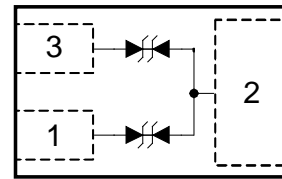


**ESD9NS5V**
**2-Lines Bidirectional Transient Voltage Suppressors**
[Http://www.sh-willsemi.com](http://www.sh-willsemi.com)
**Descriptions**

The ESD9NS5V 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 ESD9NS5V was past ESD transient voltage up to  $\pm 30\text{kV}$  (contact) according to IEC61000-4-2 and withstand peak current up to 9A for 8/20us pulse according to IEC61000-4-5.

The ESD9NS5V is available in DFN1006-3L package. Standard products are Pb-free and Halogen-free.


**DFN1006-3L**

**Pin configuration (Top view)**

**DFN1006-3L**

**S** = Device code  
**\*** = Month code (A~Z)  
**Marking**

**Features**

- Working voltage : 5V
- Peak power (tp=8/20us) : 99W Max.
- Peak current (tp=8/20us) : 9A Max.
- Transient protection  
 IEC61000-4-2, Level 4 :  $\pm 30\text{kV}$  air  
 :  $\pm 30\text{kV}$  contact
- Low clamping voltage
- Low leakage current
- Small package

**Order information**

Device	Package	Shipping
ESD9NS5V-3/TR	DFN1006-3L	10000/Tape&Reel

**Applications**

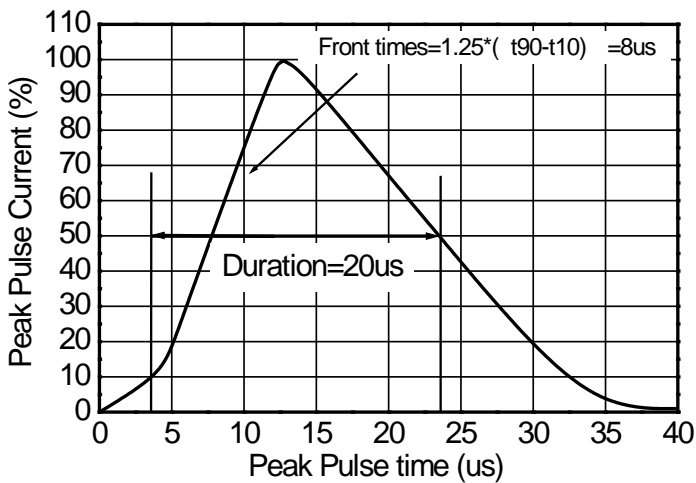
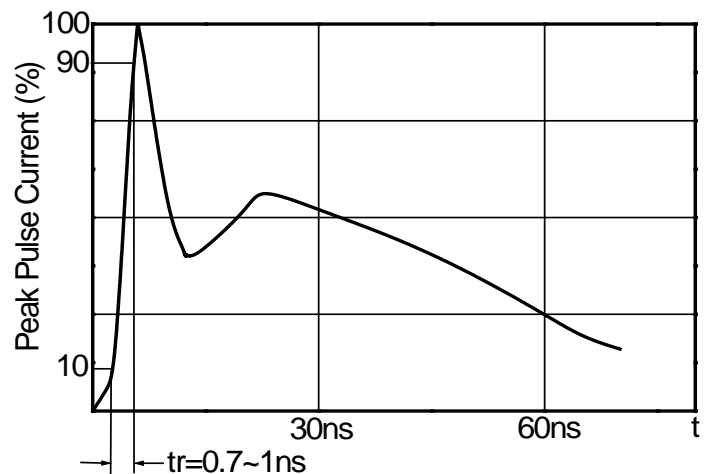
- Cell phone
- PMP
- MID
- PDA
- Digital camera
- Other electronics equipments

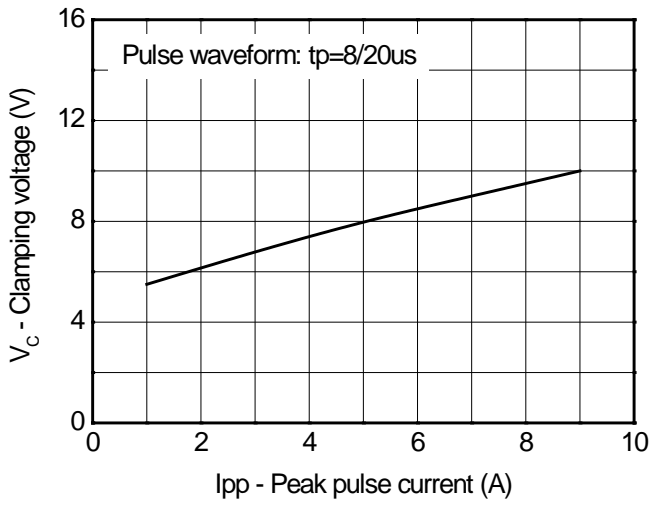
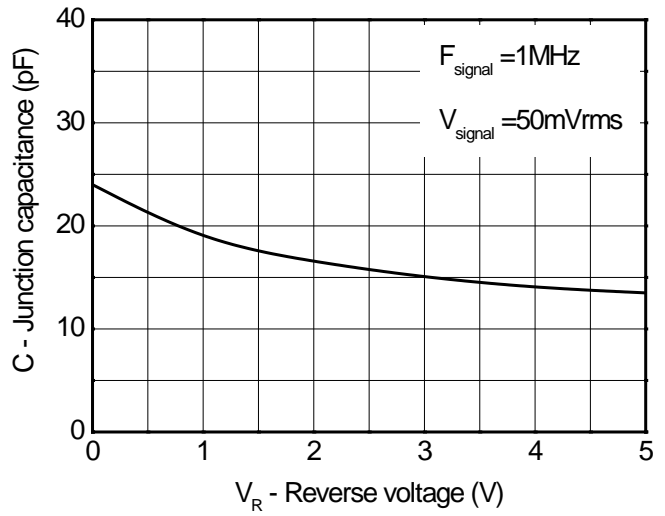
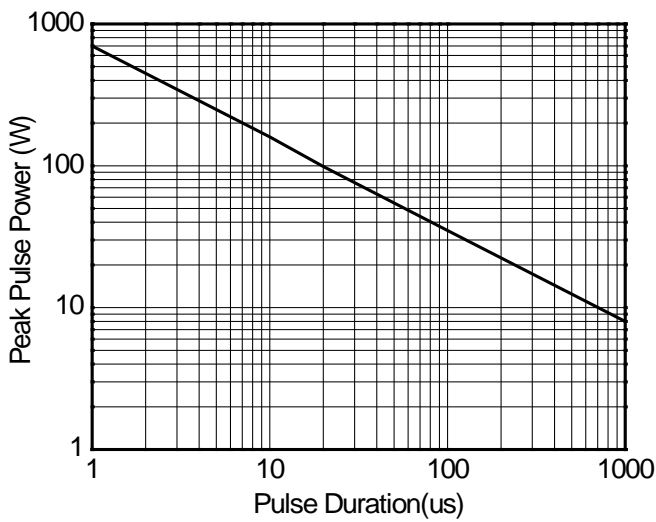
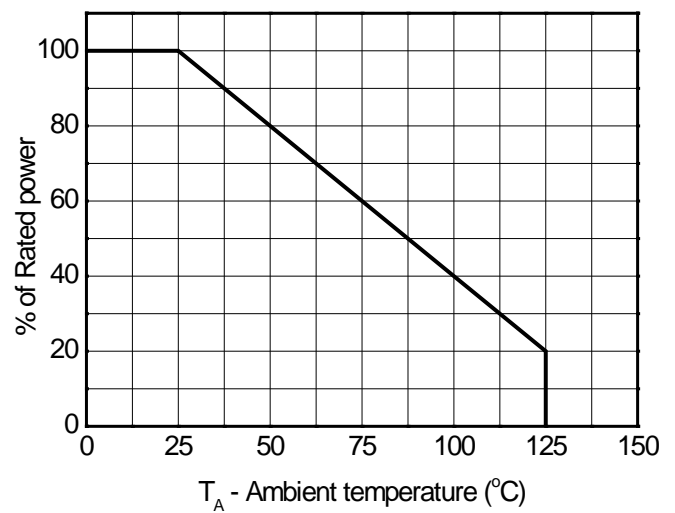
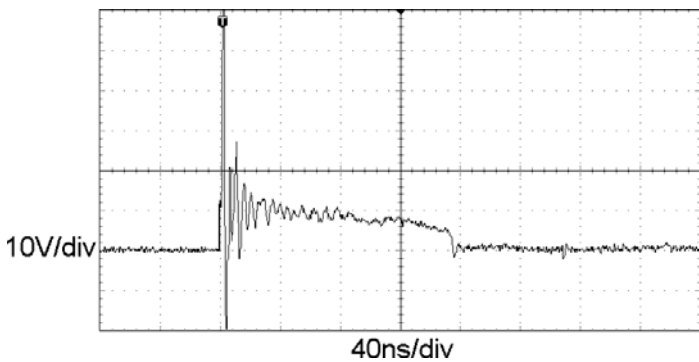
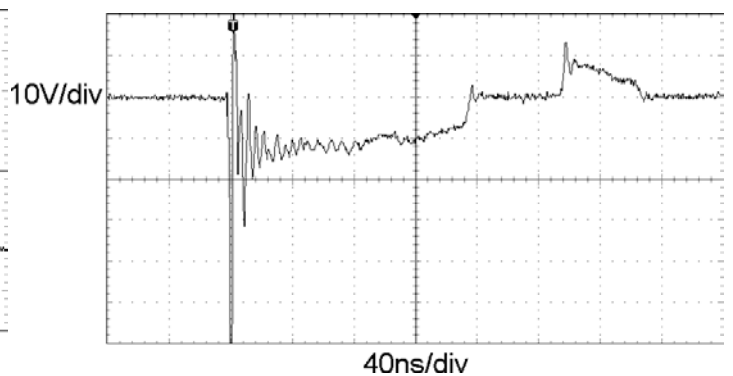
**Absolute maximum ratings**

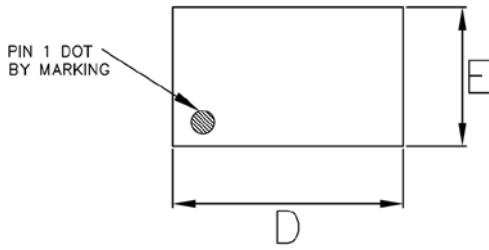
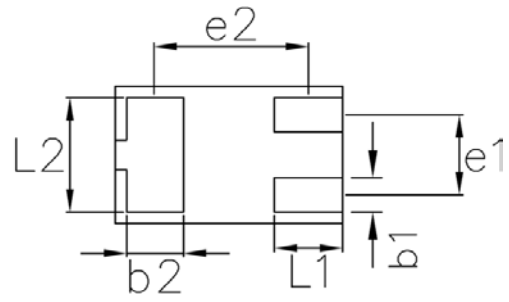
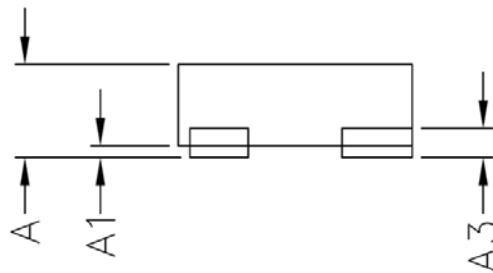
Parameter	Symbol	Rating	Unit
Peak pulse power (tp=8/20us)	Ppk	99	W
Peak pulse current (tp=8/20us)	Ipp	9	A
ESD voltage IEC61000-4-2 air	V <sub>ESD</sub>	±30	kV
ESD voltage IEC61000-4-2 contact		±30	
Junction temperature	T <sub>J</sub>	125	°C
Operating temperature	T <sub>OP</sub>	-40~85	°C
Lead temperature	T <sub>L</sub>	260	°C
Storage temperature	T <sub>STG</sub>	-55~150	°C

**Electronics characteristics (Ta=25°C, unless otherwise noted)**

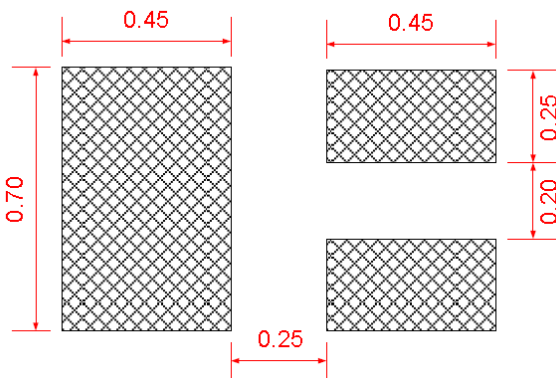
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse maximum working voltage	V <sub>RWM</sub>				5.0	V
Reverse leakage current	I <sub>R</sub>	V <sub>RWM</sub> =5V			1	uA
Reverse breakdown voltage	V <sub>BR</sub>	I <sub>T</sub> =1mA	5.8	6.8	8.1	V
Clamping voltage	V <sub>C</sub>	Ipp=1A tp=8/20us			6	V
		Ipp=9A tp=8/20us			11	V
Junction capacitance	C <sub>J</sub>	F=1MHz, V <sub>R</sub> =0V		24	30	pF


**8/20us waveform**

**IEC61000-4-2 waveform**

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

**Clamping voltage vs. Peak pulse current**

**Capacitance vs. Reverse voltage**

**Non-Repetitive Peak Pulse Power vs. Pulse time**

**Power derating vs. Temperature**

**ESD clamping voltage  
(IEC61000-4-2 +8kV contact)**

**ESD clamping voltage  
(IEC61000-4-2 -8kV contact)**

**Package outline dimensions**
**DFN1006-3L**

**Top View**

**Bottom View**

**Side View**

Symbol	Dimensions in millimeter		
	Min.	Typ.	Max.
A	>0.40	-	0.40
A1	0.00	-	0.05
A3	0.125REF		
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	0.35BSC		
e2	0.675BSC		

**Recommend PCB Layout (Unit: mm)**

**Notes:**

This recommended land pattern is for reference purposes only. Please consult your manufacturing group to ensure your PCB design guidelines are met.