

# 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
MUR550PF	TO-220AC	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.

\*This package is inherently Pb-Free.

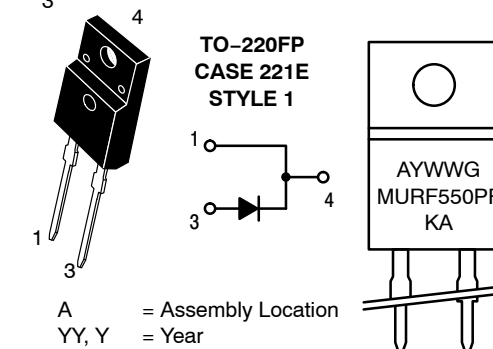
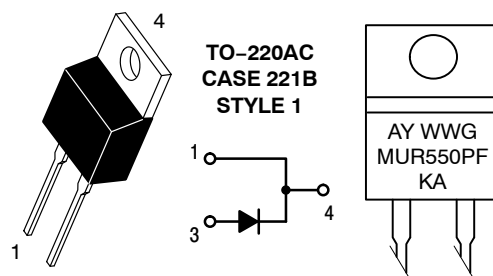
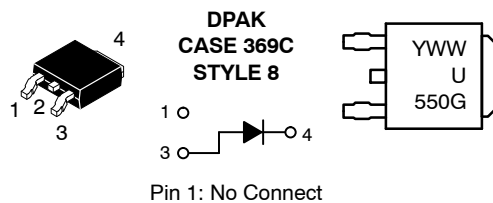
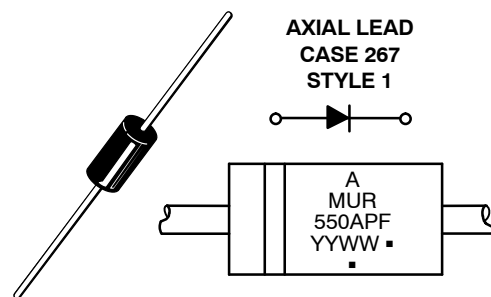


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## ULTRAFast RECTIFIER 5.0 AMPERES, 520 VOLTS

### 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	$\mu\text{A}$
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  $\mu\text{s}$ , Duty Cycle  $\leq 2.0\%$ .

NOTE 2 — AMBIENT MOUNTING DATA

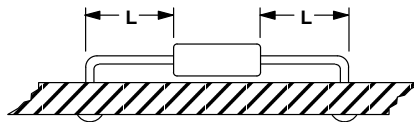
Data shown for thermal resistance junction-to-ambient ( $R_{\theta JA}$ ) for the mountings shown is to be used as typical guideline values for preliminary engineering or in case the tie point temperature cannot be measured.

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

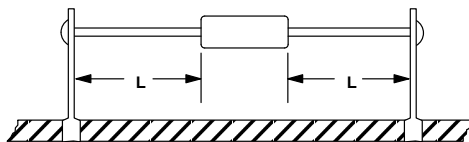
MOUNTING METHOD 1

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



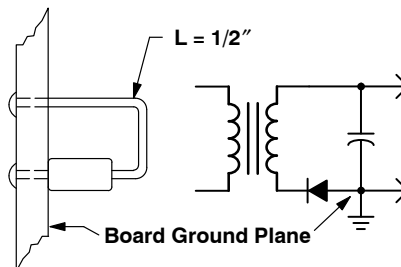
MOUNTING METHOD 2

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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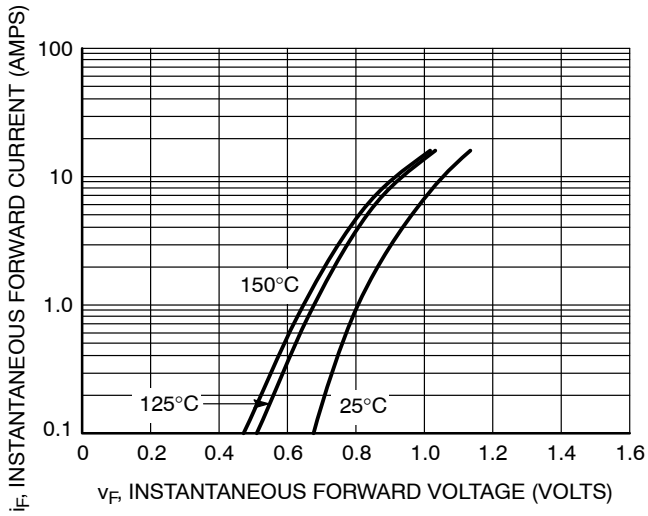


Figure 1. Typical Forward Voltage

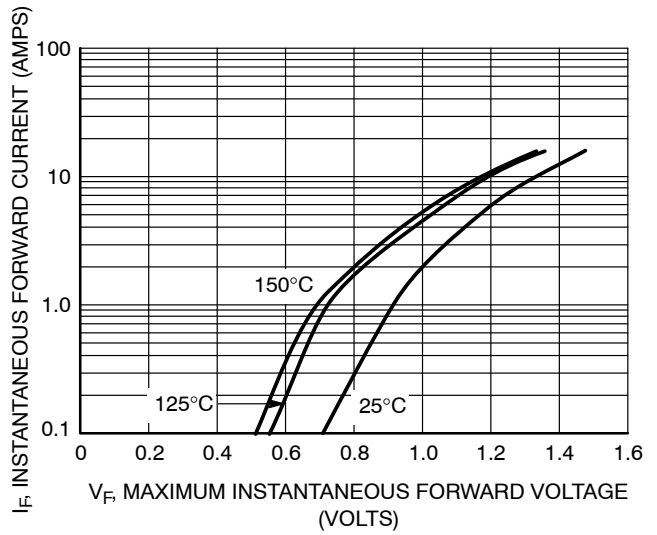


Figure 2. Maximum Forward Voltage

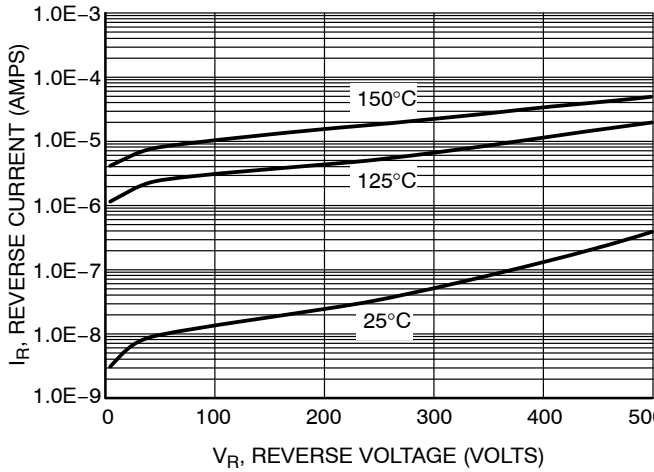


Figure 3. Typical Reverse Current

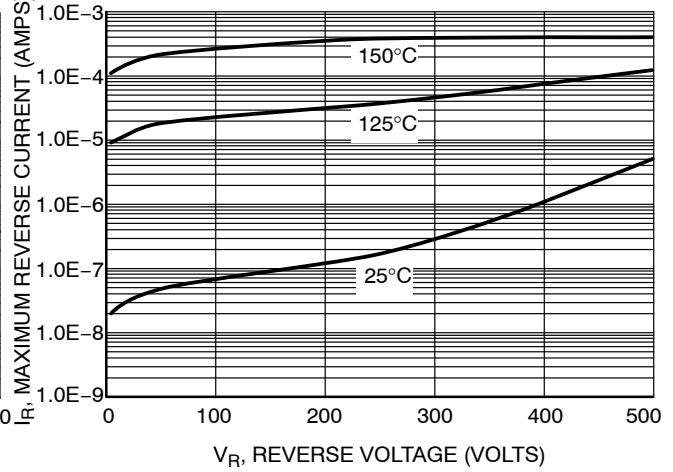


Figure 4. Maximum Reverse Current

MUR550APF, MURD550PF, MUR550PF, MURF550PF

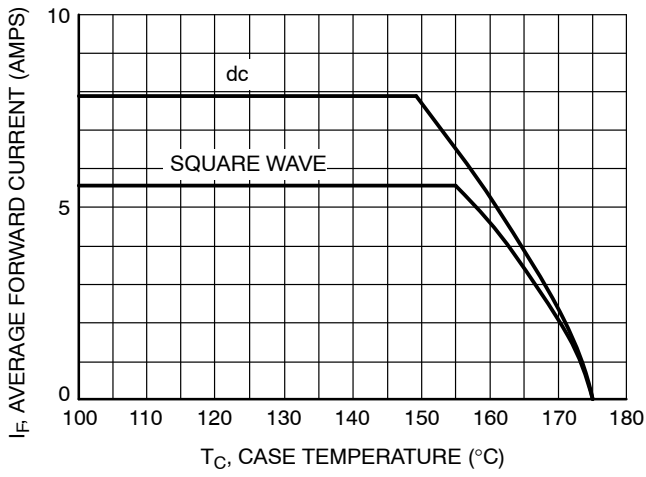


Figure 5. Current Derating

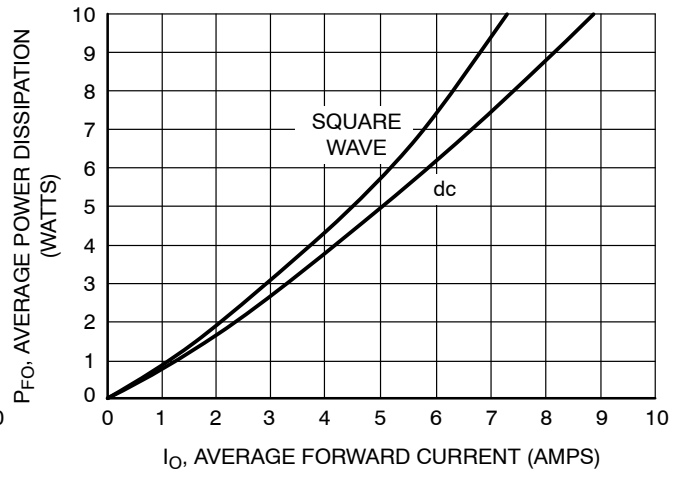


Figure 6. Forward Power Dissipation

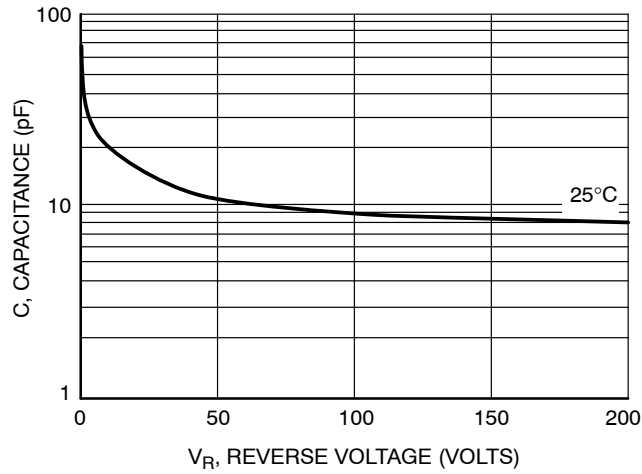


Figure 7. Capacitance

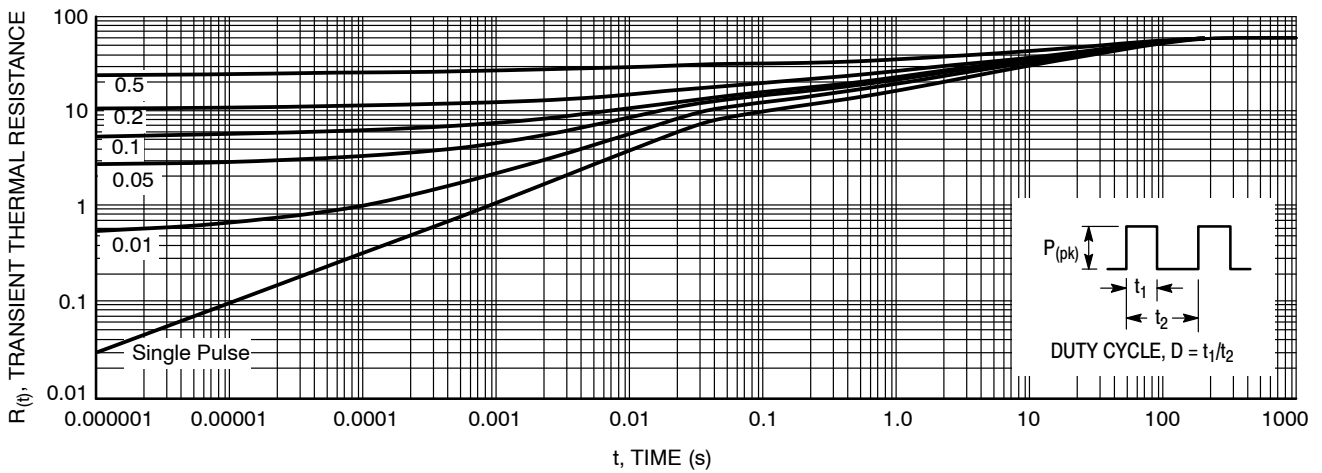


Figure 8. Thermal Response for MUR550APF

MUR550APF, MURD550PF, MUR550PF, MURF550PF

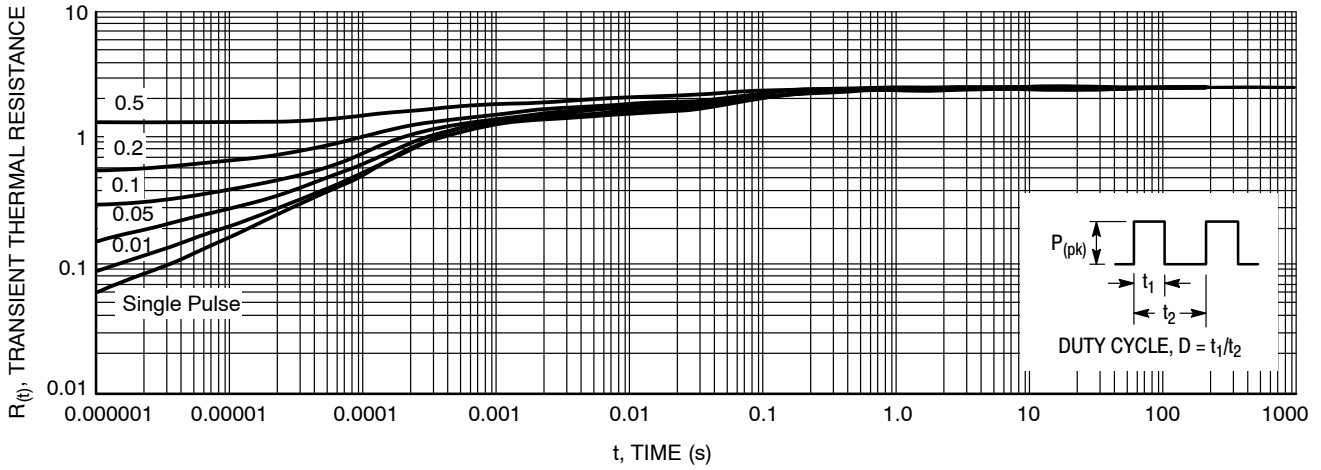


Figure 9. Thermal Response for MURD550PF

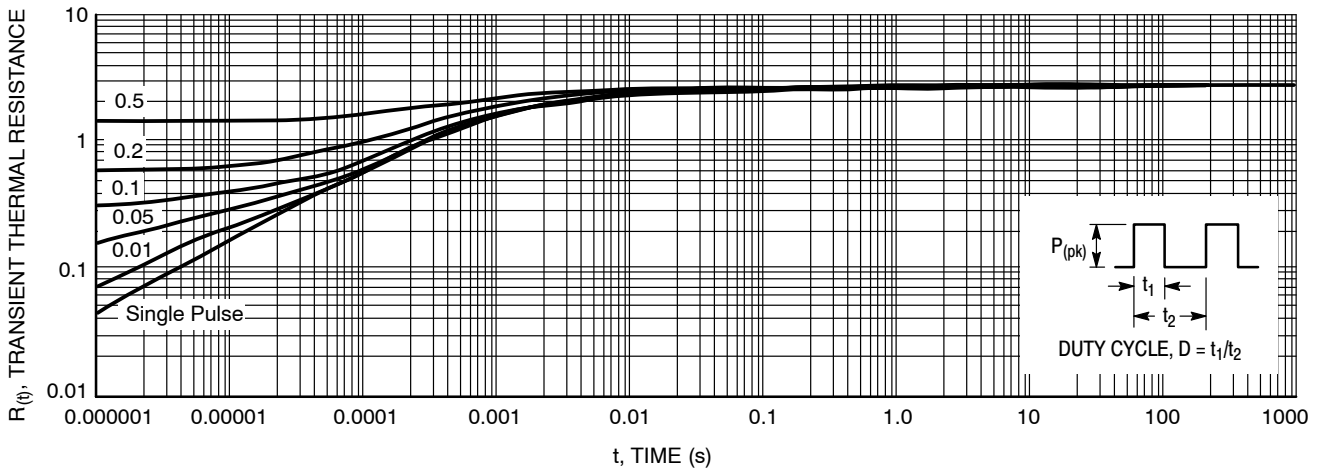


Figure 10. Thermal Response for MUR550PF

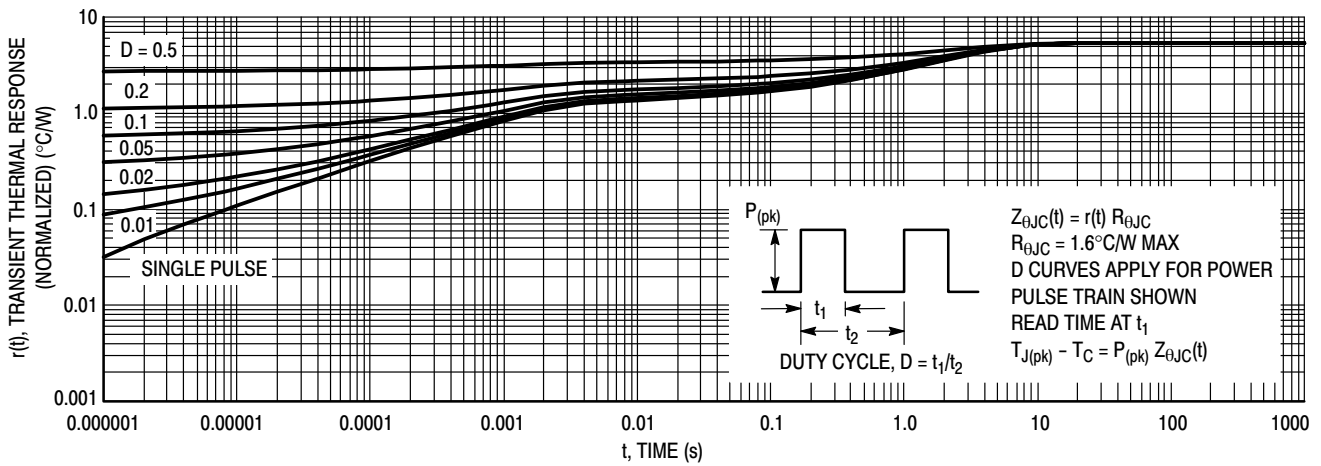


Figure 11. Thermal Response, (MURF550PF) Junction-to-Case ( $R_{\theta JC}$ )

MUR550APF, MURD550PF, MUR550PF, MURF550PF

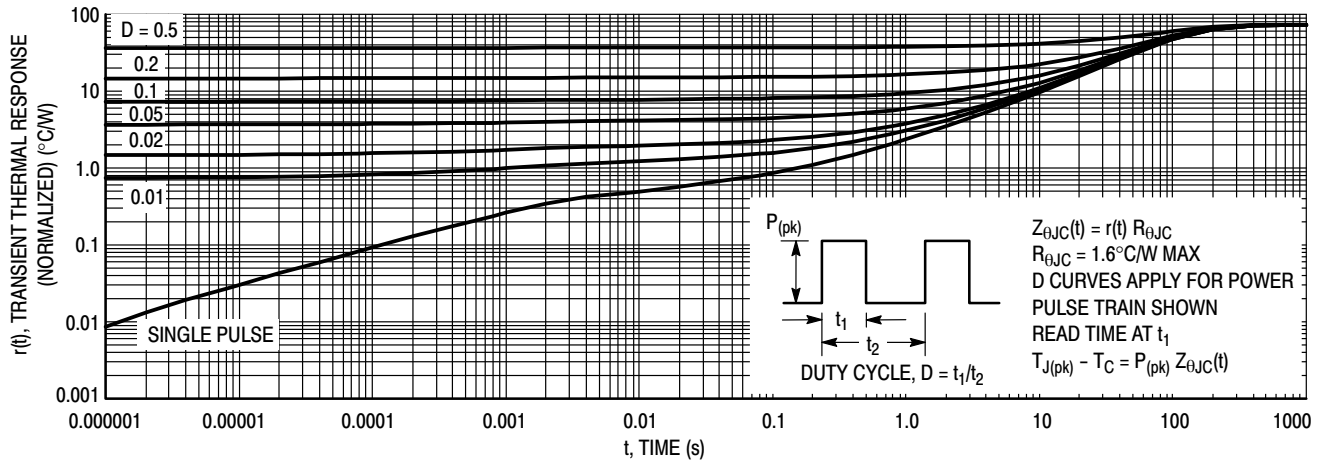
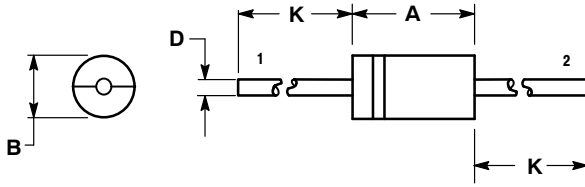


Figure 12. Thermal Response, (MURF550PF) Junction-to-Ambient ( $R_{\theta JA}$ )

# MUR550APF, MURD550PF, MUR550PF, MURF550PF

## PACKAGE DIMENSIONS

### AXIAL LEAD CASE 267-05 ISSUE G



NOTES:

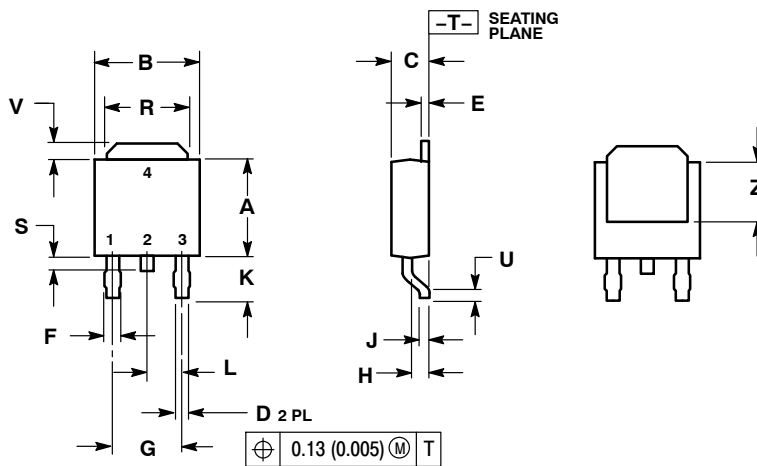
1. DIMENSIONS AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.
3. 267-04 OBSOLETE, NEW STANDARD 267-05.

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)
- ANODE

### DPAK CASE 369C-01 ISSUE A



NOTES:

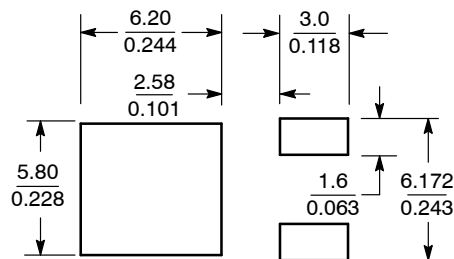
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: INCH.

DIM	INCHES		MILLIMETERS	
	MIN	MAX	MIN	MAX
A	0.235	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	---

STYLE 8:

- PIN 1. N/C
- CATHODE
- ANODE
- CATHODE

### SOLDERING FOOTPRINT\*



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

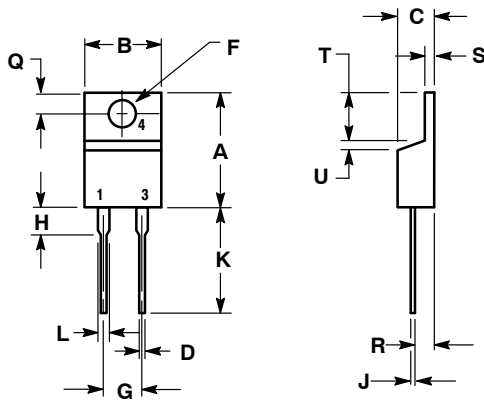
\*For additional information on our Pb-Free strategy and soldering details, please download the ON Semiconductor Soldering and Mounting Techniques Reference Manual, SOLDERRM/D.



# MUR550APF, MURD550PF, MUR550PF, MURF550PF

## PACKAGE DIMENSIONS

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

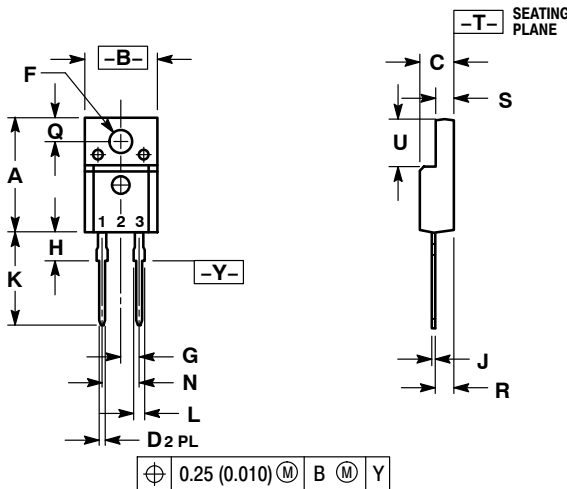


- NOTES:  
1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.  
2. CONTROLLING DIMENSION: INCH.

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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