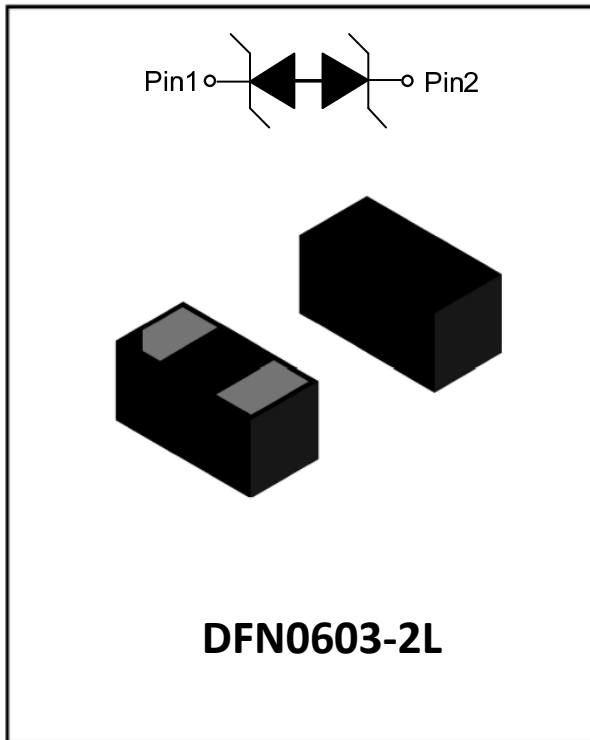


## 1-Line, Bi-directional, Transient Voltage Suppressor



### Features

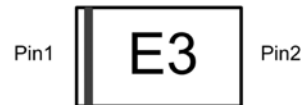
- Ultra small package
- Stand-off voltage:  $\pm 3.3V$  Max
- Transient protection for each line according to  
IEC61000-4-2(ESD):  $\pm 30kV$  (contact)  
IEC61000-4-4 (EFT): 80A (5/50ns)  
IEC61000-4-5(surge): 20A (8/20 $\mu s$ )
- Ultra-low capacitance:  $C_J = 35pF$  typ
- Low leakage current
- Low clamping voltage
- RoHS Compliant

### Applications

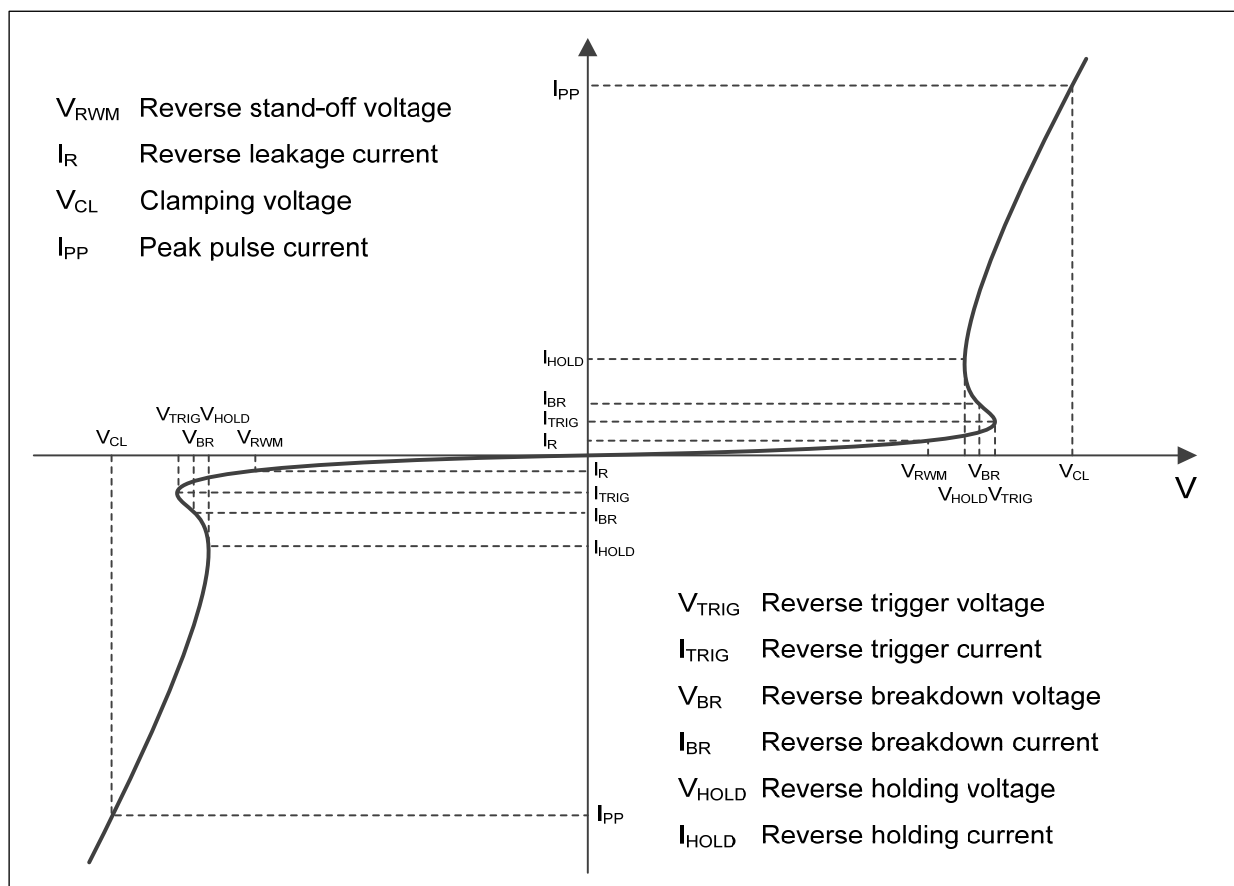
- Cellular handsets
- Tablets
- Laptops
- Other portable devices
- Network communication devices

### Mechanical Characteristics

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



### ■Definitions of electrical characteristics





# ESD3V3LZBA1

## ■Absolute Maximum Ratings (Ta=25°C unless otherwise specified)

| PARAMETER                                       | SYMBOL    | Rating  | UNIT |
|-------------------------------------------------|-----------|---------|------|
| Peak pulse power ( $t_p = 8/20\mu s$ )          | $P_{pk}$  | 170     | W    |
| Peak pulse current ( $t_p = 8/20\mu s$ )        | $I_{PP}$  | 20      | A    |
| ESD according to IEC61000-4-2 air discharge     | $V_{ESD}$ | ±30     | KV   |
| ESD according to IEC61000-4-2 contact discharge |           | ±30     | KV   |
| Junction temperature                            | $T_J$     | 125     | °C   |
| Operating temperature                           | $T_{OP}$  | -40~85  | °C   |
| Storage temperature                             | $T_{STG}$ | -55~150 | °C   |

## ■Electrical Characteristics (Ta=25°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    | $I_{BR} = 1mA$                  | 3.5 | 4   |      |
| Reverse holding voltage          | $V_{HOLD}$ | V    | $I_{HOLD} = 50mA$               | 3.5 | 4   |      |
| Clamping voltage <sup>1)</sup>   | $V_{CL}$   | V    | $I_{PP} = 16A, t_p = 100ns$     |     | 5.6 |      |
| Dynamic resistance <sup>1)</sup> | $R_{DYN}$  | Ω    |                                 |     | 0.1 |      |
| Clamping voltage <sup>2)</sup>   | $V_{CL}$   | V    | $V_{ESD} = 8kV$                 |     | 8   |      |
| Clamping voltage <sup>3)</sup>   | $V_{CL}$   | V    | $I_{PP} = 1A, t_p = 8/20\mu s$  |     | 4.3 | 5.5  |
|                                  |            | V    | $I_{PP} = 10A, t_p = 8/20\mu s$ |     | 5.5 | 7    |
|                                  |            | V    | $I_{PP} = 20A, t_p = 8/20\mu s$ |     | 6.5 | 8.5  |
| Junction capacitance             | $C_J$      | pF   | $V_R = 0V, f = 1MHz$            |     | 35  | 45   |
|                                  |            | pF   | $V_R = 2.5V, f = 1MHz$          |     | 25  | 35   |

(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)

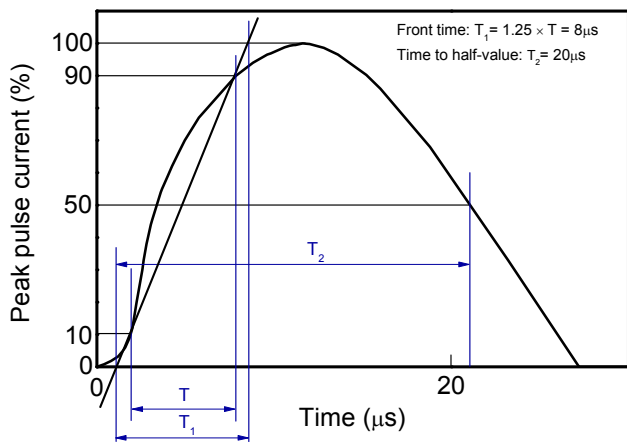
| PREFERRED P/N | UNIT WEIGHT(mg)  | MINIMUM PACKAGE(pcs) | INNER BOX QUANTITY(pcs) | OUTER CARTON QUANTITY(pcs) | DELIVERY MODE |
|---------------|------------------|----------------------|-------------------------|----------------------------|---------------|
| ESD3V3LZBA1   | Approximate 0.18 | 10000                | 100000                  | 400000                     | Tae& reel     |



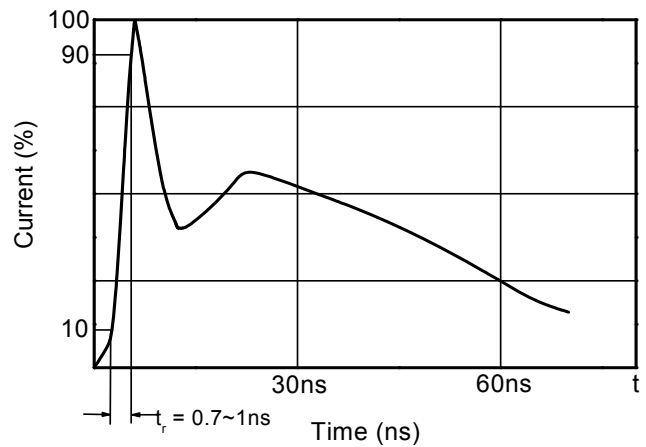
## ESD3V3LZBA1

### ■ Typical Performance Characteristics (Ta=25°C unless otherwise Specified)

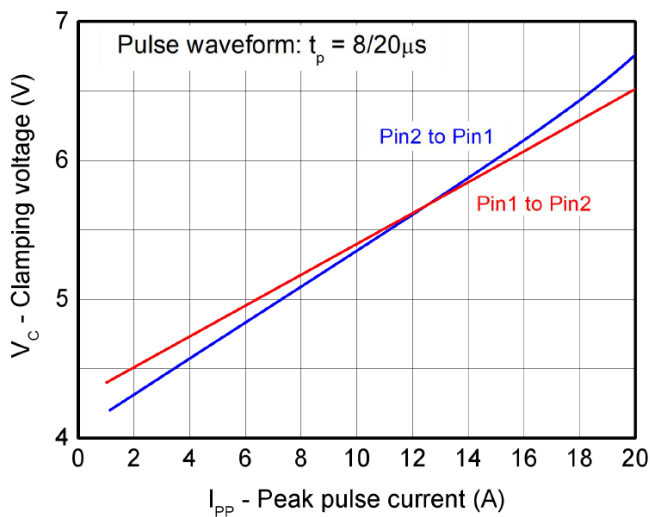
8/20μs waveform per IEC61000-4-5



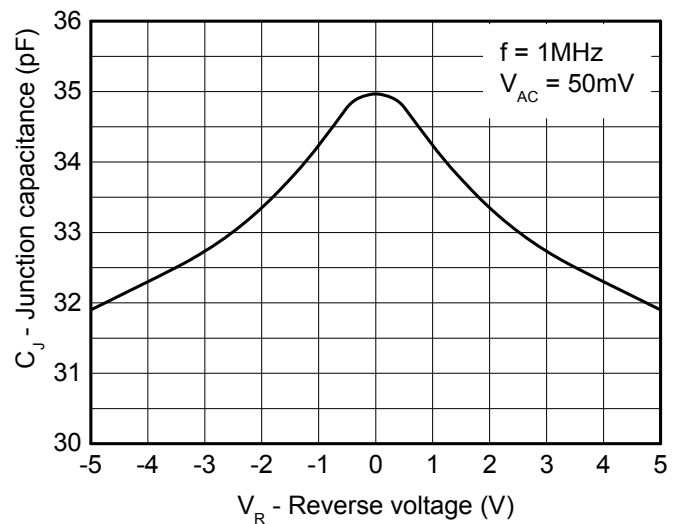
Contact discharge current waveform per IEC61000-4-2



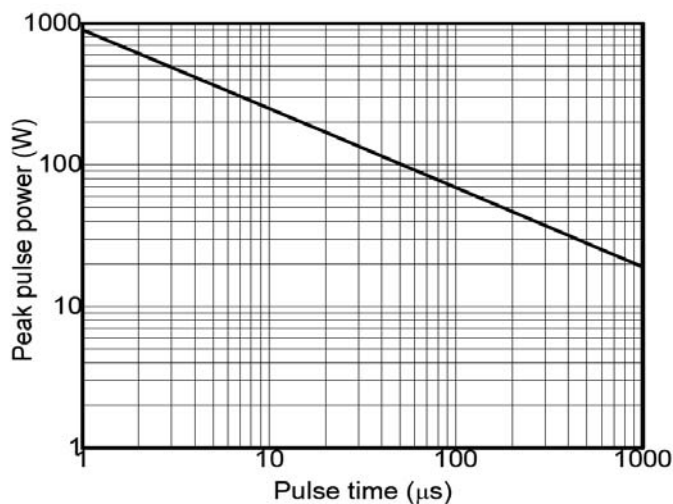
Clamping voltage vs. Peak pulse current



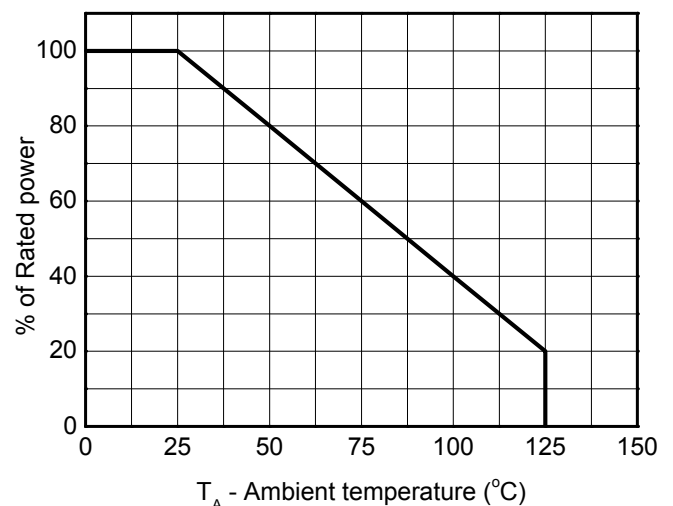
Capacitance vs. Reverse voltage



Non-repetitive peak pulse power vs. Pulse time



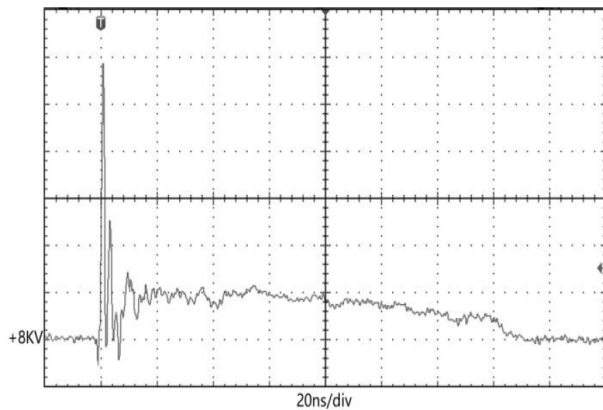
Power derating vs. Ambient temperature



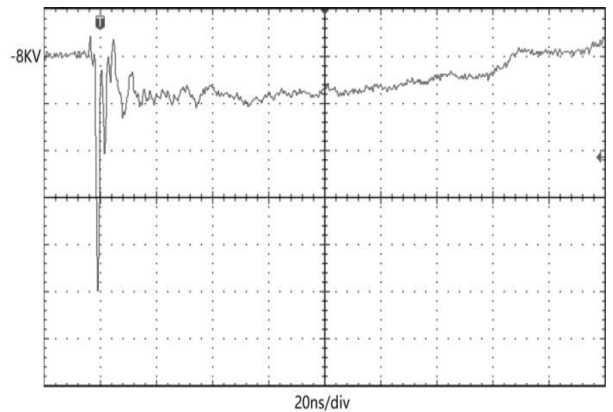


## ESD3V3LZBA1

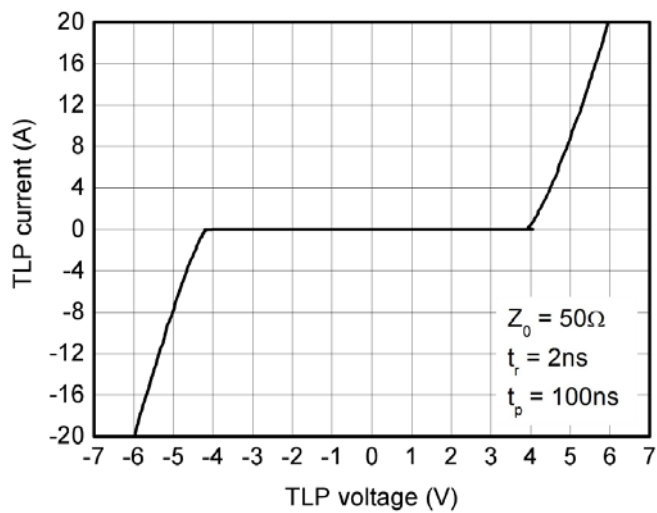
ESD clamping  
(+8kV contact discharge per IEC61000-4-2)



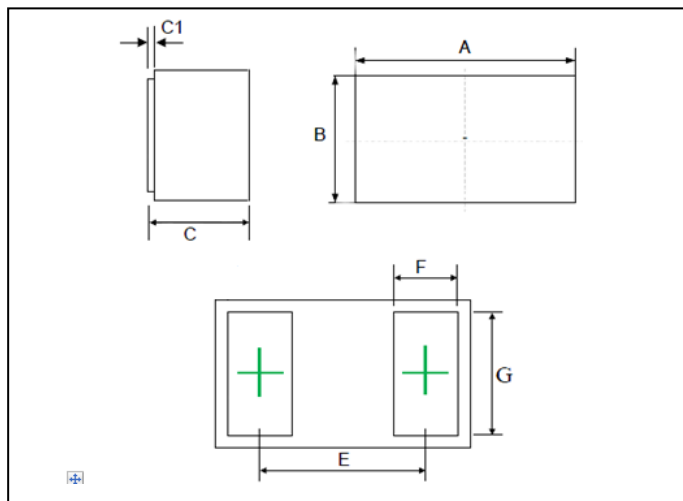
ESD clamping  
(-8kV contact discharge per IEC61000-4-2)



TLP Measurement



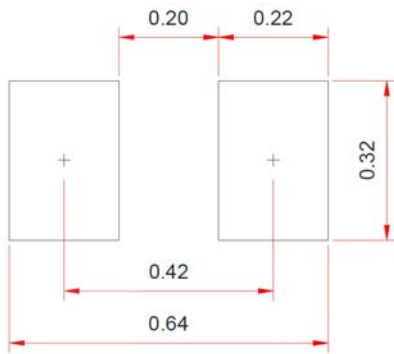
### ■ Outline Dimensions



| Symbol | min. (mm) | Max. (mm) |
|--------|-----------|-----------|
| A      | 0.55      | 0.67      |
| B      | 0.25      | 0.37      |
| C      | 0.23      | 0.35      |
| C1     |           | 0.05      |
| E      |           | 0.4       |
| F      | 0.100     | 0.205     |
| G      | 0.200     | 0.295     |



## ■ Recommend land pattern (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



## ESD3V3LZBA1

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