

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

| V <sub>RRM</sub> (V) | I <sub>O</sub> (A) | V <sub>F(MAX)</sub> (mV) | I <sub>R(MAX)</sub> (μA) |
|----------------------|--------------------|--------------------------|--------------------------|
| 40                   | 3                  | 500                      | 400                      |

**Features and Benefits**

- Low Leakage Current
- Patented Super Barrier Rectifier Technology (SBR®)
- 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)**
- **The SBR3A40SAQ is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.**

<https://www.diodes.com/quality/product-definitions/>

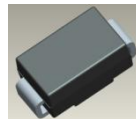
**Applications**

- SMPS
- AC-DC
- DC-DC converters
- Freewheeling diodes

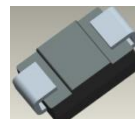
**Mechanical Data**

- Package: SMA
- Package 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 ③
- Polarity Indicator: Cathode Band
- Weight: 0.064 grams (Approximate)

SMA



Top View

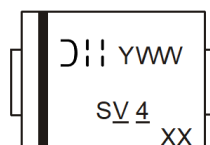


Bottom View

**Ordering Information** (Note 4)

| Orderable Part Number | Package | Packing |             |
|-----------------------|---------|---------|-------------|
|                       |         | Qty.    | Carrier     |
| SBR3A40SA-13          | SMA     | 5,000   | Tape & Reel |
| SBR3A40SAQ-13         | SMA     | 5,000   | Tape & Reel |

- Notes:
1. EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
  2. See <https://www.diodes.com/quality/lead-free/> 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 <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

**Marking Information** (Note 5)


SV 4 = Product Type Marking Code  
 DII = Manufacturer's Code Marking  
 YWW = Date Code Marking  
 A Bar or Underline around the Date Code or Product Type Marking Code Denotes Assembly Site if Marked.  
 Y = Last Digit of Year (ex: 6 for 2026)  
 WW = Week Code 01 to 52  
 XX = Foundry and Assembly Site

Note: 5. Device has a cathode band (as shown above) and may also have a cathode notch.

SBR® is a registered trademark of Diodes Incorporated.

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

Single phase, half wave, 60Hz, resistive or inductive load  
For capacitive load, derate current by 20%.

| Characteristic                                                                                      | Symbol              | Value  | Unit |
|-----------------------------------------------------------------------------------------------------|---------------------|--------|------|
| Peak Repetitive Reverse Voltage                                                                     | V <sub>RRM</sub>    | 40     | V    |
| Working Peak Reverse Voltage                                                                        | V <sub>RWM</sub>    |        |      |
| DC Blocking Voltage                                                                                 | V <sub>RM</sub>     |        |      |
| Maximum Voltage Rate of Change (Rated V <sub>R</sub> )                                              | dv/dt               | 10,000 | V/μs |
| RMS Reverse Voltage                                                                                 | V <sub>R(RMS)</sub> | 28     | V    |
| Average Rectified Output Current                                                                    | I <sub>O</sub>      | 3      | A    |
| Non-Repetitive Peak Forward Surge Current 8.3ms<br>Single Half Sine Wave Superimposed on Rated Load | I <sub>FSM</sub>    | 45     | A    |

## Thermal Characteristics

| Characteristic                                     | Symbol                            | Value       | Unit |
|----------------------------------------------------|-----------------------------------|-------------|------|
| Maximum Thermal Resistance                         | R <sub>θJS</sub>                  | 5           | °C/W |
| Thermal Resistance Junction to Soldering (Note 6)  | R <sub>θJA</sub>                  | 124         |      |
| Thermal Resistance Junction to Ambient (Note 7)    | R <sub>θJC</sub>                  | 14.3        |      |
| Thermal Resistance Junction to Case (Note 7)       |                                   |             |      |
| Power Dissipation (Note 7) @T <sub>A</sub> = +25°C | P <sub>D</sub>                    | 1.2         | W    |
| Operating and Storage Temperature Range (Note 8)   | 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> | 40  | —    | —    | V    | I <sub>R</sub> = 0.4mA                                                 |
| Forward Voltage Drop               | V <sub>F</sub>     | —   | 0.30 | 0.35 | V    | I <sub>F</sub> = 0.5A, T <sub>J</sub> = +25°C                          |
|                                    |                    | —   | 0.33 | 0.38 |      | I <sub>F</sub> = 1.0A, T <sub>J</sub> = +25°C                          |
|                                    |                    | —   | 0.43 | 0.50 |      | I <sub>F</sub> = 3.0A, T <sub>J</sub> = +25°C                          |
|                                    |                    | —   | —    | 0.48 |      | I <sub>F</sub> = 3.0A, T <sub>J</sub> = +125°C                         |
| Leakage Current (Note 9)           | I <sub>R</sub>     | —   | 45   | 250  | μA   | V <sub>R</sub> = 5V, T <sub>J</sub> = +25°C                            |
|                                    |                    | —   | 80   | 400  | μA   | V <sub>R</sub> = 40V, T <sub>J</sub> = +25°C                           |
|                                    |                    | —   | 9    | 40   | mA   | V <sub>R</sub> = 40V, T <sub>J</sub> = +125°C                          |
| Junction Capacitance               | C <sub>J</sub>     | —   | 130  | —    | pF   | V <sub>R</sub> = 4V, T <sub>J</sub> = +25°C                            |
| Reverse-Recovery Time              | t <sub>RR</sub>    | —   | 12   | —    | ns   | I <sub>F</sub> = 0.5A, I <sub>R</sub> = 1A,<br>I <sub>RR</sub> = 0.25A |

- Notes:
6. Theoretical R<sub>θJS</sub> calculated from the top center of the die straight down to the PCB cathode tab solder junction.
  7. FR-4 PCB, 2oz. copper, minimum recommended pad layout per <http://www.diodes.com/package-outlines.html>.
  8. The heat generated must be less than thermal conductivity from junction-to-ambient: dP<sub>D</sub> / dT<sub>J</sub> < 1 / R<sub>θJA</sub>.
  9. Short duration pulse test used to minimize self-heating effect.

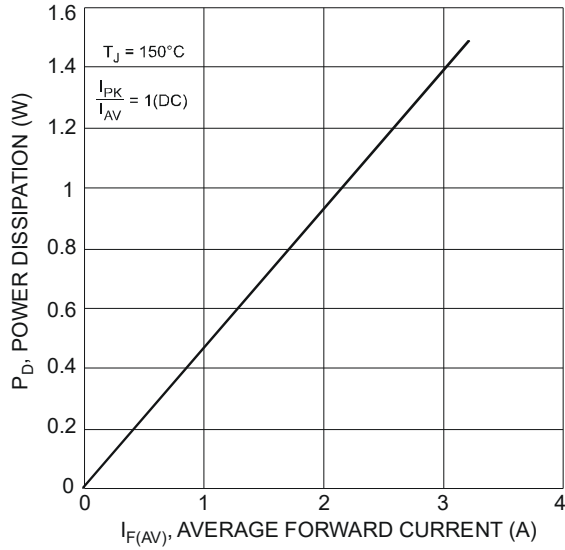


Fig. 1 Forward Power Dissipation

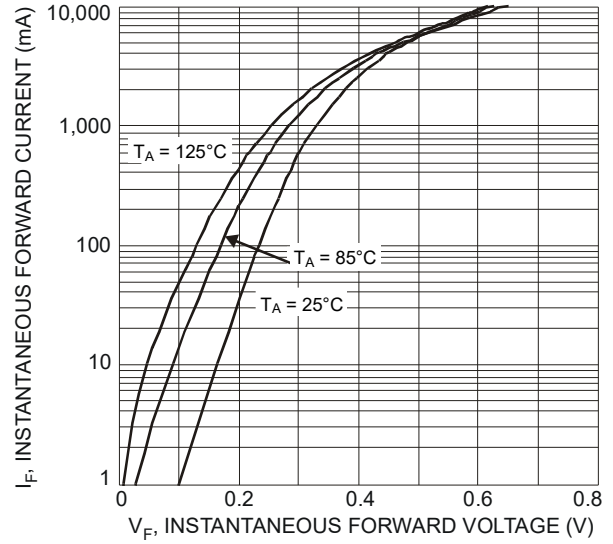


Fig. 2 Typical Forward Characteristics

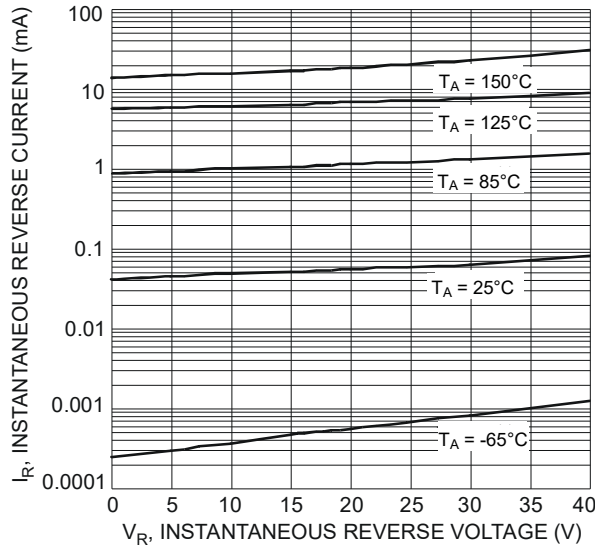


Fig. 3 Typical Reverse Characteristics

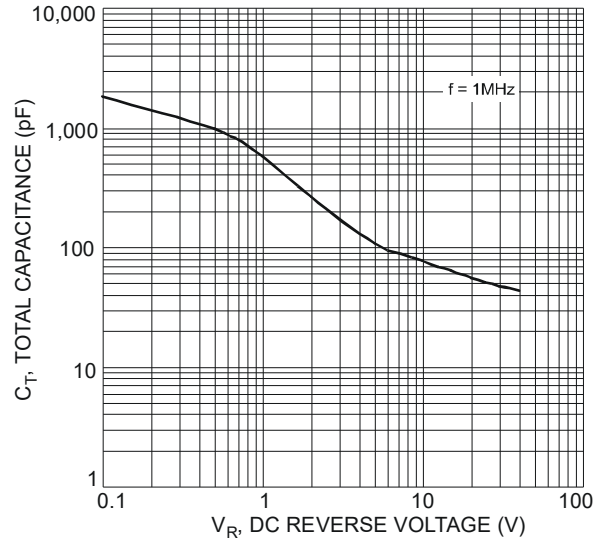


Fig. 4 Total Capacitance vs. Reverse Voltage

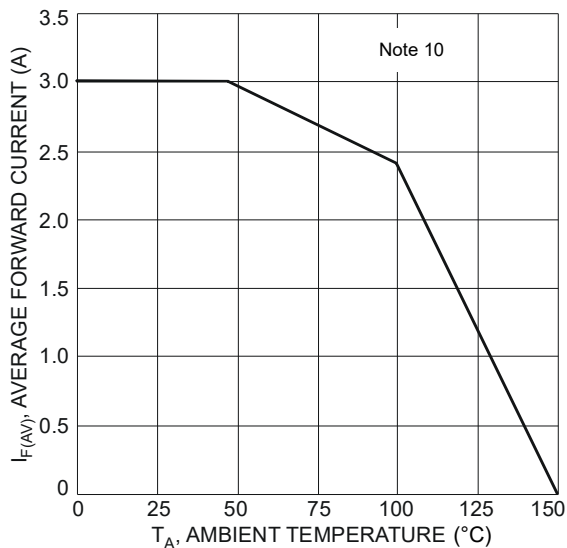


Fig. 5 Forward Current Derating Curve

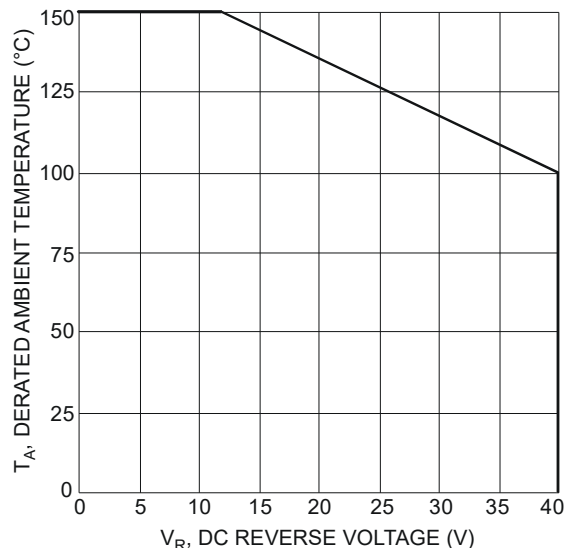
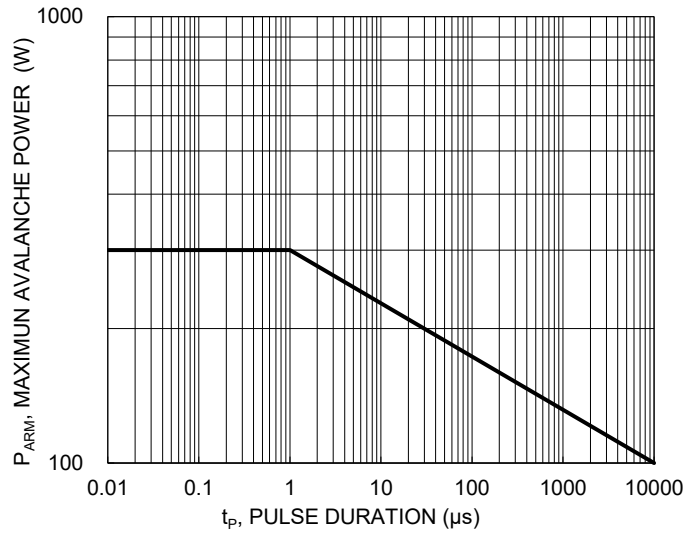


Fig. 6 Operating Temperature Derating

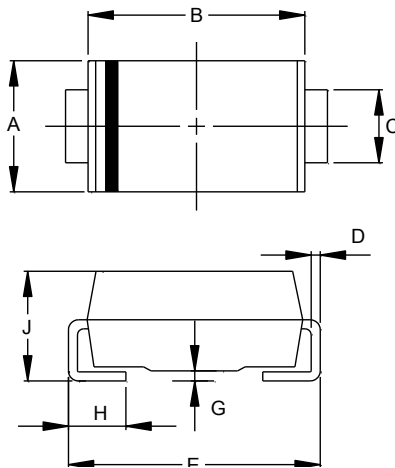
Note: 10. FR-4 PCB, 2oz. copper, single-side 16 x MRP, 1" x 1" PC board.



## Package Outline Dimensions

Please see <http://www.diodes.com/package-outlines.html> for the latest version.

### SMA

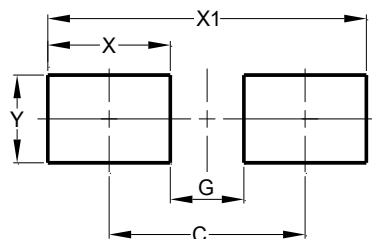


| SMA                  |      |      |
|----------------------|------|------|
| Dim                  | Min  | Max  |
| A                    | 2.29 | 2.92 |
| B                    | 4.00 | 4.60 |
| C                    | 1.27 | 1.63 |
| D                    | 0.15 | 0.31 |
| E                    | 4.80 | 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 <http://www.diodes.com/package-outlines.html> 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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