

## Product Summary

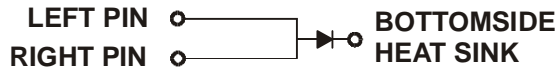
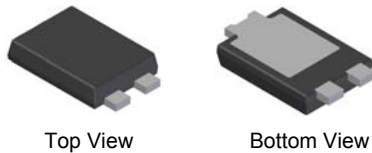
$V_{RRM}$ (V)	$I_o$ (A)	$V_F$ max (V) @+25°C	$I_R$ max (μA) @ +25°C
60	8	0.53	0.33

## Description and Applications

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

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

POWERDI5



**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)**
- **Qualified to AEC-Q101 Standards for High Reliability**

## Mechanical Data

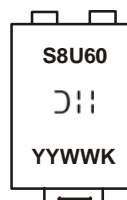
- Case: POWERDI5
- Case Material: Molded Plastic, "Green" Molding compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish - Matte Tin annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208
- Polarity: See Below
- Weight: 0.099 grams (approximate)

## Ordering Information (Note 4)

Part Number	Compliance	Case	Packaging
SBR8U60P5Q-13	Automotive	POWERDI5	5000/Tape & Reel
SBR8U60P5Q-13D (Note 5)	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](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



S8U60 = 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

**Maximum Ratings** (@ $T_A = +25^\circ\text{C}$ , 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	$V_{RRM}$	60	V
Working Peak Reverse Voltage	$V_{RWM}$		
DC Blocking Voltage	$V_{RM}$		
Average Rectified Output Current @ $T_C = +140^\circ\text{C}$	$I_O$	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 (1 $\mu\text{s}$ , +25 $^\circ\text{C}$ )	$P_{ARM}$	6000	W
Non-Repetitive Avalanche Energy ( $T_J = +25^\circ\text{C}$ , $I_{AS} = 12\text{A}$ , $L = 10\text{mH}$ )	$E_{AS}$	620	mJ

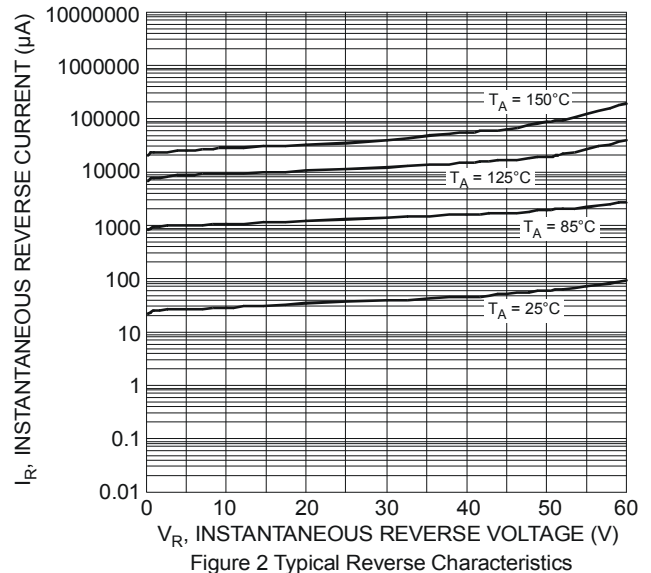
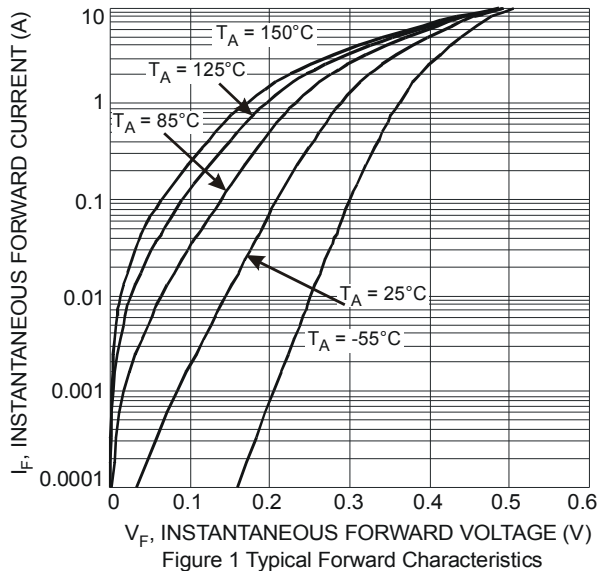
**Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Maximum Thermal Resistance			
Thermal Resistance Junction to Soldering (Note 5)	$R_{\theta JS}$	3	$^\circ\text{C}/\text{W}$
Thermal Resistance Junction to Ambient (Note 6)	$R_{\theta JA}$	60	
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	$^\circ\text{C}$

**Electrical Characteristics** (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Forward Voltage Drop	$V_F$	—	0.30	0.35	V	$I_F = 1.0\text{A}, T_J = +25^\circ\text{C}$
		—	0.46	0.53		$I_F = 8\text{A}, T_J = +25^\circ\text{C}$
		—	0.43	—		$I_F = 8\text{A}, T_J = +125^\circ\text{C}$
Leakage Current (Note 7)	$I_R$	—	0.1	0.33	mA	$V_R = 60\text{V}, T_J = +25^\circ\text{C}$
		—	40	—		$V_R = 60\text{V}, T_J = +125^\circ\text{C}$

- Notes: 5. Theoretical  $R_{\theta JS}$  calculated from the top center of the die straight down to the PCB cathode tab solder junction.  
6. Polyimide PCB, 2 oz. Copper, minimum recommended pad layout per <http://www.diodes.com>.  
7. Short duration pulse test used to minimize self-heating effect.



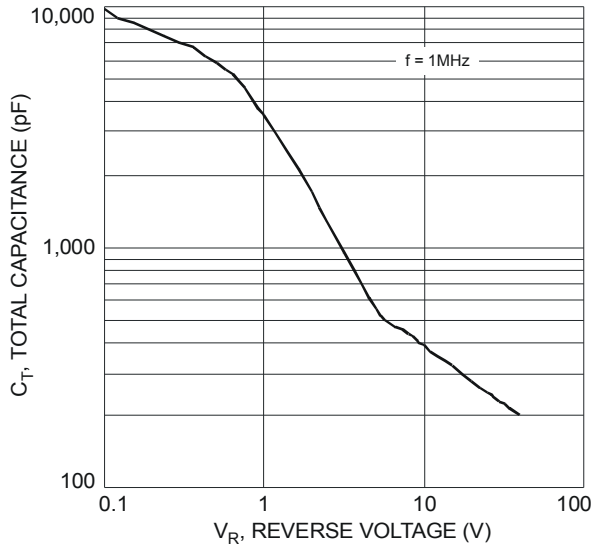


Figure 3 Typical Total Capacitance

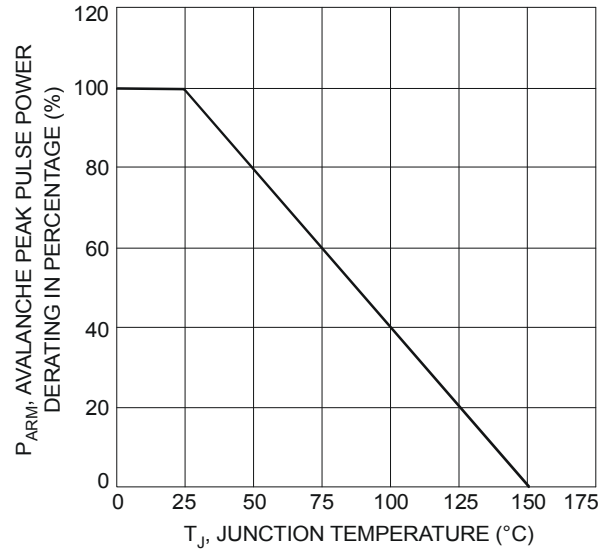


Figure 4 Pulse Derating Curve

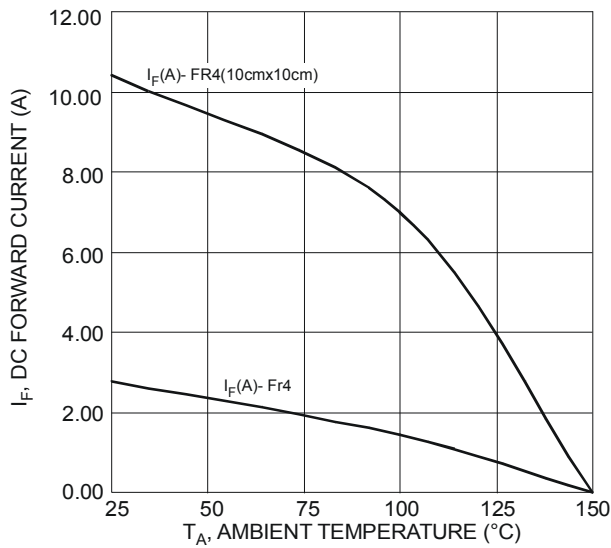


Figure 5 Forward Current Derating Curve

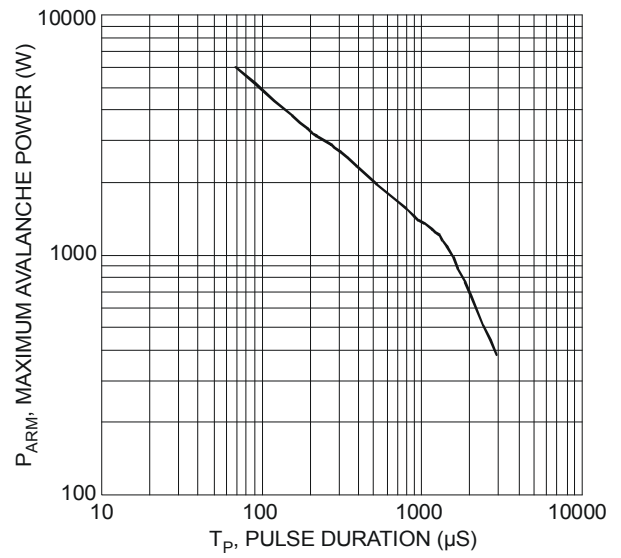


Figure 6 Maximum Avalanche Power Curve, Per Element

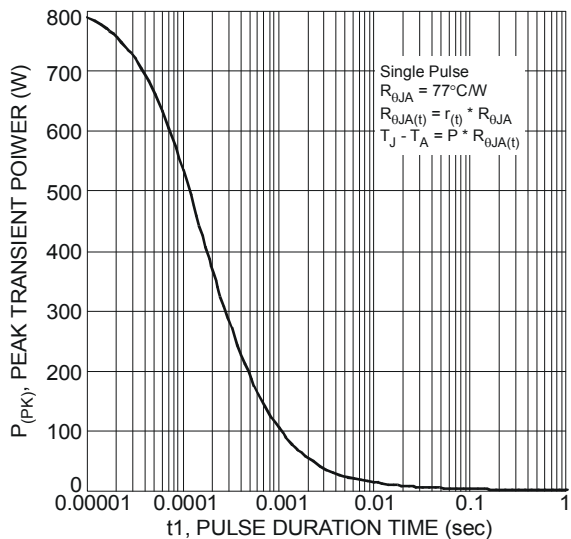
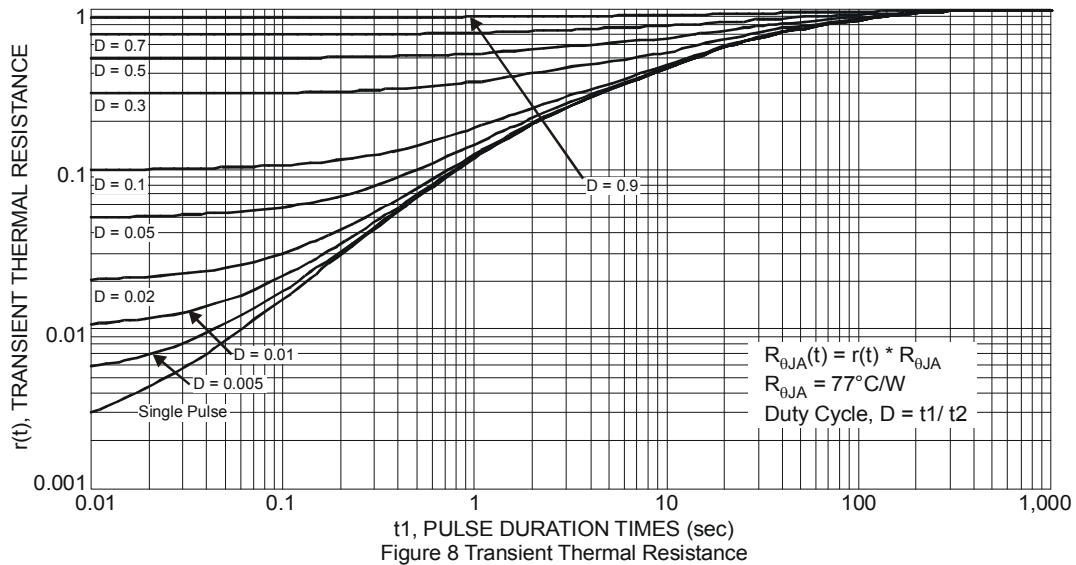
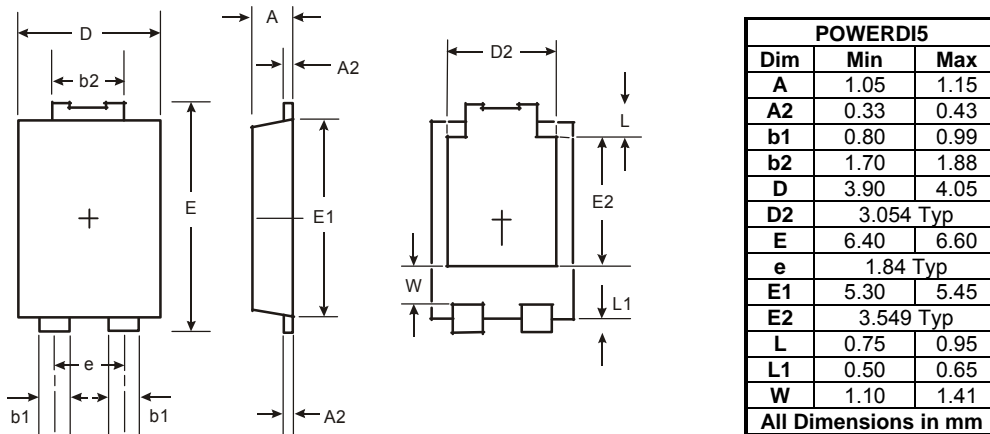


Figure 7 Single Pulse Maximum Power Dissipation



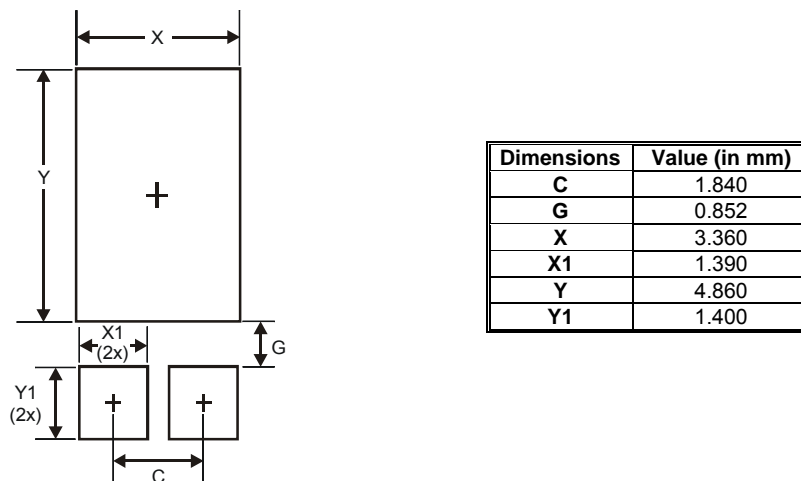
**Package Outline Dimensions**

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



**Suggested Pad Layout**

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.



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