

RoHS Compliant Product  
A suffix of "-C" specifies halogen & lead-free

## DESCRIPTION

Designed to protect voltage sensitive electronic components from ESD and other transients. Excellent clamping capability, low leakage, and fast response time provide best in class protection on designs that are exposed to ESD.

The combination of small size, high level ESD protection makes them a flexible solution for applications such as HDMI, Display Port TM, and MDDI interfaces. It is designed to replace multiplayer varistors (MLV) in consumer equipments applications such as mobile phone, notebook, PAD, STB, LCD TV etc.

## FEATURES

- Uni-directional ESD protection of one line
- Low reverse stand-off voltage: 5V
- Low reverse clamping voltage
- Low leakage current
- Fast response time
- Peak pulse power: 7000W (IEC61000-4-5 8/20 $\mu$ s)
- JESD22-A114-B ESD Rating of class 3B per human body model
- IEC 61000-4-2 Level 4 ESD protection

## MARKING



Front Side

## PACKAGE INFORMATION

| Package   | MPQ | Leader Size |
|-----------|-----|-------------|
| DFN2x2-3L | 3K  | 7 inch      |

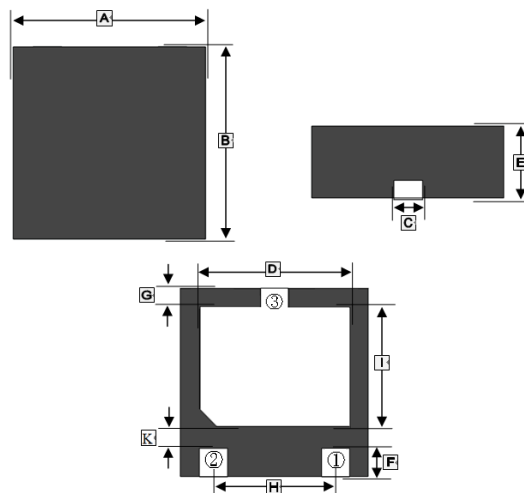
## ORDER INFORMATION

| Part Number | Type                            |
|-------------|---------------------------------|
| SQESD05-C   | Lead (Pb)-free and Halogen-free |

## MAXIMUM RATINGS (T<sub>A</sub>=25°C unless otherwise noted)

| Parameter  |                      | Symbol                            | Rating       | Unit |
|--|----------------------|-----------------------------------|--------------|------|
| IEC 61000-4-2 ESD Voltage <sup>1</sup>             | Air Model            | V <sub>ESD</sub>                  | ±30          | kV   |
|  | Contact Model        |                                   | ±30          |      |
| JESD22-A114-B ESD Voltage <sup>1</sup>             | Per Human Body Model |                                   | ±20          |      |
| ESD Voltage <sup>1</sup>                           | Machine Model        |                                   | ±0.4         |      |
| Peak Pulsed Power <sup>2</sup>                     |                      | P <sub>PP</sub>                   | 7000         | W    |
| Peak Pulsed Current <sup>2</sup>                   |                      | I <sub>PP</sub>                   | 300          | A    |
| Maximum Lead Solder Temperature @10Second Duration |                      | T <sub>L</sub>                    | 260          | °C   |
| Junction and Storage Temperature Range             |                      | T <sub>J</sub> , T <sub>STG</sub> | 150, -55~150 | °C   |

## DFN2x2-3L



| REF. | Millimeter |      | REF. | Millimeter |       |
|------|------------|------|------|------------|-------|
|      | Min.       | Max. |      | Min.       | Max.  |
| A    | 1.90       | 2.10 | F    | 0.324      | 0.476 |
| B    | 1.90       | 2.10 | G    | 0.20       | 0.30  |
| C    | 0.30       | BSC. | H    | 1.30       | BSC.  |
| D    | 1.40       | 1.60 | I    | 0.90       | 1.15  |
| E    | 0.50       | 0.65 | K    | 0.20       | 0.45  |



**ELECTRICAL CHARACTERISTICS** ( $T_A=25^{\circ}\text{C}$  unless otherwise specified)

| Parameter  | Symbol    | Min. | Typ. | Max. | Unit          |
|--|-----------|------|------|------|---------------|
| Working Peak Reverse Voltage                             | $V_{RWM}$ | -    | -    | 5    | V             |
| Breakdown Voltage @ $I_T=1\text{mA}$                     | $V_{BR}$  | 5.3  | -    | 6    | V             |
| Clamping Voltage <sup>2</sup> @ $I_{PP}=300\text{A}$     | $V_C$     | -    | 25   | -    | V             |
| Reverse Leakage Current @ $V_{RWM}=4.5\text{V}$          | $I_R$     | -    | -    | 40   | $\mu\text{A}$ |
| Junction Capacitance @ $V_R=0\text{V}$ , $f=1\text{MHz}$ | $C_J$     | -    | 2500 | -    | pF            |

Notes:

1. Device stressed with ten non-repetitive ESD pulses.
2. Non-repetitive current pulse 8/20 $\mu\text{s}$  exponential decay waveform according to IEC61000-4-5.

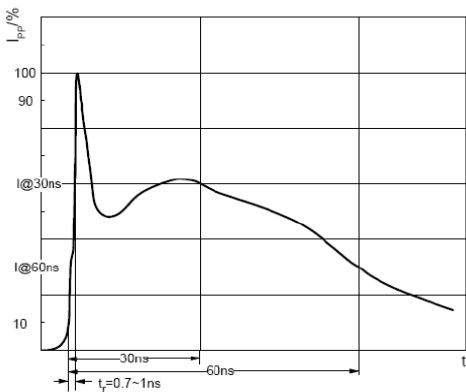
**ESD STANDARDS COMPLIANCE**

**IEC61000-4-2 Standard**

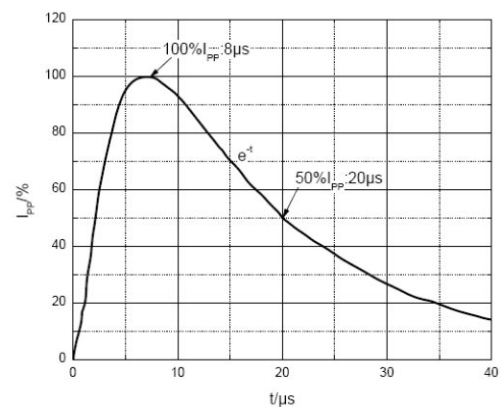
| Contact Discharge |                 | Air Discharge |                 |
|-------------------|-----------------|---------------|-----------------|
| Level             | Test Voltage kV | Level         | Test Voltage kV |
| 1                 | 2               | 1             | 2               |
| 2                 | 4               | 2             | 4               |
| 3                 | 6               | 3             | 8               |
| 4                 | 8               | 4             | 15              |

**JESD22-A114-B Standard**

| ESD Class | Human Body Discharge V |
|-----------|------------------------|
| 0         | 0~249                  |
| 1A        | 250~499                |
| 1B        | 500~999                |
| 1C        | 1000~1999              |
| 2         | 2000~3999              |
| 3A        | 4000~7999              |
| 3B        | 8000~15999             |



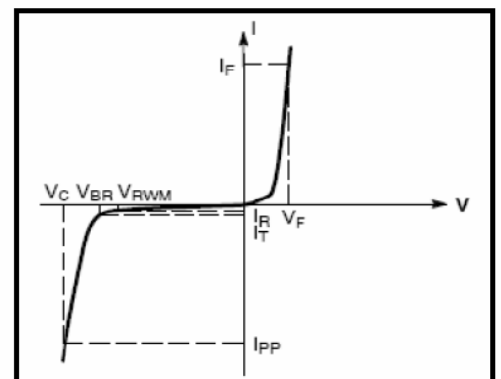
ESD pulse waveform according to IEC61000-4-2



8/20 $\mu\text{s}$  pulse waveform according to IEC 61000-4-5

**ELECTRICAL PARAMETER**

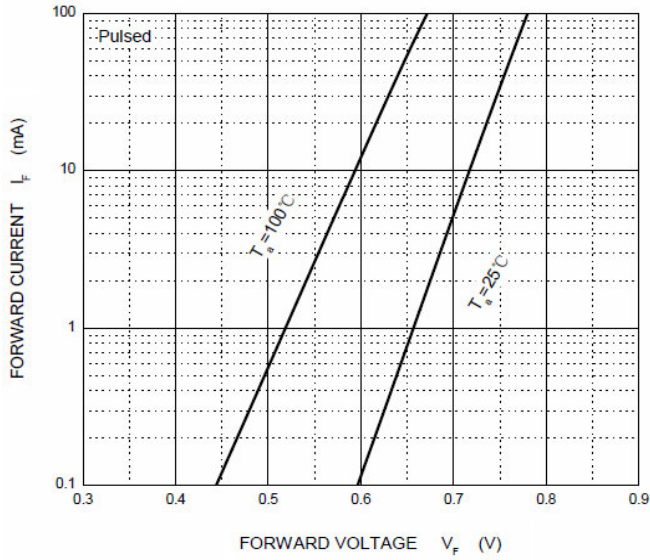
| Symbol    | Parameter                           |
|-----------|-------------------------------------|
| $V_C$     | Clamping Voltage @ $I_{PP}$         |
| $I_{PP}$  | Peak Pulse Current                  |
| $V_{BR}$  | Breakdown Voltage @ $I_T$           |
| $I_T$     | Test Current                        |
| $I_R$     | Reverse Leakage Current @ $V_{RWM}$ |
| $V_{RWM}$ | Reverse Standoff Voltage            |
| $V_F$     | Forward Voltage @ $I_F$             |
| $I_F$     | Forward Current                     |



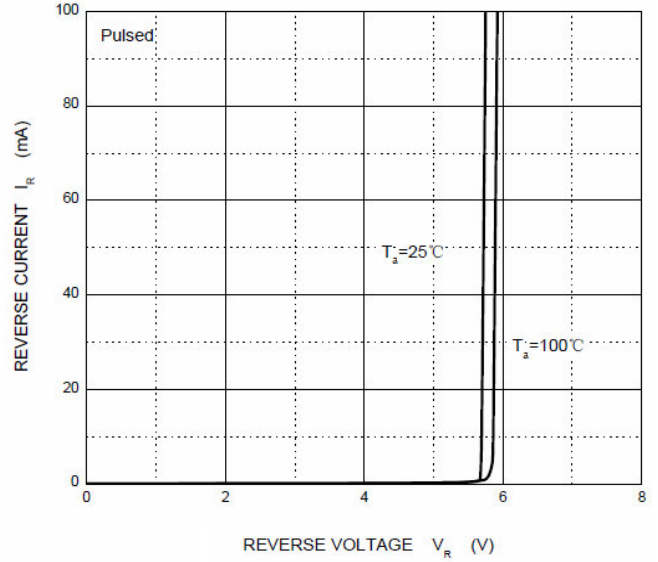
V-I characteristics for a uni-directional TVS

**CHARACTERISTICS CURVES**

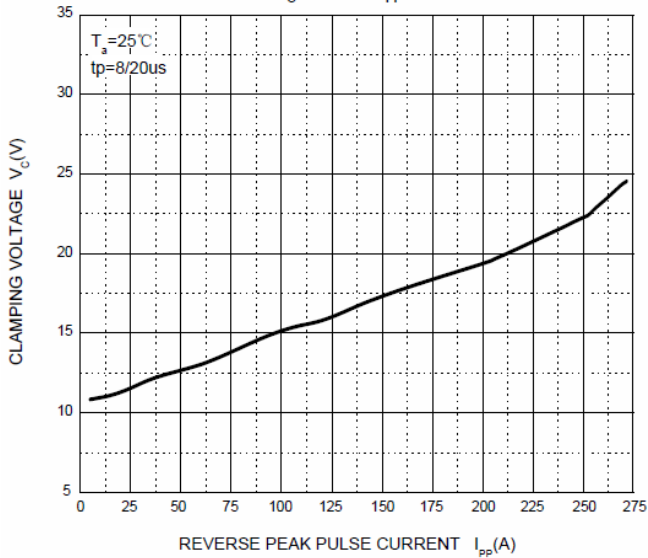
Forward Characteristics



Reverse Characteristics



$V_C$  —  $I_{pp}$



Capacitance Characteristics

