

1.0A SURFACE-MOUNT ULTRA-FAST RECTIFIER
Product Summary (@ T_A = +25°C)

V _R RM (V)	I _O (A)	V _F Max (V)	I _R Max (μA)
400	1	1.25	1

Description

The US1GWF is a rectifier packaged in the SOD123F (Standard) 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 displays
- Switching power supplies/chargers
- LED lighting
- Freewheeling diodes

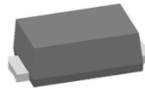
Features and Benefits

- Low Profile, Small Form Factor Package
- Very 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)**
- **This part is qualified to JEDEC standards (as references in AEC-Q) for High Reliability.**
<https://www.diodes.com/quality/product-definitions/>
- **An automotive-compliant part is available under a separate datasheet (US1GWFQ)**

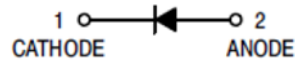
Mechanical Data

- Package: SOD123F
- Package 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 (Standard)



Top View



Schematic View

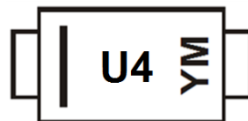
Ordering Information (Note 4)

Orderable Part Number	Package	Packing	
		Qty.	Carrier
US1GWF-7	SOD123F (Standard)	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 <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information

SOD123F (Standard)



- U4 = Product Type Marking Code
- YM = Date Code Marking
- Y = Year (ex.: N = 2026)
- M = Month (ex: D = December)

Date Code Key

Year	2016	-	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Code	D	-	N	P	R	S	T	U	V	W	X	Y

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}	400	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 (Note 6)	R _{θJC}	63	°C/W
Typical Thermal Resistance Junction to Ambient (Note 5)	R _{θJA}	118	°C/W
Typical Thermal Resistance Junction to Ambient (Note 6)	R _{θJA}	95	°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}	400	—	—	V	I _R = 10μA
Forward Voltage	V _F	—	1.1 0.9	1.25 —	V	I _F = 1A, T _J = +25°C I _F = 1A, T _J = +125°C
Reverse Leakage Current (Note 7)	I _R	—	0.1 2	1 10	μA	V _R = 400V, T _J = +25°C V _R = 400V, T _J = +100°C
Reverse-Recovery Time	t _{RR}	—	28	35	ns	I _F = 0.5A, I _R = 1.0A, I _{RR} = 0.25A
Typical Total Capacitance	C _T	—	9	—	pF	V _R = 4V, f = 1MHz

Notes: 5. Device mounted on FR-4 substrate, 1"*1", 2oz, single-sided, PC boards with 0.1"*0.15" 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.

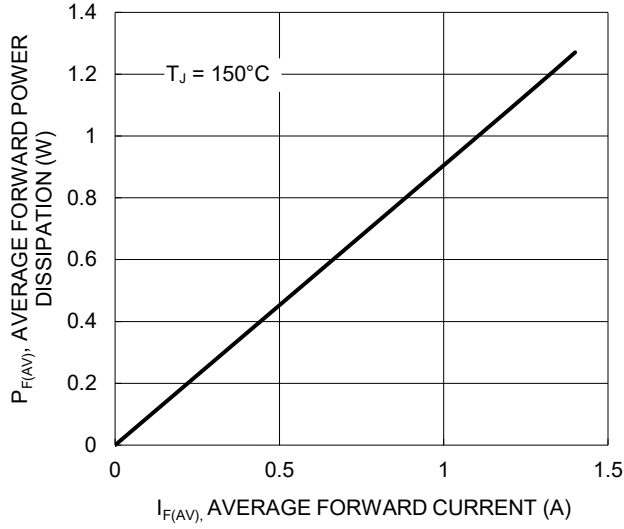


Figure 1. Forward Power Dissipation

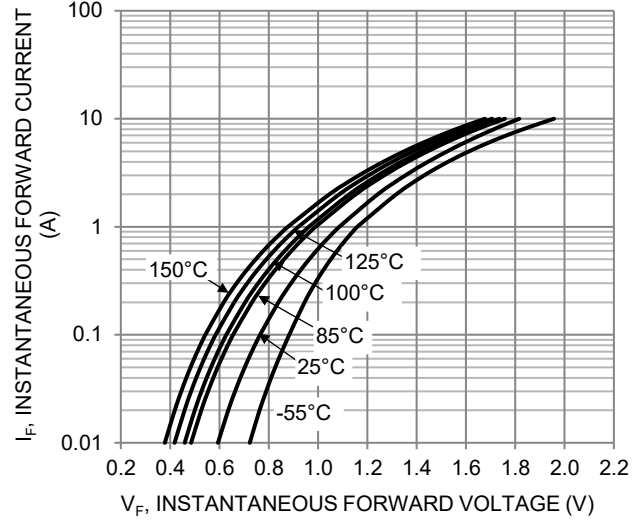


Figure 2. Typical Forward Characteristic

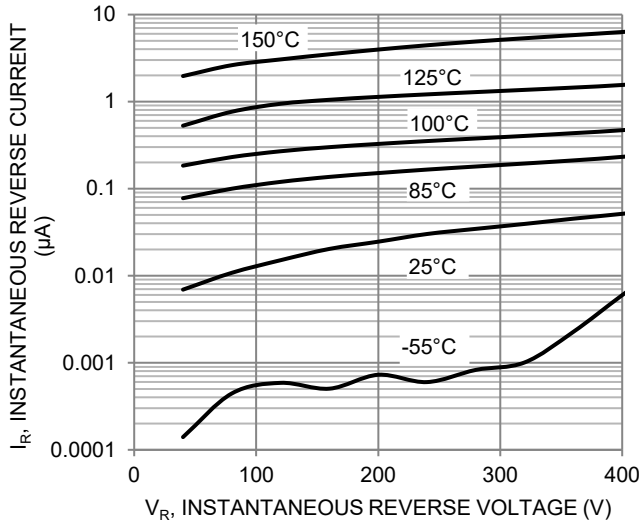


Figure 3. Typical Reverse Characteristic

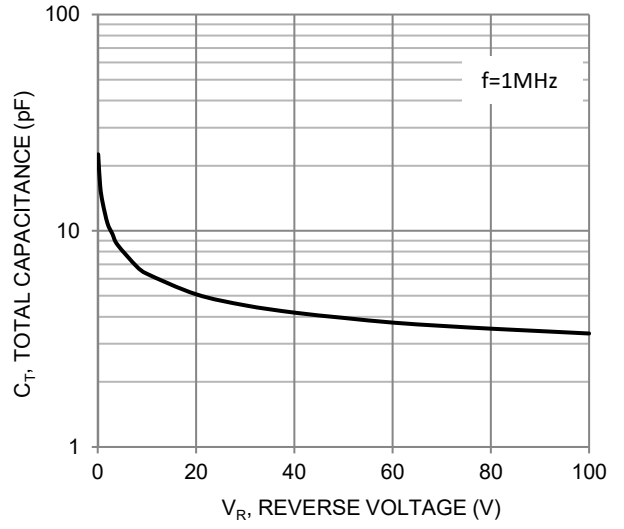


Figure 4. Total Capacitance vs. Reverse Voltage

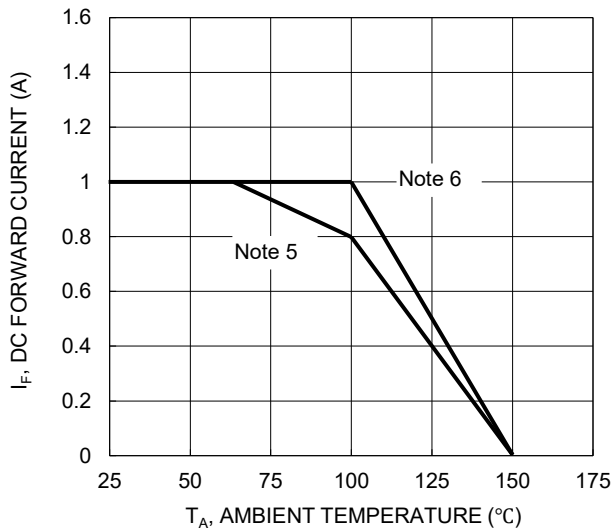
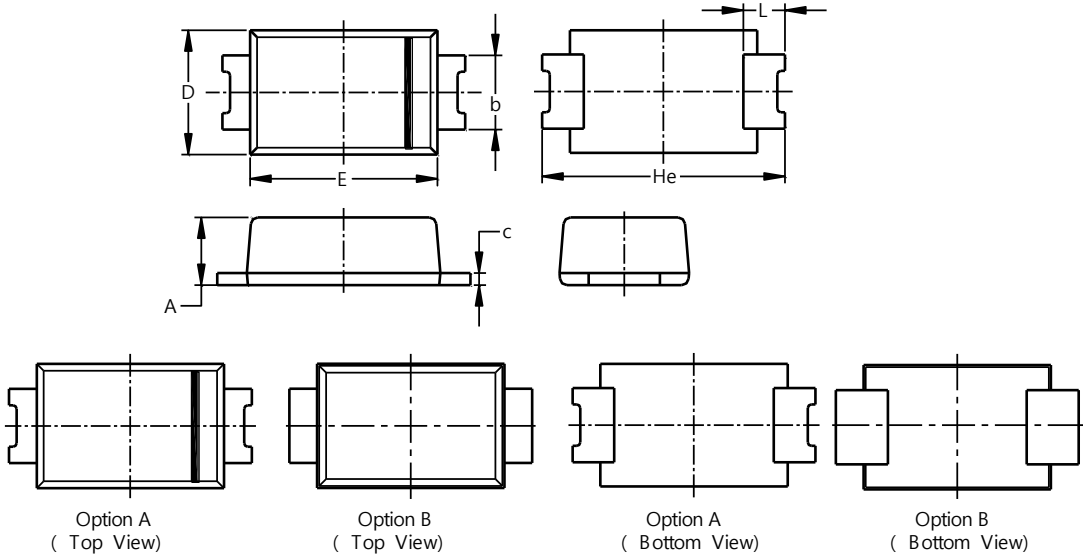


Figure 5. DC Forward Current Derating

Package Outline Dimensions

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

SOD123F (Standard)

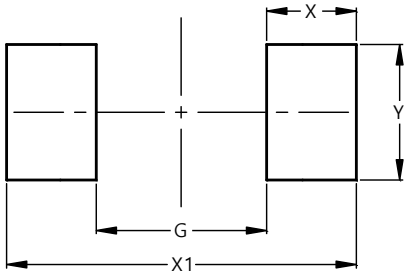


SOD123F (Standard)			
Dim	Min	Max	Typ
A	0.81	1.15	-
b	0.80	1.35	-
c	0.05	0.30	-
D	1.70	1.90	1.80
E	2.60	2.80	2.70
He	3.30	3.70	3.50
L	0.35	0.85	-
All Dimensions in mm			

Suggested Pad Layout

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

SOD123F (Standard)



Dimensions	Value (in mm)
G	1.90
X	1.00
X1	3.90
Y	1.50

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