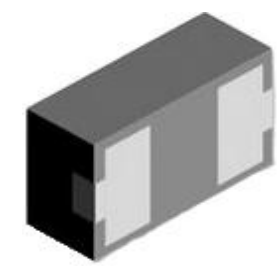
JULC0521P
1-Line Bi-directional TVS Diode

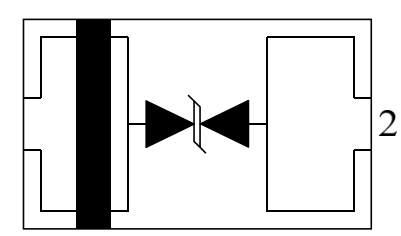
DESCRIPTION

JULC0521P is a low-capacitance Transient Voltage Suppressor (TVS) designed to provide electrostatic discharge (ESD) protection for high-speed data interfaces. With typical capacitance of 0.4pF only, JULC0521P 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 (±30kV air, ±15kV 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.

JULC0521P uses ultra-small uDFN-2L package or FBP1006. Each JULC0521P 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 JULC0521P ideal for high-speed data port and high-frequency line (e.g., USB 2.0 & antenna line) applications,such as cellular phones and HD visual devices.



FBP1006



APPLICATIONS

- ✧ Serial ATA.
- ✧ Desktops, Servers and Notebooks.
- ✧ Cellular Phones.
- ✧ MDDI Ports.
- ✧ USB2.0 Power and Data Line Protection.
- ✧ Display Ports
  Digital Visual Interfaces (DVI).

FEATURES

- ✧ Transient protection for high-speed data lines IEC 61000-4-2
  (ESD) ±30kV (Air)
  ±15kV (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×0.4mm).
- ✧ Protects one data, control or power line.
- ✧ Low capacitance: 0.4pF (Typical).
- ✧ Low leakage current: 10nA @ VRWM (Typical)
  Low clamping voltage.

ORDERING INFORMATION

- ✧ Device: JULC0521P
- ✧ Package: uDFN-2L or FBP1006
- ✧ Material: Halogen free
- ✧ Packing: Tape & Reel
- ✧ Quantity per reel: 5,000pcs or 10,000pcs

MACHANICAL DATA

- ✧ uDFN-2L package or FBP1006
- ✧ Flammability Rating: UL 94V-0
- ✧ Packaging: Tape and Reel
- ✧ High temperature soldering guaranted:260℃/10s
  Reel size: 7 inch

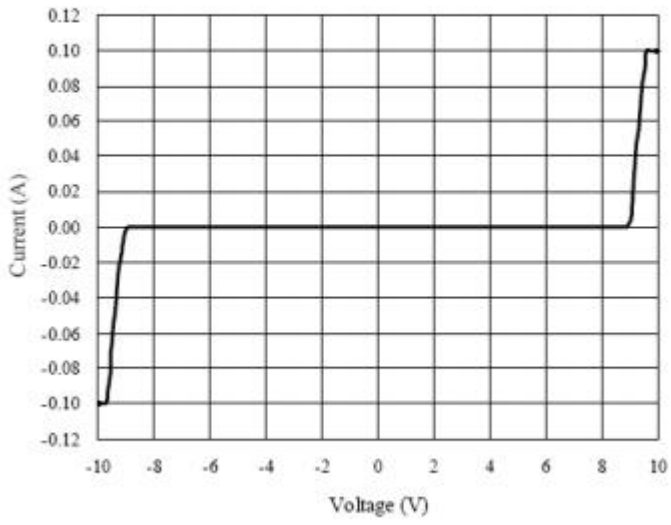
DEVICE CHARACTERISTICS

ABSOLUTE MAXIMUM RATING			
Symbol	**Parameter**	**Value**	**Units**
V_{ESD}	ESD per IEC 61000-4-2 (Air) ESD per IEC 61000-4-2 (Contact)	±30 ±15	kV
T_{OPT}	Operating Temperature	-55/+125	°C
T_{STG}	Storage Temperature	-55/+150	°C

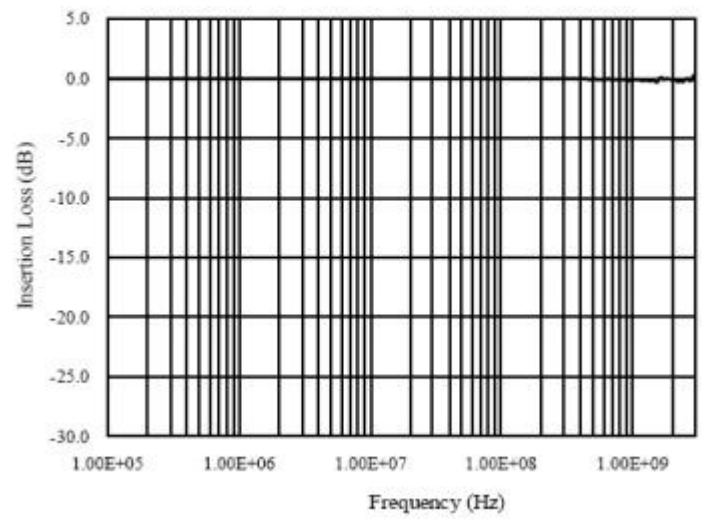
ELECTRICAL CHARACTERISTICS (T_A=25°C)

Symbol	Parameter	Test Condition	Min	Typ	Max	Units
V_{RWM}	Reverse Working Voltage				5.0	V
V_{BR}	Reverse Breakdown Voltage	I_T = 1mA	6.0		7.8	V
I_R	Reverse Leakage Current	V_{RWM} = 5V		0.01	0.5	μA
V_{C1}	Clamping Voltage 1	I_{PP} = 1A, t_p = 8/20μs			12	V
V_{C2}	Clamping Voltage 2	I_{PP} = 4A, t_p = 8/20μs			21	V
C_J	Junction Capacitance	V_R = 0V, f = 1MHz		0.40	0.65	pF

Voltage Sweeping of I/O to I/O

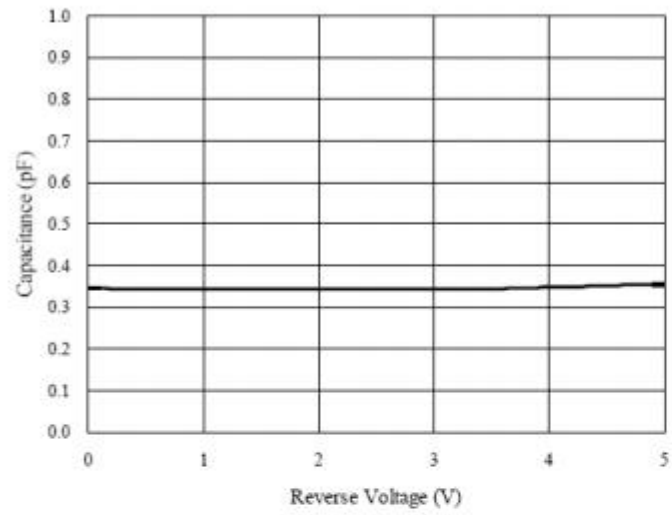


Insertion Loss S21 of I/O to I/O

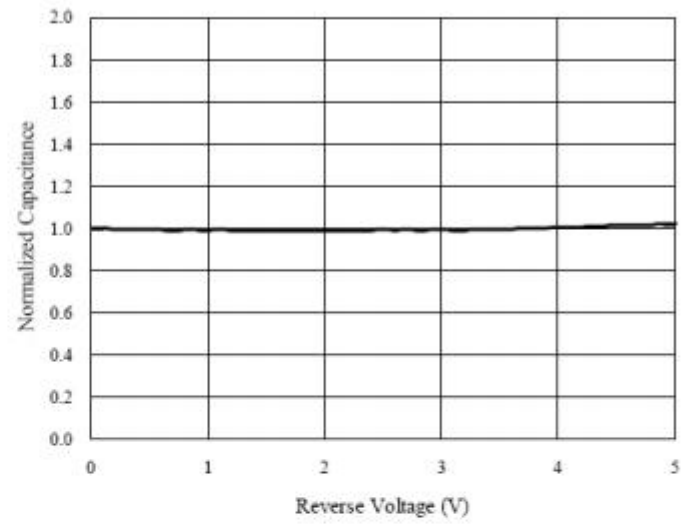


Capacitance *vs.* Voltage of I/O to I/O (f = 1MHz)

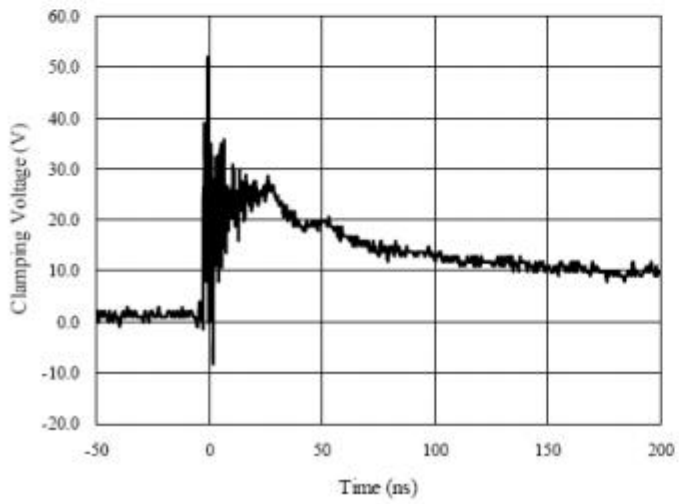
Capacitance *vs.* Reverse Voltage



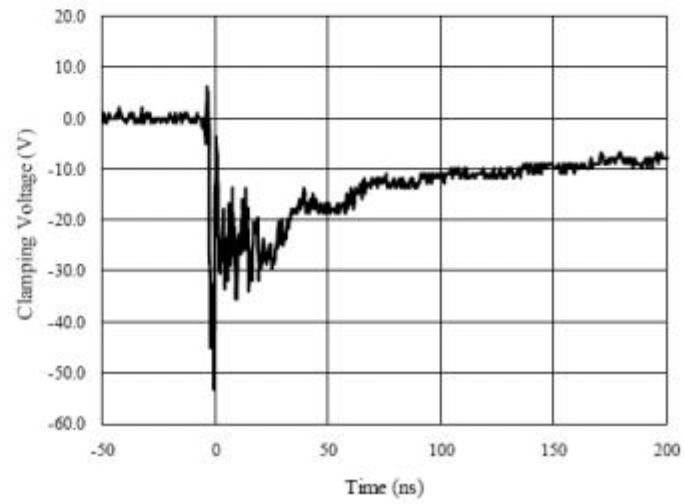
Normalized Capacitance *vs.* Reverse Voltage



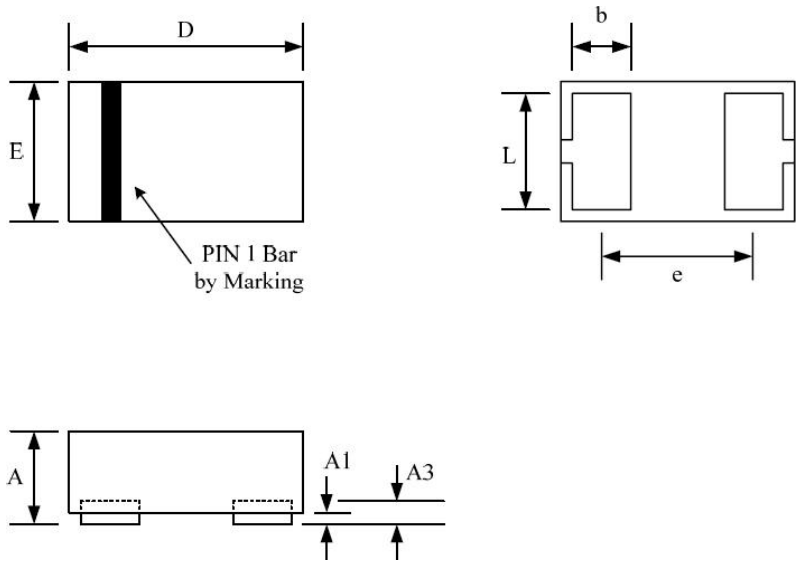
ESD Clamping of I/O to I/O (+8kV Contact per IEC 61000-4-2)



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



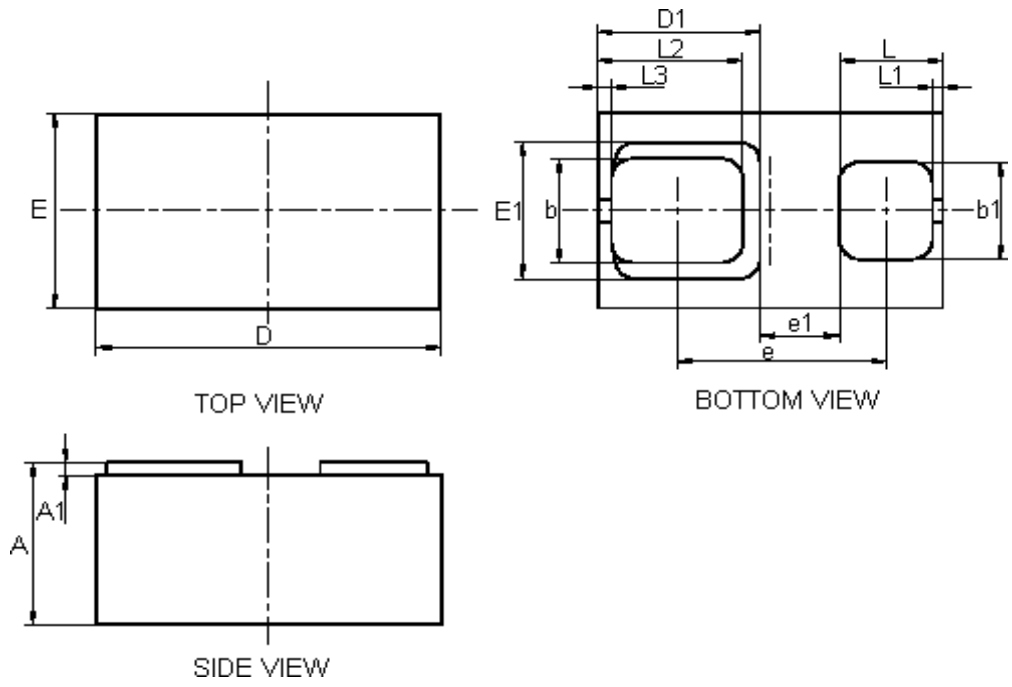
uDFN-2L PACKAGE OUTLINE DIMENSIONS



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

FBP1006 PACKAGE OUTLINE DIMENSIONS



Symbol	Millimeters		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
D1	0.470 REF		0.019 REF	
E1	0.420 REF		0.017 REF	
b	0.270	0.370	0.011	0.015
b1	0.250	0.350	0.010	0.014
e	0.555	0.655	0.022	0.026
e1	0.230 REF		0.009 REF	
L	0.250	0.350	0.010	0.014
L1	0.030 REF		0.001 REF	
L2	0.370	0.470	0.015	0.019
L3	0.040 REF		0.002 REF	