



**THE DATASHEET OF  
PD3S120L-7**



## Features

- Guard Ring Die Construction for Transient Protection
- High Surge Capability
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Ultra-Small Surface Mount Package**
- **Qualified to AEC-Q101 Standards for High Reliability**

## Mechanical Data

- Case: PowerDI<sup>®</sup>323
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020D
- Polarity: Cathode Band
- Terminals: Finish – Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208<sup>(e3)</sup>
- Weight: 0.006 grams (Approximate)



Top View



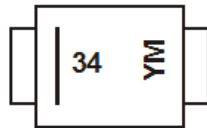
Bottom View

## Ordering Information (Note 4)

Part Number	Case	Packaging
PD3S120L-7	PowerDI323	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 <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



34 = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: E = 2017)  
 M = Month (ex: 2 = Feb)

### Date Code Key

Year	2004	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024
Code	R	B	C	D	E	F	G	H	I	J	K	L

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<sub>A</sub> = +25°C, unless otherwise specified.)

Single phase, half wave, 60Hz, resistive or inductive load.  
For capacitance load, derate current by 20%.

Characteristic	Symbol	Value	Unit
Peak Repetitive Reverse Voltage	V <sub>RRM</sub>	20	V
Working Peak Reverse Voltage	V <sub>RWM</sub>		
DC Blocking Voltage	V <sub>R</sub>		
RMS Reverse Voltage	V <sub>R(RMS)</sub>	14	V
Average Forward Current (See Figure 6)	I <sub>F(AV)</sub>	1.0	A
Non-Repetitive Peak Forward Surge Current 8.3ms Single Half Sine-Wave Superimposed on Rated Load	I <sub>FSM</sub>	33	A

### Thermal Characteristics

Characteristic	Symbol	Typ	Max	Unit
Thermal Resistance Junction to Soldering Point	R <sub>θJS</sub>	—	6	°C/W
Thermal Resistance Junction to Ambient Air (Note 5)	R <sub>θJA</sub>	170	—	°C/W
Thermal Resistance Junction to Ambient Air (Note 6)	R <sub>θJA</sub>	144	—	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-65 to +125		°C

### Electrical Characteristics (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Breakdown Voltage (Note 7)	V <sub>(BR)R</sub>	20	—	—	V	I <sub>R</sub> = 100μA
Forward Voltage	V <sub>F</sub>	—	0.27	0.31	V	I <sub>F</sub> = 0.1A, T <sub>A</sub> = +25°C
		—	0.34	0.38		I <sub>F</sub> = 0.7A, T <sub>A</sub> = +25°C
		—	0.36	0.42		I <sub>F</sub> = 1.0A, T <sub>A</sub> = +25°C
		—	0.27	0.30		I <sub>F</sub> = 1.0A, T <sub>A</sub> = +125°C
Leakage Current (Note 7)	I <sub>R</sub>	—	10	50	μA	V <sub>R</sub> = 5V, T <sub>A</sub> = +25°C
		—	13	60	μA	V <sub>R</sub> = 10V, T <sub>A</sub> = +25°C
		—	30	160	μA	V <sub>R</sub> = 20V, T <sub>A</sub> = +25°C
		—	11	30	mA	V <sub>R</sub> = 20V, T <sub>A</sub> = +125°C
Total Capacitance	C <sub>T</sub>	—	46	—	pF	V <sub>R</sub> = 10V, f = 1.0MHz

- Notes:
5. FR-4 PCB, 2 oz. copper, minimum recommended pad layout per <https://www.diodes.com/design/support/packaging/diodes-packaging/>.
  6. Polyimide PCB, 2 oz. copper, minimum recommended pad layout per <https://www.diodes.com/design/support/packaging/diodes-packaging/>.
  7. Short duration pulse test to minimize self-heating effect.

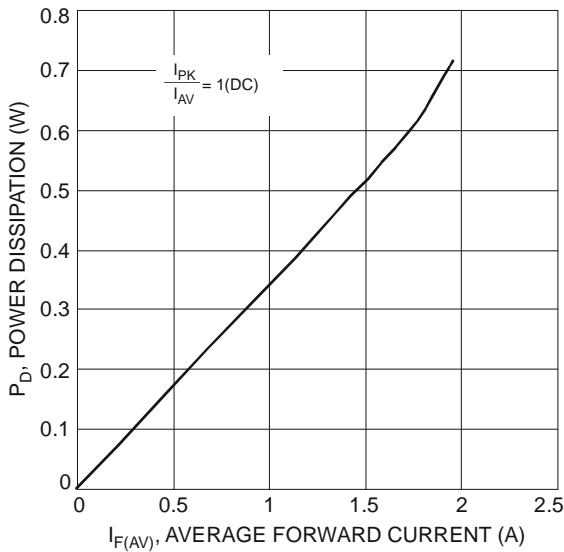


Fig. 1 Forward Power Dissipation

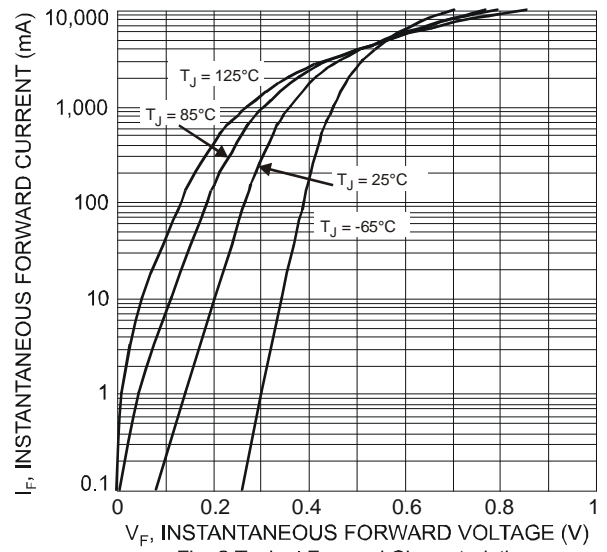


Fig. 2 Typical Forward Characteristics

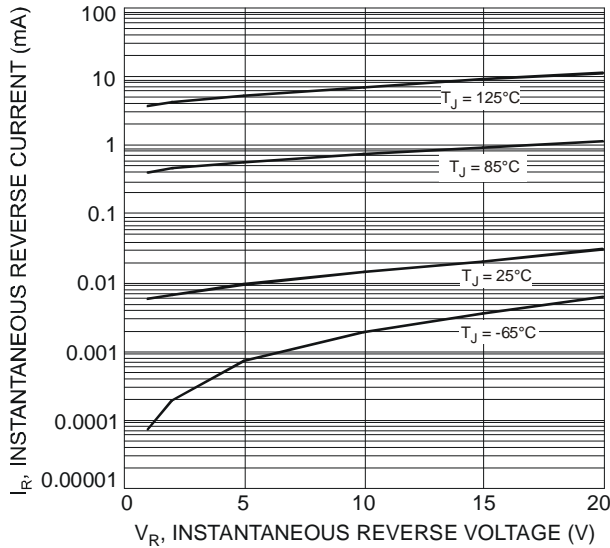


Fig. 3 Typical Reverse Characteristics

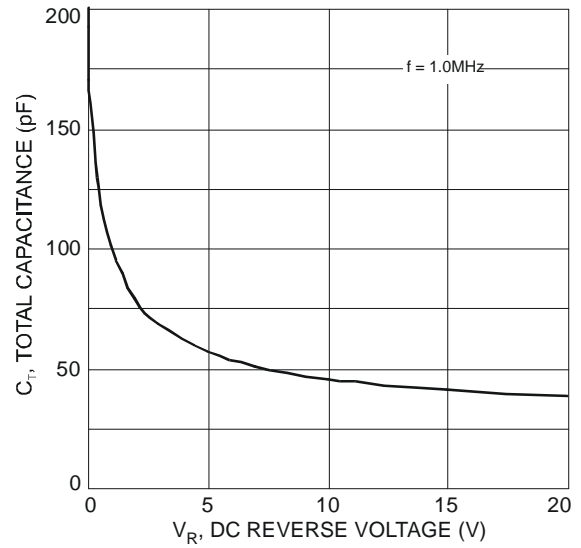


Fig. 4 Total Capacitance vs. Reverse Voltage

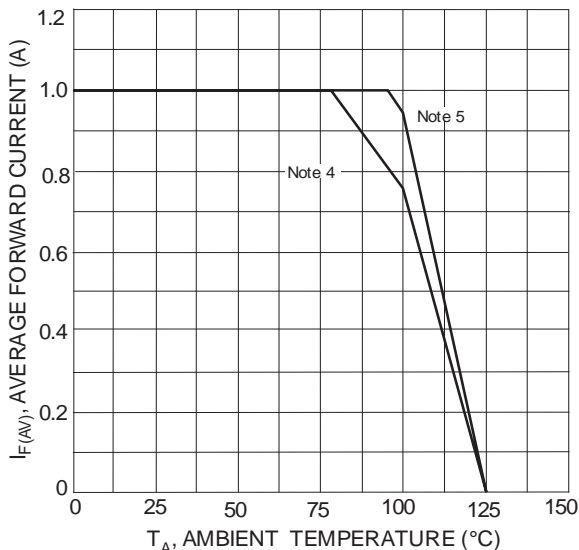


Fig. 5 Forward Current Derating Curve

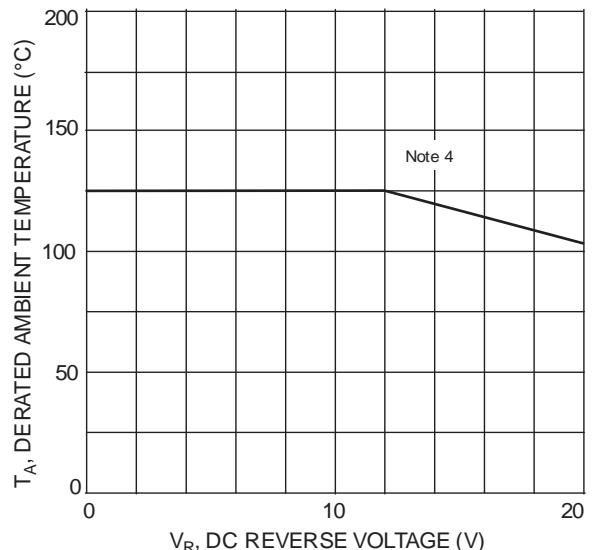
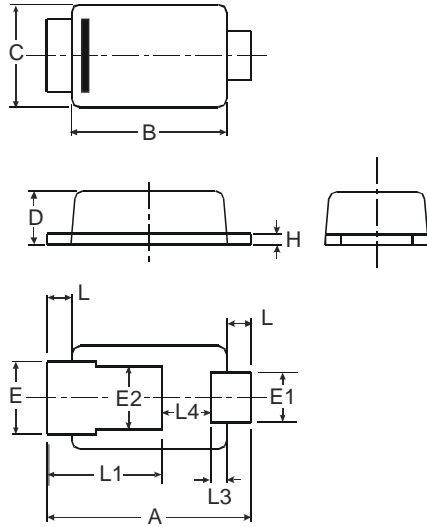


Fig. 6 Operating Temperature Derating

**Package Outline Dimensions**

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

**PowerDI323**

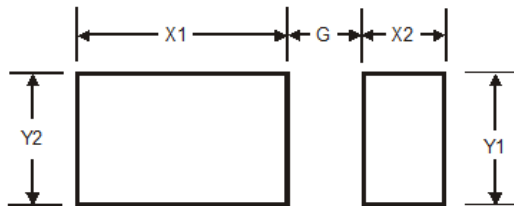


PowerDI323			
Dim	Min	Max	Typ
A	2.40	2.60	2.50
B	1.85	1.95	1.90
C	1.20	1.30	1.25
D	0.60	0.70	0.65
E	0.78	0.98	0.88
E1	0.50	0.70	0.60
E2	0.60	1.00	0.80
H	0.08	0.18	0.13
L	0.20	0.40	0.30
L1	-	-	1.40
L3	-	-	0.20
L4	0.40	0.80	0.60
All Dimensions in mm			

**Suggested Pad Layout**

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

**PowerDI323**



Dimensions	Value (in mm)
G	0.5
X1	2.0
X2	0.8
Y1	0.8
Y2	1.1

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