

**1-Line, Uni-directional, Ultra-low Capacitance
Transient Voltage Suppressors**

Descriptions

The ESD5321N is an ultra-low capacitance TVS (Transient Voltage Suppressor) designed to protect high speed data interfaces. It has been specifically designed to protect sensitive electronic components which are connected to data and transmission lines from over-stress caused by ESD (Electrostatic Discharge).

The ESD5321N incorporates one pair of Ultra-low capacitance steering diodes plus a TVS diode.

The ESD5321N may be used to provide ESD protection up to ±30kV (contact discharge) according to IEC61000-4-2, and withstand peak pulse current up to 10A (8/20µs) according to IEC61000-4-5.

The ESD5321N is available in DFN1006-2L package. Standard products are Pb-free and Halogen-free.

Features

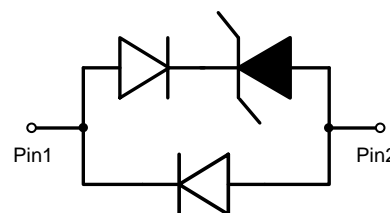
- Stand-off voltage: 5V Max
- Transient protection for each line according to IEC61000-4-2 (ESD): ±30kV (contact discharge)
IEC61000-4-5 (surge): 10A (8/20µs)
- Ultra-low capacitance: $C_J = 0.8\text{pF typ.}$
- Ultra-low leakage current: $I_R = 0.1\text{nA typ.}$
- Low clamping voltage: $V_{CL} = 15\text{V typ. @ } I_{PP} = 16\text{A (TLP)}$
- Solid-state silicon technology

Applications

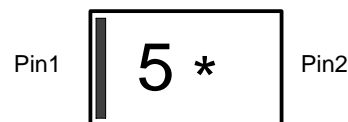
- USB Interface
- HDMI Interface
- DVI Interface
- Portable Electronics
- Notebooks



DFN1006-2L (Bottom View)



Pin configuration



5 = Device code

* = Month code (A~Z)

Marking (Top View)

Order information

Device	Package	Shipping
ESD5321N-2/TR	DFN1006-2L	10000/Tape&Reel

Absolute maximum ratings

Parameter	Symbol	Rating	Unit
Peak pulse power ($t_p = 8/20\mu s$)	P_{pk}	160	W
Peak pulse current ($t_p = 8/20\mu s$)	I_{PP}	10	A
ESD according to IEC61000-4-2 air discharge	V_{ESD}	± 30	kV
ESD according to IEC61000-4-2 contact discharge		± 30	
Operation junction temperature	T_J	125	$^{\circ}C$
Lead temperature	T_L	260	$^{\circ}C$
Storage temperature	T_{STG}	-55~150	$^{\circ}C$

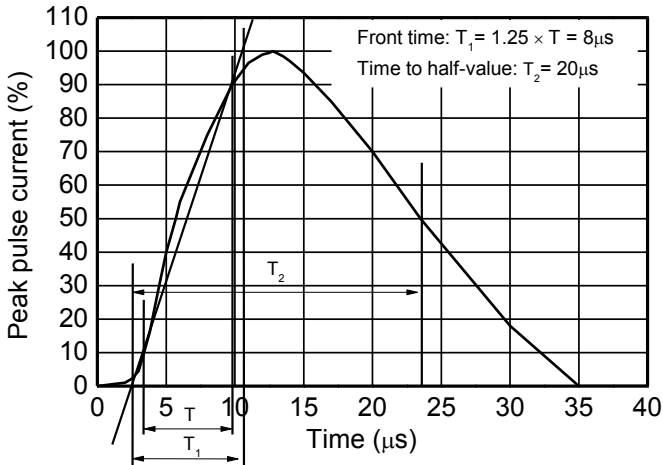
Electrical characteristics ($T_A=25^{\circ}C$, unless otherwise noted)

Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse maximum working voltage	V_{RWM}				5.0	V
Reverse leakage current	I_R	$V_{RWM} = 5V$		0.1	100	nA
Reverse breakdown voltage	V_{BR}	$I_T = 1mA$	7.0	8.0	9.0	V
Forward voltage	V_F	$I_T = 10mA$	0.6	0.9	1.2	V
Clamping voltage ¹⁾	V_{CL}	$I_{PP} = 16A, t_p = 100ns$		15		V
Dynamic resistance ¹⁾	R_{DYN}			0.25		Ω
Clamping voltage ²⁾	V_{CL}	$I_{PP} = 1A, t_p = 8/20\mu s$			10	V
		$I_{PP} = 10A, t_p = 8/20\mu s$			16	V
Junction capacitance	C_J	$V_R = 0V, f = 1MHz$ Any I/O pin to GND		0.8	1.0	pF

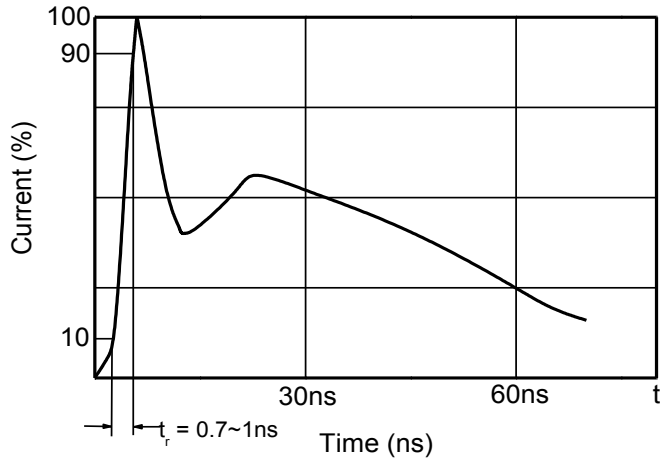
1) TLP parameter: $Z_0 = 50 \Omega$, $t_p = 100ns$, $t_r = 2ns$, averaging window from 60ns to 80ns. R_{DYN} is calculated from 4A to 16A.

2) According to IEC61000-4-5.

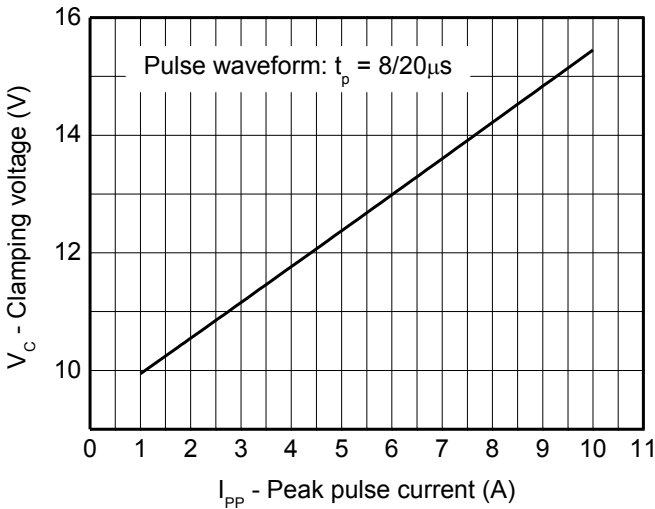
Typical characteristics ($T_A=25^\circ\text{C}$, unless otherwise noted)



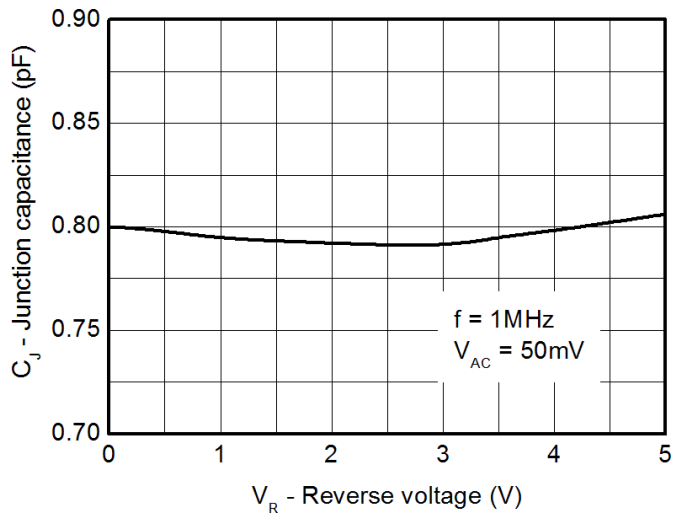
8/20μs waveform per IEC61000-4-5



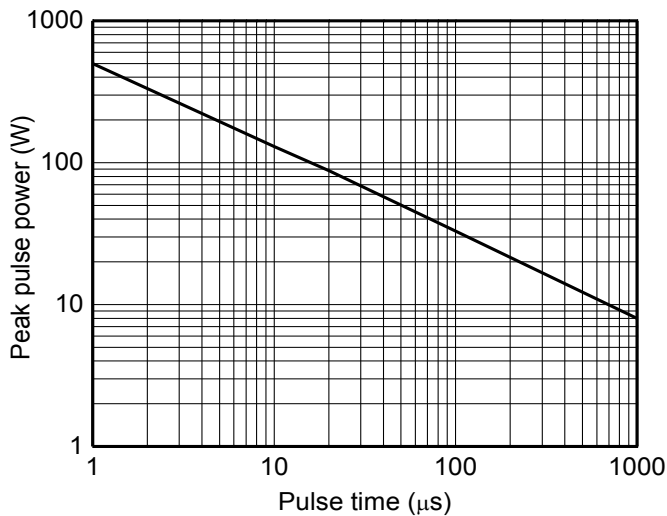
Contact discharge current waveform per IEC61000-4-2



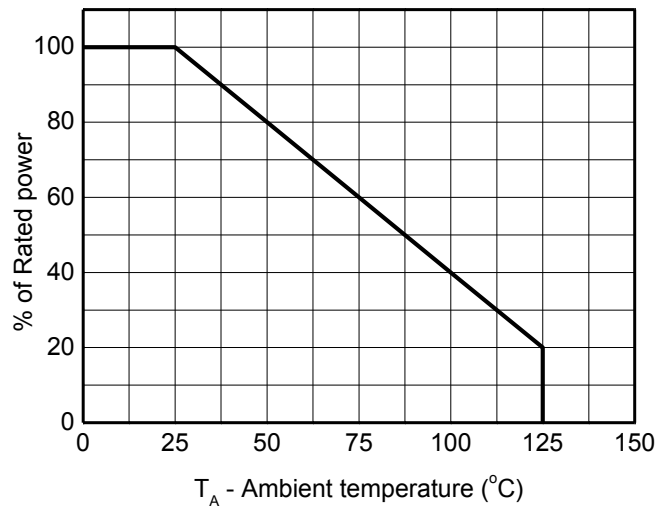
Clamping voltage vs. Peak pulse current



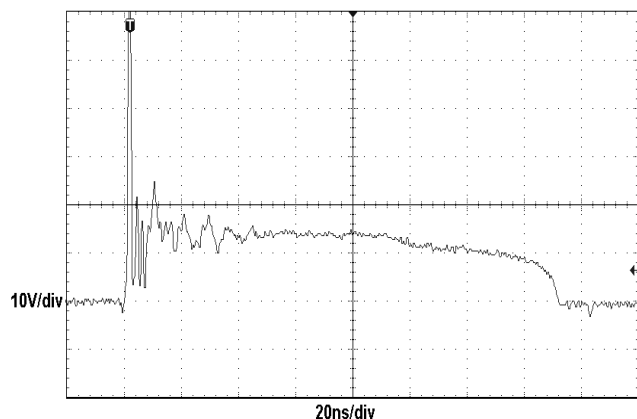
Capacitance vs. Reverse voltage



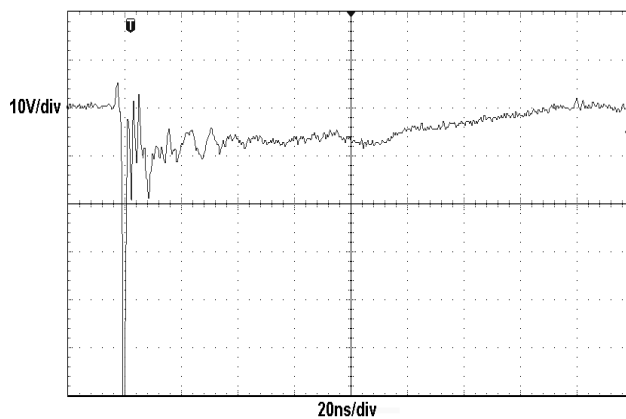
Non-repetitive peak pulse power vs. Pulse time



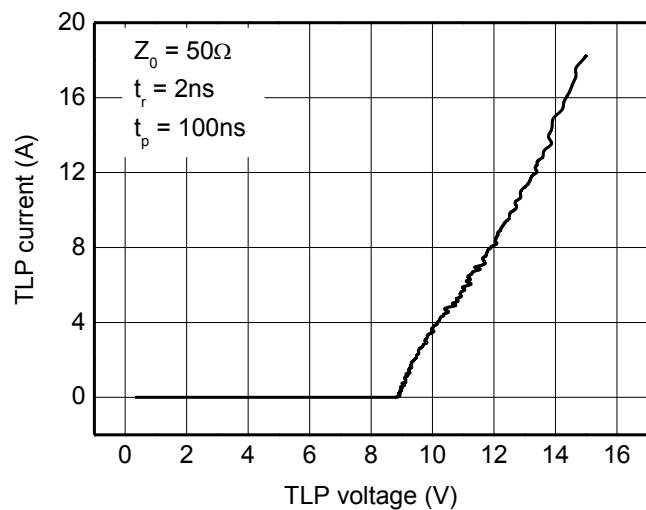
Power derating vs. Ambient temperature



ESD clamping
(+8kV contact discharge per IEC61000-4-2)



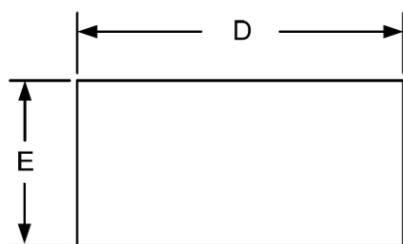
ESD clamping
(-8kV contact discharge per IEC61000-4-2)



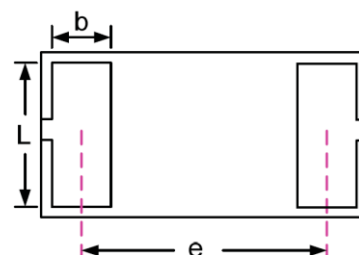
TLP Measurement

Package outline dimensions

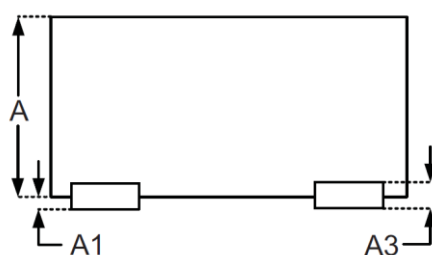
DFN1006-2L



Top View



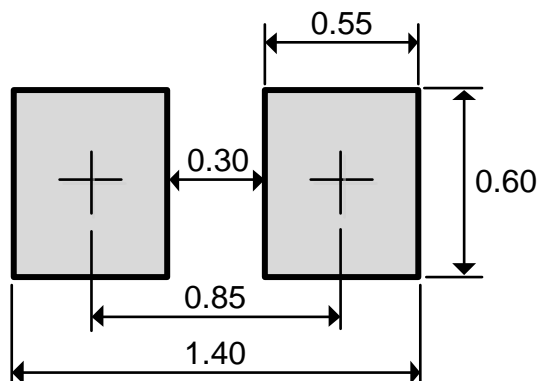
Bottom View



Side View

Symbol	Dimensions in millimeter		
	Min.	Typ.	Max.
A	0.40	-	0.50
A1	0.00	-	0.05
A3	0.125 Ref.		
D	0.95	1.00	1.05
E	0.55	0.60	0.65
b	0.20	0.25	0.30
L	0.45	0.50	0.55
e	0.65 Typ.		

Recommend land pattern (Unit: mm)



Notes: This land pattern is for your reference only.