

## Product Summary

V <sub>BR</sub> (min)	I <sub>PP</sub> (max)	I <sub>R</sub> (max)
5.8V and 11V	9A	25nA

## 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

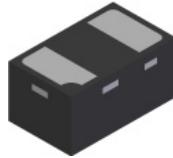
## Features

- Low Profile Package (0.53mm max) and Ultra-small PCB Footprint Area (1.08 \* 0.68mm max) Suitable for Compact Portable Electronics
- Provides ESD Protection per IEC 61000-4-2 Standard: Air  $\pm 30kV$ , Contact  $\pm 30kV$
- 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: X1-DFN1006-2
- 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 **e4**
- Weight: 0.001 grams (approximate)

X1-DFN1006-2



Bottom View



Device Schematic

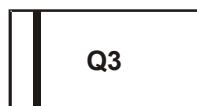
## Ordering Information (Note 4)

Product	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
DESDALC5LP-7B	Standard	Q3	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



Q3 = Product Type Marking Code  
Line Denotes Pin 1

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

Characteristic	Symbol	Value	Unit	Conditions
Peak Pulse Power Dissipation	$P_{PP}$	150	W	8/20 $\mu\text{s}$
Peak Pulse Current	$I_{PP}$	9	A	8/20 $\mu\text{s}$
ESD Protection – Contact Discharge	$V_{ESD\_Contact}$	$\pm 30$	kV	IEC 61000-4-2 Standard
ESD Protection – Air Discharge	$V_{ESD\_Air}$	$\pm 30$	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	$T_J, T_{STG}$	-65 to +150	°C

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Conditions
Reverse Breakdown Voltage	$V_{BR}$	11	13	17	V	$I_R = 1\text{mA}$ , pin1 to pin2
		5.8	8	11		$I_R = 1\text{mA}$ , pin2 to pin1
Reverse Current (Note 6)	$I_R$	—	—	25	nA	$V_R = 5\text{V}$
Dynamic Resistance, from Pin 1 to Pin 2	$R_{DYN}$	—	0.19	—	Ω	$I_{TLP} = 1\text{A}$ to $20\text{A}$ , $t_p = 100\text{ns}$
Dynamic Resistance, from Pin 2 to Pin 1	$R_{DYN}$	—	0.19	—	Ω	$I_{TLP} = 1\text{A}$ to $20\text{A}$ , $t_p = 100\text{ns}$
Capacitance	$C_T$	—	26	30	pF	$V_R = 0\text{V}$ , $f = 1\text{MHz}$
Clamping Voltage, from Pin 1 to Pin 2	$V_{CL}$	—	21	—	V	8kV contact discharge after 30ns IEC61000-4-2
Clamping Voltage, from Pin 2 to Pin 1	$V_{CL}$	—	12	—	V	8kV contact discharge after 30ns IEC61000-4-2

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.

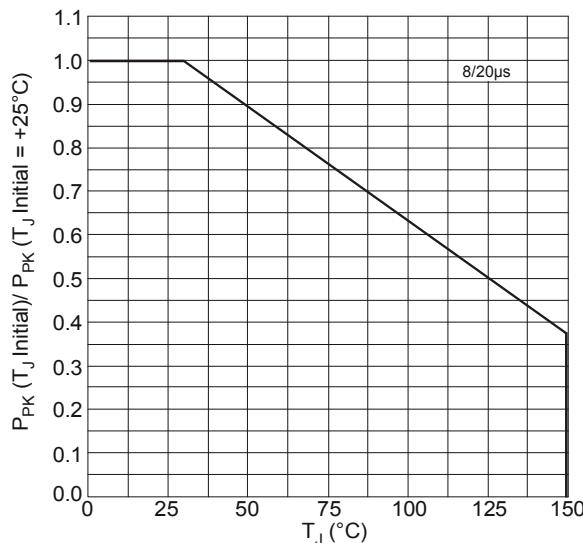


Figure 1 Normalized Peak Pulse Power vs.  
Initial Junction Temperature

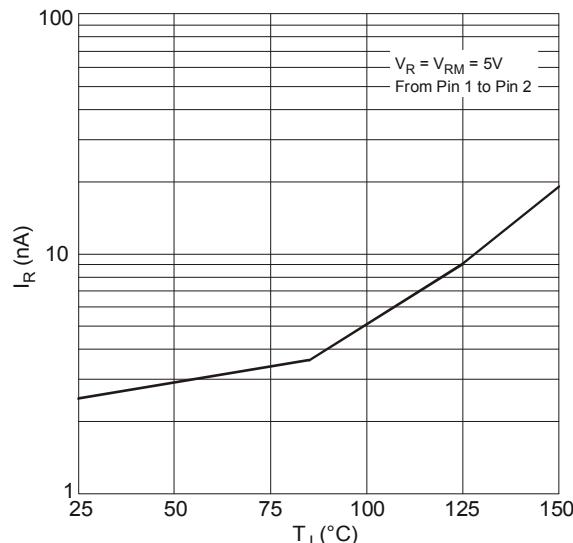
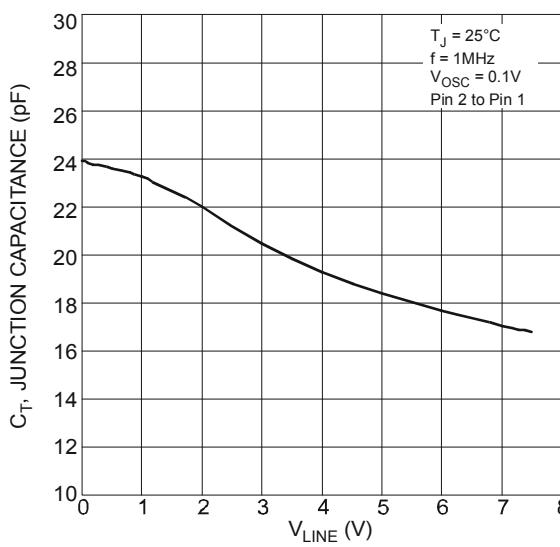
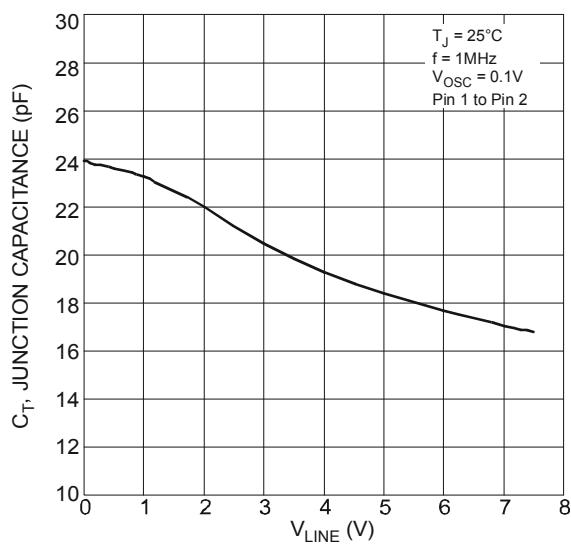
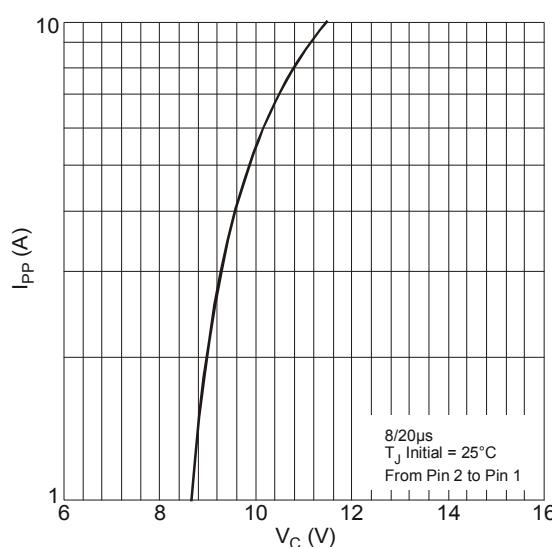
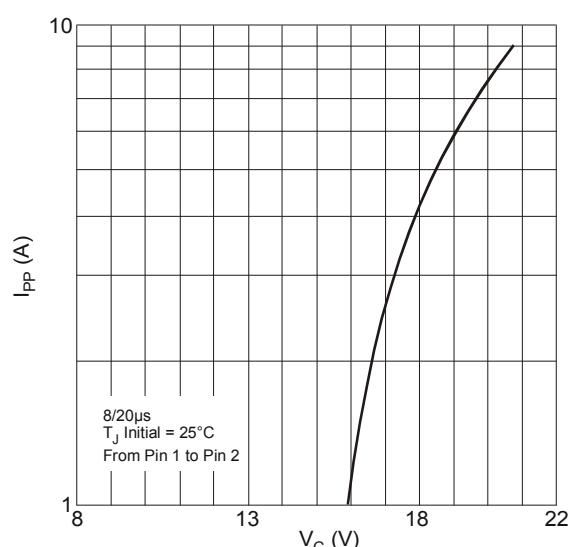
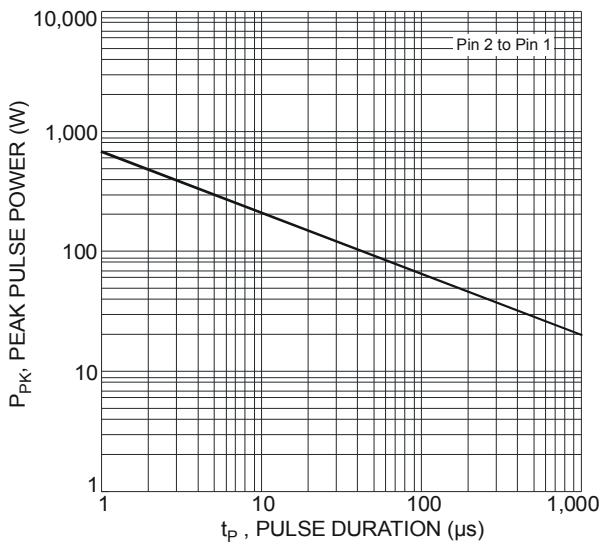
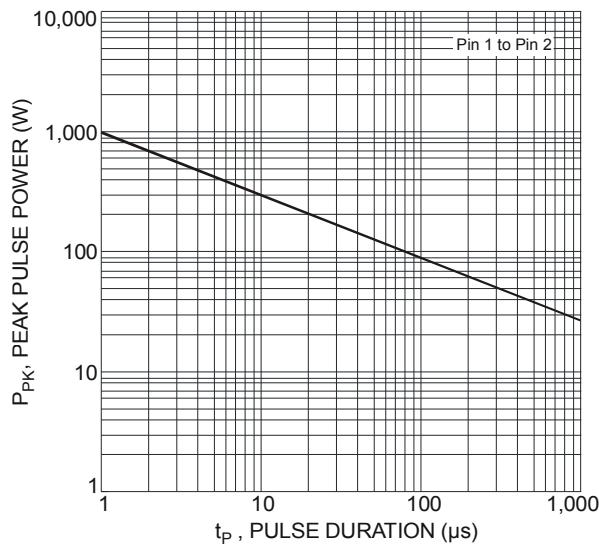


Figure 2 Leakage Current vs. Junction Temperature  
(Typical Values)



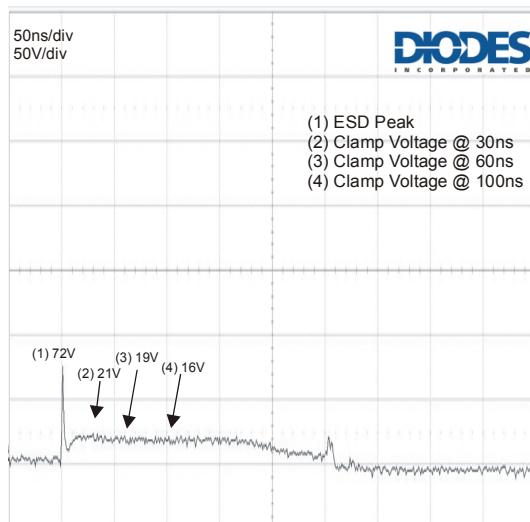


Figure 9 ESD Response to IEC 6100-4-2  
(+8kV Contact Discharge)

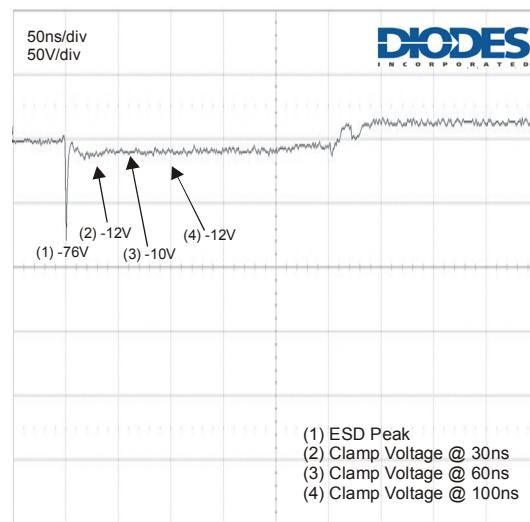


Figure 10 ESD Response to IEC 6100-4-2  
(-8kV Contact Discharge)

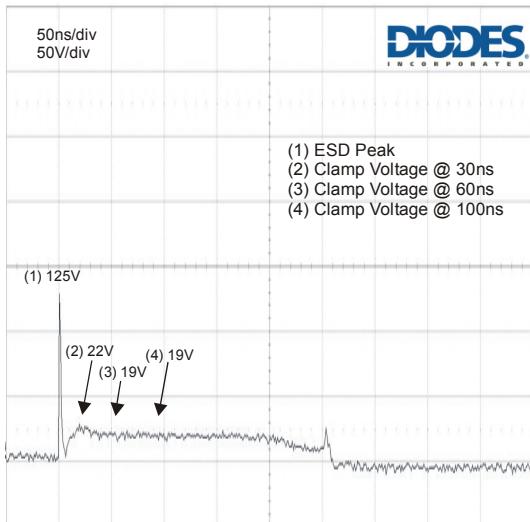


Figure 11 ESD Response to IEC 6100-4-2  
(+15kV Contact Discharge)

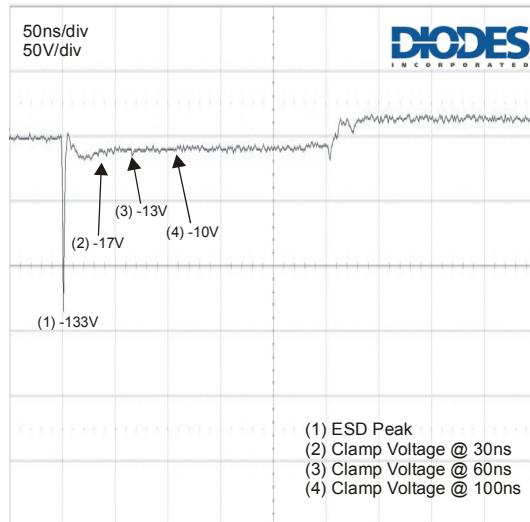


Figure 12 ESD Response to IEC 6100-4-2  
(-15kV Contact Discharge)

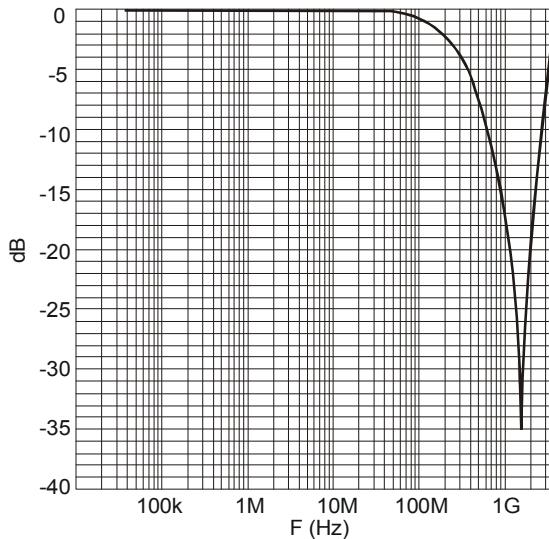


Figure 13 S21 Attenuation Measurement Result

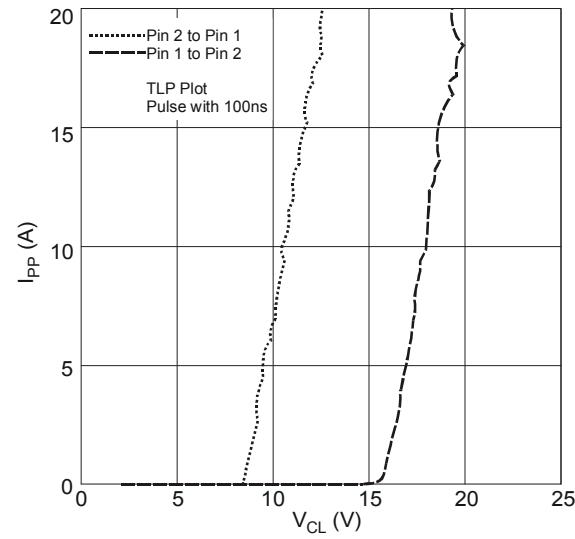
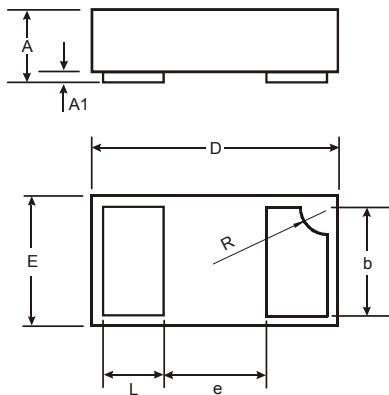


Figure 14 TLP Measurement

## Package Outline Dimensions

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

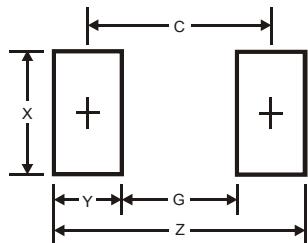


X1-DFN1006-2			
Dim	Min	Max	Typ
<b>A</b>	0.47	0.53	0.50
<b>A1</b>	0	0.05	0.03
<b>b</b>	0.45	0.55	0.50
<b>D</b>	0.95	1.075	1.00
<b>E</b>	0.55	0.675	0.60
<b>e</b>	-	-	0.40
<b>L</b>	0.20	0.30	0.25
<b>R</b>	0.05	0.15	0.10

All Dimensions in mm

## Suggested Pad Layout

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



Dimensions	Value (in mm)
<b>Z</b>	1.1
<b>G</b>	0.3
<b>X</b>	0.7
<b>Y</b>	0.4
<b>C</b>	0.7

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