

**0.5A SURFACE MOUNT SCHOTTKY BARRIER RECTIFIER**
**Product Summary**

| $V_{RRM}$ (V) | $I_O$ (A) | $V_{F(MAX)}$ (V)<br>@ +25°C | $I_{R(MAX)}$ (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 ( $V_F$ ) 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

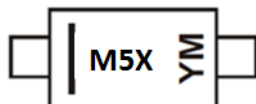


Top View

**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  
 YM = Date Code Marking  
 Y = Year (ex.: E = 2017)  
 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 capacitive load, derate current by 20%.

| Characteristic                                                                                      | Symbol                                                  | Value | Unit |
|-----------------------------------------------------------------------------------------------------|---------------------------------------------------------|-------|------|
| Peak Repetitive Reverse Voltage<br>Working Peak Reverse Voltage<br>DC Blocking Voltage              | V <sub>RRM</sub><br>V <sub>RWM</sub><br>V <sub>RM</sub> | 80    | V    |
| 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<br>0.56 | 0.80<br>— | V    | I <sub>F</sub> = 0.5A, T <sub>A</sub> = +25°C<br>I <sub>F</sub> = 0.5A, T <sub>A</sub> = +125°C |
| Leakage Current (Note 7)           | I <sub>R</sub>    | —   | 0.5<br>280   | 5<br>—    | μA   | V <sub>R</sub> = 80V, T <sub>A</sub> = +25°C<br>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/package-outlines.html>.  
6. Device mounted on FR-4 substrate, 2 oz. copper, 1inch square Cu pad.  
7. Short duration pulse test used to minimize self-heating effect.

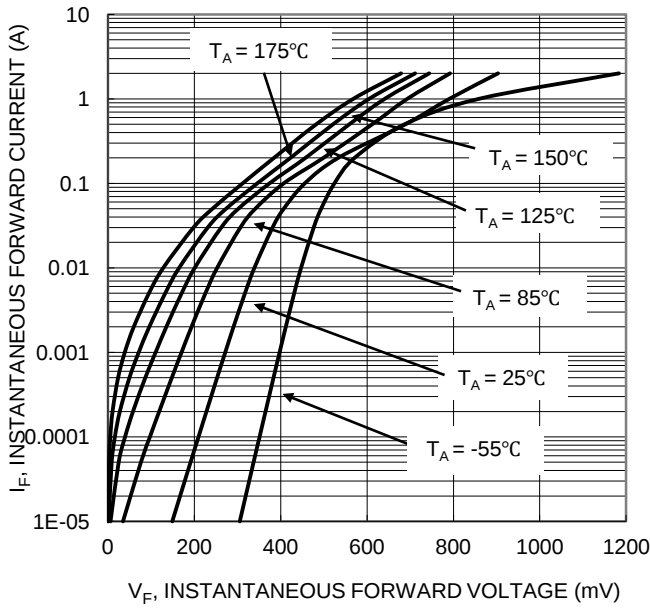


Figure 1. Typical Forward Characteristics

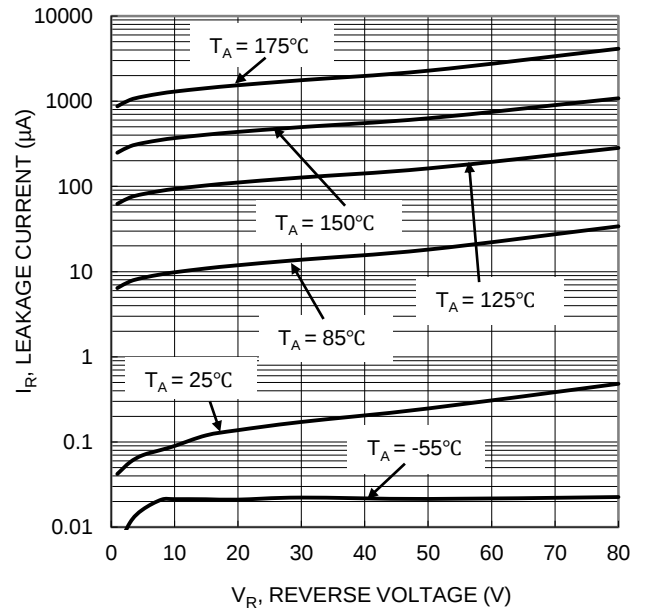


Figure 2. Typical Reverse Characteristics

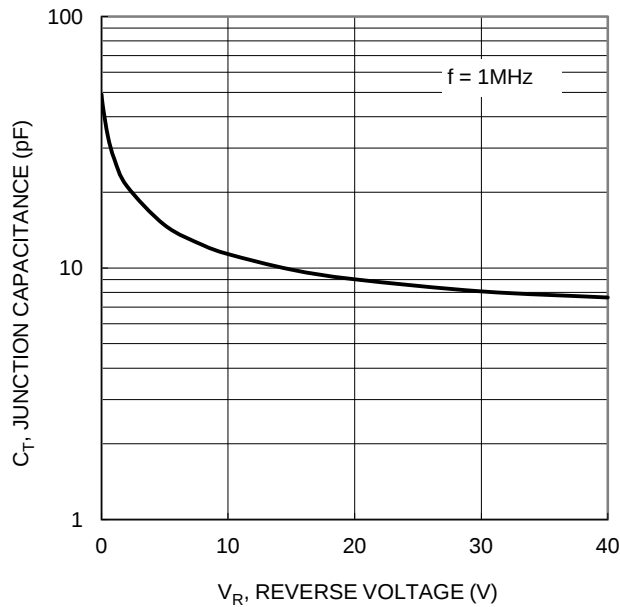


Figure 3. Typical Junction Capacitance

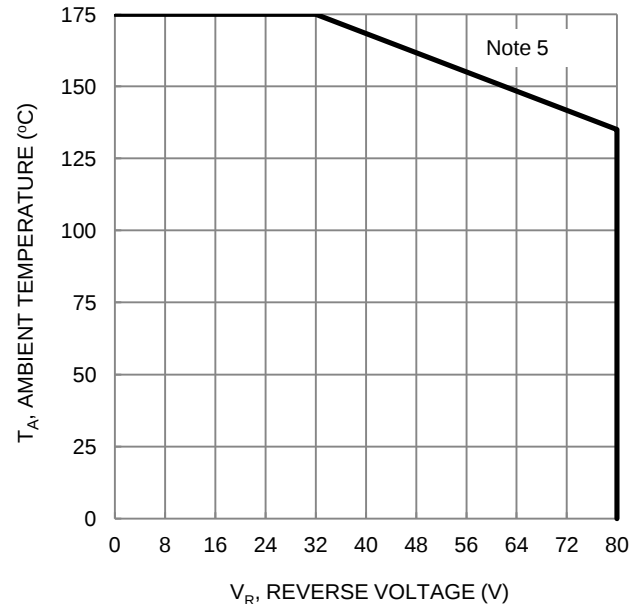


Figure 4. Operating Temperature Derating

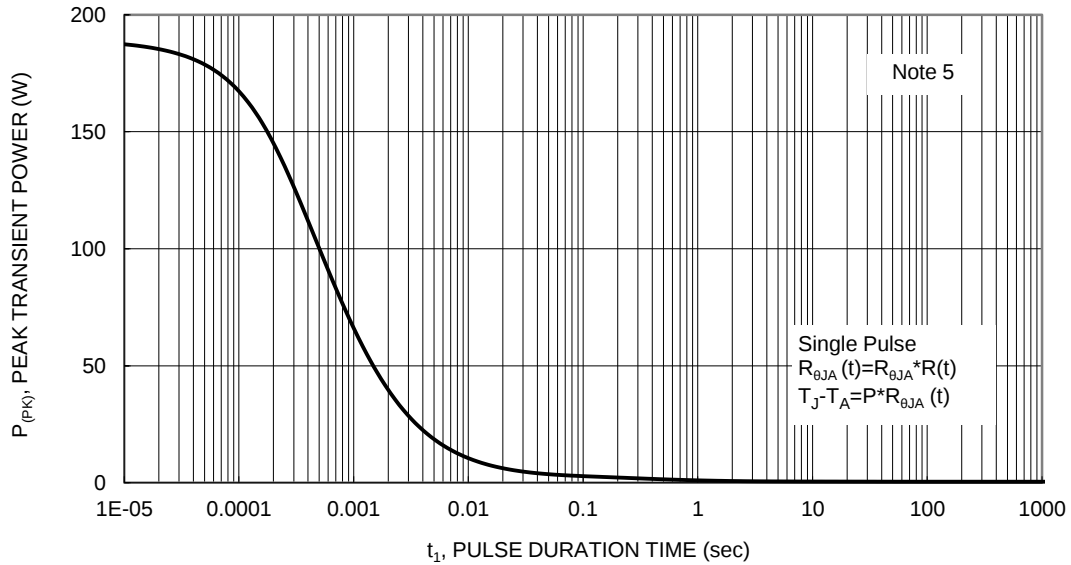


Figure 5. Single Pulse Maximum Power Dissipation

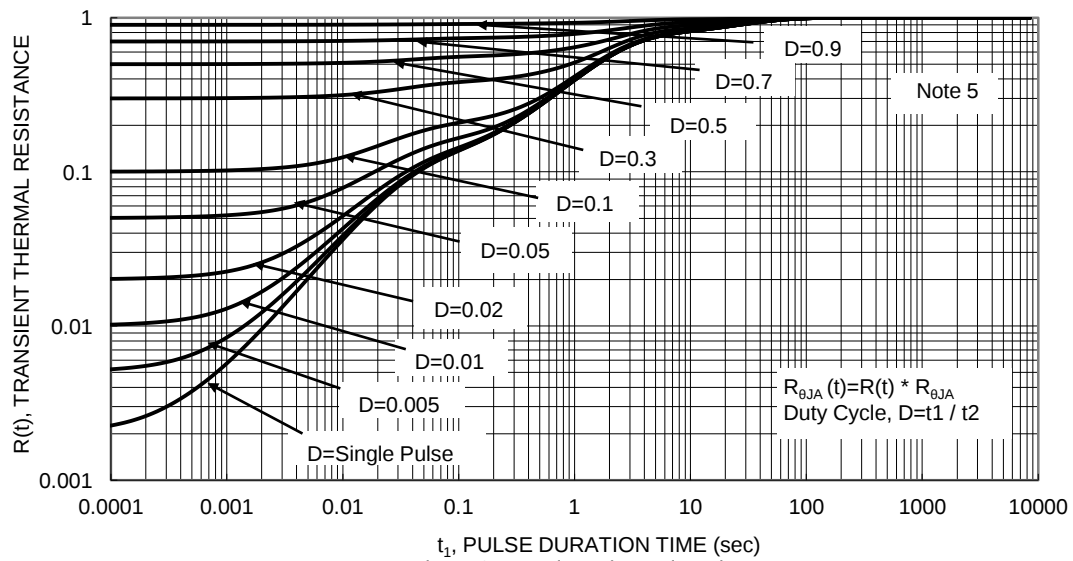
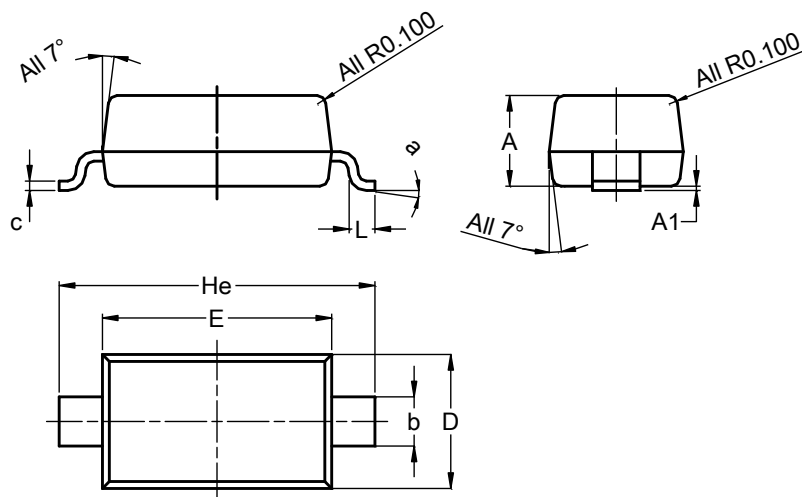


Figure 6. Transient Thermal Resistance

## Package Outline Dimensions

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

### SOD123

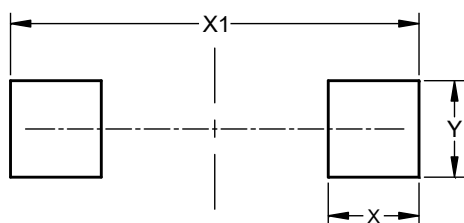


| SOD123               |      |      |      |
|----------------------|------|------|------|
| Dim                  | Min  | Max  | Typ  |
| A                    | 1.00 | 1.35 | 1.05 |
| A1                   | 0.00 | 0.10 | 0.05 |
| b                    | 0.52 | 0.62 | 0.57 |
| c                    | 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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