SBR8U60P5Q

8A SBR
SUPER BARRIER RECTIFIER
PowerDI5

Product Summary

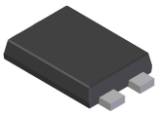
V_{RRM} (V)	I_O (A)	V_F Max (V) @+25°C	I_R Max (mA) @ +25°C
60	8	0.53	0.33

Description and Applications

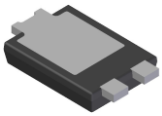
These Super Barrier Rectifier (SBR®) diodes have been designed to meet the stringent requirements of automotive applications. They are ideally suited for use as:

- Polarity protection diodes
- Re-circulating diodes
- Switching diodes

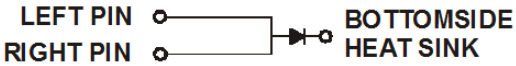
PowerDI®5



Top View



Bottom View



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

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)**
- **The SBR8U60P5Q is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.**
  https://www.diodes.com/quality/product-definitions/

Mechanical Data

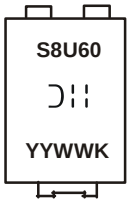
- Package: PowerDI5
- Package Material: Molded Plastic, "Green" Molding compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 e3
- Polarity: See Below
- Weight: 0.099 grams (Approximate)

Ordering Information (Note 4)

Orderable Part Number	Package	Packing	
		Qty.	Carrier
SBR8U60P5Q-13	PowerDI5	5000	Tape & Reel
SBR8U60P5Q-13D (Note 5)	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/.
5. "D" suffix designates for the 12mm Tape and Reel option.

Marking Information



S8U60 = Product Type Marking Code
= Manufacturers' Code Marking
YYWW = Date Code Marking
YY = Last Two Digits of Year (ex: 24 for 2024)
WW = Week Code (01 to 53)
K = Factory Designator

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}	60	V
Average Rectified Output Current @T_C = +140°C	I_O	8	A
Non-Repetitive Peak Forward Surge Current 8.3ms Single Half Sine-Wave Superimposed on Rated Load	I_{FSM}	280	A
Repetitive Peak Avalanche Power (1µs, +25°C)	P_{ARM}	6000	W
Non-Repetitive Avalanche Energy (T_J = +25°C, I_{AS} = 12A, L = 10mH)	E_{AS}	620	mJ

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Maximum Thermal Resistance Thermal Resistance Junction to Soldering (Note 6) Thermal Resistance Junction to Ambient (Note 7)	 $R_{\theta JS}$ $R_{\theta JA}$	 3 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	— — —	0.30 0.46 0.43	0.35 0.53 —	V	I_F = 1.0A, T_J = +25°C I_F = 8A, T_J = +25°C I_F = 8A, T_J = +125°C
Leakage Current (Note 8)	I_R	— —	0.1 40	0.33 —	mA	V_R = 60V, T_J = +25°C V_R = 60V, T_J = +125°C
Junction Capacitance	C_J	—	590	—	pF	V_R = 4V, f = 1MHz
Reverse-Recovery Time	t_{RR}	—	28	—	ns	I_F = 0.5A, I_R = 1.0A, I_{RR} = 0.25A, T_A = +25°C

Notes: 6. Theoretical $R_{\theta JS}$ calculated from the top center of the die straight down to the PCB cathode tab solder junction.
7. Polymide PCB, 2 oz. copper, minimum recommended pad layout per http://www.diodes.com/package-outlines.html.
8. Short duration pulse test used to minimize self-heating effect.

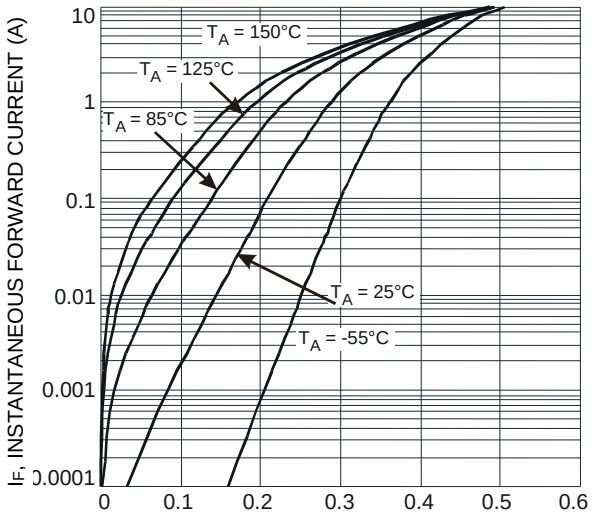


Figure 1 Typical Forward Characteristics

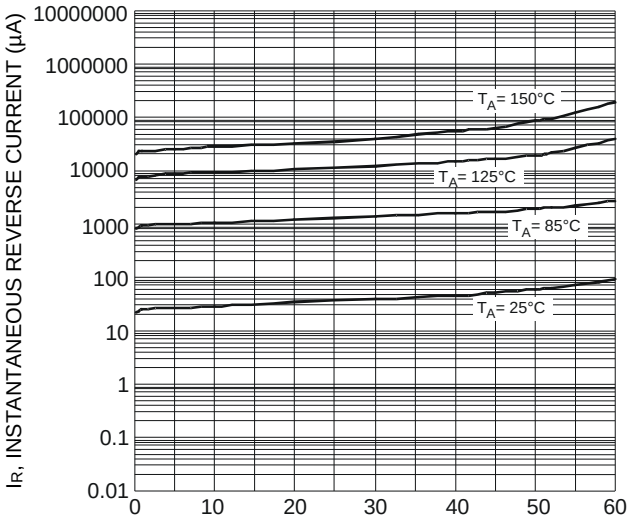


Figure 2 Typical Reverse Characteristics

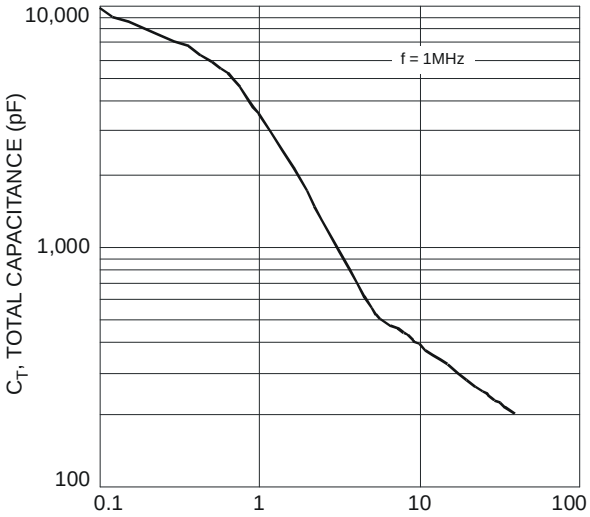


Figure 3 Typical Total Capacitance

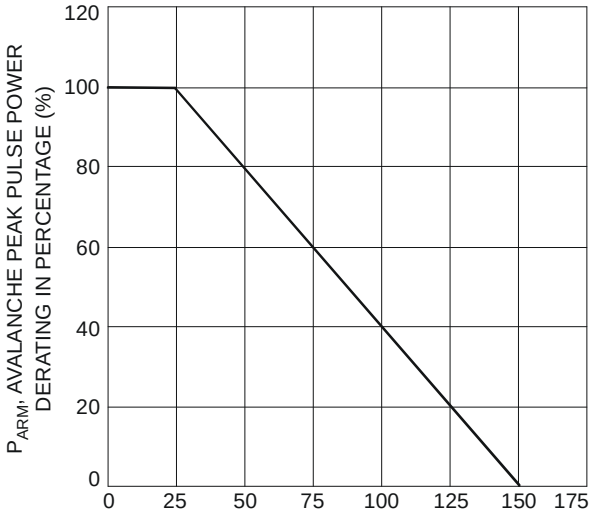


Figure 4 Pulse Derating Curve

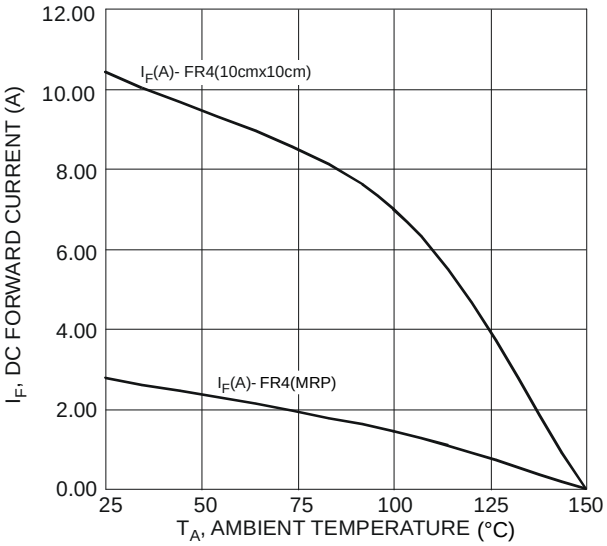


Figure 5 Forward Current Derating Curve

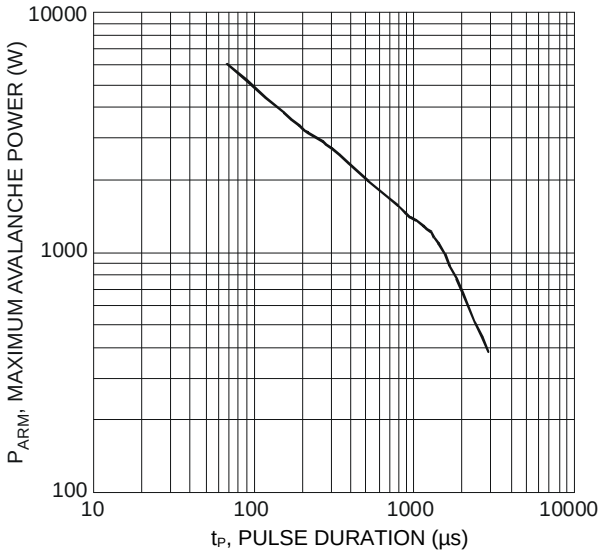


Figure 6 Maximum Avalanche Power Curve, Per Element

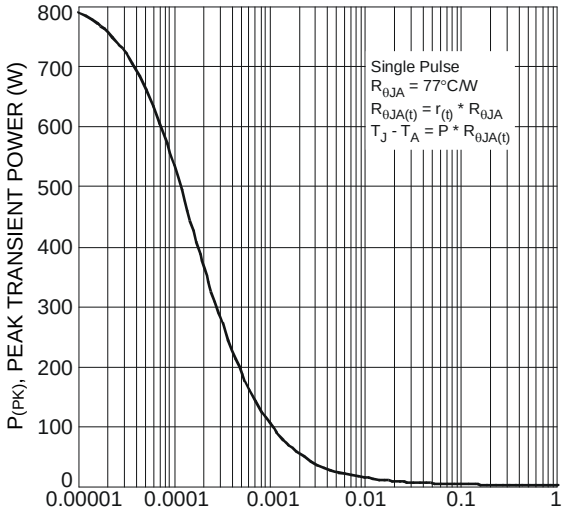


Figure 7 Single Pulse Maximum Power Dissipation

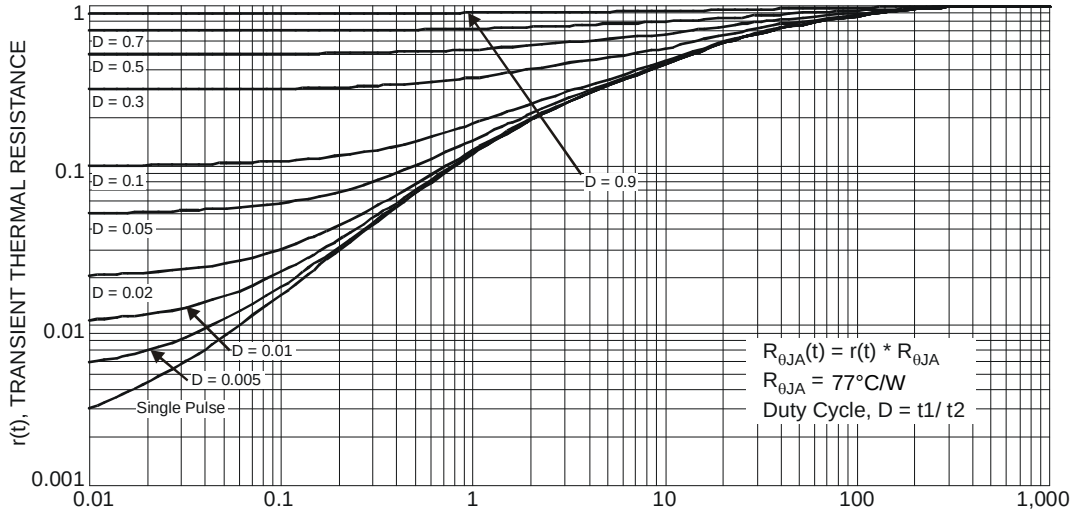
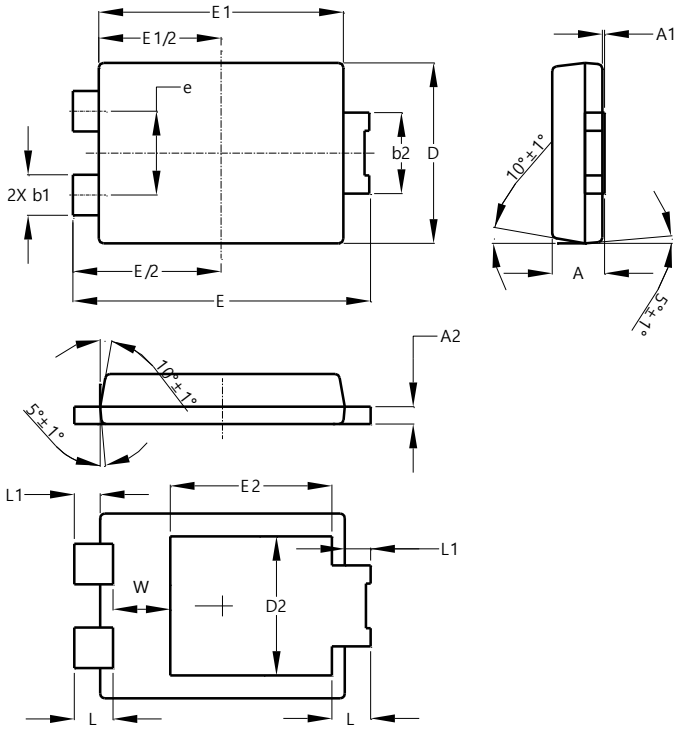


Figure 8 Transient Thermal Resistance

Package Outline Dimensions

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

PowerDI5

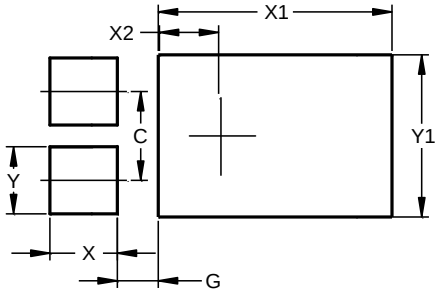


PowerDI5			
Dim	**Min**	**Max**	**Typ**
A	1.05	1.15	1.10
A1	0.00	0.05	--
A2	0.33	0.43	0.381
b1	0.80	0.99	0.89
b2	1.70	1.88	1.78
D	3.90	4.05	3.966
D2	--	--	3.054
E	6.40	6.60	6.51
e	--	--	1.84
E1	5.30	5.45	5.37
E2	--	--	3.549
L	0.75	0.95	0.85
L1	0.50	0.65	0.57
W	1.10	1.41	1.255
All Dimensions in mm			

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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