

## Features

1. Excellent ESD clamping & Small Insertion Loss
2. High transient current capability, Fastest response time
3. Capacitance is designed to ultra-low value, which can be efficiently suitable to high speed data line.
4. EU-RoHS Compliance

## Applications

1. CMOS and MOSFET protection from ESD
  2. Computer ESD and I/O protection
  3. Telecommunication transient protection
- USB2.0 port, IEEE-1394, RF module, Antenna circuit, high speed Protocol Etc.

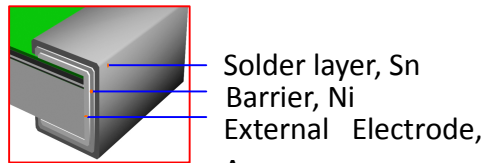
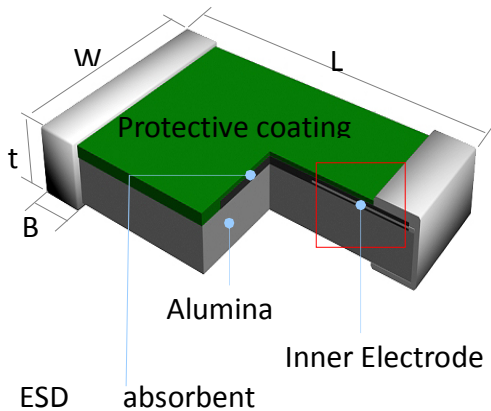
PART NO. MV0603E240C0R2T

## Standards

MV    0603    E    240    C    0R2    T  
 ①        ②        ③        ④        ⑤        ⑥        ⑦

- ① production series: ESD/Varistor
- ② size: 0402=1005, 0603=1608
- ③ type: G: general ; E: ESD ; H: high energy
- ④ working voltage (DC): 5R0=5V, 140=14V, 180=18V, 240=24V, 260=26V
- ⑤ Capacitance
- ⑥ typical capacitance value measured : X: 无容值要求;  
0R15=0.15PF, 0R2=0.2PF, 0R5=0.5PF, 3R0=3PF, 361=360pf, 801=800PF
- ⑦ package: T: taping B: bulk

## Shape & Dimension



unit : mm

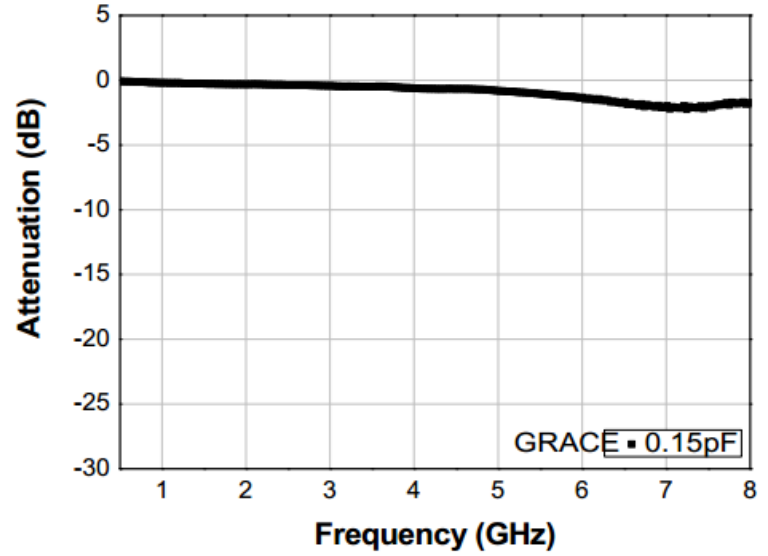
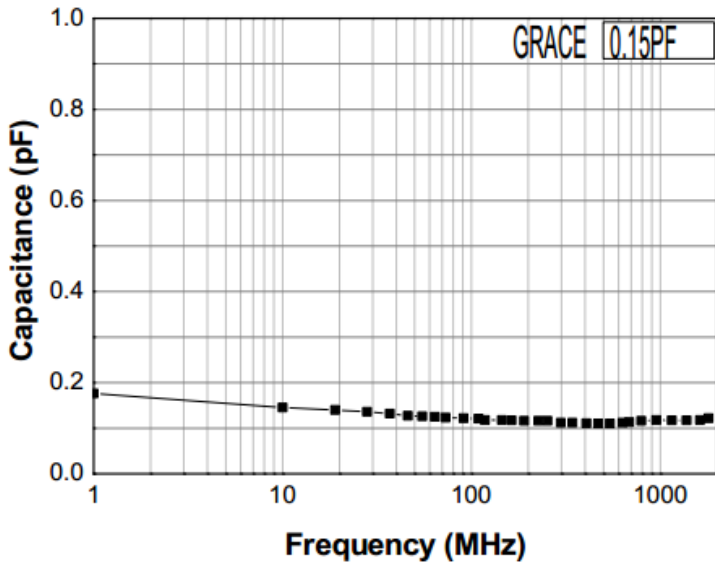
| SIZE | L       | W       | t        | B       |
|------|---------|---------|----------|---------|
| 1608 | 1.6±0.2 | 0.8±0.2 | 0.55±0.1 | 0.4±0.2 |

## Specifications

| Part No.        | Cp @1MHz, 1Vrms |         | Working Voltage, Vw | Clamping voltage | Leakage Current <sup>1</sup> | ESD                  |                              |
|-----------------|-----------------|---------|---------------------|------------------|------------------------------|----------------------|------------------------------|
|                 | Typical         | Maximum | Typical             |                  |                              | Capability           | Trigger Voltage <sup>2</sup> |
| MV0603E240C0R2T | 0.2pF           | 0.35pF  | 24Vdc               | 45V              | < 1uA                        | IEC61000-4-2 Level 4 | 300V                         |

1. Leakage current at Max. working Voltage  
 2. Max. voltage which is controlled by LopiVa when ESD pulse of 8kV is applied.

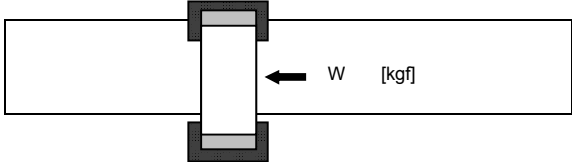
■ Frequency properties ; Cp, Insertion Loss



■ ESD suppressor effect

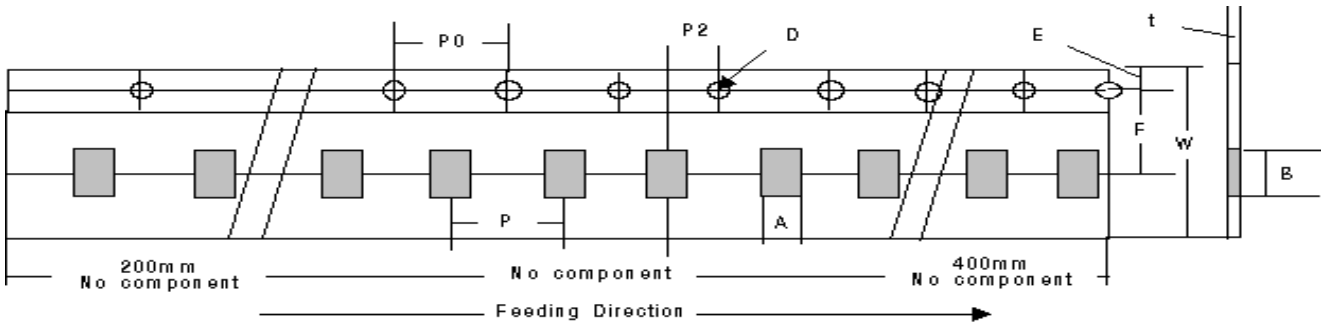
|  |  |
|--|--|
| <p>Wave form</p> <p>[IEC61000-4-2<br/>Contact 8kV]</p> |  |
| <p>Test method</p>                                     | <p>· Above wave form and suppression peak value may be differently shown as the applied test circuit</p> |

## Performance specifications

| No | Item               | Requirements  | Test method   |
|----|--------------------|---|---|
| 1  | Operation Range    | 1. -40°C ~ 85°C   |   |
| 2  | Leakage current    | 1. Satisfaction to the specification, under 1uA   | 1. Applied voltage : specified working voltage  |
| 3  | Capacitance        | 1. Satisfaction to the specification, under 1pF   | 1. Frquency & OSC level : 1MHz, 1.0Vrms   |
| 4  | Solderability      | 1. More than 90% of the terminal electrode shall be covered with new solder.  | 1. Type of solder : H63A<br>2. Soldering Temp & Time : 230+/-5°C, 5+/-1 sec   |
| 5  | Reflow soldering   | 1. No Serious mechanical damage<br>2. More than 50% of the terminal electrode shall be covered with new solder<br>3. Leakage Current : ≤ 10uA | 1. Type of solder : H63A<br>2. Temp & Time : max 260+/-5°C, min 10sec<br>* Refer to the soldering profile of page 6 |
| 6  | Humidity Load Test | 1. No Serious mechanical damage<br>2. Leakage Current : ≤ 10uA  | 1. Test Temp. & Relative Humidity & Time : 85+/- 5°C,<br>85 +/- 5% RH, Vw Applied, 500 +/- 12hrs                    |
| 7  | Thermal Shock      |   | 1. Step 1 : -40 +/- 5°C, Step 2 : 85 +/- 5°C<br>2. Cycle : 30min ± 3min, each 5 cycles                              |
| 8  | High Temp. Test    |   | 1. Temp. & time : 85+/-5°C , 1000 +/- 24hrs   |
| 9  | Adhesive strength  | 1. No Serious mechanical damage under condition of<br>1005 : min 0.5kgf, 1608 : min 1.0kgf  |                                 |
| 10 | ESD                | 1. No mechanical damage after test<br>2. Leakage Current : ≤ 10uA<br>* ESD gun (IEC61000-4-2 standard)<br>* C=150pF R=330Ω                    | 1. Contact discharge<br>* Voltage : +/-8kV(Level 4)<br>* Number : 10 times in 10sec                                 |
|    |                    |   | 2. Air discharge<br>* Voltage : +/-15kV(Level 4)<br>* Number : 10 times in 10sec                                    |

**■ Packing specifications**

1. Carrier tape



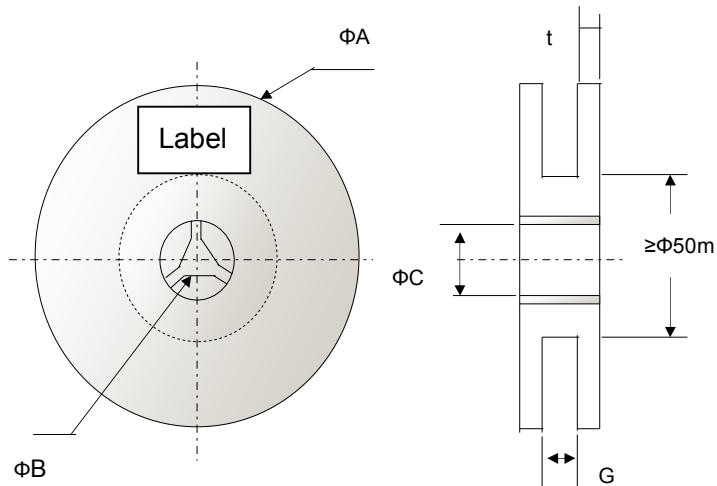
unit :mm

| Size      | A           | B           | W           | D           | E           | F           | P         | P0         | P2         | t      |
|-----------|-------------|-------------|-------------|-------------|-------------|-------------|-----------|------------|------------|--------|
| 0402=1005 | 0.65+/-0.10 | 1.15+/-0.10 | 8.00+/-0.20 | 1.50+/-0.25 | 1.75+/-0.10 | 3.50+/-0.50 | 2.0+/-0.1 | 4.0+/-0.10 | 2.0+/-0.10 | 1.1max |
| 0603=1608 | 1.10+/-0.10 | 1.90+/-0.10 |             |             |             |             | 4.0+/-0.1 |            |            |        |

\* paper type

2. Reel & Label

[Plastic Reel]

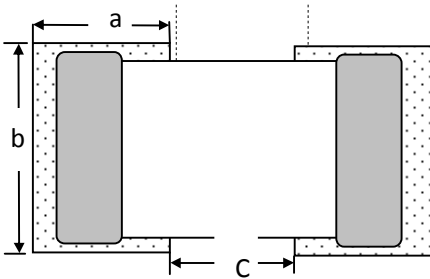


unit :  
mm

| code | dimension  |
|------|------------|
| ΦA   | 178+/-2.0  |
| ΦB   | 13.0+/-0.5 |
| ΦC   | 22.0+/-2.0 |
| G    | 10.0+/-1.5 |
| t    | 2.5+/-0.5  |

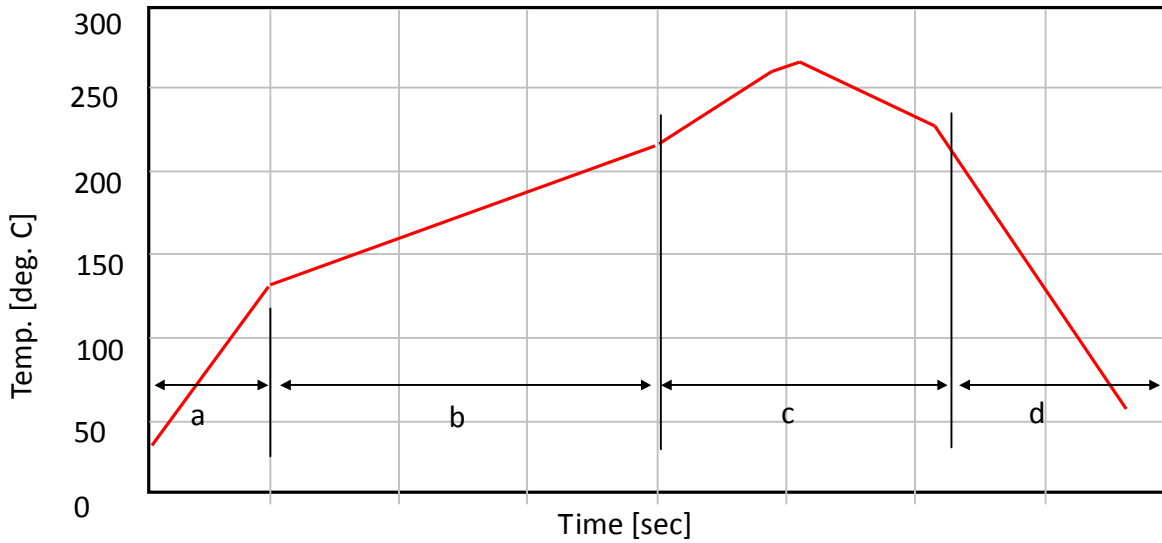
**Recommended Soldering condition**

1) Land Pattern Design



| Code | Land Dimension with Chip Size [mm] |           |           |           |
|------|------------------------------------|-----------|-----------|-----------|
|      | 0201=0603                          | 0402=1005 | 0603=1608 | 0805=2012 |
| a    | 0.20~0.35                          | 0.30~0.50 | 0.60~0.70 | 0.60~0.70 |
| b    | 0.25~0.40                          | 0.40~0.60 | 0.60~0.80 | 0.80~1.10 |
| c    | 0.25~0.40                          | 0.30~0.50 | 0.60~0.80 | 1.00~1.20 |

2) Reflow Soldering



| Zone | temp. range [deg. C] | time [sec]          | Remark   |
|------|----------------------|---------------------|--|
| a    | Curing               | RT ~ 130            | * Solder : Sn-Ag-Cu<br>* 260deg. C, over 10sec |
| b    | Preheat              | max 220             |  |
| c    | Soldering            | 220 ~ 260 [max 270] |  |
| d    | Cooling              | 220 ~ RT            |  |

3) Soldering Iron

