

Product Summary (@ $T_A = +25^\circ\text{C}$)

V_{RRM} (V)	I_O (A)	$V_{F(MAX)}$ (V)	$I_{R(MAX)}$ (mA)
45	10	0.55	0.45

Applications

- SMPS
- DC-DC Converter
- Freewheeling Diodes

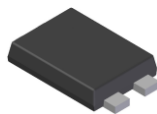
Features and Benefits

- Designed as Bypass Diodes for Solar Panels
- Selectively Rated for $+200^\circ\text{C}$ 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)**
- **Qualified to AEC-Q101 Standards for High Reliability**

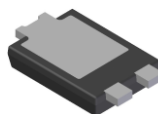
Mechanical Data

- 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 (63)
- Weight: 0.093 grams (Approximate)

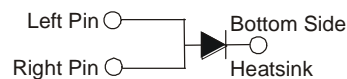
POWERDI5



Top View



Bottom View



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

Ordering Information (Note 4)

Part Number	Case	Packaging
SBR1045SP5-13	POWERDI5	5000/Tape & Reel
SBR1045SP5-13D (Note 5)	POWERDI5	5000/Tape & Reel
SBR1045SP5-7	POWERDI5	1500/Tape & Reel
SBR1045SP5-7D (Note 5)	POWERDI5	1500/Tape & Reel
SBR1045SP5Q-13	POWERDI5	5000/Tape & Reel
SBR1045SP5Q-13D (Note 5)	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/products/packages.html>.
 5. POWERDI5 available in 5K quantity on 13in. reel & 12mm tape, part number suffix "13D". 1.5K quantity on 7in. reel also, part number suffix "7". Diodes also provide 12mm tape with 7in. reel, part number suffix "7D".

Marking Information



S1045S = Product Type Marking Code
 D = Manufacturers' Code Marking
 K = Factory Designator
 YYWW = Date Code Marking
 YY = Last Two Digits of Year (ex: 14 for 2014)
 WW = Week code (01 - 53)

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}		
RMS Reverse Voltage	V _{R(RMS)}	32	V
Average Rectified Output Current	I _O	10	A
Non-Repetitive Peak Forward Surge Current 8.3ms Single Half Sine-Wave Superimposed on Rated Load	I _{FSM}	180	A
Repetitive Peak Avalanche Power (1μs, +25°C)	P _{ARM}	10,000	W

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Typical Thermal Resistance	R _{θJL}	3	°C/W
Thermal Resistance Junction to Lead	R _{θJC}	6	
Thermal Resistance Junction to Case (Note 6)	R _{θJA}	102	
Thermal Resistance Junction to Ambient (Note 6)	R _{θJA}	60	
Operating Temperature Range	V _R ≤ 80% V _{RRM}	-65 to +150	°C
	V _R ≤ 50% V _{RRM}	≤180	
	DC Forward Mode	≤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
Reverse Breakdown Voltage (Note 8)	V _{(BR)R}	45	-	-	V	I _R = 0.5mA
Forward Voltage Drop	V _F	-	-	0.51	V	I _F = 8A, T _J = +25°C
		-	0.49	0.55		I _F = 10A, T _J = +25°C
		-	0.47	0.53		I _F = 10A, T _J = +125°C
Leakage Current (Note 8)	I _R	-	0.03	0.45	mA	V _R = 45V, T _J = +25°C
		-	-	18		V _R = 45V, T _J = +100°C
		-	17	100		V _R = 45V, T _J = +150°C
Typical Junction Capacitance	C _J	-	500	-	pF	f = MHz, I _R = 4V

Notes: 6. FR-4 PCB, 2oz. Copper, minimum recommended pad layout per <http://www.diodes.com>.
 7. Polyimide PCB, 2oz. Copper, minimum recommended pad layout per <http://www.diodes.com>.
 8. Short duration pulse test used to minimize self-heating effect.

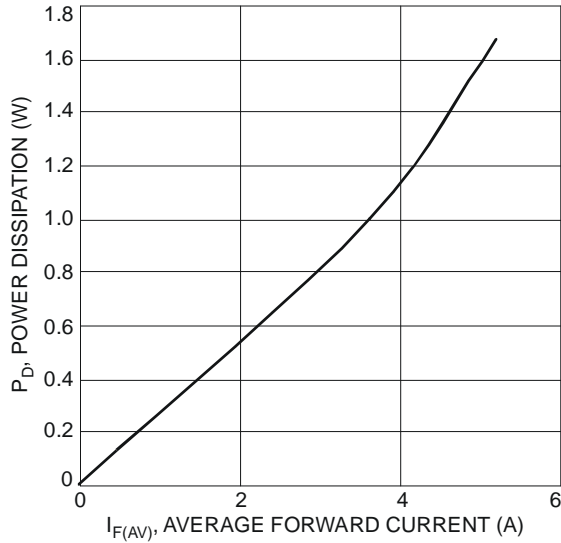


Fig. 1 Forward Power Dissipation

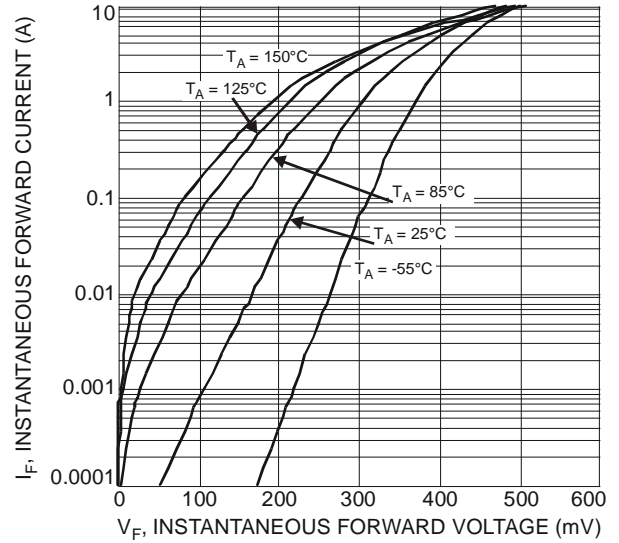


Fig. 2 Typical Forward Characteristics

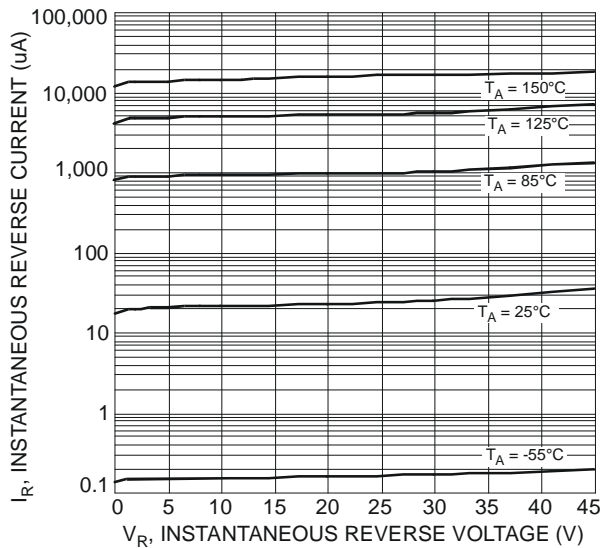


Fig. 3 Typical Reverse Characteristics

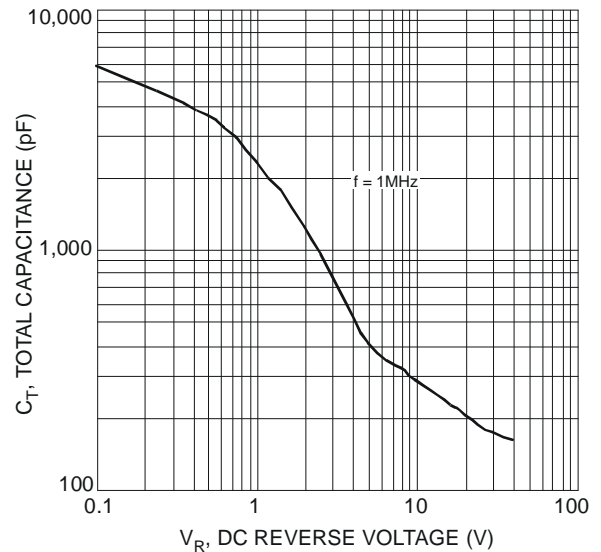


Fig. 4 Total Capacitance vs. Reverse Voltage

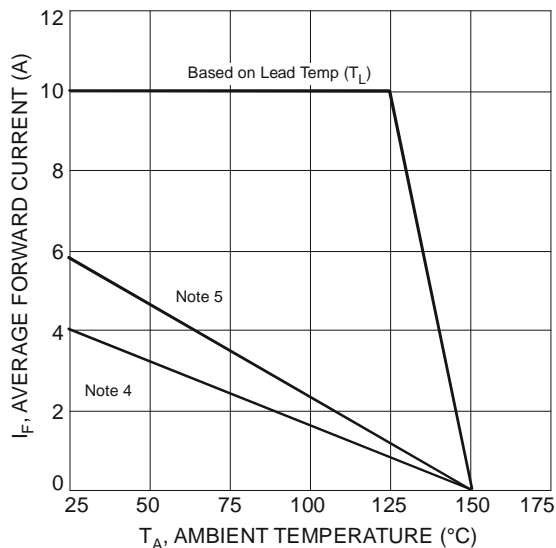


Fig. 5 Forward Current Derating Curve

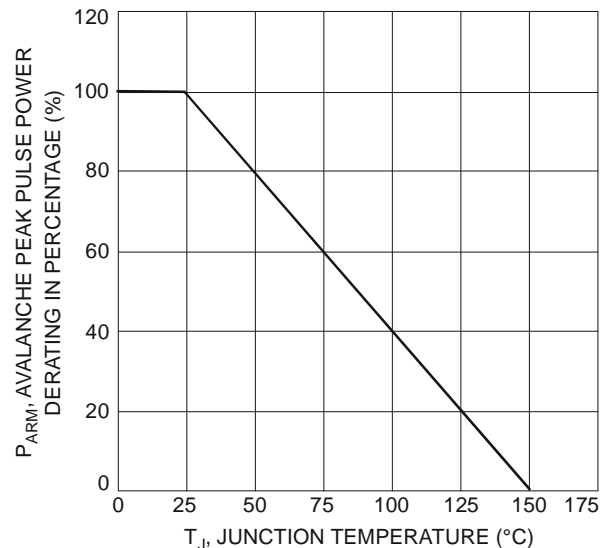


Fig. 6 Pulse Derating Curve

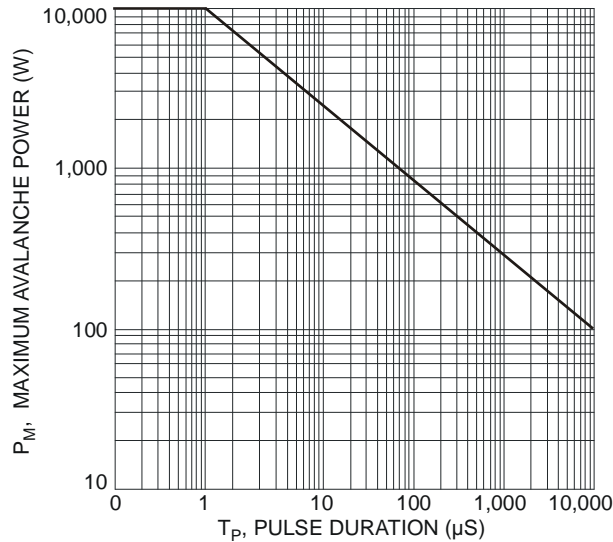
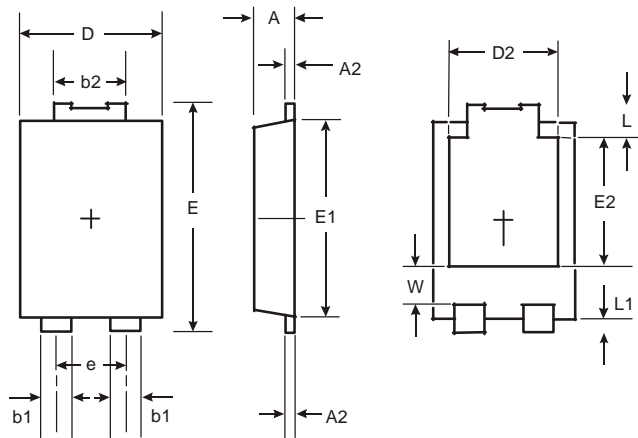


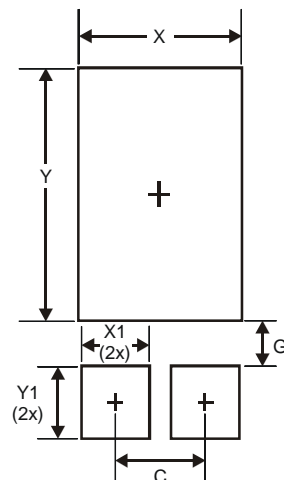
Fig. 7 Maximum Avalanche Power vs. Pulse Duration

Package Outline Dimensions

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


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

 Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.


Dimensions	Value (in mm)
C	1.840
G	0.852
X	3.360
X1	1.390
Y	4.860
Y1	1.400

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