

NEW PRODUCT
Product Summary (@ T_A = +25°C)

| V _{RRM} (V) | I _o (A) | V _F Max (V) | I _R Max (μA) |
|----------------------|--------------------|------------------------|-------------------------|
| 200 | 1 | 0.95 | 5 |

Description

The US1DWF 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 ultra-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

Features and Benefits

- Low Profile, Small Form Factor Package
- Low Leakage Current
- Glass Passivate Die Construction
- Enhanced Ultrafast Recovery Times for High Efficiency
- Low Forward Voltage, Low Power Loss
- **Lead-Free Finish & RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

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 Ⓔ3
- Polarity: Cathode Band
- Weight: 0.016 grams (Approximate)

SOD123F



Top View



Schematic View

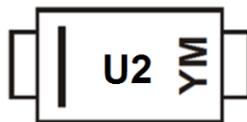
Ordering Information (Note 4)

| Part Number | Qualification | Case | Packaging |
|-------------|---------------|---------|-------------------|
| US1DWF-7 | AEC-Q101 | 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 <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information

SOD123F



U2 = Product Type Marking Code
 YM = Date Code Marking
 Y = Year (ex: E = 2017)
 M = Month (ex: 9 = September)

Date Code Key

| Year | 2015 | 2016 | 2017 | 2018 | 2019 | 2020 | 2021 | 2022 |
|------|------|------|------|------|------|------|------|------|
| Code | C | D | E | F | G | H | I | J |

| 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 | V _{RRM} | 200 | V |
| Working Peak Reverse Voltage | V _{RWM} | | |
| DC Blocking Voltage | V _R | | |
| Average Rectified Output Current | I _O | 1 | A |
| Non-Repetitive Peak Forward Surge Current 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 _{θJC} | 34 | °C/W |
| Typical Thermal Resistance Junction to Ambient (Note 5) | R _{θJA} | 96 | °C/W |
| Typical Thermal Resistance Junction to Ambient (Note 6) | R _{θJA} | 87 | °C/W |
| Operating and Storage Temperature Range | T _J , T _{STG} | -55 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} | 200 | — | — | V | I _R = 10μA |
| Forward Voltage | V _F | — | 0.9 0.8 | 0.95 — | V | I _F = 1A, T _J = +25°C I _F = 1A, T _J = +125°C |
| Reverse Leakage Current (Note 7) | I _R | — | 0.1 1.0 | 5 100 | μA | V _R = 200V, T _J = +25°C V _R = 200V, T _J = +125°C |
| Reverse Recovery Time | t _{RR} | — | 30 | 35 | ns | I _F = 0.5A, I _R = 1.0A, I _{RR} = 0.25A |
| Typical Total Capacitance | C _T | — | 14 | — | pF | V _R = 4V, f=1MHz |

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

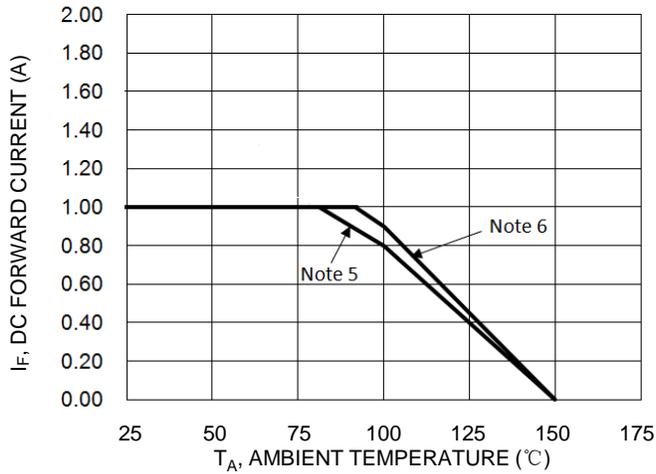


Figure 1. DC Forward Current Derating

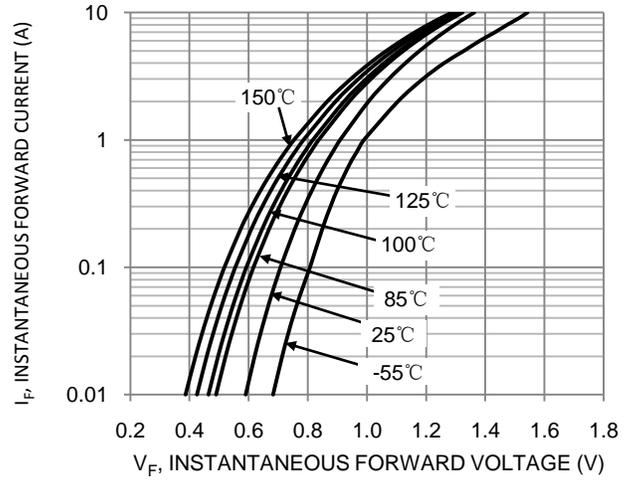


Figure 2. Typical Forward Characteristics

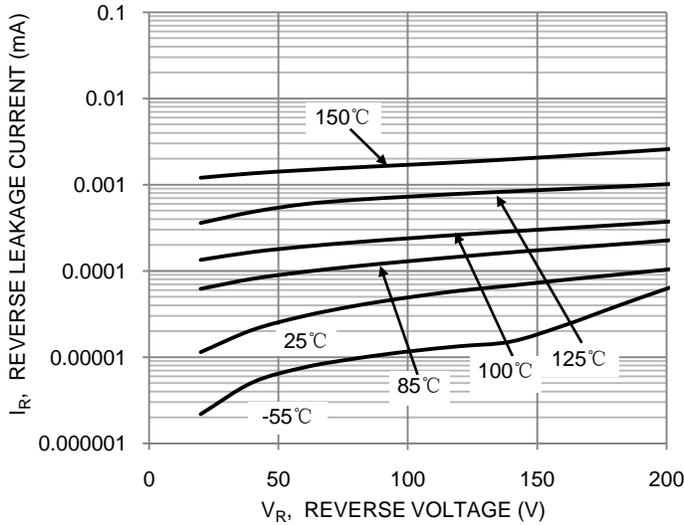


Figure 3. Typical Reverse Characteristics

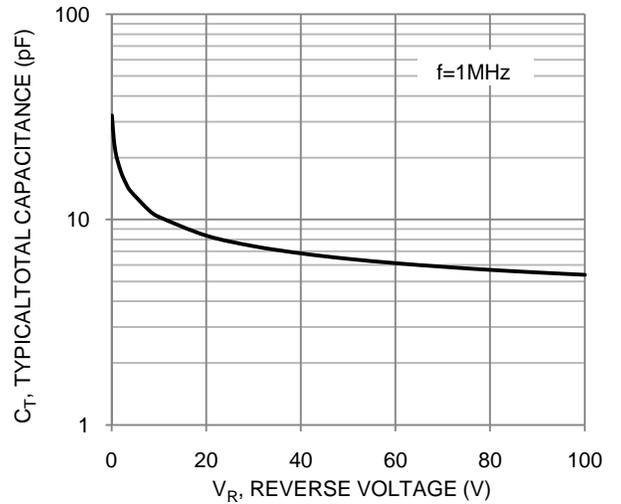


Figure 4. Typical Forward Characteristics

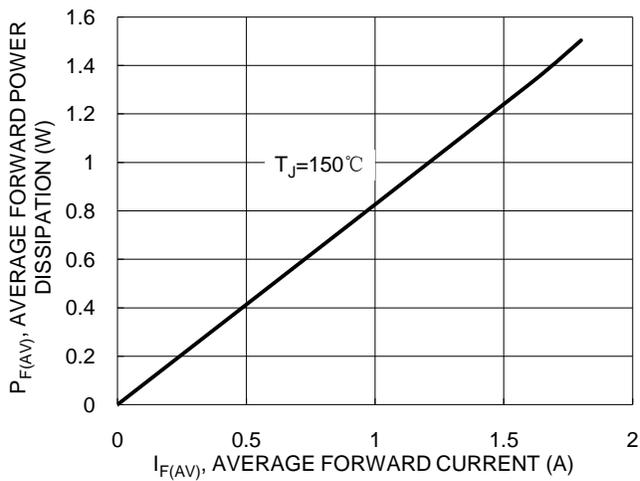
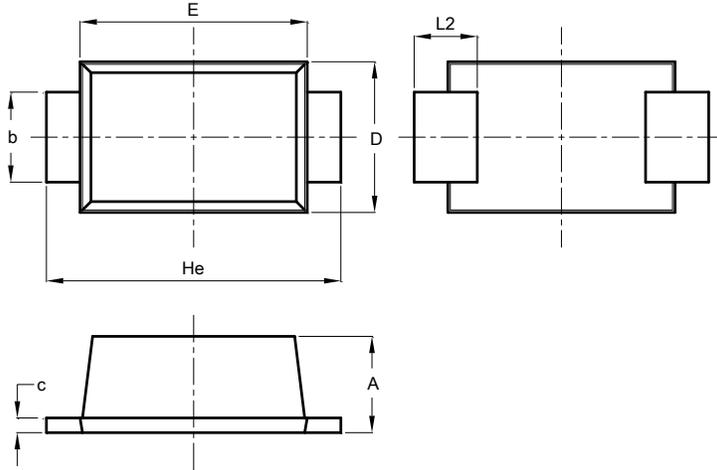


Figure 5. Forward Power Dissipation

Package Outline Dimensions

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

SOD123F

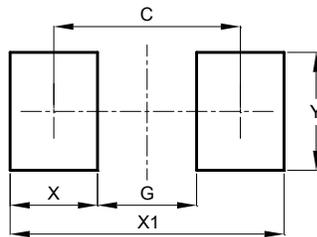


| SOD123F | | | |
|----------------------|------|------|------|
| Dim | Min | Max | Typ |
| A | 0.81 | 1.15 | - |
| b | 0.80 | 1.05 | - |
| c | 0.05 | 0.30 | - |
| D | 1.70 | 1.90 | 1.80 |
| E | 2.60 | 2.80 | 2.70 |
| He | 3.30 | 3.70 | 3.50 |
| L2 | 0.35 | 0.85 | - |
| All Dimensions in mm | | | |

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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