

Switch-mode Power Rectifier

MUR550APFG, MURD550PFG, MUR550PFG, MURF550PFG, NRVUD550PFT4G, NRVUD550PFT4G-VF01

These state-of-the-art devices are designed for power factor correction in discontinuous and critical conduction mode.

Features

- 520 V Rating Meets 80% Derating Requirements of Major OEMs
- Low Forward Voltage Drop
- Low Leakage
- Ultrafast 95 Nanosecond Recovery Time
- Reduces Forward Conduction Loss
- NRVUD Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable
- These Devices are Pb-Free, Halogen Free/BFR Free and are RoHS Compliant

Applications

- DCM PFC Designs
- Switching Power Supplies
- Power Inverters

Mechanical Characteristics:

- Case: Epoxy, Molded
- Epoxy Meets UL 94 V-0 @ 0.125 in
- Weight: MUR550APFG: 1.1 Gram (Approximately)
MURD550PFG, NRVUD550PFT4G,
NRVUD550PFT4G-VF01: 0.4 Gram
(Approximately)
MUR550PFG, MURF550PFG: 1.9 Gram
(Approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead and Mounting Surface Temperature for Soldering Purposes: 260°C Max. for 10 Seconds

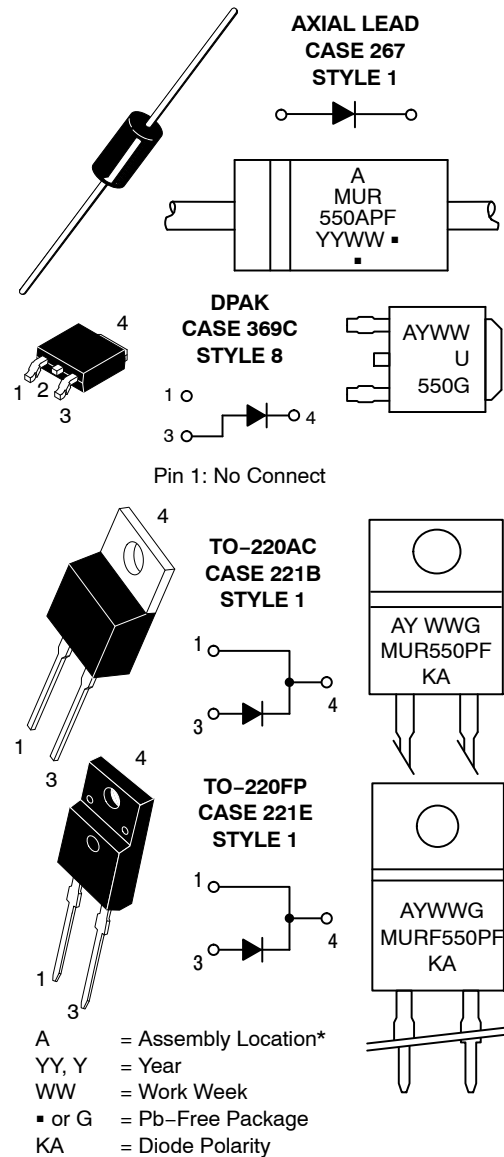


ON Semiconductor®

www.onsemi.com

ULTRAFAST RECTIFIER 5.0 AMPERES, 520 VOLTS

MARKING DIAGRAMS



*The Assembly Location Code (A) is front side optional. In cases where the Assembly Location is stamped in the package bottom (molding ejector pin), the front side assembly code may be blank.
(Note: Microdot may be in either location)

MUR550APFG, MURD550PFG, MUR550PFG, MURF550PFG, NRVUD550PFT4G,

ORDERING INFORMATION

| Device | Package | Shipping† |
|---------------------|-----------------------|-------------------|
| MUR550APFG | Axial | 500 Units/Bag |
| MUR550APFRLG | Axial | 1,500 Tape & Reel |
| MURD550PFT4G | DPAK (Pb-Free) | 2,500 Tape & Reel |
| NRVUD550PFT4G* | DPAK (Pb-Free) | 2,500 Tape & Reel |
| NRVUD550PFT4G-VF01* | DPAK (Pb-Free) | 50 Units / Rail |
| MUR550PFG | TO-220AC (Pb-Free) | 50 Units / Rail |
| MURF550PFG | TO-220FP (Pb-Free) | 50 Units / Rail |

†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification Brochure, BRD8011/D.

*NRVUD Prefix for Automotive and Other Applications Requiring Unique Site and Control Change Requirements; AEC-Q101 Qualified and PPAP Capable.

MAXIMUM RATINGS

| Rating | Symbol | Value | Unit |
|--|---------------------------------|-----------------|------------------|
| Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage | V_{RRM} V_{RWM} V_R | 520 | V |
| Average Rectified Forward Current (Rated V_R) $T_C = 65^\circ\text{C}$ (Rated V_R) $T_C = 160^\circ\text{C}$ | $I_{F(AV)}$ | 5.0 5.0 | A |
| Non-Repetitive Peak Surge Current (Surge Applied at Rated Load Conditions Halfwave, 60 Hz) | I_{FSM} | 85 75 100 | A |
| Operating Junction Temperature Range | T_J | -65 to +175 | $^\circ\text{C}$ |
| Storage Temperature Range | T_{stg} | -65 to +175 | $^\circ\text{C}$ |
| ESD Ratings: Machine Model = C Human Body Model = 3B | ESD | > 400 > 8000 | V |

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 | Value | Unit |
|--|-----------------|--------------------|--------------------|
| Thermal Resistance, Junction-to-Case (Note 1) MURD550PFG, MUR550PFG, NRVUD550PFT4G, NRVUD550PFT4G-VF01 MURF550PFG | $R_{\theta JC}$ | 2.8 5.75 | $^\circ\text{C/W}$ |
| Thermal Resistance, Junction-to-Ambient MUR550APFG NRVUD550PFT4G, NRVUD550PFT4G-VF01, MURD550PFG (Note 3), MURF550PFG | $R_{\theta JA}$ | Note 2 62 75 | $^\circ\text{C/W}$ |

1. Rating applies when surface mounted on the minimum pad sizes recommended.
2. See Note 2, Ambient Mounting Data.
3. 1 inch square pad size on FR4 board.

MUR550APFG, MURD550PFG, MUR550PFG, MURF550PFG, NRVUD550PFT4G,

ELECTRICAL CHARACTERISTICS

| Characteristic | Symbol | Value | Unit |
|--|----------|--------------|---------------|
| Maximum Instantaneous Forward Voltage Drop (Note 4) ($I_F = 5.0 \text{ A}$, $T_J = 25^\circ\text{C}$) ($I_F = 5.0 \text{ A}$, $T_J = 150^\circ\text{C}$) | V_F | 1.15 0.98 | V |
| Maximum Instantaneous Reverse Current (Note 4) ($V_R = 520 \text{ V}$, $T_J = 25^\circ\text{C}$) ($V_R = 520 \text{ V}$, $T_J = 150^\circ\text{C}$) | I_R | 5.0 400 | μA |
| Maximum Reverse Recovery Time ($I_F = 1.0 \text{ A}$, $di/dt = 50 \text{ A}/\mu\text{s}$, $V_R = 30 \text{ V}$, $T_J = 25^\circ\text{C}$) | t_{rr} | 95 | 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.

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

NOTE 2 — AMBIENT MOUNTING DATA

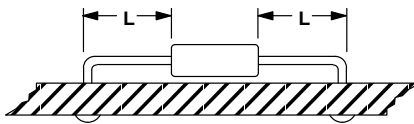
Data shown for thermal resistance junction-to-ambient ($R_{\theta JA}$) for the mountings shown is to be used as typical guideline values for preliminary engineering or in case the tie point temperature cannot be measured.

TYPICAL VALUES FOR $R_{\theta JA}$ IN STILL AIR

| Mounting Method | $R_{\theta JA}$ | Lead Length, L (IN) | | | | Units |
|-----------------|-----------------|---------------------|-----|-----|-----|-------|
| | | 1/8 | 1/4 | 1/2 | 3/4 | |
| 1 | | 50 | 51 | 53 | 55 | °C/W |
| 2 | | 58 | 59 | 61 | 63 | °C/W |
| 3 | | 28 | | | | °C/W |

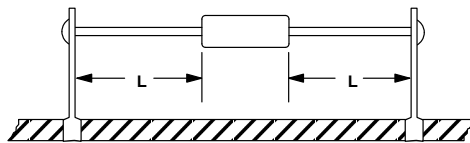
MOUNTING METHOD 1

P.C. Board Where Available Copper Surface area is small.



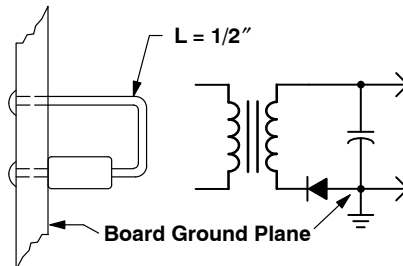
MOUNTING METHOD 2

Vector Push-In Terminals T-28



MOUNTING METHOD 3

P.C. Board with 1-1/2" x 1-1/2" Copper Surface



MUR550APFG, MURD550PFG, MUR550PFG, MURF550PFG, NRVUD550PFT4G,

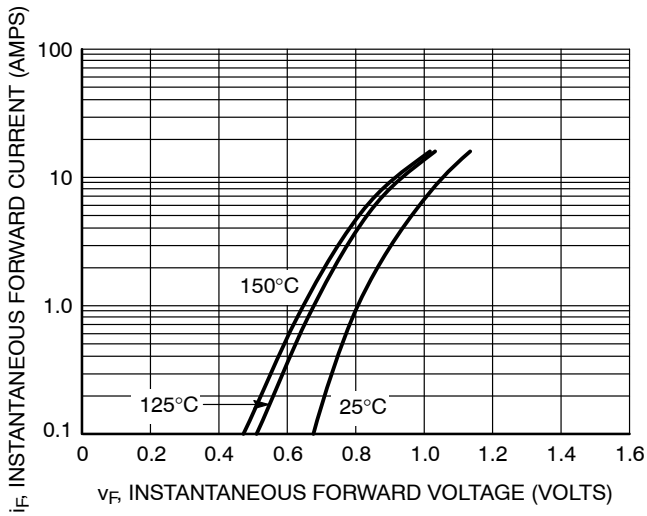


Figure 1. Typical Forward Voltage

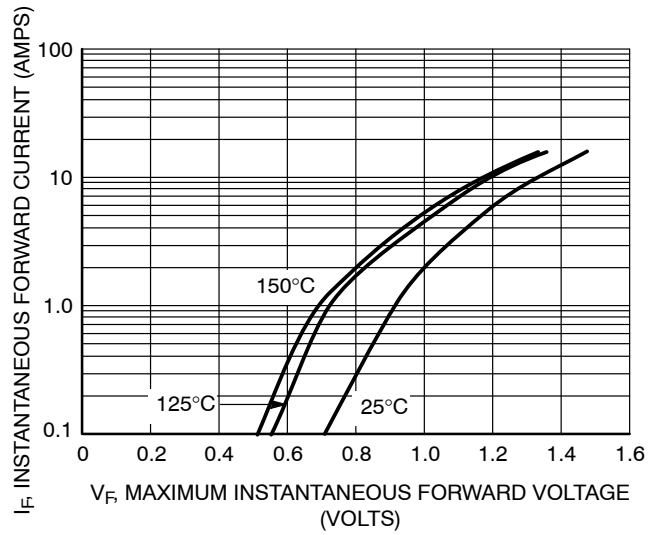


Figure 2. Maximum Forward Voltage

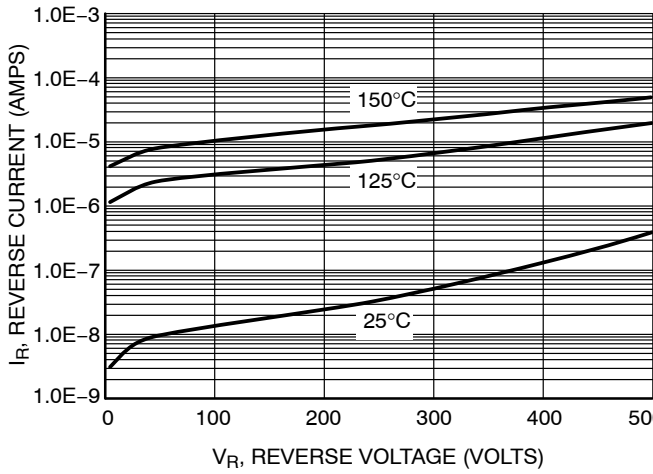


Figure 3. Typical Reverse Current

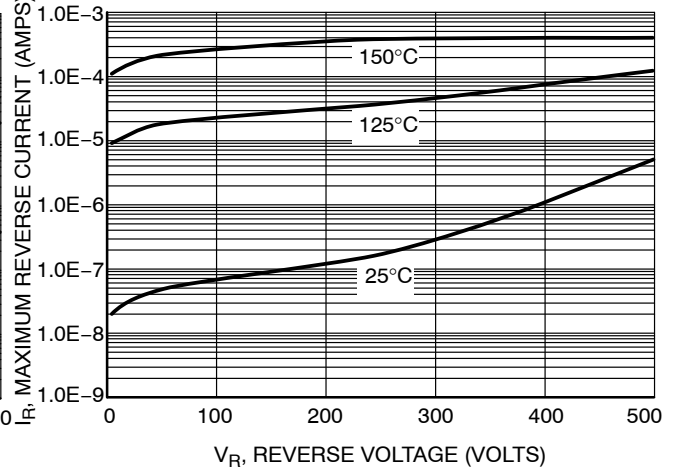


Figure 4. Maximum Reverse Current

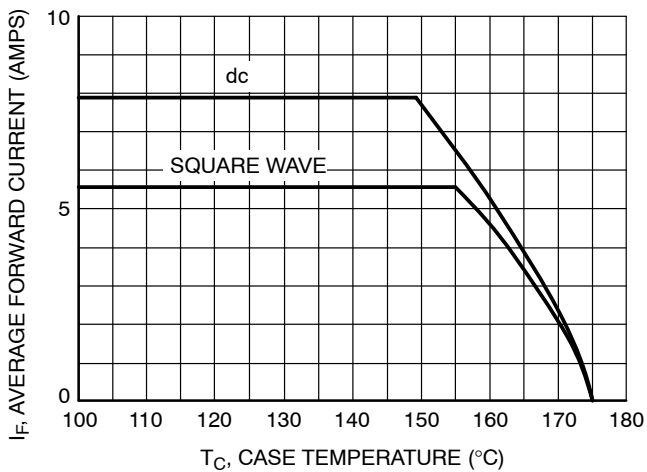


Figure 5. Current Derating

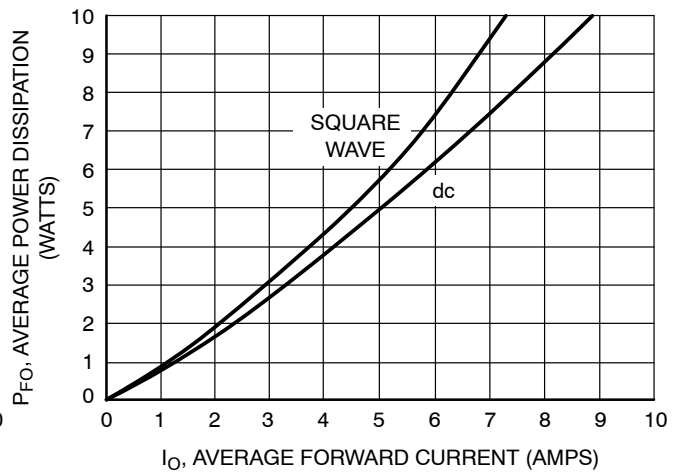


Figure 6. Forward Power Dissipation

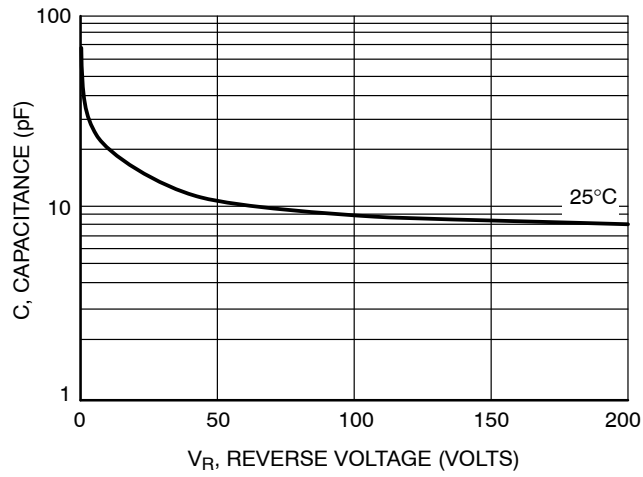


Figure 7. Capacitance

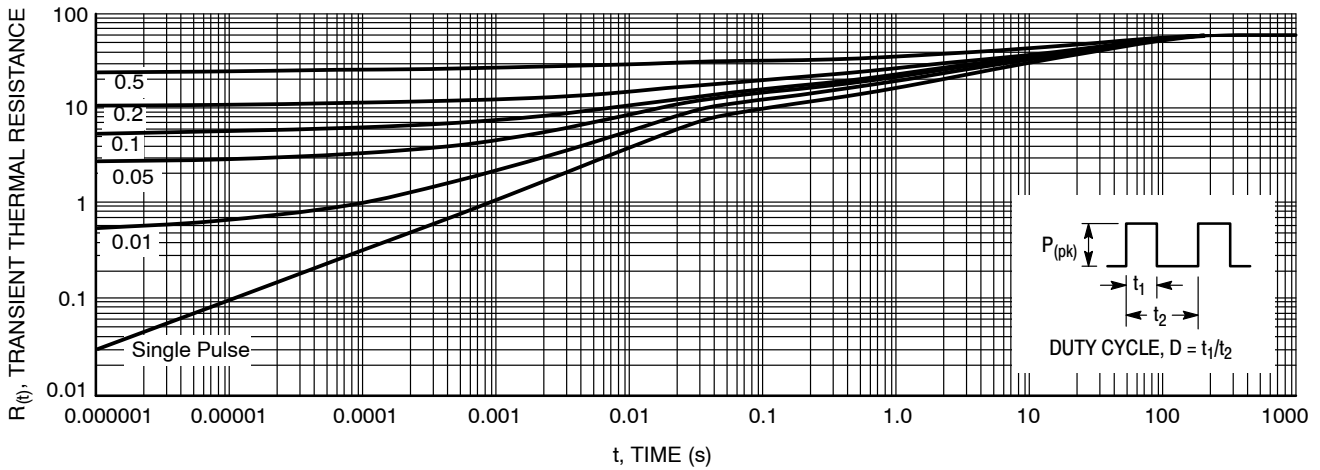


Figure 8. Thermal Response for MUR550APFG

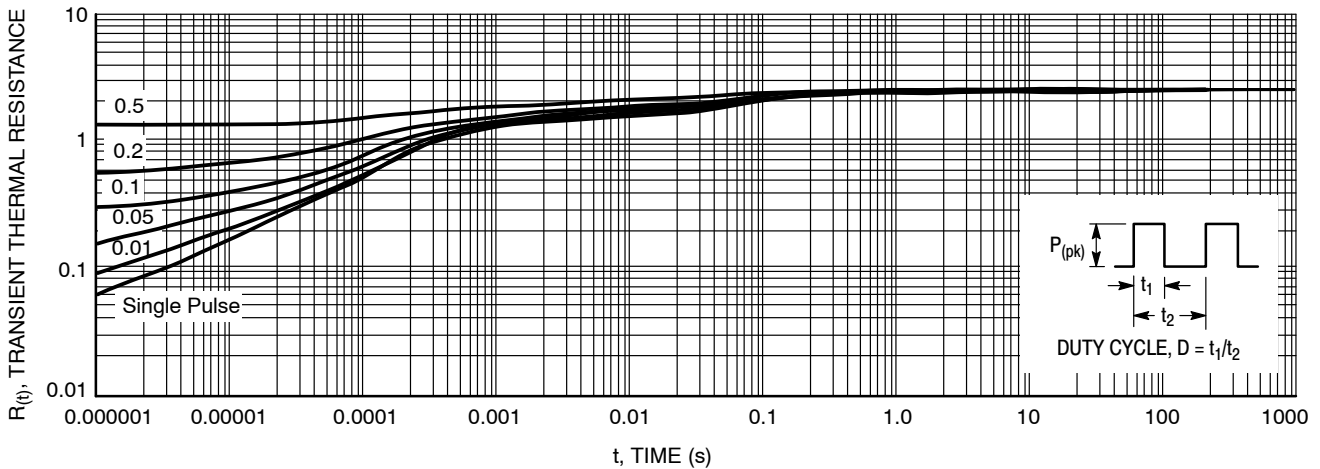


Figure 9. Thermal Response for MURD550PFG, NRVUD550PFT4G, NRVUD550PFT4G-VF01

MUR550APFG, MURD550PFG, MUR550PFG, MURF550PFG, NRVUD550PFT4G,

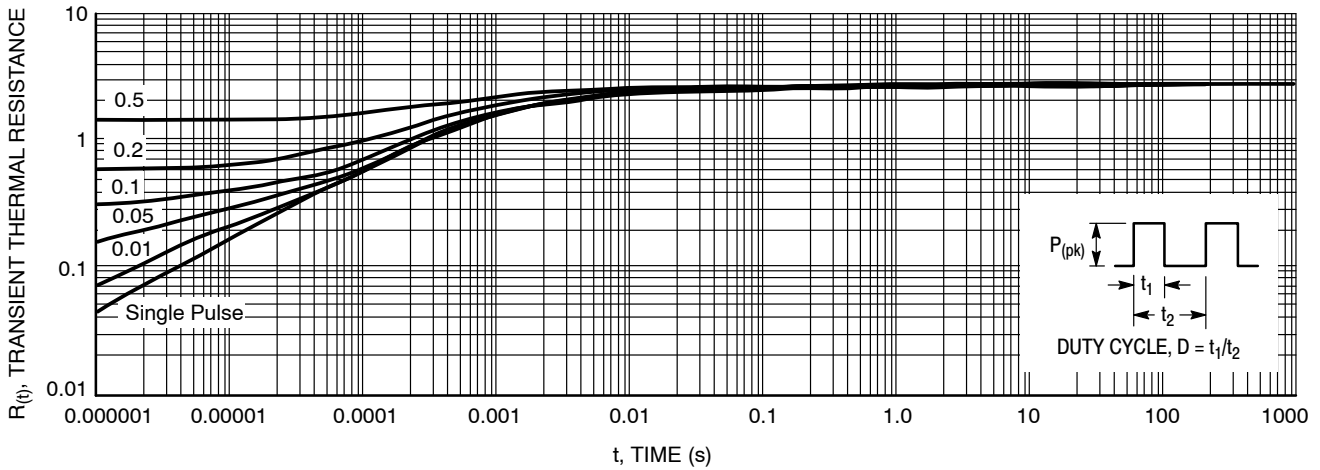


Figure 10. Thermal Response for MUR550PFG

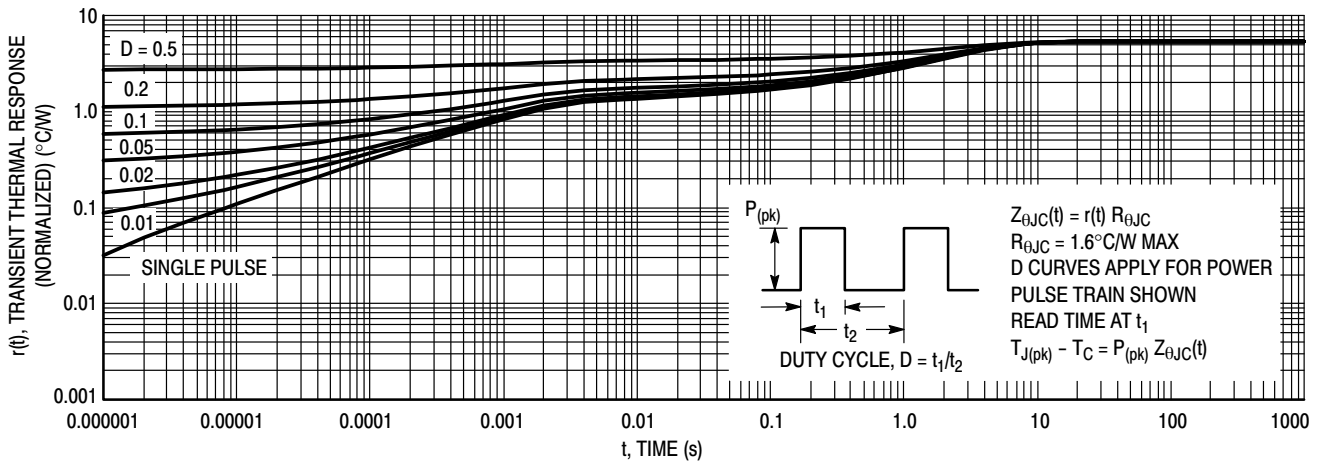


Figure 11. Thermal Response, (MURF550PFG) Junction-to-Case ($R_{\theta JC}$)

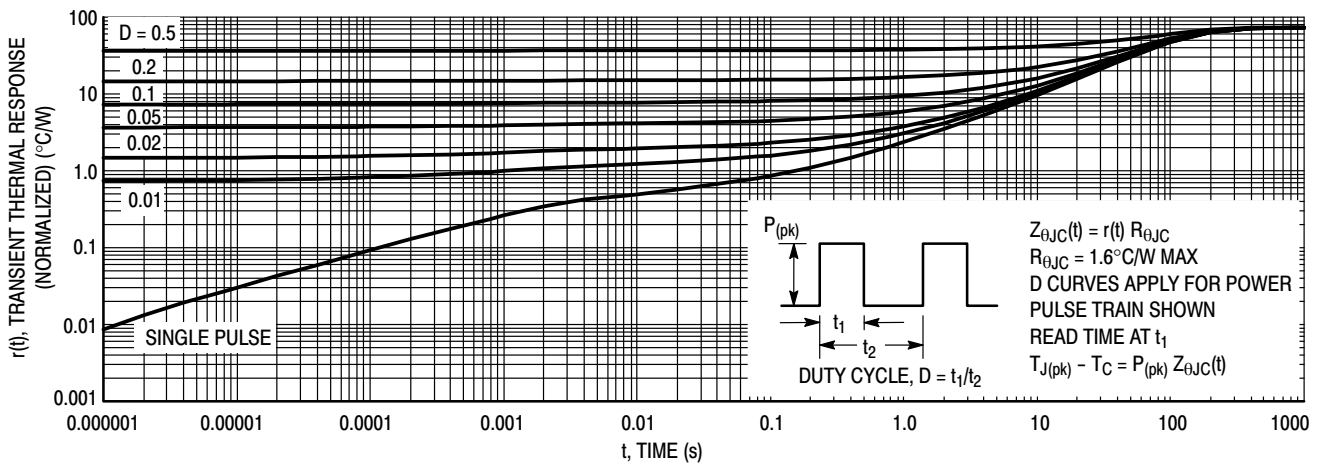


Figure 12. Thermal Response, (MURF550PFG) Junction-to-Ambient ($R_{\theta JA}$)

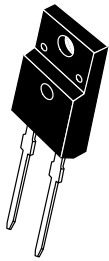
MECHANICAL CASE OUTLINE
PACKAGE DIMENSIONS

ON Semiconductor®

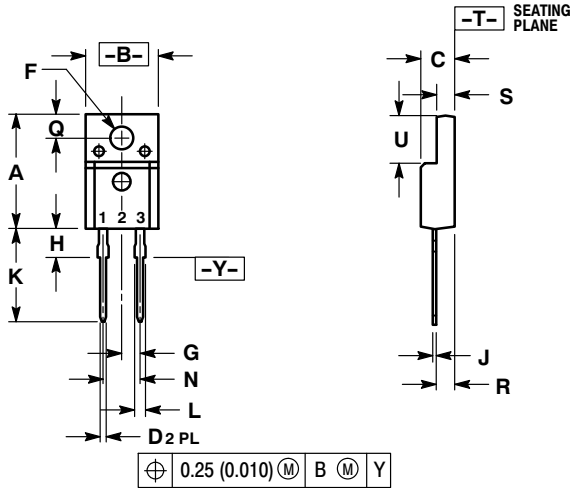


TO-220 FULLPAK, 2-LEAD
CASE 221E-01
ISSUE A

DATE 21 JAN 2008



SCALE 1:1



- 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

GENERIC MARKING DIAGRAM*



Rectifier

- A = Assembly Location
- Y = Year
- WW = Work Week
- G = Pb-Free Package
- xxxxxx = Device Code
- KA = Polarity Designator

*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "▪", may or may not be present.

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| DESCRIPTION: | TO-220 FULLPAK, 2-LEAD | PAGE 1 OF 2 |

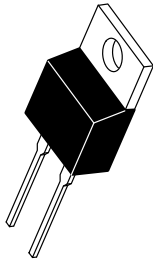
MECHANICAL CASE OUTLINE

PACKAGE DIMENSIONS

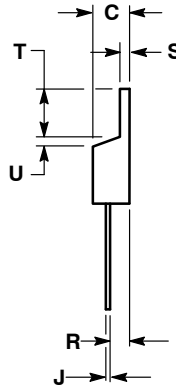
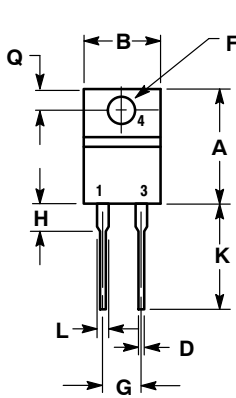


TO-220, 2-LEAD CASE 221B-04 ISSUE F

DATE 12 APR 2013



SCALE 1:1



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

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

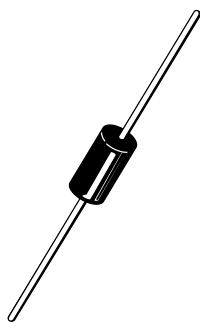
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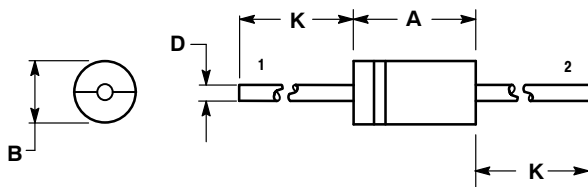


AXIAL LEAD
CASE 267-05
ISSUE G

DATE 06/06/2000



SCALE 1:1



NOTES:

1. DIMENSIONS AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. 267-04 OBSOLETE, NEW STANDARD 267-05.

| DIM | INCHES | | MILLIMETERS | |
|-----|--------|-------|-------------|------|
| | MIN | MAX | MIN | MAX |
| A | 0.287 | 0.374 | 7.30 | 9.50 |
| B | 0.189 | 0.209 | 4.80 | 5.30 |
| D | 0.047 | 0.051 | 1.20 | 1.30 |
| K | 1.000 | --- | 25.40 | --- |

STYLE 1:
 PIN 1. CATHODE (POLARITY BAND)
 2. ANODE

STYLE 2:
 NO POLARITY

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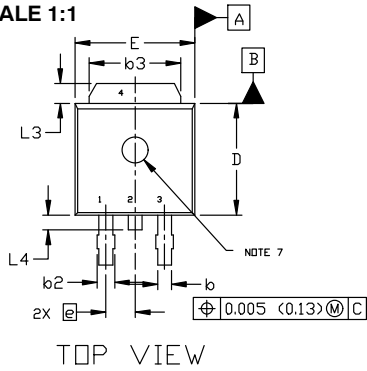
MECHANICAL CASE OUTLINE PACKAGE DIMENSIONS



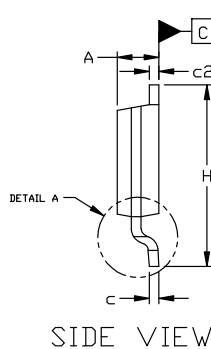
DPAK (SINGLE GAUGE) CASE 369C ISSUE G

DATE 31 MAY 2023

SCALE 1:1



TOP VIEW

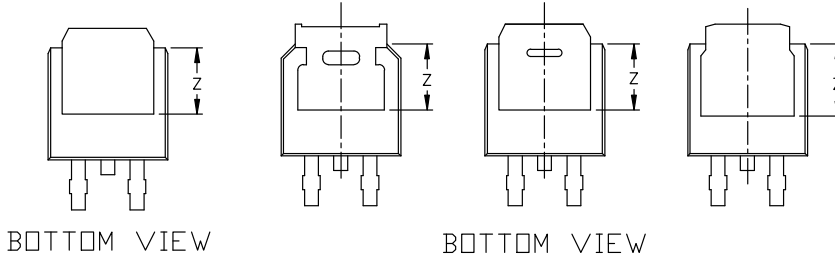


SIDE VIEW

NOTES:

1. DIMENSIONING AND TOLERANCING ASME Y14.5M, 1994.
2. CONTROLLING DIMENSION: INCHES
3. THERMAL PAD CONTOUR OPTIONAL WITHIN DIMENSIONS b3, L3, AND Z.
4. DIMENSIONS D AND E DO NOT INCLUDE MOLD FLASH, PROTRUSIONS, OR BURRS. MOLD FLASH, PROTRUSIONS, OR GATE BURRS SHALL NOT EXCEED 0.006 INCHES PER SIDE.
5. DIMENSIONS D AND E ARE DETERMINED AT THE OUTERMOST EXTREMES OF THE PLASTIC BODY.
6. DATUMS A AND B ARE DETERMINED AT DATUM PLANE H.
7. OPTIONAL MOLD FEATURE.

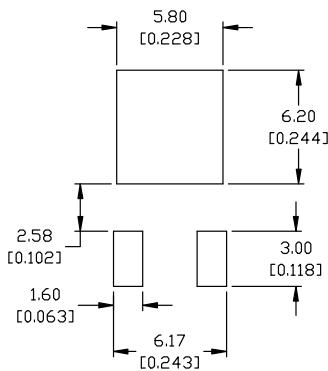
| DIM | INCHES | | MILLIMETERS | |
|-----|--------|-------|-------------|-------|
| | MIN. | MAX. | MIN. | MAX. |
| A | 0.086 | 0.094 | 2.18 | 2.38 |
| A1 | 0.000 | 0.005 | 0.00 | 0.13 |
| b | 0.025 | 0.035 | 0.63 | 0.89 |
| b2 | 0.028 | 0.045 | 0.72 | 1.14 |
| b3 | 0.180 | 0.215 | 4.57 | 5.46 |
| c | 0.018 | 0.024 | 0.46 | 0.61 |
| c2 | 0.018 | 0.024 | 0.46 | 0.61 |
| D | 0.235 | 0.245 | 5.97 | 6.22 |
| E | 0.250 | 0.265 | 6.35 | 6.73 |
| e | 0.090 | BSC | 2.29 | BSC |
| H | 0.370 | 0.410 | 9.40 | 10.41 |
| L | 0.055 | 0.070 | 1.40 | 1.78 |
| L1 | 0.114 | REF | 2.90 | REF |
| L2 | 0.020 | BSC | 0.51 | BSC |
| L3 | 0.035 | 0.050 | 0.89 | 1.27 |
| L4 | ---- | 0.040 | --- | 1.01 |
| Z | 0.155 | ---- | 3.93 | --- |



BOTTOM VIEW

BOTTOM VIEW

ALTERNATE CONSTRUCTIONS

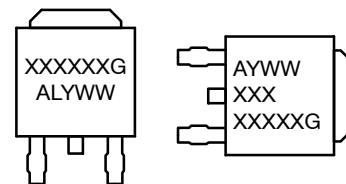


RECOMMENDED MOUNTING FOOTPRINT*

*FOR ADDITIONAL INFORMATION ON OUR Pb-FREE STRATEGY AND SOLDERING DETAILS, PLEASE DOWNLOAD THE ON SEMICONDUCTOR SOLDERING AND MOUNTING TECHNIQUES REFERENCE MANUAL, SOLDERM/D.

- | | | | | |
|--|--|---|---|--|
| <p>STYLE 1: PIN 1. BASE 2. COLLECTOR 3. EMITTER 4. COLLECTOR</p> | <p>STYLE 2: PIN 1. GATE 2. DRAIN 3. SOURCE 4. DRAIN</p> | <p>STYLE 3: PIN 1. ANODE 2. CATHODE 3. ANODE 4. CATHODE</p> | <p>STYLE 4: PIN 1. CATHODE 2. ANODE 3. GATE 4. ANODE</p> | <p>STYLE 5: PIN 1. GATE 2. ANODE 3. CATHODE 4. ANODE</p> |
| <p>STYLE 6: PIN 1. MT1 2. MT2 3. GATE 4. MT2</p> | <p>STYLE 7: PIN 1. GATE 2. COLLECTOR 3. EMITTER 4. COLLECTOR</p> | <p>STYLE 8: PIN 1. N/C 2. CATHODE 3. ANODE 4. CATHODE</p> | <p>STYLE 9: PIN 1. ANODE 2. CATHODE 3. RESISTOR ADJUST 4. CATHODE</p> | <p>STYLE 10: PIN 1. CATHODE 2. ANODE 3. CATHODE 4. ANODE</p> |

GENERIC MARKING DIAGRAM*



IC

Discrete

- XXXXXX = Device Code
- A = Assembly Location
- L = Wafer Lot
- Y = Year
- WW = Work Week
- G = Pb-Free Package

*This information is generic. Please refer to device data sheet for actual part marking. Pb-Free indicator, "G" or microdot "•", may or may not be present. Some products may not follow the Generic Marking.

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