

## 0.5A SURFACE MOUNT SCHOTTKY BARRIER RECTIFIER

### Product Summary

| V <sub>RRM</sub> (V) | I <sub>O</sub> (A) | V <sub>F(MAX)</sub> (V)<br>@ +25°C | I <sub>R(MAX)</sub> (μA)<br>@ +25°C |
|----------------------|--------------------|------------------------------------|-------------------------------------|
| 80                   | 0.5                | 0.80                               | 5                                   |

### Description and Applications

This MBR0580S1 is a single rectifier packaged in SOD123. Ideally suited for low voltage, high frequency rectification or as free-wheeling and polarity protection diodes in surface mount applications where compact size and weight are critical to the system. Typical applications are AC-DC and DC-DC converters, reverse battery protection, and “O-ring” of multiple supply voltages and any other application where performance and size are critical.

### Features and Benefits

- Low Forward Voltage (V<sub>F</sub>) Minimizes Conduction Losses and Improves Efficiency
- Guard Ring Die Construction for Transient Protection
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. “Green” Device (Note 3)**

### 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 Copper Leadframe. Solderable per MIL-STD-202, Method 208
- Polarity: Cathode Band
- Weight: 0.01 grams (Approximate)

SOD123



Top View

### Ordering Information (Note 4)

| Part Number | Case   | Packaging         |
|-------------|--------|-------------------|
| MBR0580S1-7 | 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. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

### Marking Information



M5X = Product Type Marking Code (ex: M58 = MBR0580S1)  
 YM = Date Code Marking  
 Y = Year (ex.: B = 2014)  
 M = Month (ex: 9 = September)

#### Date Code Key

| Year | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 |
|------|------|------|------|------|------|------|------|------|
| Code | B    | C    | D    | E    | F    | G    | H    | I    |

| 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 capacitance load, derate current by 20%.

| Characteristic  | Symbol              | Value | Unit |
|---|---------------------|-------|------|
| Peak Repetitive Reverse Voltage   | V <sub>R(RM)</sub>  | 80    | V    |
| Working Peak Reverse Voltage  | V <sub>R(WM)</sub>  |       |      |
| DC Blocking Voltage   | V <sub>RM</sub>     |       |      |
| RMS Reverse Voltage   | V <sub>R(RMS)</sub> | 56    | V    |
| Average Rectified Output Current  | 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>    | 14    | A    |

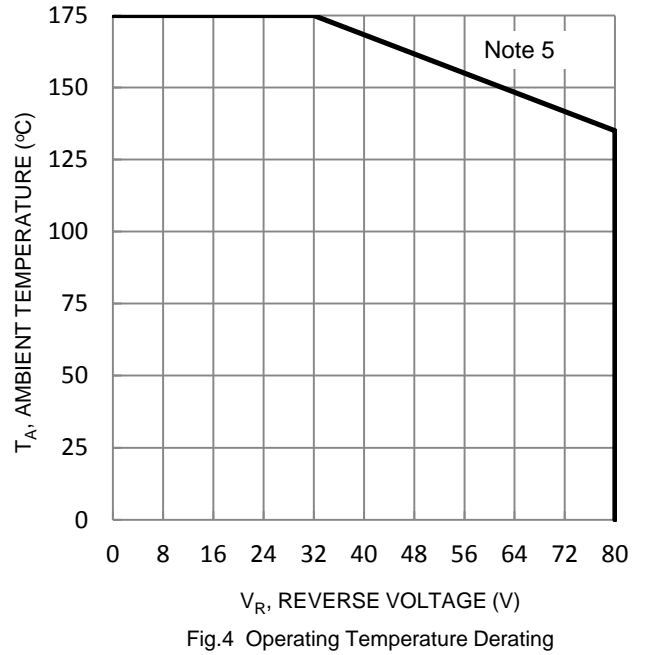
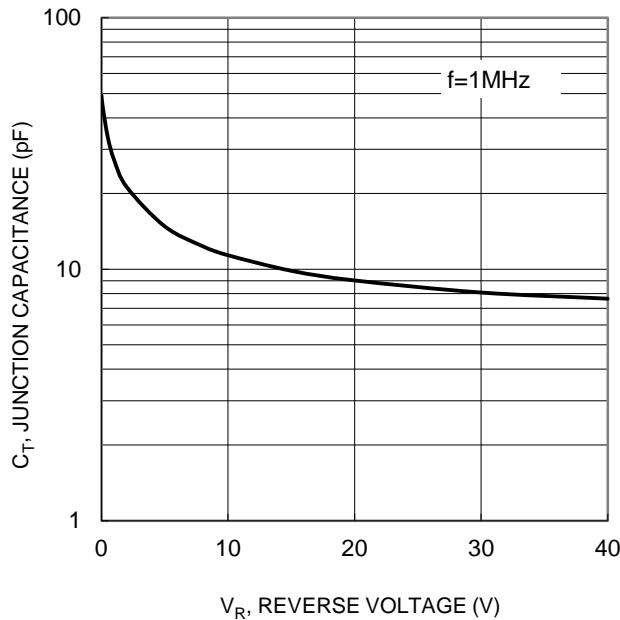
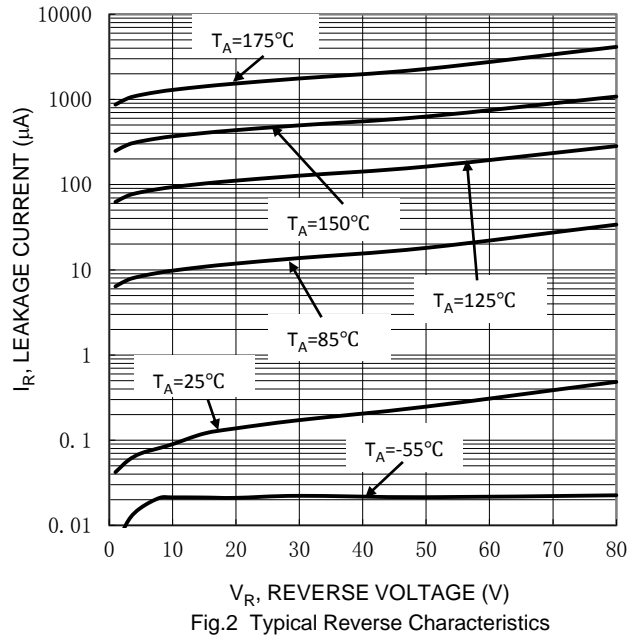
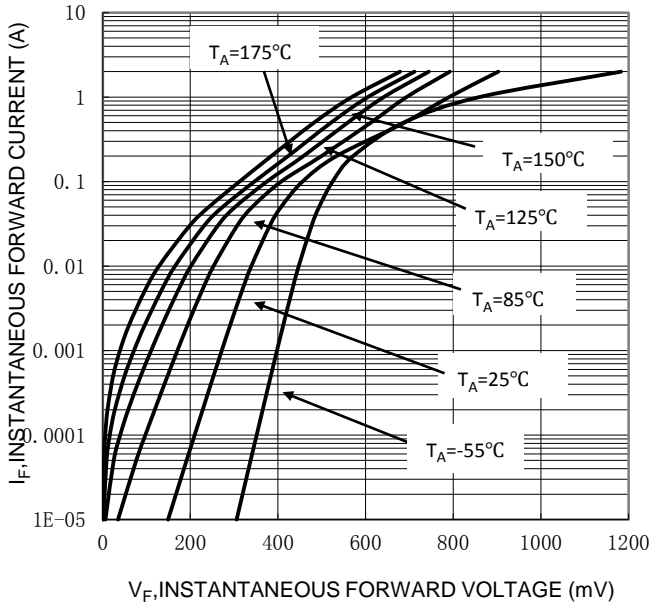
### Thermal Characteristics

| Characteristic  | Symbol           | Value       | Unit |
|---|------------------|-------------|------|
| Typical Thermal Resistance Junction to Ambient (Note 5) | R <sub>θJA</sub> | 354         | °C/W |
| Typical Thermal Resistance Junction to Ambient (Note 6) | R <sub>θJA</sub> | 200         | °C/W |
| Typical Thermal Resistance Junction to Case (Note 5)    | R <sub>θJC</sub> | 80          | °C/W |
| Typical Thermal Resistance Junction to Case (Note 6)    | R <sub>θJC</sub> | 70          | °C/W |
| Operating Temperature Range                             | T <sub>J</sub>   | -55 to +175 | °C   |
| Storage Temperature Range                               | T <sub>STG</sub> | -55 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 7) | V <sub>(BR)</sub> | 80  | —    | —    | V    | I <sub>R</sub> = 1.0mA                         |
| Forward Voltage Drop               | V <sub>F</sub>    | —   | 0.69 | 0.80 | V    | I <sub>F</sub> = 0.5A, T <sub>A</sub> = +25°C  |
|                                    |                   | —   | 0.56 | —    |      | I <sub>F</sub> = 0.5A, T <sub>A</sub> = +125°C |
| Leakage Current (Note 7)           | I <sub>R</sub>    | —   | 0.5  | 5    | μA   | V <sub>R</sub> = 80V, T <sub>A</sub> = +25°C   |
|                                    |                   | —   | 280  | —    |      | V <sub>R</sub> = 80V, T <sub>A</sub> = +125°C  |
| Total Capacitance                  | C <sub>T</sub>    | —   | 15   | —    | pF   | V <sub>R</sub> = 5V, f = 1.0MHz                |

Notes: 5. Device mounted on FR-4 substrate, 2 oz. copper, minimum recommended pad layout per <http://www.diodes.com/datasheets/ap02001.pdf>.  
6. Device mounted on FR-4 substrate, 2 oz. copper, 1in. square Cu pad.  
7. Short duration pulse test used to minimize self-heating effect.



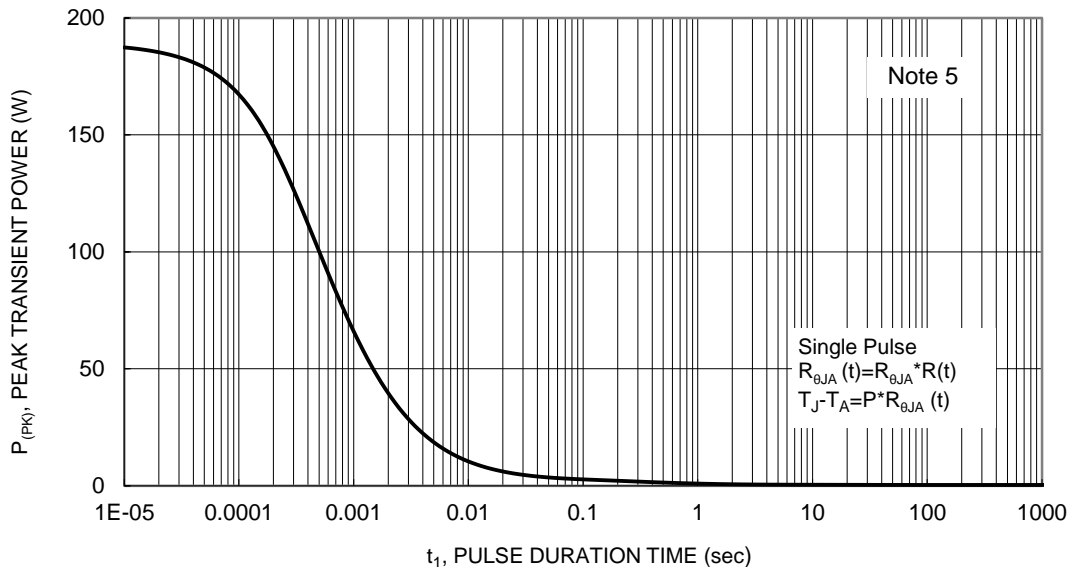


Fig.5 Single Pulse Maximum Power Dissipation

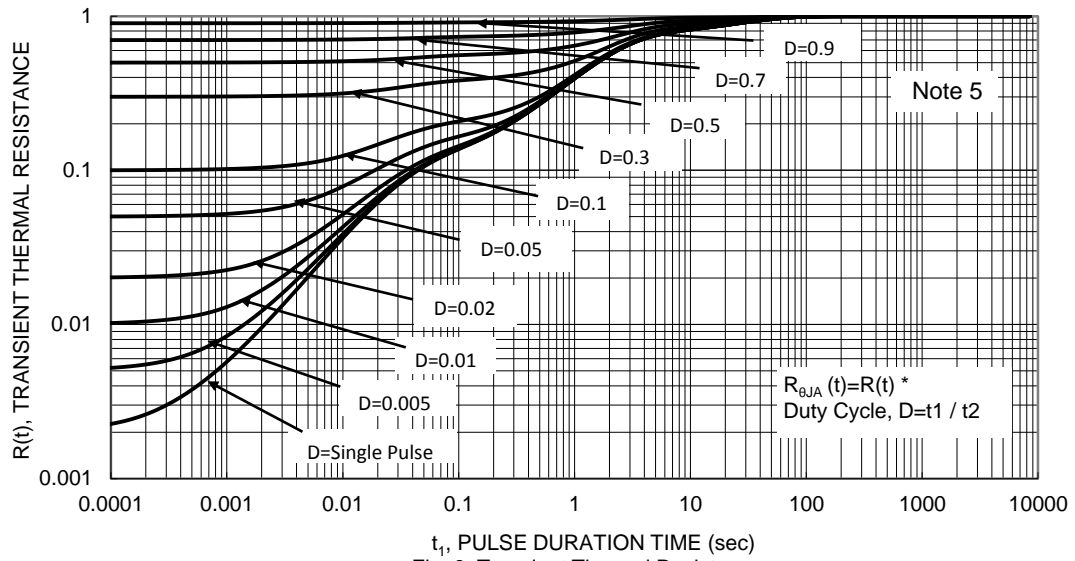
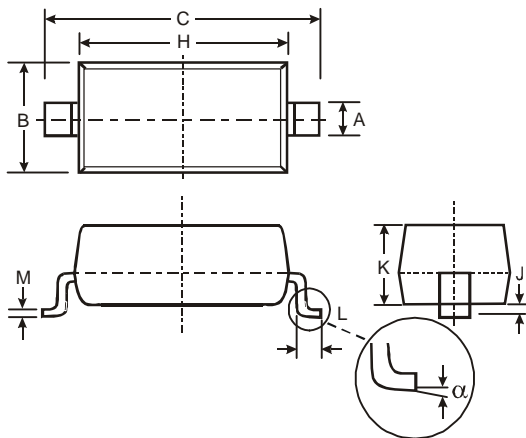


Fig. 6 Transient Thermal Resistance

**Package Outline Dimensions**

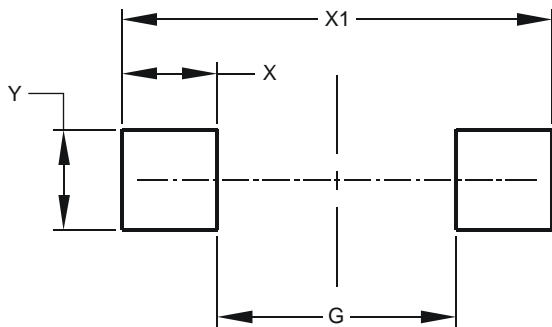
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



| SOD123               |          |      |
|----------------------|----------|------|
| 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**

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



| Dimensions | Value (in mm) |
|------------|---------------|
| G          | 2.250         |
| X          | 0.900         |
| X1         | 4.050         |
| Y          | 0.950         |

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