# 1.0A SBR®
# SURFACE MOUNT SUPER BARRIER RECTIFIER

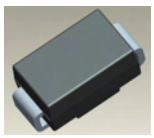
## Features

- Ultra Low Forward Voltage Drop
- Excellent High Temperature Capability
- Patented Super Barrier Rectifier Technology
- Soft, Fast Switching Capability
- 150ºC Operating Junction Temperature
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Notes 3 & 4)**
- **Qualified to AEC-Q101 Standards for High Reliability**

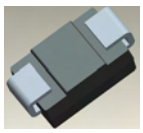
## Mechanical Data

- Case: SMA
- Case Material: Molded Plastic, UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: Lead Free Plating (Matte Tin Finish.) Solderable per MIL-STD-202, Method 208 e3
- Polarity Indicator: Cathode Band
- Weight: 0.064 grams (approximate)

SMA



Top View



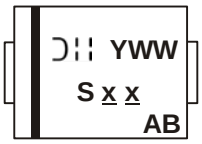
Bottom View

## Ordering Information (Note 5)

| Part Number | Case | Packaging |
|---|---|---|
| SBR1U150SA-13 | SMA | 5000/Tape & Reel |
| SBR1U150SAQ-13 | SMA | 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 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. Product manufactured with Date Code 0924 (week 24, 2009) and newer are built with Green Molding Compound.
5. For packaging details, go to our website at http://www.diodes.com.

## Marking Information




S D B, S V B = Product Type Marking Code
= Manufacturers' Code Marking
YWW = Date Code Marking
Y = Last digit of year (ex: 7 for 2007)
WW = Week code (01 to 53)
AB = Foundry and Assembly Code

## 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<br>Working Peak Reverse Voltage<br>DC Blocking Voltage | $V_{RRM}$<br>$V_{RWM}$<br>$V_{RM}$ | 150 | V |
| RMS Reverse Voltage | $V_{R(RMS)}$ | 106 | V |
| Average Rectified Output Current (See Figure 1) | $I_O$ | 1.0 | A |
| Non-Repetitive Peak Forward Surge Current 8.3ms<br>Single Half Sine-Wave Superimposed on Rated Load | $I_{FSM}$ | 42 | A |
| Repetitive Peak Avalanche Power (1μS, +25°C) | $P_{ARM}$ | 6,000 | W |

## Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|---|---|---|---|
| Thermal Resistance Junction to Soldering (Note 6) | $R_{\theta JS}$ | 3 | °C/W |
| Thermal Resistance Junction to Ambient (Note 7) | $R_{\theta JA}$ | 119 | |
| Thermal Resistance Junction to Ambient (Note 8) | $R_{\theta JA}$ | 88 | |
| Operating and Storage Temperature Range | $T_J$, $T_{STG}$ | -65 to +150 | °C |

## Electrical Characteristics (@$T_A$ = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|---|---|---|---|---|---|---|
| Reverse Breakdown Voltage (Note 9) | $V_{(BR)R}$ | 150 | - | - | V | $I_R$ = 100μA |
| Forward Voltage Drop | $V_F$ | - | - | 0.70 | V | $I_F$ = 1.0A, $T_J$ = +25ºC |
| | | - | - | 0.56 | | $I_F$ = 1.0A, $T_J$ = +125ºC |
| Leakage Current (Note 9) | $I_R$ | - | - | 0.1 | mA | $V_R$ = 150V, $T_J$ = +25ºC |
| | | - | - | 10 | mA | $V_R$ = 150V, $T_J$ = +125ºC |

Notes:
6. Theoretical $R_{\theta JS}$ calculated from the top center of the die straight down to the PCB cathode tab solder junction.
7. FR-4 PCB, 2 oz. Copper, minimum recommended pad layout per http://www.diodes.com/datasheets/ap02001.pdf. $T_A$ = 25ºC
8. Polymide PCB, 2 oz. Copper, minimum recommended pad layout per http://www.diodes.com
9. Short duration pulse test used to minimize self-heating effect.

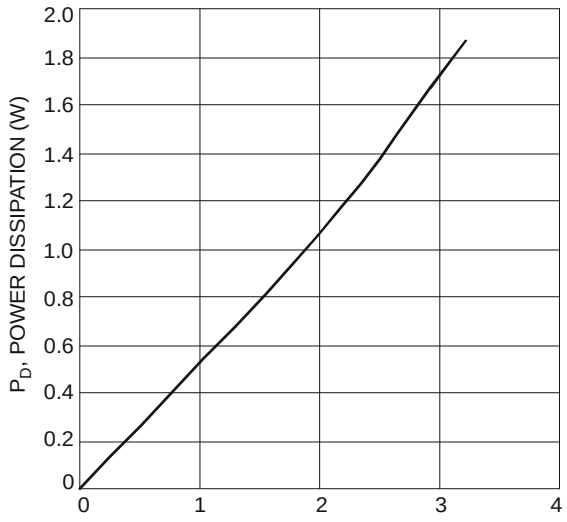



Fig. 1 Forward Power Dissipation

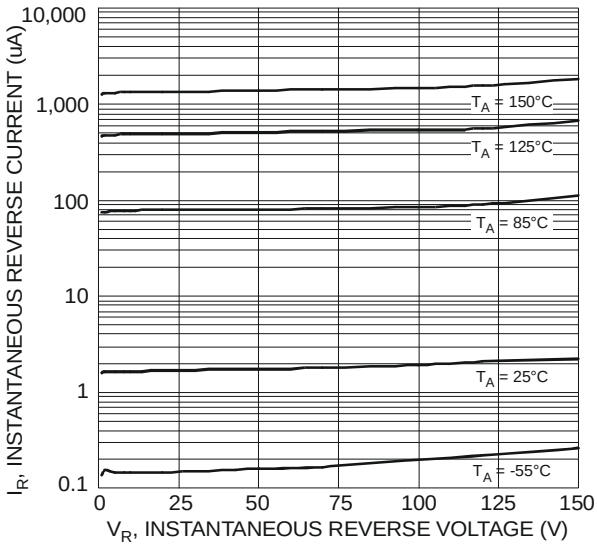



Fig. 2 Typical Reverse Characteristics

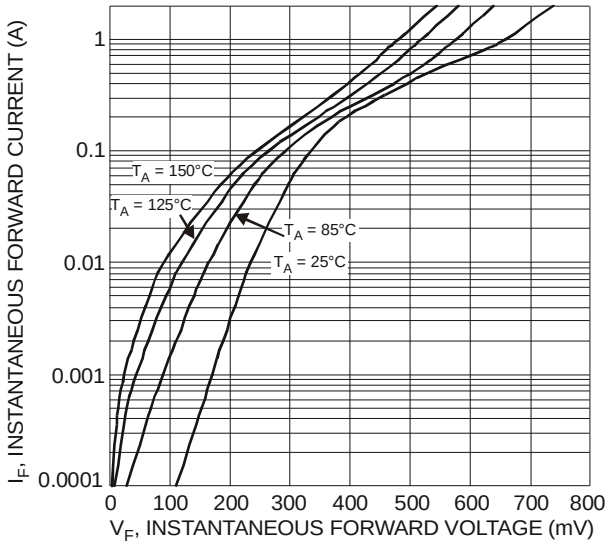



Fig. 3 Typical Forward Characteristics

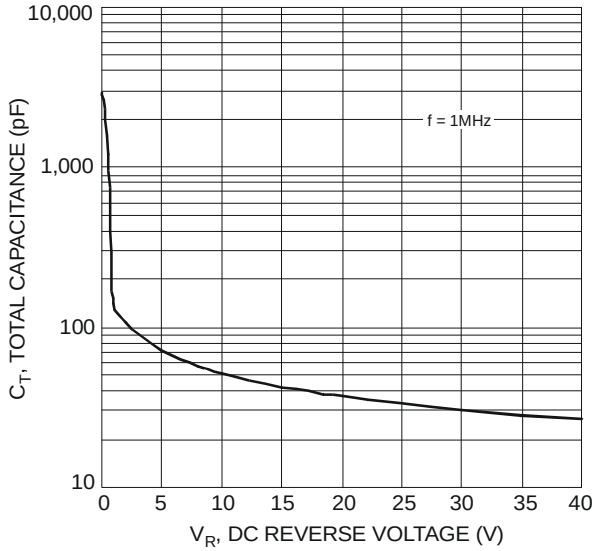



Fig. 4 Total Capacitance vs. Reverse Voltage

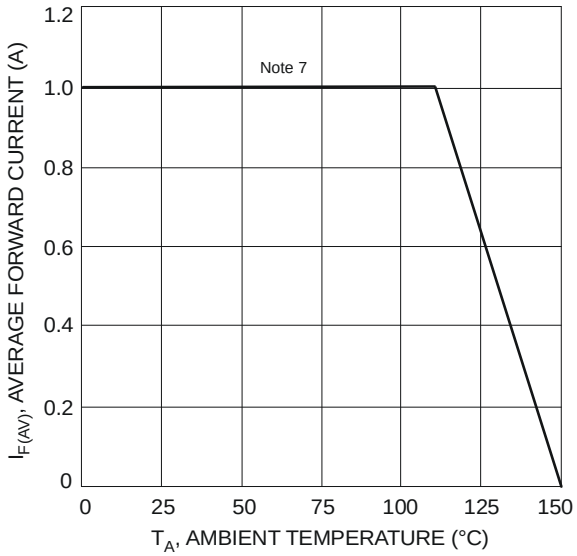



Fig. 5 DC Forward Current Derating Curve

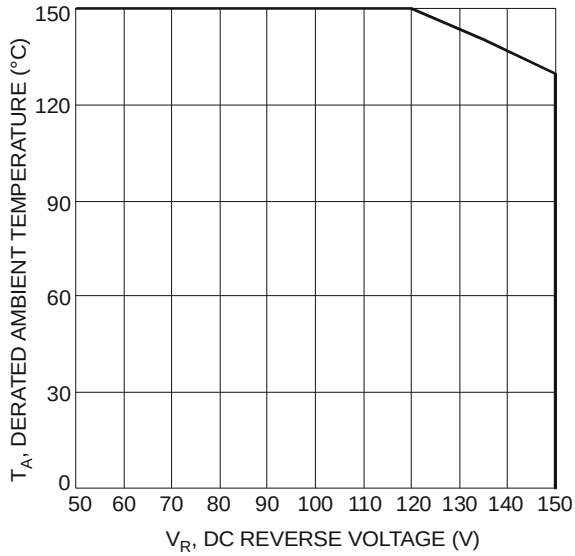



Fig. 6 Operating Temperature Derating

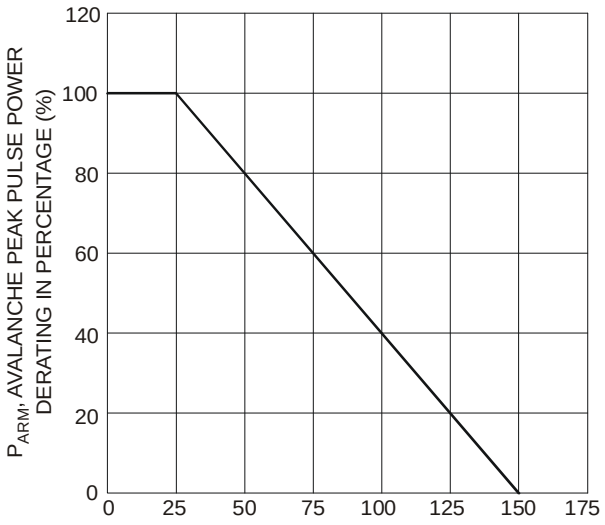



Fig. 7 Pulse Derating Curve

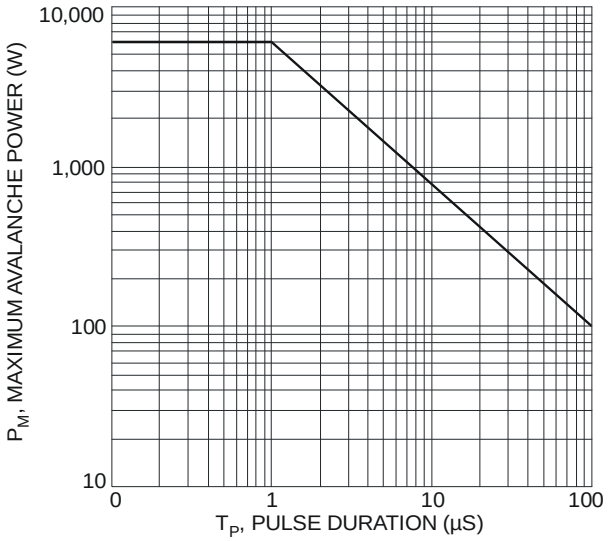
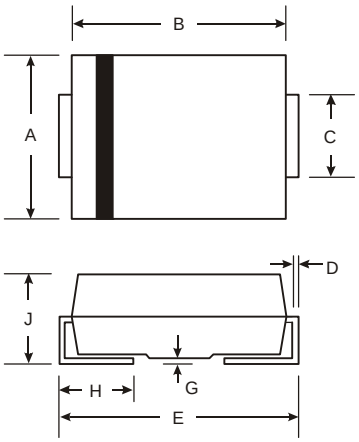



Fig. 8 Maximum Avalanche Power vs. Pulse Duration

## Package Outline Dimensions

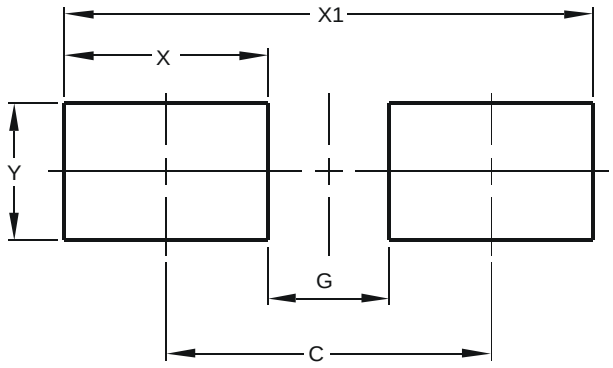
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.




| SMA | | |
|---|---|---|
| **Dim** | **Min** | **Max** |
| **A** | 2.29 | 2.92 |
| **B** | 4.00 | 4.60 |
| **C** | 1.27 | 1.63 |
| **D** | 0.15 | 0.31 |
| **E** | 4.80 | 5.59 |
| **G** | 0.05 | 0.20 |
| **H** | 0.76 | 1.52 |
| **J** | 2.01 | 2.30 |
| **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** | 4.00 |
| **G** | 1.50 |
| **X** | 2.50 |
| **X1** | 6.50 |
| **Y** | 1.70 |

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