

0.5A SURFACE MOUNT SCHOTTKY BARRIER RECTIFIER
Features

- Low Forward Voltage Drop
- Guard Ring Construction for Transient Protection
- High Conductance
- **Lead, Halogen and Antimony Free, RoHS Compliant (Note 1)**
- **"Green" Device (Note 5)**
- **Qualified to AEC-Q101 Standards for High Reliability**

Mechanical Data

- Case: SOD-123
- Case Material: Molded Plastic, "Green" Molding Compound (Note 5). UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020D
- Lead Free Plating (Matte Tin Finish annealed over Alloy 42 leadframe) Solderable per MIL-STD-202, Method 208
- Polarity: Cathode Band
- Marking Information: See Page 3
- Ordering Information: See Page 3
- Weight: 0.01 grams (approximate)



Top View

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_R | | |
| RMS Reverse Voltage | $V_{R(RMS)}$ | 28 | V |
| Average Rectified Output Current (See Figure 4) | I_O | 0.5 | A |
| Non-Repetitive Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load | I_{FSM} | 5.5 | A |

Thermal Characteristics

| Characteristic | Symbol | Typ | Max | Unit |
|--|-----------------|-------------|-----|--------------------|
| Thermal Resistance Junction to Ambient Air (Note 2) $T_A = 25^\circ\text{C}$ | $R_{\theta JA}$ | 385 | — | $^\circ\text{C/W}$ |
| Thermal Resistance Junction to Ambient Air (Note 3) $T_A = 25^\circ\text{C}$ | $R_{\theta JA}$ | 325 | — | $^\circ\text{C/W}$ |
| 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 | Value | Unit | Test Conditions |
|--|-------------|-------|---------------|--|
| Minimum Reverse Breakdown Voltage (Note 4) | $V_{(BR)R}$ | 40 | V | $I_R = 20\mu\text{A}$ |
| Maximum Forward Voltage Drop | V_{FM} | 0.510 | V | $I_F = 0.5\text{A}, T_J = 25^\circ\text{C}$ |
| | | 0.620 | | $I_F = 1.0\text{A}, T_J = 25^\circ\text{C}$ |
| | | 0.460 | | $I_F = 0.5\text{A}, T_J = 100^\circ\text{C}$ |
| | | 0.610 | | $I_F = 1.0\text{A}, T_J = 100^\circ\text{C}$ |
| Maximum Leakage Current (Note 4) | I_{RM} | 10 | μA | $V_R = 20\text{V}, T_J = 25^\circ\text{C}$ |
| | | 20 | | $V_R = 40\text{V}, T_J = 25^\circ\text{C}$ |
| | | 5.0 | mA | $V_R = 20\text{V}, T_J = 100^\circ\text{C}$ |
| | | 13 | | $V_R = 40\text{V}, T_J = 100^\circ\text{C}$ |
| Total Capacitance | C_T | 170 | pF | $f = 1\text{MHz}, V_R = 0\text{V DC}$ |

- Notes:
1. No purposefully added lead. Halogen and Antimony Free.
 2. FR-4 PCB, minimum recommended pad layout per <http://www.diodes.com/datasheets/ap02001.pdf>.
 3. Polyimide PCB, minimum recommended pad layout per <http://www.diodes.com/datasheets/ap02001.pdf>.
 4. Short duration pulse test used to minimize self-heating effect.
 5. Product manufactured with Data Code V9 (week 33, 2008) and newer are built with Green Molding Compound. Product manufactured prior to Date Code V9 are built with Non-Green Molding Compound and may contain Halogens or Sb_2O_3 Fire Retardants.

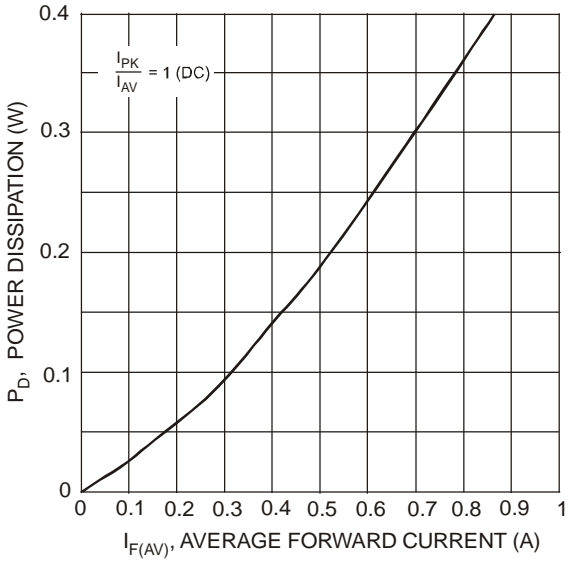


Fig. 1 Forward Power Dissipation

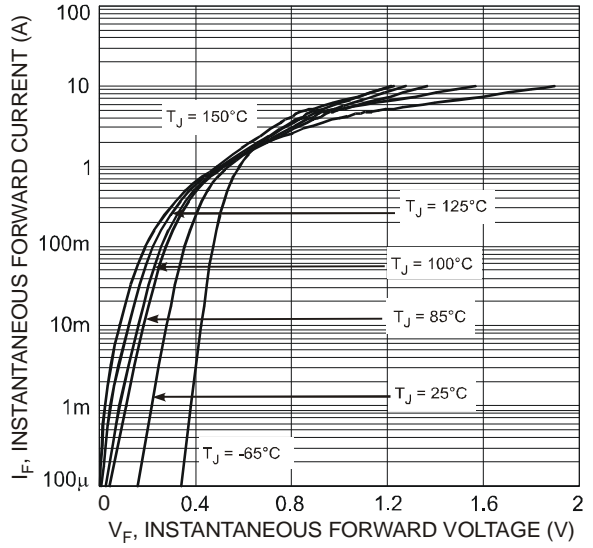


Fig. 2 Typical Forward Characteristics

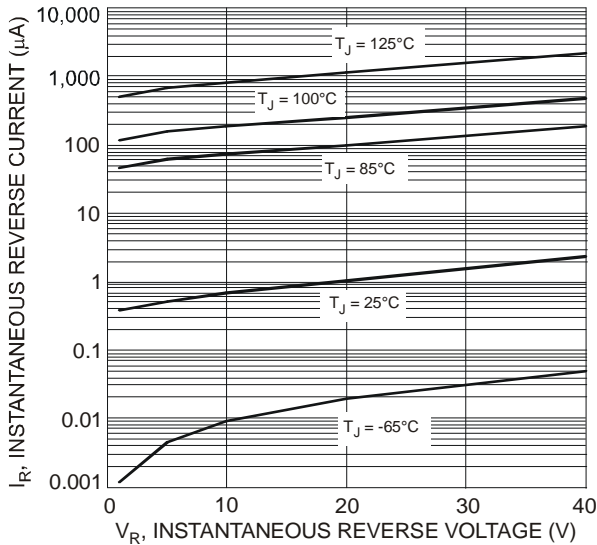


Fig. 3 Typical Reverse Characteristics

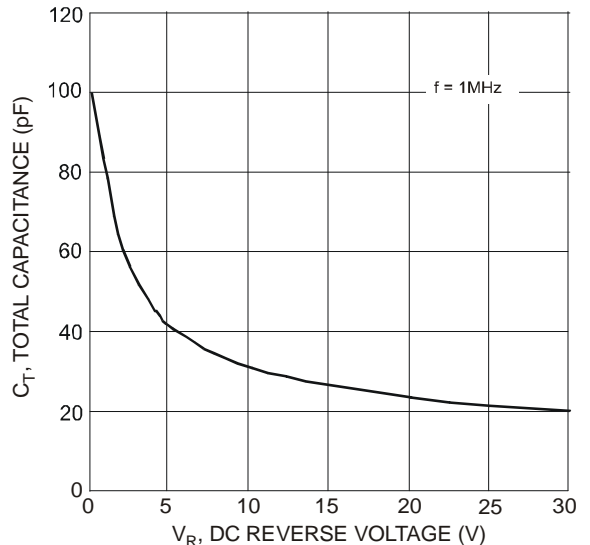


Fig. 4 Total Capacitance vs. Reverse Voltage

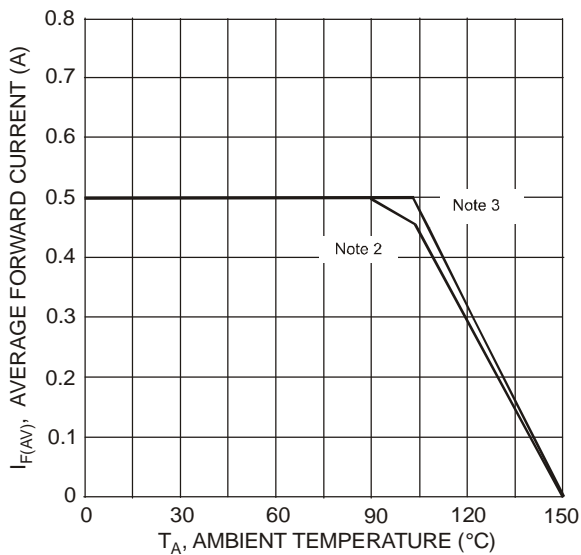


Fig. 5 Forward Current Derating Curve

Ordering Information (Note 6)

| Part Number | Case | Packaging |
|-------------|---------|------------------|
| B0540W-7-F | SOD-123 | 3000/Tape & Reel |

Notes: 6. For packaging details, go to our website at <http://www.diodes.com/datasheets/ap02007.pdf>.

Marking Information



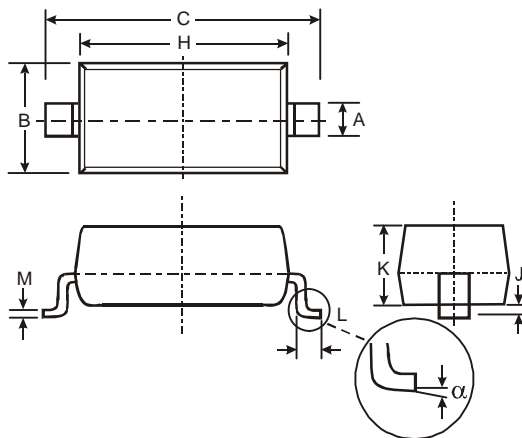
SF = Product Type Marking Code
 YM = Date Code Marking
 Y = Year (ex: N = 2002)
 M = Month (ex: 9 = September)

Date Code Key

| Year | 1998 | 1999 | 2000 | 2001 | 2002 | 2003 | 2004 | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 | 2011 | 2012 |
|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| Code | J | K | L | M | N | P | R | S | T | U | V | W | X | Y | Z |

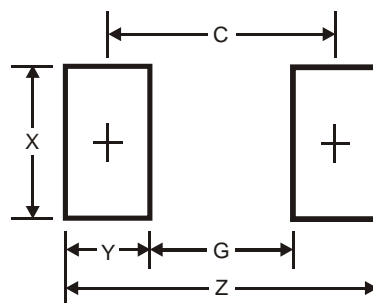
| Month | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec |
|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Code | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | O | N | D |

Package Outline Dimensions



| SOD-123 | | |
|-----------------------------|----------|------|
| Dim | Min | Max |
| A | 0.55 Typ | |
| B | 1.40 | 1.70 |
| C | 3.55 | 3.85 |
| H | 2.55 | 2.85 |
| J | 0.00 | 0.10 |
| K | 1.00 | 1.35 |
| L | 0.25 | 0.40 |
| M | 0.10 | 0.15 |
| α | 0 | 8° |
| All Dimensions in mm | | |

Suggested Pad Layout



| Dimensions | Value (in mm) |
|------------|---------------|
| Z | 4.9 |
| G | 2.5 |
| X | 0.7 |
| Y | 1.2 |
| C | 3.7 |

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