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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

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)**
- **The SBR8U20SP5Q 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/>

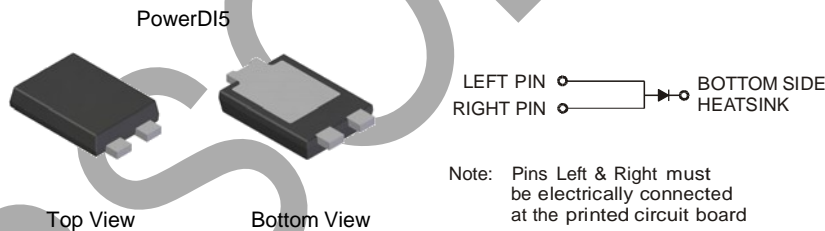
Description and Applications

This Super Barrier Rectifier (SBR[®]) diode has been designed to meet the stringent requirements of automotive applications. It is ideally suited to be used as:

- Polarity protection diodes
- Recirculating diodes
- Switching diodes

Mechanical Data

- Package: PowerDI[®]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 (e3)
- Weight: 0.093 grams (Approximate)

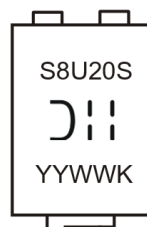


Ordering Information (Note 4)

Orderable Part Number	Package	Packing	
		Qty.	Carrier
SBR8U20SP5Q-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/>.

Marking Information



⌋⌋⌋ = Manufacturer's Code Marking
 S8U20S = Product Type Marking Code
 K = Factory Designator
 YYWW = Date Code Marking
 YY = Last Two Digits of Year (ex: 24 for 2024)
 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	V _{RRM}	20	V
Working Peak Reverse Voltage	V _{RWM}		
DC Blocking Voltage	V _{RM}		
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 _{θJA}	102	°C/W
Typical Thermal Resistance Junction to Lead	R _{θJL}	60	°C/W
Operating and Storage Temperature Range	T _J , T _{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	0.51	V	I _F = 8A, T _J = +25°C
		—	0.33	—		I _F = 8A, T _J = +125°C
Leakage Current (Note 7)	I _R	—	0.040.1	0.2	mA	V _R = 4V, T _J = +25°C
		—	—	0.3		V _R = 20V, T _J = +25°C
Total Capacitance	C _T	—	360	—	pf	V _R = 20V, f = 1MHz

- Notes: 5. FR-4 PCB, 2oz. copper, minimum recommended pad layout per <http://www.diodes.com/package-outlines.html>.
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.

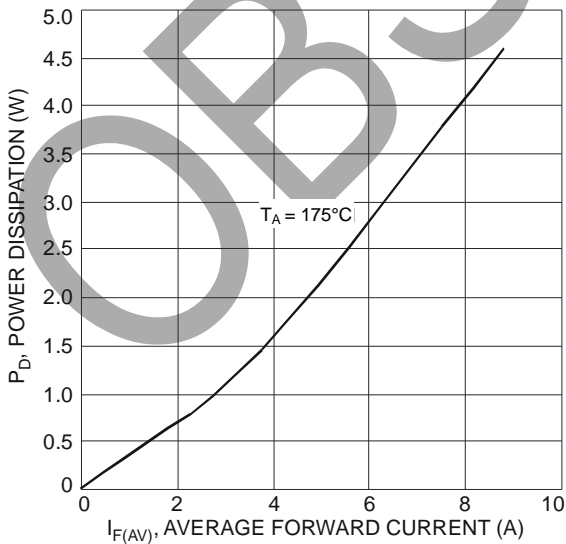


Fig. 1 Forward Power Dissipation

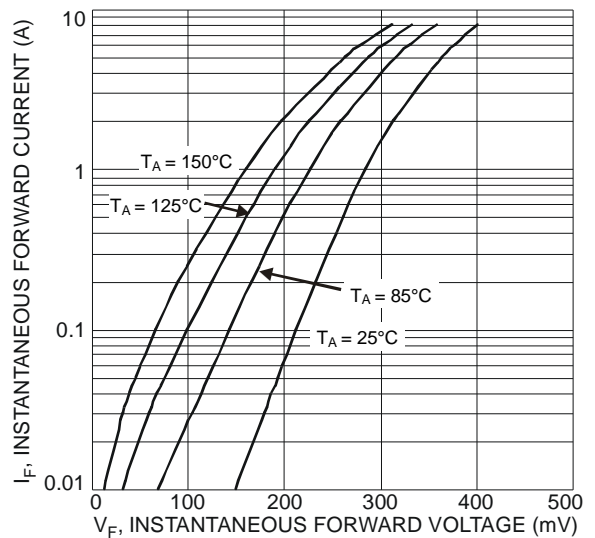


Fig. 2 Typical Forward Characteristics

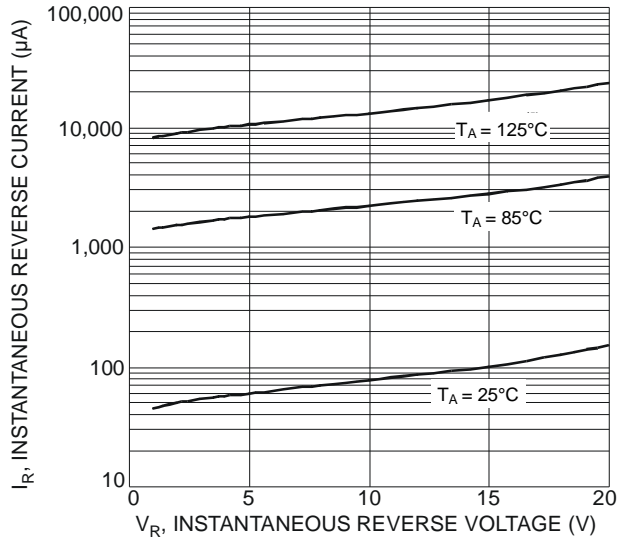


Fig. 3 Typical Reverse Characteristics

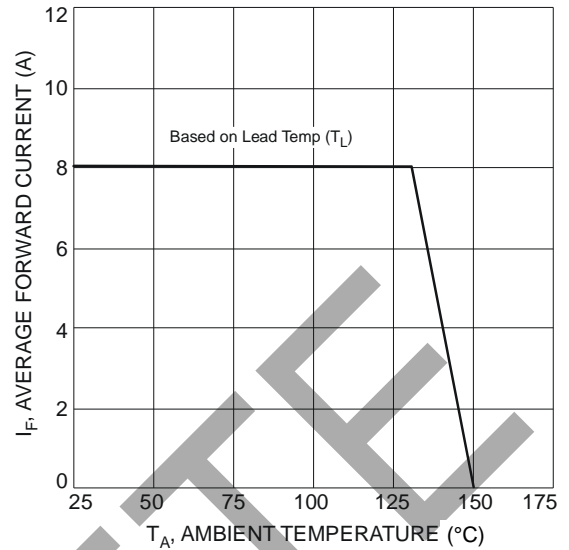


Fig. 4 Forward Current Derating Curve

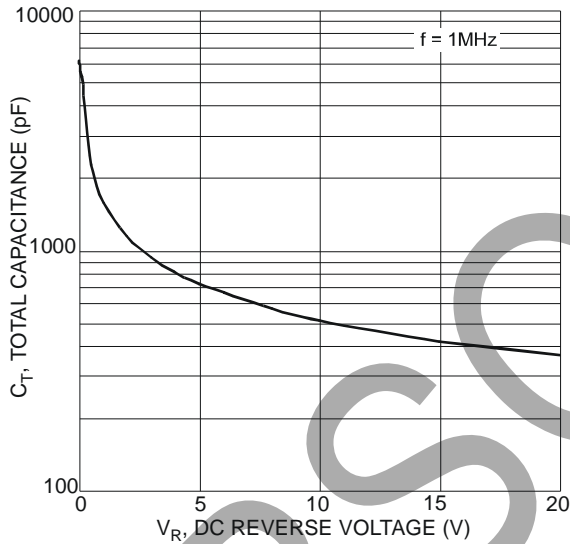


Fig. 5 Total Capacitance vs. Reverse Voltage

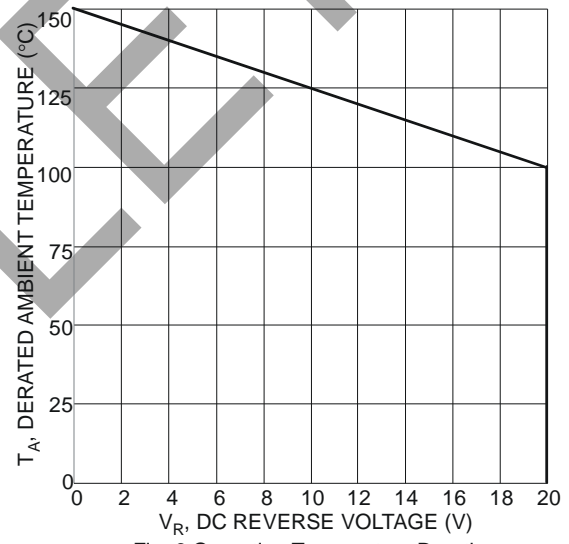


Fig. 6 Operating Temperature Derating

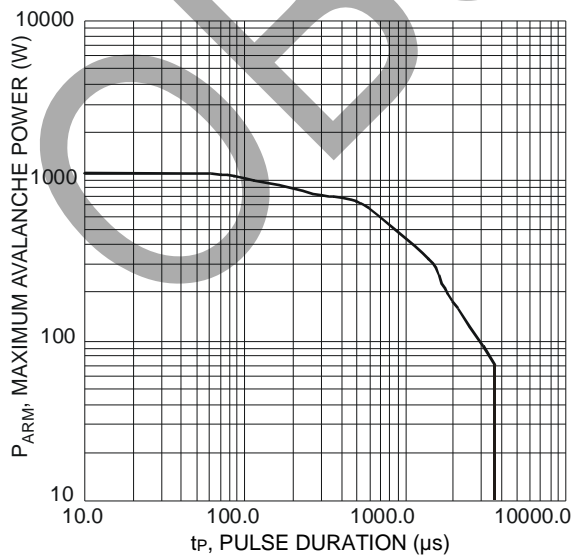


Figure 7 Maximum Avalanche Power Curve, Per Element

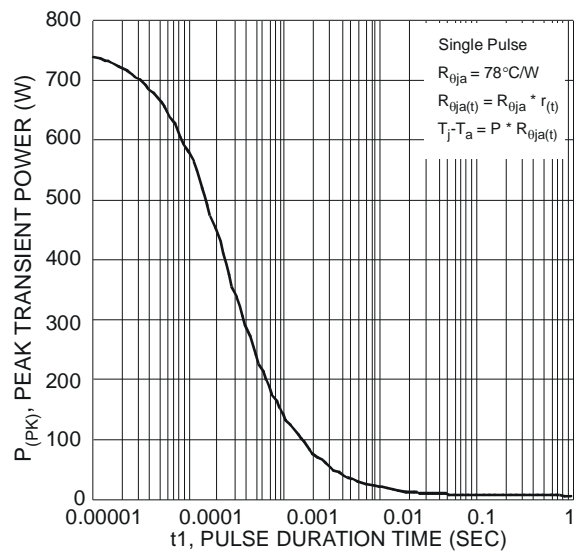
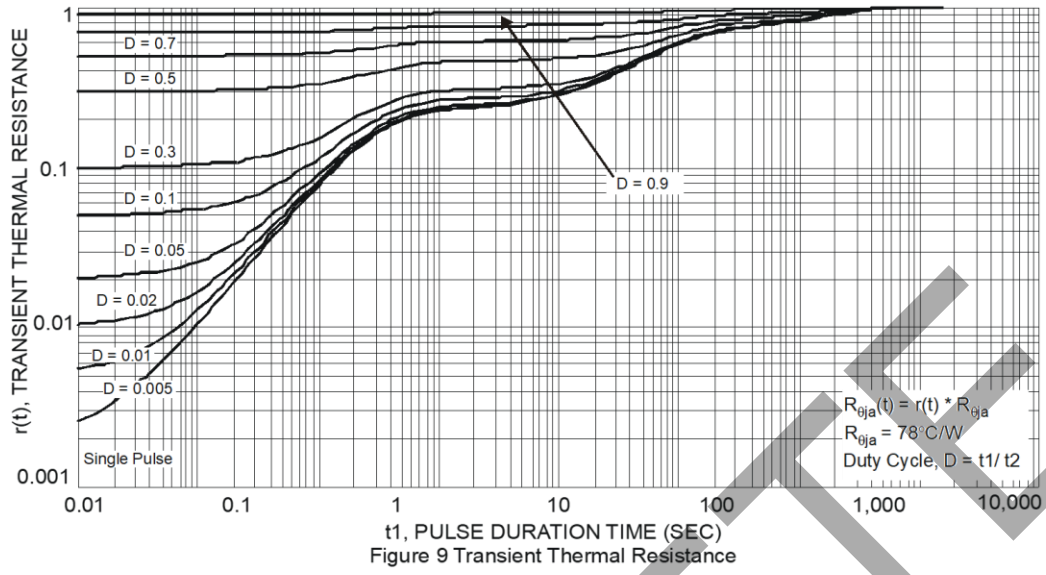


Fig 8 Single Pulse Maximum Power Dissipation

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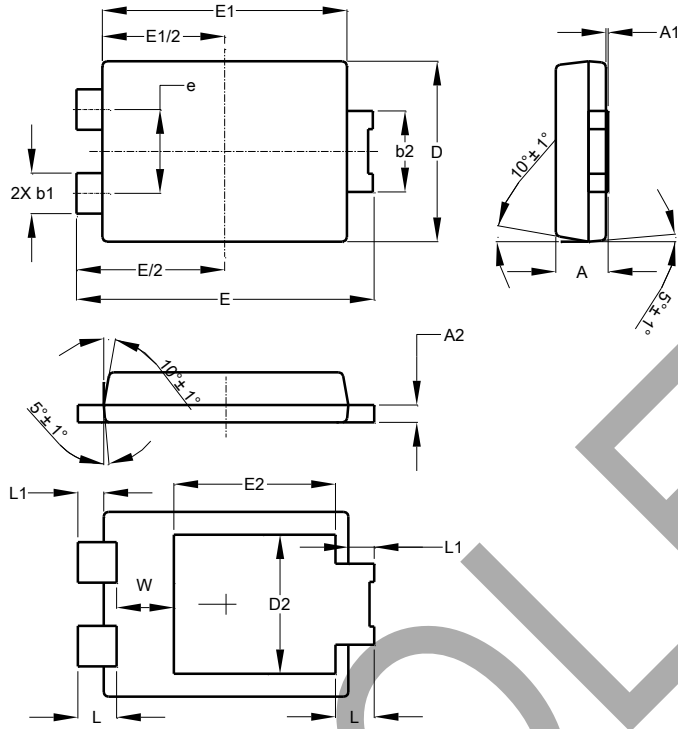


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Package Outline Dimensions

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

PowerDI5

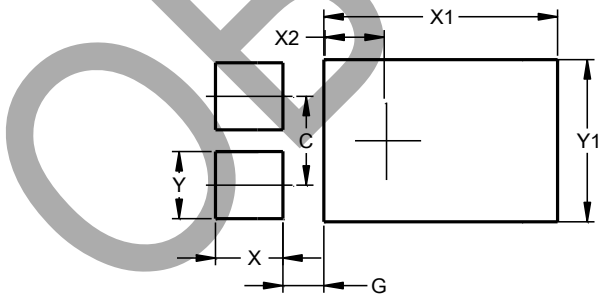


PowerDI5			
Dim	Min	Max	Typ
A	1.05	1.15	1.10
A1	0.00	0.05	--
A2	0.33	0.43	0.381
b1	0.80	0.99	0.89
b2	1.70	1.88	1.78
D	3.90	4.05	3.966
D2	--	--	3.054
E	6.40	6.60	6.51
e	--	--	1.84
E1	5.30	5.45	5.37
E2	--	--	3.549
L	0.75	0.95	0.85
L1	0.50	0.65	0.57
W	1.10	1.41	1.255
All Dimensions in mm			

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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