

# 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

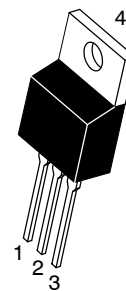
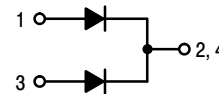
\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.



ON Semiconductor®

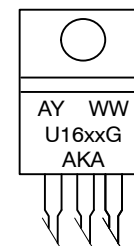
<http://onsemi.com>

## 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<br>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.

# MUR1610CT, MUR1615CT, MUR1620CT, MUR1640CT, MUR1660CT

## MAXIMUM RATINGS

| Rating   | Symbol                          | MUR16       |      |      |      |      | Unit             |
|--|---------------------------------|-------------|------|------|------|------|------------------|
|  |                                 | 10CT        | 15CT | 20CT | 40CT | 60CT |                  |
| 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<br>Total Device, (Rated $V_R$ ), $T_C = 150^\circ\text{C}$               | $I_{F(AV)}$                     | 8.0<br>16   |      |      |      |      | A                |
| Peak Rectified 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   | $T_J, T_{stg}$                  | -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)<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, $T_C = 150^\circ\text{C}$ )<br>(Rated DC Voltage, $T_C = 25^\circ\text{C}$ )                            | $i_R$    | 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  $\leq 2.0\%$

# MUR1610CT, MUR1615CT, MUR1620CT, MUR1640CT, MUR1660CT

## MUR1610CT, MUR1615CT, MUR1620CT

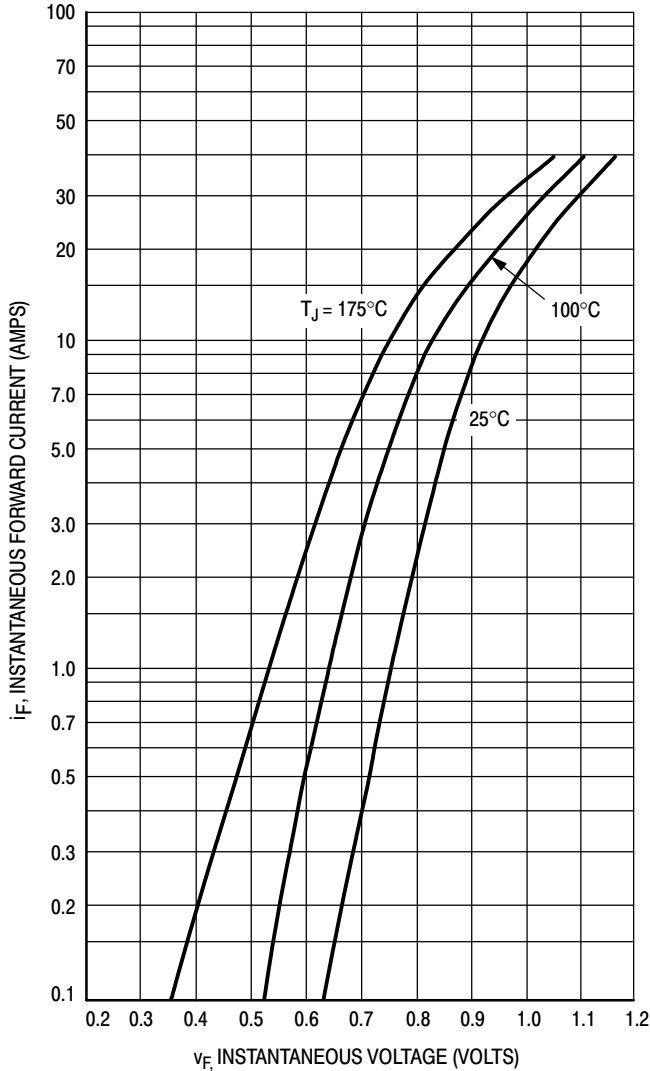


Figure 1. Typical Forward Voltage, Per Leg

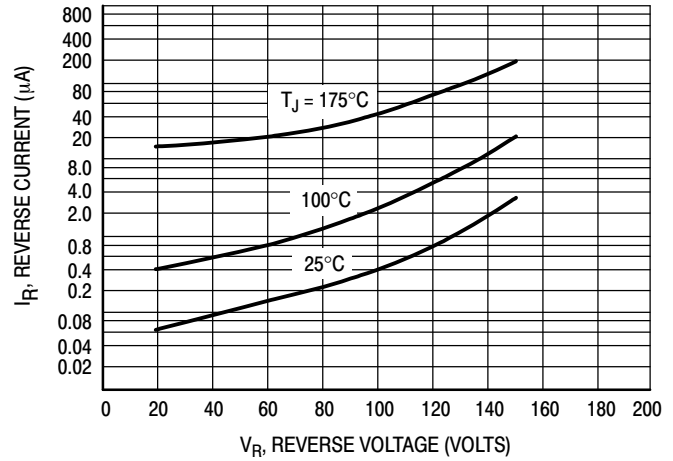


Figure 2. Typical Reverse Current, Per Leg\*

\* 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  $V_R$ .

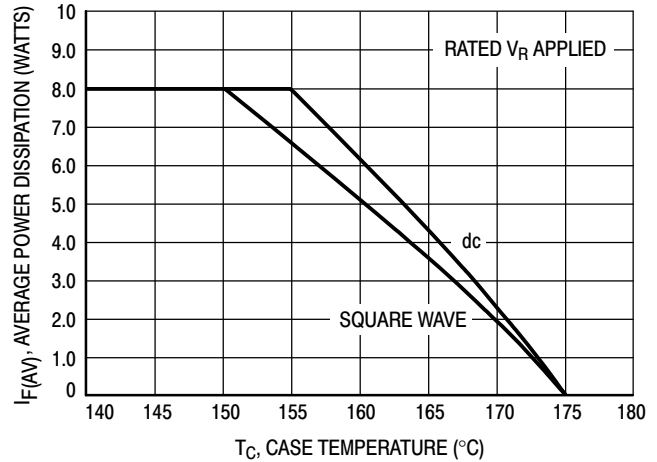


Figure 3. Current Derating, Case, Per Leg

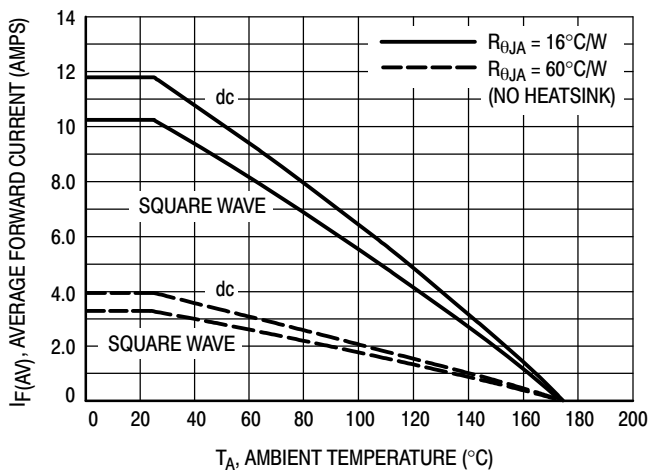


Figure 4. Current Derating, Ambient, Per Leg

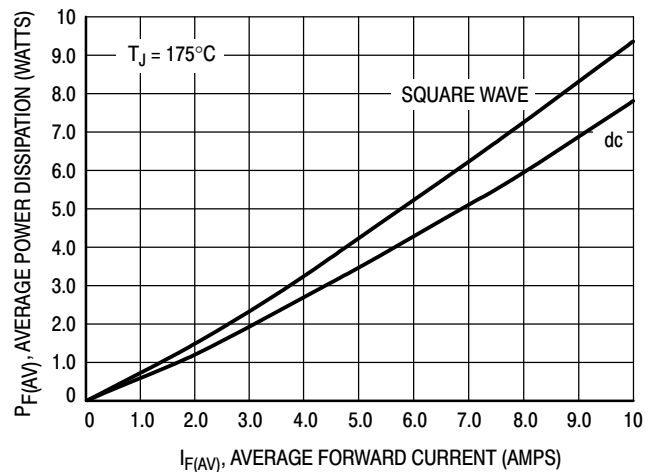


Figure 5. Power Dissipation, Per Leg

MUR1640CT

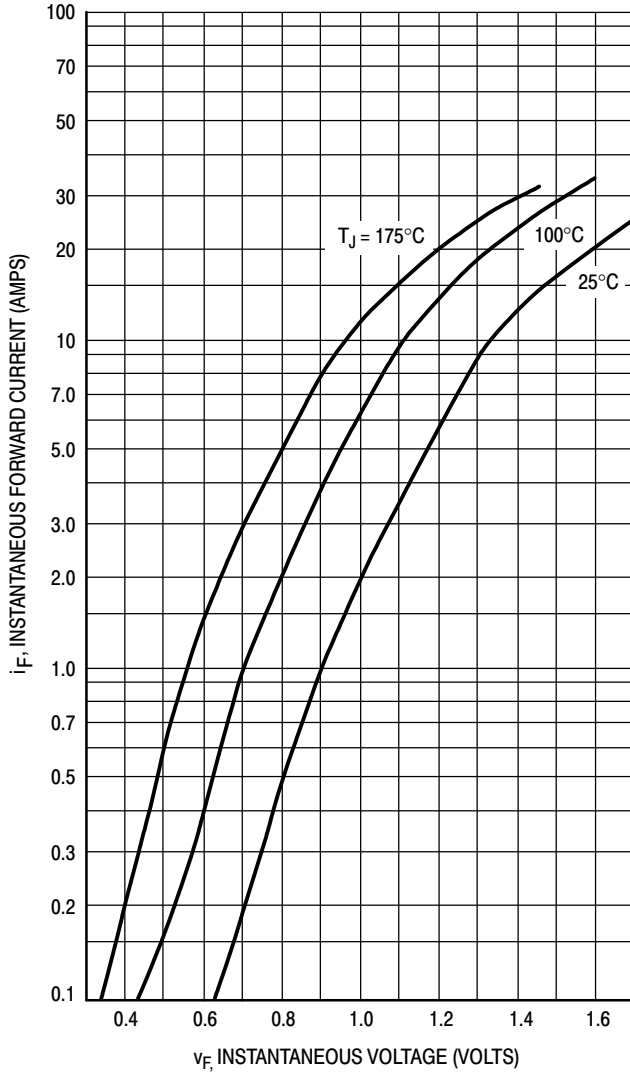


Figure 6. Typical Forward Voltage, Per Leg

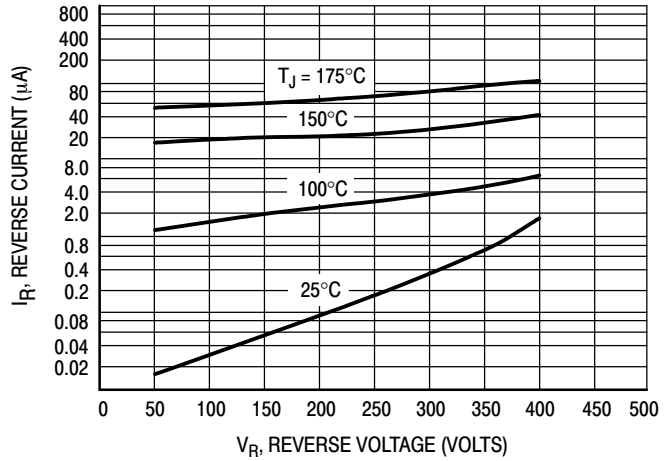


Figure 7. Typical Reverse Current, Per Leg\*

\* 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  $V_R$ .

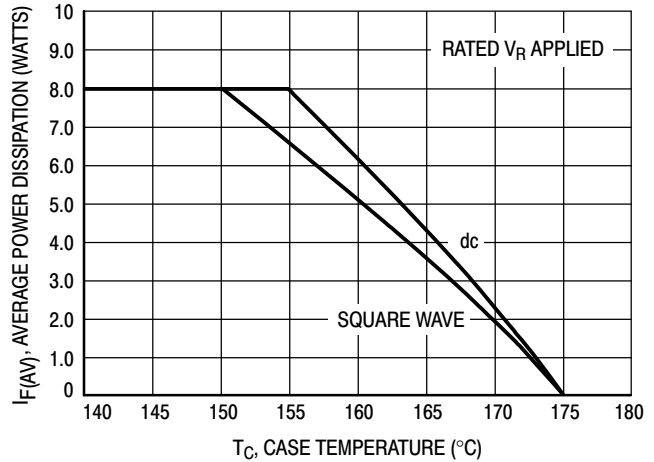


Figure 8. Current Derating, Case, Per Leg

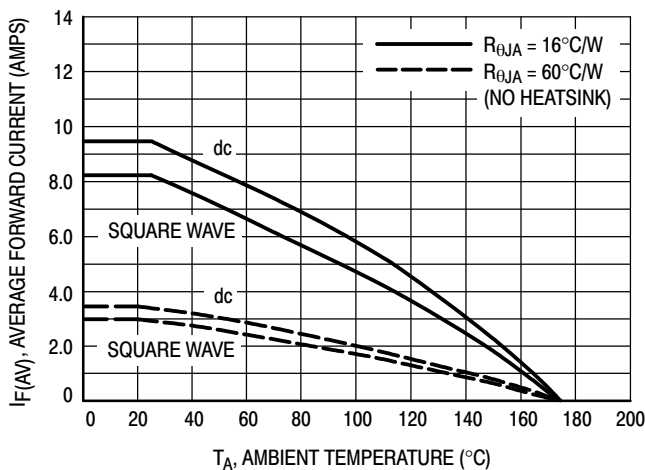


Figure 9. Current Derating, Ambient, Per Leg

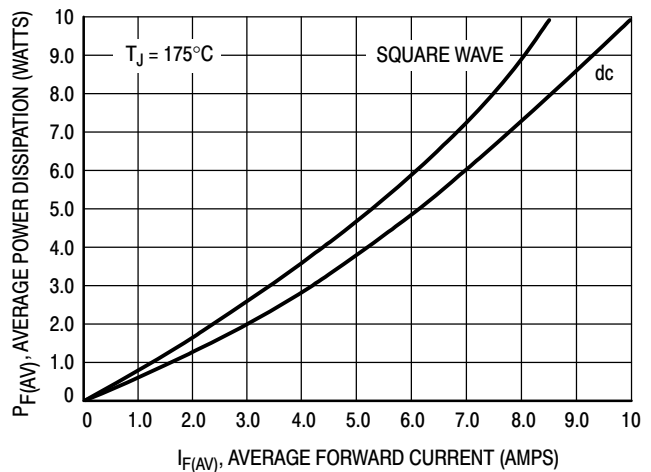


Figure 10. Power Dissipation, Per Leg

MUR1660CT

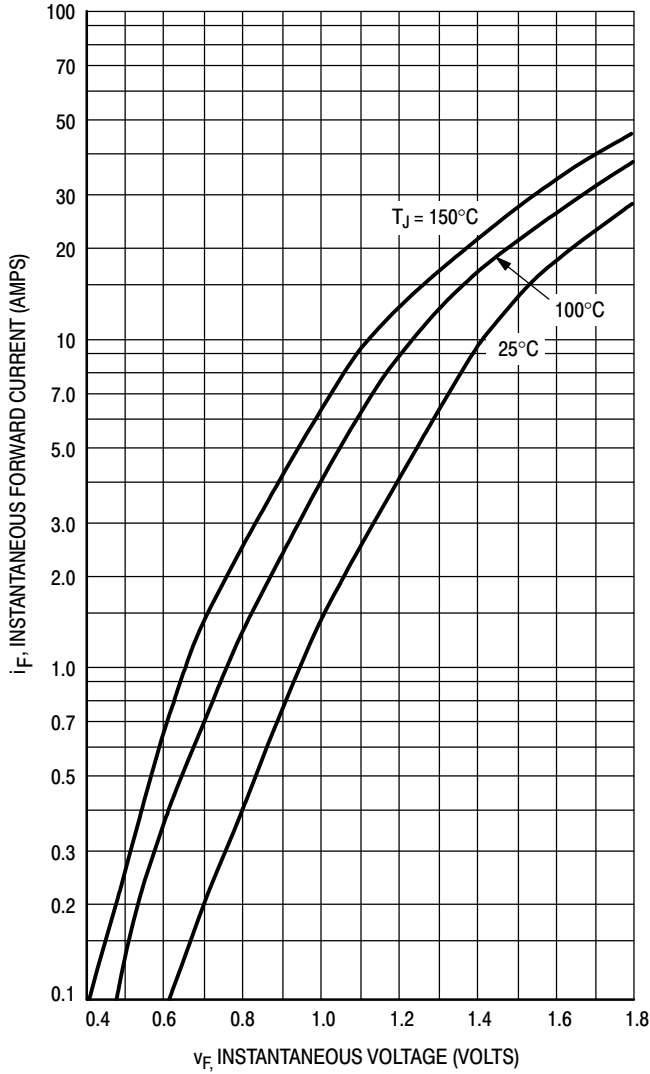


Figure 11. Typical Forward Voltage, Per Leg

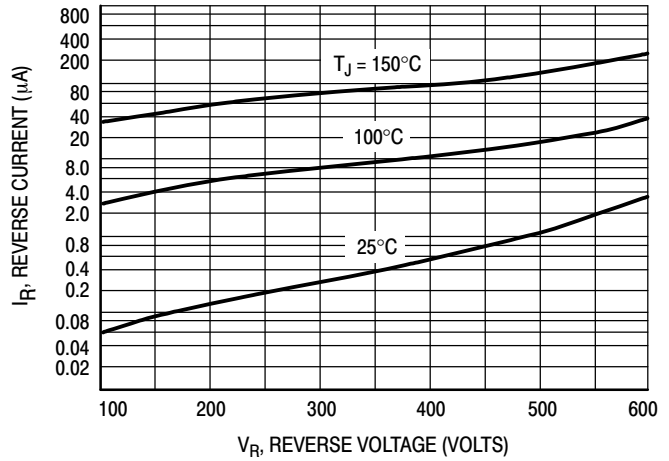


Figure 12. Typical Reverse Current, Per Leg\*

\* 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  $V_R$ .

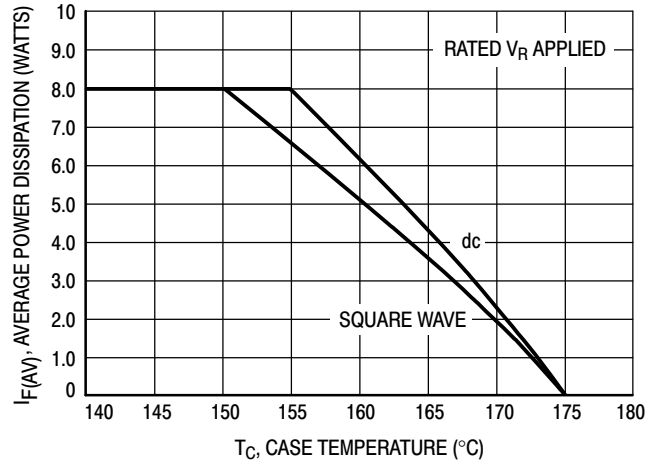


Figure 13. Current Derating, Case, Per Leg

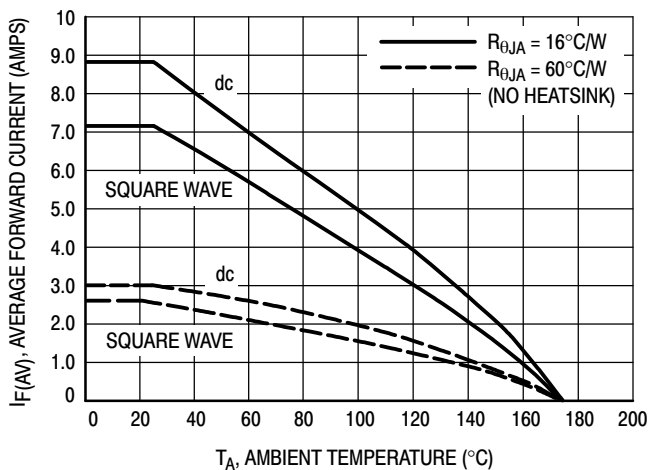


Figure 14. Current Derating, Ambient, Per Leg

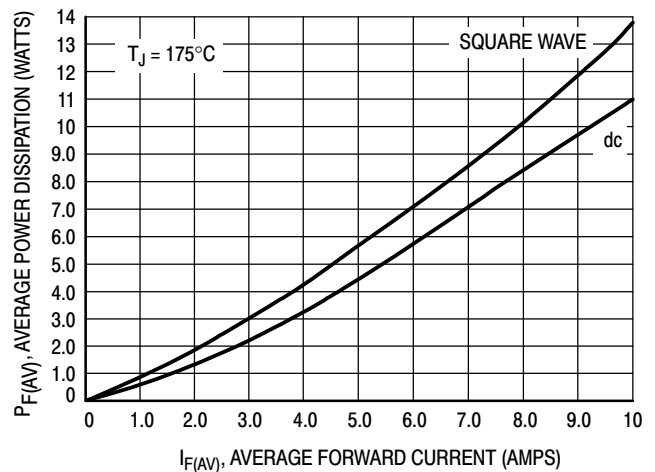


Figure 15. Power Dissipation, Per Leg

# MUR1610CT, MUR1615CT, MUR1620CT, MUR1640CT, MUR1660CT

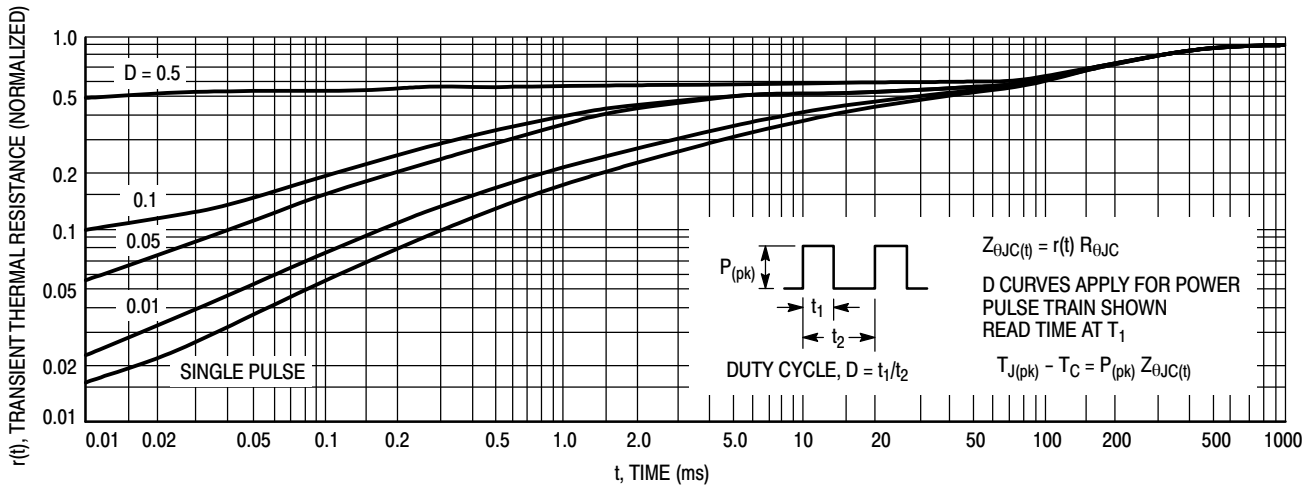


Figure 16. Thermal Response

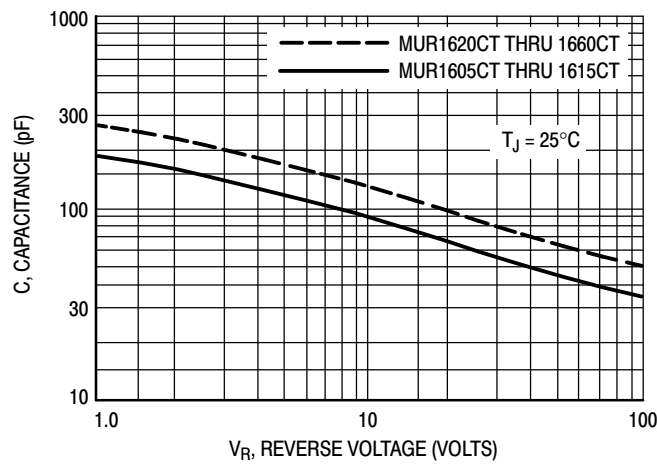


Figure 17. Typical Capacitance, Per Leg

## ORDERING INFORMATION

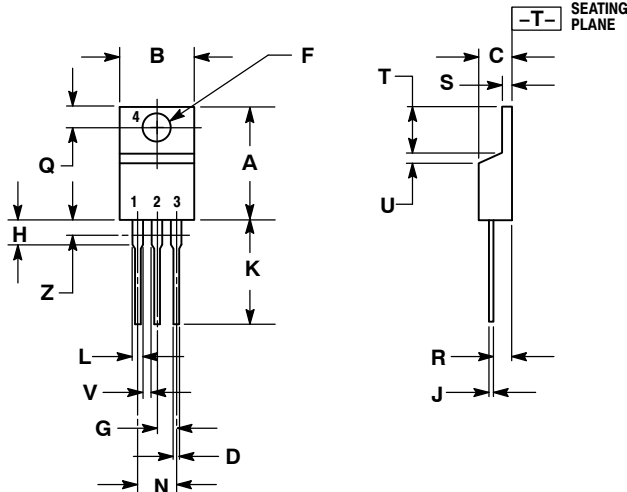
| Device     | Package             | Shipping <sup>†</sup> |
|------------|---------------------|-----------------------|
| MUR1610CT  | TO-220              | 50 Units / Rail       |
| MUR1610CTG | TO-220<br>(Pb-Free) |                       |
| MUR1615CT  | TO-220              |                       |
| MUR1615CTG | TO-220<br>(Pb-Free) |                       |
| MUR1620CT  | TO-220              |                       |
| MUR1620CTG | TO-220<br>(Pb-Free) |                       |
| MUR1640CT  | TO-220              |                       |
| MUR1640CTG | TO-220<br>(Pb-Free) |                       |
| MUR1660CT  | TO-220              |                       |
| MUR1660CTG | TO-220<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.

# MUR1610CT, MUR1615CT, MUR1620CT, MUR1640CT, MUR1660CT

## 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  |

SWITCHMODE is a trademark of Semiconductor Components Industries, LLC.

**ON Semiconductor** and **ON** are registered trademarks of Semiconductor Components Industries, LLC (SCILLC). SCILLC reserves the right to make changes without further notice to any products herein. SCILLC makes no warranty, representation or guarantee regarding the suitability of its products for any particular purpose, nor does SCILLC assume any liability arising out of the application or use of any product or circuit, and specifically disclaims any and all liability, including without limitation special, consequential or incidental damages. "Typical" parameters which may be provided in SCILLC data sheets and/or specifications can and do vary in different applications and actual performance may vary over time. All operating parameters, including "Typicals" must be validated for each customer application by customer's technical experts. SCILLC does not convey any license under its patent rights nor the rights of others. SCILLC products are not designed, intended, or authorized for use as components in systems intended for surgical implant into the body, or other applications intended to support or sustain life, or for any other application in which the failure of the SCILLC product could create a situation where personal injury or death may occur. Should Buyer purchase or use SCILLC products for any such unintended or unauthorized application, Buyer shall indemnify and hold SCILLC and its officers, employees, subsidiaries, affiliates, and distributors harmless against all claims, costs, damages, and expenses, and reasonable attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized use, even if such claim alleges that SCILLC was negligent regarding the design or manufacture of the part. SCILLC is an Equal Opportunity/Affirmative Action Employer. This literature is subject to all applicable copyright laws and is not for resale in any manner.

### PUBLICATION ORDERING INFORMATION

**LITERATURE FULFILLMENT:**  
Literature Distribution Center for ON Semiconductor  
P.O. Box 5163, Denver, Colorado 80217 USA  
**Phone:** 303-675-2175 or 800-344-3860 Toll Free USA/Canada  
**Fax:** 303-675-2176 or 800-344-3867 Toll Free USA/Canada  
**Email:** orderlit@onsemi.com

**N. American Technical Support:** 800-282-9855 Toll Free USA/Canada  
**Europe, Middle East and Africa Technical Support:**  
Phone: 421 33 790 2910  
**Japan Customer Focus Center**  
Phone: 81-3-5773-3850

**ON Semiconductor Website:** [www.onsemi.com](http://www.onsemi.com)  
**Order Literature:** <http://www.onsemi.com/orderlit>

For additional information, please contact your local Sales Representative