

## 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

## Description

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

## Applications

It is ideally suited to use as:

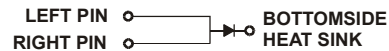
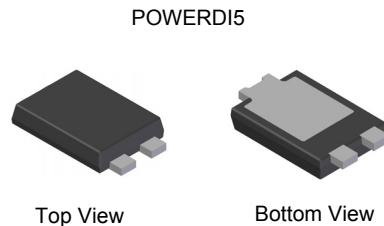
- Polarity Protection Diode
- Re-circulating Diode
- Switching Diode

## 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)**

## 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)



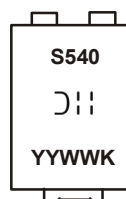
**Note:** Pins Left & Right must be electrically connected at the printed circuit board.

## 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](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/](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<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	V <sub>RRM</sub>	40	V
Working Peak Reverse Voltage	V <sub>RWM</sub>		
DC Blocking Voltage	V <sub>R</sub>		
RMS Reverse Voltage	V <sub>R(RMS)</sub>	28	V
Average Rectified Output Current (See Figure 6)	I <sub>O</sub>	5	A
Non-Repetitive Peak Forward Surge Current 8.3ms Single half sine-wave Superimposed on Rated Load	I <sub>FSM</sub>	150	A

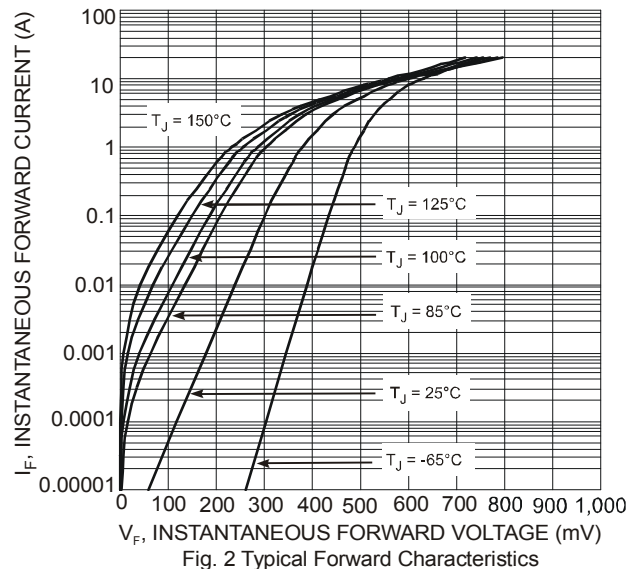
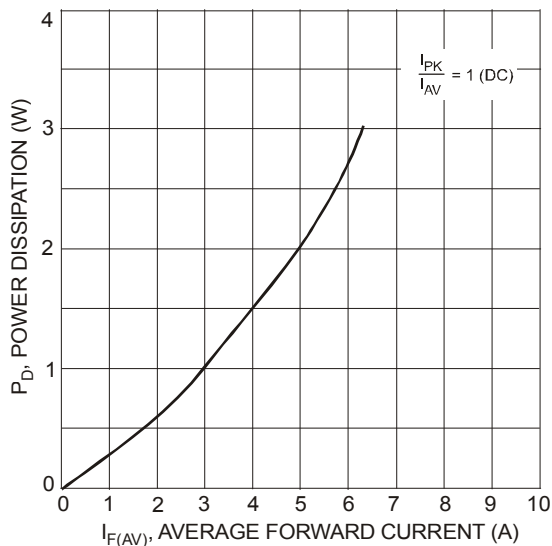
**Thermal Characteristics**

Characteristic	Symbol	Typ	Max	Unit
Thermal Resistance Junction to Soldering Point	R <sub>θJS</sub>	—	4.0	°C/W
Thermal Resistance Junction to Ambient Air (Note 6)	R <sub>θJA</sub>	90	—	°C/W
Thermal Resistance Junction to Ambient Air (Note 7)	R <sub>θJA</sub>	65	—	°C/W
Thermal Resistance Junction to Ambient Air (Note 8)	R <sub>θJA</sub>	50	—	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-65 to +150		°C

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Breakdown Voltage (Note 10)	V <sub>(BR)R</sub>	40	—	—	V	I <sub>R</sub> = 0.5mA
Forward Voltage	V <sub>F</sub>	—	0.48	0.52	V	I <sub>F</sub> = 5A, T <sub>S</sub> = +25°C
		—	0.43	0.47		I <sub>F</sub> = 5A, T <sub>S</sub> = +125°C
		—	0.57	0.65		I <sub>F</sub> = 10A, T <sub>S</sub> = +25°C
		—	0.55	0.59		I <sub>F</sub> = 10A, T <sub>S</sub> = +125°C
Reverse Leakage Current (Note 10)	I <sub>R</sub>	—	0.015	0.25	mA	T <sub>S</sub> = +25°C, V <sub>R</sub> = 40V
		—	3	15		T <sub>S</sub> = +100°C, V <sub>R</sub> = 40V
		—	10	40		T <sub>S</sub> = +125°C, V <sub>R</sub> = 40V

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



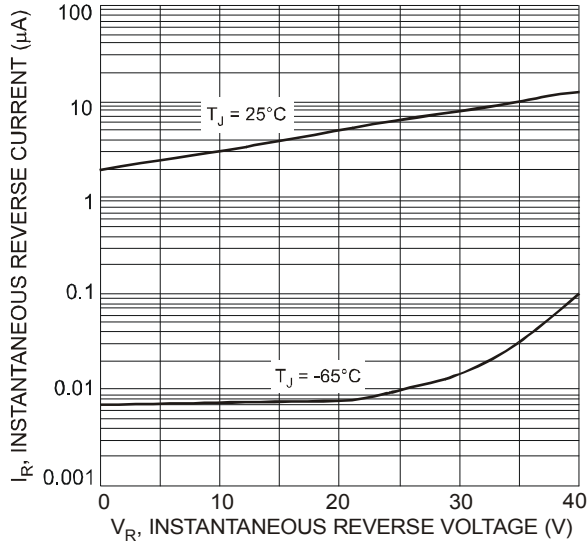


Fig. 3 Typical Reverse Characteristics

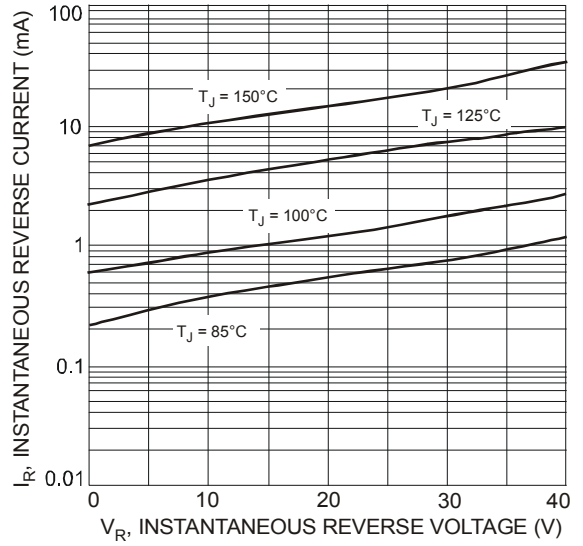


Fig. 4 Typical Reverse Characteristics

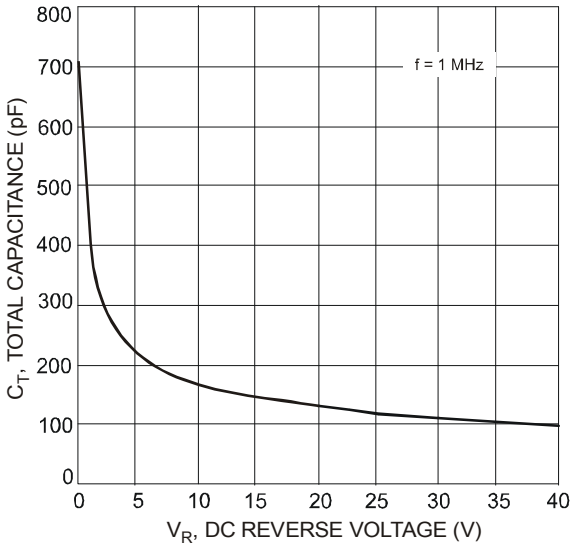


Fig. 5 Total Capacitance vs. Reverse Voltage

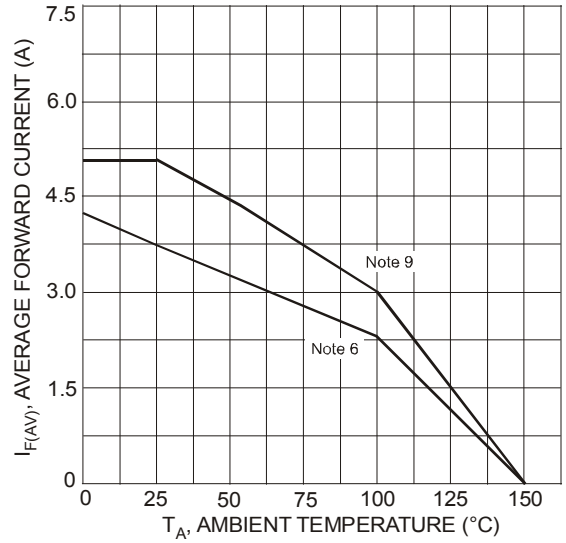


Fig. 6 Forward Current Derating Curve

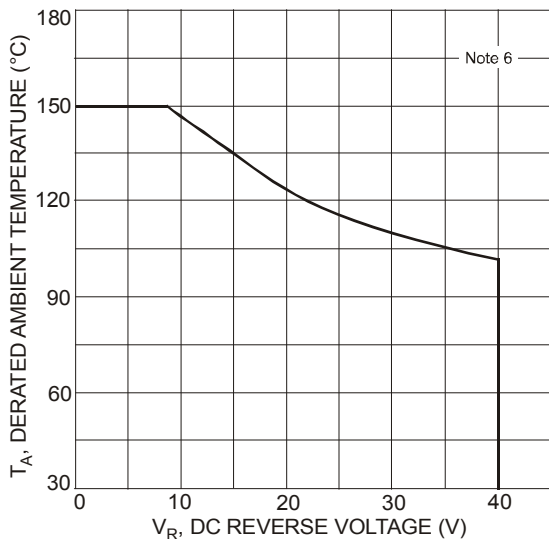
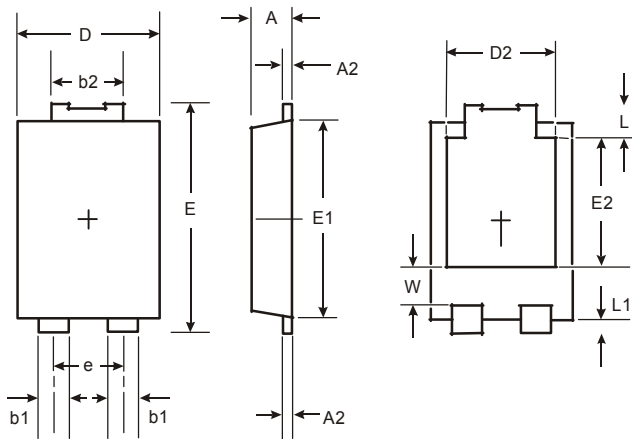


Fig. 7 Operating Temperature Derating

## Package Outline Dimensions

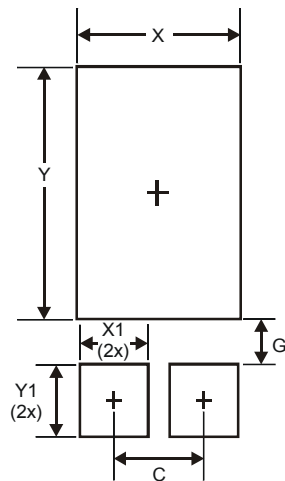
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



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
<b>All Dimensions in mm</b>		

## 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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