



LOW CAPACITANCE BIDIRECTIONAL TVS DIODE

Product Summary

V _{BR_MIN}	IPP_MAX	CIN_Max
13V	3A	0.5pF

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 and Thunderbolt 3.

Applications

- USB3.1
- Thunderbolt 3
- Computers and Peripheral

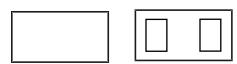
Features

- Provides ESD Protection per IEC 61000-4-2 Standard: Air ±14kV, Contact ±14kV
- 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 <u>contact us</u> or your local Diodes representative. https://www.diodes.com/quality/product-definitions/

Mechanical Data

- Package: X2-DSN0603-2
- Package Material: Chip Scale Package
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: NiAu Bump. Solderable per MIL-STD-202, Method 208 [™]
- Weight: 0.0002 grams (Approximate)

X2-DSN0603-2



Top View Bottom View



Device Schematic

Ordering Information (Note 4)

Part Number	Compliance	Package	Marking	Reel Size (inches)	Reel Size (inches) Tape Width (mm)		Packing	
Fart Number Compi	Compliance	ompliance Fackage	wai Kilig	Reel Size (Iliches)	rape widin (ililii)	Qty.	Carrier	
D12V0X1B2CSP-7	Standard	X2-DSN0603-2	NN	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 http://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



NN = Product Type Marking Code
Bar = Pin1 Direction



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

Characteristic	Symbol	Value	Unit	Condition
Peak Pulse Power Dissipation	Ppp	78	W	8/20µs, per Figure 3
Peak Pulse Current	lpp	3	Α	8/20µs, per Figure 3
ESD Protection – Air Discharge	Vesd_air	±14	kV	IEC61000-4-2 Standard
ESD Protection – Contact Discharge	VESD_CONTACT	±14	kV	IEC61000-4-2 Standard

Thermal Characteristics

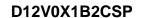
Characteristic	Symbol	Value	Unit
Package Power Dissipation (Note 5)	P_{D}	250	mW
Thermal Resistance, Junction to Ambient (Note 5)	R _θ JA	500	°C/W
Operating and Storage Temperature Range	TJ, TSTG	-65 to +150	°C

Electrical Characteristics (@TA = +25°C, unless otherwise specified.)

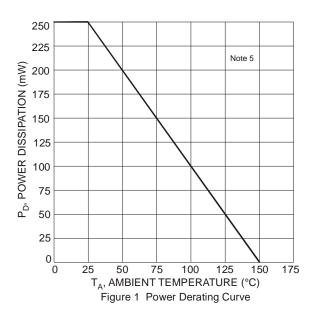
Characteristic	Symbol	Min	Тур.	Max	Unit	Test Conditions	
Reverse Standoff Voltage	VRWM	_	_	12	V	_	
Channel Leakage Current (Note 6)	I _{RM}	_	0.01	1	μА	V _{RWM} = 12V	
		_	_	20		I _{PP} = 1A, t _P = 8/20µs	
Clamping Voltage	VcL	_	_	26	V	$I_{PP} = 3A, t_P = 8/20 \mu s$	
		_	34	_		ITLP = 16A, t _P =100ns	
Dynamic Resistance	R _{DYN}	_	1	_	Ω	I _{TLP} = 4A to 16A, t _P = 100ns	
Breakdown Voltage	V _{BR}	13	15	18	V	I _R = 1mA	
Channel Input Capacitance	Cin	_	_	0.5	pF	V _R = 0V, f = 1MHz	

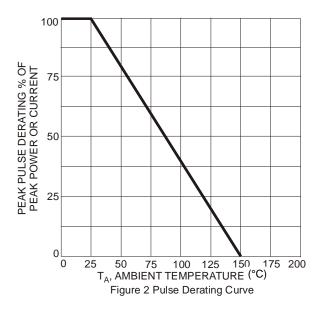
Notes:

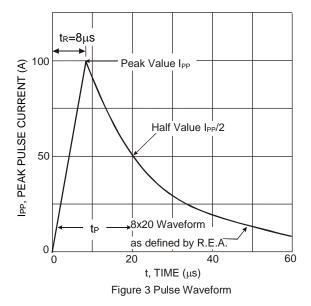
^{5.} Device mounted on FR-4 PCB pad layout (2oz copper) as shown on Diodes Incorporated's suggested pad layout, which can be found on our website at http://www.diodes.com/package-outlines.html.6. Short duration pulse test used to minimize self-heating effect.

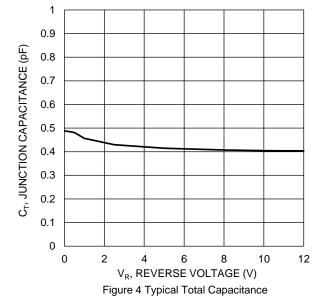




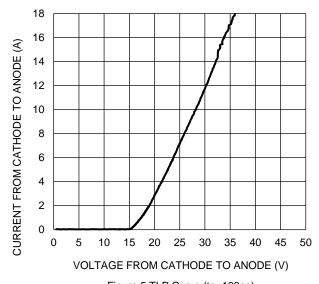












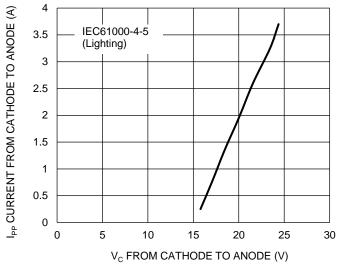
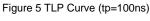


Figure 6 Clamping Voltage Characteristic (Surge)



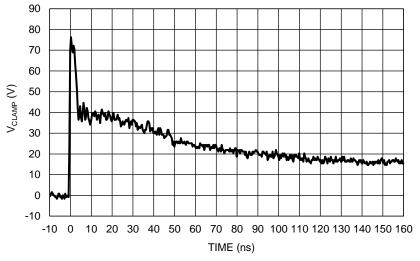


Figure 7 ESD Clamping Voltage of IEC61000-4-2 8kV Contact Mode

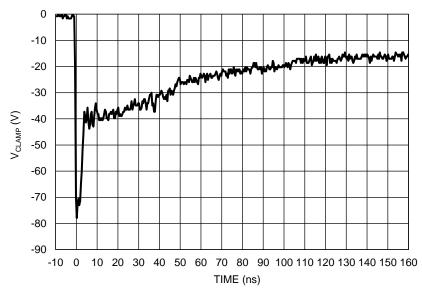


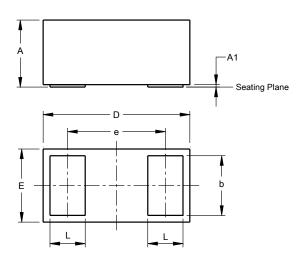
Figure 8 ESD Clamping Voltage of IEC61000-4-2 8kV Contact Mode



Package Outline Dimensions (Note 7)

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

X2-DSN0603-2



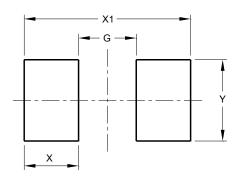
X2-DSN0603-2					
Dim	Min	Max	Тур		
Α	0.280	0.320	0.300		
A1	0.00	0.020	0.010		
b	0.220	0.260	0.240		
D	0.575	0.625	0.600		
E	0.275	0.325	0.300		
е	-	-	0.400		
L	0.120	0.160	0.140		
All Dimensions in mm					

Note 7: Device side walls are electrically active bare silicon. Avoid contact of solder or flux on the side walls during the PCB assembly process.

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
Х	0.194
Y	0.291
¥1	0 594



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