

## 1.0A HIGH VOLTAGE SCHOTTKY BARRIER RECTIFIER POWERDI

### Product Summary

V <sub>RRM</sub> (V)	I <sub>O</sub> (A)	V <sub>F</sub> max (V)	I <sub>R</sub> max (μA)
100	1	0.77	0.35

### Features and Benefits

- Guard Ring Die Construction for Transient Protection
- Low Power Loss, High Efficiency
- Patented Interlocking Clip Design for High Surge Current Capacity
- **Lead Free Finish, RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**
- **PPAP Capable (Note 4)**

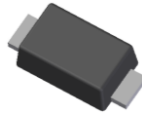
### Description and Applications

This Schottky Barrier Rectifier is designed to meet the stringent requirements of Automotive Applications. It is ideally suited for use as:

- Polarity Protection Diode
- Re-circulating Diode
- Switching Diode

### Mechanical Data

- Case: POWERDI<sup>®</sup>123
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminal Connections: Cathode Band
- Terminals: Finish – Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 <sup>Ⓔ</sup>
- Weight: 0.01 grams (Approximate)



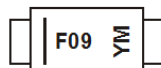
Top View

### Ordering Information (Note 5)

Part Number	Compliance	Case	Packaging
DFLS1100-7	Commercial	POWERDI <sup>®</sup> 123	3000/Tape & Reel
DFLS1100Q-7	Automotive	POWERDI <sup>®</sup> 123	3000/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](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. Automotive products are AEC-Q101 qualified and are PPAP capable. Automotive, AEC-Q101 and standard products are electrically and thermally the same, except where specified. For more information, please refer to [http://www.diodes.com/product\\_compliance\\_definitions.html](http://www.diodes.com/product_compliance_definitions.html).
  5. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

### Marking Information



F09 = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: B = 2014)  
 M = Month (ex: 9 = September)

#### Date Code Key

Year	2013	2014	2015	2016	2017	2018	2019	2020	2021
Code	A	B	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<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>	100	V
Working Peak Reverse Voltage	V <sub>RWM</sub>		
DC Blocking Voltage	V <sub>R</sub>		
RMS Reverse Voltage	V <sub>R(RMS)</sub>	71	V
Forward Current rms (T <sub>C</sub> = +160°C, D = 0.5)	I <sub>F(RMS)</sub>	2	A
Average Forward Current	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>	50	A
Repetitive Peak Reverse Current t <sub>p</sub> = 2μs, f = 1kHz Square	I <sub>RRM</sub>	1.0	A
Repetitive Peak Avalanche Power t <sub>p</sub> = 1μs, T <sub>J</sub> = +25°C	P <sub>ARM</sub>	1500	W
Non-repetitive Peak Reverse Current t <sub>p</sub> = 100μs Square	I <sub>RSM</sub>	1.0	A
Critical Rate of Rise of Reverse Voltage (Rated V <sub>R</sub> , T <sub>J</sub> = +25°C)	dV/dt	10000	V/μs

### Thermal Characteristics

Characteristic	Symbol	Typ	Max	Unit
Thermal Resistance Junction to Soldering (Note 6)	R <sub>θJS</sub>	—	7	°C/W
Thermal Resistance Junction to Ambient (Note 7) T <sub>A</sub> = +25°C	R <sub>θJA</sub>	125	—	
Thermal Resistance Junction to Case (Note 7) T <sub>A</sub> = +25°C	R <sub>θJC</sub>	21	—	
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +175		°C

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Breakdown Voltage (Note 8)	V <sub>(BR)R</sub>	100	—	—	V	I <sub>R</sub> = 1mA
Forward Voltage	V <sub>F</sub>	—	—	0.77	V	I <sub>F</sub> = 1.0A, T <sub>A</sub> = +25°C
		—	0.58	0.62		I <sub>F</sub> = 1.0A, T <sub>A</sub> = +125°C
		—	—	0.86		I <sub>F</sub> = 2.0A, T <sub>A</sub> = +25°C
		—	0.65	0.7		I <sub>F</sub> = 2.0A, T <sub>A</sub> = +125°C
Leakage Current (Note 8)	I <sub>R</sub>	—	—	0.10	μA	V <sub>R</sub> = 50V, T <sub>A</sub> = +25°C
		—	—	3	μA	V <sub>R</sub> = 50V, T <sub>A</sub> = +65°C
		—	—	15	μA	V <sub>R</sub> = 50V, T <sub>A</sub> = +85°C
		—	—	0.35	μA	V <sub>R</sub> = 100V, T <sub>A</sub> = +25°C
		—	—	0.35	mA	V <sub>R</sub> = 100V, T <sub>A</sub> = +125°C
Total Capacitance	C <sub>T</sub>	—	36	—	pF	V <sub>R</sub> = 5V <sub>DC</sub> , f = 1MHz

- Notes:
6. Theoretical R<sub>θJS</sub> calculated from the top center of the die straight down to the PCB/cathode tab solder junction.
  7. Part mounted on FR-4 board with 2oz., minimum recommended copper pad layout, which can be found on our website at <http://www.diodes.com>.
  8. Short duration pulse test used to minimize self-heating effect.

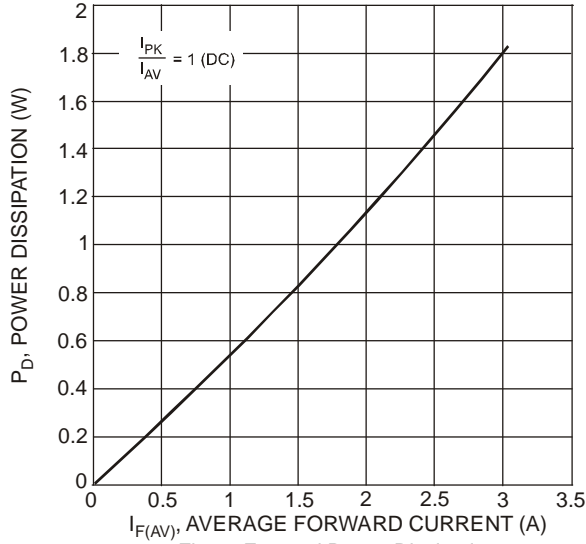


Fig. 1 Forward Power Dissipation

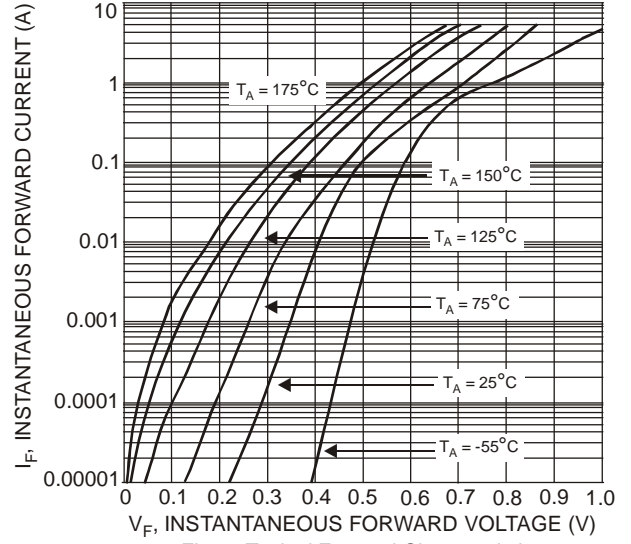


Fig. 2 Typical Forward Characteristics

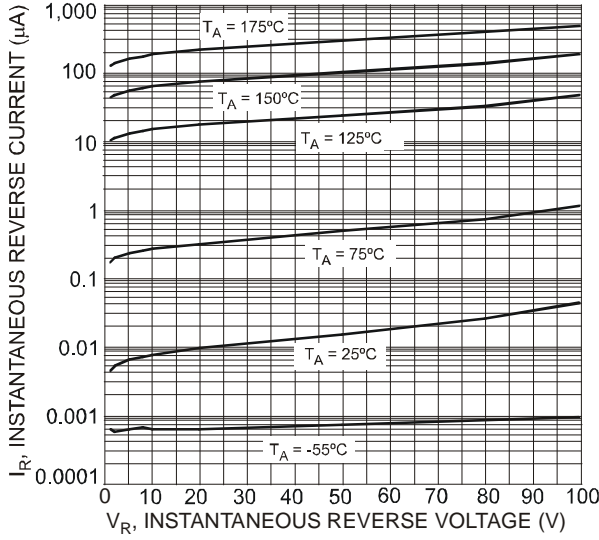


Fig. 3 Typical Reverse Characteristics

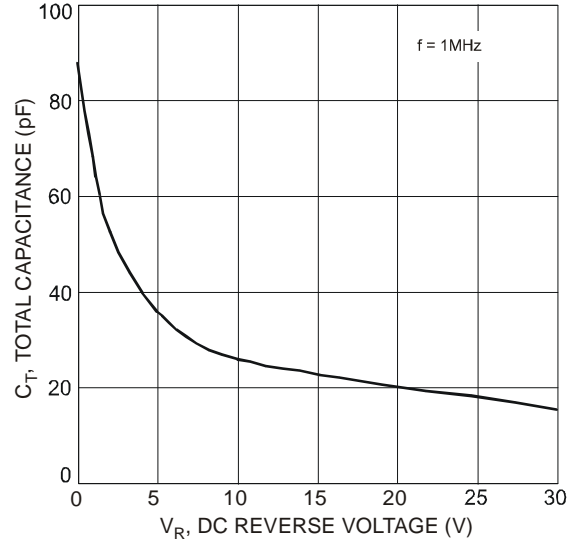


Fig. 4 Total Capacitance vs. Reverse Voltage

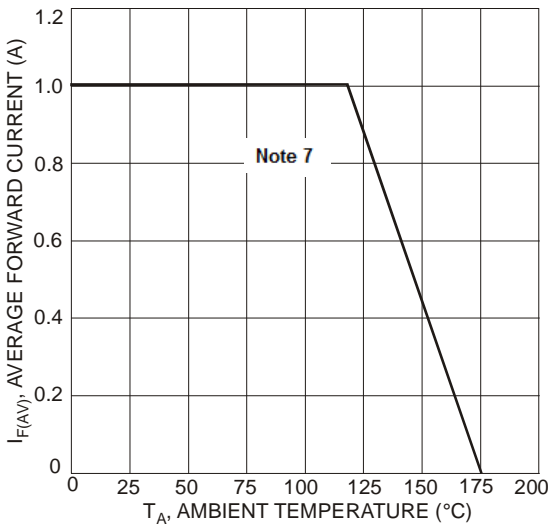


Fig. 5 Forward Current Derating Curve

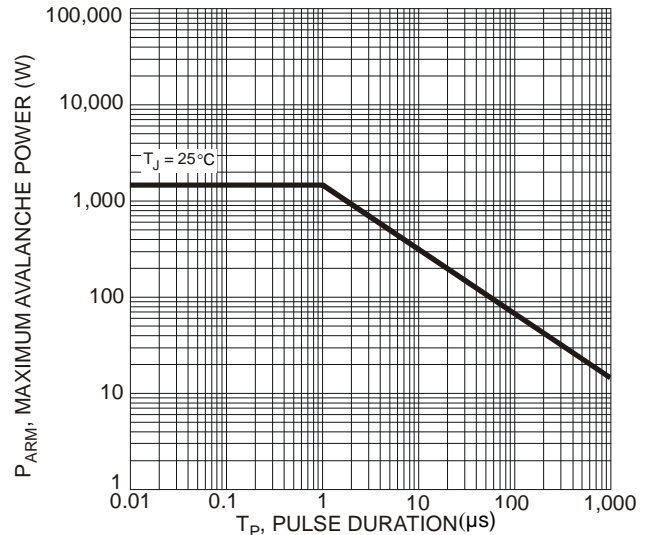


Fig. 6 Maximum Avalanche Power Curve

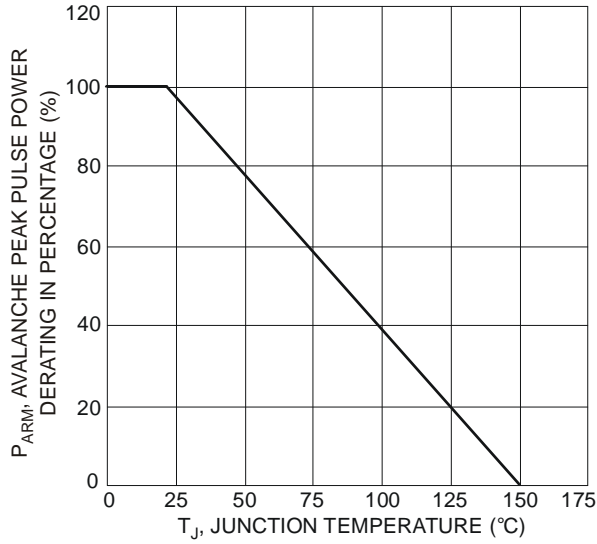


Fig. 7 Pulse Derating Curve

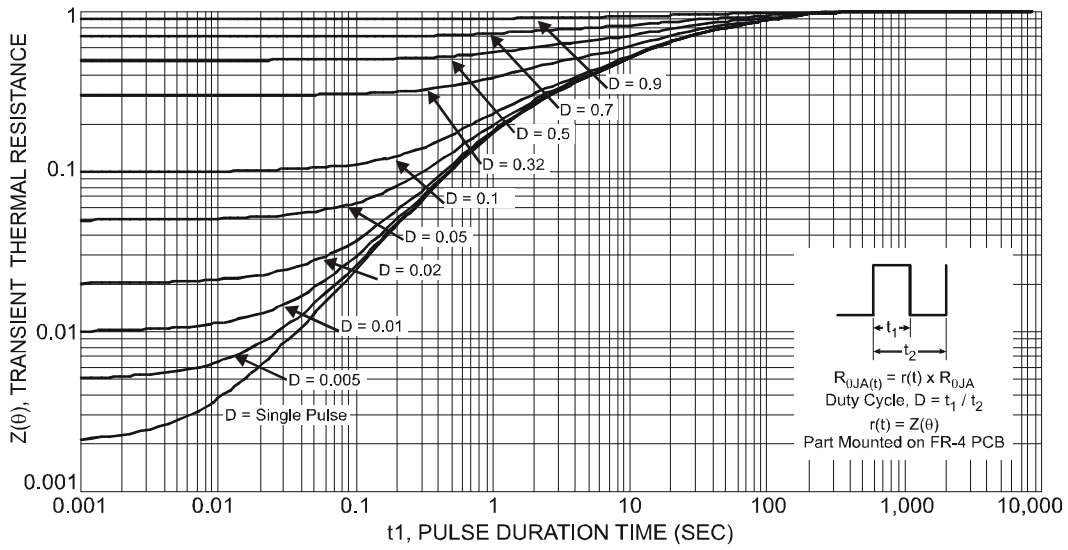
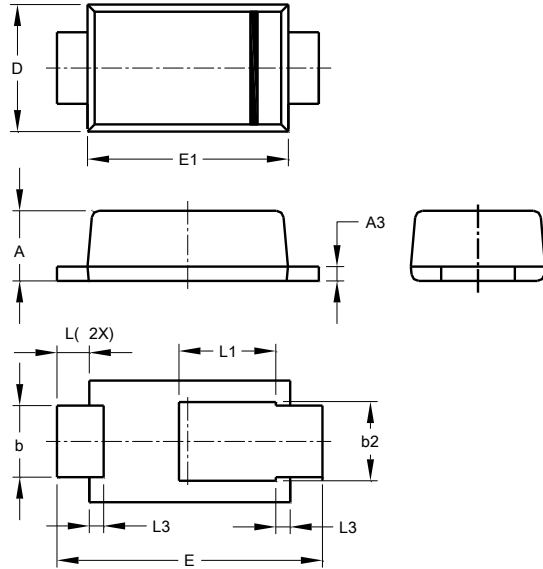


Fig. 8 Transient Thermal Resistance

**Package Outline Dimensions**

Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.

**POWERDI®123**

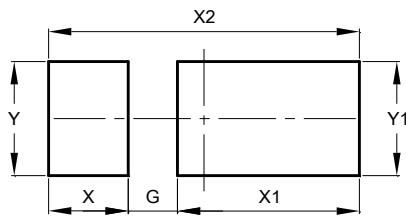


POWERDI®123			
Dim	Min	Max	Typ
A	0.93	1.00	0.98
A3	0.15	0.25	0.20
b	0.85	1.25	1.00
b2	1.025	1.125	1.10
D	1.63	1.93	1.78
E	3.50	3.90	3.70
E1	2.60	3.00	2.80
L	0.40	0.50	0.45
L1	1.25	1.40	1.35
L3	0.125	0.275	0.20
All Dimensions in mm			

**Suggested Pad Layout**

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.

**POWERDI®123**



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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