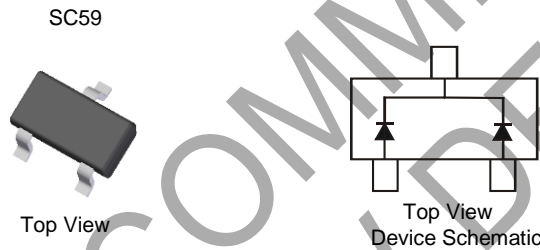


**Features**

- Ultra Low Forward Voltage Drop
- Superior Reverse Avalanche Capability
- Patented Super Barrier Rectifier (SBR<sup>®</sup>) 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)**
- **For automotive applications requiring specific change control (i.e.: parts qualified to AEC-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please refer to the related automotive grade (Q-suffix) part. A listing can be found at <https://www.diodes.com/products/automotive/automotive-products/>.**
- **This part is qualified to JEDEC standards (as references in AEC-Q) for High Reliability. <https://www.diodes.com/quality/product-definitions/>**

**Mechanical Data**

- Case: SC59
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Terminals: Matte Tin Finish Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 (e3)
- Polarity: See Diagram
- Weight: 0.008 grams (Approximate)

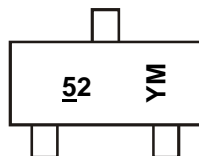


**Ordering Information** (Note 4)

| Part Number  | Case | Packaging        |
|--------------|------|------------------|
| SBR05U20SN-7 | SC59 | 3000/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**



52 = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: H = 2020)  
 M = Month (ex: 9 = September)

**Date Code Key**

| Year | 2008 | ... | 2020 | 2021 | 2022 | 2023 | 2024 | 2025 | 2026 | 2027 | 2028 | 2029 |
|------|------|-----|------|------|------|------|------|------|------|------|------|------|
| Code | V    | ... | H    | I    | J    | K    | L    | M    | N    | O    | P    | R    |

| Month | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Code  | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   | O   | N   | D   |

**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>    | 20    | V    |
| Working Peak Reverse Voltage                    | V <sub>RWM</sub>    |       |      |
| DC Blocking Voltage                             | V <sub>RM</sub>     |       |      |
| RMS Reverse Voltage                             | V <sub>R(RMS)</sub> | 14    | V    |
| Average Rectified Output Current (See Figure 1) | I <sub>O</sub>      | 500   | mA   |
| Non-Repetitive Peak Forward Surge Current       | I <sub>FSM</sub>    | 3     | A    |

**Thermal Characteristics**

| Characteristic                                   | Symbol                            | Value       | Unit |
|--|-----------------------------------|-------------|------|
| Maximum Thermal Resistance                       | R <sub>θJA</sub>                  | 134         | °C/W |
| Thermal Resistance, Junction to Ambient (Note 6) |                                   |             |      |
| 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 5) | V <sub>(BR)R</sub> | 20  | —    | —    | V    | I <sub>R</sub> = 100μA                         |
| Forward Voltage Drop               | V <sub>F</sub>     | —   | 0.51 | 0.56 | V    | I <sub>F</sub> = 0.5A, T <sub>J</sub> = +25°C  |
|                                    |                    |     | 0.48 | 0.53 |      | I <sub>F</sub> = 0.5A, T <sub>J</sub> = +125°C |
| Leakage Current (Note 5)           | I <sub>R</sub>     | —   | 6    | 100  | μA   | V <sub>R</sub> = 20V, T <sub>J</sub> = +25°C   |
|                                    |                    |     | 0.5  | 20   | mA   | V <sub>R</sub> = 20V, T <sub>J</sub> = +125°C  |

- Notes:
5. Short duration pulse test used to minimize self-heating effect.
  6. Polyimide PCB, 2oz, copper minimum recommended pad layout per <http://www.diodes.com/package-outlines.html>.

NOT RECOMMENDED FOR NEW DESIGN

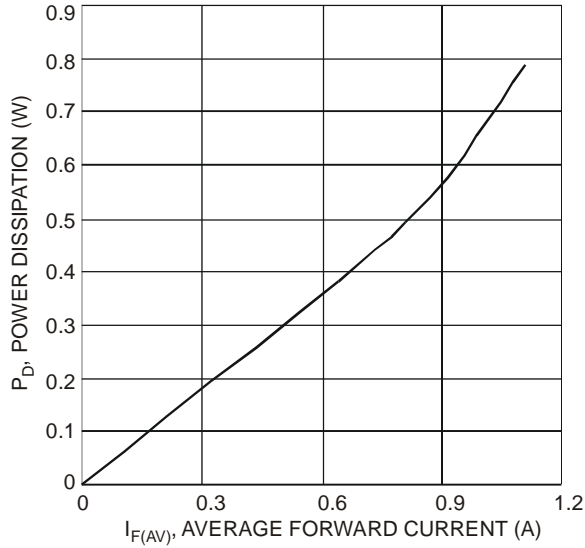


Fig. 1 Forward Power Dissipation

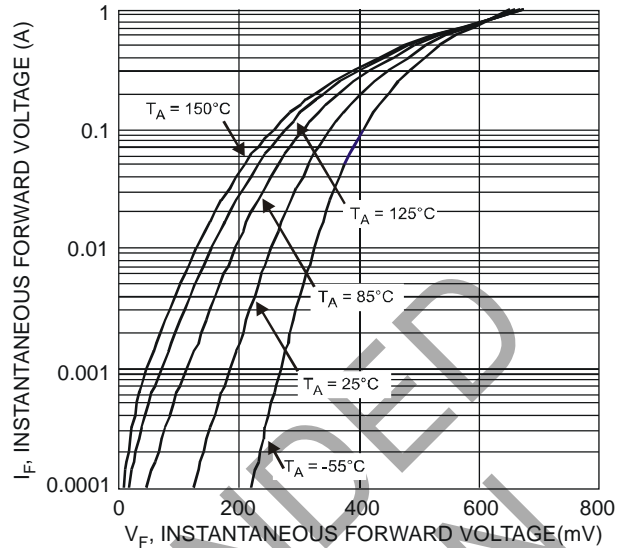


Fig. 2 Typical Forward Characteristics

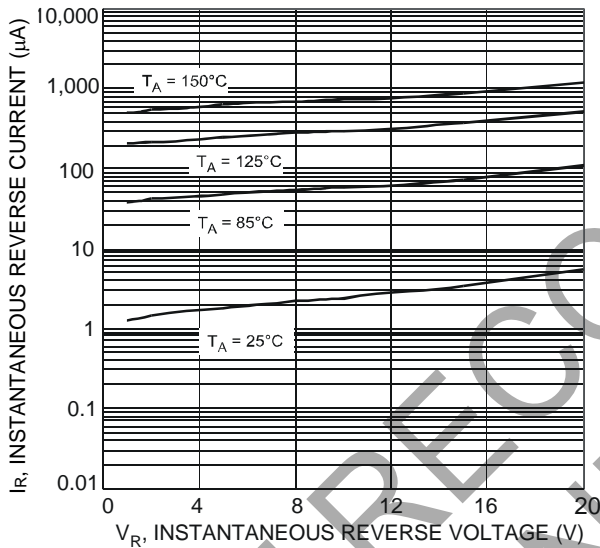


Fig. 3 Typical Reverse Characteristics

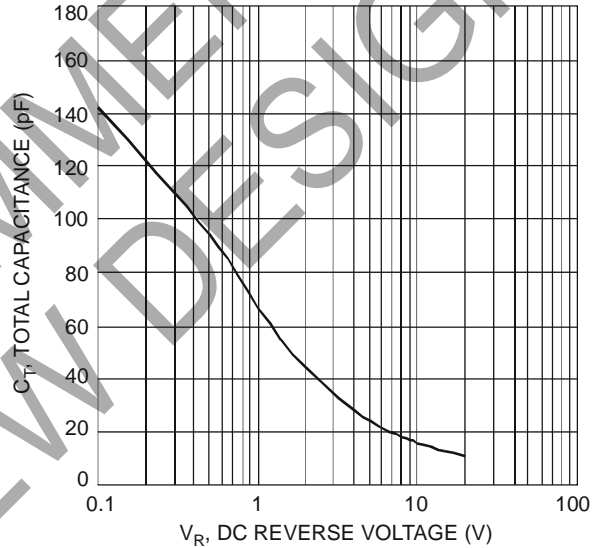


Fig. 4 Total Capacitance vs. Reverse Voltage

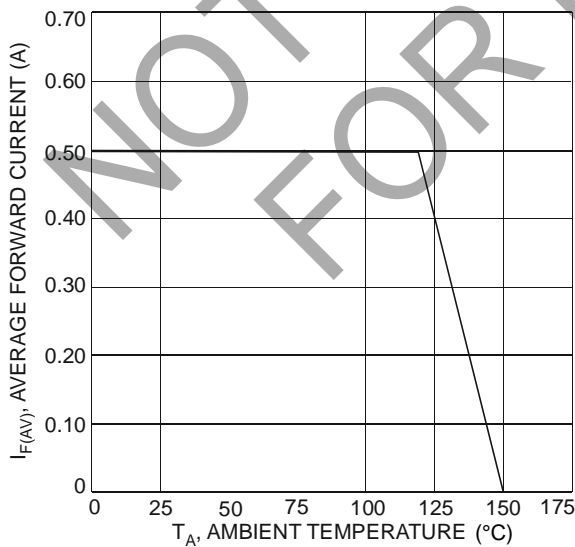


Fig. 5 Forward Current Derating Curve

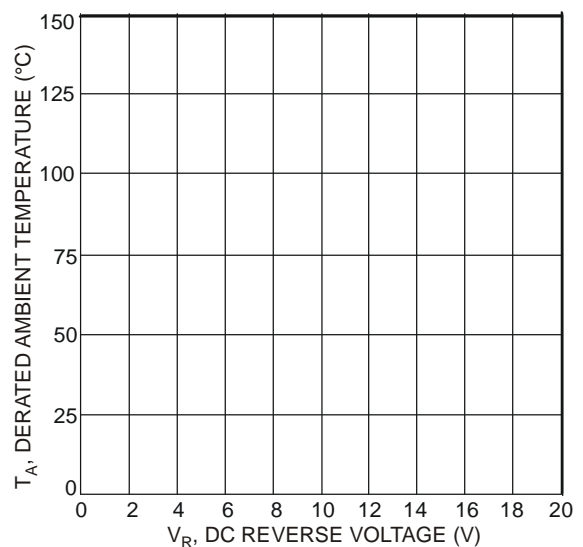
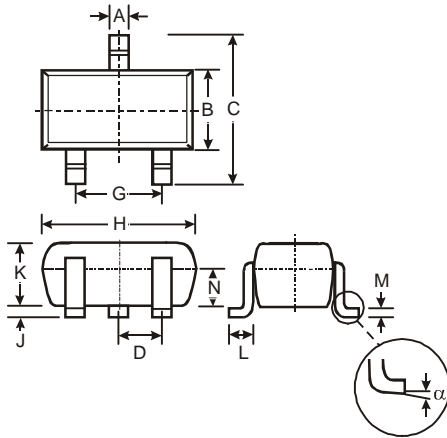


Fig. 6 Operating Temperature Derating

**Package Outline Dimensions**

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

**SC59**

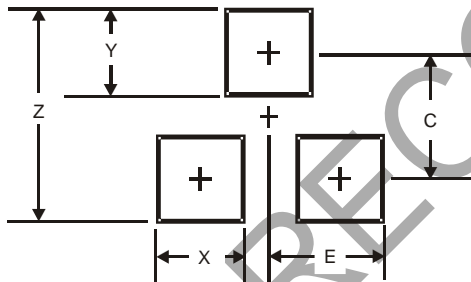


| SC59                 |       |      |      |
|----------------------|-------|------|------|
| Dim                  | Min   | Max  | Typ  |
| A                    | 0.35  | 0.50 | 0.38 |
| B                    | 1.50  | 1.70 | 1.60 |
| C                    | 2.70  | 3.00 | 2.80 |
| D                    | -     | -    | 0.95 |
| G                    | -     | -    | 1.90 |
| H                    | 2.90  | 3.10 | 3.00 |
| J                    | 0.013 | 0.10 | 0.05 |
| K                    | 1.00  | 1.30 | 1.10 |
| L                    | 0.35  | 0.55 | 0.40 |
| M                    | 0.10  | 0.20 | 0.15 |
| N                    | 0.70  | 0.80 | 0.75 |
| α                    | 0°    | 8°   |      |
| All Dimensions in mm |       |      |      |

**Suggested Pad Layout**

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

**SC59**



| Dimensions | Value (in mm) |
|------------|---------------|
| Z          | 3.4           |
| X          | 0.8           |
| Y          | 1.0           |
| C          | 2.4           |
| E          | 1.35          |

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