Features

- Transient protection for high-speed data lines
  - IEC 61000-4-2 (ESD) ±30kV (Air)
  - ±30kV (Contact)
  - IEC 61000-4-4 (EFT) 40A (5/50 ns)
  - Cable Discharge Event (CDE)
- Package optimized for high-speed lines
- Ultra-small package (0.6mmx0.3mmx0.3mm)
- Protects one data, control or power line
- Low capacitance: 12pF (Typical)
- Low leakage current: 0.1uA @V_{RWM} (Typical)
- Low clamping voltage
- Each I/O pin can withstand over 1000 ESD strikes for ±8kV contact discharge

Description

T0501MA is a low-capacitance Transient Voltage Suppressor (TVS) designed to provide electrostatic discharge (ESD) protection for high-speed data interfaces. With typical capacitance of 12pF only, T0501MA is designed to protect parasitic-sensitive systems against over-voltage and over-current transient events. It complies with IEC 61000-4-2 (ESD), Level 4 (±15kV air, ±8kV contact discharge), IEC 61000-4-4 (electrical fast transient - EFT) (40A,5/50 ns), very fast charged device model (CDM) ESD and cable discharge event (CDE), etc.

T0501MA uses ultra-small DFN0603 package. Each T0501MA device can protect one data line . It offers system designers flexibility to protect single data line where space is a premium concern.

Applications

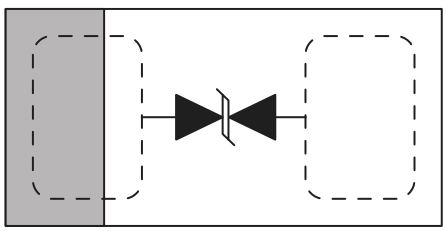
- Portable Electronics
- Desktops, Servers and Notebooks
- Cellular Phones
- MP3 Ports
- Digital Camera Ports

Mechanical Characteristics

- DFN0603-2L package
- Flammability Rating: UL 94V-0
- Packaging: Tape and Reel

Circuit Diagram

Pin Configuration



DFN0603
(Top View)

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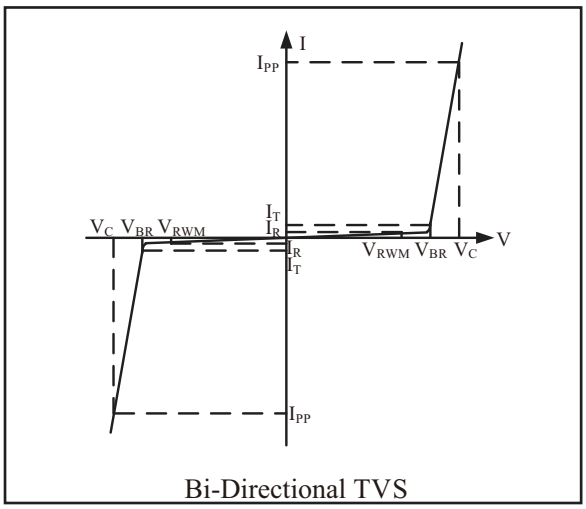
Absolute Maximum Rating

Symbol	Parameter	Value	Units
V_{ESD}	ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	±30 ±30	kV
T_{OPT}	Operating Temperature	-55/+125	°C
T_{STG}	Storage Temperature	-55/+150	°C

Electrical Characteristics (T = 25°C)

Symbol	Parameter
V_{RWM}	Nominal Reverse Working Voltage
I_R	Reverse Leakage Current @ V_{RWM}
V_{BR}	Reverse Breakdown Voltage @ I_T
I_T	Test Current for Reverse Breakdown
V_C	Clamping Voltage @ I_{PP}
I_{PP}	Maximum Peak Pulse Current
C_{ESD}	Parasitic Capacitance
V_R	Reverse Voltage
f	Small Signal Frequency



Bi-Directional TVS

Symbol	Test Condition	Minimum	Typical	Maximum	Units
V_{RWM}				5.0	V
I_R	V_{RWM} = 5V, T = 25°C Between I/O_1 and I/O_2		0.1	1.0	μA
V_{BR}	I_T = 1mA Between I/O_1 and I/O_2	5.5	6.0	8.0	V
V_C	I_{PP} = 1A, t_p = 8/20μs Between I/O_1 and I/O_2			10	V
V_C	I_{PP} = 4A, t_p = 8/20μs Between I/O_1 and I/O_2			15	V
C_{ESD}	V_R = 0V, f = 1MHz Between I/O_1 and I/O_2	10	12	15	pF

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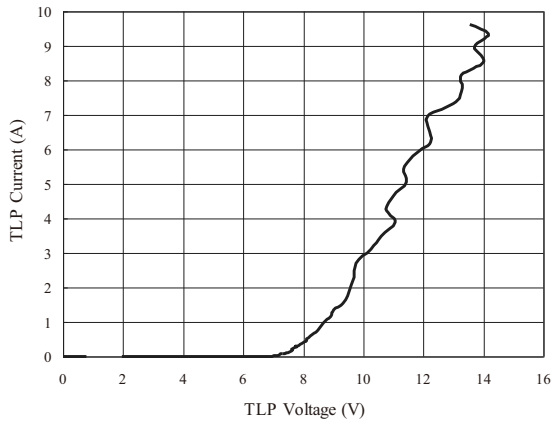
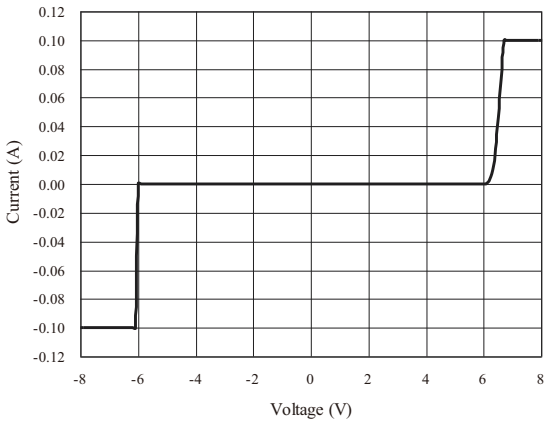
TLP Measurement of I/O_1 to I/O_2

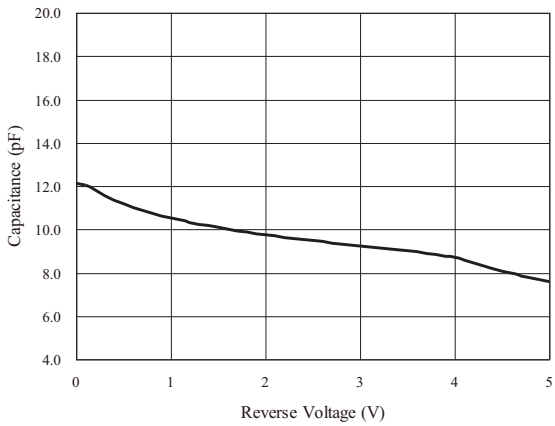


Voltage Sweeping of I/O_1 to I/O_2

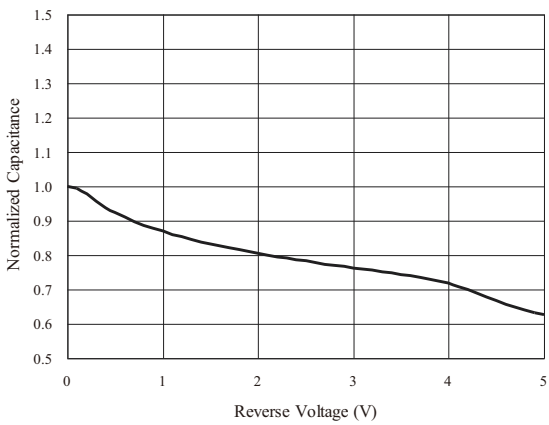


Capacitance vs. Voltage of I/O_1 to I/O_2 (f = 1MHz)

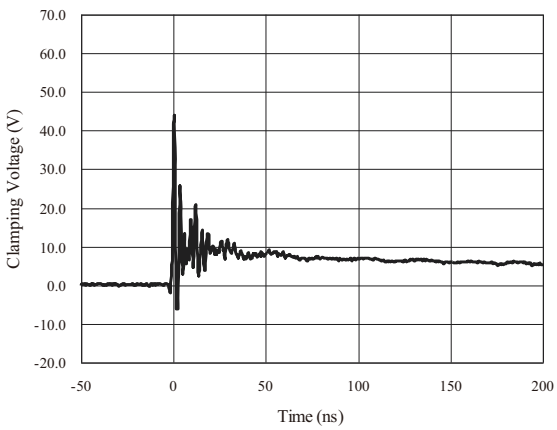
Capacitance *vs.* Reverse Voltage



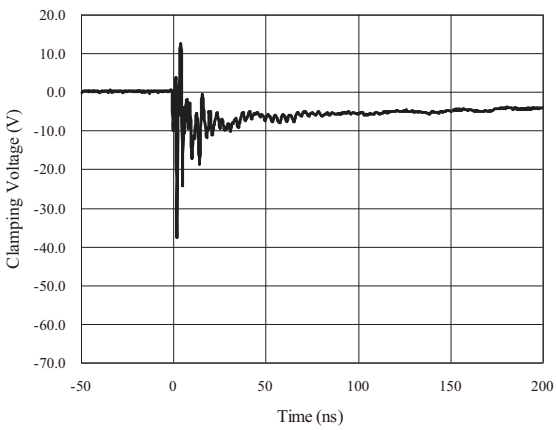
Normalized Capacitance *vs.* Reverse Voltage



ESD Clamping of I/O_1 to I/O_2 (+8kV Contact per IEC 61000-4-2)

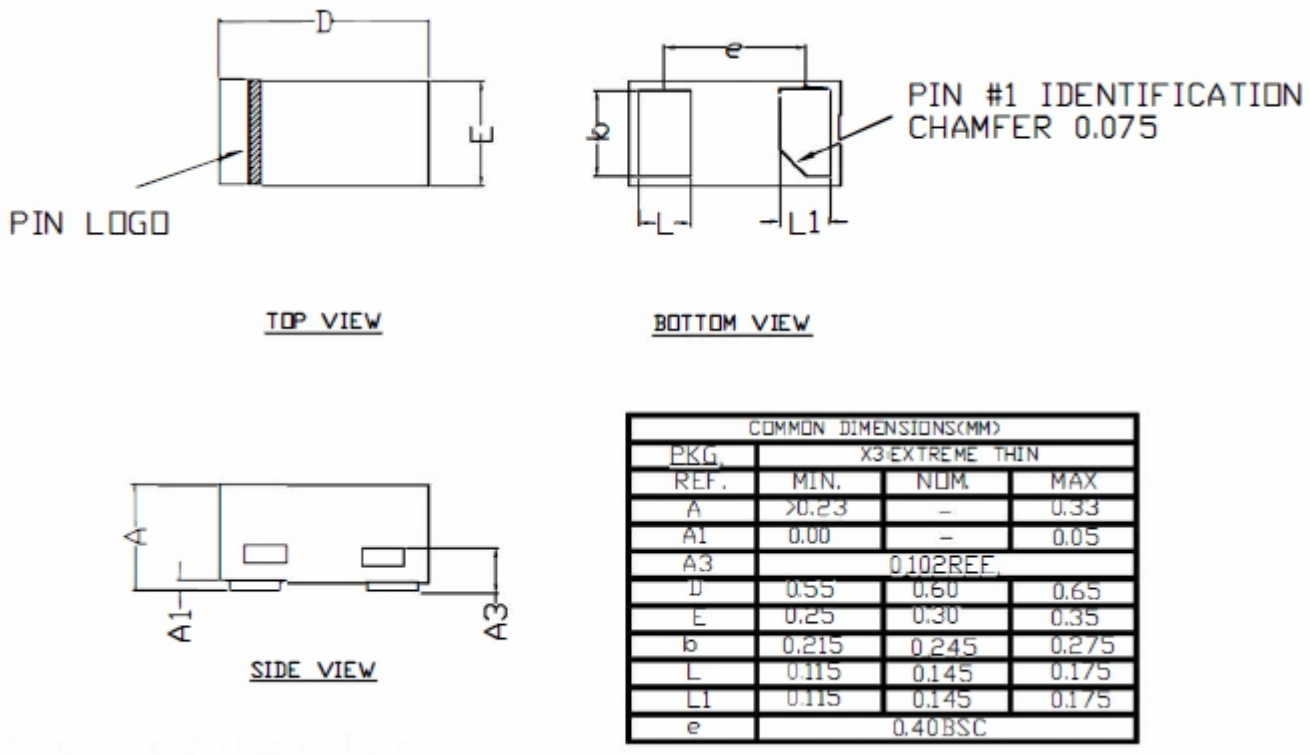


ESD Clamping of I/O_1 to I/O_2 (-8kV Contact per IEC 61000-4-2)



Package Outline

DFN0603-2L package
2 leads
MSL-1



COMMON DIMENSIONS(MM)			
PKG. REF.	X3-EXTREME THIN		
	MIN.	NOM.	MAX
A	>0.23	–	0.33
A1	0.00	–	0.05
A3	0.102REF.		
D	0.55	0.60	0.65
E	0.25	0.30	0.35
b	0.215	0.245	0.275
L	0.115	0.145	0.175
L1	0.115	0.145	0.175
e	0.40BSC		

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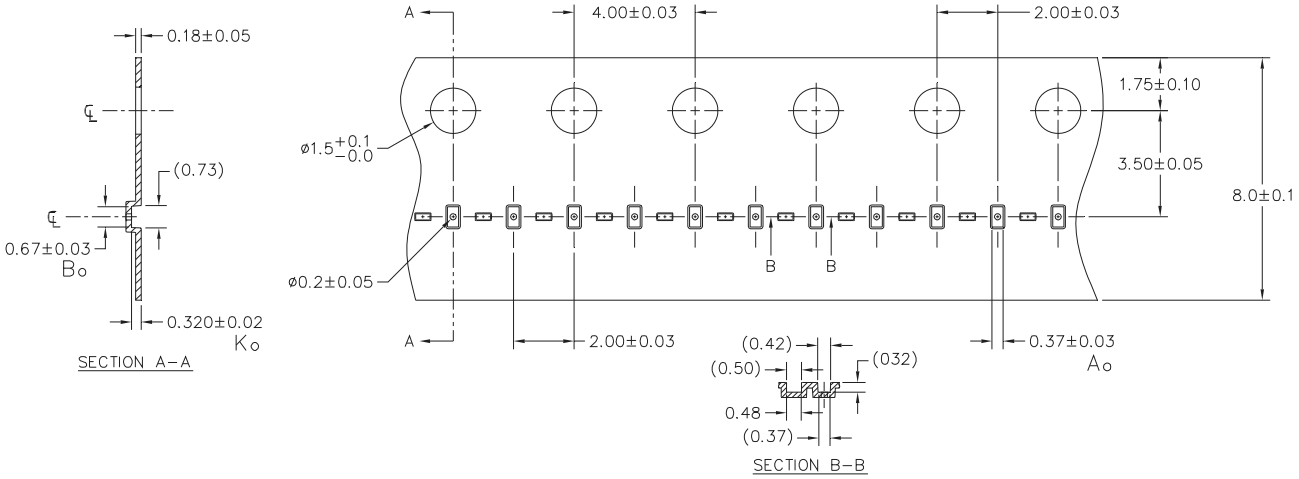
Ordering Information

Part Number	Qty per Reel	Reel Size
T0501MA	10,000	7inch

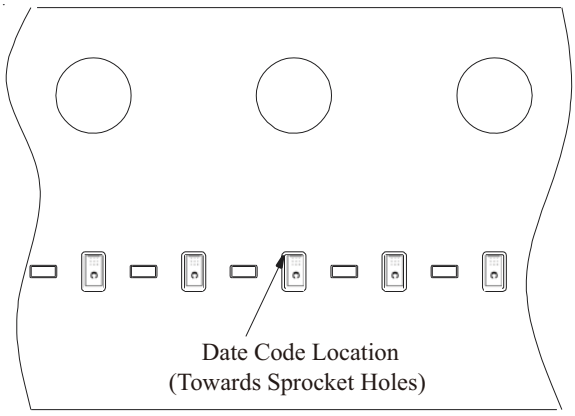
Carries Tape Specification



A0	B0	K0
0.37 +/-0.03	0.67 +/-0.03	0.32 +/-0.02 mm

Note:All dimensions in mm unless otherwise specified

Device Orientation in Tape



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