SBR12U45LH

12A SBR®
SUPER BARRIER RECTIFIER
POWERDI®5SP

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 and Applications

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 specially suited for use as a bypass diode in solar panels.

- Solar Bypass Diode

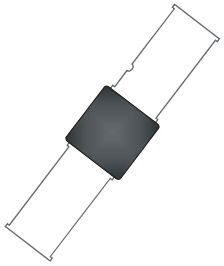
Features and Benefits

- 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 200ºC 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 (Note 1)**
- **"Green" Molding Compound (No Br, Sb) Qualified to IEC 61730-2 Standard**

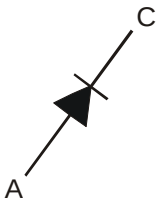
Mechanical Data

- Case: POWERDI®5SP
- Case Material: Molded Plastic, UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Weight: 0.199 grams (approximate)

POWERDI®5SP



Top View



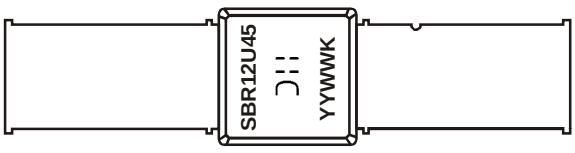
Pin Configuration

Ordering Information (Note 2)

Part Number	Case	Packaging
SBR12U45LH-13	POWERDI®5SP	3,500Tape & Reel, 13-inch

Notes: 1. EU Directive 2002/95/EC (RoHS). All applicable RoHS exemptions applied, see *EU Directive 2002/95/EC Annex Notes.*
2. For packaging details, go to our website at http://www.diodes.com.

Marking Information



SBR12U45 = Product Type Marking Code
= Manufacturers' Code Marking
YYWWK = Date Code Marking
YY = Last Two Digits of Year (ex: 11 for 2011)
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 3)		$R_{\theta JA}$	66	°C/W
Operating Temperature Range	$V_R \le 80\% V_{RRM}$	T_J	-65 to +150	°C
	$V_R \le 50\% V_{RRM}$		≤180	
	DC Forward Mode		≤200	
Storage Temperature Range		T_{STG}	-65 to +200	°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	-	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 4)	I_R	-	86	300	μA	V_R = 45V, T_J = 25°C
		-	19	75	mA	V_R = 45V, T_J = 125°C
		-	60	180		V_R = 45V, T_J = 150°C

Notes: 3. FR-4 PCB, 2oz. Copper, minimum recommended pad layout per http://www.diodes.com.pdf
4. Short duration pulse test used to minimize self-heating effect.

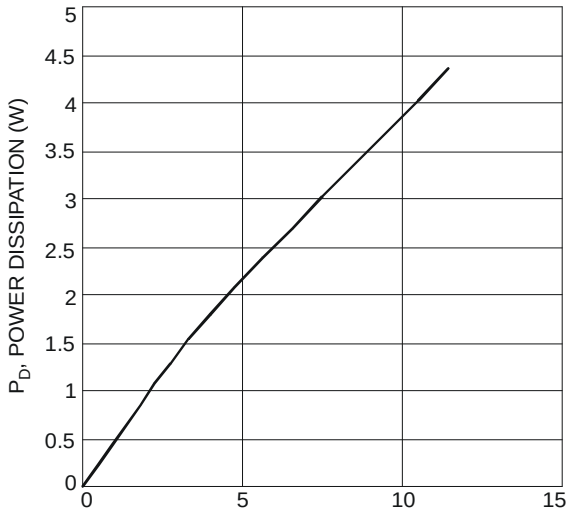


Fig. 1 Forward Power Dissipation

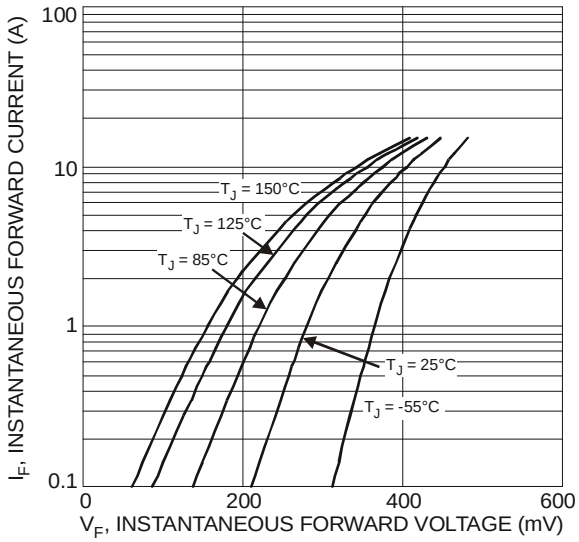


Fig. 2 Typical Forward Characteristics

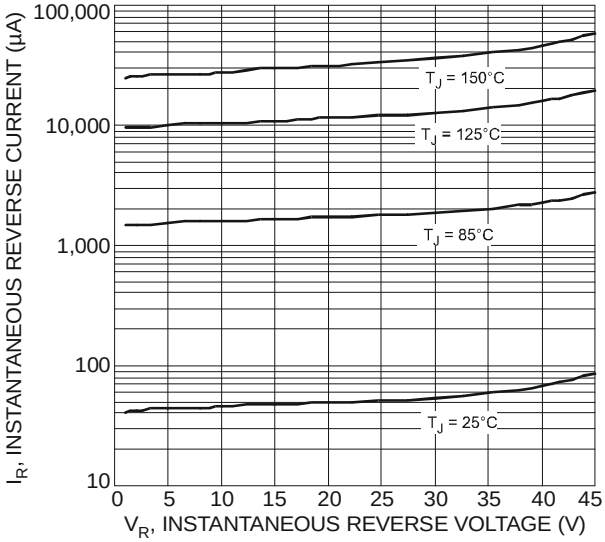


Fig. 3 Typical Reverse Characteristics

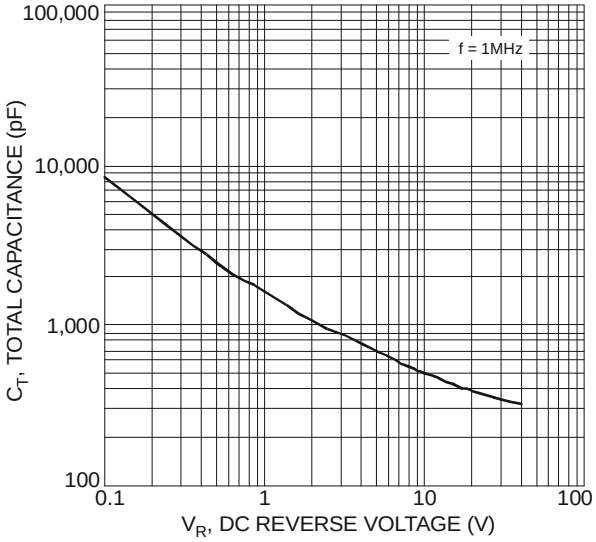


Fig. 4 Total Capacitance vs. Reverse Voltage

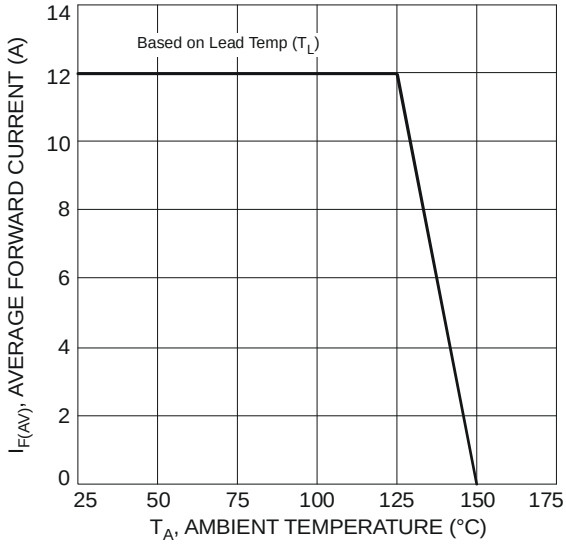


Fig. 5 Forward Current Derating Curve

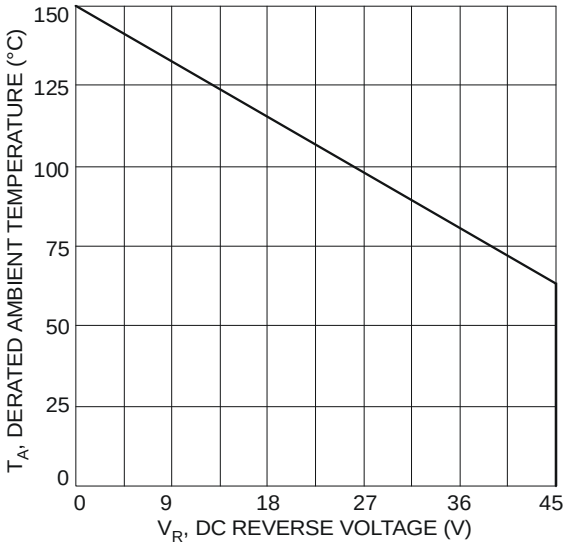
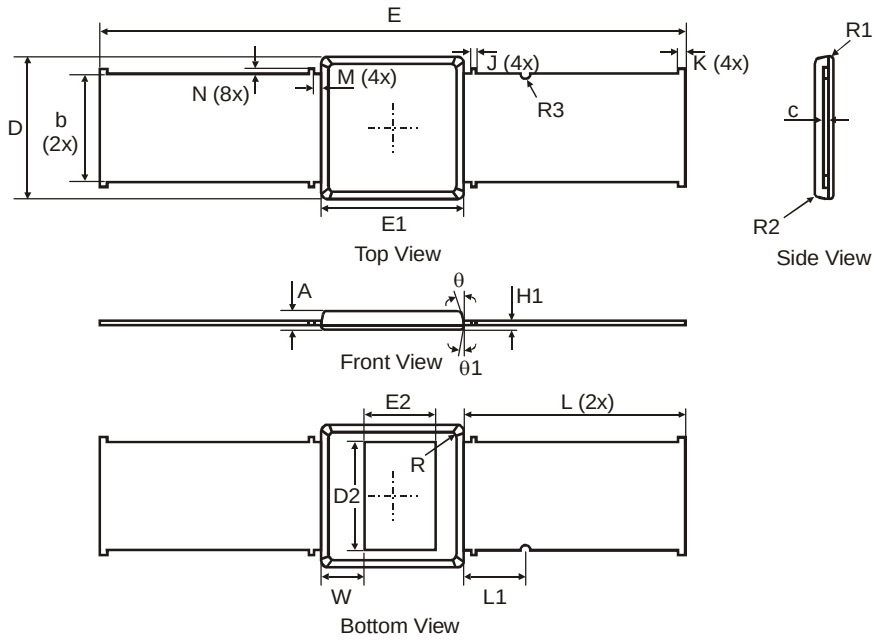


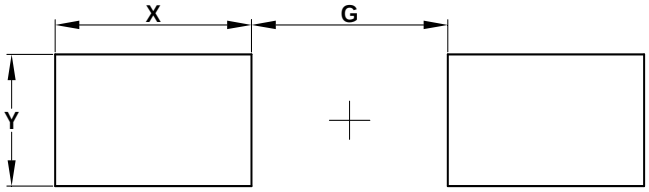
Fig. 6 Operating Temperature Derating

Package Outline Dimensions



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
θ	4°	12°	–
θ2	0°	8°	–
All Dimensions in mm			

Suggested Pad Layout



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

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