

Product Summary (@ T_A = +25°C)

V _{RRM} (V)	I ₀ (A)	V _F Max (V)	I _R Max (µA)
1,000	1	1.3	10

Description and Applications

The RS1MSP1 is a rectifier packaged in the PowerDI123 package. Providing fast recovery time for high efficiency, 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

Features and Benefits

- Glass Passivated Die Construction
- Fast Recovery Time For High Efficiency
- Low Profile Design, Package Height Less than 1.0mm
- Ideally Suited for Automated Assembly
- 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)**

Mechanical Data

- Case: PowerDI123
- 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: 0.01 grams (Approximate)

PowerDI123



Top View

Ordering Information (Note 4)

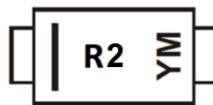
Part Number	Compliance	Case	Packaging
RS1MSP1-7	Commercial	PowerDI123	3,000/Tape & Reel

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 <http://www.diodes.com/products/packages.html>.

Marking Information

PowerDI123



R2 = Product Type Marking Code
YM = Date Code Marking
Y = Year (ex.: C = 2015)
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 (@ $T_A = +25^\circ\text{C}$, 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}		
Working Peak Reverse Voltage	V_{RWM}	1,000	V
DC Blocking Voltage	V_{RM}		
RMS Reverse Voltage	$V_{R(\text{RMS})}$	700	V
Average Rectified Output Current @ $T_A = +30^\circ\text{C}$	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)	$R_{\theta JC}$	24	°C/W
Typical Thermal Resistance, Junction to Soldering Point (Note 6)	$R_{\theta JS}$	7	°C/W
Typical Thermal Resistance Junction to Ambient (Note 5)	$R_{\theta JA}$	152	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

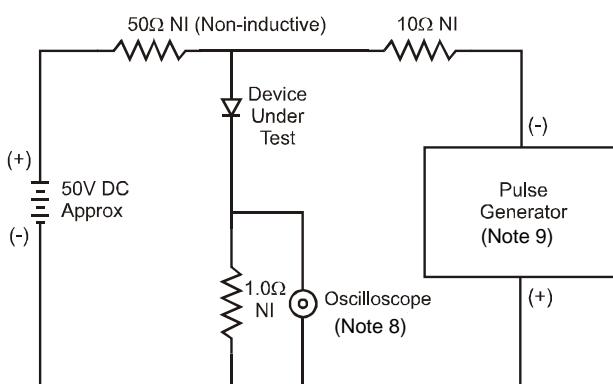
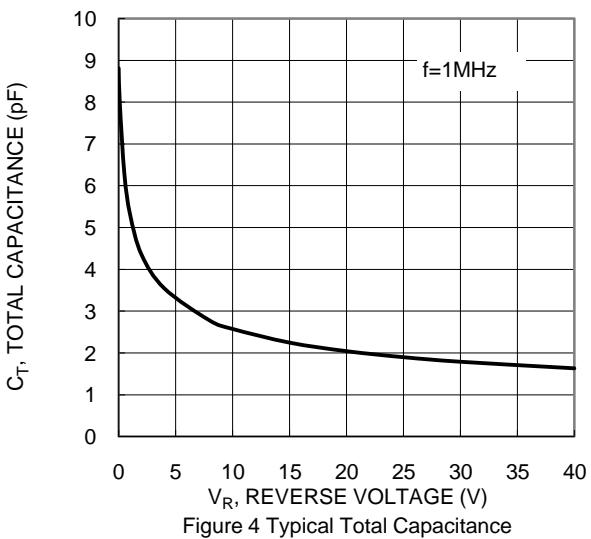
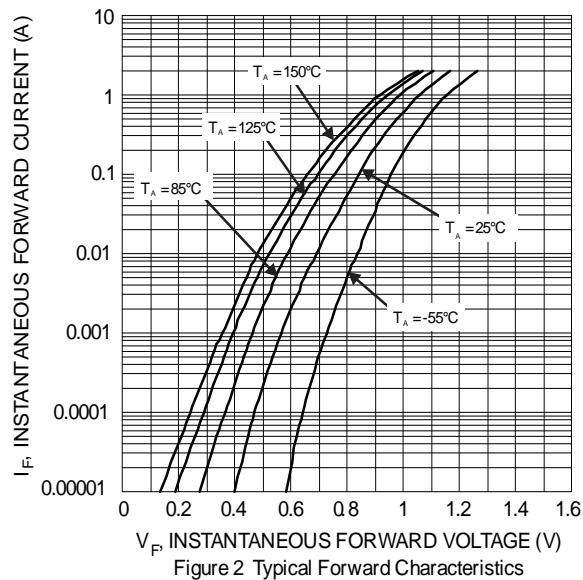
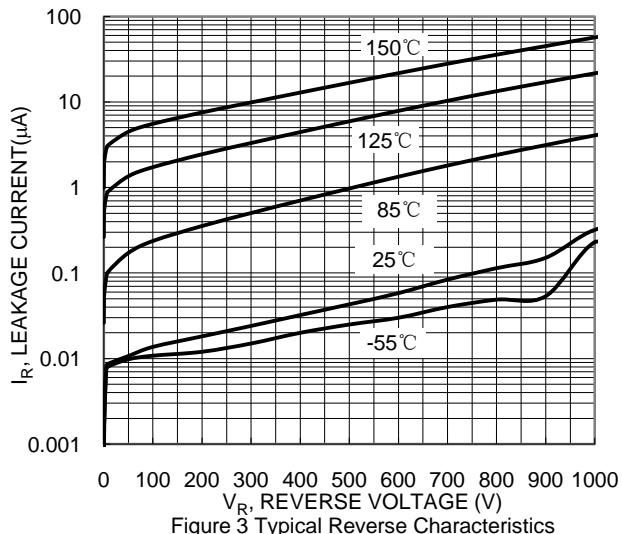
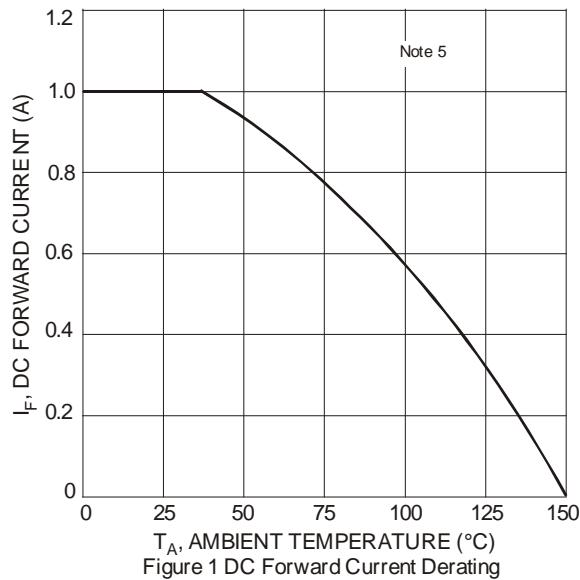
Electrical Characteristics (@ $T_A = +25^\circ\text{C}$, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Breakdown Voltage (Note 7)	$V_{(BR)R}$	1,000	—	—	V	$I_R = 5\mu\text{A}$
Forward Voltage Drop	V_F	—	1.1 0.97	1.3 —	V	$I_F = 1\text{A}, T_J = +25^\circ\text{C}$ $I_F = 1\text{A}, T_J = +125^\circ\text{C}$
Leakage Current (Note 7)	I_R	—	0.3 22	10 200	μA	$V_R = 1,000\text{V}, T_J = +25^\circ\text{C}$ $V_R = 1,000\text{V}, T_J = +125^\circ\text{C}$
Reverse Recovery Time	t_{RR}	—	200	500	ns	$I_F = 0.5\text{A}, I_R = 1.0\text{A},$ $I_{RR} = 0.25\text{A}$
Total Capacitance	C_T	—	4	—	pF	$V_R = 4.0\text{V}_{\text{DC}}, f = 1\text{MHz}$

Notes: 5. Device mounted on 1" x 1", FR-4 PCB; 2 oz. Cu pad layout as shown on Diodes' website at <http://www.diodes.com/package-outlines.html>. $T_A = +25^\circ\text{C}$.

6. Theoretical $R_{\theta JS}$ calculated from the top center of the die straight down to the PCB/cathode tab solder junction.

7. 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.

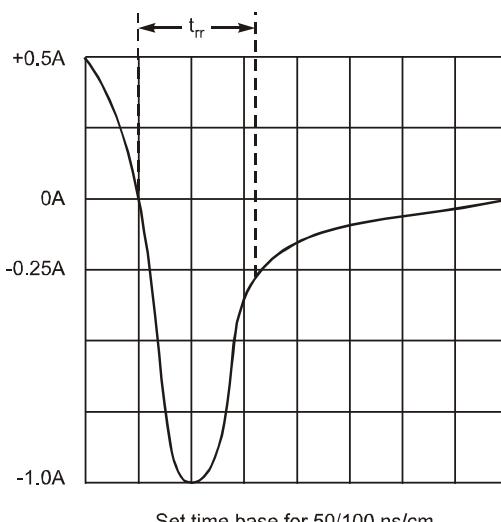
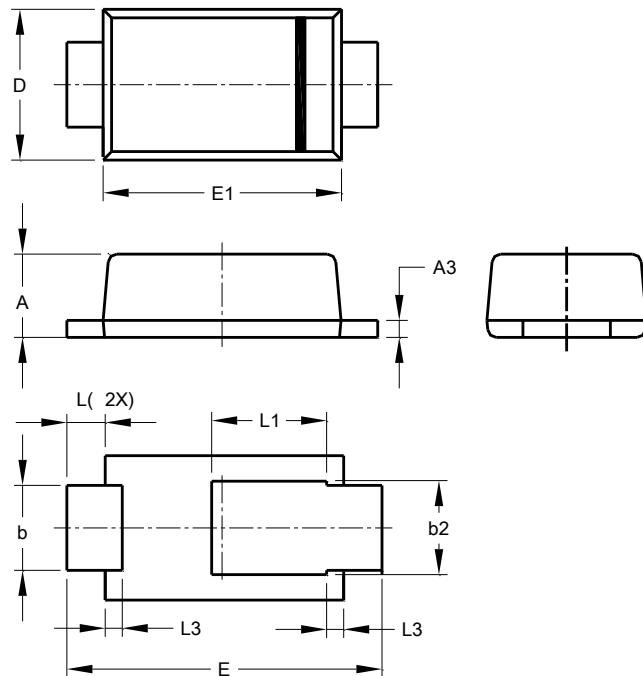


Fig. 5 Reverse Recovery Time Characteristic and Test Circuit

Package Outline Dimensions

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

PowerDI123

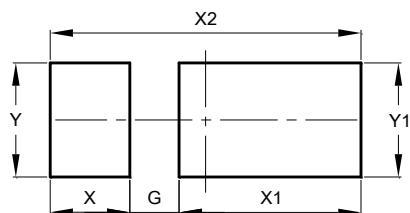


PowerDI123			
Dim	Min	Max	Typ
A	0.93	1.00	0.98
A3	0.15	0.25	0.20
b	0.85	1.25	1.00
b2	1.025	1.125	1.10
D	1.63	1.93	1.78
E	3.50	3.90	3.70
E1	2.60	3.00	2.80
L	0.40	0.50	0.45
L1	1.25	1.40	1.35
L3	0.125	0.275	0.20
All Dimensions in mm			

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

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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