12A SBR® SUPER BARRIER RECTIFIER POWERDI®5

Product Summary

V_{RRM} (V)	I_O (A)	$V_{F\ max}$ (V) @ +25°C	$I_{R\ max}$ (mA) @ +25°C
100	12	0.78	0.25

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

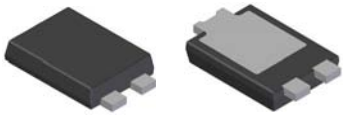
Features

- 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 in high temperature operation
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AECQ101**

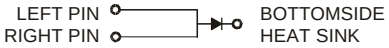
Mechanical Data

- Case: POWERDI5
- Case Material: Molded Plastic, "Green" Molding compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish annealed over Copper leadframe.
- Solderable per MIL-STD-202, Method 208 e3
- Polarity: See Diagram
- Weight: 0.093 grams (approximate)

POWERDI® 5



Top View Bottom View



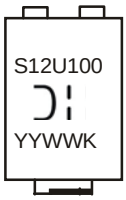
Note: Pins Left & Right must be electrically connected at the printed circuit

Ordering Information (Note 4)

Part Number	Compliance	Case	Packaging
SBR12U100P5Q-13	Automotive	POWERDI5	5000/Tape & Reel
SBR12U100P5Q-13D	Automotive	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. "D" suffix designate for the 12mm Tape and Reel option.

Marking Information



S12U100 = Product Type Marking Code
= Manufacturers' Code Marking
YYWW = Date Code Marking
YY = Last Two Digits of Year (ex: 13 for 2013)
WW = Week Code (01 - 53)
K = Factory Designator

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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 Working Peak Reverse Voltage DC Blocking Voltage	V_{RRM} V_{RWM} V_{RM}	100	V
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}	250	A
Non-Repetitive Avalanche Energy (T_J = +25°C, I_{AS} = 12A, L = 10mH)	E_{AS}	592	mJ
Repetitive Peak Avalanche Energy (1µs, +25°C)	P_{ARM}	12000	W

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Typical Thermal Resistance Junction to Ambient (Note 6)	$R_{\theta JA}$	27	°C/W
Typical Thermal Resistance Junction to Lead	$R_{\theta JL}$	3	°C/W
Operating and Storage Temperature Range	$T_{J, STG}$	-55 to +150	°C

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Forward Voltage Drop	V_F	— — —	0.49 0.67 0.58	— 0.78 —	V	I_F = 5A, T_J = +25°C I_F = 12A, T_J = +25°C I_F = 12A, T_J = +125°C
Leakage Current (Note 7)	I_R	— —	0.06 11	0.25 40	mA	V_R = 100V, T_J = +25°C V_R = 100V, T_J = +125°C

Notes: 6. Polymide, 2oz. Copper 16x minimum recommended pad layout per http://www.diodes.com
7. Short duration pulse test used to minimize self-heating effect.

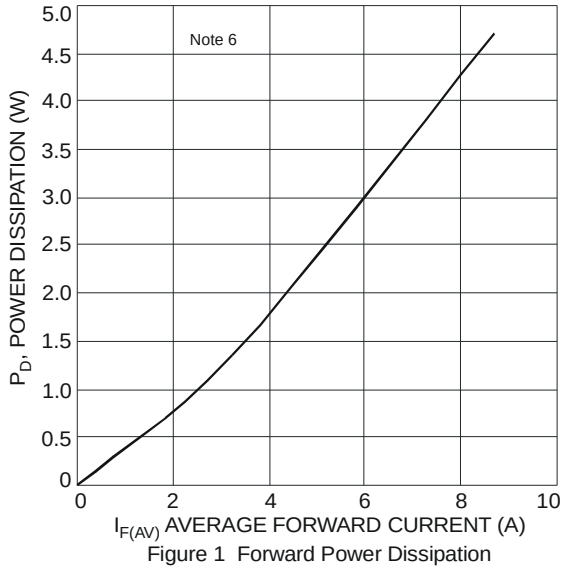

Figure 1 Forward Power Dissipation

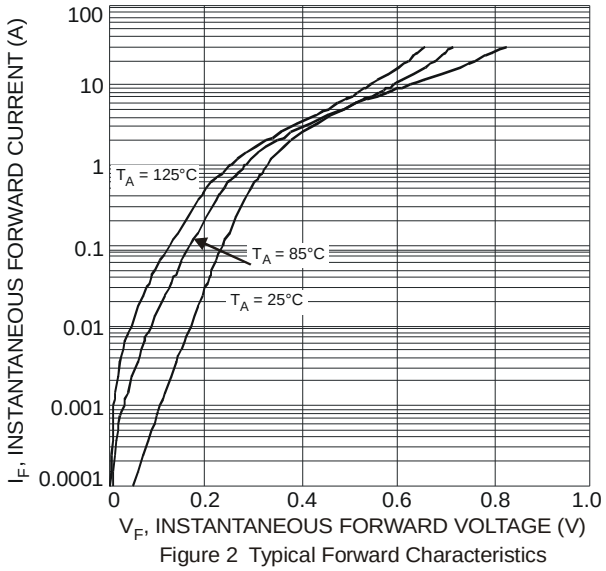

Figure 2 Typical Forward Characteristics

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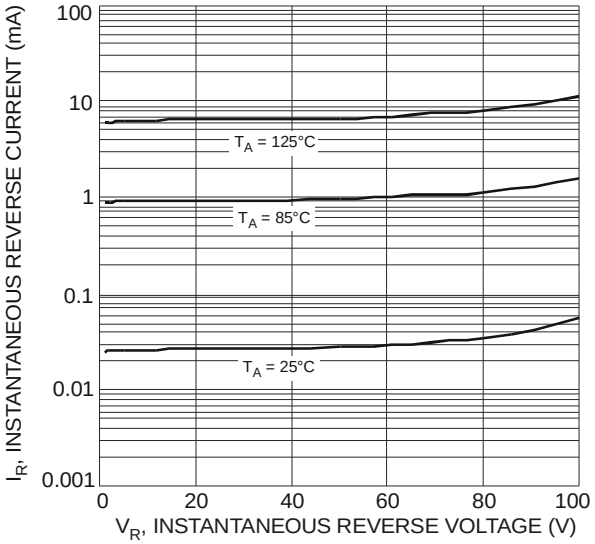

Figure 3 Typical Reverse Characteristics

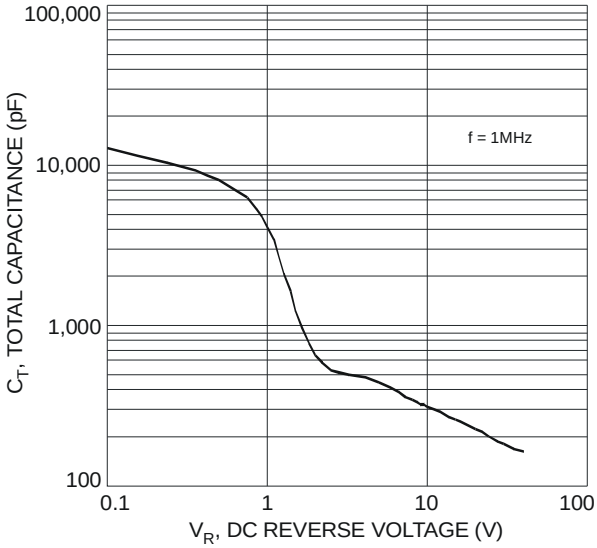

Figure 4 Total Capacitance vs. Reverse Voltage

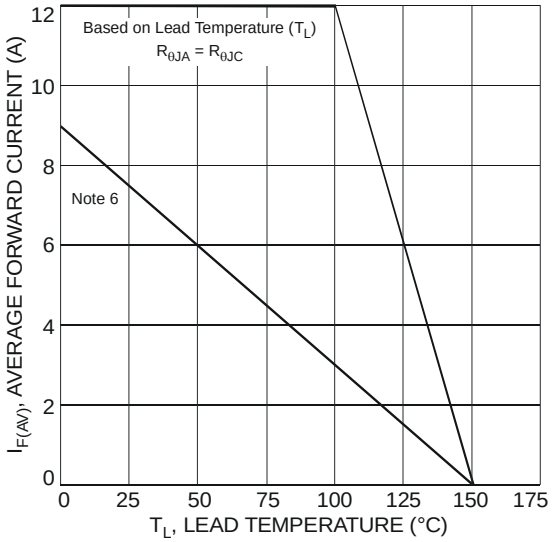

Figure 5 Forward Current Derating Curve

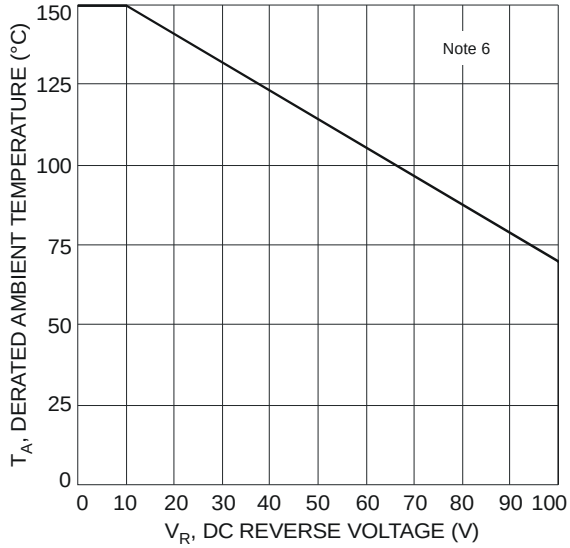

Figure 6 Operating Temperature Derating

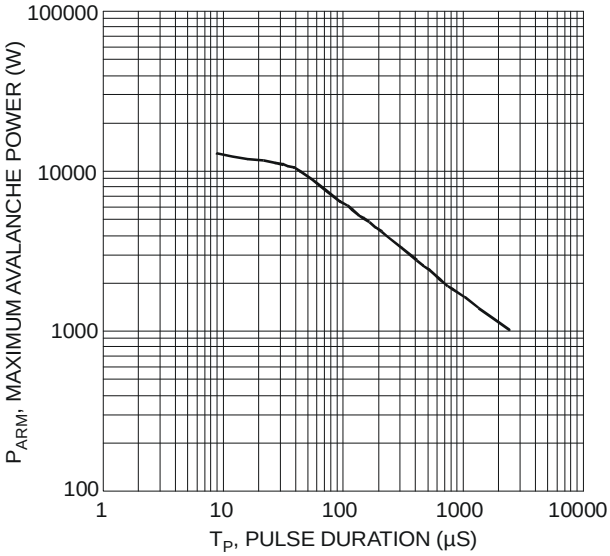

Figure 7 Maximum Avalanche Power Curve

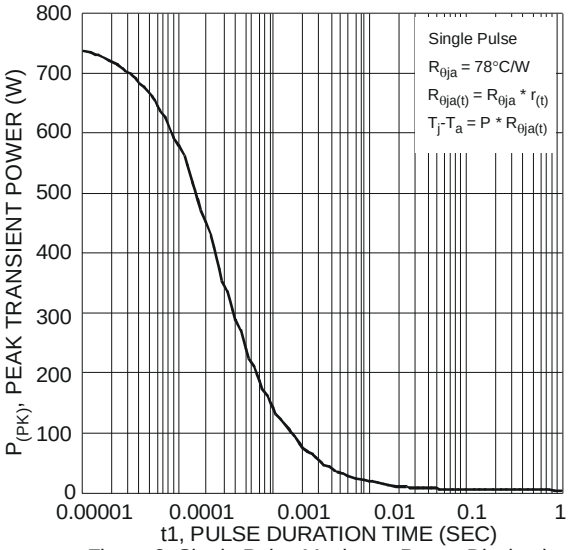

Figure 8 Single Pulse Maximum Power Dissipation

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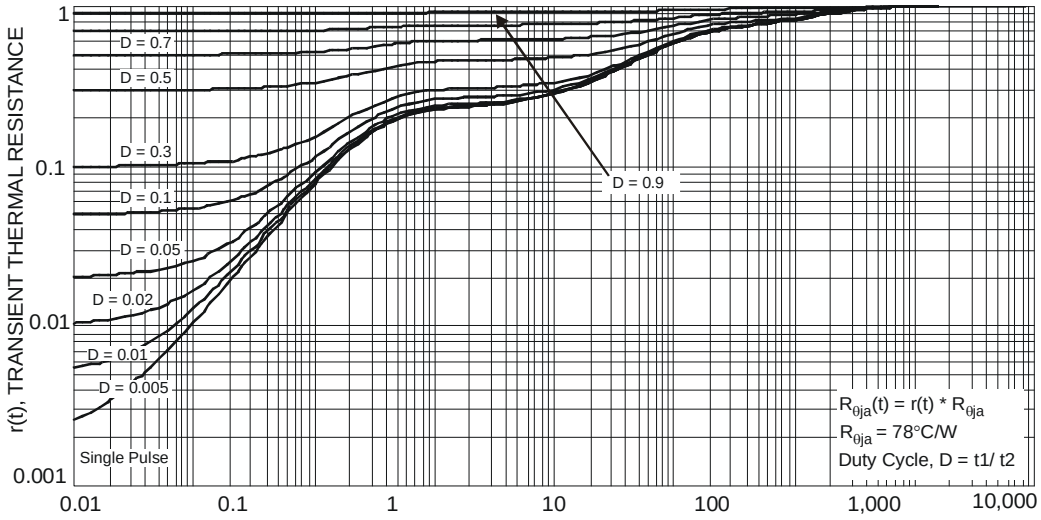
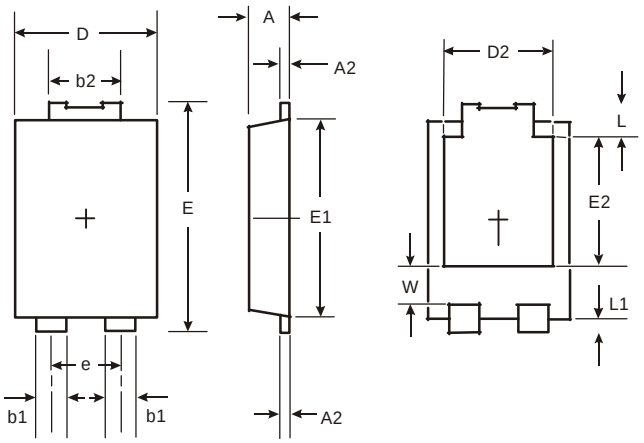


Figure 9 Transient Thermal Resistance

Package Outline Dimensions

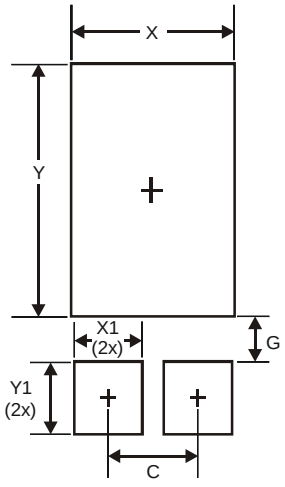
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.



POWERDI®5		
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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