PDS540Q

5A SCHOTTKY BARRIER RECTIFIER
POWERDI®

Product Summary

V_R (V)	I_F (A)	$V_{F\ MAX}$ (V) @ +25°C	$I_{R\ MAX}$ (mA) @ +25°C
40	5.0	0.52	0.25

Features and Benefits

- Guard Ring Die Construction for Transient Protection
- Low Power Loss, High Efficiency
- Low Forward Voltage Drop
- For Use in Low Voltage, High Frequency Inverters, Free Wheeling, and Polarity Protection Applications
- High Forward Surge Current Capability
- **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

This Schottky Barrier Rectifier has been designed to meet the stringent requirements of Automotive Applications.

Applications

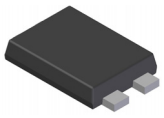
It is ideally suited to use as:

- Polarity Protection Diode
- Re-circulating Diode
- Switching Diode

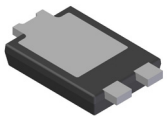
Mechanical Data

- Case: POWERDI5
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Finish – Matte Tin annealed over Copper leadframe. Solderable per MIL-STD-202, Method 208 e3
- Polarity: See Diagram
- Weight: 0.093 grams (approximate)

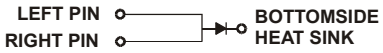
POWERDI5



Top View



Bottom View



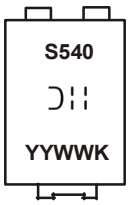
Note: Pins Left & Right must be electrically connected at the printed circuit board.

Ordering Information (Notes 4 & 5)

Part Number	Compliance	Case	Packaging
PDS540Q-13	Automotive	POWERDI5	5000/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



S540 = Product type marking code
⊐¦¦ = Manufacturers' code marking
YYWW = Date code marking
YY = Last digit of year (ex: 14 for 2014)
WW = Week code (01 – 53)
K = Factory Designator

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	40	V
RMS Reverse Voltage	$V_{R(RMS)}$	28	V
Average Rectified Output Current (See Figure 6)	I_O	5	A
Non-Repetitive Peak Forward Surge Current 8.3ms Single half sine-wave Superimposed on Rated Load	I_{FSM}	150	A

Thermal Characteristics

Characteristic	Symbol	Typ	Max	Unit
Thermal Resistance Junction to Soldering Point	$R_{\theta JS}$	—	4.0	°C/W
Thermal Resistance Junction to Ambient Air (Note 6)	$R_{\theta JA}$	90	—	°C/W
Thermal Resistance Junction to Ambient Air (Note 7)	$R_{\theta JA}$	65	—	°C/W
Thermal Resistance Junction to Ambient Air (Note 8)	$R_{\theta JA}$	50	—	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +150		°C

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Breakdown Voltage (Note 10)	$V_{(BR)R}$	40	—	—	V	I_R = 0.5mA
Forward Voltage	V_F	— — — —	0.48 0.43 0.57 0.55	0.52 0.47 0.65 0.59	V	I_F = 5A, T_S = +25°C I_F = 5A, T_S = +125°C I_F = 10A, T_S = +25°C I_F = 10A, T_S = +125°C
Reverse Leakage Current (Note 10)	I_R	— — —	0.015 3 10	0.25 15 40	mA	T_S = +25°C, V_R = 40V T_S = +100°C, V_R = 40V T_S = +125°C, V_R = 40V

Notes:
6. FR-4 PCB, 2 oz. Copper, minimum recommended pad layout per http://www.diodes.com.
7. Polyimide PCB, 2 oz. Copper, minimum recommended pad layout per http://www.diodes.com.
8. Polyimide PCB, 2 oz. Copper. Cathode pad dimensions 9.4mm x 7.2mm. Anode pad dimensions 2.7mm x 1.6mm.
9. Polyimide PCB, 2 oz. Copper. Cathode pad dimensions 6.5mm x 5.0mm. Anode pad dimensions 1.8mm x 1.1mm.
10. Short duration pulse test used to minimize self-heating effect.

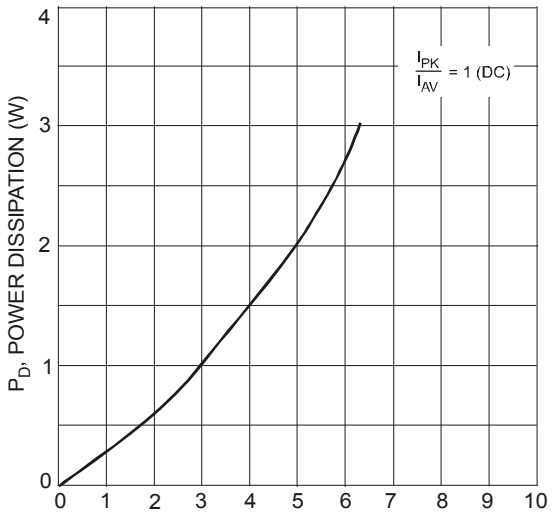


Fig. 1 Forward Power Dissipation

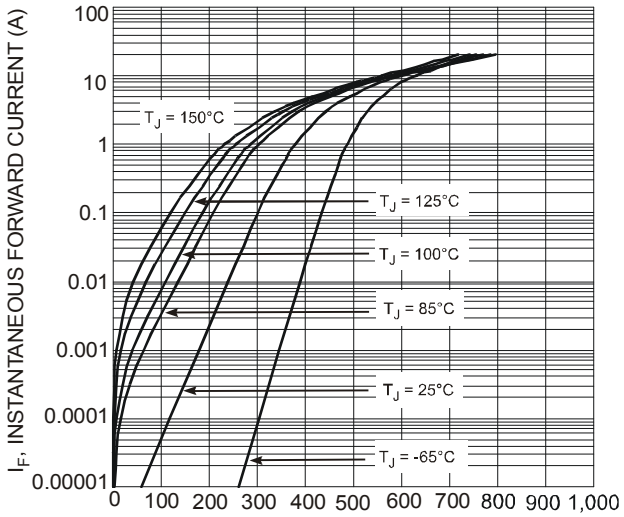


Fig. 2 Typical Forward Characteristics

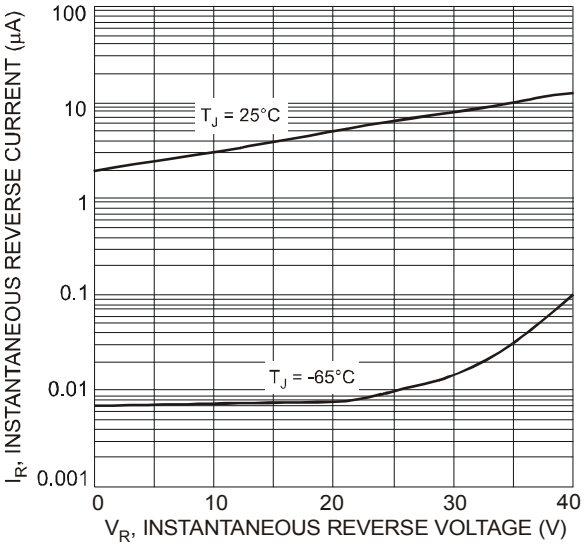


Fig. 3 Typical Reverse Characteristics

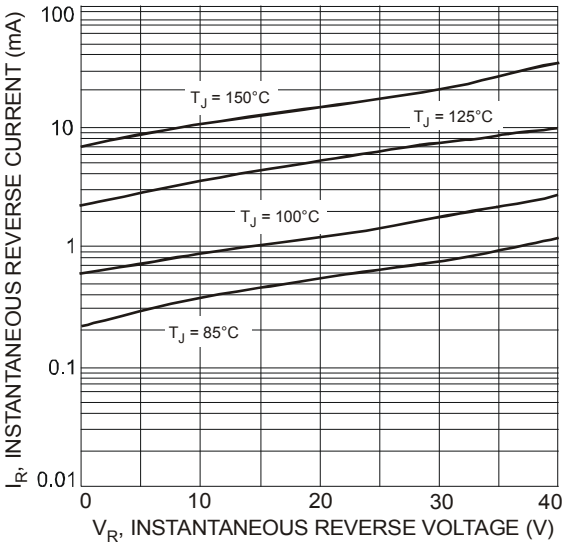


Fig. 4 Typical Reverse Characteristics

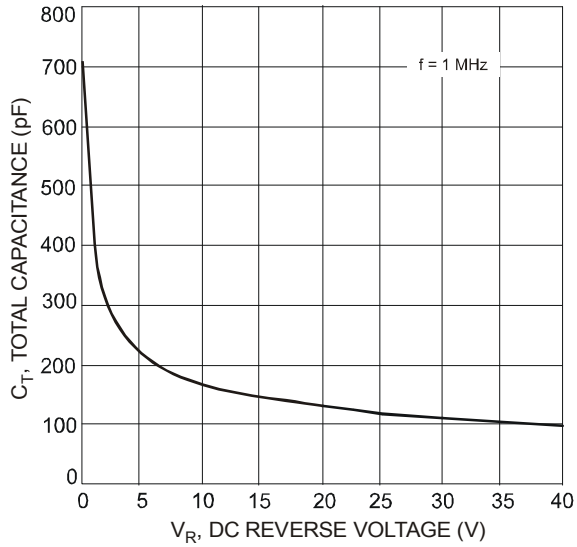


Fig. 5 Total Capacitance vs. Reverse Voltage

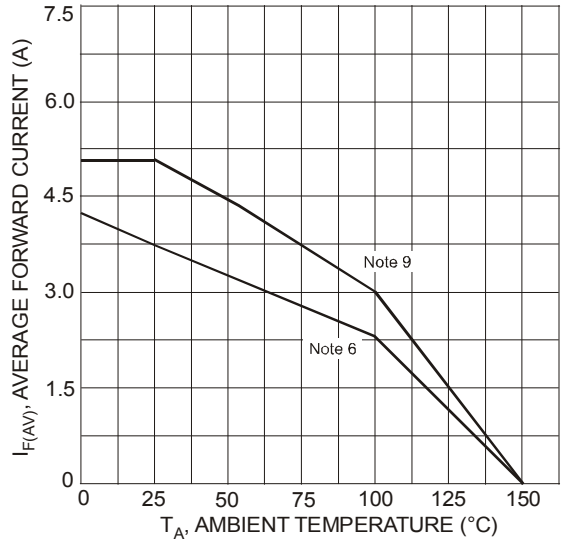


Fig. 6 Forward Current Derating Curve

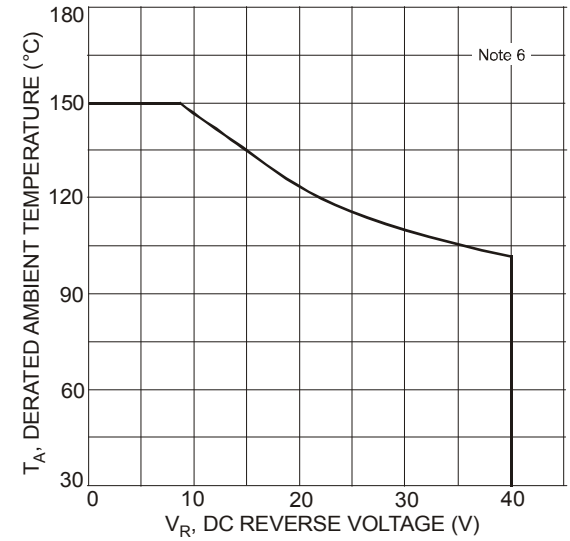
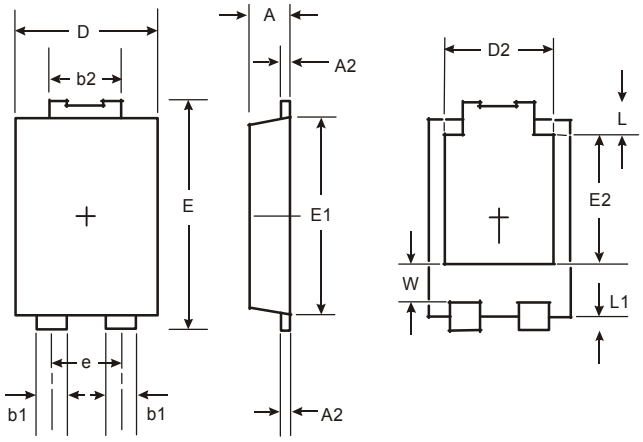


Fig. 7 Operating Temperature Derating

Package Outline Dimensions

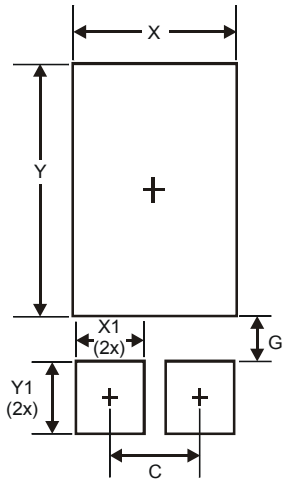
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.



POWERDI5		
Dim	**Min**	**Max**
A	1.05	1.15
A2	0.33	0.43
b1	0.80	0.99
b2	1.70	1.88
D	3.90	4.05
D2	3.054 Typ	
E	6.40	6.60
e	1.84 Typ	
E1	5.30	5.45
E2	3.549 Typ	
L	0.75	0.95
L1	0.50	0.65
W	1.10	1.41
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)
C	1.840
G	0.852
X	3.360
X1	1.390
Y	4.860
Y1	1.400

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