

Features

- ❑ Transient protection for high-speed data lines
IEC 61000-4-2 (ESD) $\pm 30\text{kV}$ (Air)
 $\pm 30\text{kV}$ (Contact)
IEC 61000-4-5 (Lightning) 18A (8/20 μs)
Cable Discharge Event (CDE)
- ❑ Package optimized for high-speed lines
- ❑ Ultra-small package (0.6mm×0.3mm×0.3mm)
- ❑ Protects one data, control or power line
- ❑ Low capacitance: 25pF (Typical)
- ❑ Low leakage current: 0.1 μA @ V_{RWM} (Typical)
- ❑ Low clamping voltage
- ❑ Each I/O pin can withstand over 1000 ESD strikes for $\pm 8\text{kV}$ contact discharge
- ❑ ROHS compliant

Description

TS0501LAX is a Bi-directional Transient Voltage Suppressor (TVS) designed to provide electrostatic discharge (ESD) protection for high-speed data interfaces. With typical capacitance of 25pF only, TS0501LAX 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 ($\pm 15\text{kV}$ air, $\pm 8\text{kV}$ contact discharge). TS0501LAX uses ultra-small

DFN0603 package. Each TS0501LAX 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

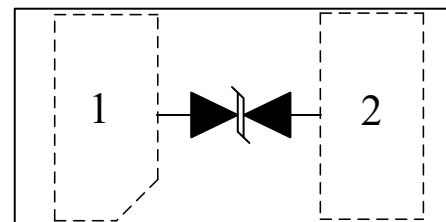
Mechanical Characteristics

- ❑ DFN0603 package
- ❑ Flammability Rating: UL 94V-0
- ❑ Marking: Part number
- ❑ Packaging: Tape and Reel

Circuit Diagram



Pin Configuration



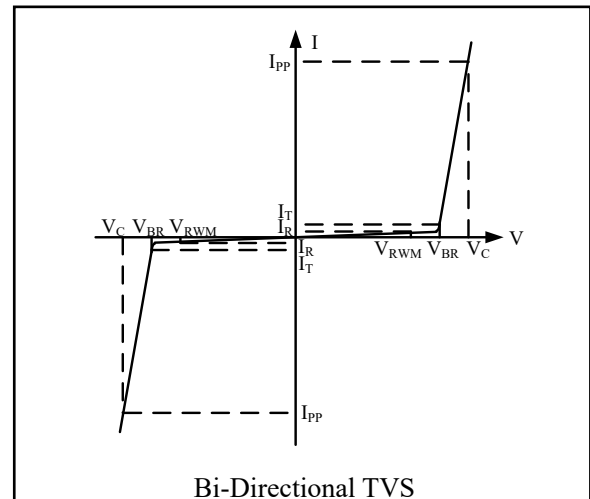
DFN0603
(Top View)

Absolute Maximum Rating

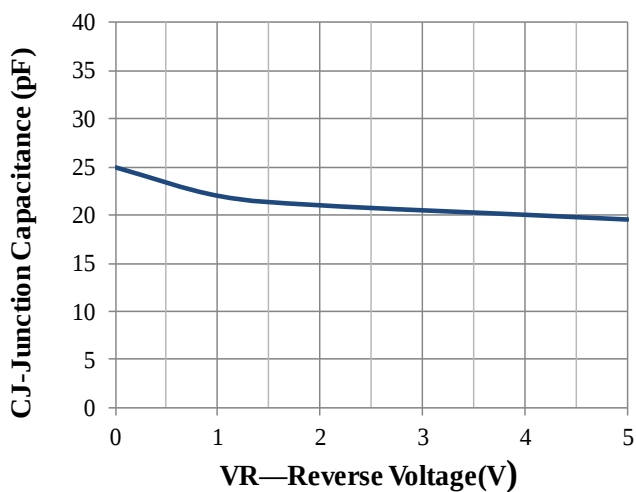
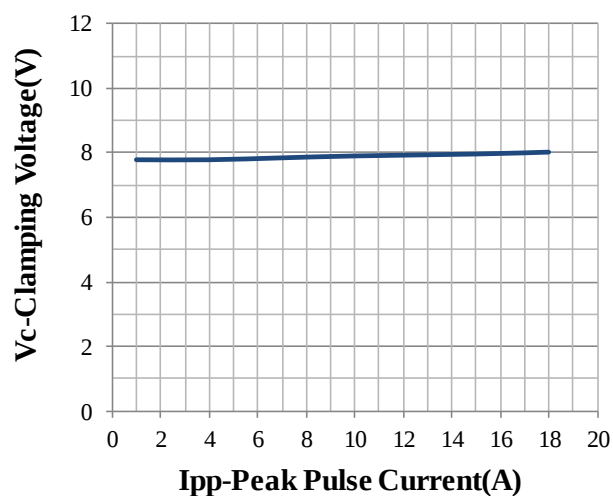
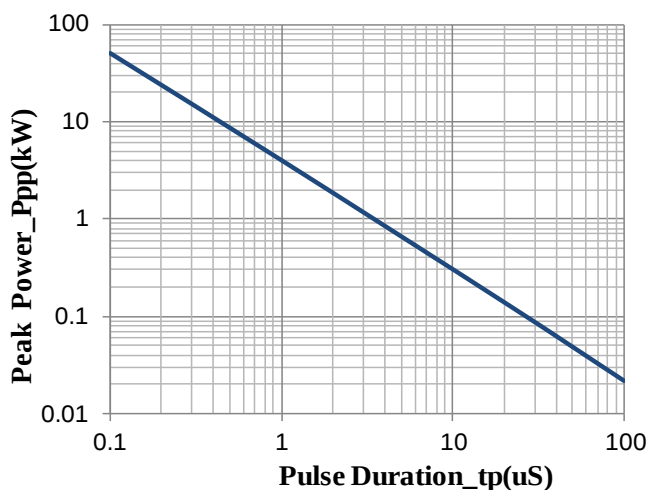
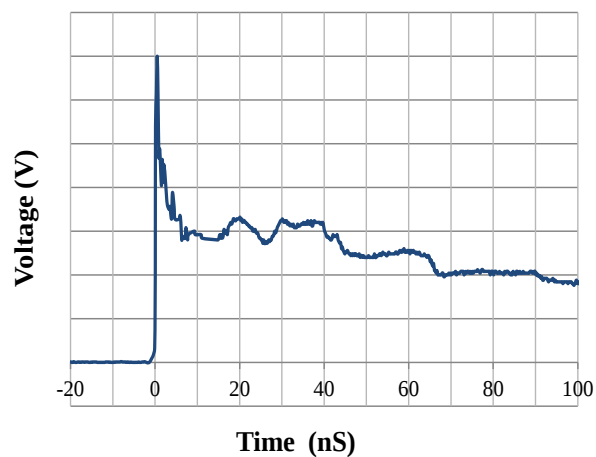
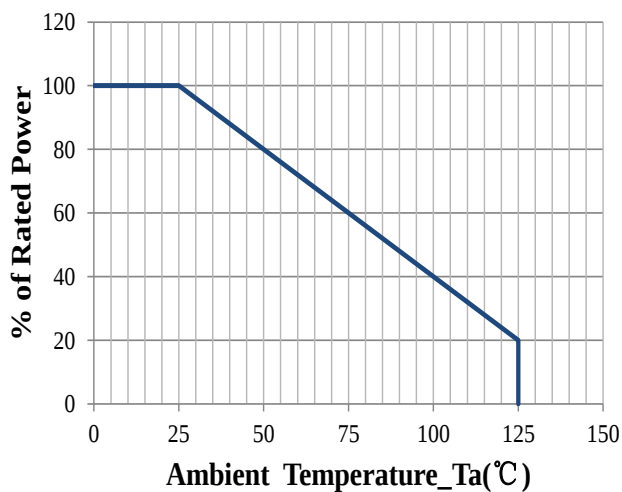
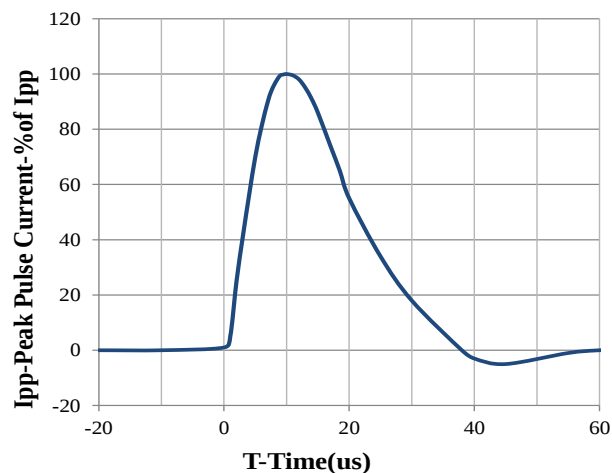
Symbol	Parameter	Value	Units
I_{PP}	Peak Pulse Current (8/20 μ s)	18	A
P_{PK}	Peak Pulse Power (8/20 μ s)	140	Watts
V_{ESD}	ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	± 30 ± 30	kV
T_{OPT}	Operating Temperature	-55 to +125	°C
T_{STG}	Storage Temperature	-55 to +150	°C

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

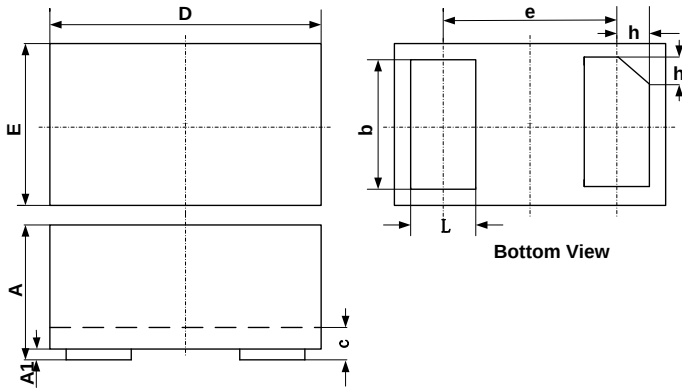


Symbol	Test Condition	Minimum	Typical	Maximum	Units
V_{RWM}			3.3	5.0	V
I_R	$V_{RWM} = 5V$, $T = 25^\circ C$ Between I/O_1 and I/O_2		0.1	0.5	μA
V_{BR}	$I_T = 1mA$ Between I/O_1 and I/O_2	6.0		8.0	V
V_C	$I_{PP} = 1A$, $t_p = 8/20\mu s$ Between I/O_1 and I/O_2			8.0	V
V_C	$I_{PP} = 18A$, $t_p = 8/20\mu s$ Between I/O_1 and I/O_2		8.5	9.5	V
C_{ESD}	$V_R = 0V$, $f = 1MHz$ Between I/O_1 and I/O_2		25	30	pF

Typical Performance Characteristics ($T_A=25^{\circ}\text{C}$ unless otherwise Specified)

Junction Capacitance vs. Reverse Voltage

Clamping Voltage vs. Peak Pulse Current

Peak Pulse Power vs. Pulse Time

IEC61000-4-2 Pulse Waveform

Power Derating Curve

8 X 20us Pulse Waveform

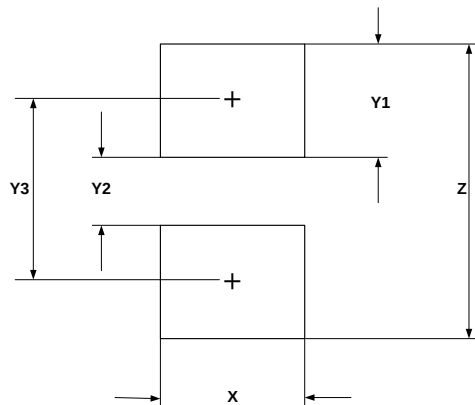
Package Outline

□ DFN0603 package



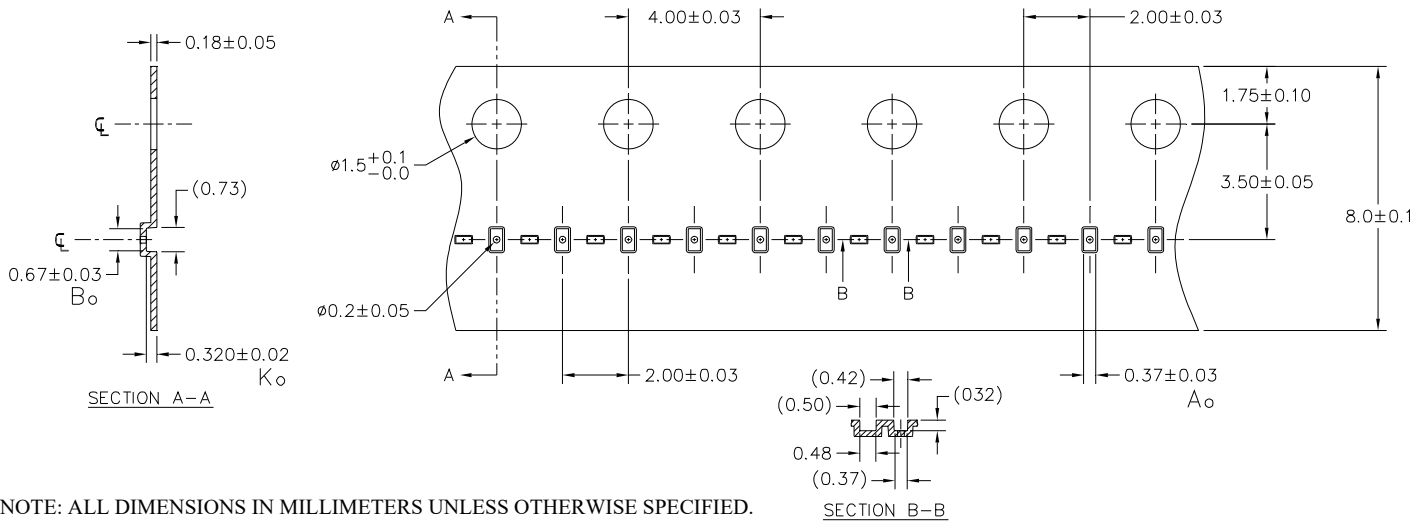
SYM	DIMENSIONS		
	MILLIMETERS		
	MIN	NOM	MAX
A	0.230	0.300	0.330
A1	0.000	0.020	0.050
b	0.215	0.245	0.275
c	0.120	0.150	0.180
D	0.550	0.600	0.650
e	0.355 BSC		
E	0.250	0.300	0.350
L	0.160	0.190	0.220
h	0.079 BSC		

Suggested Land Pattern



SYM	DIMENSIONS	
	MILLIMETERS	INCHES
X	0.30	0.012
Y1	0.25	0.010
Y2	0.15	0.006
Y3	0.40	0.016
Z	0.65	0.026

Carries Tape Specification

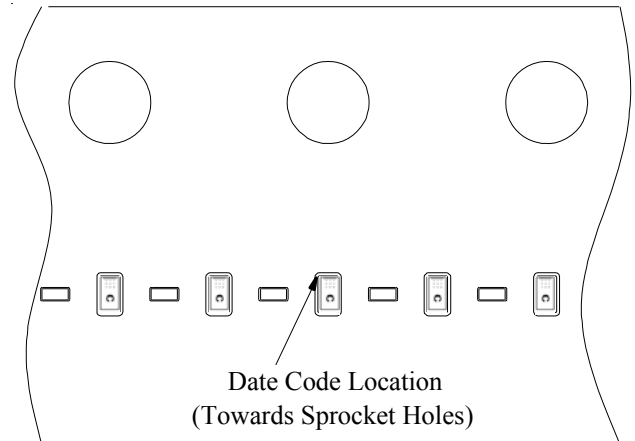


NOTE: ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.

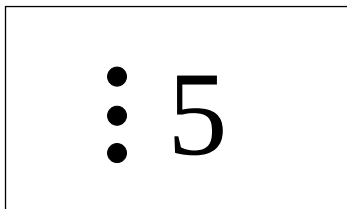
Device Orientation in Tape

A0	B0	K0
0.37 ± 0.03	0.67 ± 0.03	0.32 ± 0.02 mm

Note: All dimensions in mm unless otherwise specified



Marking Codes



Note:

(1) "5" is part number, fixed

Ordering Information

Part Number	Qty per Reel	Reel Size
TS0501LAX	10,000	7 inch