

Ultra Low Capacitance ESD Protection Diode

DESCRIPTION

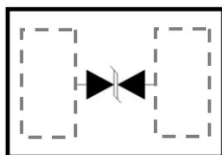
ESD1501BU is an ultra low capacitance Transient Voltage Suppressor (TVS) designed to provide electrostatic discharge (ESD) protection for high-speed data interfaces. With typical capacitance of 0.25pF, ESD1501BU is designed to protect parasitic-sensitive systems against over-voltage and over-current transient events. It complies with IEC 61000-4-2 (ESD), Level 4 ($\pm 15\text{kV}$ air, $\pm 8\text{kV}$ contact discharge), very fast charged device model (CDM) ESD and cable discharge event (CDE), etc.

ESD1501BU uses ultra-small DFN1006 package. Each ESD1501BU device can **protect one** high-speed data line. It offers system designers flexibility to protect single data line where space is a premium concern. The combined features of low capacitance, ultra-small size and high ESD robustness make ESD1501BU ideal for high-speed data port and high-frequency line applications.

ORDERING INFORMATION

- ✧ Device: ESD1501BU
- ✧ Package: DFN1006
- ✧ Marking: 15BU
- ✧ Material: Halogen free
- ✧ Packing: Tape & Reel
- ✧ Quantity per reel: 10,000pcs

PIN CONFIGURATION



FEATURES

- ✧ Transient protection for high-speed data lines
IEC 61000-4-2 (ESD) $\pm 15\text{kV}$ (Contact)
 $\pm 20\text{kV}$ (Air)
Cable Discharge Event (CDE)
- ✧ Package optimized for high-speed lines
- ✧ Ultra-small package (1.0mm \times 0.6mm \times 0.5mm)
- ✧ Protects one data, control line
- ✧ Low capacitance: 0.25pF (Typical)
- ✧ Low leakage current
- ✧ Low clamping voltage

MACHANICAL DATA

- ✧ DFN1006 package
- ✧ Flammability Rating: UL 94V-0
- ✧ High temperature soldering guaranteed:
 $260^{\circ}\text{C}/10\text{s}$
- ✧ Packaging: Tape and Reel
- ✧ Reel size: 7 inch

APPLICATIONS

- ✧ Local Area Network (LAN) equipment
- ✧ FireWire
- ✧ Computers and peripherals
- ✧ Communication systems
- ✧ High-speed data lines

PACKAGE OUTLINE



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ABSOLUTE MAXIMUM RATING

Symbol	Parameter	Value	Units
V_{ESD}	ESD per IEC 61000-4-2 (Contact) ESD per IEC 61000-4-2 (Air)	± 15 ± 20	kV
P_{PP}	Peak Pulse Power (8/20 μ s)	70	W
T_{OPT}	Operating Temperature	-55~125	$^{\circ}$ C
T_{STG}	Storage Temperature	-55~150	$^{\circ}$ C

ELECTRICAL CHARACTERISTICS ($T_{amb}=25^{\circ}$ C)

Symbol	Parameter	Test Condition	Min	Typ	Max	Units
V_{RWM}	Reverse Working Voltage				15.0	V
V_{BR}	Reverse Breakdown Voltage	$I_T = 1mA$	16			V
I_R	Reverse Leakage Current	$V_{RWM} = 15V$			500	nA
V_C	Clamping Voltage	$I_{PP} = 1A, t_p = 8/20\mu s$			25	V
		$I_{PP} = 2A, t_p = 8/20\mu s$			35	V
C_J	Junction Capacitance	$V_R = 0V, f = 1MHz$		0.25	0.40	pF

ELECTRICAL CHARACTERISTICS CURVE

Fig 1 Power Derating Curve

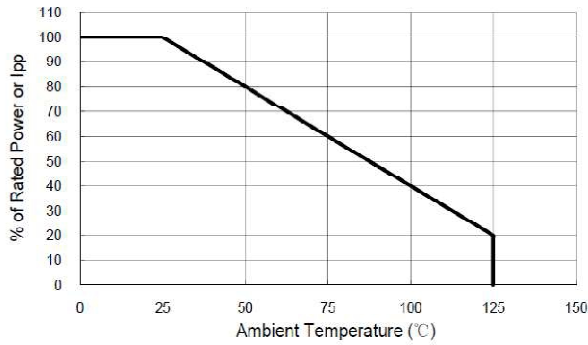


Fig 2 8/20μs Waveform per IEC61000-4-5

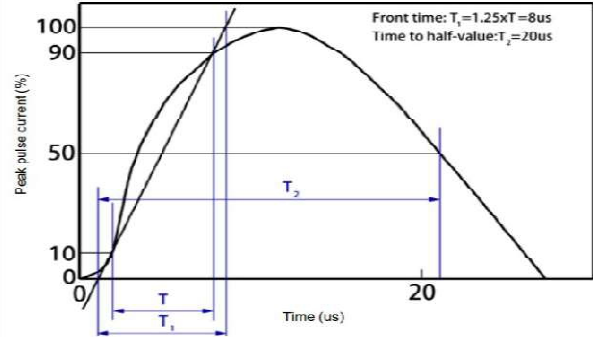


Fig 3 Clamping Voltage vs Peak Pulse Current

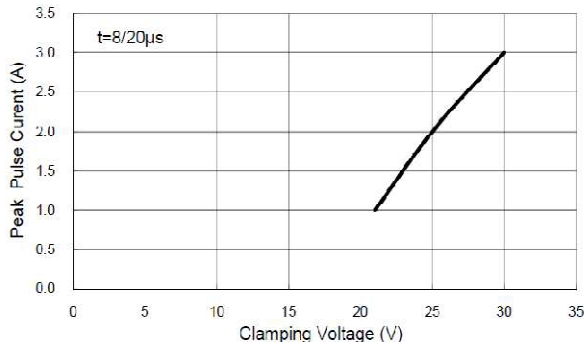


Fig 4 Voltage vs Capacitance

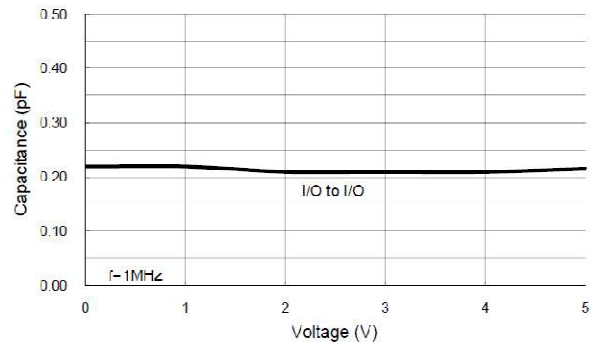


Fig 5 ESD Clamping of I/O to GND (+8kV Contact per IEC 61000-4-2)

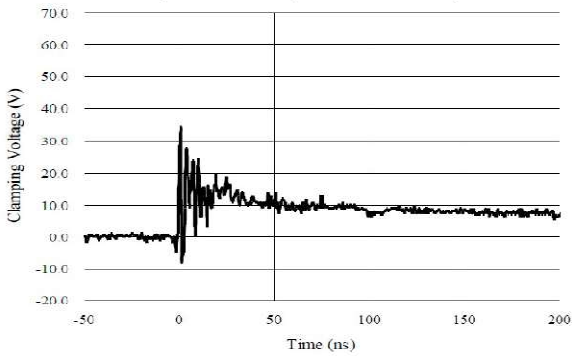
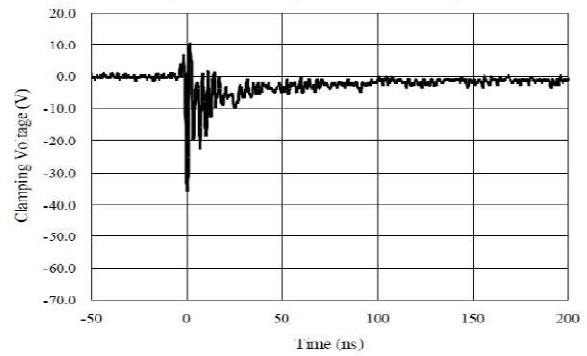
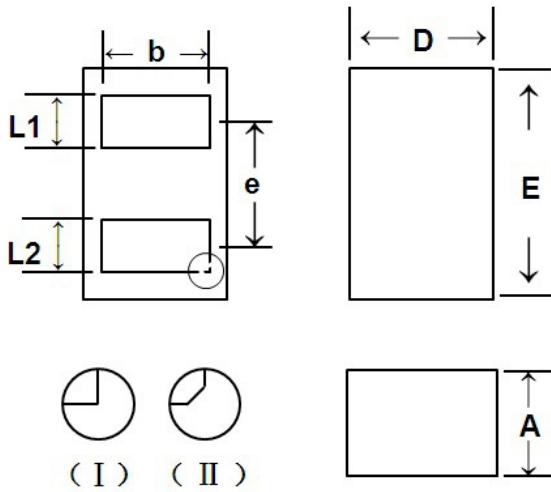


Fig 6 ESD Clamping of I/O to GND (-8kV Contact per IEC 61000-4-2)



DFN1006 PACKAGE OUTLINE DIMENSIONS



NOTE: ALL DIMENSIONS IN MM

	MIN	NOM	MAX
D	0.55	0.60	0.65
E	0.95	1.00	1.05
L1	0.20	0.25	0.30
L2	0.20	0.25	0.30
A	0.45	0.50	0.55
b	0.45	0.50	0.55
e		0.64BSC	

