

MUR550APF, MURD550PF, MUR550PF, MURF550PF

SWITCHMODE Power Rectifier

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
- Pb-Free Packages are Available

Applications

- DCM PFC Designs
- Switching Power Supplies
- Power Inverters

Mechanical Characteristics:

- Case: Epoxy, Molded
- Epoxy Meets UL 94 V-0 @ 0.125 in
- Weight: MUR550APF: 1.1 Gram (Approximately)
MURD550PF: 0.4 Gram (Approximately)
MUR550PF, MURF550PF: 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

ORDERING INFORMATION

| Device | Package | Shipping† |
|--------------|--------------------|------------------|
| MUR550APF | Axial* | 500 Units/Bag |
| MUR550APFG | Axial* | 500 Units/Bag |
| MUR550APFRL | Axial* | 1500 Tape & Reel |
| MUR550APFRLG | Axial* | 1500 Tape & Reel |
| MURD550PFT4 | DPAK | 2500 Tape & Reel |
| MURD550PFT4G | DPAK (Pb-Free) | 2500 Tape & Reel |
| 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.

*This package is inherently Pb-Free.

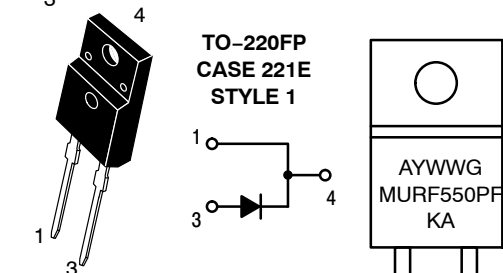
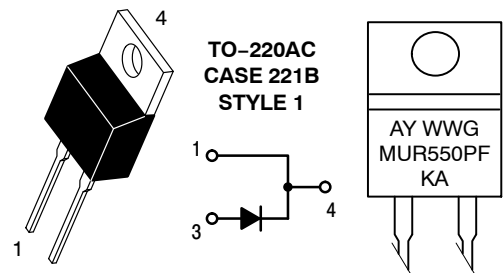
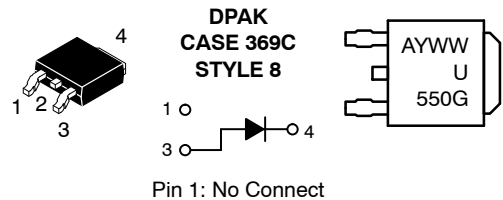
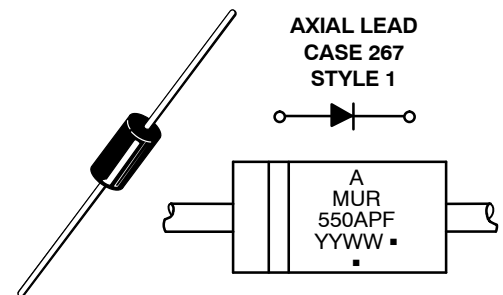


ON Semiconductor®

<http://onsemi.com>

ULTRAFast RECTIFIER 5.0 AMPERES, 520 VOLTS

MARKING DIAGRAMS



A = Assembly Location
YY, Y = Year
WW = Work Week
▪ or G = Pb-Free Package
KA = Diode Polarity

(Note: Microdot may be in either location)

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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 | 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 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

| Rating | Symbol | Value | Unit |
|---|-----------------|--------------------|---------------------------|
| Thermal Resistance, Junction-to-Case (Note 1) | $R_{\theta JC}$ | 2.8 5.75 | $^\circ\text{C}/\text{W}$ |
| Thermal Resistance, Junction-to-Ambient | $R_{\theta JA}$ | Note 2 62 75 | $^\circ\text{C}/\text{W}$ |

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.

ELECTRICAL CHARACTERISTICS

| Rating | 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 |

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

NOTE 2 — AMBIENT MOUNTING DATA

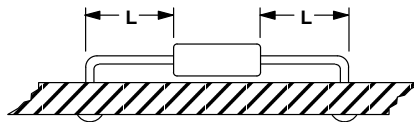
Data shown for thermal resistance junction-to-ambient ($R_{\theta JA}$) for the mountings shown is to be used as typical guideline values for preliminary engineering or in case the tie point temperature cannot be measured.

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 |

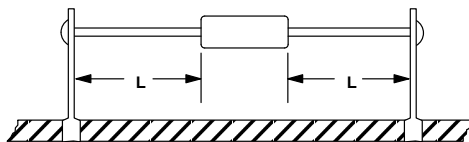
MOUNTING METHOD 1

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



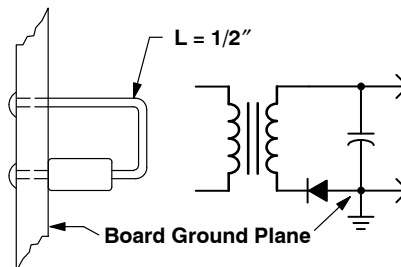
MOUNTING METHOD 2

Vector Push-In Terminals T-28



MOUNTING METHOD 3

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



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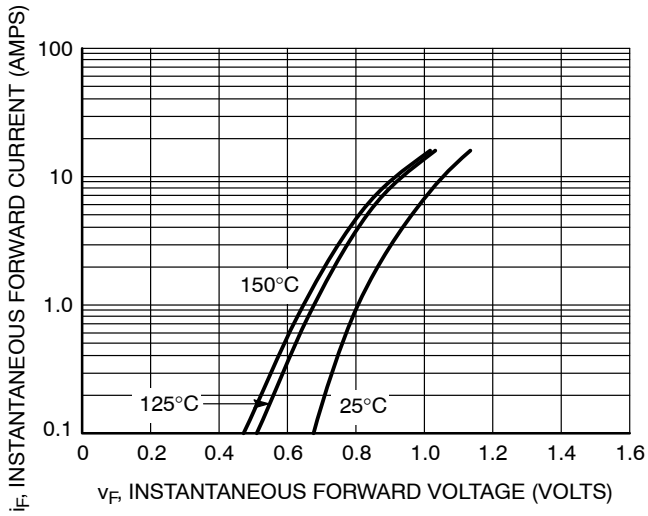


Figure 1. Typical Forward Voltage

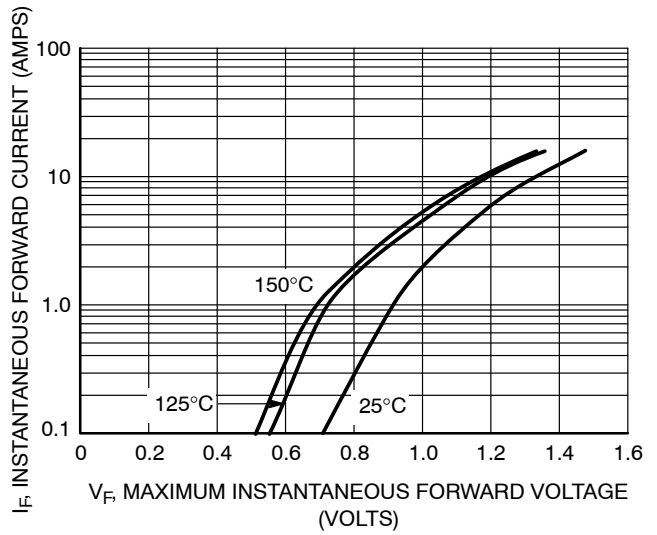


Figure 2. Maximum Forward Voltage

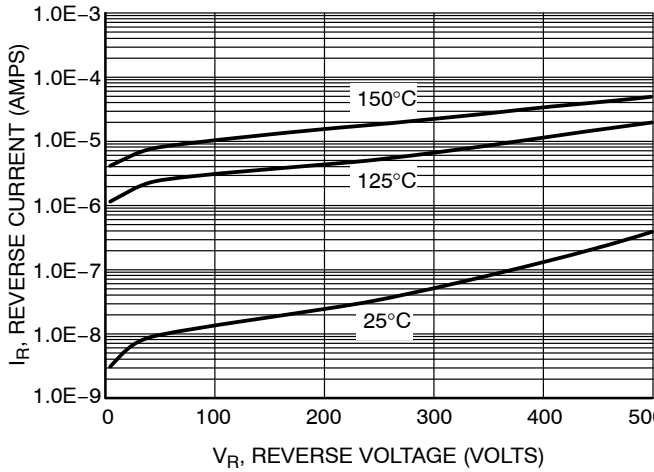


Figure 3. Typical Reverse Current

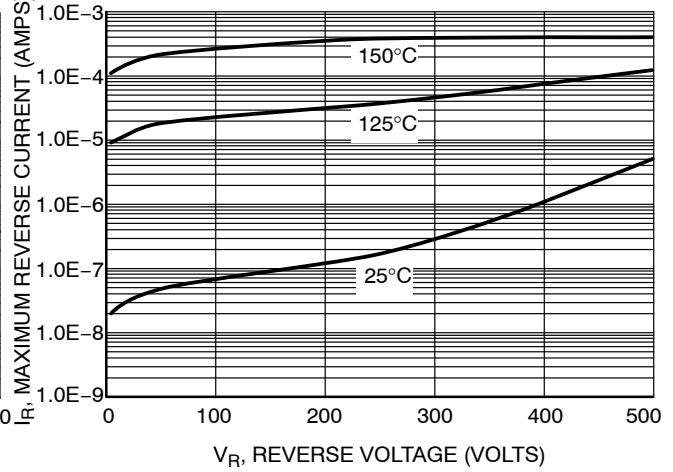


Figure 4. Maximum Reverse Current

MUR550APF, MURD550PF, MUR550PF, MURF550PF

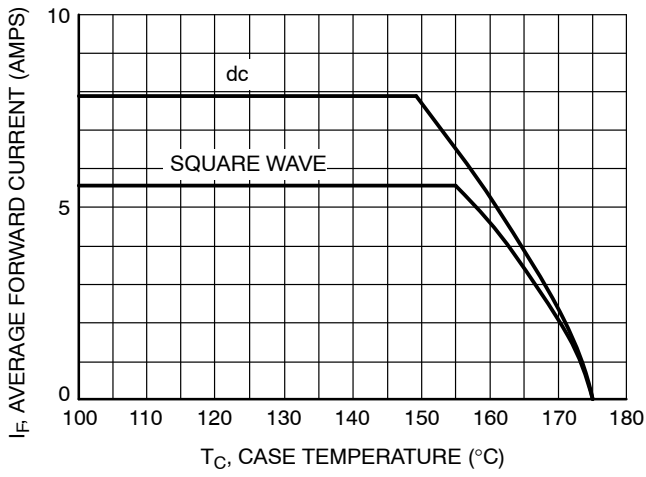


Figure 5. Current Derating

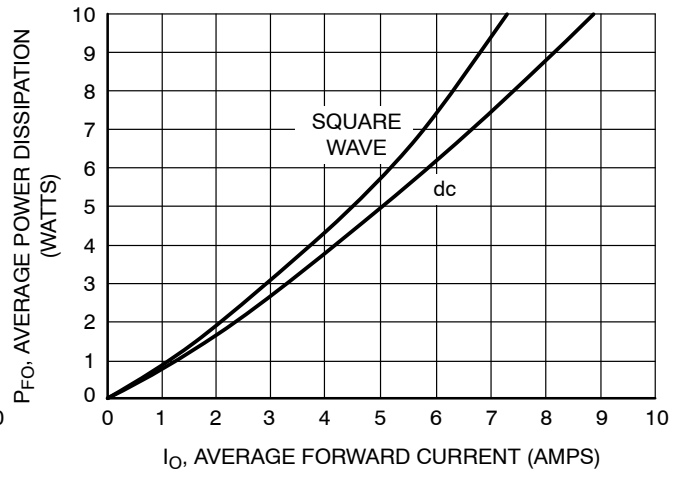


Figure 6. Forward Power Dissipation

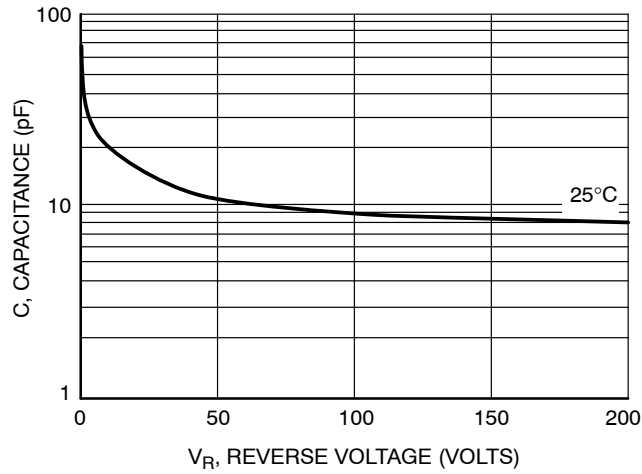


Figure 7. Capacitance

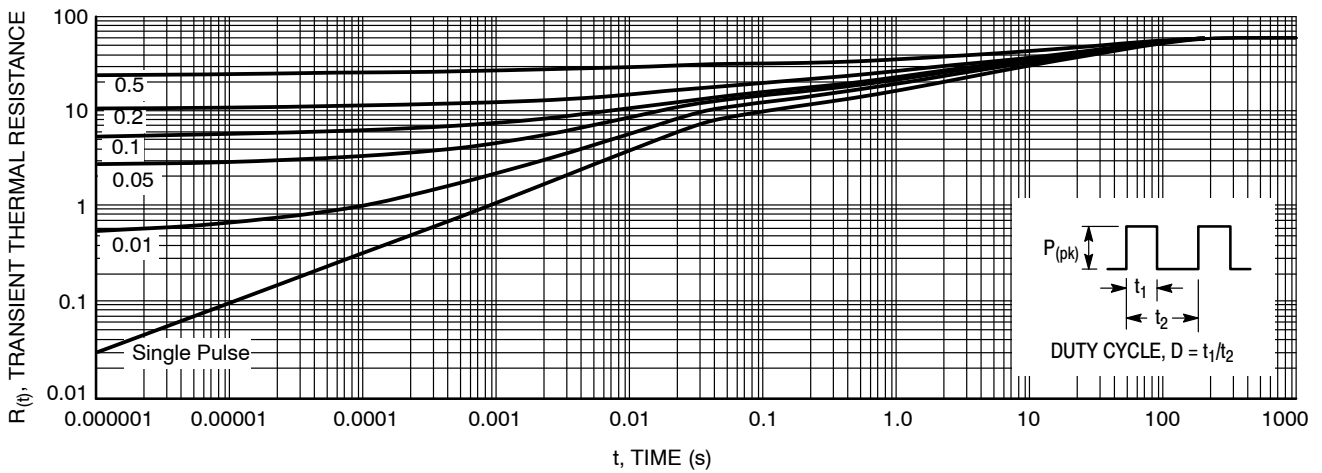


Figure 8. Thermal Response for MUR550APF

MUR550APF, MURD550PF, MUR550PF, MURF550PF

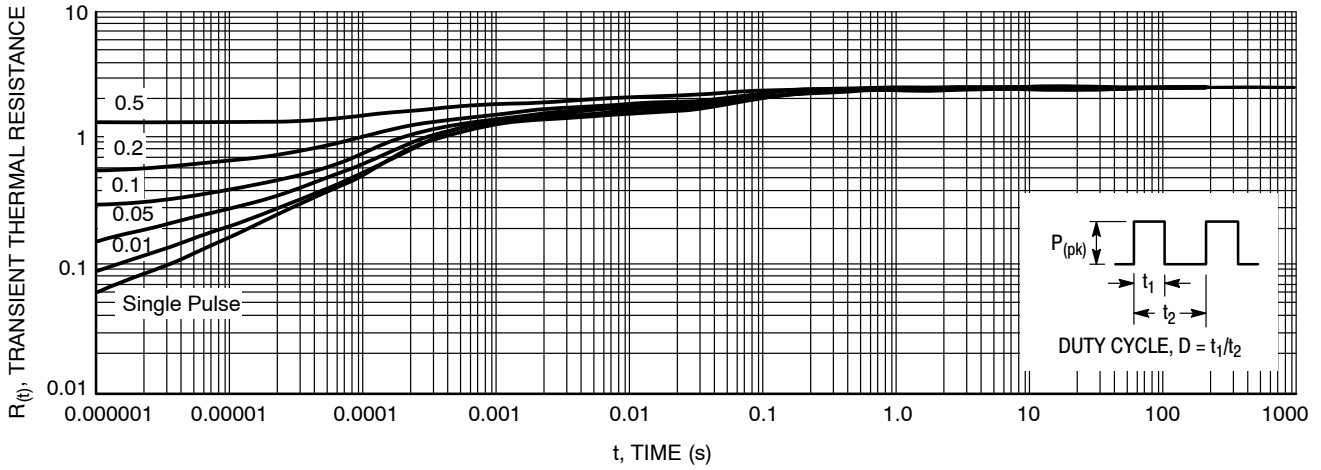


Figure 9. Thermal Response for MURD550PF

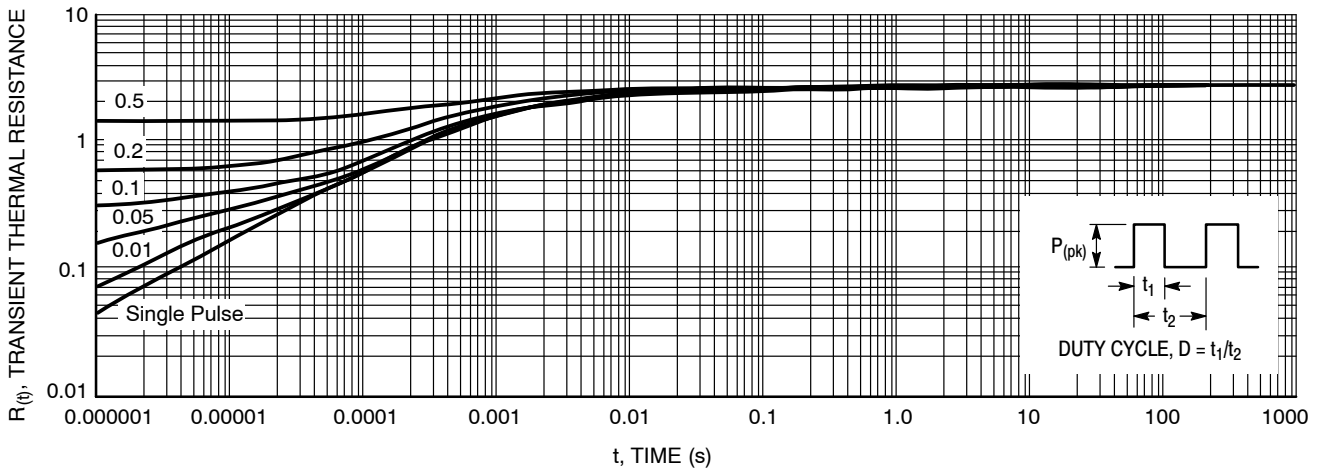


Figure 10. Thermal Response for MUR550PF

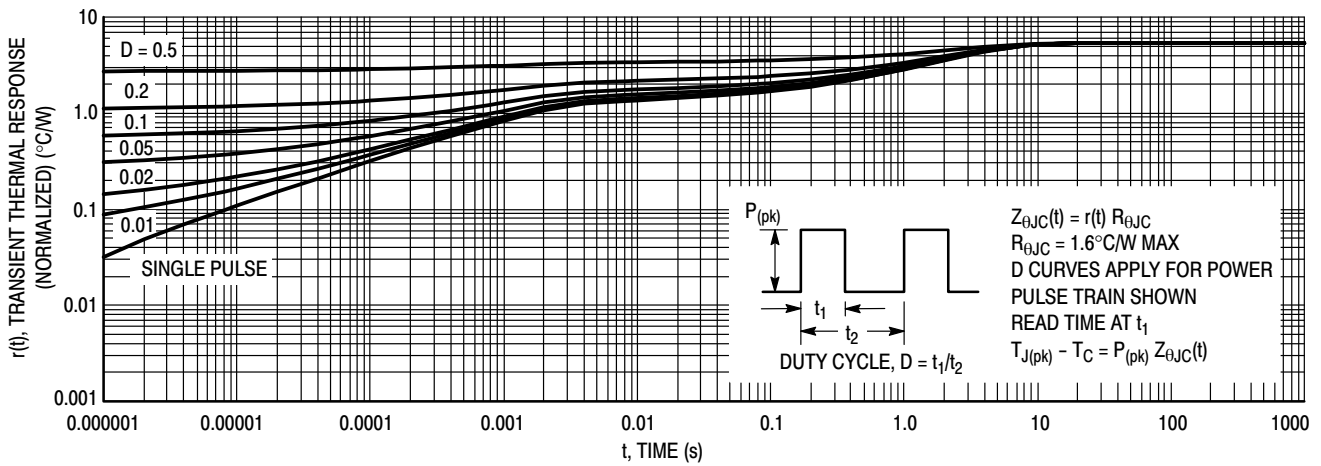


Figure 11. Thermal Response, (MURF550PF) Junction-to-Case ($R_{\theta JC}$)

MUR550APF, MURD550PF, MUR550PF, MURF550PF

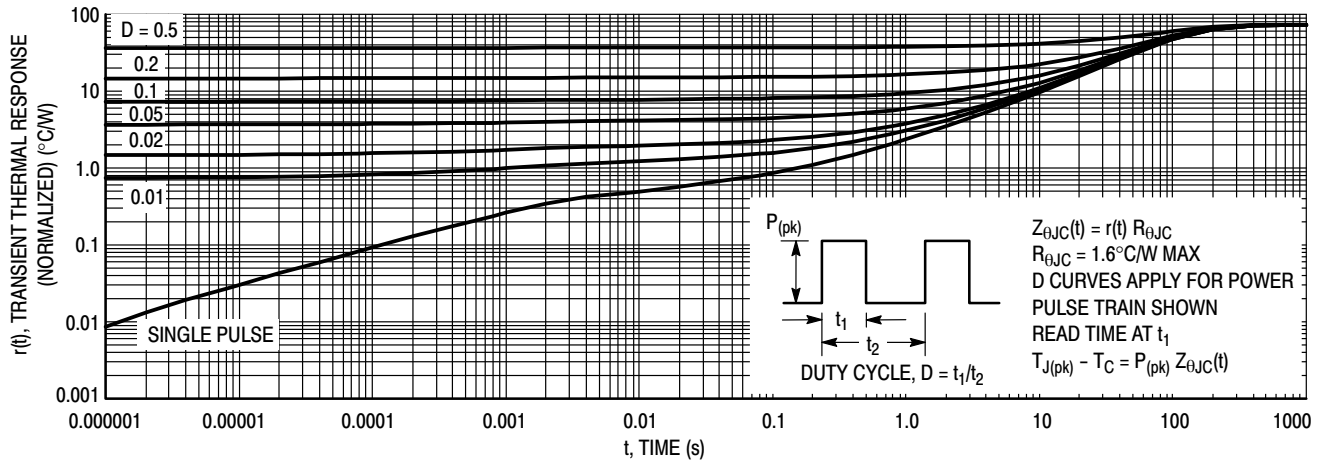
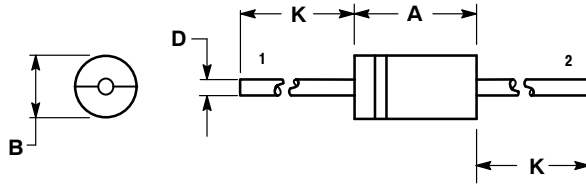


Figure 12. Thermal Response, (MURF550PF) Junction-to-Ambient ($R_{\theta JA}$)

MUR550APF, MURD550PF, MUR550PF, MURF550PF

PACKAGE DIMENSIONS

AXIAL LEAD
CASE 267-05
ISSUE G



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 | --- |

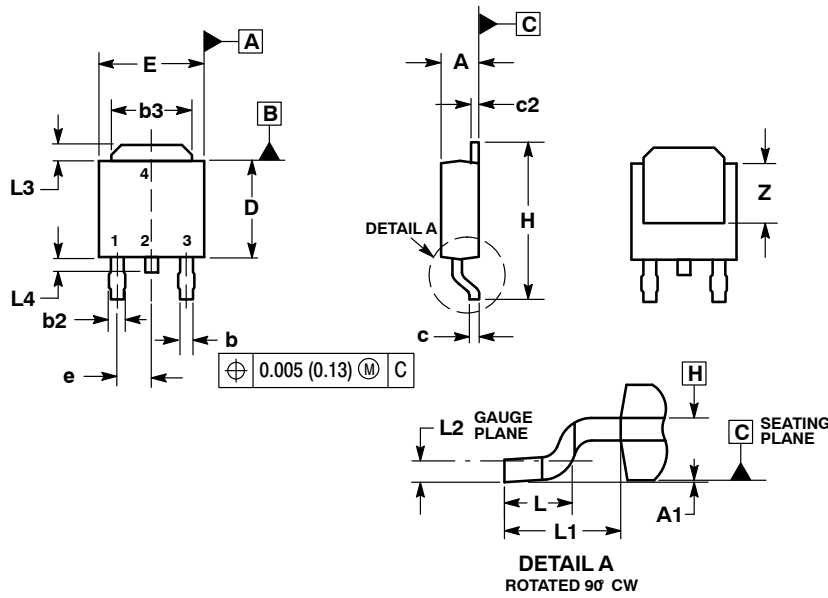
STYLE 1:

- PIN 1. CATHODE (POLARITY BAND)
- PIN 2. ANODE

MUR550APF, MURD550PF, MUR550PF, MURF550PF

PACKAGE DIMENSIONS

DPAK (SINGLE GAUGE) CASE 369C-01 ISSUE D

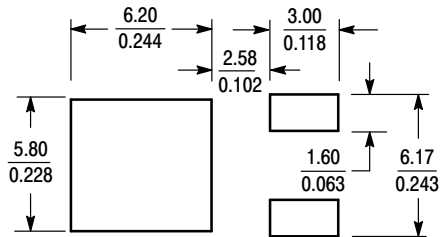


NOTES:

1. DIMENSIONING AND TOLERANCING PER 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.

| 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 | 0.030 | 0.045 | 0.76 | 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 | 0.108 REF | | 2.74 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 | --- |

SOLDERING FOOTPRINT*



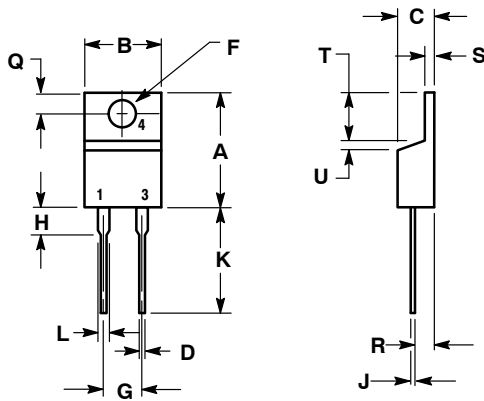
SCALE 3:1 $\left(\frac{\text{mm}}{\text{inches}}\right)$

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

MUR550APF, MURD550PF, MUR550PF, MURF550PF

PACKAGE DIMENSIONS

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

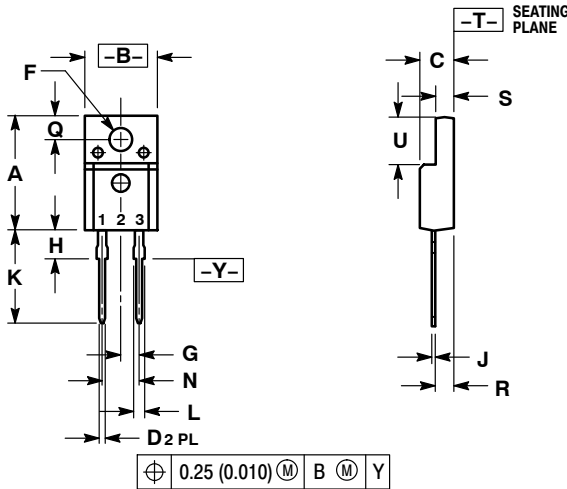


- NOTES:
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

| 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 |

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

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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