

Product Summary

V_R (V)	I_F (A)	$V_{F\ MAX}$ (V) @ +25°C	$I_{R\ MAX}$ (mA) @ +25°C
60	1.0	0.50	0.1

Description and Applications

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

- Polarity Protection Diode
- Re-Circulating Diode
- Switching Diode

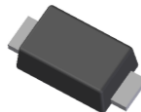
Features and Benefits

- Guard Ring Die Construction for Transient Protection
- Low Power Loss, High Efficiency
- Patented Interlocking Clip Design for High Surge Current Capacity
- **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[®]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 [Ⓔ]
- Weight: 0.01 grams (Approximate)

PowerDI123



Top View

Ordering Information (Note 5)

Part Number	Compliance	Case	Packaging
DFLS160Q-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 <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information



F17 = Product Type Marking Code
 YM = Date Code Marking
 Y = Year (ex: F = 2018)
 M = Month (ex: 9 = September)

Date Code Key

Year	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027
Code	B	C	D	E	F	G	H	I	J	K	L	M	N	O

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 capacitive load, derate current by 20%.

Characteristic	Symbol	Value	Unit
Peak Repetitive Reverse Voltage	V_{RRM}	60	V
Working Peak Reverse Voltage	V_{RWM}		
DC Blocking Voltage	V_R		
RMS Reverse Voltage	$V_{R(RMS)}$	42	V
Average Forward Current	$I_{F(AV)}$	1.0	A
Non-Repetitive Peak Forward Surge Current 8.3ms Single Half Sine-Wave Superimposed on Rated Load	I_{FSM}	50	A
Electrostatic Discharge	HBM	4000	V
Electrostatic Discharge	MM	400	V
Electrostatic Discharge	CDM	1	kV

Thermal Characteristics

Characteristic	Symbol	Typ	Max	Unit
Thermal Resistance Junction to Soldering Point (Cathode) (Note 6)	$R_{\theta JS}$	—	6	$^\circ\text{C/W}$
Thermal Resistance Junction to Ambient (Note 7)	$R_{\theta JA}$	125	—	$^\circ\text{C/W}$
Thermal Resistance Junction to Ambient (Note 8)	$R_{\theta JA}$	60	—	$^\circ\text{C/W}$
Typical Thermal Resistance to Case (Note 9)	$R_{\theta JC}$	—	18	$^\circ\text{C/W}$
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +150		$^\circ\text{C}$

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Breakdown Voltage (Note 10)	$V_{(BR)R}$	60	—	—	V	$I_R = 0.2\text{mA}$
Forward Voltage	V_F	—	—	0.50	V	$I_F = 1.0\text{A}$
Leakage Current (Note 10)	I_R	—	—	0.1	mA	$V_R = 60\text{V}, T_A = +25^\circ\text{C}$
Total Capacitance	C_T	—	67	—	pF	$V_R = 10\text{V}, f = 1.0\text{MHz}$
Switching Speed t_{RR}	t_{RR}	—	12	—	ns	$I_F=0.5\text{A}, I_R=1\text{A}, I_{RR}=0.25\text{A}$ (RG1)

- Notes:
- Theoretical $R_{\theta JS}$ calculated from the top center of the die straight down to the PCB/cathode tab solder junction.
 - Device mounted on Polyimide substrate, 1" x 1" 2oz copper double-sided PC board with minimum recommended pad layout, which can be found on our website at <http://www.diodes.com/package-outlines.html>.
 - Part mounted on 50.8mm*50.8mm GETEK board with 25.4mm*25.4mm copper pad, 25% anode, 75% cathode. $T_A = +25^\circ\text{C}$
 - Part mounted on FR-4 board with 1.8mm X 2.5mm cathode and 1.8mm X 1.2mm anode, 1 oz. copper pads. $T_A = +25^\circ\text{C}$
 - Short duration pulse test to minimize self-heating effect

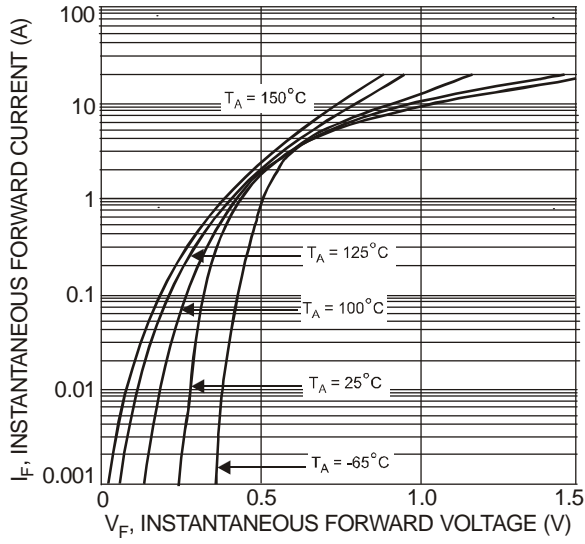


Fig. 1 Typical Forward Characteristics

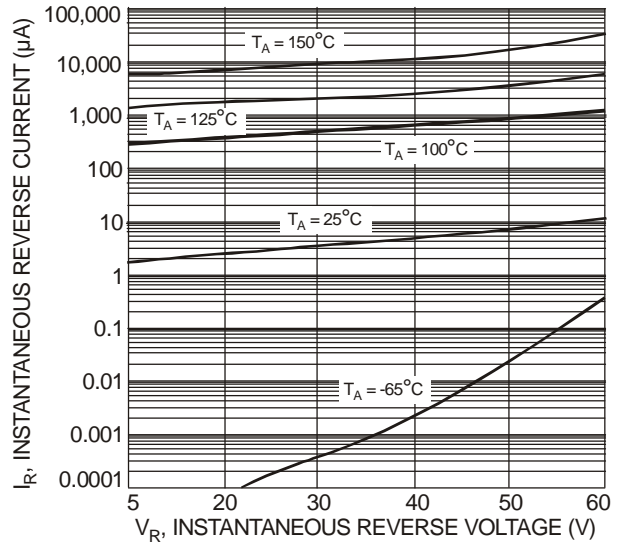


Fig. 2 Typical Reverse Characteristics

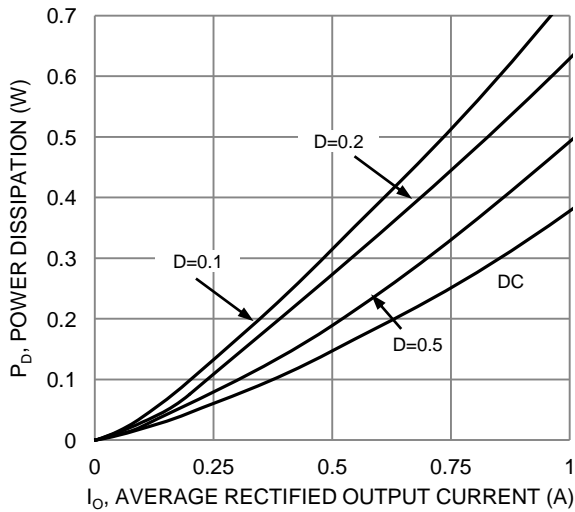


Fig. 3 Forward Power Dissipation $T_J=125^\circ\text{C}$

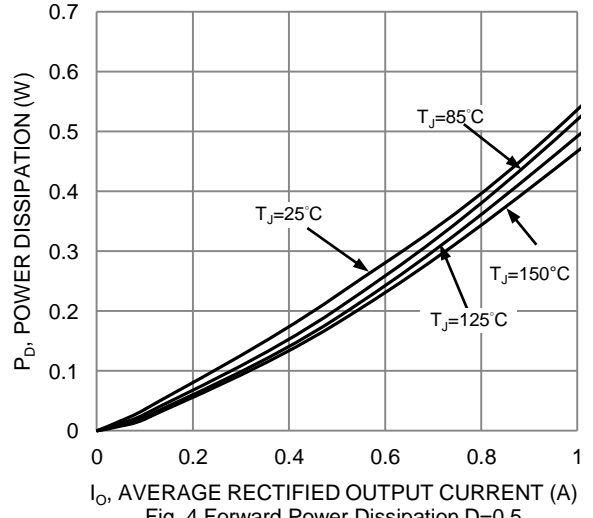


Fig. 4 Forward Power Dissipation $D=0.5$

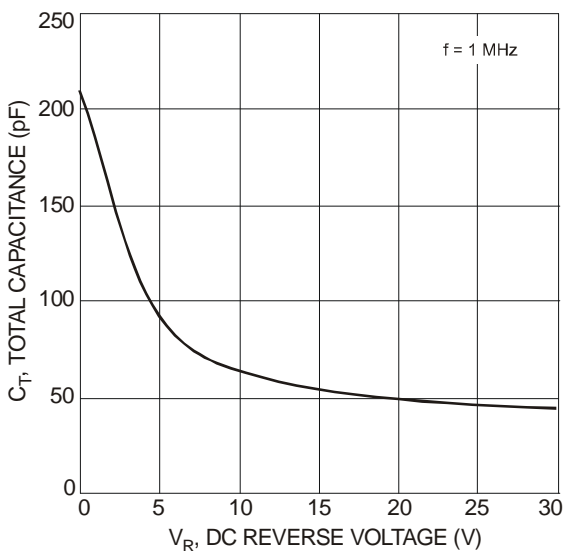


Fig. 5 Total Capacitance vs. Reverse Voltage

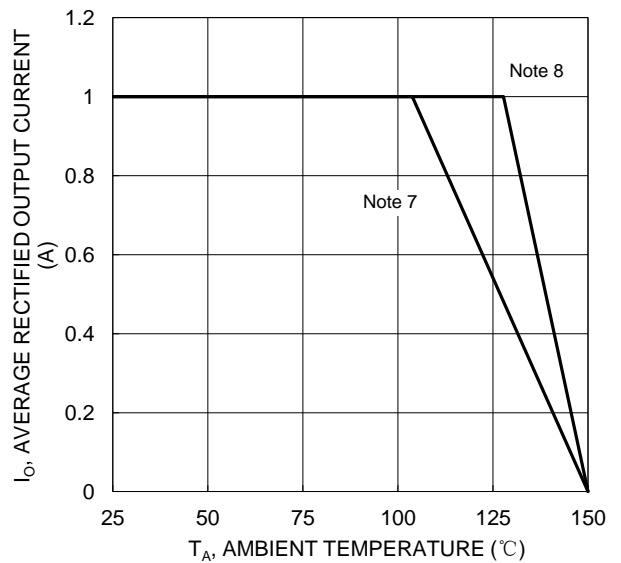


Fig. 6 DC Forward Current Derating

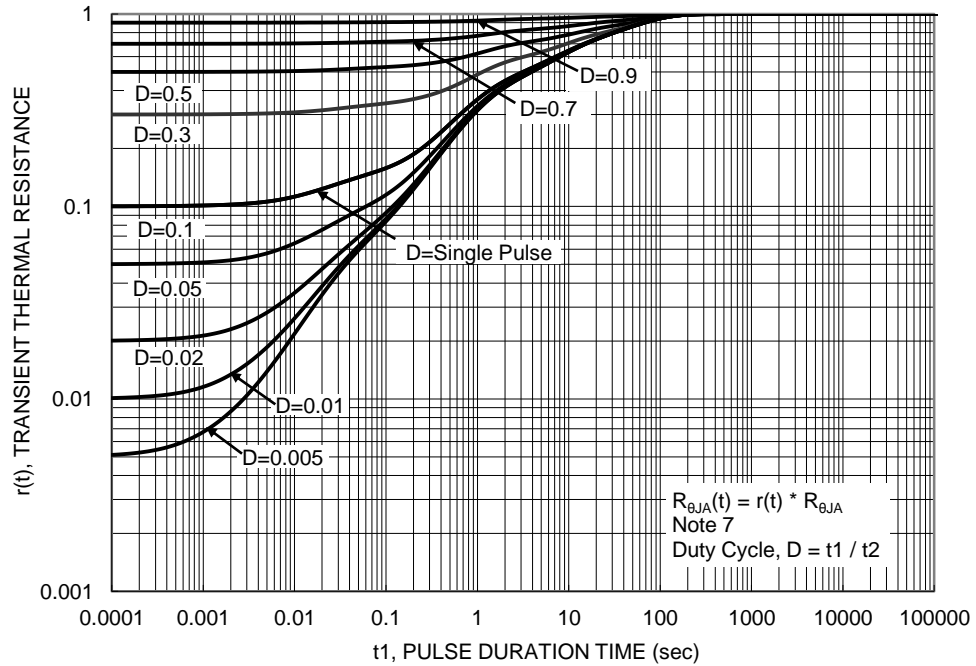
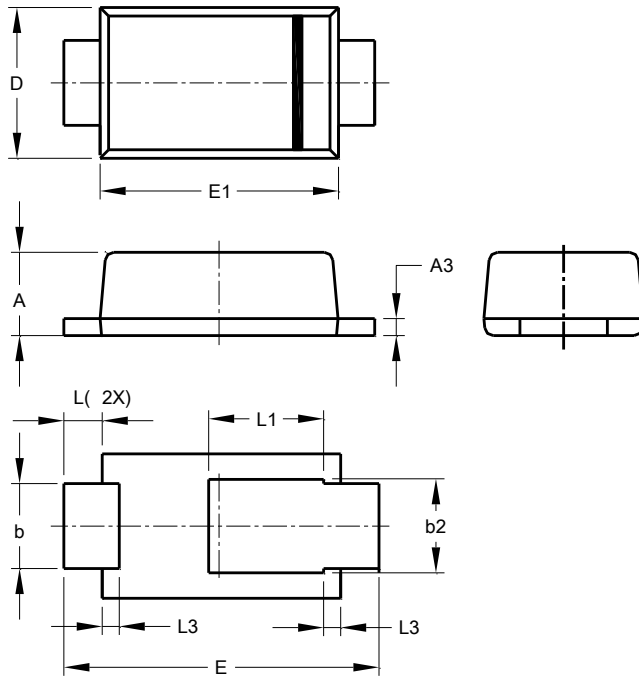


Fig. 7 Transient Thermal Resistance

Package Outline Dimensions

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

PowerDI123

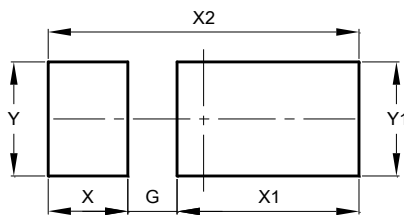


PowerDI123			
Dim	Min	Max	Typ
A	0.93	1.00	0.98
A3	0.15	0.25	0.20
b	0.85	1.25	1.00
b2	1.025	1.125	1.10
D	1.63	1.93	1.78
E	3.50	3.90	3.70
E1	2.60	3.00	2.80
L	0.40	0.50	0.45
L1	1.25	1.40	1.35
L3	0.125	0.275	0.20
All Dimensions in mm			

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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