

Product Summary

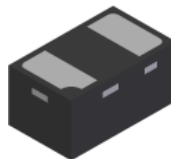
V_{RWM}	$V_{BR} \text{ Min}$	$I_{pp} \text{ Max}$
3.3V	6.0V	5A

Description and Applications

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

- Cellular Handsets
- Portable Electronics
- Computers and Peripheral

X1-DFN1006-2



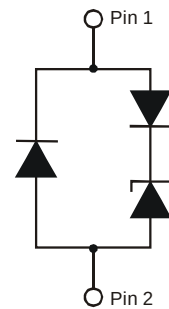
Bottom View

Features and Benefits

- IEC 61000-4-2 (ESD): Air $\pm 15\text{kV}$, Contact $\pm 8\text{kV}$
- 1 Channel of ESD Protection
- Low Channel Input Capacitance of 0.85pF Typical
- Low Profile Package (0.53mm Max) and Ultra-Small PCB Footprint Area (1.08mm * 0.68mm Max) Suitable for Compact Portable Electronics
- Typically Used at High Speed Ports such as USB 2.0, IEEE1394, Serial ATA, DVI, HDMI, PCI
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- Halogen and Antimony Free. "Green" Device (Note 3)**
- Qualified to AEC-Q101 Standards for High Reliability**
- PPAP Capable (Note 4)**

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 208④
- Weight: 0.001 grams (Approximate)



Device Schematic

Ordering Information (Note 5)

Part Number	Compliance	Marking	Reel Size (Inches)	Tape Width (mm)	Case	Packaging
D1213A-01LPQ-7B	Automotive	U2	7	8	X1-DFN1006-2	10,000/Tape & Reel

- Notes:
- No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
 - See 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.
 - Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
 - Automotive products are AEC-Q101 qualified and are PPAP capable. Refer to http://www.diodes.com/product_compliance_definitions.html.
 - For packaging details, go to our website at <http://www.diodes.com/products/packages.html>.

Marking Information



Top View

U2 = Product Type Marking Code
Bar Denotes Pin 1 or Cathode Side

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

Characteristic	Symbol	Value	Unit	Conditions
Peak Pulse Current	I _{PP}	5	A	8/20μs, Per Figure 3
ESD Protection – Contact Discharge	V _{ESD_CONTACT}	±8	kV	Standard IEC 61000-4-2
ESD Protection – Air Discharge	V _{ESD_AIR}	±15	kV	Standard IEC 61000-4-2

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Package Power Dissipation (Note 6)	P _D	250	mW
Thermal Resistance, Junction to Ambient (Note 6)	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}	—	—	3.3	V	—
Reverse Current (Note 7)	I _R	—	0.1	1.0	μA	V _R = V _{RWM} = 3.3V
Reverse Breakdown Voltage	V _{BR}	6.0	—	—	V	I _R = 1mA
Forward Voltage	V _F	0.6	0.8	0.95	V	I _F = 8mA
Reverse Clamping Voltage, Positive Transients	V _{CL1}	—	10.0	—	V	I _{PP} = 1A, t _p = 8/20μs
Reverse Clamping Voltage, Negative Transients	V _{CL2}	—	-1.7	—	V	I _{PP} = -1A, t _p = 8/20μs
Dynamic Resistance	R _{DYN}	—	0.9	—	Ω	I _R = 1A, t _p = 8/20μs
Capacitance	C _T	—	0.85	1.2	pF	V _R = 1.65V, f = 1MHz

- Notes:
6. 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>.
 7. Short duration pulse test used to minimize self-heating effect.
 8. For information on the impact of Diodes Incorporated's USB 2.0 compatible ESD protectors on signal integrity including eye diagram plots, please refer to AN77 at the following URL: http://www.diodes.com/destools/appnote_dnote.html.

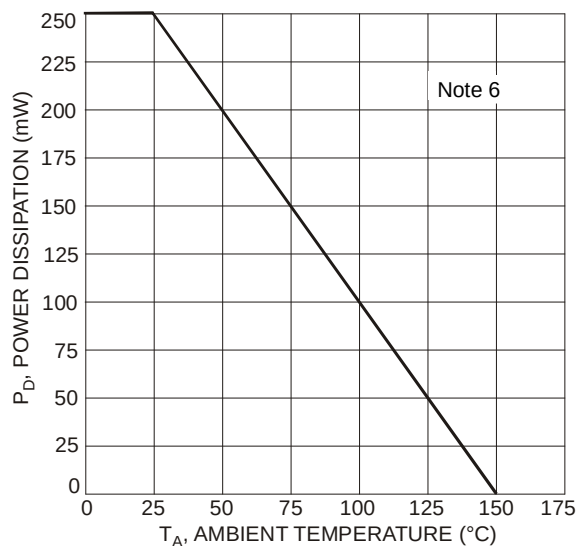


Figure 1 Power Derating Curve

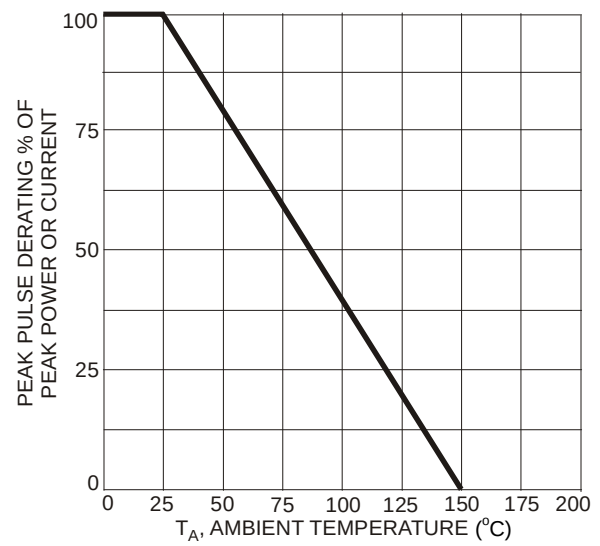


Figure 2 Pulse Derating Curve

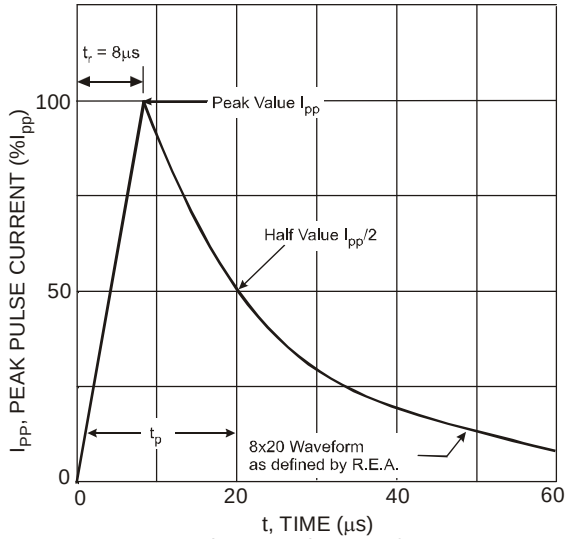


Figure 3 Pulse Waveform

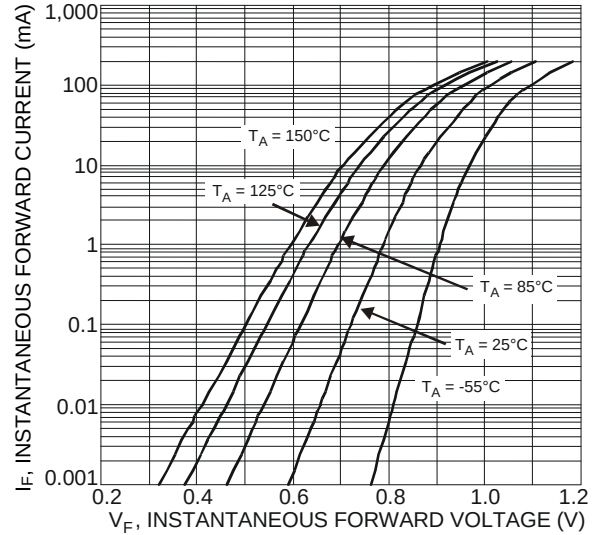


Figure 4 Typical Forward Characteristics

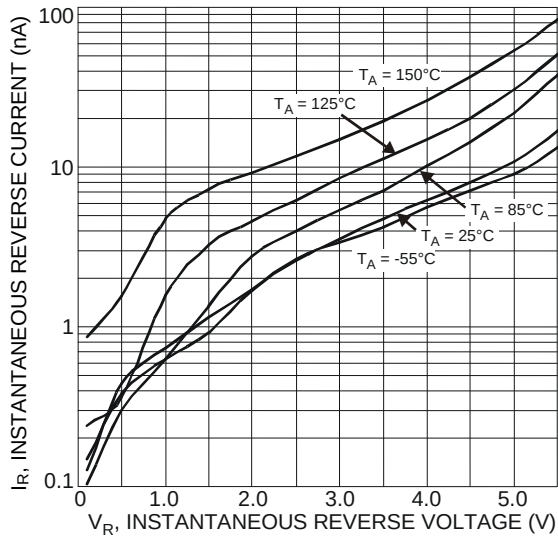


Figure 5 Typical Reverse Characteristics

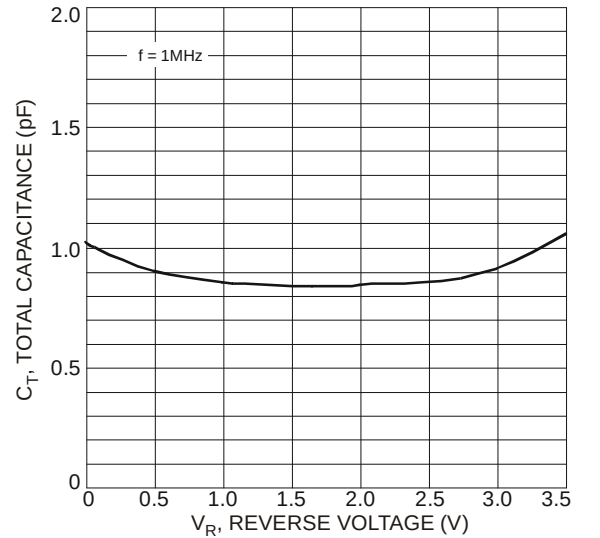
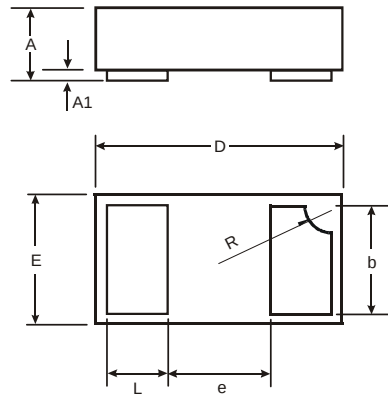


Figure 6 Typical Total Capacitance vs. Reverse Voltage

Package Outline Dimensions

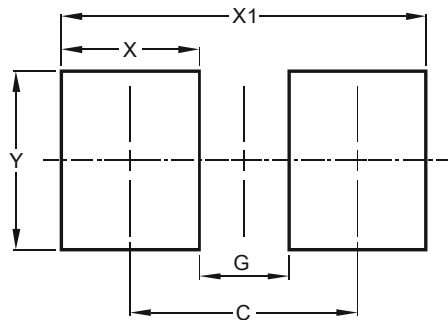
Please see <http://www.diodes.com/package-outlines.html> for the latest version.



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.



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

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