

Product Summary

V_{RRM} (V)	I_O (A)	$V_F(TYP)$ @ +125°C (V)	$I_{R(MAX)}$ @ V_{RRM} (mA)
45	12	0.40	0.3

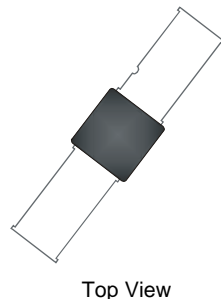
Description

The SBR12E45LH1 uses SBR patented technology that offers ultra-low V_F to reduce forward power loss and improve efficiency. Encapsulated in the new PowerDI5SP (Type B) 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 (Type B)



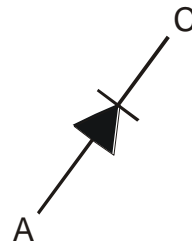
Top View

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 SBR® technology
- Ultra low forward voltage drop to minimize forward power losses
- Very low reverse leakage to ensure 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 (Type B)
- Case Material: Molded Plastic, UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Lead-Free Plating (Matte Tin Finish). Solderable per MIL-STD-202, Method 208 **e3**
- 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
SBR12E45LH1-13	PowerDI5SP (Type 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>. Device is packed with marking code side down to the pocket of 32mm carrier tape and carrier tape is wound with device facing inside of reel.

Marking Information



12E45LH1 = Product Type Marking Code
 311 = Manufacturers' Code Marking
 YYWWK = Date Code Marking
 YY = Last Two Digits of Year (ex: 16 for 2016)
 WW = Week Code (01 to 53)
 K = Factory Designator

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

Single phase, half wave, 60Hz, resistive or inductive load.
For capacitive 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	-65 to +150	°C
V _R ≤ 80% V _{RRM} DC Forward Mode (Note 6)		≤ 200	
Storage Temperature Range	T _{STG}	-55 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	—	0.42	0.50	V	I _F = 10A, T _J = +25°C
		—	0.44	0.52		I _F = 12A, T _J = +25°C
		—	0.40	0.47		I _F = 12A, T _J = +125°C
Leakage Current (Note 7)	I _R	—	35	200	μA	V _R = 40V, T _J = +25°C
		—	40	300		V _R = 45V, T _J = +25°C
		—	15	—	mA	V _R = 45V, T _J = +125°C
		—	40	—		V _R = 45V, T _J = +150°C

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

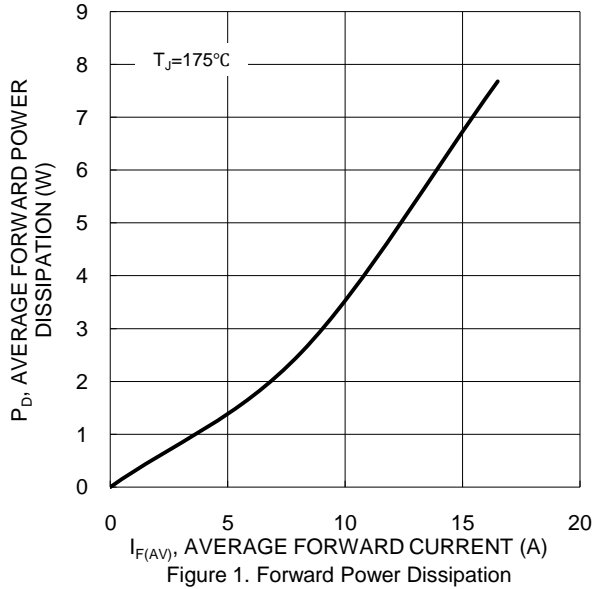


Figure 1. Forward Power Dissipation

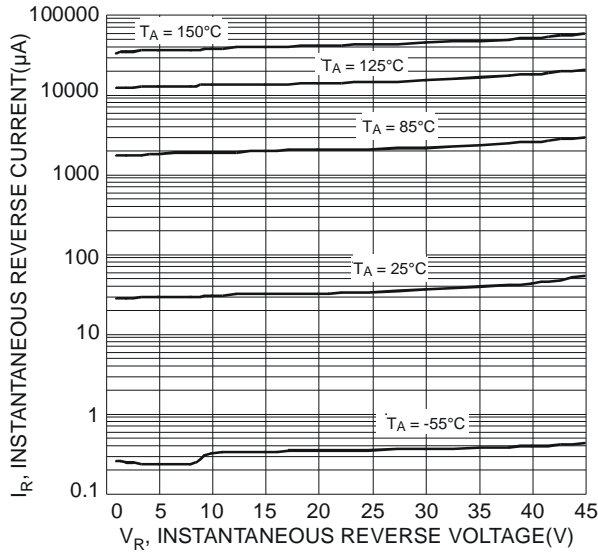


Figure 3 Typical Reverse Characteristics

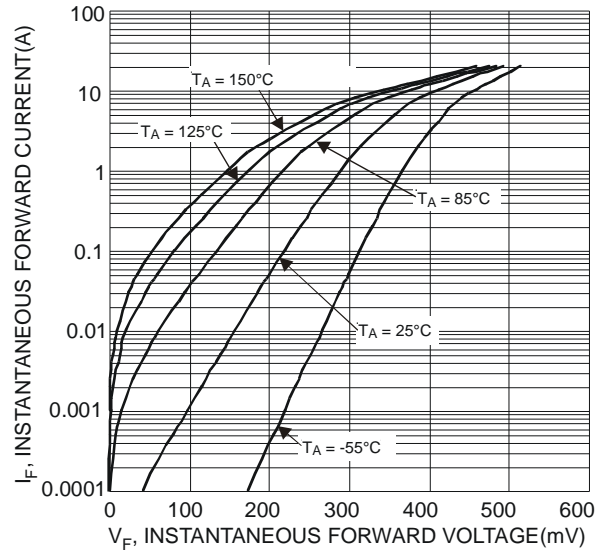


Figure 2 Typical Forward Characteristics

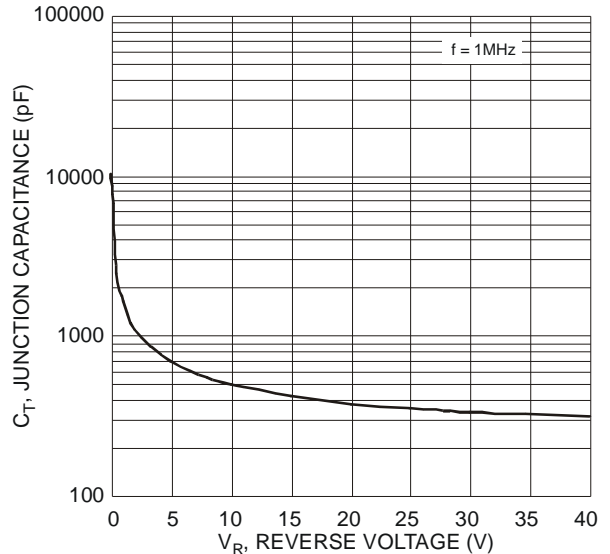


Figure 4 Typical Junction Capacitance

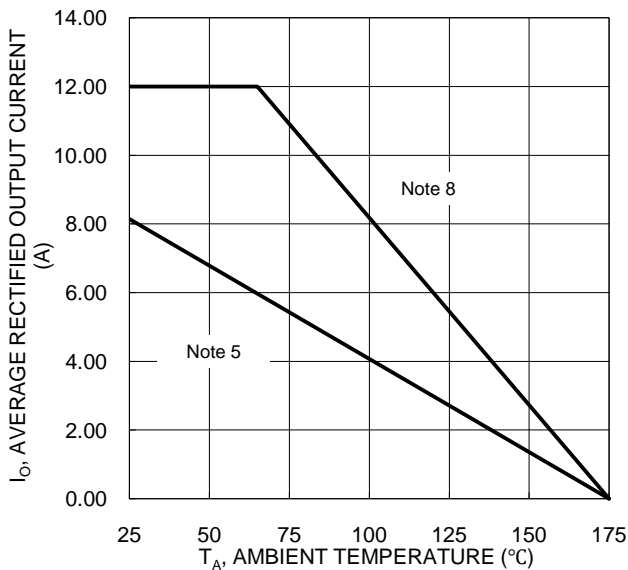


Figure 5. DC Forward Current Derating

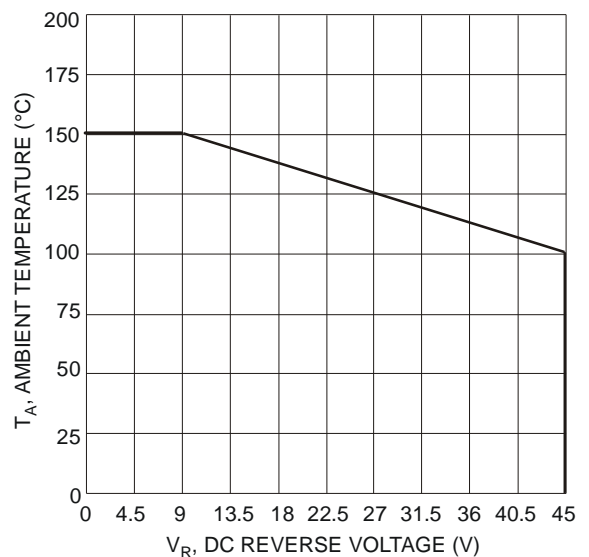


Figure 6 Operating Temperature Derating

Note: 8. Device mounted on FR-4 substrate PCB with 10cm*10cm double-sided copper pad.

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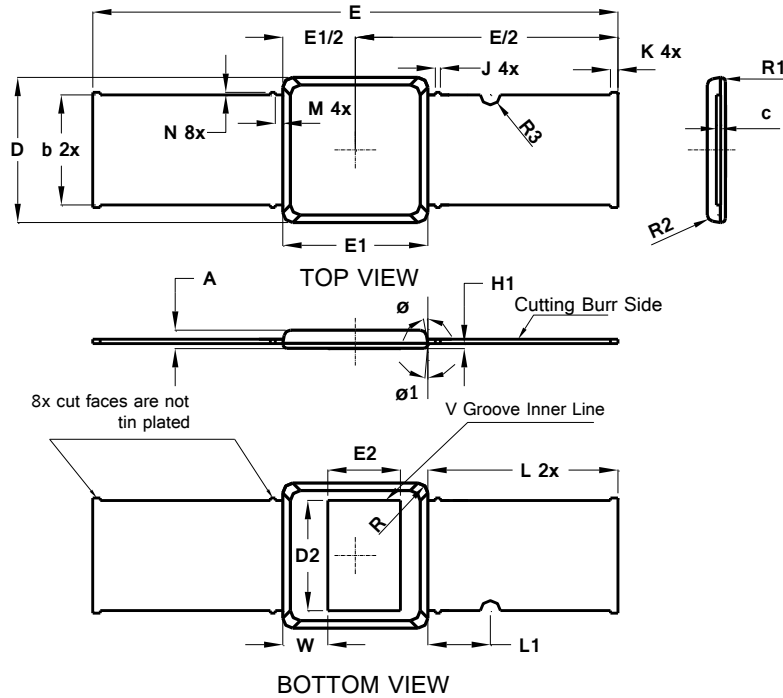
SBR12E45LH1

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Package Outline Dimensions

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

PowerDI5SP (Type B)

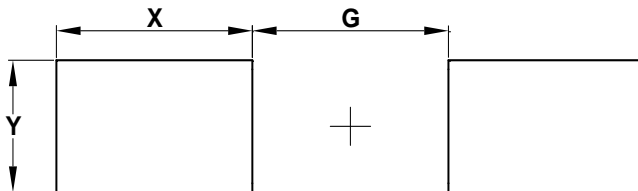


PowerDI5SP (Type B)			
Dim	Min	Max	Typ
A	—	0.75	—
b	4.30	4.50	4.40
c	0.155	0.191	—
D	5.70	5.90	5.80
D2	4.40	—	—
E	20.8	21.2	21.0
E1	5.70	5.90	5.80
E2	2.90	—	—
H1	0.19	0.21	0.20
J	—	—	0.20
K	—	—	0.30
L	—	—	7.60
L1	—	—	2.50
M	—	—	0.30
N	0	0.20	—
R	—	—	0.40
R1	—	—	0.15
R2	—	—	0.25
R3	—	—	0.40
W	1.63	1.97	1.80
Ø	8°	12°	—
Ø1	3°	7°	—
All Dimensions in mm			

Suggested Pad Layout

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

PowerDI5SP (Type B)



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

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