

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

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

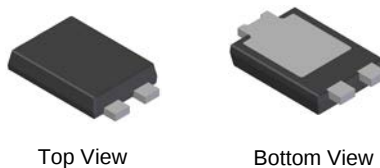
Features

- 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)**

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 ^(e3)
- Polarity: See Diagram
- Weight: 0.093 grams (Approximate)

PowerDI5



LEFT PIN ○ RIGHT PIN ○

BOTTOMSIDE HEAT SINK

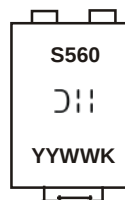
Note: Pins Left & Right must be electrically connected at the printed circuit board.

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/packaging/diodes-packaging/>.

Marking Information



S560 = Product Type Marking Code
 DII = 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°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 8.3ms Single Half Sine-Wave Superimposed on Rated Load	I _{FSM}	150	A
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 _{θJS}	2.0	—	°C/W
Thermal Resistance Junction to Ambient Air (Note 5) T _A = +25°C	R _{θJA}	95	—	°C/W
Thermal Resistance Junction to Ambient Air (Note 6) T _A = +25°C	R _{θJA}	70	—	°C/W
Thermal Resistance Junction to Ambient Air (Note 7) T _A = +25°C	R _{θJA}	50	—	°C/W
Thermal Resistance Junction to Ambient Air (Note 8) T _A = +25°C	R _{θJA}	25	—	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-65 to +150		°C

Notes: 5. FR-4 PCB, 2oz. Copper, minimum recommended pad layout per <http://www.diodes.com>.
6. Polyimide PCB, 2oz. Copper, minimum recommended pad layout per <http://www.diodes.com>.
7. Polyimide PCB, 2 oz. Copper. Cathode pad dimensions 9.4mm × 7.2mm. Anode pad dimensions 2.7mm × 1.6mm.
8. 2inch × 2inch Al board.

Electrical Characteristics (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Breakdown Voltage (Note 9)	V _{(BR)R}	60	—	—	V	I _R = 0.2mA
Forward Voltage	V _F	—	0.61	0.67	V	I _F = 5A, T _S = +25°C
		—	0.54	0.60		I _F = 5A, T _S = +125°C
		—	0.71	0.77		I _F = 8A, T _S = +25°C
		—	—	0.68		I _F = 8A, T _S = +125°C
Reverse Leakage Current (Note 9)	I _R	—	4	150	μA	T _S = +25°C, V _R = 60V
		—	—	15	mA	T _S = +100°C, V _R = 60V
		—	2	30	mA	T _S = +125°C, V _R = 60V
Switching Speed t _{RR}	t _{RR}	—	12	—	ns	I _F =0.5A, I _R =1A, I _{RR} =0.25A (RG1)

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

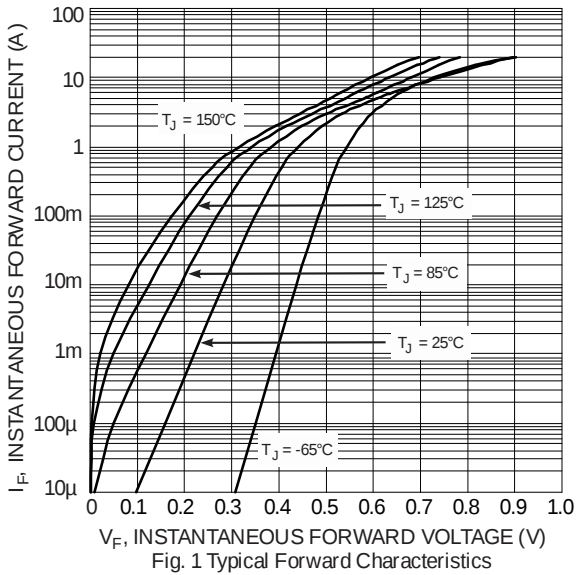


Fig. 1 Typical Forward Characteristics

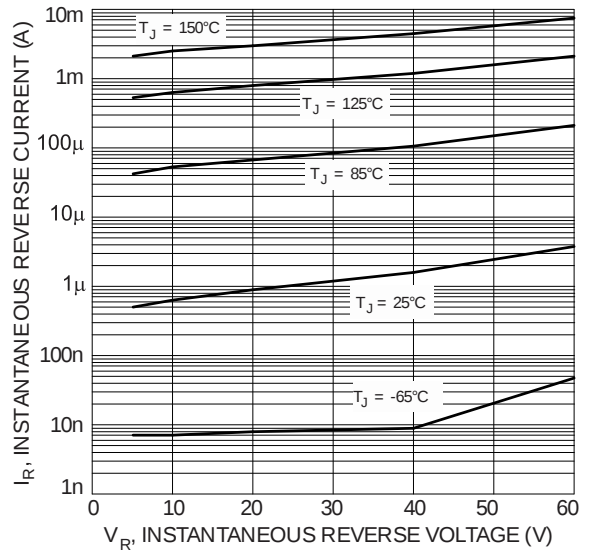


Fig. 2 Typical Reverse Characteristics

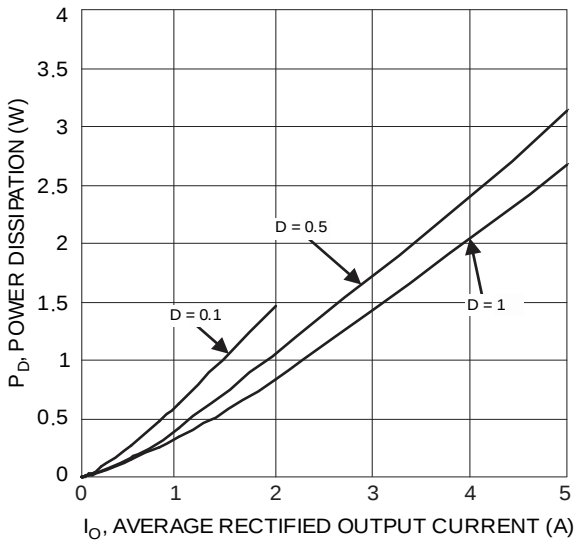


Figure 3 Forward Power Dissipation, $T_J = 125^\circ\text{C}$

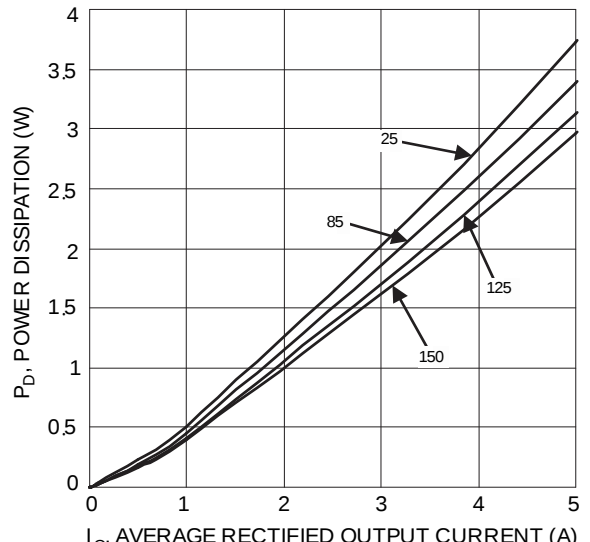


Figure 4 Forward Power Dissipation, $D = 0.5$

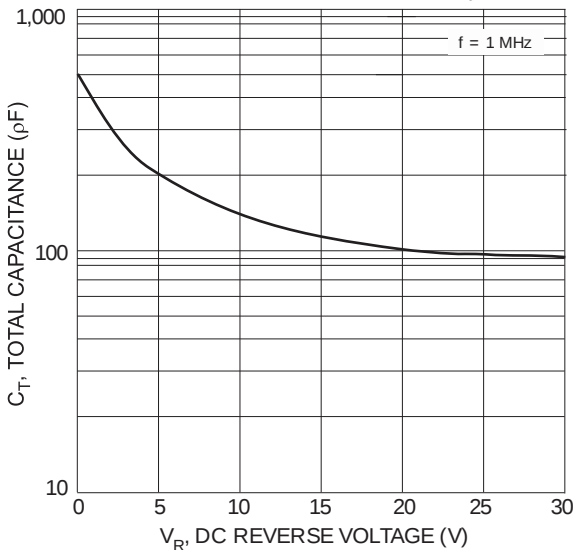
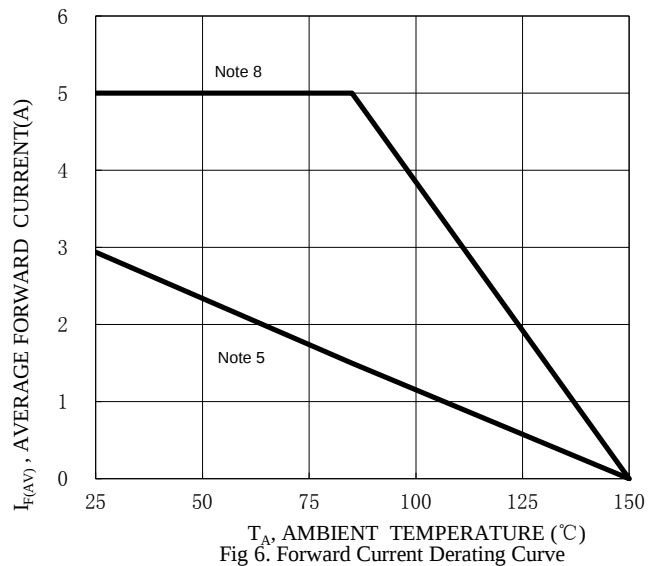
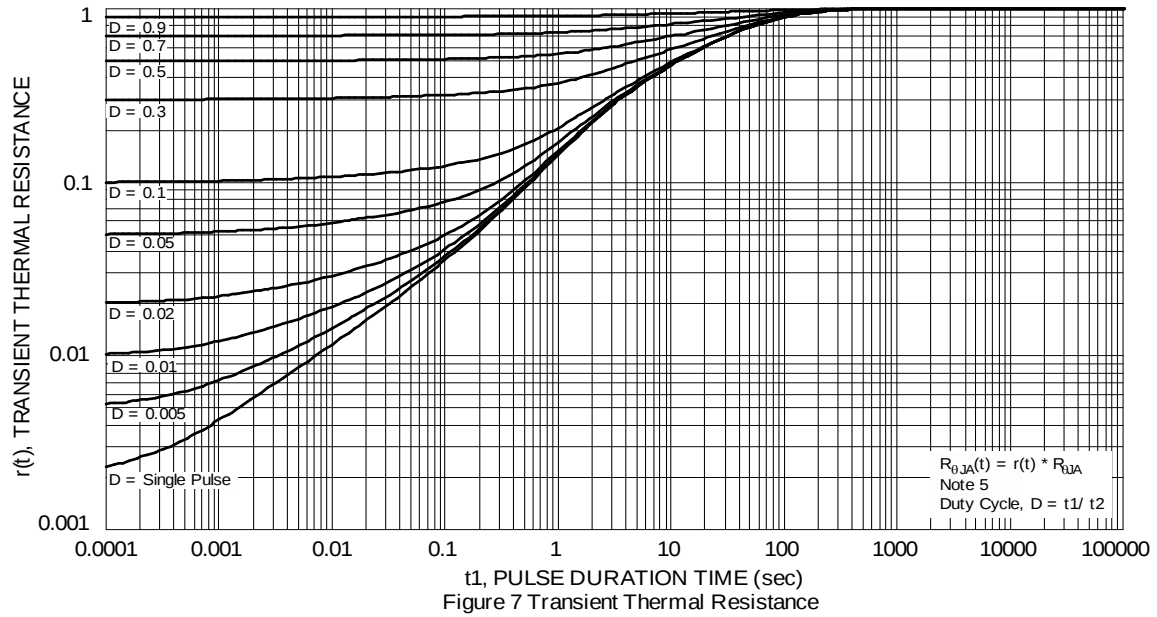


Fig. 5 Total Capacitance vs. Reverse Voltage

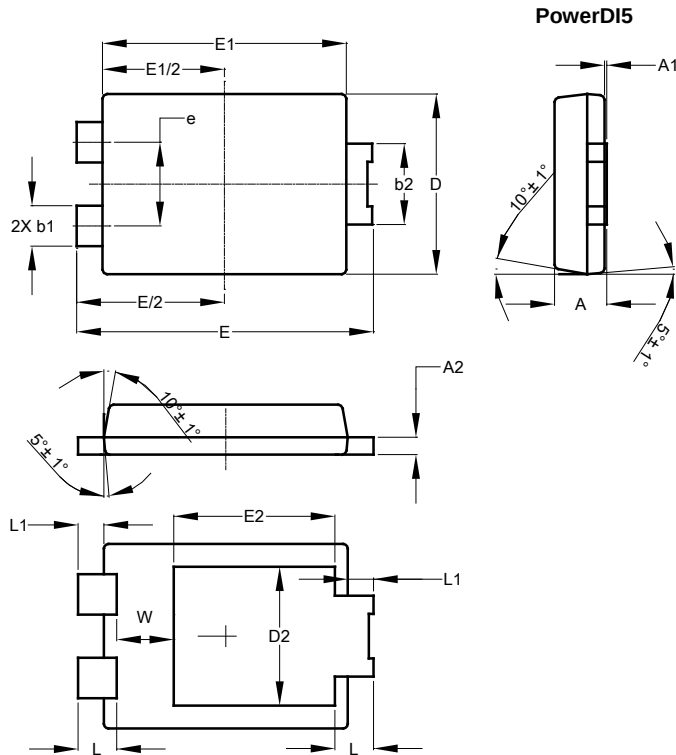


T_A , AMBIENT TEMPERATURE ($^\circ\text{C}$)
Fig. 6 Forward Current Derating Curve



Package Outline Dimensions

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

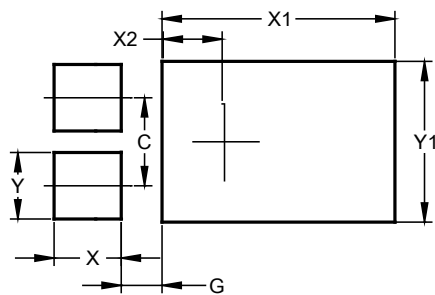


PowerDI5			
Dim	Min	Max	Typ
A	1.05	1.15	1.10
A1	0.00	0.05	—
A2	0.33	0.43	0.381
b1	0.80	0.99	0.89
b2	1.70	1.88	1.78
D	3.90	4.05	3.966
D2	—	—	3.054
E	6.40	6.60	6.51
e	—	—	1.84
E1	5.30	5.45	5.37
E2	—	—	3.549
L	0.75	0.95	0.85
L1	0.50	0.65	0.57
W	1.10	1.41	1.255
All Dimensions in mm			

Suggested Pad Layout

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

PowerDI5



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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