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NEW PRODUCT

# SF1JWF

## 1.0A SURFACE MOUNT SUPER-FAST RECTIFIER

## Product Summary (@ $T_A$ = +25°C)

| $V_{RRM}$ (V) | $I_O$ (A) | $V_{F(MAX)}$ (V) | $I_{R(MAX)}$ (µA) |
|---|---|---|---|
| 600 | 1 | 1.7 | 5 |

## Features and Benefits

- Soft, Super-Fast Switching Capability for High Efficiency
- Low Leakage Current
- Glass Passivated for High Reliability
- Small Form Factor Package
- High Reverse Breakdown Voltage $V_{RRM}$
- Low Forward Voltage, Low Power Loss
- **Lead-Free Finish & RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

## Description

The SF1JWF-7 is a rectifier packaged in the SOD123F package and is suited as a boost diode in power factor correction circuitry. For use in secondary rectification and freewheeling for super-fast switching speed AC-AC and DC-DC converters in high-temperature conditions for consumer applications.

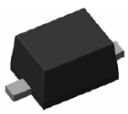
## Applications

- Flat Panel Display
- Switching Power Supplies/Chargers
- LED Lighting
- Freewheeling Diode

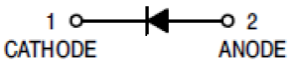
## Mechanical Data

- 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: 0.016 grams (Approximate)

**SOD123F**



Top View




Schematic View

## Ordering Information (Note 4)

| Part Number | Compliance | Case | Packaging |
|---|---|---|---|
| SF1JWF-7 | Commercial | SOD123F | 3,000/Tape & Reel |

Notes:
1. EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant. All applicable RoHS exemptions applied.
2. See https://www.diodes.com/quality/lead-free/ 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

**SOD123F**




E6 = Product Type Marking Code
YM = Date Code Marking
Y = Year (ex: E = 2017)
M = Month (ex: 9 = September)

Date Code Key

| Year | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 | 2023 | 2024 |
|---|---|---|---|---|---|---|---|---|
| Code | E | F | G | H | I | J | K | L |

| 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 |


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## Maximum Ratings (@$T_A$ = +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<br>Working Peak Reverse Voltage<br>DC Blocking Voltage | $V_{RRM}$<br>$V_{RWM}$<br>$V_R$ | 600 | V |
| RMS Reverse Voltage | $V_{R(RMS)}$ | 420 | V |
| Average Rectified Output Current @$T_A$ = +25°C | $I_O$ | 1 | A |
| Non-Repetitive Peak Forward Surge Current<br>8.3ms Single Half Sine-Wave Superimposed on Rated Load | $I_{FSM}$ | 30 | A |

## Thermal Characteristics

| Characteristic | Symbol | Value | Unit |
|---|---|---|---|
| Typical Thermal Resistance Junction to Case | $R_{\Theta JC}$ | 58 | °C/W |
| Typical Thermal Resistance Junction to Ambient (Note 6) | $R_{\Theta JA}$ | 95 | °C/W |
| Power Dissipation (Note 6) | $P_D$ | 1.7 | W |
| Operating and Storage Temperature Range | $T_J$, $T_{STG}$ | -65 to +150 | °C |

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

| Characteristic | Symbol | Min | Typ | Max | Unit | Test Condition |
|---|---|---|---|---|---|---|
| Reverse Breakdown Voltage (Note 7) | $V_{(BR)R}$ | 600 | — | — | V | $I_R$ = 10μA |
| Forward Voltage | $V_F$ | —<br>— | 1.4<br>1.1 | 1.7<br>— | V | $I_F$ = 1A, $T_J$ = +25°C<br>$I_F$ = 1A, $T_J$ = +125°C |
| Reverse Leakage Current (Note 7) | $I_R$ | —<br>— | 0.3<br>0.2 | 5<br>— | μA<br>mA | $V_R$ = 600V, $T_J$ = +25°C<br>$V_R$ = 600V, $T_J$ = +125°C |
| Reverse Recovery Time | $t_{RR}$ | — | 30 | 35 | ns | $I_F$ = 0.5A, $I_R$ = 1.0A, $I_{RR}$ = 0.25A |
| Total Capacitance | $C_T$ | — | 7 | — | pF | $V_R$ = 4.0$V_{DC}$, f = 1MHz |

Notes:
5. Device mounted on FR-4 substrate, 0.4" × 0.5", 2oz, single-sided, PCBs with 0.2" × 0.25" copper pad.
6. Device mounted on FR-4 substrate, 25.4mm × 25.4mm, 2oz, single-sided, PCBs with 2.1mm × 2.1mm copper pad.
7. Short duration pulse test used to minimize self-heating effect.


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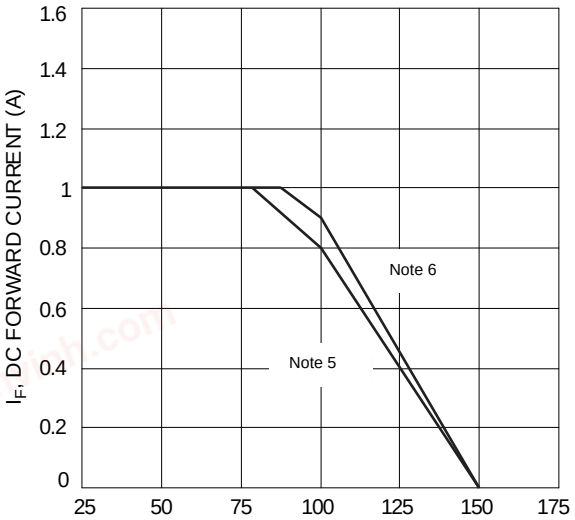



Figure 1 DC Forward Current Derating

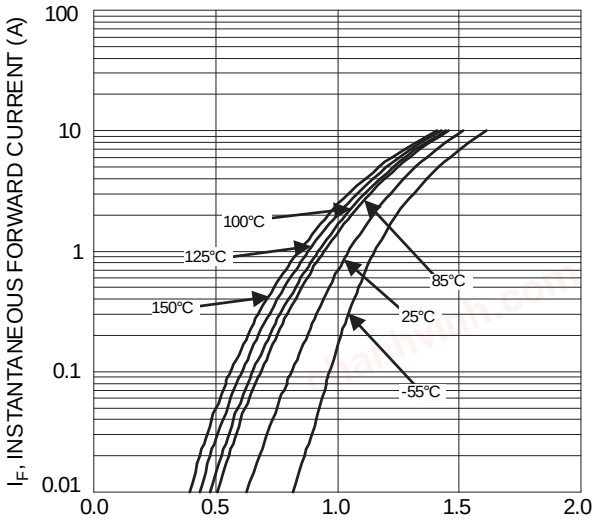



Figure 2 Typical Forward Characteristics

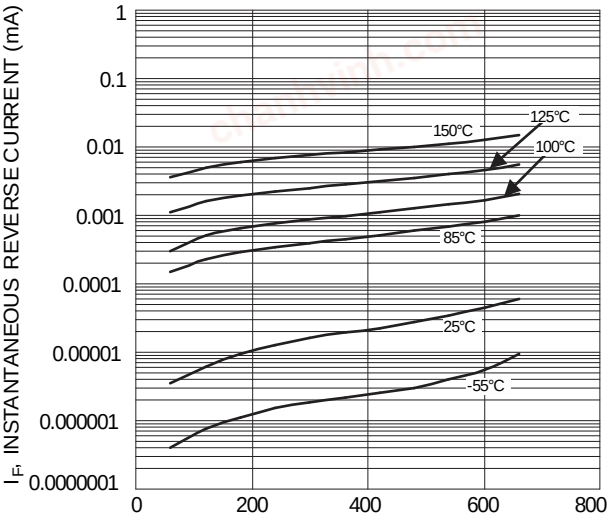



Figure 3 Typical Reverse Characteristics

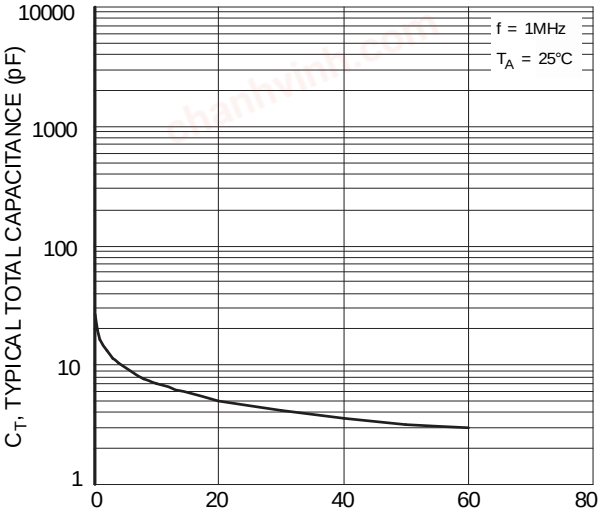



Figure 4 Total Capacitance

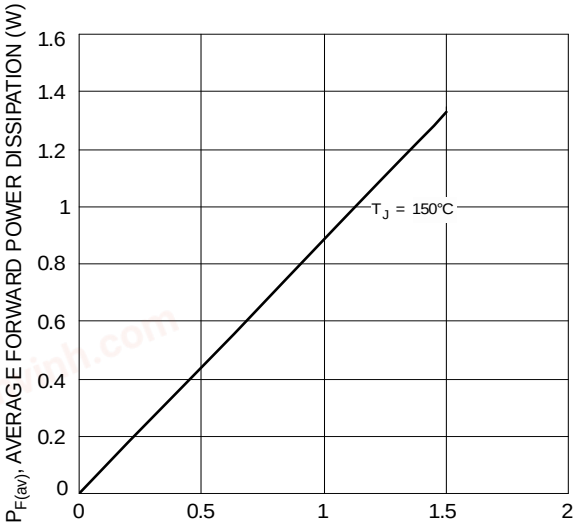



Figure 5 Forward Power Dissipation

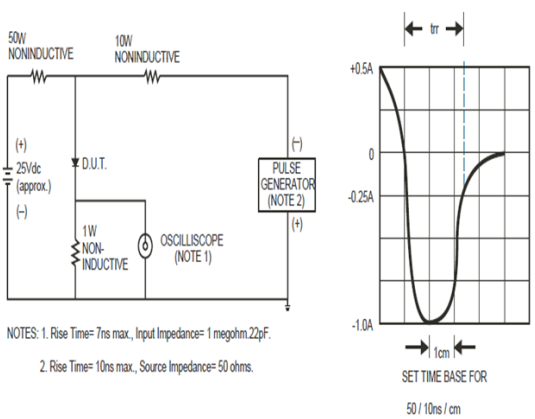



Fig 6. Reverse Recovery Time Characteristic and Test Circuit


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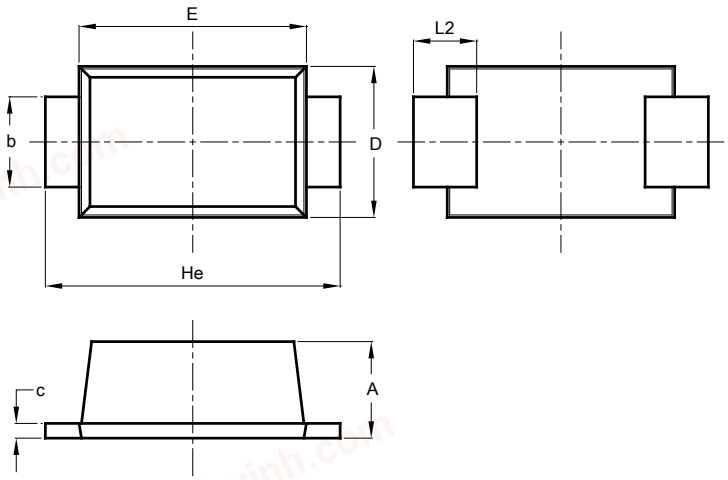


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## Package Outline Dimensions

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

**SOD123F**

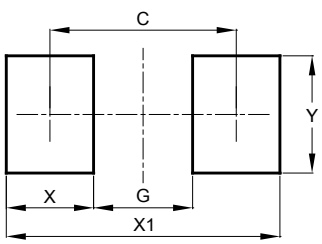



| SOD123F | | | |
|---|---|---|---|
| **Dim** | **Min** | **Max** | **Typ** |
| **A** | 0.81 | 1.15 | — |
| **b** | 0.80 | 1.05 | — |
| **c** | 0.05 | 0.30 | — |
| **D** | 1.70 | 1.90 | 1.80 |
| **E** | 2.60 | 2.80 | 2.70 |
| **He** | 3.30 | 3.70 | 3.50 |
| **L2** | 0.35 | 0.85 | — |
| **All Dimensions 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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