



DT2042-04SO

### 4 CHANNEL LOW CAPACITANCE TVS DIODE ARRAY

### **Features**

- Low Clamping Voltage
- Typical 9V at 10A 100ns, TLP
- Typical 9V at 10A 8μs/20μs
- IEC 61000-4-2 (ESD): Air ±30kV, Contact ±30kV
- IEC 61000-4-4 (EFT): 60A(5/50ns, I/O to V<sub>ss</sub>)
- IEC 61000-4-5 (Lightning): ±10A
- 4 Channels of ESD protection
- Low Channel Input Capacitance of 1.2pF Typical
- TLP Dynamic Resistance: 0.25Ω
- Typically Used for High Speed Ports such as USB 2.0, IEEE1394, VGA, 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)

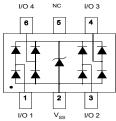
### SOT26



Top View

## **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)



Device Schematic

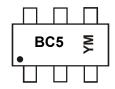
## **Ordering Information** (Note 4)

Product	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
DT2042-04SO-7	Standard	BC5	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.
- See 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**



BC5 = Product Type Marking Code YM = Date Code Marking Y = Year (ex: A = 2013) M = Month (ex: 9 = September)

### Date Code Key

Year	20	13	20	14	20	15	20	16	20	17	20	18
Code	P	4	Е	3	(	)	[	)	Е		ı	
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** (@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</sub>	±10	Α	I/O to V <sub>SS</sub> , 8/20 µs
Peak Pulse Power, per IEC 61000-4-5	P <sub>PP</sub>	105	W	I/O to V <sub>SS</sub> , 8/20 µs
Operating Voltage (DC)	$V_{DC}$	5.5	V	I/O to V <sub>SS</sub>
ESD Protection – Contact Discharge, per IEC61000-4-2	V <sub>ESD_contact</sub>	±30	kV	I/O to V <sub>SS</sub>
ESD Protection – Air Discharge, per IEC 61000-4-2	V <sub>ESD_air</sub>	±30	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

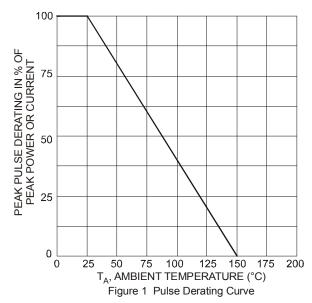
Characteristic	Symbol	Value	Unit
Power Dissipation Typical (Note 5)	P <sub>D</sub>	300	mW
Thermal Resistance, Junction to Ambient Typical (Note 5)	$R_{ heta JA}$	417	°C/W

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

Characteristic	Symbol	Min	Тур	Max	Unit	Test Conditions
Reverse Working Voltage	V <sub>RWM</sub>			5.5	V	I/O to V <sub>SS</sub>
Reverse Current(Note6)	I <sub>R</sub>			1	μΑ	V <sub>R</sub> = 5V, any I/O to V <sub>SS</sub>
Reverse Breakdown Voltage	$V_{BR}$	6		9	V	I <sub>R</sub> = 1mA, I/O to V <sub>SS</sub>
Forward Clamping Voltage	V <sub>F</sub>	-1.0	-0.8	_	V	$I_F$ = -15mA, I/O to $V_{SS}$
Holding Voltage	V <sub>H</sub>	5.5	_		V	_
Trigger Voltage	V <sub>TRIG</sub>		9	9.5	V	_
Reverse Clamping Voltage (Note 7)	V <sub>C_5A</sub>		7.5	_	V	I <sub>PP</sub> = 5A, I/O to V <sub>SS</sub> , 8/20 μs
Reverse Clamping Voltage (Note 7)	V <sub>C_10A</sub>		9	10.5	V	I <sub>PP</sub> = 10A, I/O to V <sub>SS</sub> , 8/20 μs
ESD Clamping Voltage	V <sub>ESD</sub>		9	_	V	TLP, 10A, tp = 100 ns, I/O to V <sub>SS</sub> , per Fig. 7
Dynamic Resistance	R <sub>DIF</sub>		0.25	_	Ω	TLP, 10A, tp = 100 ns, I/O to V <sub>SS</sub>
Channel Input Capacitance	C <sub>I/O</sub>		1.2	1.5	pF	V <sub>R</sub> = 2.5V, f = 1MHz
Variation of Channel Input Capacitance	$\Delta C_{I/O}$		0.02	_	pF	$\label{eq:Vss} \begin{array}{l} \text{Vss} = \text{OV,I/O} = \text{2.5V, } \text{f} = \text{1MHz, T} = \text{25^{\circ}C} \text{ ,} \\ \text{I/O}\_\text{x to V}_\text{SS} - \text{I/O}\_\text{y to V}_\text{SS} \end{array}$

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. Clamping voltage value is based on an  $8x20\mu s$  peak pulse current ( $I_{pp}$ ) waveform.



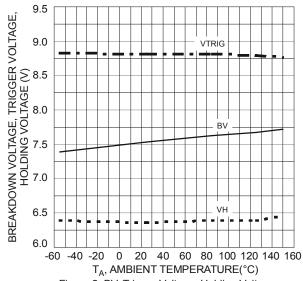
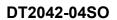
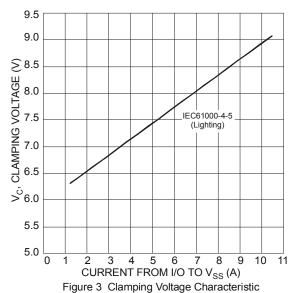
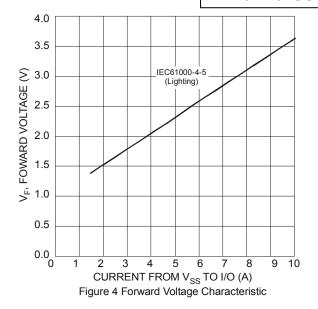


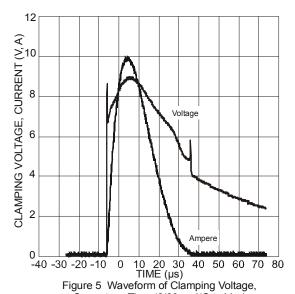
Figure 2 BV, Trigger Voltage, Holding Voltage vs.
Ambient Temperature

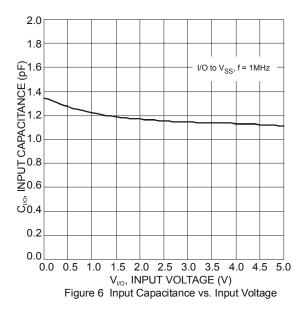












Current vs. Time (8/20µs, I/O to V<sub>SS</sub>)

20
18

(4) 16

(5) 14

OL 12

WO 10

12

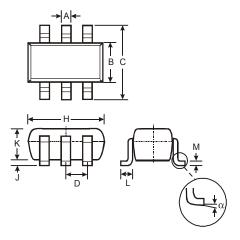
VOLTAGE FROM I/O TO V<sub>SS</sub> (V)

Figure 7 Current vs. Voltage



# **Package Outline Dimensions**

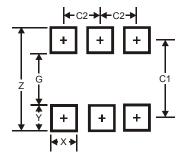
Please see AP02002 at http://www.diodes.com/datasheets/ap02002.pdf for latest version.



SOT26							
Dim	Min	Max	Тур				
Α	0.35	0.50	0.38				
В	1.50	1.70	1.60				
С	2.70	3.00	2.80				
D	_	_	0.95				
Н	2.90	3.10	3.00				
7	0.013	0.10	0.05				
K	1.00	1.30	1.10				
٦	0.35	0.55	0.40				
М	0.10	0.20	0.15				
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	3.20
G	1.60
X	0.55
Y	0.80
C1	2.40
C2	0.95



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