Product Summary

$V_{BR\ Min}$	$I_{PP\ Max}$	$C_{IN\ Typ}$
5V	4A	0.21pF

Description

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 portable applications such as USB3.1, computers and peripheral.

Applications

- USB3.1
- Thunderbolt3
- Computers and Peripheral

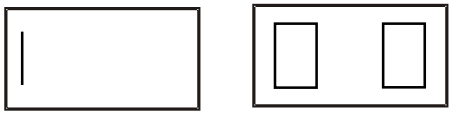
Features

- Provides ESD Protection per IEC 61000-4-2 Standard: 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)**
- **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 or your local Diodes representative. https://www.diodes.com/quality/product-definitions/**

Mechanical Data

- Case: X2-DSN0603-2
- Case Material: Chip Scale Package
- Terminals: NiAu Bump. Solderable per MIL-STD-202, Method 208 e4
- Weight: 0.0002 grams (Approximate)

X2-DSN0603-2



Top View

Bottom View

Device Schematic

Ordering Information (Note 4)

Part Number	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
DESD3V3X1BCSF-7	Standard	MO	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

MO = 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	P_{PP}	21	W	8/20µs, per Figure 3
Peak Pulse Current	I_{PP}	4	A	8/20µs, per Figure 3
ESD Protection – Contact Discharge	$V_{ESD\_Contact}$	±10	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)	$R_{\theta JA}$	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 Standoff Voltage	V_{RWM}	—	—	3.3	V	—
Channel Leakage Current (Note 6)	I_{RM}	—	—	1	µA	V_{RWM} = 3.3V
Clamping Voltage (Note 7)	V_{CL}	—	5.2	—	V	I_{PP} = 4A, t_P = 8/20µs
ESD Clamping Voltage (Note 8)	V_C	—	6.0	—	V	I_{PP} = 8A,TLP, t_P = 100ns
		—	9.0	—	V	I_{PP} = 16A,TLP, t_P = 100ns
Breakdown Voltage	V_{BR}	5	—	9	V	I_R = 1mA
Differential Resistance	R_{DYN}	—	0.35	—	Ω	TLP, 10A, t_P = 100ns
Channel Input Capacitance	C_{IN}	—	0.21	—	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.
6. Short duration pulse test used to minimize self-heating effect.
7. Clamping voltage value is based on an 8x20µs peak pulse current (I_{PP}) waveform.
8. Transmission Line Pulse Test (TLP) settings: t_P = 100ns, t_R = 1ns, I_{TLP} and V_{TLP} averaging window is from 70ns to 90ns.

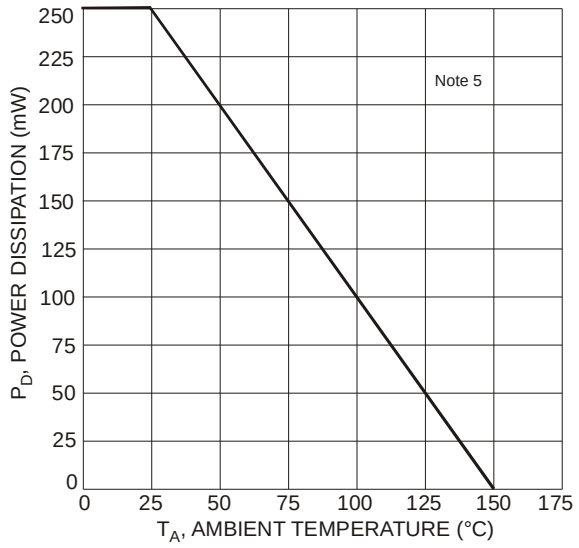


Figure 1 Power Derating Curve

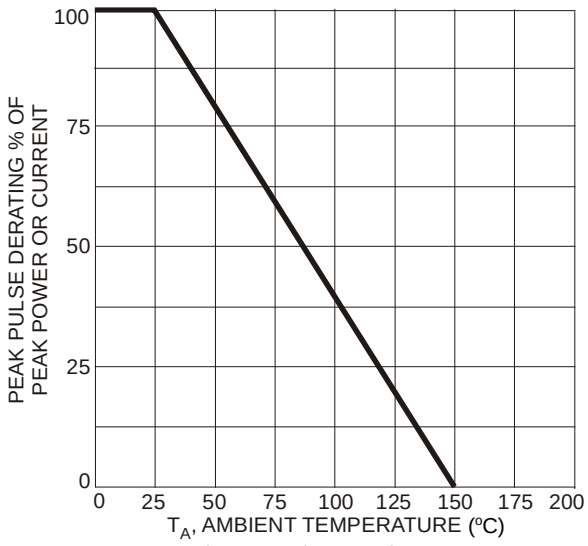


Figure 2 Pulse Derating Curve

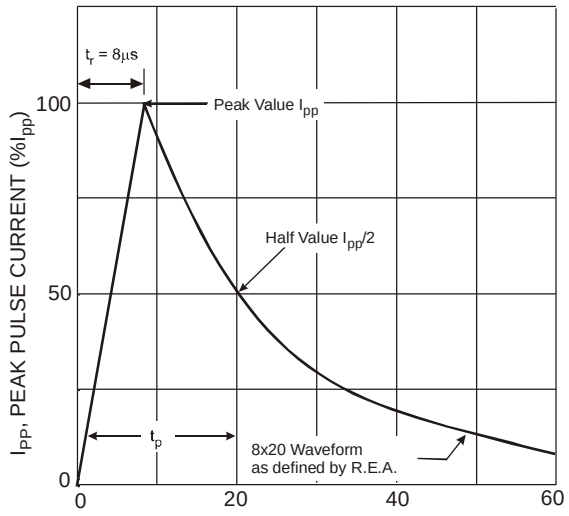


Figure 3 Pulse Waveform

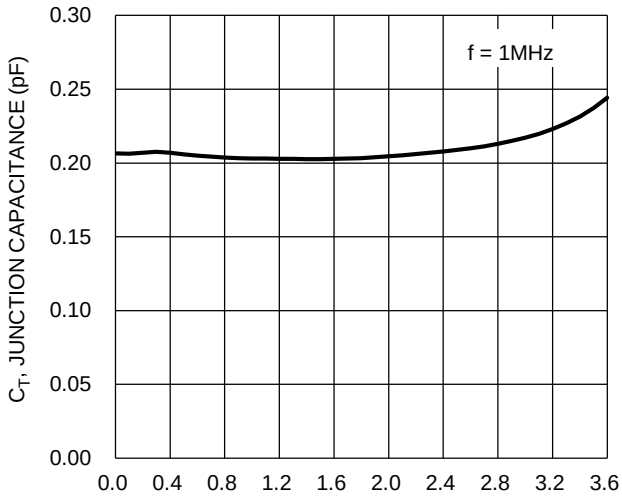


Figure 4 Typical Total Capacitance

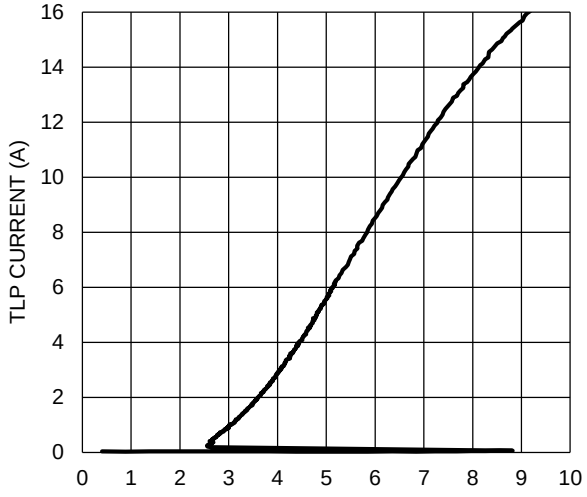
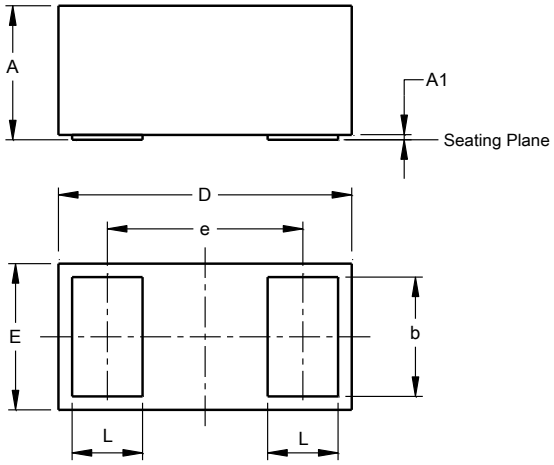


Figure 5 TLP Curve (t_P = 100ns)

Package Outline Dimensions

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

X2-DSN0603-2

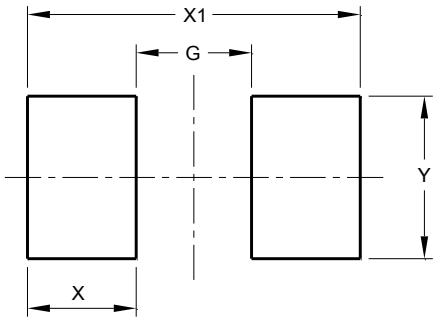


X2-DSN0603-2			
Dim	**Min**	**Max**	**Typ**
A	0.280	0.320	0.300
A1	0.00	0.020	0.010
b	0.220	0.260	0.240
D	0.575	0.625	0.600
E	0.275	0.325	0.300
e	-	-	0.400
L	0.120	0.160	0.140
All Dimensions in mm			

Suggested Pad Layout

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

X2-DSN0603-2



Dimensions	Value (in mm)
G	0.206
X	0.194
Y	0.291
X1	0.594

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