## Product Summary

| $V_{RRM}$ (V) | $I_O$ (A) | $V_F$ Max (V) @ +25°C | $I_R$ Max (mA) @ +25°C |
|---|---|---|---|
| 60 | 1 | 0.53 | 0.06 |

## Features and Benefits

- Guard Ring Die Construction for Transient Protection
- Low Power Loss, High Efficiency
- Interlocking Clip Design for High Surge Current Capacity
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **An Automotive-Compliant Part is Available Under Separate Datasheet (SDM160S1FQ)**

## Description and Applications

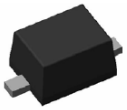
The SDM160S1F is a single rectifier packaged in SOD123F. Offering low $V_F$, low power loss and high efficiency, this device is ideal for use in general rectification applications as a:

- Boost Diode
- Blocking Diode

## Mechanical Data

- Case: SOD123F
- 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 e3
- Polarity: Cathode Band
- Weight: 0.015 grams (Approximate)

SOD123F



Top View

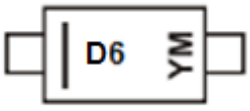
## Ordering Information (Note 4)

| Part Number | Case | Packaging |
|---|---|---|
| SDM160S1F-7 | SOD123F | 3,000/Tape & Reel |

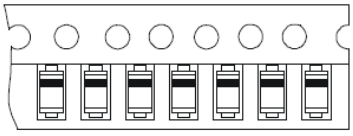
Notes:
1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
2. See http://www.diodes.com/quality/lead_free.html for more information about Diodes Incorporated's definitions of Halogen- and Antimony-free, "Green" and Lead-free.
3. Halogen- and Antimony-free "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

Cathode Pin




D6 = Product Type Marking Code
YM = Date Code Marking
Y = Year (ex.: D = 2016)
M = Month (ex.: 9 = September)
Bar Denotes Cathode Pin



Bar Denotes Cathode Pin

Date Code Key

| Year | 2013 | 2014 | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 |
|---|---|---|---|---|---|---|---|---|
| Code | A | B | C | D | E | F | G | H |

| 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 (@$T_A$ = +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 | $V_{RRM}$<br>$V_{RWM}$<br>$V_{RM}$ | 60 | V |
| Average Rectified Output Current | $I_O$ | 1 | A |
| Non-Repetitive Peak Forward Surge Current<br>8.3ms Single Half Sine-Wave Superimposed on Rated Load | $I_{FSM}$ | 50 | A |

## Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|---|---|---|---|
| Typical Thermal Resistance Junction to Case (Note 5) | $R_{\theta JC}$ | 40 | °C/W |
| Typical Thermal Resistance Junction to Ambient (Note 5) | $R_{\theta JA}$ | 110 | |
| Typical Thermal Resistance Junction to Case (Note 6) | $R_{\theta JC}$ | 8 | |
| Typical Thermal Resistance Junction to Ambient (Note 6) | $R_{\theta JA}$ | 75 | |
| Typical Thermal Resistance Junction to Solder point (Note 6) | $R_{\theta JS}$ | 18 | |
| Operating and Storage Temperature Range | $T_J$, $T_{STG}$ | -55 to +175 | °C |

## Electrical Characteristics (@$T_A$ = +25°C, unless otherwise specified.)

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|---|---|---|---|---|---|---|
| Reverse Breakdown Voltage (Note 7) | $V_{(BR)R}$ | 60 | — | — | V | $I_R$ = 1.0mA |
| Forward Voltage Drop | $V_F$ | —<br>—<br>— | 0.32<br>0.43<br>0.46 | 0.37<br>0.49<br>0.53 | V | $I_F$ = 0.1A, $T_J$ = +25°C<br>$I_F$ = 0.7A, $T_J$ = +25°C<br>$I_F$ = 1A, $T_J$ = +25°C |
| Leakage Current (Note 7) | $I_R$ | —<br>—<br>—<br>— | 0.002<br>0.010<br>0.40<br>3.7 | —<br>0.060<br>—<br>— | mA | $V_R$ = 10V, $T_J$ = +25°C<br>$V_R$ = 60V, $T_J$ = +25°C<br>$V_R$ = 60V, $T_J$ = +85°C<br>$V_R$ = 60V, $T_J$ = +125°C |
| Total Capacitance | $C_T$ | — | 48 | — | pF | $V_R$ = 10V, f = 1MHz |

Notes: 5. Device mounted on 1*MRP FR-4 PC board, 2oz.
6. Device mounted on 1-inch sq. copper pad, 2oz.
7. Short duration pulse test used to minimize self-heating effect.

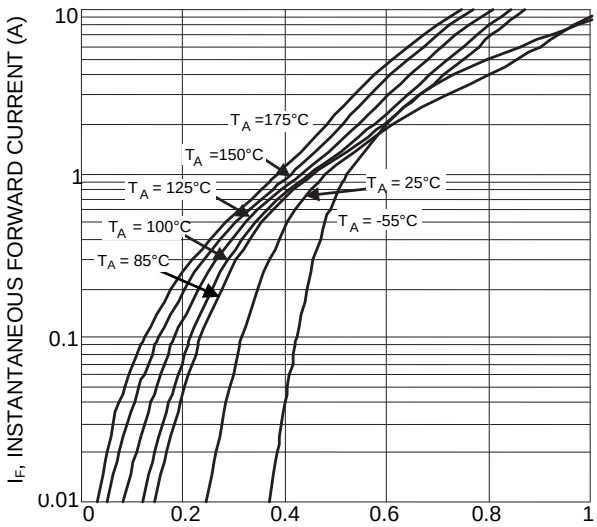



Figure 1 Typical Forward Characteristics

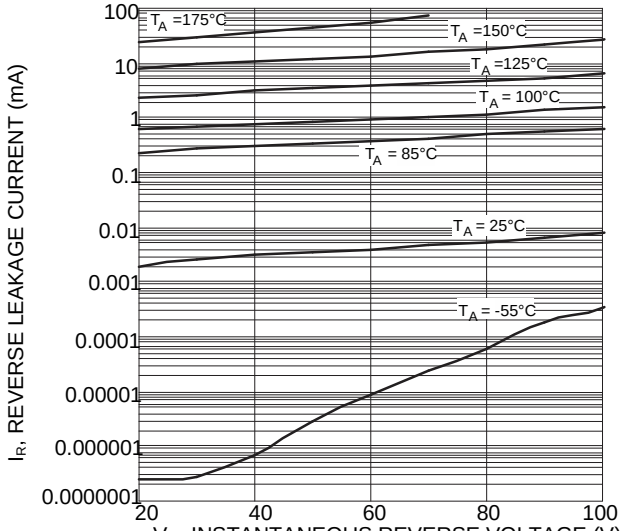



Figure 2 Typical Reverse Characteristics

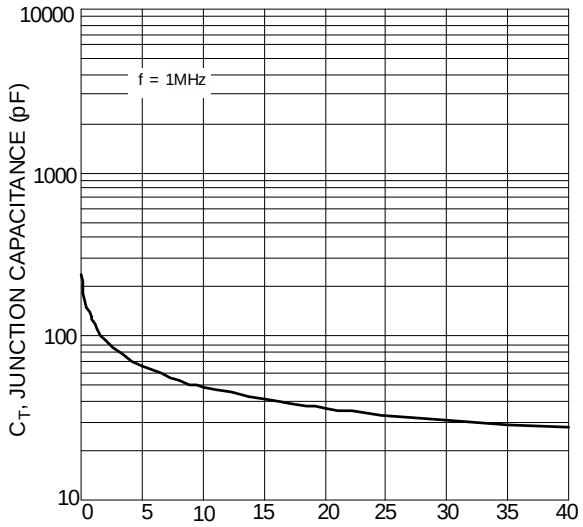



Figure 3 Typical Junction Capacitance

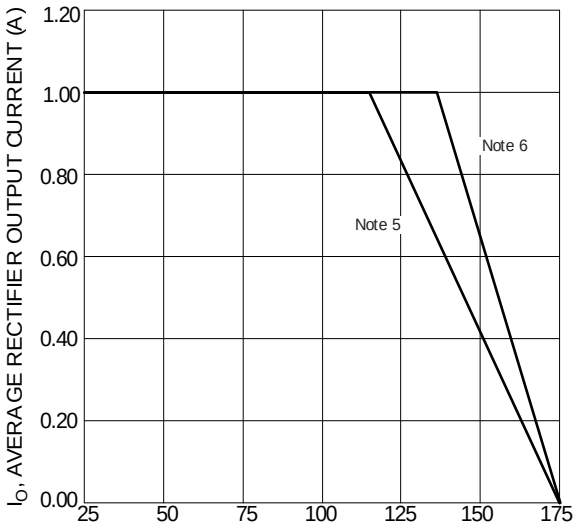



Figure 4 DC Forward Current Derating Curve

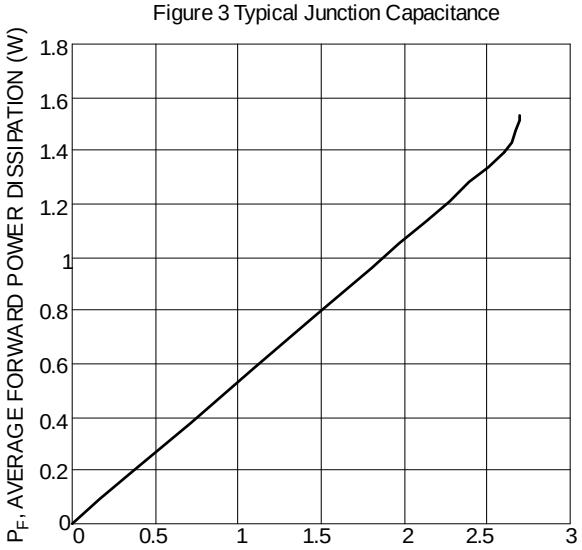
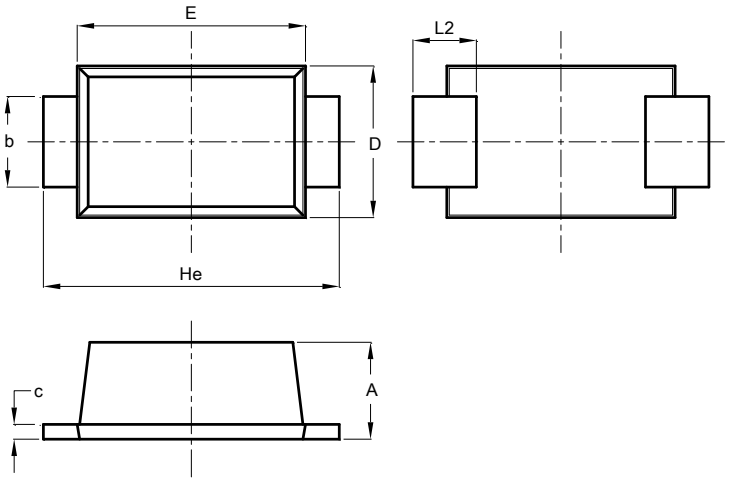



Figure 5 Forward Power Dissipation

## Package Outline Dimensions

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

**SOD123F**

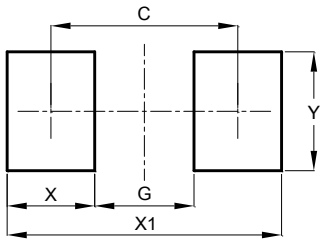



| SOD123F | | | |
|---|---|---|---|
| **Dim** | **Min** | **Max** | **Typ** |
| **A** | 0.81 | 1.15 | - |
| **b** | 0.80 | 1.35 | - |
| **c** | 0.05 | 0.30 | - |
| **D** | 1.70 | 1.90 | 1.80 |
| **E** | 2.60 | 2.80 | 2.70 |
| **He** | 3.30 | 3.70 | 3.50 |
| **L2** | 0.35 | 0.85 | - |
| **All Dimensions in mm** | | | |

## Suggested Pad Layout

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

**SOD123F**




| Dimensions | Value (in mm) |
|---|---|
| **C** | 2.86 |
| **G** | 1.52 |
| **X** | 1.34 |
| **X1** | 4.20 |
| **Y** | 1.80 |

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