Features

- Transient protection for high-speed data lines
  IEC 61000-4-2 (ESD) ±15kV (Air)
  ±8kV (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: 4.0 pF (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
- ROHS compliant

Description

TT2401MAX is a low-capacitance Transient Voltage Suppressor (TVS) designed to provide electrostatic discharge (ESD) protection for high-speed data interfaces. With typical capacitance of 4.0 pF only, TT2401MAX 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.

TT2401MAX uses ultra-small DFN0603 package. Each TT2401MAX device can protect one high-speed 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)

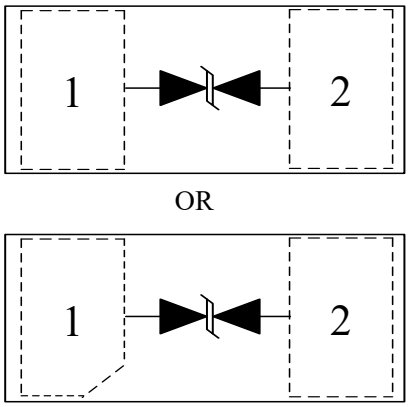
Mechanical Characteristics

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

Circuit Diagram



Pin Configuration



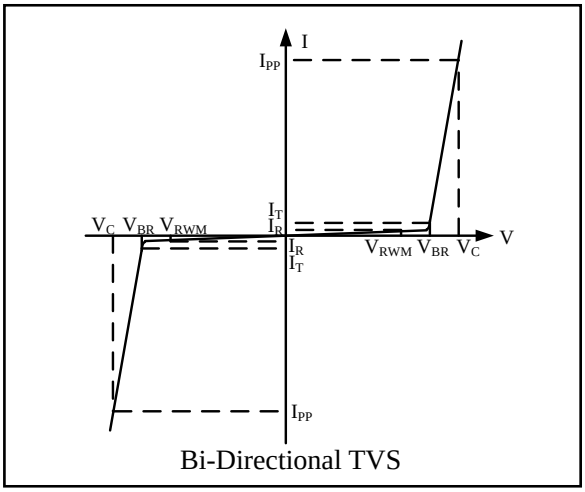
DFN0603-2L
(Top View)

Absolute Maximum Rating

Symbol	Parameter	Value	Units
I_{PP}	Peak Pulse Current (8/20μs)	1	A
P_{PK}	Peak Pulse Power (8/20μs)	30	W
V_{ESD}	ESD per IEC61000-4-2 (Air) ESD per IEC61000-4-2 (Contact)	±10 ±10	kV
HBM	Human body model	±2500	V
CDM	Charged device model	±1000	V
MM	Machine model	±200	V
T_{OPT}	Operating Temperature	-55/+125	°C
T_{STG}	Storage Temperature	-55/+150	°C

Electrical Characteristics (T = 25″C)

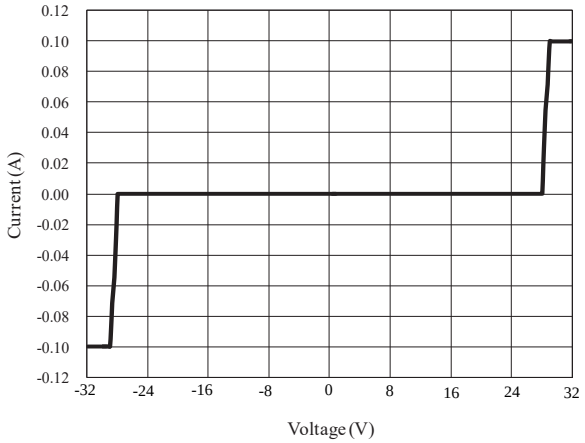
Symbol	Parameter
V_{RWM}	Nominal Reverse Working Voltage
I_R	Reverse Leakage Current @ V_{RWM}
V_{BR}	Reverse Breakdown Voltage @ I_T
I_T	Test Current for Reverse Breakdown
V_C	Clamping Voltage @ I_{PP}
I_{PP}	Maximum Peak Pulse Current
C_{ESD}	Parasitic Capacitance
V_R	Reverse Voltage
f	Small Signal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



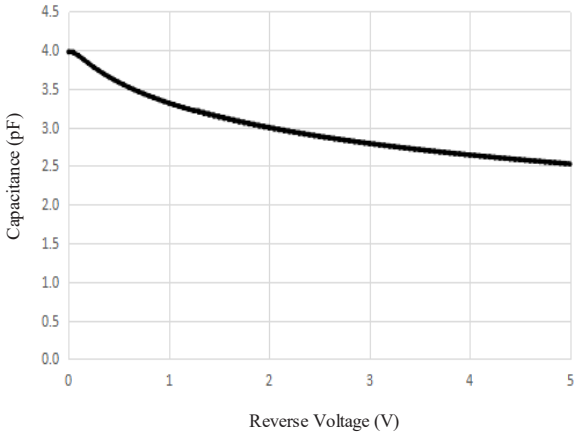
Bi-Directional TVS

Symbol	Test Condition	Minimum	Typical	Maximum	Units
V_{RWM}				24.0	V
I_R	V_{RWM} = 24V, T = 25″C Between I/O and I/O		0.1	1.0	μA
V_{BR}	I_T = 1mA Between I/O and I/O	26			V
V_C	I_{PP} = 1A, t_p = 8/20μs Between I/O and I/O			40	V
C_{ESD}	V_R = 0V, f = 1MHz Between I/O and I/O		4	6	pF

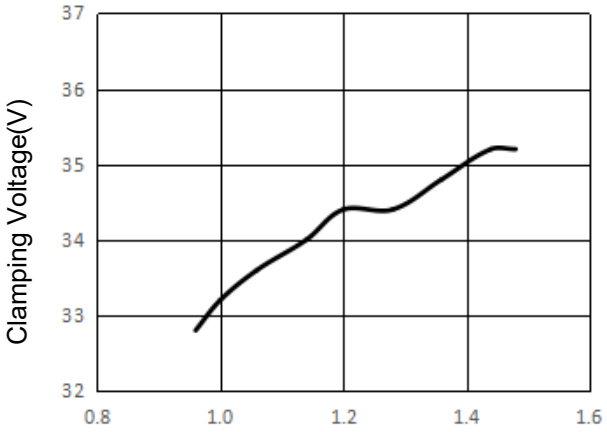
Voltage Sweeping of I/O to I/O



Capacitance *vs.* Voltage of I/O to I/O

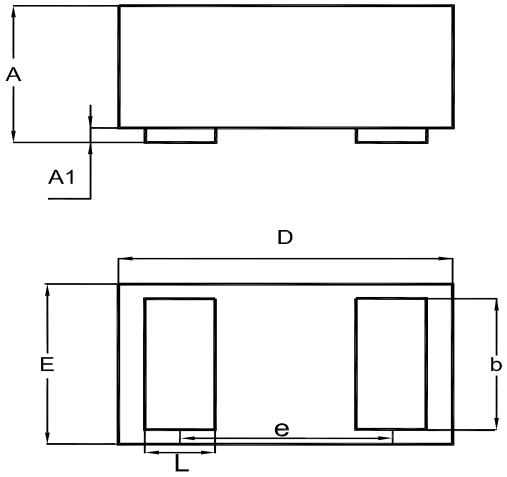


8/20us Current IO to IO



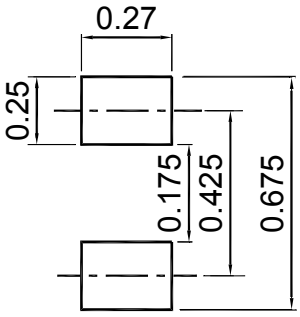
Package Outline

- ❑ DFN0603-2L package
- ❑ MSL-1



UNIT	A	A1	b	D	E	e	L
mm	0.27 0.33	0 0.025	0.21 0.29	0.57 0.65	0.28 0.35	0.355	0.14 0.22

Recommended Soldering Footprint

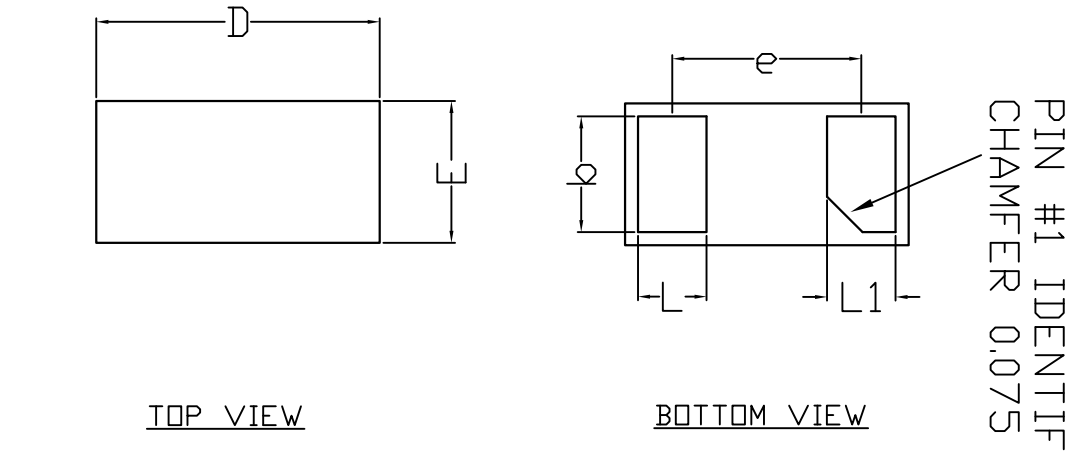


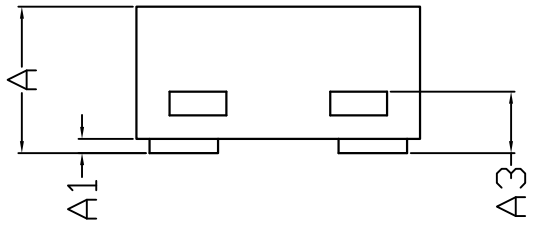
Packing information

Package	Tape Width (mm)	Pitch		Reel Size		Per Reel Packing Quantity
		mm	inch	mm	inch	
DFN0603	8	4 ± 0.1	0.157 ± 0.004	178	7	10,000

Package Outline

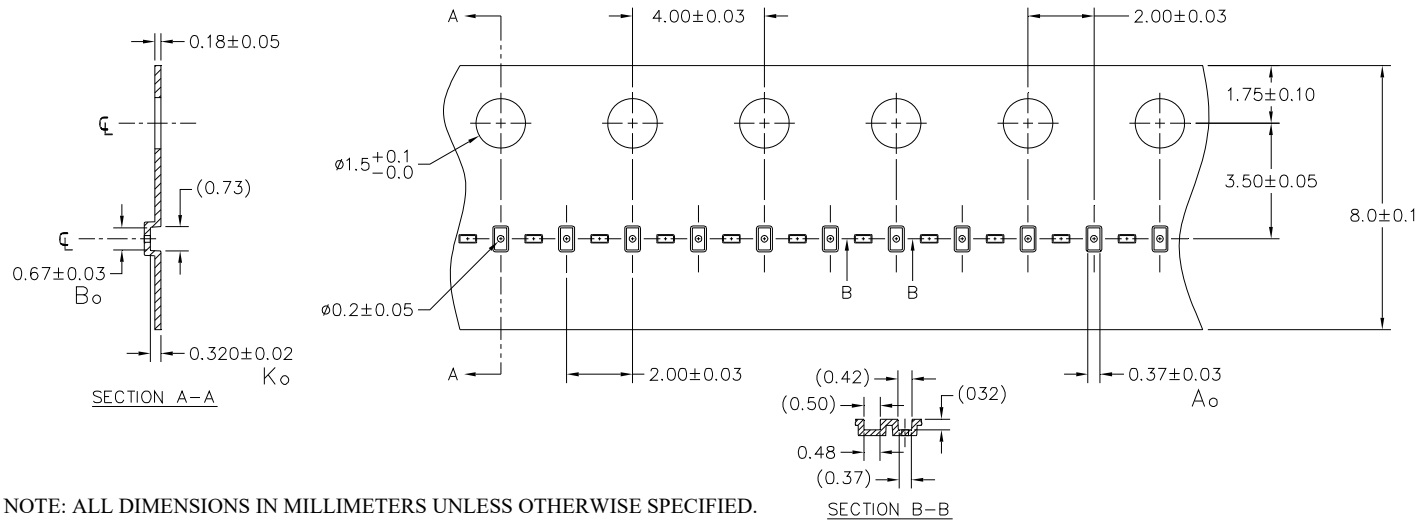
- DFN0603 package
- 2 leads
- MSL-1





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

Marking Codes

EM

Ordering Information

Part Number	Working Voltage	Quantity Per Reel	Reel Size
TT2401MAX	24V	10,000	7 Inch

Note:
(1) "EM" is part number.

Unikeyic Electronics

Global Electronic Components Distributor

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JY:

JY2126AX P0300SCX TT1501SBX JY1106-180EX JY1106-ADJBX JY2312X TT0301MAX TT0401TBX JY1117E50AX TS0512PMX RCLAMP0524P TS0321LEX JY1103-H330QX JY9425X TNM01K20FX TS1811LD-CX TT0201SAX JY1103-H390BX MMBT3906X TL431 TS0334PLX TT0314TPX P3100SCX SMCJ20AX TP6063F-TDX TS2411LEX TT0514TLX B5819WX TS0421LEX TT0511TEX