SBR8U20SP5Q

8A 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
20	8	0.51	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

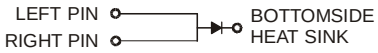
- 100% Avalanche Tested.
- Patented SBR technology provides a superior avalanche capability than schottky diodes ensuring more rugged and reliable end applications.
- Reduced Ultra-low forward voltage drop (V_F); better efficiency and cooler operation.
- Reduced high temperature reverse leakage; Increased reliability against thermal runaway failure 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: 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)

POWERDI®5

Top View Bottom View



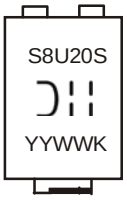
Note: Pins Left & Right must be electrically connected at the printed circuit board.

Ordering Information (Note 4)

Part Number	Case	Packaging
SBR8U20SP5Q-13	POWERDI®5	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

Marking Information



= 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 Working Peak Reverse Voltage DC Blocking Voltage	V_{RRM} V_{RWM} V_{RM}	20	V
Average Rectified Output Current	I_O	8	A
Non-Repetitive Peak Forward Surge Current 8.3ms Single Half Sine-Wave Superimposed on Rated Load	I_{FSM}	180	A
Non-Repetitive Avalanche Energy (T_J = +25°C, I_{AS} = 6A, L = 10mH)	E_{AS}	146	mJ
Repetitive Peak Avalanche Energy (1µs, +25°C)	P_{ARM}	1000	W

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Typical Thermal Resistance Junction to Ambient (Note 5)	$R_{\theta JA}$	102	°C/W
Typical Thermal Resistance Junction to Lead	$R_{\theta JL}$	60	°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	- -	0.41 0.33	0.51 -	V	I_F = 8A, T_J = +25°C I_F = 8A, T_J = +125°C
Leakage Current (Note 5)	I_R	- -	0.04 0.1	0.2 0.3	mA	V_R = 4V, T_J = +25°C V_R = 20V, T_J = +25°C
Total Capacitance	C_T	-	360	-	pf	Vr= 20V, F= 1MHz

Notes: 3. FR-4 PCB, 2oz. Copper, minimum recommended pad layout per http://www.diodes.com.
4. Polymide PCB, 2oz. Copper. Cathode pad dimensions 18.8mm x 14.4mm. Anode pad dimensions 5.6mm x 14.4mm.
5. Short duration pulse test used to minimize self-heating effect.

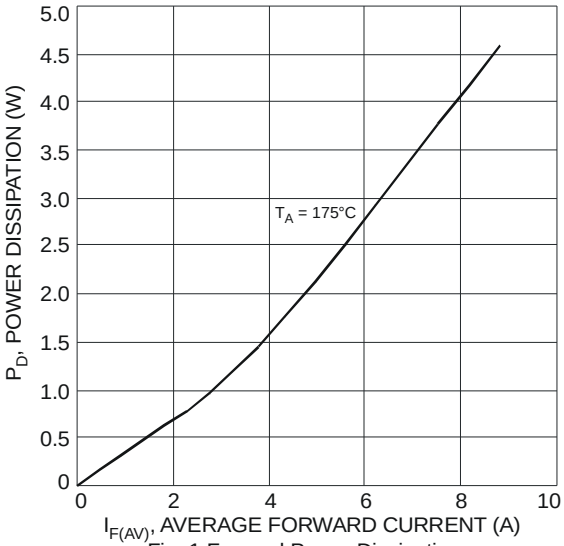


Fig. 1 Forward Power Dissipation

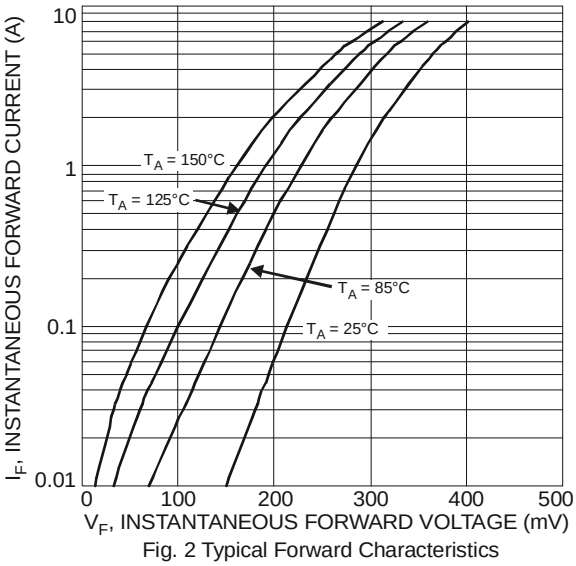


Fig. 2 Typical Forward Characteristics

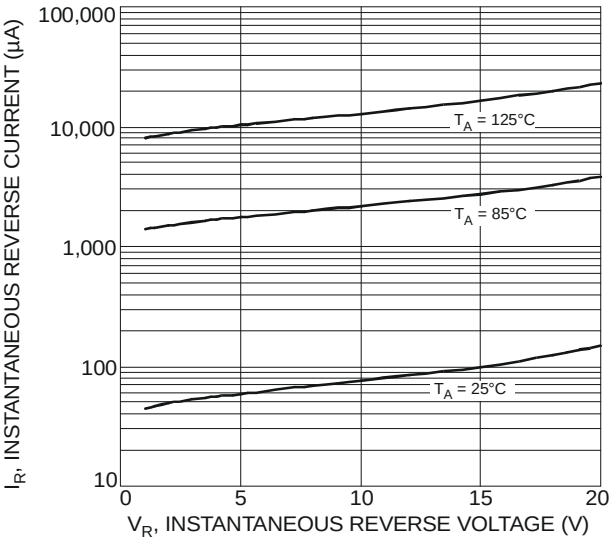


Fig. 3 Typical Reverse Characteristics

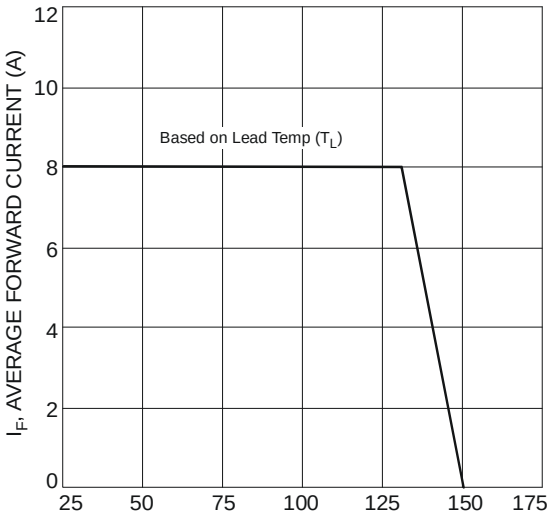


Fig. 4 Forward Current Derating Curve

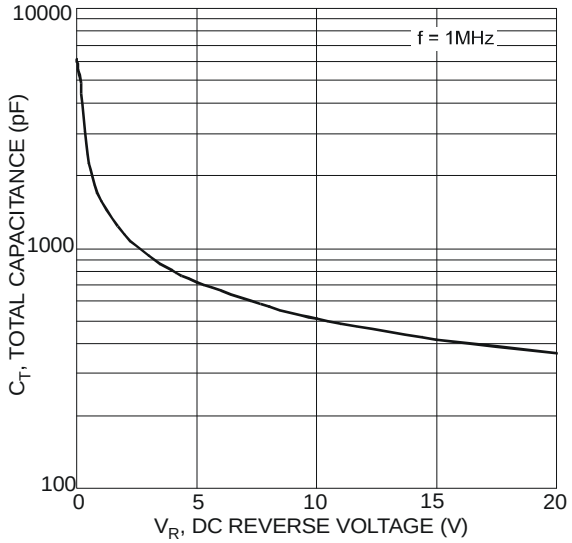


Fig. 5 Total Capacitance vs. Reverse Voltage

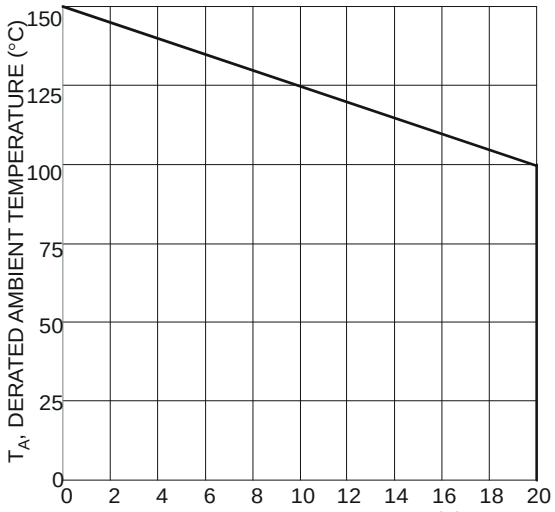


Fig. 6 Operating Temperature Derating

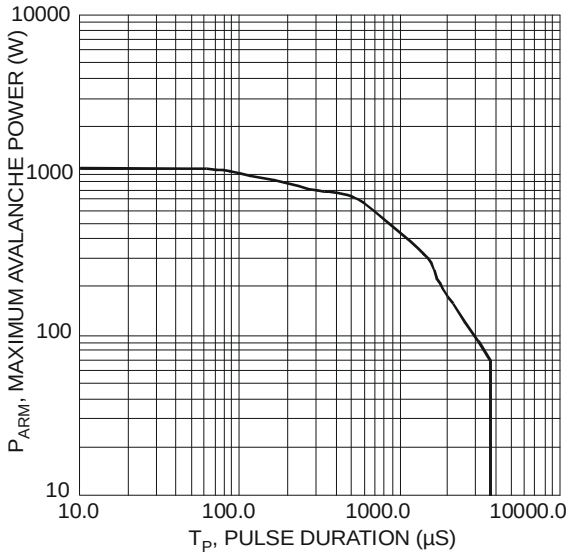


Figure 7 Maximum Avalanche Power Curve, Per Element

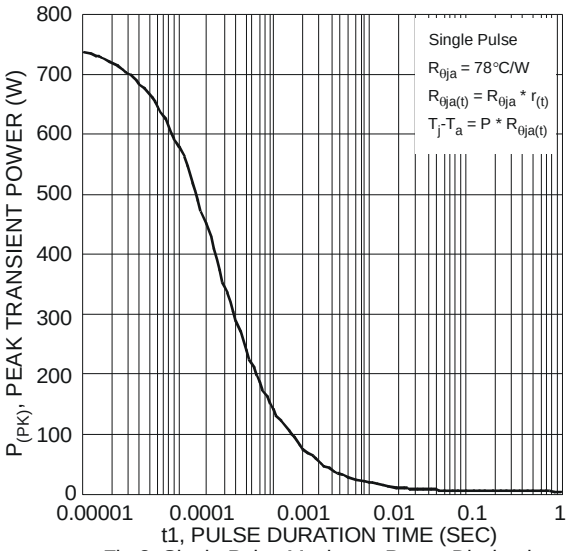


Fig 8 Single Pulse Maximum Power Dissipation

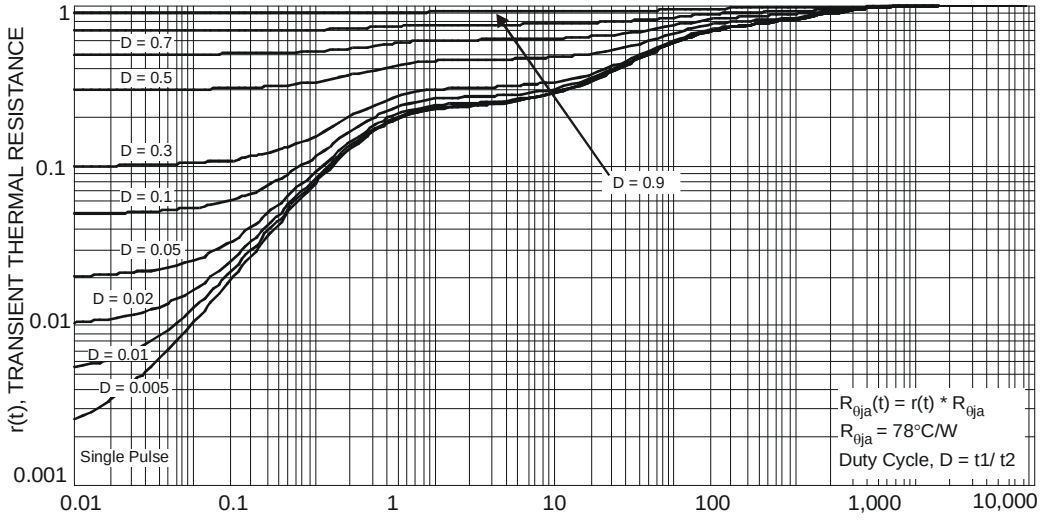
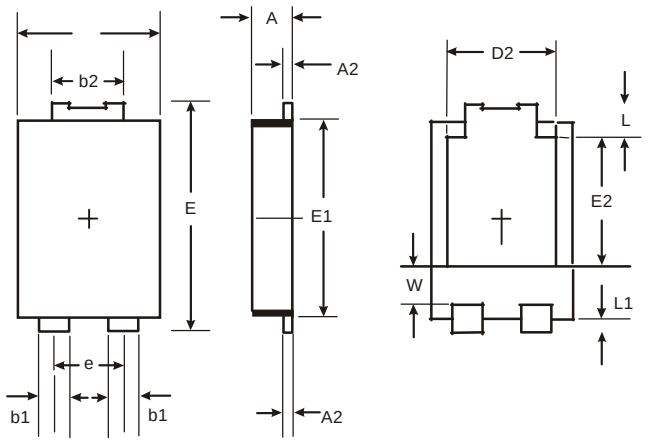


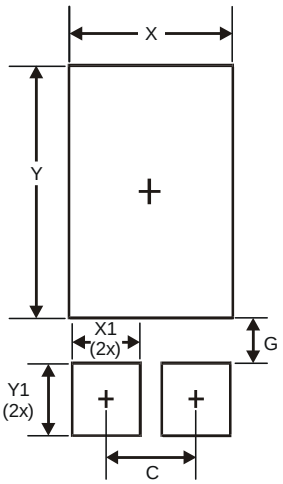
Figure 9 Transient Thermal Resistance

Package Outline Dimensions



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



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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