



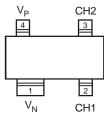
#### 2 CHANNEL LOW CAPACITANCE TVS DIODE ARRAY

#### **Features**

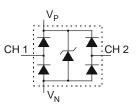
- IEC 61000-4-2 (ESD): Air ±15kV, Contact ±8kV
- 2 Channels of ESD Protection
- Low Channel Input Capacitance of 0.85pF Typical
- Typically Used at High Speed Ports such as USB 2.0, IEEE1394, Serial ATA, DVI, HDMI, PCI
- Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)
- Halogen and Antimony Free.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

#### **Mechanical Data**

- Case: SOT143
- 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 63
- Weight: 0.009 grams (approximate)







**Device Schematic** 

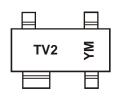
## Ordering Information (Note 4)

Part Number	Case	Packaging
D1213A-02SR-7	SOT143	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 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**



TV2 = Product Type Marking Code YM = Date Code Marking Y = Year (ex: Z = 2012) M = Month (ex: 9 = September)

Date Code Key

Year	201	1	2012		2013	20	14	2015		2016	2	2017
Code	Υ		Z		Α	-	3	С		D		Е
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Code	1	2	3	4	5	6	7	8	9	0	N	D



#### Maximum Ratings @TA = 25°C unless otherwise specified

Characteristic	Symbol	Value	Unit	Conditions
Operating Supply Voltage	$V_P - V_N$	6.0	V	-
DC Voltage at any Channel Input	-	$(V_N - 0.5)$ to $(V_P + 0.5)$	V	-
Peak Pulse Current	I <sub>PP</sub>	5	Α	8/20 μs, Per Fig. 2
ESD Protection – Contact Discharge	V <sub>ESD_Contact</sub>	±8	kV	Standard IEC 61000-4-2
ESD Protection – Air Discharge	$V_{ESD\_Air}$	±15	kV	Standard IEC 61000-4-2

#### **Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P <sub>D</sub>	400	mW
Thermal Resistance, Junction to Ambient (Note 5)	$R_{ heta JA}$	310	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-65 to +150	°C

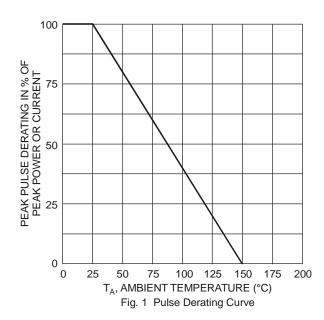
# Electrical Characteristics @T<sub>A</sub> = 25°C unless otherwise specified

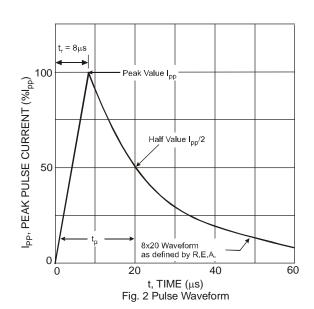
Characteristic	Symbol	Min	Тур	Max	Unit	Test Conditions
Operating Supply Voltage	V <sub>P</sub>	-	3.3	5.5	V	-
Operating Supply Current (Note 6)	lρ	-	-	8.0	μΑ	$(V_P - V_N) = 3.3V$
Channel Leakage Current (Note 6)	I <sub>R</sub>	-	±0.1	±1.0	μΑ	$V_P = 5V, V_N = 0V$
Reverse breakdown voltage	$V_{BR}$	6.0	-	-	V	$I_R = 1 \text{mA}$
Clamping Voltage, Positive Transients	V <sub>CL1</sub>	-	10.0	-	V	$I_{PP} = 1A, t_p = 8/20 \mu s$
Clamping Voltage, Negative Transients	V <sub>CL2</sub>	-	-1.7	-	V	$I_{PP} = -1A, t_p = 8/20 \mu s$
Forward Voltage for Top Diode	V <sub>FD1</sub>	0.60	0.80	0.95	V	$I_F = 8mA$ , CH1 to $V_P$ or CH2 to $V_P$
Forward Voltage for Bottom Diode	V <sub>FD2</sub>	0.60	0.80	0.95	V	$I_F = 8mA$ , $V_N$ to CH1 or $V_N$ to CH2
Dynamic Resistance	R <sub>DYN</sub>	-	0.9	-	Ω	$I_{PP} = 1A, t_p = 8/20 \mu s$
Channel Input Capacitance	Ст	-	0.85	1.2	pF	$V_{IN} = 1.65V, V_P = 3.3V,$ $V_N = 0V, f = 1MHz$

Notes:

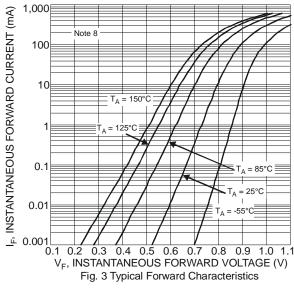
- 5. Device mounted on FR-4 PCB pad layout (2oz copper) as shown on Diodes, Inc. suggested pad layout AP02001, which can be found on our website at http://www.diodes.com.
  6. Short duration pulse test used to minimize self-heating effect.
  7. Measured from CH1 to VN or CH2 to VN.

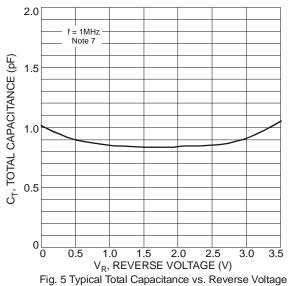
- 8. Measured from VP to VN.

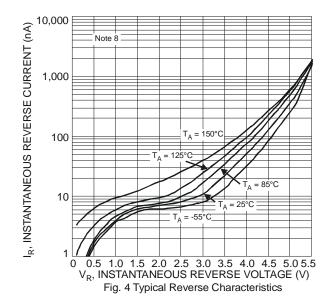




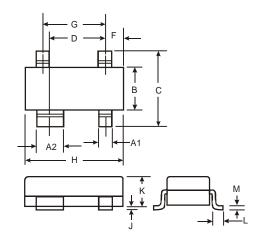








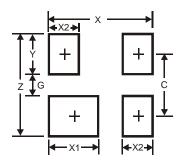
# **Package Outline Dimensions**



	SOT143							
Dim	Min	Max	Тур					
A1	0.37	0.51	0.400					
A2	0.77	0.93	0.800					
В	1.20	1.40	1.30					
С	2.28	2.48	2.38					
D	1.58	1.83	1.72					
F	0.45	0.60	0.49					
G	1.78	2.03	1.92					
Н	2.80	3.00	2.90					
J	0.013	1.00	0.05					
K	0.89	1.00	-					
L	0.46	0.60	0.50					
М	0.085	0.18	0.11					
All	All Dimensions in mm							



### **Suggested Pad Layout**



Dimensions	Value (in mm)
Z	2.70
G	1.30
Х	2.50
X1	1.0
X2	0.60
Y	0.70
С	2.0

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