

## Features

- Ultra Low Forward Voltage Drop
- Low Leakage Current
- Superior Reverse Avalanche Capability
- Excellent High Temperature Stability
- Patented Interlocking Clip Design for High Surge Current Capacity
- Patented Super Barrier Rectifier Technology (SBR®)
- Soft, Fast Switching Capability
- +150°C Operating Junction Temperature
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

## Mechanical Data

- Case: PowerDI® 123
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Polarity Indicator: Cathode Band
- Terminals: Finish - Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 (E3)
- Weight: 0.018 grams (Approximate)

PowerDI123



Top View

## Ordering Information (Note 4)

Part Number	Case	Packaging
SBR1U400P1-7	PowerDI123	3000/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



SDE = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: F = 2018)  
 M = Month (ex: 9 = September)

### Date Code Key

Year	2015	2016	2017	2018	2019	2020	2021					
Code	C	D	E	F	G	H	I					
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	$V_{RWM}$	400	V
DC Blocking Voltage	$V_{RM}$		
Average Rectified Output Current (See Figure 1)	$I_O$	1.0	A
Non-Repetitive Peak Forward Surge Current 8.3ms	$I_{FSM}$	40	A
Single Half Sine-Wave Superimposed on Rated Load			

**Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Maximum Thermal Resistance Junction to Ambient (Note 5)	$R_{\theta JA}$	217	$^\circ\text{C/W}$
Maximum Thermal Resistance Junction to Ambient (Note 6)	$R_{\theta JA}$	138	$^\circ\text{C/W}$
Operating and Storage Temperature Range	$T_J, T_{STG}$	-65 to +150	$^\circ\text{C}$

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Forward Voltage	$V_F$	—	0.82	0.90	V	$I_F = 1.0\text{A}, T_J = +25^\circ\text{C}$ $I_F = 1.0\text{A}, T_J = +125^\circ\text{C}$
Reverse Current (Note 7)	$I_R$	—	—	0.05	mA	$V_R = 400\text{V}, T_J = +25^\circ\text{C}$ $V_R = 400\text{V}, T_J = +85^\circ\text{C}$ $V_R = 400\text{V}, T_J = +125^\circ\text{C}$
Reverse Recovery Time	$t_{RR}$	—	—	85	ns	$I_F = 0.5\text{A}, I_R = 1\text{A},$ $I_{RR} = 0.25\text{A}$

Notes:  
 5. FR-4 PCB, 2 oz. Copper, minimum recommended pad layout per <http://www.diodes.com/package-outlines.html>.  
 6. Polyimide PCB, 2 oz. Copper, minimum recommended pad layout per <http://www.diodes.com/package-outlines.html>.  
 7. Short duration pulse test used to minimize self-heating effect.

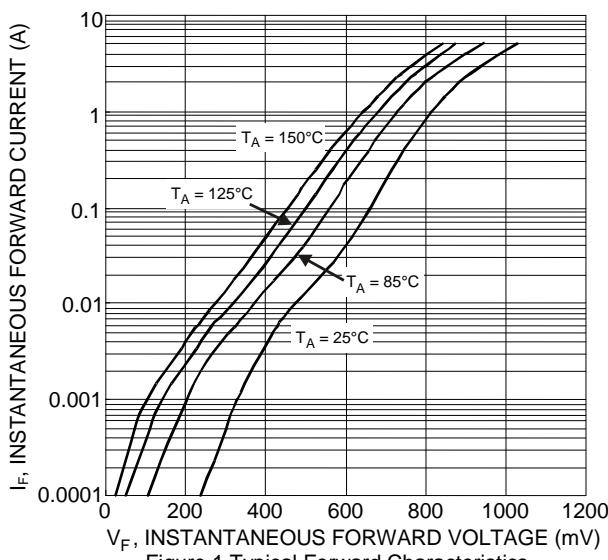


Figure 1 Typical Forward Characteristics

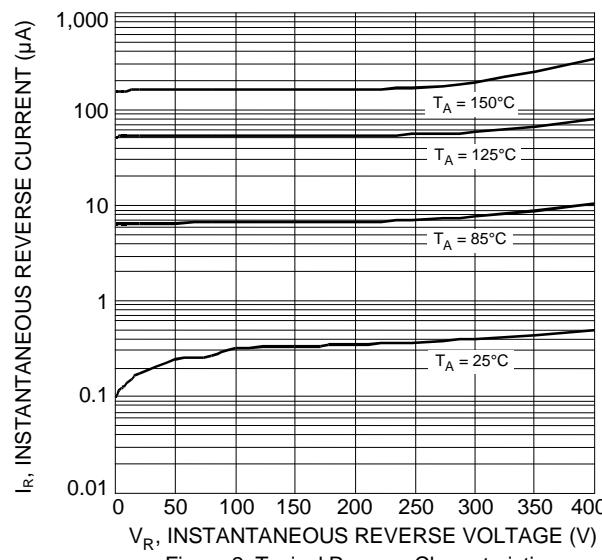


Figure 2 Typical Reverse Characteristics

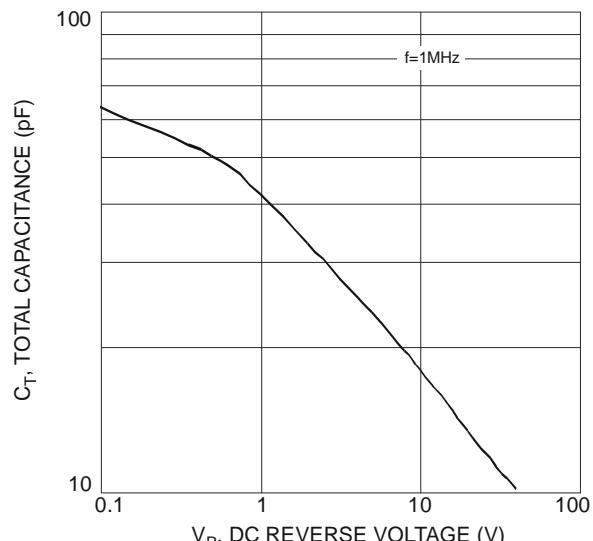


Figure 3 Total Capacitance vs. Reverse Voltage

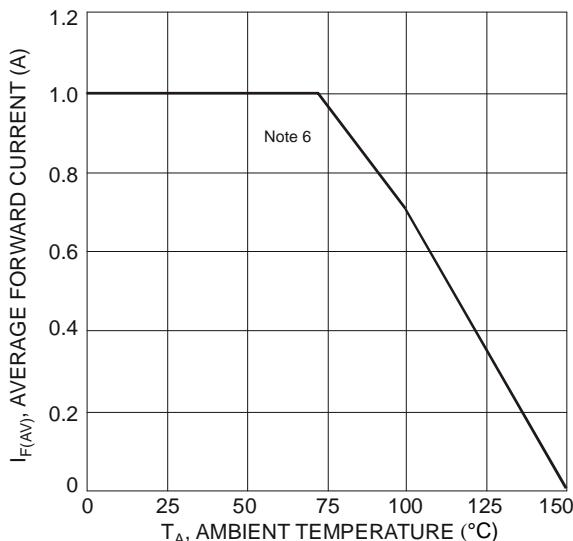


Figure 4 Forward Current Derating Curve

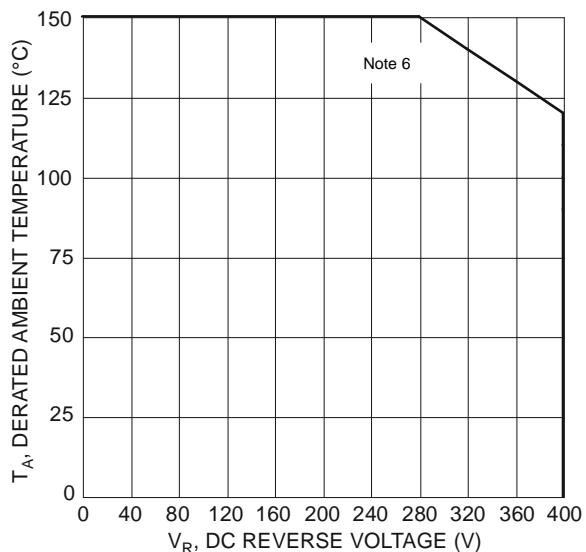
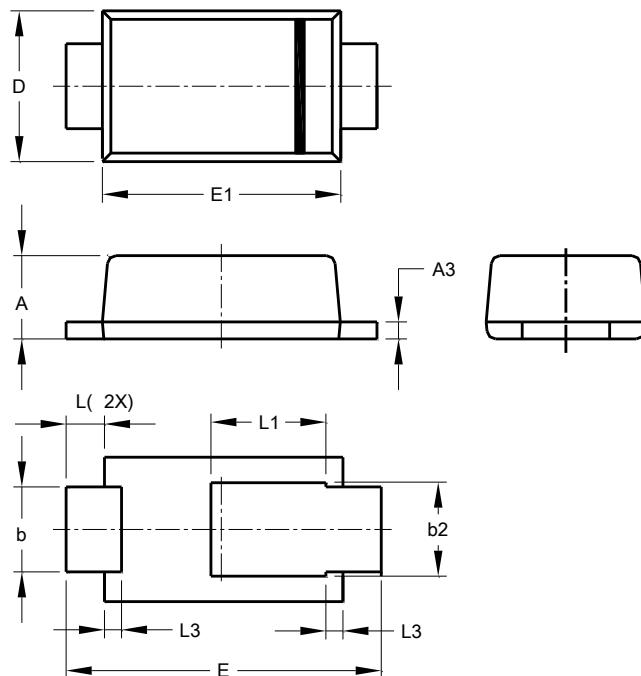


Figure 5 Operating Temperature Derating

## Package Outline Dimensions

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

**PowerDI123**



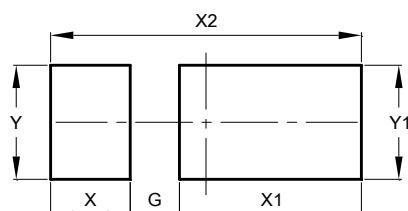
PowerDI123			
Dim	Min	Max	Typ
<b>A</b>	0.93	1.00	0.98
<b>A3</b>	0.15	0.25	0.20
<b>b</b>	0.85	1.25	1.00
<b>b2</b>	1.025	1.125	1.10
<b>D</b>	1.63	1.93	1.78
<b>E</b>	3.50	3.90	3.70
<b>E1</b>	2.60	3.00	2.80
<b>L</b>	0.40	0.50	0.45
<b>L1</b>	1.25	1.40	1.35
<b>L3</b>	0.125	0.275	0.20

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)
<b>G</b>	0.65
<b>X</b>	1.05
<b>X1</b>	2.40
<b>X2</b>	4.10
<b>Y</b>	1.50
<b>Y1</b>	1.50

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