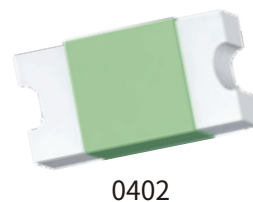


## FEATURES

- | ESD protection for high speed data lines to IEC61000-4-2
- | ESD contact discharge typical 8KV, max 15KV
- | ESD air discharge typical 15KV, max 25KV
- | Surface mount
- | Extremely low capacitance
- | Very low leakage current
- | Fast response time
- | Bi-directional ESD protection
- | Lead free solder termination
- | The best ESD protection for high frequency, low voltage applications



## APPLICATIONS

- | USB3.0, Firewire, DVI, HDMI, S-ATA, Thunderbolt
- | Mobile HDMI Link, MDDI, MIPI, SWP/NFC

## APPROVALS

|             |                                    |
|-------------|------------------------------------|
| <b>RoHS</b> | Compliance with 2011/65/EU         |
| <b>HF</b>   | Compliance with IEC61249-2-21:2003 |

## MECHANICAL DATA

- | Case: 0402 (plastic package)
- | Molding Compound Flammability Rating: UL 94 V-0

## ABSOLUTE MAXIMUM RATINGS

| Symbol            | Parameter  | Value       | Unit |
|-------------------|--|-------------|------|
| -                 | Maximum Contact discharge voltage Per IEC61000-4-2 | 15KV        | V    |
| -                 | Maximum Air discharge voltage Per IEC61000-4-2     | 25KV        | V    |
| T <sub>OPER</sub> | Maximum Operating temperature                      | -55 to +125 | °C   |
| T <sub>STG</sub>  | Maximum Storage temperature                        | -55 to +125 | °C   |

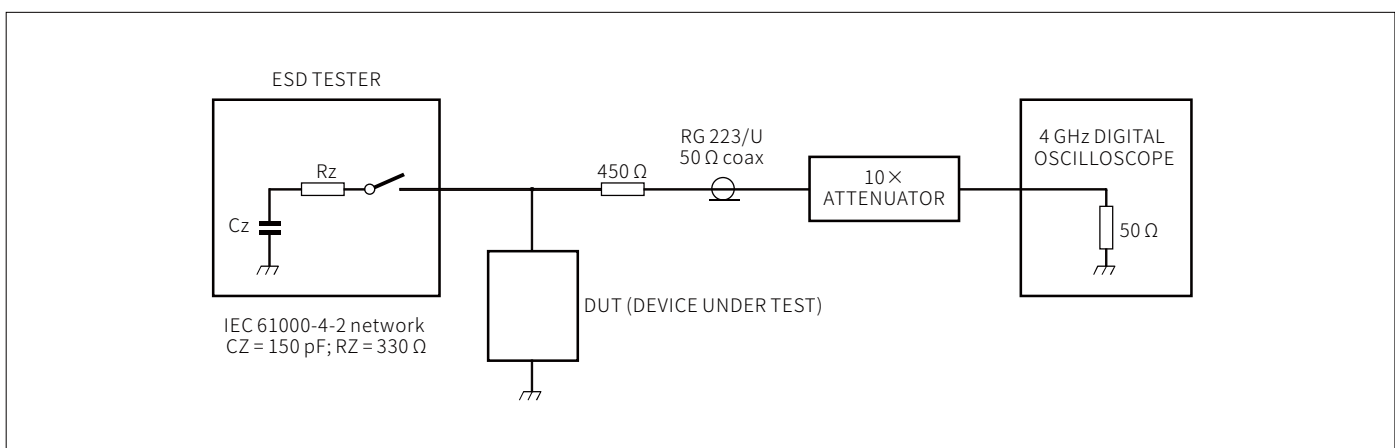
## ELECTRICAL CHARACTERISTICS (T<sub>A</sub>=25°C)

| Symbol         | Parameter        | Test Conditions                      | Min. | Typ. | Max. | Unit |
|----------------|------------------|--------------------------------------|------|------|------|------|
| V <sub>R</sub> | Rated Voltage    | -                                    | -    | -    | 15   | V    |
| V <sub>T</sub> | Trigger Voltage  | IEC61000-4-2 8KV contact discharge   | -    | 300  | -    | V    |
| V <sub>C</sub> | Clamping Voltage | IEC61000-4-2 8KV contact discharge   | -    | 35   | -    | V    |
| I <sub>L</sub> | Leakage Current  | DC 15V shall be applied on component | -    | 0.01 | 0.10 | μA   |
| C <sub>P</sub> | Capacitance      | V <sub>R</sub> = 0V, f = 1MHz        | -    | 0.05 | -    | pF   |

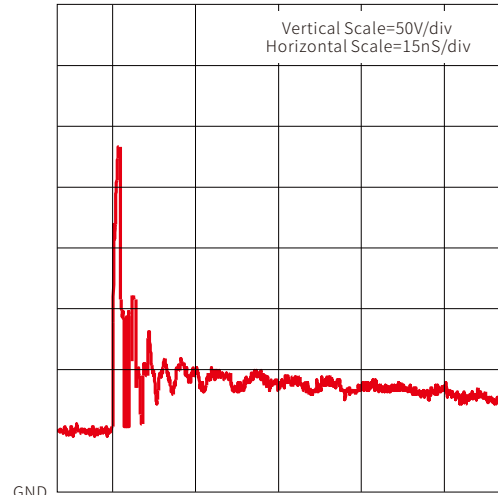
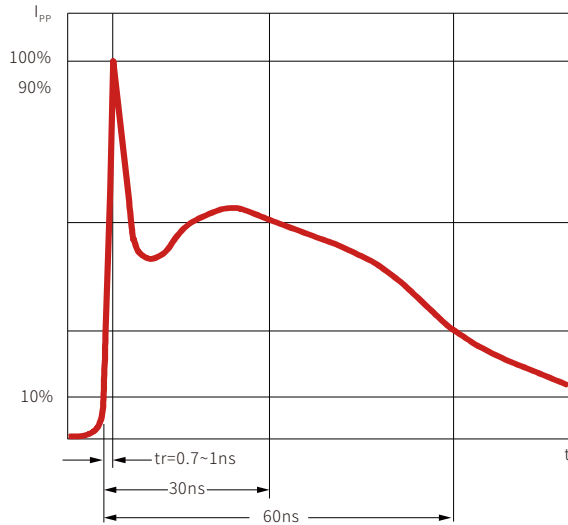
Note:

1. Trigger and clamping voltage are measured per IEC 61000-4-2, 8KV contact discharge method.
2. After reliability tests such as high temp storage, temp cycles, continuous ESD strike etc, the maximum leakage current is less than 10uA.

## ESD CLAMPING TEST



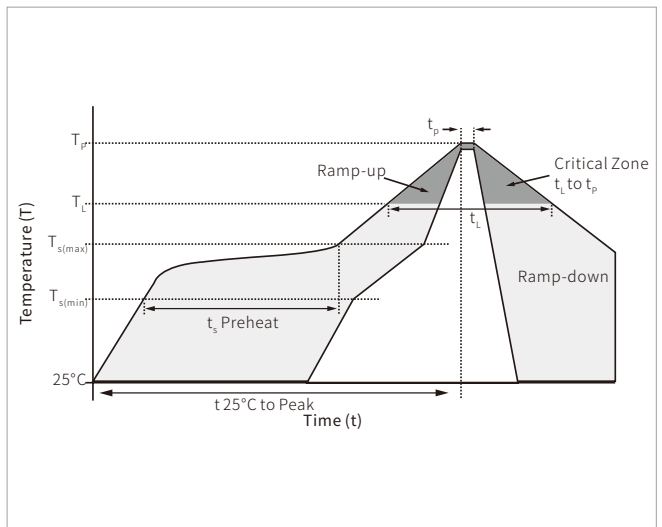
## CHARACTERISTIC CURVES



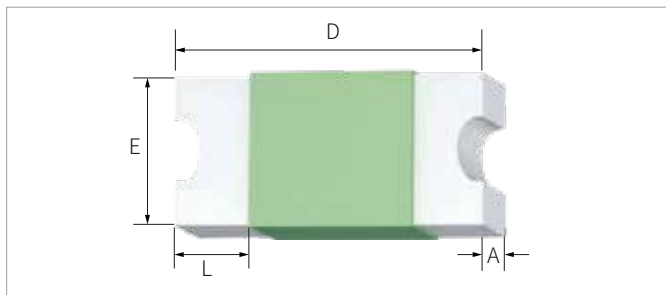
ESD CLAMPING TEST WAVEFORMS

## SOLDERING PARAMETERS

| Reflow Condition                                      |                                  | Lead-free assembly |
|---|----------------------------------|--------------------|
| Pre Heat  | Temperature Max ( $T_{s(min)}$ ) | 150°C              |
|   | Temperature Max ( $T_{s(max)}$ ) | 200°C              |
|   | Time (min to max) ( $t_s$ )      | 60 – 180 secs      |
| Average ramp up rate (Liquidus Temp ( $T_L$ ) to peak |                                  | 3°C/second max     |
| $T_{s(max)}$ to $T_L$ - Ramp-up Rate                  |                                  | 3°C/second max     |
| Reflow  | Temperature ( $T_L$ ) (Liquidus) | 217°C              |
|   | Time (min to max) ( $t_L$ )      | 60 – 150 seconds   |
| Peak Temperature ( $T_p$ )                            |                                  | 260°C              |
| Time within 5°C of actual peak Temperature ( $t_p$ )  |                                  | 20 – 40 seconds    |
| Ramp-down Rate  |                                  | 6°C/second max     |
| Time 25°C to peak Temperature ( $T_p$ )               |                                  | 8 minutes max.     |
| Do not exceed   |                                  | 260°C              |

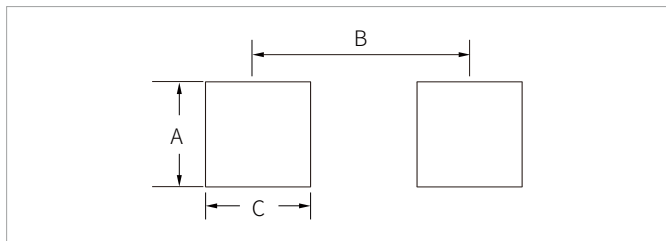


## PACKAGE INFORMATION



| Ref. | Dimension |      |      | Unit |
|------|-----------|------|------|------|
|      | Min.      | Typ. | Max. |      |
| D    | 0.90      | 1.05 | 1.20 | mm   |
| E    | 0.45      | 0.55 | 0.65 |      |
| L    | 0.15      | 0.25 | 0.35 |      |
| A    | 0.25      | 0.35 | 0.45 |      |

## RECOMMENDED PAD LAYOUT DIMENSIONS



| Ref. | Dimension | Unit |
|------|-----------|------|
| A    | 0.50      | mm   |
| B    | 0.90      |      |
| C    | 0.65      |      |

## ORDERING INFORMATION

| Part Number | Component Package | QTY/Reel | Reel Size |
|-------------|-------------------|----------|-----------|
| SPE0402B15  | 0402              | 10000PCS | 7"        |

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