

Ratings

Rated power	The maximum power that can be applied continuously at or below the specified ambient temperature (see the table below). It also applies to the other characteristics. When the ambient temperature exceeds the specified temperature, the power is derated according to the power derating curve (Fig. 1).
Rated voltage	The DC or AC voltage corresponding to the rated power: $E = \sqrt{P \times R}$ E: rated voltage (V); P: rated power (W); R: nominal resistance (Ω). If the voltage obtained from the formula exceeds the maximum continuous working voltage, the maximum continuous working voltage is the rated voltage. ⑥
Resistance	The nominal resistance value (indicated on the resistor), in Ω or KΩ.
Applicable temperature range	-30°C ~ +155°C ⑦

Rated power	W ⑧
Ambient temperature	70°C

On the original form the box for 70°C is ticked;
the box for 25°C is not.

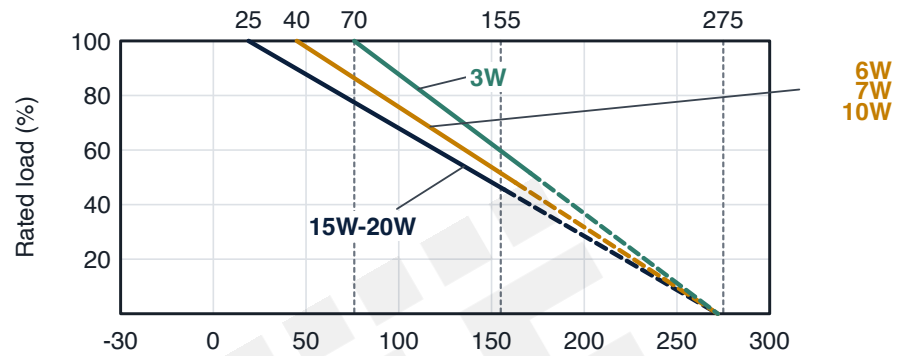


Fig. 1 Power derating curve ⑨

Performance specification

Mechanical characteristics

Item	Test method	Requirement
Terminal solderability ⑩	Dip the terminal into flux up to 7mm from the end for 5 to 10 seconds. Adjust the solder temperature to 230±5°C and wipe the dross and burned flux off the molten solder. Then dip the terminal up to 5mm from the end for 3±0.5 seconds, pull it out within 25.4±6.4 seconds, let it cool in air and wash the flux away.	After removal of the flux: (a) at least 95% of the terminal is soldered, with a clean and smooth surface; (b) pin holes need not be concentrated in one place, but their total area shall not exceed 10%.
Terminal strength: (a) stress	Fix the resistor by one terminal and apply a load of up to 4.5 kg directly, in the direction of the fixed terminal.	No abnormality.
Terminal strength: (b) bend	Apply a load of 500 g to the terminal from any direction for up to 60 seconds.	Bending angle within 5 degrees; no abnormality.

Non-flammability

Item	Test method	Requirement
Burn test (UL-492, item 278) ⑪	Apply the test flame to the resistor for 15 seconds and remove it; within about 10 seconds, before the heat has dissipated, apply the flame again for 15 seconds. Repeat 5 times.	After the cycles, no damage to the appearance.
Overload test	Apply 120% of the rated power for 1 minute.	No smell and no smoke.

Electrical performance

Item	Test method	Requirement
Temperature coefficient ⑫	Keep the resistor at each stage temperature (see the table below) for about 30 to 40 min. and measure the resistance. Calculate the temperature coefficient: $TCR = (R - R_0) / R_0 \times 1 / (T - T_0) \times 10^6$ (PPM/°C) R_0 : resistance (Ω) at the base temperature (2nd stage); R: resistance at each test temperature stage; T_0 : base temperature (2nd stage); T: test temperature (°C).	Within ±260 ppm in all stages.
Short-time overload ⑬	Apply 10 times the rated power (W) to the resistor for 5 seconds, then leave it at room conditions for 30 min.	No flame or charring and no change in mechanical appearance; resistance change within (2%+0.05Ω) ⑬.
Temperature sensitivity (normal state) ⑭	At a constant temperature of 40±2°C and a constant relative humidity of 90~95%, connect the resistor (terminals) as the anode and a metal plate as the cathode, and apply 100V DC for 1,000 hours.	Resistance change within 3%±0.05Ω ⑬.
Durability (rated load)	In a constant-temperature chamber at 70±3°C (15W and above: 25±3°C ⑮), apply the rated voltage for 1.5 hours and disconnect for 0.5 hour, cycling for 1,000 hours; then leave the resistor at room conditions with no load for 1 hour.	Resistance change within 3%±0.05Ω ⑬; no marked change in appearance.
Durability (humidity)	At a constant temperature of 40±2°C and a relative humidity of 90~95%, apply the rated DC voltage for 1.5 hours and disconnect for 0.5 hour, cycling for 1,000 hours; then return the resistor to room conditions with no load for 1 hour.	Resistance change within 3%±0.05Ω ⑬; no marked change in appearance.
Thermal shock	Apply the rated power at room temperature for 30 min.; then, within 8~12 seconds, bring the resistor into air at -30±5°C for 15 min. or longer. Return it to room temperature and keep it there for 1 hour.	Resistance change within 2%±0.05Ω ⑬; no marked change in appearance.
Insulation resistance ⑯	Put the resistor on a flat metal plate and measure between one terminal and the plate at 500V DC.	Over 10,000MΩ.
Withstand voltage	With the resistor set up as for insulation resistance, apply a 1,000V AC sine wave between the terminals and the plate for 1 min.	No damage.
Resistance to soldering heat ⑰	Dip the terminals up to 5.0±0.8mm from the end under the time and temperature conditions of the table below, then leave the resistor at normal temperature for 24 hours.	Resistance change within 2%±0.05Ω ⑬; no damage to the appearance.
Rated load	Apply the rated power to the resistor for 30 min., then keep it at no load for 2 hours.	Resistance change within 2%±0.05Ω ⑬.
Heat resistance	Keep the resistor at 275°C constantly for 2 hours.	No marked change in appearance.

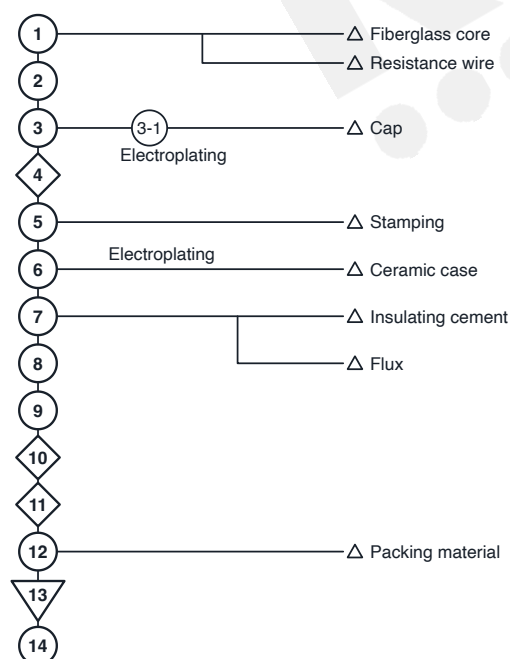
Temperature coefficient: test stages (unit: °C)

Stage	1st	2nd	3rd	4th	5th
Temperature	-30±2	25±2	65±2	105±2	180±2

Resistance to soldering heat: conditions

Item	Soldering temp. (°C)	Dip time (seconds)
Auto soldering	260±5°C	10±1 sec
Manual soldering	350±10°C	3±1 sec

Production flow chart



- 1 Fiberglass core winding
- 2 Resistor element cutting
- 3 Terminal capping
- 4 Semi-finished product inspection ⑱
- 5 Stamping
- 6 Assembly into ceramic case
- 7 Cement filling
- 8 Natural drying
- 9 Baking
- 10 100% resistance check
- 11 Appearance inspection
- 12 Packing
- 13 Storage
- 14 Shipment (FQC check)

Notes

- ① Scope: the English text of the original calls the product a “cermet type” wirewound resistor and does not name the applications; the Chinese text (printed here) and the page titles call it a cement type — subject to manufacturer confirmation.
- ② Product code: the ordering example begins with “SQP”, while the product code list gives the code “CR-L” for SQP cement resistors and the dimension table names the style “SQP-L” — subject to manufacturer confirmation.
- ③ Rated power codes are printed as shown: “12 = 1/6W” appears twice, the example code “25” stands for 1/4W, and no codes are given for 3W, 5WA, 10W, 15W, 20W, 25W, 30W and 40W, while the dimension table covers 1W to 40W — subject to manufacturer confirmation.
- ④ Packing: tape/box (T52, T73) and tape reel (R) codes are listed, but no taping data are given for this series — subject to manufacturer confirmation.
- ⑤ Total characters and resistance value: the coding examples are printed as shown and not explained further; “10K=1000=4” equates 10K with 1000, while “10K = 10,000” equates it with 10,000 — subject to manufacturer confirmation.
- ⑥ Rated voltage: the original refers to a maximum continuous working voltage but gives no value; it has no table of working voltages or resistance ranges for this series — subject to manufacturer confirmation.
- ⑦ Applicable temperature range: printed as -30°C ~ +155°C. On the derating curve the left end of the bottom scale is labelled “-30”, although the 50°C grid spacing places it at -50, and the curves continue beyond 155°C (dashed) down to 0% near the 275 mark — subject to manufacturer confirmation.
- ⑧ The rated-power table prints the unit “W” without a value and ticks 70°C as the ambient temperature, while on the derating curve the 6W / 7W / 10W and 15W-20W curves start to derate below 70°C (at the marks 40 and 25) — subject to manufacturer confirmation.
- ⑨ Derating curve, reproduced as printed: the curves are labelled 3W, 6W / 7W / 10W and 15W-20W; the “6” is barely legible and may be a 5 (the series has 5W and 5WA, but no 6W), and no curve is labelled for 1W, 2W, 5WA, 25W, 30W or 40W. The marks 25, 40 and 70 above the chart do not line up with 25, 40 and 70 of the bottom scale — subject to manufacturer confirmation.
- ⑩ Terminal solderability: the procedure is printed from the English text; the Chinese text makes the second 5mm dip in flux and lets the terminal cool naturally for 25.4±6.4 seconds. Requirement (a) is printed from the Chinese text; the English text reads “terminal should be new smooth” and gives no 95% — subject to manufacturer confirmation.
- ⑪ Burn test: printed from the Chinese text. The English text removes the flame for 15 seconds between applications, requires the heat to be dismissed within 10 seconds after the full cycle and requires no colour change or crack breakage — subject to manufacturer confirmation.
- ⑫ Temperature coefficient: the measuring time is 30 to 40 min. in the English text and 30 to 45 minutes in the Chinese text; the English is printed — subject to manufacturer confirmation.
- ⑬ Resistance-change limits differ between the Chinese and English texts (Chinese / English): short-time overload 2%±0.05 / (2%±0.05Ω); temperature sensitivity 3% / 3%±0.05Ω; durability (humidity) 3% / 3%±0.05; thermal shock 2% / 2%±0.05; rated load 2%±0.05Ω / ±2% 0.05 OHM. The English is printed, except for rated load; for durability (rated load) and resistance to soldering heat the English gives no limit and the Chinese is printed — subject to manufacturer confirmation.
- ⑭ This test is headed “temperature sensitivity (normal state)” in both languages, although its conditions describe a humidity test with DC bias — subject to manufacturer confirmation.
- ⑮ Durability (rated load): the Chinese text applies 25±3°C to 15W and above (printed here), the English text to ratings over 15W — subject to manufacturer confirmation.
- ⑯ Insulation resistance: the English text gives over 10,000MΩ (printed here), the Chinese text 1000MΩ or more — subject to manufacturer confirmation.
- ⑰ Resistance to soldering heat: printed from the Chinese text; the English text ends “for 24” without a unit, gives no resistance-change limit and refers to “Table I” (the rated-power table) for the soldering conditions — subject to manufacturer confirmation.
- ⑱ Short-time overload: the Chinese text specifies ten times the rated power (W), which is printed here; the English text reads ‘APPLY VOLTAGE 10 TIMES OVER RATING POWER’ — subject to manufacturer confirmation.
- ⑲ Production flow, step 4: the Chinese text of the original says ‘resistance-value inspection’, while the English text says ‘Semi-products Inspection’. The English wording is printed here as ‘Semi-finished product inspection’ — subject to manufacturer confirmation.