

## Product Summary

$V_{RWM}$	$V_{BR} \text{ Min}$	$I_{PPM} \text{ Max}$
28V	31V	41A

## Features and Benefits

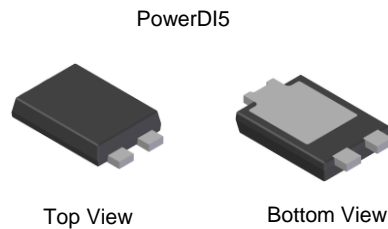
- Uni-directional polarity
- Low profile thermally efficient package
- Compliant with IEC 61000-4-2, IEC61000-4-4, IEC61000-4-5
- **ISO7637-2 (pulses 1, 2a, 2b, 3) Compliant**
- **Lead-Free Finish; RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for Automotive**
- **PPAP Capable (Note 4)**

## Description and Applications

Packaged in the thermally efficient PowerDI<sup>®</sup>5 this 1800W TVS is designed to protect sensitive electronic circuits in automotive applications from transients induced by inductive load switching.

## Mechanical Data

- Case: PowerDI5
- 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
- Terminal Connections: See Diagram Below
- Weight: 0.093 grams (Approximate)



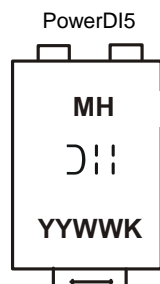
**Note: Pins Left & Right must be electrically connected at the printed circuit board.**

## Ordering Information (Note 5)

Product	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
D28V0H1U2P5Q-13	Automotive	MH	13	16	5,000/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](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. Please refer to [http://www.diodes.com/quality/product\\_compliance\\_definitions/](http://www.diodes.com/quality/product_compliance_definitions/).
  5. For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

## Marking Information



MH = Product Type Marking Code  
 YYWW = Date Code Marking  
 YY = Last Two Digits of Year (ex: 17 = 2017)  
 WW = Week Code (01 - 53)  
 K = Factory Designator

**Maximum Ratings** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit	Conditions
Peak Pulse Power Dissipation	P <sub>PP</sub>	1,800	W	10/1000μs, See Figure 4
Maximum Instantaneous Forward Voltage	V <sub>F</sub>	3.5	V	I <sub>F</sub> = 50A
Peak Pulse Surge Current	I <sub>PPM</sub>	41	A	10/1000μs, See Figure 4
Non-Repetitive Peak Forward Surge Current 8.3ms	I <sub>FSM</sub>	150	A	8.3ms single half sine-wave. Duty cycle = 4 pulses per minute max
ESD Protection – Human Body Model	V <sub>ESD_HBM</sub>	8	kV	IEC 61000-4-2 Standard
ESD Protection – Machine Body Model	V <sub>ESD_MM</sub>	400	V	IEC 61000-4-2 Standard
ESD Protection – Contact Discharge	V <sub>ESD_CONTACT</sub>	30	kV	IEC 61000-4-2 Standard
ESD Protection – Air Discharge	V <sub>ESD_AIR</sub>	30	kV	IEC 61000-4-2 Standard

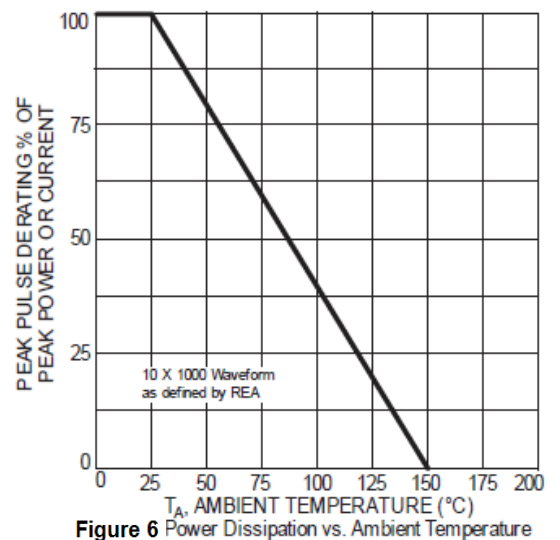
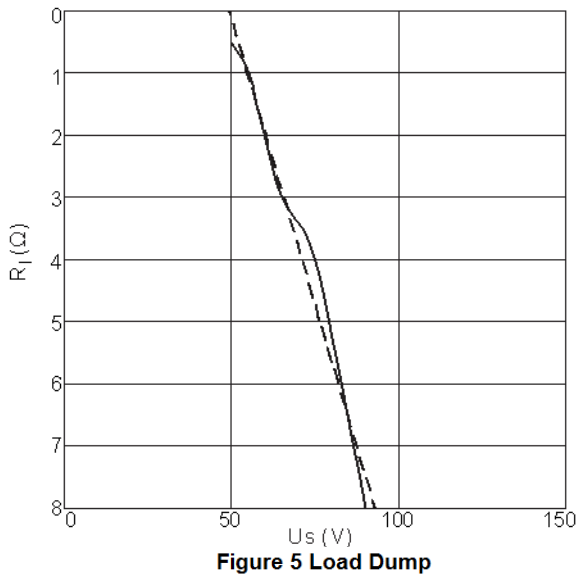
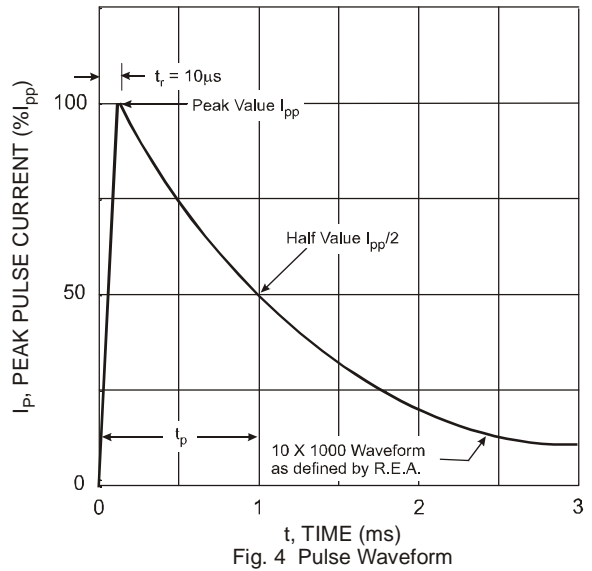
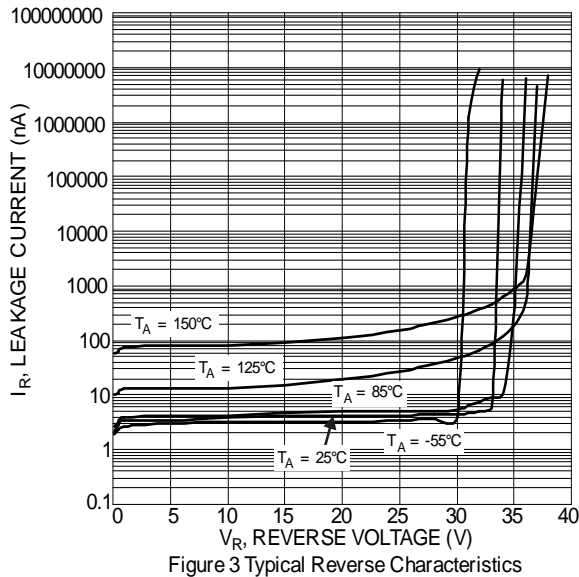
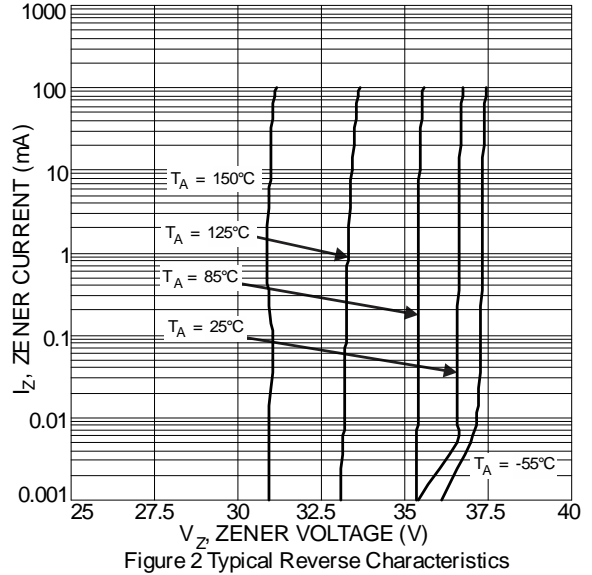
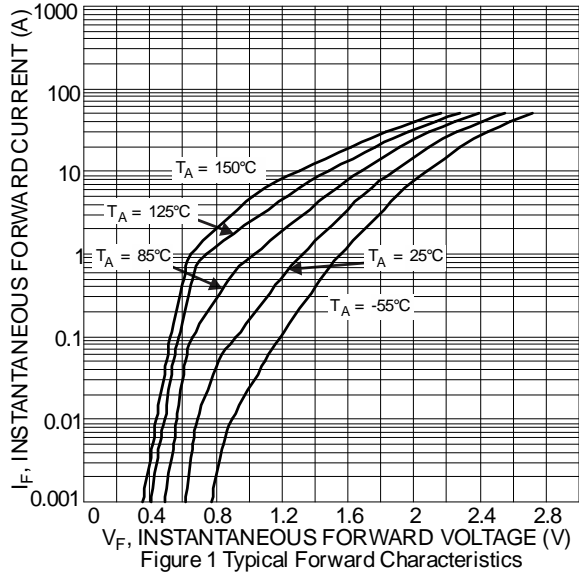
**Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Package Power Dissipation (Note 6)	P <sub>D</sub>	1,300	mW
Thermal Resistance, Junction to Ambient (Note 6)	R <sub>θJA</sub>	90	°C/W
Thermal Resistance, Junction to Case (Note 6)	R <sub>θJC</sub>	21	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Conditions
Reverse Standoff Voltage	V <sub>RWM</sub>	—	—	28	V	—
Channel Leakage Current (Note 7)	I <sub>RM</sub>	—	—	100	nA	V <sub>RWM</sub> = 28V
Clamping Voltage, Positive Transients	V <sub>CL</sub>	—	—	44	V	I <sub>PP</sub> = I <sub>PPM</sub> , t <sub>P</sub> = 10/1000μs
Breakdown Voltage	V <sub>BR</sub>	31	—	35	V	I <sub>R</sub> = 1mA
Differential Resistance	R <sub>DIF</sub>	—	—	0.45	Ω	I <sub>R</sub> = 1A, t <sub>P</sub> = 10/1000μs

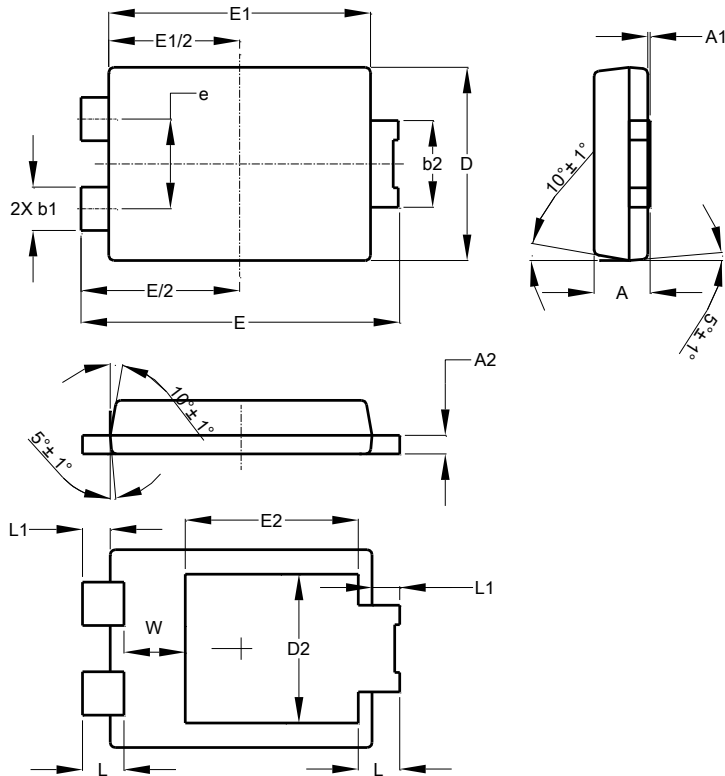
Notes: 6. Device mounted on FR-4 substrate PC board, with minimum recommended pad layout. Refer to <http://www.diodes.com/package-outlines.html>.  
7. Short duration pulse test used to minimize self-heating effect.



## Package Outline Dimensions

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

### PowerDI5

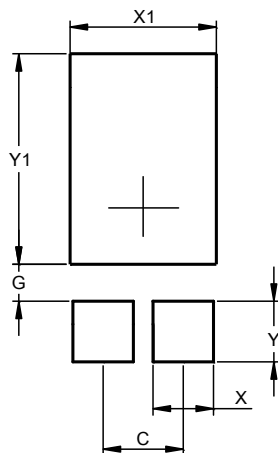


PowerDI5			
Dim	Min	Max	Typ
A	1.05	1.15	1.10
A1	0.00	0.05	—
A2	0.33	0.43	0.381
b1	0.80	0.99	0.89
b2	1.70	1.88	1.78
D	3.90	4.05	3.966
D2	—	—	3.054
E	6.40	6.60	6.504
e	—	—	1.84
E1	5.30	5.45	5.37
E2	—	—	3.549
L	0.75	0.95	0.85
L1	0.50	0.65	0.57
W	1.10	1.41	1.255
All Dimensions in mm			

## Suggested Pad Layout

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	1.390
X1	3.360
Y	1.400
Y1	4.860

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