UMW ESD5451N

1.Features

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.

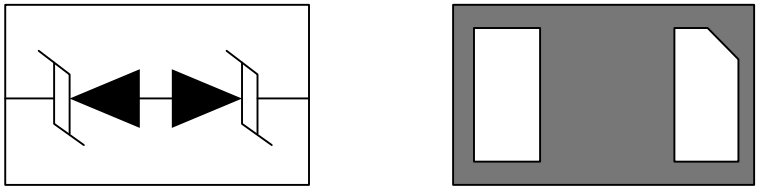
2.Applications

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

3.Features

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

4.Pinning information



DFN1006-2

5.Absolute Maximum Ratings

Parameter	Symbol	Value	Units
Peak Pulse Power (t_p=8/20μs)	P_{PK}	80	W
Peak Pulse Current (t_p=8/20μs)	I_{PP}	8	A
ESD according to IEC61000-4-2 air discharge	V_{ESD}	±30	kV
ESD according to IEC61000-4-2 contact discharge		±30	kV
Operation junction temperature	T_J	125	°C
Lead temperature	T_L	260	°C
Storage temperature	T_{STG}	-55 to 150	°C

6.Electrical Characteristics(T_A=25°C unless otherwise noted)

Parameter	Symbol	Conditions	Min	Typ	Max	Units
Reverse stand-off voltage	V_{RWM}				±5	V
Reverse leakage current	I_R	V_{RWM}=5V		<1	100	nA
Reverse breakdown voltage	V_{BR}	I_{BR}=1mA	5.1			V
Reverse holding voltage	V_{HOLD}	I_{HOLD}=50mA, t_p=100ns	5.1			V
Clamping voltage [1]	V_{CL}	V_{ESD}=8kV		9		V
Clamping voltage [2]	V_{CL}	I_{PP}=1A, t_p=8/20μs		9		V
Clamping voltage [3]	V_{CL}	I_{PP}=5A, t_p=8/20μs			6.5	V
		I_{PP}=8A, t_p=8/20μs			8.5	V
					10	V
Dynamic resistance [1]	R_{DYN}			0.2		Ω
Junction capacitance	C_J	V_R=0V, f=1MHz		17.5	22	pF
		V_R=5V, f=1MHz		11.5	16	pF

Notes:

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

7.1Typical characteristic

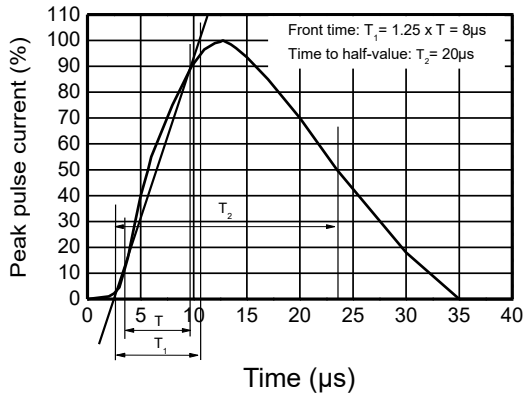


Figure 1: 8/20μs waveform per IEC61000-4-5

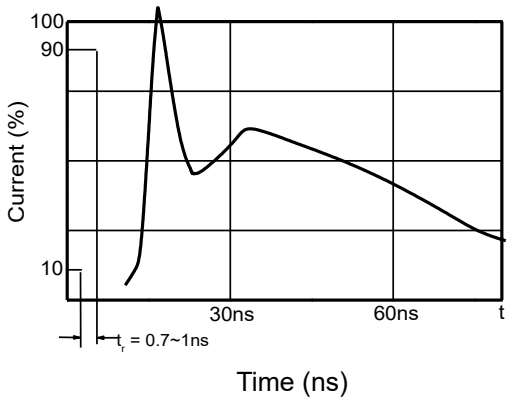


Figure 2: Contact discharge current waveform per IEC61000-4-2

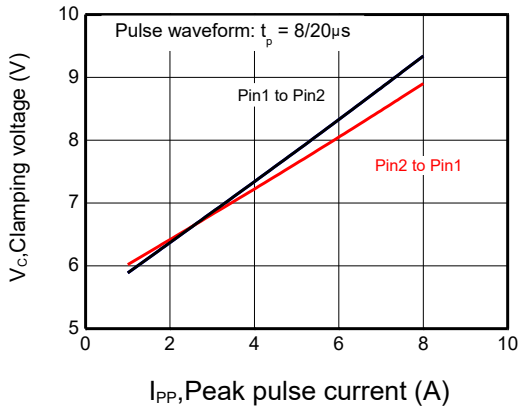


Figure 3: Clamping voltage vs. Peak pulse current

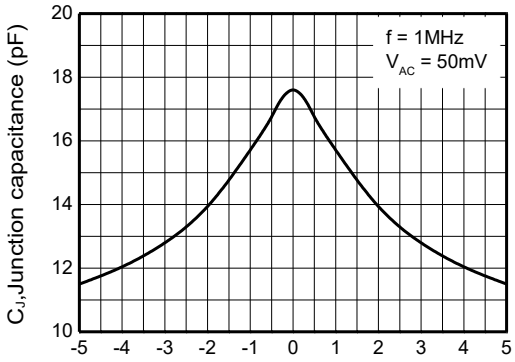


Figure 4: Capacitance vs. Reveres voltage

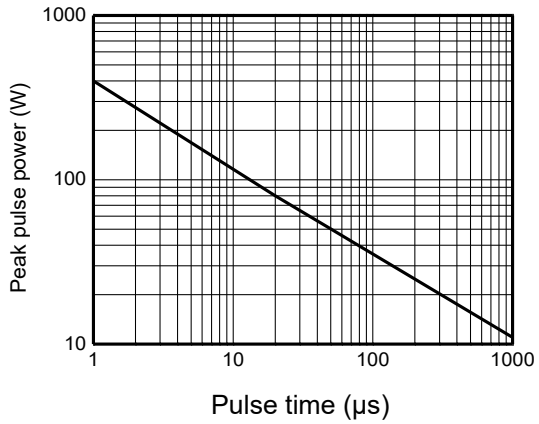


Figure 5: Non-repetitive peak pulse power vs. Pulse time

Figure 6: Power derating vs. Ambient temperature

7.2Typical characteristic

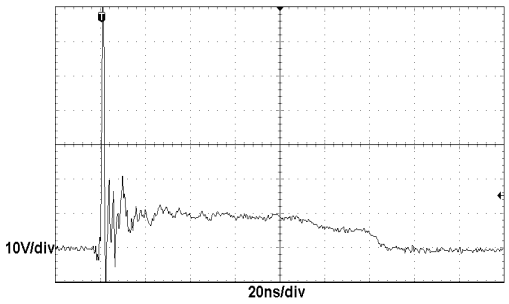


Figure 7: ESD clamping
(+8kV contact discharge per IEC61000-4-2)

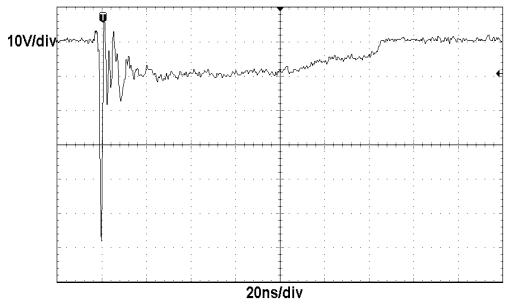


Figure 8: ESD clamping
(- 8kV contact discharge per IEC61000-4-2)

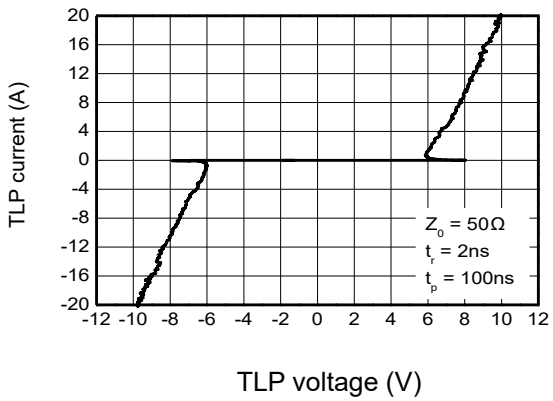
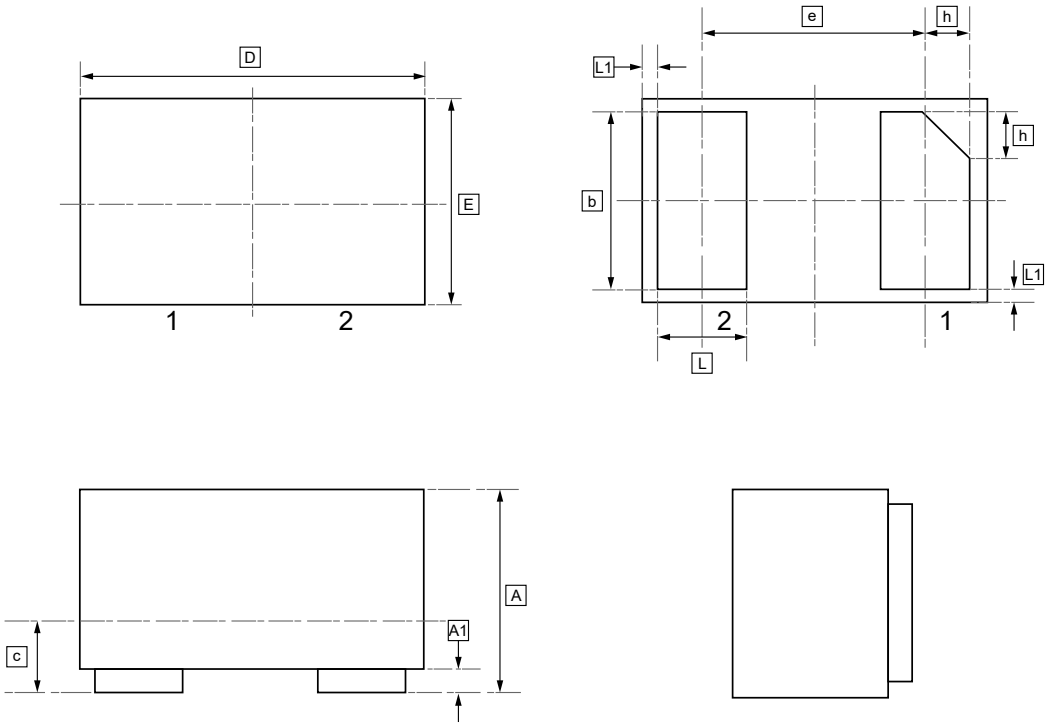


Figure 9: TLP Measurement

8.DFN1006-2L 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 ESD5451N	DFN1006-2	10000	Tape and reel

10.Disclaimer

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