

**LOW CAPACITANCE BIDIRECTIONAL TVS DIODE**
**Product Summary**

<b>V<sub>BR</sub> min</b>	<b>I<sub>PP</sub> max</b>	<b>C<sub>IN</sub> typ</b>
3.8V	4A	6pF

**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 cellular phones, digital cameras, and MP3 players.

**Applications**

- Cellular Handsets
- Portable Electronics
- Computers and Peripherals

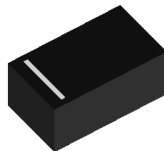
**Features**

- Provides ESD Protection per IEC 61000-4-2 Standard: Air ±16kV, 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)**

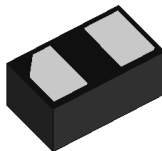
**Mechanical Data**

- Case: X3-ESN0603-2
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: NiAu Bump. Solderable per MIL-STD-202, Method 208 <sup>Ⓔ</sup>
- Weight: 0.001 grams (Approximate)

X3-ESN0603-2



Top View



Bottom View



Device Schematic

**Ordering Information** (Note 4)

Part Number	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
D3V3Q1B2DLP3-7	Standard	CD	7	8	10,000/Tape & Reel

- Notes:
1. No purposely added lead. Fully EU Directive 2002/95/EC (RoHS) & 2011/65/EU (RoHS 2) compliant.
  2. See [http://www.diodes.com/quality/lead\\_free.html](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.
  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 <http://www.diodes.com/products/packages.html>.

**Marking Information**


CD = Product Type Marking Code  
Line Denotes Pin 1

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

Characteristic	Symbol	Value	Unit	Conditions
Peak Pulse Power Dissipation	P <sub>PP</sub>	30	W	8/20μs, per Figure 3
Peak Pulse Current	I <sub>PP</sub>	4	A	8/20μs, per Figure 3
ESD Protection – Contact Discharge	V <sub>ESD_Contact</sub>	±14	kV	IEC 61000-4-2 Standard
ESD Protection – Air Discharge	V <sub>ESD_Air</sub>	±16	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>	-65 to +150	°C

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Conditions
Reverse Standoff Voltage	V <sub>RWM</sub>	—	—	3.3	V	—
Channel Leakage Current (Note 6)	I <sub>RM</sub>	—	1	50	nA	V <sub>RWM</sub> = 3.3V
Clamping Voltage, Positive Transients	V <sub>CL</sub>	—	—	5.5	V	I <sub>PP</sub> = 1A, t <sub>p</sub> = 8/20μs
		—	—	6.5		I <sub>PP</sub> = 3A, t <sub>p</sub> = 8/20μs
		—	—	7.5		I <sub>PP</sub> = 4A, t <sub>p</sub> = 8/20μs
Breakdown Voltage	V <sub>BR</sub>	3.8	—	6.5	V	I <sub>R</sub> = 1mA
Differential Resistance	R <sub>DIF</sub>	—	0.4	—	Ω	TLP, 10A, t <sub>p</sub> = 100ns
Channel Input Capacitance	C <sub>IN</sub>	—	6	9	pF	V <sub>R</sub> = 0V, f = 1MHz

Notes: 5. Device mounted on FR-4 PCB pad layout (2oz copper) as shown on Diodes, Inc. suggested pad layout AP02001, which can be found on our website at <http://www.diodes.com>.  
6. Short duration pulse test used to minimize self-heating effect.

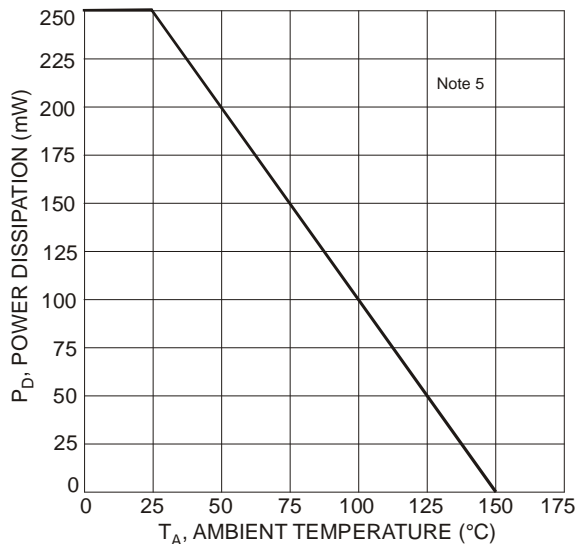


Figure 1 Power Derating Curve

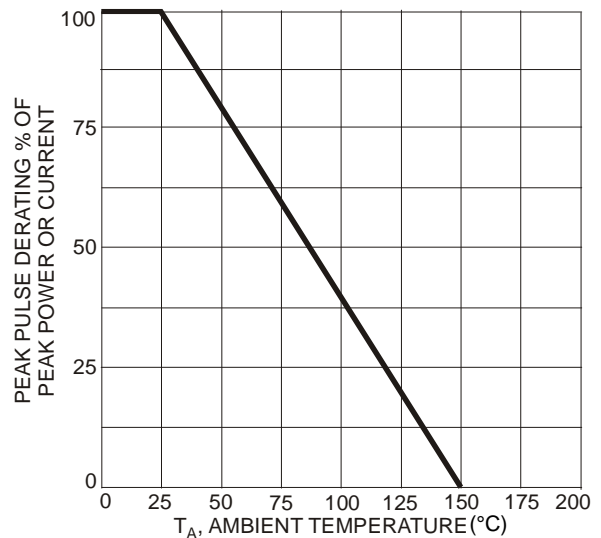
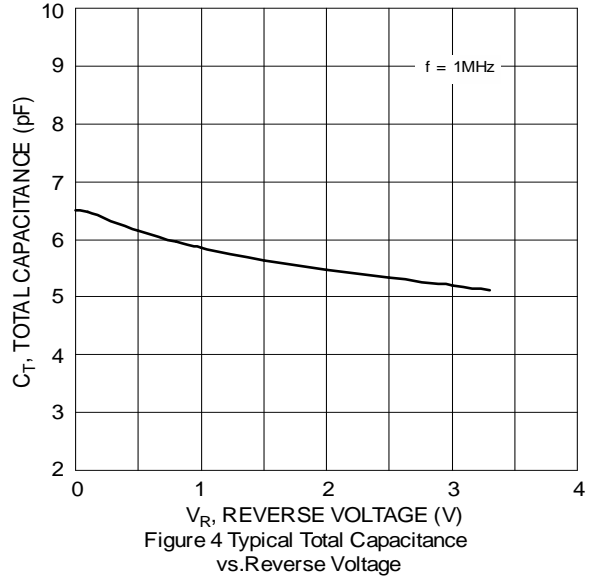
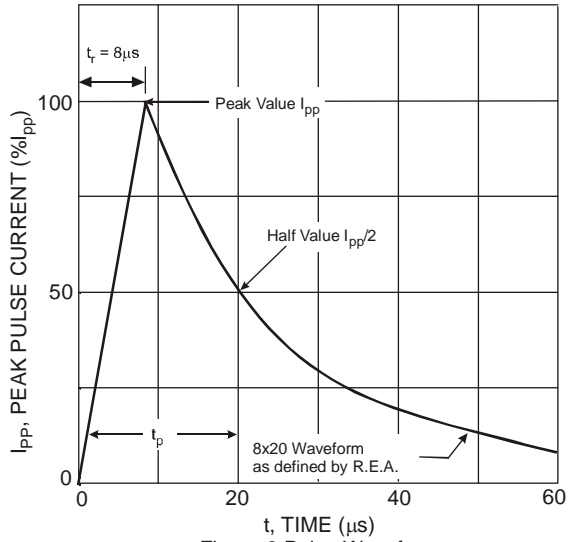


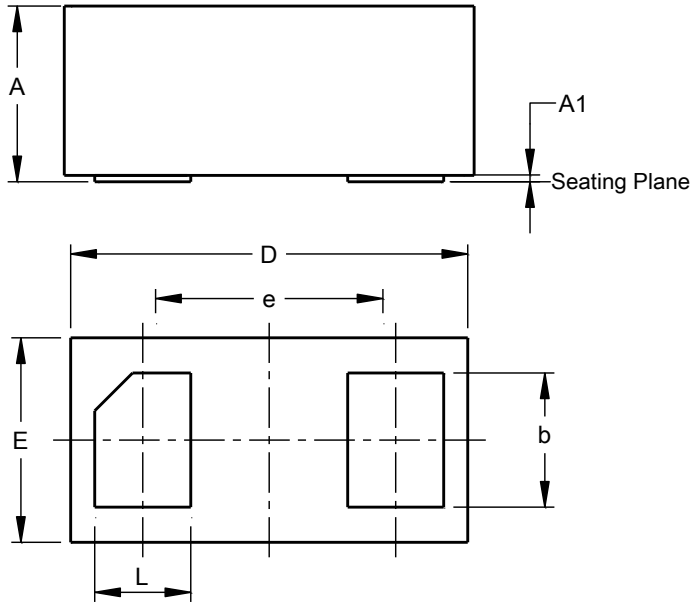
Figure 2 Pulse Derating Curve



**Package Outline Dimensions**

Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.

**X3-ESN0603-2 (Type B)**

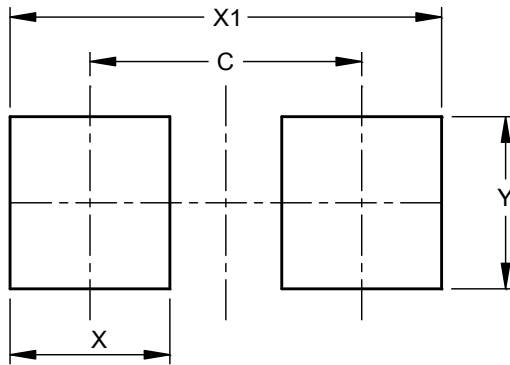


X3-ESN0603-2 (Type B)			
Dim	Min	Max	Typ
A	0.250	0.300	0.275
A1	0.00	0.02	0.01
b	0.16	0.26	0.21
D	0.595	0.645	0.620
E	0.295	0.345	0.320
e	--	--	0.355
L	0.10	0.20	0.15
All Dimensions in mm			

**Suggested Pad Layout**

Please see AP02001 at <http://www.diodes.com/datasheets/ap02001.pdf> for the latest version.

**X3-ESN0603-2 (Type B)**



Dimensions	Value (in mm)
C	0.425
X	0.250
X1	0.675
Y	0.270

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