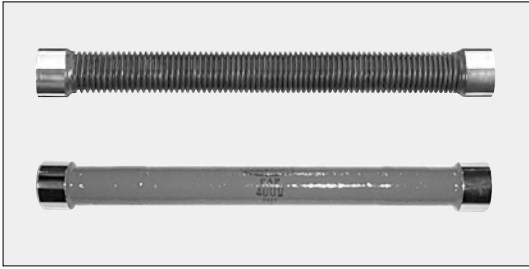


HIGH VOLTAGE POWER RESISTORS



PSN·PV·PSO·PN·PWW·PAP | High Voltage Power Resistors

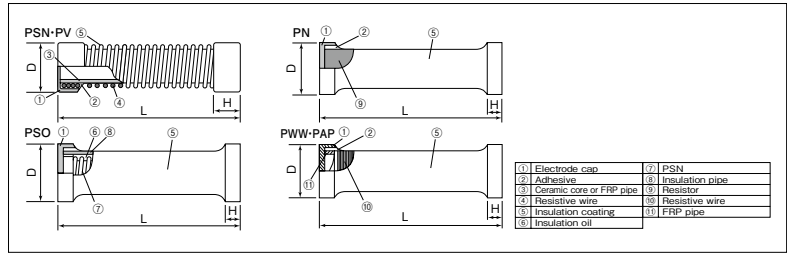


Body color : Red
Marking : Alphanumeric

■Features

- PSN can respond to high voltage and high power with a wide resistance range of 500Ω~6GΩ.
- PSO is made completely moisture preventive to be PSN that can be used under high moisture environment.
- PN is a non-inductive type and can be used for high frequency.
- PWW and PAP type are non-inductive wire wound resistors.
- PWW resistors have the same shapes as PSN and can be used for a low resistance area that cannot be produced with PSN resistors.
- PAP resistors are non-inductive wire wound resistors with inductance lessened than PWW can be used for pulse wave measurement, impulse generators, etc.
- Products with Pb free symbol “F” meet EU-RoHS requirement.

■Construction



■Applications

- Resistors for charging and discharging for high voltage, resistors for surge absorption, and protective resistors at the time of a short-circuit.
- Voltage Equalizing Resistors at the time of using and connecting diodes and capacitors in series.
- Dividers for DC voltage and for measuring lightning and switching impulses.

■Precautions for Use

- Impulse withstanding voltage is specified for waveform of 1/40μs or 1.2/50μs as a standard. Please inquire of us in advance when using other than the standard waveform, since the specified value may change, depending on time constant or length of wave tail.
- Use the components under less dusty places, as continual applying of high voltage makes dust adhere to the surface of the resistors and causes surface leakage and corona. Also periodic cleaning of the surface of resistors is needed.
- Use them at 50% or under of the rated power for stable use for a long time.
- Do not touch the resistors with high resistance value by hand to prevent surface-leakage current.
- Set the products away from near electric conductors 1cm or over per 3kVd.c. to avoid occurrence of corona and short-circuit by discharge, if there are electric conductors near to.
- Take care that the resistors may become instable in resistance value by absorption of humidity when they are stored or used in high humidity environment.

■Type Designation

Example

| | | | | | | | |
|--------------|---|-------------------|------|--------------------------|--------------------|------------------------------|---|
| PSN | PSN | 0.5 | CP | F | A | 105 | J |
| Product Code | Power Rating | Cap ^{#1} | RoHS | Holder ^{#2} | Nominal Resistance | Resistance Tolerance | |
| | 0.5:2W 1:5W 2:10W 3:25W 4:50W 5:125W 6:250W | C M CP | | Nil: No holder A B | 3 digits | J: ±5% K: ±10% M: ±20% | |

| | | | | | | |
|--------------|--|-------------------|------|--------------------|------------------------------|---|
| PSO | PSO | 1 | C | F | 105 | J |
| Product Code | Power Rating | Cap ^{#1} | RoHS | Nominal Resistance | Resistance Tolerance | |
| | 1:4W 2:8W 3:20W 4:40W 5:100W 6:200W | C | | 3 digits | J: ±5% K: ±10% M: ±20% | |

| | | | | | | | |
|--------------|--|-------------------|------|--------------------------|--------------------|------------------------------|---|
| PV | PV | 0.5 | CP | F | | 105 | J |
| Product Code | Power Rating | Cap ^{#1} | RoHS | Holder ^{#2} | Nominal Resistance | Resistance Tolerance | |
| | 0.5:2W 1:4W 2:7W 5:12W 8:20W | C M CP | | Nil: No holder A B | 3 digits | J: ±5% K: ±10% M: ±20% | |

| | | | | | | |
|--------------|---|-------------------|------|--------------------|------------------------------|---|
| PN | PN | 1 | CP | F | 105 | J |
| Product Code | Power Rating | Cap ^{#1} | RoHS | Nominal Resistance | Resistance Tolerance | |
| | 0.5:1.5W 1:3W 2:6W 3:9W 4:12W | C M CP | | 3 digits | J: ±5% K: ±10% M: ±20% | |

| | | | | | | | |
|--------------|------------------------------------|-------------------|------|--------------------------|--------------------|------------------------------|---|
| PWW·PAP | PWW | 3 | M | F | A | 102 | J |
| Product Code | Power Rating | Cap ^{#1} | RoHS | Holder ^{#2} | Nominal Resistance | Resistance Tolerance | |
| PWW PAP | 3:25W 4:50W 5:100W 6:200W | M | | Nil: No holder A B | 3 digits | J: ±5% K: ±10% M: ±20% | |

※2 See next page for detail.

※1 Contact us when you have control request for environmental hazardous material other than the substance specified by EU-RoHS.

P series resistors use brass for the electrode cap. Lead in brass is a substance not subject to the EU-RoHS (exemption 6(c)), but please note that it exceeds the threshold of the EU-REACH (Reach 19th SVHC list).

Ratings

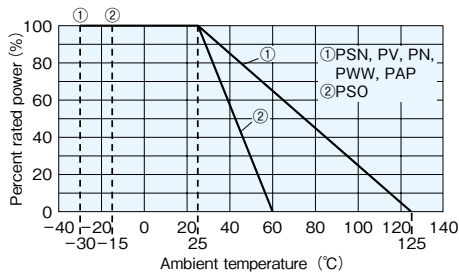
| Type | Power Rating (W) | Resistance Range (Ω) J : ±5% K : ±10% M : ±20% (E24*) | T.C.R. (×10 ⁻⁶ /K) | Max. Working Voltage | Impulse Withstand Voltage | Operating Temperature Range | Energy Rating 1 time/5 min. | Dimensions (mm) | | | Weight (g) (1pcs) | | | | |
|---------|------------------|--|---|----------------------|---------------------------|-----------------------------|-----------------------------|-----------------|-------|--------------|-------------------|-------|-------|----|-------|
| | | | | | | | | L | D±0.5 | H (Nominal) | | | | | |
| PSN-0.5 | 2 | 500~500M | ±1500: +25°C/-15°C ±1000: +25°C/+85°C (R<1GΩ) | 15kV | 20kV | -30°C~+125°C | 50J | 50±2 | 17.5 | 10 | 20 | | | | |
| PSN-1 | 5 | 1k~1G | | 30kV | 40kV | | 125J | 100±2 | | | | | | | |
| PSN-2 | 10 | 2k~2G | | 60kV | 80kV | | 400J | 200±2 | | | | | | | |
| PSN-3 | 25 | 3k~3G | | 90kV | 120kV | | 1.8kJ | 300±2 | 33 | 20 | 250 | | | | |
| PSN-4 | 50 | 4k~4G | | 120kV | 160kV | | 4.0kJ | 400±3 | | | | | | | |
| PSN-5 | 125 | 5k~5G | | 150kV | 200kV | | 9.0kJ | 500±3 | | | | | | | |
| PSN-6 | 250 | 6k~6G | | 300kV | 400kV | | 20.0kJ | 1000±5 | 62 | 25 | 1350 | | | | |
| PV-0.5 | 2 | 500~500M | | 24kV | 32kV | | 45J | 80±2 | | | | | | | |
| PV-1 | 4 | 1k~1G | | 45kV | 60kV | | 90J | 150±2 | | | | | | | |
| PV-2 | 7 | 1.5k~1.5G | | ±3000 (R≥1GΩ) | 30kV | | 40kV | -15°C~+60°C | 270J | 17.5 | 10 | 45 | | | |
| PV-5 | 12 | 2.5k~2.5G | | | | | | | 650J | | | | 24 | 15 | 105 |
| PV-8 | 20 | 2.5k~2.5G | | | | | | | 950J | | | | 250±2 | 33 | 20 |
| PSO-1 | 4 | 1k~1G | 30kV | | | 40kV | | | 100J | 105±5 | 28 | 10 | 150 | | |
| PSO-2 | 8 | 2k~2G | 60kV | | | 80kV | | | 320J | 205±5 | | | | | |
| PSO-3 | 20 | 3k~3G | 90kV | | | 120kV | | | 1.5kJ | 320±5 | | | | | |
| PSO-4 | 40 | 4k~4G | 120kV | 160kV | 3.2kJ | 420±5 | 65 | 20 | 1900 | | | | | | |
| PSO-5 | 100 | 5k~5G | 150kV | 200kV | 7.2kJ | 530±5 | | | | | | | | | |
| PSO-6 | 200 | 6k~6G | 300kV | 400kV | 16.0kJ | 1050±5 | | | | | | | | | |
| PN-0.5 | 1.5 | 50~500k | - | 20kV | 40kV | -30°C~+125°C | 35J | 50±2 | 8 | 25 | | | | | |
| PN-1 | 3 | 100~1M | | | | | 70J | | | | 100±2 | | | | |
| PN-2 | 6 | 200~2M | | | | | 130J | | | | 200±2 | | | | |
| PN-3 | 9 | 300~3M | | | | | 200J | 300±2 | | | | | | | |
| PN-4 | 12 | 400~4M | | | | | 270J | 400±2 | | | | | | | |
| PWW-3 | 25 | 10~800 | | | | | - | 120kV | 160kV | -30°C~+125°C | 2kJ~5kJ | 300±2 | 33 | 20 | |
| PWW-4 | 50 | 15~1.5k | 4kJ~12kJ | 400±3 | 45 | | | | | | | | | | |
| PWW-5 | 100 | 25~2.5k | 7kJ~20kJ | 500±3 | 62 | 25 | | | | | 1300 | | | | |
| PWW-6 | 200 | 50~5k | 14kJ~40kJ | 1000±5 | 2700 | | | | | | | | | | |
| PAP-3 | 25 | 10~400 | - | 120kV | 160kV | -30°C~+125°C | | | | | 1kJ~2kJ | 300±2 | 33 | 20 | |
| PAP-4 | 50 | 10~800 | | | | | | | | | 1.5kJ~4kJ | | | | 400±3 |
| PAP-5 | 100 | 15~1k | | | | | 3.5kJ~10kJ | 500±3 | 62 | 25 | 960 | | | | |
| PAP-6 | 200 | 25~2k | | | | | 7kJ~25kJ | 1000±5 | 1850 | | | | | | |

Rated Ambient Temperature : +25°C

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

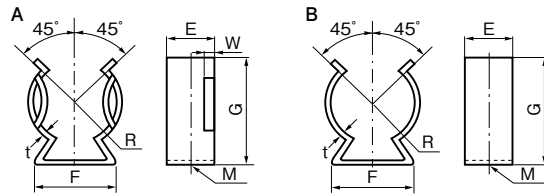
*3 Please ask of us about resistance other than E24 series.

Derating Curve



For resistors operated at an ambient temperature of 25°C or higher, the power shall be derated in accordance with the above derating curve.

Holder Dimensions (PSN · PV · PWW · PAP) (mm)



| Type | R | E | F | G | M | t | W |
|-------------------------|------|----|----|----|------|-----|---------|
| PSN-0.5·PSN-1 · PV-2 | 8.5 | 11 | 16 | 24 | φ4.2 | 0.8 | 1.5±0.5 |
| PSN-2·PV-5 | 11.5 | 15 | 18 | 32 | | | |
| PSN-3·PV-8·PWW-3·PAP-3 | 16 | 18 | 24 | 40 | φ6.5 | 1.5 | 2.0±1.0 |
| PSN-4·PWW-4·PAP-4 | 22 | 20 | 36 | 59 | | | |
| PSN-5.6·PWW-5.6·PAP-5.6 | 30 | 25 | 46 | 74 | | | |

Cap Dimensions (mm)

| Type | C | | M | | | | CP | | C | | | |
|-------------------------|------|--------------|------|---|---|----|-----|-----|----|----|----------------|----------------|
| | D | d | D | M | K | A | d | ℓ | D | M | ℓ ₁ | ℓ ₂ |
| PSN-0.5·PSN-1 · PV-2 | 17.5 | 7 | 17.5 | 3 | 2 | 7 | 1.0 | 90 | - | - | - | - |
| PSN-2·PV-5 | 24 | 12 | 24 | 4 | 2 | 10 | 1.2 | 120 | - | - | - | - |
| PSN-3·PV-8·PWW-3·PAP-3 | 33 | 14 | 33 | 5 | 4 | 14 | - | - | - | - | - | - |
| PSN-4·PWW-4·PAP-4 | - | - | 45 | 6 | 4 | 16 | - | - | - | - | - | - |
| PSN-5.6·PWW-5.6·PAP-5.6 | - | - | 62 | 8 | 7 | 26 | - | - | - | - | - | - |
| PV-0.5·PV-1 | 9.5 | Without hole | - | - | - | - | 0.9 | 90 | - | - | - | - |
| PN-0.5 | 17 | Without hole | - | - | - | - | 1.0 | 90 | - | - | - | - |
| PN-1 | - | - | 17 | 4 | - | - | 1.2 | 120 | - | - | - | - |
| PN-2~PN-4 | - | - | - | - | - | - | - | - | - | - | - | - |
| PSO-1 | - | - | - | - | - | - | - | - | 28 | 4 | 8 | - |
| PSO-2 | - | - | - | - | - | - | - | - | 38 | 6 | 10 | - |
| PSO-3 | - | - | - | - | - | - | - | - | 46 | 8 | - | 15 |
| PSO-4 | - | - | - | - | - | - | - | - | 65 | 10 | - | 20 |
| PSO-5,6 | - | - | - | - | - | - | - | - | 80 | 12 | - | 25 |