

**Product Summary** (@ T<sub>A</sub> = +25°C)

V <sub>RRM</sub> (V)	I <sub>O</sub> (A)	V <sub>F(MAX)</sub> (V)	I <sub>R(MAX)</sub> (mA)
45	10	0.55	0.45

**Features and Benefits**

- Designed as Bypass Diodes for Solar Panels
- Selectively Rated for +200°C Maximum Junction Temperature for High Thermal Reliability
- Patented Super Barrier Rectifier Technology (SBR<sup>®</sup>)
- Low-Forward Voltage Drop
- Excellent High-Temperature Stability
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. “Green” Device (Note 3)**
- **The SBR1045SP5Q is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF16949 certified facilities.**

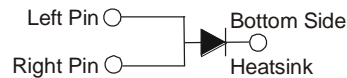
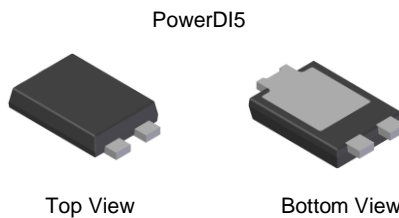
<https://www.diodes.com/quality/product-definitions/>

**Applications**

- SMPS
- DC-DC converters
- Freewheeling diodes

**Mechanical Data**

- Package: PowerDI<sup>®</sup>5
- Package 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)

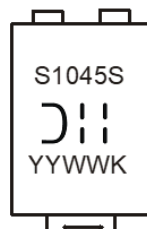


Note: Pins Left & Right must be electrically connected at the printed circuit board.

**Ordering Information** (Note 4)

Orderable Part Number	Package	Packing	
		Qty.	Carrier
SBR1045SP5-13	PowerDI5	5000	Tape & Reel
SBR1045SP5-13D (Note 5)	PowerDI5	5000	Tape & Reel
SBR1045SP5Q-13	PowerDI5	5000	Tape & Reel

- Notes:
1. EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
  2. See <https://www.diodes.com/quality/lead-free/> 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 <https://www.diodes.com/design/support/packaging/diodes-packaging/>.
  5. PowerDI5 available in 5k quantity on 13in. reel & 12mm tape, part number suffix "13D".

**Marking Information**


S1045S = Product Type Marking Code  
 J11 = Manufacturer's Code Marking  
 YYWW = Date Code Marking  
 YY = Last Two Digits of Year (ex: 24 for 2024)  
 WW = Week Code (01 to 53)  
 K = Factory Designator

**Maximum Ratings** (@T<sub>A</sub> = +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 <sub>RRM</sub>	45	V
Working Peak Reverse Voltage	V <sub>RWM</sub>		
DC Blocking Voltage	V <sub>RM</sub>		
RMS Reverse Voltage	V <sub>R(RMS)</sub>	32	V
Average Rectified Output Current	I <sub>O</sub>	10	A
Non-Repetitive Peak Forward Surge Current 8.3ms Single Half Sine Wave Superimposed on Rated Load	I <sub>FSM</sub>	180	A
Repetitive Peak Avalanche Power (1μs, +25°C)	P <sub>ARM</sub>	10,000	W

**Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Typical Thermal Resistance Junction to Lead	R <sub>θJL</sub>	3	°C/W
Typical Thermal Resistance Junction to Case (Note 6)	R <sub>θJC</sub>	6	
Typical Thermal Resistance Junction to Ambient (Note 6)	R <sub>θJA</sub>	102	
Typical Thermal Resistance Junction to Ambient (Note 7)	R <sub>θJA</sub>	60	
Operating Temperature Range	T <sub>J</sub>	V <sub>R</sub> ≤ 80% V <sub>RRM</sub>	-65 to +150
		V <sub>R</sub> ≤ 50% V <sub>RRM</sub>	≤ +180
		DC Forward Mode (Note 8)	≤ +200
Storage Temperature Range	T <sub>STG</sub>	-65 to +175	°C

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Breakdown Voltage (Note 9)	V <sub>(BR)R</sub>	45	—	—	V	I <sub>R</sub> = 0.5mA
Forward Voltage Drop	V <sub>F</sub>	—	—	0.51	V	I <sub>F</sub> = 8A, T <sub>J</sub> = +25°C
		—	0.49	0.55		I <sub>F</sub> = 10A, T <sub>J</sub> = +25°C
		—	0.47	0.53		I <sub>F</sub> = 10A, T <sub>J</sub> = +125°C
Leakage Current (Note 9)	I <sub>R</sub>	—	0.03	0.45	mA	V <sub>R</sub> = 45V, T <sub>J</sub> = +25°C
		—	—	18		V <sub>R</sub> = 45V, T <sub>J</sub> = +100°C
		—	17	100		V <sub>R</sub> = 45V, T <sub>J</sub> = +150°C
Typical Junction Capacitance	C <sub>J</sub>	—	500	—	pF	f = 1MHz, I <sub>R</sub> = 4V
Switching Speed	t <sub>RR</sub>	—	23	—	ns	I <sub>F</sub> = 0.5A, I <sub>R</sub> = 1.0A I <sub>RR</sub> = 0.25A, T <sub>A</sub> = +25°C

- Notes:
- FR-4 PCB, 2oz. copper, minimum recommended pad layout per <http://www.diodes.com/package-outlines.html>.
  - Polyimide PCB, 2oz. copper, minimum recommended pad layout per <http://www.diodes.com/package-outlines.html>.
  - Max junction temperature guaranteed for 2 hours.
  - Short duration pulse test used to minimize self-heating effect.

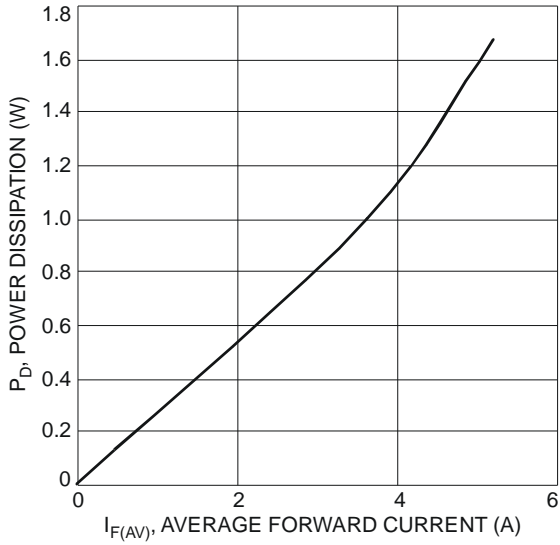


Fig. 1 Forward Power Dissipation

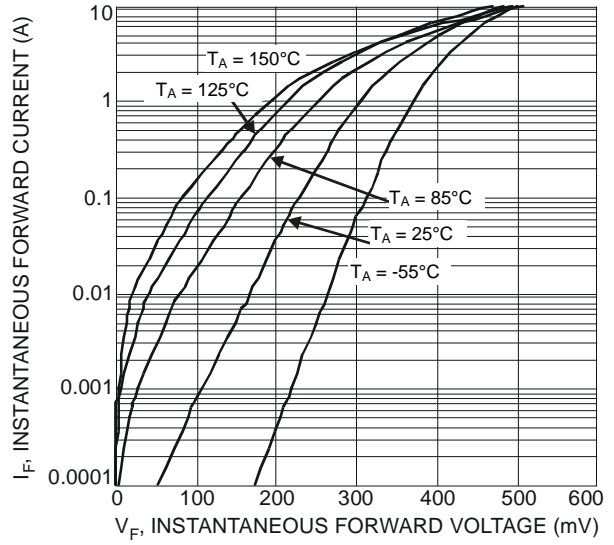


Fig. 2 Typical Forward Characteristics

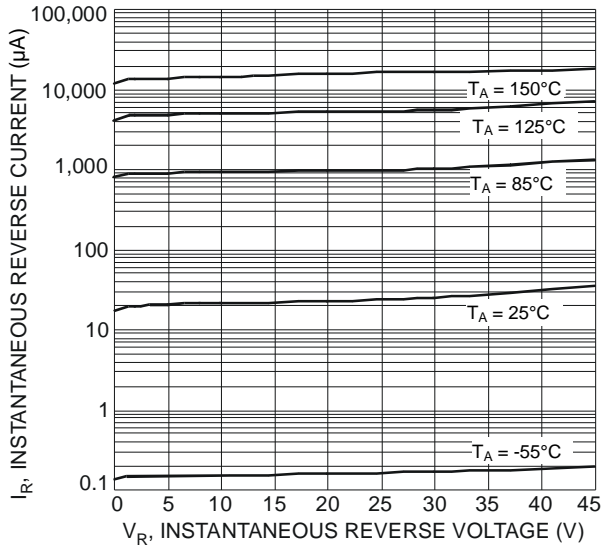


Fig. 3 Typical Reverse Characteristics

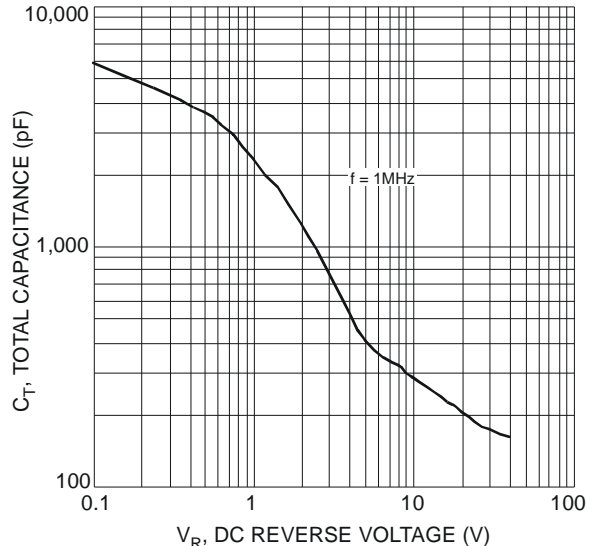


Fig. 4 Total Capacitance vs. Reverse Voltage

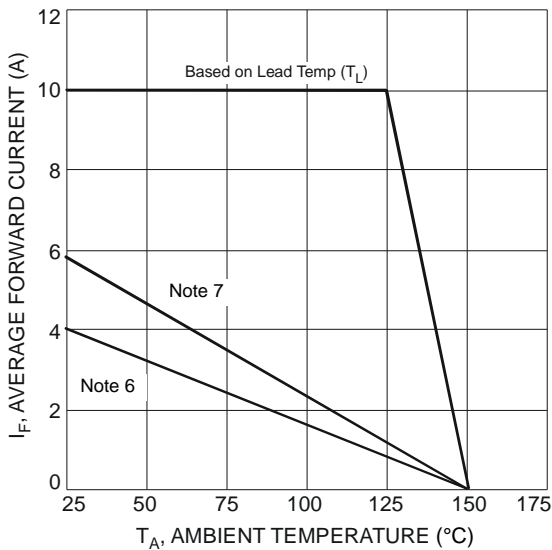


Fig. 5 Forward Current Derating Curve

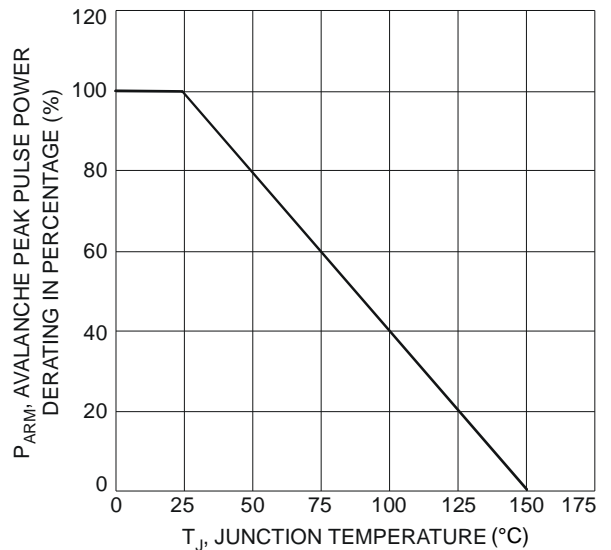


Fig. 6 Pulse Derating Curve

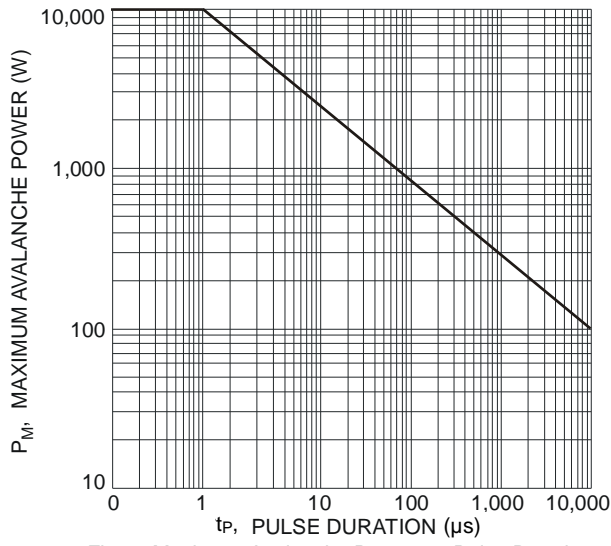
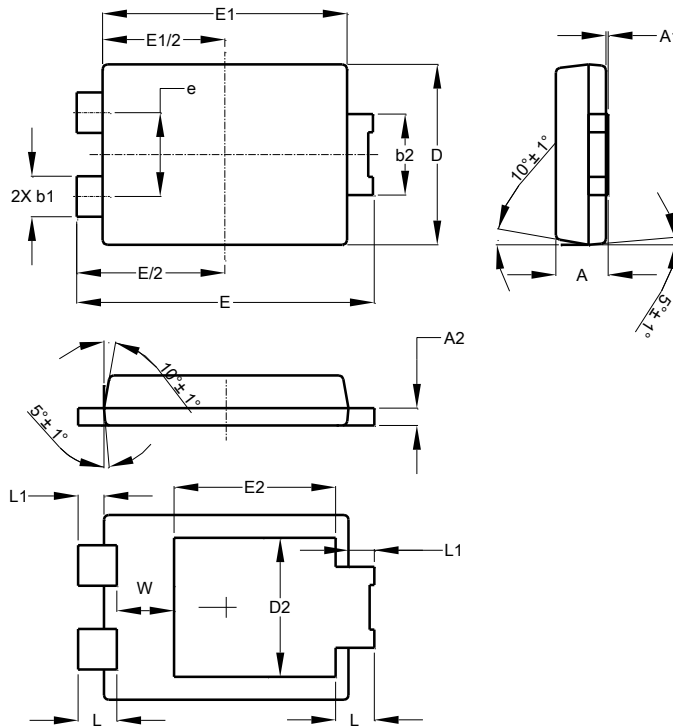


Fig. 7 Maximum Avalanche Power vs. Pulse Duration

**Package Outline Dimensions**

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

**PowerDI5**

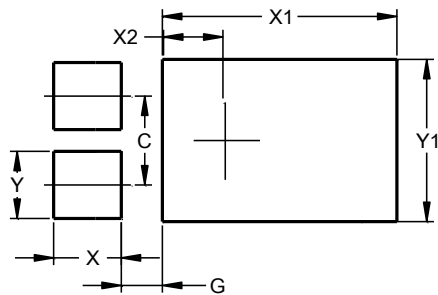


PowerDI5			
Dim	Min	Max	Typ
A	1.05	1.15	1.10
A1	0.00	0.05	--
A2	0.33	0.43	0.381
b1	0.80	0.99	0.89
b2	1.70	1.88	1.78
D	3.90	4.05	3.966
D2	--	--	3.054
E	6.40	6.60	6.51
e	--	--	1.84
E1	5.30	5.45	5.37
E2	--	--	3.549
L	0.75	0.95	0.85
L1	0.50	0.65	0.57
W	1.10	1.41	1.255
All Dimensions in mm			

**Suggested Pad Layout**

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

**PowerDI5**



Dimensions	Value (in mm)
C	1.840
G	0.852
X	1.400
X1	4.860
X2	1.310
Y	1.390
Y1	3.360

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