

**4 CHANNEL LOW CAPACITANCE TVS DIODE ARRAY**

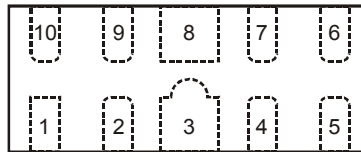
**Features**

- Clamping Voltage: 9V at 10A 100ns TLP; 9V at 6A 8µs/20µs
- IEC 61000-4-2 (ESD): Air – +20/-18kV, Contact – +20/-16kV
- IEC 61000-4-5 (Lightning): ±6A (8/20µs)
- 4 Channels of ESD protection
- Low Channel Input Capacitance of 0.5pF Typical
- TLP Dynamic Resistance: 0.25Ω
- Typically Used for High Speed Ports such as USB 2.0, DVI, HDMI, Ethernet Port, IEEE, MDDI, PCI Express, SATA/ eSATA
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. “Green” Device (Note 3)**

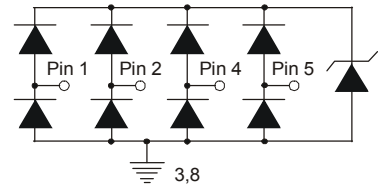
**Mechanical Data**

- Case: U-DFN2510-10
- 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 (Lead Free Plating)
- Solderable per MIL-STD-202, Method 208 (e4)
- Weight: 0.038 grams (approximate)

Pin #	Description
1, 2, 4, 5	I/O
6, 7, 9, 10	No Connection
3, 8	Vss



Pin Description (Top View)



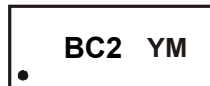
Device Schematic

**Ordering Information** (Note 4)

Product	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
DT1140-04LP-7	Standard	BC2	7	8	3,000/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**



BC2 = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: A = 2013)  
 M = Month (ex: 9 = September)

Date Code Key

Year	2013	2014	2015	2016	2017	2018
Code	A	B	C	D	E	F

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, per IEC 61000-4-5	$I_{PP}$	6	A	I/O to $V_{SS}$ , 8/20 $\mu\text{s}$
Peak Pulse Power, per IEC 61000-4-5	$P_{PP}$	60	W	I/O to $V_{SS}$ , 8/20 $\mu\text{s}$
Operating Voltage (DC)	$V_{DC}$	6	V	I/O to $V_{SS}$
ESD Protection – Contact Discharge, per IEC 61000-4-2	$V_{ESD\_Contact}$	+20/-16	kV	I/O to $V_{SS}$
ESD Protection – Air Discharge, per IEC 61000-4-2	$V_{ESD\_Air}$	+20/-18	kV	I/O to $V_{SS}$
Operating Temperature	$T_{OP}$	-55 to +85	$^\circ\text{C}$	—
Storage Temperature	$T_{STG}$	-55 to +150	$^\circ\text{C}$	—

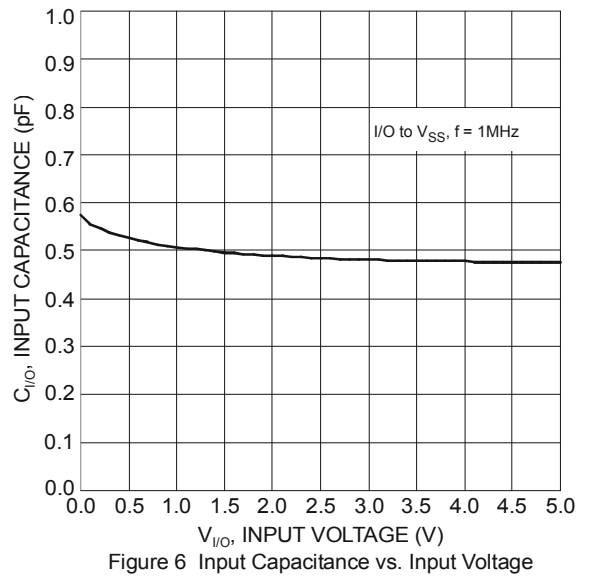
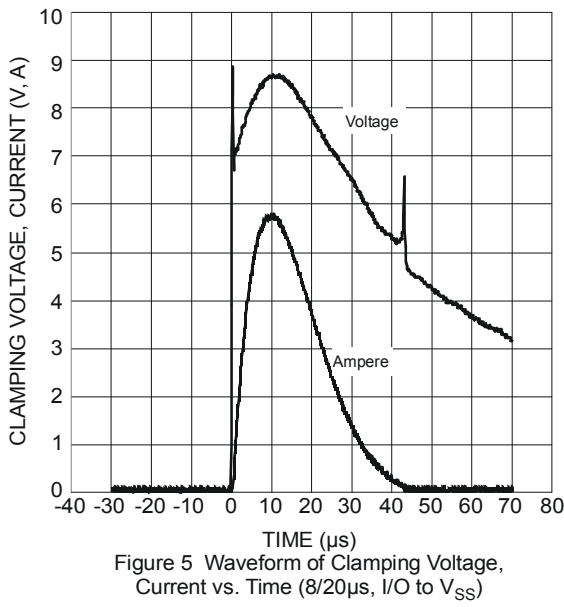
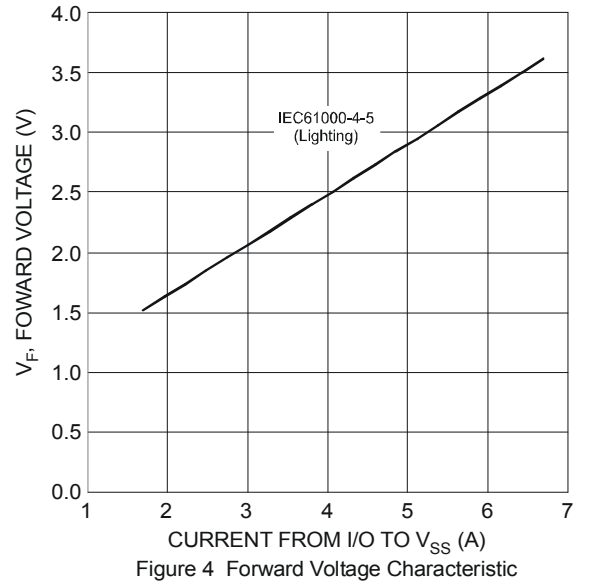
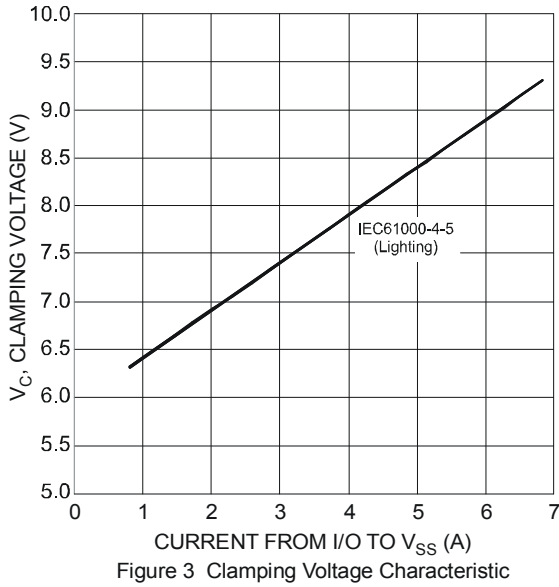
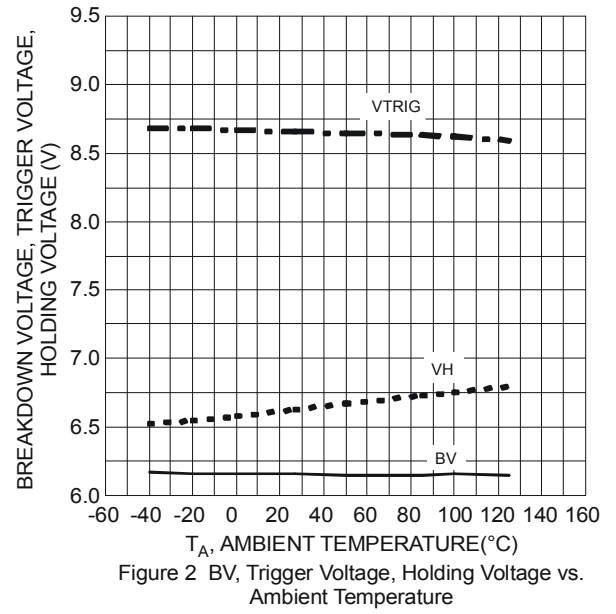
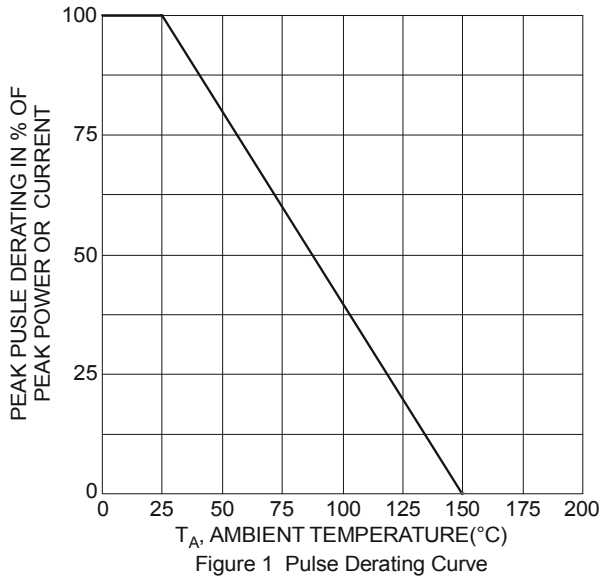
**Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Power Dissipation Typical(Note 5)	$P_D$	350	mW
Thermal Resistance, Junction to Ambient Typical(Note 5)	$R_{\theta JA}$	360	$^\circ\text{C/W}$

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Conditions
Reverse Working Voltage	$V_{RWM}$	—	—	5.5	V	$I_R = 1\text{mA}$ , I/O to $V_{SS}$
Reverse Current (Note 6)	$I_R$	—	—	0.5	$\mu\text{A}$	$V_R = 5\text{V}$ , I/O to $V_{SS}$
Reverse Breakdown Voltage	$V_{BR}$	6	—	—	V	$I_R = 1\text{mA}$ , I/O to $V_{SS}$
Forward Clamping Voltage	$V_F$	-1.0	-0.85	—	V	$I_F = -15\text{mA}$ , I/O to $V_{SS}$
Holding Voltage	$V_H$	5.5	—	—	V	—
Reverse Clamping Voltage (Note 7)	$V_C$	—	6.4	—	V	$I_{PP} = 1\text{A}$ , I/O to $V_{SS}$ , 8/20 $\mu\text{s}$
Reverse Clamping Voltage (Note 7)	$V_C$	—	9	10	V	$I_{PP} = 6\text{A}$ , I/O to $V_{SS}$ , 8/20 $\mu\text{s}$
Trigger Voltage	$V_{TRIG}$	—	—	9.5	V	—
ESD Clamping Voltage	$V_{ESD}$	—	9	—	V	TLP, 10A, $t_p = 100\text{ ns}$ , I/O to $V_{SS}$
Dynamic Reverse Resistance	$R_{DIF-R}$	—	0.25	—	$\Omega$	TLP, 10A, $t_p = 100\text{ ns}$ , I/O to $V_{SS}$
Dynamic Forward Resistance	$R_{DIF-F}$	—	0.25	—	$\Omega$	TLP, 10A, $t_p = 100\text{ ns}$ , $V_{SS}$ to I/O
Channel Input Capacitance	$C_{I/O}$	—	0.5	0.65	pF	$V_{I/O} = 2.5\text{V}$ , $V_{SS} = 0\text{V}$ , $f = 1\text{MHz}$

- Notes:
- 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>.
  - Short duration pulse test used to minimize self-heating effect.
  - Clamping voltage value is based on an 8x20 $\mu\text{s}$  peak pulse current ( $I_{PP}$ ) waveform.



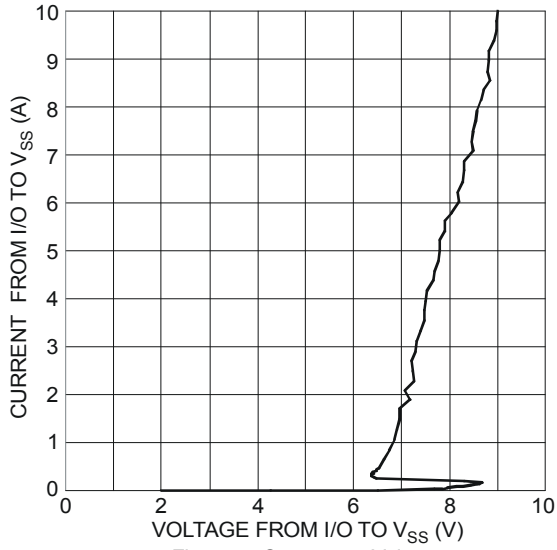
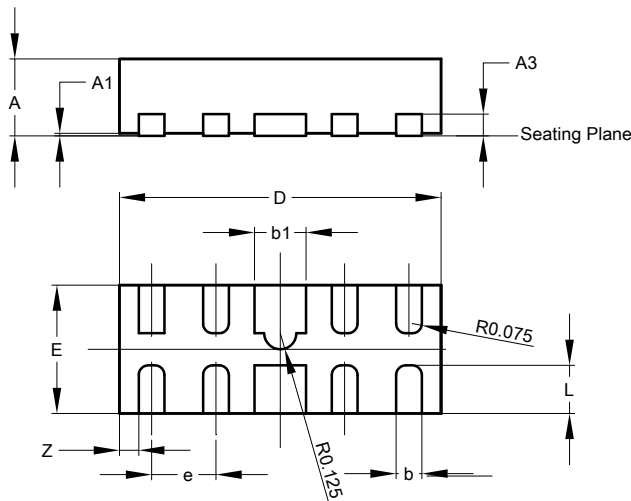


Figure 7 Current vs. Voltage

**Package Outline Dimensions**

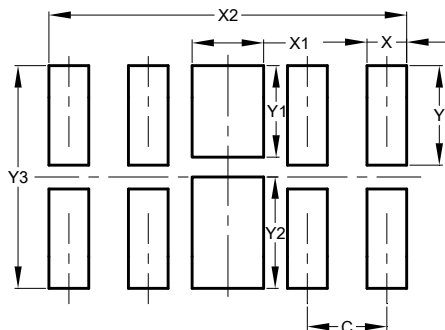
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



U-DFN2510-10			
Dim	Min	Max	Typ
A	0.545	0.605	0.575
A1	0	0.05	0.03
A3	—	—	0.13
b	0.15	0.25	0.20
b1	0.35	0.45	0.40
D	2.450	2.575	2.500
e	—	—	0.50
E	0.950	1.075	1.000
L	0.325	0.425	0.375
Z	-	-	0.150
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)
C	0.500
X	0.250
X1	0.450
X2	2.250
Y	0.625
Y1	0.575
Y2	0.700
Y3	1.400

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