

MUR550APF, MURD550PF, MUR550PF

Preferred Device

SWITCHMODE™ Power Rectifier

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

Features and Benefits

- 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 Package is Available

Applications

- DCM PFC Designs
- Switching Power Supplies
- Power Inverters

Mechanical Characteristics

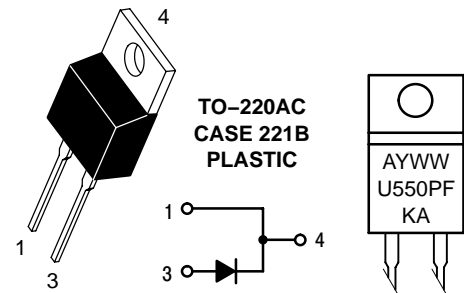
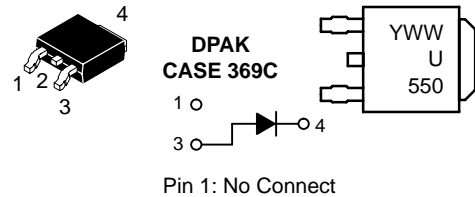
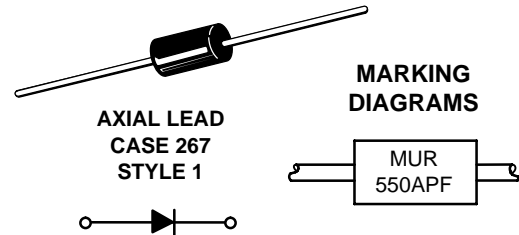
- Case: Epoxy, Molded
- Epoxy Meets UL 94 V-0 @ 0.125 in
- Weight: MUR550APF: 1.1 Gram (Approximately)
MURD550PF: 0.4 Gram (Approximately)
MUR550PF: 1.9 Gram (Approximately)
- Finish: All External Surfaces Corrosion Resistant and Terminal Leads are Readily Solderable
- Lead and Mounting Surface Temperature for Soldering Purposes: 220°C Max. for 10 Seconds



ON Semiconductor®

<http://onsemi.com>

ULTRAFAST RECTIFIER 5.0 A, 520 V



MUR550APF, = Device Code
U550PF
A = Assembly Location
Y = Year
WW = Work Week
KA = Diode Polarity

ORDERING INFORMATION

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

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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) $T_C = 65^\circ\text{C}$ MUR550APF (Rated V_R) $T_C = 160^\circ\text{C}$ MURD550PF, MUR550PF | $I_{F(AV)}$ | 5.0 | A |
| Non-Repetitive Peak Surge Current (Surge Applied at Rated Load Conditions Halfwave, 60 Hz) MUR550APF MURD550PF MUR550PF | 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 |

Maximum ratings are those values beyond which device damage can occur. Maximum ratings applied to the device are individual stress limit values (not normal operating conditions) and are not valid simultaneously. If these limits are exceeded, device functional operation is not implied, damage may occur and reliability may be affected.

THERMAL CHARACTERISTICS

| Rating | Symbol | Value | Unit |
|---|-----------------|--------------|--------------------|
| Thermal Resistance – Junction-to-Case (Note 1) MURD550PF, MUR550PF | $R_{\theta JC}$ | 2.8 | $^\circ\text{C/W}$ |
| Thermal Resistance – Junction-to-Ambient MUR550APF MURD550PF (Note 3) | $R_{\theta JA}$ | Note 2 62 | $^\circ\text{C/W}$ |

ELECTRICAL CHARACTERISTICS

| | | | |
|--|----------|--------------|---------------|
| 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 |

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

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NOTE 2 — AMBIENT MOUNTING DATA

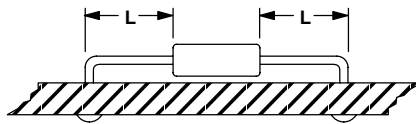
Data shown for thermal resistance junction-to-ambient ($R_{\theta JA}$) for the mountings shown is to be used as typical guideline values for preliminary engineering or in case the tie point temperature cannot be measured.

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 |

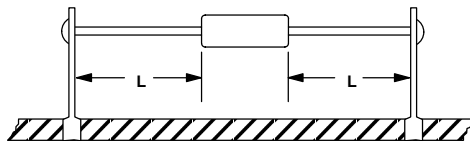
MOUNTING METHOD 1

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



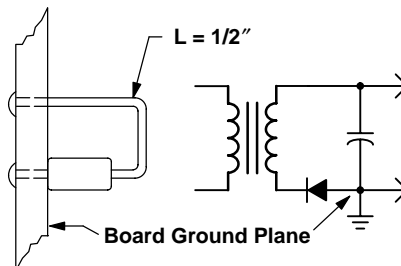
MOUNTING METHOD 2

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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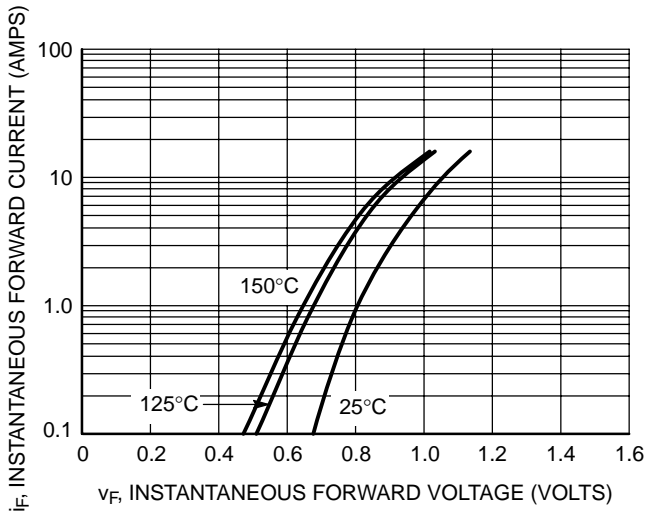


Figure 1. Typical Forward Voltage

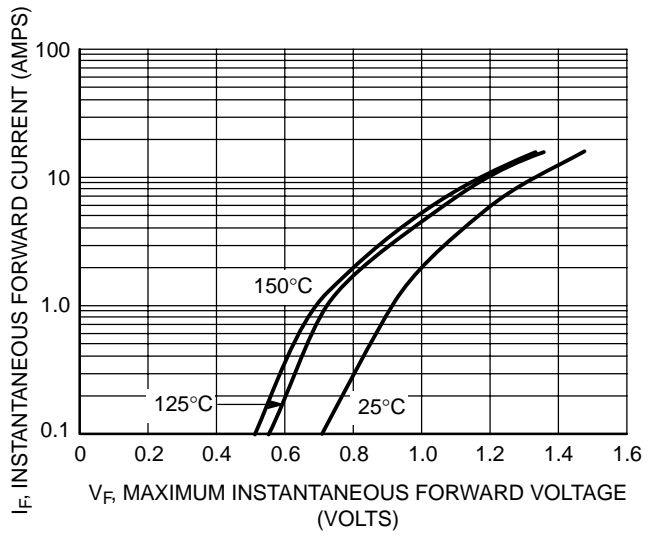


Figure 2. Maximum Forward Voltage

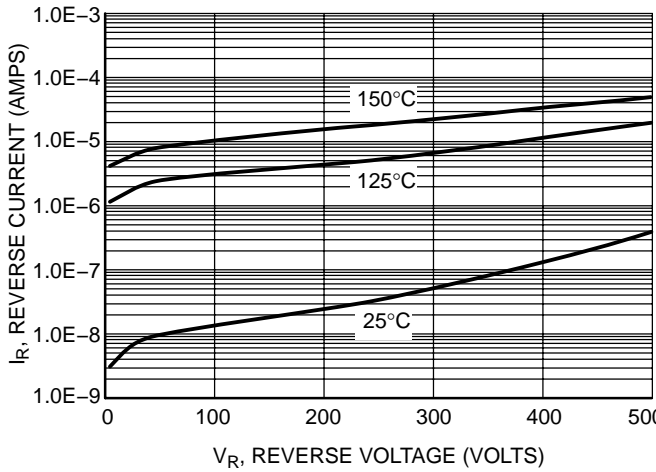


Figure 3. Typical Reverse Current

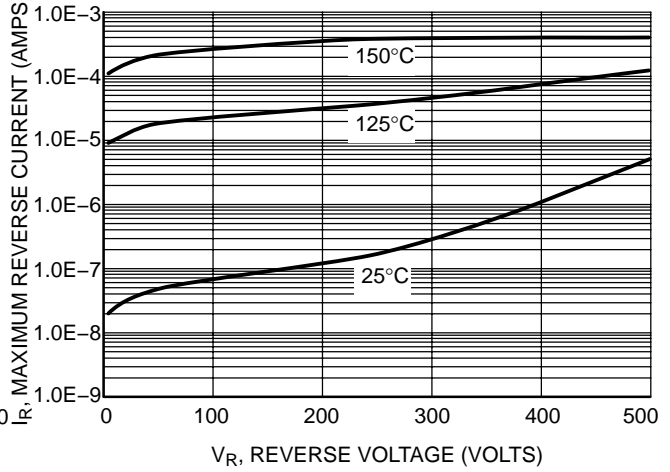


Figure 4. Maximum Reverse Current

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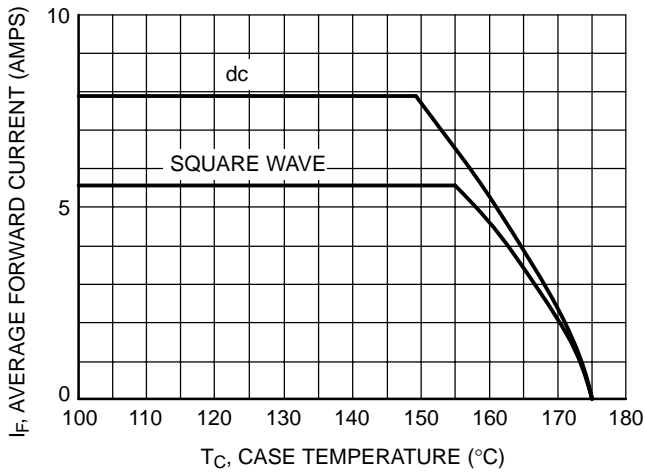


Figure 5. Current Derating

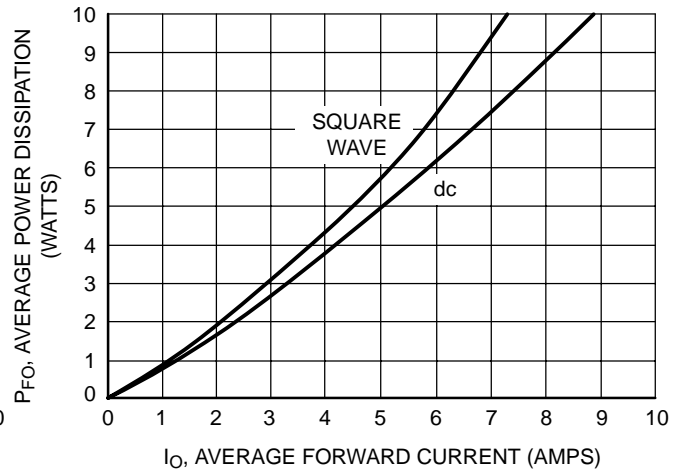


Figure 6. Forward Power Dissipation

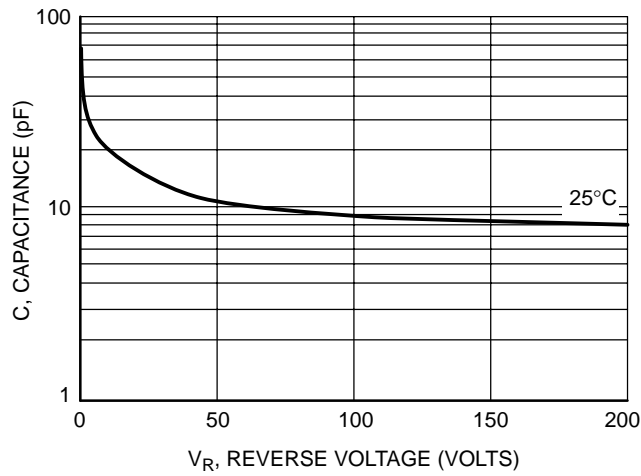


Figure 7. Capacitance

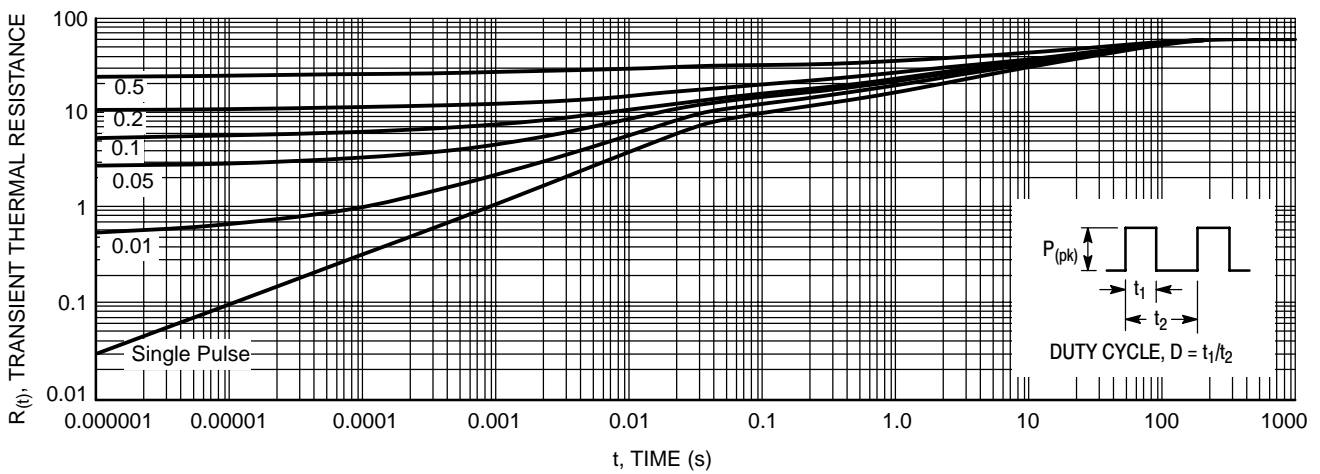


Figure 8. Thermal Response for MUR550APF

MUR550APF, MURD550PF, MUR550PF

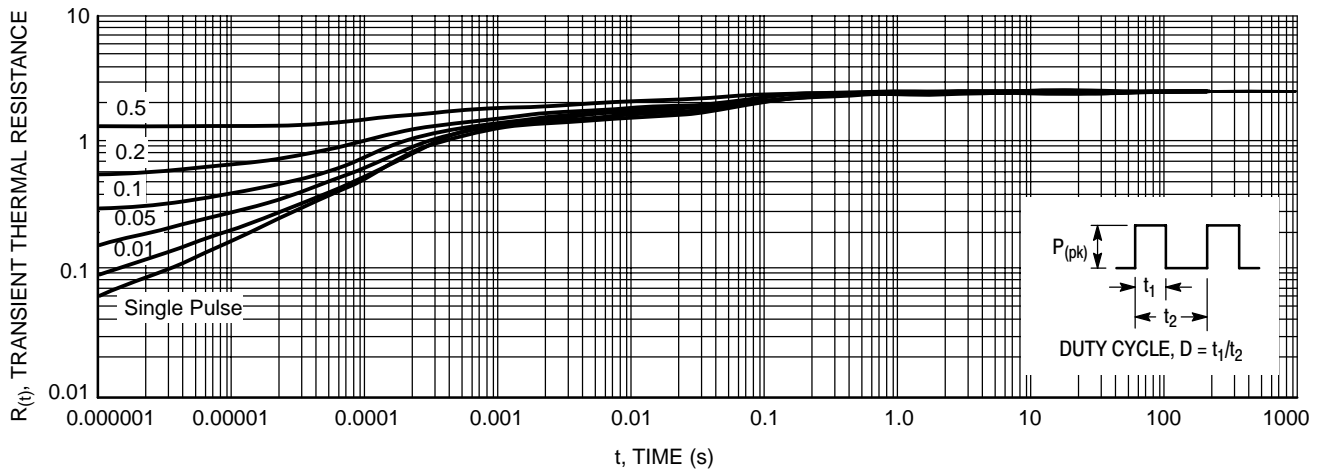


Figure 9. Thermal Response for MURD550PF

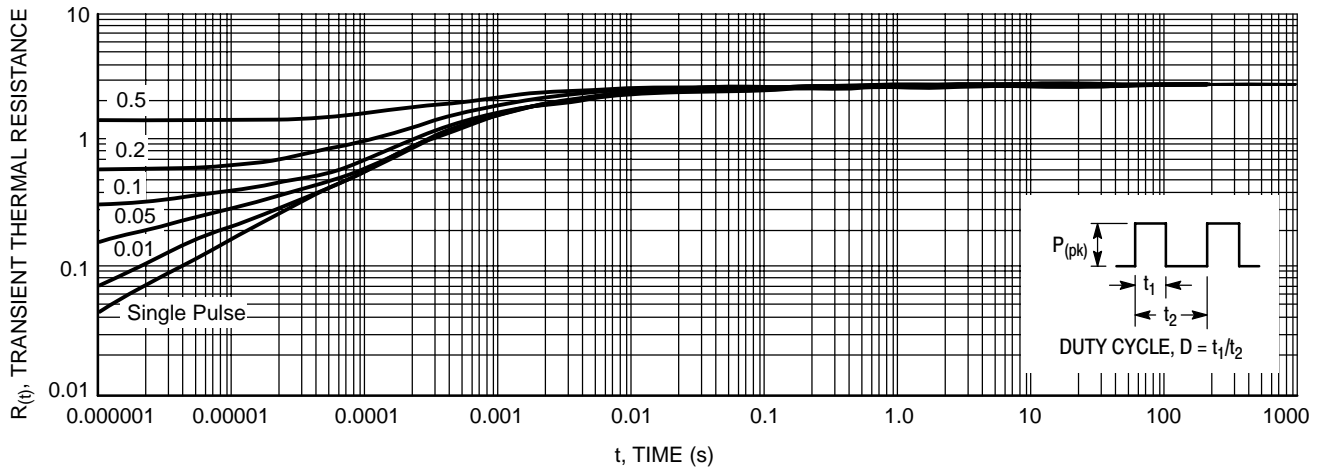


Figure 10. Thermal Response for MUR550PF

MUR550APF, MURD550PF, MUR550PF

ORDERING INFORMATION

| Device | Package | Shipping† |
|--------------|-------------------|------------------|
| MUR550APF* | Axial | 500 Units/Bag |
| MUR550APFRL* | Axial | 1500 Tape & Reel |
| MURD550PFT4 | DPAK | 2500 Tape & Reel |
| MURD550PFT4G | DPAK (Pb-Free) | 2500 Tape & Reel |
| MUR550PF | TO-220 | 50 Units/Rail |

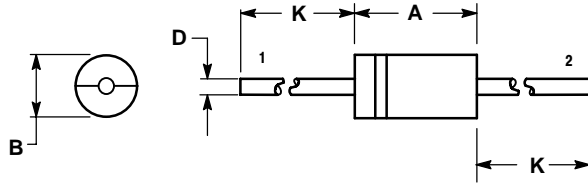
†For information on tape and reel specifications, including part orientation and tape sizes, please refer to our Tape and Reel Packaging Specification Brochure, BRD8011/D.

*These devices are manufactured with a Pb-Free external lead finish only.

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PACKAGE DIMENSIONS

AXIAL LEAD CASE 267-05 ISSUE G

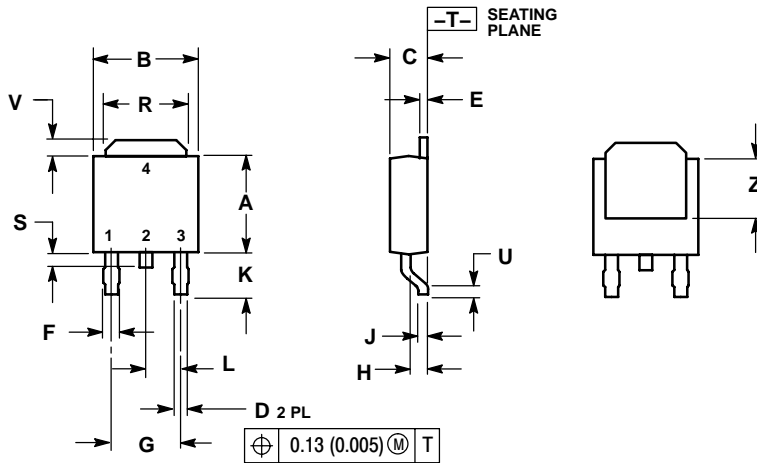


- NOTES:
 1. DIMENSIONS AND TOLERANCING PER ANSI Y14.5M, 1982.
 2. CONTROLLING DIMENSION: INCH.
 3. 267-04 OBSOLETE, NEW STANDARD 267-05.

| 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)
 2. ANODE

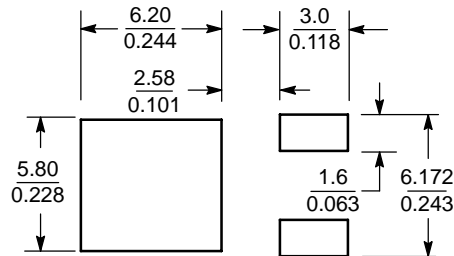
DPAK CASE 369C-01 ISSUE O



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

| DIM | INCHES | | MILLIMETERS | |
|-----|-----------|-------|-------------|------|
| | MIN | MAX | MIN | MAX |
| A | 0.235 | 0.245 | 5.97 | 6.22 |
| B | 0.250 | 0.265 | 6.35 | 6.73 |
| C | 0.086 | 0.094 | 2.19 | 2.38 |
| D | 0.027 | 0.035 | 0.69 | 0.88 |
| E | 0.018 | 0.023 | 0.46 | 0.58 |
| F | 0.037 | 0.045 | 0.94 | 1.14 |
| G | 0.180 BSC | | 4.58 BSC | |
| H | 0.034 | 0.040 | 0.87 | 1.01 |
| J | 0.018 | 0.023 | 0.46 | 0.58 |
| K | 0.102 | 0.114 | 2.60 | 2.89 |
| L | 0.090 BSC | | 2.29 BSC | |
| R | 0.180 | 0.215 | 4.57 | 5.45 |
| S | 0.025 | 0.040 | 0.63 | 1.01 |
| U | 0.020 | --- | 0.51 | --- |
| V | 0.035 | 0.050 | 0.89 | 1.27 |
| Z | 0.155 | --- | 3.93 | --- |

SOLDERING FOOTPRINT*



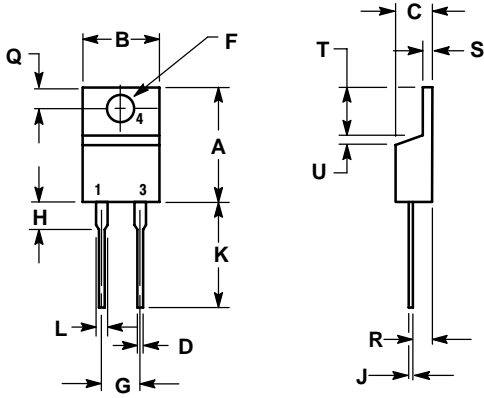
SCALE 3:1 (mm/inches)

*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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PACKAGE DIMENSIONS

TO-220
CASE 221B-04
ISSUE D




- 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 | 0.147 | 3.61 | 3.73 |
| G | 0.190 | 0.210 | 4.83 | 5.33 |
| H | 0.110 | 0.130 | 2.79 | 3.30 |
| J | 0.018 | 0.025 | 0.46 | 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 |

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