4A HIGH VOLTAGE SCHOTTKY BARRIER RECTIFIER
PowerDI5

Product Summary (@T_A = +25°C)

V_{RRM} (V)	$I_{O(MAX)}$ (A)	$V_{F(MAX)}$ (V)	$I_{R(MAX)}$ (µA)
200	4	0.84	1

Features and Benefits

- Lower Forward Voltage Drop than Ultrafast Rectifiers
- Very Low Leakage Current
- Soft Recovery Characteristics: Softness Factor (t_B/t_A) ≥ 1 (See Figure 9)
- Highly Stable Oxide Passivated Junction
- High Forward Surge Current Capability
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The DIODES™ PDS4200HQ 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/

Applications

- SMPS
- DC-DC converters
- Freewheeling diodes
- AC-DC

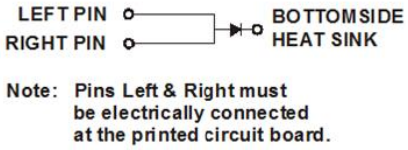
Mechanical Data

- Package: PowerDI®5
- Package 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 Lead-Frame. Solderable per MIL-STD-202, Method 208 e3
- Polarity: See Diagram
- Weight: 0.095 grams (Approximate)

PowerDI5

Top View

Bottom View

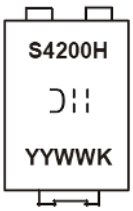


Ordering Information (Note 4)

Part Number	Package	Packing	
		Qty.	Carrier
PDS4200HQ-13	PowerDI5	5,000	Tape & Reel
PDS4200HQ-13D (Note 5)	PowerDI5	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/.
5. Suffix -13D is designated for 12mm tape width.

Marking Information



S4200H = Product Type Marking Code
YYWW = Date Code Marking
YY = Last Two Digits of Year (ex: 22 for 2022)
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	200	V
RMS Reverse Voltage	$V_{R(RMS)}$	141	V
Average Rectified Output Current	I_O	4	A
Non-Repetitive Peak Forward Surge Current 8.3ms Single Half Sine-wave Superimposed on Rated Load	I_{FSM}	100	A
Electrostatic Discharge	HBM	4	kV
Electrostatic Discharge	CDM	1	kV

Thermal Characteristics (Note 6)

Characteristic	Symbol	Typ	Max	Unit
Thermal Resistance Junction to Soldering Point	$R_{\theta JS}$	—	3.0	°C/W
Thermal Resistance Junction to Ambient Air (Note 7)	$R_{\theta JA}$	80	—	°C/W
Thermal Resistance Junction to Ambient Air (Note 8)	$R_{\theta JA}$	65	—	°C/W
Thermal Resistance Junction to Ambient Air (Note 9)	$R_{\theta JA}$	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)	$V_{(BR)R}$	200	—	—	V	I_R = 5μA
Forward Voltage	V_F	— — — — — —	0.76 — 0.785 0.61 0.84 0.68	0.82 0.59 0.84 0.64 0.89 0.75	V	I_F = 3A, T_S = +25°C I_F = 3A, T_S = +150°C I_F = 4A, T_S = +25°C I_F = 4A, T_S = +150°C I_F = 8A, T_S = +25°C I_F = 8A, T_S = +150°C
Reverse Leakage Current (Note 10)	I_R	— —	0.2 0.8	1 4	μA mA	T_S = +25°C, V_R = 200V T_S = +150°C, V_R = 200V
Reverse Recovery Time	t_{RR}	—	13	25	ns	I_F = 0.5A, I_R = 1.0A I_{RR} = 0.25A (See Figure 9)

Notes:
6. The heat generated must be less than thermal conductivity from junction-to-ambient: $\Delta P_D/\Delta T_J < 1/R_{thJA}$.
7. FR-4 PCB, 2 oz. copper, minimum recommended pad layout per http://www.diodes.com/package-outlines.html.
8. Polymide PCB, 2 oz. copper, minimum recommended pad layout per http://www.diodes.com/package-outlines.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 test pulse used to minimize self-heating effect.

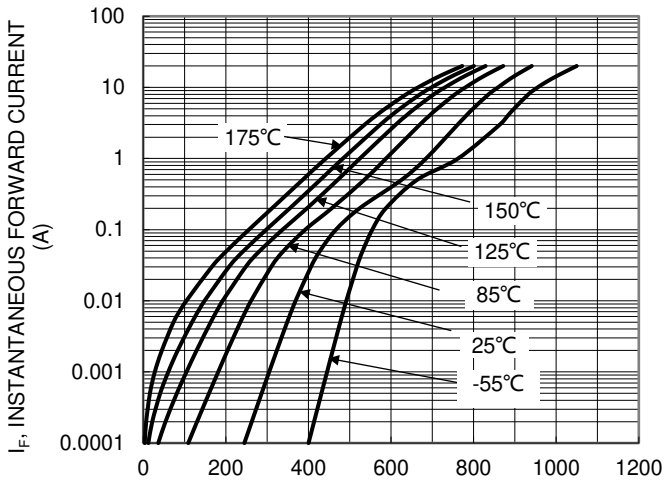


Figure 1. Typical Forward Characteristics

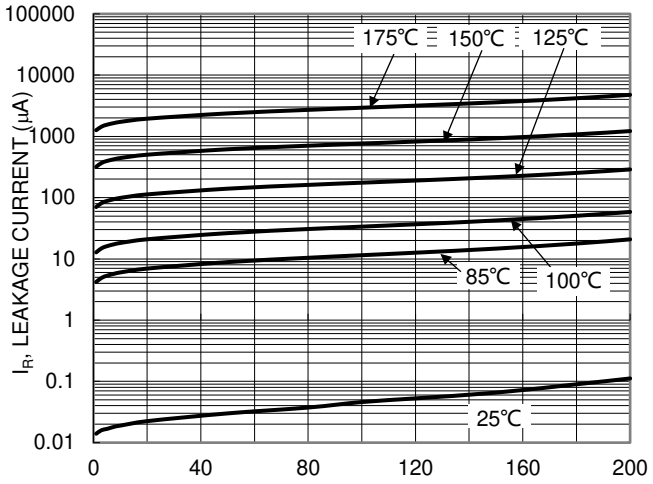


Figure 2. Typical Reverse Characteristics

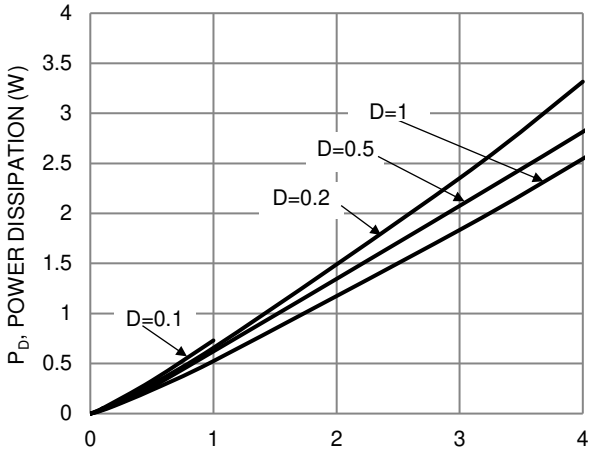


Figure 3. Forward Power Dissipation T_J=125ºC

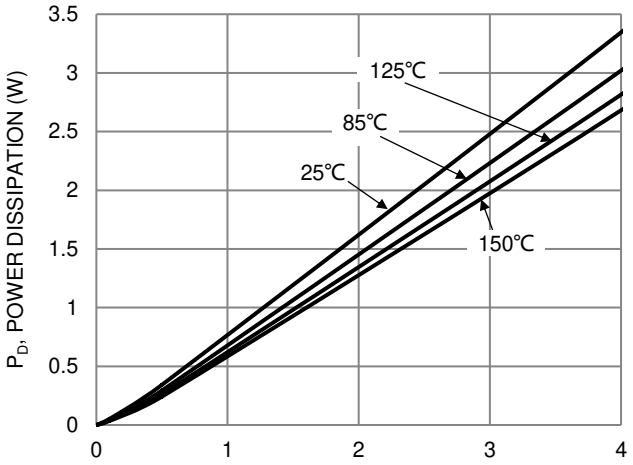


Figure 4. Forward Power Dissipation D=0.5

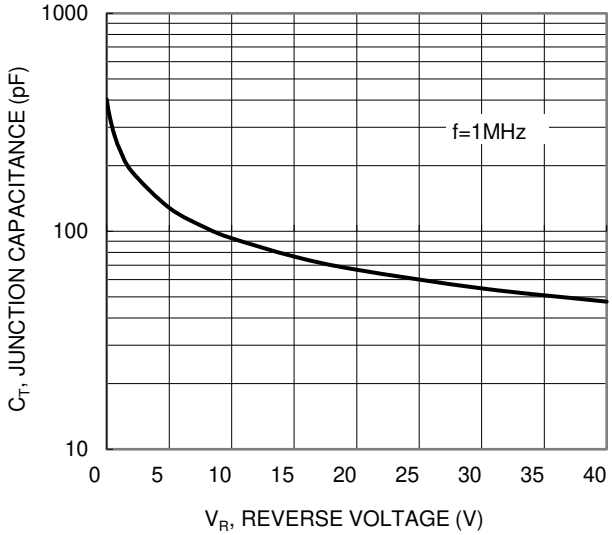


Figure 5. Typical Junction Capacitance

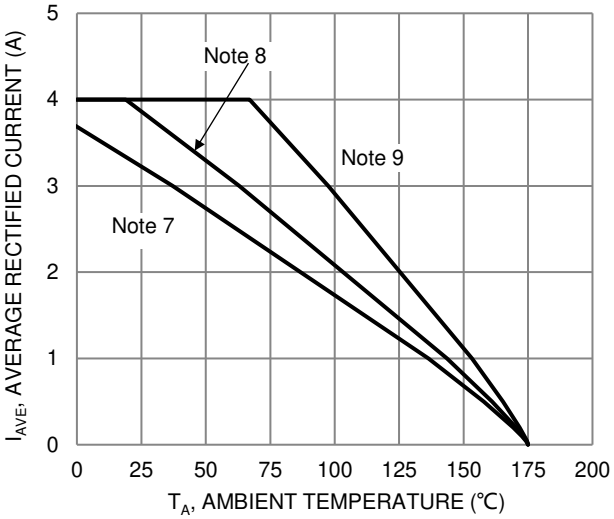


Figure 6. DC Forward Current Derating

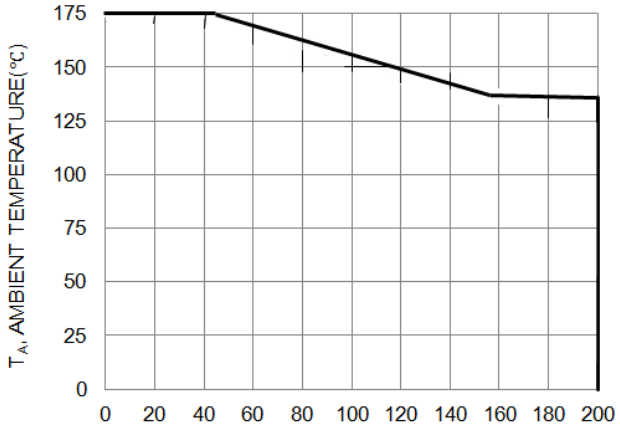


Figure 7. Operating Temperature Derating

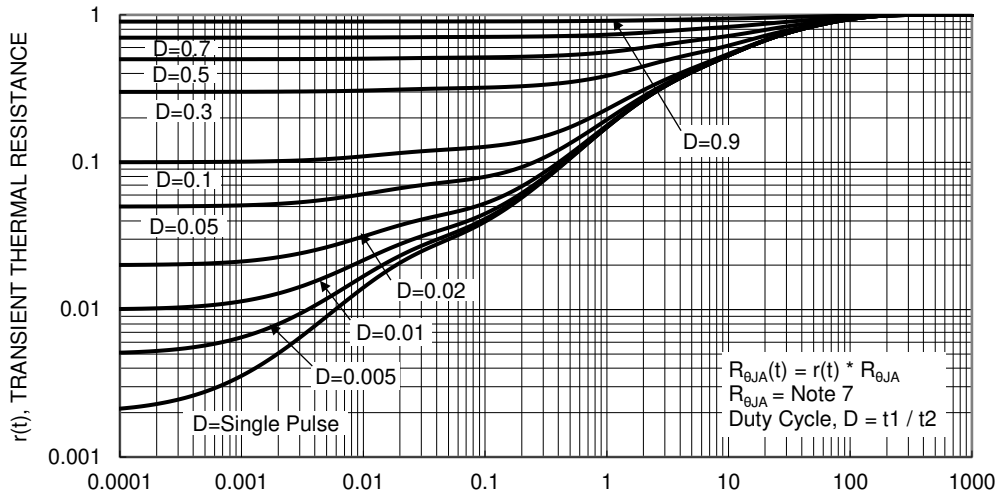
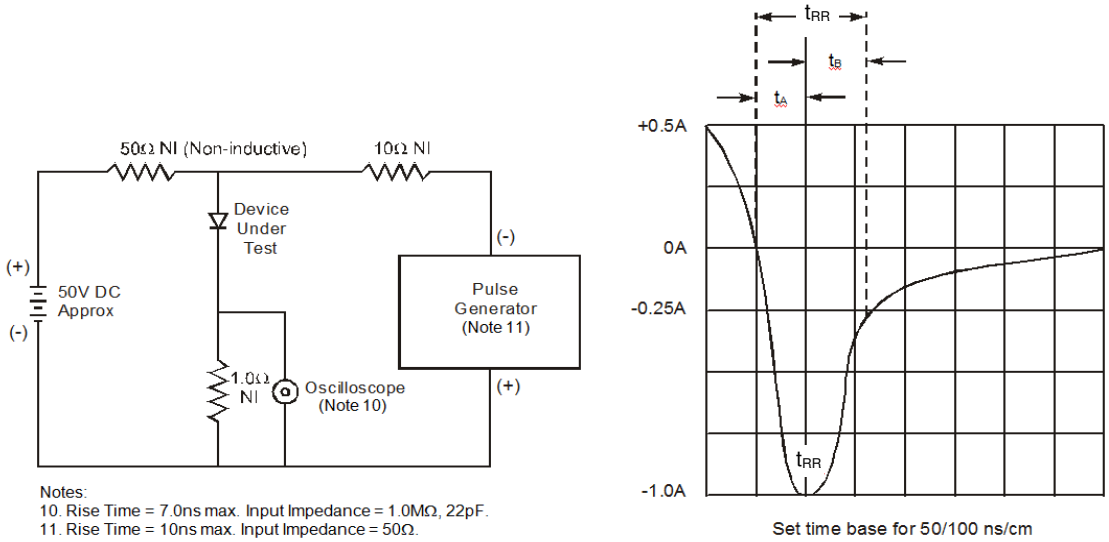


Figure 8. Transient Thermal Resistance



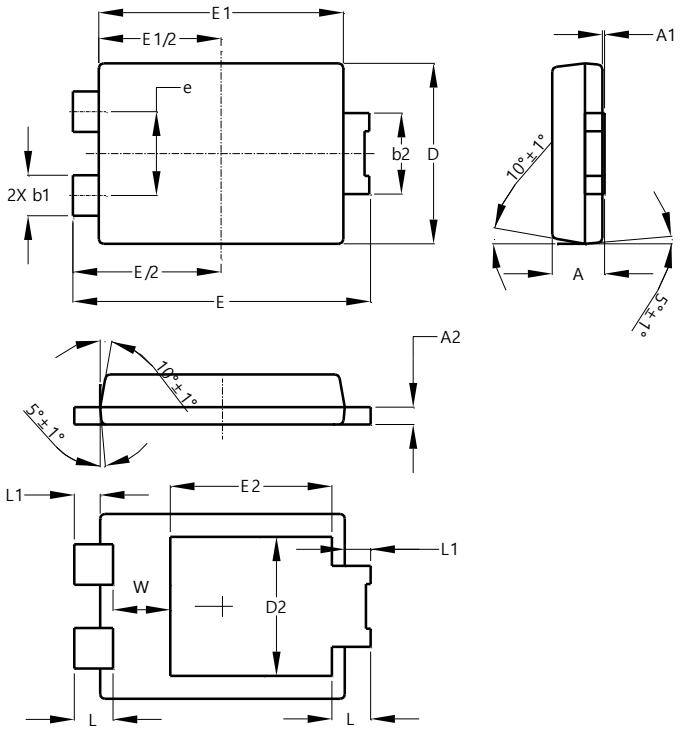
Notes:
10. Rise Time = 7.0ns max. Input Impedance = 1.0MΩ, 22pF.
11. Rise Time = 10ns max. Input Impedance = 50Ω.

Figure 9. Reverse Recovery Time Characteristic and Test Circuit

Package Outline Dimensions

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

PowerDI5

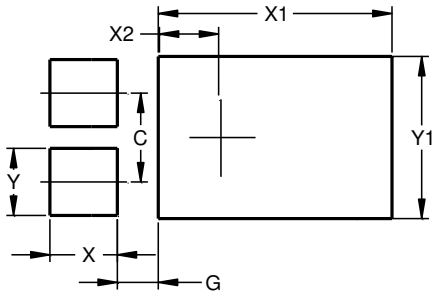


PowerDI5			
Dim	**Min**	**Max**	**Typ**
A	1.05	1.15	1.10
A1	0.00	0.05	--
A2	0.33	0.43	0.381
b1	0.80	0.99	0.89
b2	1.70	1.88	1.78
D	3.90	4.05	3.966
D2	--	--	3.054
E	6.40	6.60	6.51
e	--	--	1.84
E1	5.30	5.45	5.37
E2	--	--	3.549
L	0.75	0.95	0.85
L1	0.50	0.65	0.57
W	1.10	1.41	1.255
All Dimensions in mm			

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

Note: Dimension L and W does not include mold flash and protrusions. Mold flash or protrusion shall not exceed 0.25mm per side.

Note: The suggested land pattern dimensions have been provided for reference only, as actual pad layouts may vary depending on application. These dimensions may be modified based on user equipment capability or fabrication criteria. A more robust pattern may be desired for wave soldering and is calculated by adding 0.2 mm to the 'Z' dimension. For further information, please reference document IPC-7351A, Naming Convention for Standard SMT Land Patterns, and for International grid details, please see document IEC, Publication 97.

Note: For high voltage applications, the appropriate industry sector guidelines should be considered with regards to creepage and clearance distances between device Terminals and PCB tracking.

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