Features

- Transient protection for high-speed data lines
  IEC 61000-4-2 (ESD) ±17kV (Air)
  ±8kV (Contact)
- Protects one high-speed data line
- Low reverse current:<10nA typical (VR=1.0V)
- Working voltage: 1.0V
- Low capacitance: 0.13pF(Typical)
- Solid-state silicon-avalanche technology

Applications

- HDMI 1.3/1.4 and HDMI 2.0
- USB 2.0 and USB 3.0/3.1/4.0
- MHL
- LVDS Interfaces
- FM Antenna
- PCI Express
- eSATA Interfaces

Mechanical Characteristics

- DFN0603 package
- Pb-Free, Halogen Free, RoHS/WEEE Compliant
- Nominal Dimensions: 0.6 x 0.3 x 0.25 mm
- Lead Finish: NiAu
- Molding compound flammability rating: UL 94V-0
- Packaging : Tape and Reel

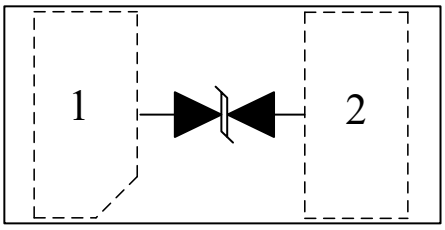
Description

TT0201SA are ultra low capacitance ESD protection devices designed to protect high speed data interfaces. They are designed to replace 0201 size mul- tilayer varistors (MLVs) in portable applications such as cell phones,notebook computers, and other portable electronics. This device offers desirable characteristics for board level protection including fast response time, low operating and clamping voltage, and no device degradation. TT0201SA has a typical capacitance of only 0.13pF.This allows it to be used on circuits operating.

TT0201SA is in a 2-pin DFN0603 package. It measures 0.6 x 0.3 mm with a nominal height of only 0.25mm. Leads are finished with lead-free NiAu. Each device will protect one line operating at 1.0 volts. It gives the designer the flexibility to protect single lines in applications where arrays are not practical . The combination of small size and high ESD surge capability makes them ideal for use in portable applications such as cellular phones , digital cameras, and MP3 players.

Circuit Diagram

Pin Configuration



DFN0603
(Top View)

Absolute Maximum Rating

Rating	Symbol	Value	Units
Peak Pulse Power (tp = 8/20μs)	Ppk	20	Watts
Peak Pulse Current (tp = 8/20μs)	I_{PP}	4	A
ESD per IEC 61000-4-2 (Air) [1] ESD per IEC 61000-4-2 (Contact) [1]	V_{ESD}	±17 ±8	kV
Operating Temperature	T_J	-55 to +125	°C
Storage Temperature	T_{STG}	-55 to +150	°C

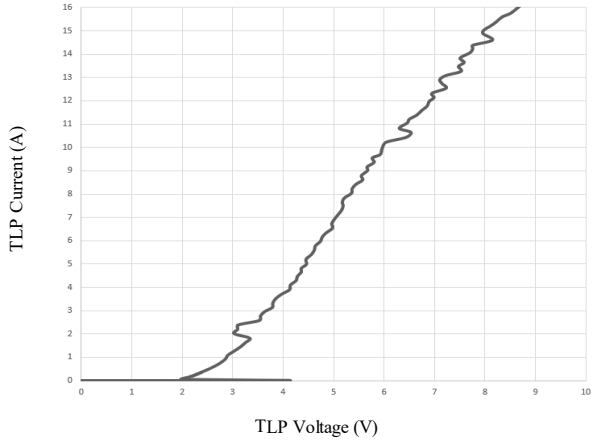
Electrical Characteristics (T = 25°C)

Parameter	Symbol	Conditions	Minimum	Typical	Maximum	Units
Reverse Stand-Off Voltage	V_{RWM}				1.0	V
Reverse Breakdown Voltage	V_{BR}	I_t = 1mA	1.2			V
Reverse Leakage Current	I_R	V_{RWM} = 1.0V, T=25°C			0.1	μA
Clamping Voltage	V_C	I_{PP} = 1A, tp = 8/20μs			3.5	V
Clamping Voltage	V_C	I_{PP} = 4A, tp = 8/20μs			4.8	V
Clamping Voltage	V_C	I_{TLP} = 8A, tp =100ns		5.5		
Clamping Voltage	V_C	I_{TLP} = 16A, tp =100ns		8.5		
Dynamic Resistance [2, 3, 4]	R_D	tp = 100ns		0.35		Ohms
Junction Capacitance	C_j	V_R = 0V, f = 1MHz		0.13		pF

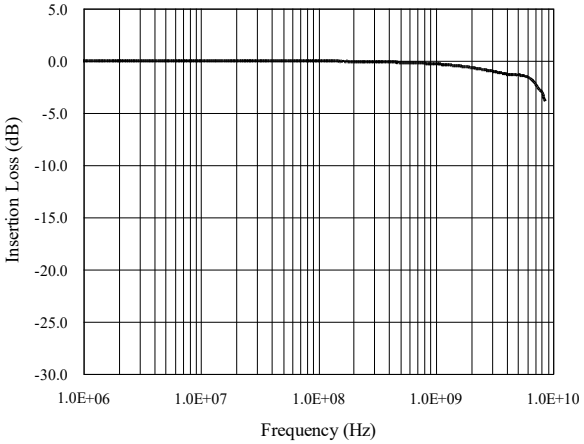
Notes

1) ESD gun return path connected to ESD ground reference plane.
2) Transmission Line Pulse Test (TLP) Settings: tp= 100ns, tr= 0.2ns, I_{TLP} and V_{TLP} averaging window: t1 = 70ns to t2= 90ns.
3) Dynamic resistance calculated from I_{TLP} = 4A to I_{TLP} = 16A
4) Guaranteed by design. Not production tested

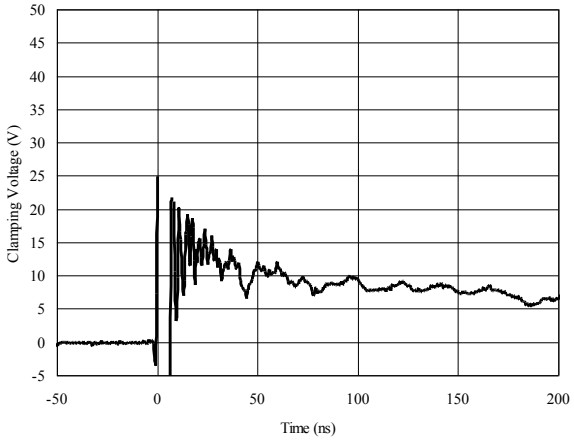
TLP Measurement of I/O to I/O



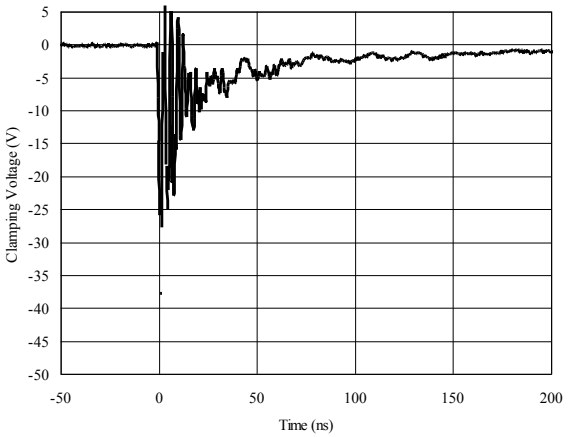
Insertion Loss S21 of I/O to I/O



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

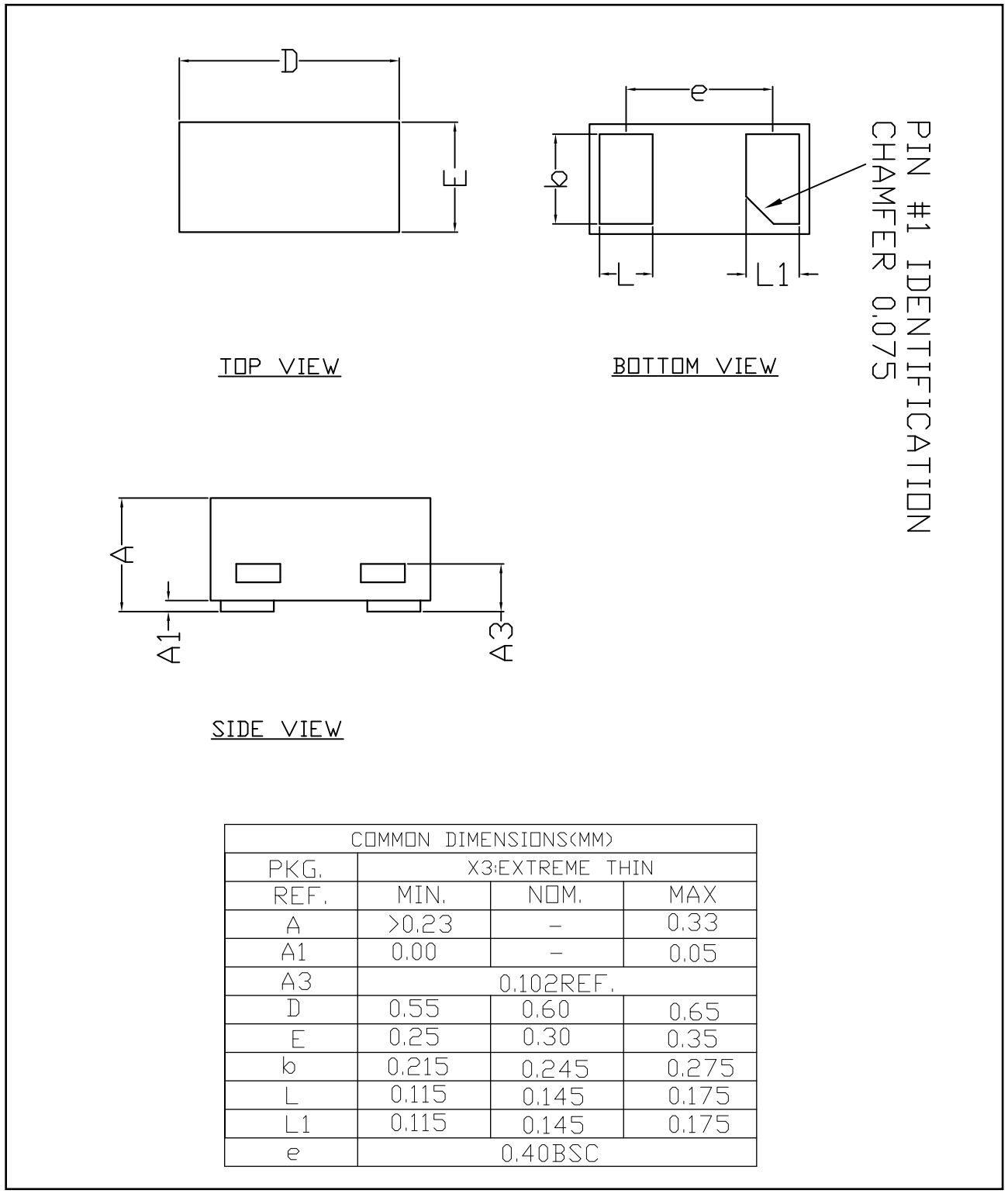


ESD Clamping of I/O to GND (-8kV Contact per IEC 61000-4-2)



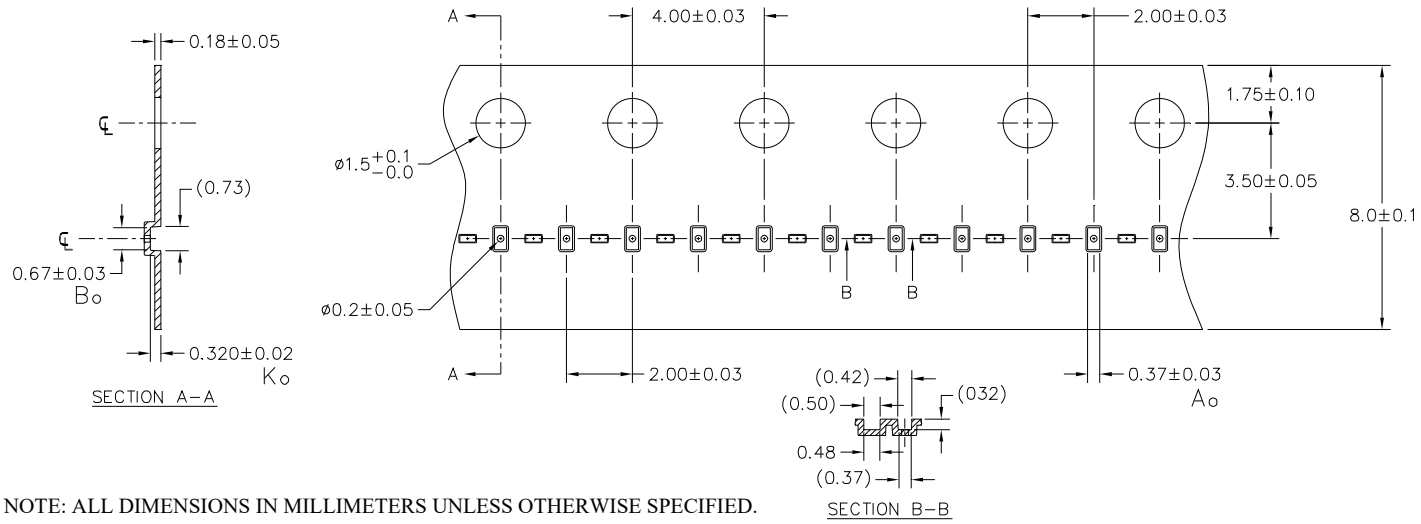
Package Outline

- DFN0603 package
- 2 leads
- MSL-1



COMMON DIMENSIONS(MM)			
PKG.	X3:EXTREME THIN		
REF.	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		

Carries Tape Specification

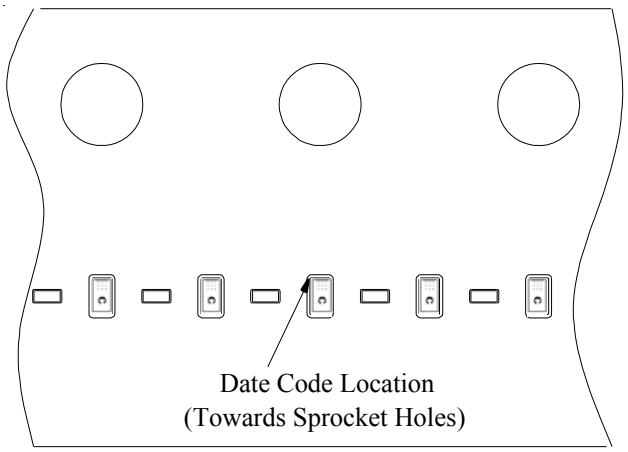


NOTE: ALL DIMENSIONS IN MILLIMETERS UNLESS OTHERWISE SPECIFIED.

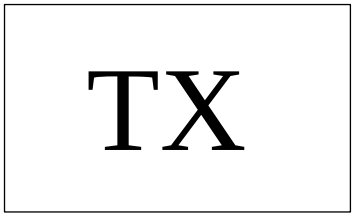
A0	B0	K0
0.37 +/-0.03	0.67 +/-0.03	0.32 +/-0.02 mm

Note: All dimensions in mm unless otherwise specified

Device Orientation in Tape



Marking Codes



Ordering Information

Part Number	Qty per Reel	Reel Size
TT0201SA	10, 000	7 inch

Note:

(1) "T" is part number, fixed

(2) "X" is the internal code