



## ESD5311N ESD Protection Diodes

### Features

- Bi-directional ESD protection of one line
- 110Watts peak pulse power ( $t_p = 8/20\mu s$ )
- Working voltage: 5V
- Junction Capacitance: 0.30pF(Typ)
- IEC 61000-4-2  $\pm 20kV$  contact  $\pm 20kV$  air
- IEC 61000-4-5 (Lightning) 5.0A ( $8/20\mu s$ )

### Applications

- Smart Phone and Tablet PC
- TV and Set Top Box
- Wearable Devices
- PDA

### Mechanical Data

- Package: DFN1006-2L
- Molding compound flammability rating: UL 94V-0
- RoHS/WEEE Compliant

### Schematic Diagram



### Order Information

| Part Number | Package    | Marking | Packing           | Reel Size |
|-------------|------------|---------|-------------------|-----------|
| ESD5311N    | DFN1006-2L | 5F      | 10000 Tape & Reel | 7 inches  |

### Limiting Values( $T_A=25^{\circ}C$ unless otherwise specified)

| Symbol    | Parameter                       | Conditions                       | Min | Max      | Unit        |
|-----------|---------------------------------|----------------------------------|-----|----------|-------------|
| $V_{ESD}$ | Electrostatic Discharge Voltage | IEC 61000-4-2; Contact Discharge | -   | $\pm 20$ | kV          |
|           |                                 | IEC 61000-4-2; Air Discharge     | -   | $\pm 20$ | kV          |
| $P_{PP}$  | Peak Pulse Power                | $t_p = 8/20 \mu s$               | -   | 110      | W           |
| $I_{PPM}$ | Rated Peak Pulse Current        | $t_p = 8/20 \mu s$               | -   | 5.0      | A           |
| $T_A$     | Operating Temperature Range     | -                                | -55 | 125      | $^{\circ}C$ |
| $T_{stg}$ | Storage Temperature Range       | -                                | -55 | 150      | $^{\circ}C$ |



## Electrical Characteristics( $T_A=25^{\circ}\text{C}$ unless otherwise specified)

| Symbol    | Parameter               | Conditions                                         | Min | Typ  | Max  | Unit          |
|-----------|-------------------------|----------------------------------------------------|-----|------|------|---------------|
| $V_{RWM}$ | Reverse Working Voltage | $T_A = 25^{\circ}\text{C}$                         | -   | -    | 5.0  | V             |
| $V_{BR}$  | Breakdown Voltage       | $I_R = 1\text{mA}$ ; $T_A = 25^{\circ}\text{C}$    | 6.0 | 8.5  | 9.5  | V             |
| $I_R$     | Reverse Leakage Current | $V_{RWM} = 5\text{V}$ ; $T_A = 25^{\circ}\text{C}$ | -   | -    | 0.1  | $\mu\text{A}$ |
| $V_C$     | Clamping Voltage        | $I_{PP}=1\text{A}$ , $t_P=8/20\mu\text{s}$         | -   | -    | 10   | V             |
|           |                         | $I_{PP}=5.0\text{A}$ , $t_P=8/20\mu\text{s}$       | -   | -    | 22   | V             |
| $C_J$     | Junction Capacitance    | $V_R = 0\text{V}$ , $f = 1\text{MHz}$              | -   | 0.30 | 0.40 | pF            |

## Typical Characteristics

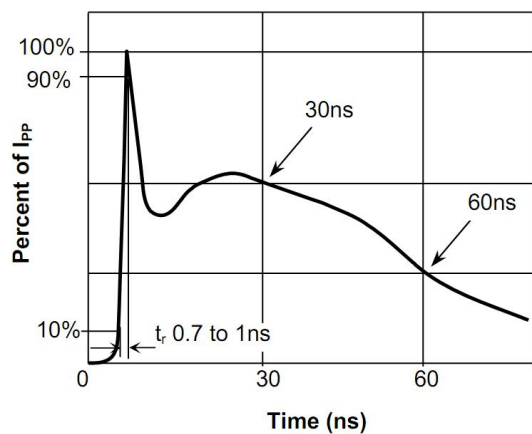


Fig.1 Pulse Waveform-ESD (IEC61000-4-2)

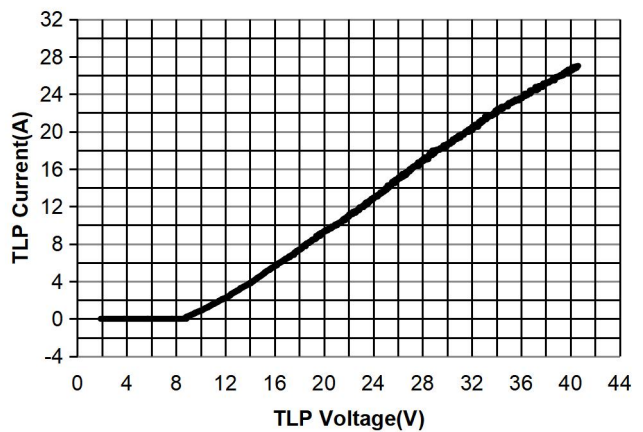


Fig.2 Transmission Line Pulse (TLP)

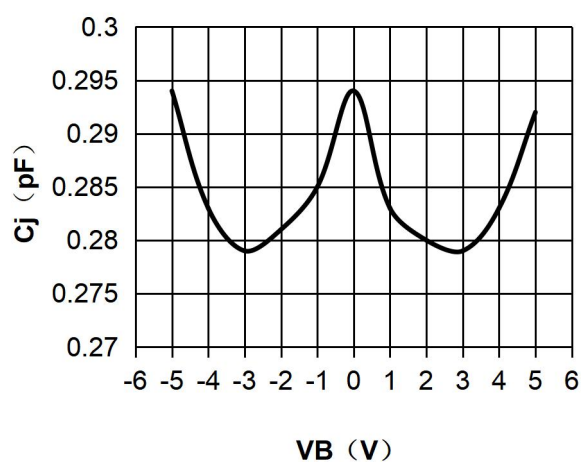


Fig.3 Capacitance vs. Reverses Voltage

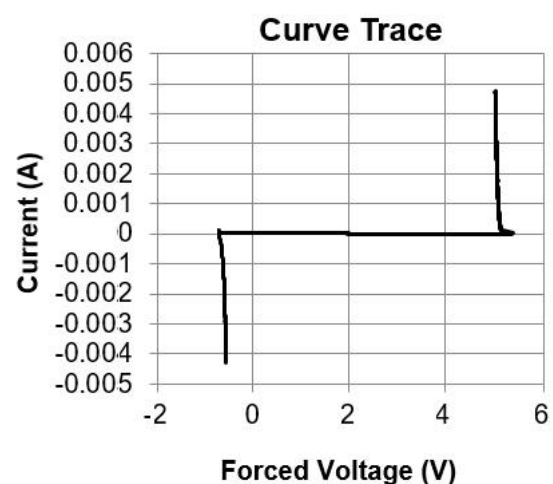
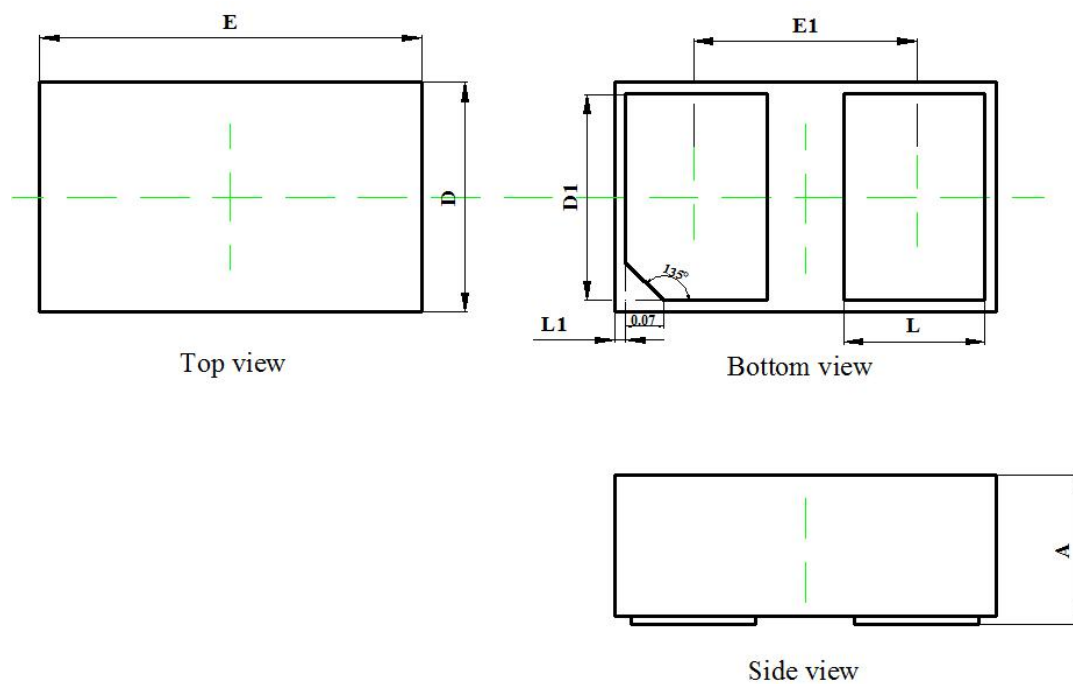


Fig.4 IV Curve



## Package Dimension

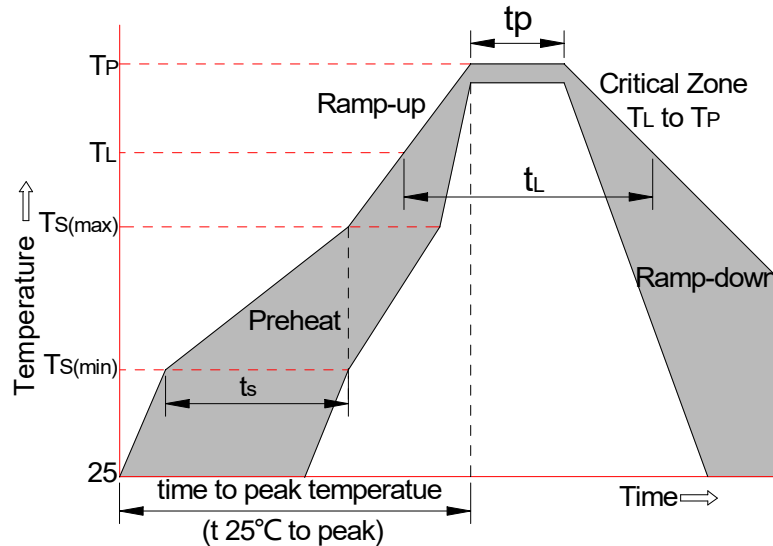
DFN1006 Package Outline



| Symbol | Dimensions In<br>Millimeters |       | Dimensions In<br>Inches |       |
|--------|------------------------------|-------|-------------------------|-------|
|        | Min                          | Max   | Min                     | Max   |
| A      | 0.350                        | 0.450 | 0.014                   | 0.018 |
| D      | 0.550                        | 0.650 | 0.022                   | 0.026 |
| E      | 0.950                        | 1.050 | 0.037                   | 0.041 |
| D1     | 0.420                        | 0.520 | 0.017                   | 0.020 |
| E1     | 0.550                        | 0.650 | 0.022                   | 0.026 |
| L      | 0.270                        | 0.370 | 0.011                   | 0.015 |
| L1     | 0.000                        | 0.100 | 0.000                   | 0.004 |



## Soldering Parameters



| Reflow Condition                                        |                                  | Pb-Free Assembly |
|---------------------------------------------------------|----------------------------------|------------------|
| Pre-heat                                                | Temperature Min ( $T_{s(min)}$ ) | +150°C           |
|                                                         | Temperature Max( $T_{s(max)}$ )  | +200°C           |
|                                                         | Time (Min to Max) ( $t_s$ )      | 60-180 secs.     |
| Average ramp up rate (Liquid us Temp ( $T_L$ ) to peak) |                                  | 3°C/sec. Max     |
| $T_{s(max)}$ to $T_L$ - Ramp-up Rate                    |                                  | 3°C/sec. Max     |
| Reflow                                                  | Temperature( $T_L$ )(Liquid us)  | +217°C           |
|                                                         | Temperature( $t_L$ )             | 60-150 secs.     |
| Peak Temp ( $T_p$ )                                     |                                  | +260(+0/-5)°C    |
| Time within 5°C of actual Peak Temp ( $t_p$ )           |                                  | 30 secs. Max     |
| Ramp-down Rate                                          |                                  | 6°C/sec. Max     |
| xTime 25°C to Peak Temp ( $T_P$ )                       |                                  | 8 min. Max       |
| Do not exceed                                           |                                  | +260°C           |