10A SBR®
SUPER BARRIER RECTIFIER

Product Summary

V_{RRM} (V)	I_O (A)	$V_{F\ MAX}$ (V) @+25°C	$I_{R\ MAX}$ (mA) @+25°C
45	10	0.58	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

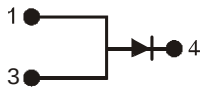
Features

- 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 (VF); 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: TO252 (DPAK)
- Case Material: Molded Plastic, "Green" Molding compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208 e3
- Weight: 0.33 grams (approximate)

Top View



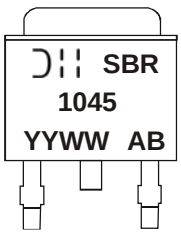
Polarity

Ordering Information (Note 4)

Part Number	Compliance	Case	Packaging
SBR1045D1Q-13	Automotive	TO252 (DPAK)	2500/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 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



SBR1045 = 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 (@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}	45	V
RMS Reverse Voltage	$V_{R(RMS)}$	32	V
Average Rectified Output Current	I_O	10	A
Non-Repetitive Peak Forward Surge Current 8.3ms Single Half Sine-Wave Superimposed on Rated Load	I_{FSM}	90	A
Repetitive Peak Avalanche Power (1µs, +25°C)	P_{ARM}	5000	W
Non-Repetitive Avalanche Energy (T_J = +25°C, I_{AS} = 12A, L = 10mH)	E_{AS}	200	mJ

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Typical Thermal Resistance Thermal Resistance Junction to Ambient (Note 5) Thermal Resistance Junction to Case (Note 5)	 $R_{\theta JA}$ $R_{\theta JC}$	 29 3	°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
Reverse Breakdown Voltage (Note 6)	$V_{(BR)R}$	45	–	–	V	I_R = 0.5mA
Forward Voltage Drop	V_F	– – – –	0.42 0.37 0.53 0.50	– – 0.58 –	V	I_F = 5A, T_J = +25°C I_F = 5A, T_J = +125°C I_F = 10A, T_J = +25°C I_F = 10A, T_J = +125°C
Leakage Current (Note 6)	I_R	– –	150 50	300 –	µA mA	V_R = 45V, T_J = +25°C V_R = 45V, T_J = +125°C
Total Capacitance	C_T	–	400	–	pF	V_R = 5V, f = 1MHz T_J = +25°C

Notes: 5. Device mounted on polymide substrate, 240mm^2 Copper pad, double-sided PC Board.
6. Short duration pulse test used to minimize self-heating effect.

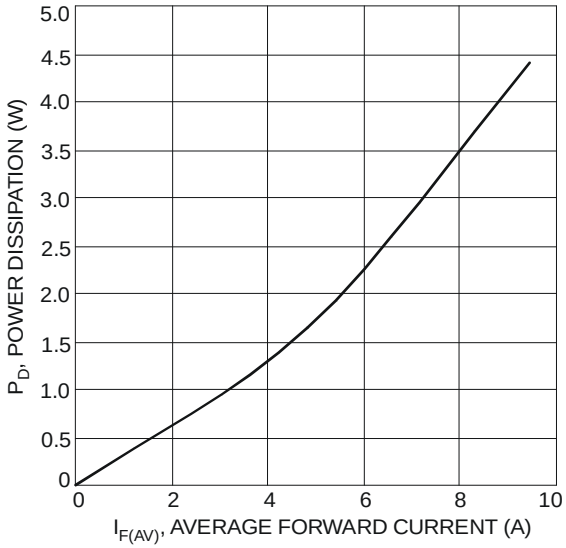


Fig. 1 Forward Power Dissipation

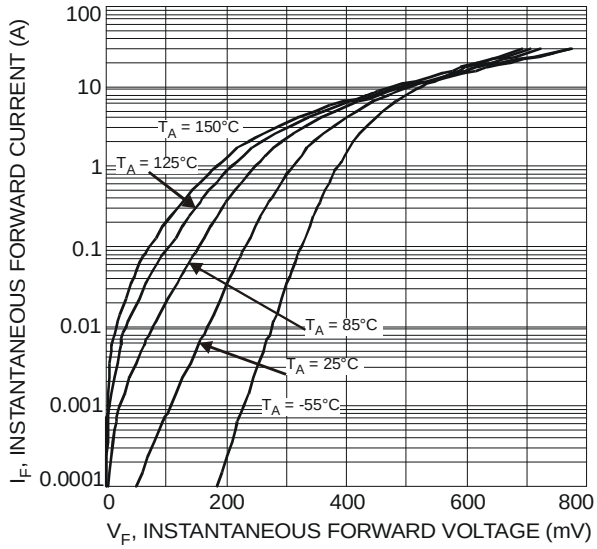


Fig. 2 Typical Forward Characteristics

Notes:7. Polymide, 2oz. Copper 16x minimum recommended pad layout per http://www.diodes.com

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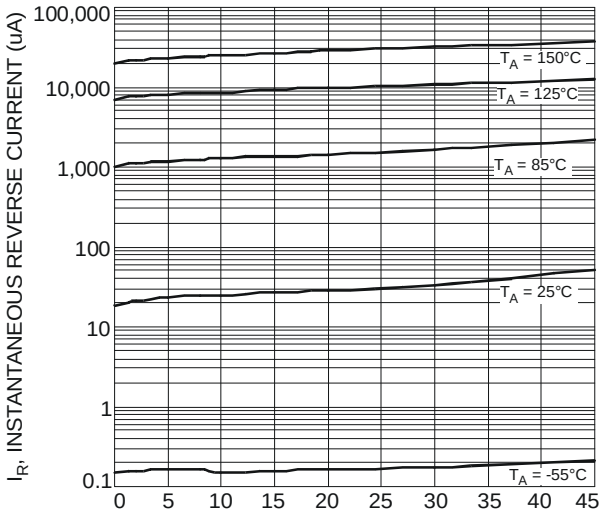

Fig. 3 Typical Reverse Characteristics

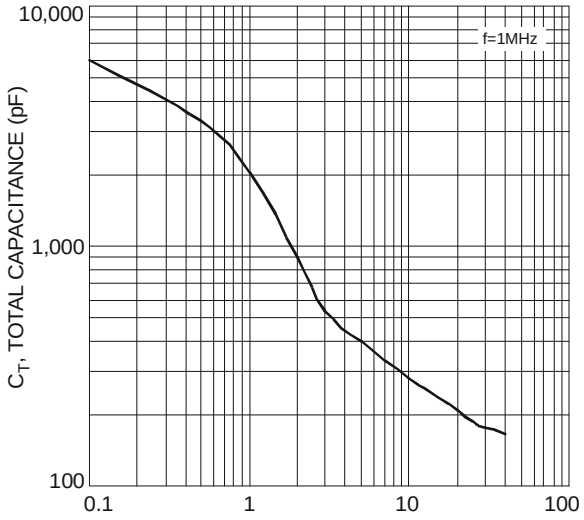

Fig. 4 Total Capacitance vs. Reverse Voltage

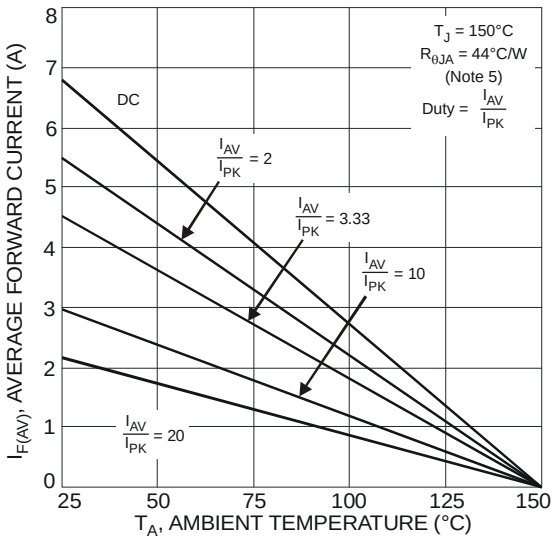

Fig. 5 Forward Current Derating Curve

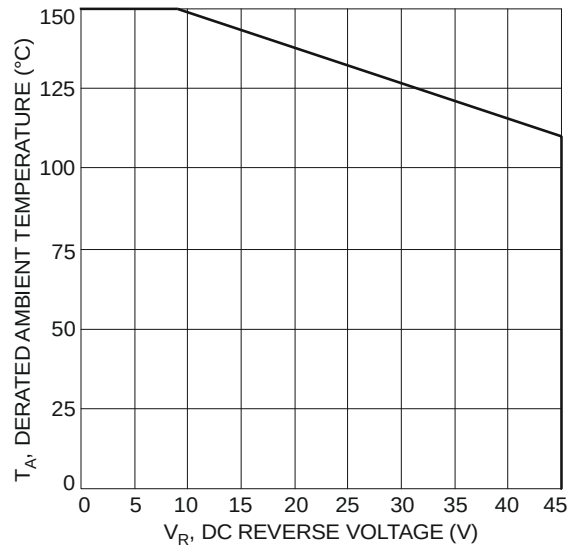

Fig. 6 Operating Temperature Derating

Notes:8. Polymide, 2oz. Copper 16x minimum recommended pad layout per http://www.diodes.com

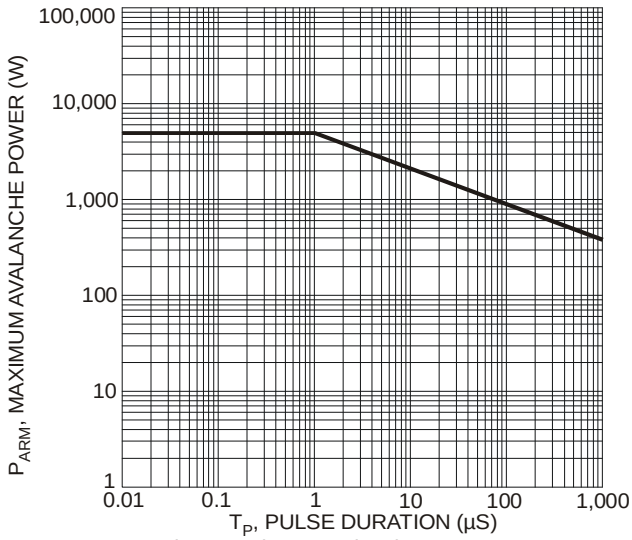

Fig. 7 Maximum Avalanche Power Curve

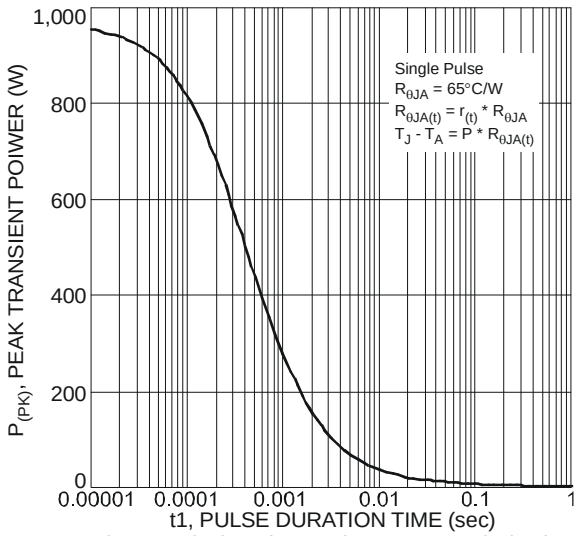

Figure 8 Single Pulse Maximum Power Dissipation

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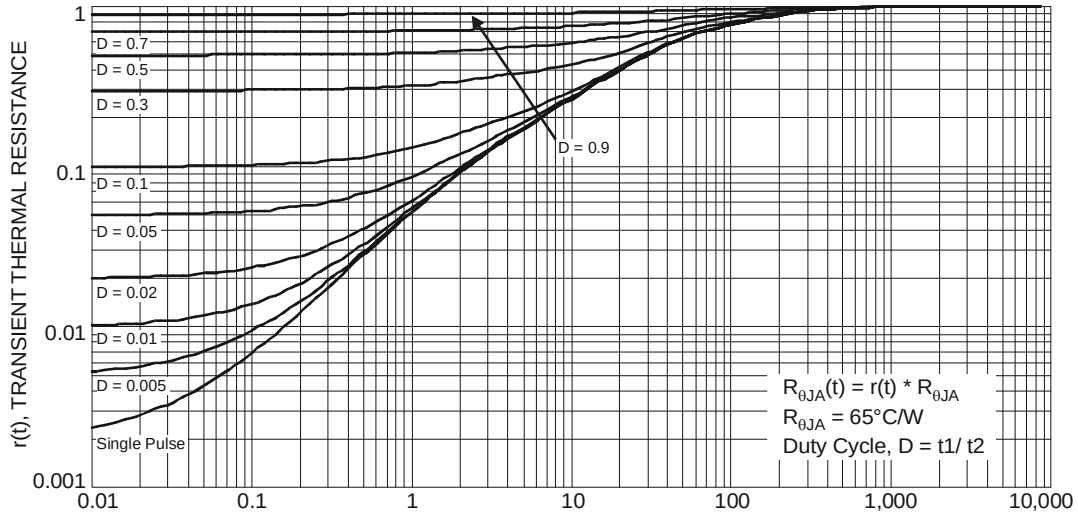
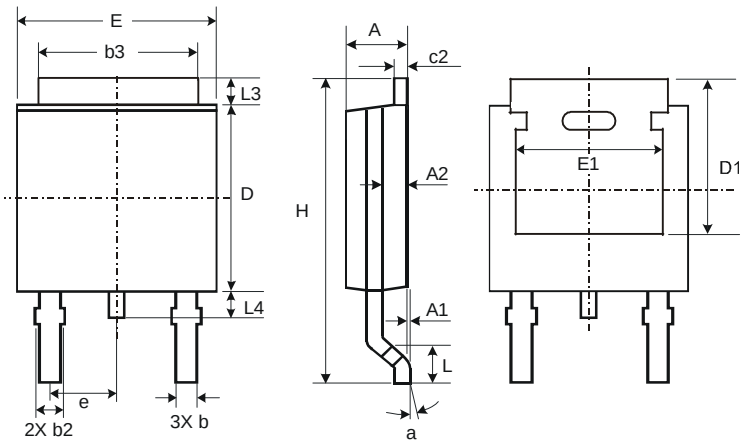


Figure 9 Transient Thermal Resistance

Package Outline Dimensions

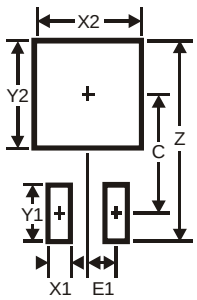
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.



TO252			
Dim	**Min**	**Max**	**Typ**
A	2.19	2.39	2.29
A1	0.00	0.13	0.08
A2	0.97	1.17	1.07
b	0.64	0.88	0.783
b2	0.76	1.14	0.95
b3	5.21	5.46	5.33
c2	0.45	0.58	0.531
D	6.00	6.20	6.10
D1	5.21	–	–
e	–	–	2.286
E	6.45	6.70	6.58
E1	4.32	–	–
H	9.40	10.41	9.91
L	1.40	1.78	1.59
L3	0.88	1.27	1.08
L4	0.64	1.02	0.83
a	0°	10°	–
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)
Z	11.6
X1	1.5
X2	7.0
Y1	2.5
Y2	7.0
C	6.9
E1	2.3

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