

Features

- ❑ Transient protection for high-speed data lines
 - IEC 61000-4-2 (ESD) ±25kV (Air)
 - ±17kV (Contact)
 - IEC 61000-4-4 (EFT) 40A (5/50 ns)
 - 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: 10 pF(Maximum)
- ❑ Low leakage current: 0.1µA @ V_{RWM} (Typical)
- ❑ Low clamping voltage
- ❑ Each I/O pin can withstand over 1000 ESD strikes for ±8kV contact discharge
- ❑ ROHS compliant

Description

TT1201MAX is a low-capacitance Transient Voltage Suppressor (TVS) designed to provide electrostatic discharge (ESD) protection for high-speed data interfaces. With maximum capacitance of 10 pF, TT1201MAX 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.

TT1201MAX uses ultra-small DFN0603 package. Each TT1201MAX device can protect one data line. It offers system designers flexibility to protect single data line where space is a premium concern.

Applications

- ❑ Serial ATA
- ❑ PCI Express
- ❑ Desktops, Servers and Notebooks
- ❑ Cellular Phones
- ❑ MDDI Ports
- ❑ Display Ports
- ❑ Digital Visual Interfaces (DVI)

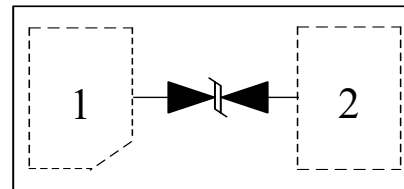
Mechanical Characteristics

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

Circuit Diagram



Pin Configuration



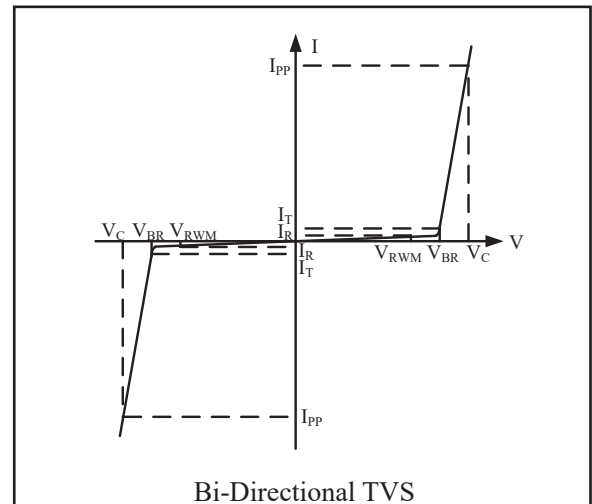
DFN0603
(Top View)

Absolute Maximum Rating

| Symbol | Parameter | Value | Units |
|-----------|---------------------------------|----------|-------|
| V_{ESD} | ESD per IEC 61000-4-2 (Air) | ±25 | kV |
| | ESD per IEC 61000-4-2 (Contact) | ±17 | |
| T_{OPT} | Operating Temperature | -55/+125 | °C |
| T_{STG} | Storage Temperature | -55/+150 | °C |

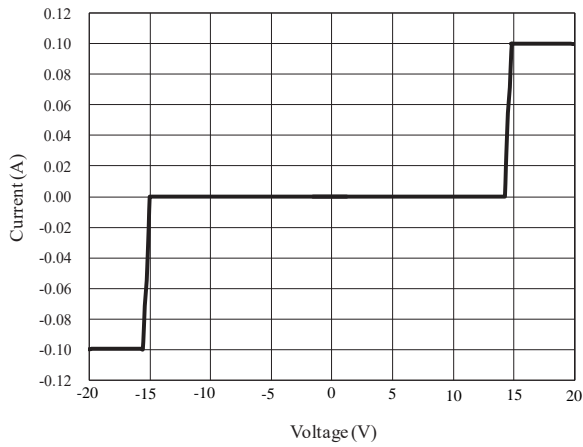
Electrical Characteristics (T = 25°C)

| 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} | Peak Pulse Current |
| C_{ESD} | Parasitic Capacitance |
| V_R | Reverse Voltage |
| f | Small Signal Frequency |

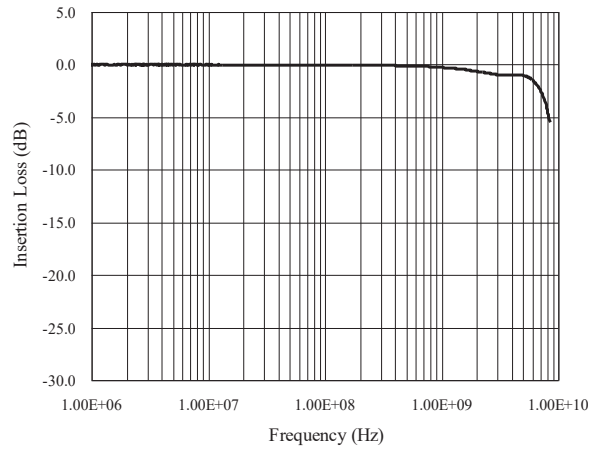


| Symbol | Test Condition | Minimum | Typical | Maximum | Units |
|-----------|--|---------|---------|---------|----------|
| V_{RWM} | | | | 12.0 | V |
| I_R | $V_{RWM} = 12V, T = 25^\circ C$ Between I/O and I/O | | 0.1 | 0.5 | uA |
| V_{BR} | $I_T = 1mA$ Between I/O and I/O | 13.3 | | | V |
| V_C | $I_{PP} = 1A, t_p = 8/20\mu s$ Between I/O and I/O | | 18 | 22 | V |
| V_C | $I_{PP} = 8.0A, t_p = 100ns^{(1)}$ | | 21.5 | | V |
| | $I_{PP} = 16.0A, t_p = 100ns^{(1)}$ | | 26.5 | | V |
| R_{dyn} | $I_{PP} = 12.0A, t_p = 100ns^{(1)}$ | | 0.63 | | Ω |
| C_{ESD} | $V_R = 0V, f = 1MHz$ Between I/O and I/O | | 5 | | pF |

Voltage Sweeping of I/O to I/O

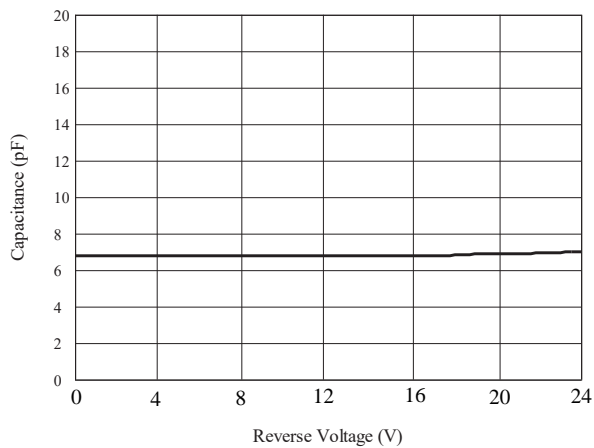


Insertion Loss S21 of I/O to I/O

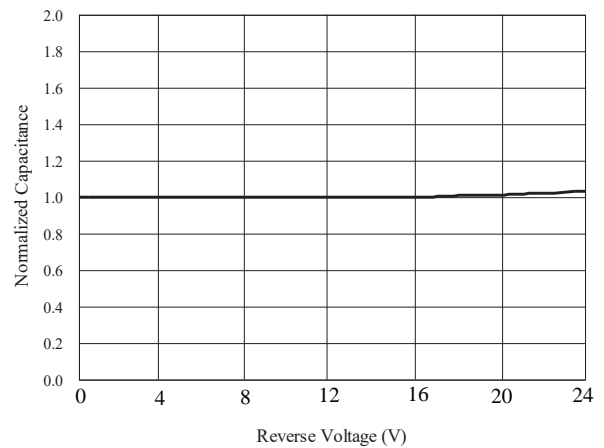


Capacitance vs. Voltage of I/O to I/O (f = 1MHz)

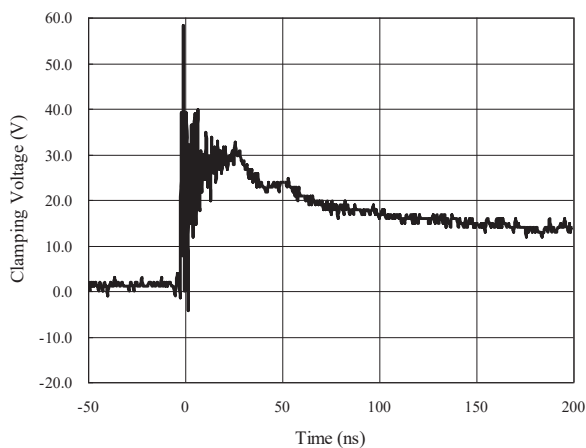
Capacitance vs. Reverse Voltage



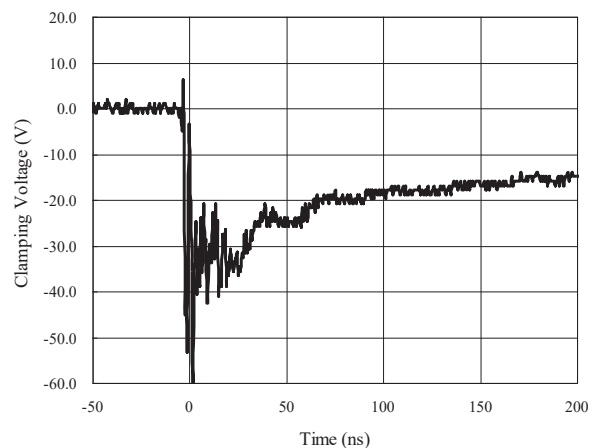
Normalized Capacitance vs. Reverse Voltage



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

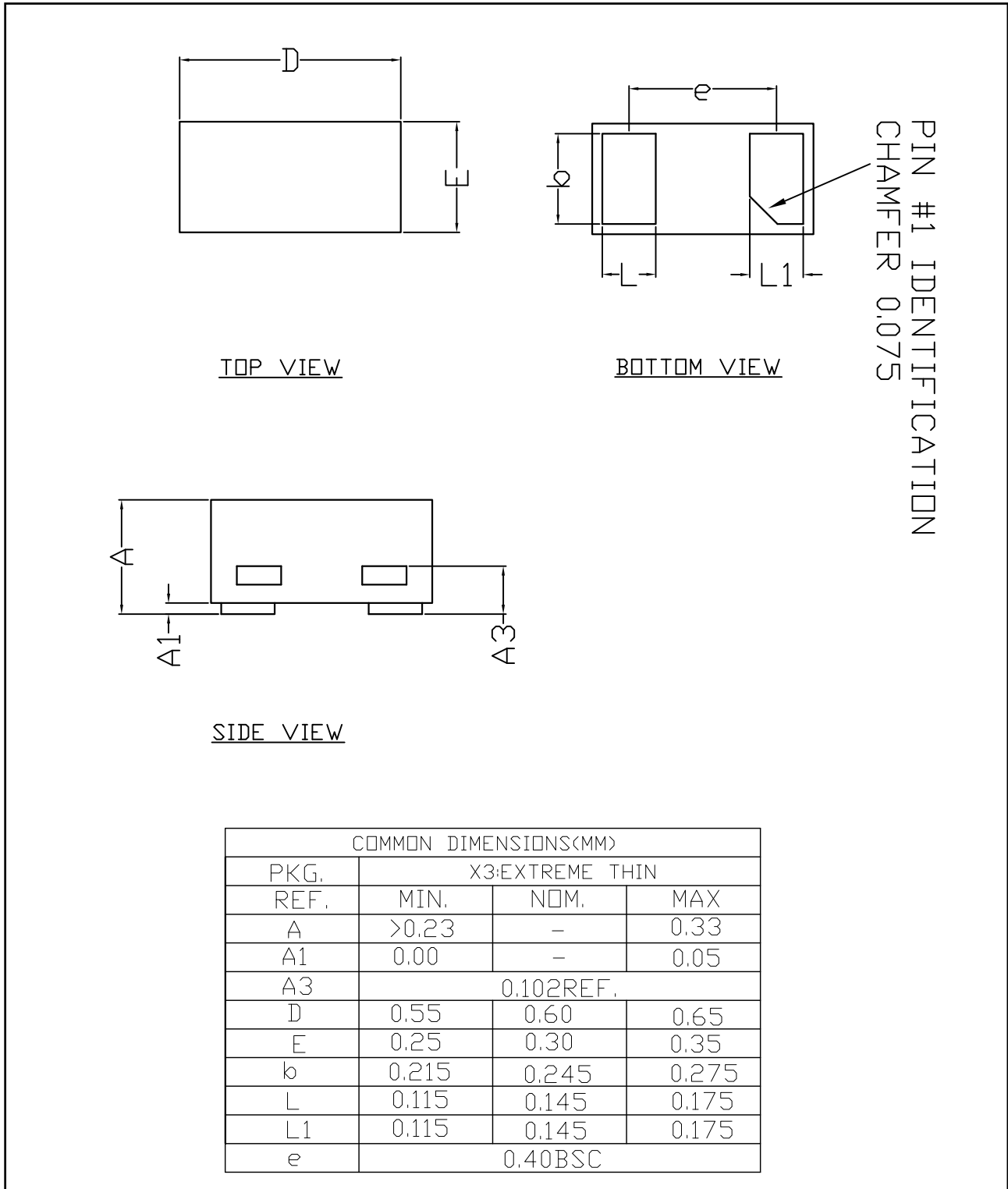


ESD Clamping of I/O to I/O (-8kV Contact per IEC 61000-4-2)

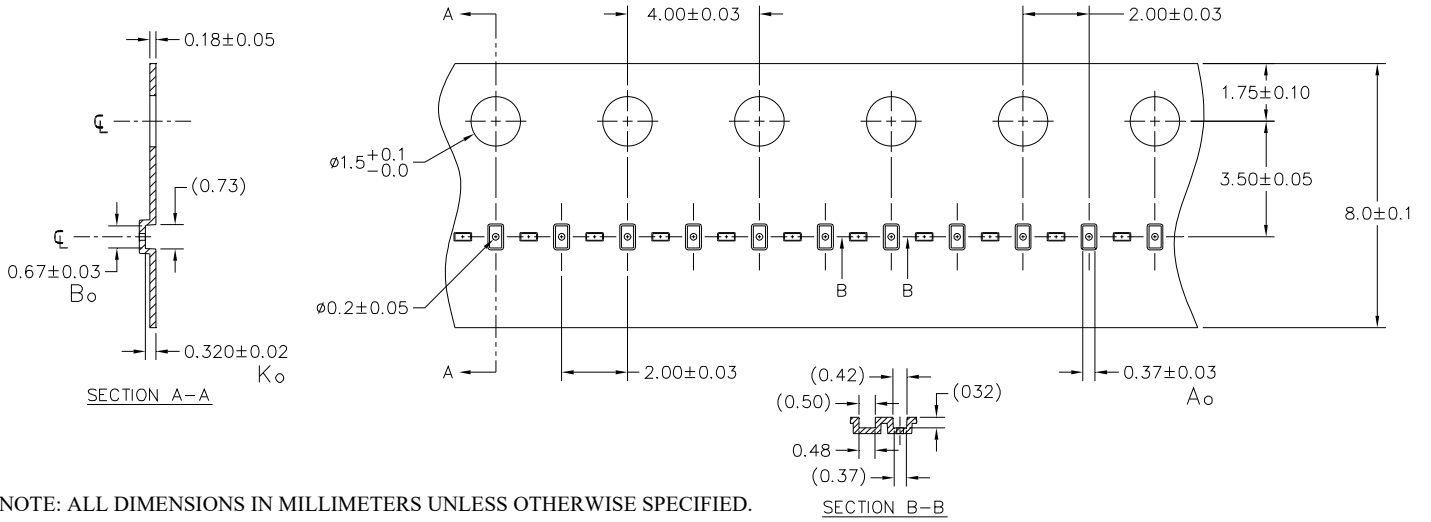


Package Outline

- DFN0603 package
- 2 leads
- MSL-1



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

Marking Codes



Ordering Information

| Part Number | Working Voltage | Quantity Per Reel | Reel Size |
|-------------|-----------------|-------------------|-----------|
| TT1201MAX | 12V | 10,000 | 7 Inch |

Note:

(1) "BM" is part number.

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