

## Product Summary

V <sub>BR</sub> (min)	I <sub>PP</sub> (max)	C <sub>T</sub> (typ)
6V	2A	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 cellular phones, digital cameras and MP3 players.

## Applications

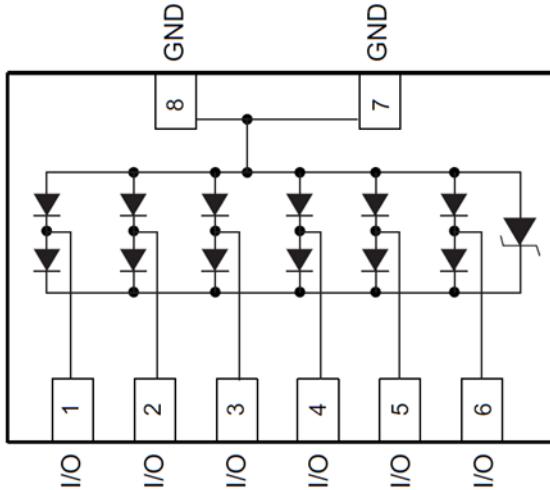
- Cellular Handsets
- Portable Electronics
- Computers and Peripheral

## Features

- Ultra Low Profile Package (0.42mm max) and Small PCB Footprint Area (3.38mm x 1.38mm max) Suitable for Compact Portable Electronics
- Provides ESD Protection per IEC 61000-4-2 Standard: Air  $\pm 15\text{kV}$ , Contact  $\pm 12\text{kV}$
- 6 Channels 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: X1-DFN3313-8
- 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 208 @4
- Weight: TBD grams (Approximate)



Pin Description (Top View)

## Ordering Information (Note 4)

Product	Compliance	Marking	Reel size(inches)	Tape width(mm)	Quantity per reel
D5V0F6U8LP33-7	Standard	TG7	7	8	3000/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



TG7 = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: B = 2014)  
 M = Month (ex: 9 = September)

### Date Code Key

Year	2014	2015	2016	2017	2018	2019	2020					
Code	B	C	D	E	F	G	H					
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	O	N	D

## Maximum Ratings (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Characteristic	Symbol	Value	Unit	Conditions
Peak Pulse Current	$I_{PP}$	2.0	A	8/20 $\mu\text{s}$ (Note 7)
ESD Protection – Contact Discharge	$V_{ESD\_Contact}$	$\pm 12$	kV	Standard IEC 61000-4-2
ESD Protection – Air Discharge	$V_{ESD\_Air}$	$\pm 15$	kV	Standard IEC 61000-4-2

## Thermal Characteristics

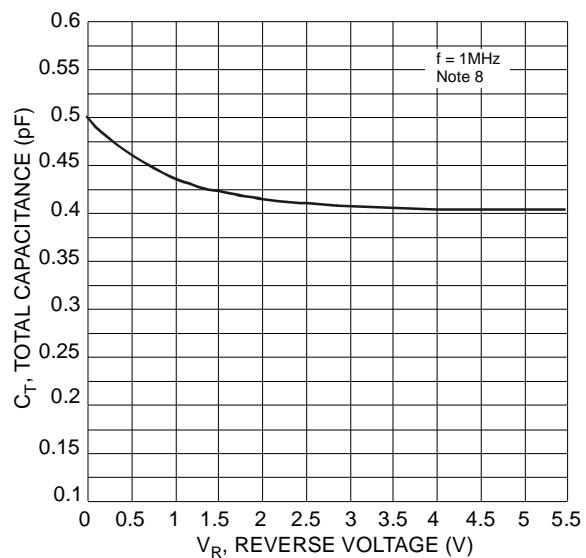
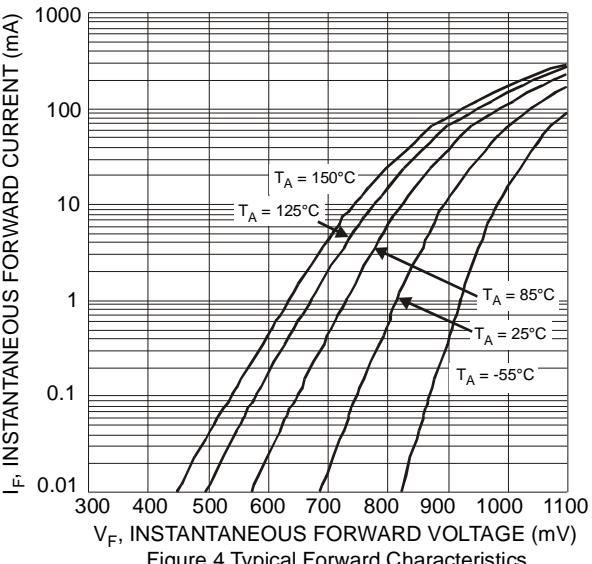
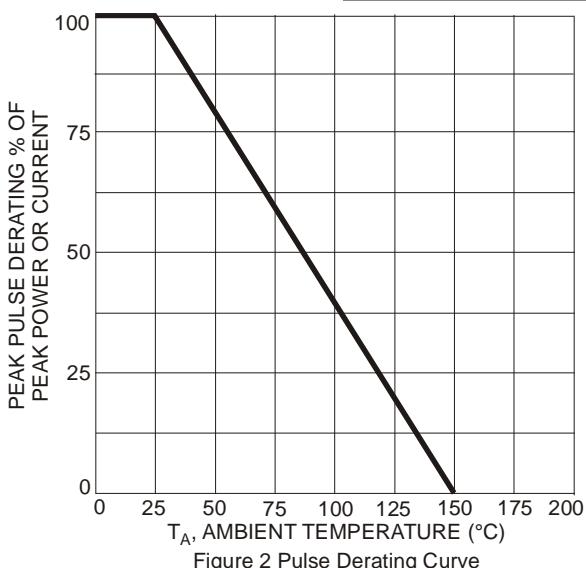
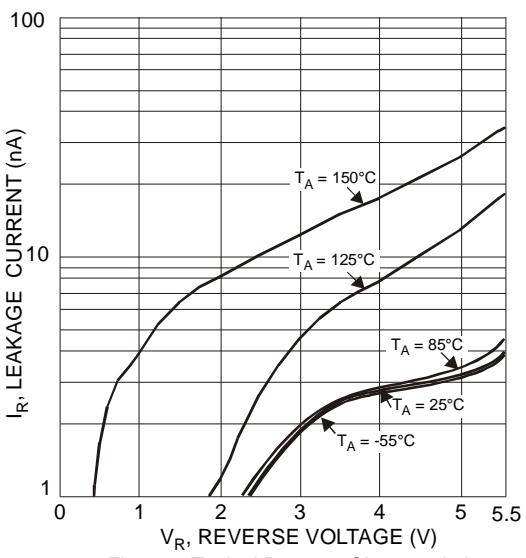
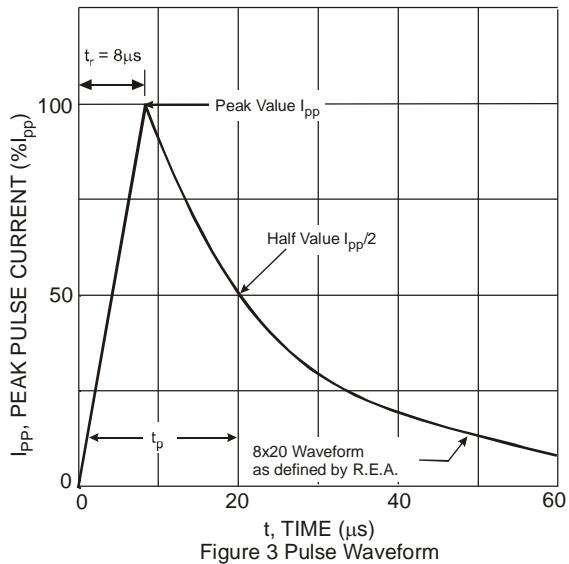
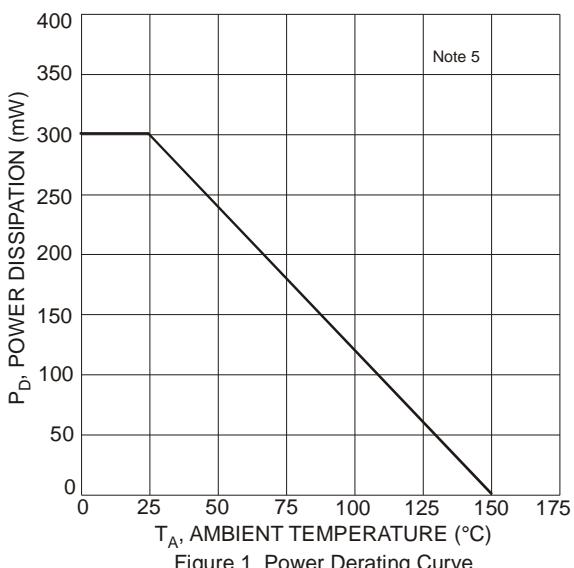
Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	$P_D$	300	mW
Thermal Resistance, Junction to Ambient $T_A = +25^\circ\text{C}$	$R_{\theta JA}$	417	°C/W
Operating and Storage Temperature Range	$T_J, T_{STG}$	-55 to +150	°C

## Electrical Characteristics (@ $T_A = +25^\circ\text{C}$ , unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Conditions
Reverse Standoff Voltage	$V_{RWM}$	—	—	5.5	V	—
Channel Leakage Current (Note 6)	$I_R$	—	—	100	nA	$V_R = 5\text{V}$ , Any I/O to GND
Reverse breakdown voltage	$V_{BR}$	6.0	—	—	V	$I_R = 1\text{mA}$
Forward voltage	$V_F$	—	0.85	—	V	$I_F = 4\text{mA}$
Clamping Voltage, Positive Transients (Note 7)	$V_C$	—	9.5	11.5	V	$I_{PP} = 1\text{A}$ , $t_p = 8/20\mu\text{s}$
		—	10.5	12.5		$I_{PP} = 2\text{A}$ , $t_p = 8/20\mu\text{s}$
Channel Input Capacitance (Note 8)	$C_T$	—	0.5	—	pF	$V_R = 0\text{V}$ , $f = 1\text{MHz}$ , Any I/O to GND
		—	0.4	0.65		$V_R = 2.5\text{V}$ , $f = 1\text{MHz}$ , Any I/O to GND
Dynamic Resistance	$R_{DYN}$	—	0.9	—	Ω	$I_{PP} = 1\text{A}$ , $t_p = 8/20\mu\text{s}$

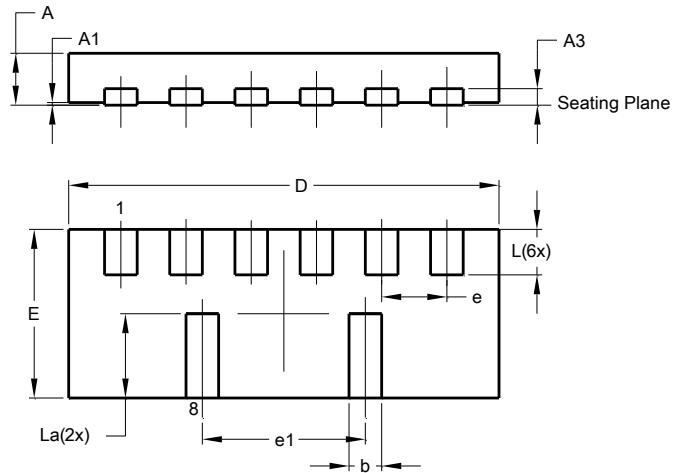
Notes:

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.
7. Clamping voltage value is based on an 8x20 $\mu\text{s}$  peak pulse current ( $I_{PP}$ ) waveform.
8. Measured from any I/O to GND.
9. For information on the impact of Diodes' 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](http://www.diodes.com/destools/appnote_dnote.html).



## Package Outline Dimensions

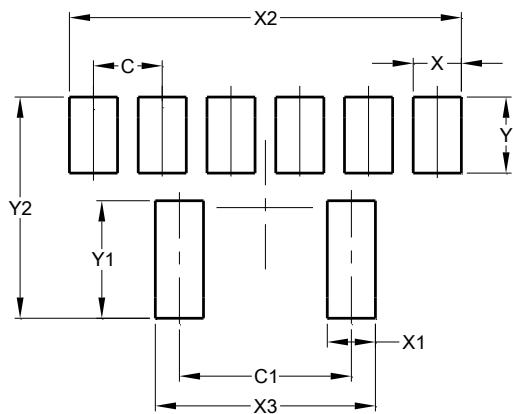
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for the latest version.



X1-DFN3313-8			
Dim	Min	Max	Typ
<b>A</b>	0.37	0.43	0.40
<b>A1</b>	0	0.05	0.02
<b>A2</b>	-	-	0.13
<b>b</b>	0.20	0.30	0.25
<b>D</b>	3.25	3.38	3.30
<b>E</b>	1.25	1.38	1.30
<b>e</b>	0.50 BSC		
<b>e1</b>	1.25 BSC		
<b>L</b>	0.30	0.43	0.38
<b>L1</b>	0.57	0.70	0.65
All Dimensions in mm			

## Suggested Pad Layout

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



Dimensions	Value (in mm)
<b>C</b>	0.500
<b>C1</b>	1.250
<b>X</b>	0.350
<b>X1</b>	0.350
<b>X2</b>	2.850
<b>X3</b>	1.600
<b>Y</b>	0.550
<b>Y1</b>	0.850
<b>Y2</b>	1.600

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