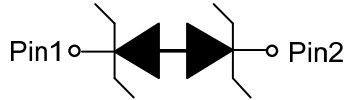


## 1-Line, Bi-directional, Transient Voltage Suppressor



**DFN1006-2L**

### Features

- Stand-off voltage: 3.3V Max
- Transient protection for each line according to  
IEC61000-4-2(ESD):  $\pm 30\text{kV}$  (contact)  
IEC61000-4-4 (EFT): 40A (5/50ns)  
IEC61000-4-5(surge): 9A (8/20 $\mu\text{s}$ )
- Low leakage current
- Low clamping voltage
- Low clamping voltage:  
 $V_{CL} = 9\text{V typ. @ } I_{PP} = 16\text{A (TLP)}$
- RoHS Compliant

### Applications

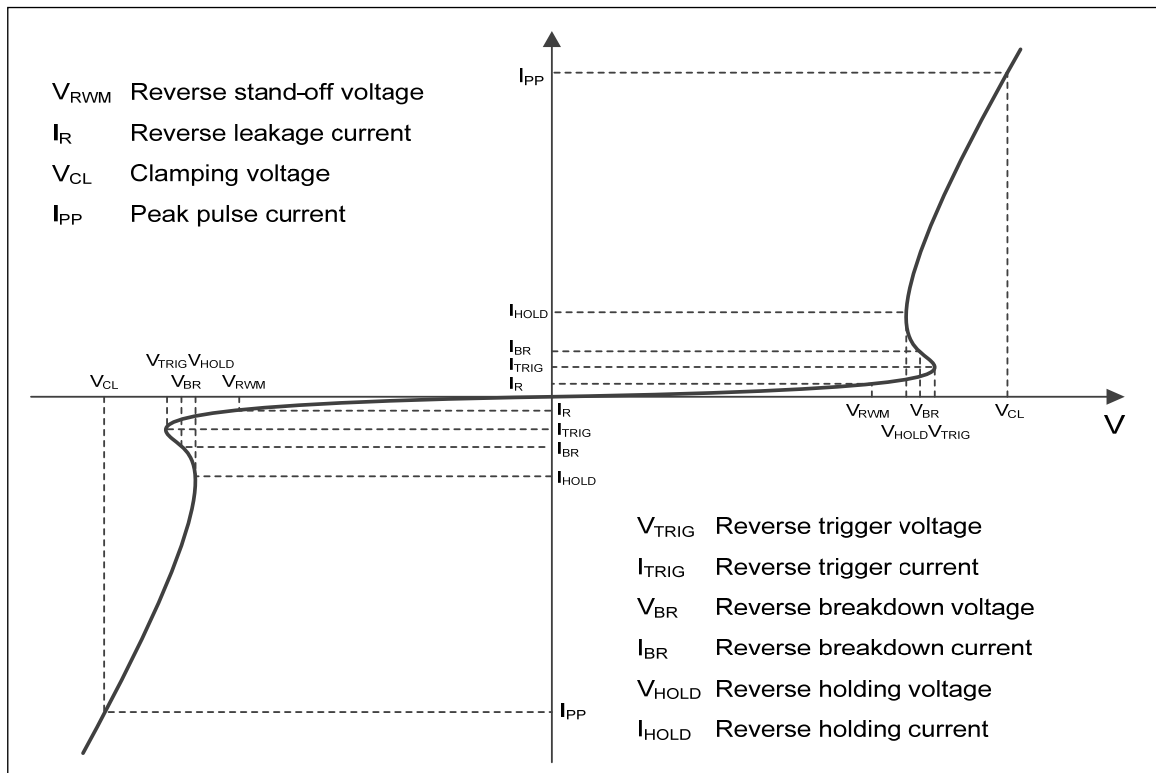
- Cellular handsets
- Tablets
- Laptops
- Network communication devices
- Other portable devices

### Mechanical Data

- Package: DFN1006-2L
- Case Material: "Green" Molding Compound
- Marking Information: See Below

Pin1 **3A** Pin2

### ■Definitions of electrical characteristics





# ESD3V3LB1

## ■Maximum Ratings

| PARAMETER                                       | SYMBOL    | Rating   | UNIT        |
|-------------------------------------------------|-----------|----------|-------------|
| Peak pulse power ( $t_p = 8/20\mu s$ )          | $P_{pk}$  | 90       | W           |
| Peak pulse current ( $t_p = 8/20\mu s$ )        | $I_{PP}$  | 9        | A           |
| ESD according to IEC61000-4-2 air discharge     | $V_{ESD}$ | $\pm 30$ | KV          |
| ESD according to IEC61000-4-2 contact discharge |           | $\pm 30$ | KV          |
| Junction temperature                            | $T_J$     | 125      | $^{\circ}C$ |
| Storage temperature                             | $T_{STG}$ | -55~150  | $^{\circ}C$ |

## ■Electrical Characteristics ( $T_a=25^{\circ}C$ Unless otherwise specified)

| PARAMETER                        | Symbol    | UNIT     | Conditions                     | Min | Typ | Max |
|----------------------------------|-----------|----------|--------------------------------|-----|-----|-----|
| Reverse maximum working voltage  | $V_{RWM}$ | V        |                                |     |     | 3.3 |
| Reverse leakage current          | $I_R$     | nA       | $V_{RWM} = 3.3V$               |     |     | 100 |
| Reverse breakdown voltage        | $V_{BR}$  | V        | $I_{BR} = 1mA$                 | 3.6 | 4   |     |
| Clamping voltage <sup>1)</sup>   | $V_{CL}$  | V        | $I_{PP} = 16A, t_p = 100ns$    |     | 9.0 |     |
| Dynamic resistance <sup>1)</sup> | $R_{DYN}$ | $\Omega$ |                                |     | 0.2 |     |
| Clamping voltage <sup>2)</sup>   | $V_{CL}$  | V        | $V_{ESD} = 8kV$                |     | 9.0 |     |
| Clamping voltage <sup>3)</sup>   | $V_{CL}$  | V        | $I_{PP} = 1A, t_p = 8/20\mu s$ |     |     | 6   |
|                                  |           | V        | $I_{PP} = 9A, t_p = 8/20\mu s$ |     |     | 10  |
| Junction capacitance             | $C_J$     | pF       | $V_R = 0V, f = 1MHz$           |     | 16  | 20  |

(1). TLP parameter:  $Z_0 = 50\Omega$ ,  $t_p = 100ns$ ,  $t_r = 2ns$ , 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.

## ■Ordering Information (Example)

| PREFERRED P/N | UNIT WEIGHT(mg) | MINIMUM PACKAGE(pcs) | INNER BOX QUANTITY(pcs) | OUTER CARTON QUANTITY(pcs) | DELIVERY MODE |
|---------------|-----------------|----------------------|-------------------------|----------------------------|---------------|
| ESD3V3LB1     | Approximate 0.9 | 10000                | 100000                  | 400000                     | Tape & reel   |



## ■ Characteristics (Typical)

Fig.1 8/20 $\mu$ s waveform per IEC61000-4-5

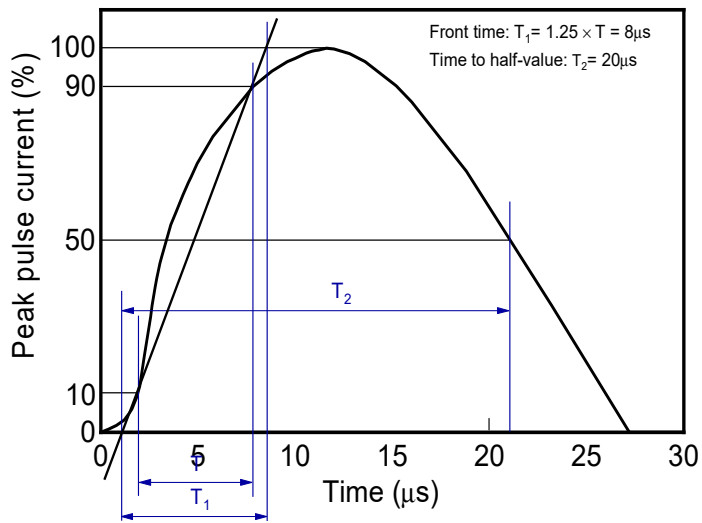


Fig.2 Contact discharge current waveform per IEC61000-4-2

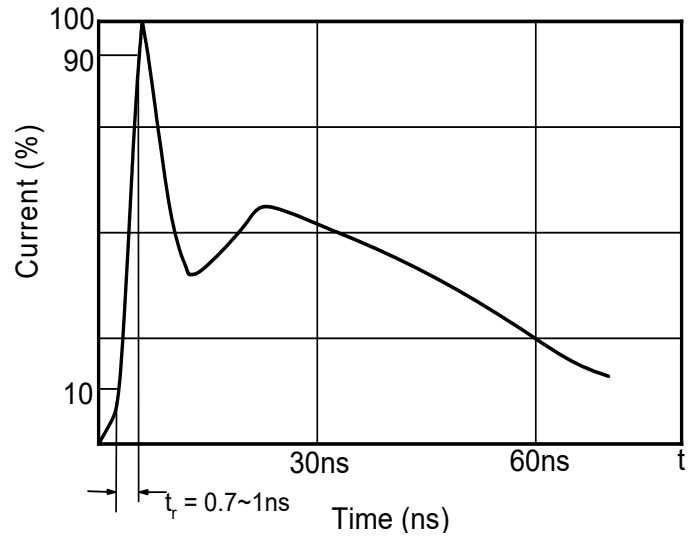


Fig.3 Clamping voltage vs. Peak pulse current

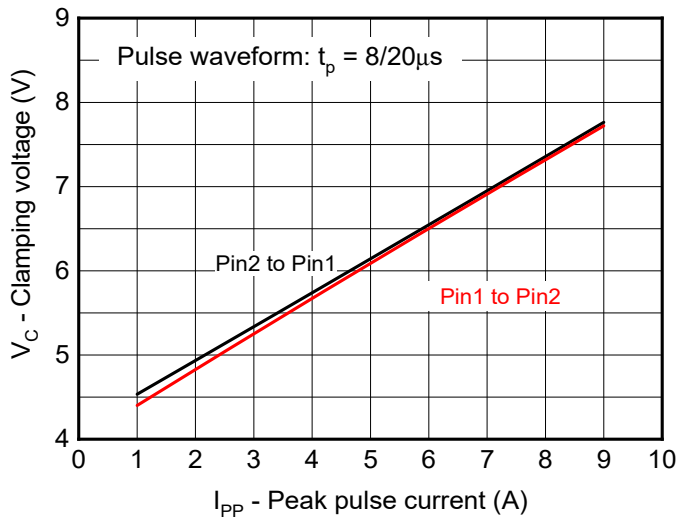


Fig.4 Capacitance vs. Reverse voltage

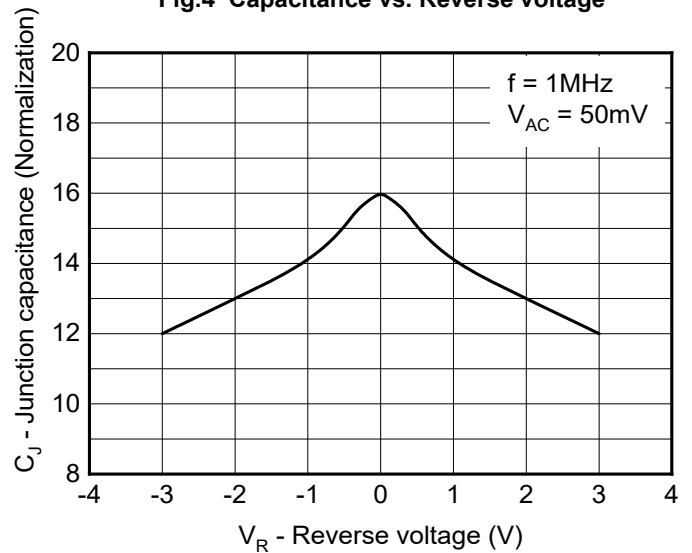


Fig.5 Non-repetitive peak pulse power vs. Pulse time

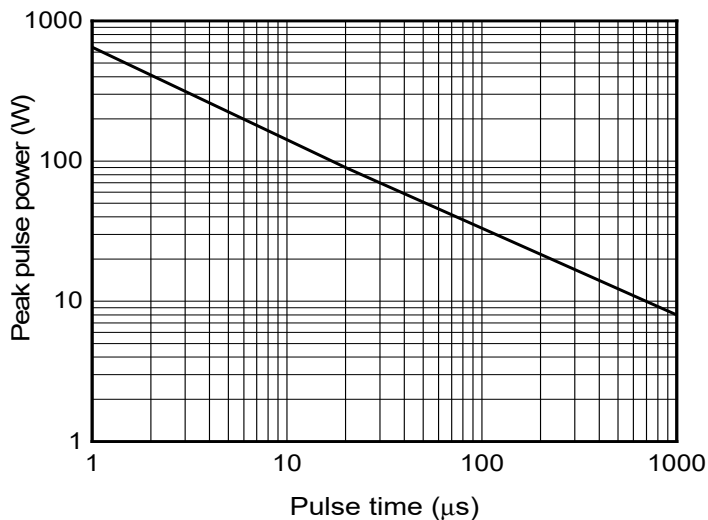
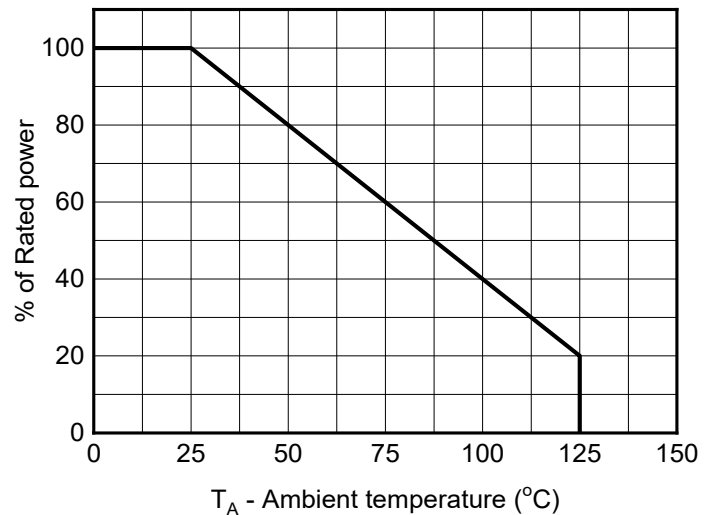


Fig.6 Power derating vs. Ambient temperature





## ESD3V3LB1

Fig.7 ESD clamping  
(+8kV contact discharge per IEC61000-4-2)

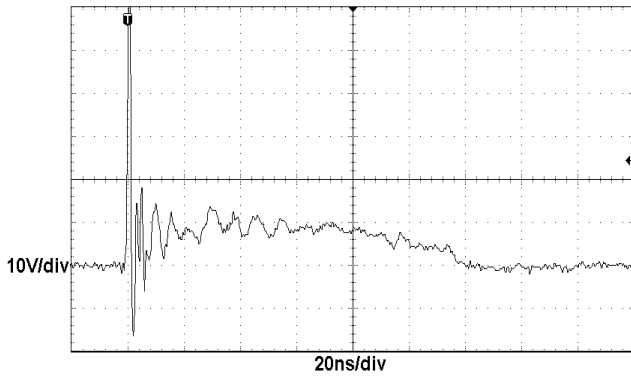


Fig.8 ESD clamping  
(-8kV contact discharge per IEC61000-4-2)

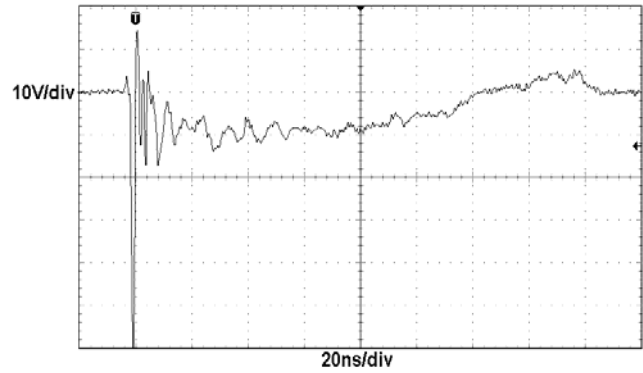
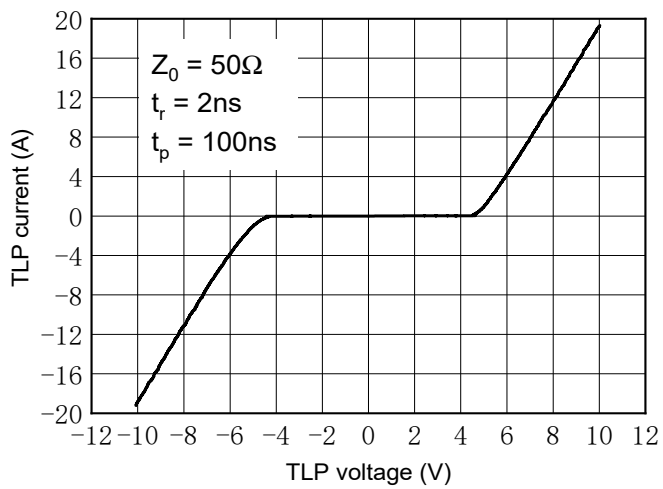


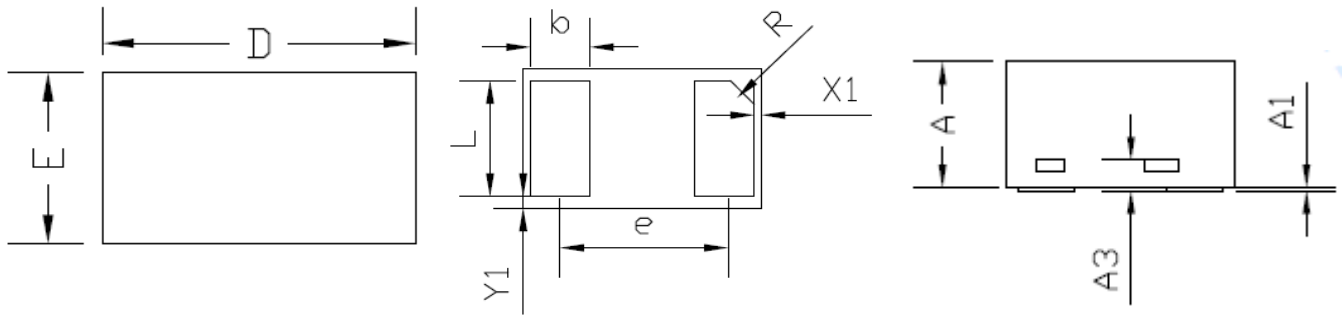
Fig.9 TLP Measurement





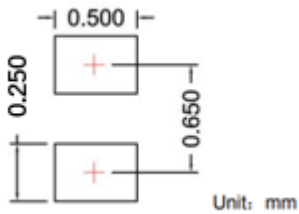
## ESD3V3LB1

### ■ Outline Dimensions



| COMMON DIMENSION (MM) |            |      |       |
|-----------------------|------------|------|-------|
| PKG                   | DFN1006-2L |      |       |
| REF.                  | MIN.       | NOM. | MAX   |
| A                     | 0.45       | 0.50 | 0.55  |
| D                     | 0.95       | 1.00 | 1.05  |
| E                     | 0.55       | 0.60 | 0.65  |
| b                     | 0.20       | 0.25 | 0.30  |
| L                     | 0.45       | 0.50 | 0.55  |
| e                     | 0.650      |      |       |
| R                     | 0.07       | 0.10 | 0.13  |
| X1                    | 0.025      | ---  | 0.065 |
| Y1                    | 0.025      | ---  | 0.065 |
| A1                    | 0          | ---  | 0.015 |
| A3                    | 0.119      | ---  | 0.15  |

### ■ Recommended PCB Layout



Unit:mm

#### Notes:

This recommended land pattern is for reference purposes only. Please consult your manufacturing group to ensure your PCB design guidelines are met



## ESD3V3LB1

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