

## Product Summary

<b>VBR (Min)</b>	<b>IPP (Max)</b>	<b>CT (Typ)</b>
12.5V	15A	70pF

## Description

This new generation TVS is designed to protect sensitive electronics from ESD and surge damages. The dual channels product with advantages of small size and high ESD surge capability is ideal for use in the Type-C CC protection for portable and computer applications.

## Applications

- Cellular handsets
- Portable electronics
- Computers and peripherals
- Type-C CC pin protections

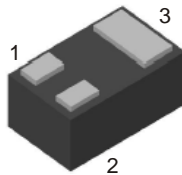
## Features

- Two Channels of ESD and Surge Protection
- Provides ESD Protection per IEC 61000-4-2 Standard: Air  $\pm 30kV$ , Contact  $\pm 30kV$
- Provides Surge and Lightning Protection per IEC 61000-4-5 Standard: IPP Max 15A
- 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-Q100/101/104/200, PPAP capable, and manufactured in IATF 16949 certified facilities), please [contact us](https://www.diodes.com/quality/product-definitions/) or your local Diodes representative.**

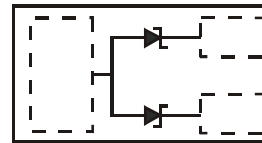
## Mechanical Data

- Package: X1-DFN1006-3
- Package Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Plated over Copper Leadframe. Solderable per MIL-STD-202, Method 208 **Ⓔ3**
- Weight: 0.001 grams (Approximate)

**X1-DFN1006-3 (Type SA)**



Bottom View



Device Schematic

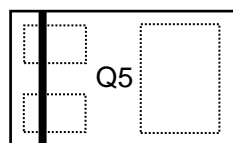
## Ordering Information (Note 4)

Part Number	Package	Marking	Reel Size (inches)	Tape Width (mm)	Packing	
					Qty.	Carrier
D12V0M2U3SLP-7B	X1-DFN1006-3 (Type SA)	Q5	7	8	10,000	Tape & Reel

- Notes:
- No purposely added lead. Fully EU Directive 2002/95/EC (RoHS), 2011/65/EU (RoHS 2) & 2015/863/EU (RoHS 3) compliant.
  - 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.
  - Halogen- and Antimony-free "Green" products are defined as those which contain <900ppm bromine, <900ppm chlorine (<1500ppm total Br + Cl) and <1000ppm antimony compounds.
  - For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

## Marking Information

**X1-DFN1006-3 (Type SA)**



Q5 = Product Type Marking Code  
Bar Denotes Cathode Side

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

Characteristic	Symbol	Value	Unit	Conditions
Peak Pulse Current	I <sub>PP</sub>	15	A	8/20μs (Figure 3)
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 5)	P <sub>D</sub>	250	mW
Thermal Resistance, Junction to Ambient (Note 5)	R <sub>θJA</sub>	500	°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 Working Voltage	V <sub>RWM</sub>	—	—	12	V	—
Reverse Current (Note 6)	I <sub>R</sub>	—	—	1	μA	V <sub>R</sub> = V <sub>RWM</sub>
Reverse Breakdown Voltage	V <sub>BR</sub>	12.5	—	16	V	I <sub>R</sub> = 1mA
Reverse Clamping Voltage (Note 7)	V <sub>CL</sub>	—	15.0	—	V	I <sub>PP</sub> = 1A, t <sub>P</sub> = 8/20μs
		—	24.0	—		I <sub>PP</sub> = 15A, t <sub>P</sub> = 8/20μs
ESD Clamping Voltage (Note 8)	V <sub>C</sub>	—	15.5	—	V	I <sub>PP</sub> = 4A, t <sub>P</sub> = 100ns
		—	17.8	—		I <sub>PP</sub> = 16A, t <sub>P</sub> = 100ns
Dynamic Resistance	R <sub>DYN</sub>	—	0.18	—	Ω	TLP, t <sub>P</sub> = 100ns
Capacitance	C <sub>T</sub>	—	70	—	pF	V <sub>R</sub> = 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.
  7. Clamping voltage value is based on an 8x20μs peak pulse current (I<sub>PP</sub>) waveform.
  8. Transmission Line Pulse Test (TLP) settings: t<sub>P</sub>=100ns, t<sub>R</sub>=10ns, I<sub>TLP</sub> and V<sub>TLP</sub> averaging window is from 70ns to 90ns.

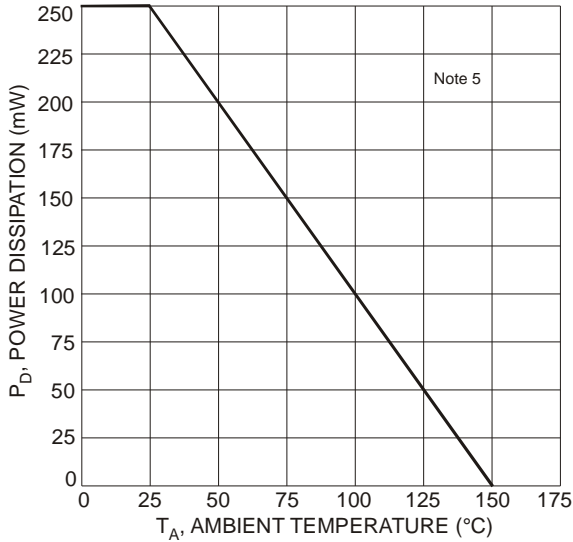


Figure 1 Power Derating Curve

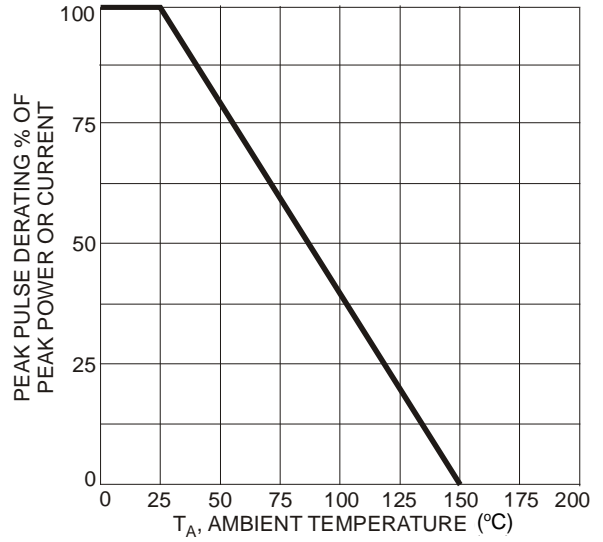


Figure 2 Pulse Derating Curve

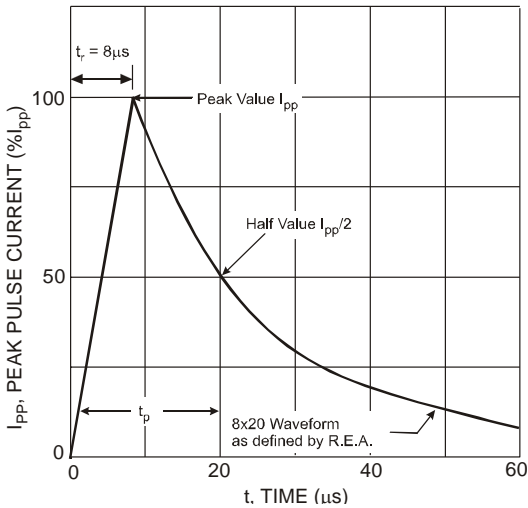


Figure 3 Typical 8 × 20µs Pulse Waveform

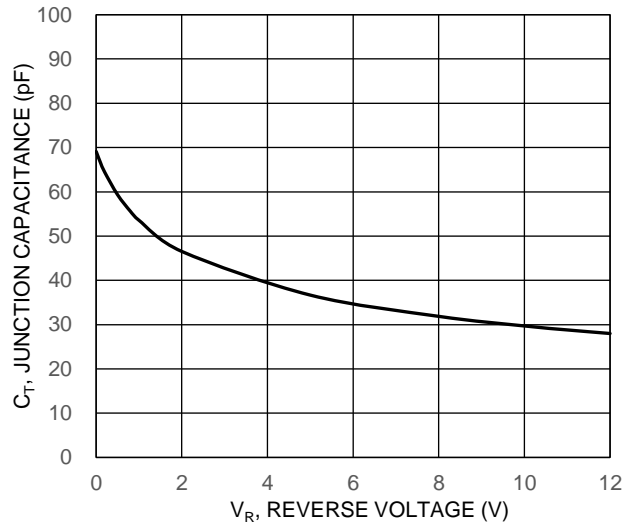


Figure 4 Typical Input Capacitance

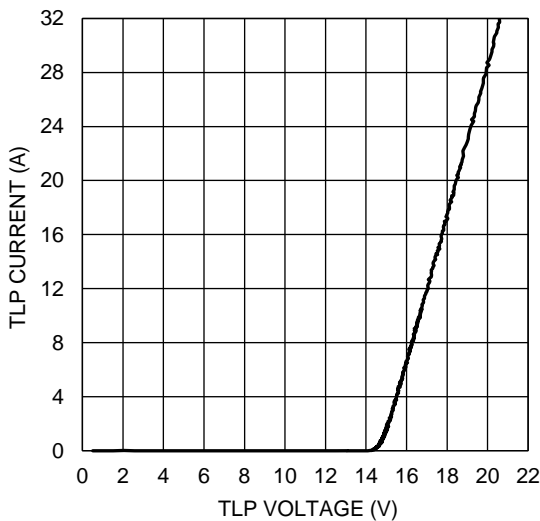


Figure 5 TLP Curve (t<sub>p</sub> = 100ns)

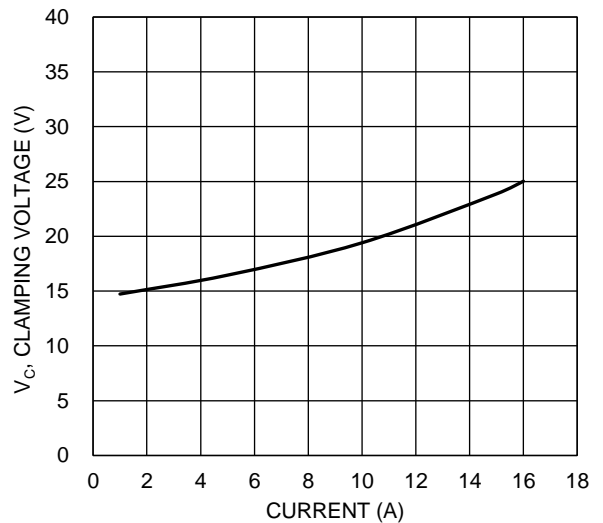
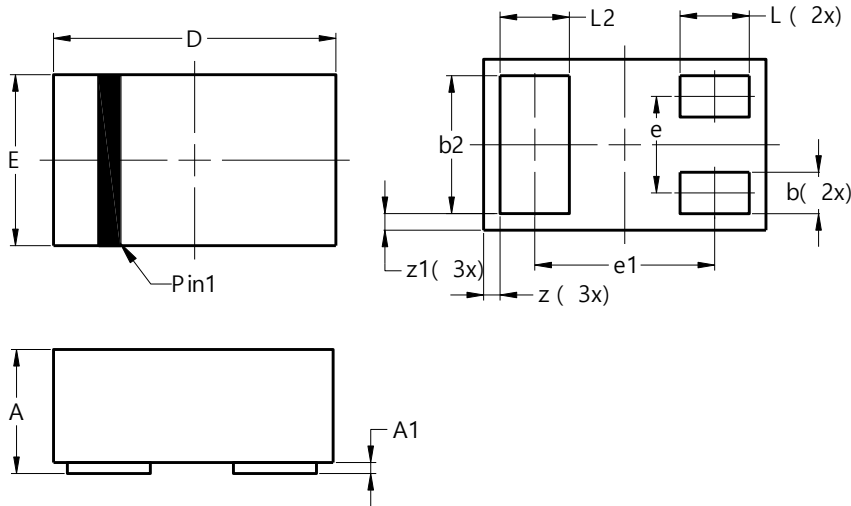


Figure 6 Clamping Voltage Characteristic (t<sub>p</sub> = 8/20µs)

**Package Outline Dimensions**

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

**X1-DFN1006-3 (Type SA)**

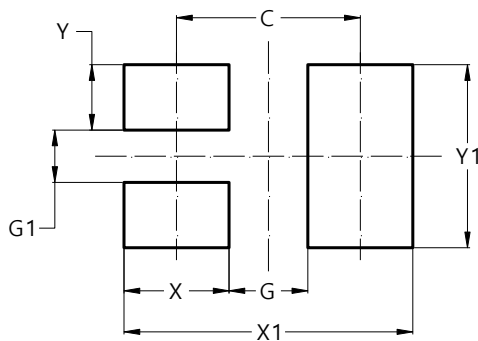


X1-DFN1006-3 (Type SA)			
Dim	Min	Max	Typ
A	0.400	0.500	--
A1	--	0.050	--
b	0.100	0.200	0.150
b2	0.450	0.550	0.500
D	0.990	1.050	1.020
E	0.590	0.650	0.620
e	0.350 BSC		
e1	0.650 BSC		
L	0.200	0.300	0.250
L2	0.200	0.300	0.250
z	0.020	0.100	0.060
z1	0.020	0.100	0.060
All Dimensions in mm			

**Suggested Pad Layout**

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

**X1-DFN1006-3 (Type SA)**



Dimensions	Value (in mm)
C	0.700
G	0.300
G1	0.200
X	0.400
X1	1.100
Y	0.250
Y1	0.700

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