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 (1.0mm×0.6mm×0.55mm)
- Protects one data, control or power line
- Low capacitance: 12pF (Typical)
- 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

TT0301MBX is a low-capacitance Transient Voltage Suppressor (TVS) designed to provide electrostatic discharge (ESD) protection for data, control or power lines. With typical capacitance of 12pF only, TT 0301 MBX 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 (±15 kV 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.

TT0301MBX uses ultra-small DFN1006-2L package. 1 Each TT0301MBX device can protect one data line. It offers system designers flexibility to protect single data line where space is a premium concern.

Applications

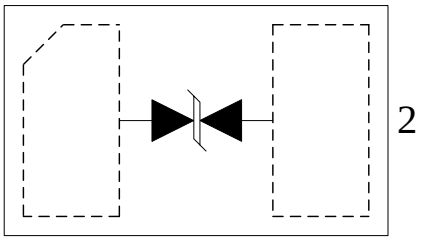
- Portable Electronics
- Desktops, Servers and Notebooks
- Cellular Phones
- MP3 Ports
- Digital Camera Ports
- Subscriber Identity Module (SIM) card

Mechanical Characteristics

- DFN1006-2L package
- Flammability Rating: UL 94V-0
- Marking: Part number
- Packaging: Tape and Reel

Circuit Diagram

Pin Configuration



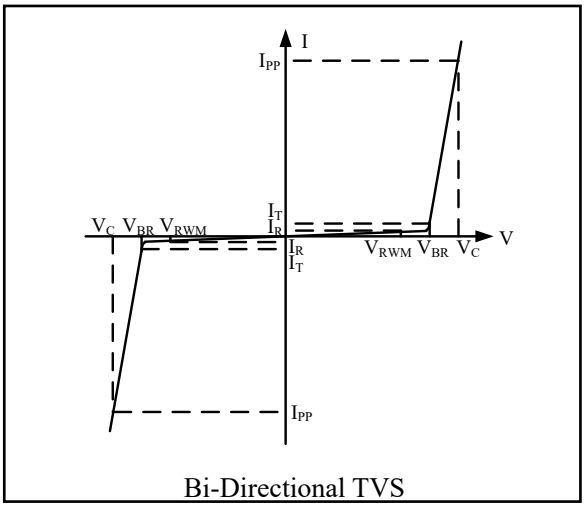
DFN1006-2L
(Top View)

Absolute Maximum Rating

Symbol	Parameter	Value	Units
P_{PP}	Peak Pulse Power (8/20μs)	48	W
I_{PP}	Peak Pulse Current(tp=8/20us)	4	A
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)

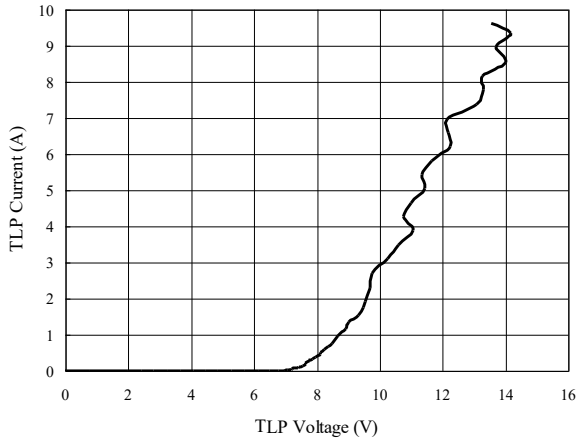
Symbol	Parameter
V_{RWM}	Nominal Reverse Working Voltage
I_R	Reverse Leakage Current @ V_{RWM}
V_{BR}	Reverse Breakdown Voltage @ I_T
I_T	Test Current for Reverse Breakdown
V_C	Clamping Voltage @ I_{PP}
I_{PP}	Maximum Peak Pulse Current
C_{ESD}	Parasitic Capacitance
V_R	Reverse Voltage
f	Small Signal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



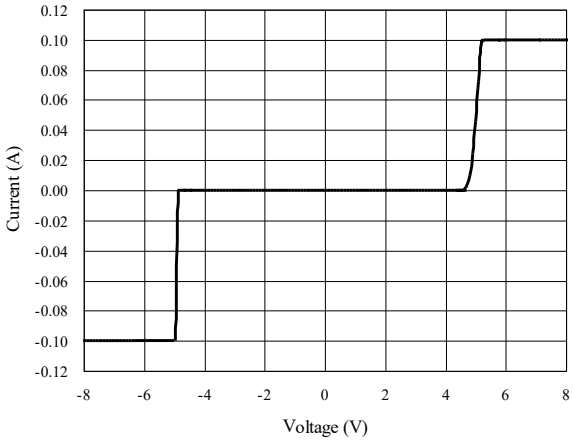
Bi-Directional TVS

Symbol	Test Condition	Minimum	Typical	Maximum	Units
V_{RWM}				3.3	V
I_R	V_{RWM}= 3.3V, 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	3.8		6.0	V
V_C	I_{PP} = 1A, t_p = 8/20μs Between I/O_1 and I/O_2			8	V
V_C	I_{PP} = 4A, t_p = 8/20μs Between I/O_1 and I/O_2			10	V
C_{ESD}	V_R = 0V, f = 1MHz Between I/O_1 and I/O_2		12	15	pF

TLP Measurement of I/O_1 to I/O_2

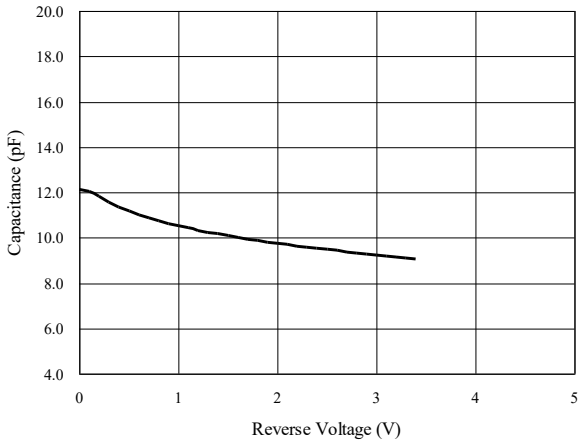


Voltage Sweeping of I/O_1 to I/O_2

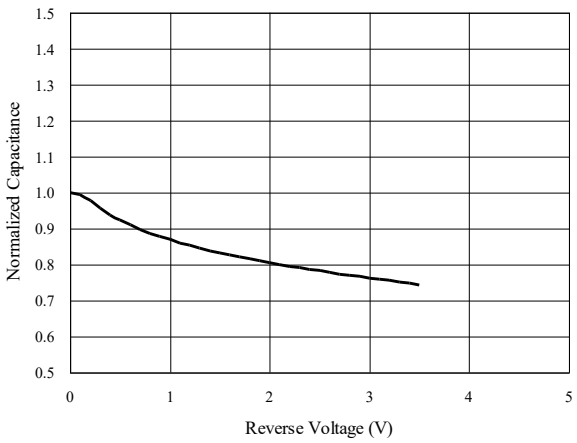


Capacitance vs. Voltage of I/O_1 to I/O_2 (f = 1MHz)

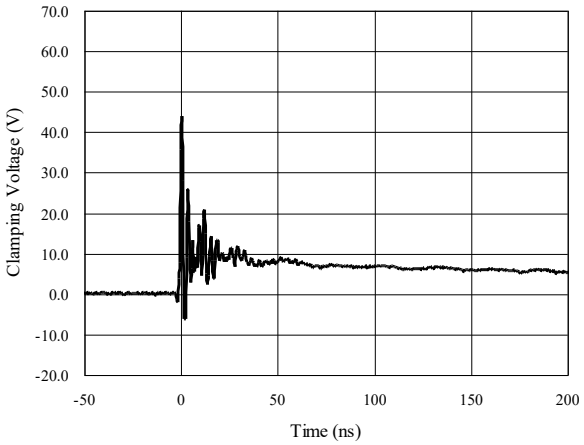
Capacitance *vs.* Reverse Voltage



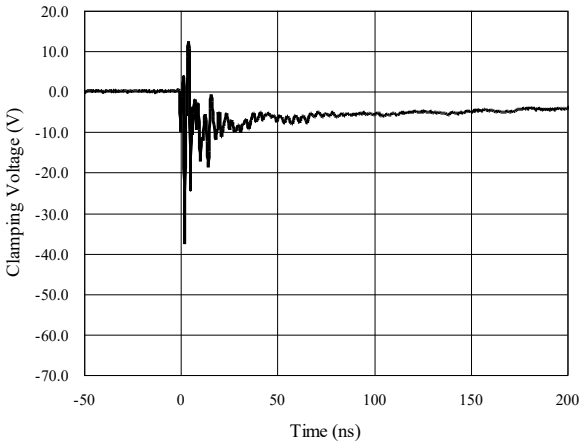
Normalized Capacitance *vs.* Reverse Voltage



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

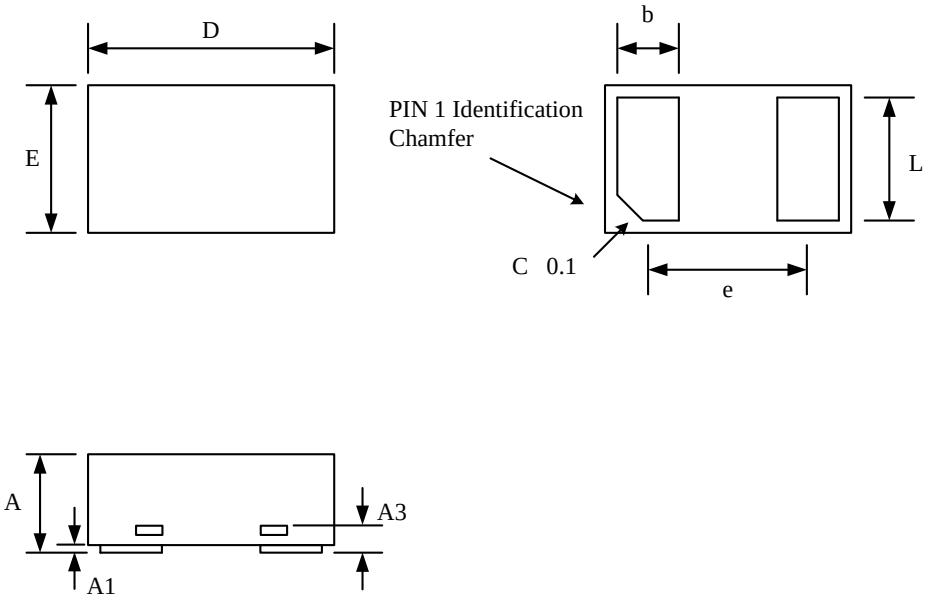


ESD Clamping of I/O_1 to I/O_2 (-8kV Contact per IEC 61000-4-2)



Package Outline

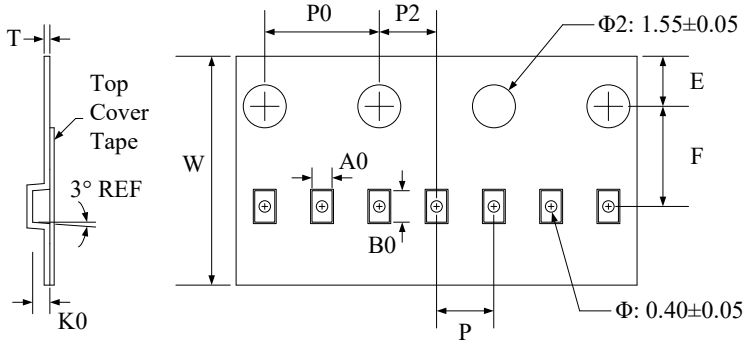
- ❑ DFN1006-2L package
- ❑ 2 leads, very small package
- ❑ MSL-1



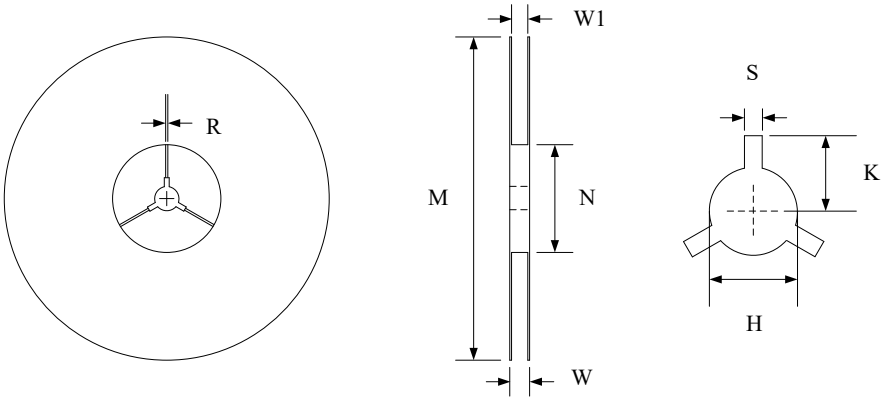
Package Dimensions (Controlling dimensions are in millimeters)

Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Minimum	Maximum	Minimum	Maximum
A	0.400	0.550	0.016	0.022
A1	0.000	0.050	0.000	0.002
A3	0.125 REF		0.005 REF	
D	0.950	1.050	0.037	0.041
E	0.550	0.650	0.022	0.026
b	0.200	0.300	0.008	0.012
e	0.650 BSC		0.026 BSC	
L	0.450	0.550	0.018	0.022

Tape and Reel Specification

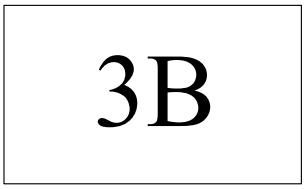


Symbol	W	A0	B0	K0	E	F	P	P0	P2	T
Dimensions (mm)	8.00±0.1	0.7±0.05	1.15±0.05	0.55±0.05	1.75±0.1	3.5±0.05	2.0±0.1	4.0±0.1	2.0±0.05	0.2±0.05



Symbol	Reel Size	M	N	W	W1	H	S	K	R
Dimensions (mm)	Φ178	178.0±1.0	60.0±1.0	11.5±0.5	9.0±0.5	13.0±0.5	2.0±0.1	11.0±0.2	1.0±0.05

Marking Codes



Note:
(1) "3B" is part number, fixed

Ordering Information

Part Number	Working Voltage	Quantity Per Reel	Reel Size
TT0301MBX	3.3V	10,000	7 Inch