PART NO: PRW05WJ****B00	FILE NO.: SSL – 02 – 001

1. *SCOPE:*

THIS SPECIFICATION FOR APPROVE RELATES TO CEMENT FIXED RESISTORS MANUFACTURED BY ROYAL-PARTS' SPECIFICATION.

2. *TYPE DESIGNATION:*

THE TYPE DESIGNATION SHALL BE IN THE FOLLOWING FORM:

	PRW	5W	J	47Ω
(EX.)	TYPE	STYLE	RESISTANCE TOLERANCE	NOMINAL RESISTANCE

3. *RATINGS:*

RATINGS SHALL BE SHOWN IN THE TABLE 1

TABLE 1

TYPE	PRW
RATED POWER	5W
RESISTANCE RANGE	0.1Ω --- 100KΩ
RATED AMBIENT TEMP.	70℃
OPERATING TEMP. RANGE	-55℃ --- +155℃
RESISTANCE TOLERANCE	± 5%

3.1 *POWER RATING:*

RESISTORS SHALL HAVE A POWER RATING BASED ON CONTINUOUS FULL LOAD OPERATION AT AN AMBIENT TEMPERATURE OF 70°C.

3.2 *VOLTAGE RATING:*

RESISTORS SHALL HAVE A RATED DIRECT-CURRENT (DC) CONTINUOUS WORKING VOLTAGE OR AN APPROXIMATE SINE-WAVE ROOT-MEAN-SQUARE (RMS) ALTERNATING-CURRENT (AC) CONTINUOUS WORKING VOLTAGE AT COMMERCIAL-LINE FREQUENCY AND WAVEFORM CORRESPONDING TO THE POWER RATING, AS DETERMINED FROM THE FOLLOWING FORMULA:

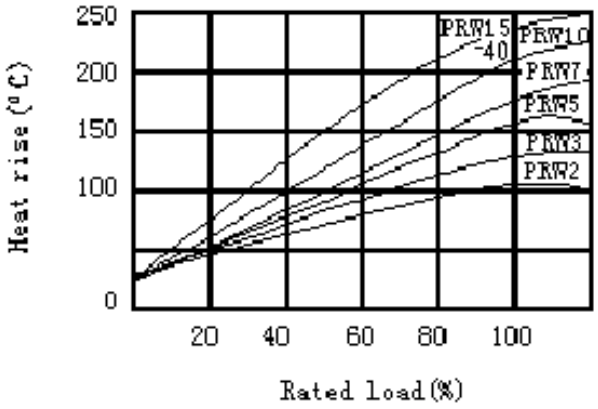
$$RCWV = \sqrt{P \times R}$$

WHERE: RCWV = RATED DC OR RMS AC CONTINUOUS WORKING VOLTAGE AT COMMERCIAL-LINE FREQUENCY AND WAVEFORM (VOLT.)

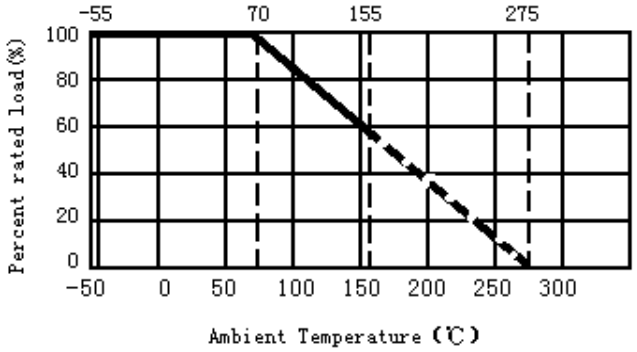
P = POWER RATING (WATT.)

R= NOMINAL RESISTANCE (OHM)

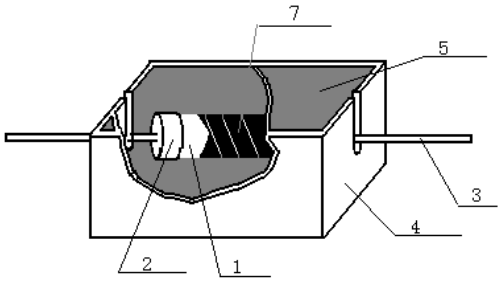
HEAT RISE CHART:

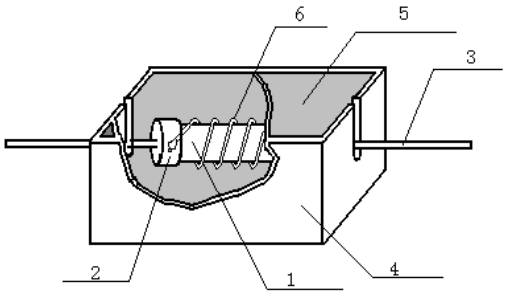


DERATING CURVE:



4. *CONSTRUCTION:*



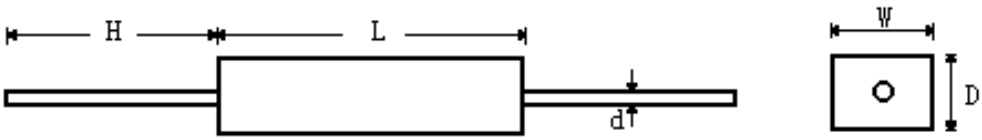


NO.	NAME	MATERIAL MAKER	MATERIAL GENERIC NAME	REMARK
1	BODY	MEIWA (JAPAN)	Al_2O_3	
2	CAP	MAKINO (TAIWAN)	TIN PLATED IRON	TIN 5% IRON 95%
3	LEAD	FORMIS (TAIWAN)	COPPER WIRE	
4	CERAMIC CASE	PAE-CHIN (TAIWAN)	Al_2O_3 Ca**O**	
5	FILLING MATERIALS	MINGSHENG (TAIWAN)	SiO_2	

CEMENT FIXED RESISTORS		
5. *CHARACTERISTIC:*		
CHARACTERISTIC	**LIMITS**	**TEST METHOD (JIS-C-5202)**
TEMPERATURE COEFFICIENT	<20Ω: ±400 PPM/°C; 20Ω: ± 350PPM/°C	5.2 NATURAL RESISTANCE CHANGE PER TEMP. DEGREE CENTIGRADE $\frac{R_2-R_1}{R_1(T_2-T_1)} \times 10^6$ (PPM/℃) R_1: RESISTANCE VALUE AT ROOM TEMP. (T_1) R_2: RESISTANCE VALUE AT ROOM TEMP. +100℃ (T_2) TEST PATTERN: ROOM TEMP., ROOM TEMP. +100℃
SHORT-TIME OVERLOAD	RESISTANCE CHANGE RATE IS:±(5%+0.05Ω) MAX. WITH NO EVIDENCE OF MECHANICAL DAMAGE.	5.5 PERMANENT RESISTANCE CHANGE AFTER THE APPLICATION OF A POTENTIAL OF 2.5 TIMES RCWV FOR 5 SECONDS.
DIELECTRIC WITHSTANDING VOLTAGE	NO EVIDENCE OF FLASHOVER MECHANICAL DAMAGE, ARCING OR INSULATION BREAK DOWN.	5.7 RESISTORS SHALL BE CLAMPED IN THE TROUGH OF A 90°METALLIC V-BLOCK AND SHALL BE TESTED AT AC POTENTIAL RESPECTIVELY SPECIFIED IN THE ABOVE LIST FOR 60+10/-0 SECONDS.
TERMINAL STRENGTH	NO EVIDENCE OF MECHANICAL DAMAGE	6.1 DIRECT LOAD: RESISTANCE TO A 2.5 Kg DIRECT LOAD FOR 10 SECONDS IN THE DIRECTION OF THE LONGITUDINAL AXIS OF THE TERMINAL LEADS. TWIST TEST: TERMINAL LEADS SHALL BE BENT THROUGH 90°AT A POINT OF ABOUT 6mm FROM THE BODY OF THE RESISTOR AND SHALL BE ROTATED THROUGH 360° ABOUT THE ORIGINAL AXIS OF THE BENT TERMINAL IN ALTERNATING DIRECTION FOR A TOTAL OF 3 ROTATIONS.
RESISTANCE TO SOLDERING HEAT	RESISTANCE CHANGE RATE IS:±(1%+0.05Ω) MAX. WITH NO EVIDENCE OF MECHANICAL DAMAGE.	6.4 PERMANENT RESISTANCE CHANGE WHEN LEADS IMMERSED TO 3.2 – 4.8 mm FROM THE BODY IN 350℃±10℃ SOLDER FOR 3±0.5 SECONDS.

<table>
<tr><th colspan="5">CEMENT FIXED RESISTORS</th></tr>
<tr><td colspan="5"></td></tr>
<tr><th>CHARACTERISTICS</th><th>LIMITS</th><th colspan="3">TEST METHODS</th></tr>
<tr><td>SOLDERABILITY</td><td>95% COVERAGE MIN.</td><td colspan="3">6.5 THE AREA COVERED WITH A NEW, SMOOTH, CLEAN, SHINY AND CONTINUOUS SURFACE FREE FROM CONCENTRATED PINHOLES.
TEST TEMP. OF SOLDER:235℃±5℃
DWELL TIME IN SOLDER: 3+0.5/-0 SECONDS.</td></tr>
<tr><td rowspan="5">TEMPERATURE CYCLING</td><td rowspan="5">RESISTANCE CHANGE RATE IS:±(2%+0.05Ω) MAX.. WITH NO EVIDENCE OF MECHANICAL DAMAGE.</td><td colspan="3">7.4 RESISTANCE CHANGE AFTER CONTINUOUS FIVE CYCLES FOR DUTY CYCLE SPECIFIED BELOW:</td></tr>
<tr><td>STEP</td><td>TEMPERATURE</td><td>TIME</td></tr>
<tr><td>1</td><td>-55℃ ± 3℃</td><td>30 MINS</td></tr>
<tr><td>2</td><td>ROOM TEMP.</td><td>10 – 15 MINS</td></tr>
<tr><td>3</td><td>+155℃ ± 2℃</td><td>30 MINS</td></tr>
<tr><td>HUMIDITY
(STEADY STATE)</td><td>RESISTANCE CHANGE RATE IS: ± (5%+0.05Ω) MAX. WITH NO EVIDENCE OF MECHANICAL DAMAGE.</td><td colspan="3">7.5 TEMPORARY RESISTANCE CHANGE AFTER A 240 HOURS EXPOSURE IN A HUMIDITY TEST CHAMBER CONTROLLED AT 40°C±2°C AND 90 TO 95% RELATIVE HUMIDITY.</td></tr>
<tr><td>LOAD LIFE IN HUMIDITY</td><td>FOR THE VALUES OF WIRE-WOUND RANGE,THE ΔR/R IS±5%.
FOR THE VALUES LESS THAN 100KΩ OF POWER FILM RANGE, THE ΔR/R IS± 5%.
FOR THE VALUES 100 KΩ OR MORE, THE ΔR/R IS± 10%.</td><td colspan="3">7.9 RESISTANCE CHANGE AFTER 1,000 HOURS OPERATING AT RCWV WITH DUTY CYCLE OF 1.5 HOURS “ON”,0.5 HOUR “OFF” IN A HUMIDITY TEST CHAMBER CONTROLLED AT 40℃±2℃ AND 90 TO 95% RELATIVE HUMIDITY.</td></tr>
<tr><td>LOAD LIFE</td><td>FOR THE VALUES OF WIRE-WOUND RANGE,THE ΔR/R IS±5%.
FOR THE VALUES LESS THAN 100KΩ OF POWER FILM RANGE, THE ΔR/R IS± 5%.
FOR THE VALUES 100 KΩ OR MORE, THE ΔR/R IS± 10%.</td><td colspan="3">7.10 PERMANENT RESISTANCE CHANGE AFTER 1,000 HOURS OPERATING AT RCWV WITH DUTY CYCLE OF 1.5 HOURS “ON”, 0.5 HOUR “OFF” AT 70℃±2℃ AMBIENT.</td></tr>
</table>

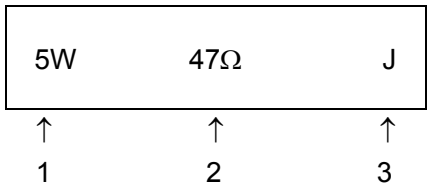
6. *DIMENSION:*



(UNIT: mm)

TYPE	W ± 1.0	D ± 1.0	L ± 1.0	d $^{+0.02}_{-0.05}$	H
5W	10.0	9.0	22.0	0.8	35.0 ± 5.0

7. *MARKING:*



CODE DESCRIPTION AND REGULATION:

1. WATTAGE RATING
2. NOMINAL RESISTANCE VALUE
3. RESISTANCE TOLERANCE . F : ± 1%
   G : ± 2%
   J : ± 5%
   K : ± 10%

COLOR OF MARKING:

(1) RED INK: WIRE-WOUND TYPE CEMENT FIXED RESISTORS

(2) BLACK INK: POWER FILM TYPE CEMENT FIXED RESISTORS

PART NUMBER SYSTEM

EXPLANATION OF PART NUMBER SYSTEM
(**CEMENT FIXED RESISTORS**)

ORDERING PROCEDURE (EXAMPLE: PRW 5W 5% 47Ω B/B):