

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



DFN0603-2L

### Features

- Stand-off voltage:  $\pm 5.5\text{V}$  Max
- Transient protection for each line according to
  - IEC61000-4-2(ESD):  $\pm 30\text{kV}$  (contact)
  - IEC61000-4-4 (EFT):  $40\text{A}$  (5/50ns)
  - IEC61000-4-5(surge):  $10\text{A}$  (8/20 $\mu\text{s}$ )
- Low leakage current
- Ultra-low capacitance:  $C_j = 25\text{pF}$  typ.
- Low clamping voltage:  $V_{CL} = 8.6\text{V}$  typ. @  $I_{PP} = 16\text{A}$  (TLP)
- Compliant
- Solid-state silicon technology

### Applications

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

### Mechanical Data

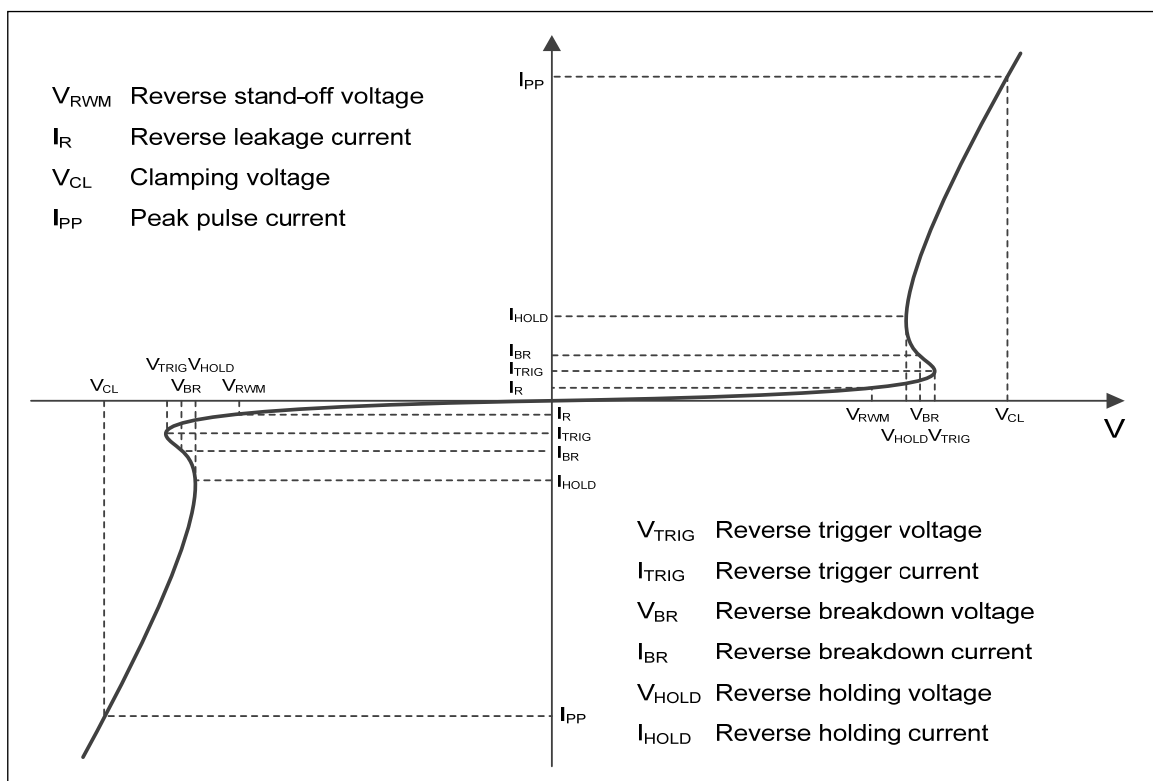
- Package: DFN0603-2L
- Case Material: "Green" Molding Compound
- Moisture Sensitivity: Level 3 per J-STD-020
- Marking Information: See Below

Pin1



Pin 2

### ■Definitions of electrical characteristics



## ■Maximum Ratings

| PARAMETER                                       | SYMBOL    | LIMITS   | UNIT |
|-------------------------------------------------|-----------|----------|------|
| Peak pulse power ( $t_p = 8/20\mu s$ )          | $P_{pk}$  | 140      | W    |
| Peak pulse current ( $t_p = 8/20\mu s$ )        | $I_{PP}$  | 10       | A    |
| ESD according to IEC61000-4-2 air discharge     | $V_{ESD}$ | $\pm 30$ | kV   |
| ESD according to IEC61000-4-2 contact discharge |           | $\pm 30$ |      |
| Junction temperature                            | $T_J$     | -45~125  | °C   |
| Storage temperature                             | $T_{STG}$ | -55~150  | °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        |                                  |     |      | $\pm 5.5$ |
| Reverse leakage current          | $I_R$     | $\mu A$  | $V_{RWM} = 5.5V$                 |     |      | 0.1       |
| Reverse breakdown voltage        | $V_{BR}$  | V        | $I_{BR} = 1mA$                   | 6.8 | 7.3  |           |
| Clamping voltage <sup>1)</sup>   | $V_{CL}$  | V        | $I_{PP} = 16A, t_p = 100ns(TLP)$ |     | 8.6  |           |
| Dynamic resistance <sup>1)</sup> | $R_{DYN}$ | $\Omega$ |                                  |     | 0.17 |           |
| Clamping voltage <sup>2)</sup>   | $V_{CL}$  | V        | $V_{ESD} = 8kV$                  |     | 12   |           |
| Clamping voltage <sup>1)</sup>   | $V_{CL}$  | V        | $I_{PP} = 1A, t_p = 8/20\mu s$   |     | 6.88 | 7.2       |
| Clamping voltage <sup>1)</sup>   | $V_{CL}$  | V        | $I_{PP} = 10A, t_p = 8/20\mu s$  |     | 10   | 13        |
| Junction capacitance             | $C_J$     | pF       | $V_R = 0V, f = 1MHz$             |     | 25   | 30        |
| Junction capacitance             | $C_J$     | pF       | $V_R = 2.5V, f = 1MHz$           |     | 17   | 22        |

Notes:

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.

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

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

## ■Ordering Information (Example)

| PREFERRED P/N | PACKING CODE | UNIT WEIGHT(mg)  | MINIMUM PACKAGE(pcs) | INNER BOX QUANTITY(pcs) | OUTER CARTON QUANTITY(pcs) | DELIVERY MODE |
|---------------|--------------|------------------|----------------------|-------------------------|----------------------------|---------------|
| ESD5V5LZBA    | F1           | Approximate 0.18 | 10000                | 100000                  | 400000                     | 7" reel       |

## ■ Characteristics (Typical)

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

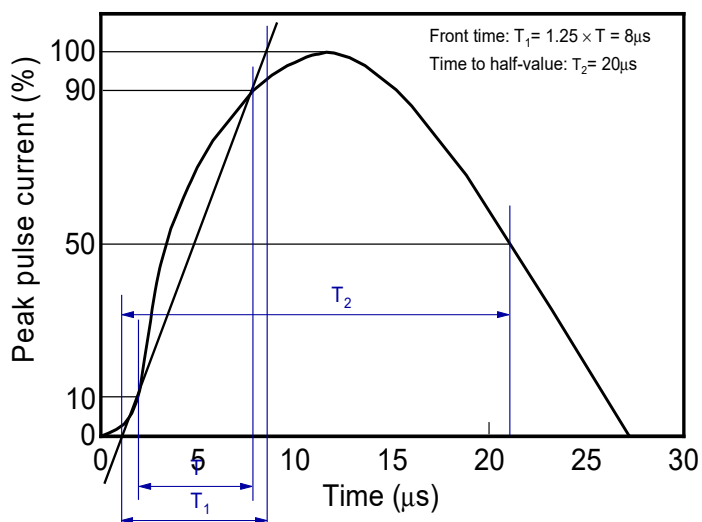


Fig.2 Contact discharge current waveform per IEC61000-4-2

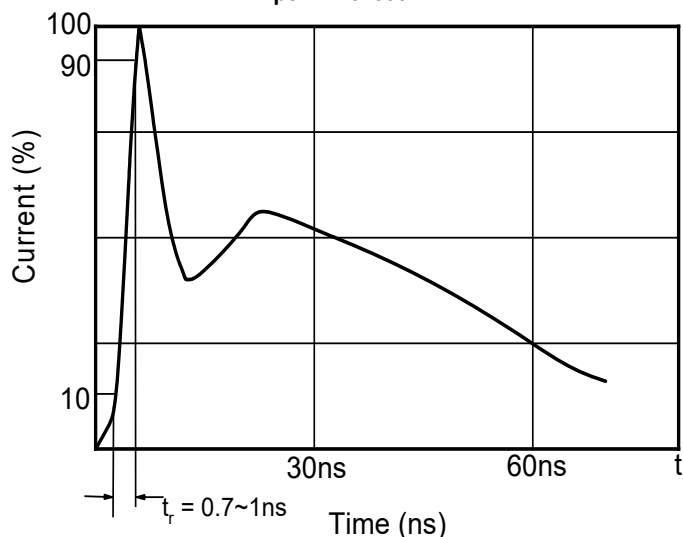


Fig.3 Clamping voltage vs. Peak pulse current

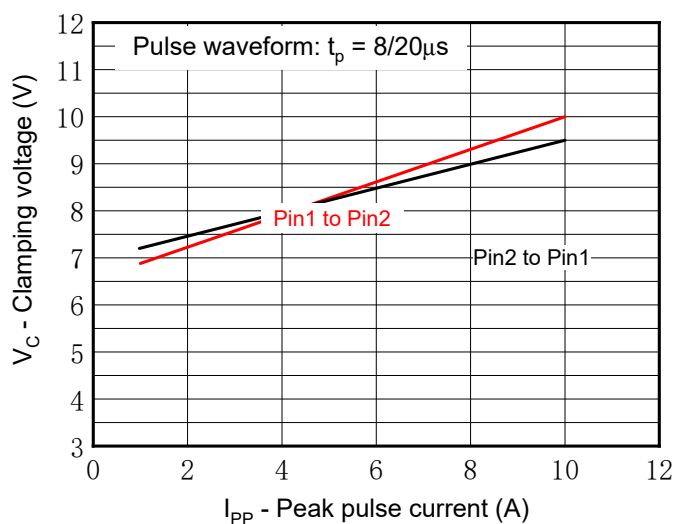


Fig.5 Non-repetitive peak pulse power vs. Pulse time

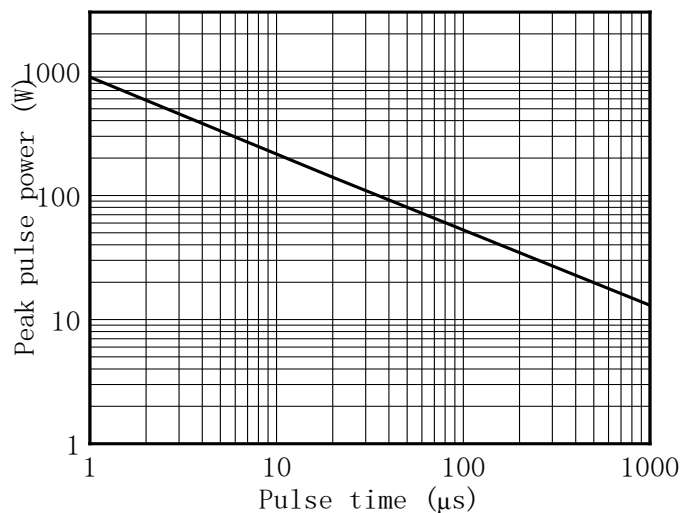


Fig.4 Capacitance vs. Reverse voltage

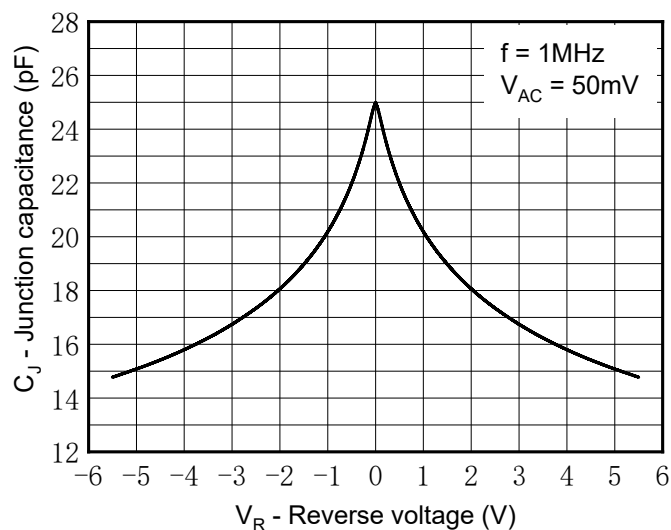


Fig.6 Power derating vs. Ambient temperature

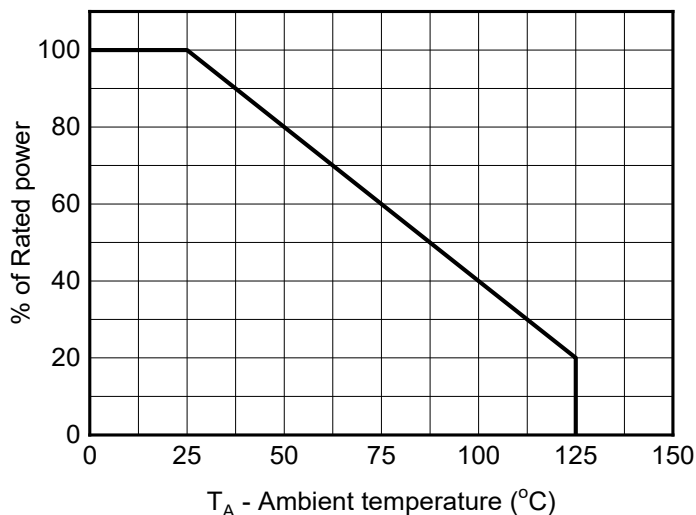
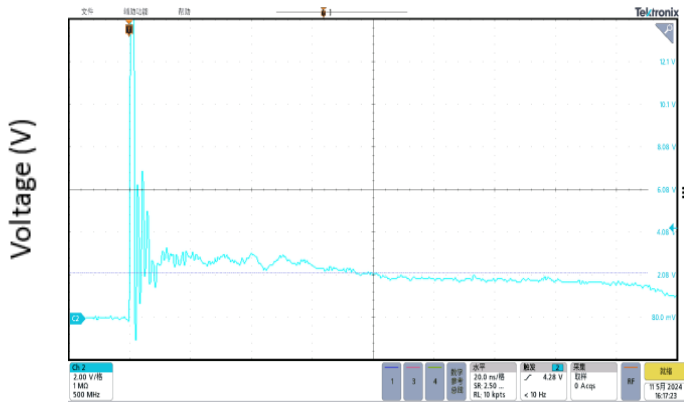


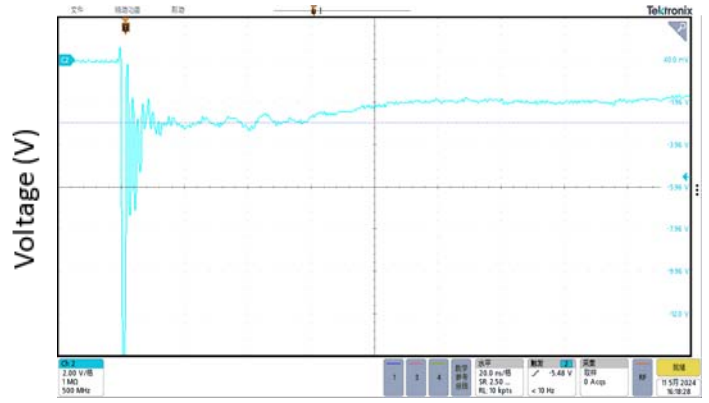
Fig.7 ESD clamping



Time (ns)

(+8kV contact discharge per IEC61000-4-2)

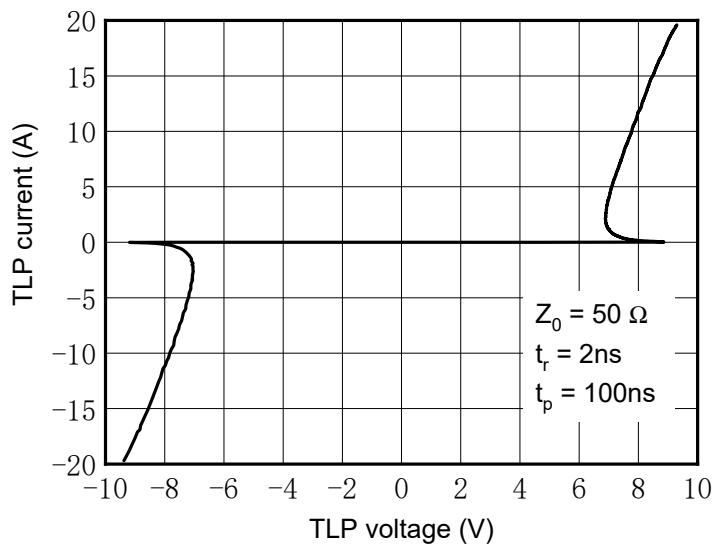
Fig.8 ESD clamping



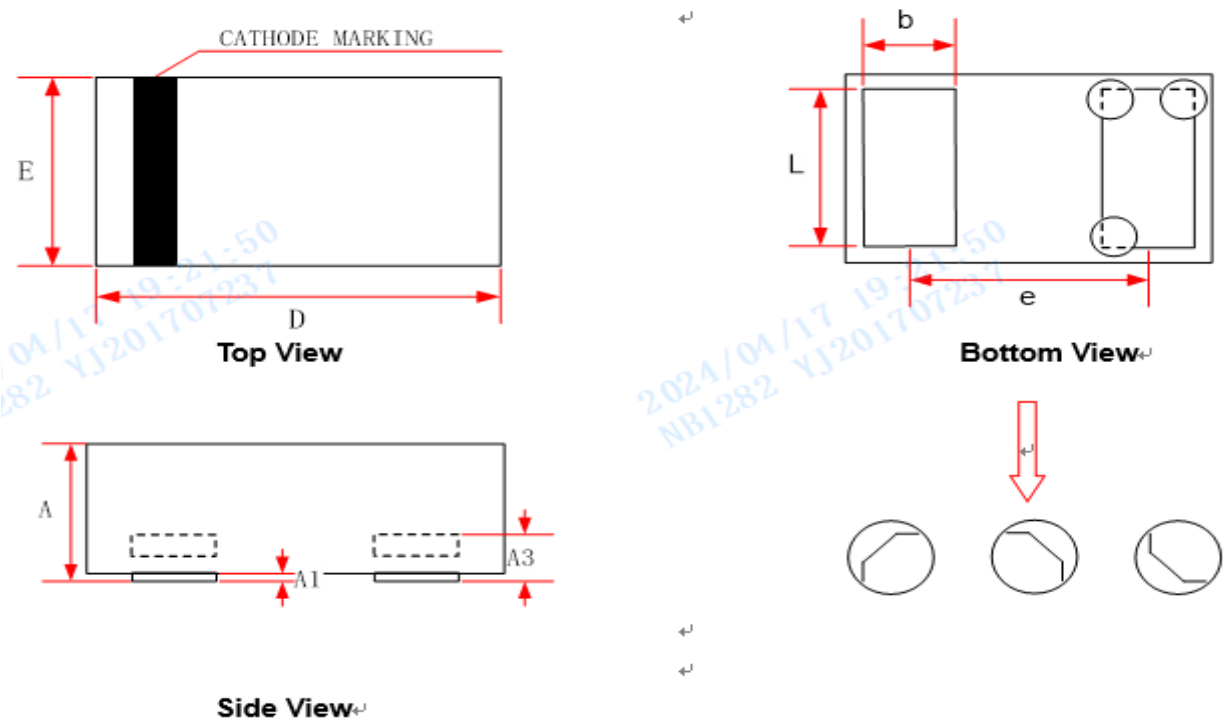
Time (ns)

(-8kV contact discharge per IEC61000-4-2)

Fig.9 TLP Measurment

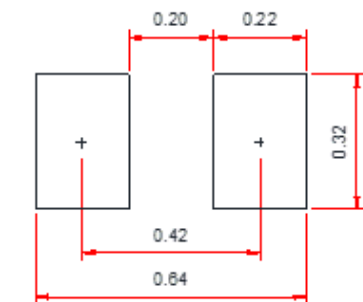


■ Outline Dimensions



| Symbol | Dimensions in Millimeters |       |       |
|--------|---------------------------|-------|-------|
|        | Min.                      | Typ.  | Max.  |
| A      | 0.230                     | 0.300 | 0.350 |
| A1     | 0.000                     | -     | 0.050 |
| A3     | 0.102REF.                 |       |       |
| D      | 0.550                     | 0.600 | 0.670 |
| E      | 0.250                     | 0.300 | 0.370 |
| b      | 0.100                     | 0.170 | 0.250 |
| L      | 0.200                     | 0.240 | 0.280 |
| e      | 0.360 BSC                 |       |       |

■ 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

### **Disclaimer**

The information presented in this document is for reference only. Shanghai Sunco Electronics Co., Ltd. reserves the right to make changes without notice for the specification of the products displayed herein to improve reliability, function or design or otherwise.

The product listed herein is designed to be used with ordinary electronic equipment or devices, and not designed to be used with equipment or devices which require high level of reliability and the malfunction of which would directly endanger human life (such as medical instruments, transportation equipment, aerospace machinery, nuclear-reactor controllers, fuel controllers and other safety devices), Russiansunco or anyone on its behalf, assumes no responsibility or liability for any damages resulting from such improper use of sale.

This publication supersedes & replaces all information previously supplied. For additional information, please visit our website [http:// www.russiansunco.com](http://www.russiansunco.com) , or consult your nearest Russiansunco's sales office for further assistance.