SBR12U45LH1

12A SBR®
SUPER BARRIER RECTIFIER
POWERDI®5SP-B

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

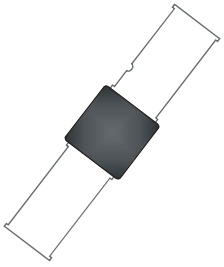
Features

- 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)**

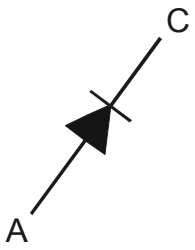
Mechanical Data

- 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)

POWERDI5SP



Top View



Pin Configuration

Ordering Information (Note 4)

Part Number	Case	Packaging
SBR12U45LH1-13	POWERDI5SP-B	3000 / 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.

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)		$R_{\theta JA}$	66	°C/W
Operating Temperature Range	$V_R \le 80\% V_{RRM}$	T_J	-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.

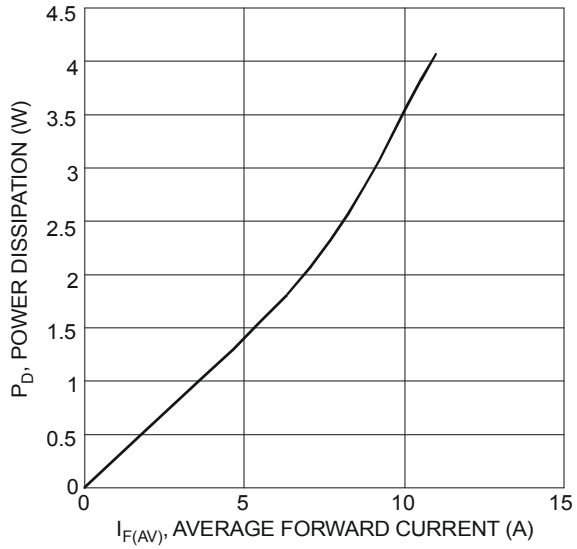


Figure 1 Forward Power Dissipation

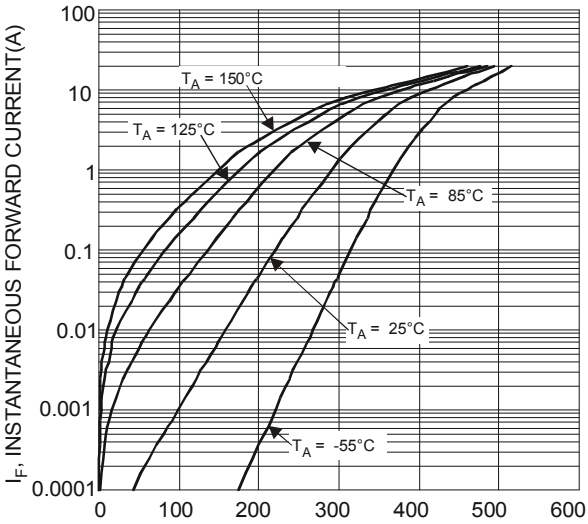


Figure 2 Typical Forward Characteristics

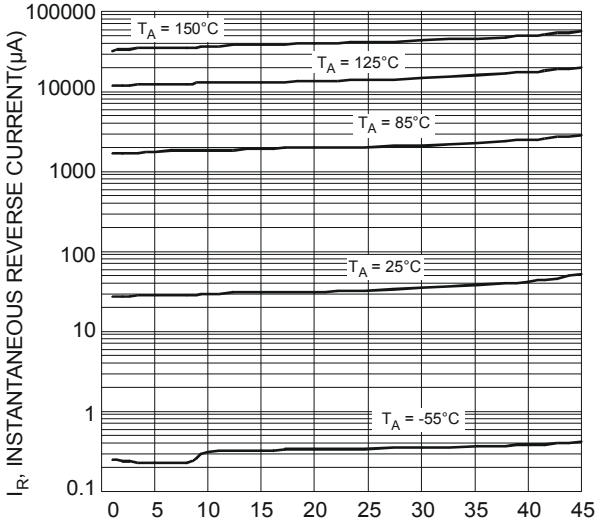


Figure 3 Typical Reverse Characteristics

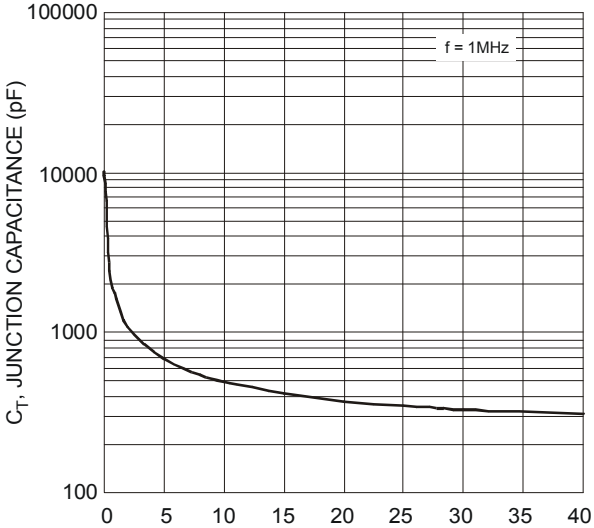


Figure 4 Typical Junction Capacitance

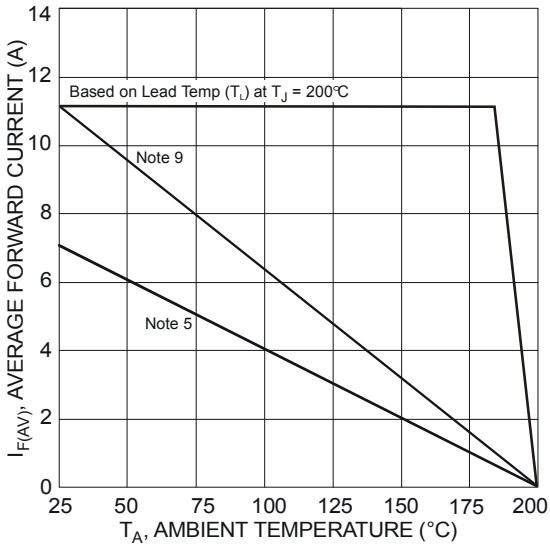


Figure 5 Forward Current Derating Curve

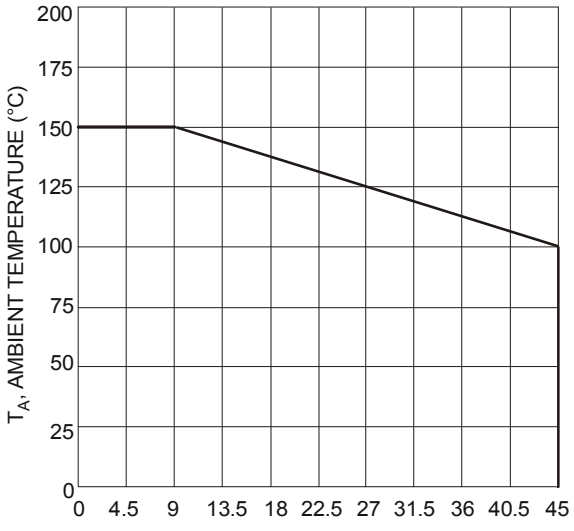
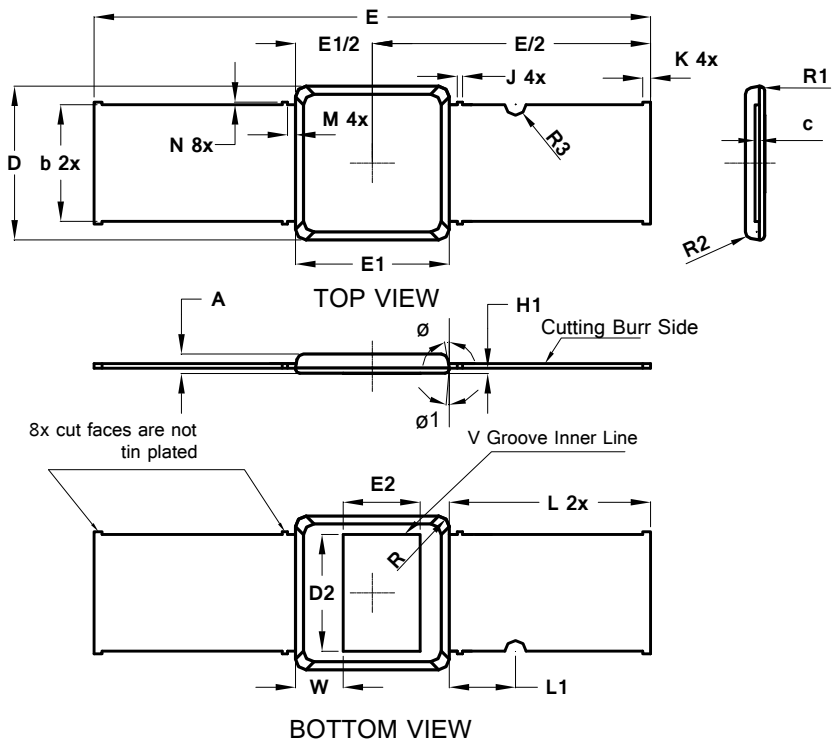


Figure 6 Operating Temperature Derating

Package Outline Dimensions

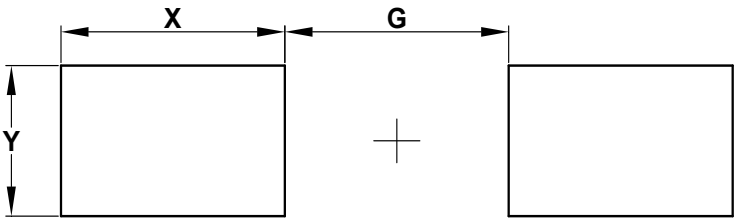
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.



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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