

Product Summary

V _{RRM} (V)	I _O (A)	V _{F max} (V) @ +25°C	I _{R max} (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

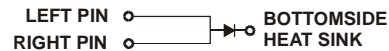
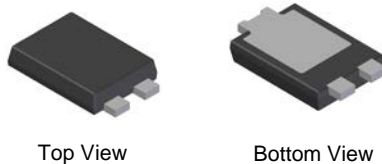
Designed to meet the stringent requirements of automotive applications, the device is ideally suited to use as:

- Polarity Protection Diode
- Recirculating Diode
- Switching Diode

Mechanical Data

- Case: Power[®]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 [Ⓔ]
- Polarity: See Diagram
- Weight: 0.093 grams (Approximate)

PowerDI5



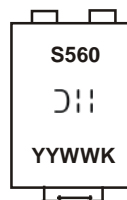
Note: Pins Left & Right must be electrically connected at the printed circuit board.

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	μA	$T_S = +25^\circ\text{C}, V_R = 60\text{V}$
		—	—	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	$I_F = 0.5\text{A}, I_R = 1\text{A}, I_{RR} = 0.25\text{A (RG1)}$

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

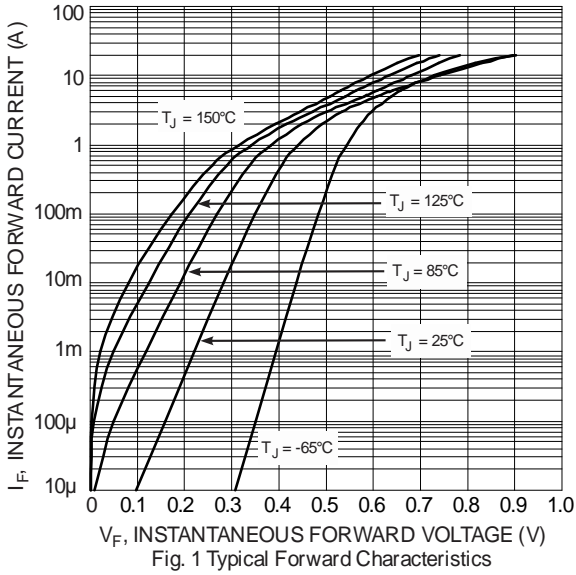


Fig. 1 Typical Forward Characteristics

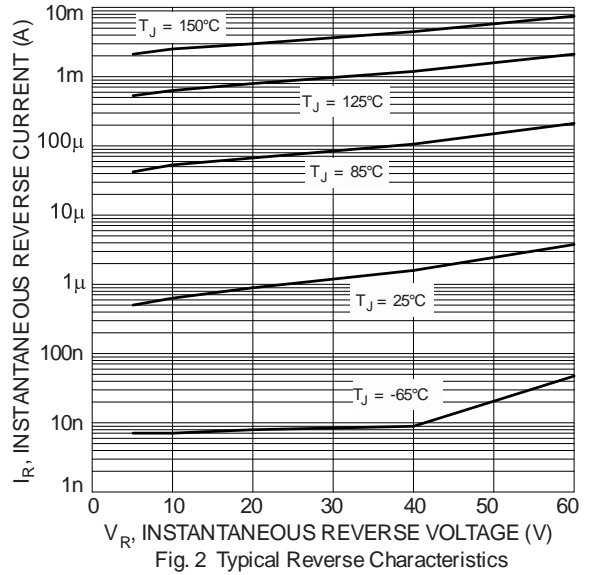


Fig. 2 Typical Reverse Characteristics

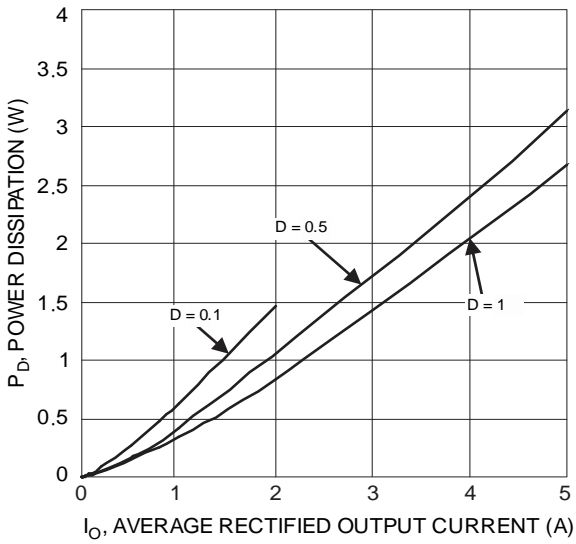


Figure 3 Forward Power Dissipation, $T_J = 125^\circ\text{C}$

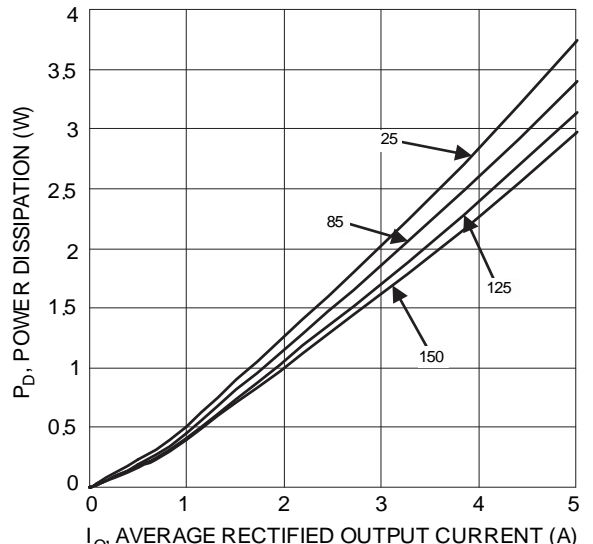


Figure 4 Forward Power Dissipation, $D = 0.5$

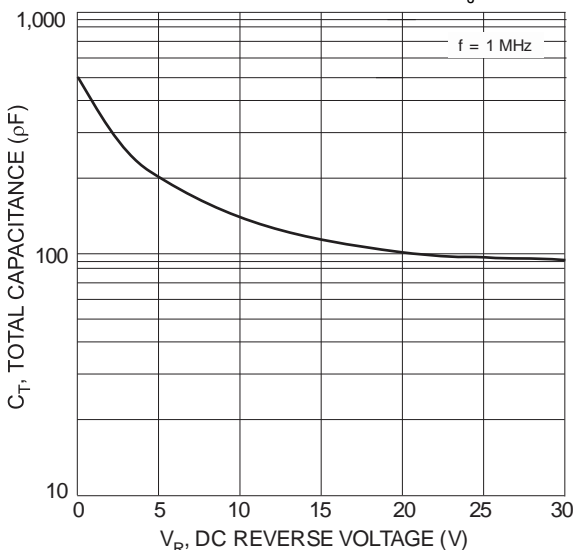


Fig. 5 Total Capacitance vs. Reverse Voltage

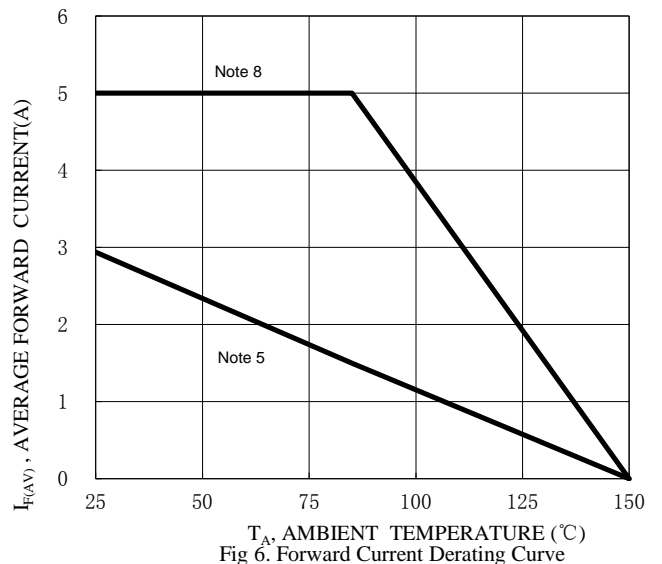
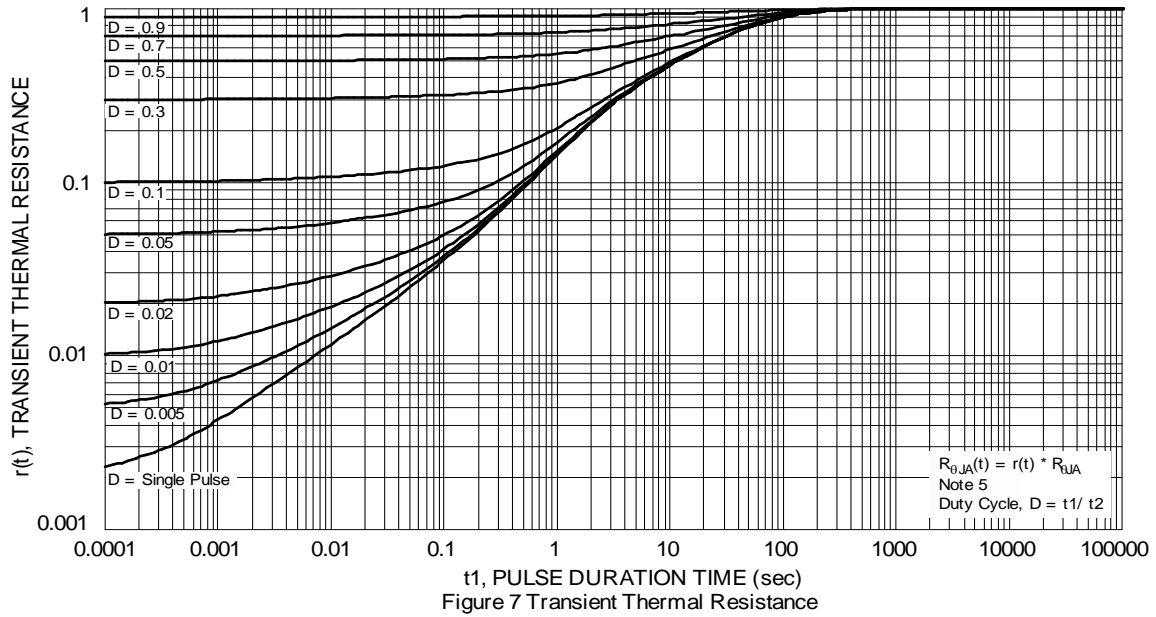
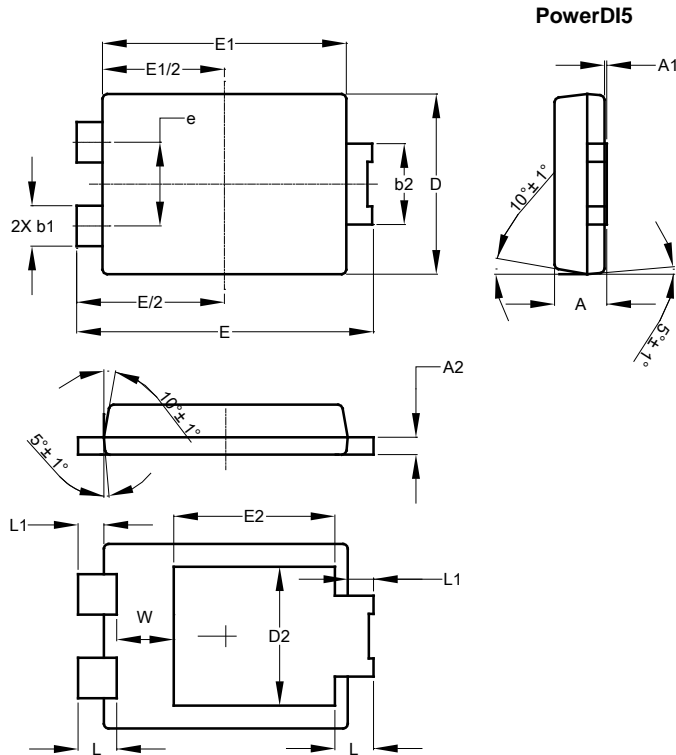


Fig. 6 Forward Current Derating Curve



Package Outline Dimensions

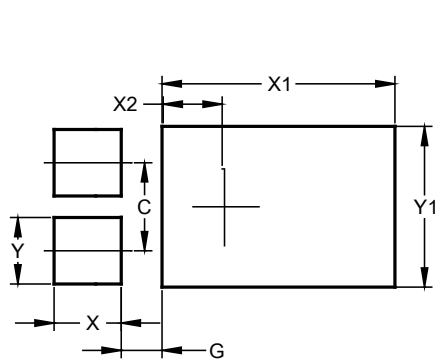
Please see <http://www.diodes.com/package-outlines.html> for the latest version.



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

IMPORTANT NOTICE

DIODES INCORPORATED MAKES NO WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, WITH REGARDS TO THIS DOCUMENT, INCLUDING, BUT NOT LIMITED TO, THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE (AND THEIR EQUIVALENTS UNDER THE LAWS OF ANY JURISDICTION).

Diodes Incorporated and its subsidiaries reserve the right to make modifications, enhancements, improvements, corrections or other changes without further notice to this document and any product described herein. Diodes Incorporated does not assume any liability arising out of the application or use of this document or any product described herein; neither does Diodes Incorporated convey any license under its patent or trademark rights, nor the rights of others. Any Customer or user of this document or products described herein in such applications shall assume all risks of such use and will agree to hold Diodes Incorporated and all the companies whose products are represented on Diodes Incorporated website, harmless against all damages.

Diodes Incorporated does not warrant or accept any liability whatsoever in respect of any products purchased through unauthorized sales channel. Should Customers purchase or use Diodes Incorporated products for any unintended or unauthorized application, Customers shall indemnify and hold Diodes Incorporated and its representatives harmless against all claims, damages, expenses, and attorney fees arising out of, directly or indirectly, any claim of personal injury or death associated with such unintended or unauthorized application.

Products described herein may be covered by one or more United States, international or foreign patents pending. Product names and markings noted herein may also be covered by one or more United States, international or foreign trademarks.

This document is written in English but may be translated into multiple languages for reference. Only the English version of this document is the final and determinative format released by Diodes Incorporated.

LIFE SUPPORT

Diodes Incorporated products are specifically not authorized for use as critical components in life support devices or systems without the express written approval of the Chief Executive Officer of Diodes Incorporated. As used herein:

A. Life support devices or systems are devices or systems which:

1. are intended to implant into the body, or
2. support or sustain life and whose failure to perform when properly used in accordance with instructions for use provided in the labeling can be reasonably expected to result in significant injury to the user.

B. A critical component is any component in a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or to affect its safety or effectiveness.

Customers represent that they have all necessary expertise in the safety and regulatory ramifications of their life support devices or systems, and acknowledge and agree that they are solely responsible for all legal, regulatory and safety-related requirements concerning their products and any use of Diodes Incorporated products in such safety-critical, life support devices or systems, notwithstanding any devices- or systems-related information or support that may be provided by Diodes Incorporated. Further, Customers must fully indemnify Diodes Incorporated and its representatives against any damages arising out of the use of Diodes Incorporated products in such safety-critical, life support devices or systems.

Copyright © 2018, Diodes Incorporated

www.diodes.com