



**THE DATASHEET OF  
DT1452-02SO-7**



**2 CHANNEL LOW CAPACITANCE TVS DIODE ARRAY**
**Features**

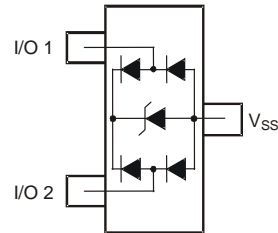
- IEC 61000-4-2 (ESD): Air – ±16kV, Contact – ±16kV
- IEC 61000-4-4 (EFT) Additional Level, 55A (5/50ns)
- IEC 61000-4-5 (Lightning): 12A (8/20µs)
- 2 Channels of ESD protection
- Low Channel Input Capacitance of 1.2pF Typical
- Typically Used at High Speed Ports such as USB 2.0, IEEE1394, Serial ATA, DVI, HDMI, PCI
- **Totally Lead-free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

**Mechanical Data**

- Case: 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 (3)
- Weight: 0.009 grams (Approximate)



Top View

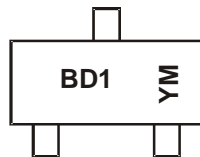


Device Schematic

**Ordering Information (Note 4)**

Product	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
DT1452-02SO-7	Standard	BD1	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**


BD1 = Product Type Marking Code  
 YM = Date Code Marking  
 Y = Year (ex: A = 2013)  
 M = Month (ex: 5 = May)

## 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<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit	Conditions
Peak Pulse Current	I <sub>PP_I/O</sub>	12	A	I/O to V <sub>SS</sub> , 8/20μs
ESD Protection – Contact Discharge	V <sub>ESD_I/O_Contact</sub>	±16	kV	I/O to V <sub>SS</sub> , per IEC 61000-4-2
ESD Protection – Air Discharge	V <sub>ESD_I/O_Air</sub>	±16	kV	I/O to V <sub>SS</sub> , per IEC 61000-4-2

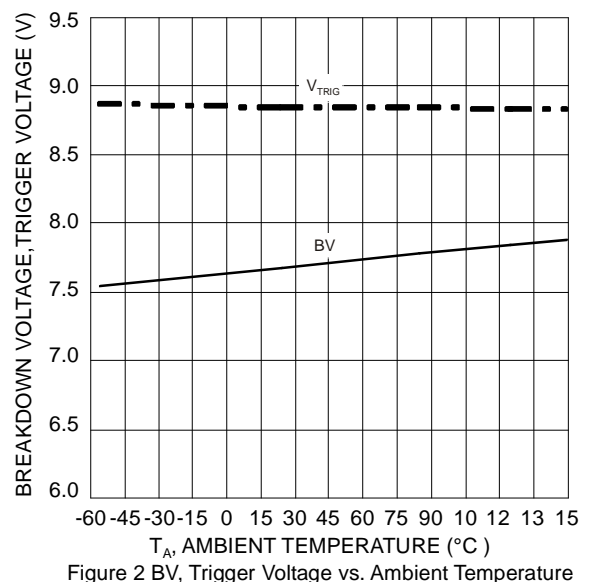
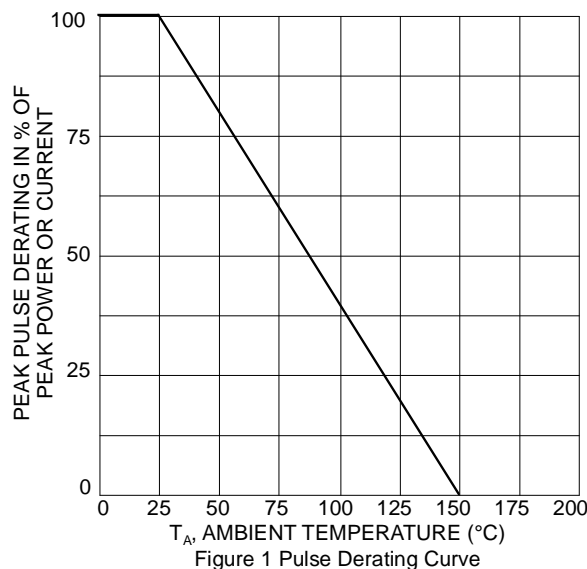
**Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P <sub>D</sub>	300	mW
Thermal Resistance, Junction to Ambient (Note 5)	R <sub>θJA</sub>	417	°C/W
Operating and Storage Temperature Range	T <sub>J</sub> , T <sub>STG</sub>	-55 to +150	°C

**Electrical Characteristics** (@T<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Conditions
Reverse Working Voltage	V <sub>RWM</sub>	—	—	5.5	V	—
Reverse Leakage Current (Note 6)	I <sub>R</sub>	—	—	1.0	μA	V <sub>R</sub> = 5V, I/O to V <sub>SS</sub>
Reverse Breakdown Voltage	V <sub>BR</sub>	7	—	10	V	I <sub>R</sub> = 1mA, I/O to V <sub>SS</sub>
Forward Voltage	V <sub>F</sub>	—	0.85	1.1	V	I <sub>F</sub> = 15mA, V <sub>SS</sub> to I/O
Reverse Clamping Voltage (Note 7)	V <sub>C</sub>	—	7.5	—	V	I <sub>PP</sub> = 5A, I/O to V <sub>SS</sub> , 8/20μs
Reverse Clamping Voltage (Note 7)	V <sub>C</sub>	—	9.5	—	V	I <sub>PP</sub> = 12A, I/O to V <sub>SS</sub> , 8/20μs
ESD Clamping Voltage	V <sub>ESD</sub>	—	11	—	V	TLP, 20A, tp = 100 ns, I/O to V <sub>SS</sub> , per Figure 7
Dynamic Resistance	R <sub>DIF</sub>	—	0.22	—	Ω	TLP, 20A, tp = 100 ns, I/O to V <sub>SS</sub> , per Figure 7
Channel Input Capacitance	C <sub>I/O</sub>	—	1.2	1.7	pF	V <sub>R</sub> = 2.5V, f = 1MHz
Variation of Channel Input Capacitance	ΔC <sub>I/O</sub>	—	0.03	—	pF	V <sub>SS</sub> = 0V, I/O = 2.5V, f = 1MHz, T = +25°C, I/O <sub>x</sub> to V <sub>SS</sub> – I/O <sub>y</sub> to V <sub>SS</sub>

- 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 8x20μs peak pulse current (I<sub>pp</sub>) waveform.



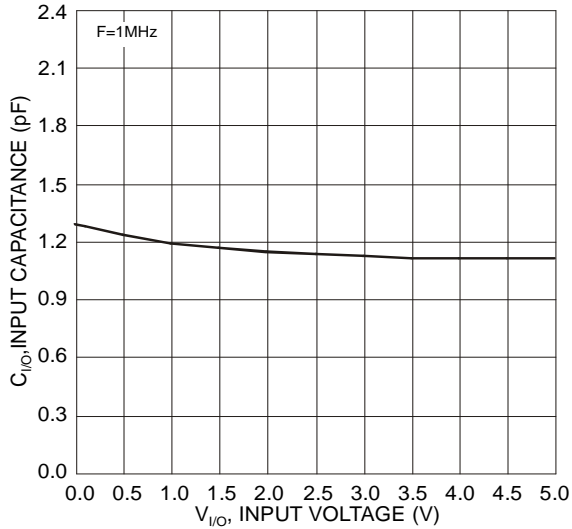


Figure 3 Input Capacitance vs. Input Voltage

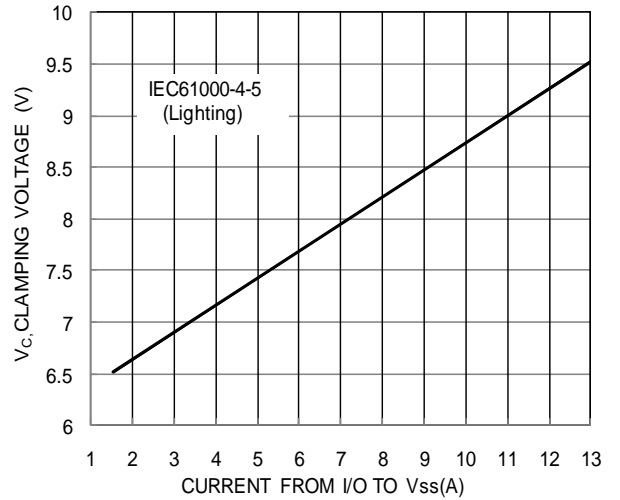


Figure 4. Clamping Voltage Characteristic

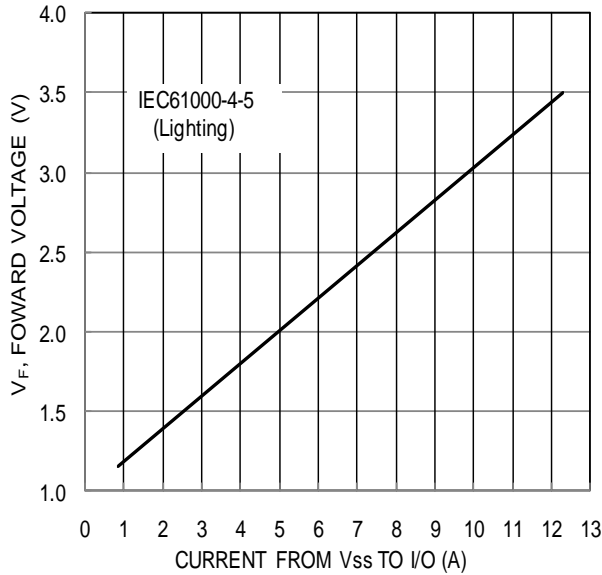


Figure 5. Forward Voltage Characteristic

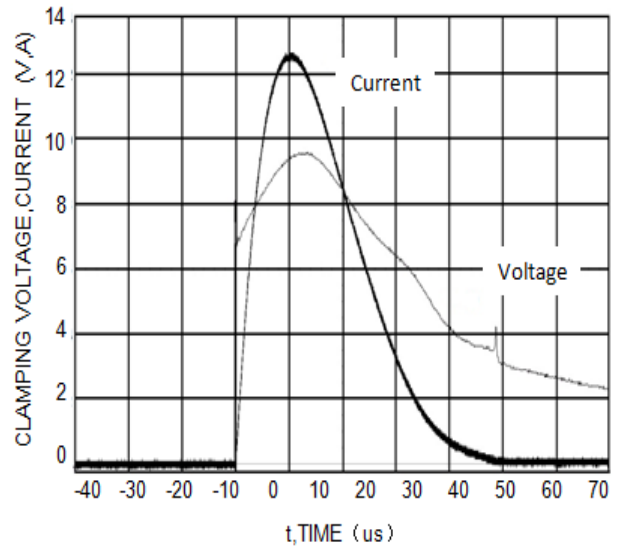


Figure 6. Waveform of Clamping Voltage, Current vs. Time(8/20us, I/O to Vss)

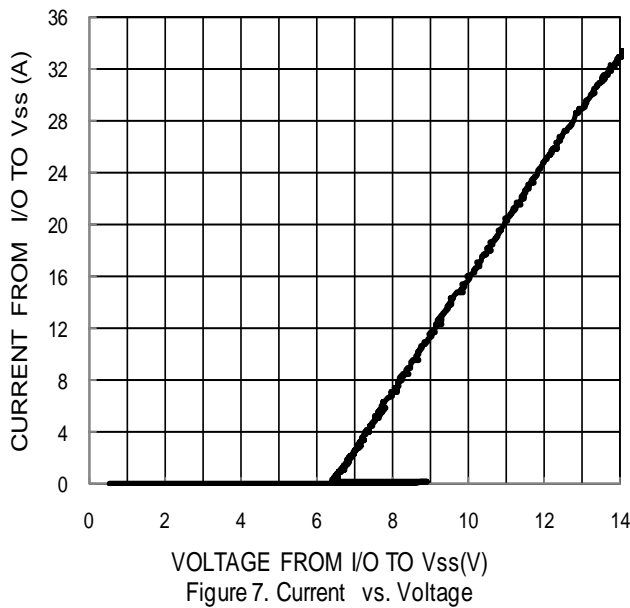
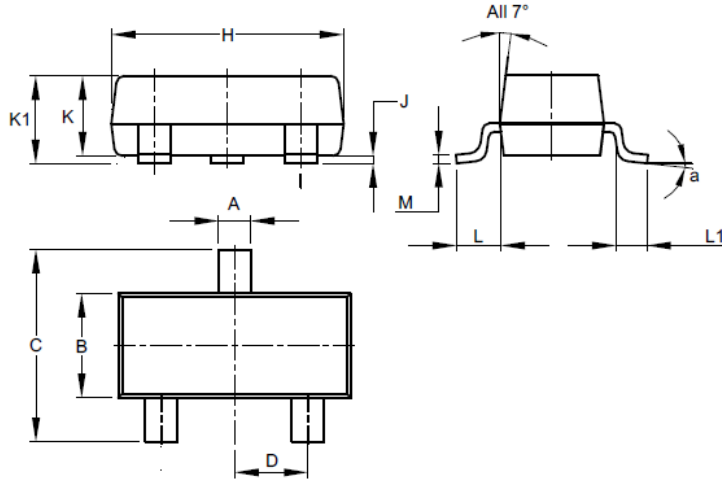


Figure 7. Current vs. Voltage

**Package Outline Dimensions**

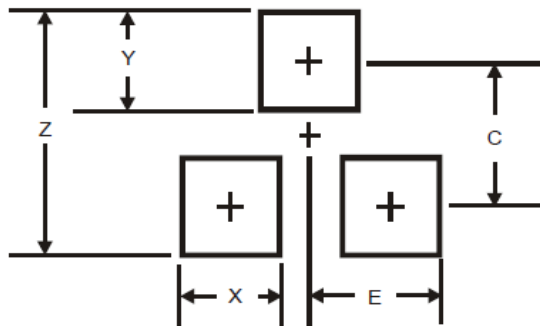
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



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	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
α	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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