

# **5A SURFACE MOUNT SCHOTTKY BARRIER RECTIFIER POWERMITE 3**

### **Features**

Guard Ring Die Construction for Transient Protection

Low Power Loss, High Efficiency

Low Forward Voltage Drop

For Use in Low Voltage, High Frequency Inverters, Free Wheeling, and Polarity Protection Applications

Lead Free Finish, RoHS Compliant (Note 2)

## **Mechanical Data**

Case: POWERMITE 3

Case Material: Molded Plastic. UL Flammability

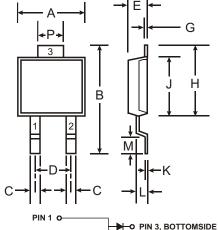
Classification Rating 94V-0

Moisture Sensitivity: Level 1 per J-STD-020C Terminals: Solderable per MIL-STD-202, Method 208

Lead Free Plating (Matte Tin Finish). @3

Polarity: See Diagram

Marking: Type Number, See also Sheet 3 Ordering Information, See Sheet 3 Weight: 0.072 grams (approximate)



PIN 3, BOTTOMSIDE PIN 2 C Note: Pins 1 & 2 must be electrically

connected at the printed circuit board.

POWERMITE 3				
Dim	Min	Max		
Α	4.03	4.09		
В	6.40	6.61		
С	.889 NOM			
D	1.83 NOM			
E	1.10	1.14		
G	.178 NOM			
Н	5.01	5.17		
J	4.37	4.43		
K	.178 NOM			
L	.71	.77		
М	.36	.46		
Р	1.73	1.83		
All Dimensions in mm				

#### Maximum Ratings @ T<sub>A</sub> = 25 C unless otherwise specified

Single phase, half wave, 60Hz, resistive or inductive load.

For capacitive load, derate current by 20%.

Characteristic	Symbol	Value	Unit
Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage	V <sub>RRM</sub> V <sub>RWM</sub> V <sub>R</sub>	40	V
RMS Reverse Voltage	V <sub>R(RMS)</sub>	28	V
Average Rectified Output Current (see also Figure 5)	Io	5	Α
Non-Repetitive Peak Forward Surge Current 8.3ms Single half sine-wave Superimposed on Rated Load @ $T_C = 90$ C	I <sub>FSM</sub>	100	А
Typical Thermal Resistance Junction to Soldering Point	R <sub>JS</sub>	3.2	C/W
Operating Temperature Range	Tj	-55 to +125	С
Storage Temperature Range	T <sub>STG</sub>	-55 to +150	°C

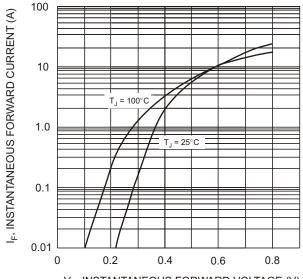
#### **Electrical Characteristics** @ T<sub>A</sub> = 25 C unless otherwise specified

Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition
Reverse Breakdown Voltage (Note 1)	$V_{(BR)R}$	40			V	$I_R = 0.5 \text{mA}$
Forward Voltage	V <sub>FM</sub>		0.48 0.45 0.59 0.56	0.52	V	$\begin{array}{l} I_F = 5A,  T_S =  25  C \\ I_F = 5A,  T_S = 125  C \\ I_F = 10A,  T_S = 25  C \\ I_F = 10A,  T_S = 125  C \end{array}$
Reverse Current (Note 1)	I <sub>RM</sub>		0.05 2.5	0.5 20	mA	T <sub>S</sub> = 25 C, V <sub>R</sub> = 40V T <sub>S</sub> = 100 C, V <sub>R</sub> = 40V
Total Capacitance	Ст		250		pF	f = 1.0MHz, V <sub>R</sub> = 4.0V DC

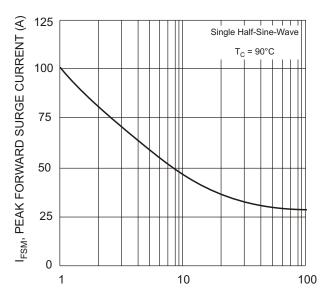
1. Short duration test pulse used to minimize self-heating effect. Notes:

2. RoHS revision 13.2.2003. High Temperature Solder Exemption Applied, see EU Directive Annex Note 7.

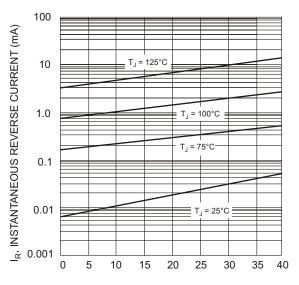




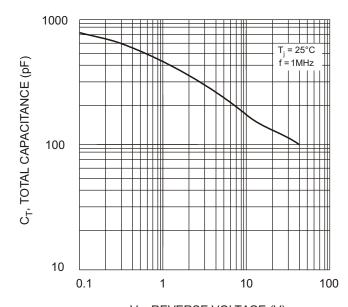
V<sub>F</sub>, INSTANTANEOUS FORWARD VOLTAGE (V) Fig. 1 Typical Forward Characteristics



NUMBER OF CYCLES AT 60 Hz Fig. 3 Max Non-Repetitive Peak Forward Surge Current

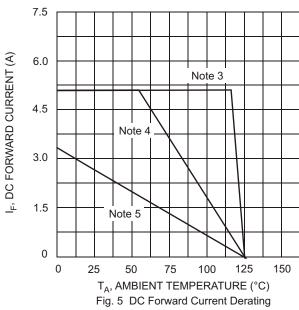


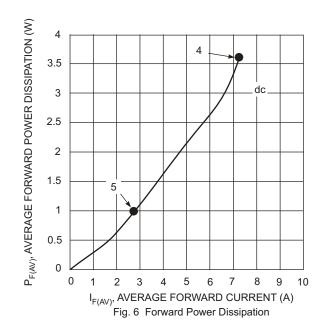
V<sub>R</sub>, INSTANTANEOUS REVERSE VOLTAGE (V) Fig. 2 Typical Reverse Characteristics



V<sub>R</sub>, REVERSE VOLTAGE (V) Fig. 4 Typical Total Capacitance vs. Reverse Voltage







Notes: 3.  $T_A = T_{SOLDERING\ POINT}$ , R  $J_S = 3.2\ C/W$ , R  $S_A = 0\ C/W$ .

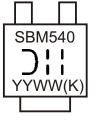
- 4. Device mounted on GETEK substrate, 2"x2", 2 oz. copper, double-sided, cathode pad dimensions 0.75" x 1.0", anode pad dimensions 0.25" x 1.0". R <sub>JA</sub> in range of 15-30°C/W.
- Device mounted on FR-4 substrate, 2"x2", 2 oz. copper, single-sided, pad layout as per Diodes Inc. suggested pad layout document AP02001 which can be found on our website at http://www.diodes.com/datasheets/ap02001.pdf. R JA in range of 60-75°C/W.

## Ordering Information (Note 6)

Device	Packaging	Shipping
SBM540-13-F	POWERMITE 3	5000/Tape & Reel

Notes: 6. For Packaging Details, go to our website at http://www.diodes.com/datasheets/ap02007.pdf.

# **Marking Information**



SBM540 = Product type marking code

O!! = Manufacturers' code marking

YYWW = Date code marking

YY = Last digit of year ex: 02 for 2002

WW = Week code 01 to 52

(K) = Factory Designator

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