

Product Summary

| V_{RRM} (V) | I_O (A) | V_F (typ) @ +125°C (V) | I_R (MAX) @ V_{RRM} (mA) |
|---------------|-----------|--------------------------|------------------------------|
| 45 | 12 | 0.38 | 0.3 |

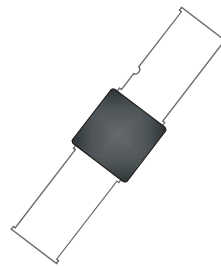
Description

The SBR12U45LH1 uses SBR patented technology that offers ultra-low V_F to reduce forward power loss and improve efficiency. Encapsulated in the new PDI-5SP package with a 0.75mm low height profile and protruding leads for easy soldering, it is especially suited for use as a bypass diode in solar panels.

Applications

- Solar Bypass Diode

POWERDI5SP



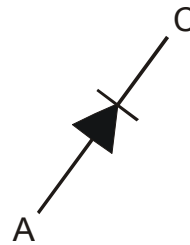
Top View

Features

- Designed as bypass diodes for solar panels
- Low profile height (0.75mm) and 7.6mm protruding leads, enabling the package to be integrated within the solar glass panel
- Selectively rated for +200°C maximum junction temperature for high thermal reliability and excellent high temperature stability
- Patented Super Barrier Rectifier technology
- Ultra low forward voltage drop to minimize forward power losses
- Very low reverse leakage to ensures maximum efficiency of solar panel
- Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- Halogen and Antimony Free. "Green" Device (Note 3)**

Mechanical Data

- Case: POWERDI5SP-B
- Case Material: Molded Plastic, UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Polarity: Cathode bar mark on top and cathode notch on lead
- Weight: 0.199 grams (approximate)



Pin Configuration

Ordering Information (Note 4)

| Part Number | Case | Packaging |
|----------------|--------------|--------------------|
| SBR12U45LH1-13 | POWERDI5SP-B | 3000 / Tape & Reel |

- Notes:
- EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
 - 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.
 - Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
 - For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

Marking Information



12U45LH1 = Product Type Marking Code
 ⤴ = Manufacturers' Code Marking
 YYWWK = Date Code Marking
 YY = Last Two Digits of Year (ex: 14 for 2014)
 WW = Week Code (01 ~ 53)
 K = Factory Designator

Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Single phase, half wave, 60Hz, resistive or inductive load.
For capacitance load, derate current by 20%.

| Characteristic | Symbol | Value | Unit |
|---|---|-------|------|
| Peak Repetitive Reverse Voltage Working Peak Reverse Voltage DC Blocking Voltage | V _{RRM} V _{RWM} V _{RM} | 45 | V |
| Average Rectified Output Current | I _O | 12 | A |
| Non-Repetitive Peak Forward Surge Current 8.3ms Single Half Sine-Wave Superimposed on Rated Load | I _{FSM} | 300 | A |

Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|---|---------------------------------------|-------------|------|
| Typical Thermal Resistance Junction to Ambient (Note 5) | R _{θJA} | 66 | °C/W |
| Operating Temperature Range | V _R ≤ 80% V _{RRM} | -65 to +150 | °C |
| | DC Forward Mode (Note 7) | ≤ 175 | |
| | DC Forward Mode (Note 8) | ≤ 200 | |
| Storage Temperature Range | T _{STG} | -65 to +175 | °C |

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

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|--------------------------|----------------|-----|------|------|------|---|
| Forward Voltage Drop | V _F | — | 0.40 | 0.48 | V | I _F = 10A, T _J = +25°C |
| | | — | 0.42 | 0.50 | | I _F = 12A, T _J = +25°C |
| | | — | 0.38 | 0.45 | | I _F = 12A, T _J = +125°C |
| Leakage Current (Note 6) | I _R | — | 70 | 200 | μA | V _R = 40V, T _J = +25°C |
| | | — | 90 | 300 | | V _R = 45V, T _J = +25°C |
| | | — | 19 | — | mA | V _R = 45V, T _J = +125°C |
| | | — | 60 | — | | V _R = 45V, T _J = +150°C |

Notes: 5. FR-4 PCB, 2oz. Copper, minimum recommended pad layout per <http://www.diodes.com.pdf>.
6. Short duration pulse test used to minimize self-heating effect.
7. Max junction temperature +175°C guaranteed for 2 hours at maximum output.
8. Max junction temperature +200°C guaranteed for 2 hours at maximum output.

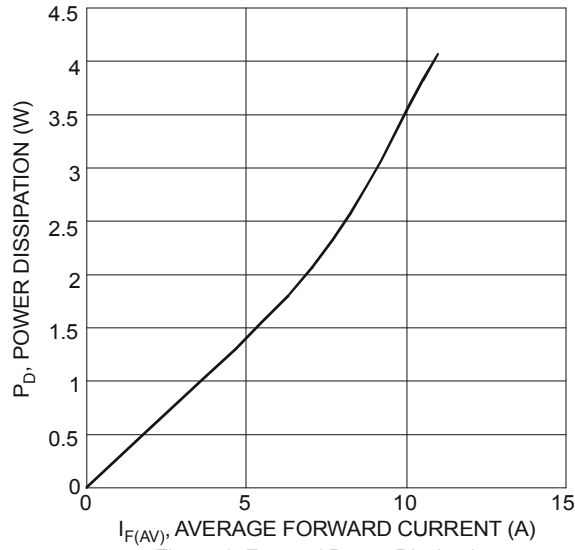


Figure 1 Forward Power Dissipation

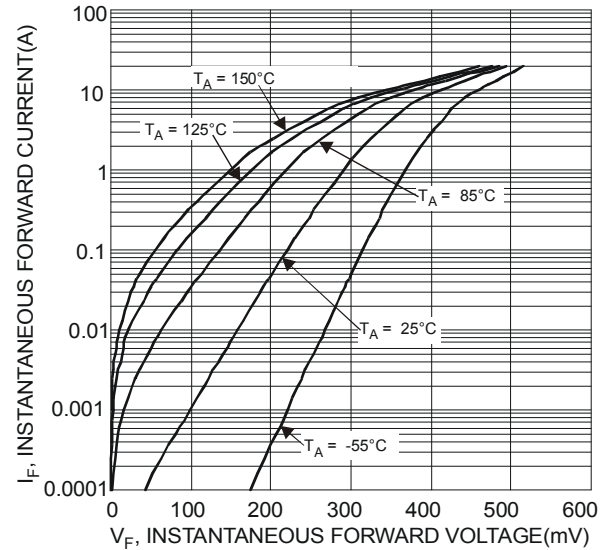


Figure 2 Typical Forward Characteristics

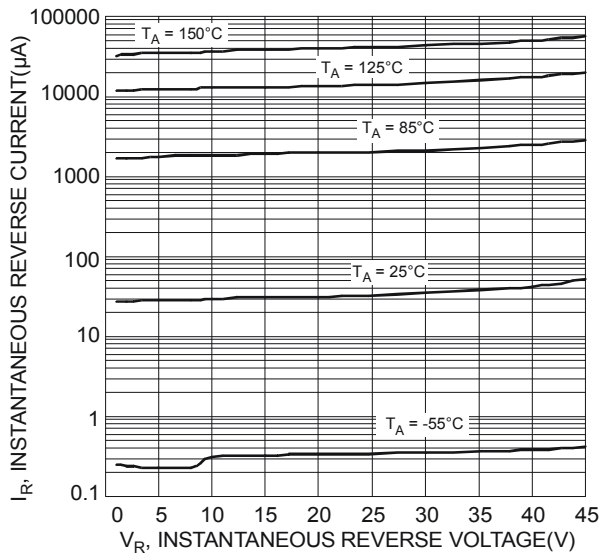


Figure 3 Typical Reverse Characteristics

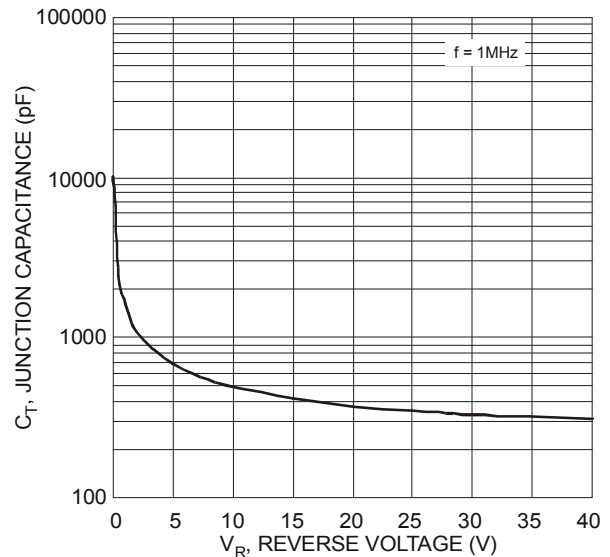


Figure 4 Typical Junction Capacitance

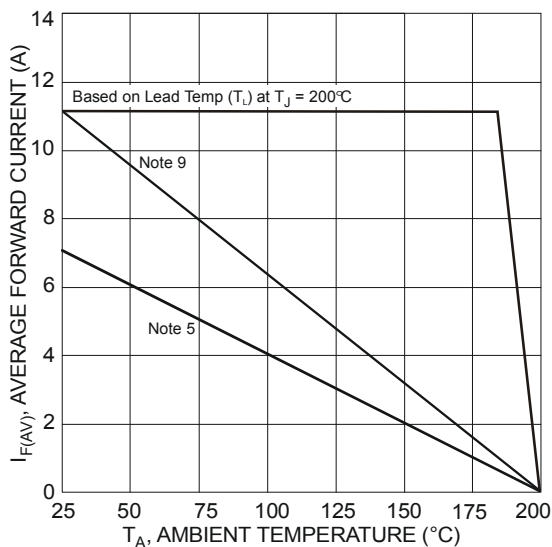


Figure 5 Forward Current Derating Curve

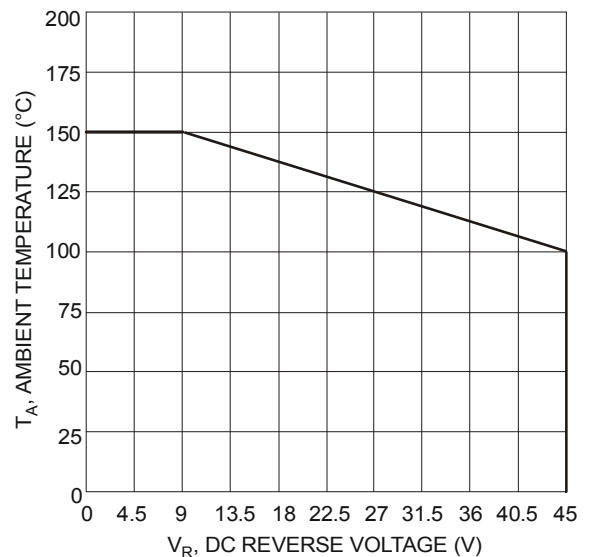
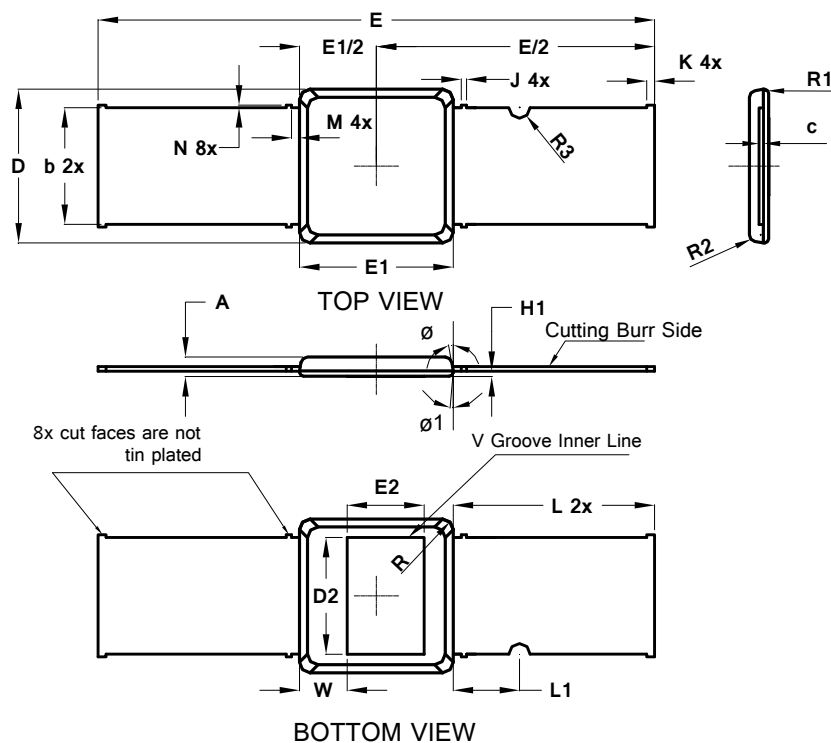


Figure 6 Operating Temperature Derating

Package Outline Dimensions

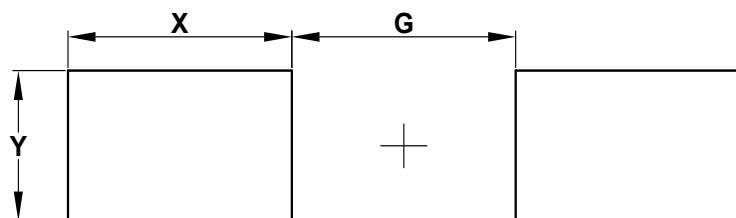
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



| POWERDI [®] 5SP Type B | | | |
|------------------------------------|-------|-------|------|
| Dim | Min | Max | Typ |
| A | — | 0.75 | — |
| B | 4.30 | 4.50 | 4.40 |
| C | 0.155 | 0.191 | — |
| D | 5.70 | 5.90 | 5.80 |
| D2 | 4.40 | — | — |
| E | 20.8 | 21.2 | 21.0 |
| E1 | 5.70 | 5.90 | 5.80 |
| E2 | 2.90 | — | — |
| H1 | 0.19 | 0.21 | 0.20 |
| J | — | — | 0.20 |
| K | — | — | 0.30 |
| L | — | — | 7.60 |
| L1 | — | — | 2.50 |
| M | — | — | 0.30 |
| N | 0 | 0.20 | — |
| R | — | — | 0.40 |
| R1 | — | — | 0.15 |
| R2 | — | — | 0.25 |
| R3 | — | — | 0.40 |
| W | 1.63 | 1.97 | 1.80 |
| Ø | 8° | 12° | — |
| Ø 1 | 3° | 7° | — |
| All Dimensions in mm | | | |

Suggested Pad Layout

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



| Dimensions | Value (in mm) |
|------------|------------------|
| G | 8.101 |
| X | 8.100 |
| Y | 5.100 |

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