ESD56321NXX

1-Line, Uni-directional, Transient Voltage Suppressors

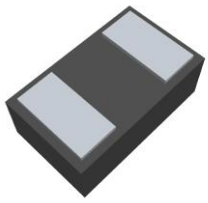
http//:www.omnivision-group.com

Descriptions

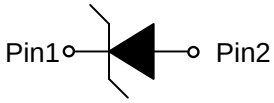
The ESD56321NXX is a transient voltage suppressor designed to protect power interfaces. It is suitable to replace multiple discrete components in portable electronics.

The ESD56321NXX is specifically designed to protect USB port.

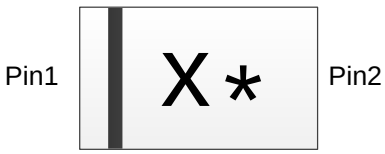
The ESD56321NXX is available in DFN1006-2L package. Standard products are Pb-free and Halogen-free.



DFN1006-2L (Bottom View)



Circuit diagram



X= Device code ($\overline{S}$,$\overline{W}$,$\overline{R}$,$\overline{X}$,$\overline{Y}$)

* = Month code (A~Z)

Marking (Top View)

Features

- Reverse stand-off voltage: 9V ~ 18V
- Surge protection according to IEC61000-4-5 see Table 4
- ESD protection according to IEC61000-4-2 ±30kV (contact and air discharge)
- Low clamping voltage
- Solid-state silicon technology

Applications

- CC & SBU
- SMART-PA

Order information

Table 1.

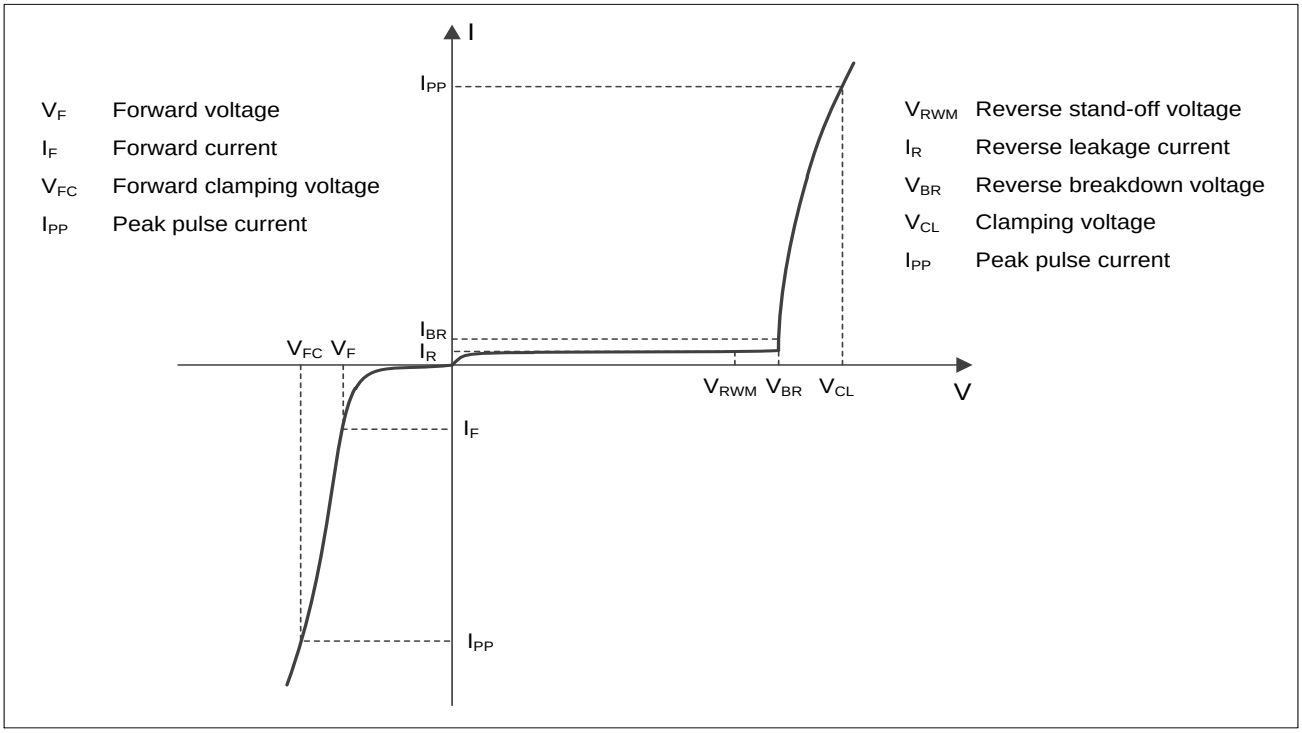
Device	Package	Shipping	Marking
ESD56321N09-2/TR	DFN1006-2L	10000/Tape&Reel	$\overline{S}$*
ESD56321N12-2/TR	DFN1006-2L	10000/Tape&Reel	$\overline{W}$*
ESD56321N13-2/TR	DFN1006-2L	10000/Tape&Reel	$\overline{R}$*
ESD56321N15-2/TR	DFN1006-2L	10000/Tape&Reel	$\overline{X}$*
ESD56321N18-2/TR	DFN1006-2L	10000/Tape&Reel	$\overline{Y}$*

Absolute maximum ratings

Table 2.

Parameter	Symbol	Rating	Unit
Peak pulse power (tp=8/20μs)	Ppk	420	W
ESD according to IEC61000-4-2 air discharge	V_{ESD}	±30	kV
ESD according to IEC61000-4-2 contact discharge		±30	
Junction temperature	T_J	125	°C
Operating temperature	T_{OP}	-40~85	°C
Lead temperature	T_L	260	°C
Storage temperature	T_{STG}	-55~150	°C

Electrical characteristics (T_A = 25°C, unless otherwise noted)



Definitions of electrical characteristics

Electrical characteristics (T_A = 25°C, unless otherwise noted)

Table 3.

Type number	Reverse Stand off Voltage V_{RWM} (V)	Breakdown voltage V_{BR}(V) I_{BR} = 1mA			Reverse leakage current I_{RM}(nA) at V_{RWM}		Forward voltage V_F(V) I_F = 20mA		Junction capacitance F=1MHz, VR=0V (pF)	
	Max.	Min.	Typ.	Max.	Typ.	Max.	Min.	Max.	Typ.	Max.
ESD56321N09	9.0	9.5	10.5	11.5	1	100	0.5	1.1	170	180
ESD56321N12	12.0	13.0	14.0	15.0	1	100	0.5	1.1	120	130
ESD56321N13	13.5	14.5	16.5	17.5	1	100	0.5	1.1	100	110
ESD56321N15	15.0	16.0	17.5	19.0	1	100	0.5	1.1	95	110
ESD56321N18	18.0	19.2	21.1	23.0	1	100	0.5	1.1	75	90

Table 4.

Type number	Rated peak pulse current I_{PP} （A） *1)3)*	Clamping voltage Typ. V_{CL}(V) at I_{PP}（A） *1)3)*	Clamping voltage Typ. V_{CL}(V) at I_{PP} = 16A, t_p = 100ns *2)3)*	Clamping voltage Typ. V_{CL}(V) at V_{ESD} = 8kV *2)3)*
ESD56321N09	28	15.0	11	12
ESD56321N12	20	18.5	15	16
ESD56321N13	19	23.0	18	20
ESD56321N15	18	24.0	19	22
ESD56321N18	15	30.0	25	28

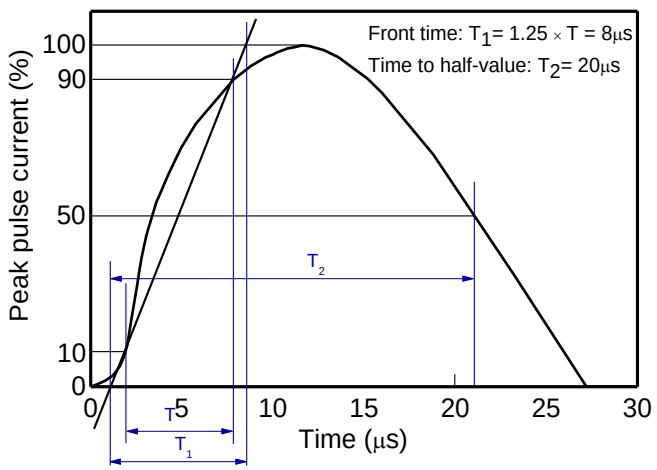
Notes:

1) Non-repetitive current pulse, according to IEC61000-4-5.（8/20μs current waveform）

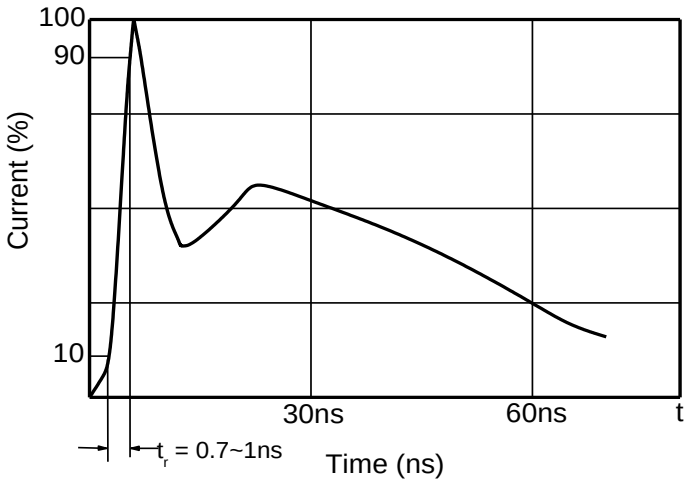
2) Non-repetitive current pulse, according to IEC61000-4-2.

3) Measured from pin 1 to pin 2.

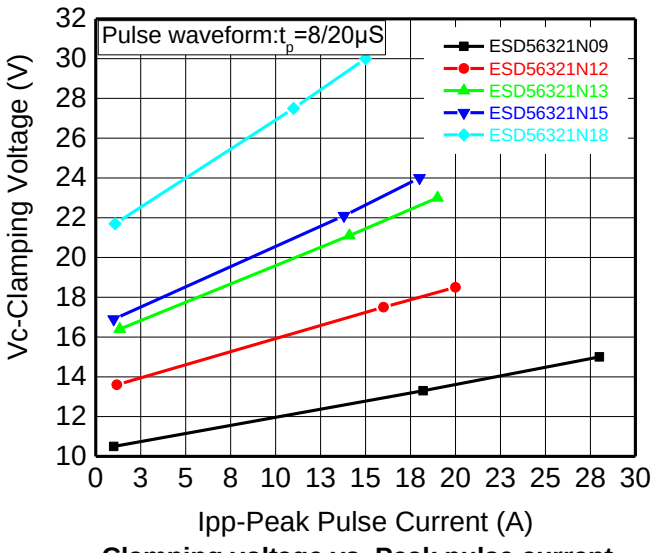
Typical characteristics (T_A = 25°C, unless otherwise noted)



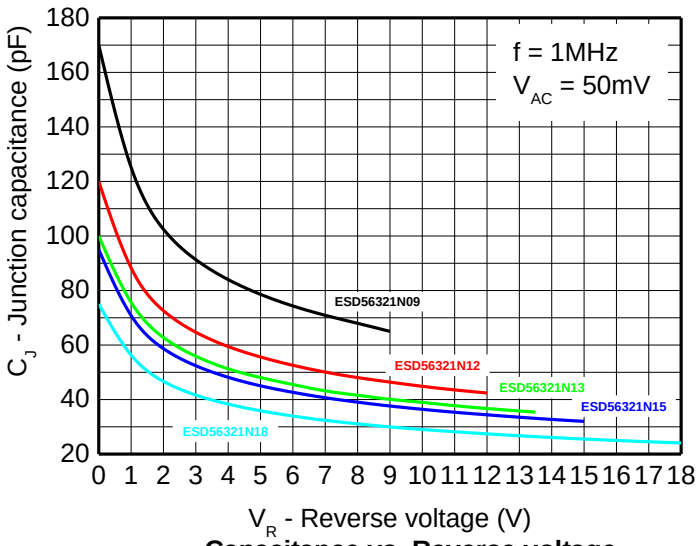
8/20μs waveform per IEC61000-4-5



Contact discharge current waveform per IEC61000-4-2



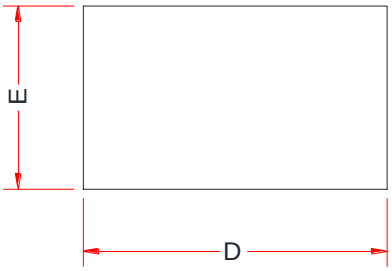
Clamping voltage vs. Peak pulse current



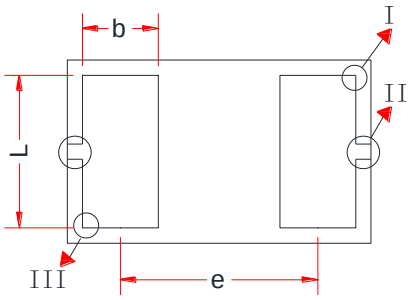
Capacitance vs. Reverse voltage

PACKAGE OUTLINE DIMENSIONS

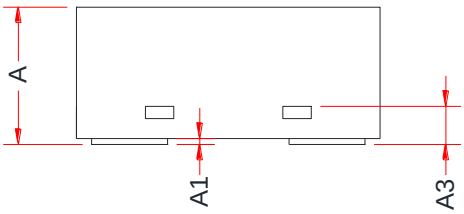
DFN1006-2L



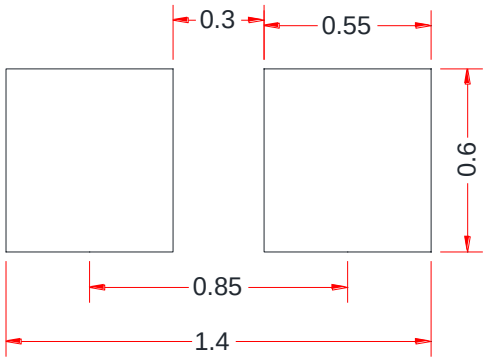
TOP VIEW



BOTTOM VIEW



SIDE VIEW

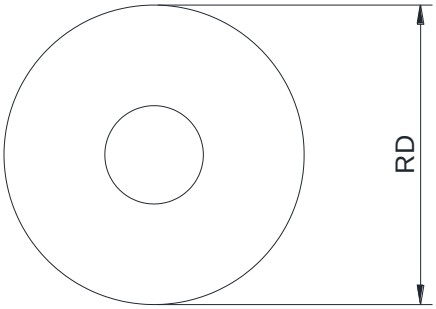


RECOMMENDED LAND PATTERN(Unit:mm)

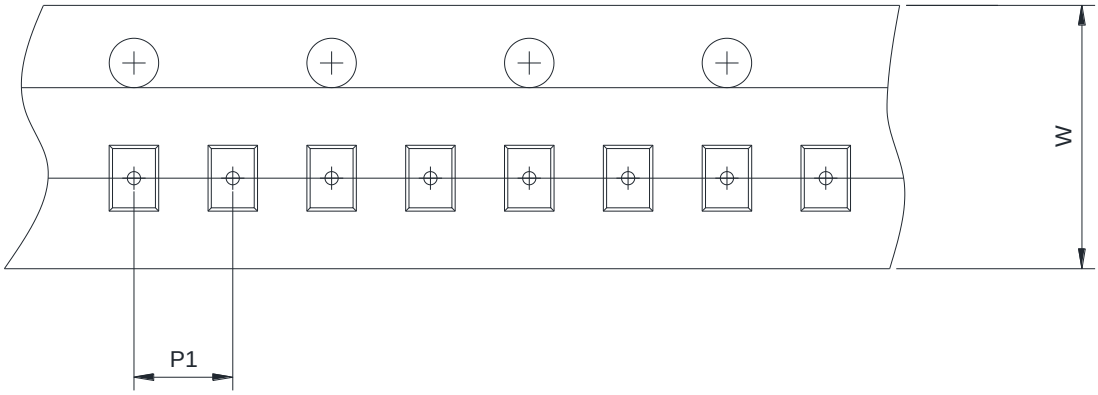
Symbol	Dimensions in Millimeters		
	Min.	Typ.	Max.
A	0.36	0.45	0.50
A1	0.00	0.02	0.05
A3	0.125 Ref.		
D	0.95	1.00	1.05
E	0.55	0.60	0.65
b	0.20	0.25	0.30
L	0.45	0.50	0.55
e	0.65 BSC		

TAPE AND REEL INFORMATION

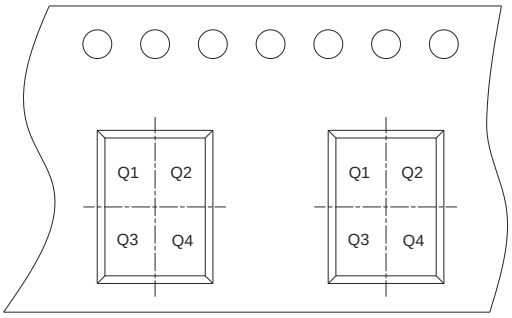
Reel Dimensions



Tape Dimensions



Quadrant Assignments For PIN1 Orientation In Tape



User Direction of Feed

RD	Reel Dimension	☑ 7inch ☐ 13inch
W	Overall width of the carrier tape	☑ 8mm ☐ 12mm ☐ 16mm
P1	Pitch between successive cavity centers	☑ 2mm ☐ 4mm ☐ 8mm
Pin1	Pin1 Quadrant	☑ Q1 ☑ Q2 ☐ Q3 ☐ Q4