

## 0.5A SURFACE MOUNT SCHOTTKY BARRIER RECTIFIER

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

| V <sub>RRM</sub> (V) | I <sub>O</sub> (A) | V <sub>F</sub> Max | I <sub>R</sub> Max |
|----------------------|--------------------|--------------------|--------------------|
| 40                   | 0.5                | 0.51V              | 10µA               |

### Features and Benefits

- Low Forward Voltage Drop
- Guard Ring Construction for Transient Protection
- High Conductance
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **PPAP Capable (Note 4)**

### Applications

- DC-DC Converters
- Mobile Telecommunications
- Blocking Diodes
- Reverse Polarity Protection

### Mechanical Data

- Case: SOD123
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish Annealed over Alloy 42 Leadframe. (Lead-Free Plating). Solderable per MIL-STD-202, Method 208 ②
- Polarity: Cathode Band
- Weight: 0.01 grams (Approximate)

SOD123



Top View

### Ordering Information (Note 5)

| Part Number | Case   | Packaging         |
|-------------|--------|-------------------|
| B0540WQ-7-F | SOD123 | 3,000/Tape & Reel |

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
  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 <https://www.diodes.com/quality/product-compliance-definitions/>.
  5. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

### Marking Information



SF = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: E = 2017)  
 M = Month (ex: 9 = September)

#### Date Code Key

| Year | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|------|------|------|------|------|------|------|------|
| Code | D    | E    | F    | G    | H    | I    | J    |

| 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>    | 40    | V    |
| Working Peak Reverse Voltage  | V <sub>RWM</sub>    |       |      |
| DC Blocking Voltage   | V <sub>R</sub>      |       |      |
| RMS Reverse Voltage   | V <sub>R(RMS)</sub> | 28    | V    |
| Average Rectified Output Current (See Figure 4)   | I <sub>O</sub>      | 0.5   | A    |
| Non-Repetitive Peak Forward Surge Current<br>8.3ms Single Half Sine-Wave Superimposed on Rated Load | I <sub>FSM</sub>    | 5.5   | A    |

### Thermal Characteristics

| Characteristic   | Symbol                            | Typ         | Max | Unit |
|--|-----------------------------------|-------------|-----|------|
| Thermal Resistance Junction to Ambient Air (Note 6) T <sub>A</sub> = +25°C | R <sub>θJA</sub>                  | 385         | —   | °C/W |
| Thermal Resistance Junction to Ambient Air (Note 7) T <sub>A</sub> = +25°C | R <sub>θJA</sub>                  | 325         | —   | °C/W |
| 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  | Value | Unit | Test Conditions                                |
|--|---|-------|------|--|
| Minimum Reverse Breakdown Voltage (Note 8) | V <sub>(BR)R</sub>                            | 40    | V    | I <sub>R</sub> = 20μA                          |
| Maximum Forward Voltage Drop               | V <sub>FM</sub>                               | 0.510 | V    | I <sub>F</sub> = 0.5A, T <sub>J</sub> = +25°C  |
|  |   | 0.620 |      | I <sub>F</sub> = 1.0A, T <sub>J</sub> = +25°C  |
|  |   | 0.460 |      | I <sub>F</sub> = 0.5A, T <sub>J</sub> = +100°C |
|  |   | 0.610 |      | I <sub>F</sub> = 1.0A, T <sub>J</sub> = +100°C |
| Maximum Leakage Current (Note 8)           | I <sub>RM</sub>                               | 10    | μA   | V <sub>R</sub> = 20V, T <sub>J</sub> = +25°C   |
|  |   | 20    |      | V <sub>R</sub> = 40V, T <sub>J</sub> = +25°C   |
|  |   | 5.0   | mA   | V <sub>R</sub> = 20V, T <sub>J</sub> = +100°C  |
| 13   | V <sub>R</sub> = 40V, T <sub>J</sub> = +100°C |       |      |  |
| Total Capacitance                          | C <sub>T</sub>                                | 170   | pF   | f = 1MHz, V <sub>R</sub> = 0V                  |

- Notes:
6. FR-4 PCB, minimum recommended pad layout per <http://www.diodes.com/package-outlines.html>.
  7. Polyimide PCB, minimum recommended pad layout per <http://www.diodes.com/package-outlines.html>.
  8. Short duration pulse test used to minimize self-heating effect.

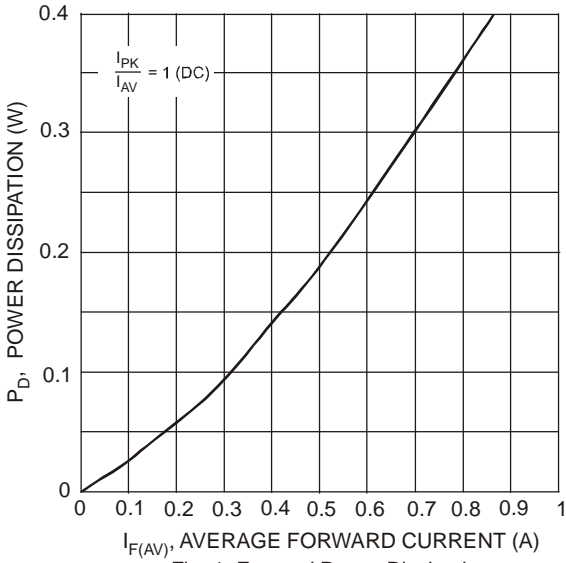


Fig. 1 Forward Power Dissipation

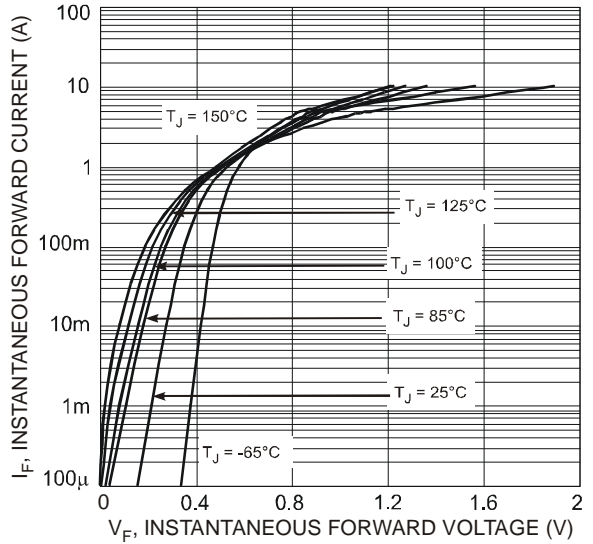


Fig. 2 Typical Forward Characteristics

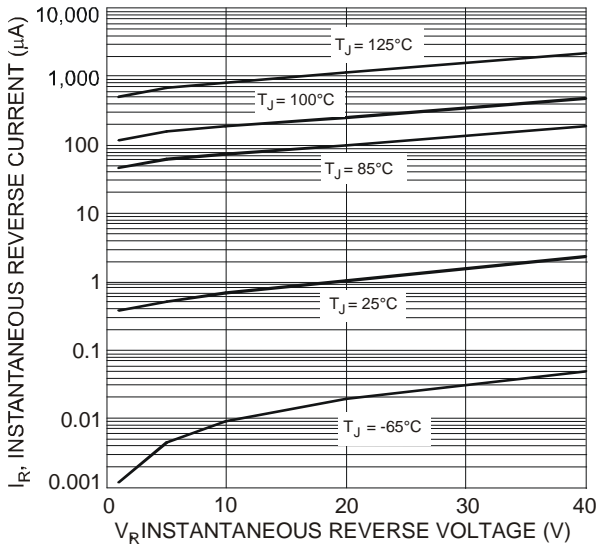


Fig. 3 Typical Reverse Characteristics

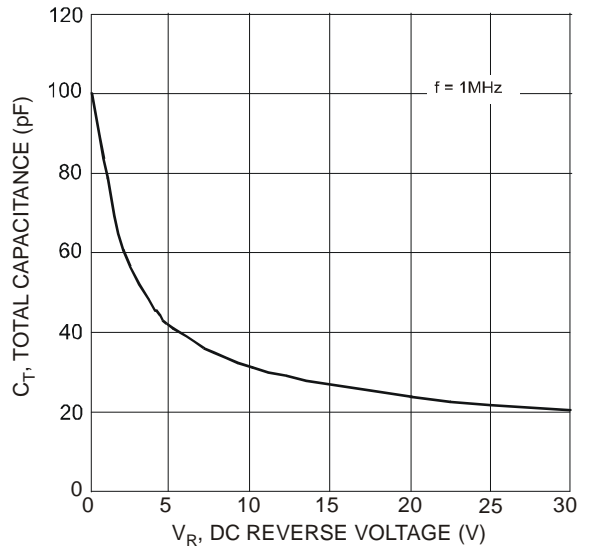


Fig. 4 Total Capacitance vs. Reverse Voltage

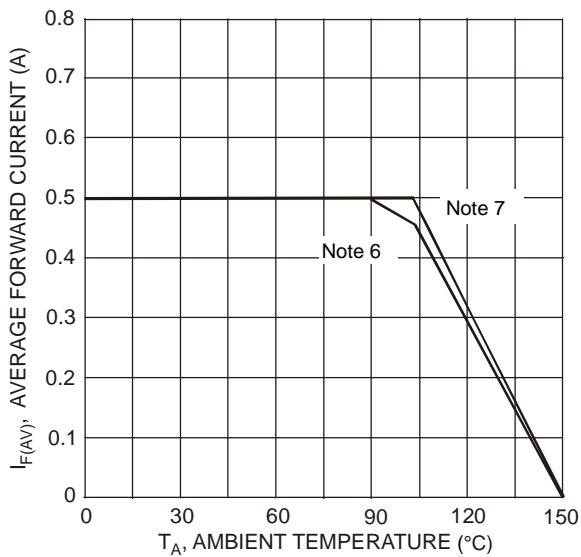
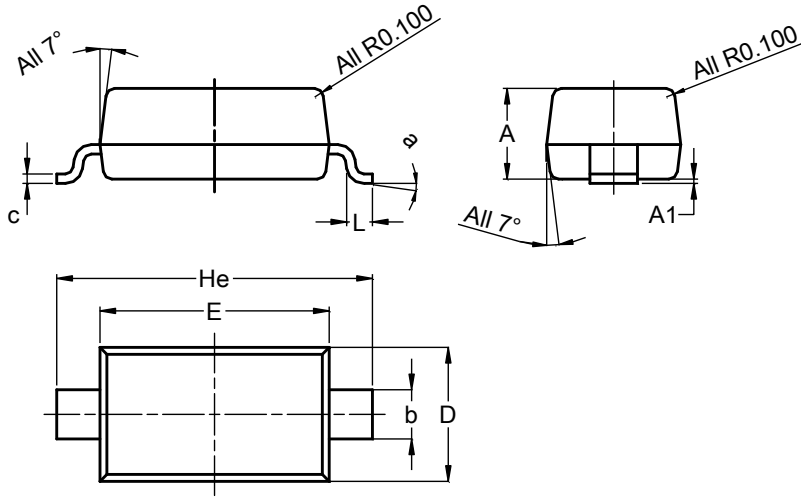


Fig. 5 Forward Current Derating Curve

**Package Outline Dimensions**

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

SOD123

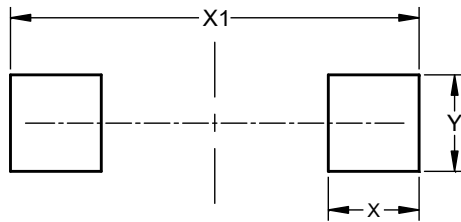


| SOD123               |      |      |      |
|----------------------|------|------|------|
| Dim                  | Min  | Max  | Typ  |
| A                    | 1.00 | 1.35 | 1.05 |
| A1                   | 0.00 | 0.10 | 0.05 |
| b                    | 0.52 | 0.62 | 0.57 |
| c                    | 0.10 | 0.15 | 0.11 |
| D                    | 1.40 | 1.70 | 1.55 |
| E                    | 2.55 | 2.85 | 2.65 |
| He                   | 3.55 | 3.85 | 3.65 |
| L                    | 0.25 | 0.40 | 0.30 |
| a                    | 0°   | 8°   | --   |
| All Dimensions in mm |      |      |      |

**Suggested Pad Layout**

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

SOD123



| Dimensions | Value (in mm) |
|------------|---------------|
| X          | 0.900         |
| X1         | 4.050         |
| Y          | 0.950         |

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