

**2.0A SURFACE MOUNT SCHOTTKY BARRIER RECTIFIER POWERDI123**
**Product Summary**

$V_R$ (V)	$I_F$ (A)	$V_F$ MAX (V) @ +25°C	$I_R$ MAX (mA) @ +25°C
30	2.0	0.49	1.0

**Features**

- Ultra-Small Surface Mount Package
- Low Power Loss, High Efficiency
- Patented Interlocking Clip Design for High Surge Current Capacity
- Low Forward Voltage Drop
- Guard Ring Die Construction for Transient Protection
- **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 to use as :

- Polarity Protection Diode
- Recirculating Diode
- Switching Diode

**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
- Terminal Connections: Cathode Band
- Terminals: Finish—Matte Tin Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208@3
- Weight: 0.01 grams (approximate)

Top View


**Ordering Information (Note 5)**

Part Number	Compliance	Case	Packaging
DFLS230Q-7	Automotive	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. Automotive products are AEC-Q101 qualified and are PPAP capable. Refer to <https://www.diodes.com/quality/>.
  5. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

**Marking Information**


F01A = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: B = 2014)  
 M = Month (ex: 9 = September)

## Date Code Key

Year	2014	2015	2016	2017	2018	2019	2020	2021	2022
Code	B	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<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>	30	V
Working Peak Reverse Voltage	V <sub>RWM</sub>		
DC Blocking Voltage	V <sub>R</sub>		
Average Forward Current	I <sub>F(AV)</sub>	2.0	A
Non-Repetitive Peak Forward Surge Current 8.3ms Single Half Sine-Wave Superimposed on Rated Load	I <sub>FSM</sub>	40	A

Characteristic	Symbol	Ratings	Unit
Human Body Mode ESD Protection	ESD HBM	4000	V
Machine Model ESD Protection	ESD MM	400	V
Charged Device Model	ESD CDM	1	kV

**Thermal Characteristics**

Characteristic	Symbol	Typ	Max	Unit
Thermal Resistance Junction to Ambient (Note 6)	R <sub>θJA</sub>	60	—	°C/W
Thermal Resistance Junction to Ambient (Note 7)	R <sub>θJA</sub>	180	—	°C/W
Thermal Resistance Junction to Ambient (Note 8)	R <sub>θJA</sub>	110	—	°C/W
Thermal Resistance Junction to Ambient (Note 9)	R <sub>θJA</sub>	55	—	°C/W
Thermal Resistance Junction to Soldering (Note 10)	R <sub>θJS</sub>	10	—	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 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 11)	V <sub>(BR)R</sub>	30	—	—	V	I <sub>R</sub> = 1.5mA
Forward Voltage	V <sub>F</sub>	—	0.36 0.4	0.42 0.49	V	I <sub>F</sub> = 1.0A, T <sub>A</sub> = +25°C I <sub>F</sub> = 2.0A, T <sub>A</sub> = +25°C
Leakage Current (Note 11)	I <sub>R</sub>	—	0.15	1.0	mA	V <sub>R</sub> = 30V, T <sub>A</sub> = +25°C
Total Capacitance	C <sub>T</sub>	—	75	—	pF	V <sub>R</sub> = 10V, f = 1.0MHz
Switching Speed t <sub>RR</sub>	t <sub>RR</sub>	—	17	—	ns	I <sub>F</sub> = 0.5A, I <sub>R</sub> = 1A, I <sub>RR</sub> = 0.25A (RG1)

- Notes:
6. Part mounted on 50.8mm x 50.8mm GETEK board with 25.4mm x 25.4mm copper pad, 25% anode, 75% cathode. T<sub>A</sub> = +25°C.
  7. Part mounted on FR-4 board with 1.8mm x 2.5mm cathode and 1.8mm x 1.2mm anode, 1 oz. copper pads. T<sub>A</sub> = +25°C.
  8. Part mounted on FR4 PCB, 2oz.
  9. Part Mounted on 1inch sq. copper pad, 2oz.
  10. Theoretical R<sub>θJS</sub> calculated from the top center of the die straight down to the PCB cathode tab solder junction.
  11. Short duration pulse test to minimize self-heating effect.

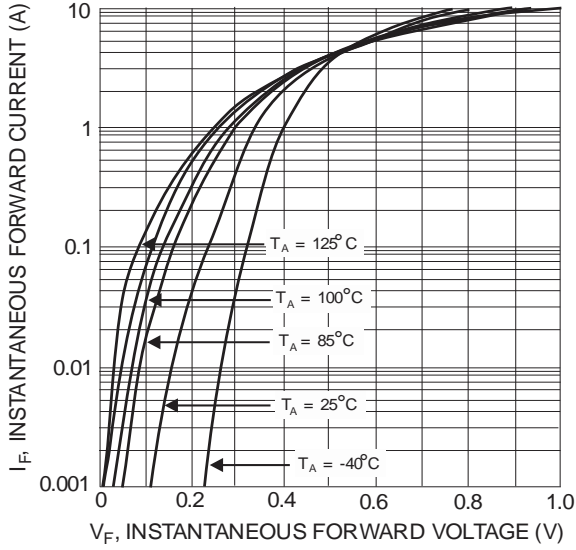


Figure 1 Typical Forward Characteristics

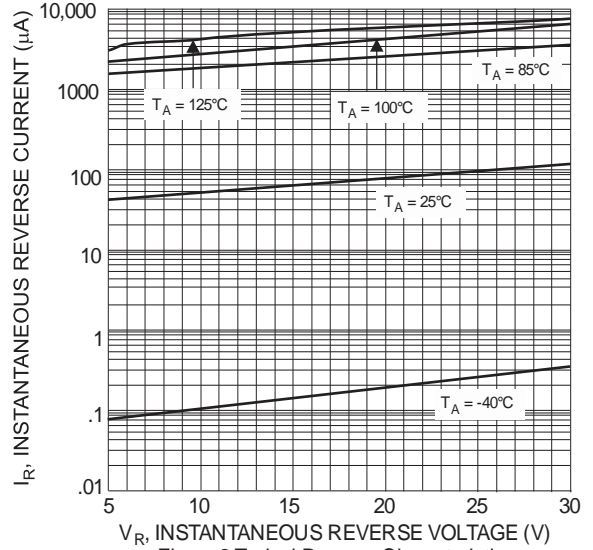


Figure 2 Typical Reverse Characteristics

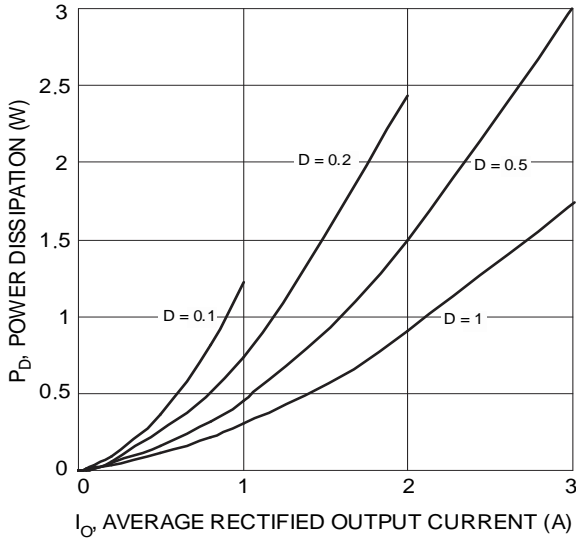


Figure 3 Forward Power Dissipation  $T_j = 125^\circ\text{C}$

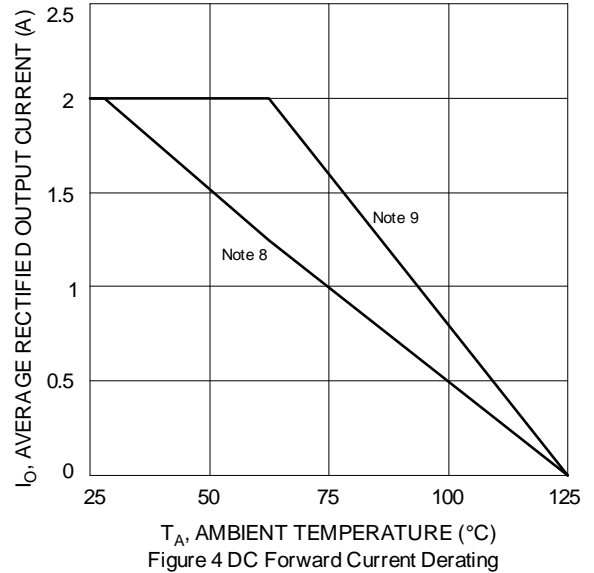


Figure 4 DC Forward Current Derating

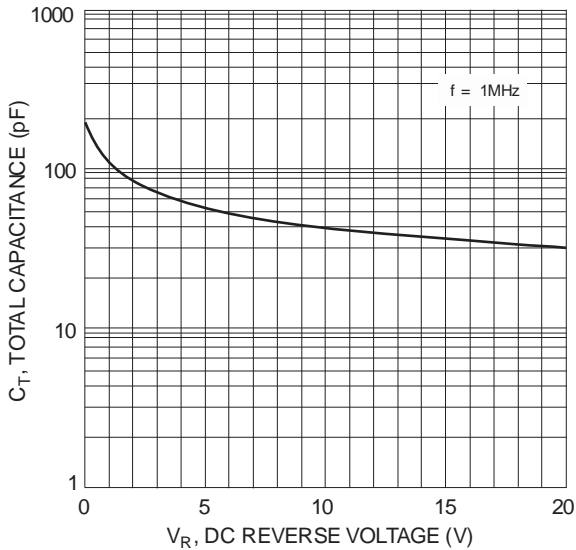
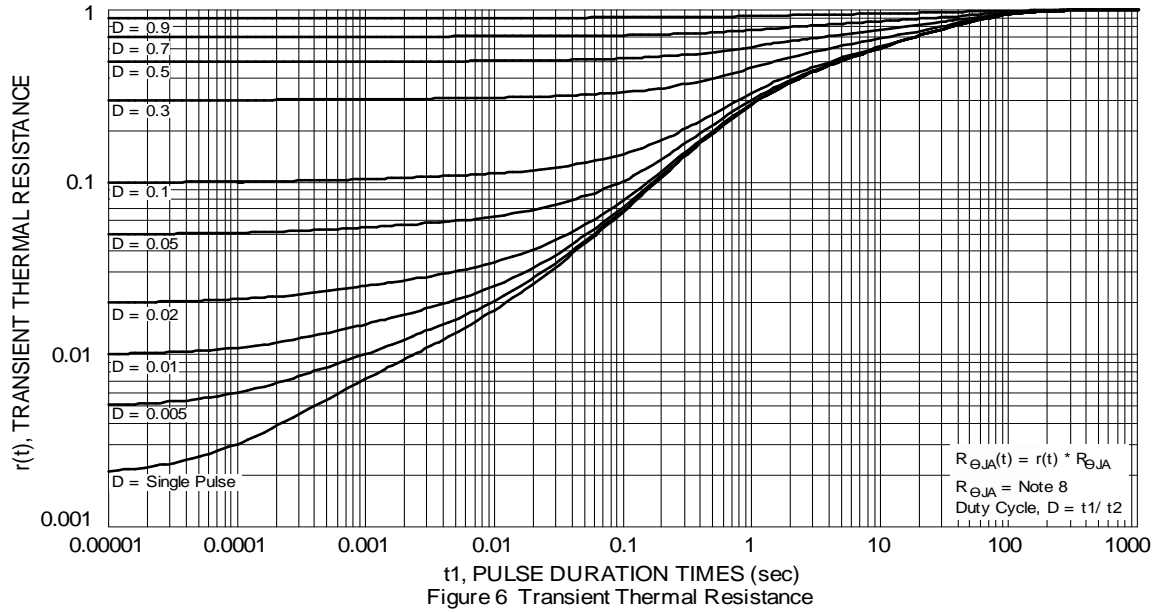


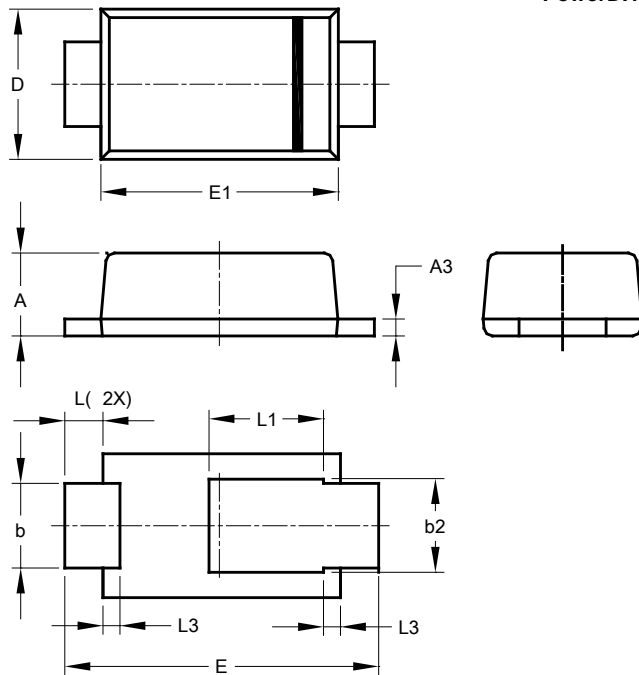
Figure 5 Typical Total Capacitance



## Package Outline Dimensions

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

**PowerDI123**

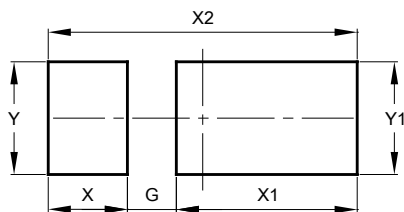


PowerDI123			
Dim	Min	Max	Typ
A	0.93	1.00	0.98
A3	0.15	0.25	0.20
b	0.85	1.25	1.00
b2	1.025	1.125	1.10
D	1.63	1.93	1.78
E	3.50	3.90	3.70
E1	2.60	3.00	2.80
L	0.40	0.50	0.45
L1	1.25	1.40	1.35
L3	0.125	0.275	0.20
All Dimensions in mm			

## 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

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