

1.Features

The ESD5311N is an ultra-low capacitance TVS(Transient Voltage Suppressor) designed to protect high speed data interfaces. It has been specifically designed to protect sensitive electronic components which are connected to data and transmission lines from overstress caused by ESD (Electrostatic Discharge).The ESD5311N incorporates one pair of ultralow capacitance steering diodes plus a TVS diode.

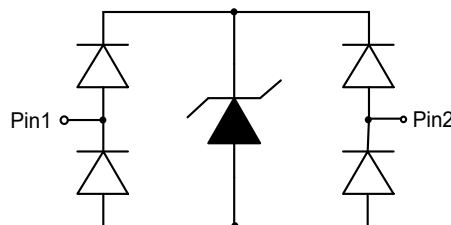
2.Applications

- USB 2.0 and USB 3.0
- HDMI 1.3 and HDMI 1.4
- SATA and eSATA
- DVI
- IEEE 1394
- PCI Express
- Portable Electronics
- Notebooks

3.Applications

- Stand-off voltage: 5V Max
- Transient protection for each line according to IEC61000-4-2 (ESD): $\pm 20\text{kV}$ (contact discharge)
IEC61000-4-5 (surge): 4 A (8/20 μs)
- Ultra-low capacitance: $C_J = 0.25\text{pF}$ typ.
- Ultra-low leakage current: $I_R < 1\text{nA}$ typ.
- Low clamping voltage:
 $V_{CL}=21\text{V}$ typ. @ $I_{PP}=16\text{A}$ (TLP)
- Solid-state silicon technology

4.Pinning information



DFN1006-2



5. Absolute Maximum Ratings

| Parameter | Symbol | Value | Units |
|---|-----------|------------|-------------|
| Peak Pulse Power ($t_p=8/20\mu s$) | P_{PK} | 84 | W |
| Peak Pulse Current ($t_p=8/20\mu s$) | I_{PP} | 4 | A |
| ESD according to IEC61000-4-2 air discharge | V_{ESD} | ± 20 | kV |
| ESD according to IEC61000-4-2 contact discharge | | ± 20 | kV |
| Operation junction temperature | T_J | 125 | $^{\circ}C$ |
| Lead temperature | T_L | 260 | $^{\circ}C$ |
| Storage temperature | T_{STG} | -55 to 150 | $^{\circ}C$ |



6. Electrical Characteristics ($T_A=25^\circ\text{C}$ unless otherwise noted)

| Parameter | Symbol | Conditions | Min | Typ | Max | Units |
|----------------------------------|-----------|--|-----|------|-----|----------|
| Reverse maximum working voltage | V_{RWM} | | | | 5 | V |
| Reverse leakage current | I_R | $V_{RWM}=5\text{V}$ | | <1 | 100 | nA |
| Reverse breakdown voltage | V_{BR} | $I_T=1\text{mA}$ | 7.5 | 9 | 10 | V |
| Clamping voltage ¹⁾ | V_{CL} | $I_{PP}=16\text{A}$, $t_p=100\text{ns}$ | | 21 | | V |
| Dynamic resistance ¹⁾ | R_{DYN} | | | 0.7 | | Ω |
| Clamping voltage ²⁾ | V_{CL} | $V_{ESD}=8\text{kV}$ | | 21 | | V |
| Clamping voltage ³⁾ | V_{CL} | $I_{PP}=1\text{A}$, $t_p=8/20\mu\text{s}$ | | | 14 | V |
| | | $I_{PP}=4\text{A}$, $t_p=8/20\mu\text{s}$ | | | 21 | V |
| Junction capacitance | C_J | $V_R=0\text{V}$, $f=1\text{MHz}$, Any I/O pin to GND | | 0.25 | 0.4 | pF |

Notes:

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) Contact discharge mode, according to IEC61000-4-2.

3) Non-repetitive current pulse, according to IEC61000-4-5.

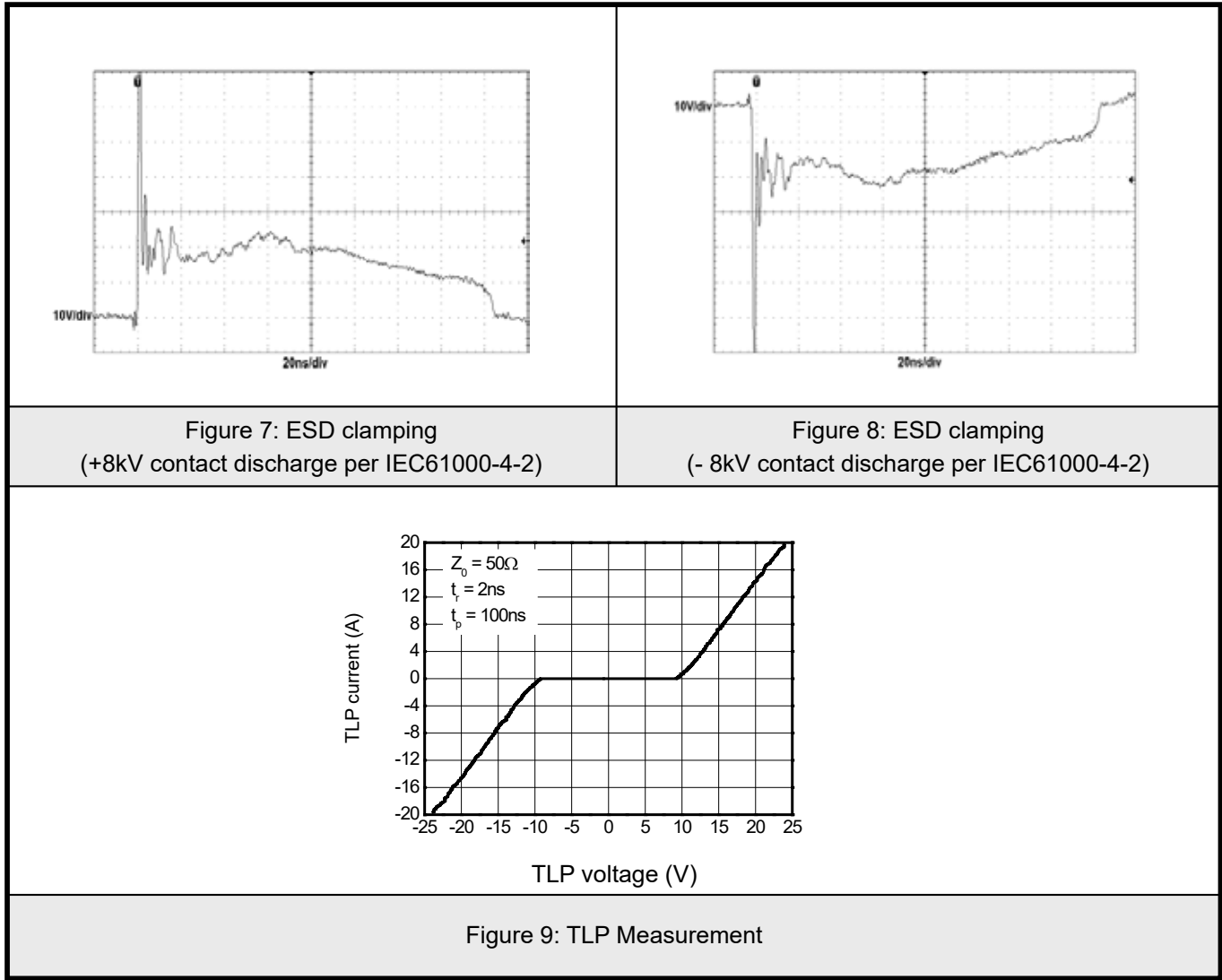


7.1Typical characteristic

| | |
|--|---|
| | |
| 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. Reverse voltage |
| | |
| Figure 5: Non-repetitive peak pulse power vs. Pulse time | Figure 6: Power derating vs. Ambient temperature |

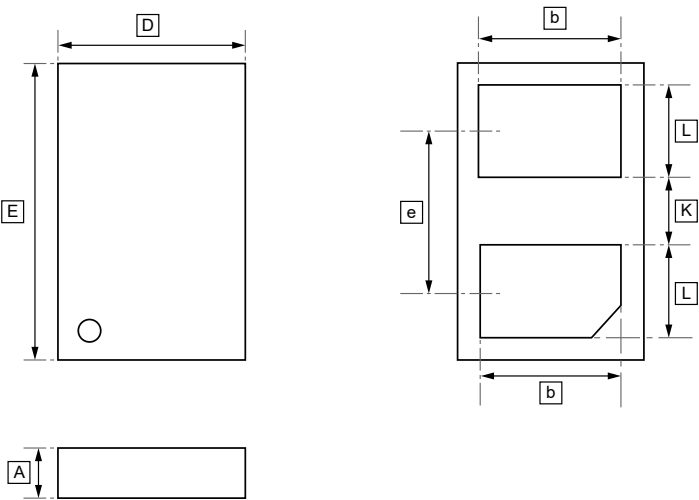


7.2Typical characteristic





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 ESD5311N | DFN1006-2 | 10000 | Tape and reel |



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