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## Contact us

Tel: +86-755-8981 8866 Fax: +86-755-8427 6832

Email & Skype: info@chipsmall.com Web: www.chipsmall.com

Address: A1208, Overseas Decoration Building, #122 Zhenhua RD., Futian, Shenzhen, China



**Product Summary** (@T<sub>A</sub> = +25°C)

| V <sub>RRM</sub> (V) | I <sub>o</sub> (A) | V <sub>F(MAX)</sub> (V) | I <sub>R(MAX)</sub> (mA) |
|----------------------|--------------------|-------------------------|--------------------------|
| 45                   | 5                  | 0.6                     | 0.28                     |

**Features and Benefits**

- Ultra Low Forward Voltage Drop (V<sub>F</sub>) Helps Minimize Power Losses
- Excellent Reverse Leakage (I<sub>R</sub>) Stability at Higher Temperatures
- Thermally Efficient Package for Cooler Running Applications
- Less Than 1.1mm Package Profile Ideal for Thin Applications
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

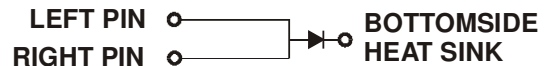
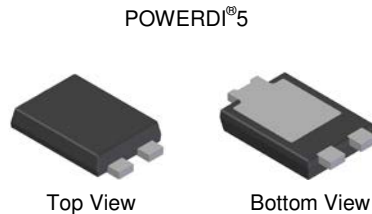
**Description and Applications**

Packaged in the compact thermally efficient POWERDI<sup>®</sup>5 package, the SBR5E45P5 provides ultra-low forward-voltage drop (V<sub>F</sub>) and excellent low reverse leakage stability at high temperatures. It is ideal for use as a rectification, freewheeling or polarity protection diode in applications such as:

- >10W AC-DC Adaptors/Chargers
- DC-DC Converters

**Mechanical Data**

- Case: POWERDI<sup>®</sup>5
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: See Diagram Below
- Weight: 0.093 grams (Approximate)



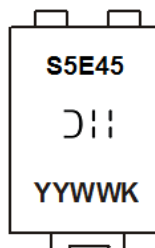
**Note: Pins Left & Right must be electrically connected at the printed circuit board.**

**Ordering Information** (Note 4)

| Part Number            | Case                   | Packaging         |
|------------------------|------------------------|-------------------|
| SBR5E45P5-13           | POWERDI <sup>®</sup> 5 | 5,000/Tape & Reel |
| SBR5E45P5-13D (Note 5) | POWERDI <sup>®</sup> 5 | 5,000/Tape & Reel |
| SBR5E45P5-7            | POWERDI <sup>®</sup> 5 | 1,500/Tape & Reel |
| SBR5E45P5-7D (Note 5)  | POWERDI <sup>®</sup> 5 | 1,500/Tape & Reel |

- Notes:
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
  2. See [http://www.diodes.com/quality/lead\\_free.html](http://www.diodes.com/quality/lead_free.html) for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
  3. Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
  4. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.
  5. POWERDI<sup>®</sup>5 available in 5K quantity on 13-inch reel & 12mm tape, part number suffix "13D"; 1.5K quantity on 7-inch reel, part number suffix "7". Diodes also provides 12mm tape with 7-inch reel, part number suffix "7D".

**Marking Information**



S5E45 = Product Type Marking Code  
 YYWW = Date Code Marking  
 YY = Last Two Digits of Year (ex: 15 = 2015)  
 WW = Week (01 to 53)  
 K = Factory Designator

**Maximum Ratings** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

| Characteristic   | Symbol    | Value | Unit |
|--|-----------|-------|------|
| Peak Repetitive Reverse Voltage<br>Working Peak Reverse Voltage<br>DC Blocking Voltage | $V_{RRM}$ | 45    | V    |
| Average Rectified Output Current   | $I_O$     | 5     | A    |
| Non-Repetitive Peak Forward Surge Current 8.3mS  | $I_{FSM}$ | 120   | A    |

| Parameter                       | Symbol  | Value | Unit |
|---------------------------------|---------|-------|------|
| Human Body Model ESD Protection | ESD HBM | 8     | kV   |
| Machine Model ESD Protection    | ESD MM  | 400   | V    |

Caution: Stresses greater than the 'Absolute Maximum Ratings' specified above, may cause permanent damage to the device. These are stress ratings only; functional operation of the device at these or any other conditions exceeding those indicated in this specification is not implied. Device reliability may be affected by exposure to absolute maximum rating conditions for extended periods of time. Semiconductor devices are ESD sensitive and may be damaged by exposure to ESD events. Suitable ESD precautions should be taken when handling and transporting these devices.

**Thermal Characteristics**

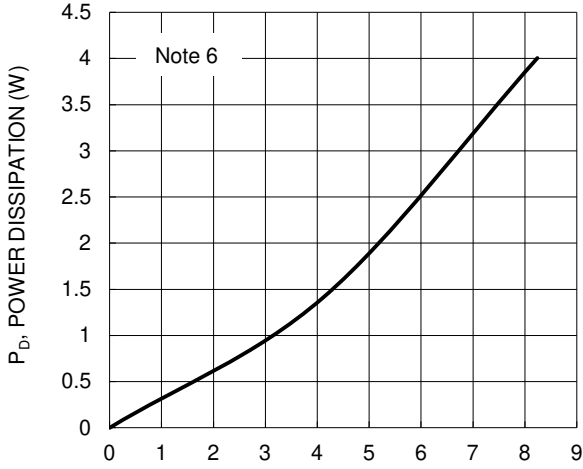
| Characteristic  | Symbol          | Value       | Unit                      |
|---|-----------------|-------------|---------------------------|
| Typical Thermal Resistance Junction to Ambient (Note 6) | $R_{\theta JA}$ | 90          | $^\circ\text{C}/\text{W}$ |
| Typical Thermal Resistance Junction to Case (Note 6)    | $R_{\theta JC}$ | 8           | $^\circ\text{C}/\text{W}$ |
| Operating and Storage Temperature Range                 | $T_J, T_{STG}$  | -55 to +150 | $^\circ\text{C}$          |

**Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

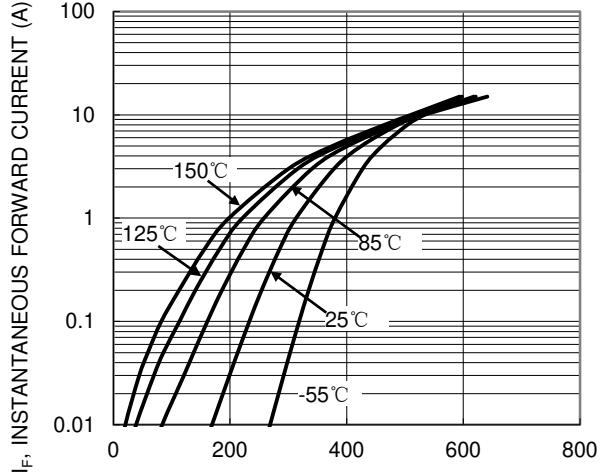
| Characteristic           | Symbol | Min | Typ  | Max  | Unit | Test Condition                               |
|--------------------------|--------|-----|------|------|------|--|
| Forward Voltage Drop     | $V_F$  | —   | —    | 0.6  | V    | $I_F = 5\text{A}, T_A = +25^\circ\text{C}$   |
|                          |        | —   | 0.4  | 0.57 |      | $I_F = 5\text{A}, T_A = +125^\circ\text{C}$  |
| Leakage Current (Note 7) | $I_R$  | —   | 0.05 | 0.28 | mA   | $V_R = 45\text{V}, T_A = +25^\circ\text{C}$  |
|                          |        | —   | —    | 75   |      | $V_R = 45\text{V}, T_A = +125^\circ\text{C}$ |

Notes: 6. Device mounted on 1 x MRP FR-4 PC board, 2oz.  
7. Short duration pulse test used to minimize self-heating effect.

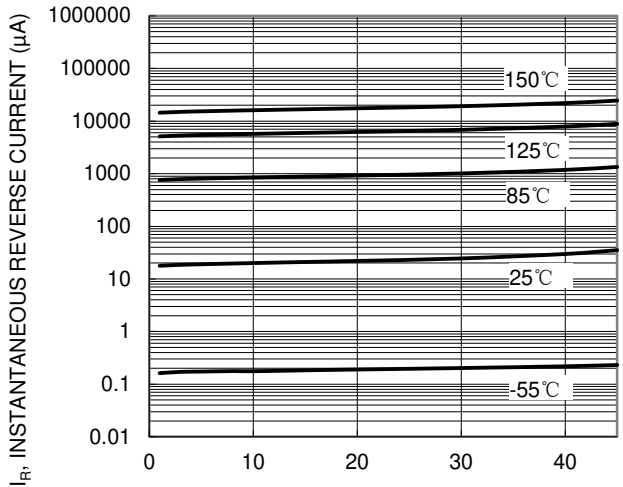




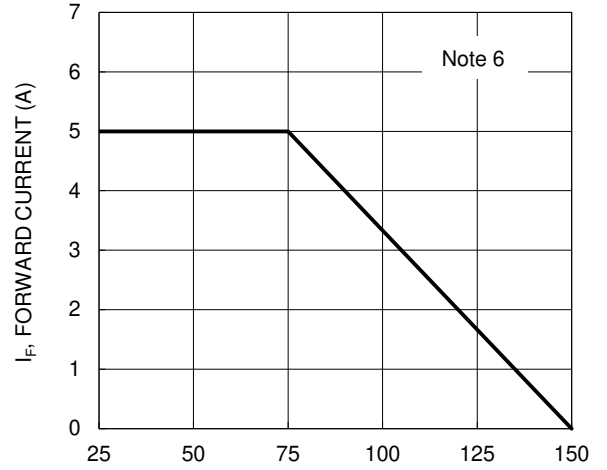
$I_{F(AV)}$ , AVERAGE FORWARD CURRENT (A)  
Figure 1. Forward Power Dissipation



$V_F$ , INSTANTANEOUS FORWARD VOLTAGE (mV)  
Figure 2. Typical Forward Characteristics



$V_R$ , INSTANTANEOUS REVERSE VOLTAGE (V)  
Figure 3. Typical Reverse Characteristics



$T_A$ , AMBIENT TEMPERATURE (°C)  
Figure 4. Forward Current Derating Curve

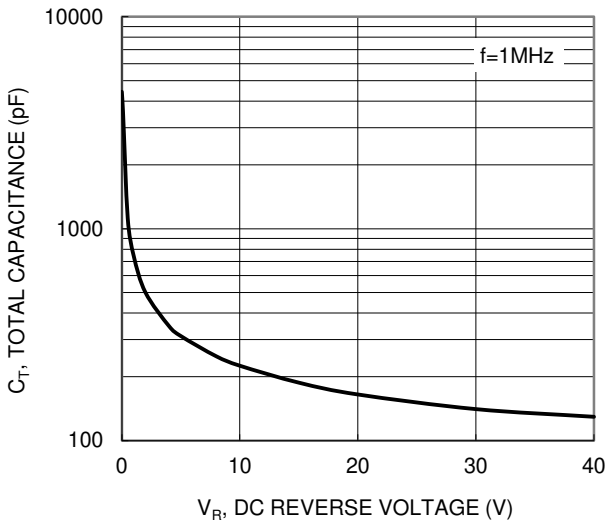
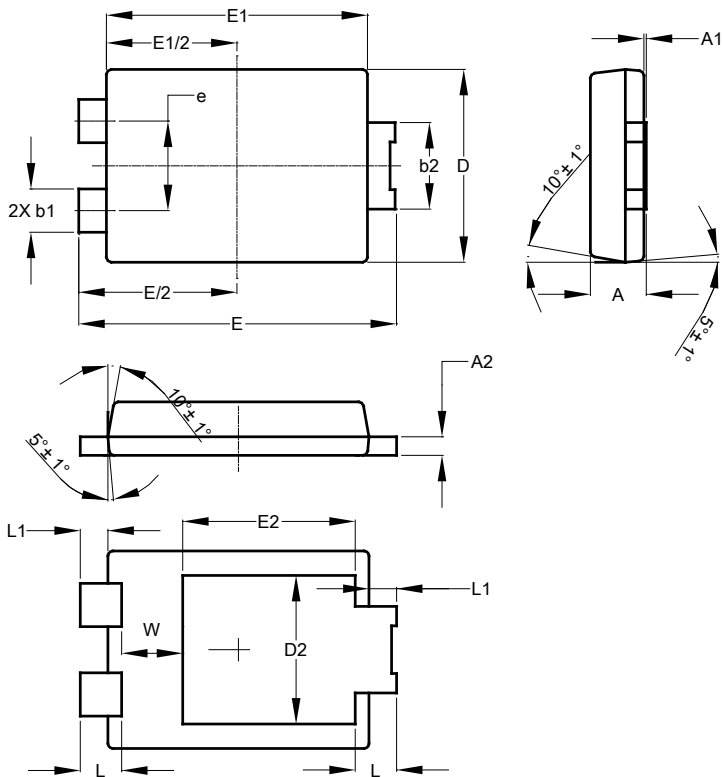


Figure 5. Total Capacitance vs. Reverse Voltage

**Package Outline Dimensions**

Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.

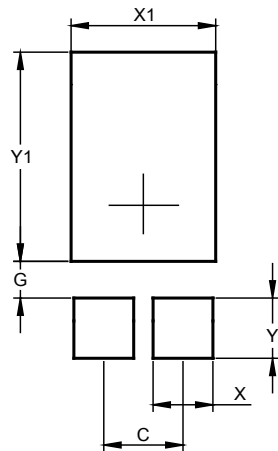


| POWERDI <sup>®</sup> 5 |      |      |       |
|------------------------|------|------|-------|
| Dim                    | Min  | Max  | Typ   |
| A                      | 1.05 | 1.15 | 1.10  |
| A1                     | 0.00 | 0.05 | --    |
| A2                     | 0.33 | 0.43 | 0.381 |
| b1                     | 0.80 | 0.99 | 0.89  |
| b2                     | 1.70 | 1.88 | 1.78  |
| D                      | 3.90 | 4.05 | 3.966 |
| D2                     | --   | --   | 3.054 |
| E                      | 6.40 | 6.60 | 6.504 |
| e                      | --   | --   | 1.84  |
| E1                     | 5.30 | 5.45 | 5.37  |
| E2                     | --   | --   | 3.549 |
| L                      | 0.75 | 0.95 | 0.85  |
| L1                     | 0.50 | 0.65 | 0.57  |
| W                      | 1.10 | 1.41 | 1.255 |
| All Dimensions in mm   |      |      |       |

NEW PRODUCT

**Suggested Pad Layout**

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



| Dimensions | Value (in mm) |
|------------|---------------|
| C          | 1.840         |
| G          | 0.852         |
| X          | 1.390         |
| X1         | 3.360         |
| Y          | 1.400         |
| Y1         | 4.860         |

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