ESD5402N

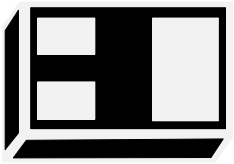
2-Lines, Uni-directional Transient Voltage Suppressors

Descriptions

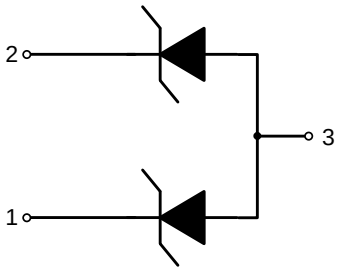
The ESD5402N is a transient voltage suppressors (TVS) which provide a very high level protection for sensitive electronic components that may be subjected to electrostatic discharge (ESD). It is designed to replace multilayer varistors (MLV) in consumer equipments applications such as mobile phone, notebook, PAD, STB, LCD TV etc.

The ESD5402N was past ESD transient voltage up to ±15kV (contact) according to IEC61000-4-2 and withstand peak current up to 3A for 8/20us pulse according to IEC61000-4-5.

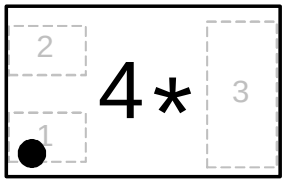
The ESD5402N is available in FBP-02C package. Standard products are Pb-free and Halogen-free.



DFN1006-3L (Bottom View)



Circuit diagram



4= Device code

* = Month code (A~Z)

Marking (Top View)

Features

- Working voltage : 5V
- Peak power (tp=8/20us) : 39W
- ESD protection
  IEC61000-4-2 (Contact) : ±15kV
  IEC61000-4-2 (Air) : ±15kV
- Low leakage current
- Small package

Applications

- Mobile phone
- PAD
- Notebook
- STB
- LCD TV
- Digital camera
- Other electronics equipments

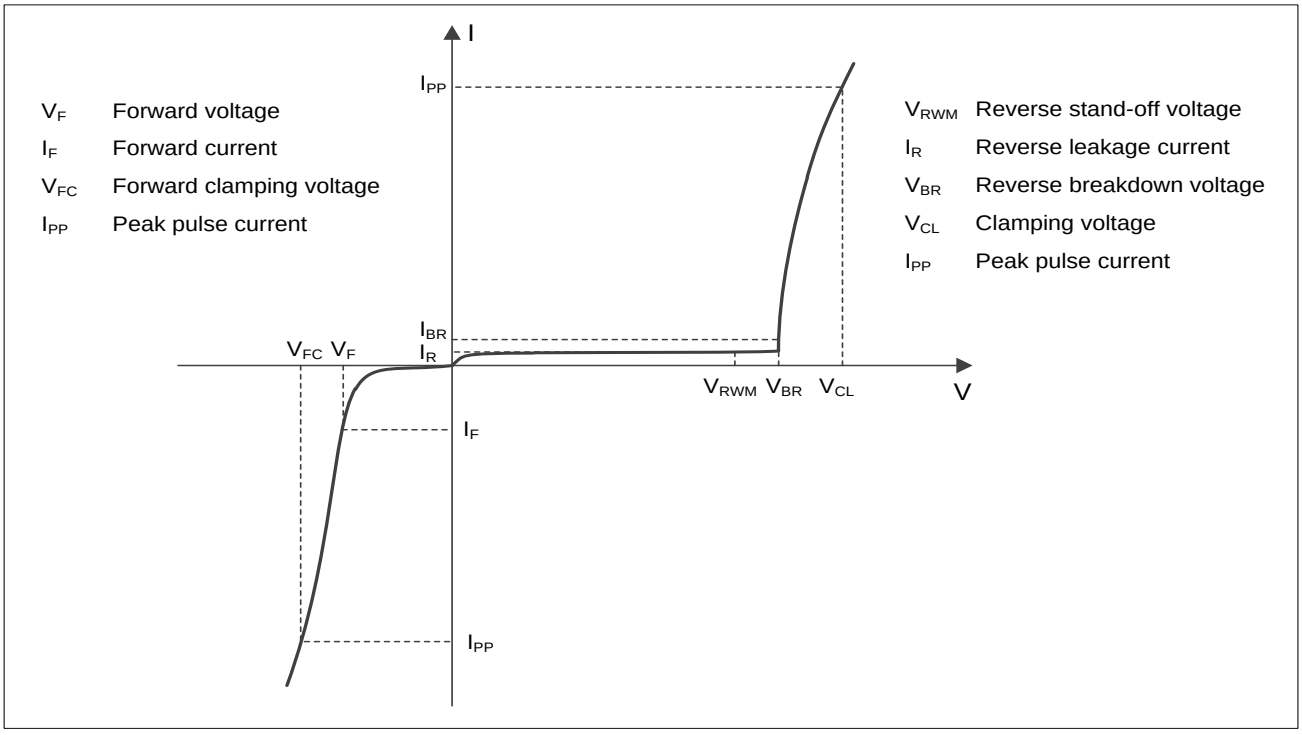
Order information

Device	Package	Shipping
ESD5402N-3/TR	DFN1006-3L	10000/Tape&Reel

Absolute maximum ratings

Parameter	Symbol	Rating	Unit
Peak pulse power (t_p = 8/20μs)	P_{pk}	39	W
Peak pulse current (t_p = 8/20μs)	I_{PP}	3	A
ESD according to IEC61000-4-2 air discharge	V_{ESD}	±15	kV
ESD according to IEC61000-4-2 contact discharge		±15	
Operation junction temperature	T_J	125	°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

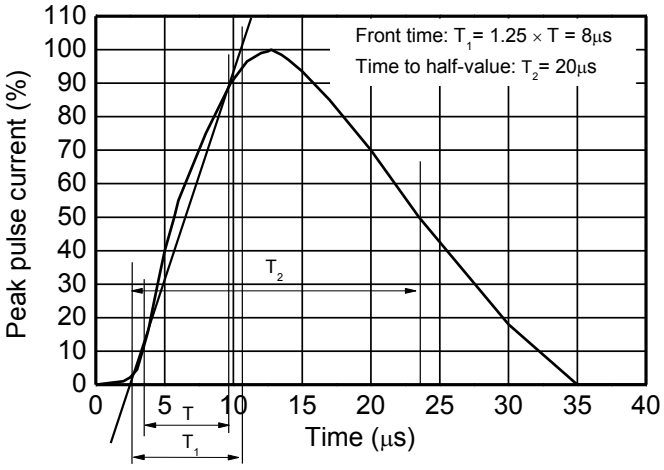
Electrical characteristics (T_A=25 °C, unless otherwise noted)

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	50	nA
Reverse breakdown voltage	V_{BR}	I_T = 1mA	6.2	6.8	7.6	V
Forward voltage	V_F	I_T = 10mA	0.55	0.9	1.25	V
Clamping voltage 1)	V_{CL}	I_{PP} = 16A, t_p = 100ns		26		V
Dynamic resistance 1)	R_{DYN}			1.23		Ω
Clamping voltage 2)	V_{CL}	I_{PP} = 1A, t_p = 8/20μs			8.5	V
		I_{PP} = 3A, t_p = 8/20μs			12	V
Junction capacitance	C_J	V_R = 0V, f = 1MHz		12	15	pF

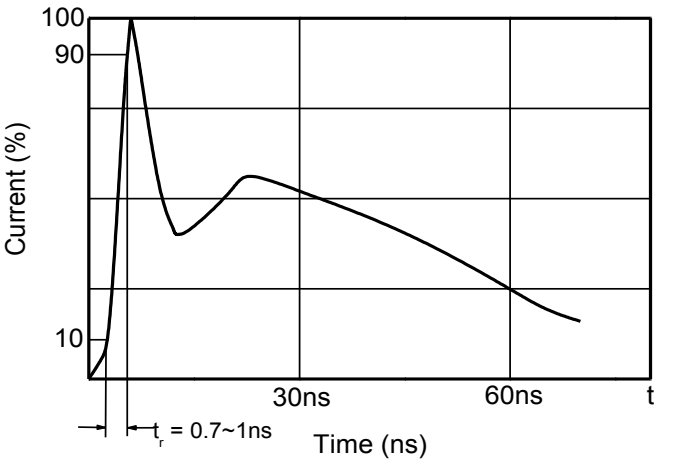
1) TLP parameter: Z_0 = 50 Ω , t_p = 100ns, t_r = 2ns, averaging window from 60ns to 80ns. R_{DYN} is calculated from 4A to 16A.

2) According to IEC61000-4-5.

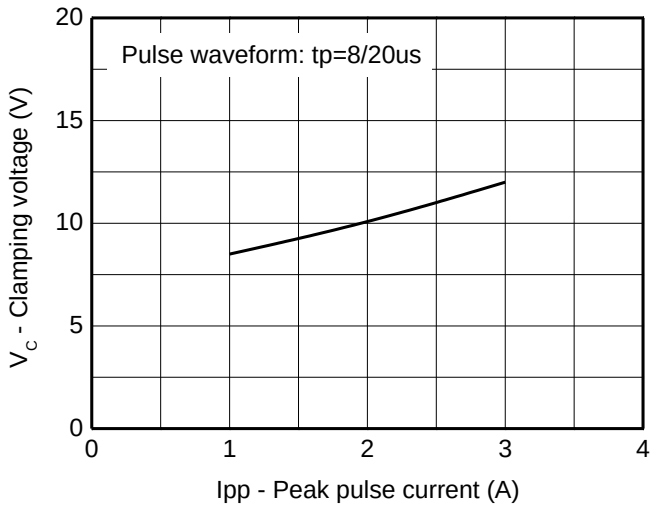
Typical characteristics (T_A=25°C, unless otherwise noted)



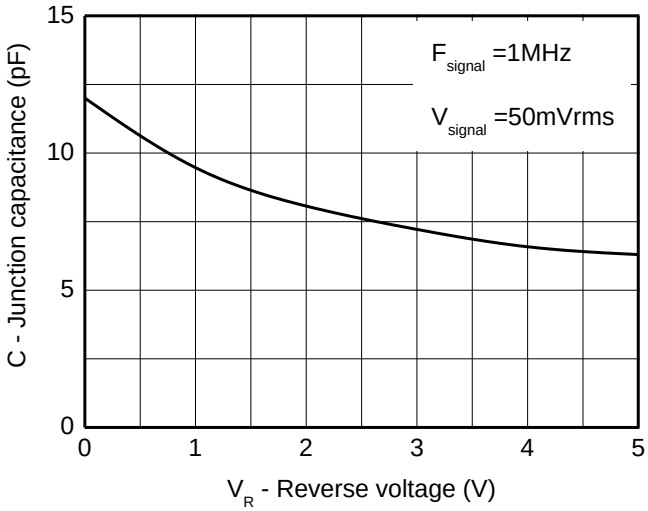
8/20μs waveform per IEC61000-4-5



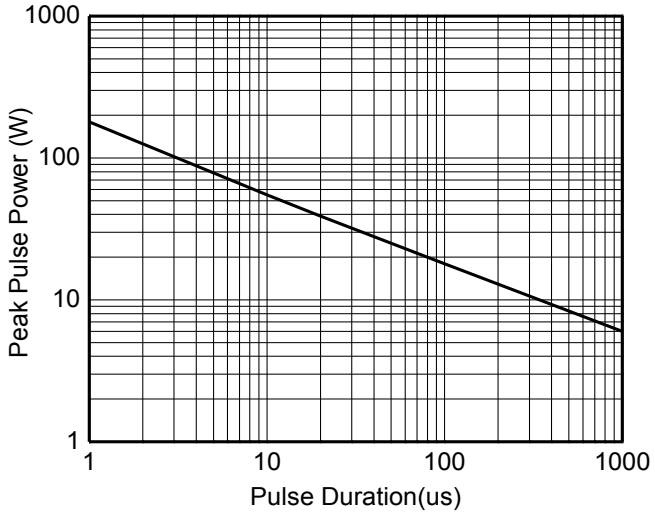
Contact discharge current waveform per IEC61000-4-2



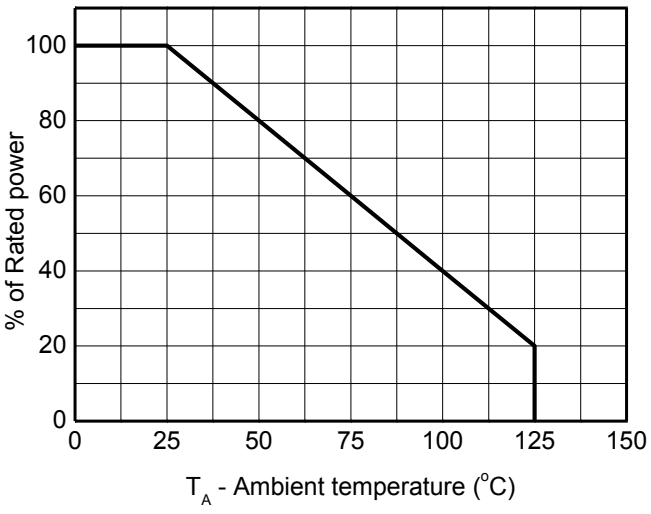
Clamping voltage vs. Peak pulse current



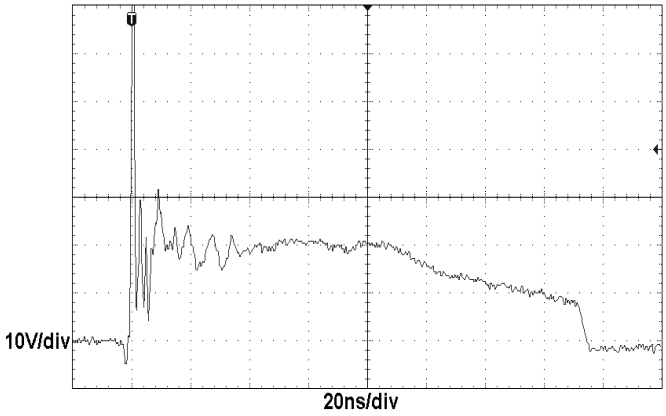
Capacitance vs. Reveres voltage



Non-repetitive peak pulse power vs. Pulse time

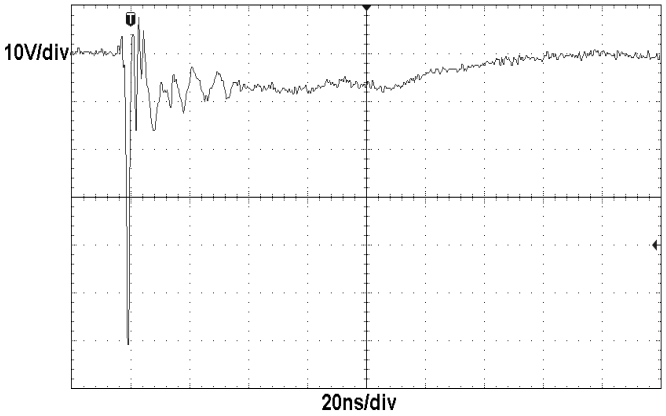


Power derating vs. Ambient temperature



ESD clamping

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



ESD clamping

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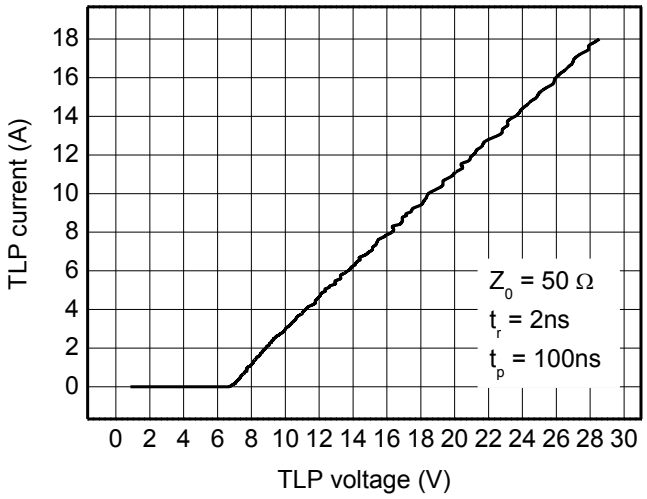
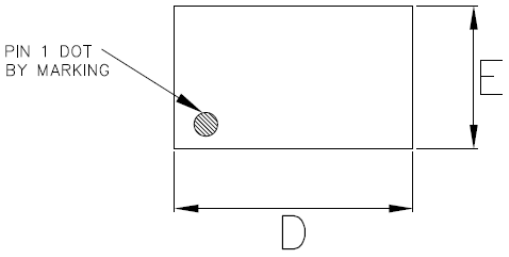


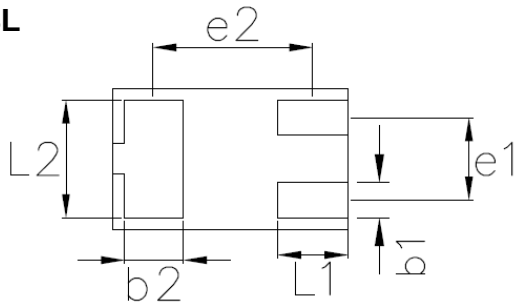
TLP Measurement

Package outline dimensions

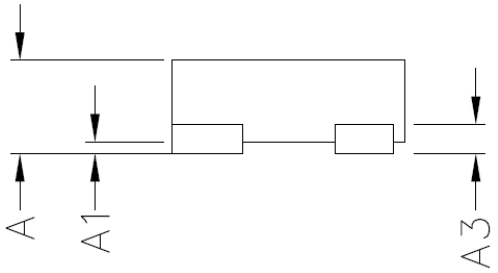
DFN1006-3L



Top View



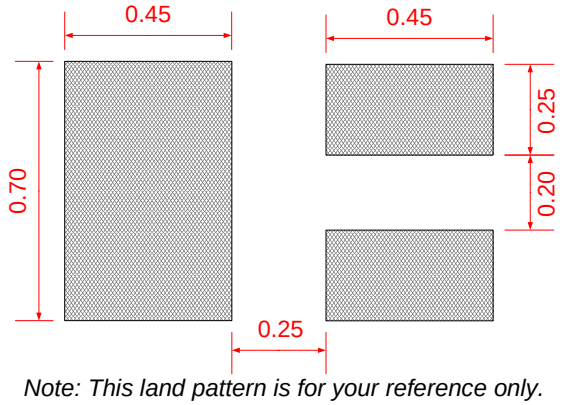
Bottom View



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
b1	0.10	0.15	0.20
b2	0.20	0.25	0.30
L1	0.20	0.30	0.40
L2	0.40	0.50	0.60
e1	0.35 BSC		
e2	0.675 BSC		

Recommend land pattern (Unit: mm)



Note: This land pattern is for your reference only.