ESD0302L

Ultra Low Capacitance TVS/ESD Protection Diodes

DFN1006-3L Plastic-Encapsulate ESD Protection Diodes

DESCRIPTION

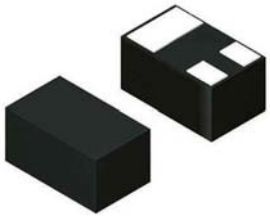
ESD0302L is an ultra-low-capacitance Transient Voltage Suppressor (TVS) designed to provide electrostatic discharge (ESD) protection For high-speed data interfaces. With typical capacitance of 0.2pF (I/O to I/O) only, ESD0302L is designed to protect parasitic-sensitive systems against over-voltage and over-current transsient events. It complies with IEC 61000-4-2 (ESD), Level 4 (±15kV air, ±8kV contact discharge), IEC 61000-4-4 (electrical fast transientt - EFT) (40A, 5/50 ns), very fast charged devicee model (CDM) ESD and cable discharge event (CDE), etc. ESD0302L uses ultra-small DFN1006-3L package. Each ESD0302L device can protect two high-speed data lines. The combined features of low capacitance, small size and high ESD robustness make ESD0302L ideal for high-speed data port and high-frequency line applications, The low camping voltage of the ESD0302L guarantees a minimum stress on the protected IC.

Features

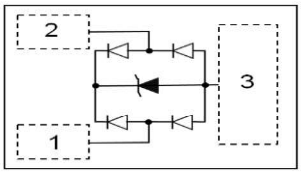
- Peak Power Dissipation : 56W (8/20μs)
- Transient protection for high speed data lines
- IEC61000-4-2 (ESD) ±15kV (air), ±8kV (contact)
- IEC61000-4-4 (EFT) 40A (5/50ns)
  Cable Discharge Event (CDE)
- Small package (2.9mm×2.4mm×1.0mm)
- Protect two data lines
- Low clamping voltage
- Low Capacitance :0.2pF Typical (I/O - I/O)
- Low leakage current

Pin Configuration

RoHS COMPLIANT



Circuit Diagram



Applications

- Serial ATA
- Desktops, Servers and Notebooks
- PCI Express
- MDDI Ports
- USB Data Line Protectioon
- Display Ports
- Digital Visual Interfacess (DVI)

Mechanical Characteristics

- Package: DFN1006-3L
- Flammability Rating: UL 94V-0
- Packaging: Tape and Reel
- Terminals: Gold plated, solderable per MIL-STD-750, method 2026
- Marking: 32L

Absolute Maximum Ratings (T_A=25°C unless otherwise specified)

Parameter	Symbol	Value	Unit
ESD per IEC 61000−4−2 (Air) ESD per IEC 61000−4−2 (Contact)	V_{ESD}	± 20 ± 20	kV
Peak Pulse Power(tp=8/20us waveform)	P_{PP}	56	W
Operating Temperature	T_{OPT}	−55 to +125	°C
Storage Temperature Range	T_{STG}	−55 to +150	°C

The above data are for reference only.

Electrical Characteristics (T_A=25°C unless otherwise specified)

Symbol	Parameter	Test Condition	Min	Typ	Max	Units
V_{RWM}	Reverse Working Voltage	I/O to GND			3.3	V
V_{BR}	Reverse Breakdown Voltage	I_T = 1mA Between I/O and GND	4.2			V
I_R	Reverse Leakage Current	V_{RWM} = 3.3V Between I/O and GND			100	nA
V_C	Clamping Voltage	I_{PP} = 1A, t_p = 8/20μs Between I/O and GND			10	V
		I_{PP} = 4A, t_p = 8/20μs Between I/O and GND			14	V
V_F	Forward Voltage	I_T = 10mA Between I/O and GND			1.2	V
C_T	Total Capacitance	V_R = 0V, f = 1MHz Between I/O and GND		0.4	0.6	pF
		V_R = 0V, f = 1MHz Between I/O and I/O		0.2	0.3	pF

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ELECTRICAL CHARACTERISTICS CURVE

Fig 1 Power Derating Curve

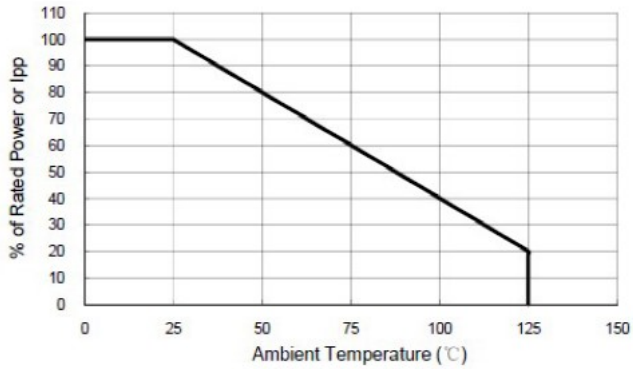


Fig 2 Clamping Voltage vs Peak Pulse Current

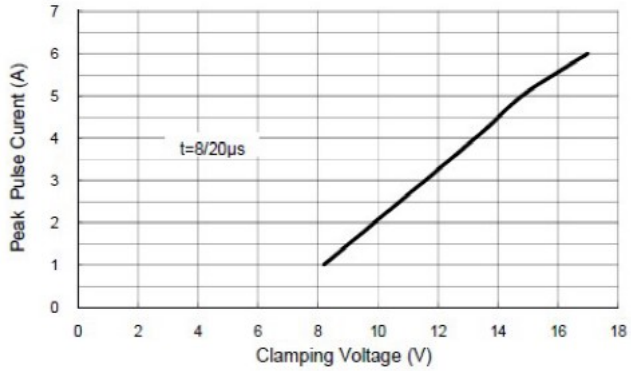


Fig 3 Voltage Sweeping

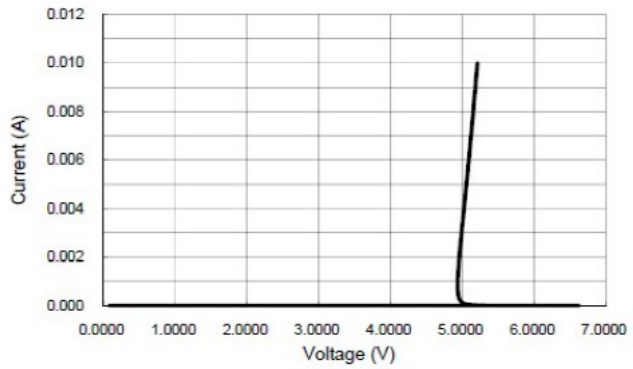


Fig 4 Voltage vs Capacitance

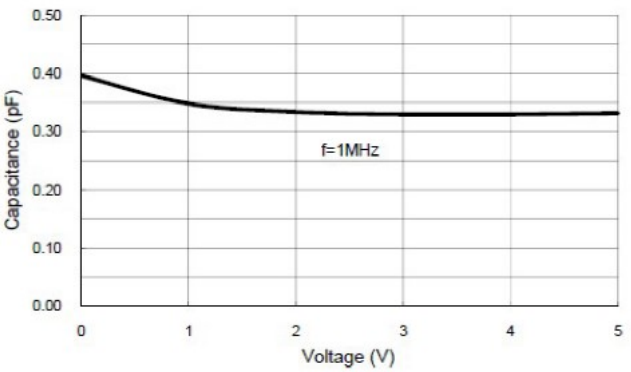


Fig 5 ESD Clamping
(+8kV Contact per IEC 61000-4-2)

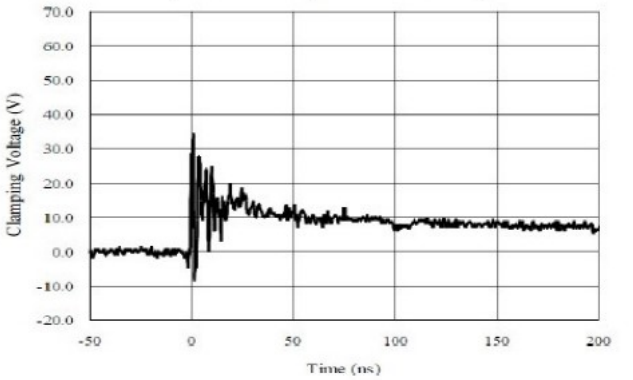
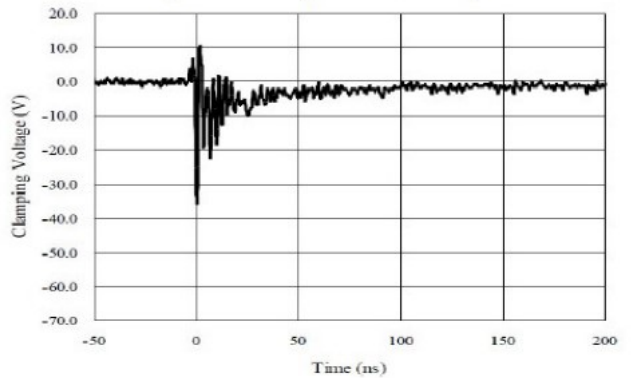


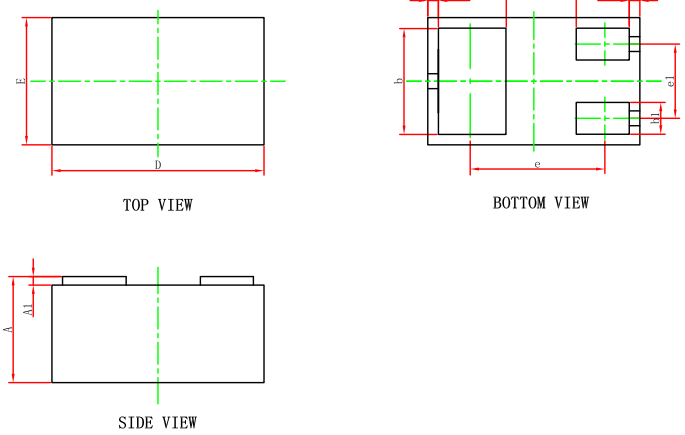
Fig 6 ESD Clamping
(-8kV Contact per IEC 61000-4-2)



The above data are for reference only.

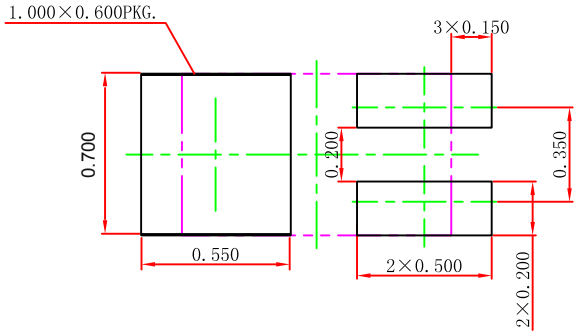
Outlitne Drawing

DFN1006-3L Package Outline Dimensions



Symbol	Dimensions In Millimeters		Dimensions In Inches	
	Min.	Max.	Min.	Max.
A	0.450	0.550	0.018	0.022
A1	0.010	0.100	0.000	0.004
D	0.950	1.050	0.037	0.041
E	0.550	0.650	0.022	0.026
b	0.450REF.		0.018REF.	
b1	0.100	0.200	0.004	0.008
e	0.635REF.		0.025REF.	
e1	0.300	0.400	0.012	0.016
L	0.200	0.300	0.008	0.012
L1	0.050REF.		0.002REF.	
L2	0.200	0.300	0.008	0.012

Suggested Pad Layout



Dimensions	Value (in mm)
C	0.90
G	0.40
X	0.50
X1	1.10
Y	0.50

Note:
1.Controlling dimension:in/millimeters.
2.General tolerance: ±0.05mm.
3.The pad layout is for reference purposes only.

PACKAGE SPECIFICATIONS

Package	Reel Size	Reel DIA. (mm)	Q'TY/Reel (pcs)	Box Size (mm)	QTY/Box (pcs)	Carton Size (mm)	Q'TY/Carton (pcs)
DFN1006	7'	178	10,000	210×210×205	100,000	445×445×230	400,000