



**THE DATASHEET OF  
SBM1040-13-F**



## 10A LOW VF SCHOTTKY BARRIER RECTIFIER POWERMITE®3

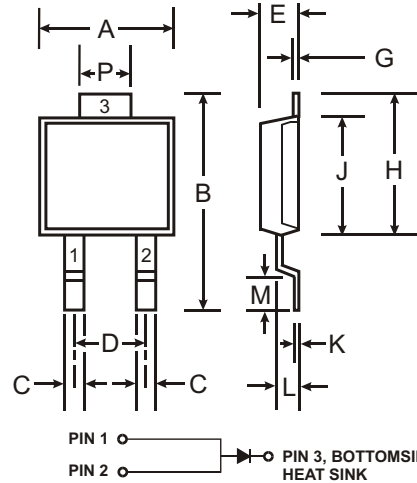
NOT RECOMMENDED FOR NEW DESIGNS  
USE PDS1040

### Features

- Guard Ring Die Construction for Transient Protection
- Low Power Loss, High Efficiency
- High Surge Capability
- High Max Junction Temperature Rating
- Low Forward Voltage Drop
- Very Low Leakage Current
- For Use in Low Voltage, High Frequency Inverters, Free Wheeling, and Polarity Protection Applications
- Available in Lead Free Finish/RoHS Compliant Version (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
- Also available in Lead Free Plating (Matte Tin Finish). Please see Ordering Information, Note 12, on Page 3
- Polarity: See Diagram
- Marking Information: See Page 3
- Weight: 0.072 grams (approximate)



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

POWERMITE®3		
Dim	Min	Max
A	4.03	4.09
B	6.40	6.61
C	.864	.914
D	1.83 NOM	
E	1.10	1.14
G	.173	.203
H	5.01	5.17
J	4.37	4.43
K	.173	.203
L	.71	.77
M	.36	.46
P	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 4)	I <sub>O</sub>	10	A
Non-Repetitive Peak Forward Surge Current 8.3ms Single half sine-wave Superimposed on Rated Load @ T <sub>C</sub> = 88°C	I <sub>FSM</sub>	150	A
Typical Thermal Resistance Junction to Soldering Point	R <sub>θJS</sub>	2.5	°C/W
Operating Temperature Range	T <sub>J</sub>	-65 to +150	°C
Storage Temperature Range	T <sub>STG</sub>	-65 to +150	°C

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Breakdown Voltage (Note 1)	V <sub>(BR)R</sub>	40	—	—	V	I <sub>R</sub> = 1mA
Forward Voltage	V <sub>F</sub>	—	0.45 — 0.47	0.49 0.41 0.51	V	I <sub>F</sub> = 8A, T <sub>S</sub> = 25°C I <sub>F</sub> = 8A, T <sub>S</sub> = 125°C I <sub>F</sub> = 10A, T <sub>S</sub> = 25°C
Reverse Current (Note 1)	I <sub>R</sub>	—	0.1 — 12.5	0.3 25	mA	T <sub>S</sub> = 25°C, V <sub>R</sub> = 35V T <sub>S</sub> = 100°C, V <sub>R</sub> = 35V
Total Capacitance	C <sub>T</sub>	—	700	—	pF	f = 1.0MHz, V <sub>R</sub> = 4.0V DC

- Notes:
1. Short duration test pulse used to minimize self-heating effect.
  2. RoHS revision 13.2.2003. Glass and High Temperature Solder Exemptions Applied, see EU Directive Annex Notes 5 and 7.

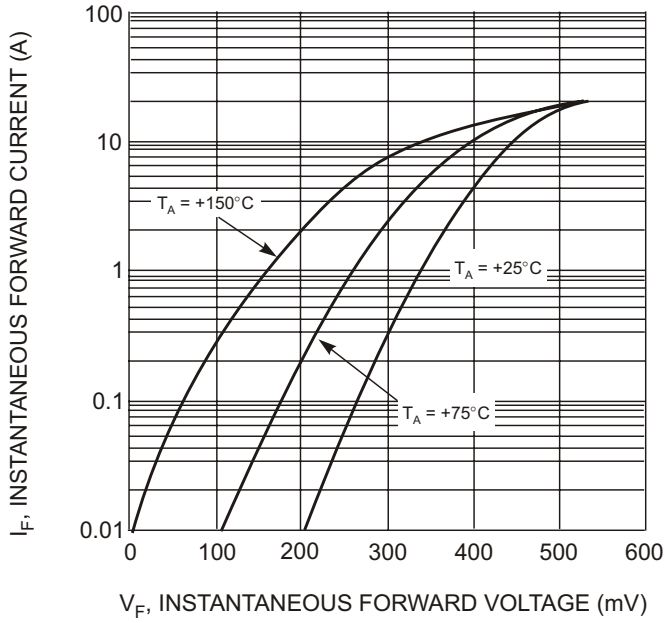


Fig. 1 Typical Forward Characteristics

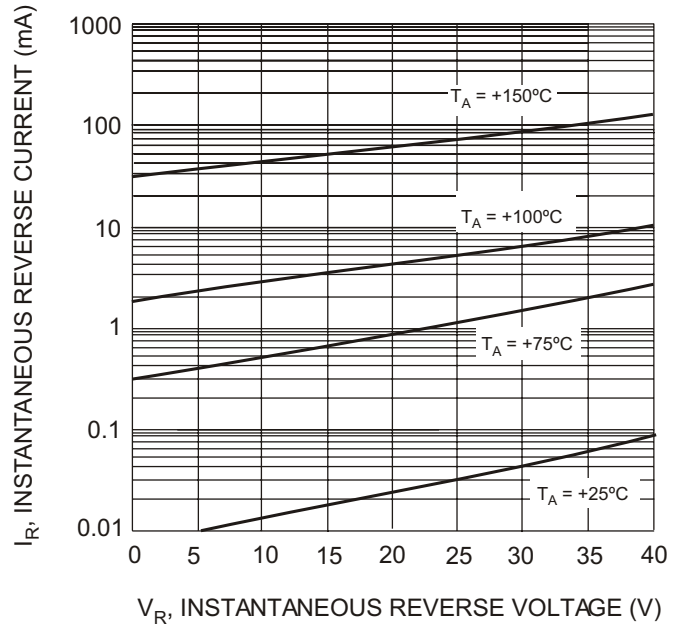


Fig. 2 Typical Reverse Characteristics

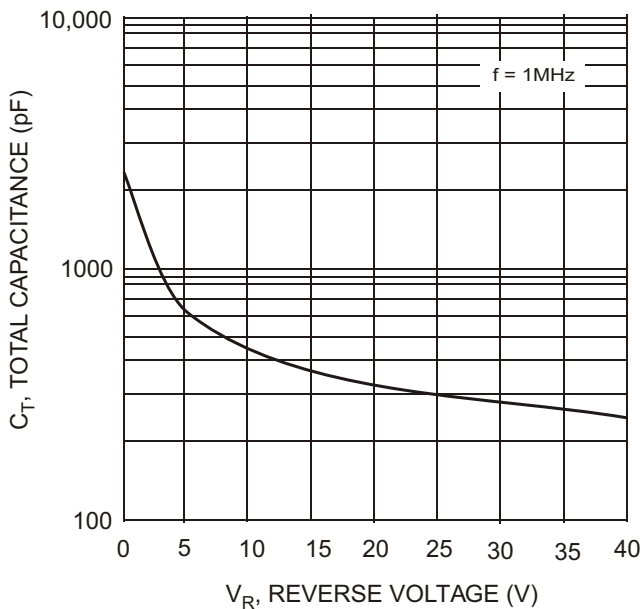


Fig. 3 Typical Total Capacitance vs. Reverse Voltage

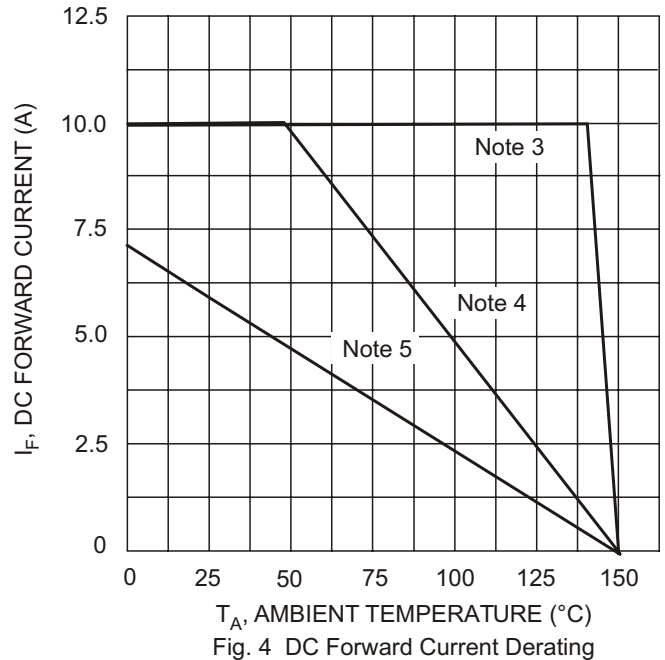


Fig. 4 DC Forward Current Derating

- Notes:
3.  $T_A = T_{\text{SOLDERING POINT}}$ ,  $R_{\theta JS} = 2.5^\circ\text{C/W}$ ,  $R_{\theta SA} = 0^\circ\text{C/W}$ .
  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".  $R_{\theta JA}$  in range of 15-30°C/W.
  5. 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>.  $R_{\theta JA}$  in range of 60-75°C/W.

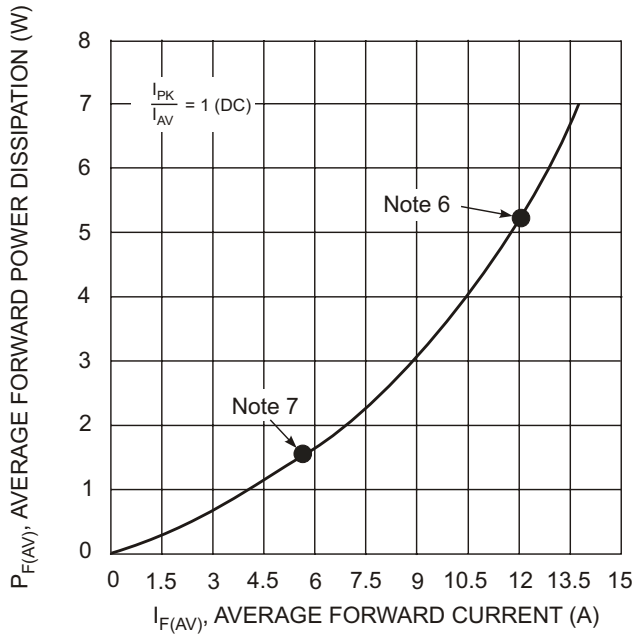


Fig. 5 Forward Power Dissipation

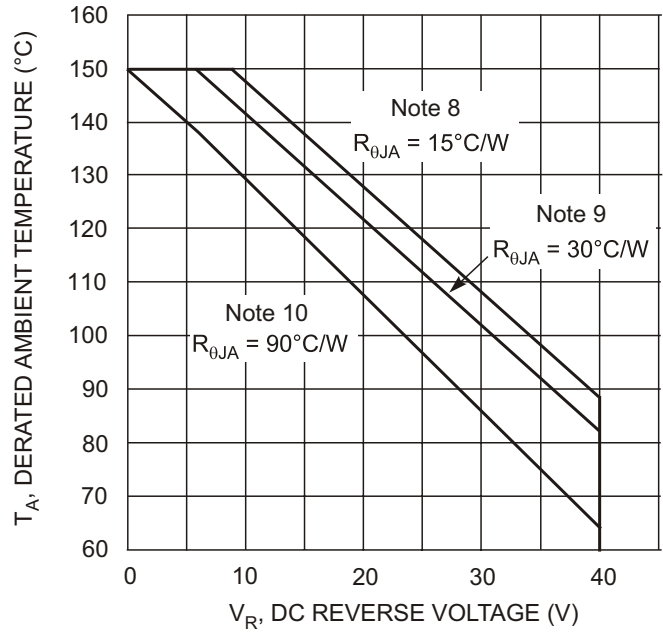


Fig. 6 Operating Temperature Derating

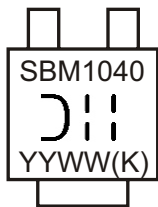
- Notes:
- Maximum power dissipation when device mounted on GETEK substrate, 2"x2", 2 oz. copper, double-sided, cathode pad dimensions 0.75" x 1.0", anode pad dimensions 0.25" x 1.0". R<sub>θJA</sub> in range of 15-30°C/W.
  - Maximum power dissipation when device mounted on FR-4 substrate, 2"x2", 2 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<sub>θJA</sub> in range of 60-75°C/W.
  - R<sub>θJA</sub> = 15°C/W when mounted on 2"x2", single-sided, ceramic board with cathode pad dimensions 0.75"x1.0", anode pad dimensions 0.25"x1.0".
  - R<sub>θJA</sub> = 30°C/W when mounted on 2"x2", single-sided, FR-4 board with cathode pad dimensions 0.5"x1.0", anode pad dimensions 0.5"x1.0", 2 oz. copper pads.
  - R<sub>θJA</sub> = 90°C/W when mounted on 0.5"x0.625", single-sided, FR-4 board with minimum recommended pad layout.

## Ordering Information (Note 11)

Device	Packaging	Shipping
SBM1040-13	POWERMITE®3	5000/Tape & Reel

- Notes:
- For Packaging Details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.
  - For Lead Free Finish/RoHS Compliant version part number, please add "-F" suffix to the part number above. Example: SBM1040-13-F.

## Marking Information



SBM1040 = Product type marking code  
 D|| = Manufacturers' code marking  
 YYWW = Date code marking  
 YY = Last two digits of year ex: 02 for 2002  
 WW = Week code 01 to 52  
 (K) = Factory designator

**NOT RECOMMENDED FOR NEW DESIGNS  
 USE PDS1040**

## Looking for pricing, stock, or lifecycle information?

Click below to explore more details on WIN SOURCE:

 [View SBM1040-13-F on WIN SOURCE](#)

 [Diodes Incorporated](#) Information

## Optimize Your Supply Chain with WIN SOURCE Solutions

-  Global Sourcing Solution
-  Obsolete Management
-  Cost Control Management
-  Shortage Management
-  Alternative Solution
-  Excess Inventory Management