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Lead-free Green

D5V0X1B2LPQ

ULTRA LOW CAPACITANCE BIDIRECTIONAL TVS DIODE

Product Summary

$V_{BR(Min)}$	$I_{PP(Max)}$	$C_{T(Typ)}$
7V	1.5A	0.23pF

Features And Benefits

- Low Profile Package (0.53mm Max) and Ultra-Small PCB Footprint Area (1.08mm x 0.68mm Max) Suitable for Compact Portable Electronics
- Provides ESD Protection per IEC 61000-4-2 Standard: Air ±15kV, Contact ±15kV
- 1 Channel of ESD Protection
- Low Channel Input Capacitance
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **The D5V0X1B2LPQ 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/

Description And Applications

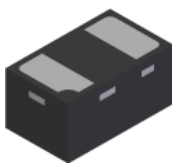
This new generation TVS is designed to protect sensitive electronics from the damage due to ESD. The combination of small size and high ESD surge capability makes it ideal for use in Automotive Infotainment applications.

- USB Modules
- HDMI™ Inputs
- Infotainment Consoles

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 e4
- Weight: 0.001 grams (Approximate)

X1-DFN1006-2



Bottom View



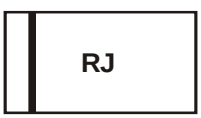
Device Schematic

Ordering Information (Note 4)

Part Number	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
D5V0X1B2LPQ-7B	Automotive	RJ	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



RJ = Product Type Marking Code
Bar Denotes Pin 1

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

Characteristic	Symbol	Value	Unit	Conditions
Peak Pulse Current	I_{PP}	1.5	A	8/20µs, per Figure 3
ESD Protection – Contact Discharge	$V_{ESD_CONTACT}$	±15	kV	IEC 61000-4-2 Standard
ESD Protection – Air Discharge	V_{ESD_AIR}	±15	kV	IEC 61000-4-2 Standard

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Package Power Dissipation (Note 5)	P_D	570	mW
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	220	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-65 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}	—	—	5.5	V	—
Reverse Current (Note 6)	I_R	—	—	100	nA	V_R = 5.0V
Reverse Breakdown Voltage	V_{BR}	7.0	—	—	V	I_R = 1mA
Reverse Clamping Voltage, Positive Transients	V_{CL}	—	—	14	V	I_{PP} = 1A, t_P = 8/20µs
Dynamic Resistance	R_{DYN}	—	1.0	—	Ω	I_R = 1A, t_P = 8/20µs
Capacitance	C_T	—	0.23	0.4	pF	V_R = 2.5V, f = 1MHz
		—	0.3	—	pF	V_R = 0V, f = 1MHz

Notes: 5. 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.
6. Short duration pulse test used to minimize self-heating effect.

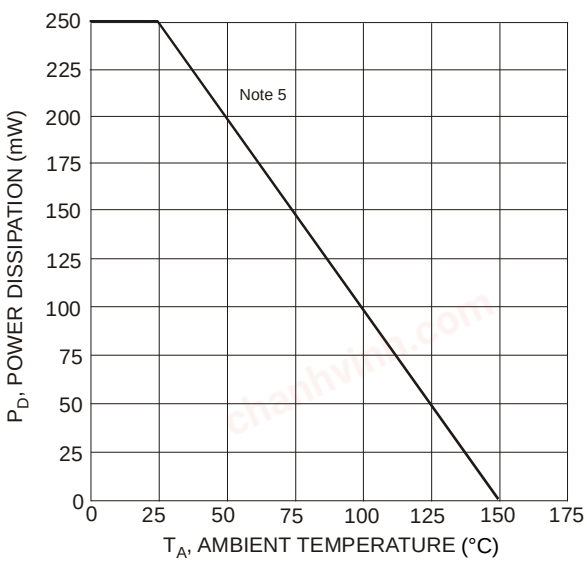

Figure 1 Power Derating Curve

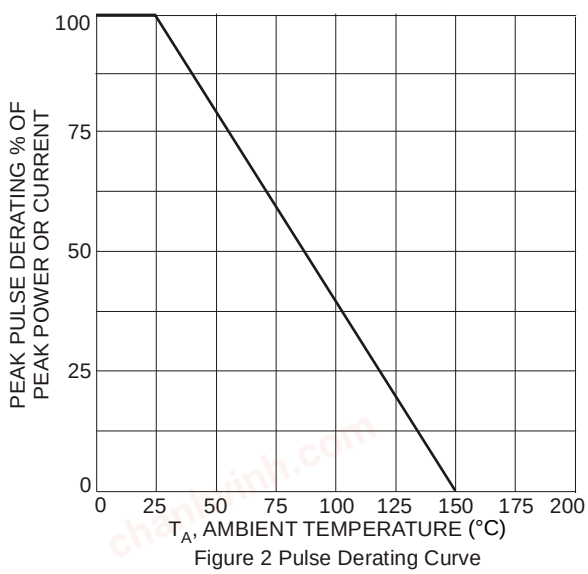

Figure 2 Pulse Derating Curve

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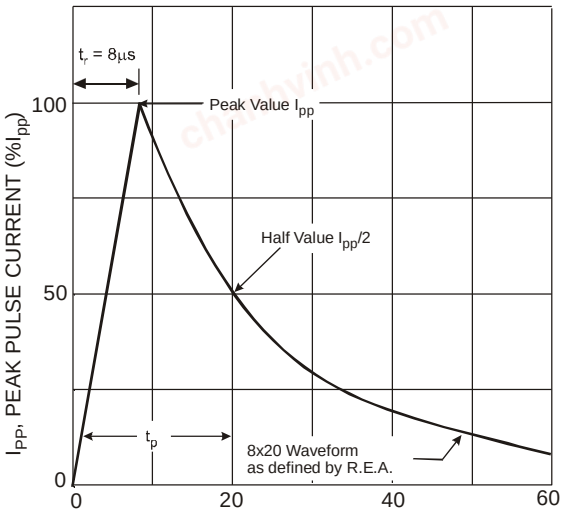

Figure 3 Pulse Waveform

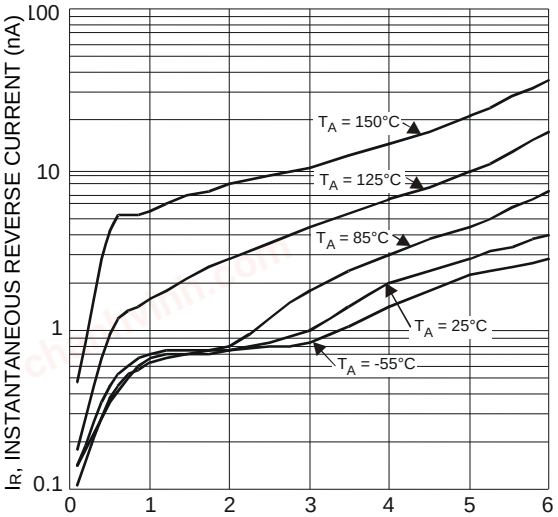

Figure 4 Typical Reverse Characteristics

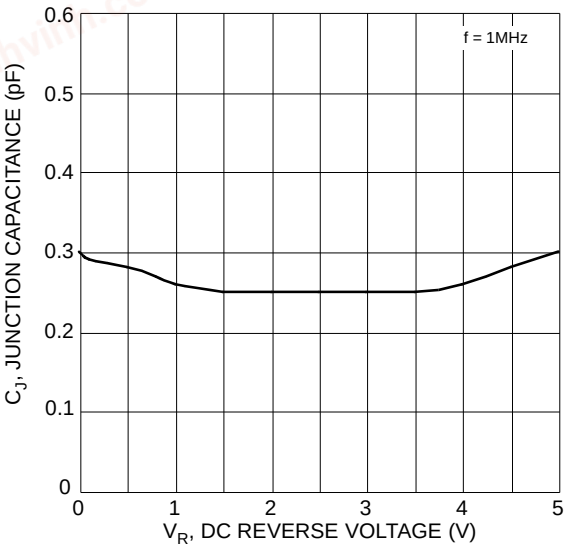

Figure 5 Total Capacitance vs. Reverse Voltage

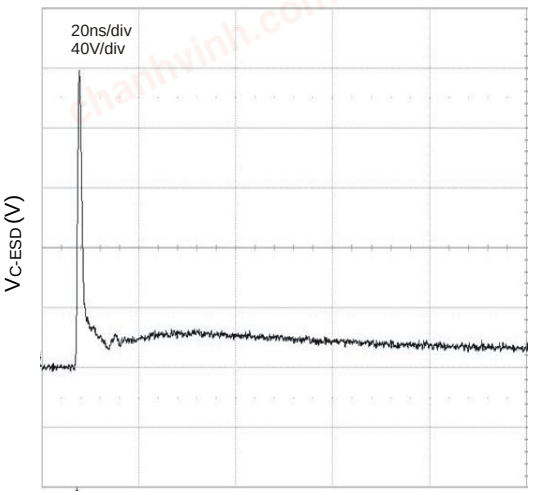

Figure 6 ESD Response to IEC 61000-4-2
(+8kV Contact Discharge)

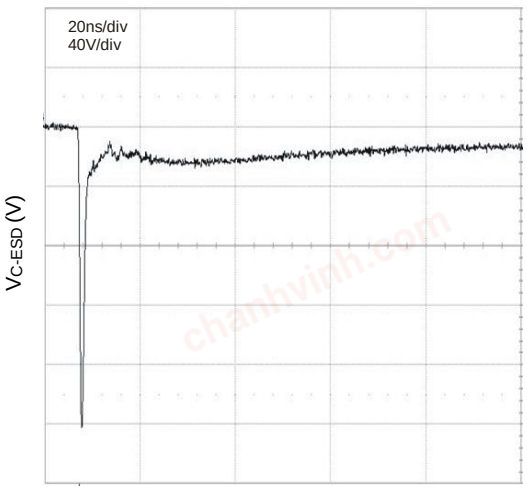

Figure 7 ESD Response to IEC 61000-4-2
(-8kV Contact Discharge)

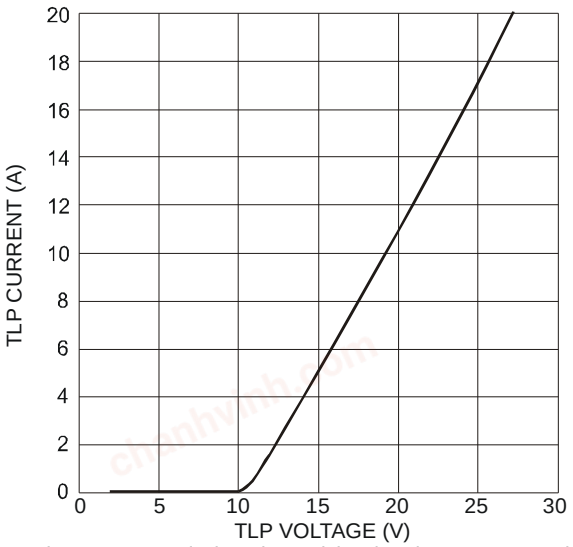

Figure 8 Transmission Line Pulsing (TLP) Current vs. Voltage

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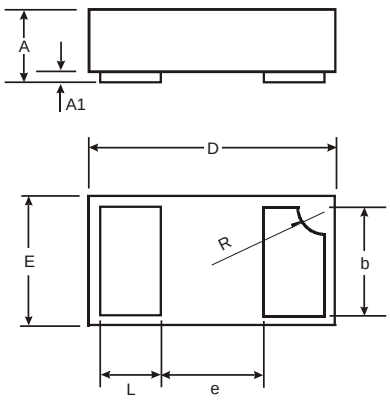
Package Outline Dimensions

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

X1-DFN1006-2

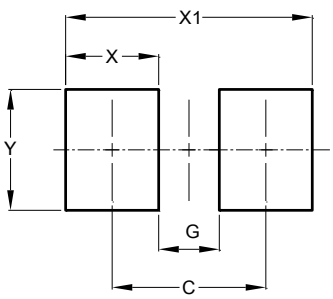


X1-DFN1006-2			
Dim	**Min**	**Max**	**Typ**
A	0.47	0.53	0.50
A1	0	0.05	0.03
b	0.45	0.55	0.50
D	0.95	1.075	1.00
E	0.55	0.675	0.60
e	-	-	0.40
L	0.20	0.30	0.25
R	0.05	0.15	0.10
All Dimensions in mm			

Suggested Pad Layout

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

X1-DFN1006-2



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

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