

### DESCRIPTION

This UPS540e3 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	$I_o$	5	A
Non-Repetitive Peak Forward Surge Current 8.3ms Single half sine wave Superimposed on Rated Load@ $T_c = 90^\circ C$	$I_{FSM}$	100	A
Storage Temperature	$T_{STG}$	-55 to +150	°C
Junction Temperature	$T_J$	-55 to +125	°C

### APPLICATIONS/BENEFITS

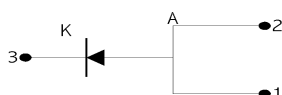
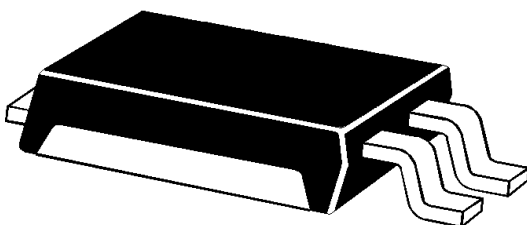
- Switching and Regulating Power Supplies.
- Silicon Schottky (hot carrier) rectifier for minimal reverse voltage recovery
- Elimination of reverse-recovery oscillations to reduce need for EMI filtering
- Charge Pump Circuits
- Reduces reverse recovery loss with low  $I_{RM}$
- Small foot print  = 190 X 270 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<sup>™</sup>



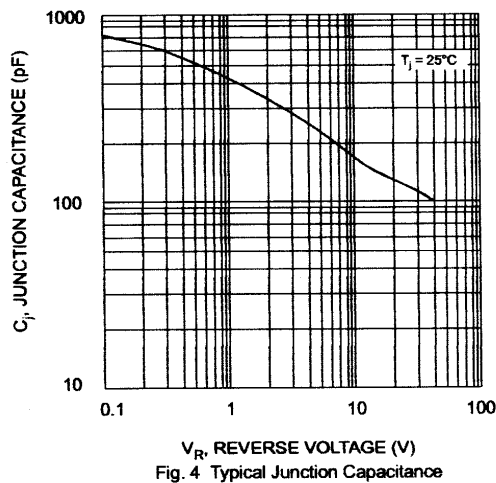
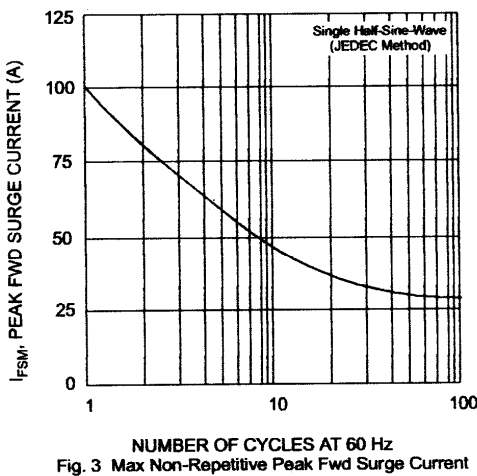
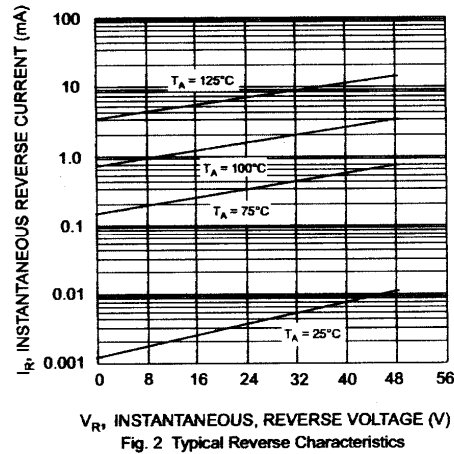
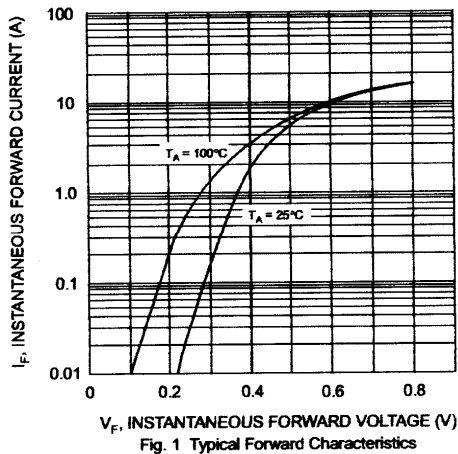
### MECHANICAL & PACKAGING

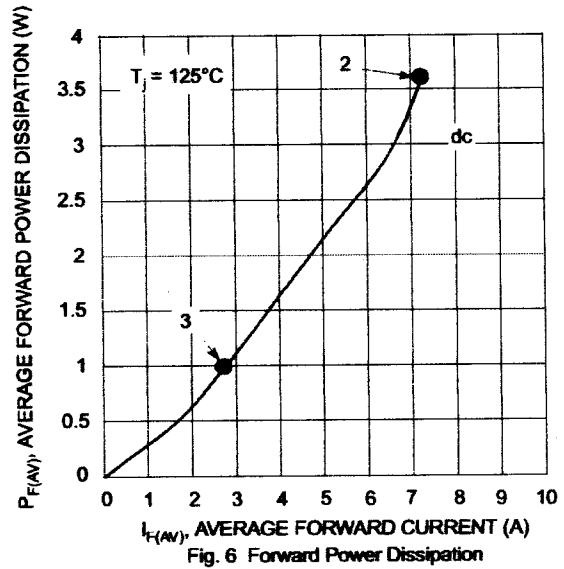
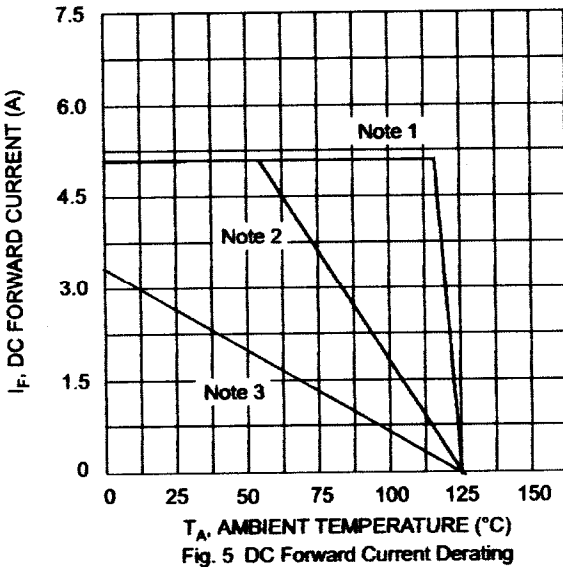
- CASE: Void-free transfer molded thermosetting epoxy compound meeting UL94V-0
- FINISH: Annealed matte-Tin plating over copper and readily solderable per MIL-STD-750 method 2026 (consult factory for Tin-Lead plating)
- POLARITY: See figure (left)
- MARKING: S540•
- WEIGHT: 0.072 gram (approx.)
- Package 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)**

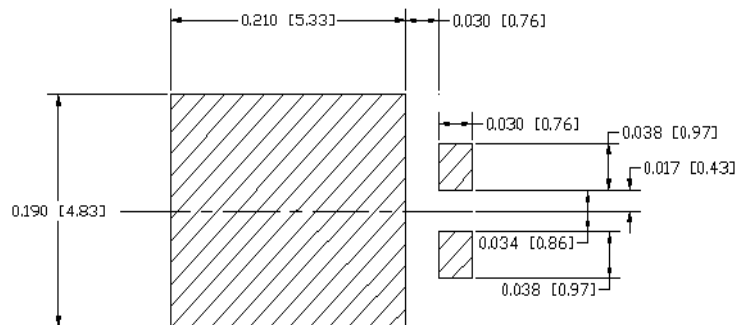
Parameter	Symbol	Conditions	Min	Typ.	Max	Units
Forward Voltage (Note 1)	$V_F$	$I_F = 5\text{ A}, T_j = 25\text{ °C}$ $I_F = 5\text{ A}, T_j = 125\text{ °C}$ $I_F = 10\text{ A}, T_j = 25\text{ °C}$ $I_F = 10\text{ A}, T_j = 125\text{ °C}$		0.47 0.45 0.62 0.59	0.54	V
Reverse Break Down Voltage (Note 1)	$V_{BR}$	$I_R = 0.5\text{ mA}$	40			V
Reverse Current (Note 1)	$I_R$	$V_R = 40\text{ V}, T_j = 25\text{ °C}$ $V_R = 40\text{ V}, T_j = 125\text{ °C}$		0.030 2.5	0.5 20	mA
Capacitance	$C_T$	$V_R = 4\text{ V}; F = 1\text{ MHz}$		250		pF

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

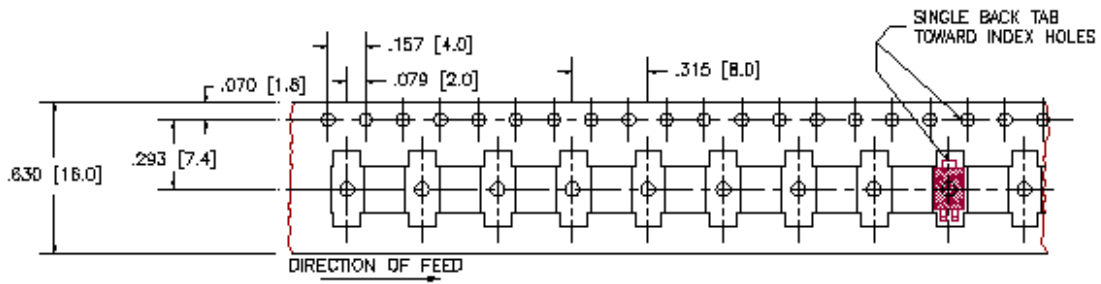
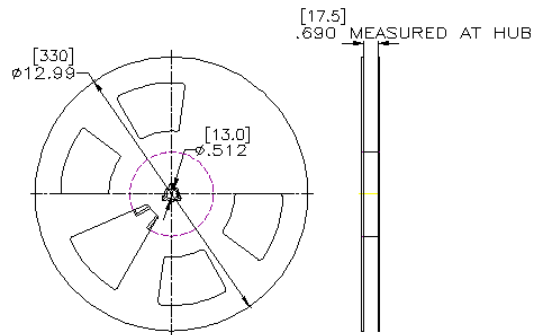


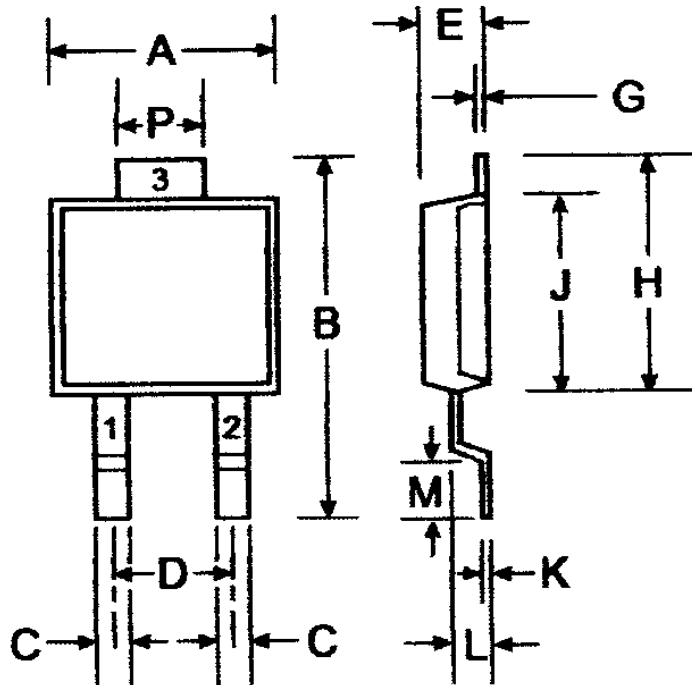


- Notes:
1.  $T_A = T_{\text{SOLDERING POINT}}$ ,  $R_{\theta JS} = 3.2^\circ\text{C/W}$ ,  $R_{\theta SA} = 0^\circ\text{C/W}$ .
  2. Device mounted on GETEK substrate, 2" x 2", 2 oz. copper, double-sided, cathode pad dimensions 0.75" x 1.0", anode pad dimensions 0.25" x 1.0".  $R_{\theta JA}$  in range of 15-30° C/W.
  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 below.



Mounting Pad Dimensions: inches [mm]

**16 mm TAPE****13 INCH REEL**

**DIMENSIONS**


PIN 1 ○  
 PIN 2 ○

PIN 3, BOTTOMSIDE  
 HEAT SINK

**Note:** Pins 1 & 2 must be electrically connected at the printed circuit board.

<b>POWERMTE®3</b>		
<b>Dim</b>	<b>Min</b>	<b>Max</b>
<b>A</b>	<b>4.03</b>	<b>4.09</b>
<b>B</b>	<b>6.40</b>	<b>6.61</b>
<b>C</b>	<b>.889 NOM</b>	
<b>D</b>	<b>1.83 NOM</b>	
<b>E</b>	<b>1.10</b>	<b>1.14</b>
<b>G</b>	<b>.178 NOM</b>	
<b>H</b>	<b>5.01</b>	<b>5.17</b>
<b>J</b>	<b>4.37</b>	<b>4.43</b>
<b>K</b>	<b>.178 NOM</b>	
<b>L</b>	<b>.71</b>	<b>.77</b>
<b>M</b>	<b>.36</b>	<b>.46</b>
<b>P</b>	<b>1.73</b>	<b>1.83</b>
<b>All Dimensions in mm</b>		



UPS540e3

5 A Schottky Barrier Rectifier

NOTES: