

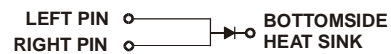
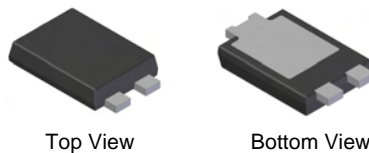
Features

- Designed as Bypass Diodes for Solar Panels
- Selectively Rated for 200°C Maximum Junction Temperature for High Thermal Reliability
- Patented Super Barrier Rectifier Technology
- Low Forward Voltage Drop
- Excellent High Temperature Stability
- **Lead Free Finish, RoHS compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

Mechanical Data

- Case: POWERDI5
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208 **Ⓔ3**
- Weight: 0.093 grams (approximate)

POWERDI5



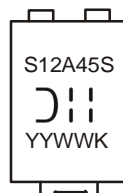
Note: Pins Left & Right must be electrically connected at the printed circuit board.

Ordering Information (Note 4)

Part Number	Case	Packaging
SBR12A45SP5-13	POWERDI5	5000/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>.

Marking Information



S12A45S = Product Type Marking Code
 = Manufacturers' code marking
 K = Factory designator
 YYWW = Date Code Marking
 YY = Last two digits of year (ex: 09 for 2009)
 WW = Week code (01 - 53)

Maximum Ratings @ $T_A = 25^\circ\text{C}$ 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}	280	A
Non-Repetitive Avalanche Energy ($T_J = 25^\circ\text{C}$, $I_{AS} = 2\text{A}$, $L = 8.5\text{ mH}$)	EAS	30	mJ

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Typical Thermal Resistance Junction to Case (Note 5)	$R_{\theta JC}$	3	$^\circ\text{C/W}$
Typical Thermal Resistance Junction to Ambient (Note 5)	$R_{\theta JA}$	27	$^\circ\text{C/W}$
Operating Temperature Range	T_J	$V_R \leq 80\% V_{RRM}$	-65 to +150
		$V_R \leq 50\% V_{RRM}$	≤ 180
		DC Forward Mode	≤ 200
Storage Temperature Range	T_{STG}	-65 to +175	$^\circ\text{C}$

Electrical Characteristics @ $T_A = 25^\circ\text{C}$ unless otherwise specified

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Forward Voltage Drop	V_F	-	0.43	-	V	$I_F = 6\text{A}$, $T_J = 25^\circ\text{C}$
		-	0.50	0.60		$I_F = 12\text{A}$, $T_J = 25^\circ\text{C}$
		-	0.33	-		$I_F = 6\text{A}$, $T_J = 125^\circ\text{C}$
		-	0.43	0.52		$I_F = 12\text{A}$, $T_J = 125^\circ\text{C}$
		-	0.05	0.3		$V_R = 45\text{V}$, $T_J = 25^\circ\text{C}$
Leakage Current (Note 6)	I_R	-	17	75	mA	$V_R = 45\text{V}$, $T_J = 125^\circ\text{C}$
Typical Junction Capacitance	C_J	-	1000	-	pF	4.0V, 1MHz

Notes: 5. Polymide PCB, 2oz. Copper, minimum recommended pad layout per <http://www.diodes.com>.
6. Short duration pulse test used to minimize self-heating effect.

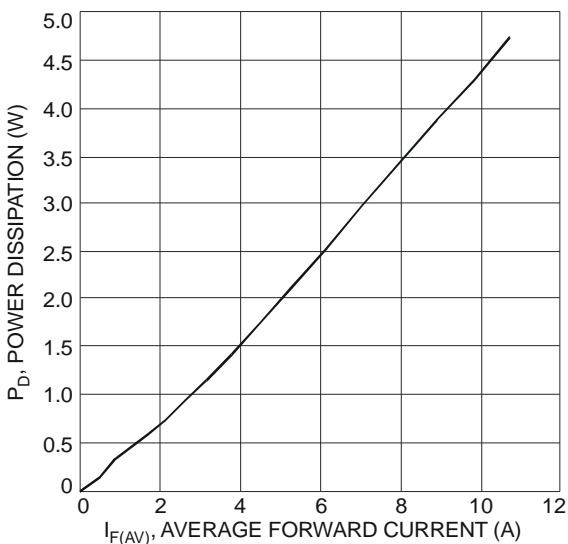


Fig. 1 Forward Power Dissipation

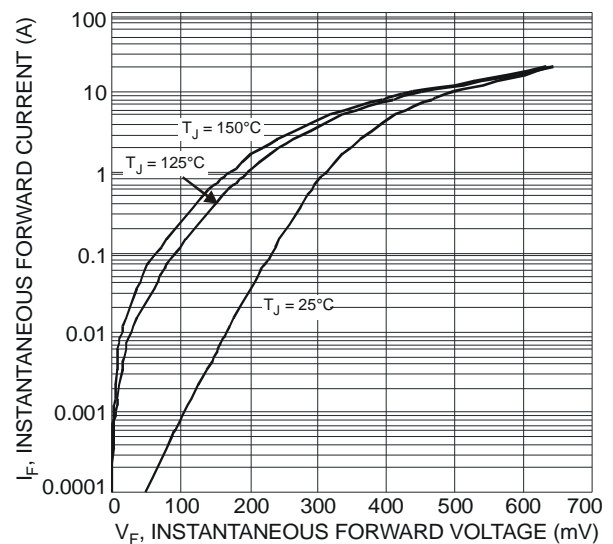


Fig. 2 Typical Forward Characteristics

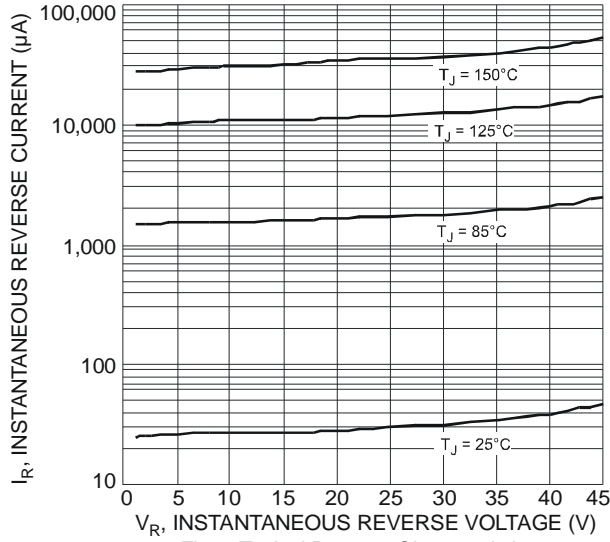


Fig. 3 Typical Reverse Characteristics

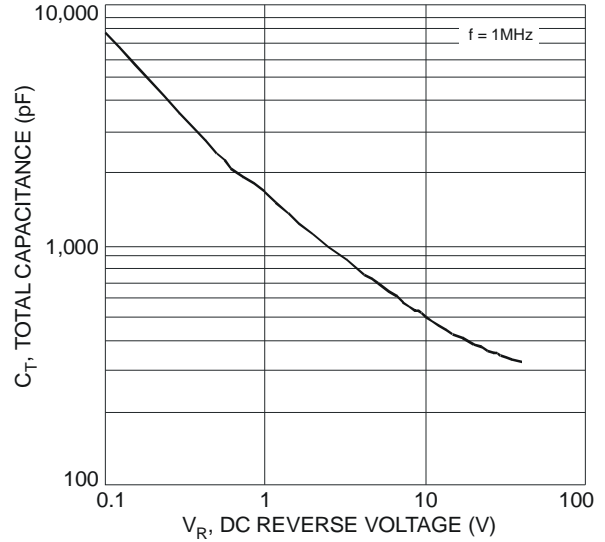


Fig. 4 Total Capacitance vs. Reverse Voltage

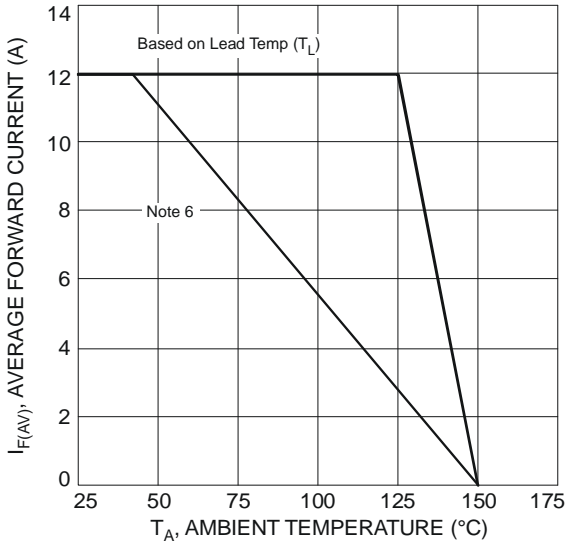


Fig. 5 Forward Current Derating Curve

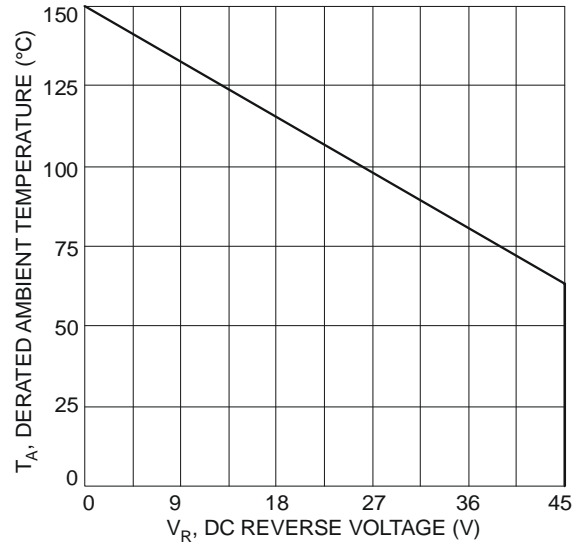
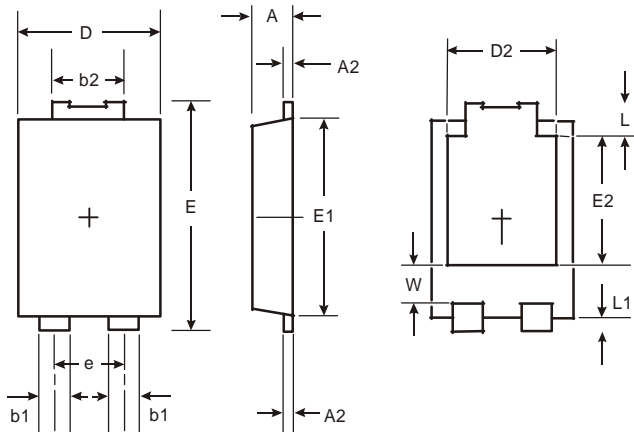


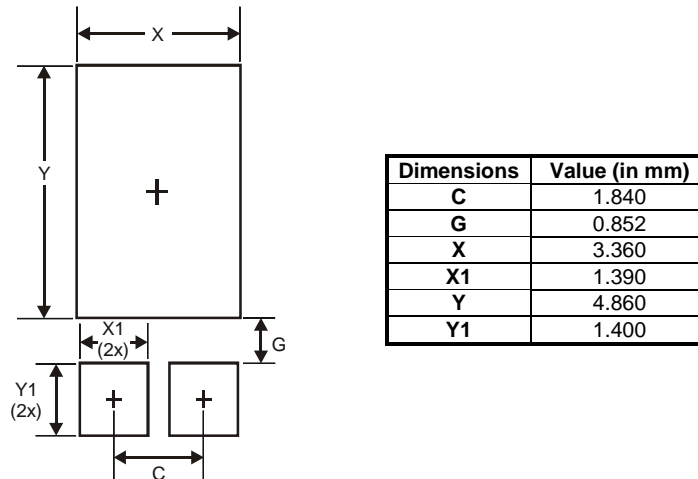
Fig. 6 Operating Temperature Derating

Package Outline Dimensions



POWERDI5		
Dim	Min	Max
A	1.05	1.15
A2	0.33	0.43
b1	0.80	0.99
b2	1.70	1.88
D	3.90	4.05
D2	3.054 Typ	
E	6.40	6.60
e	1.84 Typ	
E1	5.30	5.45
E2	3.549 Typ	
L	0.75	0.95
L1	0.50	0.65
W	1.10	1.41
All Dimensions in mm		

Suggested Pad Layout



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