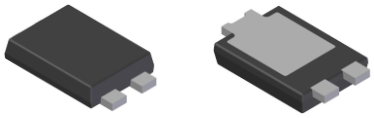
Features

- Designed as Bypass Diodes for Solar Panels
- Selectively Rated for +200°C Maximum Junction Temperature for High Thermal Reliability
- Patented Super Barrier Rectifier Technology (SBR®)
- High Forward Surge Capability
- Ultra Low Forward Voltage Drop
- Excellent High Temperature Stability
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **An Automotive-Compliant Part is Available Under Separate Datasheet (SBR10U45SP5Q)**

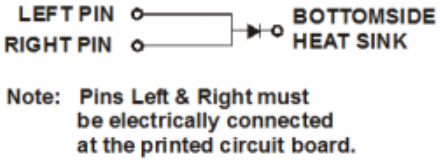
Mechanical Data

- Case: PowerDI®5
- 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 e3
- Weight: 0.093 grams (Approximate)

PowerDI5



Top View Bottom View



Ordering Information (Note 4)

Part Number	Case	Packaging
SBR10U45SP5-13	PowerDI5	5,000/Tape & Reel

Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
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 https://www.diodes.com/design/support/packaging/diodes-packaging/.

Marking Information

PowerDI5

S10U45S = Product Type Marking Code
= Manufacturer's Code Marking
K = Factory Designator
YYWW = Date Code Marking
YY = Last Two Digits of Year (ex: 17 for 2017)
WW = Week Code (01 to 53)

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 Working Peak Reverse Voltage DC Blocking Voltage	V_{RRM} V_{RWM} V_{RM}	45	V
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}	275	A
Repetitive Peak Avalanche Power (1µs, +25°C)	P_{ARM}	30,000	W

Thermal Characteristics

Characteristic		Symbol	Value	Unit
Thermal Resistance Junction to Ambient (Note 5) Thermal Resistance Junction to Ambient (Note 6)		$R_{\theta JA}$ $R_{\theta JA}$	73 31	°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 +175	°C

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Breakdown Voltage (Note 7)	$V_{(BR)R}$	45	—	—	V	I_R = 0.3mA
Forward Voltage Drop	V_F	— — —	— 0.42 0.38	0.42 0.47 0.41	V	I_F = 8A, T_J = +25°C I_F = 10A, T_J = +25°C I_F = 10A, T_J = +125°C
Leakage Current (Note 7)	I_R	— — —	0.05 — 28.0	0.3 15 75	mA	V_R = 45V, T_J = +25°C V_R = 45V, T_J = +100°C 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. Polymide PCB, 2oz. Copper. Cathode pad dimensions 18.8mm x 14.4mm. Anode pad dimensions 5.6mm x 14.4mm.
7. Short duration pulse test used to minimize self-heating effect.

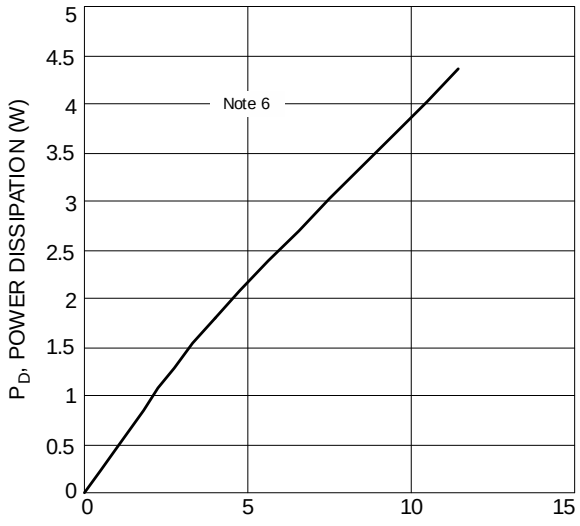


Figure 1 Forward Power Dissipation

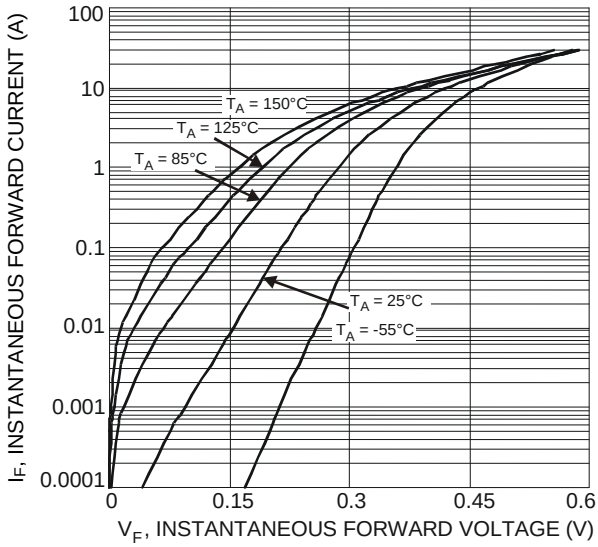


Figure 2 Typical Forward Characteristics

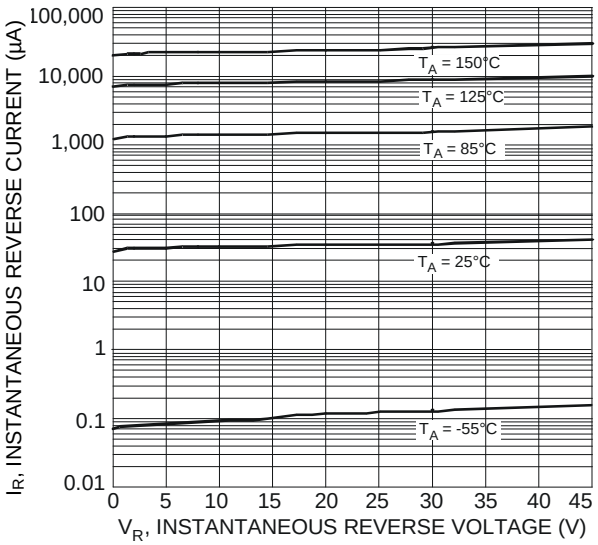


Figure 3 Typical Reverse Characteristics

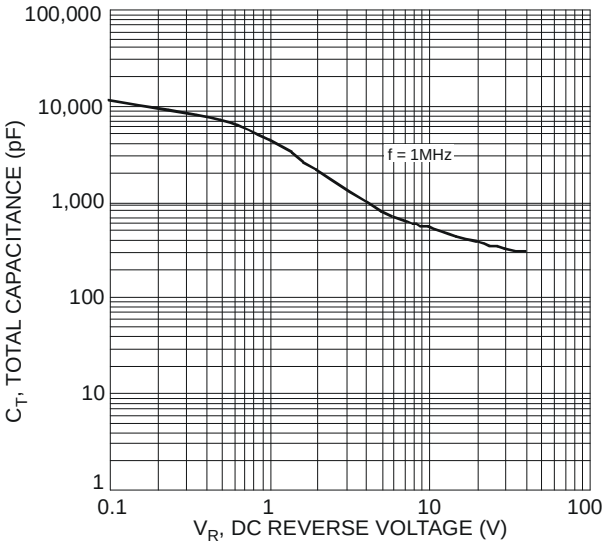


Figure 4 Total Capacitance vs. Reverse Voltage

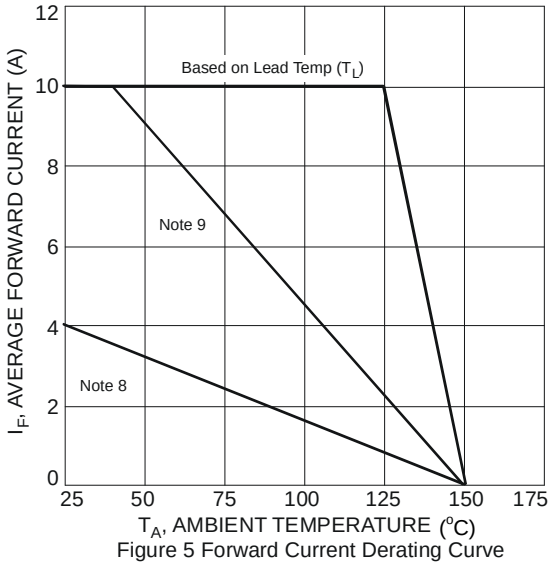


Figure 5 Forward Current Derating Curve

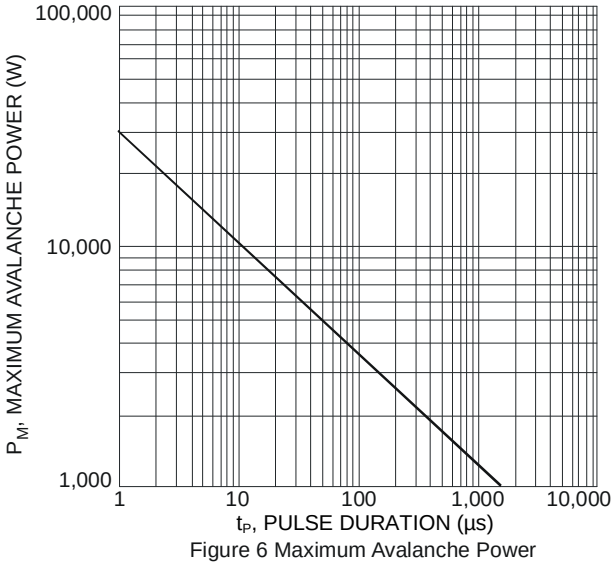


Figure 6 Maximum Avalanche Power

Notes: 8. Device mounted on FR-4 substrate, 2oz copper, with minimum recommended pad layout.
9. Device mounted on FR-4 substrate, 2oz copper, with 10cm x 10cm pad layout.

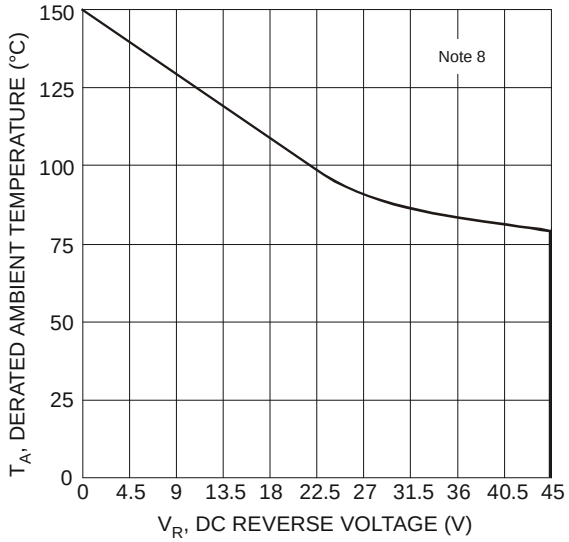
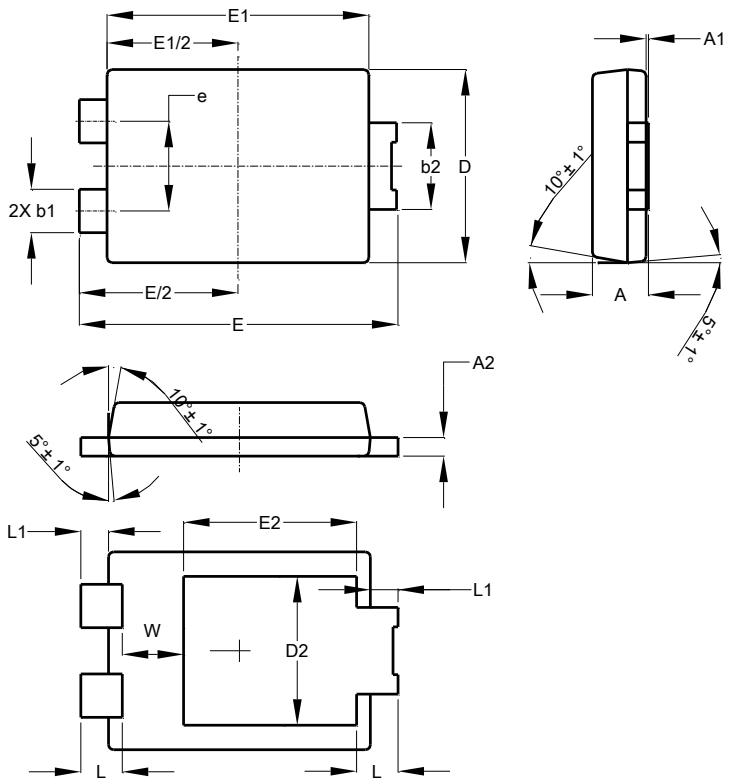


Figure 7 Operating Temperature Derating

Package Outline Dimensions

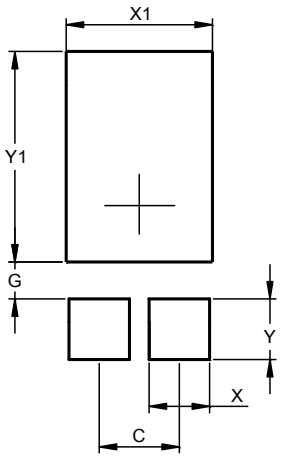
Please see http://www.diodes.com/package-outlines.html for the latest version.



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	6.504
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.



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

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