

1. Description

The ESD9N12BA is a TVS (Transient Voltage Suppressor) designed to protect sensitive electronic components which are connected to data and transmission lines from over-stress caused by ESD (Electrostatic Discharge), EFT (Electrical Fast Transients) and lightning.

3. Features

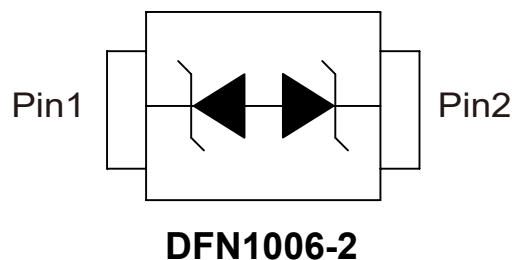
- Stand-off voltage: $\pm 12\text{V}$ Max.
- Transient protection for each line according to IEC61000-4-2 (ESD): $\pm 30\text{kV}$ (contact discharge)
IEC61000-4-5 (surge): 5.5A ($8/20\mu\text{s}$)
- Capacitance: $C_J = 27\text{pF}$ typ.

2. Applications

- Computers and peripherals
- Cellular handsets
- Portable Electronics
- Notebooks

- Ultra-low leakage current: $I_R = 0.1\text{nA}$ typ.
- Low clamping voltage:
 $V_{CL} = 20\text{V}$ typ. @ $I_{PP} = 16\text{A}$ (TLP)
- Solid-state silicon technology

4. Pinning information





5. Absolute Maximum Ratings

Parameter	Symbol	Value	Units
Peak Pulse Power ($t_p=8/20\mu s$)	P_{PK}	99	W
Peak Pulse Current ($t_p=8/20\mu s$)	I_{PP}	5.5	A
ESD according to IEC61000-4-2 air discharge	V_{ESD}	± 30	kV
ESD according to IEC61000-4-2 contact discharge		± 30	kV
Junction temperature	T_J	125	$^{\circ}C$
Operating temperature	T_{OP}	-40 to 85	$^{\circ}C$
Lead temperature	T_L	260	$^{\circ}C$
Storage temperature	T_{STG}	-55 to 150	$^{\circ}C$



6. Electrical Characteristics ($T_A=25^\circ\text{C}$ unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Reverse stand-off voltage	V_{RWM}				± 12	V
Reverse leakage current	I_R	$V_{RWM}=12\text{V}$		0.1	50	nA
Reverse breakdown voltage	V_{BR}	$I_{BR}=1\text{mA}$	13		16.5	V
Clamping voltage 1)	V_{CL}	$I_{PP}=16\text{A}$, $t_p=100\text{ns}$		20		V
Dynamic resistance 1)	R_{DYN}			0.35		Ω
Clamping voltage 2)	V_{CL}	$I_{PP}=1\text{A}$, $t_p=8/20\mu\text{s}$			16	V
		$I_{PP}=5.5\text{A}$, $t_p=8/20\mu\text{s}$			18	V
Junction capacitance	C_J	$V_R=0\text{V}$, $f=1\text{MHz}$		27	35	pF
		$V_R=12\text{V}$, $f=1\text{MHz}$		14	20	pF

Notes:

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

2) Non-repetitive current pulse, according to IEC61000-4-5.



7.1 Typical characteristic

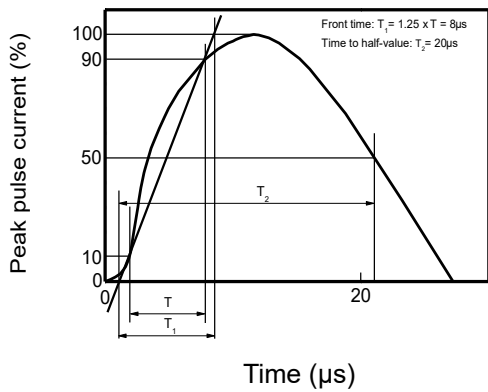


Figure 1: 8/20μs waveform per IEC61000-4-5

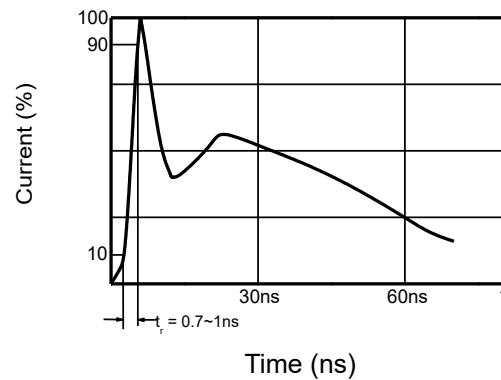


Figure 2: Contact discharge current waveform per IEC61000-4-2

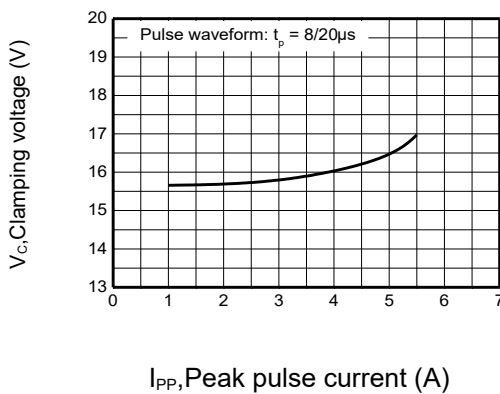


Figure 3: Clamping voltage vs. Peak pulse current

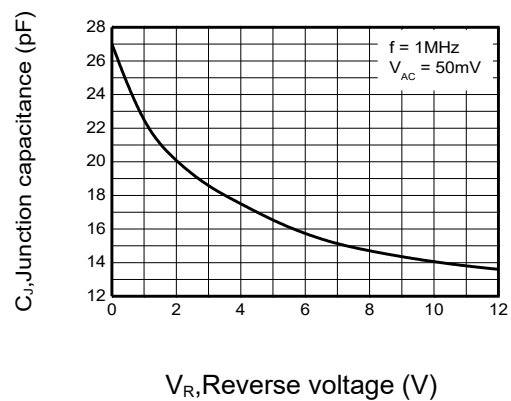


Figure 4: Capacitance vs. Reverse voltage

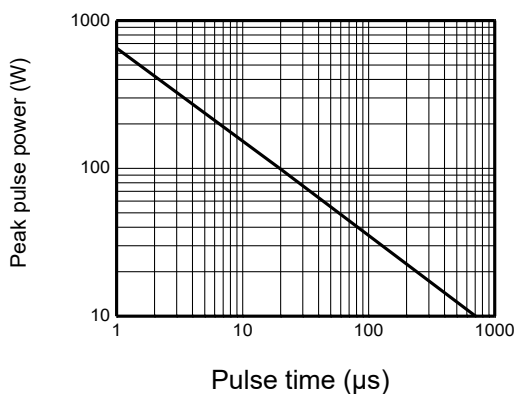


Figure 5: Non-repetitive peak pulse power vs. Pulse time

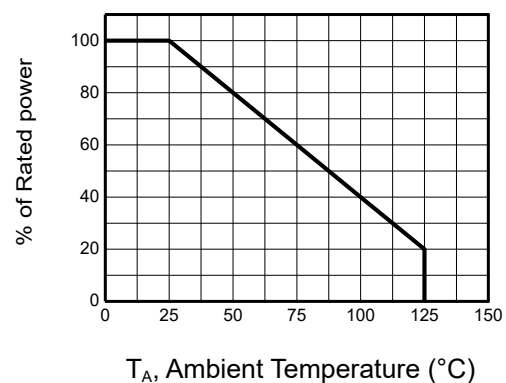
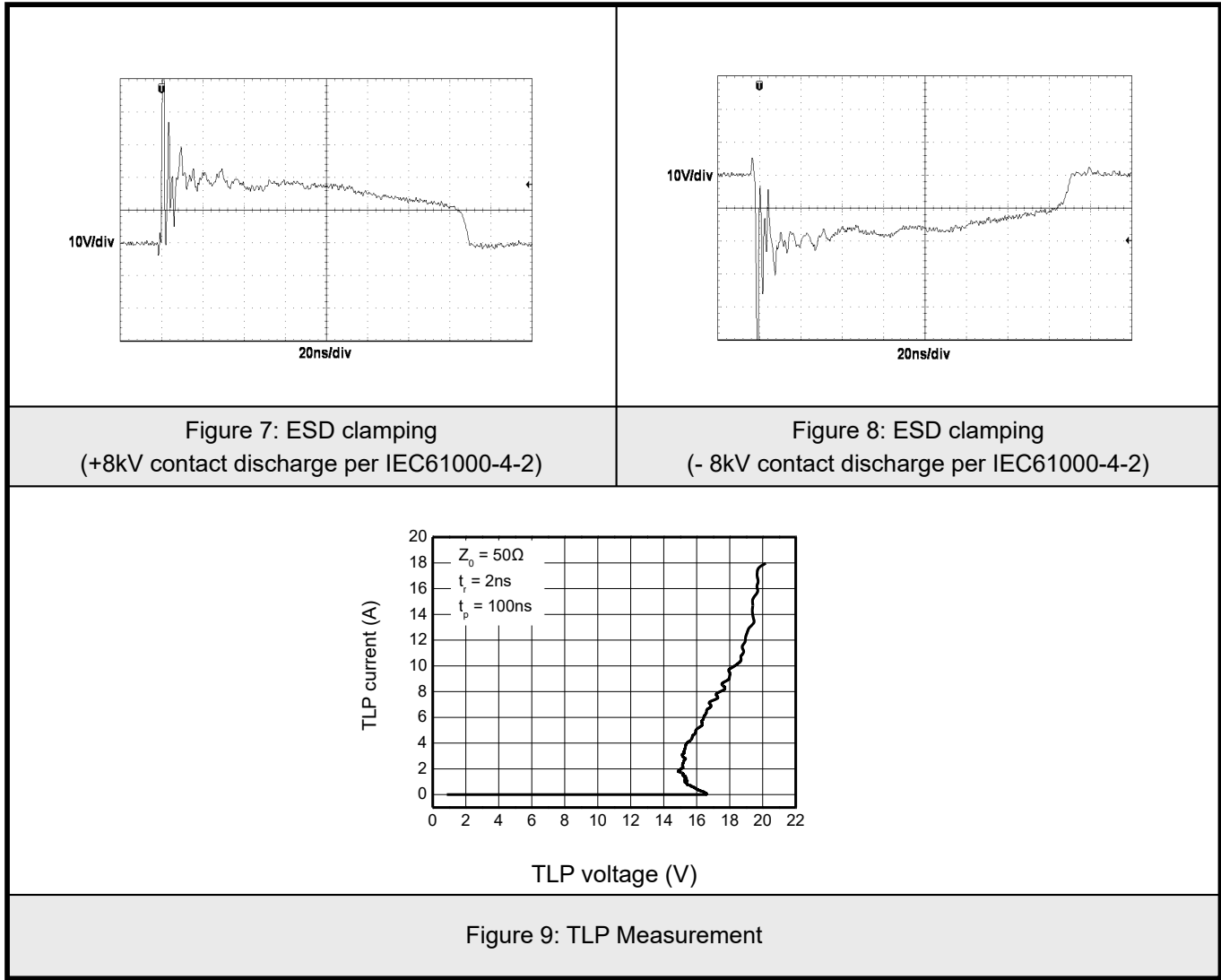


Figure 6: Power derating vs. Ambient temperature

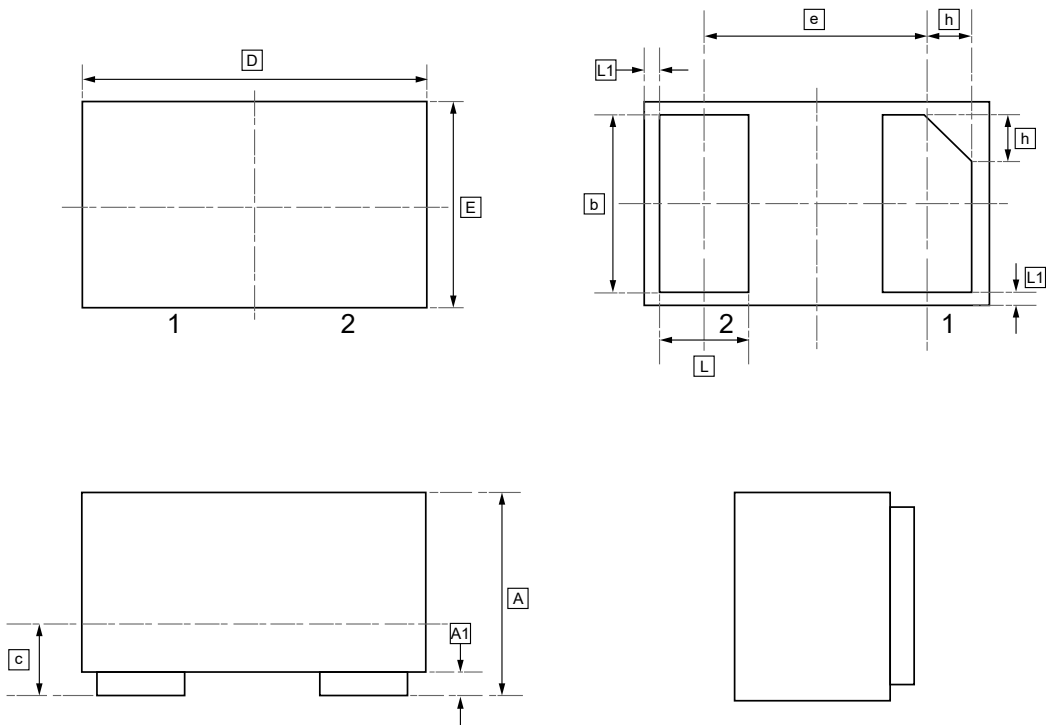


7.2Typical characteristic





8.DFN1006-2 Package Outline Dimensions

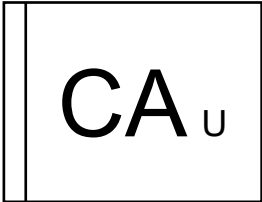


DIMENSIONS (mm are the original dimensions)

Symbol	A	A1	b	c	D	e	E	L	L1	h
Min	0.45	0.00	0.45	0.12	0.95	0.65	0.55	0.20	0.05	0.07
Max	0.55	0.05	0.55	0.18	1.05	BSC	0.65	0.30	REF	0.17



9.Ordering information



Order Code	Package	Base QTY	Delivery Mode
UMW ESD9N12BA	DFN1006-2	10000	Tape and reel



10.Disclaimer

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