

Product Summary

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

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

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
- Provides ESD Protection per ISO10605 Standard: Air ±10kV, Contact ±10kV
- 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/>

Mechanical Data

- Package: X1-DFN1006-2
- Package 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



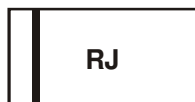
Device Schematic

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

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
		20	A	t _r = 10 ns; see Figure 8
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
ESD Protection – Contact Discharge	V _{ESD_CONTACT}	±10	kV	ISO10605 Standard
ESD Protection – Air Discharge	V _{ESD_AIR}	±10	kV	ISO10605 Standard

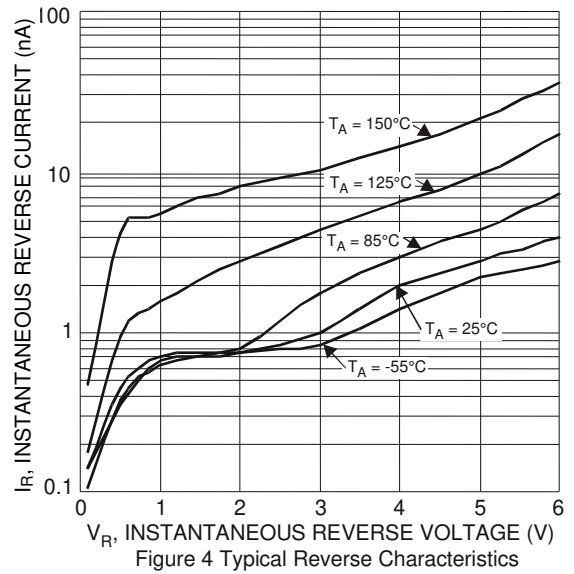
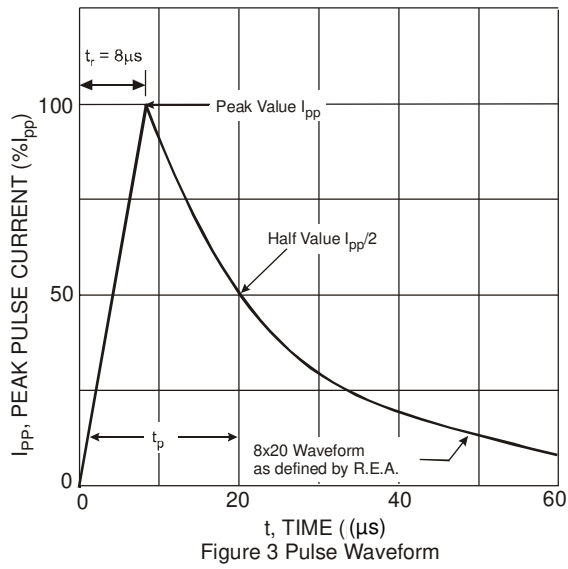
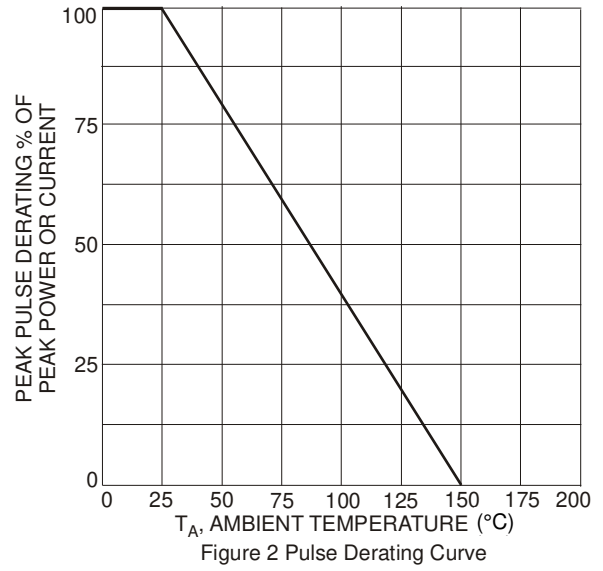
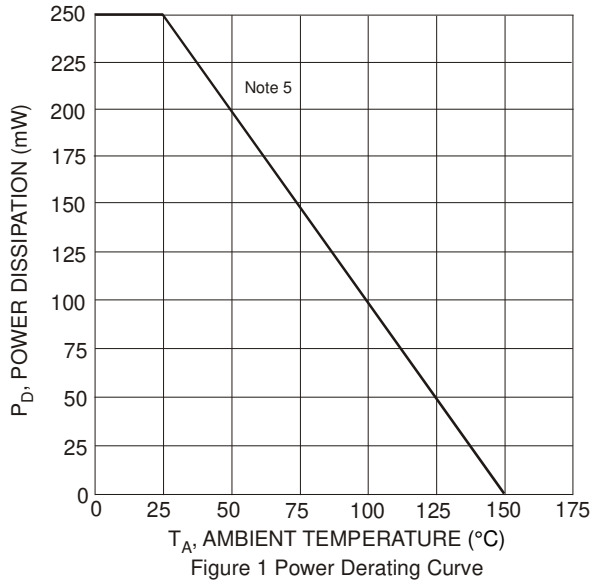
Thermal Characteristics

Characteristic	Symbol	Value	Unit
Package Power Dissipation (Note 5)	P _D	570	mW
Thermal Resistance, Junction to Ambient (Note 5)	R _{θJA}	220	°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}	—	—	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
Holding Voltage (Note 7)	V _{hold}	10	-	-	V	t _r = 10 ns;
Dynamic resistance (Note 7)	R _{DYN}	-	0.8	-	Ω	I _R = 20 A; t _r = 10 ns;
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 <https://www.diodes.com/design/support/packaging/>.
 6. Short duration pulse test used to minimize self-heating effect.
 7. Non-repetitive current pulse, Transmission Line Pulse (TLP); square pulse;



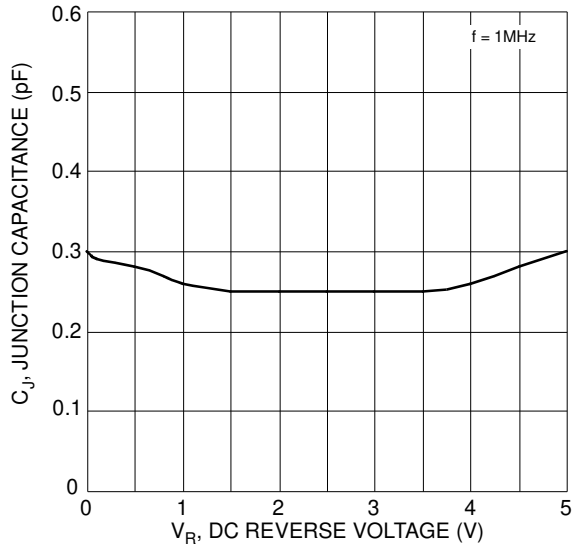


Figure 5 Total Capacitance vs. Reverse Voltage

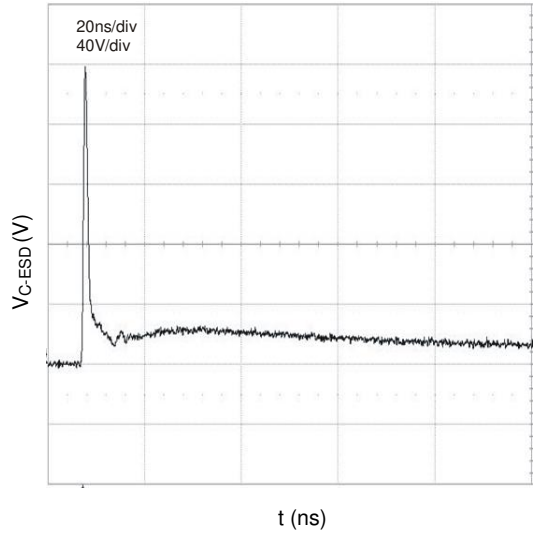


Figure 6 ESD Response to IEC 61000-4-2 (+8kV Contact Discharge)

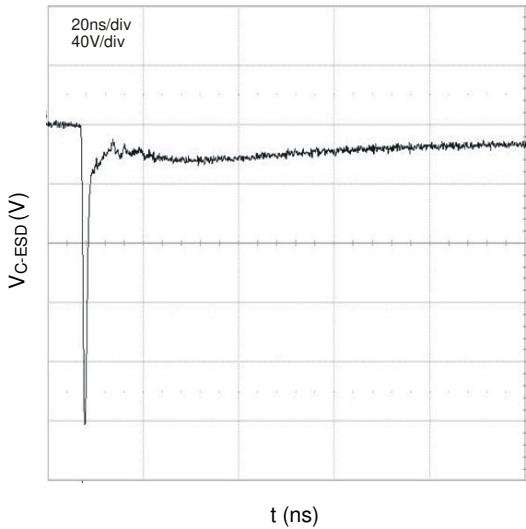


Figure 7 ESD Response to IEC 61000-4-2 (-8kV Contact Discharge)

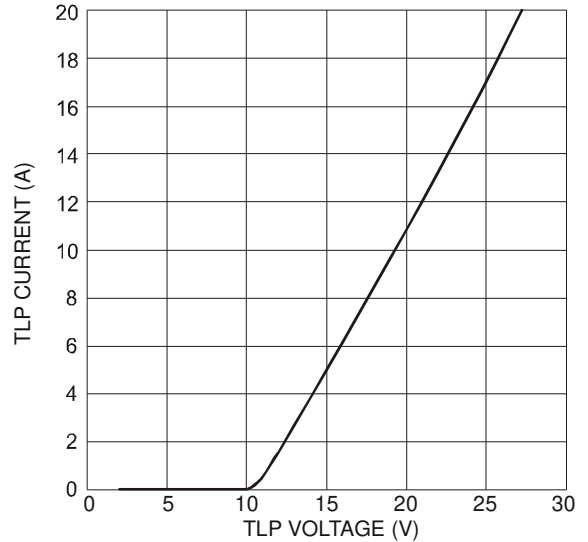
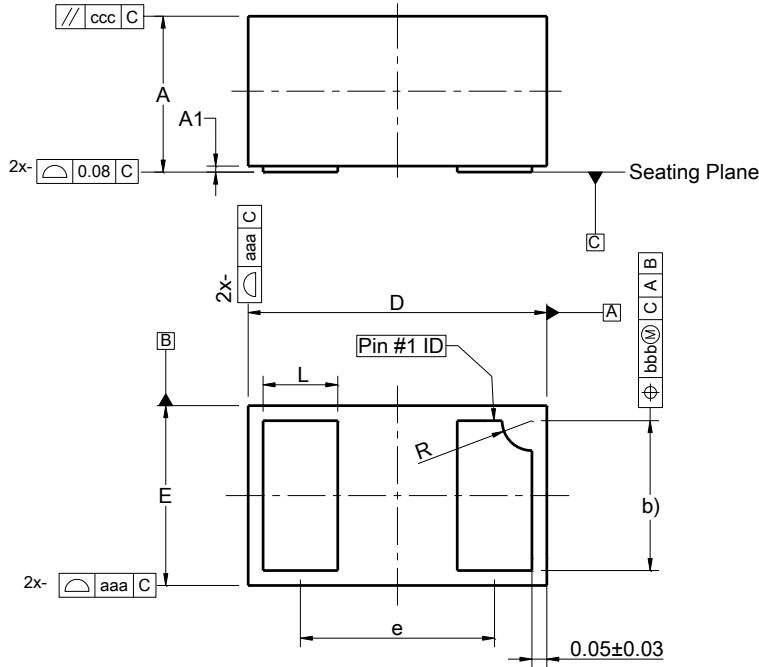


Figure 8 Transmission Line Pulsing (TLP) Current vs. Voltage

Package Outline Dimensions

Please see <https://www.diodes.com/design/support/packaging/> for the latest version.

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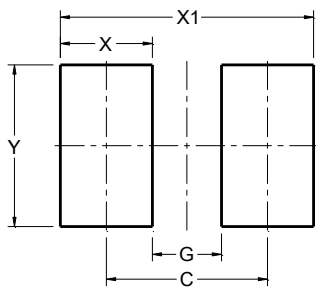


X1-DFN1006-2			
Dim	Min	Max	Typ
A	0.47	0.53	0.50
A1	0.00	0.05	0.03
b	0.45	0.55	0.50
D	0.95	1.075	1.00
E	0.55	0.675	0.60
e	--	--	0.65
L	0.20	0.30	0.25
R	0.05	0.15	0.10
aaa	0.15		
bbb	0.05		
ccc	0.05		
All Dimensions in mm			

Suggested Pad Layout

Please see <https://www.diodes.com/design/support/packaging/> 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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