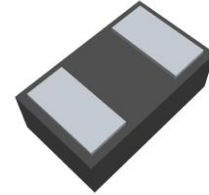


ESD56321NXX
1-Line, Uni-directional, Transient Voltage Suppressors
<http://www.omnivision-group.com>
Descriptions

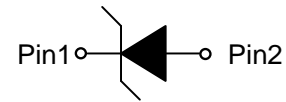
The ESD56321NXX is a transient voltage suppressor designed to protect power interfaces. It is suitable to replace multiple discrete components in portable electronics.

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)
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


Circuit diagram
Applications

- CC & SBU
- SMART-PA



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

* = Month code (A~Z)

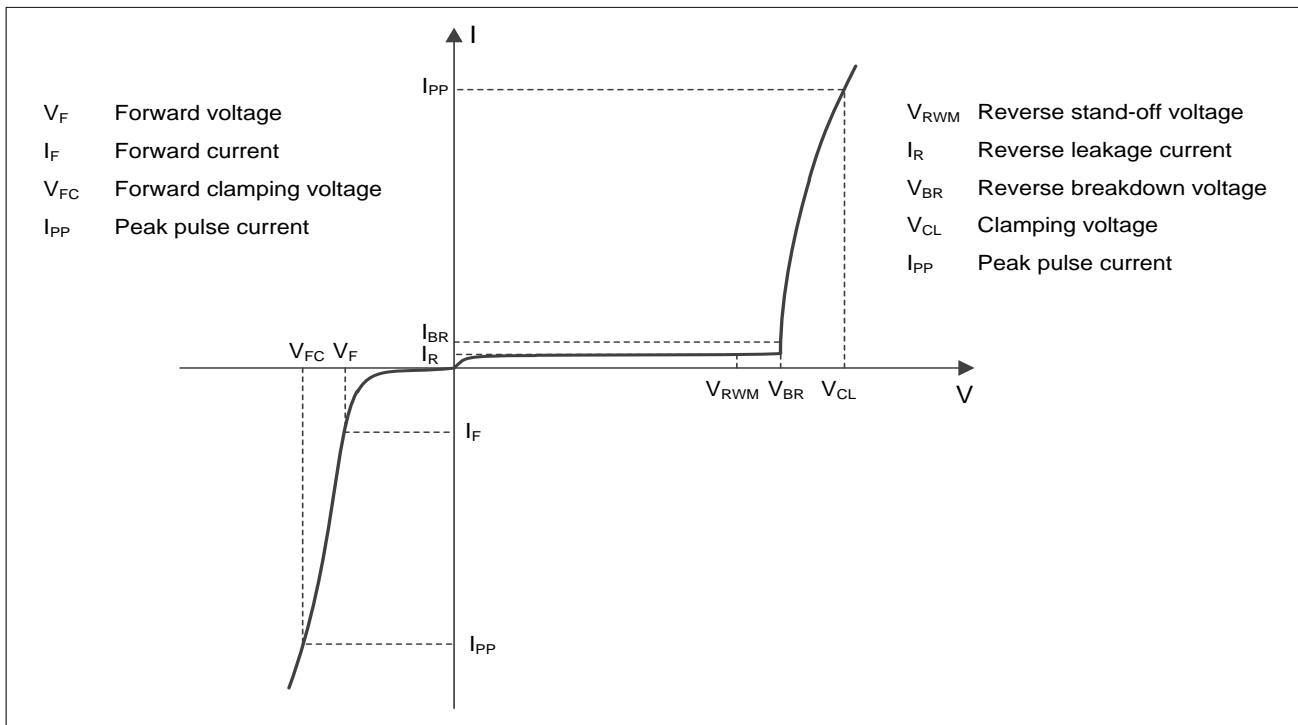
Marking (Top View)

Order information
Table 1.

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

Absolute maximum ratings
Table 2.

Parameter	Symbol	Rating	Unit
Peak pulse power ($t_p=8/20\mu s$)	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 ($T_A = 25^\circ\text{C}$, unless otherwise noted)
Table 3.

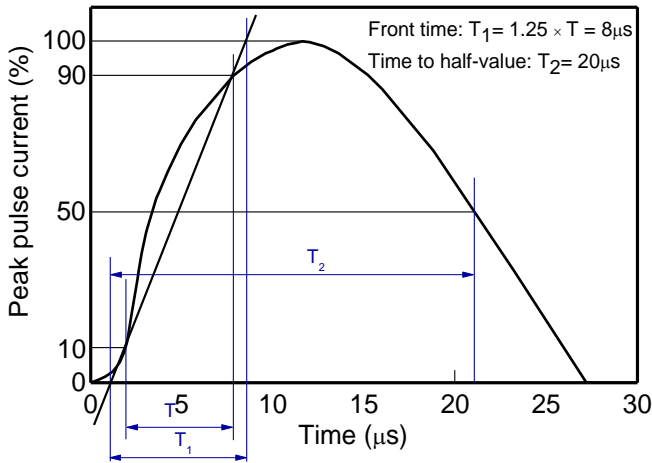
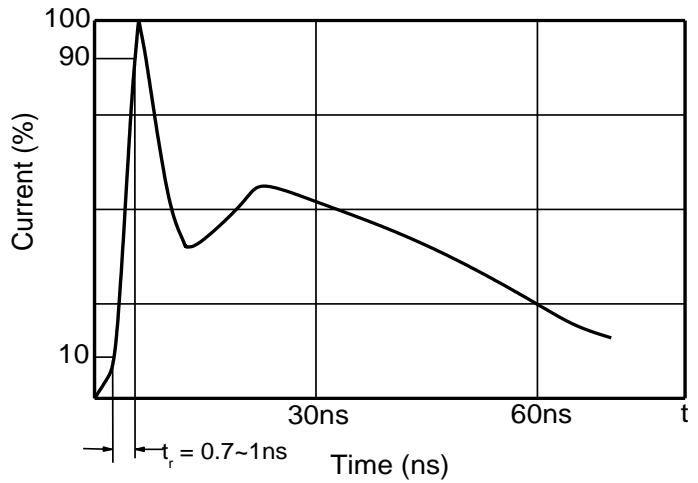
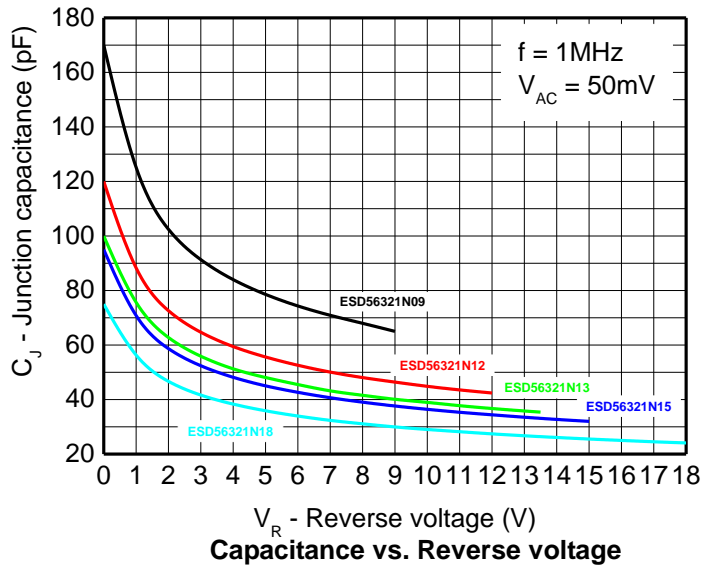
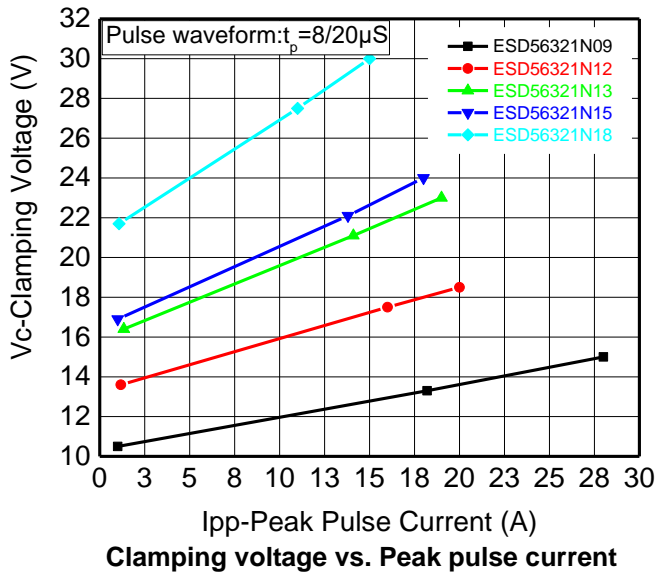
Type number	Reverse Stand off Voltage V_{RWM} (V)	Breakdown voltage V_{BR} (V) $I_{BR} = 1\text{mA}$			Reverse leakage current I_{RM} (nA) at V_{RWM}		Forward voltage V_F (V) $I_F = 20\text{mA}$		Junction capacitance $F=1\text{MHz}$, $V_R=0\text{V}$ (pF)	
	Max.	Min.	Typ.	Max.	Typ.	Max.	Min.	Max.	Typ.	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

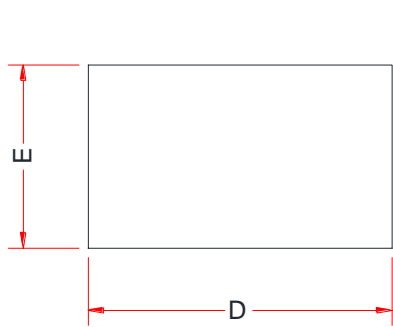
Table 4.

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 $I_{PP} = 16\text{A}$, $t_p = 100\text{ns}$ ²⁾³⁾	Clamping voltage Typ. V_{CL} (V) at $V_{ESD} = 8\text{kV}$ 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

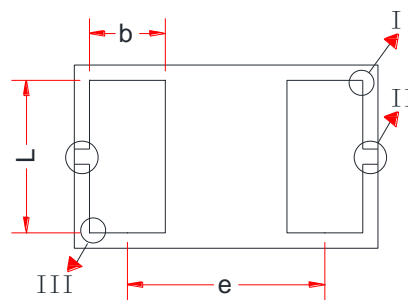
Notes:

- 1) Non-repetitive current pulse, according to IEC61000-4-5. (8/20 μs current waveform)
- 2) Non-repetitive current pulse, according to IEC61000-4-2.
- 3) Measured from pin 1 to pin 2.

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

8/20 μs waveform per IEC61000-4-5

Contact discharge current waveform per IEC61000-4-2


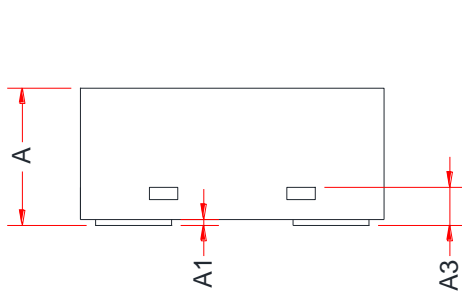
PACKAGE OUTLINE DIMENSIONS
DFN1006-2L


TOP VIEW

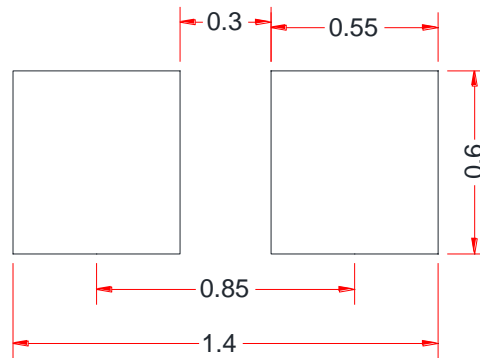


BOTTOM VIEW

- I
- 1. 
- 2. 
- 3. 
- II
- 1. 
- 2. 
- III
- 1. 
- 2. 

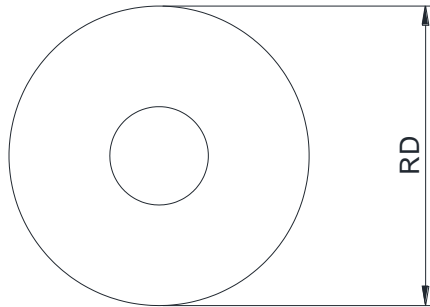
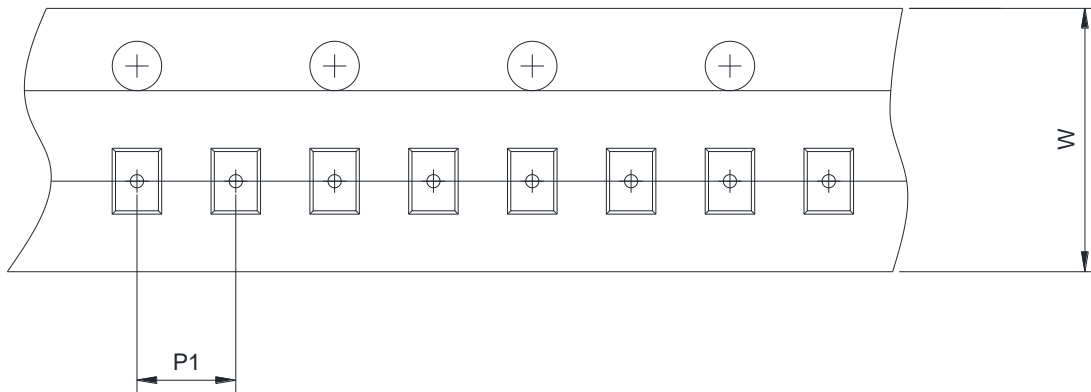
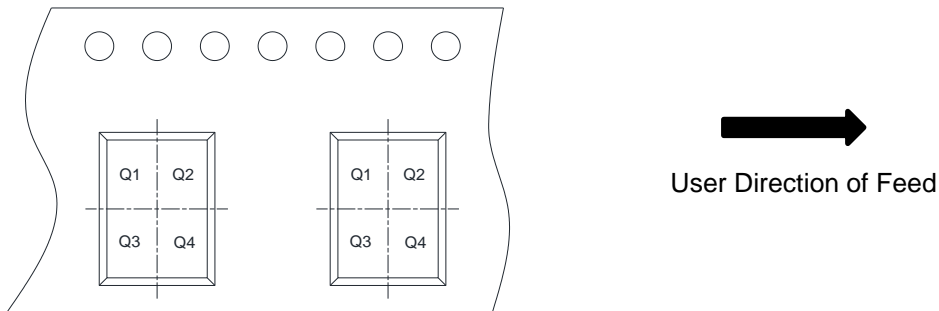


SIDE VIEW



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


RD	Reel Dimension	<input checked="" type="checkbox"/> 7inch	<input type="checkbox"/> 13inch
W	Overall width of the carrier tape	<input checked="" type="checkbox"/> 8mm	<input type="checkbox"/> 12mm <input type="checkbox"/> 16mm
P1	Pitch between successive cavity centers	<input checked="" type="checkbox"/> 2mm	<input type="checkbox"/> 4mm <input type="checkbox"/> 8mm
Pin1	Pin1 Quadrant	<input checked="" type="checkbox"/> Q1	<input checked="" type="checkbox"/> Q2 <input type="checkbox"/> Q3 <input type="checkbox"/> Q4

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