

**1.0A SURFACE MOUNT GLASS PASSIVATED RECTIFIER
PowerDI123**

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™ S1MSP1 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](#) 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)

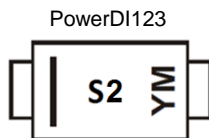


Ordering Information (Note 4)

Part Number	Package	Packing	
		Qty.	Carrier
S1MSP1-7	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



S2 = Product Type Marking Code
 YM = Date Code Marking
 Y = Year (ex.: J = 2022)
 M = Month (ex: 9 = September)

Date Code Key

Year	2015	...	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
Code	C	...	J	K	L	M	N	O	P	R	S	T
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 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

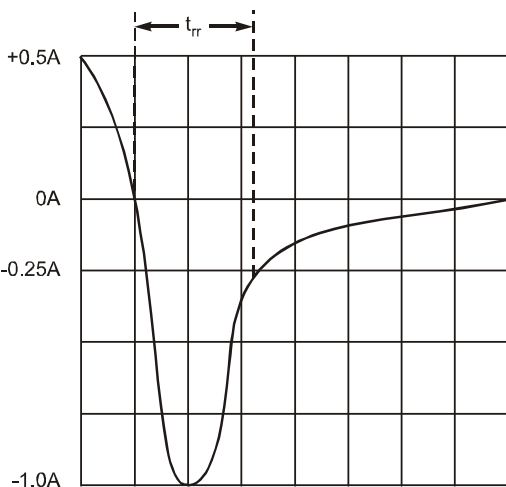
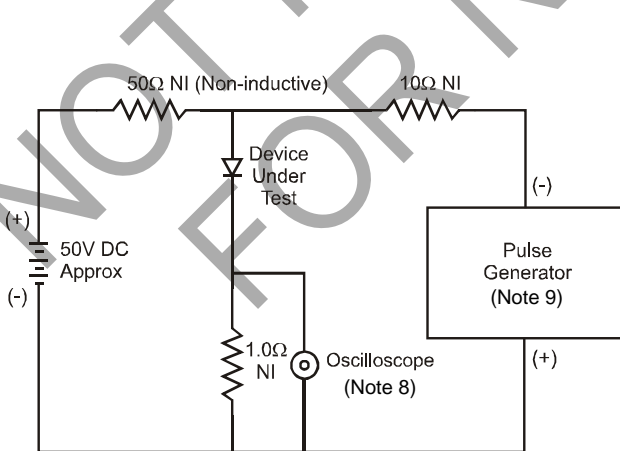
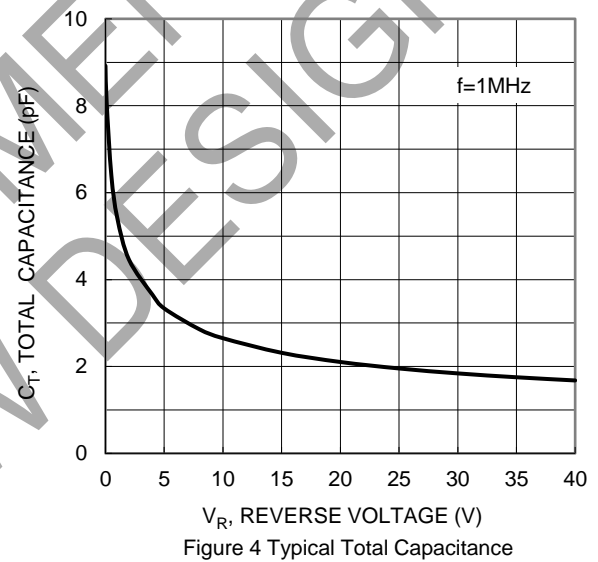
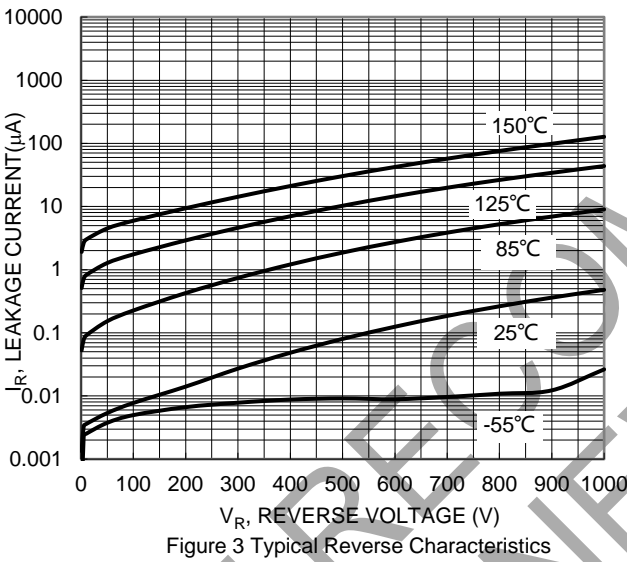
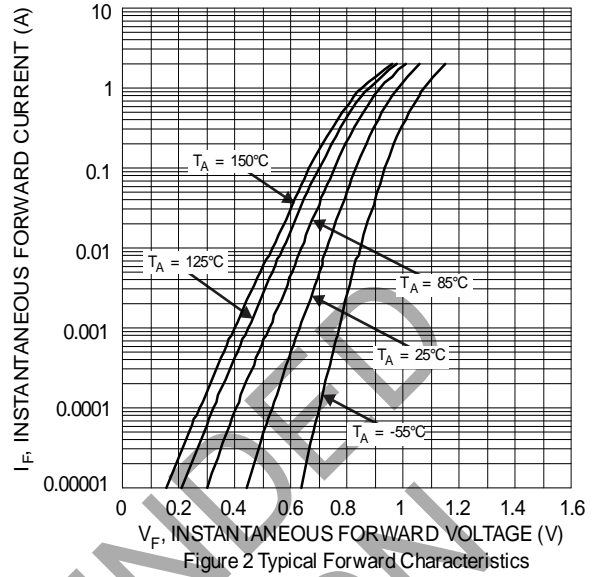
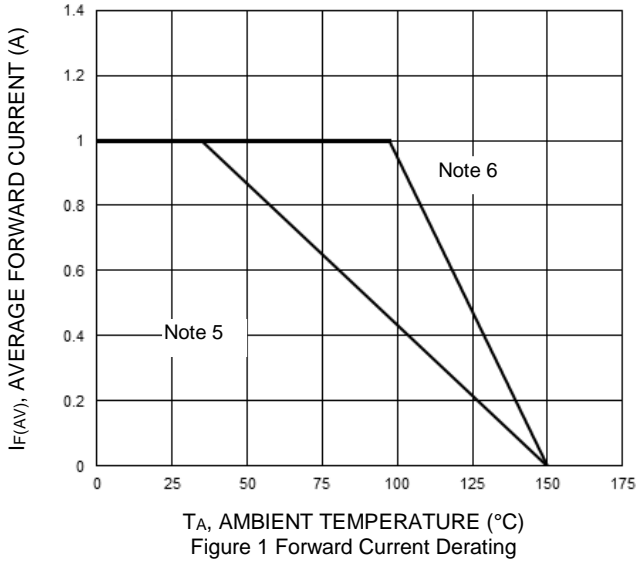
Thermal Characteristics

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	—	0.97	1.1	V	I _F = 1A, T _J = +25°C
Leakage Current (Note 7)	I _R	—	0.5 43	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	—	4	—	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; 2 oz. 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.



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

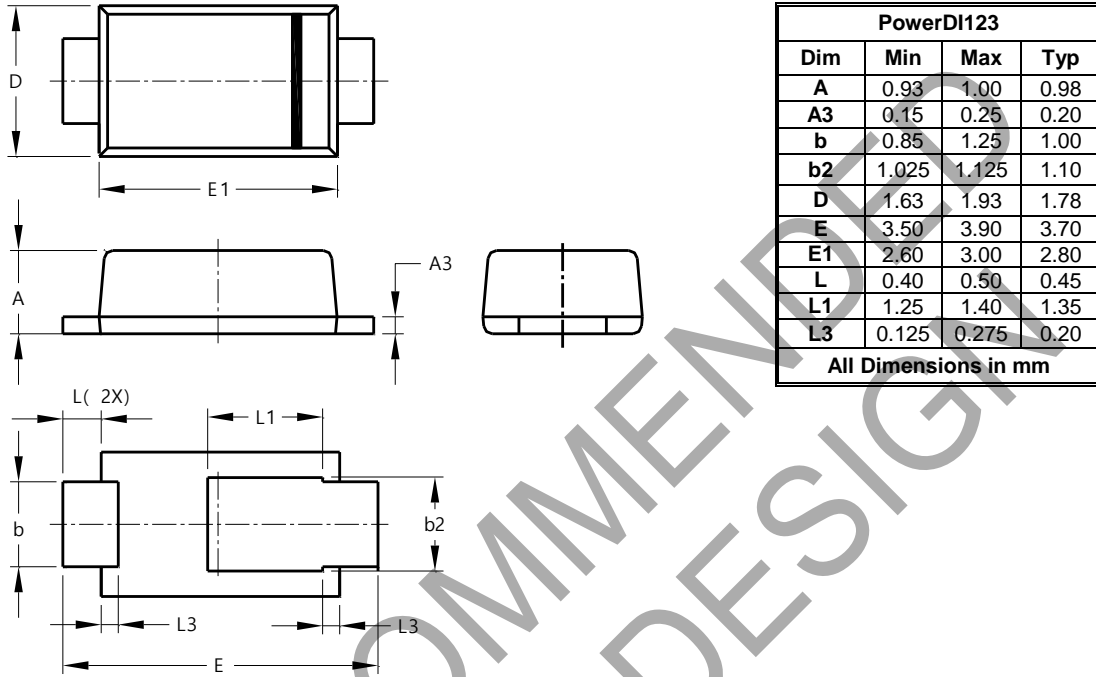
Set time base for 50/100 ns/cm

Fig. 5 Reverse Recovery Time Characteristic and Test Circuit

Package Outline Dimensions

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

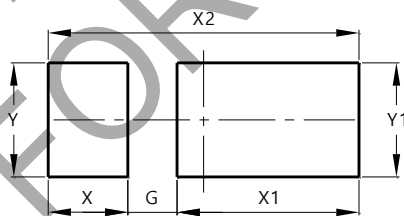
PowerDI123



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

Note: For high voltage applications, the appropriate industry sector guidelines should be considered with regards to creepage and clearance distances between device terminals and PCB tracking.

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