

## Product Summary

V <sub>RRM</sub> (V)	I <sub>O</sub> (A)	V <sub>F max</sub> (V) @ +25°C	I <sub>R max</sub> (μA) @ +25°C
60	5	0.60	150

## Features

- Guard Ring Die Construction for Transient Protection
- High Surge Current Capability
- Low Leakage Current
- Low Power Loss, High Efficiency
- For Use in 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 and Applications

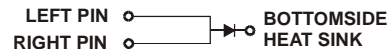
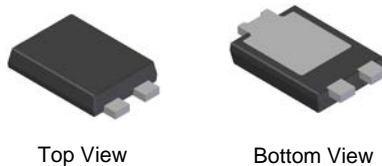
Designed to meet the stringent requirements of automotive applications, the device is ideally suited to use as:

- Polarity Protection Diode
- Recirculating Diode
- Switching Diode

## Mechanical Data

- Case: Power<sup>®</sup>DI5
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish Annealed over Copper Leadframe. Solderable per MIL-STD-202, Method 208 <sup>Ⓔ</sup>
- Polarity: See Diagram
- Weight: 0.093 grams (Approximate)

PowerDI5



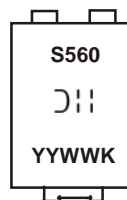
**Note:** Pins Left & Right must be electrically connected at the printed circuit board.

## Ordering Information (Note 5)

Part Number	Compliance	Case	Packaging
PDS560Q-13	Automotive	PowerDI5	5000/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/package/diodes-packaging/>.

## Marking Information



S560 = Product Type Marking Code  
 ⓂⓂ = Manufacturers' Code Marking  
 YYWW = Date Code Marking  
 YY = Last Two Digits of Year (ex: 18 for 2018)  
 WW = Week Code (01 – 53)  
 K = Factory Designator

**Maximum Ratings** (@ $T_A = +25^\circ\text{C}$ , 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	$V_{RRM}$	60	V
Working Peak Reverse Voltage	$V_{RWM}$		
DC Blocking Voltage	$V_R$		
RMS Reverse Voltage	$V_{R(RMS)}$	42	V
Average Rectified Output Current	$I_O$	5	A
Non-Repetitive Peak Forward Surge Current	$I_{FSM}$	150	A
8.3ms Single Half Sine-Wave Superimposed on Rated Load			
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 Lead (Cathode)	$R_{\theta JS}$	2.0	—	$^\circ\text{C/W}$
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) $T_A = +25^\circ\text{C}$	$R_{\theta JA}$	70	—	$^\circ\text{C/W}$
Thermal Resistance Junction to Ambient Air (Note 7) $T_A = +25^\circ\text{C}$	$R_{\theta JA}$	50	—	$^\circ\text{C/W}$
Thermal Resistance Junction to Ambient Air (Note 8) $T_A = +25^\circ\text{C}$	$R_{\theta JA}$	25	—	$^\circ\text{C/W}$
Operating and Storage Temperature Range	$T_J, T_{STG}$	-65 to +150		$^\circ\text{C}$

- Notes:
- FR-4 PCB, 2oz. Copper, minimum recommended pad layout per <http://www.diodes.com>.
  - Polymide PCB, 2oz. Copper, minimum recommended pad layout per <http://www.diodes.com>.
  - Polymide PCB, 2 oz. Copper. Cathode pad dimensions 9.4mm x 7.2mm. Anode pad dimensions 2.7mm x 1.6mm.
  - 2inch x 2inch Al board.

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Breakdown Voltage (Note 9)	$V_{(BR)R}$	60	—	—	V	$I_R = 0.2\text{mA}$
Forward Voltage	$V_F$	—	0.61	0.67	V	$I_F = 5\text{A}, T_S = +25^\circ\text{C}$
		—	0.54	0.60		$I_F = 5\text{A}, T_S = +125^\circ\text{C}$
		—	0.71	0.77		$I_F = 8\text{A}, T_S = +25^\circ\text{C}$
		—	—	0.68		$I_F = 8\text{A}, T_S = +125^\circ\text{C}$
Reverse Leakage Current (Note 9)	$I_R$	—	4	150	$\mu\text{A}$	$T_S = +25^\circ\text{C}, V_R = 60\text{V}$
		—	—	15	mA	$T_S = +100^\circ\text{C}, V_R = 60\text{V}$
		—	2	30	mA	$T_S = +125^\circ\text{C}, V_R = 60\text{V}$
Switching Speed $t_{RR}$	$t_{RR}$	—	12	—	ns	$I_F = 0.5\text{A}, I_R = 1\text{A}, I_{RR} = 0.25\text{A} (\text{RG1})$

- Note: 9. Short duration pulse test used to minimize self-heating effect.

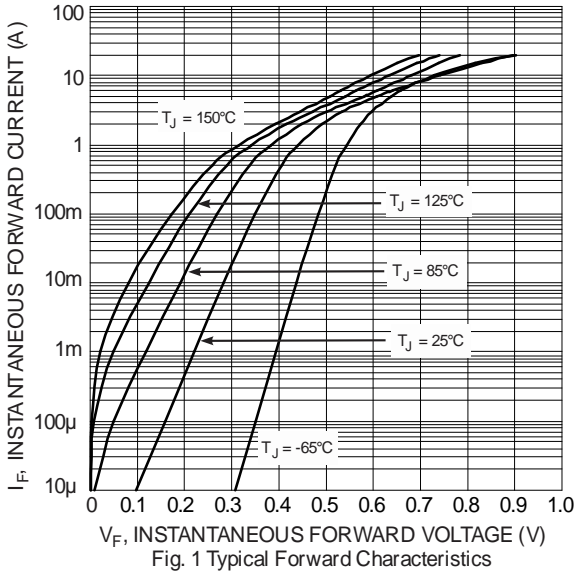


Fig. 1 Typical Forward Characteristics

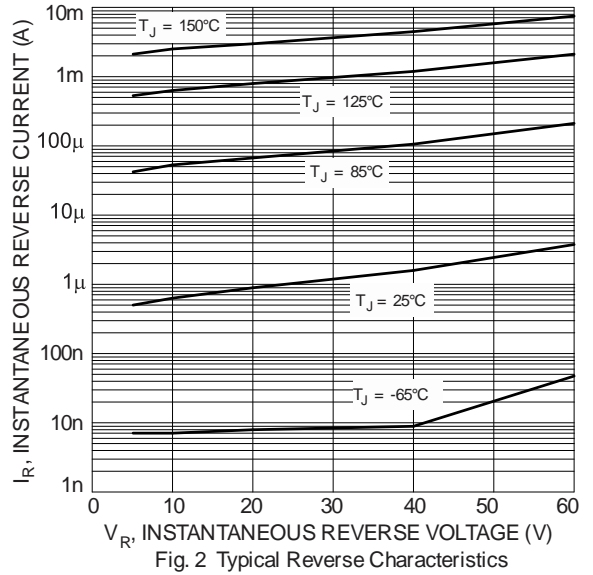


Fig. 2 Typical Reverse Characteristics

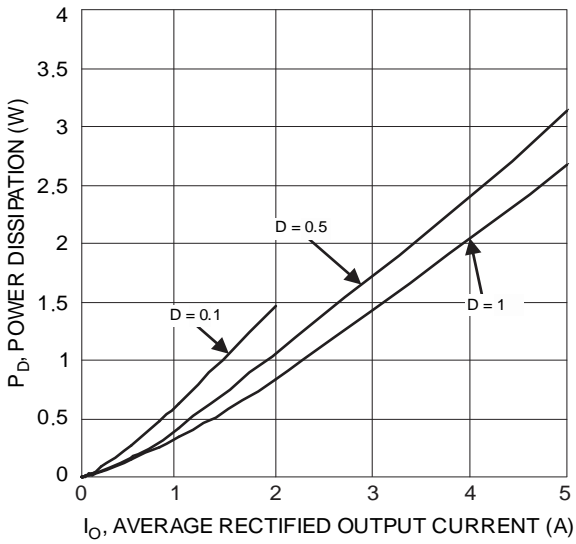


Figure 3 Forward Power Dissipation,  $T_J = 125^\circ\text{C}$

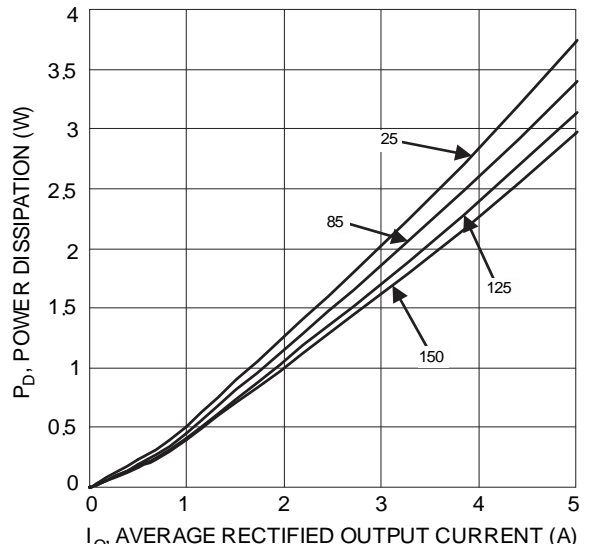


Figure 4 Forward Power Dissipation,  $D = 0.5$

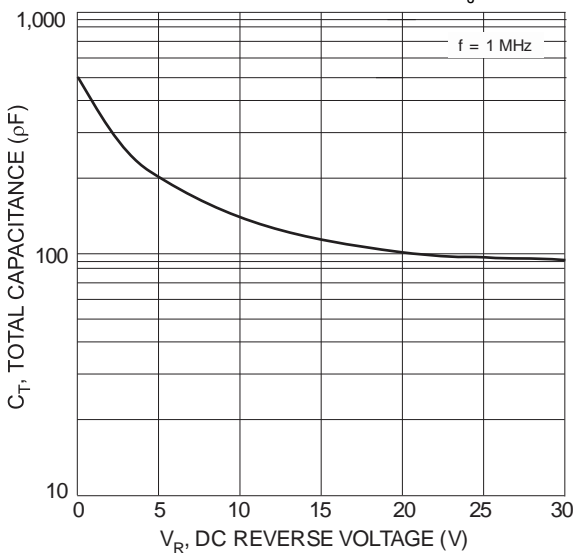


Fig. 5 Total Capacitance vs. Reverse Voltage

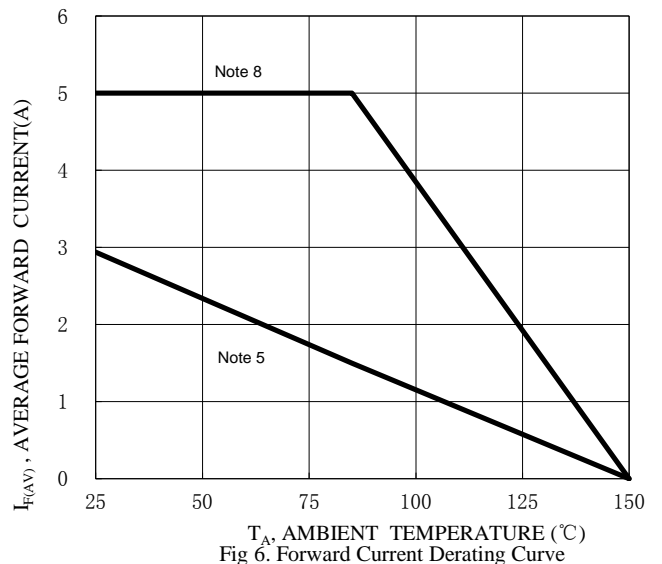
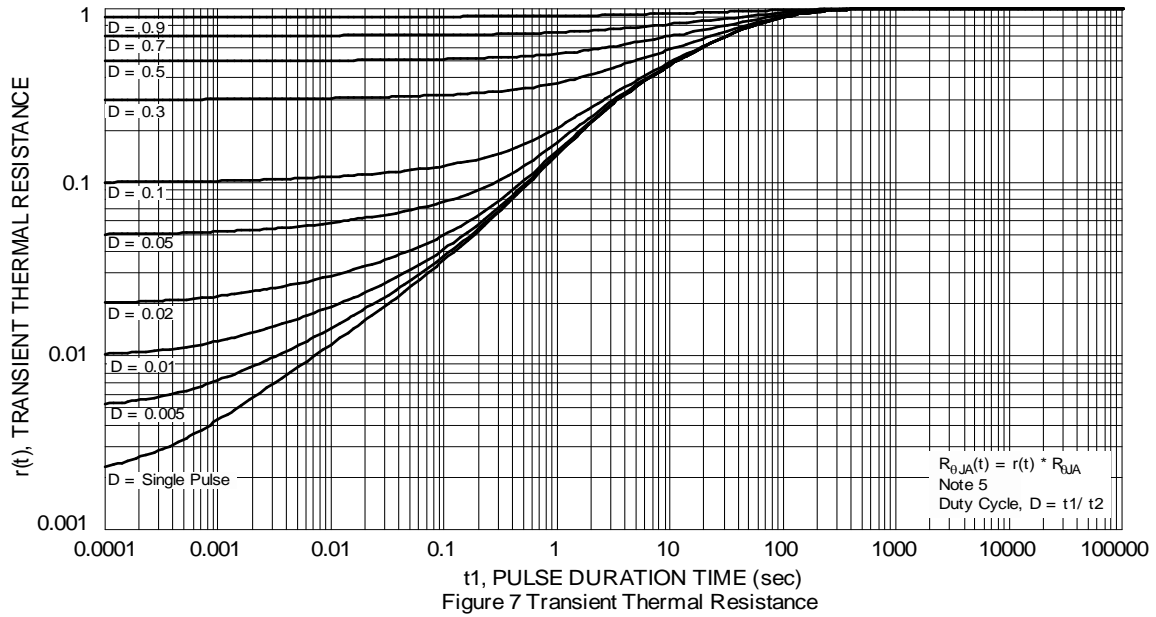
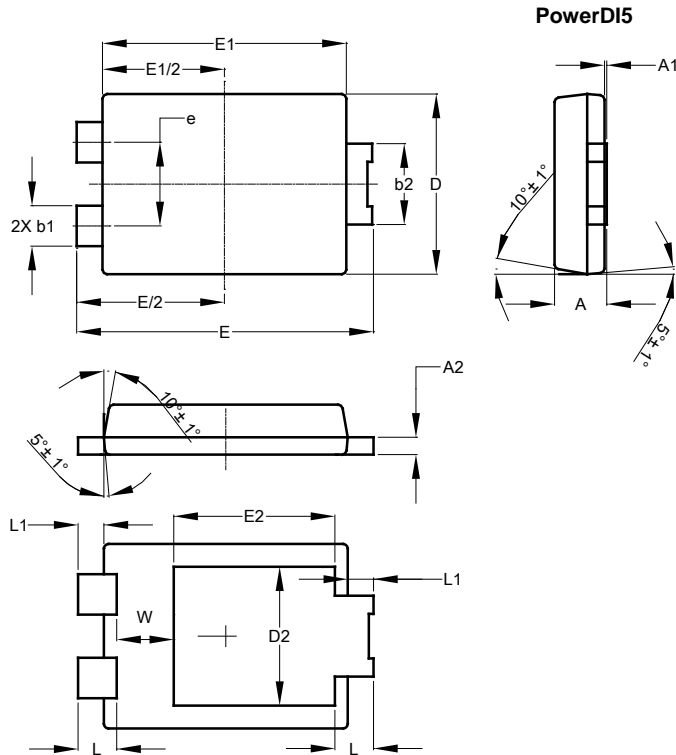


Fig. 6 Forward Current Derating Curve



## Package Outline Dimensions

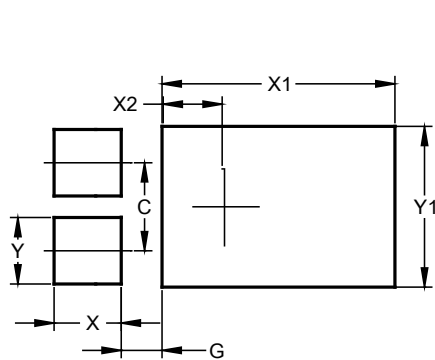
Please see <http://www.diodes.com/package-outlines.html> for the latest version.



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	6.51
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.



Dimensions	Value (in mm)
C	1.840
G	0.852
X	1.400
X1	4.860
X2	1.310
Y	1.390
Y1	3.360

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