

Product Summary

V_{RRM} (V)	I_O (A)	V_F MAX (V) @+25°C	I_R MAX (mA) @+25°C
45	10	0.47	0.3

Description and Applications

This Super Barrier Rectifier (SBR) diode has been designed to meet the stringent requirements of Automotive Applications. It is ideally suited to use as :

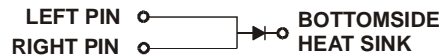
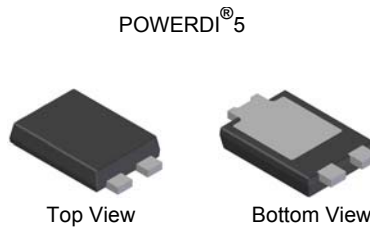
- Polarity Protection Diode
- Re-circulating Diode
- Switching Diode

Features and Benefits

- 100% Avalanche Tested.
- Patented SBR technology provides a superior avalanche capability than schottky diodes ensuring more rugged and reliable end applications.
- Reduced ultra-low forward voltage drop (V_F); better efficiency and cooler operation.
- Reduced high temperature reverse leakage; increased reliability against thermal runaway failure at high temperature
- **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 ^{e3}
- Weight: 0.093 grams (approximate)



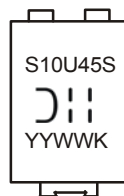
Note: Pins Left & Right must be electrically connected at the printed circuit board.

Ordering Information (Note 4)

Part Number	Compliance	Case	Packaging
SBR10U45SP5Q-13	Automotive	POWERDI5	5000/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 <http://www.diodes.com/products/packages.html>.

Marking Information



S10U45S = Product Type Marking Code
 J|| = Manufacturers' Code Marking
 K = Factory Designator
 YYWW = Date Code Marking
 YY = Last Two Digits of Year (ex: 13 for 2013)
 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}	275	A
Repetitive Peak Avalanche Power (1μs, +25°C)	P _{ARM}	5630	W
Non-Repetitive Avalanche Energy (T _J = +25°C, I _{AS} = 12A, L = 10mH)	E _{AS}	530	mJ

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Maximum Thermal Resistance	—	—	—
Thermal Resistance Junction to Ambient (Note 5)	R _{θJA}	73	°C/W
Thermal Resistance Junction to Ambient (Note 6)	R _{θJA}	31	°C/W
Storage Temperature Range	T _{STG}	-55 to +150	°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	—	0.41	—	V	I _F = 8A, T _J = +25°C
		—	0.44	0.47		I _F = 10A, T _J = +25°C
		—	0.38	—		I _F = 10A, T _J = +125°C
Leakage Current (Note 7)	I _R	—	0.09	0.3	mA	V _R = 45V, T _J = +25°C
		—	30	—		V _R = 45V, T _J = +125°C

- Notes:
5. FR-4 PCB, 2oz. Copper. Minimum recommended pad layout per <http://www.diodes.com>.
 6. Polyimide 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.

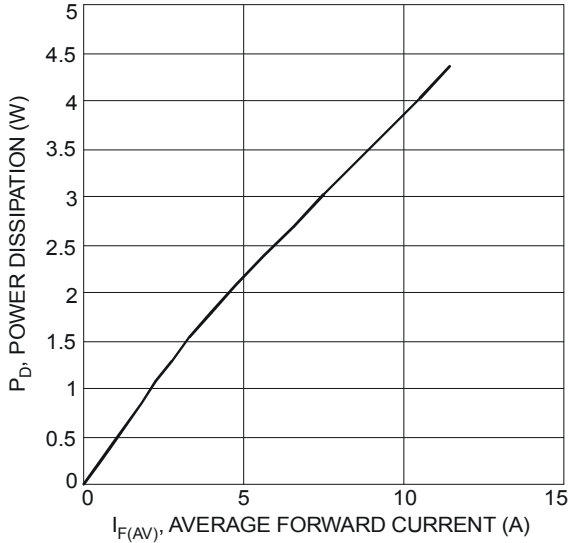


Figure 1 Forward Power Dissipation

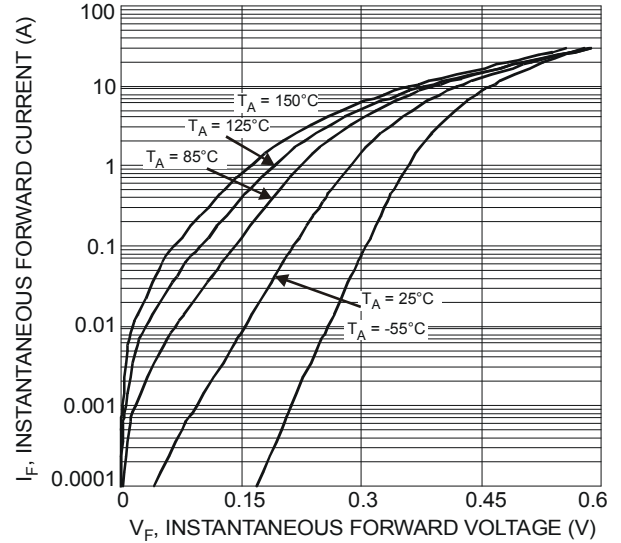


Figure 2 Typical Forward Characteristics

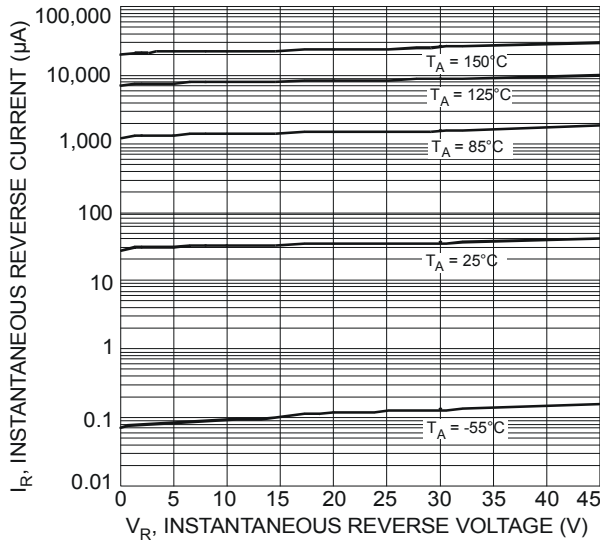


Figure 3 Typical Reverse Characteristics

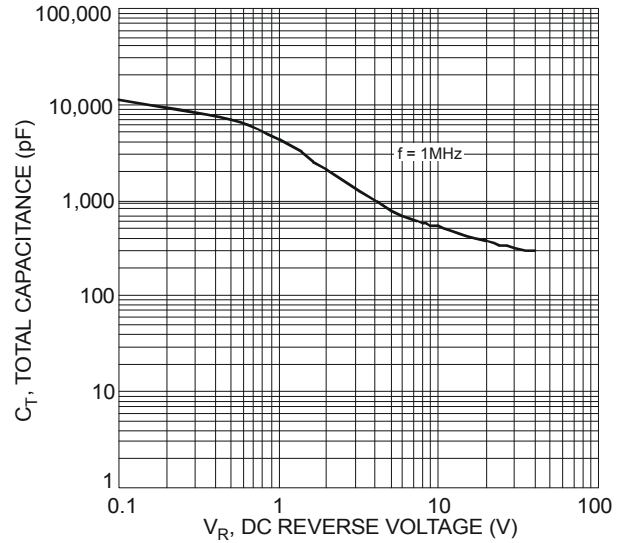


Figure 4 Total Capacitance vs. Reverse Voltage

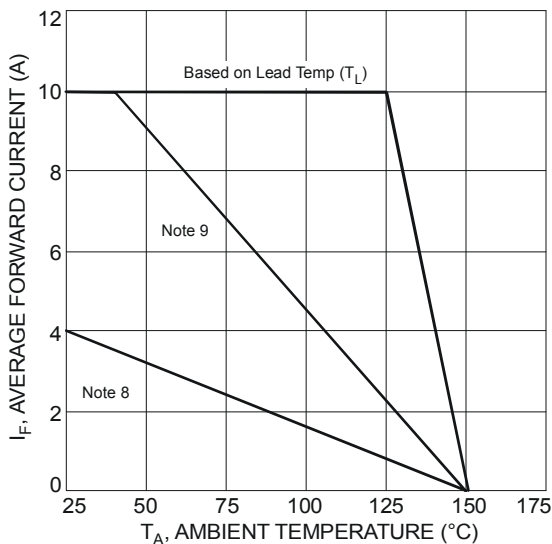


Figure 5 Forward Current Derating Curve

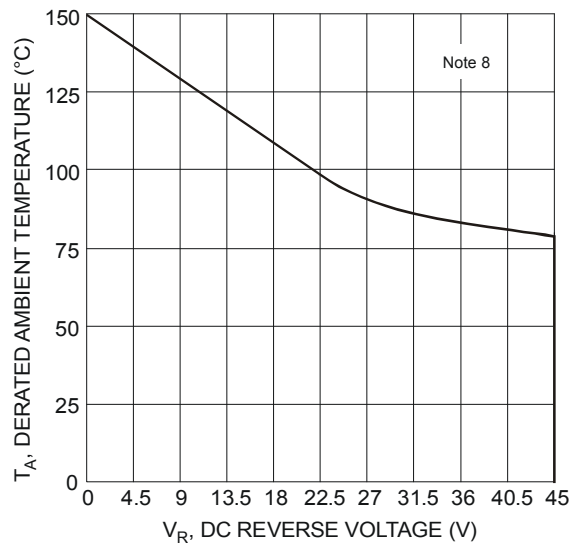


Figure 6 Operating Temperature Derating

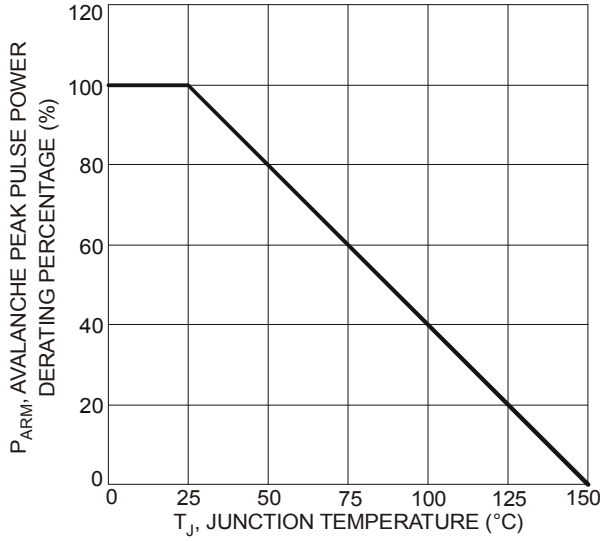


Figure 7 Pulse Derating Curve

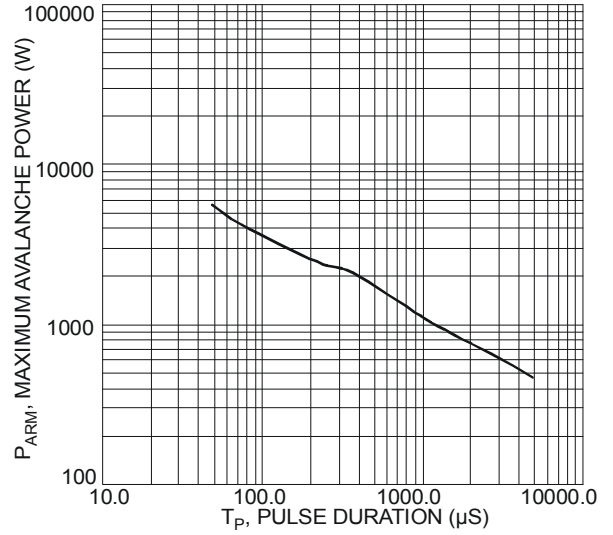


Figure 8 Maximum Avalanche Power

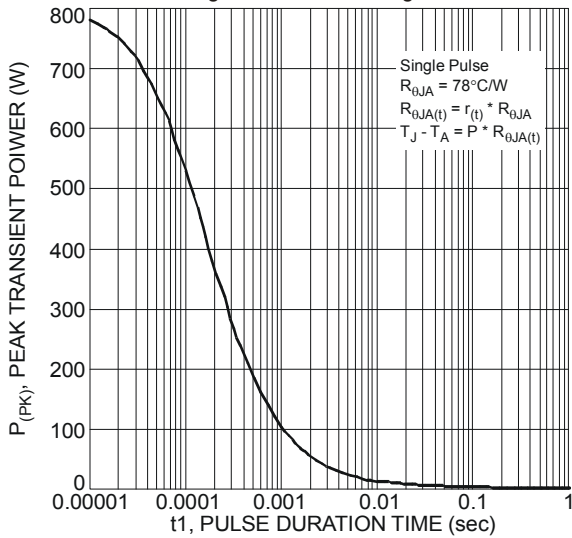


Figure 9 Single Pulse Maximum Power Dissipation

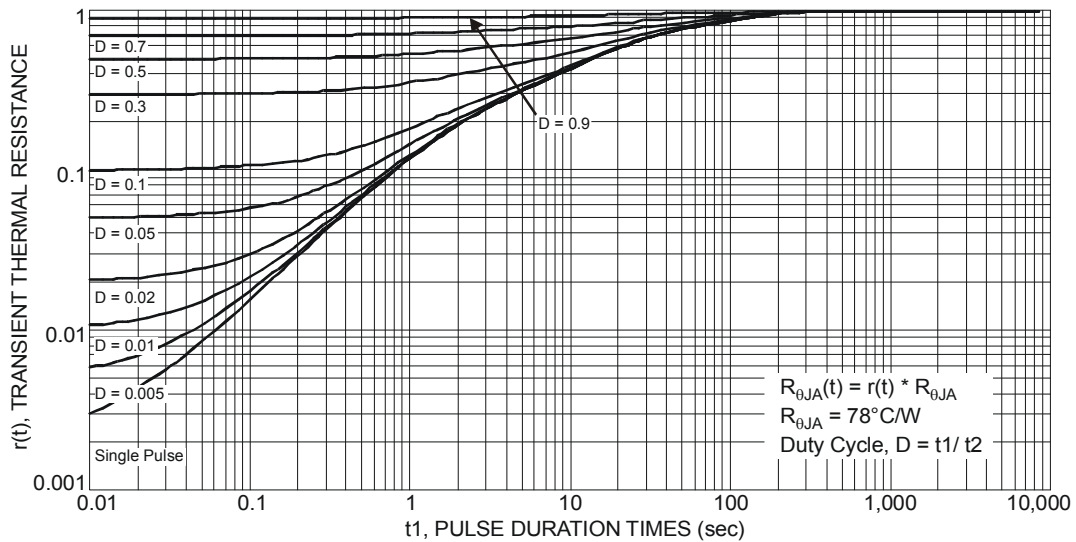
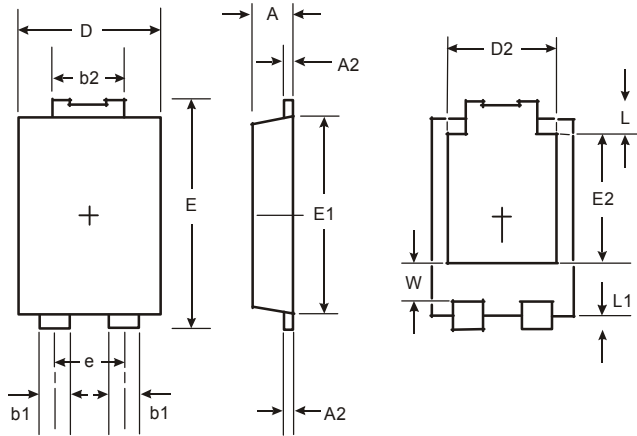


Figure 10 Transient Thermal Resistance

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

Package Outline Dimensions

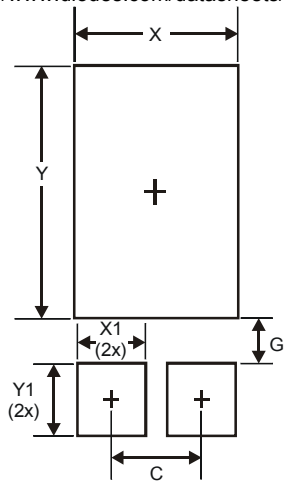
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



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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