

Product Summary (@T_A = +25°C)

V _{RRM} (V)	I _O (A)	V _F Max (V)	I _R Max (μA)
1,000	1.0	1.1	10

Description and Applications

The DIODES™ S1MSP1M is a rectifier packaged in the PowerDI[®]123 package. Providing high-reverse breakdown voltage and high-current capability for standard rectification, this device is ideal for use in applications such as:

- Switching-mode power-supply applications
- DC-DC converter applications
- AC-DC adaptors/chargers
- Mobile devices
- LED lighting

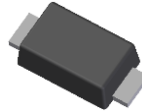
Features and Benefits

- Glass Passivated Die Construction
- Ideally Suited for Automated Assembly
- Low Profile Design, Package Height Less than 1.0mm
- Low Reverse Leakage Current
- Exceptional Thermal Transfer Based on Exposed Heat Sink on the Underside of the Device
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. “Green” Device (Note 3)**
- **For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/104/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please [contact us](mailto:contact@diodes.com) or your local Diodes representative. <https://www.diodes.com/quality/product-definitions/>**

Mechanical Data

- Package: PowerDI123
- 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
- Polarity: Cathode Band
- Weight: 0.01 grams (Approximate)

PowerDI123



Top View

Ordering Information (Note 4)

Part Number	Package	Packing	
		Qty.	Carrier
S1MSP1M-7	PowerDI123	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

PowerDI123



G20 = Product Type Marking Code
 YM = Date Code Marking
 Y = Year (ex: J = 2022)
 M = Month (ex: 9 = September)

Date Code Key

Year	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033
Code	J	K	L	M	N	O	P	R	S	T	U	V
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

PowerDI is a registered trademark of Diodes Incorporated.

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}	1,000	V
Working Peak Reverse Voltage	V _{RWM}		
DC Blocking Voltage	V _{RM}		
RMS Reverse Voltage	V _{R(RMS)}	700	V
Average Rectified Output Current @ T _A = +30°C	I _O	1.0	A
Non-Repetitive Peak Forward Surge Current 8.3ms Single Half Sine-Wave Superimposed on Rated Load	I _{FSM}	25	A

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Typical Thermal Resistance, Junction to Case (Note 5)	R _{θJC}	25	°C/W
Typical Thermal Resistance Junction to Ambient (Note 5)	R _{θJA}	137	°C/W
Typical Thermal Resistance, Junction to Lead (Note 5)	R _{θJL}	20	°C/W
Typical Thermal Resistance, Junction to Case (Note 6)	R _{θJC}	6	°C/W
Typical Thermal Resistance Junction to Ambient (Note 6)	R _{θJA}	54	°C/W
Typical Thermal Resistance, Junction to Lead (Note 6)	R _{θJL}	5	°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}	1,000	—	—	V	I _R = 5μA
Forward Voltage Drop	V _F	—	0.98	1.1	V	I _F = 1A, T _J = +25°C
Leakage Current (Note 7)	I _R	—	0.5 12	10 100	μA	V _R = 1,000V, T _J = +25°C V _R = 1,000V, T _J = +125°C
Reverse Recovery Time	t _{rr}	—	1.2	—	μs	I _F = 0.5A, I _R = 1.0A, I _{RR} = 0.25A
Total Capacitance	C _T	—	2.8	—	pF	V _R = 4.0V _{DC} , f = 1MHz

- Notes:
- Device mounted on FR-4 substrate PC board, with minimum recommended pad layout.
 - Device mounted on 1" x 1", FR-4 PCB; 2oz. Cu pad layout as shown on Diodes Incorporated's website at <http://www.diodes.com/package-outlines.html>. T_A = +25°C.
 - Short duration test pulse used to minimize self-heating effect.

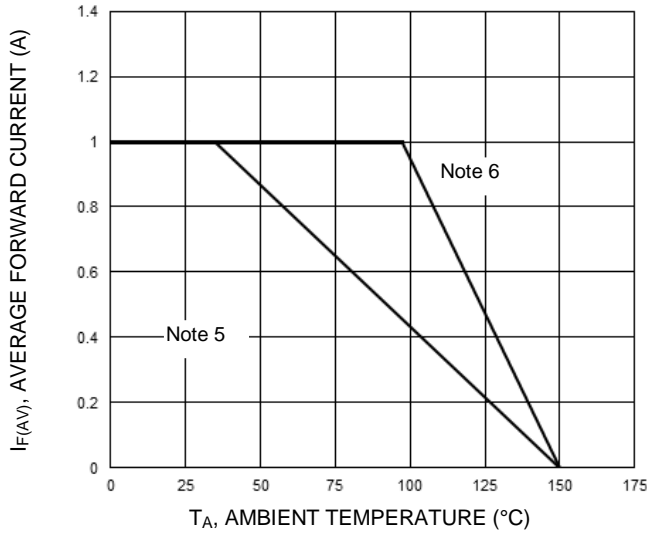


Figure 1. Forward Current Derating

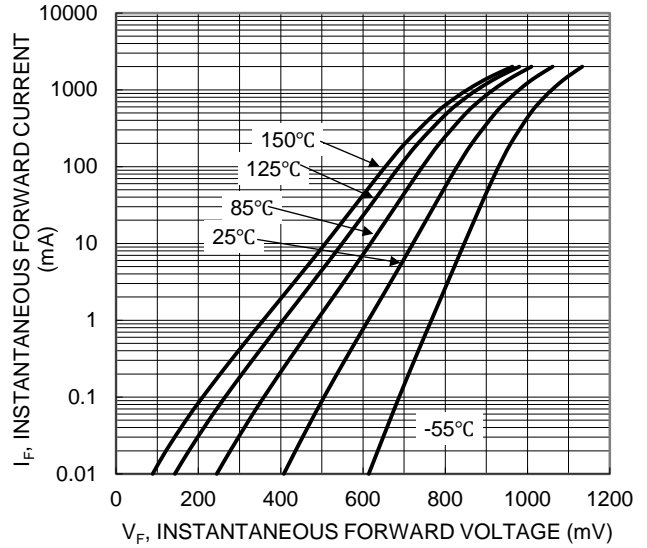


Figure 2. Typical Forward Characteristics

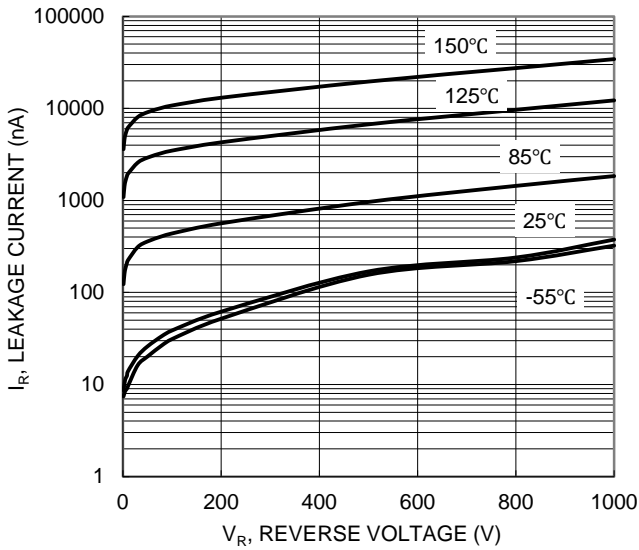


Figure 3. Typical Reverse Characteristics

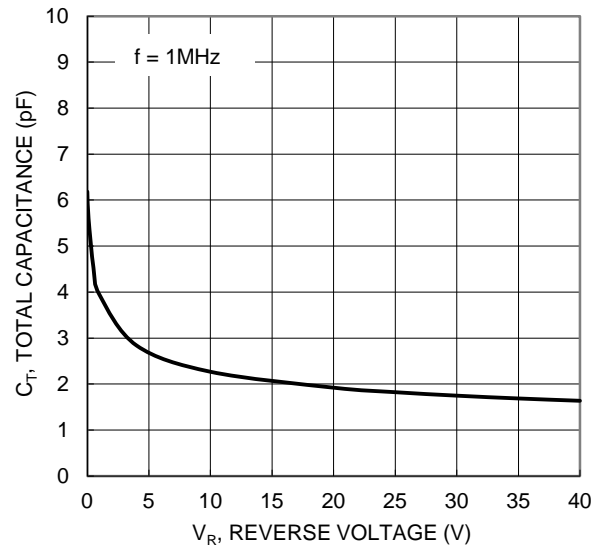
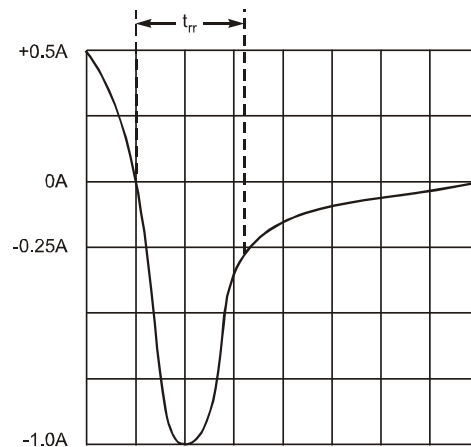
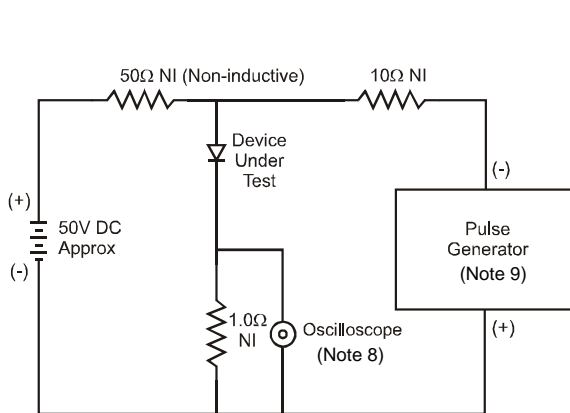


Figure 4. Typical Total Capacitance



Set time base for 50/100 ns/cm

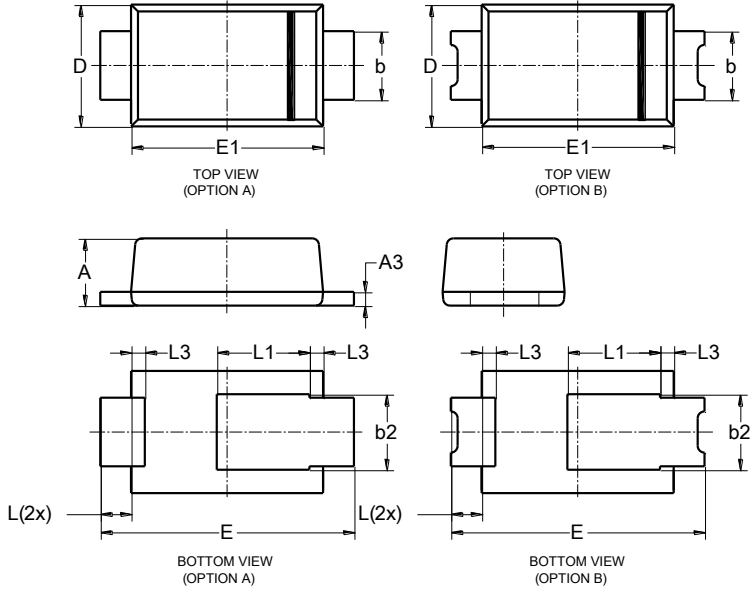
Figure 5. Reverse Recovery Time Characteristic and Test Circuit

Notes: 8. Rise time = 7.0ns max. Input impedance = 1.0MΩ, 22pF.
9. Rise time = 10ns max. Input impedance = 50Ω.

Package Outline Dimensions

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

PowerDI123

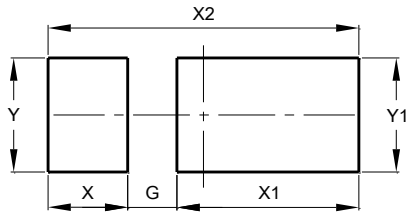


PowerDI123			
Dim	Min	Max	Typ
A	0.93	1.00	0.98
A3	0.15	0.25	0.20
b	0.85	1.25	1.00
b2	1.025	1.125	1.10
D	1.63	1.93	1.78
E	3.50	3.90	3.70
E1	2.60	3.00	2.80
L	0.40	0.50	0.45
L1	1.25	1.40	1.35
L3	0.125	0.275	0.20
All Dimensions in mm			

Suggested Pad Layout

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

PowerDI123



Dimensions	Value (in mm)
G	0.65
X	1.05
X1	2.40
X2	4.10
Y	1.50
Y1	1.50

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