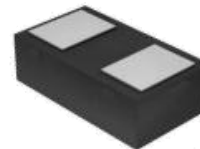


## 1. Features

- Capacitance: 15pF(typ.)
- Reverse Working Voltage: 5V
- IEC 61000-4-2 (ESD Air):  $\pm 25\text{KV}$   
IEC 61000-4-2 (ESD Contact):  $\pm 25\text{KV}$   
IEC 61000-4-5 (Lightning 8/20 $\mu\text{s}$ ): 8A

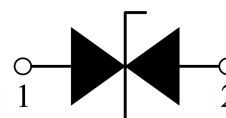
## 2. Pin Description



## 3. Applications

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

## 4. Schematic Diagram



## 5. Order Information

| Type     | Package | Size (mm)      | Delivery Form | Delivery Quantity |
|----------|---------|----------------|---------------|-------------------|
| ESD5451N | DFN1006 | 1.00x0.60x0.37 | 7" T&R        | 10,000            |

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

| Symbol           | Parameter                       | Conditions                       | Min | Max      | Unit               |
|------------------|---------------------------------|----------------------------------|-----|----------|--------------------|
| $V_{\text{ESD}}$ | Electrostatic Discharge Voltage | IEC 61000-4-2; Contact Discharge | -   | $\pm 25$ | kV                 |
|                  |                                 | IEC 61000-4-2; Air Discharge     | -   | $\pm 25$ | kV                 |
| $P_{\text{PP}}$  | Peak Pulse Power                | $t_P = 8/20\text{ }\mu\text{s}$  | -   | 80       | W                  |
| $I_{\text{PPM}}$ | Rated Peak Pulse Current        | $t_P = 8/20\text{ }\mu\text{s}$  | -   | 8        | A                  |
| $T_A$            | Ambient Temperature Range       | -                                | -55 | 125      | $^{\circ}\text{C}$ |
| $T_{\text{stg}}$ | Storage Temperature Range       | -                                | -55 | 150      | $^{\circ}\text{C}$ |

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

| Symbol           | Parameter               | Conditions                                                        | Min | Typ. | Max | Unit          |
|------------------|-------------------------|-------------------------------------------------------------------|-----|------|-----|---------------|
| $V_{\text{RWM}}$ | Reverse Working Voltage | $T_A = 25\text{ }^{\circ}\text{C}$                                | -   | -    | 5.0 | V             |
| $V_{\text{BR}}$  | Breakdown Voltage       | $I_R = 1\text{mA}$ ; $T_A = 25\text{ }^{\circ}\text{C}$           | 5.6 | 6.5  | 8.4 | V             |
| $I_R$            | Reverse Leakage Current | $V_{\text{RWM}} = 5\text{V}$ ; $T_A = 25\text{ }^{\circ}\text{C}$ | -   | -    | 0.1 | $\mu\text{A}$ |
| $V_C$            | Clamping Voltage        | $I_{\text{PP}} = 1\text{A}$ , $t_P = 8/20\mu\text{s}$             | -   | -    | 6   | V             |
|                  |                         | $I_{\text{PP}} = 8\text{A}$ , $t_P = 8/20\mu\text{s}$             | -   | -    | 10  | V             |
| $C_J$            | Junction Capacitance    | $V_R = 0\text{V}$ , $f = 1\text{MHz}$                             | -   | 15   | 18  | pF            |

## 8. Typical Characteristics

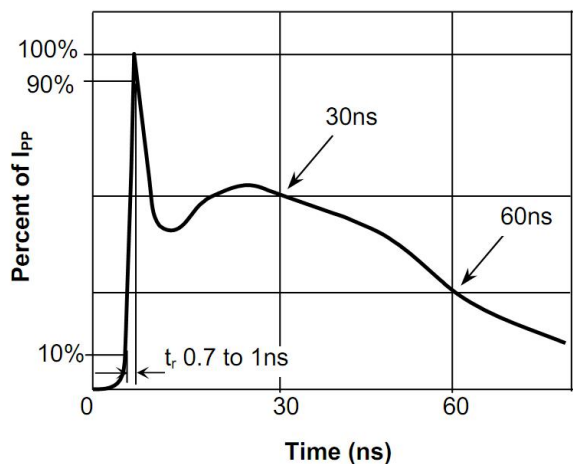


Fig.1 Pulse Waveform-ESD (IEC61000-4-2)

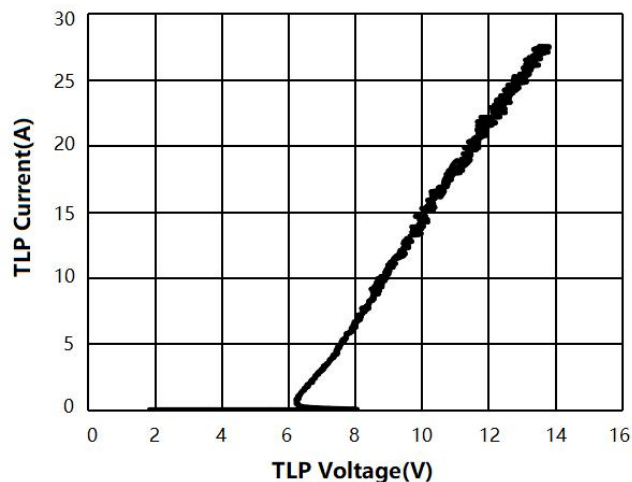


Fig.2 Transmission Line Pulse (TLP)

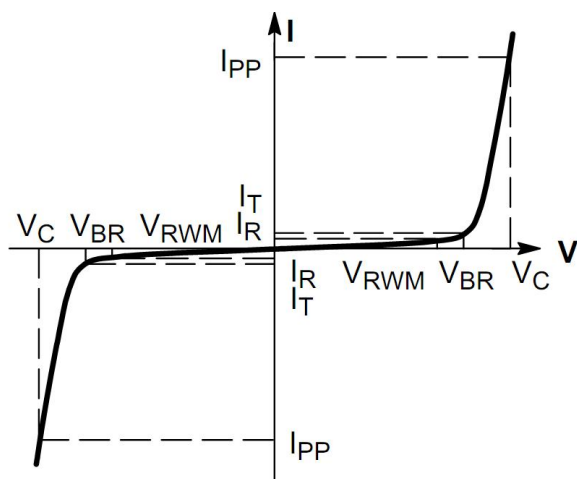


Fig.3 V-I Characteristics for Bidirectional Diode

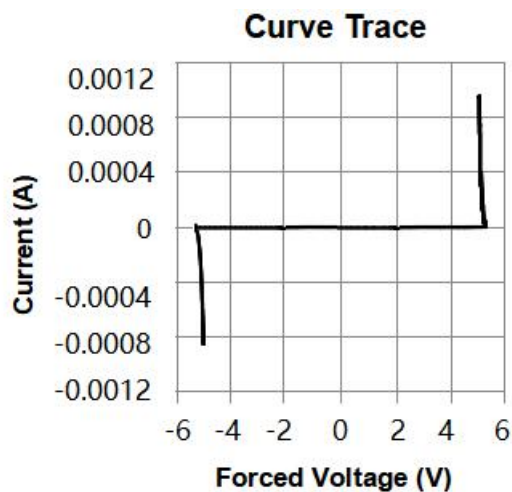


Fig.4 IV Curve

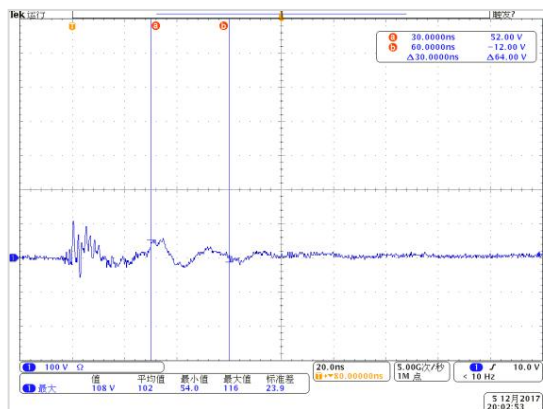


Fig.5 Clamping Voltage at IEC61000-4-2  
+8kV Pulse Waveform

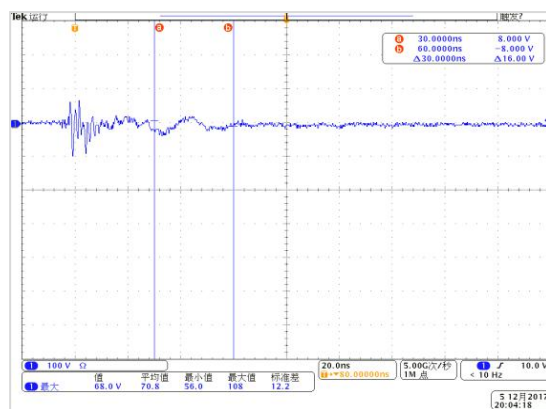
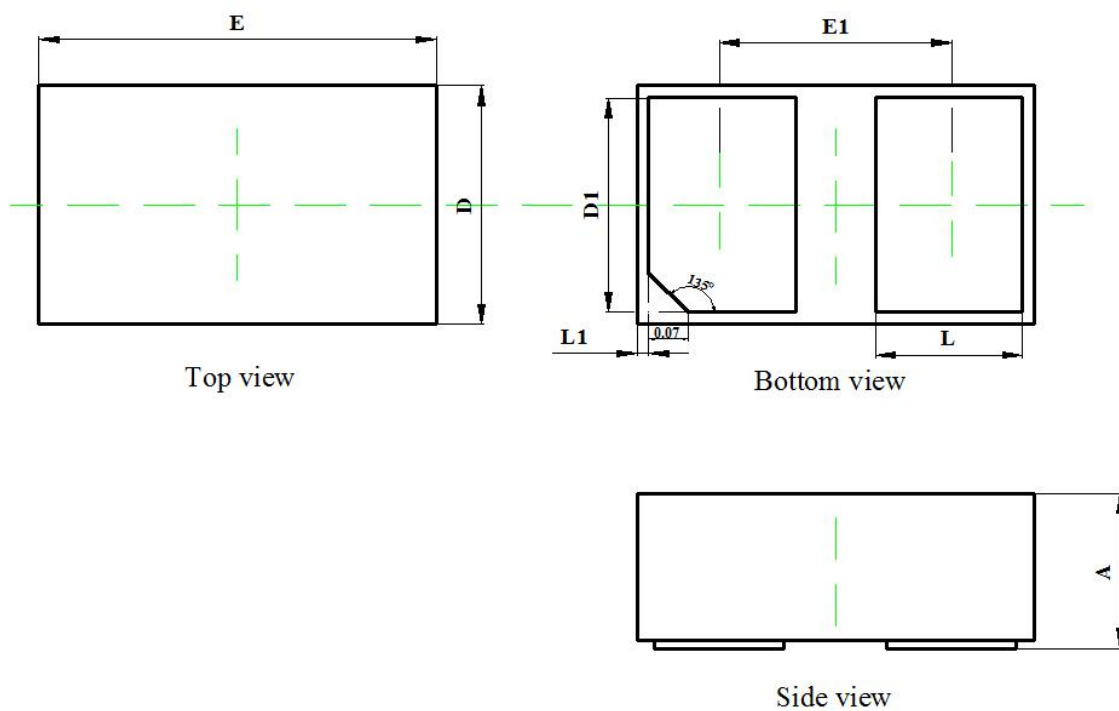


Fig.6 Clamping Voltage at IEC61000-4-2  
-8kV Pulse Waveform

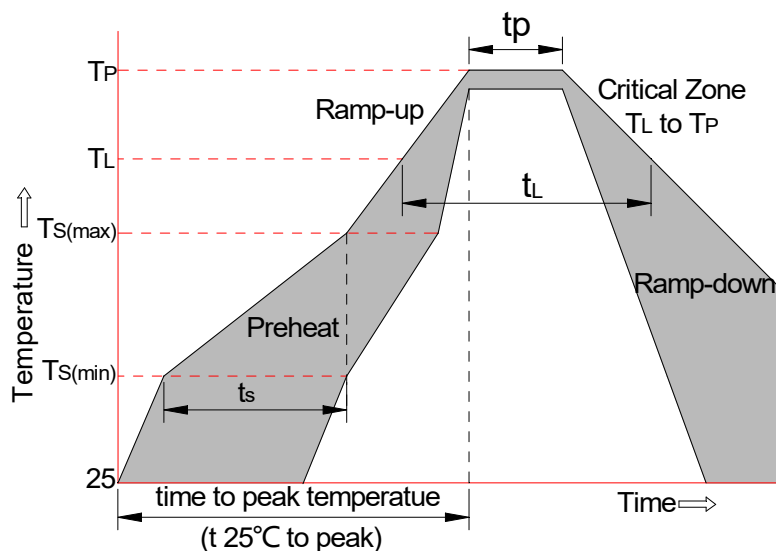
## 9. Package Outline Dimensions

DFN1006 Package Outline



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

## 10. 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           |