

DESCRIPTION

This UPS1040e3 in the Powermite3[®] package is a high efficiency Schottky rectifier that is also RoHS compliant offering high current/power capabilities previously found only in much larger packages. They are ideal for SMD applications that operate at high frequencies. In addition to its size advantages, the Powermite3[®] package includes a full metallic bottom that eliminates the possibility of solder flux entrapment during assembly and a unique locking tab act as an efficient heat path to the heat-sink mounting. Its innovative design makes this device ideal for use with automatic insertion equipment.

IMPORTANT: For the most current data, consult MICROSEMI's website: <http://www.microsemi.com>


KEY FEATURES

- Very low thermal resistance package
- RoHS Compliant with e3 suffix part number
- Guard-ring-die construction for transient protection
- Efficient heat path with Integral locking bottom metal tab
- Low forward voltage
- Full metallic bottom eliminates flux entrapment
- Compatible with automatic insertion
- Low profile-maximum height of 1mm

**ABSOLUTE MAXIMUM RATINGS AT 25° C
(UNLESS OTHERWISE SPECIFIED)**

Rating	Symbol	Value	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	V_{RRM} V_{RWM} V_R	40	V
RMS Reverse Voltage	V_R (RMS)	28	V
Average Rectified Output Current	I_o	10	A
Non-Repetitive Peak Forward Surge Current 8.3 ms Single half sine wave Superimposed on Rated Load@ $T_c = 90^\circ\text{C}$	I_{FSM}	150	A
Storage Temperature	T_{STG}	-55 to +150	°C
Junction Temperature	T_J	-55 to +150	°C

APPLICATIONS/BENEFITS

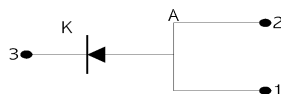
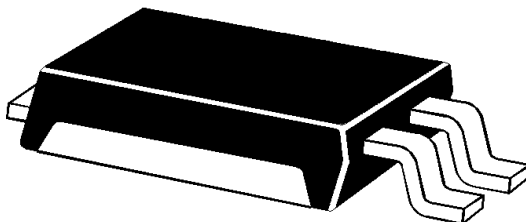
- Switching and Regulating Power Supplies.
- Silicon Schottky (hot carrier) rectifier for minimal reverse voltage recovery
- Elimination of reverse-recovery oscillations to reduce need for EMI filtering
- Charge Pump Circuits
- Reduces reverse recovery loss with low I_{RM}
- Small foot print  = 190 X 260 mils (1:1 Actual size)
See mounting pad details on pg 3

THERMAL CHARACTERISTICS

Thermal Resistance			
Junction-to-case (bottom)	$R_{\theta JC}$	3.2	°C/ Watt
Junction to ambient (1)	$R_{\theta JA}$	65	°C/ Watt

(1) When mounted on FR-4 PC board using 2 oz copper with recommended minimum foot print

Powermite 3™



MECHANICAL & PACKAGING

- CASE: Void-free transfer molded thermosetting epoxy compound meeting UL94V-0
- FINISH: Annealed matte-Tin plating over copper and readily solderable per MIL-STD-750 method 2026 (consult factory for Tin-Lead plating)
- POLARITY: See figure (left)
- MARKING: S1040•
- WEIGHT: 0.072 gram (approx.)
- Package dimension on last page
- Tape & Reel option: 16 mm tape per Standard EIA-481-B, 5000 on 13" reel

ELECTRICAL PARAMETERS @ 25°C (unless otherwise specified)

Parameter	Symbol	Conditions	Min	Typ.	Max	Units
Forward Voltage (Note 1)	V_F	$I_F = 8 \text{ A}, T_j = 25^\circ\text{C}$ $I_F = 8 \text{ A}, T_j = 125^\circ\text{C}$ $I_F = 10 \text{ A}, T_j = 25^\circ\text{C}$		0.45 0.47	0.49 0.51	V
Reverse Break Down Voltage (Note 1)	V_{BR}	$I_R = 1 \text{ mA}$	40			V
Reverse Current (Note1)	I_R	$V_R = 35 \text{ V}, T_j = 25^\circ\text{C}$ $V_R = 35 \text{ V}, T_j = 100^\circ\text{C}$		0.1 12.5	0.3 25	mA mA
Capacitance	C_T	$V_R = 4.0\text{V}; f = 1 \text{ MHz}$		700		pF

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

GRAPHS

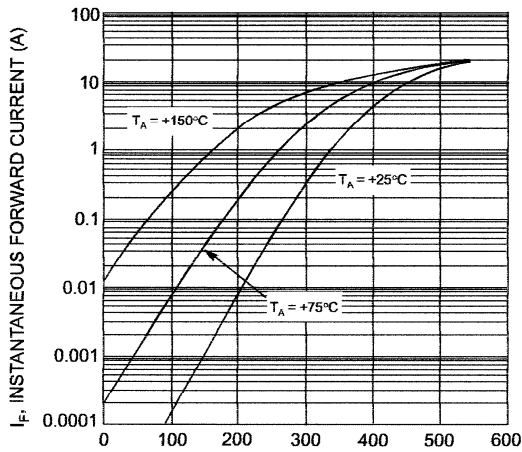


Fig. 1 Typical Forward Characteristics

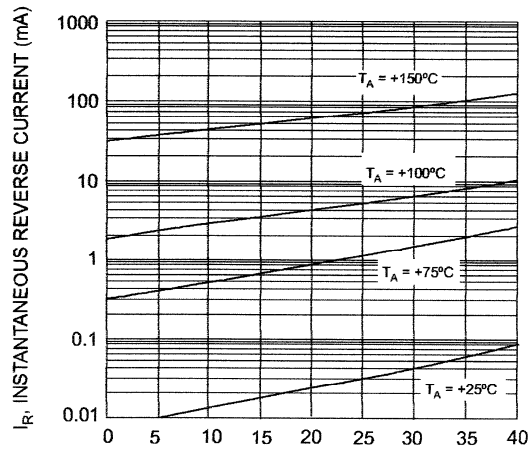


Fig. 2 Typical Reverse Characteristics

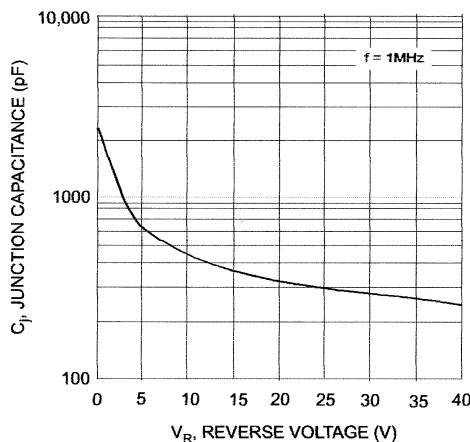
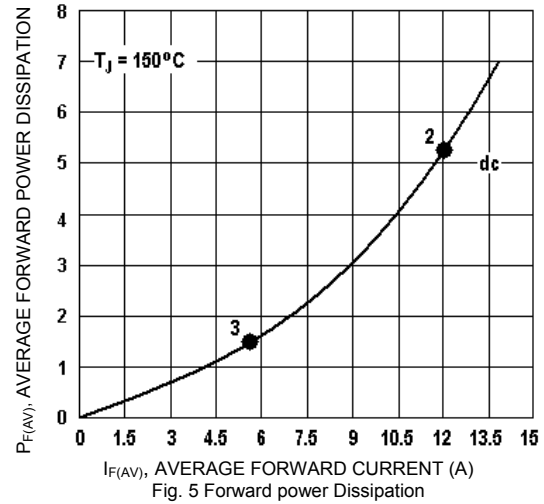
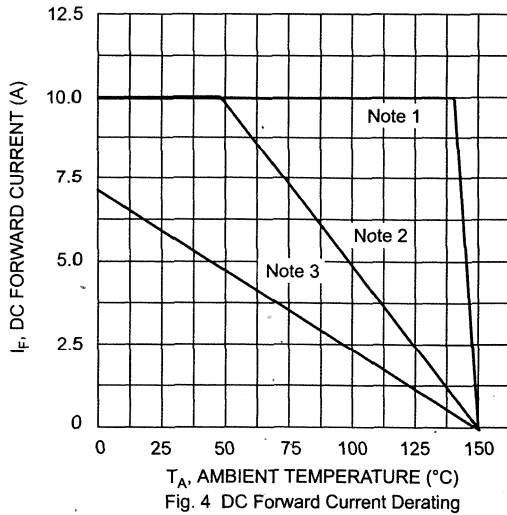


Fig. 3 Typical Junction Capacitance vs. Reverse Voltage

GRAPHS



- NOTE 1: $T_A = T_C$ at case bottom where $R_{\theta JC} = 2.5^\circ \text{C/W}$ and $R_{\theta CA} = 0^\circ \text{C/W}$ (infinite heat sink).
- NOTE 2: Device mounted on GETEK substrate, 2" x 2", 2 oz. copper, double-sided, cathode pad dimensions 0.75" x 1.0", anode pad dimensions 0.25" x 1.0". $R_{\theta JA}$ in range of 15-30° C/W.
- NOTE 3: Device mounted on FRA-4 substrate, 2" x 2", 2 oz. copper, single-sided, pad layout $R_{\theta JA}$ in range of 65°C/W. See mounting pad dimensions on next page.

PACKAGE & MOUNTING PAD DIMENSIONS

PACKAGING:

DIM	INCHES		MILLIMETERS	
	NOMINAL		NOMINAL	
A	0.070		1.778	
B	0.173		4.392	
C	0.200		5.080	
D	0.035		0.889	
E	0.160		4.064	
F	0.072		1.829	
G	0.056		1.422	
H	0.044		1.118	
J	0.190		4.826	
K	0.210		5.344	
L	0.038		0.965	
M	0.034		0.864	
N	0.030		0.762	
P	0.030		0.762	

