


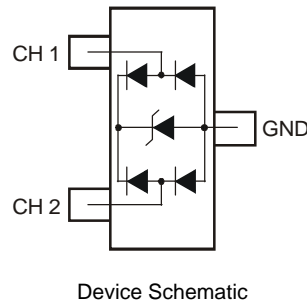
**2 CHANNEL LOW CAPACITANCE TVS DIODE ARRAY**

**Features**

- IEC 61000-4-2 (ESD): Air ±15kV, Contact ±8kV
- 2 Channels of ESD Protection
- Low Channel Input Capacitance of 0.85pF Typical
- Typically Used at High Speed Ports such as USB 2.0, IEEE1394, Serial ATA, DVI, HDMI, PCI
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**
- **Qualified to AEC-Q101 Standards for High Reliability**

**Mechanical Data**

- Case: SOT23
- Case Material: Molded Plastic, "Green" Molding Compound. UL Flammability Classification Rating 94V-0
- Moisture Sensitivity: Level 1 per J-STD-020
- Terminals: Matte Tin Finish annealed over Alloy 42 leadframe (Lead Free Plating). Solderable per MIL-STD-202, Method 208 
- Weight: 0.009 grams (Approximate)

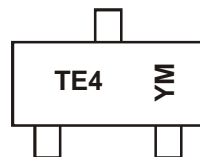


**Ordering Information** (Note 4)

Part Number	Case	Packaging
D1213A-02SOL-7	SOT23	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> 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>.

**Marking Information**



TE4 = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: Z = 2012)  
 M = Month (ex: 9 = September)

Date Code Key

Year	2011	2012	2013	2014	2015	2016	2017
Code	Y	Z	A	B	C	D	E

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 (Note 7)	$I_{PP}$	5	A	8/20 $\mu\text{s}$ , Per Figure 3
ESD Protection – Contact Discharge	$V_{ESD\_Contact}$	$\pm 8$	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
Package Power Dissipation (Note 5)	$P_D$	300	mW
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	417	$^\circ\text{C/W}$
Operating and Storage Temperature Range	$T_J, T_{STG}$	-65 to +150	$^\circ\text{C}$

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

Characteristic (Note 7)	Symbol	Min	Typ	Max	Unit	Test Conditions
Reverse working voltage	$V_{RWM}$	—	—	3.3	V	—
Reverse current (Note 6)	$I_R$	—	0.1	1.0	$\mu\text{A}$	$V_R = V_{RWM} = 3.3\text{V}$
Reverse breakdown voltage	$V_{BR}$	6.0	—	—	V	$I_R = 1\text{mA}$
Forward voltage	$V_F$	0.6	0.8	0.95	V	$I_F = 8\text{mA}$
Reverse clamping voltage, Positive Transients	$V_{CL1}$	—	10.0	—	V	$I_{PP} = 1\text{A}, t_p = 8/20\mu\text{s}$
Reverse clamping voltage, Negative Transients	$V_{CL2}$	—	-1.7	—	V	$I_{PP} = -1\text{A}, t_p = 8/20\mu\text{s}$
Dynamic resistance	$R_{DYN}$	—	0.9	—	$\Omega$	$I_R = 1\text{A}, t_p = 8/20\mu\text{s}$
Capacitance	$C_T$	—	0.85	1.2	pF	$V_R = 1.65\text{V}, f = 1\text{MHz}$

- 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.
  - Measured between any channel and GND.
  - 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/destdtools/appnote\\_dnote.html](http://www.diodes.com/destdtools/appnote_dnote.html).

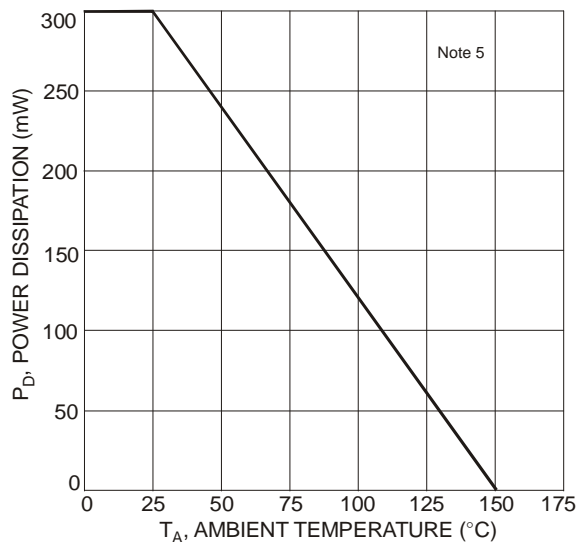


Figure 1 Power Derating Curve

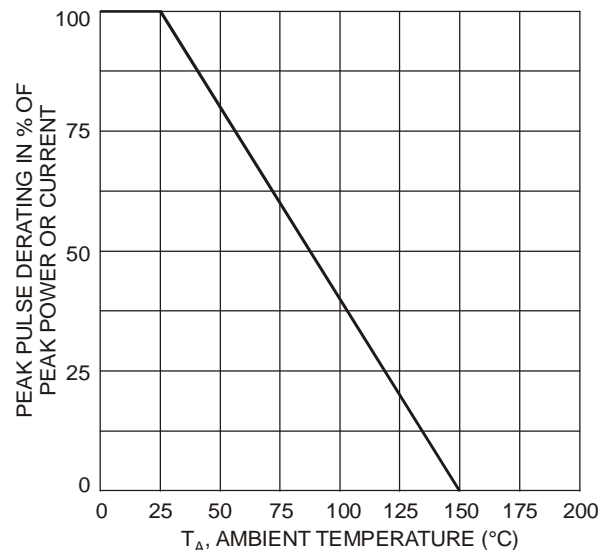


Figure 2 Pulse Derating Curve

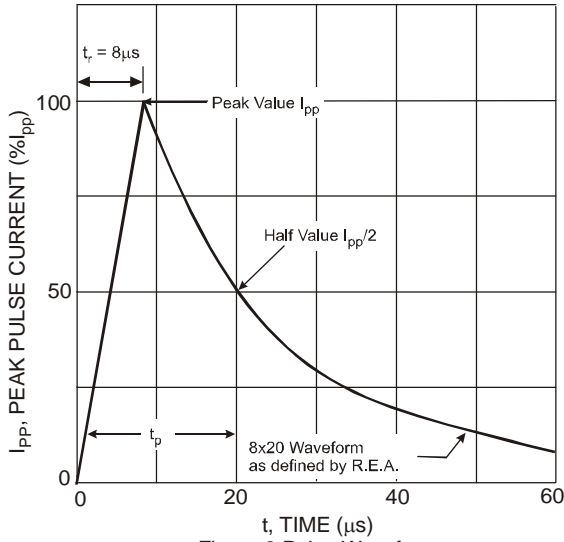


Figure 3 Pulse Waveform

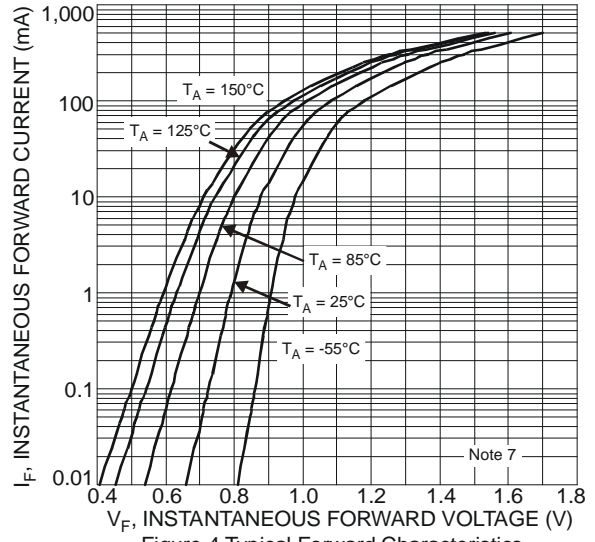


Figure 4 Typical Forward Characteristics

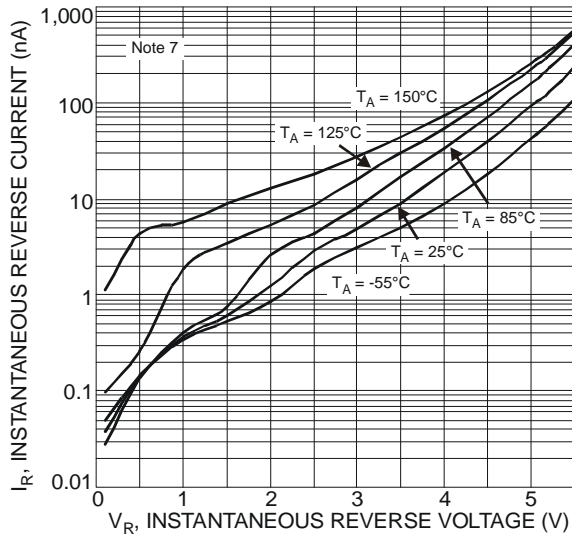


Figure 5 Typical Reverse Characteristics

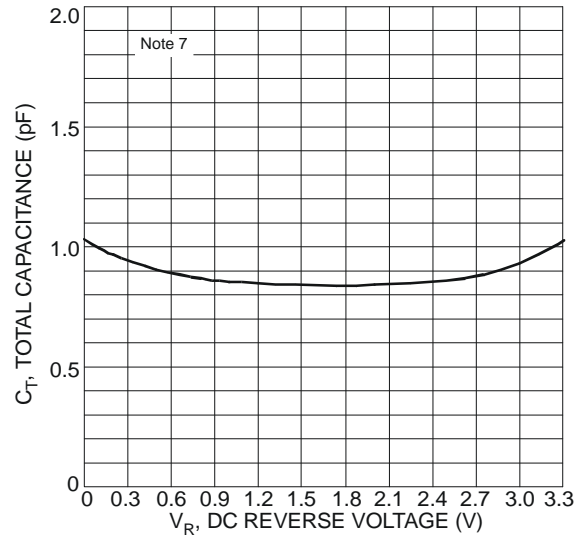
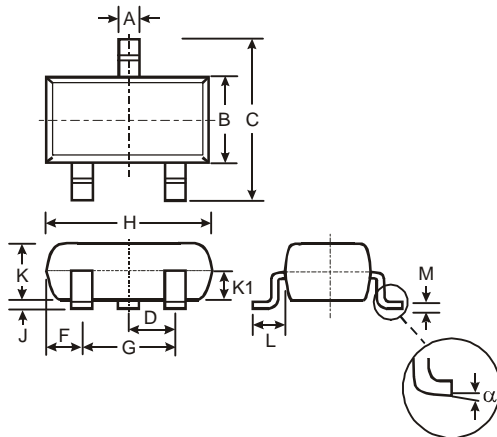


Figure 6 Total Capacitance vs. Reverse Voltage

## Package Outline Dimensions

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

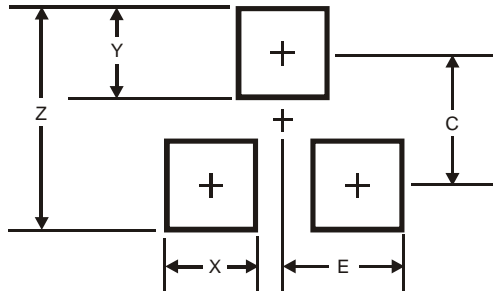


SOT23			
Dim	Min	Max	Typ
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.903	1.10	1.00
K1	-	-	0.400
L	0.45	0.61	0.55
M	0.085	0.18	0.11
α	0°	8°	-

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)
Z	2.9
X	0.8
Y	0.9
C	2.0
E	1.35

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