

## Product Summary

| $V_{RRM}$ (V) | $I_O$ (A) | $V_F$ Max (V)<br>$T_A = +25^\circ\text{C}$ | $I_R$ Max (mA)<br>$T_A = +25^\circ\text{C}$ |
|---------------|-----------|--------------------------------------------|---------------------------------------------|
| 150           | 1.0       | 0.7                                        | 0.1                                         |

## Applications

- Polarity Protection Diode
- Re-Circulating Diode
- Blocking Diode
- DC-DC
- AC-DC

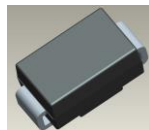
## Features and Benefits

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

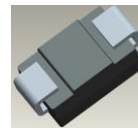
## Mechanical Data

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

SMA



Top View



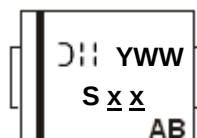
Bottom View

## Ordering Information (Note 5)

| Part Number    | Case | Packaging        |
|----------------|------|------------------|
| 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/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. Automotive products are AEC-Q101 qualified and are PPAP capable. Refer to [http://www.diodes.com/product\\_compliance\\_definitions.html](http://www.diodes.com/product_compliance_definitions.html).
  5. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

## Marking Information



SDB, SVB = 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<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>    | 150   | V    |
| Working Peak Reverse Voltage                     | V <sub>RWM</sub>    |       |      |
| DC Blocking Voltage                              | V <sub>RM</sub>     |       |      |
| RMS Reverse Voltage                              | V <sub>R(RMS)</sub> | 106   | V    |
| Average Rectified Output Current (See Figure 1)  | I <sub>O</sub>      | 1.0   | A    |
| Non-Repetitive Peak Forward Surge Current 8.3ms  | I <sub>FSM</sub>    | 42    | A    |
| Single Half Sine-Wave Superimposed on Rated Load |                     |       |      |
| Repetitive Peak Avalanche Power (1μS, +25°C)     | P <sub>ARM</sub>    | 6,000 | W    |

## Thermal Characteristics

| Characteristic                                    | Symbol                            | Value       | Unit |
|---------------------------------------------------|-----------------------------------|-------------|------|
| Thermal Resistance Junction to Soldering (Note 6) | R <sub>θJS</sub>                  | 3           | °C/W |
| Thermal Resistance Junction to Ambient (Note 7)   | R <sub>θJA</sub>                  | 119         |      |
| Thermal Resistance Junction to Ambient (Note 8)   | R <sub>θJA</sub>                  | 88          |      |
| Operating and Storage Temperature Range           | T <sub>J</sub> , T <sub>STG</sub> | -65 to +150 | °C   |

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

| Characteristic                     | Symbol             | Min | Typ | Max  | Unit | Test Condition                                 |
|------------------------------------|--------------------|-----|-----|------|------|------------------------------------------------|
| Reverse Breakdown Voltage (Note 9) | V <sub>(BR)R</sub> | 150 | -   | -    | V    | I <sub>R</sub> = 100μA                         |
| Forward Voltage Drop               | V <sub>F</sub>     | -   | -   | 0.70 | V    | I <sub>F</sub> = 1.0A, T <sub>J</sub> = +25°C  |
|                                    |                    | -   | -   | 0.56 |      | I <sub>F</sub> = 1.0A, T <sub>J</sub> = +125°C |
| Leakage Current (Note 9)           | I <sub>R</sub>     | -   | -   | 0.1  | mA   | V <sub>R</sub> = 150V, T <sub>J</sub> = +25°C  |
|                                    |                    | -   | -   | 10   | mA   | V <sub>R</sub> = 150V, T <sub>J</sub> = +125°C |

- Notes:
- Theoretical R<sub>θJS</sub> calculated from the top center of the die straight down to the PCB cathode tab solder junction.
  - FR-4 PCB, 2 oz. Copper, minimum recommended pad layout per [http://www.diodes.com/\\_files/datasheets/ap02001.pdf](http://www.diodes.com/_files/datasheets/ap02001.pdf). T<sub>A</sub> = +25°C.
  - Polymide PCB, 2 oz. Copper, minimum recommended pad layout per [http://www.diodes.com/\\_files/datasheets/ap02001.pdf](http://www.diodes.com/_files/datasheets/ap02001.pdf).
  - Short duration pulse test used to minimize self-heating effect.

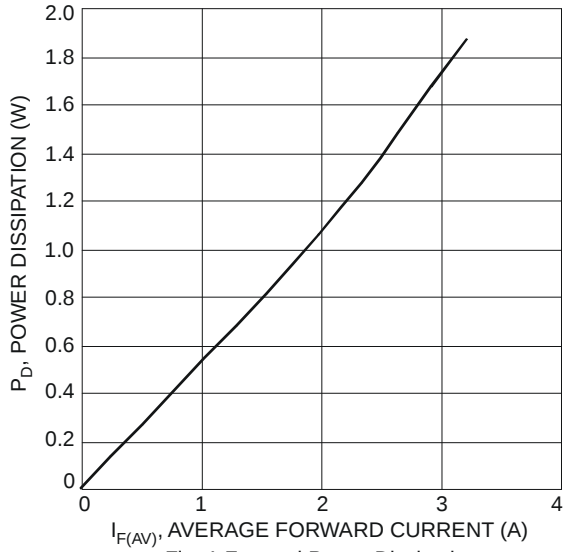


Fig. 1 Forward Power Dissipation

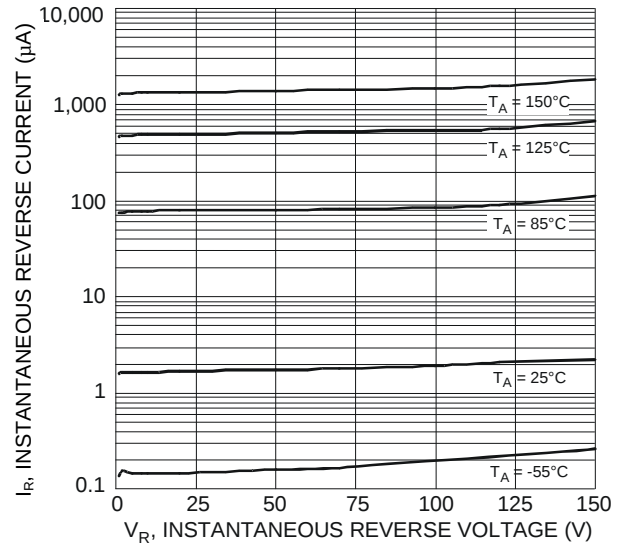


Fig. 2 Typical Reverse Characteristics

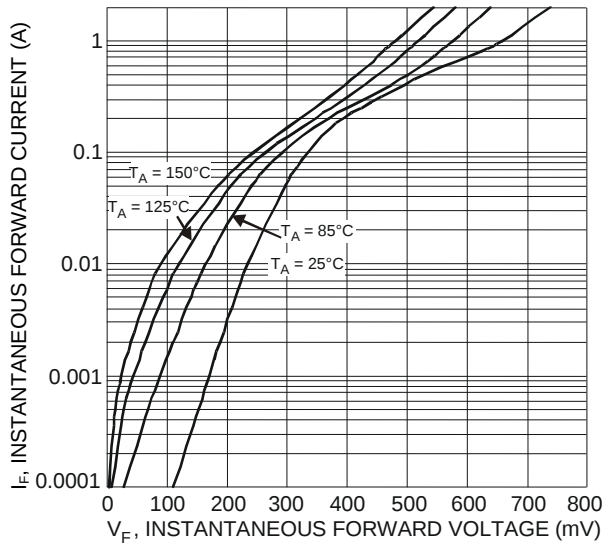


Fig. 3 Typical Forward Characteristics

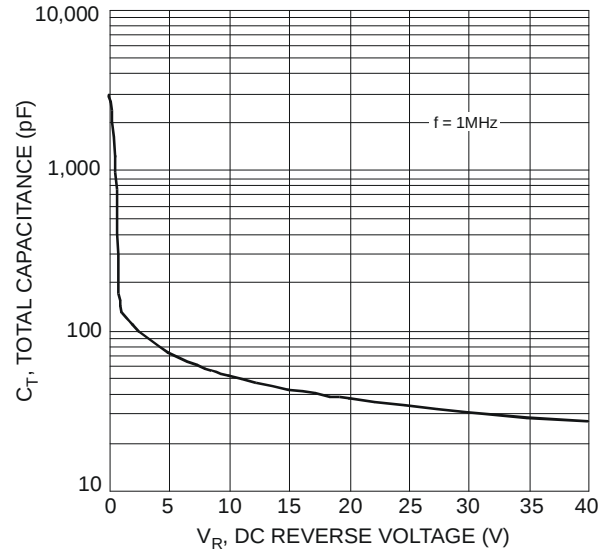


Fig. 4 Total Capacitance vs. Reverse Voltage

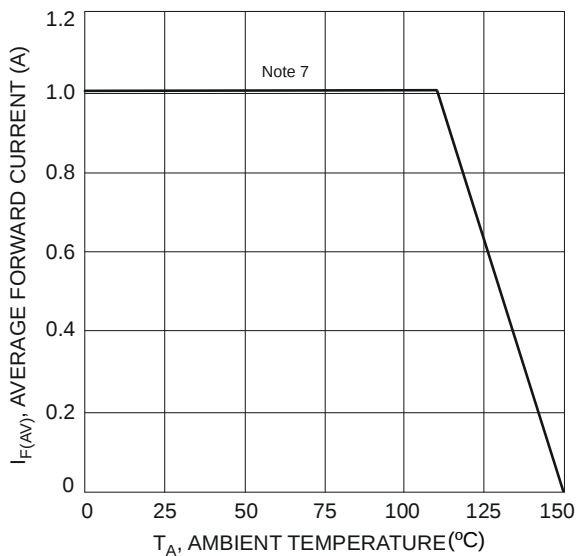


Fig. 5 DC Forward Current Derating Curve

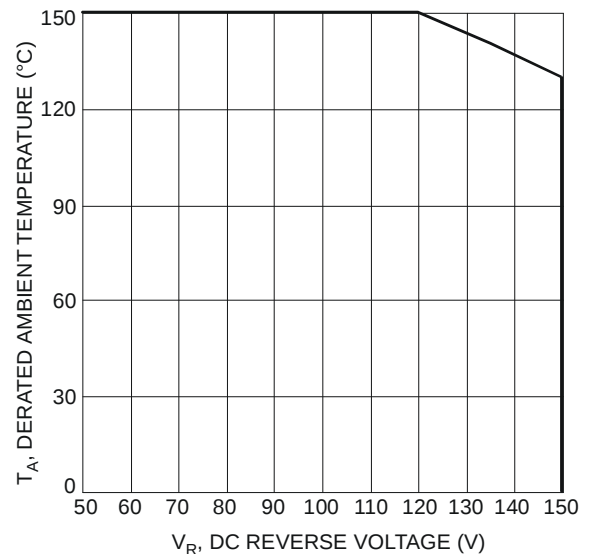


Fig. 6 Operating Temperature Derating

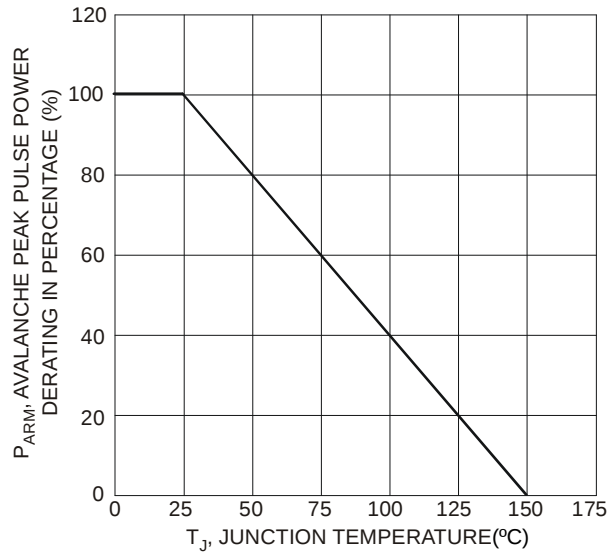


Fig. 7 Pulse Derating Curve

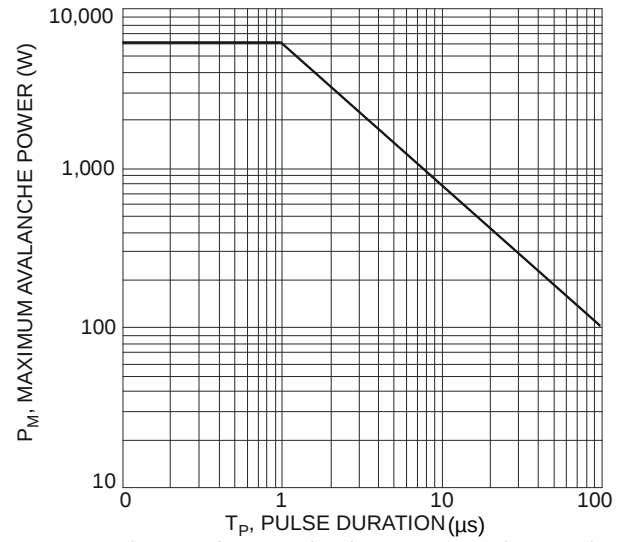
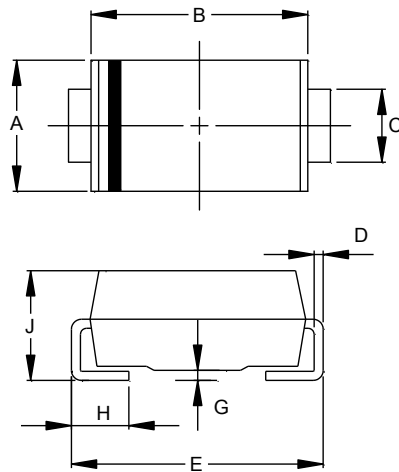


Fig. 8 Maximum Avalanche Power vs. Pulse Duration

## Package Outline Dimensions

Please see AP02001 at [http://www.diodes.com/\\_files/datasheets/ap02001.pdf](http://www.diodes.com/_files/datasheets/ap02001.pdf) for the latest version.

### SMA

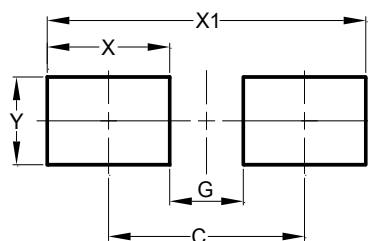


| SMA                  |      |      |
|----------------------|------|------|
| Dim                  | Min  | Max  |
| A                    | 2.29 | 2.92 |
| B                    | 4.00 | 4.60 |
| C                    | 1.27 | 1.63 |
| D                    | 0.15 | 0.31 |
| E                    | 4.80 | 5.59 |
| G                    | 0.05 | 0.20 |
| H                    | 0.76 | 1.52 |
| J                    | 1.96 | 2.40 |
| All Dimensions in mm |      |      |

## Suggested Pad Layout

Please see AP02001 at [http://www.diodes.com/\\_files/datasheets/ap02001.pdf](http://www.diodes.com/_files/datasheets/ap02001.pdf) for the latest version.

### SMA



| Dimensions | Value (in mm) |
|------------|---------------|
| C          | 4.00          |
| G          | 1.50          |
| X          | 2.50          |
| X1         | 6.50          |
| Y          | 1.70          |

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