

# EVVOSEMI<sup>®</sup>

THINK CHANGE DO



ESD



TVS



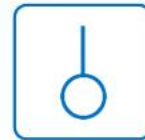
MOS



LDO



Diode



Sensor



DC-DC

## Product Specification

▶ Domestic	Part Number	ESD9N12BA
▶ Overseas	Part Number	ESD9N12BA
▶ Equivalent	Part Number	ESD9N12BA

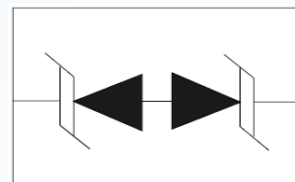
EV is the abbreviation of name EVVO

## Descriptions

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.

The ESD9N12BA may be used to provide ESD protection up to  $\pm 30\text{kV}$  (contact discharge) according to IEC61000-4-2, and withstand peak pulse current up to 5.5A (8/20 $\mu\text{s}$ ) according to IEC61000-4-5.

The ESD9N12BA is available in DFN1006-2L package. Standard products are Pb-free and Halogen-free.



## 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.
- 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

## Applications

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

## Absolute maximum ratings

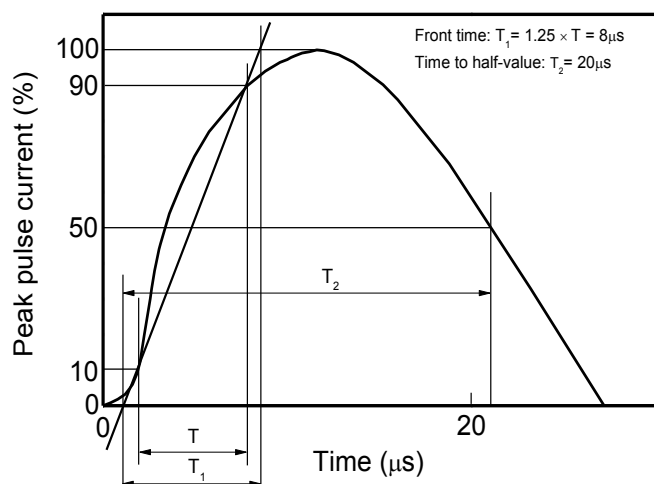
Parameter	Symbol	Rating	Unit
Peak pulse power ( $t_p = 8/20\mu\text{s}$ )	$P_{pk}$	99	W
Peak pulse current ( $t_p = 8/20\mu\text{s}$ )	$I_{PP}$	5.5	A
ESD according to IEC61000-4-2 air discharge	$V_{ESD}$	$\pm 30$	kV
ESD according to IEC61000-4-2 contact discharge		$\pm 30$	
Junction temperature	$T_J$	125	$^{\circ}\text{C}$
Operating temperature	$T_{OP}$	-40~85	$^{\circ}\text{C}$
Lead temperature	$T_L$	260	$^{\circ}\text{C}$
Storage temperature	$T_{STG}$	-55~150	$^{\circ}\text{C}$

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

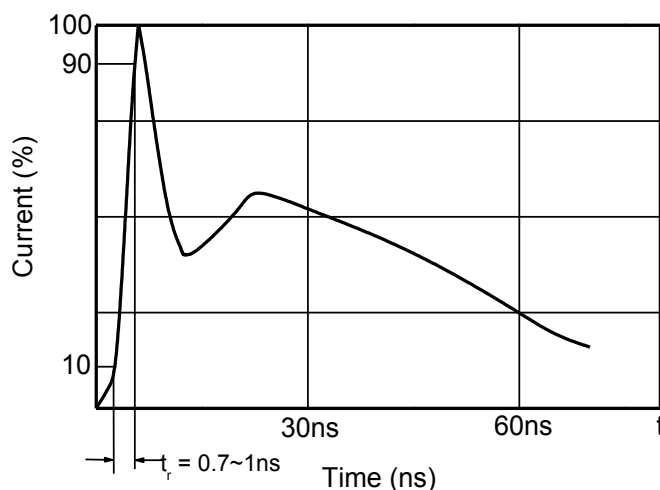
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Stand-off voltage	$V_{RWM}$				$\pm 12$	V
Reverse leakage current	$I_R$	$V_{RWM} = 12\text{V}$		0.1	50	nA
Reverse breakdown voltage	$V_{BR}$	$I_T = 1\text{mA}$	13		16.5	V
Clamping voltage <sup>1)</sup>	$V_{CL}$	$I_{PP} = 16\text{A}$ , $t_p = 100\text{ns}$		20		V
Dynamic resistance <sup>1)</sup>	$R_{DYN}$			0.35		$\Omega$
Clamping voltage <sup>2)</sup>	$V_{CL}$	$I_{PP} = 1\text{A}$ , $t_p = 8/20\mu\text{s}$			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

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.

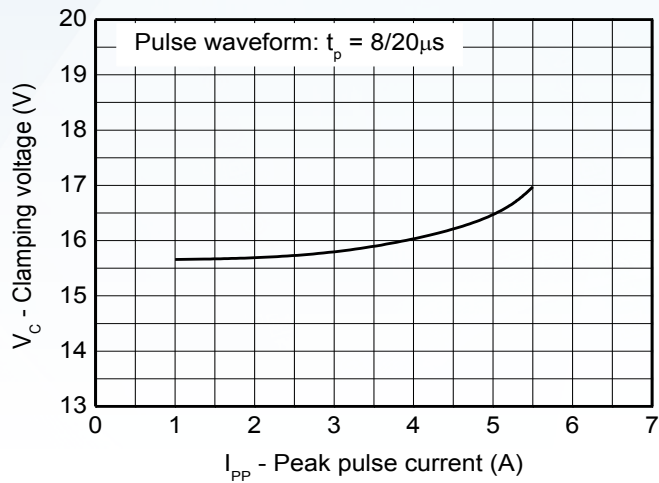
**Typical characteristics ( $T_A=25^\circ\text{C}$ , unless otherwise noted)**


8/20 $\mu\text{s}$  waveform per IEC61000-4-5

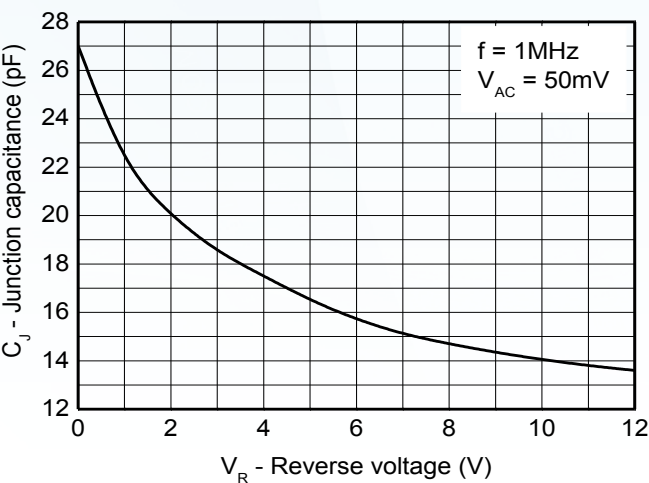


Contact discharge current waveform per IEC61000-4-2

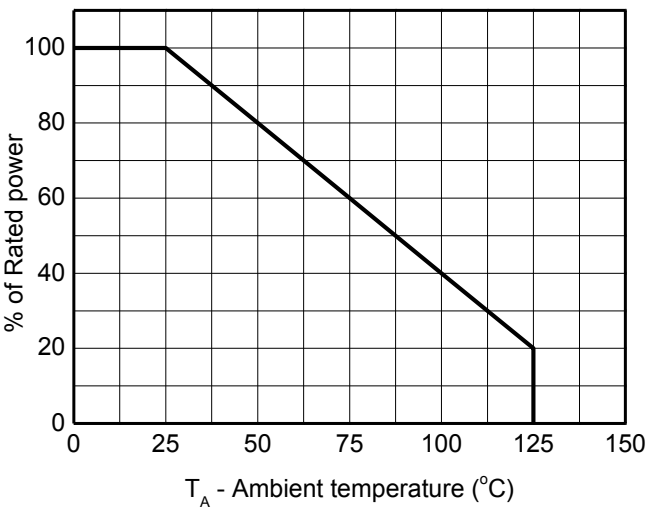
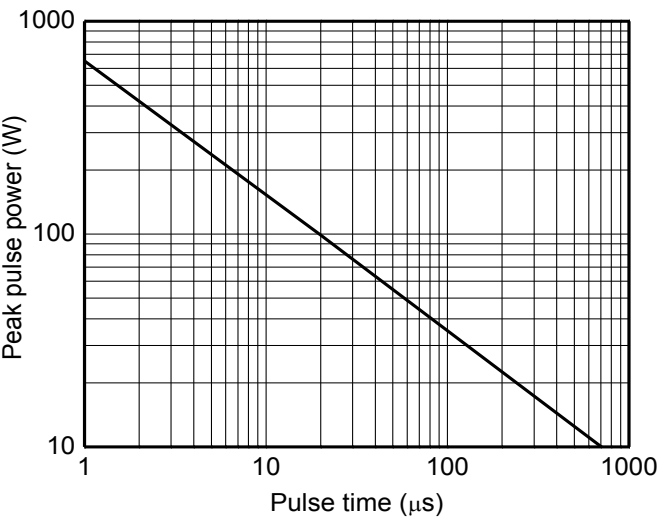
Typical characteristics (T<sub>A</sub>=25°C, unless otherwise noted)



Clamping voltage vs. Peak pulse current

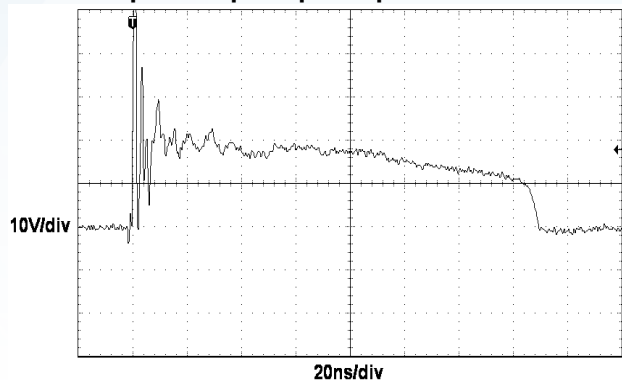


Capacitance vs. Reverse voltage



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

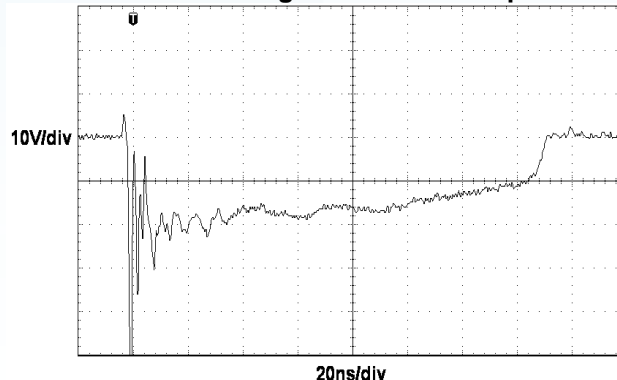
Non-repetitive peak pulse power vs. Pulse time



ESD clamping

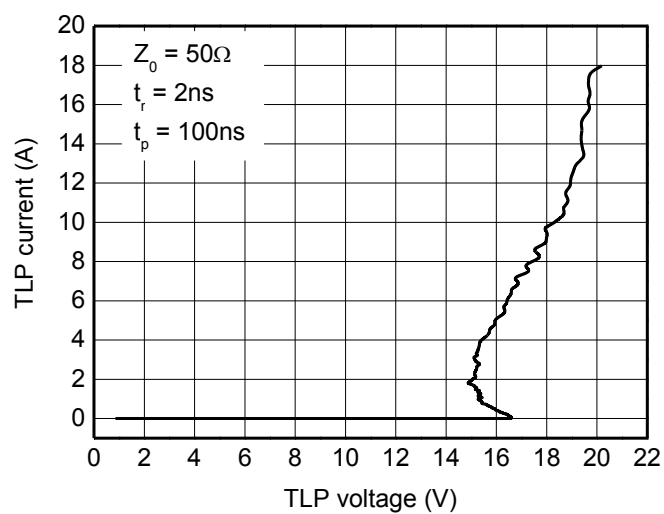
(+8kV contact discharge per IEC61000-4-2)

Power derating vs. Ambient temperature

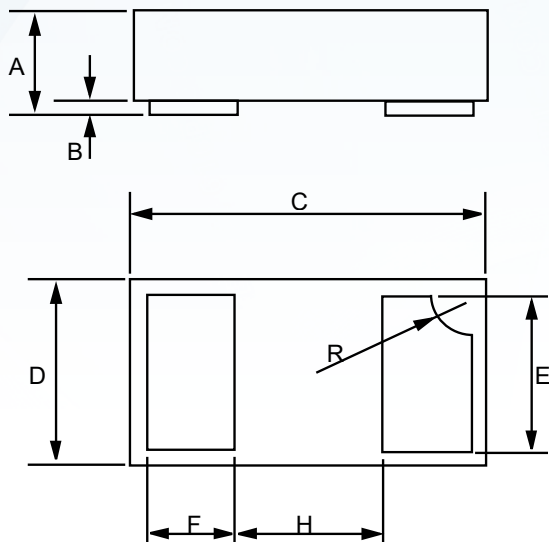


ESD clamping

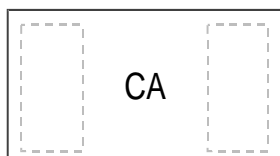
(-8kV contact discharge per IEC61000-4-2)



TLP Measurement

**DFN1006-2 PACKAGE OUTLINE DIMENSIONS**


Dim	Inches		Millimeters	
	MIN	MAX	MIN	MAX
A	0.013	0.020	0.34	0.50
B	0.000	0.002	0.00	0.05
C	0.037	0.042	0.95	1.075
D	0.021	0.026	0.55	0.675
E	0.017	0.021	0.45	0.55
F	0.007	0.011	0.20	0.30
H	0.015Typ.		0.40Typ.	
R	0.001	0.005	0.05	0.15

**Marking**

**Ordering information**

Order code	Package	Baseqty	Deliverymode
ESD9N12BA	DFN1006-2	10000	Tape and reel



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