

Product Summary (@T_A = +25°C)

V _{RRM} (V)	I _O (A)	V _F Max (V)	I _R 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



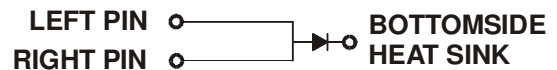
Bottom View

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 (E3)
- Weight: 0.096 grams (Approximate)

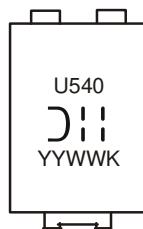


Note: Pins Left & Right must be electrically connected at the printed circuit board.

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 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
 D11 = 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 (@ $T_A = +25^\circ\text{C}$, 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 Working Peak Reverse Voltage DC Blocking Voltage	V_{RRM} V_{RWM} V_R	400	V
RMS Reverse Voltage	$V_{R(RMS)}$	283	V
Average Rectified Output Current (See Figure 4)	I_O	5	A
Non-Repetitive Peak Forward Surge Current 8.3ms Single Half Sine-Wave Superimposed on Rated Load	I_{FSM}	125	A

Thermal Characteristics

Characteristic	Symbol	Typ	Max	Unit
Thermal Resistance Junction to Soldering Point	$R_{\theta JS}$	—	3.0	$^\circ\text{C/W}$
Thermal Resistance Junction to Ambient Air (Note 5)	$T_A = +25^\circ\text{C}$ $R_{\theta JA}$	95	—	$^\circ\text{C/W}$
Thermal Resistance Junction to Ambient Air (Note 6)	$T_A = +25^\circ\text{C}$ $R_{\theta JA}$	55	—	$^\circ\text{C/W}$
Thermal Resistance Junction to Ambient Air (Note 7)	$T_A = +25^\circ\text{C}$ $R_{\theta JA}$	40	—	$^\circ\text{C/W}$
Operating Temperature Range	T_J	-65 to +150		$^\circ\text{C}$
Storage Temperature Range	T_{STG}	-65 to +150		$^\circ\text{C}$

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

Characteristic	Symbol	Value	Unit	Test Condition
Minimum Reverse Breakdown Voltage (Note 8)	$V_{(BR)R}$	400	V	$I_R = 10\mu\text{A}$
Maximum Forward Voltage	V_{FM}	1.185	V	$I_F = 5\text{A}, T_S = +25^\circ\text{C}$
		0.935		$I_F = 5\text{A}, T_S = +150^\circ\text{C}$
		1.25		$I_F = 8\text{A}, T_S = +25^\circ\text{C}$
		1.00		$I_F = 8\text{A}, T_S = +150^\circ\text{C}$
Maximum Reverse Leakage Current (Note 8)	I_{RM}	10	μA	$T_S = +25^\circ\text{C}, V_R = 400\text{V}$
		500		$T_S = +100^\circ\text{C}, V_R = 400\text{V}$
Maximum Reverse Recovery Time	t_{RR}	35	ns	$I_F = 0.5\text{A}, I_R = 1.0\text{A}$ $I_{RR} = 0.25\text{A}$ (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.

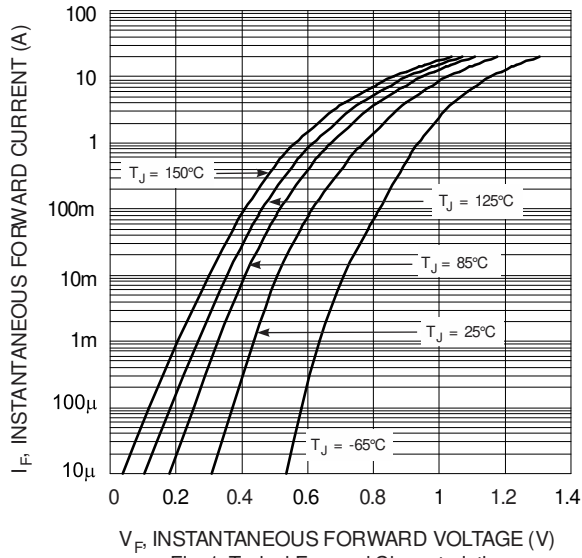


Fig. 1 Typical Forward Characteristics

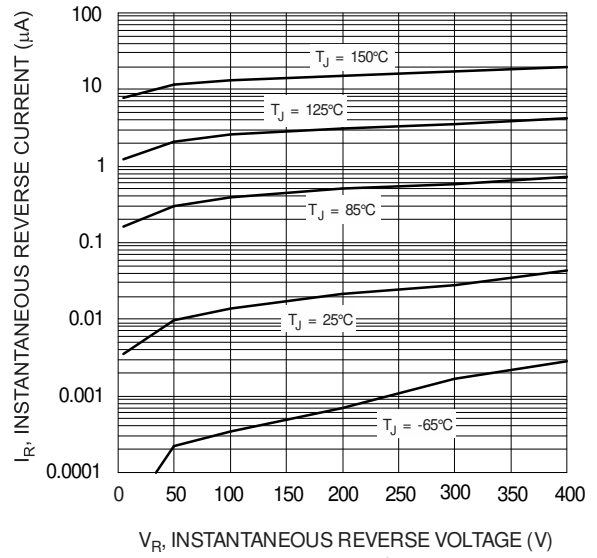


Fig. 2 Typical Reverse Characteristics

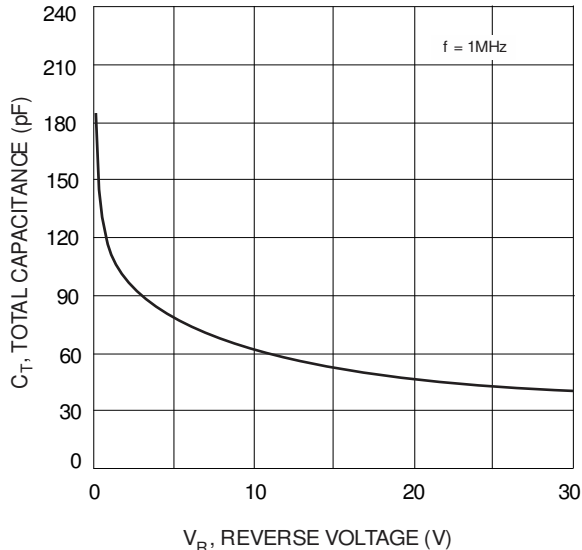


Fig. 3 Typical Total Capacitance vs. Reverse Voltage

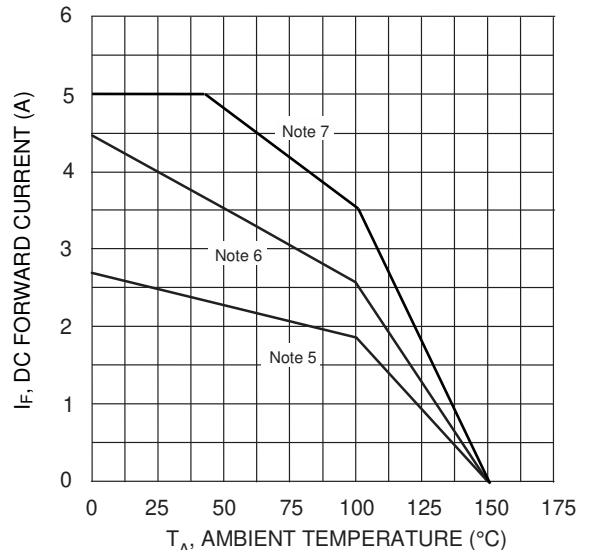


Fig. 4 DC Forward Current Derating

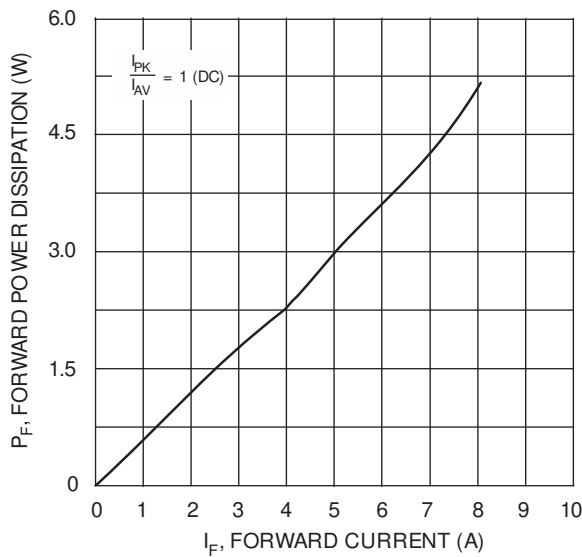


Fig. 5 Forward Power Dissipation

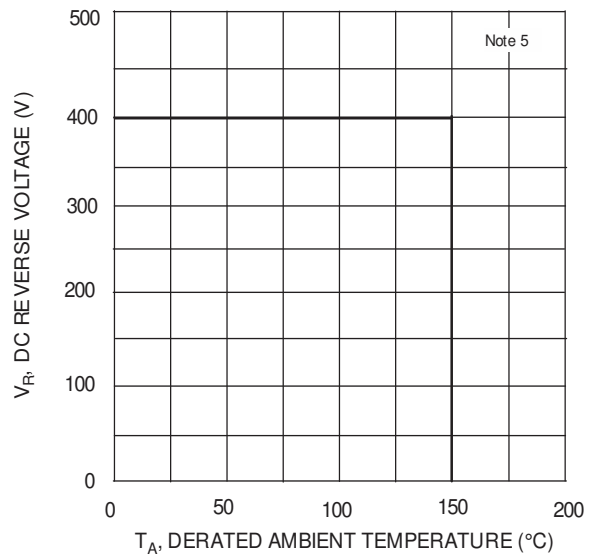
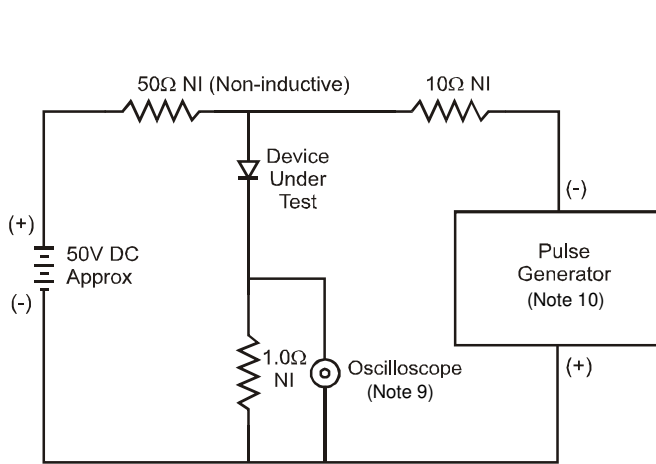


Fig. 6 Operating Temperature Derating



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

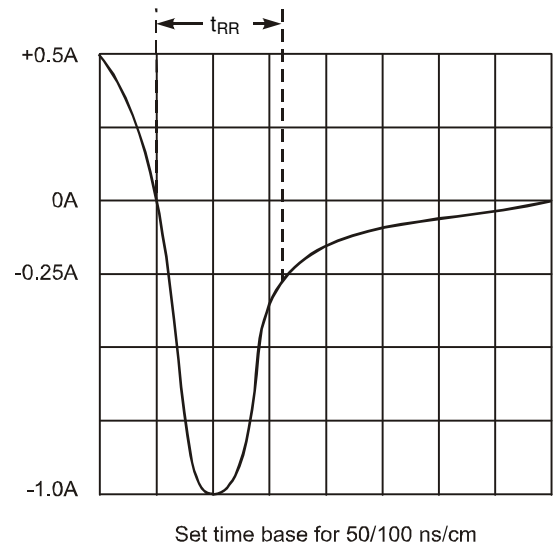
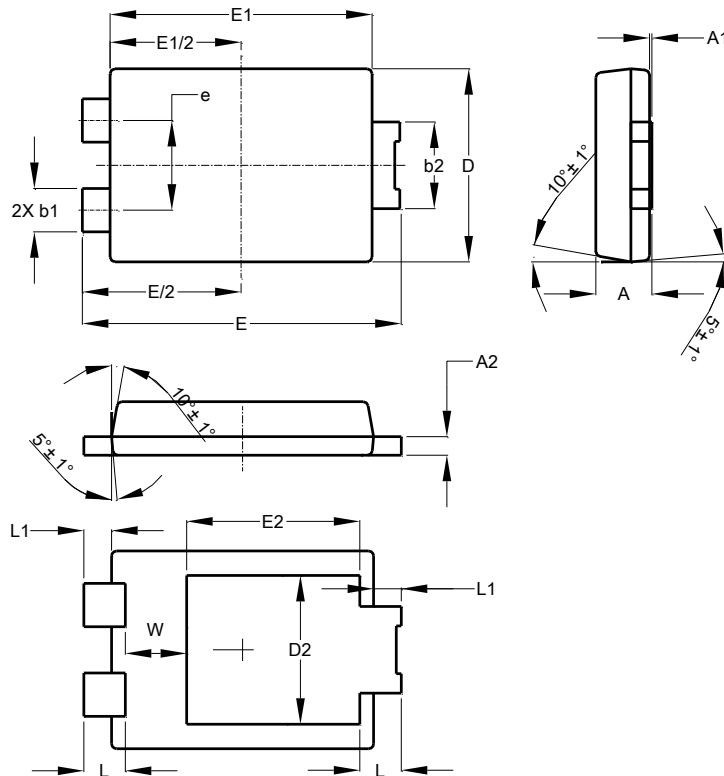


Fig. 7 Reverse Recovery Time Characteristic and Test Circuit

Package Outline Dimensions

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

PowerDI5



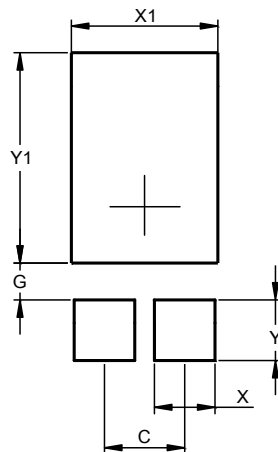
PowerDI5			
Dim	Min	Max	Typ
A	1.05	1.15	1.10
A1	0.00	0.05	—
A2	0.33	0.43	0.381
b1	0.80	0.99	0.89
b2	1.70	1.88	1.78
D	3.90	4.05	3.966
D2	—	—	3.054
E	6.40	6.60	6.504
e	—	—	1.84
E1	5.30	5.45	5.37
E2	—	—	3.549
L	0.75	0.95	0.85
L1	0.50	0.65	0.57
W	1.10	1.41	1.255

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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