5A HIGH VOLTAGE SCHOTTKY BARRIER RECTIFIER
PowerDI5

Product Summary

V_R (V)	I_F (A)	$V_{F\ MAX}$ (V) @ +25°C	$I_{R\ MAX}$ (mA) @ +25°C
100	5.0	0.71	0.0035

Features and Benefits

- Guard Ring Die Construction for Transient Protection
- High Maximum Junction Temperature
- Very Low Leakage Current
- Highly Stable Oxide Passivated Junction
- Low Forward Voltage Drop
- 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

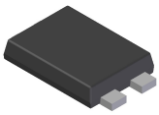
This Schottky Barrier Rectifier has been designed to meet the stringent requirements of Automotive Applications. It is ideally suited to use as:

- Polarity Protection Diode
- Re-circulating Diode
- Switching Diode

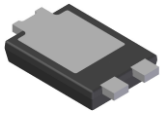
Mechanical Data

- 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 e3
- Polarity: See Diagram
- Weight: 0.096 grams (Approximate)

PowerDI5



Top View



Bottom View

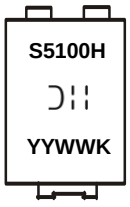
Note: Pins Left & Right must be electrically connected at the printed circuit board.

Ordering Information (Note 5)

Part Number	Compliance	Case	Packaging
PDS5100H-13	AEC-Q101	PowerDI5	5000/Tape & Reel
PDS5100HQ-13	Automotive	PowerDI5	5000/Tape & Reel
PDS5100H-13D (Note 6)	AEC-Q101	PowerDI5	5000/Tape & Reel
PDS5100HQ-13D (Note 6)	Automotive	PowerDI5	5000/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. Automotive products are AEC-Q101 qualified and are PPAP capable. Automotive, AEC-Q101 and standard products are electrically and thermally the same, except where specified. For more information, please refer to http://www.diodes.com/product_compliance_definitions.html.
5. For packaging details, go to our website at http://www.diodes.com/products/packages.html.
6. Suffix -13D is designated for 12mm tape width.

Marking Information



S5100H = Product Type Marking Code
= Manufacturers' Code Marking
YYWW = Date Code Marking
YY = Last Two Digits of Year (ex: 17 for 2017)
WW = Week Code (01 to 53)
K = Factory Designator

PowerDI is a registered trademark of Diodes Incorporated.

Maximum Ratings (@T_A = +25°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	100	V
RMS Reverse Voltage	$V_{R(RMS)}$	71	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}	250	A

Thermal Characteristics

Characteristic	Symbol	Typ	Max	Unit
Typical Power Dissipation (Note 9)	P_D	2.5	—	W
Thermal Resistance Junction to Case (Note 11)	$R_{\theta JC}$	—	5	°C/W
Thermal Resistance Junction to Soldering Point	$R_{\theta JS}$	—	2.0	°C/W
Thermal Resistance Junction to Ambient Air (Note 7) T_A = +25°C	$R_{\theta JA}$	85	—	°C/W
Thermal Resistance Junction to Ambient Air (Note 8) T_A = +25°C	$R_{\theta JA}$	70	—	°C/W
Thermal Resistance Junction to Ambient Air (Note 9) T_A = +25°C	$R_{\theta JA}$	45	—	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-65 to +175		°C

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Condition
Reverse Breakdown Voltage (Note 10)	$V_{(BR)R}$	100	—	—	V	I_R = 3.5μA
Forward Voltage	V_F	— — — —	0.67 0.55 0.75 0.62	0.71 0.58 0.80 0.66	V	I_F = 5A, T_S = +25°C I_F = 5A, T_S = +125°C I_F = 10A, T_S = +25°C I_F = 10A, T_S = +125°C
Reverse Leakage Current (Note 10)	I_R	— —	0.3 0.5	3.5 4.5	μA mA	T_S = +25°C, V_R = 100V T_S = +125°C, V_R = 100V

Notes:
7. FR-4 PCB, 2 oz. Copper, minimum recommended pad layout per http://www.diodes.com/products/packages.html.
8. Polymide PCB, 2 oz. Copper, minimum recommended pad layout per http://www.diodes.com/products/packages.html.
9. Polymide PCB, 2 oz. Copper. Cathode pad dimensions 9.4mm x 7.2mm. Anode pad dimensions 2.7mm x 1.6mm.
10. Short duration pulse test used to minimize self-heating effect.
11. Device mounted on Polymide 10cm x 10cm copper PC board.

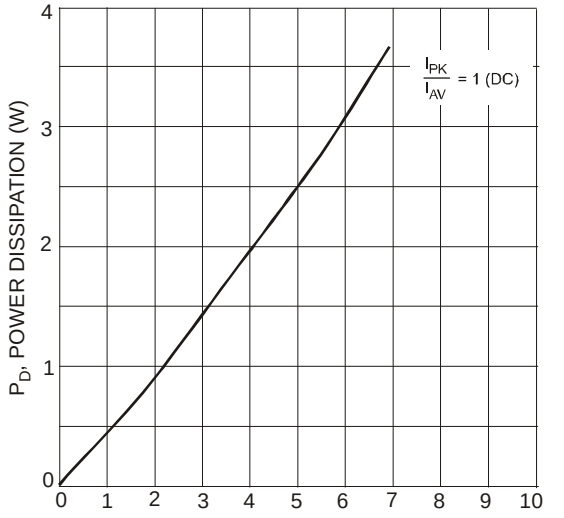


Fig. 1 Forward Power Dissipation

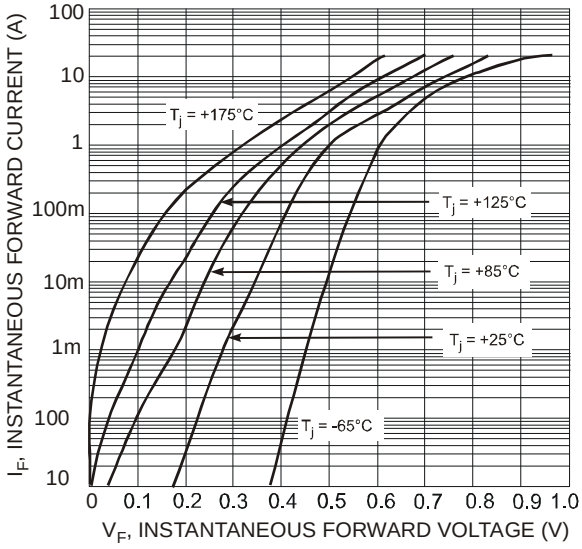


Fig. 2 Typical Forward Characteristics

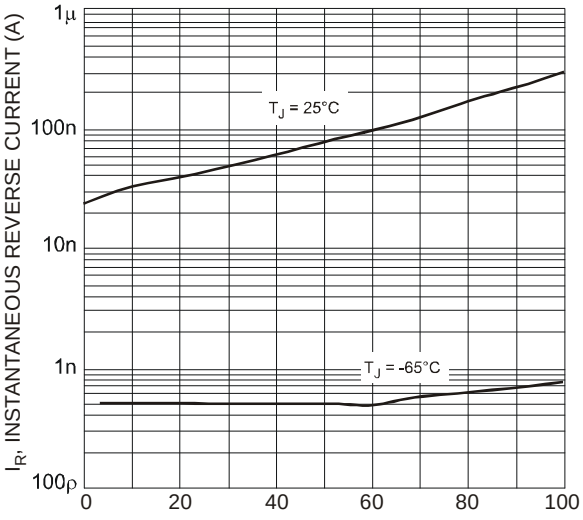


Fig. 3 Typical Reverse Characteristics

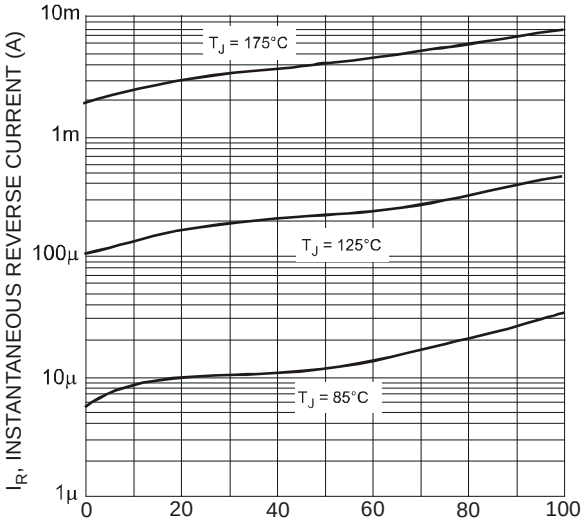


Fig. 4 Typical Reverse Characteristics

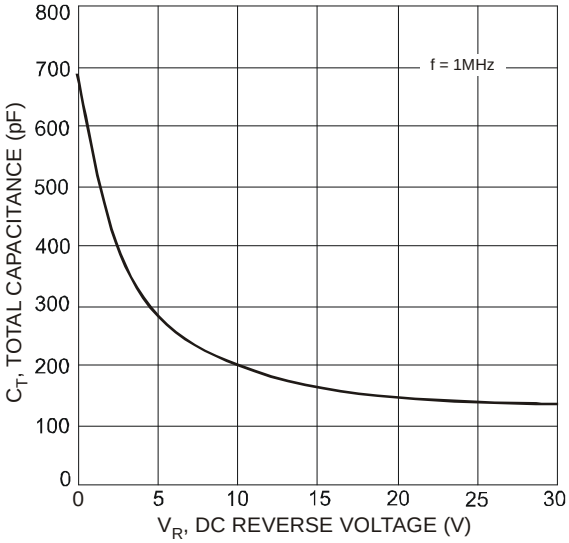


Fig. 5 Total Capacitance vs. Reverse Voltage

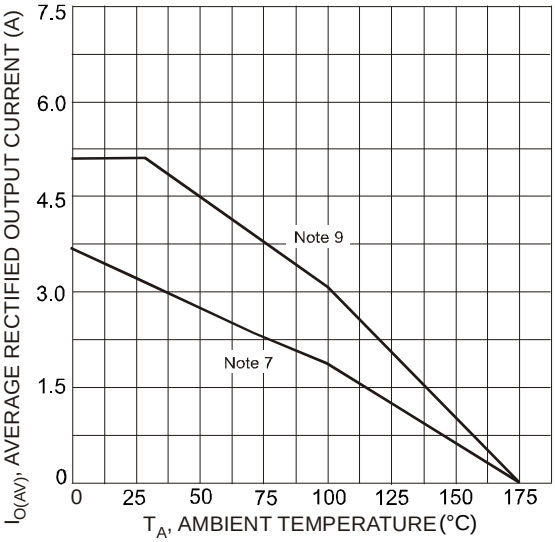


Fig. 6 Forward Current Derating Curve

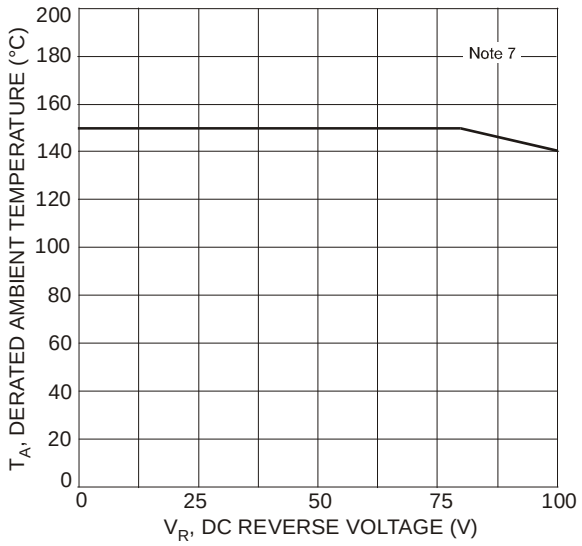
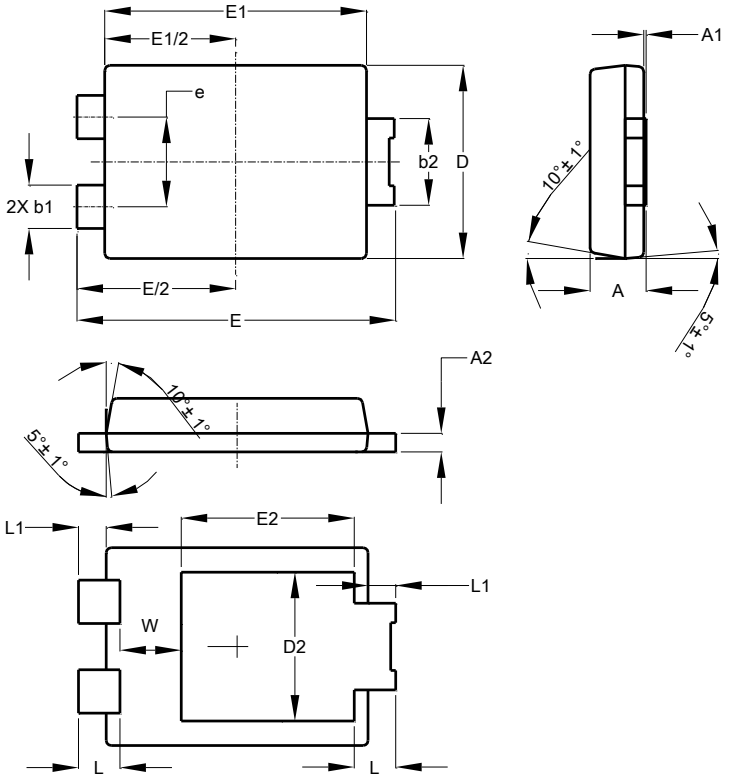


Fig. 7 Operating Temperature Derating

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	6.504
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

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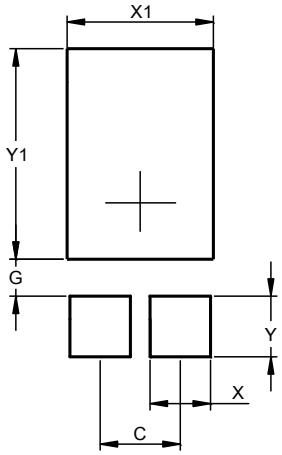
PowerDI5



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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