



DFLS140Q

# 1.0A SURFACE MOUNT SCHOTTKY BARRIER RECTIFIER PowerDI® 123

## **Product Summary**

V <sub>R</sub> (V)	I <sub>F</sub> (A)	V <sub>F MAX</sub> (V) @ +25°C	I <sub>R MAX</sub> (mA) @ +25°C
40	0.5	0.51	0.02

## **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
- 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 (Note 4)

#### **Mechanical Data**

- Case: PowerDI<sup>®</sup>123
- Case Material: Molded Plastic; UL "Green" Molding Compound UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Polarity: Cathode Band
- Terminals: Finish Matte Tin Annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208 (3)
- Weight: 0.01 grams (Approximate)

PowerDI®123



Top View

## **Ordering Information** (Note 5)

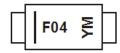
Part Number	Compliance	Case	Packaging
DFLS140Q-7	Automotive	PowerDI <sup>®</sup> 123	3,000/Tape & Reel

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<sup>®</sup>123



F04 = Product Type Marking Code YM = Date Code Marking Y = Year (ex:C = 2015) M = Month (ex: 9 = September)

Date Code Key

Year	2014	20	15	2016	2017	20	18	2019	2020	20	21	2022
Code	В	(	0	D	Е		F	G	Н		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	0	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 Working Peak Reverse Voltage DC Blocking Voltage	V <sub>RRM</sub> V <sub>RWM</sub> V <sub>R</sub>	40	٧
RMS Reverse Voltage	V <sub>R(RMS)</sub>	28	V
Average Forward Current @ T <sub>T</sub> = +119°C	I <sub>F(AV)</sub>	1.1	Α
Non-Repetitive Peak Forward Surge Current 8.3ms Single Half Sine-Wave Superimposed on Rated Load	I <sub>FSM</sub>	40	Α

#### **Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 6)	P <sub>D</sub>	1.67	W
Power Dissipation (Note 7)	P <sub>D</sub>	556	mW
Thermal Resistance Junction to Ambient (Note 6)	$R_{\theta JA}$	60	°C/W
Thermal Resistance Junction to Ambient (Note 7)	R <sub>0JA</sub>	180	°C/W
Thermal Resistance Junction to Soldering (Note 8)	R <sub>0JS</sub>	10	°C/W
Operating Temperature Range	TJ	-55 to +125	°C
Storage Temperature Range	T <sub>STG</sub>	-55 to +150	°C

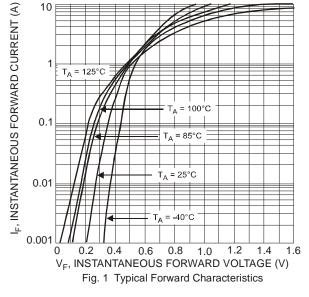
## **Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

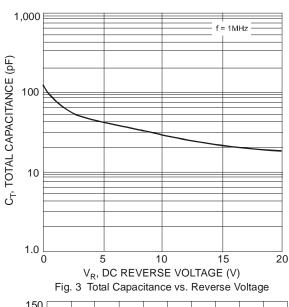
Characteristic	Symbol	Min	Тур	Max	Unit	Test Condition
Reverse Breakdown Voltage (Note 9)	$V_{(BR)R}$	40		_	V	$I_R = 20\mu A$
Forward Voltage	\/_		0.45	0.51	V	$I_F = 0.5A$
Tolward Voltage	VF	_	0.53	0.61		I <sub>F</sub> = 1.1A
Leakage Current (Note 9)	I <sub>R</sub>	_	_	20	μA	$V_R = 40V, T_J = +25^{\circ}C$
Leakage Current (Note 9)		_	_	6.0	mA	$V_R = 40V, T_J = +100$ °C
Total Capacitance	C <sub>T</sub>		28	_	pF	$V_R = 10V, f = 1.0MHz$

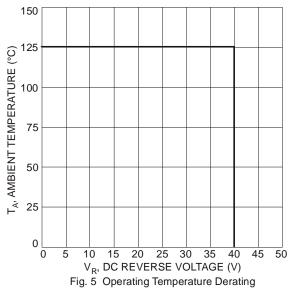
Notes:

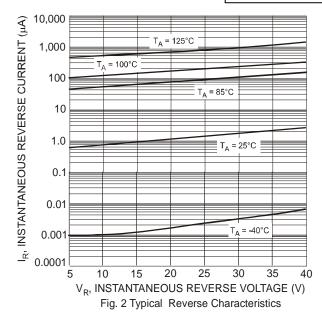
- 6. Part mounted on 50.8mm X 50.8mm GETEK board with 25.4mm X 25.4mm copper pad, 25% anode, 75% cathode. T<sub>A</sub> = +25°C.
- 7. Part mounted on FR-4 board with 1.8mm X 2.5mm cathode and 1.8mm X 1.2mm anode, 1 oz. copper pads.  $T_A = +25^{\circ}C$ . 8. Theoretical  $R_{BJS}$  calculated from the top center of the die straight down to the PCB/cathode tab solder junction.
- 9. Short duration pulse test used to minimize self-heating effect.

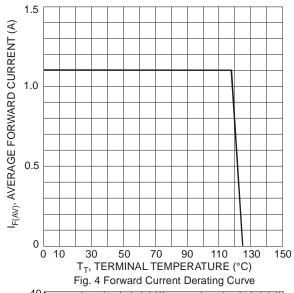












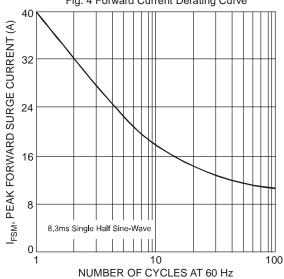
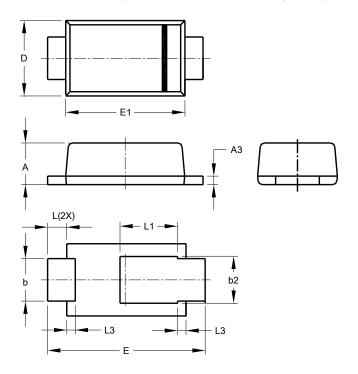


Fig. 6 Maximum Non-Repetitive Peak Forward
Surge Current



## **Package Outline Dimensions**

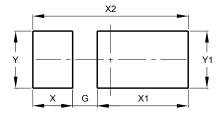
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for the latest version.



POWERDI <sup>®</sup> 123						
Dim	Min	Max	Тур			
Α	0.93	1.00	0.98			
А3	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			
Е	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
Х	1.05
X1	2.40
X2	4.10
Y	1.50
Y1	1.50



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