



THE DATASHEET OF MUR820G



MUR805G, MUR810G, MUR815G, MUR820G, MUR840G, MUR860G, MURF860G, SUR8820G, SUR8840G



ON Semiconductor®

<http://onsemi.com>

Switch-mode Power Rectifiers

This series is designed for use in switching power supplies, inverters and as free wheeling diodes.

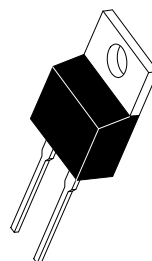
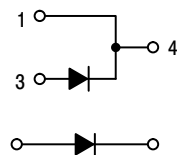
Features

- 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
- ESD Ratings:
 - ◆ Machine Model = C (> 400 V)
 - ◆ Human Body Model = 3B (> 16,000 V)
- SUR8 Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable
- These Devices are Pb-Free and are RoHS Compliant*

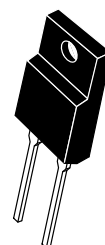
Mechanical Characteristics:

- 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

ULTRAFAST RECTIFIERS 8.0 AMPERES, 50–600 VOLTS

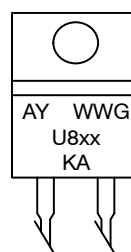


**TO-220AC
CASE 221B
STYLE 1**



**TO-220 FULLPAK
CASE 221AG
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

ORDERING INFORMATION

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

*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/SUR8 | | | | | | Unit |
|--|---------------------------------|-------------|-----|-----|-----|-----|-----|------------------|
| | | 805 | 810 | 815 | 820 | 840 | 860 | |
| Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage | V_{RRM} V_{RWM} V_R | 50 | 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 | | | | | | A |
| Peak Repetitive 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 Range | T_J, T_{stg} | -65 to +175 | | | | | | $^\circ\text{C}$ |

Stresses exceeding those listed in the Maximum Ratings table may damage the device. If any of these limits are exceeded, device functionality should not be assumed, damage may occur and reliability may be affected.

THERMAL CHARACTERISTICS

| Characteristic | Symbol | MUR/SUR8 | | | | | | Unit |
|--|-----------------|----------|-----|-----|-----|-----|-----|--------------------|
| | | 805 | 810 | 815 | 820 | 840 | 860 | |
| Maximum Thermal Resistance, Junction-to-Case | $R_{\theta JC}$ | 3.0 | | | 2.0 | | | $^\circ\text{C/W}$ |
| Thermal Resistance, Junction-to-Case MURF860 | $R_{\theta JC}$ | 4.75 | | | | | | $^\circ\text{C/W}$ |
| Thermal Resistance, Junction-to-Ambient | $R_{\theta JA}$ | 73 | | | | | | $^\circ\text{C/W}$ |
| Thermal Resistance, Junction-to-Ambient MURF860 | $R_{\theta JA}$ | 75 | | | | | | $^\circ\text{C/W}$ |

ELECTRICAL CHARACTERISTICS

| Characteristic | Symbol | MUR/SUR8 | | | | | | Unit |
|--|----------|----------------|-----|-----|--------------|--------------|-----|---------------|
| | | 805 | 810 | 815 | 820 | 840 | 860 | |
| 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, $T_J = 150^\circ\text{C}$) (Rated DC Voltage, $T_J = 25^\circ\text{C}$) | 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 |

Product parametric performance is indicated in the Electrical Characteristics for the listed test conditions, unless otherwise noted. Product performance may not be indicated by the Electrical Characteristics if operated under different conditions.

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

MUR805G, MUR810G, MUR815G, MUR820G, MUR840G, MUR860G, MURF860G,
SUR8820G, SUR8840G

MUR805G, MUR810G, MUR815G, MUR820G, SUR8820G

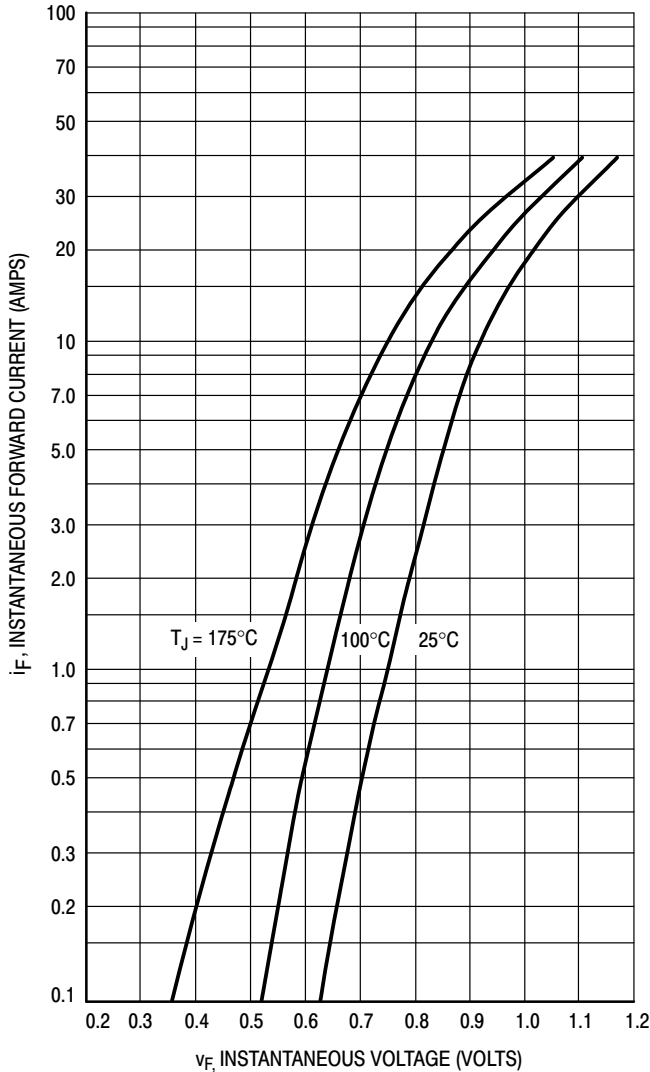


Figure 1. Typical Forward Voltage

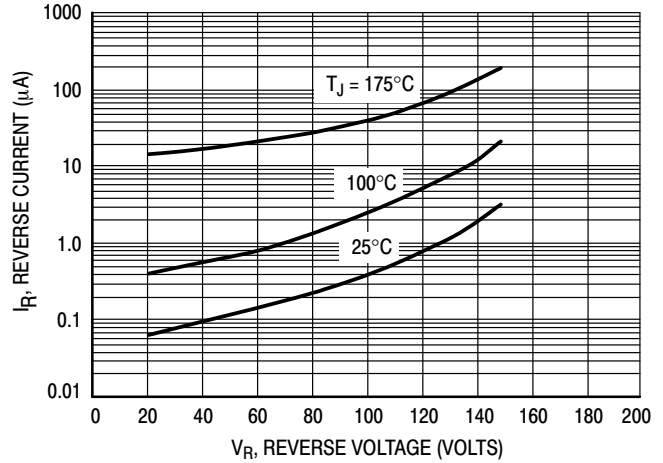


Figure 2. Typical Reverse Current*

* 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 .

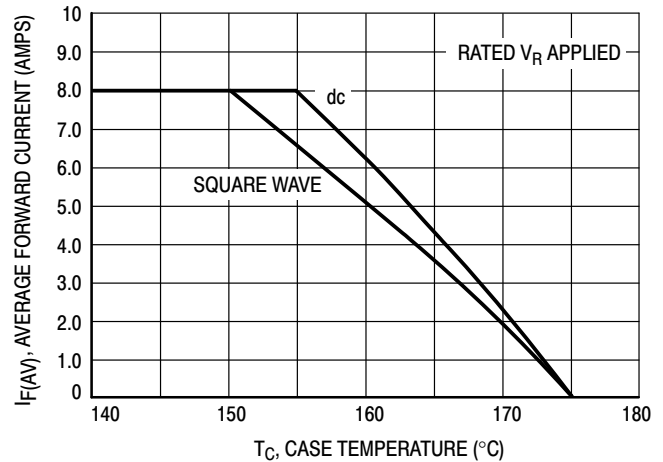


Figure 3. Current Derating, Case

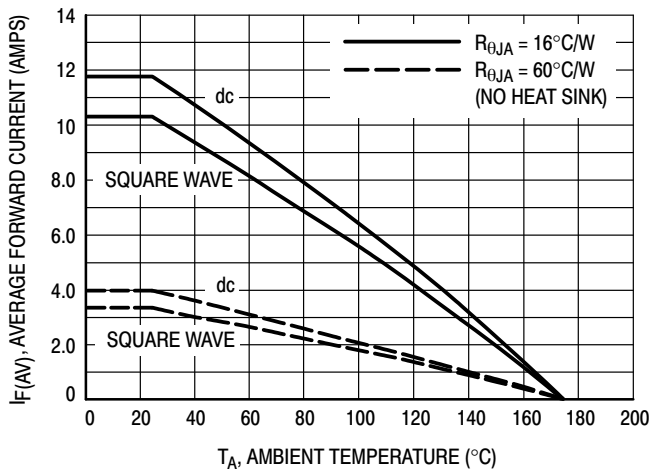


Figure 4. Current Derating, Ambient

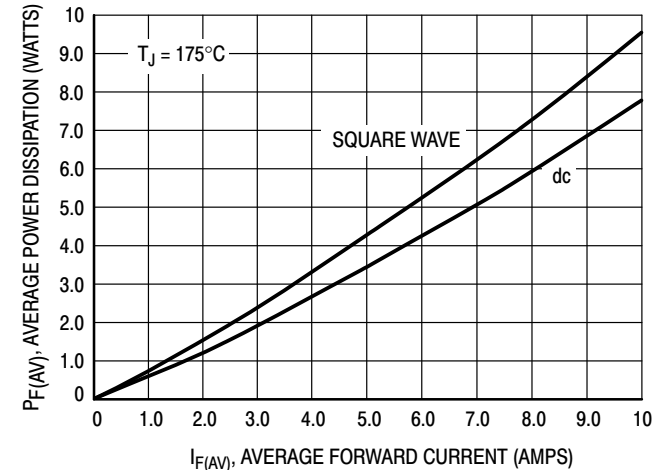


Figure 5. Power Dissipation

MUR805G, MUR810G, MUR815G, MUR820G, MUR840G, MUR860G, MURF860G,
SUR8820G, SUR8840G

MUR840G, SUR8840G

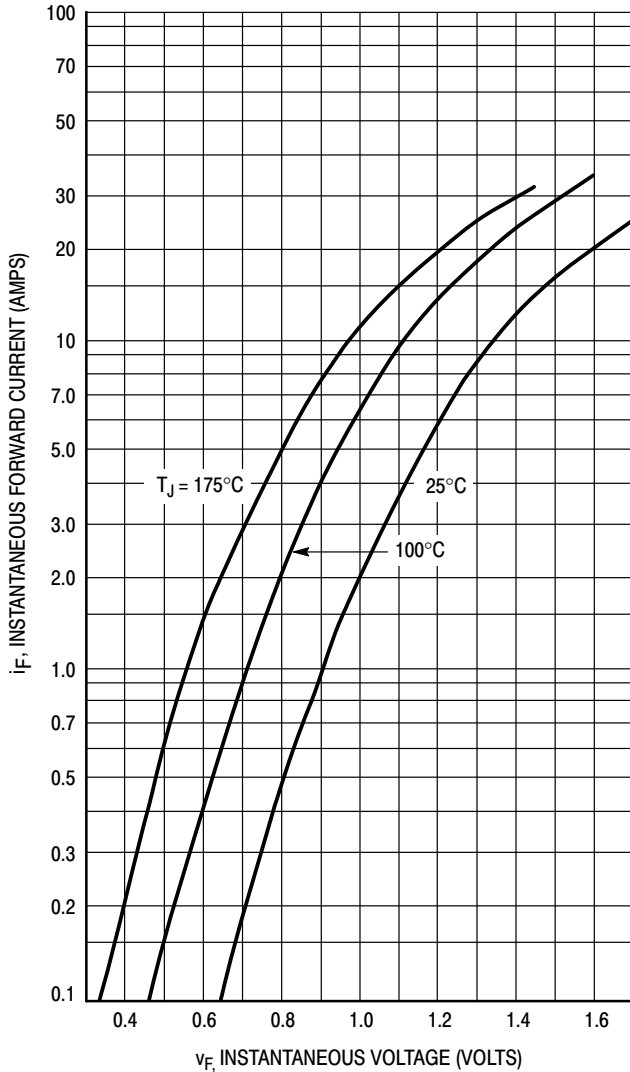


Figure 6. Typical Forward Voltage

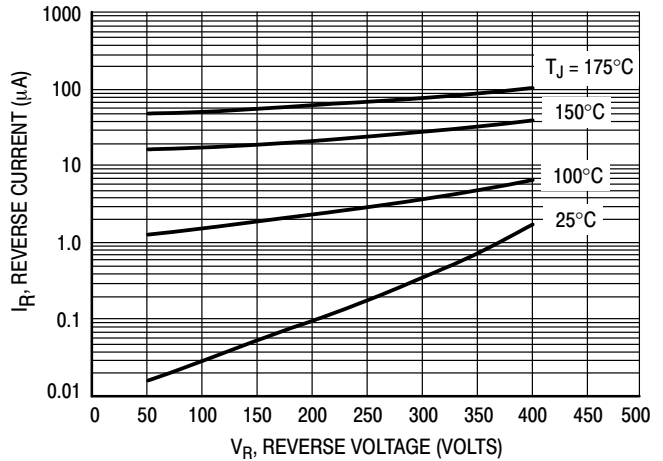


Figure 7. Typical Reverse Current*

* 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 .

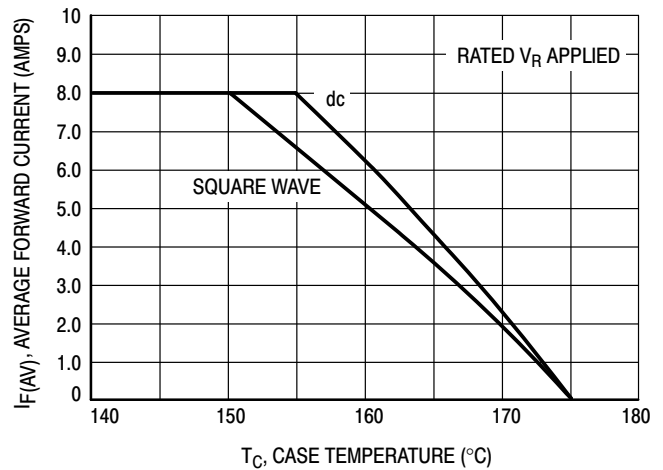


Figure 8. Current Derating, Case

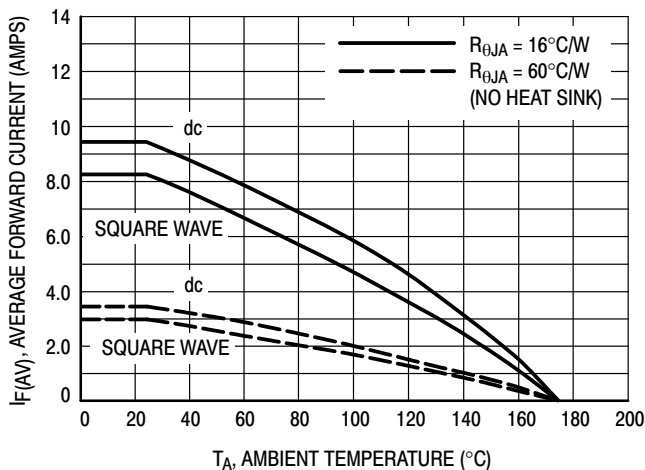


Figure 9. Current Derating, Ambient

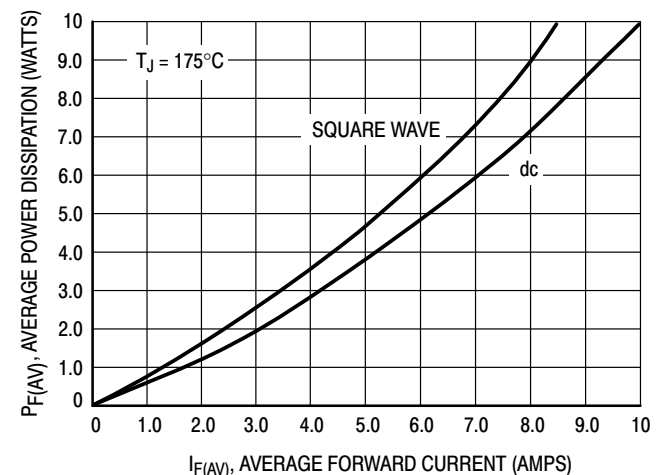


Figure 10. Power Dissipation

MUR805G, MUR810G, MUR815G, MUR820G, MUR840G, MUR860G, MURF860G,
SUR8820G, SUR8840G

MUR860G, MURF860G

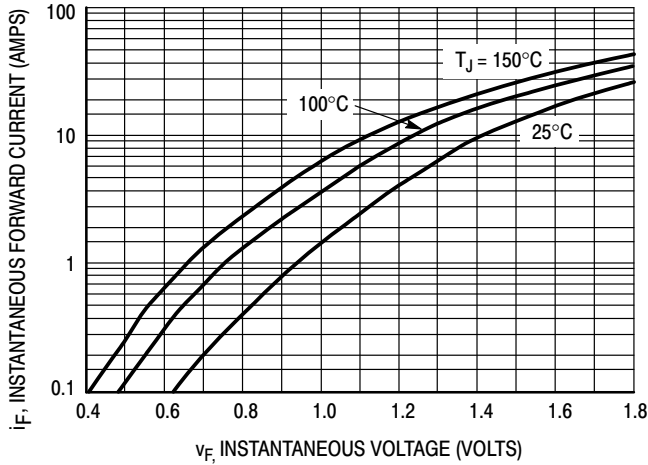


Figure 11. Typical Forward Voltage

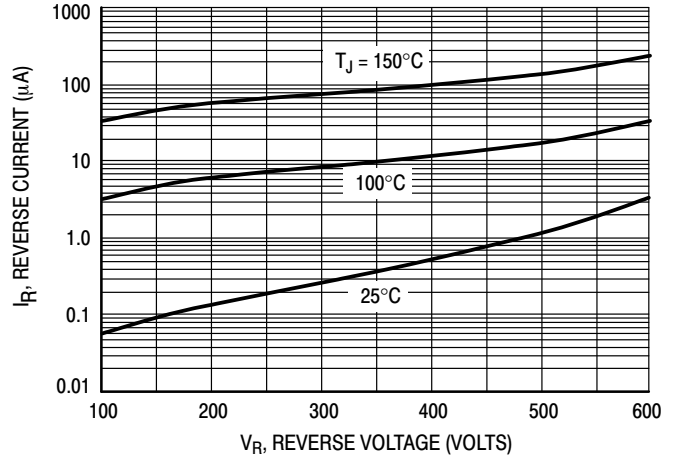


Figure 12. Typical Reverse Current*

* 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 .

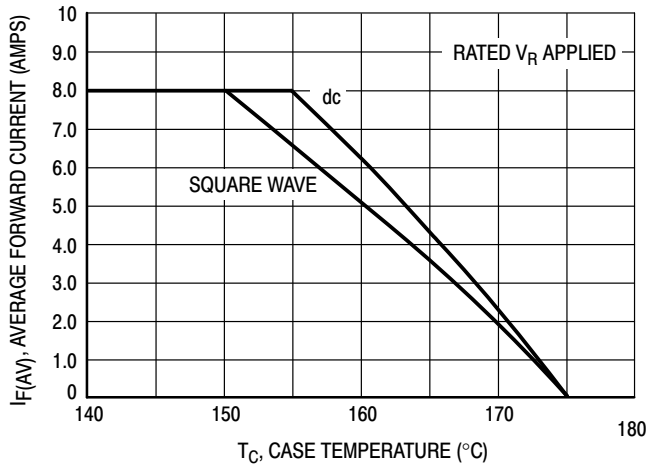


Figure 13. Current Derating, Case

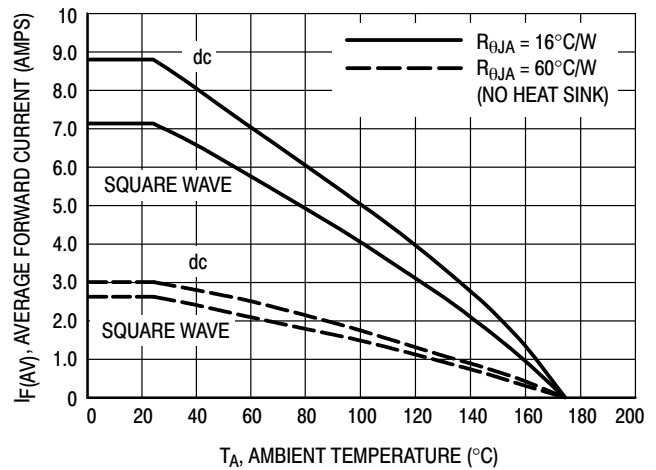


Figure 14. Current Derating, Ambient

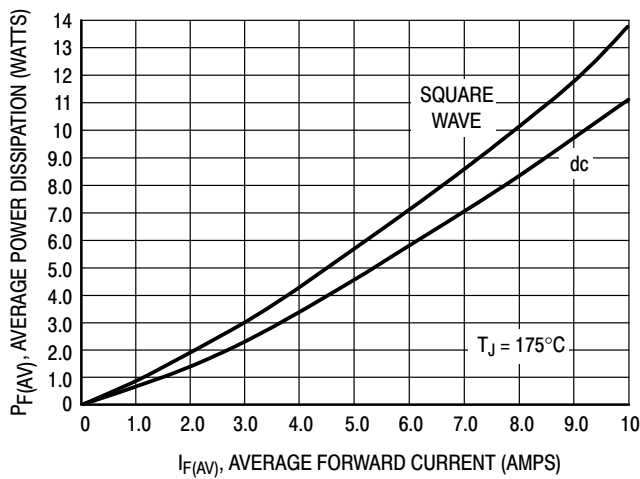


Figure 15. Power Dissipation

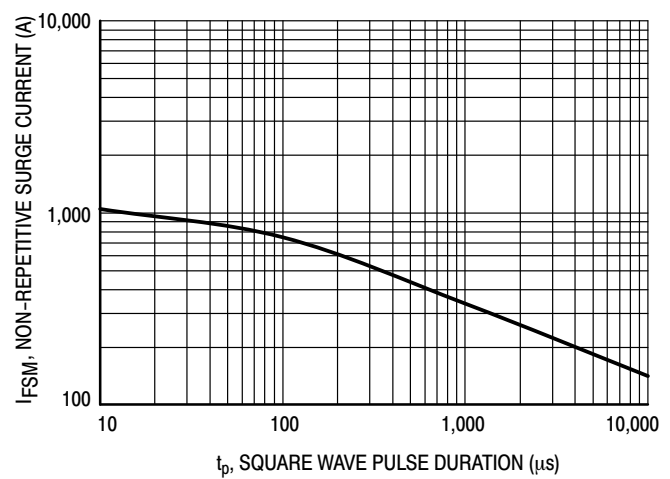
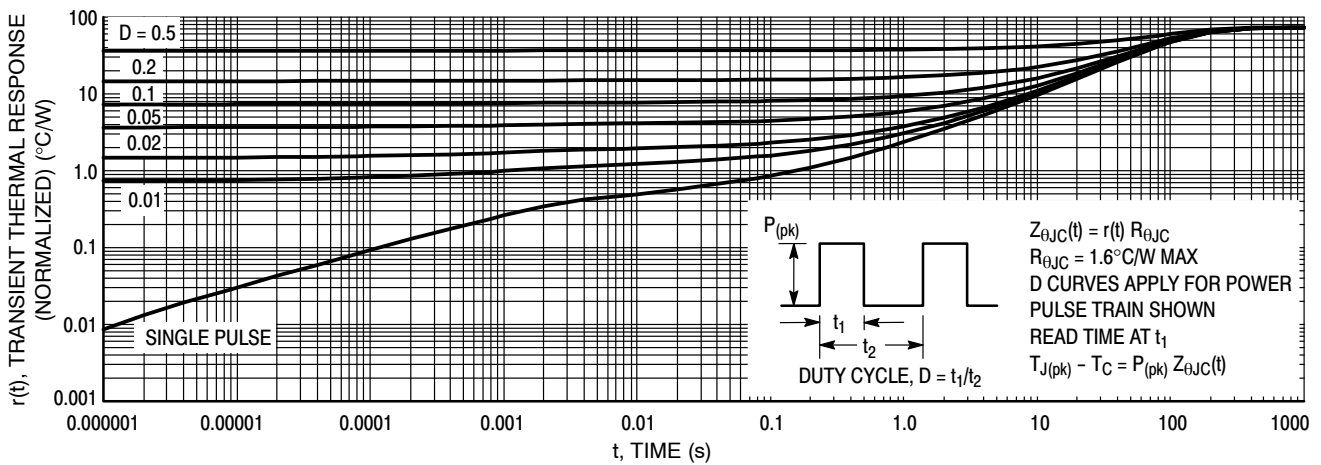
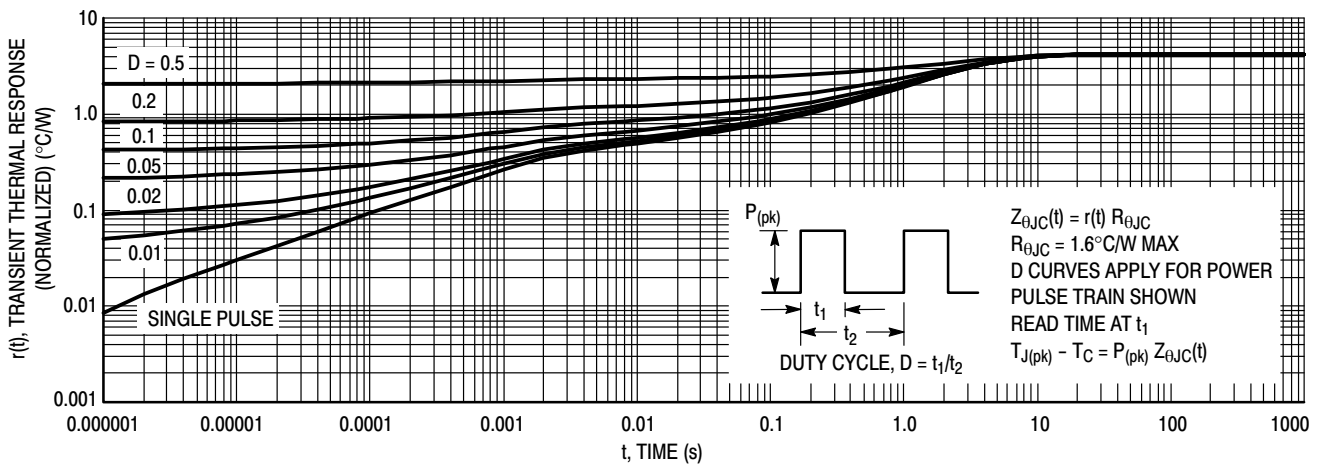
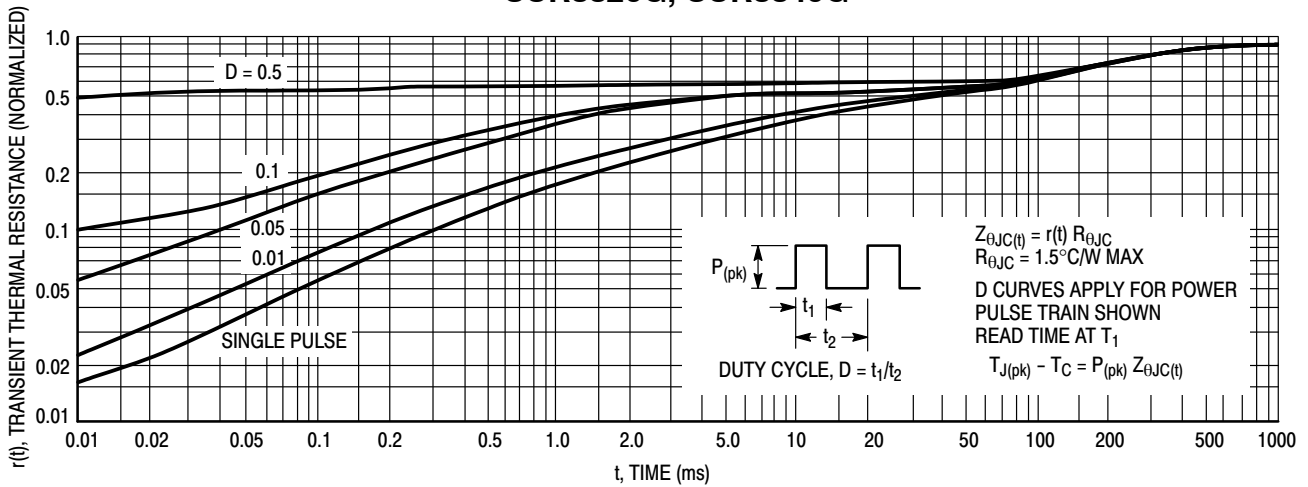


Figure 16. Typical Non-Repetitive Surge Current

* Typical performance based on a limited sample size. ON Semiconductor does not guarantee ratings not listed in the Maximum Ratings table.

MUR805G, MUR810G, MUR815G, MUR820G, MUR840G, MUR860G, MURF860G,
SUR8820G, SUR8840G



**MUR805G, MUR810G, MUR815G, MUR820G, MUR840G, MUR860G, MURF860G,
SUR8820G, SUR8840G**

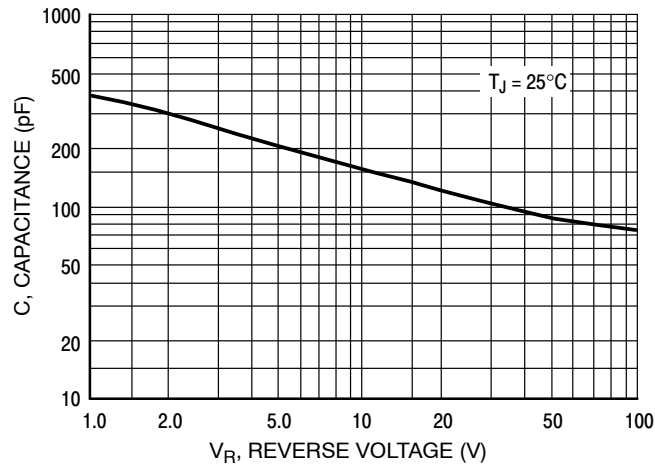


Figure 20. Typical Capacitance

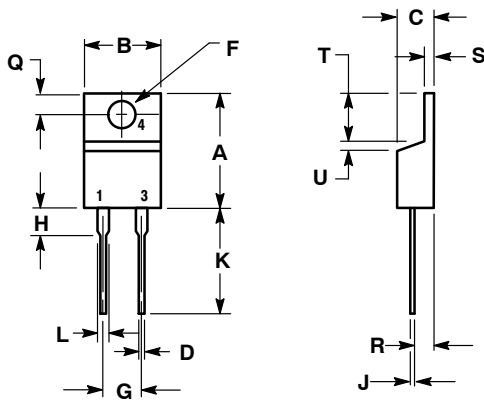
ORDERING INFORMATION

| Device | Package | Shipping |
|----------|-----------------------|-----------------|
| MUR805G | TO-220AC (Pb-Free) | 50 Units / Rail |
| MUR810G | TO-220AC (Pb-Free) | 50 Units / Rail |
| MUR815G | TO-220AC (Pb-Free) | 50 Units / Rail |
| MUR820G | TO-220AC (Pb-Free) | 50 Units / Rail |
| SUR8820G | TO-220AC (Pb-Free) | 50 Units / Rail |
| MUR840G | TO-220AC (Pb-Free) | 50 Units / Rail |
| SUR8840G | TO-220AC (Pb-Free) | 50 Units / Rail |
| MUR860G | TO-220AC (Pb-Free) | 50 Units / Rail |
| MURF860G | TO-220FP (Pb-Free) | 50 Units / Rail |

MUR805G, MUR810G, MUR815G, MUR820G, MUR840G, MUR860G, MURF860G, SUR8820G, SUR8840G

PACKAGE DIMENSIONS

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

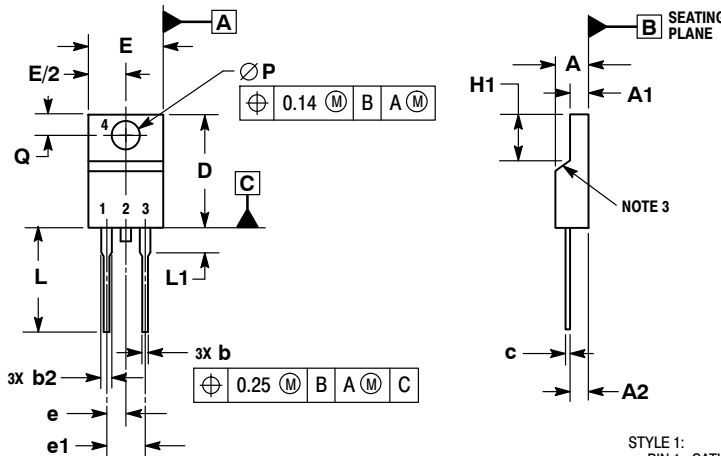


- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

| 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 | 0.039 | 0.64 | 1.00 |
| 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 |

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

TO-220 FULLPAK, 2-LEAD CASE 221AG ISSUE A



- NOTES:
1. DIMENSIONING AND TOLERANCING PER ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: MILLIMETERS.
3. CONTOUR UNCONTROLLED IN THIS AREA.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH AND GATE PROTRUSIONS. MOLD FLASH AND GATE PROTRUSIONS NOT TO EXCEED 0.13 PER SIDE. THESE DIMENSIONS ARE TO BE MEASURED AT OUTERMOST EXTREME OF THE PLASTIC BODY.
5. DIMENSION b2 DOES NOT INCLUDE DAMBAR PROTRUSION. LEAD WIDTH INCLUDING PROTRUSION SHALL NOT EXCEED 2.00.

| DIM | MILLIMETERS | |
|-----|-------------|-------|
| | MIN | MAX |
| A | 4.30 | 4.70 |
| A1 | 2.50 | 2.90 |
| A2 | 2.50 | 2.90 |
| b | 0.54 | 0.84 |
| b2 | 1.10 | 1.40 |
| c | 0.49 | 0.79 |
| D | 14.22 | 15.88 |
| E | 9.65 | 10.67 |
| e | 2.54 BSC | |
| e1 | 5.08 BSC | |
| H1 | 5.97 | 6.48 |
| L | 12.70 | 14.73 |
| L1 | --- | 2.80 |
| P | 3.00 | 3.40 |
| Q | 2.80 | 3.20 |

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

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