

Product Summary (@T_A = +25°C)

| V _{RRM} (V) | I _O (A) | V _F Max (V) | I _R Max (mA) |
|----------------------|--------------------|------------------------|-------------------------|
| 45 | 10 | 0.55 | 0.38 |

Description

Packaged in the compact thermally efficient POWERDI[®]5 package, the SBR[®]10B45P5 provides ultra-low, forward-voltage drop (V_F) and excellent low reverse leakage stability at high temperatures.

Applications

It is ideal for use as a rectification, freewheeling or polarity protection diode in applications such as:

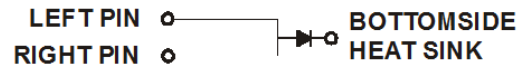
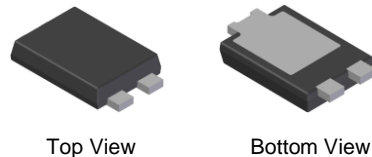
- AC-DC Adaptors/Chargers
- DC-DC Converters

Features and Benefits

- Ultra Low Forward Voltage Drop (V_F) Helps Minimize Power Losses
- Excellent Reverse Leakage (I_R) 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)**

Mechanical Data

- Case: POWERDI5
- 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)

POWERDI5


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

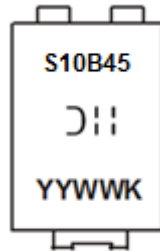
Ordering Information (Note 4)

| Part Number | Case | Packaging |
|-------------------------|----------|-------------------|
| SBR10B45P5-13 | POWERDI5 | 5,000/Tape & Reel |
| SBR10B45P5-13D (Note 5) | POWERDI5 | 5,000/Tape & Reel |
| SBR10B45P5-7 | POWERDI5 | 1,500/Tape & Reel |
| SBR10B45P5-7D (Note 5) | POWERDI5 | 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 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. POWERDI5 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

POWERDI5



S10B45 = 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°C, unless otherwise specified.)

| Characteristic | Symbol | Value | Unit |
|--|------------------|-------|------|
| Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage | V _{RRM} | 45 | V |
| Average Rectified Output Current | I _o | 10 | A |
| Non-Repetitive Peak Forward Surge Current 8.3mS | I _{FSM} | 140 | 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

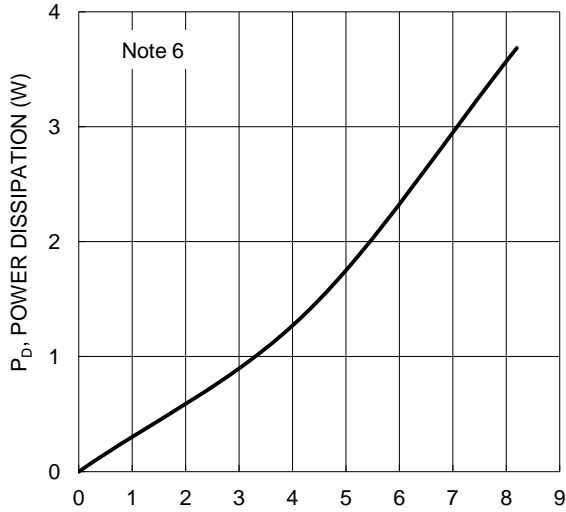
Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|---|-----------------------------------|-------------|------|
| Typical Thermal Resistance Junction to Ambient (Note 6) | R _{θJA} | 93 | °C/W |
| Typical Thermal Resistance Junction to Case (Note 6) | R _{θJC} | 10 | °C/W |
| Operating and Storage Temperature Range | T _J , T _{STG} | -55 to +150 | °C |

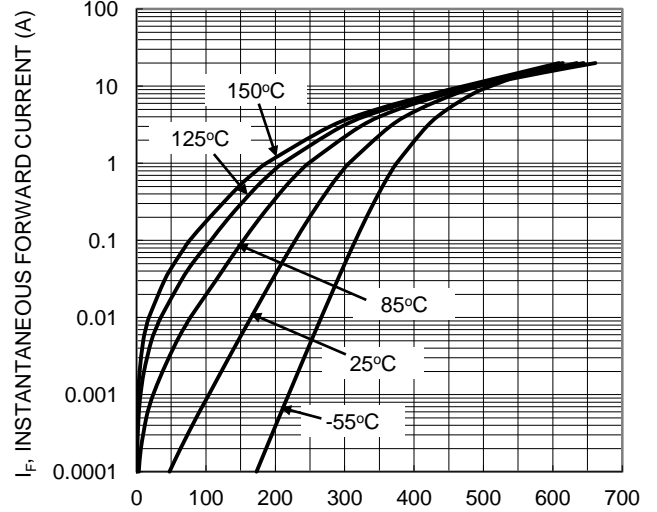
Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|--------------------------|----------------|-----|------|--------------|------|---|
| Forward Voltage Drop | V _F | — | 0.50 | 0.55 0.53 | V | I _F = 10A, T _A = +25°C I _F = 10A, T _A = +125°C |
| Leakage Current (Note 7) | I _R | — | — | 0.38 | mA | V _R = 45V, T _A = +25°C |

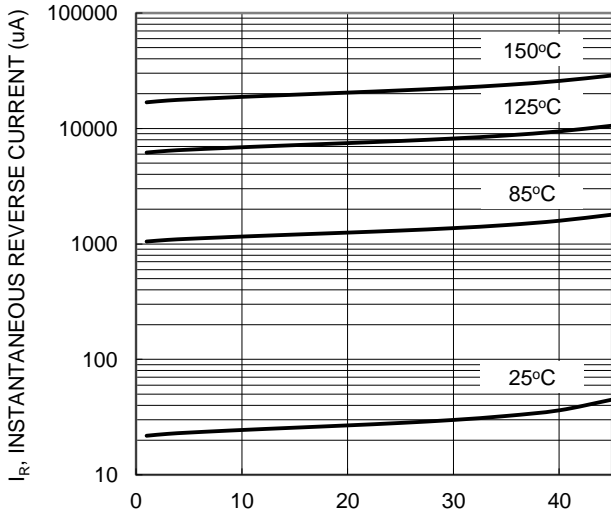
Notes: 6. Device mounted on 1 x MRP FR-4 PC board, 2oz.
 7. Short duration pulse test used to minimize self-heating effect.



$I_{F(AV)}$, 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

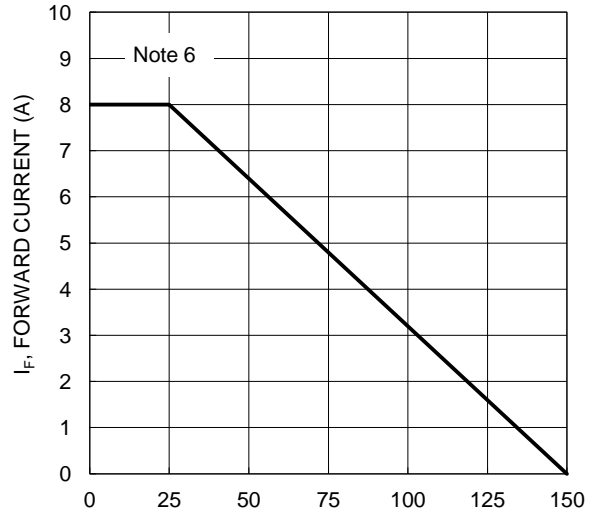
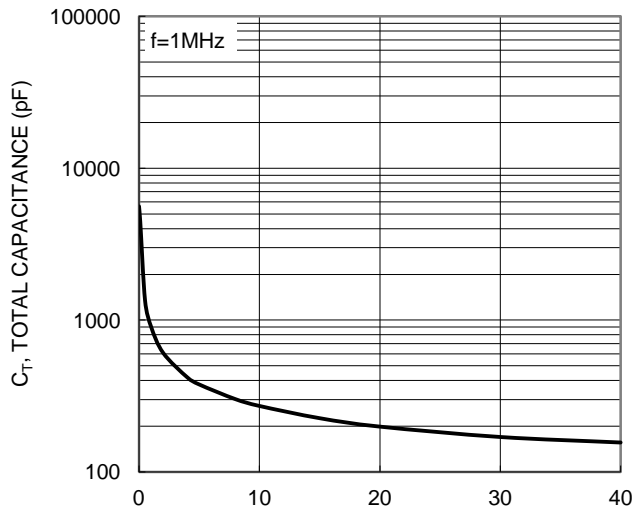


Figure 4. Forward Current Derating Curve

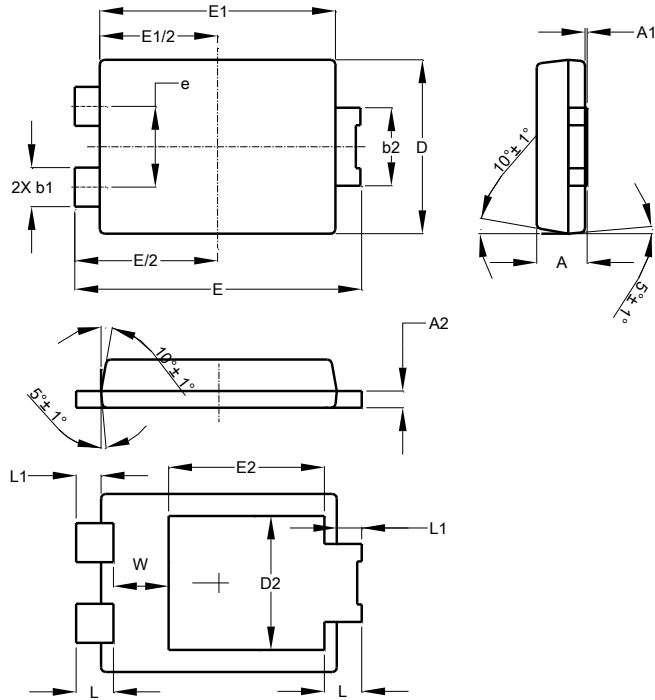


V_R , DC REVERSE VOLTAGE (V)
Figure 5. Total Capacitance vs. Reverse Voltage

Package Outline Dimensions

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

POWERDI5

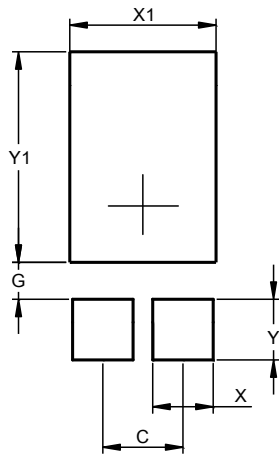


| POWERDI [®] 5 | | | |
|------------------------|------|------|-------|
| Dim | Min | Max | Typ |
| A | 1.05 | 1.15 | 1.10 |
| A1 | 0.00 | 0.05 | -- |
| A2 | 0.33 | 0.43 | 0.381 |
| b1 | 0.80 | 0.99 | 0.89 |
| b2 | 1.70 | 1.88 | 1.78 |
| D | 3.90 | 4.05 | 3.966 |
| D2 | -- | -- | 3.054 |
| E | 6.40 | 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 | | | |

Suggested Pad Layout

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

POWERDI5



| 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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Телефон: +7 812 627 14 35

Электронная почта: sales@st-electron.ru

Адрес: 198099, Санкт-Петербург,
Промышленная ул, дом № 19, литера Н,
помещение 100-Н Офис 331