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.

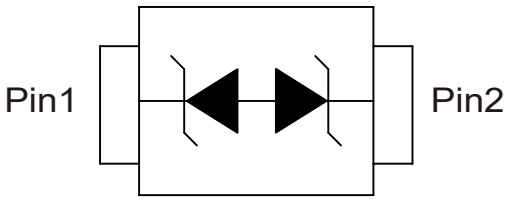
2.Applications

- 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

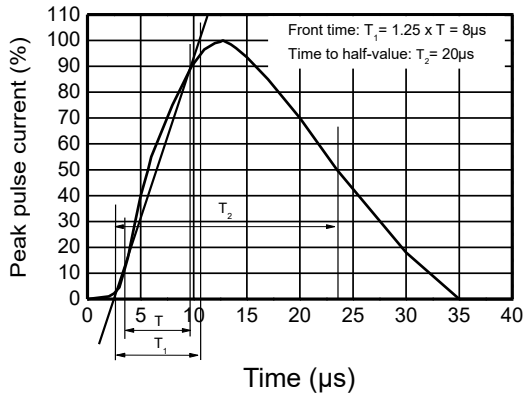


Figure 1: 8/20μs waveform per IEC61000-4-5

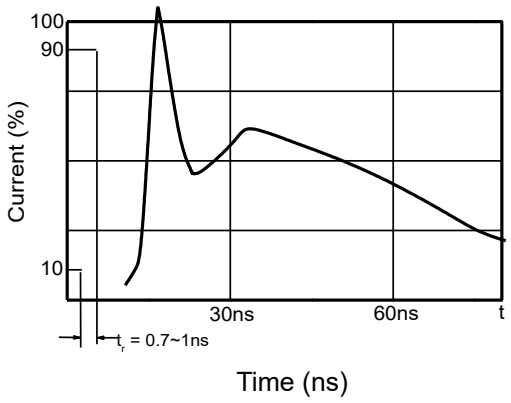


Figure 2: Contact discharge current waveform per IEC61000-4-2

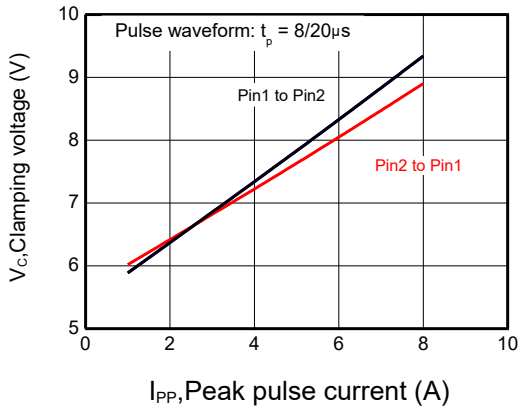


Figure 3: Clamping voltage vs. Peak pulse current

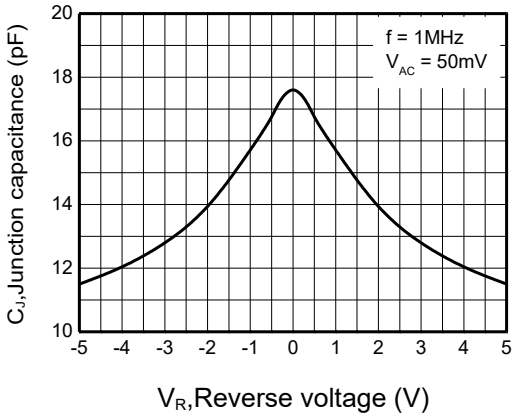


Figure 4: Capacitance vs. Reveres voltage

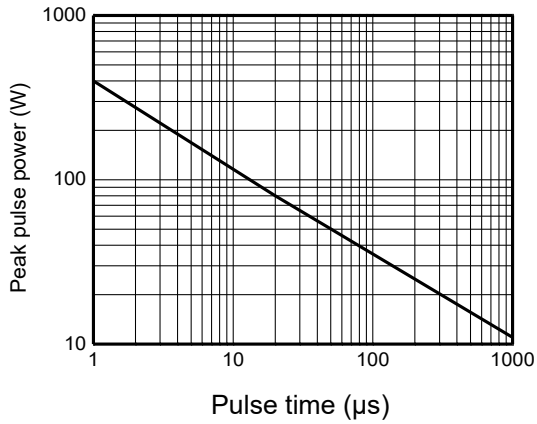


Figure 5: Non-repetitive peak pulse power vs. Pulse time

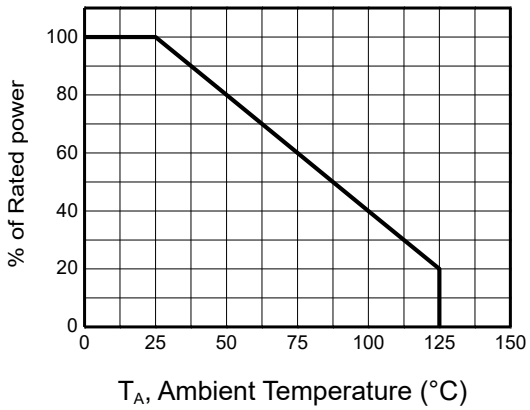


Figure 6: Power derating vs. Ambient temperature

7.2Typical characteristic

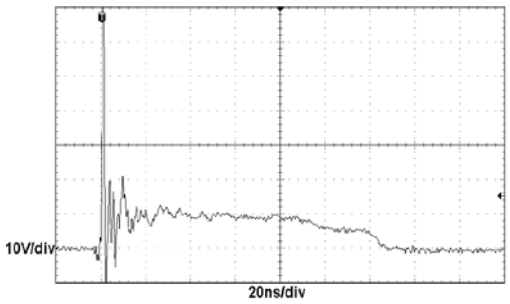


Figure 7: ESD clamping
(+8kV contact discharge per IEC61000-4-2)

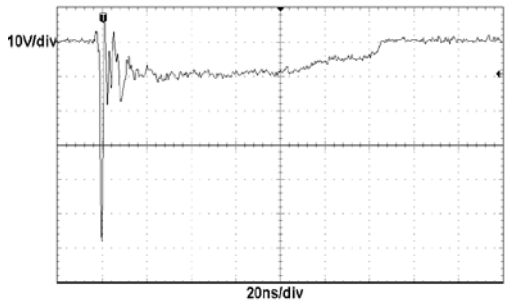


Figure 8: ESD clamping
(- 8kV contact discharge per IEC61000-4-2)

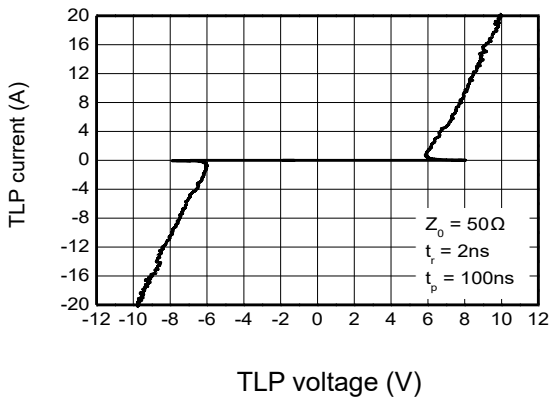
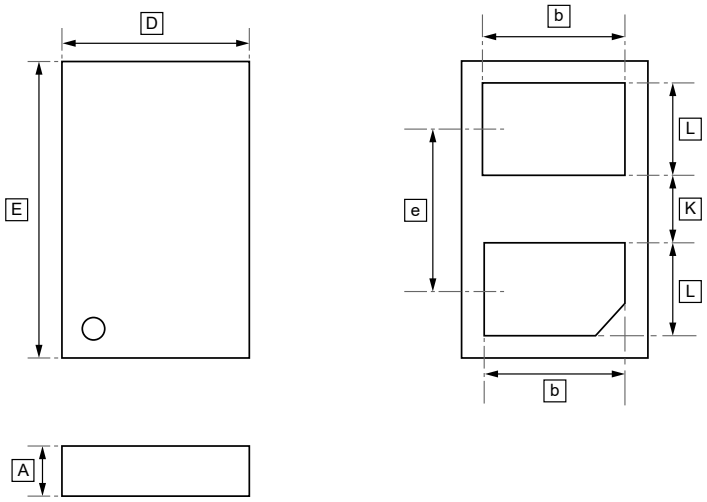


Figure 9: TLP Measurement

8.DFN1006-2 Package Outline Dimensions



DIMENSIONS (mm are the original dimensions)

Symbol	A	b	D	e	E	L	K
Min	0.30	0.22	0.27	0.40	0.57	0.14	0.20
Max	0.35	0.26	0.33	BSC	0.63	0.18	0.25

9.Ordering information

Order Code	Package	Base QTY	Delivery Mode
UMW ESD5451N	DFN1006-2	10000	Tape and reel

10.Disclaimer

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