

4 CHANNELS LOW CAPACITANCE TVS DIODE ARRAY

Product Summary

V_{BR} MIN	I_{PP} MAX	C_{I/O} TYP
6.2V	6A	0.65pF

Features And Benefits

- Low Clamping Voltage, I/O to V_{SS}
- Typical 9V at 10A 100ns, TLP
- Typical 7.7V at 6A 8µs/20µs
- IEC61000-4-2 (ESD): Air ±16kV, Contact ±16kV
- 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
- **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**
- **PPAP Capable (Note 4)**

Description And Applications

This new generation TVS is designed to protect sensitive electronics from the damage due to ESD. The combination of its small size and high ESD surge capability makes it ideal for use in automotive applications.

- USB Modules
- HDMI Ports
- LVDS

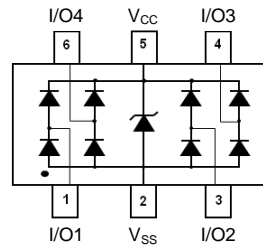
Mechanical Data

- 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 Lead-frame (Lead-Free Plating). Solderable per MIL-STD-202, Method 208 (e3)
- Weight: 0.016 grams (Approximate)

SOT26



Top View



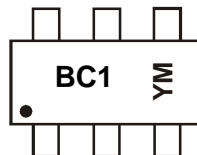
Device Schematic

Ordering Information (Note 5)

Product	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
DT1042-04SOQ-7	Automotive	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) & 2015/863/EU (RoHS 3) compliant.
 2. See <https://www.diodes.com/quality/lead-free/> 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. Automotive products are AEC-Q101 qualified and are PPAP capable. Refer to <https://www.diodes.com/quality/>.
 5. For packaging details, go to our website at <https://www.diodes.com/design/support/packaging/diodes-packaging/>.

Marking Information



BC1 = Product Type Marking Code
 YM = Date Code Marking
 Y = Year (ex: G = 2019)
 M = Month (ex: 9 = September)

Date Code Key

Year	2019	2020	2021	2022	2023	2024
Code	G	H	I	J	K	L

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°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit	Conditions
Peak Pulse Current, Per IEC61000-4-5	I _{PP_I/O}	±6	A	I/O to V _{SS} , 8/20µs
Peak Pulse Power, Per IEC61000-4-5	P _{PP_I/O}	55	W	I/O to V _{SS} , 8/20µs
Operating Voltage (DC)	V _{DC}	5.5	V	I/O to V _{SS}
ESD Protection – Contact Discharge, Per IEC61000-4-2	V _{ESD_CONTACT}	±16	kV	I/O to V _{SS}
ESD Protection – Air Discharge, Per IEC61000-4-2	V _{ESD_AIR}	±16	kV	I/O to V _{SS}
Operating Temperature	T _{OP}	-55 to +150	°C	—
Storage Temperature	T _{STG}	-55 to +150	°C	—

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation Typical (Note 6)	P _D	300	mW
Thermal Resistance, Junction to Ambient Typical (Note 5)	R _{θJA}	417	°C/W

Electrical Characteristics (@ T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Min	Typ	Max	Unit	Test Conditions
Reverse Working Voltage	V _{RWM}	—	—	5.0	V	V _{CC} to V _{SS}
Reverse Current (Note 7)	I _R (V _{CC} to V _{SS})	—	—	1.0	µA	V _R = V _{RWM} = 5V, V _{CC} to V _{SS}
Reverse Current (Note 7)	I _R (I/O to V _{SS})	—	—	0.5	µA	V _R = V _{RWM} = 5V, any I/O to V _{SS}
Reverse Breakdown Voltage	V _{BR}	6.2	—	—	V	I _R = 1mA, V _{CC} to V _{SS}
Forward Clamping Voltage	V _F	-1.0	-0.8	—	V	I _F = -15mA, V _{CC} to V _{SS}
Reverse Clamping Voltage (Note 8)	V _{C_VCC}	—	6.3	—	V	I _{PP} = 9A, V _{CC} to V _{SS} , 8/20µs
	V _{C_I/O}	—	7.7	9	V	I _{PP} = 6A, I/O to V _{SS} , 8/20µs
ESD Clamping Voltage	V _{ESD_VCC}	—	6.8	—	V	TLP, 10A, t _p = 100ns, V _{CC} to V _{SS} . Per Figure 8
	V _{ESD_I/O}	—	9	—	V	TLP, 10A, t _p = 100ns, I/O to V _{SS} . Per Figure 8
Dynamic Resistance	R _{DIF_VCC}	—	0.1	—	Ω	TLP, 10A, t _p = 100ns, V _{CC} to V _{SS}
	R _{DIF_I/O}	—	0.25	—	Ω	TLP, 10A, t _p = 100ns, I/O to V _{SS}
Channel Input Capacitance	C _{I/O}	—	0.65	0.8	pF	V _R = 2.5V, V _{CC} = 5V, f = 1MHz
Variation of Channel Input Capacitance	ΔC _{I/O}	—	0.02	—	pF	V _{CC} = 5V, V _{SS} = 0V, I/O = 2.5V, f = 1MHz, I/O _x to V _{SS} – I/O _y to V _{SS}

- Notes:
- Device mounted on Polyimide PCB pad layout (2oz copper) as shown on Diodes Incorporated's suggested pad layout, which can be found on our website at <http://www.diodes.com/package-outlines.html>.
 - Short duration pulse test used to minimize self-heating effect.
 - Clamping voltage value is based on an 8x20µs peak pulse current (I_{pp}) waveform.

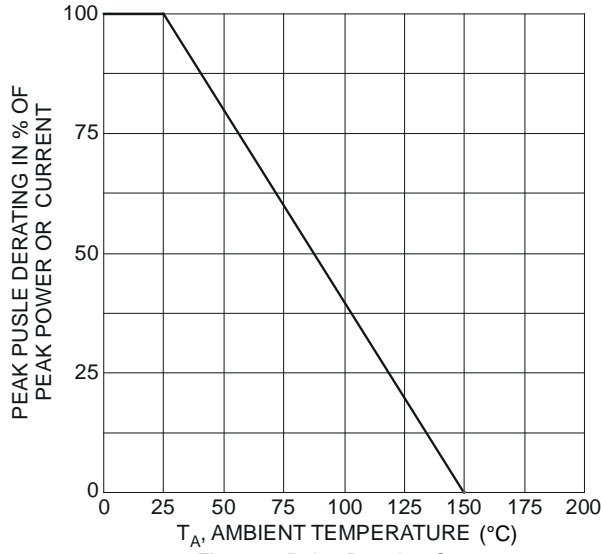


Figure 1 Pulse Derating Curve

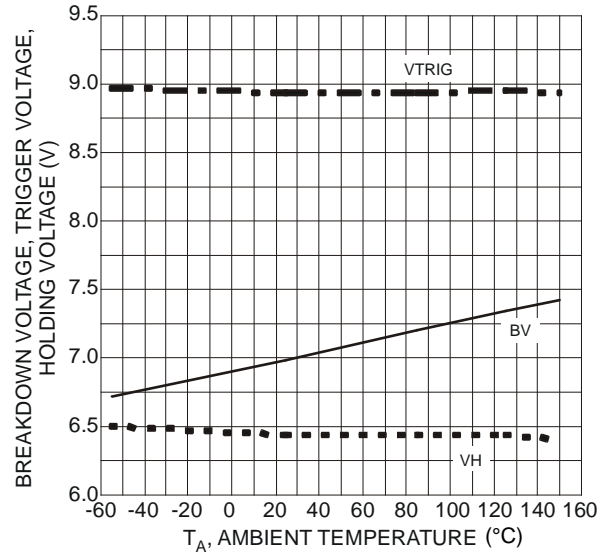


Figure 2 Breakdown Voltage, Trigger Voltage, Holding Voltage vs. Ambient Temperature

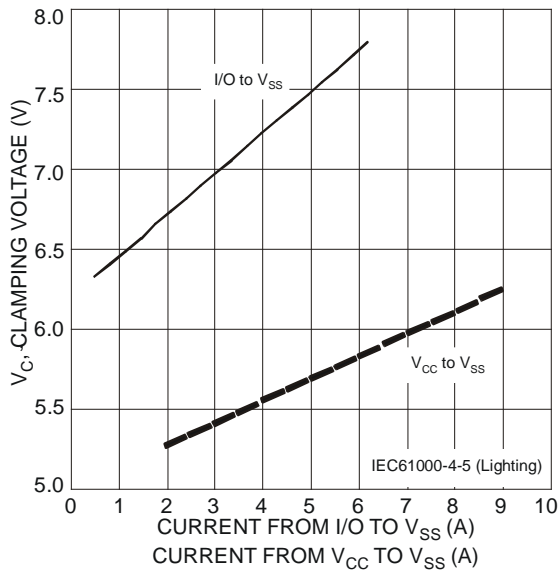


Figure 3 Clamping Voltage Characteristics

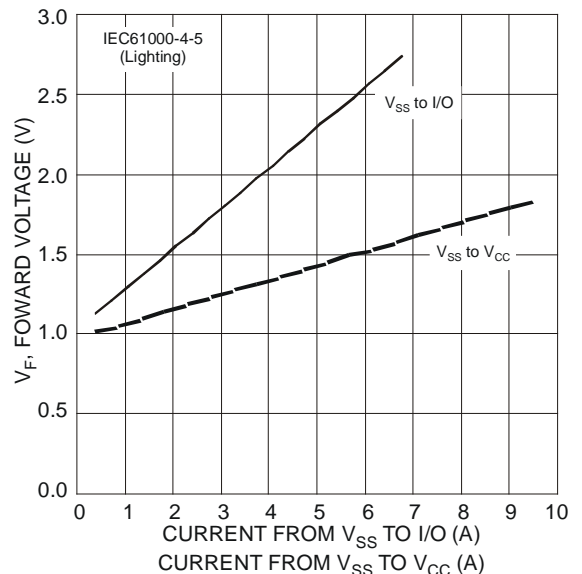


Figure 4 Forward Voltage Characteristics

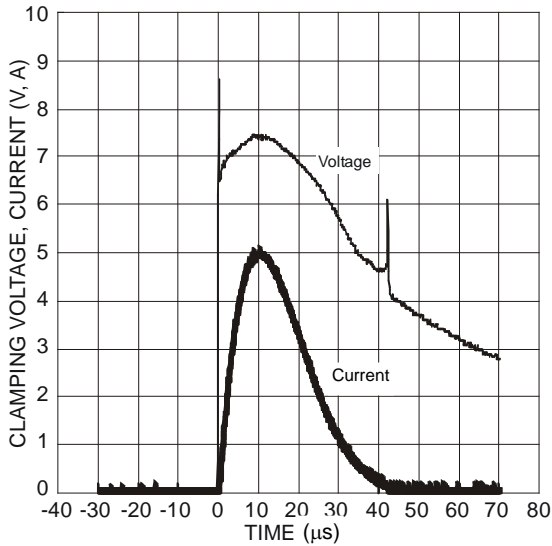


Figure 5 Waveform of Clamping Voltage, Current vs. Time (8/20µs, I/O to V_{SS})

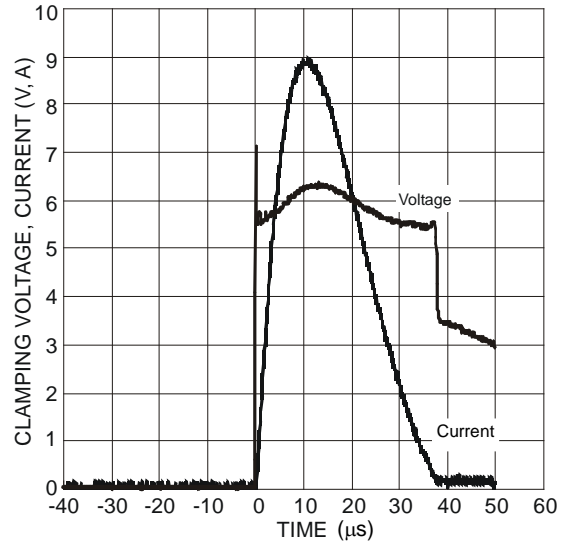


Figure 6 Waveform of Clamping Voltage, Current vs. Time (8/20µs, V_{CC} to V_{SS})

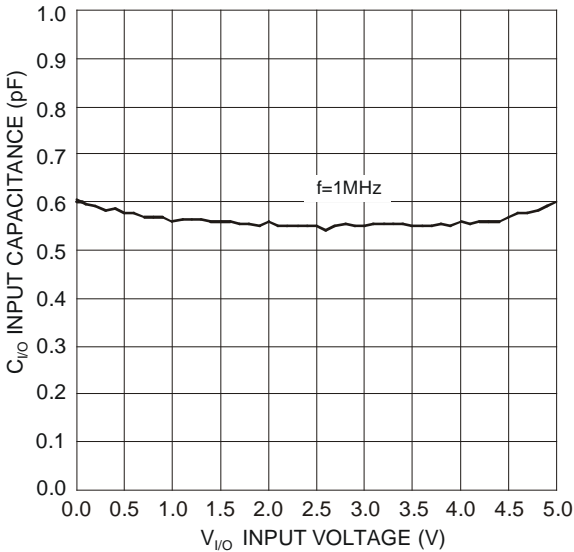


Figure 7 Input Capacitance vs. Input Voltage

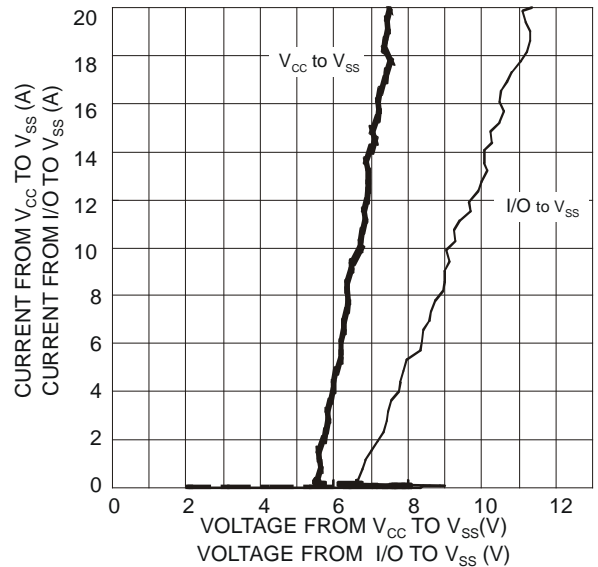
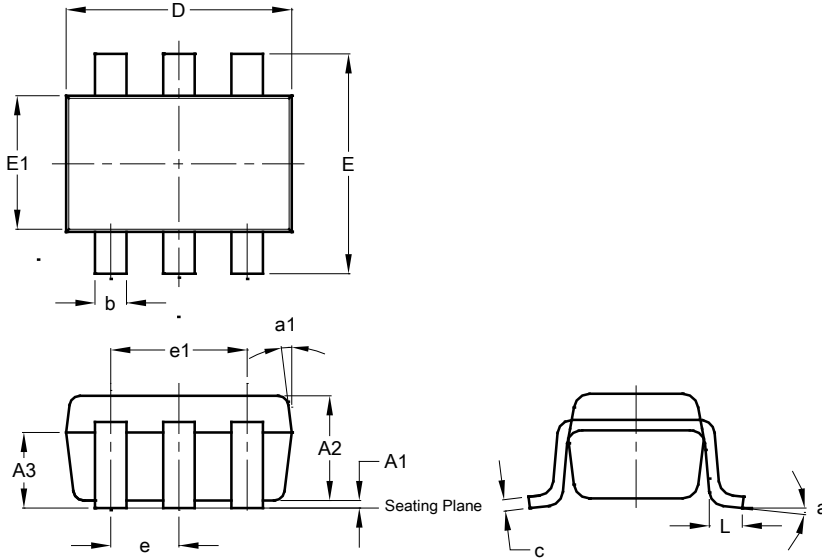


Figure 8. Current vs. Voltage

Package Outline Dimensions

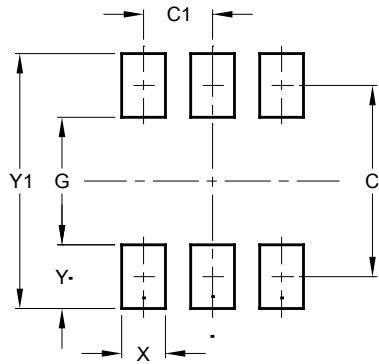
Please see <http://www.diodes.com/package-outlines.html> for the latest version.



SOT26			
Dim	Min	Max	Typ
A1	0.013	0.10	0.05
A2	1.00	1.30	1.10
A3	0.70	0.80	0.75
b	0.35	0.50	0.38
c	0.10	0.20	0.15
D	2.90	3.10	3.00
e	-	-	0.95
e1	-	-	1.90
E	2.70	3.00	2.80
E1	1.50	1.70	1.60
L	0.35	0.55	0.40
a	-	-	8°
a1	-	-	7°
All Dimensions in mm			

Suggested Pad Layout

Please see <http://www.diodes.com/package-outlines.html> for the latest version.



Dimensions	Value (in mm)
C	2.40
C1	0.95
G	1.60
X	0.55
Y	0.80
Y1	3.20

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