

### Features

- Deal ESD protection for high frequency, low voltage applications.
- Exceeds testing requirements outlined in IEC 61000-4-2
- Ultra low capacitance (3pF typ.)
- Low clamping voltage
- Very low leakage current
- Fast response time
- 2-pin leadless package
- These are Pb-Free Devices
- Response Time is Typically < 1 ns

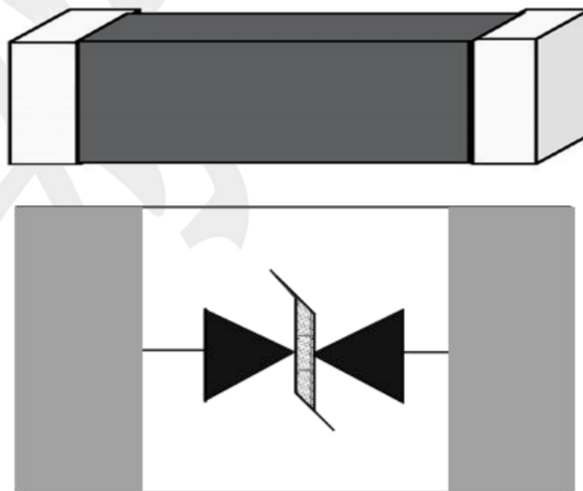
### Mechanical Characteristics

- Surface mount
- Lead Finish: Matte Tin
- RoHS Compliant
- Poly mix ESD Suppressor ( Multi-Polymer )
- -IEC 61000-4-2 (ESD) immunity test

### Applications

- Cellular Handsets and Accessories
- Personal Digital Assistants
- Notebooks and Handhelds
- Portable Instrumentation
- Peripherals

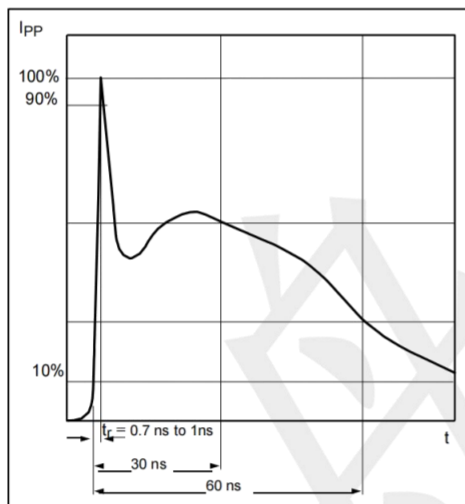
### Dimensions and Pin Configuration



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

| Parameter  | Symbol       | Value       | Unit |
|--|--------------|-------------|------|
| ESD per IEC 61000-4-2 (Air)<br>ESD per IEC 61000-4-2 (Contact) | VESD         | ±15<br>±8   | KV   |
| Response time  | TRISE        | <0.5        | nS   |
| Withstanding ESD capability                                    | IEC61000-4-2 | Level 4     | --   |
| Operating Ambient Temperature                                  | TA           | -50 to +85  | °C   |
| Storage Temperature Range                                      | Tstg         | -50 to +125 | °C   |

### ESD Wave Form



### Electrical Characteristics

| SEVERITY LEVEL | AIR DIRCHARGE | DIRECT DISCHARGE |
|----------------|---------------|------------------|
| 1              | 2KV           | 2KV              |
| 2              | 4KV           | 4KV              |
| 3              | 8KV           | 6KV              |
| 4              | 15KV          | 8KV              |

IEC61000-4-2 compliant ESD current pulse waveform

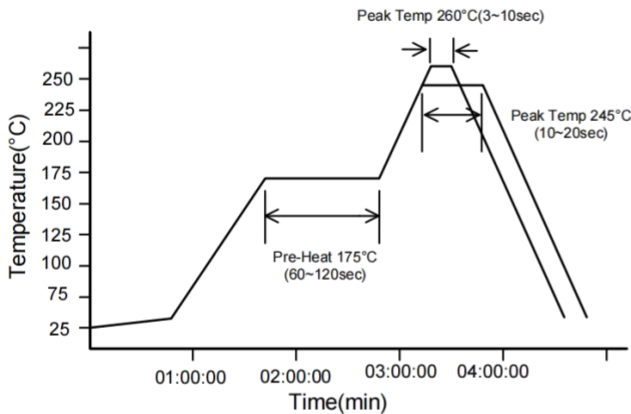
### Electrical Characteristics (TA=25°C unless otherwise specified)

| Part NO.        | Working Voltage       | Varistor <sup>1</sup> voltage measured | Maximum <sup>2</sup> ESD allowable clamping Voltage | Leakage <sup>3</sup> Current (at Initial State) | Leakage <sup>3</sup> Current (after ESD Test) | Typical Cap.Value at 1MHz |
|-----------------|-----------------------|--|---|---|---|---------------------------|
| Symbol          | V <sub>DC(max.)</sub> | V <sub>trigger</sub>                   | V <sub>C</sub>                                      | I <sub>LDC</sub>                                | I <sub>LDCA</sub>                             | C                         |
| Unit            | V                     | V                                      | V   | μA  | μA  | pF                        |
| 0603ESDA-05N-TP | 5                     | 100~150                                | <240  | <0.1  | <2.0  | 2~4.5                     |
| 0603ESDA-09N-TP | 9                     | 100~150                                | <240  | <0.1  | <2.0  | 2~4.5                     |
| 0603ESDA-14N-TP | 14                    | 100~150                                | <240  | <0.1  | <2.0  | 2~4.5                     |
| 0603ESDA-18N-TP | 18                    | 100~150                                | <240  | <0.1  | <2.0  | 2~4.5                     |
| 0603ESDA-24N-TP | 24                    | 100~150                                | <240  | <0.1  | <2.0  | 2~4.5                     |

#### Notes:

1. The varistor voltage was measured at 1 mA current
2. The Clamping voltage was measured at 8\*20 us standard current.
3. The Leakage current was measured at working voltage.

### Soldering Parameters



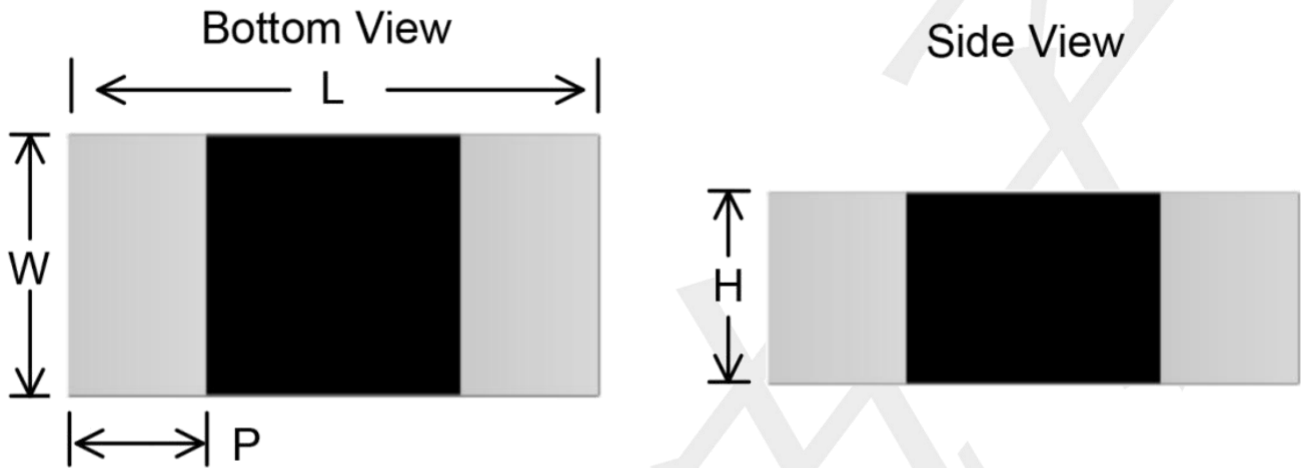
#### IR reflow Pb free process suggestion profile

- (1) The solder recommend is Sn96.5/Ag3.5 and thickness recommend as shown in table 5.3.
- (2) Ramp-up rate (217°C to peak) + 3°C /second max.
- (3) Temp. maintain at 175±25°C 180 seconds max.
- (4) Temp. maintain above 217°C 60~150 seconds.
- (5) Peak temperature range 245 +20/-10°C within 5°C of actually peak temperature (tp) 10~20 seconds.
- (6) Ramp down rate -6°C/second max.

### Environment Reliability Test

| Characteristic               | Test Method and Description   |                  |                  |         |
|------------------------------|---|------------------|------------------|---------|
| High Temperature Storage     | The specimen shall be subjected to 125±2°C for 1000±2 hours without load and then stored at room temperature and normal humidity for one or two hours. The change of varistor voltage shall be within 10%.  |                  |                  |         |
| Temperature Cycle            | The temperature cycle of specified temperature shall be repeated five times and then stored at room temperature and normal humidity for one or two hours. The change of varistor voltage shall be within 10% and mechanical damage shall be examined. | Step             | Temperature      | Period  |
|                              |   | 1                | -40±3°C          | 30±3min |
|                              |   | 2                | room temperature | 1 hour  |
|                              |   | 3                | 125±3°C          | 30±3min |
|                              | 4   | room temperature | 1 hour           |         |
| High Temperature Load        | After being continuously applied the maximum allowable voltage at 85±2°C for 1000±2 hours, the specimen shall be stored at room temperature and normal humidity for one or two hours. The change of varistor voltage shall be within 10%.             |                  |                  |         |
| Damp Heat Load/Humidity Load | The specimen should be subjected to 40±2°C and 90~95% RH, the maximum allowable voltage applied for 1000±2 hours and then stored at room temperature and normal humidity for one or two hours. The change of varistor voltage shall be within 10%.    |                  |                  |         |
| Low Temperature Storage      | The specimen should be subjected to -40±2°C for 500±2 hours without load and then stored at room temperature and normal humidity for one or two hours. The change of varistor voltage shall be within 10%.  |                  |                  |         |

### Package Outline & Dimensions



| SYMBOL | MILLIMETERS |
|--------|-------------|
|        | 0603        |
| L      | 1.60±0.15   |
| W      | 0.80±0.10   |
| P      | 0.30±0.10   |
| H      | 0.90 (Max)  |