

Product Summary

$V_R(V)$	$I_F(A)$	$V_F\ MAX(V)$ @ +25°C	$I_R\ MAX(mA)$ @ +25°C
40	1.0	0.55	0.1

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
- Re-Circulating Diode
- Switching Diode

Features and Benefits

- Guard Ring Die Construction for Transient Protection
- Low Power Loss, High Efficiency
- Patented Interlocking Clip Design for High Surge Current Capacity
- High Current Capability and Low Forward Voltage Drop
- 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 (See Note 4)

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: 0.096 grams (Approximate)

PowerDI®123



Top View

Ordering Information (Note 5)

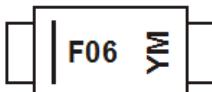
Part Number	Compliance	Case	Packaging
DFLS140LQ-7	Automotive	PowerDI®123	3,000/Tape & Reel

Notes:

1. EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant. All applicable RoHS exemptions applied.
2. See 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/quality/product_compliance_definitions/.
5. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

Marking Information

PowerDI®123



F06 = 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 (@ $T_A = +25^\circ\text{C}$, 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_{RRM}		
Working Peak Reverse Voltage	V_{RWM}	40	V
DC Blocking Voltage	V_R		
RMS Reverse Voltage	$V_{R(\text{RMS})}$	28	V
Average Forward Current @ $T_J = +120^\circ\text{C}$	$I_{F(\text{AV})}$	1.0	A
Non-Repetitive Peak Forward Surge Current 8.3ms single half sine-wave superimposed on rated load	I_{FSM}	50	A

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 6)	P_D	1.67	W
Power Dissipation (Note 7)	P_D	556	mW
Thermal Resistance Junction to Soldering Point (Note 8)	$R_{\theta JS}$	10	°C/W
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
Operating Temperature Range	T_J	-55 to +125	°C
Storage Temperature Range	T_{STG}	-55 to +150	°C

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Breakdown Voltage (Note 9)	$V_{(BR)R}$	40	—	—	V	$I_R = 500\mu\text{A}$
Forward Voltage	V_F	—	—	0.36	V	$I_F = 0.1\text{A}, T_J = +25^\circ\text{C}$
		—	—	0.30		$I_F = 0.1\text{A}, T_J = +85^\circ\text{C}$
		—	—	0.55		$I_F = 1.0\text{A}, T_J = +25^\circ\text{C}$
		—	—	0.515		$I_F = 1.0\text{A}, T_J = +85^\circ\text{C}$
		—	—	0.85		$I_F = 3.0\text{A}, T_J = +25^\circ\text{C}$
		—	—	0.88		$I_F = 3.0\text{A}, T_J = +85^\circ\text{C}$
Leakage Current (Note 9)	I_R	—	—	0.1	mA	$V_R = 40\text{V}, T_J = +25^\circ\text{C}$
		—	—	10		$V_R = 40\text{V}, T_J = +85^\circ\text{C}$
		—	—	0.05		$V_R = 20\text{V}, T_J = +25^\circ\text{C}$
		—	—	5		$V_R = 20\text{V}, T_J = +85^\circ\text{C}$
Total Capacitance	C_T	—	90	—	pF	$V_R = 10\text{V}, f = 1.0\text{MHz}$

Notes:

6. Part mounted on 50.8mm X 50.8mm GETEK board with 25.4mm X 25.4mm copper pad, 25% anode, 75% cathode. $T_A = +25^\circ\text{C}$.
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. $T_A = +25^\circ\text{C}$.
8. Theoretical $R_{\theta JS}$ calculated from the top center of the die straight down to the PCB cathode tab solder junction.
9. Short duration pulse test to minimize self-heating effect.

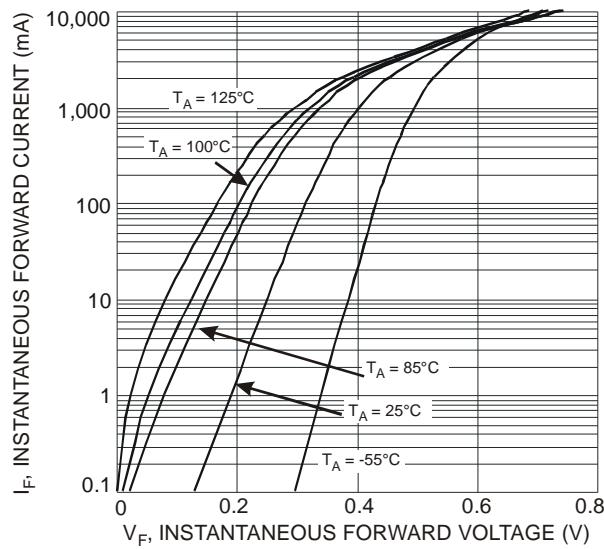


Fig. 1 Typical Forward Characteristics

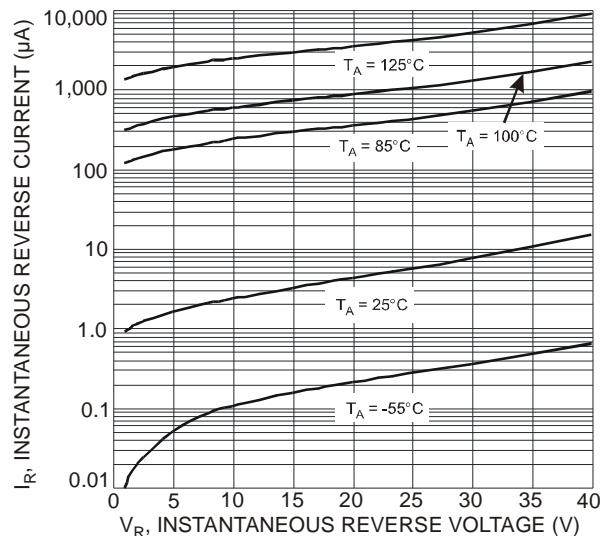


Fig. 2 Typical Reverse Characteristics

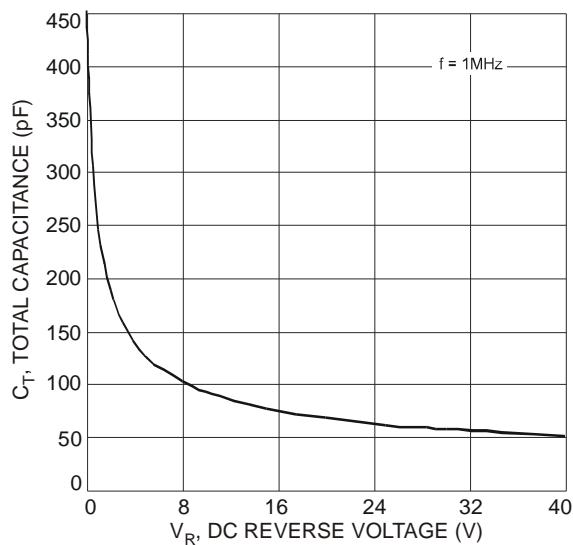


Fig. 3 Total Capacitance vs Reverse Voltage

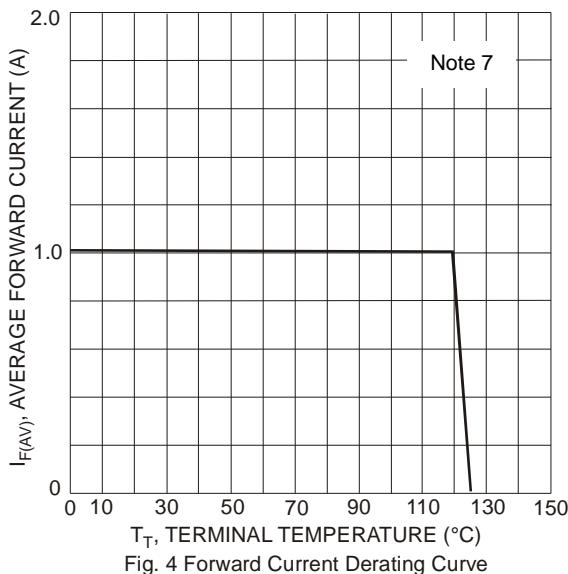


Fig. 4 Forward Current Derating Curve

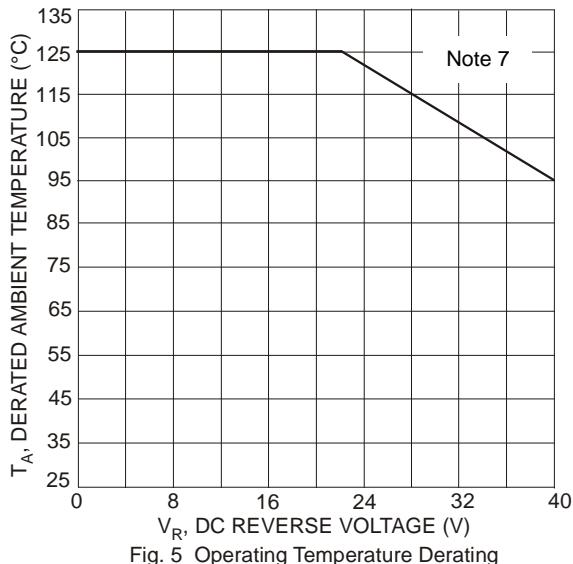
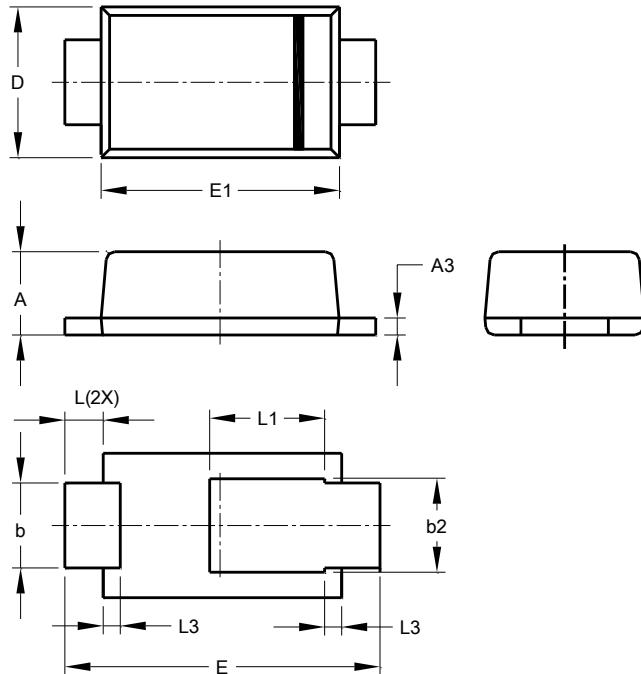


Fig. 5 Operating Temperature Derating

Package Outline Dimensions

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

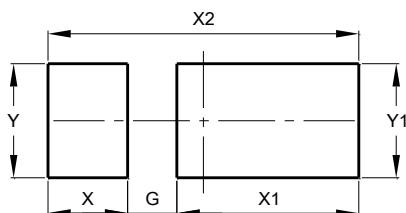


POWERDI®123			
Dim	Min	Max	Typ
A	0.93	1.00	0.98
A3	0.15	0.25	0.20
b	0.85	1.25	1.00
b2	1.025	1.125	1.10
D	1.63	1.93	1.78
E	3.50	3.90	3.70
E1	2.60	3.00	2.80
L	0.40	0.50	0.45
L1	1.25	1.40	1.35
L3	0.125	0.275	0.20

All Dimensions in mm

Suggested Pad Layout

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



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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