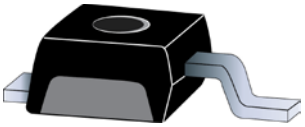
RoHS Compliant

Powermite High Efficiency 2.5 Amp Ultrafast Rectifier

DESCRIPTION

The Microsemi UPR5e3, UPR10e3, and UPR15e3 Powermite high efficiency rectifiers are RoHS compliant and offers optimized forward voltage characteristics with reverse blocking capabilities up to 150 Volts. They are ideal for surface mount applications that operate at high frequencies.
In addition to its size advantages, Powermite package features include a full metallic bottom that eliminates possibility of solder flux entrapment during assembly and a unique locking tab acts as an efficient heat path from die to mounting plane for external heat sinking with very low thermal resistance junction to case (bottom). Its innovative design makes this device ideal for use with automatic insertion equipment.



DO-216 Package

Important: For the latest information, visit our website http://www.microsemi.com.

FEATURES

- Low thermal resistance DO-216 package for higher current operation
- Ultrafast recovery time of 25 ns
- Efficient heat path with Integral locking bottom metal tab
- Low forward voltage
- Full metallic bottom eliminates flux entrapment
- Compatible with automatic insertion equipment
- Low profile-maximum height of 1 mm
- RoHS compliant.

APPLICATIONS / BENEFITS

- Switching and regulating power supplies
- Charge pump circuits
- Reduces reverse recovery loss with low I_{RM}
- Small 8.45 mm^2 foot print (See mounting pad details)

MAXIMUM RATINGS @ 25 ºC unless otherwise specified

Parameters/Test Conditions		Symbol	Value	Unit
Junction and Storage Temperature		T_J and T_{STG}	-55 to +150	ºC
Thermal Resistance Junction-to-Tab			30	ºC/W
Thermal Resistance Junction-to-Bottom			10	ºC/W
Non-Repetitive Peak Forward Surge Current (At 8.3 ms Single half-sine wave)		I_{FSM}	25	A
Working Peak Reverse Voltage	UPR5e3	V_{RWM}	50	V
	UPR10e3		100	
	UPR15e3		150	
Average Rectified Output Current (At rated V_{RWM}, T_C =75ºC)		I_O	2.5	A
Solder Temperature @ 10 s			260	°C

Notes: 1. When mounted on FR-4 PC board using 1 oz copper with recommended minimum foot print.

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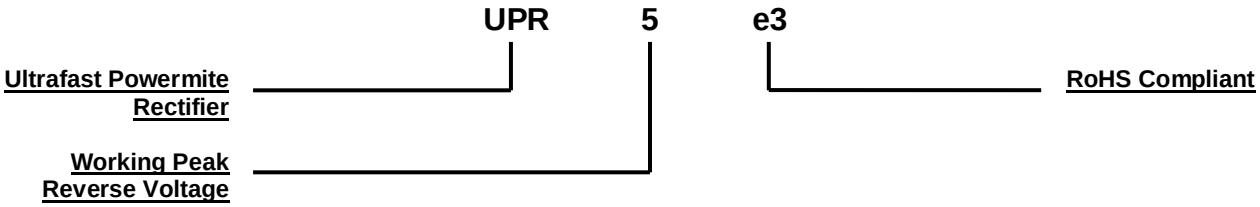
MECHANICAL and PACKAGING

- CASE: Void-free transfer molded thermosetting epoxy compound meeting UL94V-0
- TERMINALS: Annealed matte-tin plating over copper and readily solderable per MIL-STD-750, method 2026. (Consult factor for tin-lead plating.)
- MARKING: R05• for UPR5e3, R10• for UPR10e3, and R15• for UPR15e3 (dot indicates "e3" designation)
- POLARITY: Cathode designated by TAB 2
- TAPE & REEL option: 12 mm tape per standard EIA-481-B. Consult factory for quantities.
- WEIGHT: Approximately 0.016 gram
- See Package Dimensions on last page.

PART NOMENCLATURE



SYMBOLS & DEFINITIONS

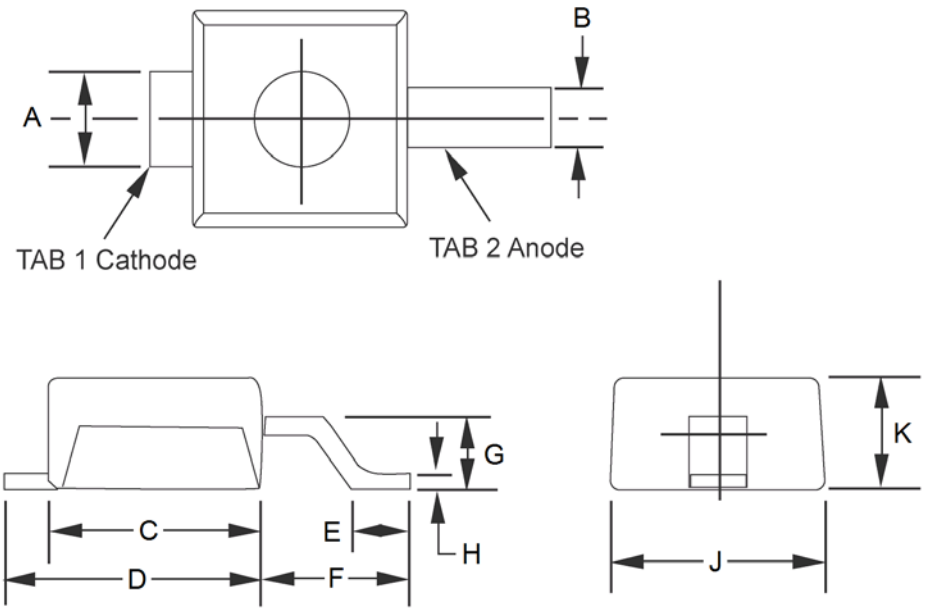
Symbol	Definition
f	Frequency
I_F	Forward Current: The dc current flowing from the external circuit into the anode terminal
I_{FSM}	Surge Peak Forward Current: The forward current including all nonrepetitive transient currents but excluding all repetitive transients (ref JESD282-B)
I_O	Average Rectified Output Current: The Output Current averaged over a full cycle with a 50 Hz or 60 Hz sine-wave input and a 180 degree conduction angle.
I_R	Reverse Current: The dc current flowing from the external circuit into the cathode terminal at the specified voltage V_R
I_{REC}	Recovery Current:
V_R	Reverse Voltage: A positive dc cathode-anode voltage below the breakdown region
V_{RWM}	Working Peak Reverse Voltage: The peak voltage excluding all transient voltages (ref JESD282-B). Also sometimes known historically as PIV.

ELECTRICAL CHARACTERISTICS @ T_A = +25 ºC unless otherwise noted

Parameter	Symbol	Conditions	Min	Max	Units
Forward Voltage (Note 1)	V_F	I_F = 2.0 Amps		0.975	V
Forward Voltage (Note 1)	V_F	I_F = 2.0 Amps, T_J = 100 ºC		0.895	V
Reverse Current	I_R	$V_R = V_{RWM}$, T_J = 25 ºC		2.0	µA
Reverse Current	I_R	$V_R = V_{RWM}$, T_J = 100 ºC		50	µA
Reverse Recovery Time	t_{rr}	I_F = 0.5 A; I_R = 1.0 A: I_{REC} = 0.25 A		25	ns

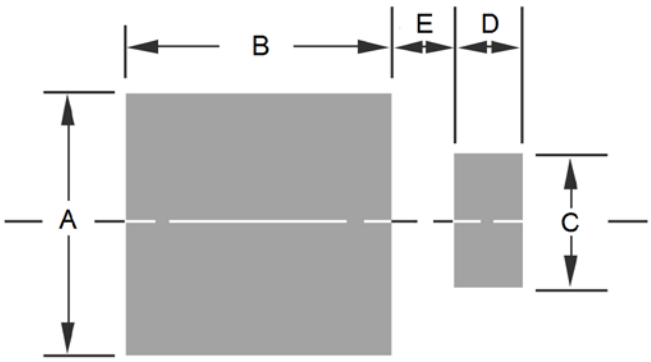
Note 1: Short duration test pulse used to minimize self – heating effect.

PACKAGE DIMENSIONS



Ltr	Dimensions			
	Inch		Millimeters	
	Min	Max	Min	Max
A	0.029	0.039	0.73	0.99
B	0.016	0.026	0.40	0.66
C	0.070	0.080	1.77	2.03
D	0.087	0.097	2.21	2.46
E	0.020	0.030	0.50	0.76
F	0.051	0.061	1.29	1.54
G	0.021	0.031	0.53	0.78
H	0.004	0.008	0.10	0.20
J	0.070	0.080	1.77	2.03
K	0.035	0.045	0.89	1.14

MOUNTING PAD DIMENSIONS



Ltr	Dimensions	
	Inch	Millimeters
A	0.100	2.54
B	0.105	2.67
C	0.050	1.27
D	0.030	0.76
E	0.025	0.64