

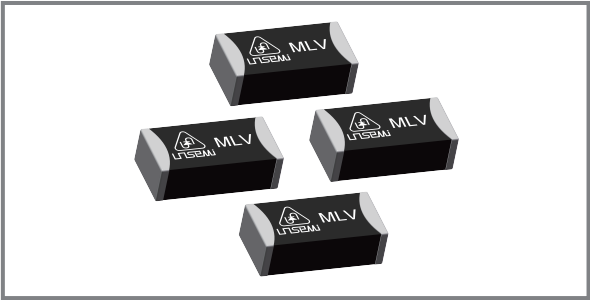


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MULTILAYER CHIP VARISTORS

Features

- ◆ Protection against high ESD voltage and current
- ◆ Compact size for EIA 0402 and 0603
- ◆ Extremely quick response time (<1ns)
- ◆ Extremely low capacitance(<0.5pF)
- ◆ Extremely low leakage current
- ◆ Zero signal distortion
- ◆ Bi-directional



Application

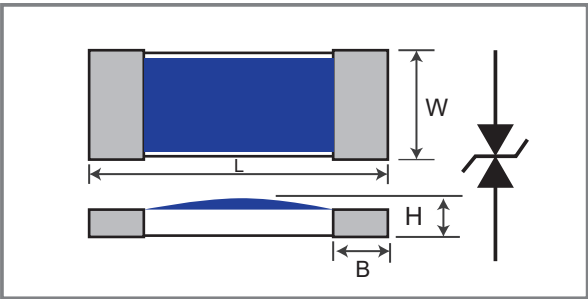
1. ESD0402 Series 、 ESD0603 Series

are applied to RF module, Antenna circuit, IEEE-1394, USB2.0, DVI, and HDMI, DisplayPort...etc. high speed signal interface.

Dimensions

Unit: mm

| Model | 1005(0402) | 1608(0603) |
|-------|------------|------------|
| L | 1.00±0.15 | 1.60±0.20 |
| W | 0.50±0.10 | 0.80±0.20 |
| H | 0.50±0.10 | 0.80±0.20 |
| B | 0.25±0.15 | 0.30±0.20 |



Electrical Characteristics @ 25°C Unless Otherwise Specified)

| Part Number | Working Voltage | Typical Capacitance | Leakage Current | Typical ESD Pulse Withstand | Clamping Voltage | Trigger Voltage | Maximum ESD IEC61000-4-2 |
|-------------|-----------------|---------------------|-----------------|-----------------------------|------------------|-----------------|----------------------------------|
| | DC | @ 1kHz | IL | ESD | 8/20μS | Vt | |
| | VDC | pF | μA | times | Vc | V | |
| ESD0402 | | | | | | | |
| ESD0402M03V | 3.0 | 0.2 | 0.01 | 1000 | 30 | 300 | Contact Discharge Voltage: 8 KV |
| ESD0402M05V | 5.0 | 0.2 | 0.01 | 1000 | 30 | 300 | |
| ESD0402M08V | 8.0 | 0.2 | 0.01 | 1000 | 30 | 300 | |
| ESD0402M12V | 12 | 0.2 | 0.01 | 1000 | 30 | 300 | Air Gap Discharge Voltage: 15 KV |
| ESD0402M15V | 15 | 0.2 | 0.01 | 1000 | 30 | 300 | |
| ESD0402M24V | 24 | 0.2 | 0.01 | 1000 | 30 | 250 | |
| ESD0603 | | | | | | | |
| ESD0603M03V | 3.0 | 0.2 | 0.01 | 1000 | 30 | 300 | Contact Discharge Voltage: 8 KV |
| ESD0603M05V | 5.0 | 0.2 | 0.01 | 1000 | 30 | 300 | |
| ESD0603M08V | 8.0 | 0.2 | 0.01 | 1000 | 30 | 300 | |
| ESD0603M12V | 12 | 0.2 | 0.01 | 1000 | 30 | 300 | Air Gap Discharge Voltage: 15 KV |
| ESD0603M15V | 15 | 0.2 | 0.01 | 1000 | 30 | 300 | |
| ESD0603M24V | 24 | 0.2 | 0.01 | 1000 | 30 | 250 | |

NOTE:

1. Leakage current at maximum operating voltage.
2. Capacitance is measured with 1V_{rms}.
3. Per IEC 61000-4-2, 30A@8KV, level 4, clamp measurement made 30 ns after initiation of pulse, all test in contact discharge mode.

General Technical Data

| | |
|--------------------------------|-------------------|
| Operating Temperature | -40 ~+85°C |
| Storage Temperature (on board) | -55 ~ +125°C |
| Response Time | <1 ns |
| Solderability | 245±5°C, 3±1sec. |
| Solder Leach Resistance | 260±5°C, 10±1sec. |

Environmental Performance

| Item | Specifications | Test Condition |
|-------------------|--------------------|---|
| Bias Humidity | $I_L \leq 10\mu A$ | 90%RH, 40°C , Working Voltage, 1000 hrs |
| Thermal Shock | | -40°C to 85°C , 30 min. cycle, 5 cycles |
| Full Load Voltage | | Working Voltage, 85°C , 1000 hrs |

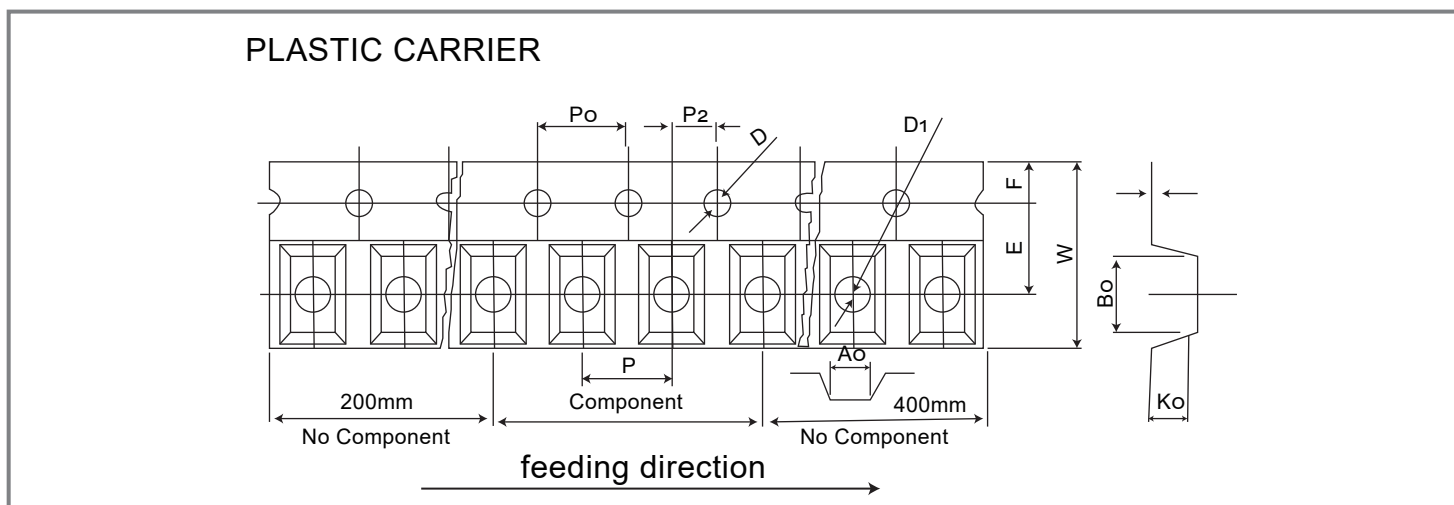
NOTE:

I_L Leakage current at rated voltage, the maximum leakage current was measured after reliability test.

Package

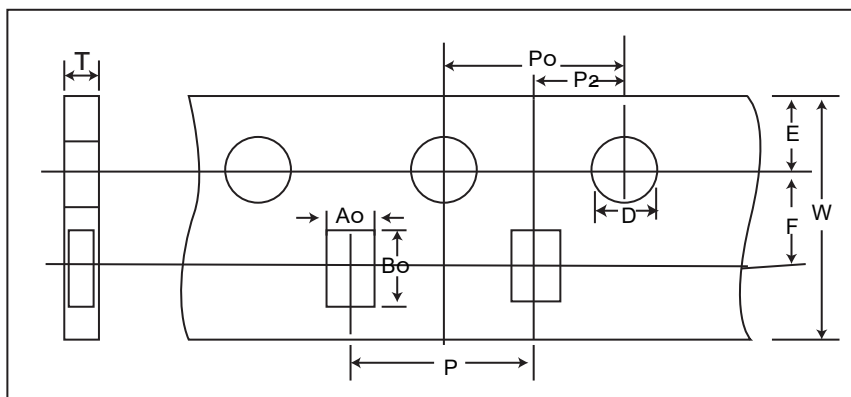
| Size EIA (EIAJ) | 0402 (1005) | 0603 (1608) |
|--|-------------|-------------|
| Standard Packing Quantity (pcs / reel) | 10,000 | 5,000 |

TAPE AND REEL SPECIFICATIONS



TAPE AND REEL SPECIFICATIONS

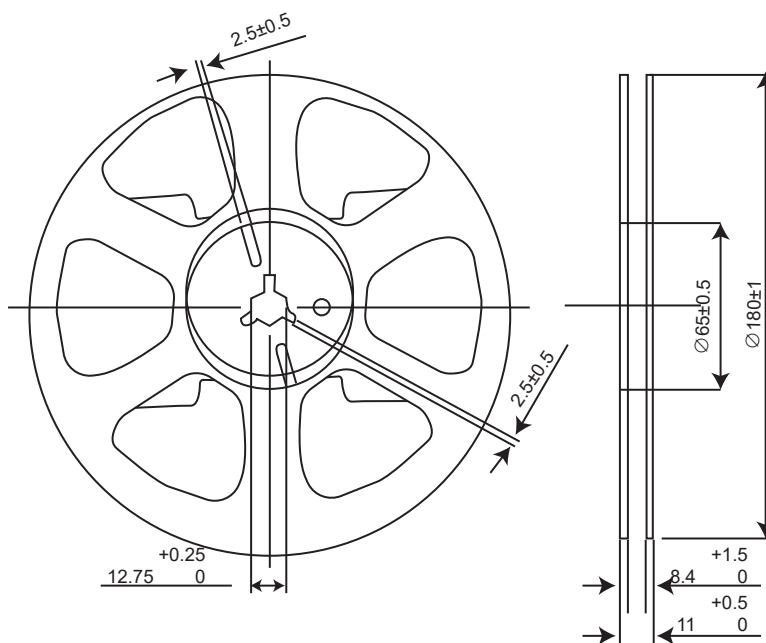
PAPER CARRIER



TAPING DIMENSIONS Unit: mm

| | 453215 | 451616 | 322513 | 321611 | 201212 | 201209 | 201209 | 160808 | 100505 |
|--------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| Symbol | PLASTIC | PLASTIC | PLASTIC | PLAST | PLASTIC | PLASTIC | PAPER | APER | APER |
| W | 12 ± 0.1 | 11.7~12.3 | 7.7~8.3 | 7.9~8.3 | 7.9~8.3 | 7.9~8.3 | 8.0 ± 0.1 | 8.0 ± 0.1 | 8.0 ± 0.1 |
| P | 8.0 ± 0.1 | 4.0 ± 0.1 | 4.0 ± 0.1 | 4.0 ± 0.1 | 4.0 ± 0.1 | 4.0 ± 0.1 | 4.0 ± 0.1 | 4.0 ± 0.1 | 2.0 ± 0.05 |
| E | 1.75 ± 0.1 | 1.75 ± 0.1 | 1.75 ± 0.1 | 1.75 ± 0.1 | 1.75 ± 0.1 | 1.75 ± 0.1 | 1.75 ± 0.1 | 1.75 ± 0.10 | 1.75 ± 0.05 |
| F | 5.5 ± 0.05 | 5.5 ± 0.05 | 3.5 ± 0.05 | 3.5 ± 0.05 | 3.5 ± 0.05 | 3.5 ± 0.05 | 3.5 ± 0.1 | 3.5 ± 0.1 | 3.5 ± 0.05 |
| D | 1.55 ± 0.05 | 1.55 ± 0.05 | 1.55 ± 0.05 | 1.55 ± 0.05 | 1.50 ± 0.05 | 1.50 ± 0.10 | 1.56 ± 0.10 | 1.56 ± 0.10 | 1.55 ± 0.05 |
| D1 | 1.5~1.75 | 1.5~1.75 | 0.95~1.20 | 0.95~1.20 | 0.95~1.20 | 1.0~1.25 | NA | NA | NA |
| Po | 4.0 ± 0.1 | 4.0 ± 0.1 | 4.0 ± 0.1 | 4.0 ± 0.1 | 4.0 ± 0.1 | 4.0 ± 0.1 | 4.0 ± 0.1 | 4.0 ± 0.1 | 4.0 ± 0.1 |
| Po10 | 40 ± 0.2 | 40 ± 0.2 | 40 ± 0.2 | 40 ± 0.2 | 40 ± 0.2 | 40 ± 0.2 | 40 ± 0.2 | NA | NA |
| P2 | 2.0 ± 0.05 | 2.0 ± 0.05 | 2.0 ± 0.05 | 2.0 ± 0.05 | 2.0 ± 0.05 | 2.0 ± 0.05 | 2.0 ± 0.1 | 2.0 ± 0.1 | 2.0 ± 0.05 |
| Ao | 3.66 ± 0.1 | 1.83 ± 0.1 | 2.57 ± 0.1 | 1.85 ± 0.1 | 1.42 ± 0.1 | 1.42 ± 0.1 | 1.50 ± 0.05 | 1.05 ± 0.05 | 0.62 ± 0.03 |
| Bo | 4.95 ± 0.1 | 4.85 ± 0.1 | 3.4 ± 0.1 | 3.43 ± 0.1 | 2.26 ± 0.1 | 2.24 ± 0.1 | 2.30 ± 0.05 | 1.85 ± 0.05 | 1.12 ± 0.03 |
| Ko(T) | 1.83 ± 0.1 | 1.83 ± 0.1 | 1.32 ± 0.1 | 1.22 ± 0.1 | 1.30 ± 0.1 | 1.04 ± 0.10 | 0.95 ± 0.05 | 0.95 ± 0.05 | 0.60 ± 0.03 |
| t | 0.23 ± 0.1 | 0.29 ± 0.1 | 0.25 ± 0.1 | 0.25 ± 0.1 | 0.23 ± 0.1 | 0.25 ± 0.1 | NA | NA | NA |

REEL DIMENSIONS



Reel Packaging Quantity

| PART SIZE (EIA SIZE) | | 1005 (0402) | 1608 (0603) | 201209 (0805) | 201212 (0805) | 321611 (1206) | 3225 (1210) | 4516 (1806) | 4532 (1812) |
|-------------------------|---------------|----------------|----------------|------------------|------------------|------------------|----------------|----------------|----------------|
| 7" REEL | Qty. (pcs) | 10,000 | 4,000 | 4,000 | 3,000 | 3,000 | 2,000 | 2,000 | 1,000 |

The Contents of a box:

4532(1812): 4 reels / inner box ;
 4516(1806): 4 reels / inner box ;
 3225(1210): 5 reels / inner box ;
 3216(1206): 5 reels / inner box ;
 2012(0805): 5 reels / inner box ;
 1608(0603): 5 reels / inner box ;
 1005(0402): 5 reels / inner box .

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