# SBM540

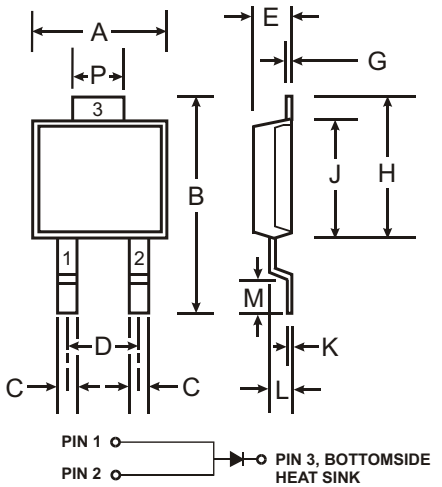
## 5A SURFACE MOUNT SCHOTTKY BARRIER RECTIFIER
## *POWERMITE 3*

## 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). e3
- Polarity: See Diagram
- Marking: Type Number, See also Sheet 3
- Ordering Information, See Sheet 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** | .889 NOM | |
| **D** | 1.83 NOM | |
| **E** | 1.10 | 1.14 |
| **G** | .178 NOM | |
| **H** | 5.01 | 5.17 |
| **J** | 4.37 | 4.43 |
| **K** | .178 NOM | |
| **L** | .71 | .77 |
| **M** | .36 | .46 |
| **P** | 1.73 | 1.83 |
| **All Dimensions in mm** | | |

## Maximum Ratings @ $T_A$ = 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<br>Working Peak Reverse Voltage<br>DC Blocking Voltage | $V_{RRM}$<br>$V_{RWM}$<br>$V_R$ | 40 | V |
| RMS Reverse Voltage | $V_{R(RMS)}$ | 28 | V |
| Average Rectified Output Current (see also Figure 5) | $I_O$ | 5 | A |
| Non-Repetitive Peak Forward Surge Current<br>8.3ms Single half sine-wave Superimposed on Rated Load<br>@ $T_C$ = 90 C | $I_{FSM}$ | 100 | A |
| Typical Thermal Resistance Junction to Soldering Point | $R_{JS}$ | 3.2 | C/W |
| Operating Temperature Range | $T_j$ | -55 to +125 | C |
| Storage Temperature Range | $T_{STG}$ | -55 to +150 | °C |

## Electrical Characteristics @ $T_A$ = 25 C unless otherwise specified

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|---|---|---|---|---|---|---|
| Reverse Breakdown Voltage (Note 1) | $V_{(BR)R}$ | 40 | | | V | $I_R$ = 0.5mA |
| Forward Voltage | $V_{FM}$ | | 0.48<br>0.45<br>0.59<br>0.56 | 0.52 | V | $I_F$ = 5A, $T_S$ = 25 C<br>$I_F$ = 5A, $T_S$ = 125 C<br>$I_F$ = 10A, $T_S$ = 25 C<br>$I_F$ = 10A, $T_S$ = 125 C |
| Reverse Current (Note 1) | $I_{RM}$ | | 0.05<br>2.5 | 0.5<br>20 | mA | $T_S$ = 25 C, $V_R$ = 40V<br>$T_S$ = 100 C, $V_R$ = 40V |
| Total Capacitance | $C_T$ | | 250 | | pF | f = 1.0MHz, $V_R$ = 4.0V DC |

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

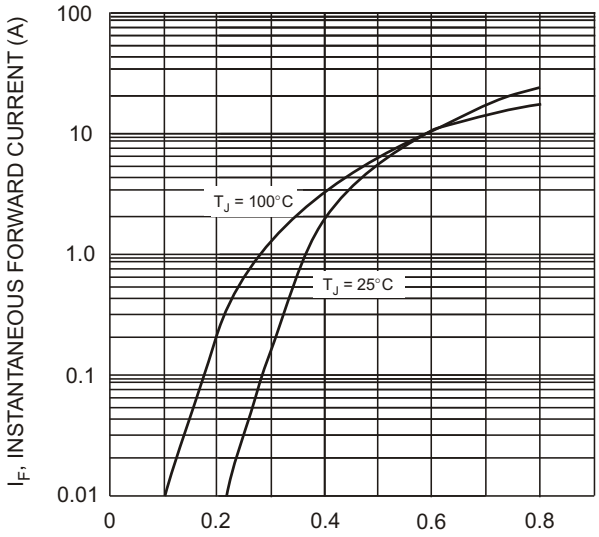



Fig. 1 Typical Forward Characteristics

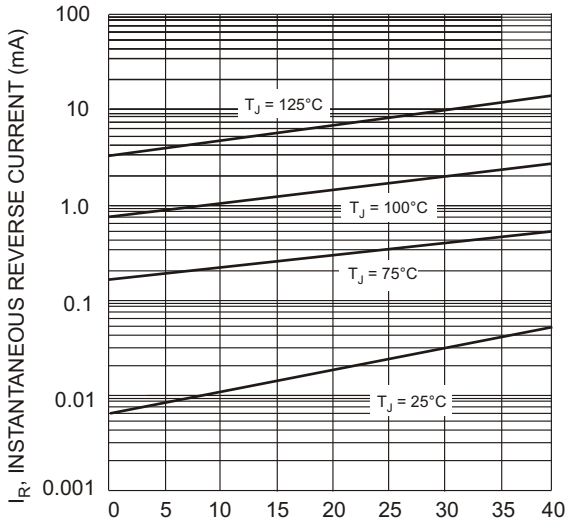



Fig. 2 Typical Reverse Characteristics

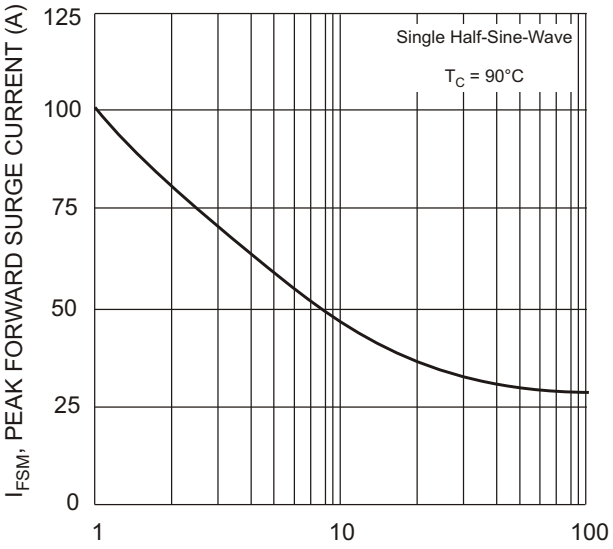



Fig. 3 Max Non-Repetitive Peak Forward Surge Current

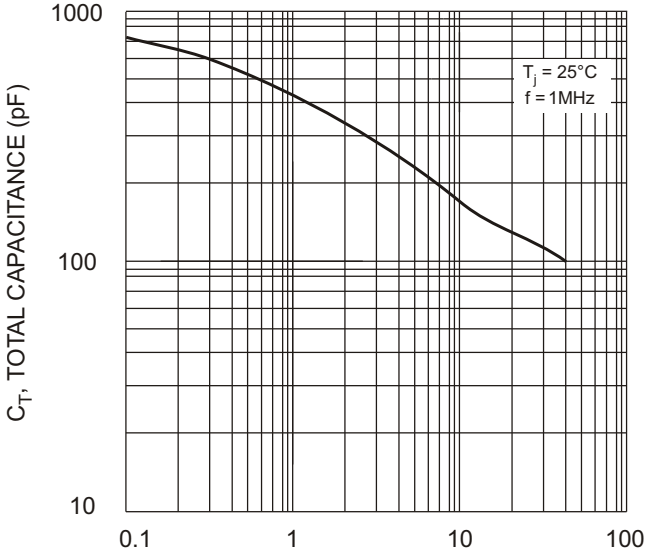



Fig. 4 Typical Total Capacitance vs. Reverse Voltage

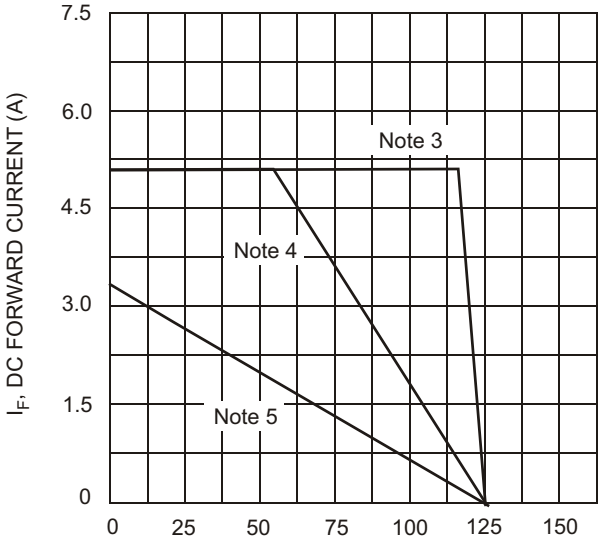



Fig. 5 DC Forward Current Derating

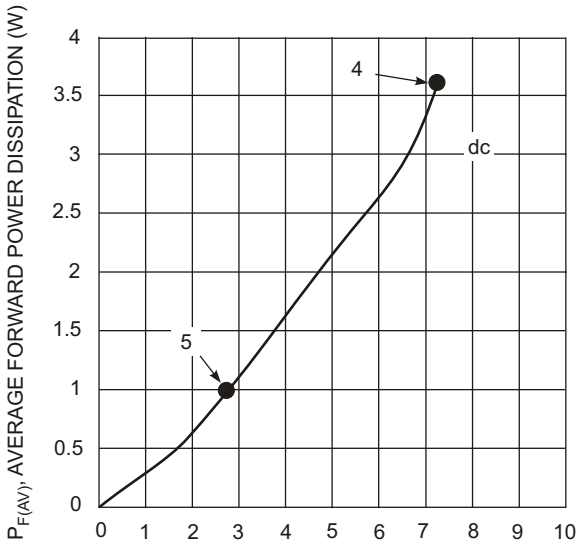



Fig. 6 Forward Power Dissipation

Notes: 3. $T_A = T_{SOLDERING\ POINT}$, $R_{JS} = 3.2$ C/W, $R_{SA} = 0$ 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". $R_{JA}$ in range of 15-30°C/W.

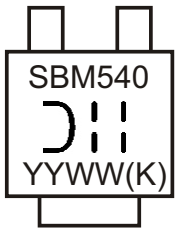
5. Device mounted on FR-4 substrate, 2"x2", 2 oz. copper, single-sided, pad layout as per Diodes Inc. suggested pad layout document AP02001 which can be found on our website at http://www.diodes.com/datasheets/ap02001.pdf. $R_{JA}$ in range of 60-75°C/W.

## 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
= 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