



**THE DATASHEET OF  
DT1042-04SO-7**

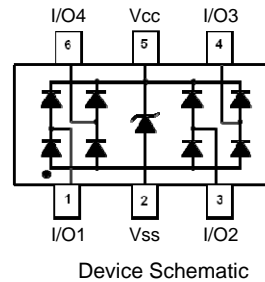


**4 CHANNEL LOW CAPACITANCE TVS DIODE ARRAY**
**Features**

- Low Clamping Voltage, I/O to V<sub>SS</sub>
- Typical 9V at 10A 100ns, TLP
- Typical 7.7V at 6A 8μs/20μs
- IEC 61000-4-2 (ESD): Air – +27/-19kV, Contact – ±16kV
- IEC 61000-4-4 (EFT): Level-4
- IEC 61000-4-5 (Lightning): ±6A
- 4 Channels of ESD protection
- Low Channel Input Capacitance of 0.65pF Typical
- TLP Dynamic Resistance: 0.25Ω
- Typically Used for High Speed Ports such as USB 2.0, IEEE1394, HDMI, Laptop and Personal Computers, Flat Panel Displays, Video Graphics Displays, SIM Ports
- **Totally Lead-Free & Fully RoHS Compliant (Notes 1 & 2)**
- **Halogen and Antimony Free. "Green" Device (Note 3)**

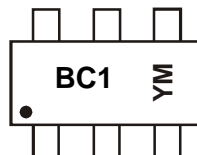
**Mechanical Data**

- Case: SOT26
- 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 Copper leadframe (Lead Free Plating). Solderable per MIL-STD-202, Method 208 **Ⓔ3**
- Weight: 0.016 grams (approximate)


**Ordering Information (Note 4)**

Product	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
DT1042-04SO-7	Standard	BC1	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**


BC1 = 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<sub>A</sub> = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit	Conditions
Peak Pulse Current, per IEC 61000-4-5	I <sub>PP_I/O</sub>	±6	A	I/O to V <sub>SS</sub> , 8/20 μs
Peak Pulse Power, per IEC 61000-4-5	P <sub>PP_I/O</sub>	55	W	I/O to V <sub>SS</sub> , 8/20 μs
Operating Voltage (DC)	V <sub>DC</sub>	5.5	V	I/O to V <sub>SS</sub>
ESD Protection – Contact Discharge, per IEC 61000-4-2	V <sub>ESD_I/O</sub>	±16	kV	I/O to V <sub>SS</sub>
ESD Protection – Air Discharge, per IEC 61000-4-2	V <sub>ESD_I/O</sub>	+27/-19	kV	I/O to V <sub>SS</sub>
Operating Temperature	T <sub>OP</sub>	-55 to +85	°C	—
Storage Temperature	T <sub>STG</sub>	-55 to +150	°C	—

**Thermal Characteristics**

Characteristic	Symbol	Value	Unit
Power Dissipation Typical (Note 5)	P <sub>D</sub>	300	mW
Thermal Resistance, Junction to Ambient Typical (Note 5)	R <sub>θJA</sub>	417	°C/W

**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>	—	—	5.0	V	V <sub>CC</sub> to V <sub>SS</sub>
Reverse Current (Note 6)	I <sub>R(VCC to VSS)</sub>	—	—	1.0	μA	V <sub>R</sub> = V <sub>RWM</sub> = 5V, V <sub>CC</sub> to V <sub>SS</sub>
Reverse Current (Note 6)	I <sub>R(I/O to VSS)</sub>	—	—	0.5	μA	V <sub>R</sub> = V <sub>RWM</sub> = 5V, any I/O to V <sub>SS</sub>
Reverse Breakdown Voltage	V <sub>BR</sub>	6.2	—	—	V	I <sub>R</sub> = 1mA, V <sub>CC</sub> to V <sub>SS</sub>
Forward Clamping Voltage	V <sub>F</sub>	-1.0	-0.8	—	V	I <sub>F</sub> = -15mA, V <sub>CC</sub> to V <sub>SS</sub>
Reverse Clamping Voltage(Note 7)	V <sub>C_VCC</sub>	—	6.3	—	V	I <sub>PP</sub> = 9A, V <sub>CC</sub> to V <sub>SS</sub> , 8/20 μs
	V <sub>C_I/O</sub>	—	7.7	9	V	I <sub>PP</sub> = 6A, I/O to V <sub>SS</sub> , 8/20 μs
ESD Clamping Voltage	V <sub>ESD_VCC</sub>	—	6.8	—	V	TLP, 10A, tp = 100 ns, V <sub>CC</sub> to V <sub>SS</sub> , per Fig. 8
	V <sub>ESD_I/O</sub>	—	9	—	V	TLP, 10A, tp = 100 ns, I/O to V <sub>SS</sub> , per Fig. 8
Dynamic Resistance	R <sub>DIF_VCC</sub>	—	0.1	—	Ω	TLP, 10A, tp = 100 ns, V <sub>CC</sub> to V <sub>SS</sub>
	R <sub>DIF_I/O</sub>	—	0.25	—	Ω	TLP, 10A, tp = 100 ns, I/O to V <sub>SS</sub>
Channel Input Capacitance	C <sub>I/O to VSS</sub>	—	0.65	0.8	pF	V <sub>R</sub> = 2.5V, V <sub>CC</sub> = 5V, f = 1MHz
Variation of Channel Input Capacitance	ΔC <sub>I/O</sub>	—	0.02	—	pF	V <sub>CC</sub> = 5V, 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 Polyimide 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.

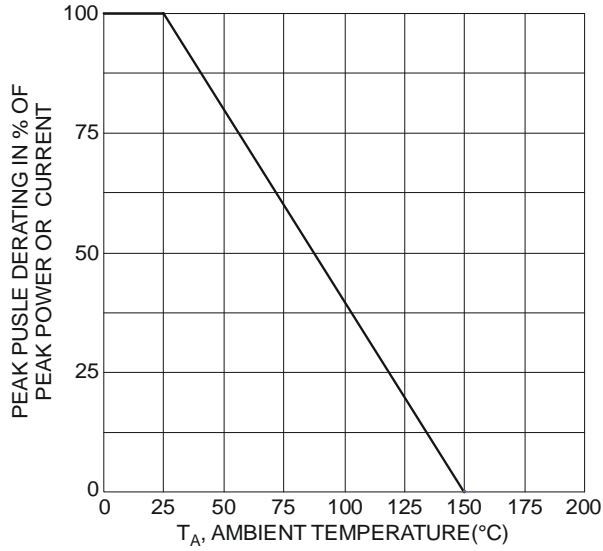


Figure 1 Pulse Derating Curve

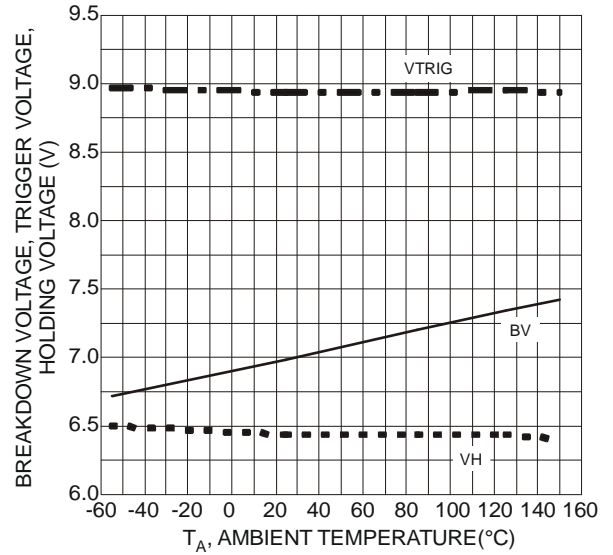


Figure 2 Breakdown Voltage, Trigger Voltage, Holding Voltage vs. Ambient Temperature

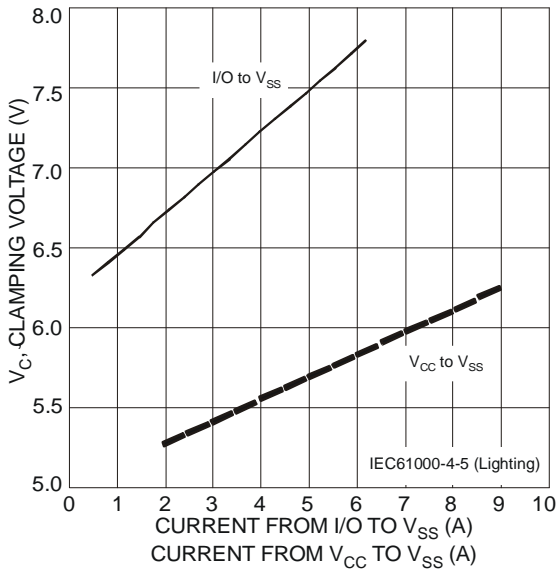


Figure 3 Clamping Voltage Characteristics

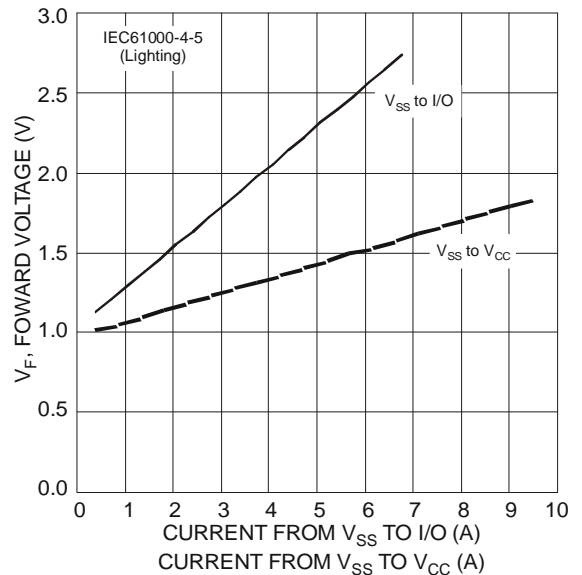


Figure 4 Forward Voltage Characteristics

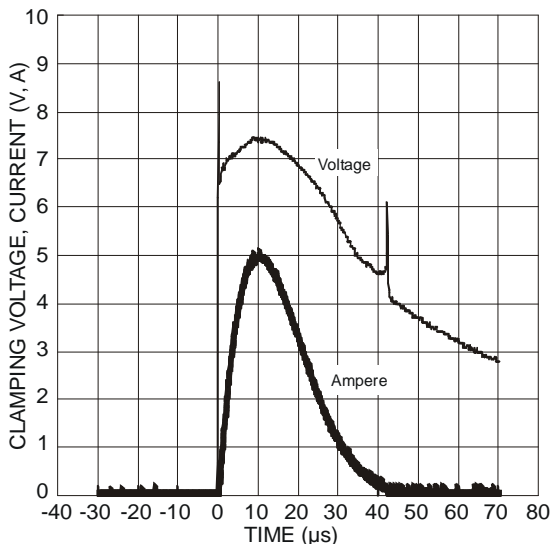


Figure 5 Waveform of Clamping Voltage, Current vs. Time (8/20µs, I/O to VSS)

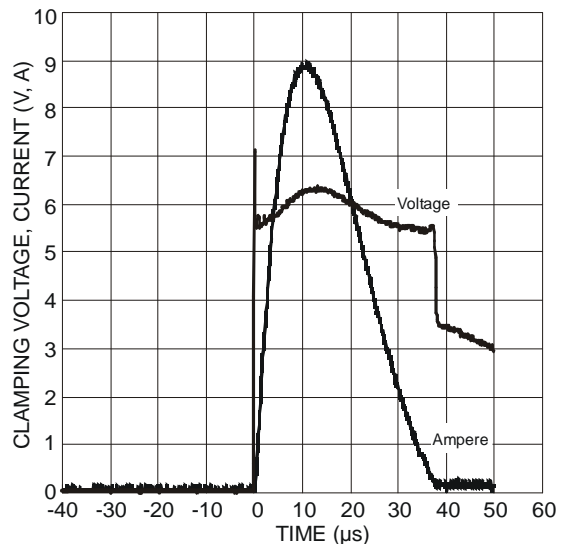


Figure 6 Waveform of Clamping Voltage, Current vs. Time (8/20µs, VCC to VSS)

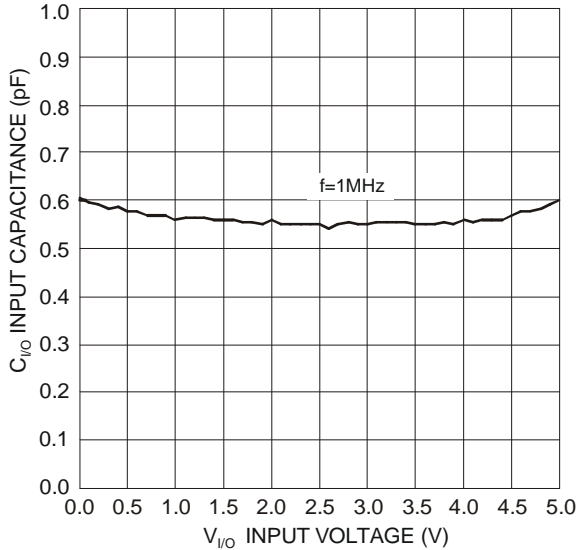


Figure 7 Input Capacitance vs. Input Voltage

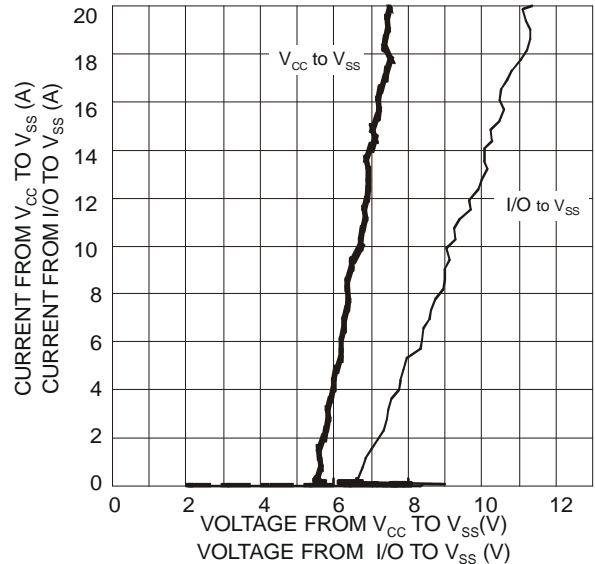
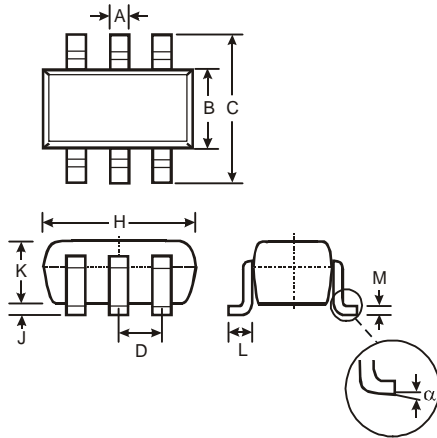


Figure 8. Current vs. Voltage

**Package Outline Dimensions**

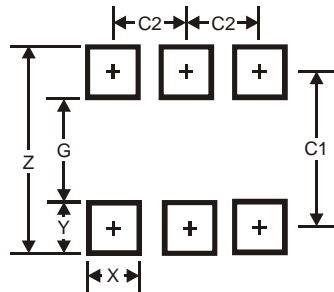
Please see AP02002 at <http://www.diodes.com/datasheets/ap02002.pdf> for latest version.



SOT26			
Dim	Min	Max	Typ
A	0.35	0.50	0.38
B	1.50	1.70	1.60
C	2.70	3.00	2.80
D	—	—	0.95
H	2.90	3.10	3.00
J	0.013	0.10	0.05
K	1.00	1.30	1.10
L	0.35	0.55	0.40
M	0.10	0.20	0.15
$\alpha$	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	3.20
G	1.60
X	0.55
Y	0.80
C1	2.40
C2	0.95

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