

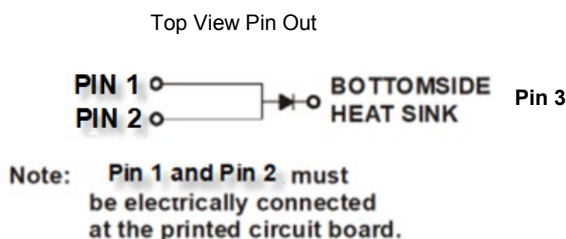
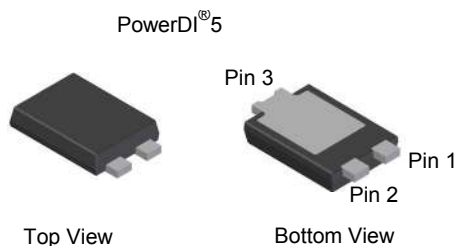
Features

- Guard Ring Die Construction for Transient Protection
- Low Power Loss, High Efficiency
- Low Forward Voltage Drop
- Very Low Leakage Current
- High Forward Surge Current Capability
- For use in low voltage, high frequency inverters, freewheeling, and polarity protection applications
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The PDS1040Q-13 is suitable for automotive applications requiring specific change control; this part is AEC-Q101 qualified, PPAP capable, and manufactured in IATF 16949 certified facilities.**

<https://www.diodes.com/quality/product-definitions/>

Mechanical Data

- Case: PowerDI[®]5
- 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 ⁽³⁾
- Polarity: See Diagram
- Weight: 0.096 grams (Approximate)

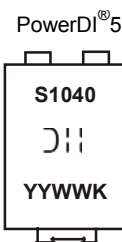


Ordering Information (Note 4)

Part Number	Case	Packaging
PDS1040-13	PowerDI [®] 5	5,000/Tape & Reel
PDS1040Q-13	PowerDI [®] 5	5,000/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. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information



S1040 = Product Type Marking Code
 DII = Manufacturers' Code Marking
 YYWW = Date Code Marking
 YY = Last Two Digits of Year (ex: 21 for 2021)
 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}	40	V
Working Peak Reverse Voltage	V _{RWM}		
DC Blocking Voltage	V _R		
RMS Reverse Voltage	V _{R(RMS)}	28	V
Average Rectified Output Current	I _O	10	A
Non-Repetitive Peak Forward Surge Current 8.3ms Single Half Sine-Wave Superimposed on Rated Load	I _{FSM}	275	A

Thermal Characteristics

Characteristic	Symbol	Typ	Max	Unit
Thermal Resistance Junction to Soldering Point	R _{θJS}	—	1.5	°C/W
Thermal Resistance Junction to Ambient Air (Note 5)	R _{θJA}	95	—	°C/W
Thermal Resistance Junction to Ambient Air (Note 6)	R _{θJA}	75	—	°C/W
Thermal Resistance Junction to Ambient Air (Note 7)	R _{θJA}	50	—	°C/W
Operating Junction Temperature Range V _R ≤ 80% V _{RRM} V _R ≤ 50% V _{RRM}	T _J	-65 to +150 -65 to +180		°C
Storage Temperature Range	T _{STG}	-65 to +150		°C

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Breakdown Voltage (Note 8)	V _{(BR)R}	40	—	—	V	I _R = 1mA
Forward Voltage	V _F	—	0.45	0.49	V	I _F = 8A, T _S = +25°C
		—	0.47	0.51		I _F = 10A, T _S = +25°C
		—	—	0.41		I _F = 8A, T _S = +125°C
		—	0.42	0.49		I _F = 10A, T _S = +125°C
Reverse Leakage Current (Note 8)	I _R	—	0.02	0.3	mA	T _S = +25°C, V _R = 35V
		—	5.5	25		T _S = +100°C, V _R = 35V
		—	0.03	0.7		T _S = +25°C, V _R = 40V
		—	6.5	50		T _S = +100°C, V _R = 40V

- 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, 2oz. Copper. Cathode pad dimensions 9.4mm x 7.2mm. Anode pad dimensions 2.7mm x 1.6mm.
 8. Short duration pulse test used to minimize self-heating effect.
 9. Polyimide PCB, 2oz. Copper. Cathode pad dimensions 18.8mm x 14.4mm. Anode pad dimensions 5.6mm x 3.0mm.
 10. Devices mounted such that R_{θJA} = 19°C/W.

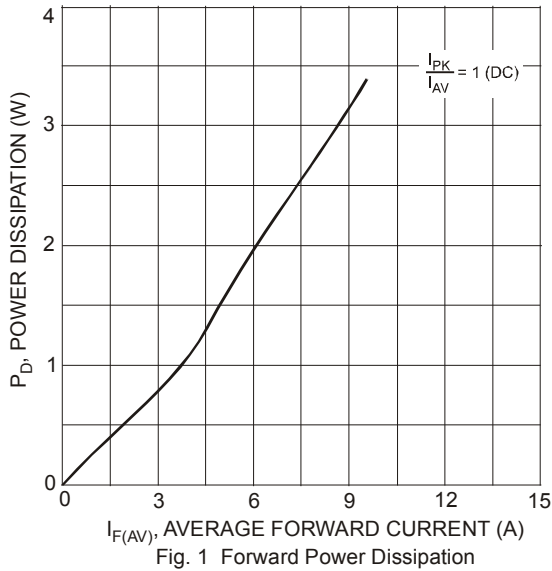


Fig. 1 Forward Power Dissipation

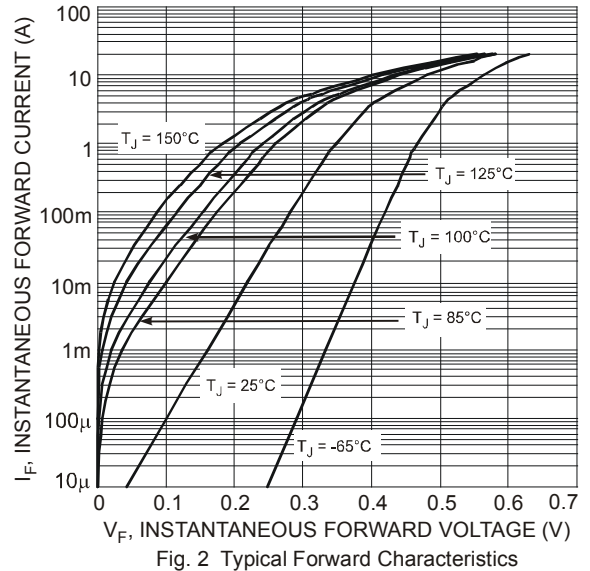


Fig. 2 Typical Forward Characteristics

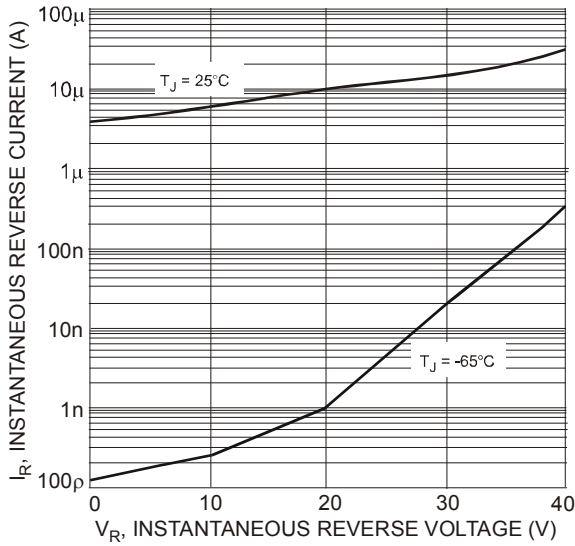


Fig. 3 Typical Reverse Characteristics

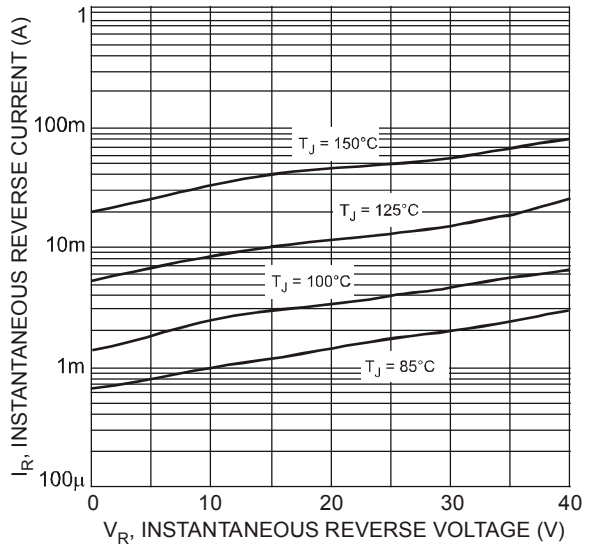


Fig. 4 Typical Reverse Characteristics

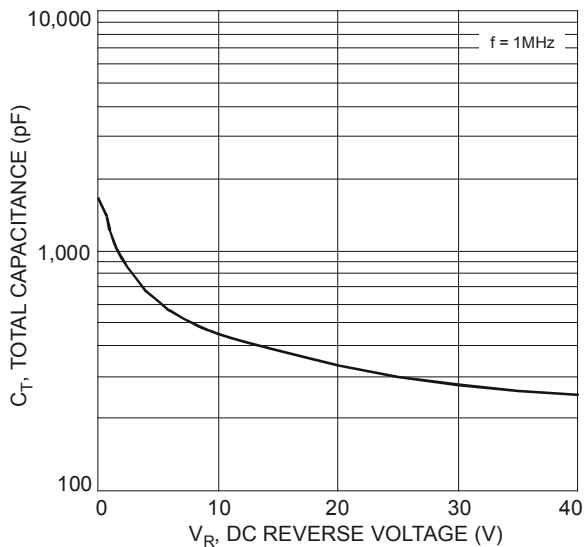


Fig. 5 Total Capacitance vs. Reverse Voltage

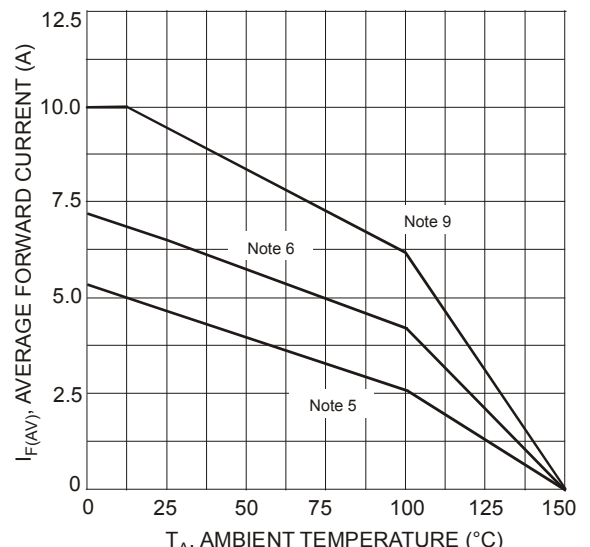


Fig. 6 Forward Current Derating Curve

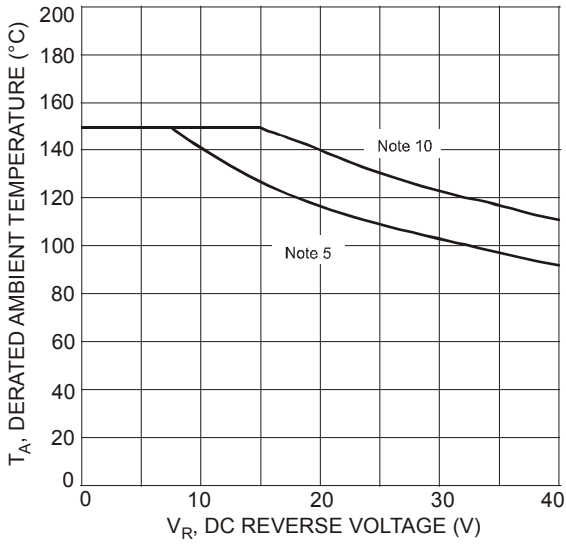
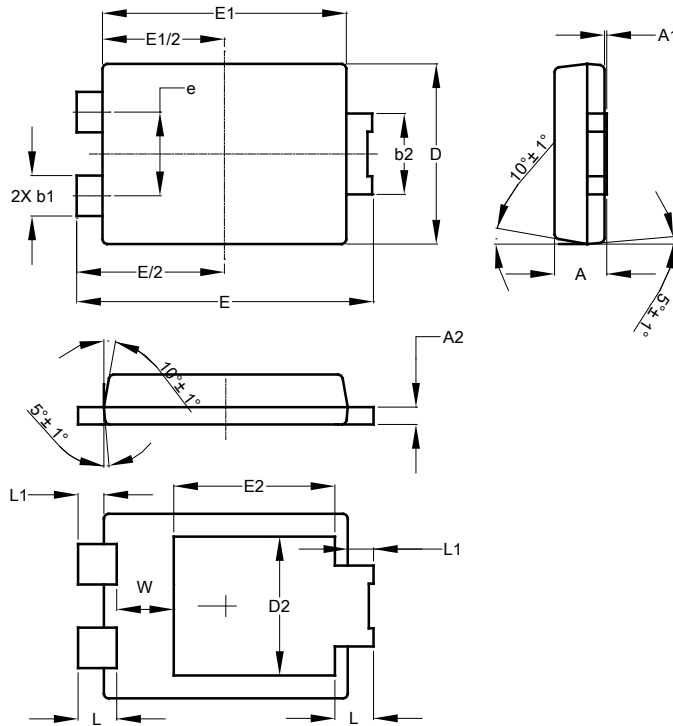


Fig. 7 Operating Temperature Derating

Package Outline Dimensions

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

PowerDI5

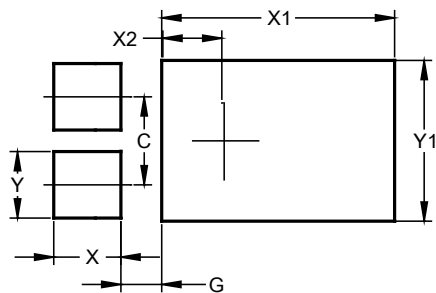


PowerDI5			
Dim	Min	Max	Typ
A	1.05	1.15	1.10
A1	0.00	0.05	--
A2	0.33	0.43	0.381
b1	0.80	0.99	0.89
b2	1.70	1.88	1.78
D	3.90	4.05	3.966
D2	--	--	3.054
E	6.40	6.60	6.51
e	--	--	1.84
E1	5.30	5.45	5.37
E2	--	--	3.549
L	0.75	0.95	0.85
L1	0.50	0.65	0.57
W	1.10	1.41	1.255
All Dimensions in mm			

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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