

UPR5 Series

Surface Mount Ultrafast Power Rectifiers

POWERMITE®

Power Surface Mount Package

Ideally suited for high voltage, high frequency rectification, or as free wheeling and protection diodes in surface mount applications where compact size and weight are critical to the system.

Features:

- Low Profile – Maximum Height of 1.1 mm
- Small Footprint – Footprint Area of 8.45 mm²
- Supplied in 12 mm Tape and Reel
 - TR7 Suffix = 3,000 Units per Reel
 - TR13 Suffix = 12,000 Units per Reel
- Low Thermal Resistance with Direct Thermal Path of Die on Exposed Cathode Heat Sink

Mechanical Characteristics:

- Powermite is JEDEC Registered as D0-216AA
- Case: Molded Epoxy
- Epoxy Meets UL94, VO at 1/8"
- Weight: 62 mg (approximately)
- ESD Ratings: Machine Model = C
Human Body Model = 3B
- Lead and Mounting Surface Temperature for Soldering Purposes.
260°C Maximum for 10 Seconds

MAXIMUM RATINGS

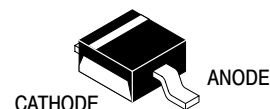
Rating	Symbol	Value	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage UPR5 Series UPR10 Series	V_{RRM} V_{RWM} V_R	50 100	V
Average Rectified Forward Current (At Rated V_R , $T_L = 95^\circ\text{C}$)	$I_{F(AV)}$	2.0	A
Non-Repetitive Peak Surge Current (Surge applied at rated load conditions halfwave, single phase, 60 Hz)	I_{FSM}	50	A
Operating Junction Temperature Range	T_J	-65 to +150	°C
Storage Temperature Range	T_{stg}	-65 to +150	°C



ON Semiconductor™

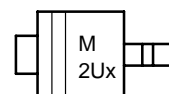
<http://onsemi.com>

**ULTRAFAST
RECTIFIERS
2.0 AMPERES
100 VOLTS**



**POWERMITE
CASE 457
PLASTIC**

MARKING DIAGRAM



M = Date Code
x = A or B
2UA = UPR5 Series Device Code
2UB = UPR10 Series Device Code

ORDERING INFORMATION

Device	Package	Shipping
UPR5TR7	POWERMITE	3,000/Tape & Reel
UPR5TR13	POWERMITE	12,000/Tape & Reel
UPR10TR7	POWERMITE	3,000/Tape & Reel
UPR10TR13	POWERMITE	12,000/Tape & Reel

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THERMAL CHARACTERISTICS

Rating	Symbol	Value	Unit
Thermal Resistance – Junction-to-Lead (Anode) (Note 1)	$R_{\theta j l}$	35	$^{\circ}\text{C/W}$
– Junction-to-Tab (Cathode) (Note 1)	$R_{\theta j t a b}$	23	
– Junction-to-Ambient (Note 1)	$R_{\theta j a}$	277	

ELECTRICAL CHARACTERISTICS ($T_A = 25^{\circ}\text{C}$ unless otherwise noted)

Maximum Instantaneous Forward Voltage ($I_F = 1.0\text{ A}$) ($I_F = 2.0\text{ A}$)	V_F	$T_J = 25^{\circ}\text{C}$ 0.830 0.905	$T_J = 100^{\circ}\text{C}$ 0.680 0.740	V
Maximum Instantaneous Reverse Current ($V_R = \text{Max Rating}$)	I_R	$T_J = 25^{\circ}\text{C}$ 2.0	$T_J = 100^{\circ}\text{C}$ 50	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}	30		ns
Typical Reverse Recovery Time ($I_F = 0.1\text{ A}$, $I_R = 0.2\text{ A}$, $I_{REC} = 50\text{ mA}$)	T_{RR}	6		ns

1. Mounted with minimum recommended pad size, PC Board FR4. See Figures 7 and 8.

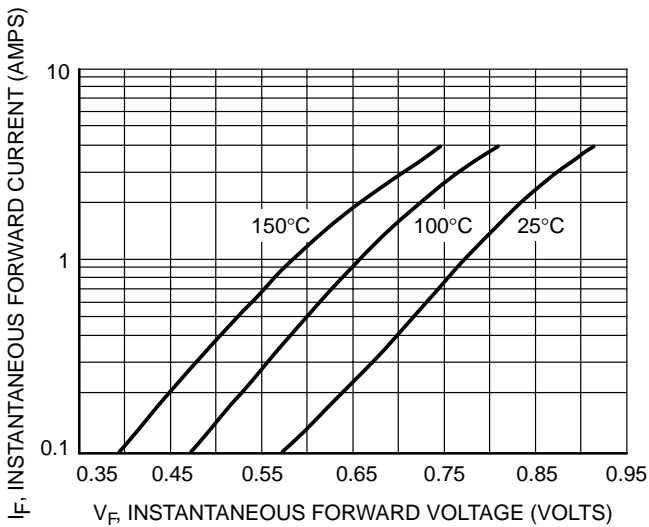


Figure 1. Typical Forward Voltage

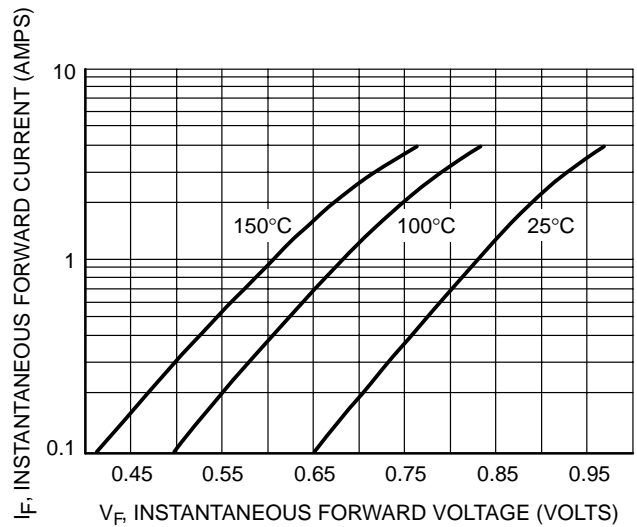


Figure 2. Maximum Forward Voltage

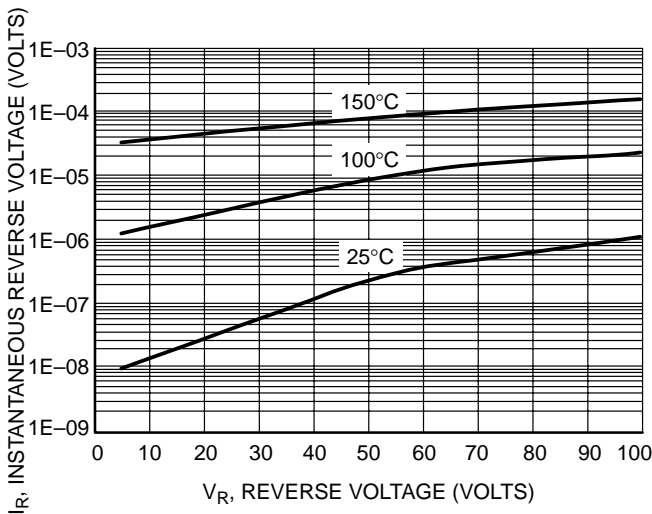


Figure 3. Typical Reverse Current

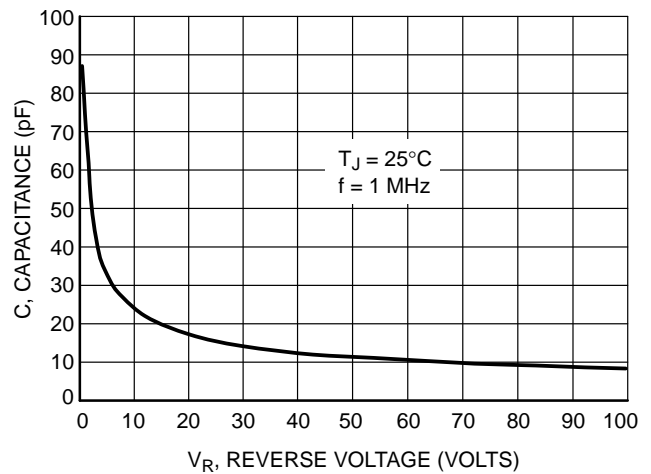


Figure 4. Typical Capacitance

UPR5 Series

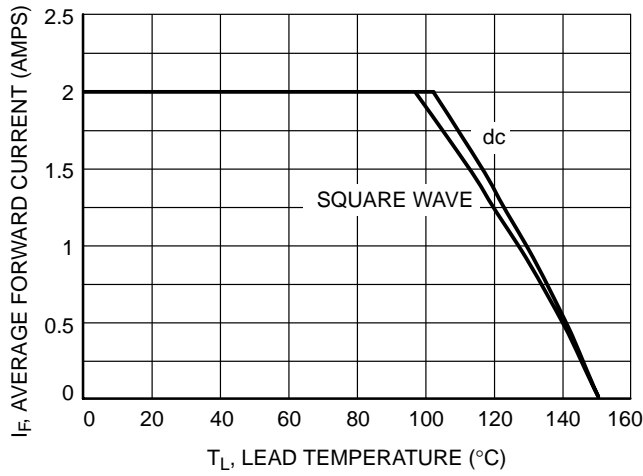


Figure 5. Current Derating – Lead

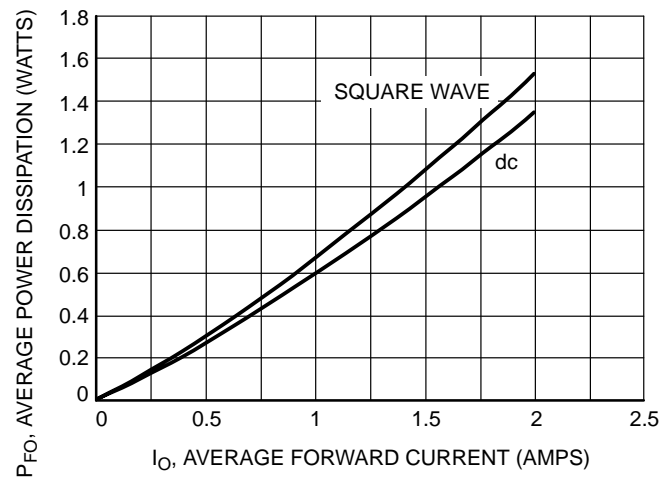


Figure 6. Forward Power Dissipation

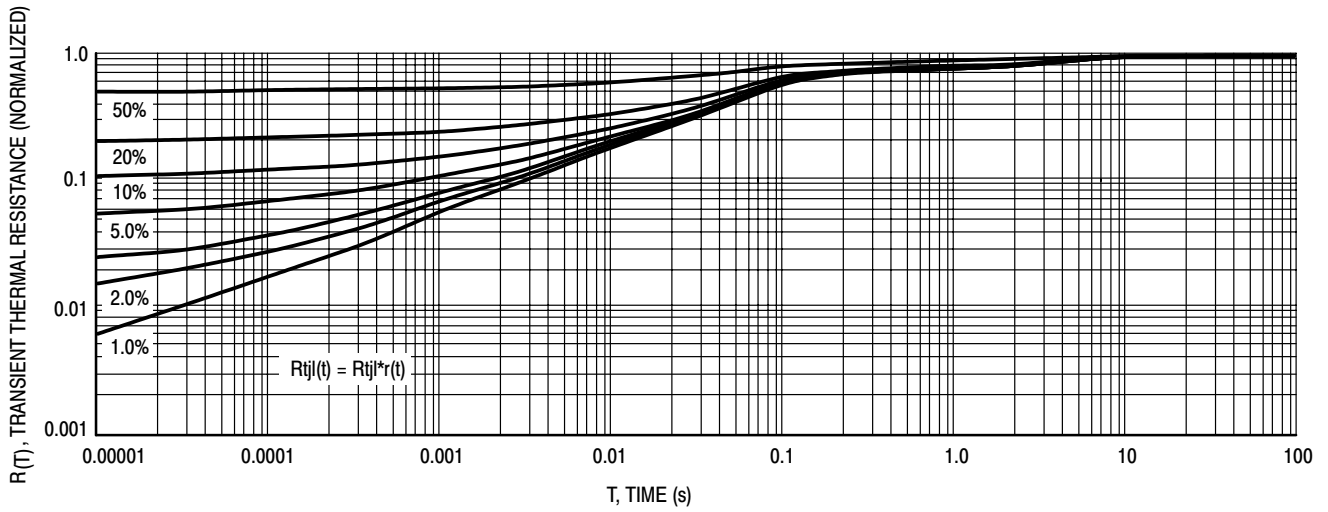


Figure 7. Thermal Response Junction to Lead

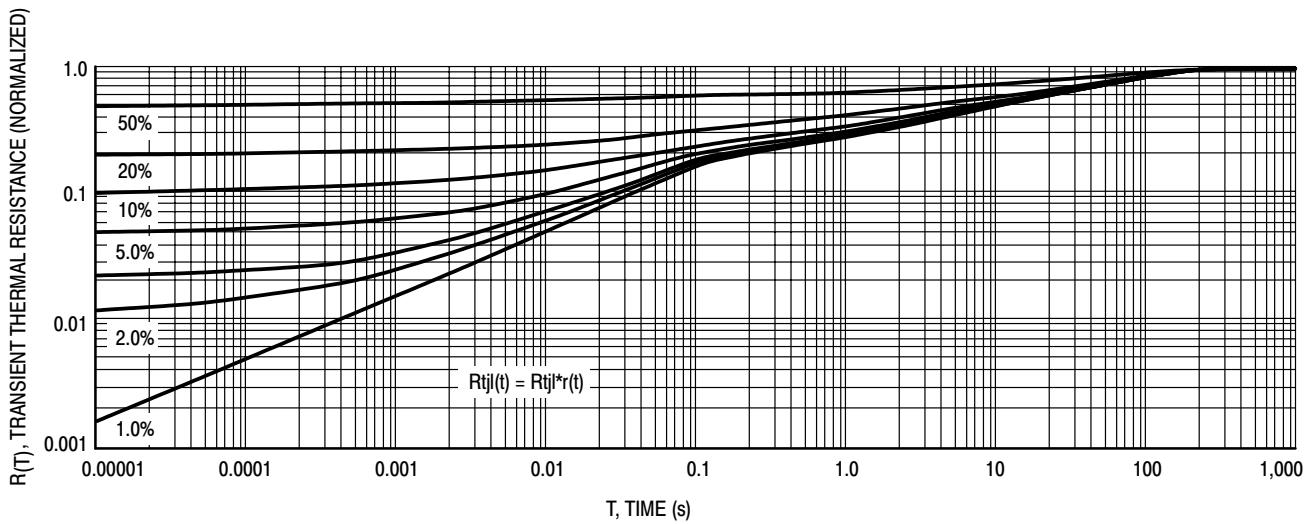
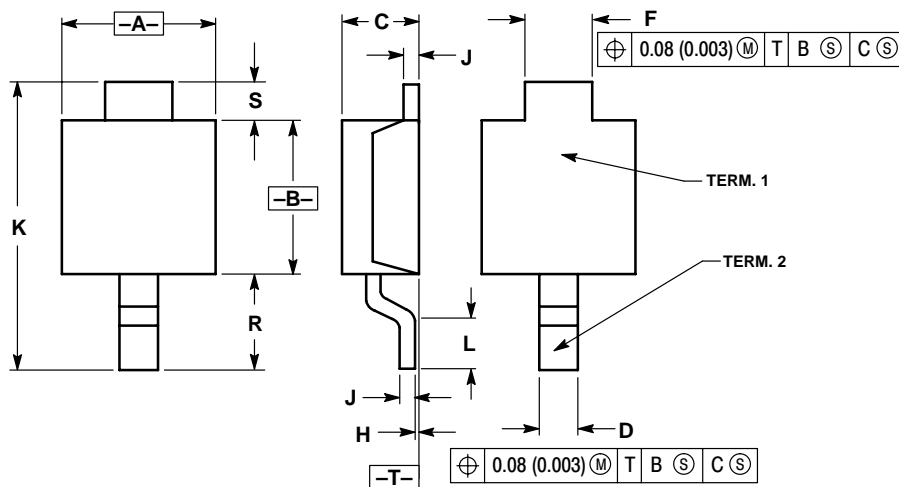


Figure 8. Thermal Response Junction to Ambient

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PACKAGE DIMENSIONS

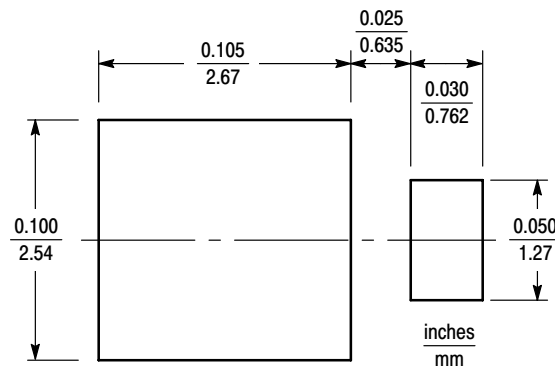
POWERMITE
CASE 457-04
ISSUE D



NOTES:


1. DIMENSIONING AND TOLERANCING PER ANSI Y14.5M, 1982.
2. CONTROLLING DIMENSION: MILLIMETER.
3. DIMENSION A DOES NOT INCLUDE MOLD FLASH, PROTRUSIONS OR GATE BURRS. MOLD FLASH, PROTRUSIONS OR GATE BURRS SHALL NOT EXCEED 0.15 (0.006) PER SIDE.

DIM	MILLIMETERS		INCHES	
	MIN	MAX	MIN	MAX
A	1.75	2.05	0.069	0.081
B	1.75	2.18	0.069	0.086
C	0.85	1.15	0.033	0.045
D	0.40	0.69	0.016	0.027
F	0.70	1.00	0.028	0.039
H	-0.05	+0.10	-0.002	+0.004
J	0.10	0.25	0.004	0.010
K	3.60	3.90	0.142	0.154
L	0.50	0.80	0.020	0.031
R	1.20	1.50	0.047	0.059
S	0.50 REF		0.019 REF	



Minimum Recommended Footprint

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