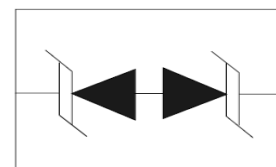


## Descriptions

The ESD5451N is a bi-directional TVS (Transient Voltage Suppressor). It is specifically designed to protect sensitive electronic components which are connected to low speed data lines and control lines from over-stress caused by ESD (Electrostatic Discharge), EFT (Electrical Fast Transients) and Lightning.

The ESD5451N may be used to provide ESD protection up to  $\pm 30\text{kV}$  (contact and air discharge) according to IEC61000-4-2, and withstand peak pulse current up to 8A (8/20 $\mu\text{s}$ ) according to IEC61000-4-5.

The ESD5451N is available in DFN1006-2L package. Standard products are Pb-free and Halogen-free.



## Features

- Reverse stand-off voltage:  $\pm 5\text{V}$  Max
- Transient protection for each line according to IEC61000-4-2 (ESD):  $\pm 30\text{kV}$  (contact and air discharge)  
IEC61000-4-4 (EFT): 40A (5/50ns)  
IEC61000-4-5 (surge): 8A (8/20 $\mu\text{s}$ )
- Capacitance:  $C_J = 17.5\text{pF}$  typ.
- Low leakage current:  $I_R < 1\text{nA}$  typ.
- Low clamping voltage:  $V_{CL} = 9\text{V}$  typ. @  $I_{PP} = 16\text{A}$  (TLP)
- Solid-state silicon technology

## Applications

- Cellular handsets
- Tablets
- Laptops
- Other portable devices
- Network communication devices

## Absolute maximum ratings

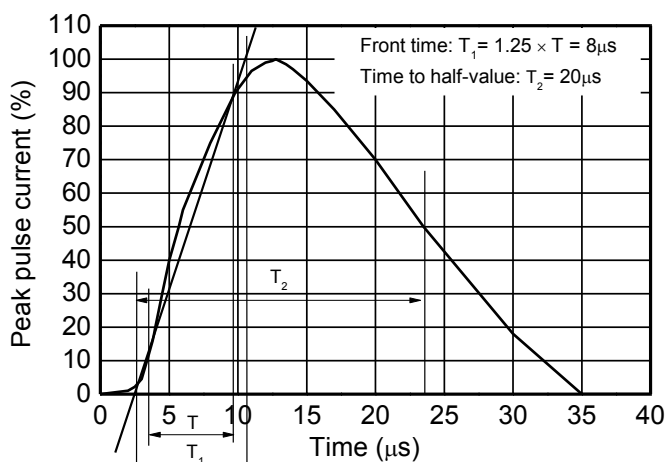
Parameter	Symbol	Rating	Unit
Peak pulse power ( $t_p = 8/20\mu\text{s}$ )	$P_{pk}$	80	W
Peak pulse current ( $t_p = 8/20\mu\text{s}$ )	$I_{PP}$	8	A
ESD according to IEC61000-4-2 air discharge	$V_{ESD}$	$\pm 30$	kV
ESD according to IEC61000-4-2 contact discharge		$\pm 30$	
Operation junction temperature	$T_J$	125	$^{\circ}\text{C}$
Lead temperature	$T_L$	260	$^{\circ}\text{C}$
Storage temperature	$T_{STG}$	-55~150	$^{\circ}\text{C}$

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

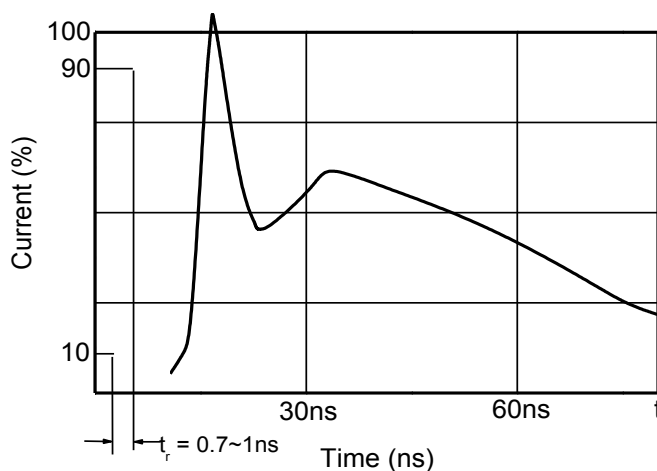
Parameter	Symbol	Condition	Min.	Typ.	Max.	Unit
Reverse stand-off voltage	V <sub>RWM</sub>				±5	V
Reverse leakage current	I <sub>R</sub>	V <sub>RWM</sub> = 5V		<1	100	nA
Reverse breakdown voltage	V <sub>BR</sub>	I <sub>BR</sub> = 1mA	5.1			V
Reverse holding voltage	V <sub>HOLD</sub>	I <sub>HOLD</sub> = 50mA	5.1			V
Clamping voltage <sup>1)</sup>	V <sub>CL</sub>	I <sub>PP</sub> = 16A, t <sub>p</sub> = 100ns		9		V
Clamping voltage <sup>2)</sup>	V <sub>CL</sub>	V <sub>ESD</sub> = 8kV		9		V
Clamping voltage <sup>3)</sup>	V <sub>CL</sub>	I <sub>PP</sub> = 1A, t <sub>p</sub> = 8/20μs			6.5	V
		I <sub>PP</sub> = 5A, t <sub>p</sub> = 8/20μs			8.5	V
		I <sub>PP</sub> = 8A, t <sub>p</sub> = 8/20μs			10	V
Dynamic resistance <sup>1)</sup>	R <sub>DYN</sub>			0.20		Ω
Junction capacitance	C <sub>J</sub>	V <sub>R</sub> = 0V, f = 1MHz		17.5	22	pF
		V <sub>R</sub> = 5V, f = 1MHz		11.5	16	pF

- 1) TLP parameter: Z<sub>0</sub> = 50Ω , t<sub>p</sub> = 100ns, t<sub>r</sub> = 2ns, averaging window from 60ns to 80ns. R<sub>DYN</sub> is calculated from 4A to 16A.
- 2) Contact discharge mode, according to IEC61000-4-2.
- 3) Non-repetitive current pulse, according to IEC61000-4-5.

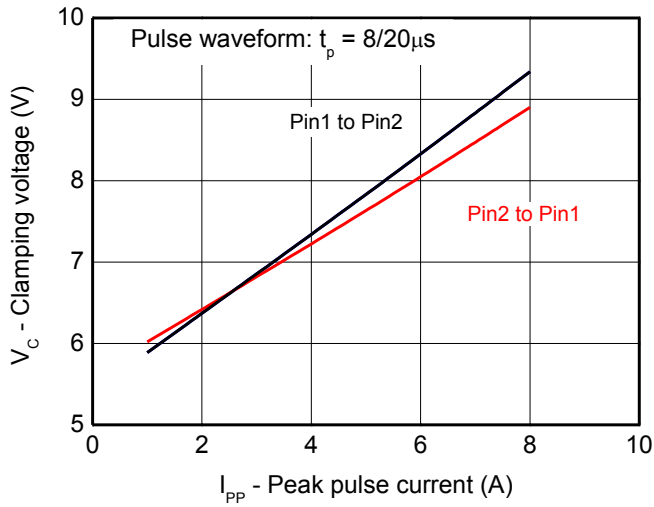
**Typical characteristics (T<sub>A</sub>=25°C, unless otherwise noted)**



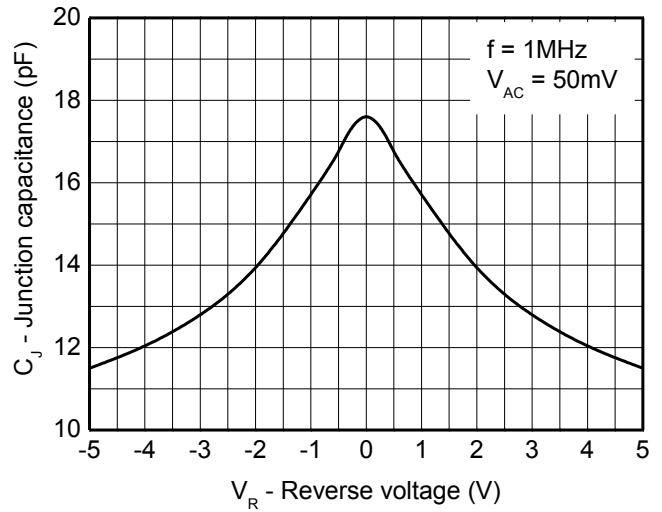
8/20μs waveform per IEC61000-4-5



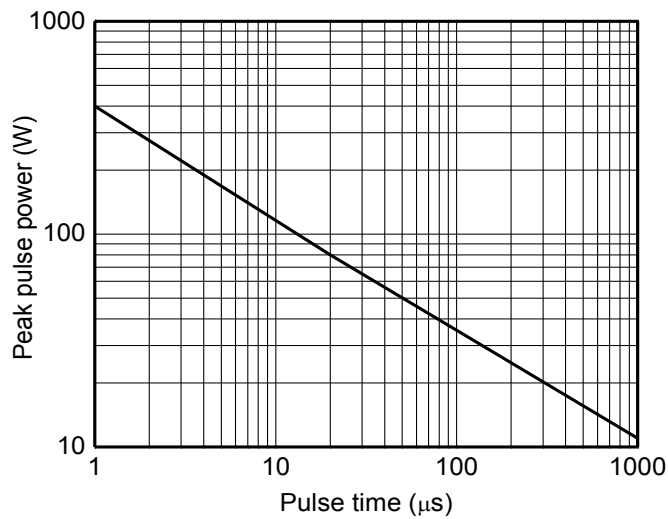
Contact discharge current waveform per IEC61000-4-2



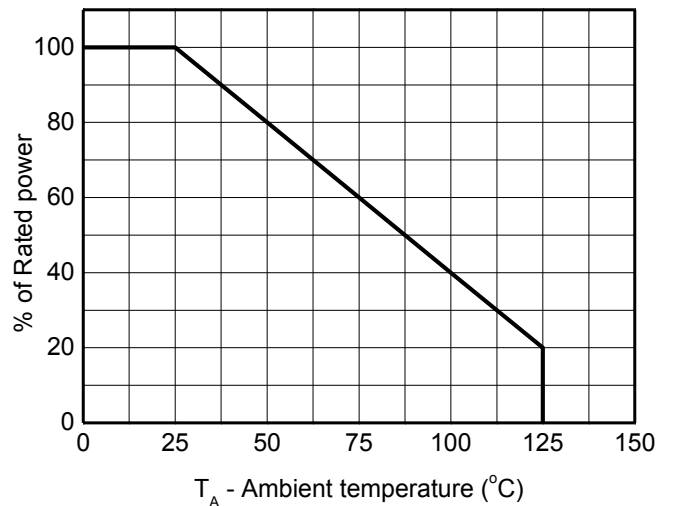
Clamping voltage vs. Peak pulse current



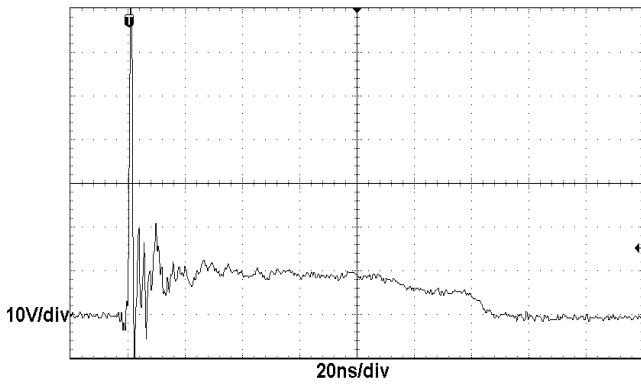
Capacitance vs. Reverse voltage



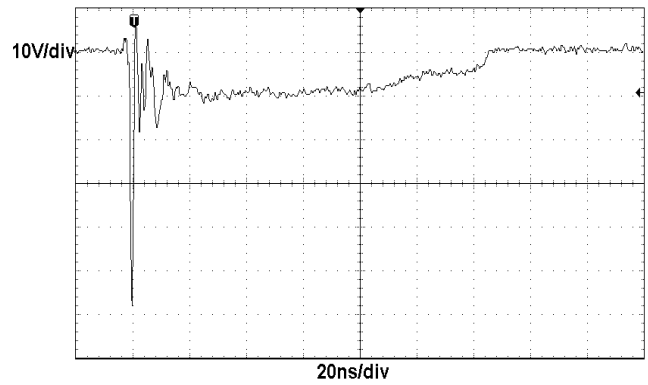
Non-repetitive peak pulse power vs. Pulse time



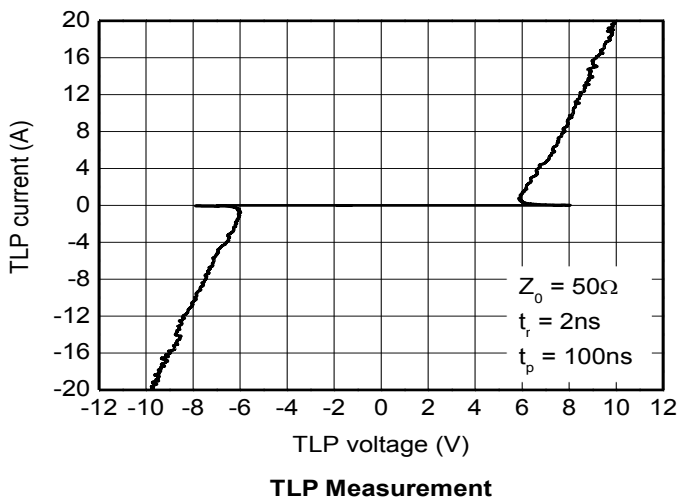
Power derating vs. Ambient temperature



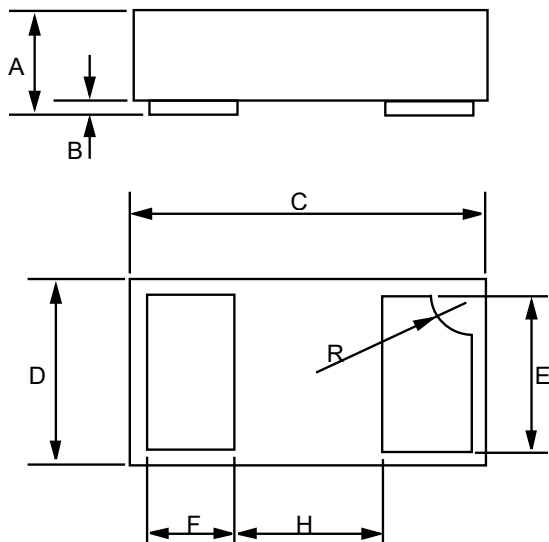
**ESD clamping**  
 (+8kV contact discharge per IEC61000-4-2)



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

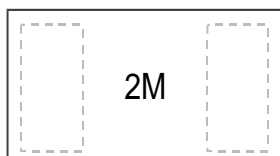


**DFN1006-2 PACKAGE OUTLINE DIMENSIONS**



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
UMW ESD5451N	DFN1006-2	10000	Tape and reel

单击下面可查看定价，库存，交付和生命周期等信息

[>>UMW\(友台半导体\)](#)