



APPROVAL SHEET

Client	
Description	CR-M(SQM)
Specification	
Part No	
Remark	

2-2 (RATING VOLTAGE)

RATING VOLTAGE MEANS THE VOLTAGE RESTRICTED BY VARIOUS DIRECT CURRENT OR ALTERNATIVE CURRENT UNDER THE RATING POWER

FORMULA $E = \sqrt{P * R}$

E: RATING VOLTAGE (V)

P: RATING POWER (W)

R: NOMINAL RESISTANCE (Ω)

2-3 (RESISTANCE)

RESISTANCE VALUE MEANS NOMINAL RESISTANCE VALUE
(INDICATE ON RESISTOR)

2-4 (APPLICABLE TEMPERATURE RANGE)

-30 °C ~ + 155 °C

3 (MECHANICAL CHARACTERISTIC)

3-1 (TERMINAL SOLDER ABILITY)

DIP THE TERMINAL WITHIN 7mm FROM THE EDGE INTO FLUX FOR 5 TO 10 SECONDS THEN ADJUSTING THE SOLDERING TEMPERATURE TO 230 ±5°C, WIPE THE SOLDERING DREGS AND BURNED FLUX FROM THE MELTED SOLDER, NEXT DIP THE TERMINAL 5mm FROM THE EDGE, DIP TIME 3±0.5 SECONDS. THEN PULL IT OUT WITHIN 25.4±6.4 SECONDS, COOL IT IN AIR THEN WASH THE FLUX AWAY. THE LEAD WIRE SHOULD MEET FOLLOWING CONDITIONS AFTER REMOVE THE FLUX.

(a) TERMINALS SHOULD BE NEW SMOOTH.

(b) PIN HOLE DOES NOT NEED TO CONCENTRATE IN ONE PLACE, BUT THE TOTAL AREA SHOULD NOT OVER 10%

3-2 (TERMINAL INTENSITY)

(a) (STRESS)

ABNORMAL PHENOMENON WILL NOT OCCUR WITHIN 4.5 KG NET WEIGHT FROM THE DIRECTION OF THE FIXING TERMINAL OF THE RESISTOR.



BENDING PHENOMENON WILL NOT OCCUR WITHIN 500 g NET WEIGHT FROM RANDOM DIRECTION WITHIN 60 SECONDS THE BENDING ANGLE WILL BE WITHIN 5 DEGREE.

4 (NON-INFLAMMABILITY)

4-1(BURN TEST)

PUT RESISTOR OVER TESTING FLAME FOR 15 SECONDS, AND THEN REMOVE THE FLAME OR ANOTHER 15 SECONDS, THUS CYCLE 5 TIMES AFTER THE TEST. HEAT SHOULD BE DISMISSED WITHIN 10 SECONDS AFTER COMPLETION OF FULL CYCLE TEST, NO COLOUR CHANGE OR CRACK BREAKAGE.

4-2 (OVERLOADING TEST)

APPLY 120% OF RATING POWER, LASTING 1 MINUTE NO SMELL AND NO SMOKE

5. (ELECTRICAL CHARACTERISTIC)

5-1 TEMPERATURE RESISTANCE (PLEASE REFER TO TABLE 5-1)

KEEP THE RESISTOR IN THE EVERY STAGE TEMPERATURE AROUND 30 TO 40 MIN. BY USING THE FORMULA BELOW.

AND ALSO THE TEMP. RESISEANCE COEFFICIENT WILL BE CALCULATED.

* TEMPERATURE RESISRANCE COEFFICIENT

$$=(R - R_0 / R_0) \times (1/T - T_0) \times 10^6 \quad (\text{PPM}/^\circ\text{C})$$

R₀: RESISTANCE (Ω) IN BASE TEMP.(2nd STAGE).

R: RESISTANCE IN EVERY TESTING TEMP.STAGE.

T₀: BASE TEMP. (2nd STAGE).

T: TESTING TEMP. (°C).

THE TEMP.COEFFICIENT SHOULD BE WITHIN ± 260 ppm IN ALL STAGES.

5-1 (Table 5-1) °C

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

5-2 (TRANSIENT OVERLOAD)

APPLY VOLTAGE 10 TIMES OVER RATING POWER FOR 5 SECONDS, NO CHANGE IN MECHANICAL APPEARANCE THEN PUT IN ROOM CONDITION FOR 30 MIN. THE VARIANCE OF VALUE SHOULD BE WITHIN $(2\% + 0.05 \Omega)$.

5-3 (TEMPERATURE SENSITIVITY (NORMAL STATE))

PUT RESISTOR IN THE STATE OF TEMP. $40 \pm 2^\circ\text{C}$ CONSTANT, RELATIVE HUMIDITY 90~95% CONSTANT, CONNECT RESISTOR AS ANODE, CONNECT METAL PLATE AS CATHODE, APPLY 100V DC FOR 1,000 HOURS, THE VARIANCE OF VALUE SHOULD BE WITHIN $3\% \pm 0.05 \Omega$.

5-4 (DURABILITY (RATING LOAD))

UNDER CONSTANT TEMP. $70 \pm 3^\circ\text{C}$. (IN CASE OVER 15W, $25 \pm 3^\circ\text{C}$), APPLYING RATING VOLTAGE FOR 1.5 HOURS, THEN DISCONNECTING FOR 0.5 HOUR, RECYCLING FOR 1,000 HOURS, PUT RESISTOR IN ROOM CONDITION AND ZERO LOADING FOR 1 HOUR THE VARIANCE OF VALUE SHALL BE WITHIN Ω . NO PROMINENT CHANGES IN APPEARANCE.

5-5 DURABILITY (HUMIDITY)

CONSTANT TEMP. $40 \pm 2^\circ\text{C}$, RELATIVE HUMIDITY 90~95%, APPLYING O F RATING VOLTAGE) DC FOR 1.5 HOUR, DISCONNECT FOR 0.5 HOUR, CYCLING FOR 1,000 HOURS THEN RETURNED TO ROOM CONDITION AND ZERO LOADING FOR I HOUR, THE VARIANCE OF VALUE SHOULD BE WITHIN $3\% \pm 0.05$. NO PROMINENT CHANGES IN APPEARANCE.

5-6 (THERMAL SHOCK)

APPLY RATING POWER IN ROOM TEMP.FOR 30 MIN. BRING RESISTOR IMMEDIATELY IN 8~12 SECONDS TO THE AIR OF $-30\pm 5^{\circ}\text{C}$ OR OVER 15 MIN . THEN RETURN TO ROOM TEMP. AND KEEP IT FOR 1 HOUR. THE VARIANCE OF VALUE SHOULD BE WITHIN $2\%\pm 0.05$. NO PROMINENT CHANGES IN APPEARANCE.

5-7 (ISULATION RESISTANCE)

PUT RESISTOR ON FLAT METAL PLATE, CONNECTING BETWEEN ONE OF TERMINAL AND THE PLATE,THST UNDER 500V DC ,THE VALUE SHALL OVER 10,000 MEG Ω .

5-8 (VOLTAGE DURABILITY)

PUT RESISTOR IN THE SAME STATE WITH ITEM 5-7, APPLYING AC SIN WAVE 1,000V FOR 1 MIN. IN BETWEEN TERMINAL AND PLATE. NO DAMAGE OCCURS.

5-9 (SOLDERING TEMP. DURABILITY)

DIP THE TERMINAL OF THE RESISROR $5.0\pm 0.8\text{mm}$ FROM THE EDGE ACCORDING TO THE CONDITIONS STATED IN TABLE I, THE PUT IN NORMAL TEMP. FOR 24 NO PROMINENT CHANGES IN APPEARANCE.

(CONDITION) \ (ITEM)	SOLDERING TEMP. $^{\circ}\text{C}$	DIP TIME SECONDS
(AUTO SOLDERING)	$260\pm 5^{\circ}\text{C}$	10 ± 1 (SEC)
(MANUAL SOLDERING)	$350\pm 10^{\circ}\text{C}$	3 ± 1 (SEC)

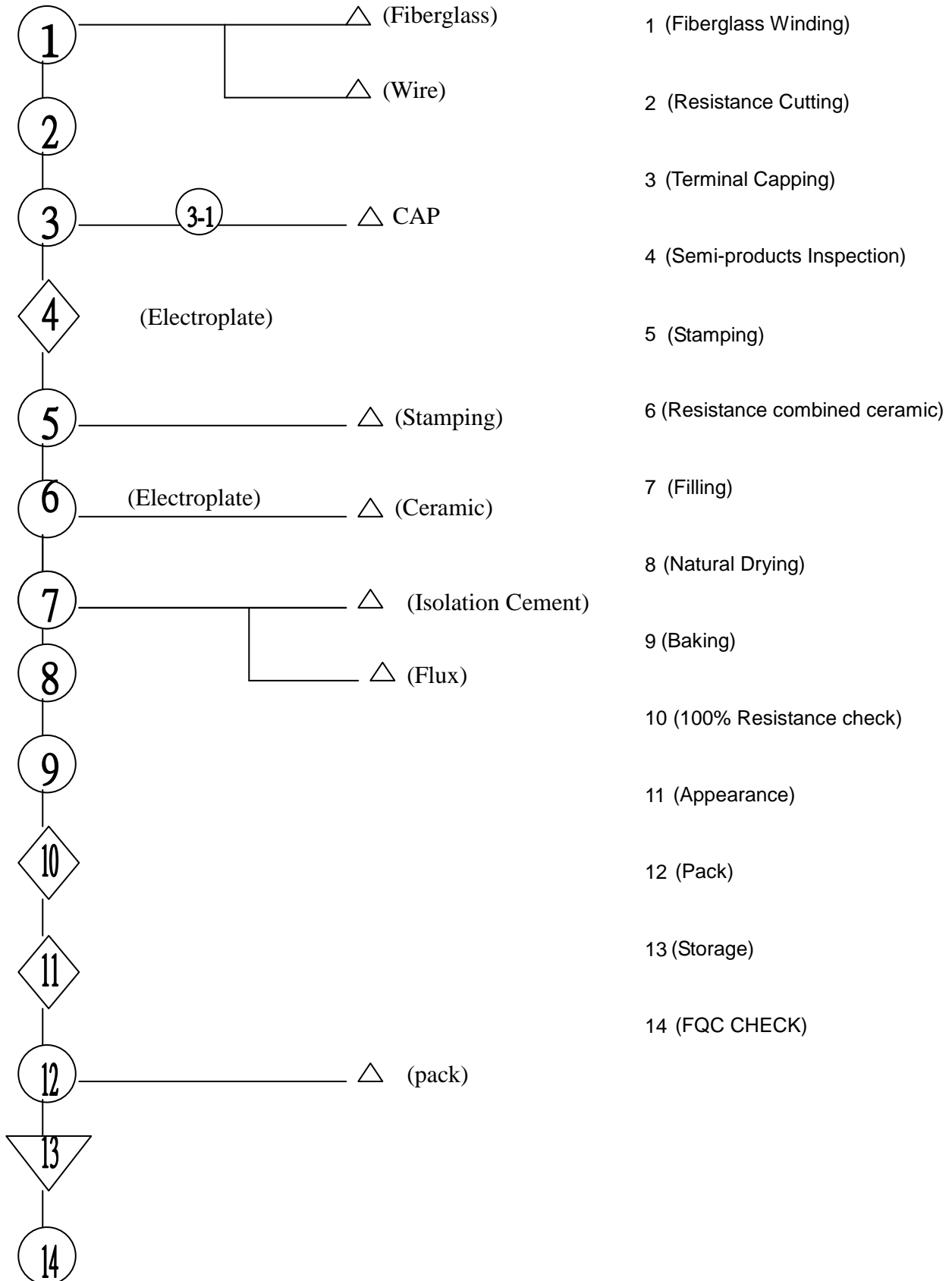
5-10 (RATING LOAD)

APPLY RATING POWER TO RESISTOR FOR 30 MIN. THE VARIANCE OF RESISROR VALUE,AFTER 2 HOURS IN ZERO LOAD CONDITION,SHOULD BE WITHIN $\pm 2\%$ 0.05 OHM.

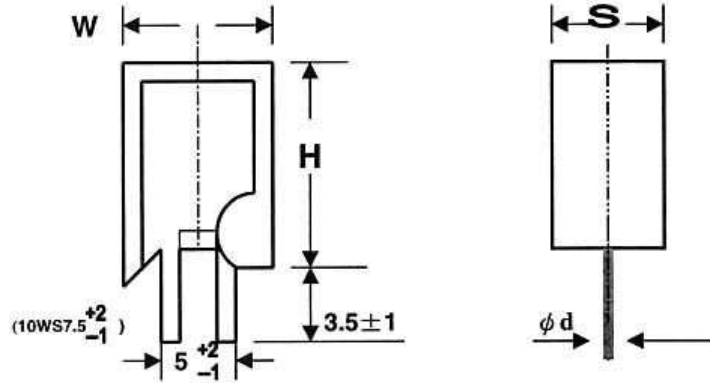
5-11 (TEMPERATURE DURABILITY)

PUT RESISTOR IN 275°C CONSTANTLY FOR 2 HOURS. NO PROMINENT CHANGES IN APPEARANCE.

PRODUCTION FLOW CHART



SQM Series Cement Wire Wound Resistors



DIMENSIONS (mm) :

STYLE	DIMENSION (mm)			
	H	W	S	$\phi d \pm 1.0$
SQM				
2W	20.5±1.0	11.5±1.0	7.5±1.0	0.6
3W	25±1.0	12±1.0	8.5±1.0	0.8
5W	25±1.0	13±1.0	9.5±1.0	0.8
7W	38±1.5	13±1.0	9.5±1.0	0.8
10W	52±2.0	13±1.0	9.5±1.0	0.8
10WA	36±2.0	16±1.0	11.5±1.0	0.8

ELECTRICAL CHARACTERISTICS:

Style \ Power Rating 70°C	SQM-2W	SQM-3W	SQM-5W	SQM-7W	SQM-10W
Operating Temp. Range	-55°C ~ +155°C				
Max. Working Voltage	250V	350V	350V	500V	500V
Max. Overload Voltage	500V	700V	700V	1000V	1000V
Dielectric Withstanding Voltage (AC)	500V	700V	700V	1000V	1000V
Value Range ±5% (Ceramic core)	0.1 ~47Ω	0.1 ~100Ω	0.1 ~180Ω	0.1 ~470Ω	0.1 ~680Ω
Value Range ±5% (Metal Oxide Film)	48 ~100K	101 ~100K	180 ~100K	471 ~10K	681 ~10K
Temp. Coefficient	±300ppm/°C				