

Cement Resistors

Axial Lead Type

Normal Style [SQP Series]
Non-Inductive Style [NSP Series]



INTRODUCTION

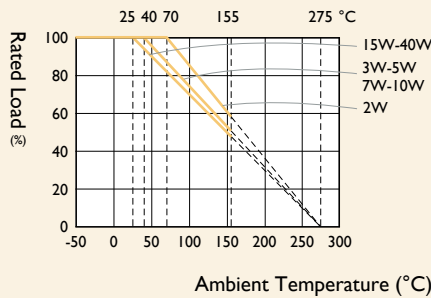
The materials used and the construction techniques ensure excellent flame resistance, arc resistance and moisture resistance as well as self-extinguishing capabilities. They will withstand the most rigorous loading test.

As resistors in radio and television receivers, hazardous conditions such as smoking and redheat can be completely prevented by the proper choice of power resistors.

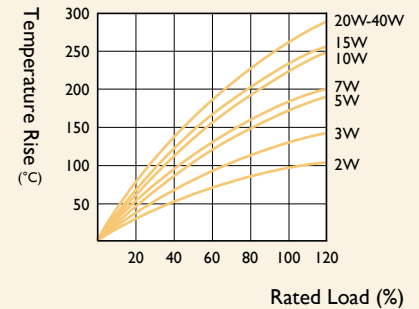
FEATURES

| | |
|----------------------|--|
| Power Rating | 2W, 3W, 5W, 7W, 10W, 15W, 20W, 25W, 30W, 40W |
| Resistance Tolerance | ±5% |
| T.C.R. | ±300ppm/°C |

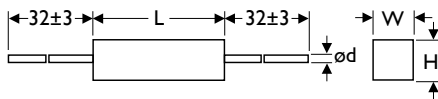
DERATING CURVE



TEMPERATURE RISE



DIMENSIONS



Unit: mm

| STYLE | | DIMENSION | | | |
|--------|---------------|-----------|----------|----------|-----------|
| Normal | Non-Inductive | L | W | H | ød |
| 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 |
| 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 | 17.0±1.5 | 0.8±0.05 |
| SQP40A | NSP40A | 90±5.0 | 19.0±1.5 | 18.0±1.5 | 0.8±0.05 |

ELECTRICAL CHARACTERISTICS

NORMAL STYLE

| STYLE | SQP200 | SQP300 | SQP500 | SQP700 | SQP10A | SQP15A | SQP20A | SQP25A | SQP30A | SQP40A |
|-------------------------------------|-----------------|------------|-------------|-------------|-------------|-------------|-------------|--------|--------|--------|
| Power Rating at 25°C | | | | | | 15W | 20W | 25W | 30W | 40W |
| Power Rating at 40°C | | 3W | 5W | 7W | 10W | | | | | |
| Power Rating at 70°C | 2W | | | | | | | | | |
| Maximum Working Voltage | 250V | 350V | | 500V | | | | 1,000V | | |
| Maximum Overload Voltage | 500V | 700V | | 1,000V | | | | 2,000V | | |
| Voltage Proof on Insulation | 500V | 700V | | 1,000V | | | | 2,000V | | |
| Resistance Range (Wirewound) | 0.1Ω - 36Ω | 0.1Ω - 68Ω | 0.1Ω - 130Ω | 0.1Ω - 330Ω | 0.1Ω - 510Ω | 0.1Ω - 680Ω | 0.15Ω - 1KΩ | | | |
| Resistance Range (Metal Oxide Film) | 39Ω - 1MΩ | 75Ω - 1MΩ | 150Ω - 1MΩ | 360Ω - 1MΩ | 560Ω - 1MΩ | 750Ω - 1MΩ | 1.2KΩ - 1MΩ | | | |
| Operating Temp. Range | -55°C to +155°C | | | | | | | | | |
| Temperature Coefficient | ±300ppm/°C | | | | | | | | | |

NON-INDUCTIVE STYLE

| STYLE | NSP200 | NSP300 | NSP500 | NSP700 | NSP10A | NSP15A | NSP20A | NSP25A | NSP30A | NSP40A |
|------------------------------|---------------------|------------|------------|-------------|--------------|--------------|--------------|--------|--------|--------|
| Power Rating at 25°C | | | | | | 15W | 20W | 25W | 30W | 40W |
| Power Rating at 40°C | | 3W | 5W | 7W | 10W | | | | | |
| Power Rating at 70°C | 2W | | | | | | | | | |
| Maximum Working Voltage | $\sqrt{P \times R}$ | | | | | | | | | |
| Voltage Proof on Insulation | 500V | 700V | | 1,000V | | | | 2,000V | | |
| Resistance Range (Wirewound) | 0.08Ω - 10Ω | 0.1Ω - 30Ω | 0.1Ω - 40Ω | 0.15Ω - 65Ω | 0.25Ω - 100Ω | 0.25Ω - 120Ω | 0.36Ω - 160Ω | | | |
| Operating Temp. Range | -55°C to +155°C | | | | | | | | | |
| Temperature Coefficient | ±300ppm/°C | | | | | | | | | |

Note: Special value is available on request

ENVIRONMENTAL CHARACTERISTICS

| PERFORMANCE TEST | TEST METHOD | | APPRAISE |
|-------------------------------|------------------|--|---|
| Short Time Overload | IEC 60115-1 4.13 | 2.5 times RCWV for 5 Sec. | ±2.0%+0.05Ω |
| Voltage Proof on Insulation | IEC 60115-1 4.7 | in V-block for 60 Sec., test voltage by type | By type |
| Temperature Coefficient | IEC 60115-1 4.8 | -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 | 235±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) |
| 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 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: Rated Continuous Working Voltage (RCWV) = $\sqrt{\text{Power Rating} \times \text{Resistance Value}}$ or Max. working voltage listed above, whichever less.

Revision: 201304



EXPLANATIONS OF ORDERING CODE

| MFR | -12 | F | T | F | 52- | 100R |
|---|--|--|---|---|---|--|
| Code 1 - 3 Series Name See Index | Code 4 - 6 Power Rating -05 = \varnothing d0.5mm -06 = \varnothing d0.6mm -07 = \varnothing d0.7mm -08 = \varnothing d0.8mm -10 = \varnothing d1.0mm -14 = \varnothing d1.4mm -12 = 1/6W -25 = 1/4W 25S = 1/4WS -50 = 1/2W 50S = 1/2WS 100 = 1W 1WS = 1WS 200 = 2W 2WS = 2WS 204 = 0.4W 207 = 0.6W 300 = 3W 3WS = 3WS 3WM = 3WM 400 = 4W 500 = 5W 5WS = 5WS 5SS = 5WSS 700 = 7W 7WS = 7WS 10A = 10W 20A = 20W 30A = 30W 40A = 40W 50A = 50W 10S = 10WS 15A = 15W 25A = 25W 10B = 100W 25B = 250W | Code 7 Tolerance P = ± 0.02 % A = ± 0.05 % B = ± 0.1 % C = ± 0.25 % D = ± 0.5 % F = ± 1 % G = ± 2 % J = ± 5 % K = ± 10 % - = Base on Spec. | Code 8 Packing Style T = Tape/Box R = Tape/Reel B = Bulk | Code 9 Temperature Coefficient of Resistance - = Base on Spec. A = ± 5 ppm/ $^{\circ}$ C B = ± 10 ppm/ $^{\circ}$ C C = ± 15 ppm/ $^{\circ}$ C S = ± 20 ppm/ $^{\circ}$ C D = ± 25 ppm/ $^{\circ}$ C E = ± 50 ppm/ $^{\circ}$ C F = ± 100 ppm/ $^{\circ}$ C G = ± 200 ppm/ $^{\circ}$ C H = ± 250 ppm/ $^{\circ}$ C I = ± 300 ppm/ $^{\circ}$ C J = ± 350 ppm/ $^{\circ}$ C | Code 10 - 12 Forming Type 26- = 26mm 52- = 52.4mm 73- = 73mm 81- = 81mm 91- = 91mm F = F Type FK = FK Type FKK = FKK Type FFK = F-form Kink M = M-Type Forming MB = M-form W/flat MT = MT Type Forming MR = MR Type AV = AVIsert PN = PANAsert | Code 13 - 17 Resistance Value 0R1 = 0.1 100R = 100 10K = 10,000 10M = 10,000,000 |

EXCEPTION:

• Cement series:

<Code 8>: Special packing style code

B: Bulk with wirewound or metal oxide sub-assembly for resistance value

W: Bulk with ceramic based wirewound sub-assembly for resistance value

M: Bulk with metal oxide sub-assembly for resistance value

F: Bulk with Fiberglass based wirewound sub-assembly for resistance value

<Code 10-12>: Without forming code

Example: **SQP500JB-10R**

• JPW series:

<Code 13-17>: without resistance value code

Example: **JPW-06-T-52-**

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