

DATA SHEET

CEMENT RESISTORS

High Power, Axial Lead

SQP Series

NSP Series

$\pm 1\%$, $\pm 5\%$

1W to 40W

RoHS compliant & Halogen Free





APPLICATIONS

- Power applications
- Home appliance
- Industry

FEATURES

- High power rating
- Excellent pulse load capability
- Axial terminal
- Flameproof ceramic case
- RoHS compliant & halogen-free

ORDERING INFORMATION

Part number of the cement resistor is identified by the series, power rating, tolerance, packing, temperature coefficient and resistance value.

PART NUMBER

SQP **500** **J** **B** **-** **22R**
 (1) (2) (3) (4) (5) (6)

(1) SERIES

SQP Series = General purpose
 NSP Series = Non inductive

(2) POWER RATING

| | |
|----------|-----------|
| 100 = 1W | 10A = 10W |
| 200 = 2W | 15A = 15W |
| 300 = 3W | 20A = 20W |
| 5WS = 5W | 25A = 25W |
| 500 = 5W | 30A = 30W |
| 700 = 7W | 40A = 40W |

(3) TOLERANCE

F = ±1% (Wirewound) J = ±5%

(4) PACKAGING

B = Bulk for wirewound or metal oxide or fiberglass element
 W = Bulk for wirewound element
 M = Bulk for metal oxide element

(5) TEMPERATURE COEFFICIENT OF RESISTANCE

F=±100ppm/°C (Wirewound) - = Based on spec.

(6) RESISTANCE VALUE

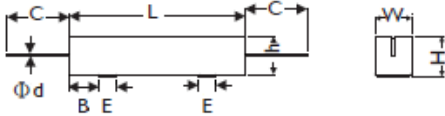
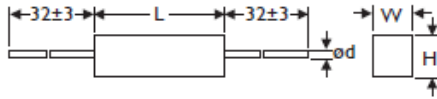
E24 & E96 Series
 Example:
 100R = 100Ω, 10K = 10,000Ω, 1M = 1,000,000Ω

DIMENSIONS

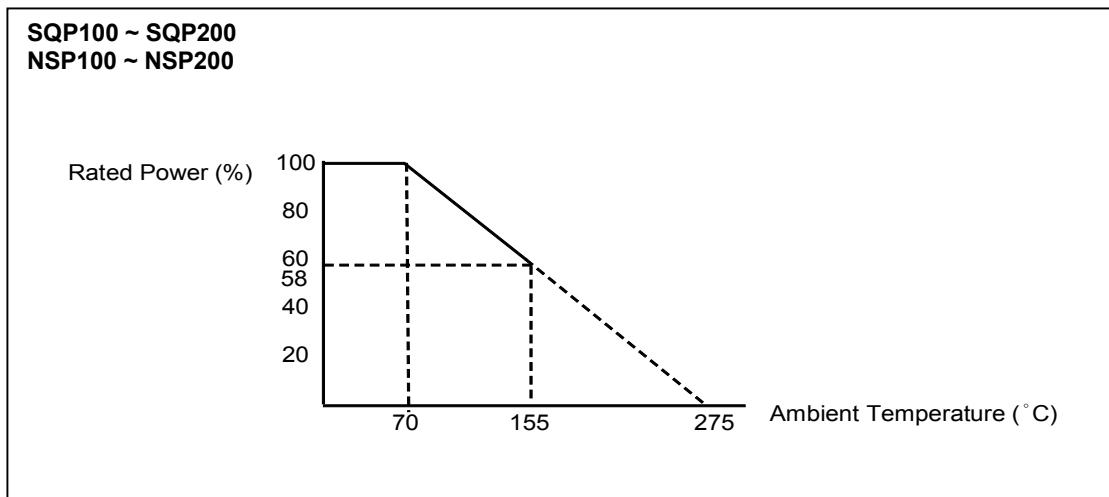
Unit: mm

| | Normal | Non-Inductive | L | W | H | ψd |
|--|--------|---------------|--------|----------|------------------------------------|-----------|
| | SQP100 | NSP100 | 13±1.0 | 5.5±1.0 | 5.5±1.0 | 0.6±0.05 |
| | SQP200 | NSP200 | 18±1.0 | 7.0±1.0 | 7.0±1.0 | 0.65±0.05 |
| | SQP300 | NSP300 | 22±1.5 | 8.0±1.0 | 8.0±1.0 | 0.8±0.05 |
| | SQP5WS | - | 25±1.5 | 6.0±1.0 | 6.0±1.0 | 0.65±0.05 |
| | SQP500 | NSP500 | 22±1.5 | 9.5±1.0 | 9.0±1.0 | 0.8±0.05 |
| | SQP700 | NSP700 | 35±1.5 | 9.5±1.0 | 9.0±1.0 | 0.8±0.05 |
| | SQP10A | NSP10A | 48±1.5 | 9.5±1.0 | 9.0±1.0 | 0.8±0.05 |
| | SQP15A | NSP15A | 48±1.5 | 12.5±1.0 | 12.5±1.0 | 0.8±0.05 |
| | SQP20A | NSP20A | 60±5.0 | 12.5±1.0 | 12.5±1.0 | 0.8±0.05 |
| | SQP25A | NSP25A | 60±5.0 | 14.0±1.5 | 13.0±1.5 | 0.8±0.05 |
| | SQP30A | NSP30A | 77±5.0 | 18.0±1.5 | 17 ^{+2.5} _{-1.0} | 0.8±0.05 |

| | Normal | Non-Inductive | L | W | H | h |
|--|--------|---------------|----------|----------|----------|----------|
| | | | 90±5.0 | 19.0±1.5 | 20.5±1.5 | 19.5±1.5 |
| | SQP40A | NSP40A | B | C | E | ψd |
| | | | 15.0±1.0 | 32±3 | 9.0±0.5 | 0.8±0.05 |

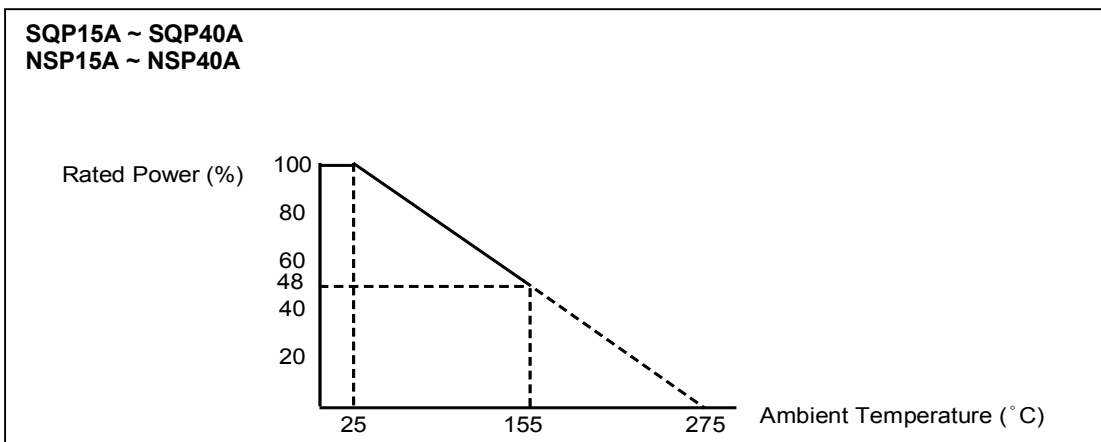
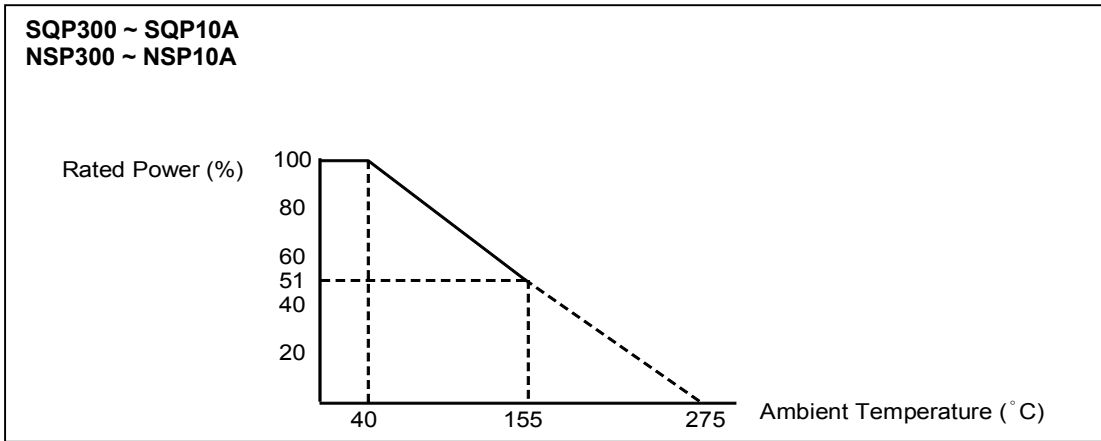


DERATING CURVE

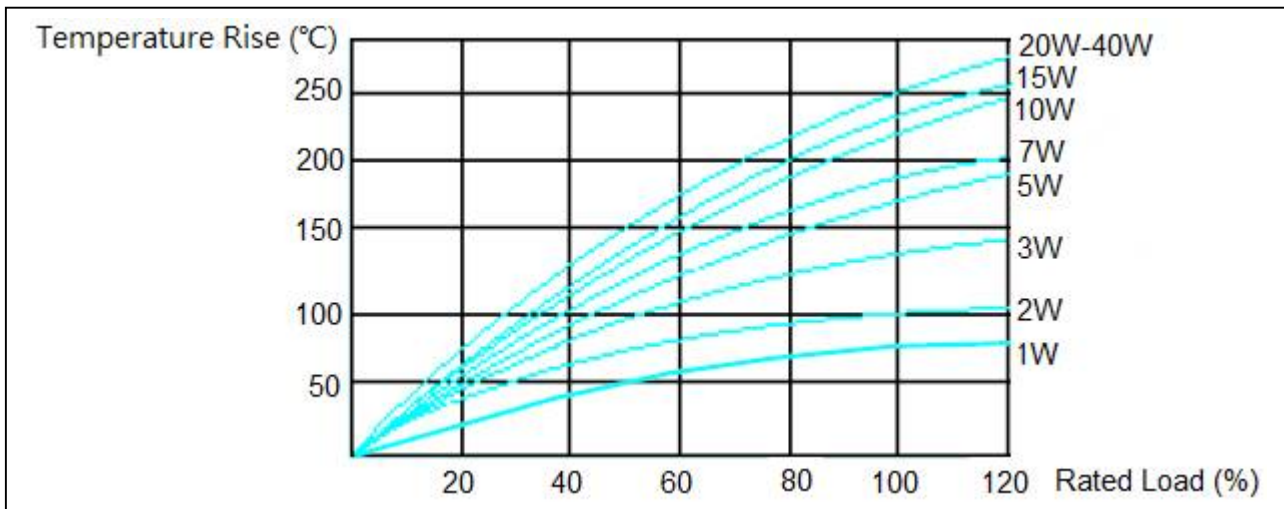


Cement Resistors

SQP / NSP



TEMPERATURE CURVE



ELECTRICAL CHARACTERISTICS

| CHARACTERISTICS | SQP100 | SQP200 | SQP300 | SQP5WS | SQP500 | SQP700 | SQP10A |
|-----------------------------|--|-------------|--------------|---------------|---------------|--------------|--------------|
| Power Rating at 70 °C | 1W | 2W | | | | | |
| Power Rating at 40 °C | | | 3W | 5W | 5W | 7W | 10A |
| Maximum Working Voltage | 200V | 250V | 350V | 350V | 350V | 500V | 500V |
| Maximum Overload Voltage | 500V | 500V | 700V | 700V | 700V | 1000V | 1000V |
| Voltage Proof on Insulation | 500V | 500V | 700V | 700V | 700V | 1000V | 1000V |
| Resistance Range(Wirewound) | 0.1Ω ~ 27Ω | 0.03Ω ~ 36Ω | 0.015Ω ~ 68Ω | 0.015Ω ~ 130Ω | 0.015Ω ~ 130Ω | 0.05Ω ~ 330Ω | 0.08Ω ~ 510Ω |
| Resistance Range(Film) | 30Ω ~ 47KΩ | 39Ω ~ 1MΩ | 75Ω ~ 1MΩ | 150Ω ~ 1MΩ | 150Ω ~ 1MΩ | 360Ω ~ 100KΩ | 560Ω ~ 100KΩ |
| Operating Temp. Range | - 55°C to +155°C | | | | | | |
| Temperature Coefficient | Wirewound :±100ppm/°C , ±300ppm/°C, Film: ±300ppm/°C | | | | | | |

Note: For resistance value out of above range is by request.

| CHARACTERISTICS | SQP15A | SQP20A | SQP25A | SQP30A | SQP40A |
|-----------------------------|------------------------------------|-------------|-------------|-------------|-------------|
| Power Rating at 25 °C | 15W | 20W | 25W | 30W | 40W |
| Maximum Working Voltage | 500V | 500V | 1000V | 1000V | 1000V |
| Maximum Overload Voltage | 1000V | 1000V | 2000V | 2000V | 2000V |
| Voltage Proof on Insulation | 1000V | 1000V | 2000V | 2000V | 2000V |
| Resistance Range(Wirewound) | 0.1Ω ~ 680Ω | 0.15Ω ~ 1KΩ | 0.15Ω ~ 1KΩ | 0.15Ω ~ 1KΩ | 0.15Ω ~ 1KΩ |
| Operating Temp. Range | - 55°C to +155°C | | | | |
| Temperature Coefficient | Wirewound :±100ppm/°C , ±300ppm/°C | | | | |

Note: For resistance value out of above range is by request.

| CHARACTERISTICS | NSP100 | NSP200 | NSP300 | NSP500 | NSP700 | NSP10A |
|-----------------------------|-----------------------|-------------|--------------|-------------|-------------|--------------|
| Power Rating at 70 °C | 1W | 2W | | | | |
| Power Rating at 40 °C | | | 3W | 5W | 7W | 10A |
| Voltage Proof on Insulation | 500V | 500V | 700V | 700V | 1000V | 1000V |
| Resistance Range(Wirewound) | 0.08Ω ~ 10Ω | 0.08Ω ~ 10Ω | 0.033Ω ~ 30Ω | 0.03Ω ~ 40Ω | 0.15Ω ~ 65Ω | 0.25Ω ~ 100Ω |
| Maximum Working Voltage | $\sqrt{(P \times R)}$ | | | | | |
| Operating Temp. Range | - 55°C to +155°C | | | | | |
| Temperature Coefficient | ±300ppm/°C | | | | | |

Note: For resistance value out of above range is by request.

Cement Resistors

SQP / NSP

| CHARACTERISTICS | NSP15A | NSP20A | NSP25A | NSP30A | NSP40A |
|-----------------------------|-----------------------|--------------|--------------|--------------|--------------|
| Power Rating at 25 °C | 15W | 20W | 25W | 30W | 40W |
| Voltage Proof on Insulation | 1000V | 1000V | 2000V | 2000V | 2000V |
| Resistance Range(Wirewound) | 0.25Ω ~ 120Ω | 0.36Ω ~ 160Ω | 0.36Ω ~ 160Ω | 0.36Ω ~ 160Ω | 0.36Ω ~ 160Ω |
| Maximum Working Voltage | $\sqrt{(P \times R)}$ | | | | |
| Operating Temp. Range | - 55°C to +155°C | | | | |
| Temperature Coefficient | ±300ppm/°C | | | | |

Note: For resistance value out of above range is by request.

TEST AND REQUIRMENTS

| TEST | TEST METHOD | PROCEDURE | APPRAISE |
|-------------------------------|------------------|---|---|
| Short Time Overload | IEC 60115-1 4.13 | 2.5 times RCWV for 5 sec.(Not more than maximum overload voltage) | ±2.0%+0.05Ω |
| Voltage Proof on Insulation | IEC 60115-1 4.7 | In V-Block for 60 sec. test voltage as above table | No Breakdown |
| Temperature Coefficient | IEC 60115-1 4.8 | Between -55°C to +155°C | By Type |
| Insulation Resistance | IEC 60115-1 4.6 | In V-Block for 60 sec. | >1,000MΩ |
| Solderability | IEC 60115-1 4.17 | 245±5°C for 3±0.5 Sec. | 95% Min. coverage |
| Solvent Resistance of Marking | IEC 60115-1 4.30 | IPA for 5±0.5 Min. with ultrasonic | No deterioration of coatings and markings |
| Robustness of Terminations | IEC 60115-1 4.16 | Direct load for 10 Sec. in the direction of the terminal leads | ≥2.5Kg(24.5N)D |
| Periodic-pulse Overload | IEC 60115-1 4.39 | 4 times RCWV 10,000 cycles (1 Sec. on, 25 Sec.off) | ±2.0%+0.05Ω |
| Damp Heat Steady State | IEC 60115-1 4.24 | 40±2°C,90-95% RH for 56 days, loaded with 0.1 times RCWV | ±5.0%+0.05Ω |
| Endurance at 70°C | IEC 60115-1 4.25 | 70±2°C at RCWV(or Umax., whichever less) for 1,000 Hr.(1.5 Hr.on,0.5 Hr. off) | ±5.0%+0.05Ω |
| Temperature Cycling | IEC 60115-1 4.19 | ➔ -55°C ➔ Room Temp. ➔ +155°C Room Temp.(5 cycles) | ±2.0%+0.05Ω |
| Resistance to Soldering Heat | IEC 60115-1 4.18 | 260±3°C for 10±1 Sec., immersed to a point 3±0.5mm from the body | ±1.0%+0.05Ω |

Note:

RCWV (Rated Continuous Working Voltage):

The DC or AC (rms) continuous working voltage corresponding to the rated power is determined by the following formula:

$$V = \sqrt{P \times R}$$

or max. working voltage whichever is less

Where

V=Continuous rated DC or AC (rms) working voltage (V)

P=Rated power (W)

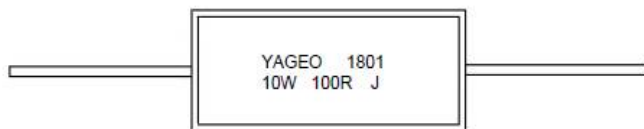
R=Resistance value (Ω)

BULK PACKING

Unit: Piece

| Normal | Non-Inductive | PACKAGE | Quantity |
|--------|---------------|---------|----------|
| SQP200 | NSP200 | Bulk | 1,400 |
| SQP300 | NSP300 | Bulk | 1,000 |
| SQP500 | NSP500 | Bulk | 900 |
| SQP700 | NSP700 | Bulk | 600 |
| SQP10A | NSP10A | Bulk | 500 |
| SQP15A | NSP15A | Bulk | 360 |
| SQP20A | NSP20A | Bulk | 50 |
| SQP25A | NSP25A | Bulk | 50 |
| SQP30A | NSP30A | Bulk | 50 |
| SQP40A | NSP40A | Bulk | 50 |

MARKING



Example:

- | | |
|-------|----------------|
| YAGEO | = Brand |
| 1801 | = Date code |
| 10W | = Power rating |
| 100R | = Resistance |
| J | = Tolerance |

REVISION HISTORY

| REVISION | DATE | CHANGE NOTIFICATION | DESCRIPTION |
|-----------|-------------|---------------------|-------------------------------------|
| Version 0 | Aug.2, 2021 | - | - First issue of this specification |

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