

Product Summary

V_{BR} (Min)	I_{PP} (Max)	C_T (Typ)
4.8V	60A	120

Description

This new generation TVS is designed to protect sensitive electronics from the damage due to ESD and surge. The combination of small size and high ESD surge capability makes it ideal for use in portable applications such as cellular phones, digital cameras, and MP3 players.

Applications

- Cellular Handsets
- Portable Electronics
- Computers and Peripheral

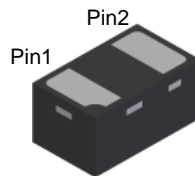
Features

- Low Profile Package (0.50mm Typical) and Ultra-Small PCB Footprint Area (1.1mm x 0.7mm Max) Suitable for Compact Portable Electronics
- Provides ESD Protection per IEC 61000-4-2 Standard: Air ±30kV, Contact ±30kV
- Provides Surge and Lightning Protection per IEC 61000-4-5 Standard: I_{PP} Max 60A
- One Channel of ESD and Surge Protection
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **For automotive applications requiring specific change control (i.e. parts qualified to AEC-Q100/101/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please [contact us](mailto:contact@diodes.com) or your local Diodes representative. <https://www.diodes.com/quality/product-definitions/>**

Mechanical Data

- Case: X1-DFN1006-2
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: NiPdAu over Copper Leadframe. Solderable per MIL-STD-202, Method 208 (64)
- Weight: 0.001 grams (Approximate)

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Bottom View



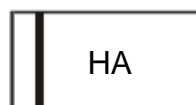
Device Schematic

Ordering Information (Note 4)

Part Number	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity
D4V5H1BS2LP-7B	Standard	HA	7	8	10,000/Tape & Reel

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
 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



HA or $\bar{H}A$ = Product Type Marking Code
Bar Denotes Pin 1

Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit	Conditions
Peak Pulse Power Dissipation (Pin1 to Pin2)	P _{PP}	528	W	8/20μs, per Figure 3
Peak Pulse Current	I _{PP}	60	A	8/20μs, per Figure 3
ESD Protection—Contact Discharge	V _{ESD_CONTACT}	±30	kV	IEC 61000-4-2 Standard
ESD Protection—Air Discharge	V _{ESD_AIR}	±30	kV	IEC 61000-4-2 Standard

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Package Power Dissipation (Note 5)	P _D	250	mW
Thermal Resistance, Junction to Ambient (Note 5)	R _{θJA}	500	°C/W
Operating and Storage Temperature Range	T _J , T _{STG}	-55 to +150	°C

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Conditions
Reverse Working Voltage	V _{RWM}	—	—	4.5	V	—
Reverse Current (Note 6)	I _R	—	—	0.5	μA	V _R = V _{RWM}
Reverse Breakdown Voltage	V _{BR}	4.8	—	7.0	V	I _R = 1mA
Reverse Clamping Voltage (Note 7)	V _{CL}	—	5.5	—	V	I _{PP} = 1A, t _P = 8/20μs
		—	7.0	—		I _{PP} = 30A, t _P = 8/20μs
		—	8.8	—		I _{PP} = 60A, t _P = 8/20μs
ESD Clamping Voltage (Note 8)	V _C	—	5.7	—	V	I _{PP} = 8A, t _P = 100ns
		—	5.8	—		I _{PP} = 16A, t _P = 100ns
Capacitance	C _T	—	120	—	pF	V _R = 0V, f = 1MHz

- Notes:
- Device mounted on FR-4 PCB pad layout (2oz copper) as shown on Diodes Incorporated's suggested pad layout, which can be found on our website at <http://www.diodes.com/package-outlines.html>.
 - Short duration pulse test used to minimize self-heating effect.
 - Clamping voltage value is based on an 8x20μs peak pulse current (I_{PP}) waveform.
 - Transmission Line Pulse Test (TLP) settings: t_p=100ns, t_r=10ns, I_{TLP} and V_{TLP} averaging window is from 70ns to 90ns.

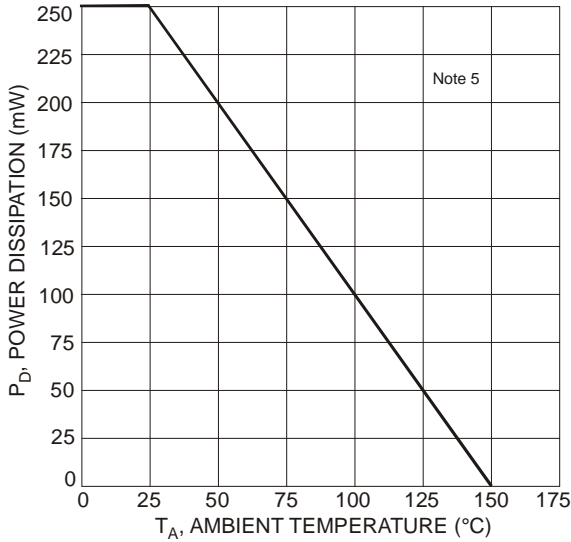


Figure 1 Power Derating Curve

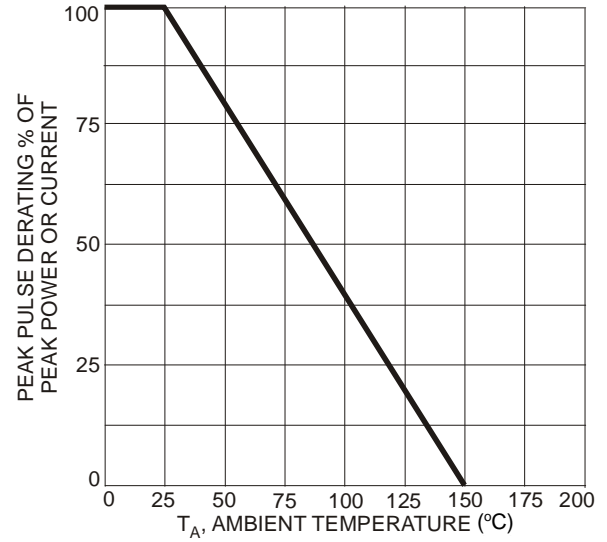


Figure 2 Pulse Derating Curve

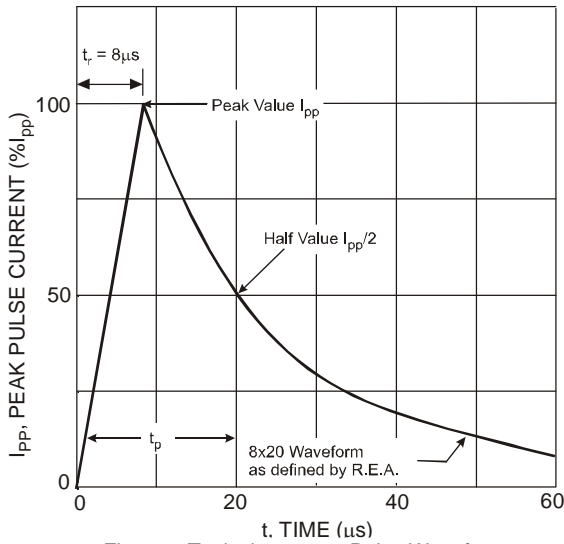


Figure 3 Typical 8 x 20µs Pulse Waveform

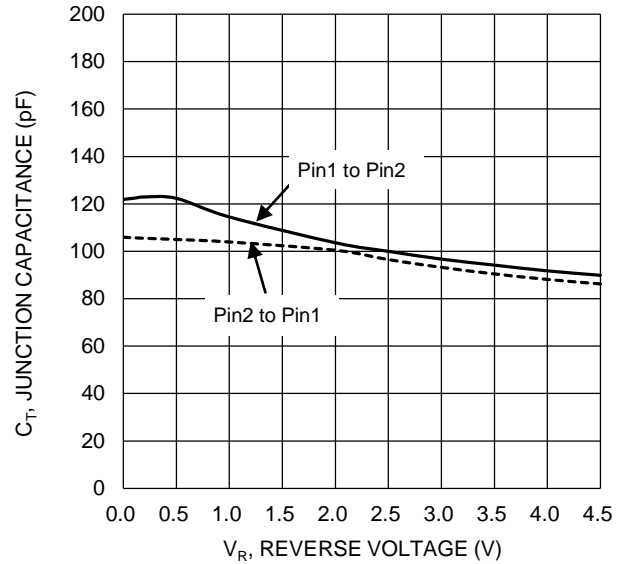


Figure 4 Typical Total Capacitance

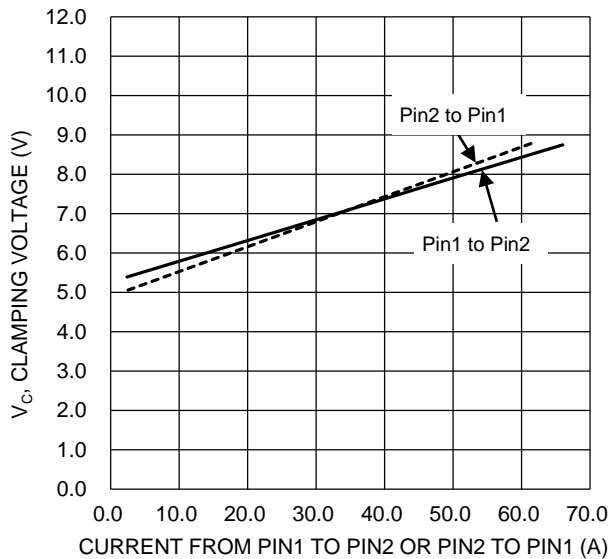


Figure 5 Clamping Voltage Characteristic (tp=8/20µs)

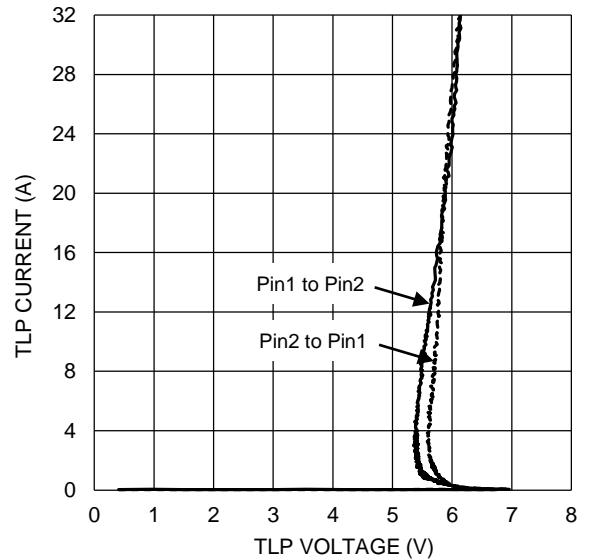
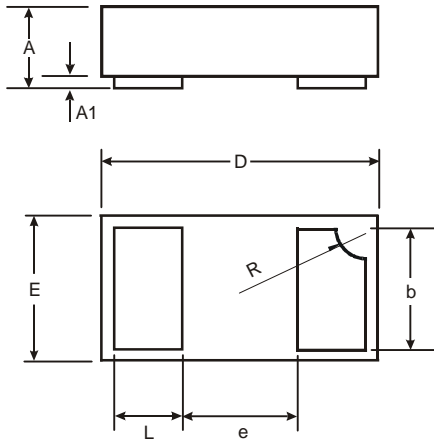


Figure 6 TLP Curve (tp=100ns)

Package Outline Dimensions

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

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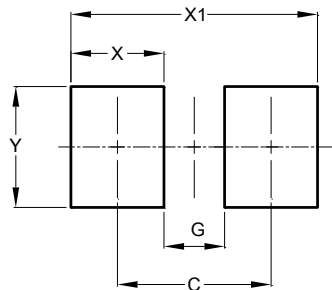


X1-DFN1006-2			
Dim	Min	Max	Typ
A	0.47	0.53	0.50
A1	0	0.05	0.03
b	0.45	0.55	0.50
D	0.95	1.075	1.00
E	0.55	0.675	0.60
e	-	-	0.40
L	0.20	0.30	0.25
R	0.05	0.15	0.10
All Dimensions in mm			

Suggested Pad Layout

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

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Dimensions	Value (in mm)
C	0.70
G	0.30
X	0.40
X1	1.10
Y	0.70

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