

## Product Summary

V <sub>RRM</sub> (V)	I <sub>O</sub> (A)	V <sub>F</sub> MAX(V) @+25°C	I <sub>R</sub> MAX(mA) @ +25°C
60	20	0.79	0.5

## 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 a :

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

## Features and Benefits

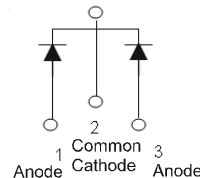
- 100% Avalanche tested.
- Patented SBR technology provides a superior avalanche capability than schottky diodes ensuring more rugged and reliable end applications.
- Reduced Ultra-low forward voltage drop (V<sub>F</sub>); better efficiency and cooler operation.
- Reduced high temperature reverse leakage; 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 AEC-Q101 Standards for High Reliability**

## Mechanical Data

- Case: TO263 (D<sup>2</sup>PAK)
- Case Material: Molded Plastic, "Green" Molding compound. UL Flammability Classification Rating 94V-0
- Terminals: Matte Tin Finish annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208 
- Weight: 1.6 grams (approximate)



TO263  
Top View



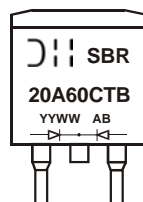
Package Pin Out  
Configuration

## Ordering Information (Notes 4)

Part Number	Compliance	Case	Packaging
SBR20A60CTBQ-13	Automotive	TO263	800/Tape & Reel

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
  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>.

## Marking Information



SBR20A60CTB = Product Type Marking Code  
AB = Foundry and Assembly Code  
YYWW = Date Code Marking  
YY = Last two digits of year (ex: 13 = 2013)  
WW = Week (01 - 53)

**Maximum Ratings (Per Leg)** (@T<sub>A</sub> = +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	V <sub>RRM</sub>	60	V
Working Peak Reverse Voltage	V <sub>RWM</sub>		
DC Blocking Voltage	V <sub>RM</sub>		
Average Rectified Output Current Per Device	I <sub>O</sub>	20	A
Non-Repetitive Peak Forward Surge Current 8.3ms Single Half Sine-Wave Superimposed on Rated Load	I <sub>FSM</sub>	180	A
Peak Repetitive Reverse Surge Current (2μS - 1KHz)	I <sub>RRM</sub>	3	A
Repetitive Peak Avalanche Power (1μs, +25°C)	P <sub>ARM</sub>	7000	W
Non-Repetitive Avalanche Energy (T <sub>J</sub> = +25°C, I <sub>AS</sub> = 12A L = 10mH)	E <sub>AS</sub>	500	mJ

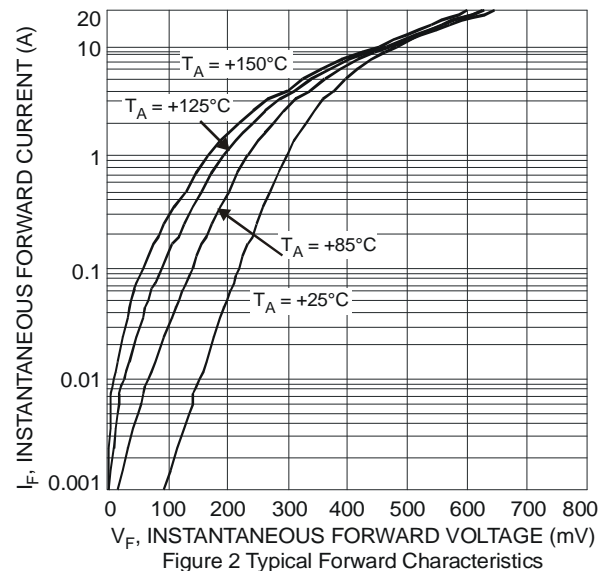
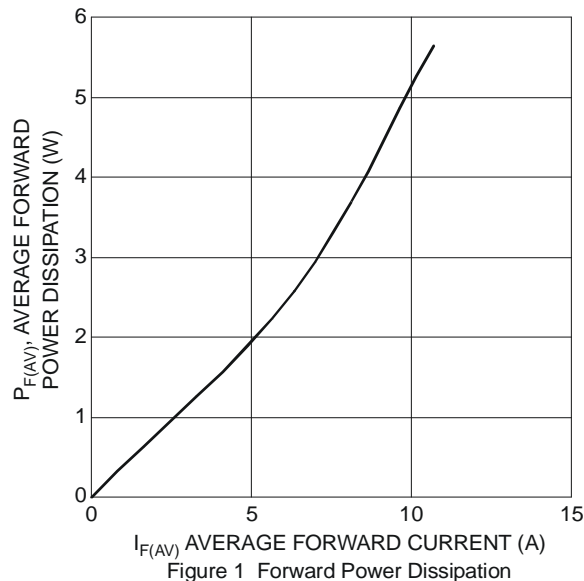
**Thermal Characteristics (Per Leg)**

Characteristic	Symbol	Value	Unit
Typical Thermal Resistance	R <sub>θJC</sub>	4	°C/W
Thermal Resistance Junction to Case (Note 5)	R <sub>θJA</sub>	8	
Thermal Resistance Junction to Ambient (Note 5)			
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-65 to +150	°C

**Electrical Characteristics (Per Leg)** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Forward Voltage Drop	V <sub>F</sub>	—	0.50	—	V	I <sub>F</sub> = 10A, T <sub>J</sub> = +25°C
		—	0.47	—		I <sub>F</sub> = 10A, T <sub>J</sub> = +125°C
		—	0.63	0.79		I <sub>F</sub> = 20A, T <sub>J</sub> = +25°C
Leakage Current (Note 6)	I <sub>R</sub>	—	0.14	0.5	mA	V <sub>R</sub> = 60V, T <sub>J</sub> = +25°C
		—	45	—		V <sub>R</sub> = 60V, T <sub>J</sub> = +125°C

Notes: 5. Mounted heatsink black Aluminum, 45mm\*20mm\*12mm, minimum recommended pad layout as shown on Diodes Inc. suggested pad layout document AP02001, which can be found on our website at <http://www.diodes.com>.  
 6. Short duration pulse test used to minimize self-heating effect.



Note: 7. Mounted heatsink, black Aluminum, 45mm\*20mm\*12mm,min recommended pad layout layout.

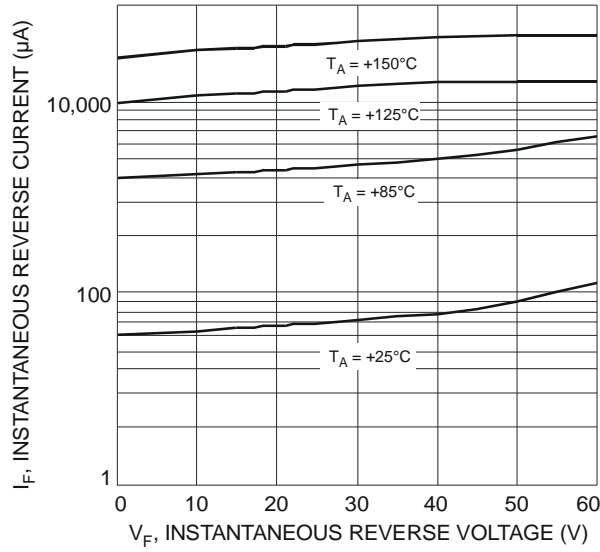


Figure 3 Typical Reverse Characteristics

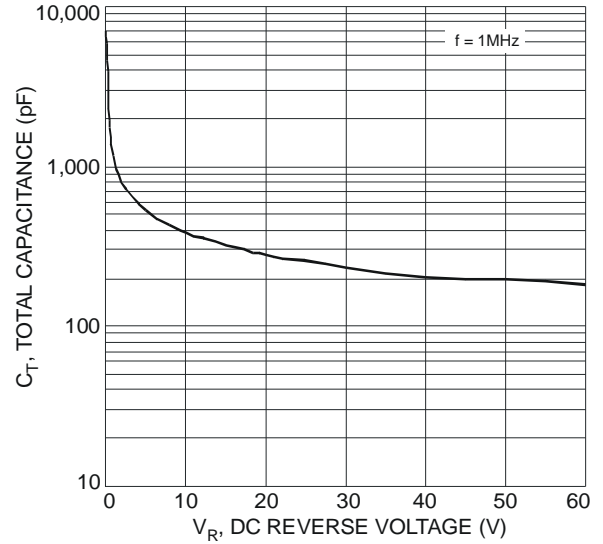


Figure 4 Total Capacitance vs. Reverse Voltage

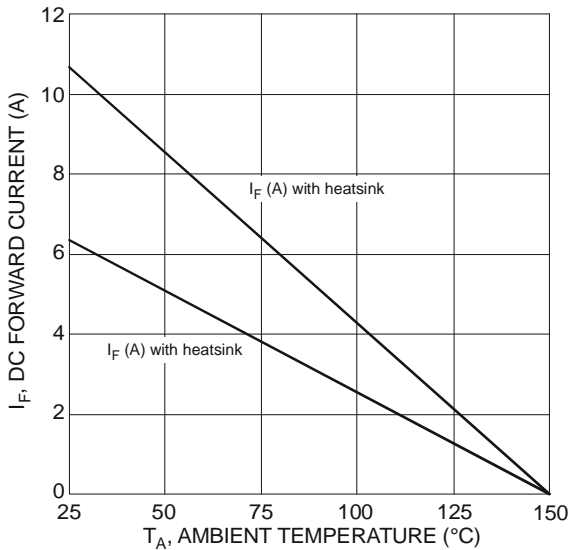


Figure 5 Forward Current Derating Curve

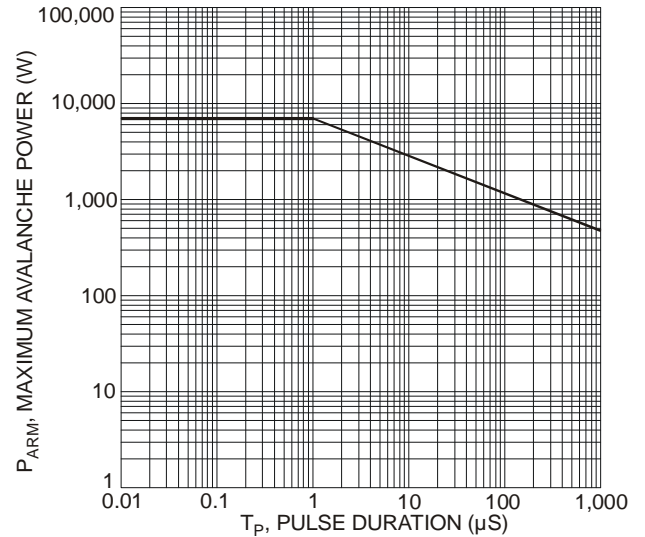


Figure 6 Maximum Avalanche Power Curve

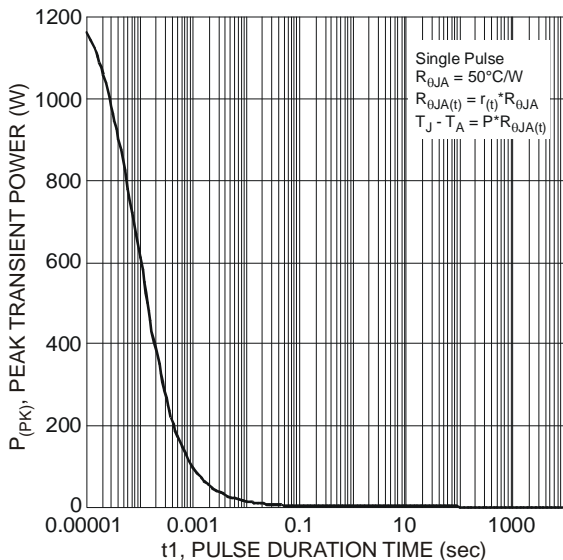
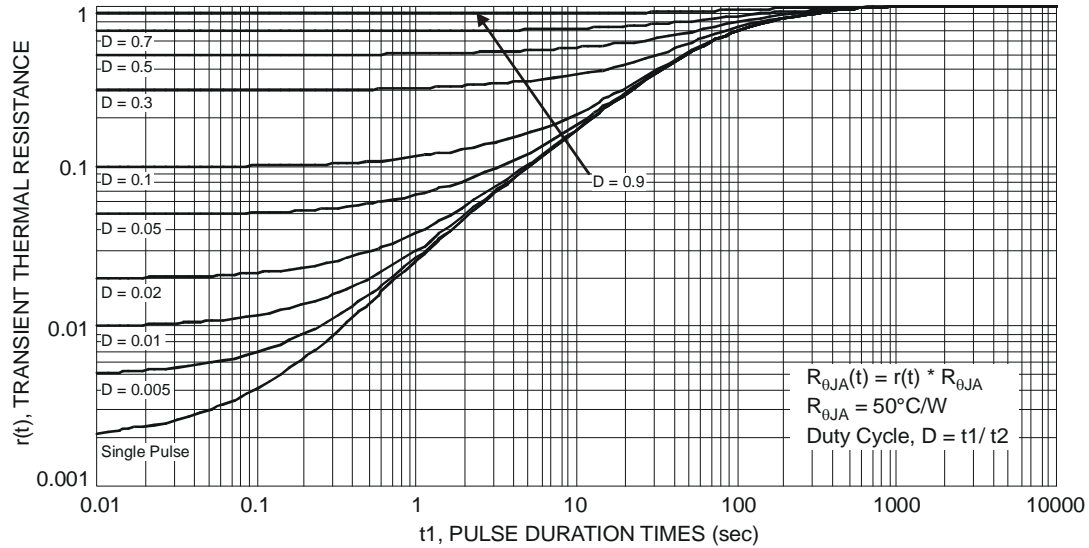
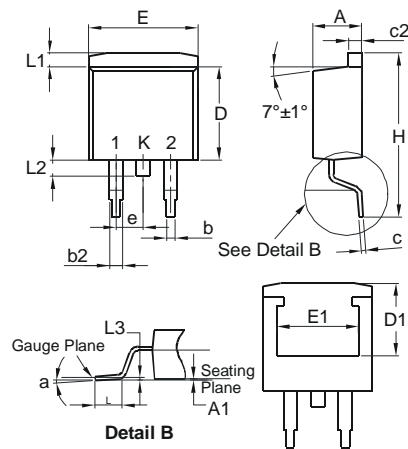


Figure 7 Single Pulse Maximum Power Dissipation



## Package Outline Dimensions

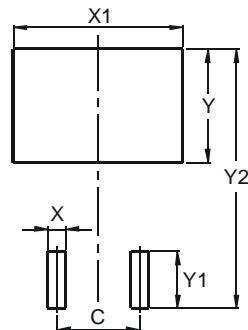
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



TO263		
Dim	Min	Max
A	4.07	4.82
A1	0.00	0.25
b	0.51	0.99
b2	1.15	1.77
c	0.356	0.73
c2	1.143	1.65
D	8.39	9.65
D1	6.55	—
E	9.66	10.66
E1	6.23	—
e	2.54 Typ	
H	14.61	15.87
L	1.78	2.79
L1	—	1.67
L2	—	1.77
a	0°	8°
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	5.08
X	1.10
X1	10.41
Y	3.50
Y1	7.01
Y2	15.99

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