2 CHANNELS LOW CAPACITANCE TVS DIODE ARRAY

Product Summary

$V_{BR\ MIN}$	$I_{PP\ MAX}$	$C_{I/O\ TYP}$
7V	12A	1.2pF

Features And Benefits

- IEC61000-4-2 (ESD): Air – ±16kV, Contact – ±16kV
- IEC61000-4-4 (EFT) Additional Level, 55A (5/50ns)
- IEC61000-4-5 (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)**
- **The DT1452-02SOQ is suitable for automotive applications requiring specific change control; it is AEC-Q101 qualified, PPAP capable, and manufactured in IATF16949:2016 certified facilities.**
- **https://www.diodes.com/quality/product-definitions/**

Description And Applications

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

- USB Modules
- HDMI Ports
- LVDS

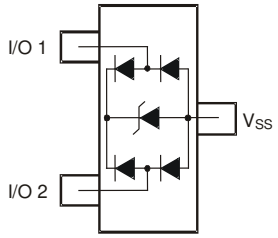
Mechanical Data

- 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
- Weight: 0.009 grams (Approximate)

SOT23



Top View



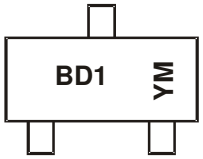
Device Schematic

Ordering Information (Note 4)

Part Number	Compliance	Marking	Reel Size (inches)	Tape Width (mm)	Quantity per Reel
DT1452-02SOQ-7	Automotive	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) & 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. For packaging details, go to our website at https://www.diodes.com/design/support/packaging/diodes-packaging/.

Marking Information



BD1 = Product Type Marking Code
YM = Date Code Marking
Y = Year (ex: G = 2019)
M = Month (ex: 5 = May)

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

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Maximum Ratings (@T_A = +25°C, unless otherwise specified.)

Characteristic	Symbol	Value	Unit	Conditions
Peak Pulse Current	$I_{PP_I/O}$	12	A	I/O to V_{SS}, 8/20µs
ESD Protection – Contact Discharge	$V_{ESD_I/O_CONTACT}$	±16	kV	I/O to V_{SS}, Per IEC61000-4-2
ESD Protection – Air Discharge	V_{ESD_I/O_AIR}	±16	kV	I/O to V_{SS}, Per IEC61000-4-2

Thermal Characteristics

Characteristic	Symbol	Value	Unit
Power Dissipation (Note 5)	P_D	300	mW
Thermal Resistance, Junction to Ambient (Note 5)	$R_{\theta JA}$	417	°C/W
Operating and Storage Temperature Range	T_J, T_{STG}	-55 to +150	°C

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

Characteristic	Symbol	Min	Typ	Max	Unit	Test Conditions
Reverse Working Voltage	V_{RWM}	—	—	5.5	V	—
Reverse Leakage Current (Note 6)	I_R	—	—	1.0	µA	V_R = 5.5V, I/O to V_{SS}
Reverse Breakdown Voltage	V_{BR}	7	—	10	V	I_R = 1mA, I/O to V_{SS}
Forward Voltage	V_F	—	0.85	1.1	V	I_F = 15mA, V_{SS} to I/O
Reverse Clamping Voltage (Note 7)	V_C	—	7.5	—	V	I_{PP} = 5A, I/O to V_{SS}, 8/20µs
Reverse Clamping Voltage (Note 7)	V_C	—	9.5	—	V	I_{PP} = 12A, I/O to V_{SS}, 8/20µs
ESD Clamping Voltage	V_{ESD}	—	11	—	V	TLP, 20A, t_P = 100ns, I/O to V_{SS}, Per Figure 7
Dynamic Resistance	R_{DIF}	—	0.22	—	Ω	TLP, 20A, t_P = 100ns, I/O to V_{SS}, Per Figure 7
Channel Input Capacitance	$C_{I/O}$	—	1.2	1.7	pF	V_R = 2.5V, f = 1MHz
Variation of Channel Input Capacitance	$\Delta C_{I/O}$	—	0.03	—	pF	V_{SS} = 0V, I/O = 2.5V, f =1MHz, I/O_x to V_{SS} – I/O_y to V_{SS}

Notes:
5. Device mounted on FR-4 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.
6. Short duration pulse test used to minimize self-heating effect.
7. Clamping voltage value is based on an 8x20µs peak pulse current (I_{PP}) waveform.

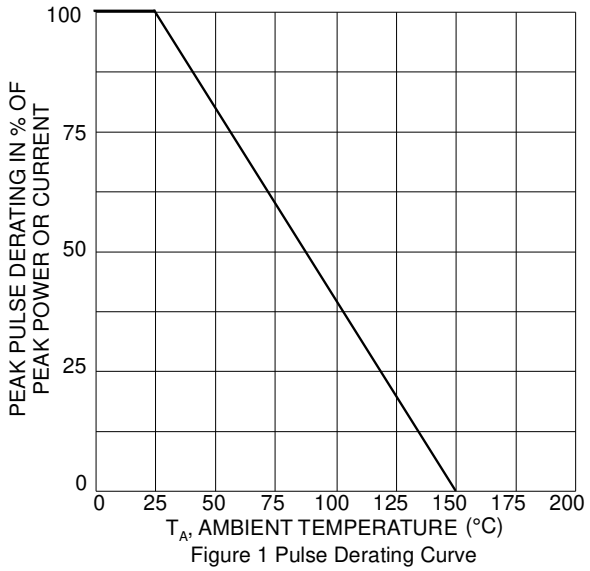


Figure 1 Pulse Derating Curve

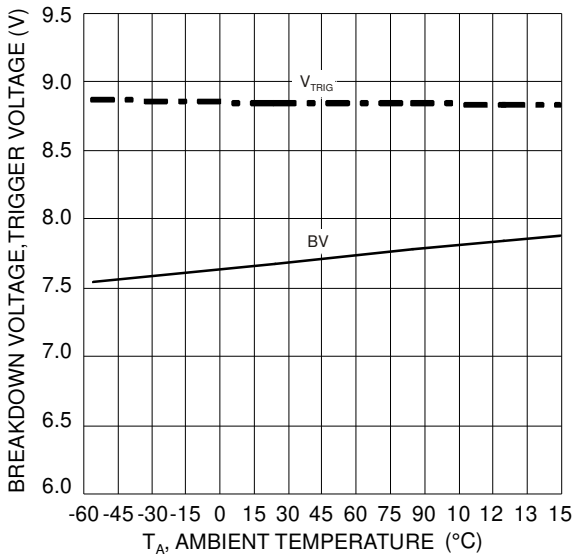


Figure 2 BV, Trigger Voltage vs. Ambient Temperature

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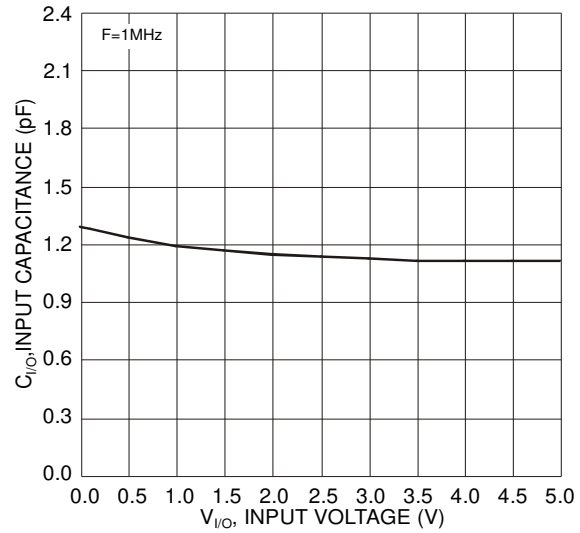


Figure 3 Input Capacitance vs. Input Voltage

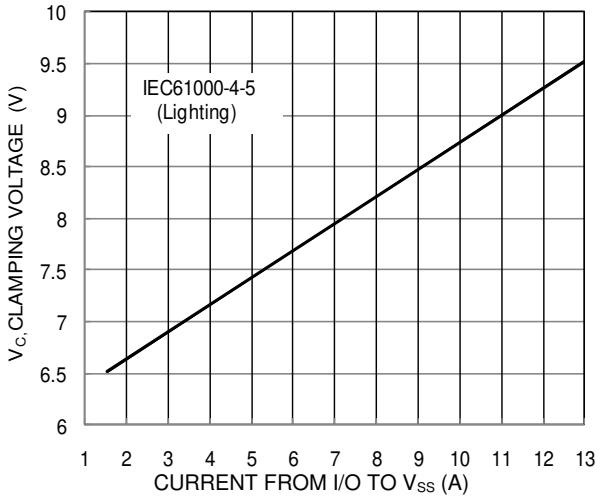


Figure 4. Clamping Voltage Characteristic

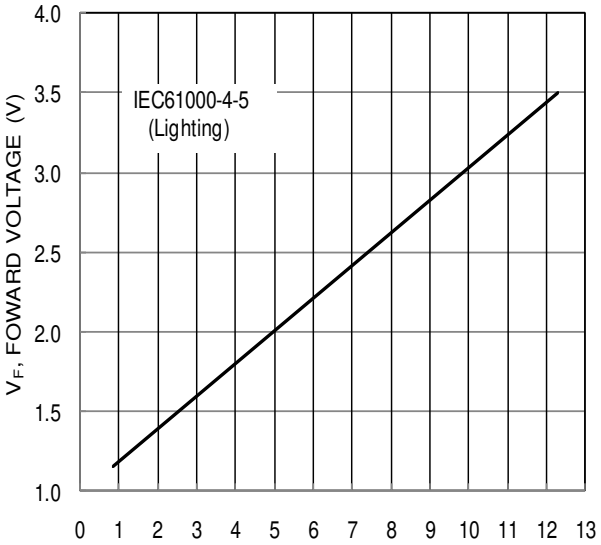


Figure5. Foward Voltage Characteristic

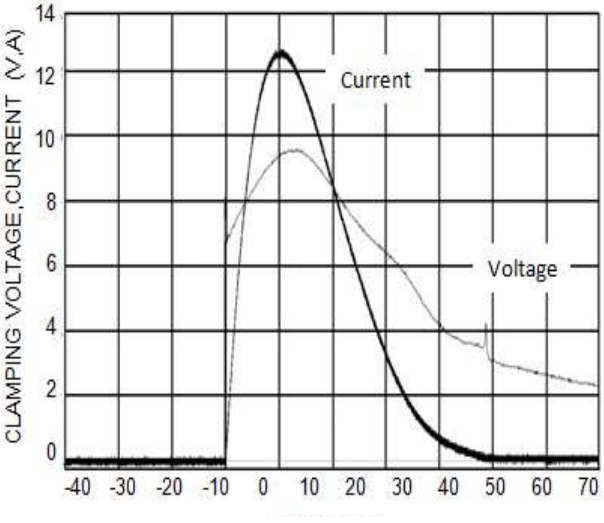


Figure 6. Waveform of Clamping Voltage, Current vs. Time (8/20μs, I/O to V_{SS})

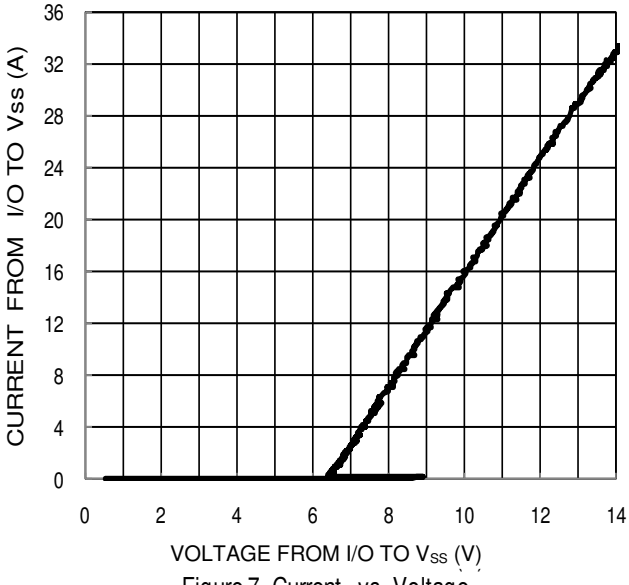


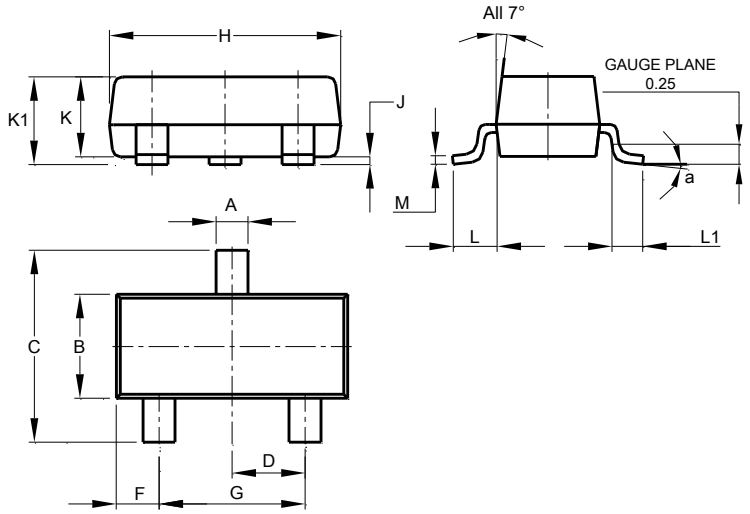
Figure 7. Current vs. Voltage

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Package Outline Dimensions

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

SOT23

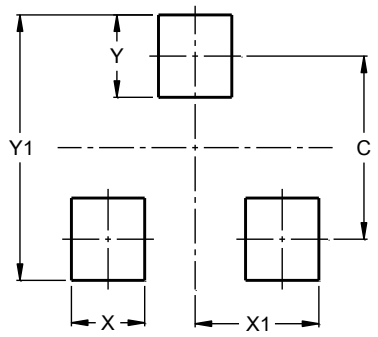


SOT23			
Dim	**Min**	**Max**	**Typ**
A	0.37	0.51	0.40
B	1.20	1.40	1.30
C	2.30	2.50	2.40
D	0.89	1.03	0.915
F	0.45	0.60	0.535
G	1.78	2.05	1.83
H	2.80	3.00	2.90
J	0.013	0.10	0.05
K	0.890	1.00	0.975
K1	0.903	1.10	1.025
L	0.45	0.61	0.55
L1	0.25	0.55	0.40
M	0.085	0.150	0.110
a	0°	8°	--
All Dimensions in mm			

Suggested Pad Layout

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

SOT23



Dimensions	Value (in mm)
C	2.0
X	0.8
X1	1.35
Y	0.9
Y1	2.9

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