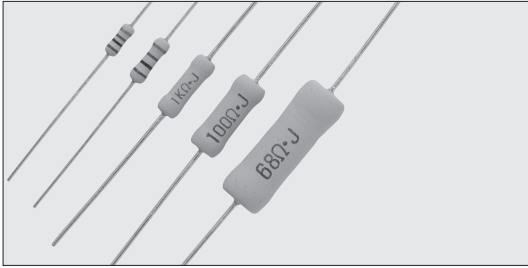


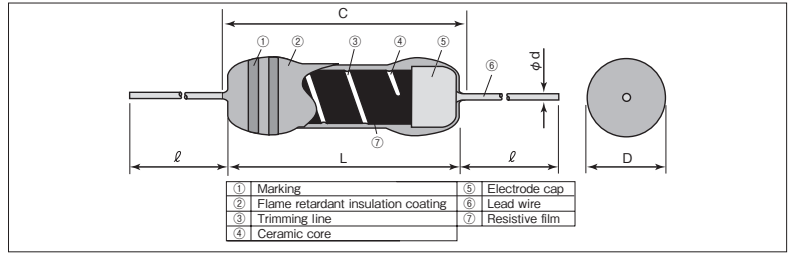
MOS Fixed Metal Oxide Film Resistors (Small type)

MOSX Fixed Metal Film Resistors (Small type)



Coating color : Lavender
 Marking : Color code (0.5W, 1W)
 Alphanumeric (2W, 3W, 5W)

Construction



Dimensions

| Type | Dimensions (mm) | | | | | Weight (g) (1000pcs) |
|------------|-----------------|--------|---------|--------------------------|-----------------|-------------------------|
| | L | C Max. | D | d(Nominal) ^{*1} | ℓ ^{*1} | |
| MOS(X) 1/2 | 6.2±0.5 | 7.1 | 2.5±0.5 | 0.6 | 24Min. | 250 |
| MOS(X) 1 | 9.0±1.0 | 11.1 | 3.0±0.5 | | | 350 |
| MOS(X) 2 | 12.0±1.0 | 15.0 | 4.0±0.5 | 0.8 | 30±3 | 800 |
| MOS(X) 3 | 15.5±1.0 | 18.0 | 6.0±1.0 | | | 1,400 |
| MOS(X) 5 | 24.5±1.0 | 28.0 | 9.0±1.0 | | | 38±3 |

^{*1} Lead length changes depending on taping and forming type. Example: 1C, 1CT52, 1CT526=0.6mm 1C8, 1CT528=0.8mm

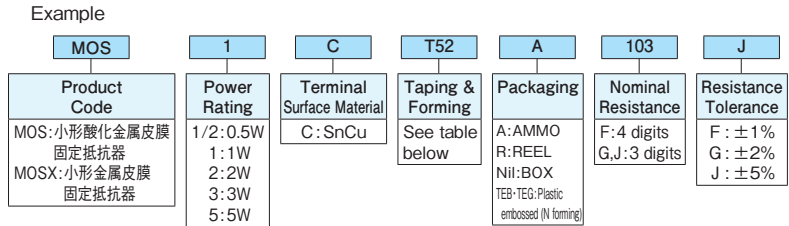
Features

- Small size power type resistors.
- Flame retardant coating. (Equivalent to UL94 V-0)
- Automatic insertion is applicable.
- Various types of formings are available.
- High reliability.
- Products meet EU-RoHS requirements.
- Automatic mounting machine is applicable by surface mounted device style lead forming.

Reference Standards

IEC 60115-4
 JIS C 5201-4
 EIAJ RC-2138

Type Designation



Contact us when you have control request for environmental hazardous material other than the substance specified by EU-RoHS.
 For further information on taping and forming, please refer to APPENDIX C on the back pages.

Taping & Forming Matrix

| Type | Axial Taping | | | | Stand-off Axial Taping | | | VT Radial Taping | | | GT Radial Taping | | L Forming ^{*2} | | | | | U Forming | | | M Forming ^{*2} | | | | | N Forming ^{*2} | | | | | |
|-------------|--------------|-----|------|------|------------------------|------|------|------------------|-----|-----|------------------|-----|-------------------------|--------|------|------|------|-----------|------|---|-------------------------|-----|-------|-----|-----|-------------------------|-----|-------|-----|-----|---|
| | T26 | T52 | T521 | T631 | L52 | L521 | L631 | VTP | VTE | VTF | GT | GT4 | L10A | L12.5A | L15A | L20A | L25A | L30A | L35A | U | UCL | M10 | M12.5 | M15 | M20 | M26 | M30 | N14.5 | N17 | N20 | |
| MOS(X) 1/2C | ○ | ○ | — | — | — | — | — | ○ | ○ | — | ○ | — | ○ | — | — | — | — | — | — | — | — | ○ | — | — | — | — | — | — | — | — | — |
| MOS(X) 1C | — | ○ | — | — | ○ | — | — | ○ | — | — | ○ | — | ○ | — | — | — | — | — | — | — | — | ○ | — | — | — | — | — | — | — | — | — |
| MOS(X) 2C | — | ○ | ○ | — | — | ○ | — | ○ | — | — | ○ | — | ○ | — | — | — | — | — | — | — | — | ○ | — | — | — | — | — | — | — | — | — |
| MOS(X) 3C | — | — | ○ | ○ | — | ○ | — | — | — | — | ○ | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |
| MOS(X) 5C | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — | — |

^{*2} P168 Ref. Secondary Processed Products

Ratings

| Type | Power Rating | Resistance Range (Ω) | | | T.C.R. (×10 ⁻⁶ /K) | Max. Working Voltage | Max. Overload Voltage | Dielectric Withstanding Voltage | Taping&Q'ty/AMMO pack (pcs) | | | |
|----------|--------------|------------------------------|--------------------------|------------|----------------------------------|----------------------|-----------------------|---------------------------------|-----------------------------|-------|-------|-------|
| | | F:±1%(E24-E96) ^{*3} | G:±2%(E24) ^{*3} | J:±5%(E24) | | | | | T26A | T52A | T521A | T631A |
| MOS1/2C | 0.5W | 10~47k | 10~47k | 10~47k | ±300 | E=√P×R(V) | 600V | 400V | 2,000 | 2,000 | — | — |
| MOS1C | 1W | 10~68k | 10~68k | 10~100k | | | | 500V | — | 2,000 | — | — |
| MOS2C | 2W | 10~100k | — | | | | | 500V | — | 1,000 | 1,000 | — |
| MOS3C | 3W | — | 10~100k | 0.1~9.1 | | 700V | — | — | 500 | 1,000 | | |
| MOS5C | 5W | — | — | | | 800V | — | — | — | — | | |
| MOSX1/2C | 0.5W | 1.0~9.1 | 0.22~9.1 | 0.1~9.1 | | E=√P×R(V) | E×2.5(V) | 400V | 2,000 | 2,000 | — | — |
| MOSX1C | 1W | | | | 500V | | | — | 2,000 | — | — | |
| MOSX2C | 2W | | | | — | | | 1,000 | 1,000 | — | — | |
| MOSX3C | 3W | | | | — | | | 500 | 1,000 | — | — | |
| MOSX5C | 5W | — | — | — | 800V | — | — | — | — | | | |

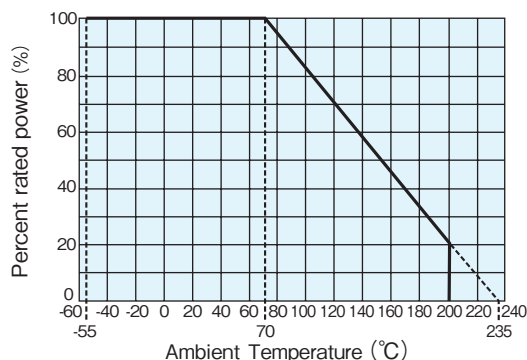
^{*3} Please consult with us for resistance other than catalog specification (tol.F/G)

Rated Ambient Temperature : +70°C

Operating Temperature Range : -55°C ~ +200°C

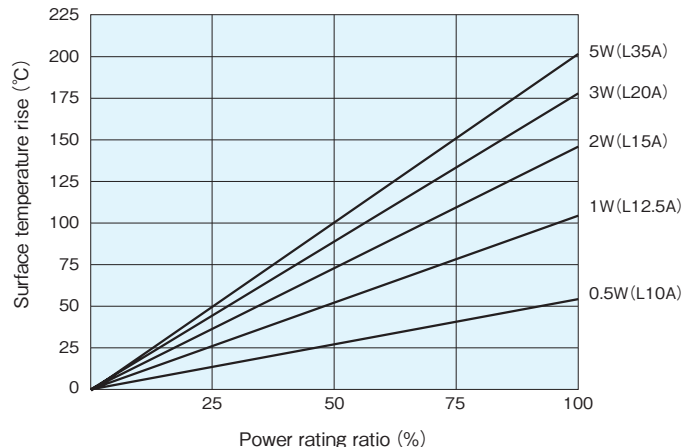
Rated voltage=√Power Rating×Resistance value or Max. working voltage, whichever is lower.

Derating Curve



For resistors operated at an ambient temperature of 70°C or above, a power rating shall be derated in accordance with the above derating curve.

Surface Temperature Rise



Performance

| Test Items | Performance Requirements $\Delta R \pm (\% + 0.05 \Omega)$ | | Test Methods |
|------------------------------|--|---------|--|
| | Limit | Typical | |
| Resistance | Within specified tolerance | — | Measuring points are 10mm±1mm from the end cap. |
| T.C.R. | Within specified T.C.R. | — | +25°C/+125°C |
| Overload (Short time) | ± (2%+0.1Ω) | 1 | Rated voltage×2.5 for 5s |
| Resistance to soldering heat | 1 | 0.5 | 260°C±5°C, 10s±1s, 350°C±10°C, 3.5s±0.5s |
| Terminal strength | No lead-coming off and loose terminals | — | Twist 360°, 5 times |
| Rapid change of temperature | 1 | 0.5 | -55°C (30min.) / +155°C (30min.) 5 cycles |
| Moisture resistance | ± (5%+0.1Ω) | 2.5 | 40°C±2°C, 90%~95%RH, 1000h 1.5h ON/0.5h OFF cycle |
| Endurance at 70°C | ± (5%+0.1Ω) | 2.5 | 70°C±2°C, 1000h 1.5h ON/0.5h OFF cycle |
| Resistance to solvent | No abnormality in appearance. Marking shall be easily legible | — | Ultrasonic washing with Isopropyl alcohol for 2 min. Power : 0.3W/cm², f : 28kHz, Temp : 35°C±5°C |
| Flame retardant | No evidence of flaming or self-flaming. | — | Flame test : The test flame shall be applied and removed for each 15 sec respectively to repeat the cycle 5 times. Overload flame retardant : AC voltage corresponding to 2, 4, 8, 16 and 32 times the power rating shall be applied for each 1min. until disconnection occurs. However the applied voltage shall not exceed the value of 4 times the maximum operating voltage. |

Precautions for Use

- Coating color, marking and dimensions are different depending on the manufacturing base. Verify them on the delivery specification.
- Be careful to handle these resistors because outer coatings are comparatively weak to outer shock due to flameproof special coats. Please wash them to a minimum. No external force is given to the coating films until they are well dried because the coating films become weaker right after washing. The original strength will be returned after they are dried, so please pay attention not to apply any external force onto the coating film of resistors for 20 minutes after drying. Especially no PC boards shall be piled up.

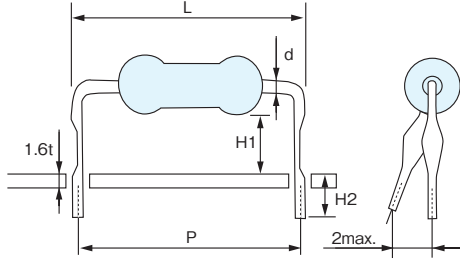
POWER TYPE

MOS Fixed Metal Oxide Film Resistors (Small type)

MOSX Fixed Metal Film Resistors (Small type)

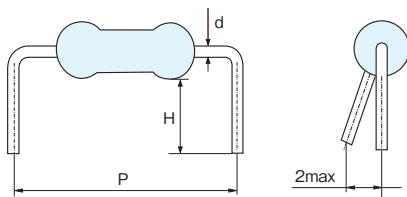
■ Secondary Processed Products (mm)

L Forming



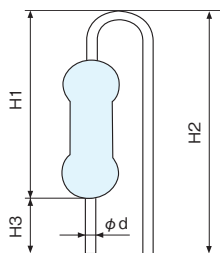
| Type MOS MOSX | P±1 | H ₁ ±1 | H ₂ ±1 | d (Nominal) | L max. | Substrate hole dia |
|---------------------|------|-------------------|-------------------|----------------|--------|-----------------------|
| 1/2CL10A | 10.0 | 5.3 | 4.0 | 0.6 | 17.5 | φ 0.8 |
| 1CL12.5A | 12.5 | 7.0 | | 0.8 | | φ 1.0 |
| 1CL15A | 15.0 | 6.5 | | | | |
| 2CL15A | | 7.0 | | | | |
| 2CL15F | 4.5 | | | | | |
| 2CL20A | 20.0 | 9.0 | | | | |
| 2CL20D | | 4.8 | | | | |
| 3CL20A | | 8.0 | | | | |
| 3CL20C | 10.0 | | | | | |
| 3CL20T | 4.0 | | | | | |
| 3CL25A | 25.0 | 7.0 | | | | |
| 3CL30A | 30.0 | 7.0 | | | | |
| 5CL30A | | 8.5 | | | | |
| 5CL35A | 35.0 | 5.5 | | | | |

M Forming



| Type MOS MOSX | P±1 | H±1 | d (Nominal) | Substrate hole dia |
|---------------------|------|------|----------------|-----------------------|
| 1/2CM10C | 10.0 | 3.5 | 0.6 | φ 0.8 |
| 1/2CM10F | 10.0 | 5.0 | 0.6 | |
| 1CM12.5C | 12.5 | 3.5 | 0.8 | φ 1.0 |
| 1CM12.5D | 12.5 | 4.0 | 0.8 | |
| 1CM15F | 15.0 | 5.0 | 0.8 | |
| 1CM15J | 15.0 | 6.3 | 0.8 | |
| 1CM15S | 15.0 | 11.0 | 0.8 | |
| 2CM15C | 15.0 | 3.5 | 0.8 | |
| 2CM15E | 15.0 | 4.5 | 0.8 | |
| 2CM20D | 20.0 | 4.0 | 0.8 | |
| 2CM20U | 20.0 | 13.5 | 0.8 | |
| 3CM20E | 20.0 | 4.6 | 0.8 | |
| 3CM26E | 26.0 | 4.7 | 0.8 | |
| 5CM30U | 30.0 | 13.0 | 0.8 | |

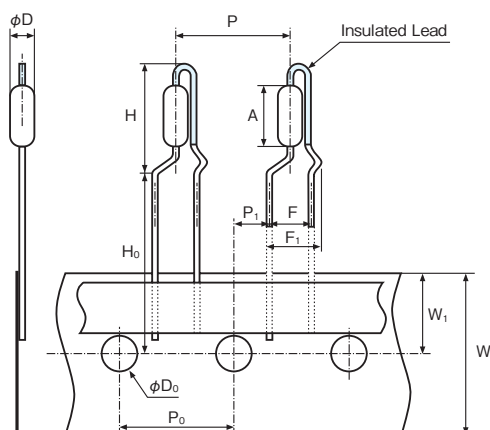
UCL Forming



| Type MOS MOSX | H ₁ ±1 | H ₂ ±1 | H ₃ ±1 | d (Nominal) | Insertion pitch | Substrate hole dia |
|---------------------|-------------------|-------------------|-------------------|----------------|-----------------|-----------------------|
| 1CUCL | 13.0 | 17.0max. | 3.5 | 0.8 | 5.0 | φ 1.0 |
| 2CUCL | 14.5 | 18.5max. | 3.5 | | | |
| 3CUCL | 20.0max. | 22.0 | 4.0 | | | |

■ Secondary Processed Products (mm)

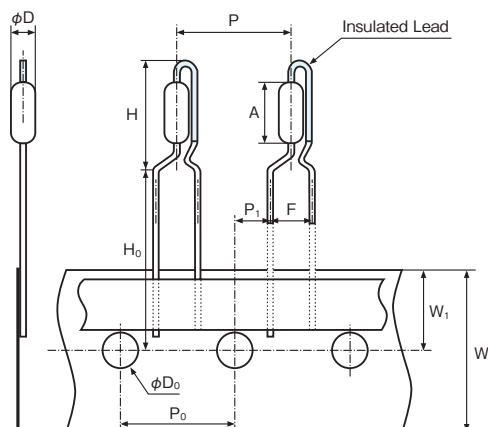
VTF Radial Taping



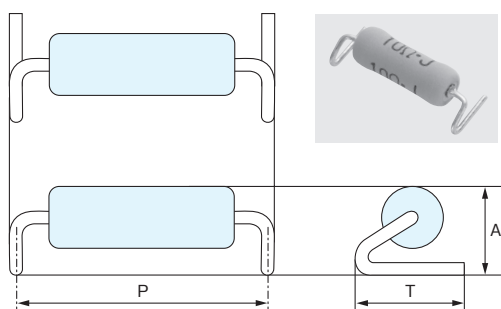
| Breed | MOS/MOSX | | | |
|--------------------|-----------|---------|----------|----------|
| Rating | 1/2C | 1C | 2C | 2C |
| Type | VTP | VTP | VTP | VTF |
| A | 6.2±0.5 | 9.0±1.0 | 12.0±1.0 | 12.0±1.0 |
| φD | 2.5±0.5 | 3.0±0.5 | 4.0±0.5 | 4.0±0.5 |
| d(nominal) | 0.6 | | 0.65 | 0.8 |
| F | 5.0±0.5 | | | |
| F ₁ | | | | 7.3max. |
| H | 13max. | 16max. | 22.5max. | 22.5max. |
| H ₀ | 16+1.0/-0 | | | |
| P | 12.7±1.0 | | | |
| P ₀ | 12.7±0.3 | | | |
| P ₁ | 3.85±0.7 | | | |
| W | 18.0±0.5 | | | |
| W ₁ | 9.0±0.5 | | | |
| φD ₀ | 4.0±0.2 | | | |
| Substrate hole dia | φ0.8 | | | φ1.0 |

- The color of insulated lead : Green
- Insertion pitch : 5.0mm

VTP Radial Taping



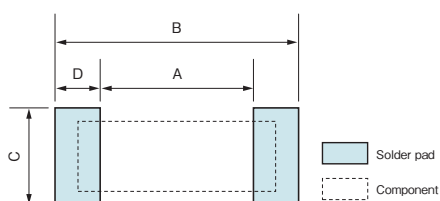
N Forming



| Breed | MOS/MOSX | | |
|------------|----------|--------|---------|
| Rating | 1C | 2C | 3C |
| Type | N14.5TEB | N17TEB | N20TEG |
| P±1 | 14.5 | 17.0 | 20.0 |
| T±0.5 | 5.0 | 6.0 | 7.5±1.0 |
| A±0.5 | 4.8 | 5.8 | 6.5 |
| d(nominal) | 0.8 | 0.8 | 0.8 |

- Need a dedicated nozzle for automatic mounting.
- Please inquire to us before use.

Recommended Pad Dimensions



| Breed | MOS/MOSX | | |
|--------|----------|--------|--------|
| Rating | 1C | 2C | 3C |
| Type | N14.5TEB | N17TEB | N20TEG |
| A | 12.5 | 14.6 | 17.6 |
| B | 16.5 | 19.4 | 22.4 |
| C | 7.0 | 8.0 | 9.5 |
| D | 2.0 | 2.4 | 2.4 |

- Please refer to APPENDIX for the packaging specification.

Various lead forming shapes are available upon request. Please feel free to ask us.