

**DESCRIPTION**

This UPS1040e3 in the Powermite3<sup>®</sup> 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<sup>®</sup> 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@ $T_c = 90^\circ C$	$I_{FSM}$	150	A
Storage Temperature	$T_{STG}$	-55 to +150	°C
Junction Temperature	$T_J$	-55 to +150	°C

**APPLICATIONS/BENEFITS**

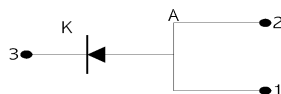
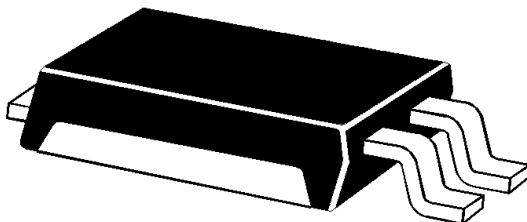
- Switching and Regulating Power Supplies.
- Silicon Schottky (hot carrier) rectifier for minimal reverse voltage recovery
- Elimination of reverse-recovery oscillations to reduce need for EMI filtering
- Charge Pump Circuits
- Reduces reverse recovery loss with low  $I_{RM}$
- Small foot print  = 190 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)	$V_F$	$I_F = 8\text{ A}, T_j = 25\text{ °C}$ $I_F = 8\text{ A}, T_j = 125\text{ °C}$ $I_F = 10\text{ A}, T_j = 25\text{ °C}$		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)	$I_R$	$V_R = 35\text{ V}, T_j = 25\text{ °C}$ $V_R = 35\text{ V}, T_j = 100\text{ °C}$		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**

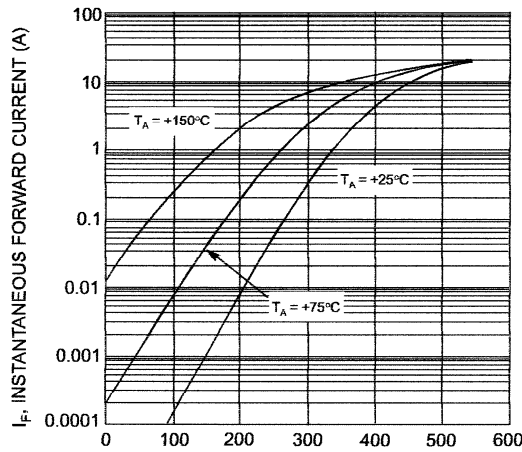


Fig. 1 Typical Forward Characteristics

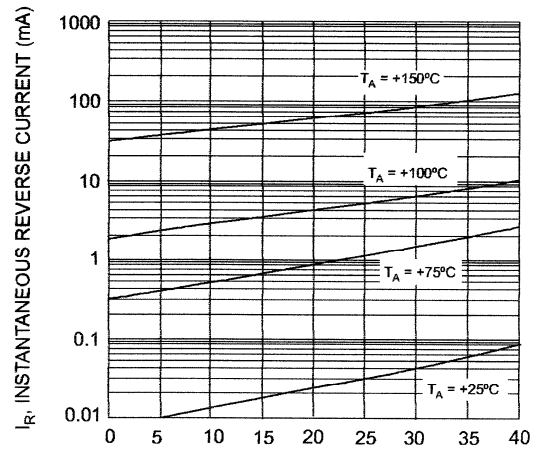


Fig. 2 Typical Reverse Characteristics

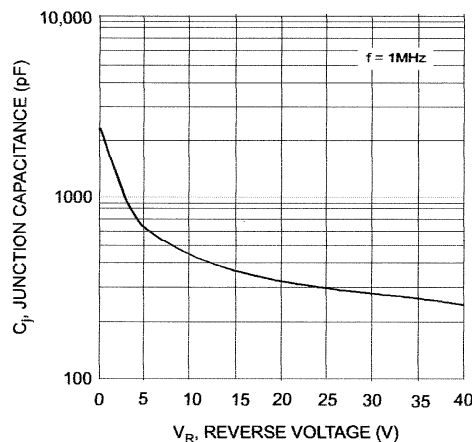
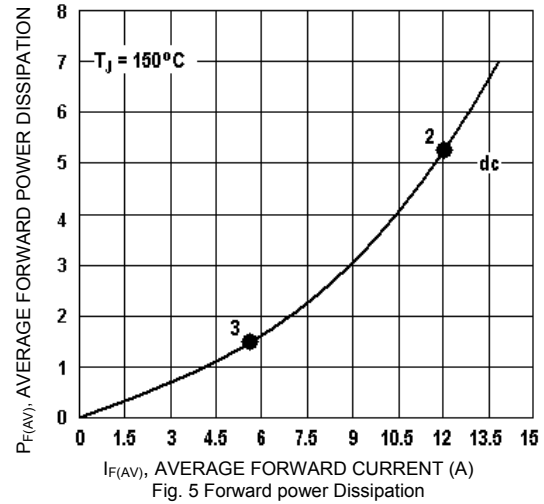
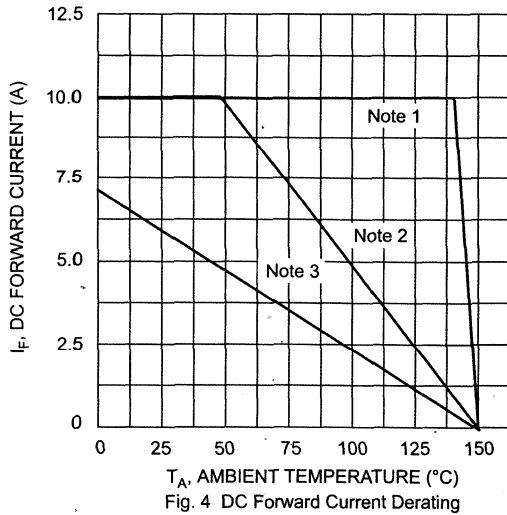


Fig. 3 Typical Junction Capacitance vs. Reverse Voltage

**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

