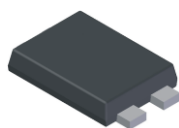


## Product Summary (@T<sub>A</sub> = +25°C)

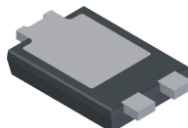
V <sub>RRM</sub> (V)	I <sub>O</sub> (A)	V <sub>F</sub> Max (V)	I <sub>R</sub> Max (μA)
400	5	1.185	10

## Description

PDU540, a 5.0A Glass Passivated Ultra-Fast Recovery Rectifier in our thermally efficient PowerDI5 package, offers ultra-fast recovery time for high efficiency, high forward surge current for use in high frequency inverters, freewheeling and polarity protection application.



Top View







Bottom View

## Features and Benefits

- Glass Passivated Die Construction
- Ultra-Fast Recovery Time for High Efficiency
- High Maximum Junction Temperature
- For Use in High Frequency Inverters, Freewheeling 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)**

## 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 
- Weight: 0.096 grams (Approximate)

LEFT PIN  RIGHT PIN   **BOTTOMSIDE HEAT SINK**

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

## Ordering Information (Note 4)

Part Number	Compliance	Case	Packaging
PDU540-13	Commercial	PowerDI5	5,000/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](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. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

## Marking Information



U540 = Product Type Marking Code  
 DII = Manufacturer's Code Marking  
 YYWW = Date Code Marking  
 YY = Last Two Digits of Year (ex: 06 = 2006)  
 WW = Week Code (01 to 52)  
 K = Factory Designator

## Maximum Ratings (@T<sub>A</sub> = +25°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 Working Peak Reverse Voltage DC Blocking Voltage	V <sub>RRM</sub> V <sub>RWM</sub> V <sub>R</sub>	400	V
RMS Reverse Voltage	V <sub>R(RMS)</sub>	283	V
Average Rectified Output Current (See Figure 4)	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>	125	A

## Thermal Characteristics

Characteristic	Symbol	Typ	Max	Unit
Thermal Resistance Junction to Soldering Point	R <sub>θJS</sub>	—	3.0	°C/W
Thermal Resistance Junction to Ambient Air (Note 5)	T <sub>A</sub> = +25°C R <sub>θJA</sub>	95	—	°C/W
Thermal Resistance Junction to Ambient Air (Note 6)	T <sub>A</sub> = +25°C R <sub>θJA</sub>	55	—	°C/W
Thermal Resistance Junction to Ambient Air (Note 7)	T <sub>A</sub> = +25°C R <sub>θJA</sub>	40	—	°C/W
Operating Temperature Range	T <sub>J</sub>	-65 to +150		°C
Storage Temperature Range	T <sub>STG</sub>	-65 to +150		°C

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

Characteristic	Symbol	Value	Unit	Test Condition
Minimum Reverse Breakdown Voltage (Note 8)	V <sub>(BR)R</sub>	400	V	I <sub>R</sub> = 10μA
Maximum Forward Voltage	V <sub>FM</sub>	1.185 0.935 1.25 1.00	V	I <sub>F</sub> = 5A, T <sub>S</sub> = +25°C I <sub>F</sub> = 5A, T <sub>S</sub> = +150°C I <sub>F</sub> = 8A, T <sub>S</sub> = +25°C I <sub>F</sub> = 8A, T <sub>S</sub> = +150°C
Maximum Reverse Leakage Current (Note 8)	I <sub>RM</sub>	10 500	μA	T <sub>S</sub> = +25°C, V <sub>R</sub> = 400V T <sub>S</sub> = +100°C, V <sub>R</sub> = 400V
Maximum Reverse Recovery Time	t <sub>RR</sub>	35	ns	I <sub>F</sub> = 0.5A, I <sub>R</sub> = 1.0A I <sub>RR</sub> = 0.25A (See Figure 7)

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

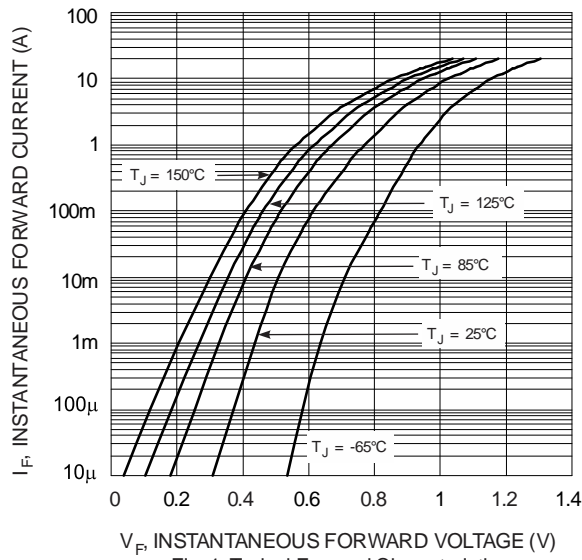


Fig. 1 Typical Forward Characteristics

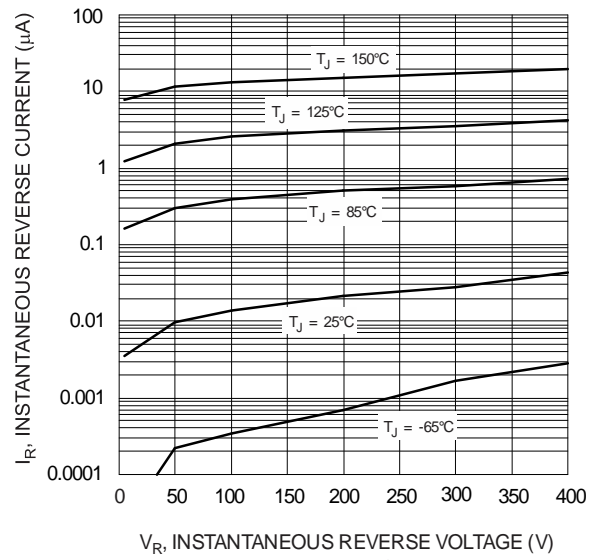


Fig. 2 Typical Reverse Characteristics

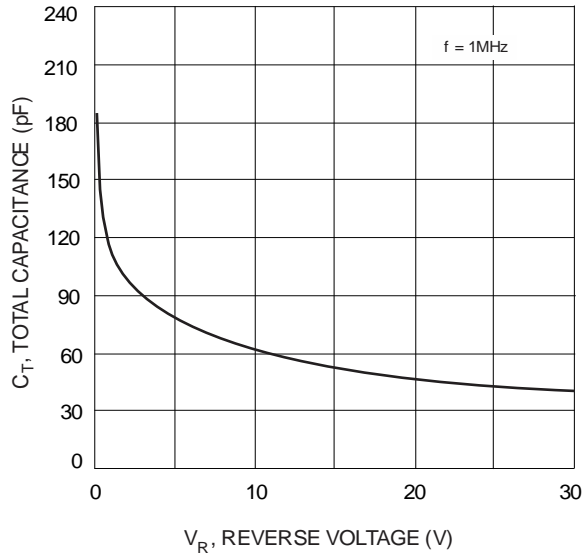


Fig. 3 Typical Total Capacitance vs. Reverse Voltage

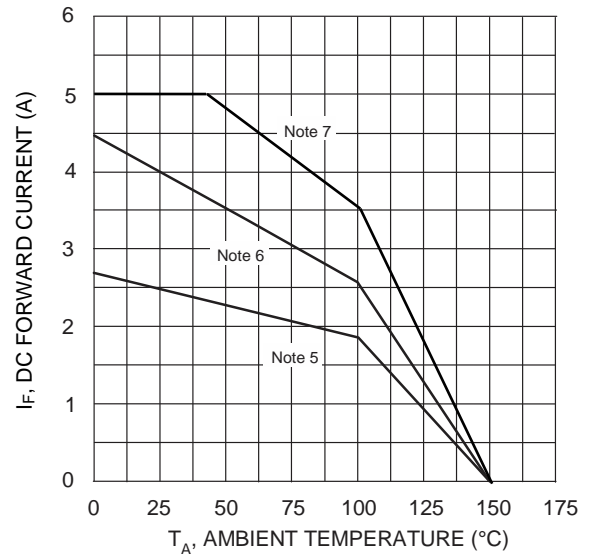


Fig. 4 DC Forward Current Derating

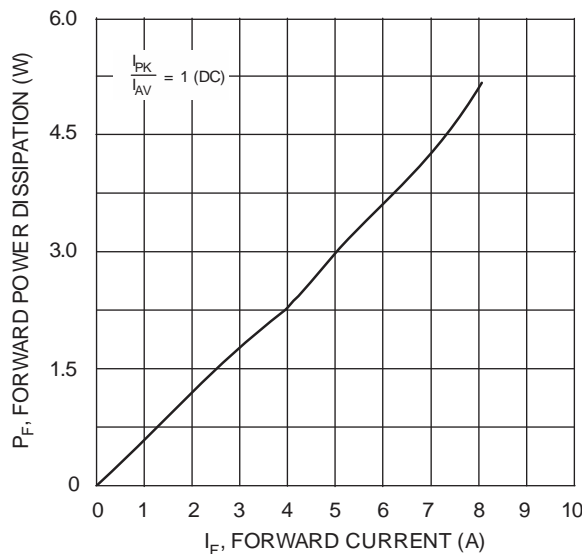


Fig. 5 Forward Power Dissipation

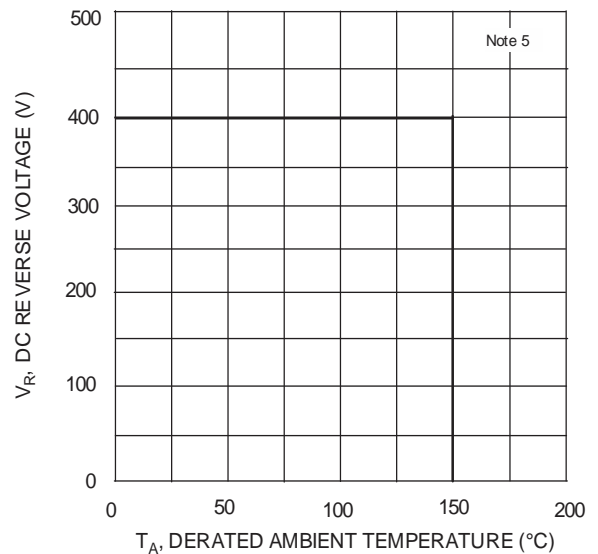
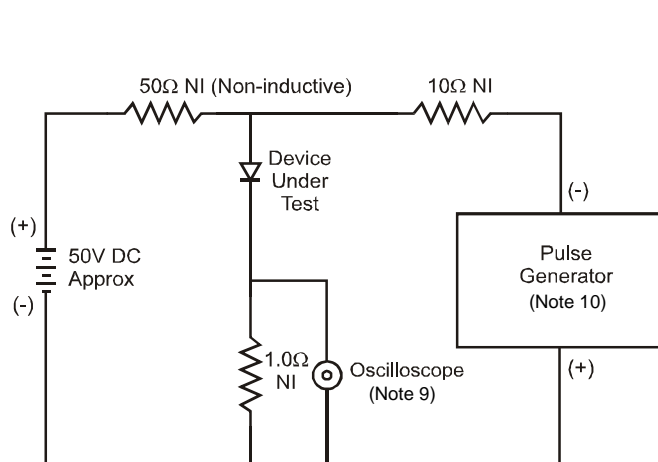


Fig. 6 Operating Temperature Derating



Notes:  
 9. Rise Time = 7.0ns max. Input Impedance = 1.0MΩ, 22pF.  
 10. Rise Time = 10ns max. Input Impedance = 50Ω.

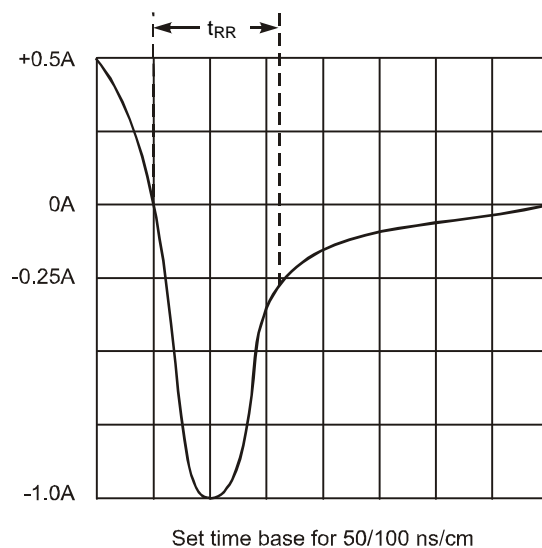
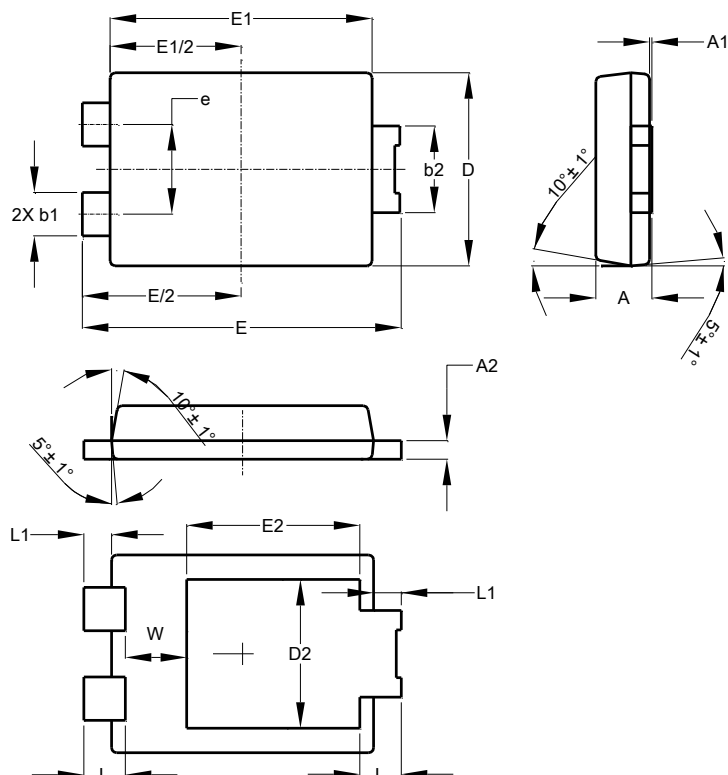


Fig. 7 Reverse Recovery Time Characteristic and Test Circuit

## Package Outline Dimensions

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

**PowerDI5**

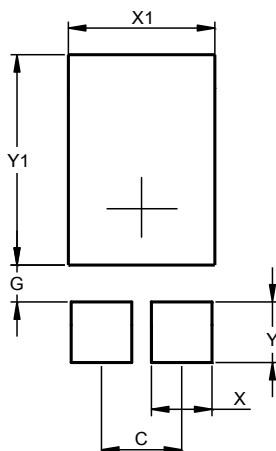


PowerDI5			
Dim	Min	Max	Typ
A	1.05	1.15	1.10
A1	0.00	0.05	—
A2	0.33	0.43	0.381
b1	0.80	0.99	0.89
b2	1.70	1.88	1.78
D	3.90	4.05	3.966
D2	—	—	3.054
E	6.40	6.60	6.504
e	—	—	1.84
E1	5.30	5.45	5.37
E2	—	—	3.549
L	0.75	0.95	0.85
L1	0.50	0.65	0.57
W	1.10	1.41	1.255
All Dimensions in mm			

## Suggested Pad Layout

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

**PowerDI5**



Dimensions	Value (in mm)
C	1.840
G	0.852
X	1.390
X1	3.360
Y	1.400
Y1	4.860

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