

SMD Multilayer Chip Varistor

AMCV-0402

RoHS
Compliant



1.0 x 0.5 x 0.5 mm

FEATURES:

- SMD type, small size suitable for high density mounting
- Excellent clamping ratio and strong capability of voltage surge suppression
- Excellent solderability (Ni, Sn plating)

APPLICATIONS:

- Transient voltage protection and voltage surge suppression for LED lighting
- Suitable for LCD-TV, STB, Switch, Router, PLC, Security System, smart meters, mobile phones
- Suppressing Induced / switching over-voltage caused by lightning and power
- Protecting DC-DC Module, I/O ports, IC driver

STANDARD SPECIFICATIONS:

Operating Temperature: -55°C ~ +125°C

Storage Temperature: -10°C ~ +40°C and RH 70% (Max.)

| Part Number | Max. Working Voltage | | Varistor Voltage | Max. Clamping Voltage | | Rated Single Pulse Transient | | Typical Capacitance |
|--------------------|----------------------|------------------|------------------|------------------------------|------------------------------|------------------------------|---------------------|-----------------------------|
| | DC | AC RMS | | 8/20μs | ESD | Energy 10/1000μs | Peak Current 8/20μs | |
| Test Condition | <20μA | | @1mA DC | 8/20μs | ESD | Energy 10/1000μs | Peak Current 8/20μs | @0.5V _{rms} , 1MHz |
| Units | Volts | Volts | Volts | Volts | Volts | Joules | Amps | pF |
| Symbol | V _{WDC} | V _{WAC} | V _B | V _C ^{*1} | V _C ^{*2} | E _T | I _P | C |
| ACMV-0402-5R5-C180 | 5.5 | 4.0 | 10.0-14.0 | 18 | 23 | 0.005 | 3 | 18 |
| ACMV-0402-5R5-C300 | 5.5 | 4.0 | 10.0-14.0 | 18 | 23 | 0.005 | 5 | 30 |
| ACMV-0402-5R5-C500 | 5.5 | 4.0 | 10.0-14.0 | 18 | 23 | 0.01 | 10 | 50 |
| ACMV-0402-5R5-C800 | 5.5 | 4.0 | 10.0-14.0 | 18 | 23 | 0.02 | 10 | 80 |
| ACMV-0402-5R5-C101 | 5.5 | 4.0 | 10.0-14.0 | 18 | 23 | 0.05 | 20 | 100 |
| ACMV-0402-090-C180 | 9.0 | 6.4 | 11.0-16.0 | 20 | 26 | 0.005 | 3 | 18 |
| ACMV-0402-090-C300 | 9.0 | 6.4 | 11.0-16.0 | 20 | 26 | 0.005 | 5 | 30 |
| ACMV-0402-090-C500 | 9.0 | 6.4 | 11.0-16.0 | 20 | 26 | 0.01 | 10 | 50 |
| ACMV-0402-090-C800 | 9.0 | 6.4 | 11.0-16.0 | 20 | 26 | 0.02 | 15 | 80 |
| ACMV-0402-090-C101 | 9.0 | 6.4 | 11.0-16.0 | 20 | 26 | 0.05 | 20 | 100 |
| ACMV-0402-140-C180 | 14.0 | 10.0 | 16.0-22.0 | 30 | 39 | 0.005 | 3 | 18 |
| ACMV-0402-140-C300 | 14.0 | 10.0 | 16.0-22.0 | 30 | 39 | 0.01 | 5 | 30 |
| ACMV-0402-140-C500 | 14.0 | 10.0 | 16.0-22.0 | 30 | 39 | 0.02 | 10 | 50 |
| ACMV-0402-140-C800 | 14.0 | 10.0 | 16.0-22.0 | 30 | 39 | 0.03 | 15 | 80 |
| ACMV-0402-140-C101 | 14.0 | 10.0 | 16.0-22.0 | 30 | 39 | 0.05 | 20 | 100 |
| ACMV-0402-180-C150 | 18.0 | 12.7 | 22.0-28.0 | 40 | 48 | 0.005 | 2 | 15 |
| ACMV-0402-180-C180 | 18.0 | 12.7 | 22.0-28.0 | 40 | 48 | 0.01 | 5 | 18 |
| ACMV-0402-180-C300 | 18.0 | 12.7 | 22.0-28.0 | 40 | 48 | 0.02 | 10 | 30 |
| ACMV-0402-180-C500 | 18.0 | 12.7 | 22.0-28.0 | 40 | 48 | 0.02 | 10 | 50 |
| ACMV-0402-180-C800 | 18.0 | 12.7 | 22.0-28.0 | 40 | 48 | 0.03 | 15 | 80 |
| ACMV-0402-180-C101 | 18.0 | 12.7 | 22.0-28.0 | 40 | 48 | 0.05 | 20 | 100 |
| ACMV-0402-260-C180 | 26.0 | 18.4 | 31.0-38.0 | 58 | 70 | 0.02 | 5 | 18 |
| ACMV-0402-260-C300 | 26.0 | 18.4 | 31.0-38.0 | 58 | 70 | 0.03 | 10 | 30 |
| ACMV-0402-260-C500 | 26.0 | 18.4 | 31.0-38.0 | 58 | 70 | 0.03 | 10 | 50 |

*1: V_c, Maximum peak voltage across the varistor measured at a specified pulse current and waveform.

| | |
|-----------------|------------------|
| Energy Rating | Pulse & Waveform |
| 0.00-0.05 Joule | 1A, 8/20μs |
| 0.10 Joule | 2A, 8/20μs |
| 0.20-0.50 Joule | 5A, 8/20μs |

*2: V_c, Maximum peak voltage across the varistor measured at 30ns after initiation of pulse on IEC61000-4-2 30A/8KV.

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Test Conditions

Unless otherwise specified, the standard atmospheric conditions for measurement/test as:

- a. Ambient Temperature: $20 \pm 15^\circ\text{C}$
- b. Relative Humidity: $65 \pm 20\%$
- c. Air Pressure: 86 kPa to 106 kPa

| Items | Test Methods and Remarks |
|--------------------------------------|--------------------------------------------------------|
| Varistor Voltage at 1mA DC (V_B) | Measuring current: 1mA DC Duration: 0.2 to 2 sec |
| Capacitance (C) | Measure source: $0.5 V_{RMS}$ Test frequency: 1MHz. |
| Leakage Current (I_L) | Measuring voltage: Maximum DC working voltage |
| Clamping Voltage (V_C) | Measuring source: 8/20us waveform, ESD waveform |

OPTIONS AND PART IDENTIFICATION:

AMCV-0402- - C -

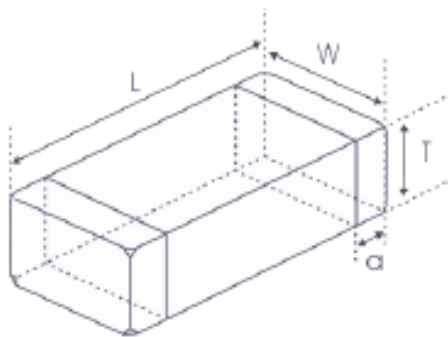
| Voltage Code |
|---------------------------------|
| Please refer to the table above |

| Capacitance Code |
|---------------------------------|
| Please refer to the table above |

| Tolerance |
|------------------|
| N= $\pm 30\%$ |
| Y= $+100, -50\%$ |
| G= $+0\%, -60\%$ |

| Packaging |
|-------------------------------------|
| T: Tape and Reel (10kpcs / reel) |

OUTLINE DIMENSION:



Recommended Land Pattern

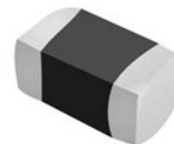


| L | W | T | a |
|----------------|----------------|----------------|----------------|
| 1.0 ± 0.15 | 0.5 ± 0.15 | 0.5 ± 0.15 | 0.25 ± 0.1 |

| A | B | C |
|------------------|------------------|------------------|
| $0.45 \sim 0.55$ | $0.40 \sim 0.50$ | $0.45 \sim 0.55$ |

Dimension: mm

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1.0 x 0.5 x 0.5 mm

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Materials

Side View



Top View



| | Part Name | Material |
|---|--------------------|-----------------------------------------|
| 1 | Base Material | ZnO |
| 2 | Internal Conductor | Ag-Pd |
| 3 | Terminal Electrode | Ag (Inner layer) Ni-Sn (Outer layer) |



REFLOW PROFILE:



| | |
|-----------------------------|-------------------------------|
| Preheat Condition | 150 to 200 °C; 60 to 120 sec. |
| Allowed time above 217 °C | 60 to 90 sec. |
| Max temperature | 260 °C |
| Max time at max temperature | 10 sec. |
| Solder paste | Sn/3.0Ag/0.5Cu |
| Allowed Reflow time | 2x max. |

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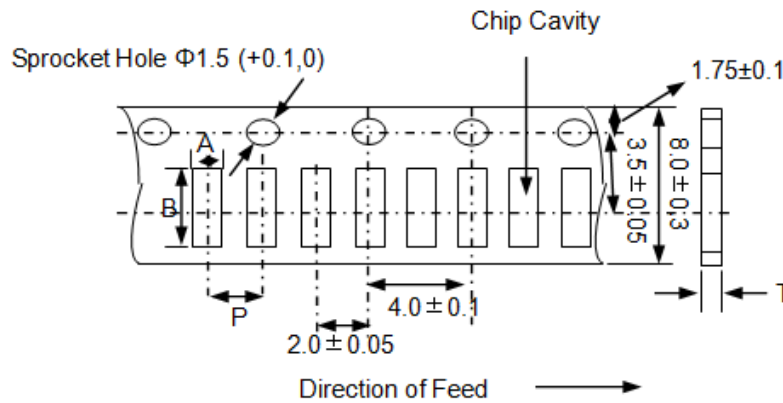


1.0 x 0.5 x 0.5 mm

TAPE & REEL:

Packing

T: 10,000pcs / reel



| A | B | P | T (max) |
|----------|----------|----------|---------|
| 0.65±0.1 | 1.15±0.1 | 2.0±0.05 | 0.8 |



Storage Conditions

- The solderability of the external electrode may be deteriorated if packages are stored where they are exposed to high humidity. Package must be stored at 40°C or less and 70% RH or less.
- The solderability of the external electrode may be deteriorated if packages are stored where they are exposed to dust of harmful gas (e.g. HCl, sulfurous gas of H₂S).
- Packaging material may be deformed if package are stored where they are exposed to heat of direct sunlight.
- Solderability shall be guaranteed for 6 months from the date of delivery on condition that they are stored at the environment specified in **a**. The parts that are stored more than 6 months shall be checked solderability before use.

Dimension: mm

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- Защиту от снятия компонента с производства.
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