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

Mechnical 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 e3
- 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_A = +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 Working Peak Reverse Voltage DC Blocking Voltage	V_{RRM} V_{RWM} V_R	30	V
Average Forward Current	$I_{F(AV)}$	2.0	A
Non-Repetitive Peak Forward Surge Current 8.3ms Single Half Sine-Wave Superimposed on Rated Load	I_{FSM}	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)	$R_{\Theta JA}$	60	—	°C/W
Thermal Resistance Junction to Ambient (Note 7)	$R_{\Theta JA}$	180	—	°C/W
Thermal Resistance Junction to Ambient (Note 8)	$R_{\Theta JA}$	110	—	°C/W
Thermal Resistance Junction to Ambient (Note 9)	$R_{\Theta JA}$	55	—	°C/W
Thermal Resistance Junction to Soldering (Note 10)	$R_{\Theta JS}$	10	—	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +125		°C

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Breakdown Voltage (Note 11)	$V_{(BR)R}$	30	—	—	V	I_R = 1.5mA
Forward Voltage	V_F	—	0.36 0.4	0.42 0.49	V	I_F = 1.0A, T_A = +25°C I_F = 2.0A, T_A = +25°C
Leakage Current (Note 11)	I_R	—	0.15	1.0	mA	V_R = 30V, T_A = +25°C
Total Capacitance	C_T	—	75	—	pF	V_R = 10V, f = 1.0MHz
Switching Speed t_{RR}	t_{RR}	—	17	—	ns	I_F = 0.5A, I_R = 1A, I_{RR} = 0.25A (RG1)

Notes:
6. Part mounted on 50.8mm × 50.8mm GETEK board with 25.4mm × 25.4mm copper pad, 25% anode, 75% cathode. T_A = +25°C.
7. Part mounted on FR-4 board with 1.8mm × 2.5mm cathode and 1.8mm × 1.2mm anode, 1 oz. copper pads. T_A = +25°C.
8. Part mounted on FR4 PCB, 2oz.
9. Part Mounted on 1inch sq. copper pad, 2oz.
10. Theoretical $R_{\Theta JS}$ 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.

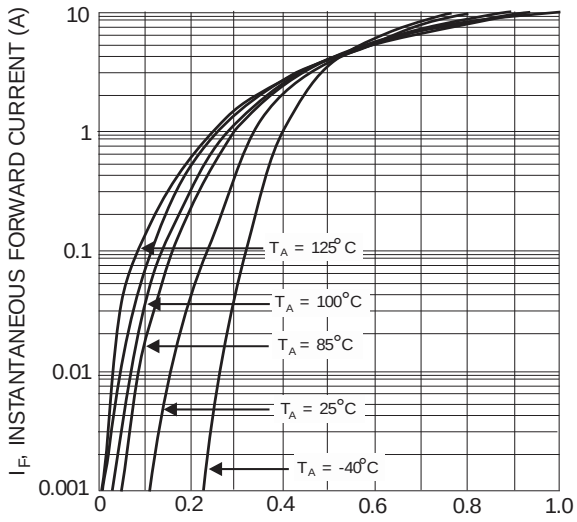


Figure 1 Typical Forward Characteristics

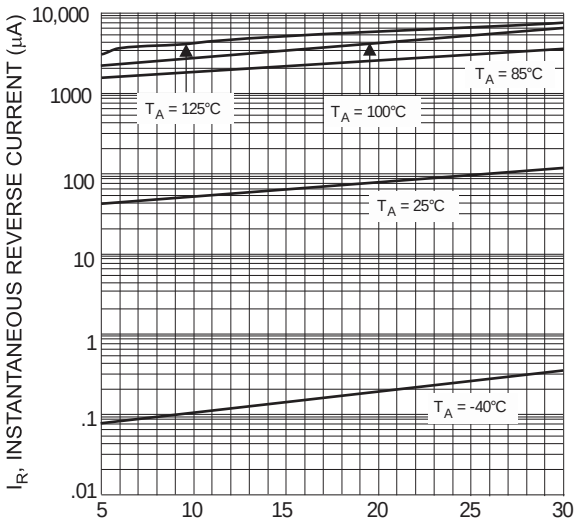


Figure 2 Typical Reverse Characteristics

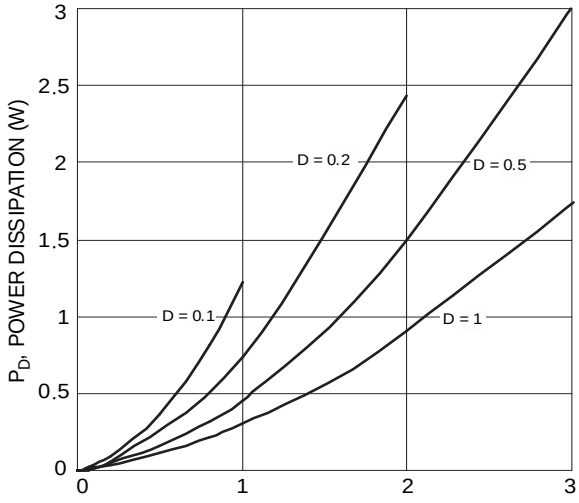


Figure 3 Forward Power Dissipation T_J=125°C

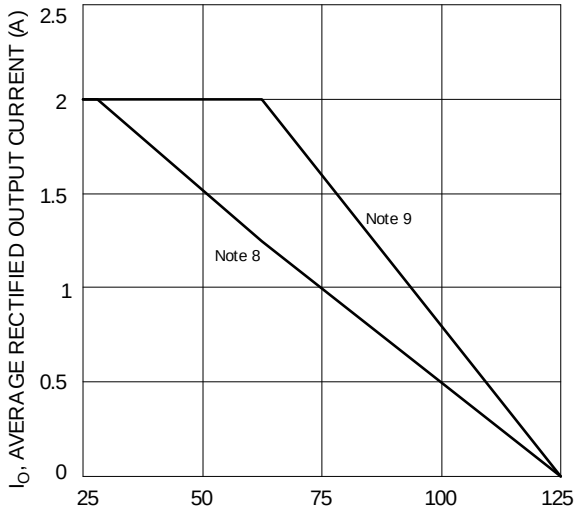


Figure 4 DC Forward Current Derating

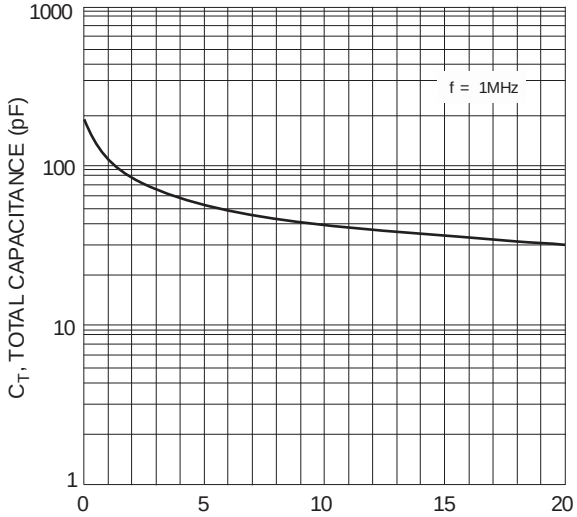


Figure 5 Typical Total Capacitance

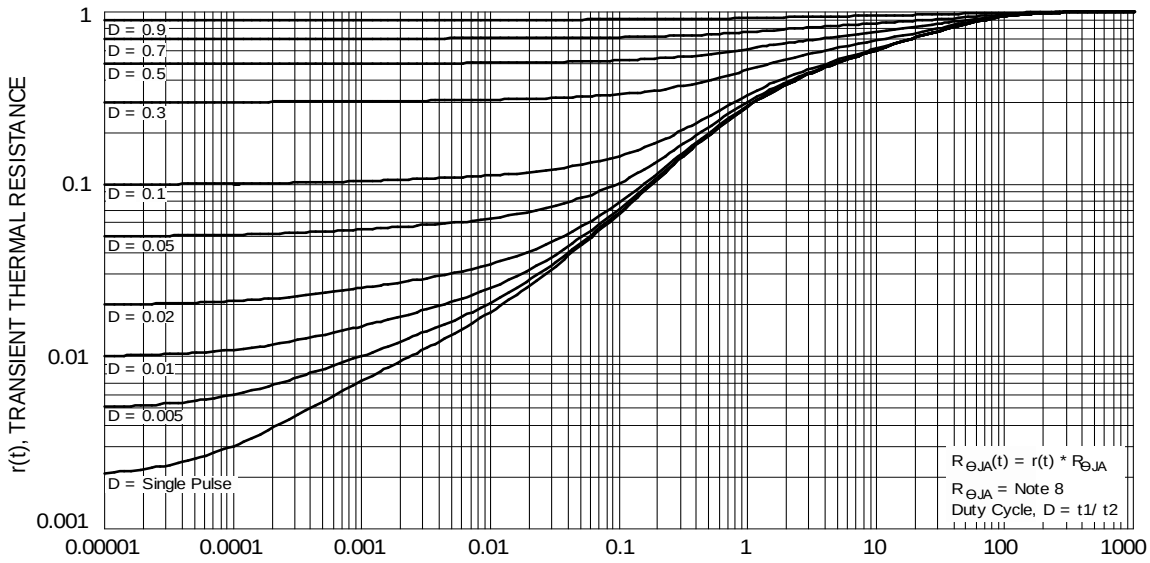
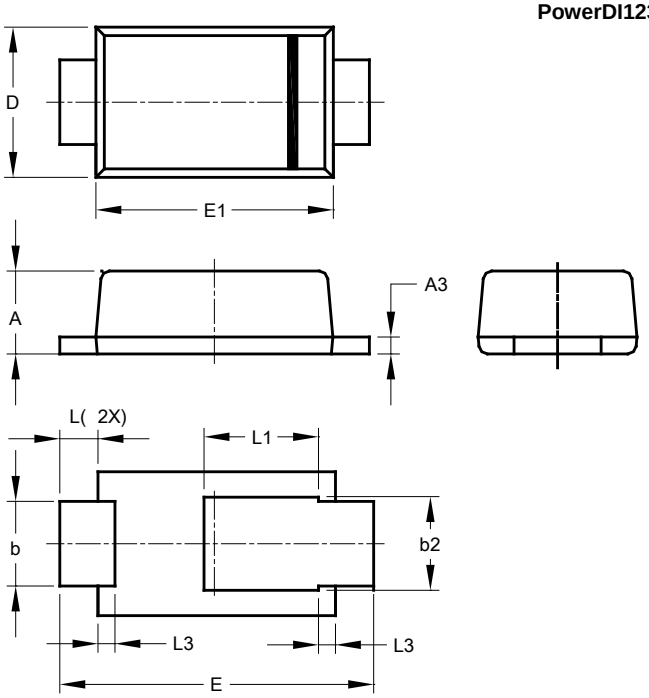


Figure 6 Transient Thermal Resistance

Package Outline Dimensions

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

PowerDI123

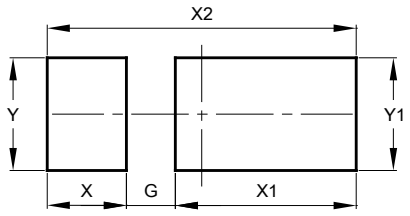


PowerDI123			
Dim	**Min**	**Max**	**Typ**
A	0.93	1.00	0.98
A3	0.15	0.25	0.20
b	0.85	1.25	1.00
b2	1.025	1.125	1.10
D	1.63	1.93	1.78
E	3.50	3.90	3.70
E1	2.60	3.00	2.80
L	0.40	0.50	0.45
L1	1.25	1.40	1.35
L3	0.125	0.275	0.20
All Dimensions in mm			

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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