

**Product Summary** (@ T<sub>A</sub> = +25°C)

| V <sub>RRM</sub> (V) | I <sub>o</sub> (A) | V <sub>F(MAX)</sub> (V) | I <sub>R(MAX)</sub> (μA) |
|----------------------|--------------------|-------------------------|--------------------------|
| 40                   | 1                  | 0.5                     | 500                      |

**Applications**

- SMPS
- DC-DC Converter
- Freewheeling Diodes

**Features and Benefits**

- Low Leakage Current
- 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 (Note 3)**

**Mechanical Data**

- Case: SMA
- Case Material: Molded Plastic, "Green" Molding Compound. 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 <sup>Ⓔ</sup>
- Polarity Indicator: Cathode Band
- Weight: 0.064 grams (Approximate)



Top View

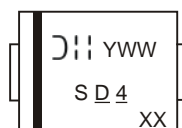


Bottom View

**Ordering Information** (Note 4)

| Part Number  | Case | Packaging        |
|--------------|------|------------------|
| SBR1A40SA-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. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

**Marking Information**


- S D 4 = Product Type Marking Code  
 J 1 1 = Manufacturers' code marking  
 YWW = Date Code Marking  
 Y = Last digit of year (ex: 9 for 2009)  
 WW = Week code (01 - 53)  
 XX = Foundry and Assembly

### 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  | $V_{RRM}$ | 40    | V    |
| Working Peak Reverse Voltage   | $V_{RWM}$ |       |      |
| DC Blocking Voltage  | $V_{RM}$  |       |      |
| Average Rectified Output Current (See Figure 1)  | $I_O$     | 1     | A    |
| Non-Repetitive Peak Forward Surge Current 8.3ms Single Half Sine-Wave Superimposed on Rated Load | $I_{FSM}$ | 15    | A    |

### Thermal Characteristics

| Characteristic   | Symbol          | Value       | Unit               |
|--|-----------------|-------------|--------------------|
| Typical Thermal Resistance, Junction to Ambient (Note 5) | $R_{\theta JA}$ | 116         | $^\circ\text{C/W}$ |
| Operating and Storage Temperature Range                  | $T_J, T_{STG}$  | -65 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     | $V_F$  | -   | -   | 0.5  | V                   | $I_F = 1.0\text{A}, T_J = +25^\circ\text{C}$  |
|                          |        |     |     | 0.45 |                     | $I_F = 1.0\text{A}, T_J = +125^\circ\text{C}$ |
| Leakage Current (Note 6) | $I_R$  | -   | -   | 500  | $\mu\text{A}$<br>mA | $V_R = 40\text{V}, T_J = +25^\circ\text{C}$   |
|                          |        |     |     | 100  |                     | $V_R = 40\text{V}, T_J = +100^\circ\text{C}$  |

Notes: 5. Device mounted on Polyimide substrate, with 1" x 1", 2 oz. Copper, double-sided PCB board.  
6. Short duration pulse test used to minimize self-heating effect.

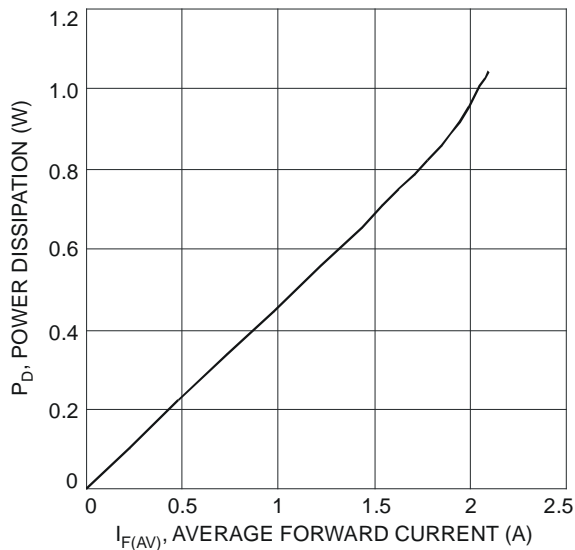


Fig. 1 Forward Power Dissipation

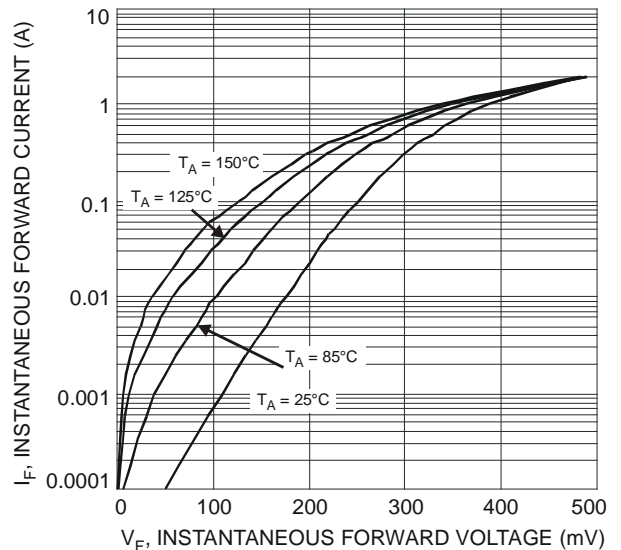


Fig. 2 Typical Forward Characteristics

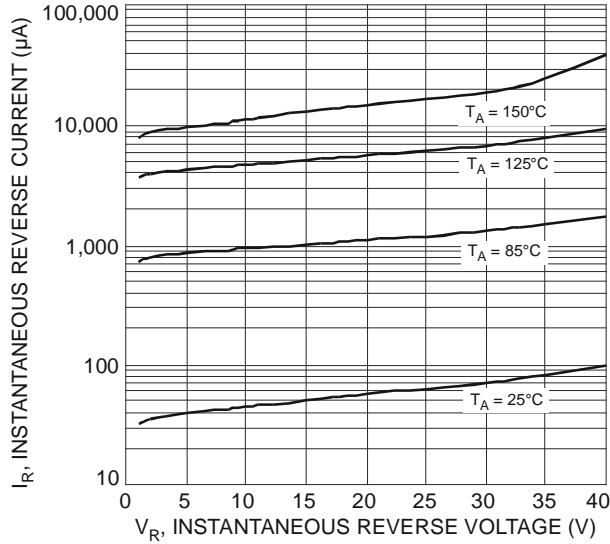


Fig. 3 Typical Reverse Characteristics

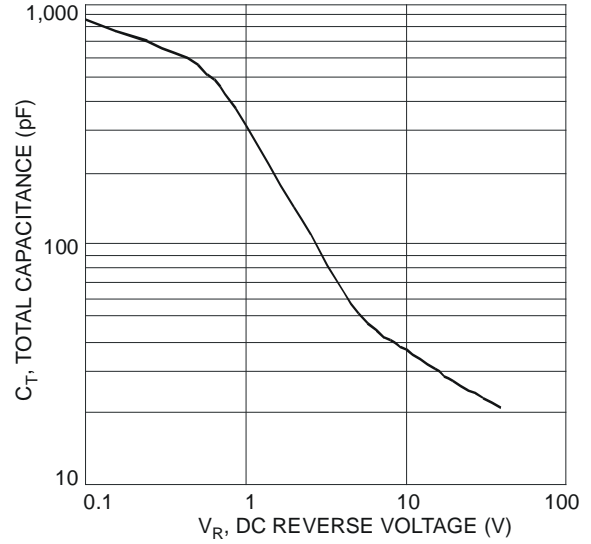


Fig. 4 Total Capacitance vs. Reverse Voltage

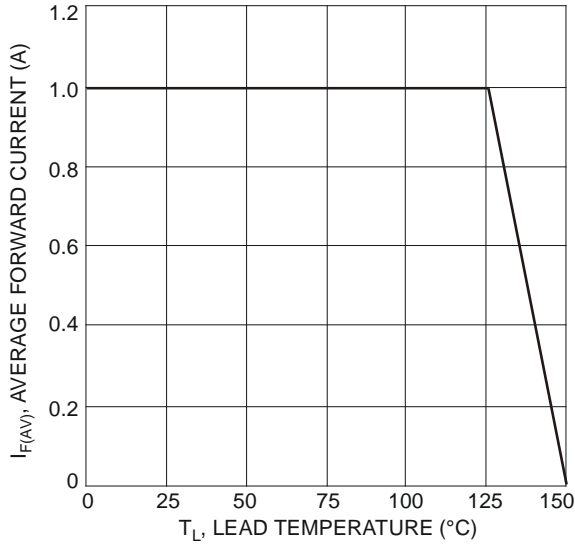


Fig. 5 Forward Current Derating Curve

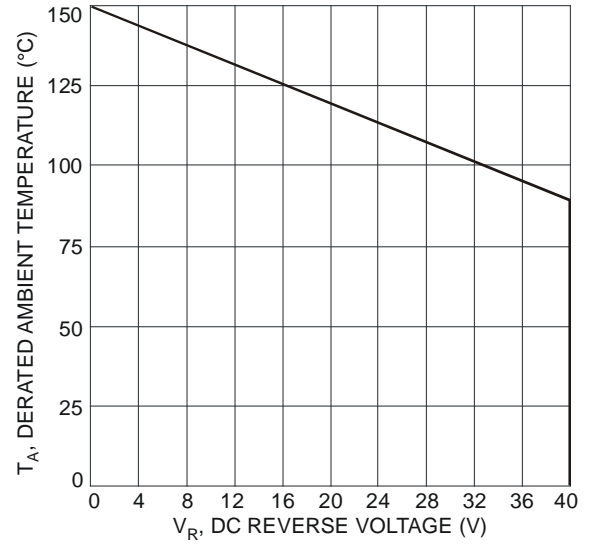
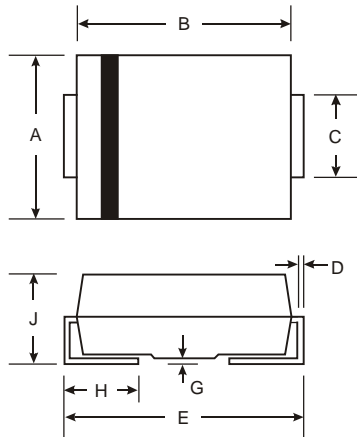


Fig. 6 Operating Temperature Derating

**Package Outline Dimensions**

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

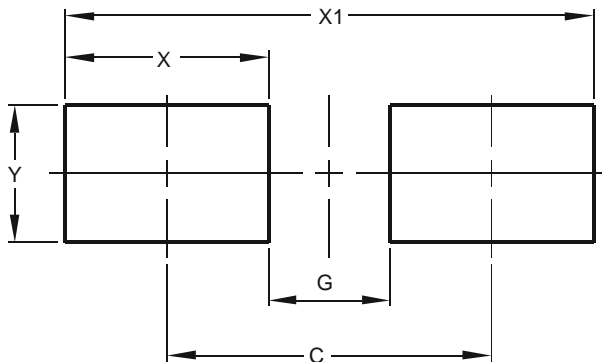


| SMA |      |      |
|-----|------|------|
| Dim | Min  | Max  |
| A   | 2.29 | 2.92 |
| B   | 4.00 | 4.60 |
| C   | 1.27 | 1.63 |
| D   | 0.15 | 0.31 |
| E   | 4.80 | 5.59 |
| G   | 0.05 | 0.20 |
| H   | 0.76 | 1.52 |
| J   | 2.01 | 2.30 |

All Dimensions in mm

## Suggested Pad Layout

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



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

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