

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 SBR12U45LH 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

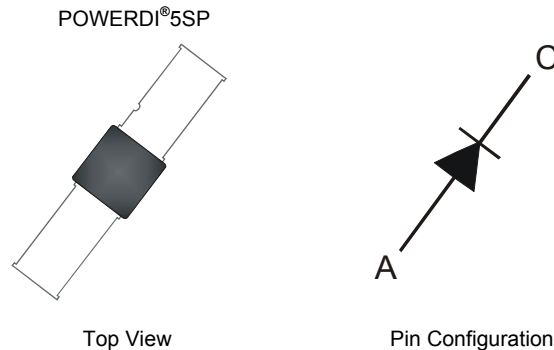
- Solar Bypass Diode

Features

- Designed as bypass diodes for solar panels
- Low profile height (0.75mm) and 9mm 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: POWERDI[®]5SP
- 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)



Ordering Information (Note 4)

Part Number	Case	Packaging
SBR12U45LH-13	POWERDI5SP	3500 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



SBR12U45 = 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	V _{RRM}	45	V
Working Peak Reverse Voltage	V _{RWM}		
DC Blocking Voltage	V _{RM}		
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	T _J	V _R ≤ 80% V _{RRM}	-65 to +150
		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.

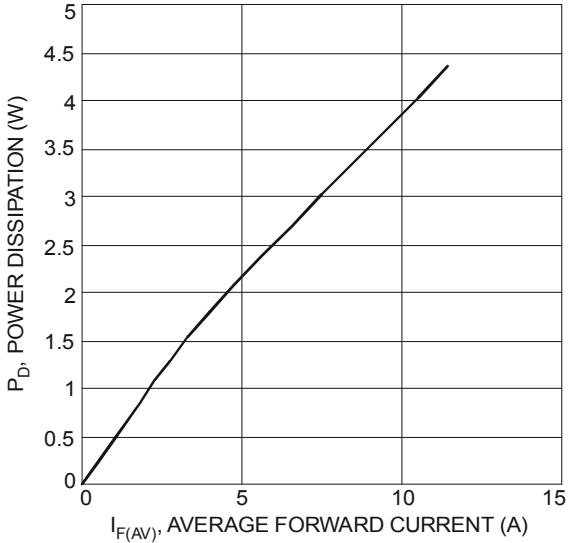


Fig. 1 Forward Power Dissipation

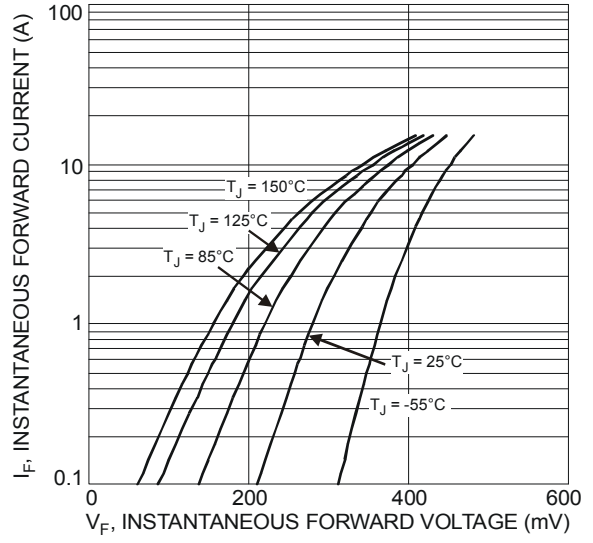


Fig. 2 Typical Forward Characteristics

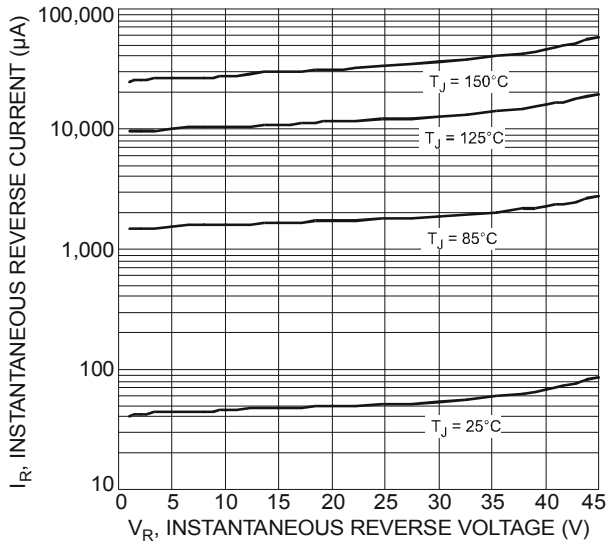


Fig. 3 Typical Reverse Characteristics

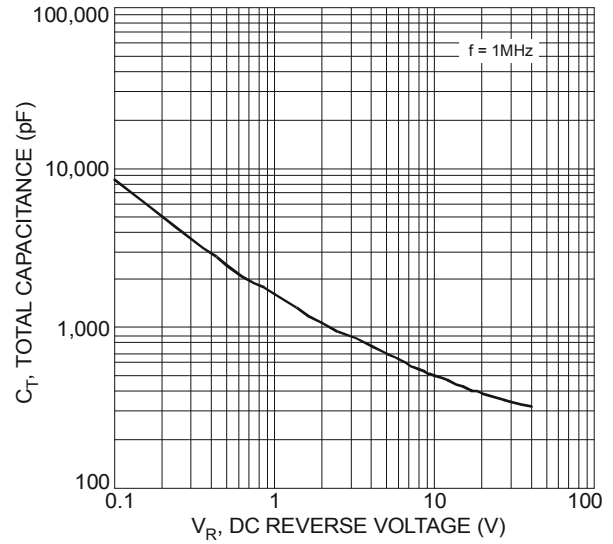


Fig. 4 Total Capacitance vs. Reverse Voltage

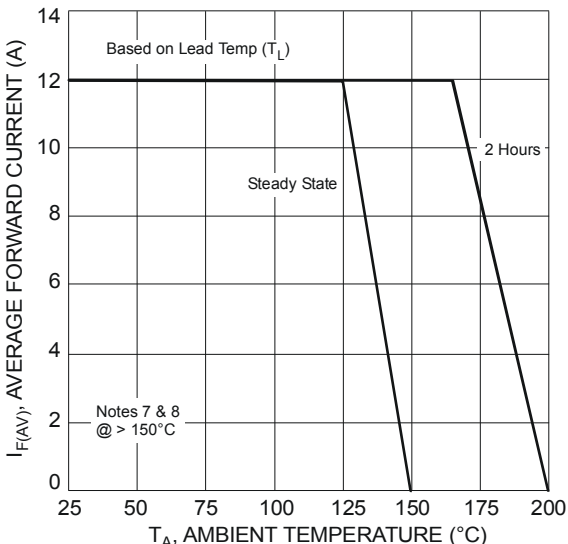


Fig. 5 Forward Current Derating Curve

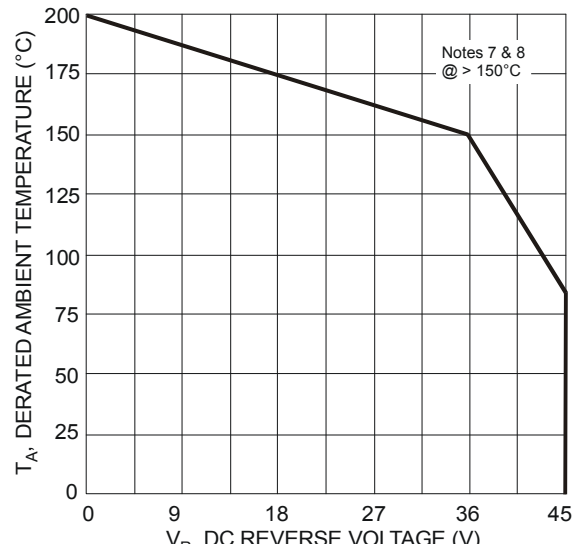
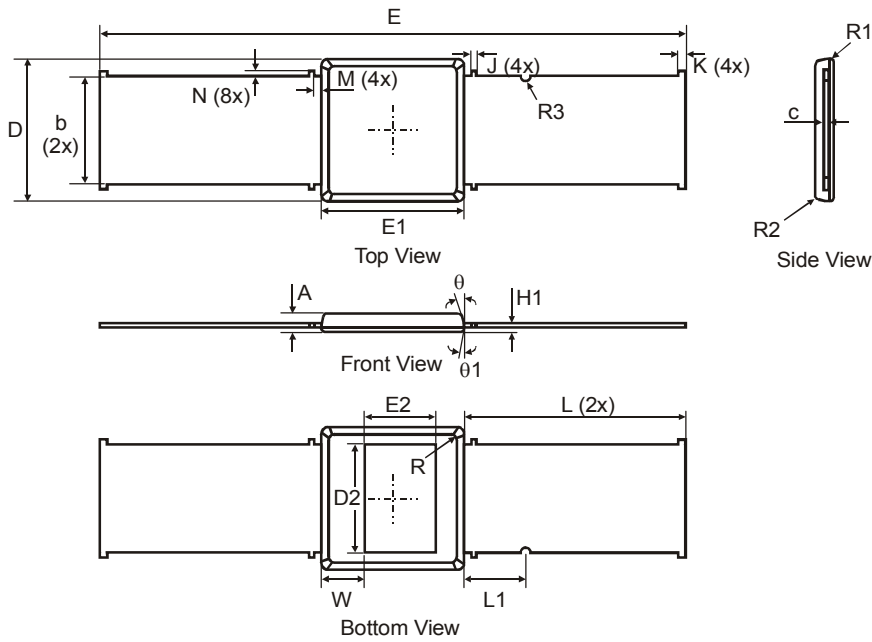


Fig. 6 Operating Temperature Derating

Package Outline Dimensions

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



POWERDI [®] 5SP			
Dim	Min	Max	Typ
A	–	0.75	0.736
c	0.155	0.195	–
b	4.30	4.50	4.40
D	5.70	5.90	5.80
D2	–	–	4.40
E	23.6	24.0	23.8
E1	5.70	5.90	5.80
E2	–	–	2.90
H1	0.19	0.21	0.20
L	–	–	9.00
L1	–	–	2.50
W	1.63	1.97	1.80
J	–	–	0.20
K	–	–	0.30
M	–	–	0.03
N	0	0.20	–
R	–	–	0.40
R1	–	–	0.15
R2	–	–	0.25
R3	–	–	0.40
theta	4°	12°	–
theta2	0°	8°	–
All Dimensions in mm			

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