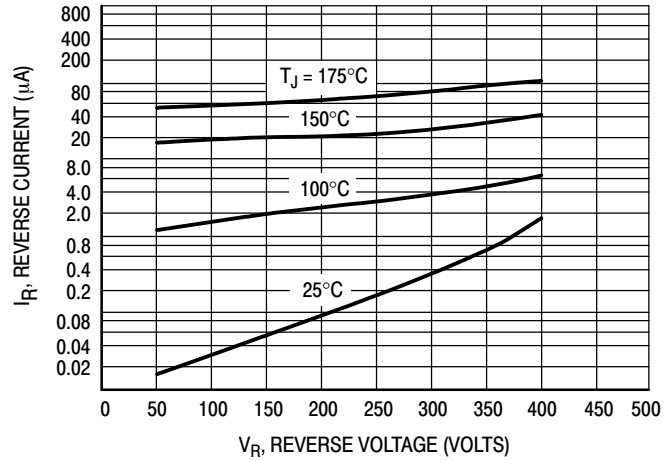


Figure 7. Typical Reverse Current, Per Leg*

* 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 curves if V_R is sufficiently below rated V_R .

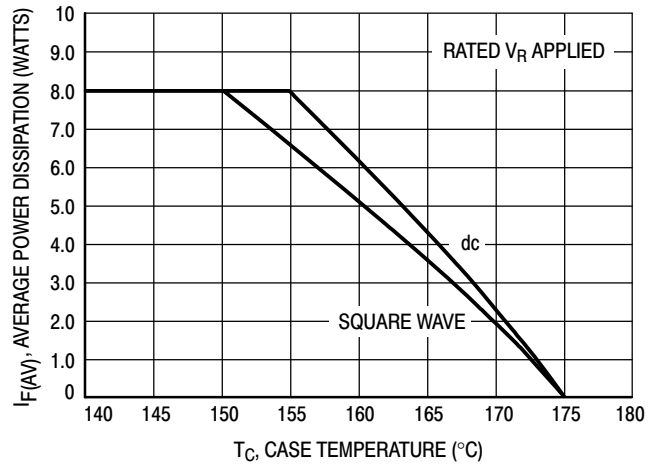


Figure 8. Current Derating, Case, Per Leg

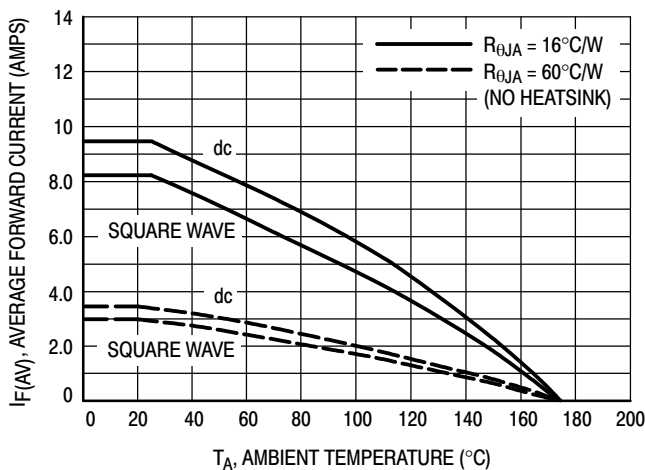


Figure 9. Current Derating, Ambient, Per Leg

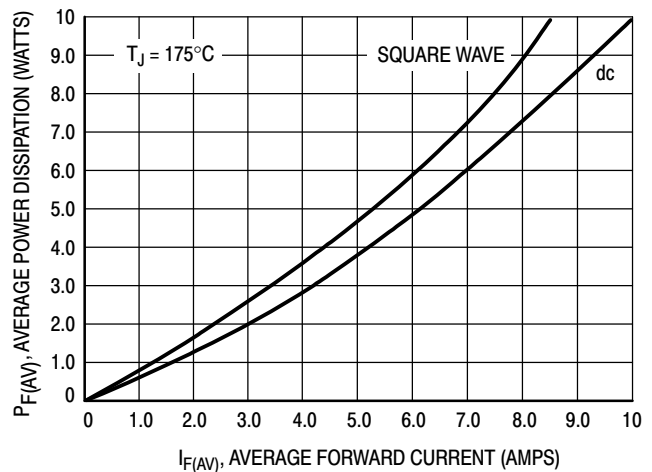


Figure 10. Power Dissipation, Per Leg

MUR1660CT

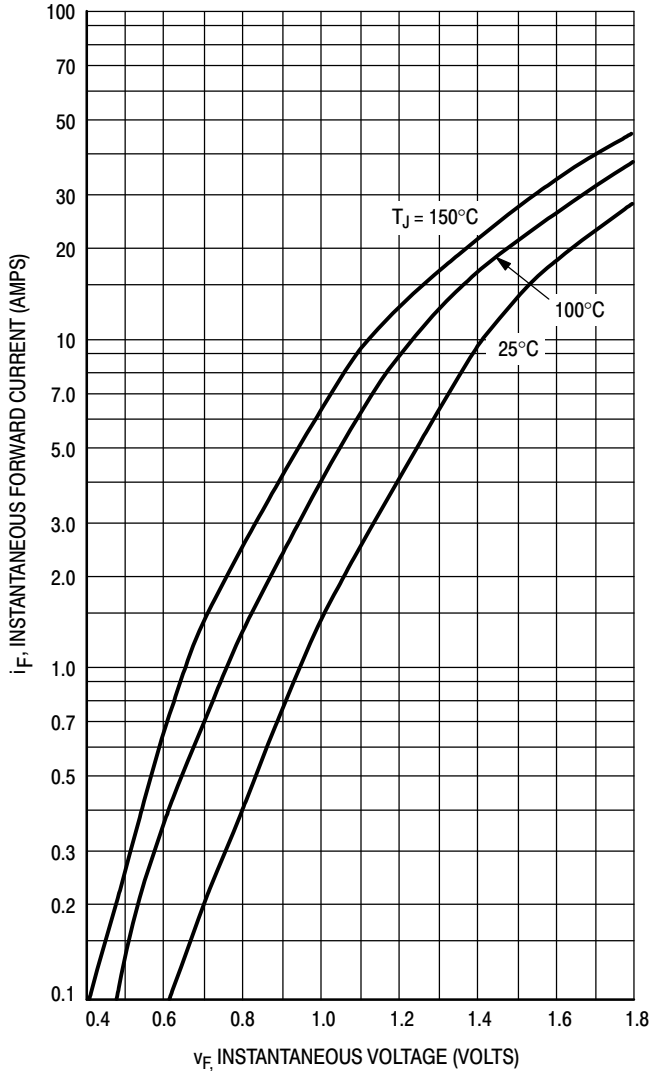


Figure 11. Typical Forward Voltage, Per Leg

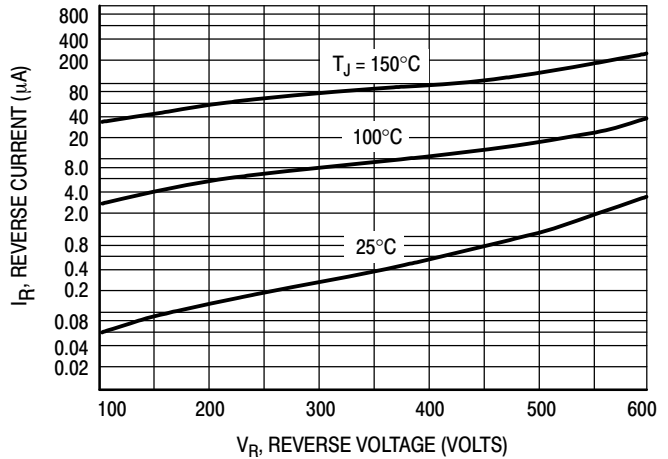


Figure 12. Typical Reverse Current, Per Leg*

* 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 .

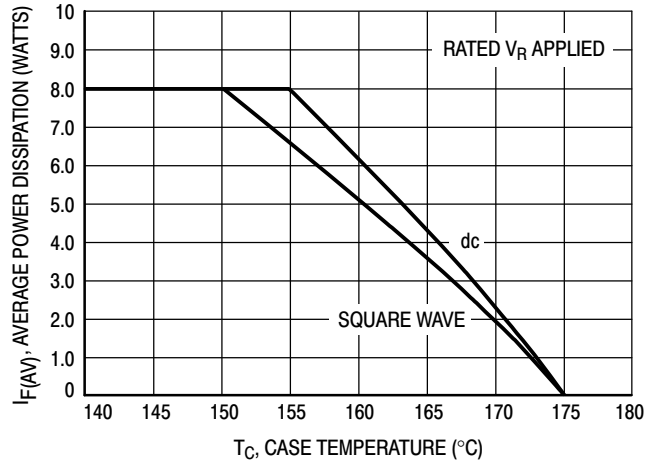


Figure 13. Current Derating, Case, Per Leg

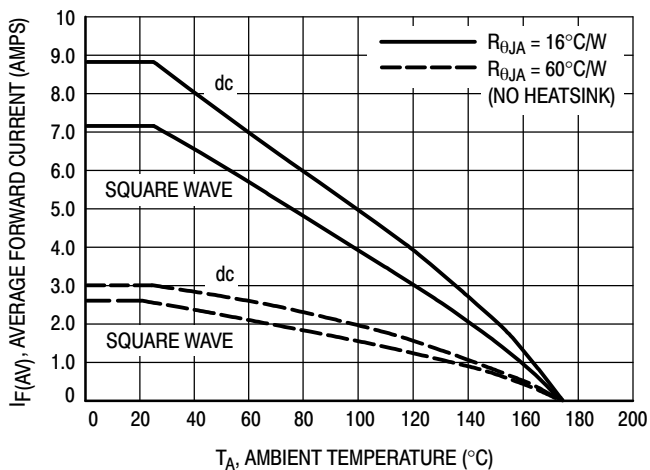


Figure 14. Current Derating, Ambient, Per Leg

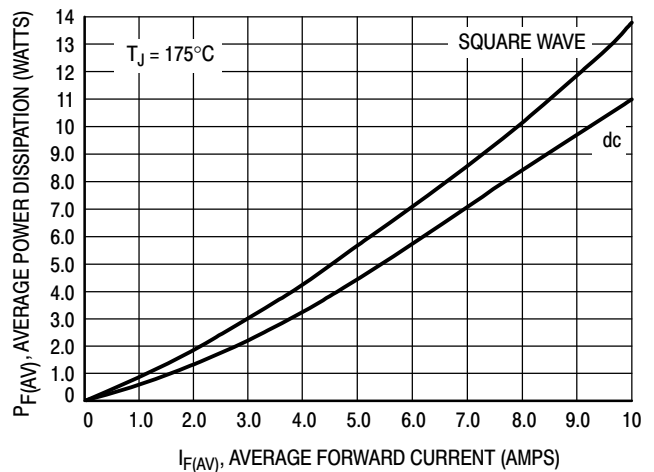


Figure 15. Power Dissipation, Per Leg

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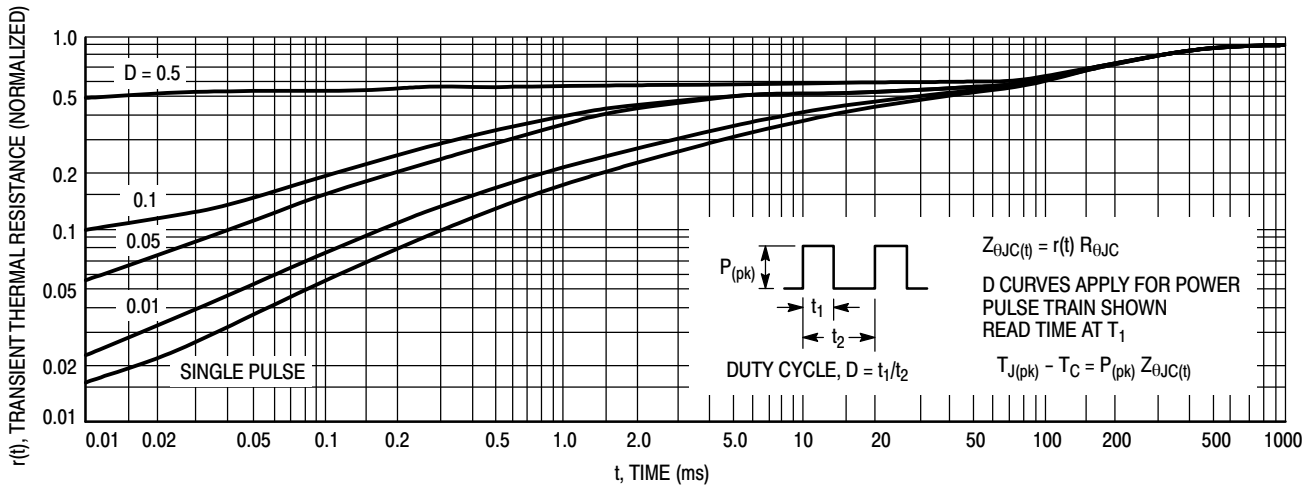


Figure 16. Thermal Response

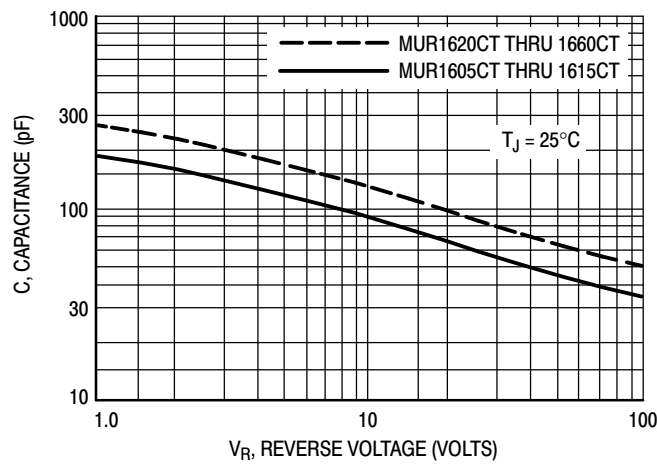


Figure 17. Typical Capacitance, Per Leg

ORDERING INFORMATION

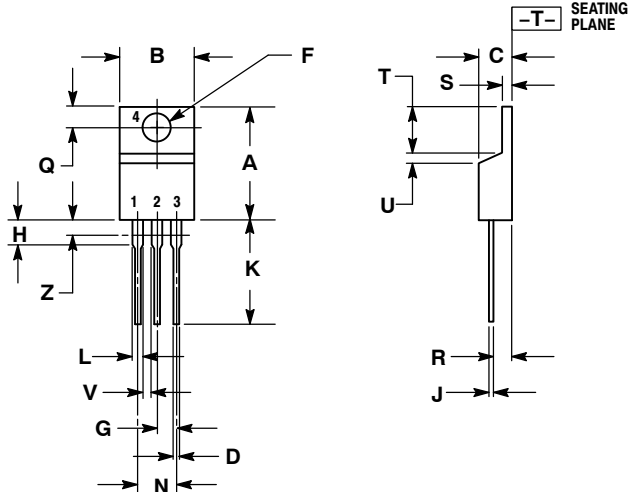
| Device | Package | Shipping [†] |
|------------|---------------------|-----------------------|
| MUR1610CT | TO-220 | 50 Units / Rail |
| MUR1610CTG | TO-220 (Pb-Free) | |
| MUR1615CT | TO-220 | |
| MUR1615CTG | TO-220 (Pb-Free) | |
| MUR1620CT | TO-220 | |
| MUR1620CTG | TO-220 (Pb-Free) | |
| MUR1640CT | TO-220 | |
| MUR1640CTG | TO-220 (Pb-Free) | |
| MUR1660CT | TO-220 | |
| MUR1660CTG | TO-220 (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
CASE 221A-09
ISSUE AF



NOTES:

1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. DIMENSION Z DEFINES A ZONE WHERE ALL BODY AND LEAD IRREGULARITIES ARE ALLOWED.

| DIM | INCHES | | MILLIMETERS | |
|-----|--------|-------|-------------|-------|
| | MIN | MAX | MIN | MAX |
| A | 0.570 | 0.620 | 14.48 | 15.75 |
| B | 0.380 | 0.405 | 9.66 | 10.28 |
| C | 0.160 | 0.190 | 4.07 | 4.82 |
| D | 0.025 | 0.035 | 0.64 | 0.88 |
| F | 0.142 | 0.161 | 3.61 | 4.09 |
| G | 0.095 | 0.105 | 2.42 | 2.66 |
| H | 0.110 | 0.155 | 2.80 | 3.93 |
| J | 0.014 | 0.025 | 0.36 | 0.64 |
| K | 0.500 | 0.562 | 12.70 | 14.27 |
| L | 0.045 | 0.060 | 1.15 | 1.52 |
| N | 0.190 | 0.210 | 4.83 | 5.33 |
| Q | 0.100 | 0.120 | 2.54 | 3.04 |
| R | 0.080 | 0.110 | 2.04 | 2.79 |
| S | 0.045 | 0.055 | 1.15 | 1.39 |
| T | 0.235 | 0.255 | 5.97 | 6.47 |
| U | 0.000 | 0.050 | 0.00 | 1.27 |
| V | 0.045 | --- | 1.15 | --- |
| Z | --- | 0.080 | --- | 2.04 |

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