

## HOW TO ORDER

KFR	25	B	J	2	100	
Product Code	RATED POWER		PACKING	Toleranc	No. of Total Character	Resistance Value
<b>KCF:</b> CARBON FILM RESISTOR <b>KMF:</b> METALFILM RESISTOR <b>KRSF:</b> METAL OXIDE FILM RESISTOR <b>FKNP:</b> KNP WIRE WOUND FUSIBLE RESISTOR <b>NKNP:</b> WIREWOUND RESISTORS(Non-Inductive) <b>KFR :</b> FUSIBLE RESISTOR <b>CR-M:</b> SQM CEMENT RESISTORS <b>CR-L:</b> SQP CEMENT RESISTORS	12	1/6W	T52 :TAPE/BOX T73: TAPE/BOX B: BULK R: TAPE REEL	F ±-1% J±-5%	100=10R=2	100=10R
	25	1/4W			100R=101=3	100R=101
	50	1/2W			10K=1000=4	10K = 10,000
	12	1/6W				
	125	1/8W				
	100	1W				
	200	2W				
	1WS	1WS				
	2WS	2WS				
	500	5W				
700	7W					

1、 **GENERAL INSTRUCTION:**

1-1 SCOPE

This specification applies to the Fusible Resistor made by PROAN Electronics Co., Ltd

2、 **NOMINAL RESISTANCE:**

The nominal resistance shall be the resistance marked on the resistor body and identified, as a rule, in units,  $\Omega$ ,  $K\Omega$ ,  $M\Omega$ .

3、 **NOMINAL RESISTANCE TOLERANCE.**

The nominal resistance tolerance is represented in one capital letter selected from G( $\pm 2\%$ ), J( $\pm 5\%$ ), K( $\pm 10\%$ ).

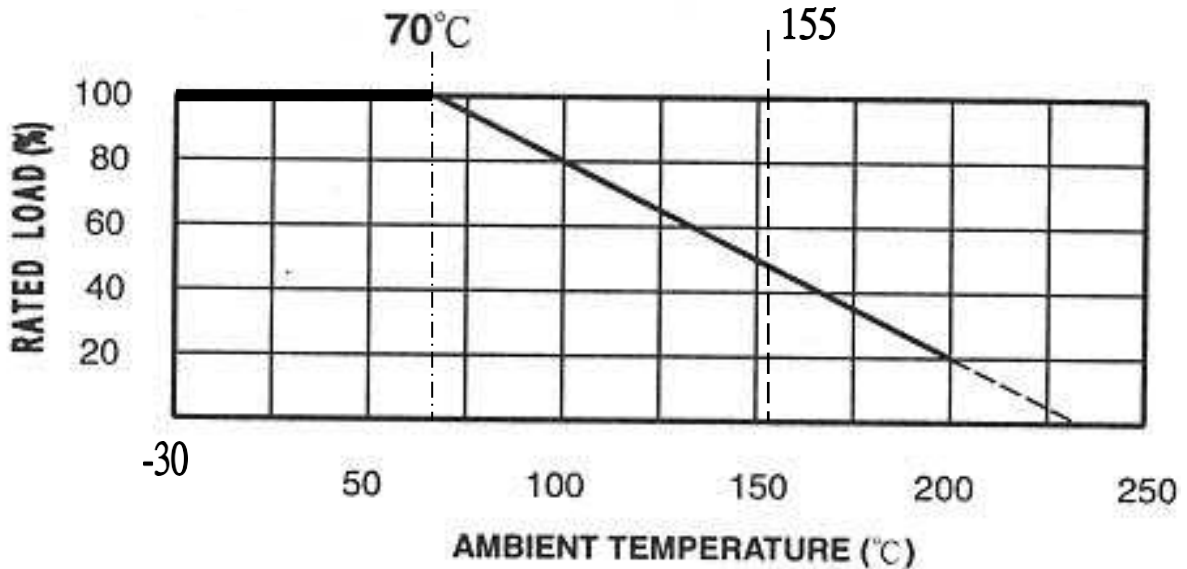
4、 **RATING:**

STYLE	MAX WORKING	MAX OVERLOAD	Dielectric Withstanding Voltage (AC)	RESISTANCE VALUE RANGE
FR1/4W	200V	250V	250V	0.1E——1K
FR1/2WS	250V	300V	300V	
FR1/2W	250V	300V	300V	
FR1WS	300V	350V	350V	
FR1W	300V	350V	350V	
FR2WS	350V	400V	500V	
FR2W	350V	400V	500V	
FR3WS	400V	500V	500V	
FR3W	400V	500V	500V	

4-1. POWER RATING

Power rating is defined as maximum power rating, continuously applied under ambient

ambient temperature exceeds 70°C, use chart 1.



4-2 .RATED VOLTAGE

Rated voltage is defined as the DC or AC (effective Value at commercial frequency example 50 C/S, 60 C/S) Voltage when rated power is applied and can be calculated

By the following EQUATION  $E = \sqrt{P \times R}$

E=RATED VOLTAGE

P=RATED POWER (WATTS)

R=NOMINAL RESISTANCE VALUE (OHM)

When the calculated rated voltage exceeds the Maximum usable voltage flue shown in CHART 1,the Maximum usable voltage is defined as the voltage According to the power-decreasing curve shown in CHART1.

4-3. POWER

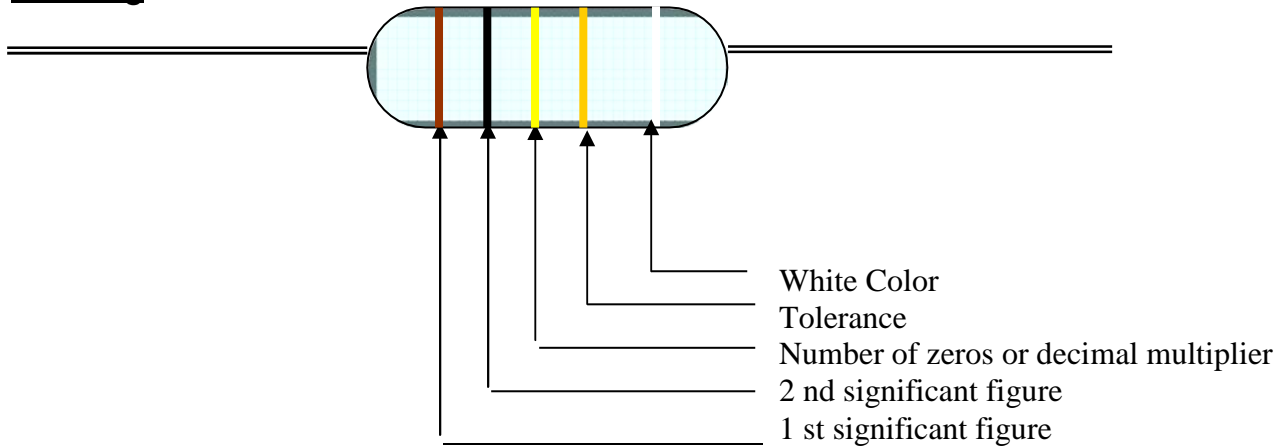
POWER	Fusing Time
	Maximum
16xwattage	1Min.
20	40sec.
24	30sec.
28	20sec.
32	15sec.

NOTES:

After voltage the variable rate of resistance in excess (over) 100 times is open; Operating Temper Range -30C,.. 155C.

ITEM (STANDARD)	PERFORMANCE AND/OR QUALITY ACCEPTANCE	TEST METHOD
Resistance value Vs temperature characteristics	±200PPM/°C	JIS-C-5202 5.2 Measure resistance (R <sub>0</sub> ohm) at room temperature (T <sub>0</sub> °C) Measure again the same at 100°C higher than room temperature $\frac{R - R_0}{R_0} \times \frac{1}{(T_0 + 100) - T_0} \text{ PPM} = \times 10^6$
Short time overload	The resistance variation shall be with in ± (2%+0.05ohm) and there shall be no mechanical breakage	JIS-C-5202 5.5 Apply DC voltage 2.5 times the rated voltage for 5 seconds. The leave at room temperature for 30 minutes then measure Max overload voltage 0.50W – 400V(DC)
Insulation resistance	10,000M ohm or more	JIS-C-5202 5.6 Lay the resistor on 90° angle metal V block, apply 100 V DC between resistor lead and V block for one Minute And measure
Voltage endurance	The resistance variation shall be with in ± (1%-0.05ohm) and there shall be no mechanical breakage	JIS-C-5202 5.7 Lay the resistor on the 90° angle metal V block and apply rated AC voltage for one minute. Test voltage
Terminal strength	Resistance variation shall be with in ± (1%+0.05ohm) also there shall be on mechanical breakage	Pull test: apply 2.5kg. force to the lead in the direction of lead axis for 30±5 seconds.
Heat resistively against soldering	Resistance variation shall be with in ± (1%+0.05ohm) also there shall be no mechanical breakage	JIS-C-5202 7.10 Dip the lead into a solder bath having a temperature of 350°C±10°C up to 4±0.8mm from the body of the resistor and hold it for 3±0.5seconds leave the resistor at room temperature 3 hours after test, then measure.
Solder ability	More than 95% of the surface of the lead shall be covered by new solder after the leads are dipped in the solder	JIS-C-5202 6.5 Dip the lead into a solder bath having a temperature of 260°C±5°C up to 4±0.8mm from the body of the resistor and hold it for 5±0.5 seconds then inspect.
Load test	The variation of the resistance shall be with in ± (5%+0.05ohm) also there shall be no mechanical breakage	JIS-C-5202 7.10 In the constant temperature chamber having temperature 70°C±2°C, apply rated DC voltage for 1.5 hour and shut voltage for 0.5 hour and repeat this cycle for 1000 hours. Leave in room temperature 1 hour after test. Then measure.
Humidity load test	Resistance variation be with in ± (5%+0.05ohm) also there shall be no mechanical breakage	JIS-C-5202 7.9 In temperature chamber having temperature 40°C ± 2°C, relative humidity 90 – 95%, apply rated voltage 1.5 hour and shut voltage 0.5 hour repeat this cycle for 1000 hours, leave in room temperature for 1 hour after test, then measure.

5. Marking



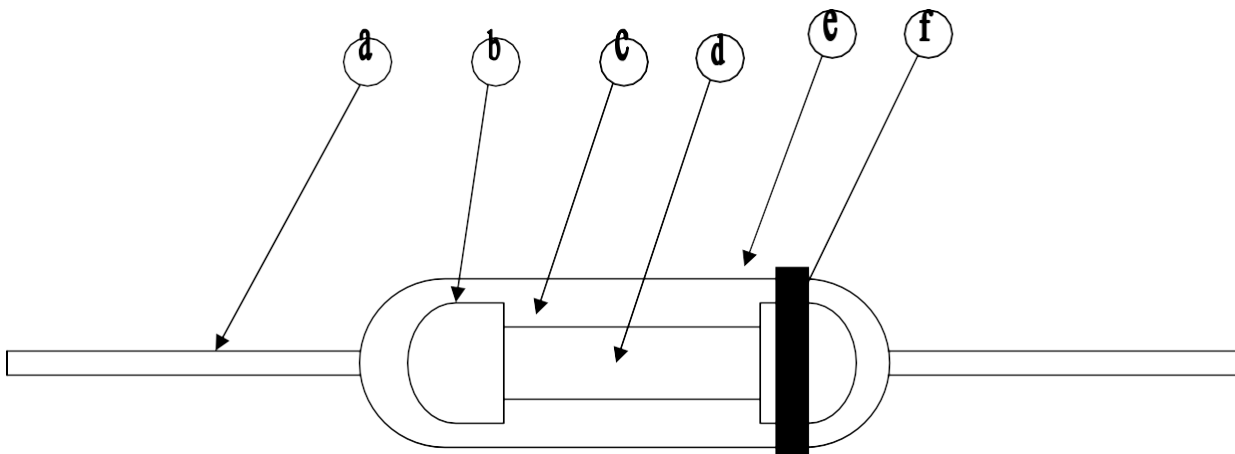
Color refer

Color	1 st Band	2 nd Band	3 rd Band	4 th Band	5 th Band
Black	0	0	$10^0$		White color
Brown	1	1	$10^1$		
Red	2	2	$10^2$	$\pm 2\%$	
Orange	3	3	$10^3$		
Yellow	4	4	$10^4$		
Green	5	5	$10^5$		
Blue	6	6	$10^6$		
Violet	7	7	$10^7$		
Grey	8	8	$10^8$		
White	9	9	$10^9$		
old			$10^{-1}$	$\pm 5\%$	
Silver			$10^{-2}$	$\pm 10\%$	

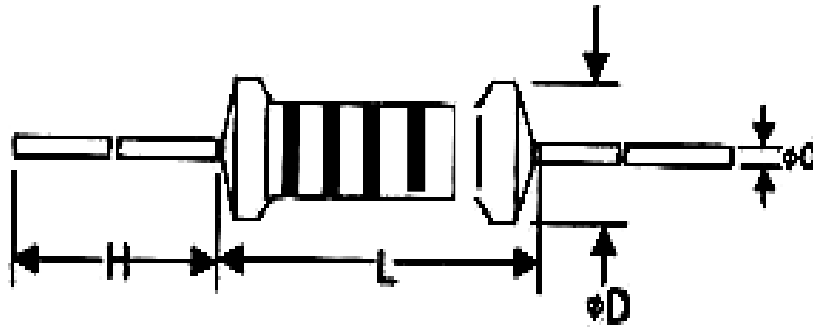
6. Construction and Dimension

6-1. Construction

- a. Lesd Wire .
- b. End Cap.
- c. Metal Film.
- d. Ceramic Rod.
- e. Epoxy Resin.
- f. Color Code.



6-2. Outline Dimensions

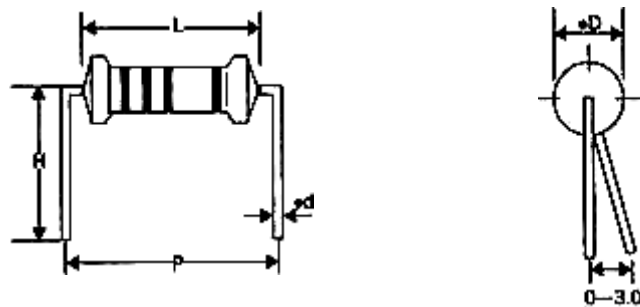


TABLE

WATTS	L	D	H	d±0.05mm
1/4W	6.0±0.5	2.3±0.3	28.0±2.0	0.45
1/2WS				
1/2W	9.0±0.5	3.2±0.3	26.0±2.0	0.52
1WS				
1W	11.0±1.0	4.2±0.5	35.0±3.0	0.65
2WS				
2W	15.0±1.0	5.0±0.5	33.0±3.0	0.72
3WS				

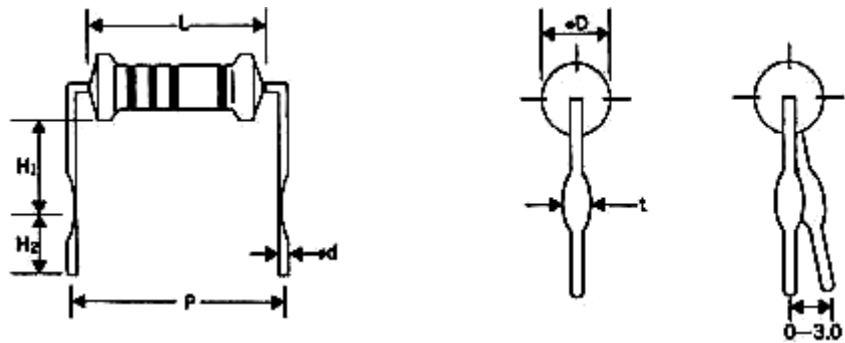
**7.FORMED DIMENSIONS**

7-1 M-TYPE



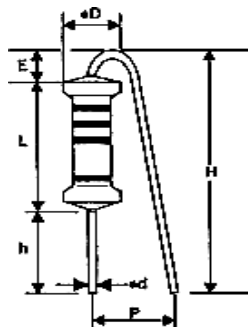
WATTS	DIMENSIONS (mm)				
	L	P±1.0	D	d±0.05	H±1.0
1/4W/1/2WS	6.0±0.5	10	2.3±0.3	0.45	8
1/2W/1WS	9.0±0.5	12.5/15	3.2±0.3	0.52	8
1W/2WS	11.0±1.0	15	4.2±0.5	0.65	10
2W/3WS	15.0±1.0	20	5.0±0.5	0.72	10

7-2 MB-TYPE



WATTS	DIMENSIONS (mm)						
	L	P $\pm$ 1.0	D	d $\pm$ 0.05	H1 $\pm$ 1.0	H2 $\pm$ 1.0	t $\pm$ 0.2
1/2W/1WS	9.0 $\pm$ 0.5	12.5	3.2 $\pm$ 0.3	0.52	10.5	5.0	1.0
1W/2WS	11.0 $\pm$ 1.0	15	4.2 $\pm$ 0.5	0.65	10.5	5.0	1.25
2W/3WS	15.0 $\pm$ 1.0	20	5.0 $\pm$ 0.5	0.72	10.5	5.0	1.25

7-3 F-TYPE

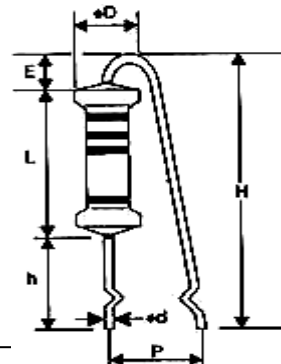
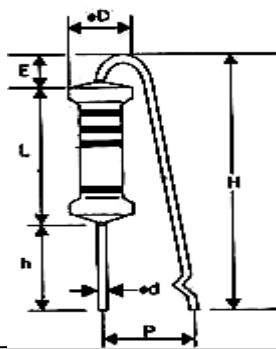
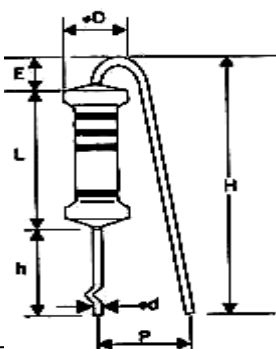


WATTS	DIMENSIONS (mm)						
	L	P $\pm$ 1.0	D	d $\pm$ 0.05	h $\pm$ 1.0	H $\pm$ 1.0	E <sub>max</sub>
1/4W/1/2WS	6.0 $\pm$ 0.5	6-8	2.3 $\pm$ 0.3	0.45	8	14	3
1/2W/1WS	9.0 $\pm$ 0.5	6-8	3.2 $\pm$ 0.3	0.52	8	18	3.5
1W/2WS	11.0 $\pm$ 1.0	6-8	4.2 $\pm$ 0.5	0.65	8	20	3.5
2W/3WS	15.0 $\pm$ 1.0	6-8	5.0 $\pm$ 0.5	0.72	8	25	3.5

7-4 FK1-TYPE,

FK2-TYPE

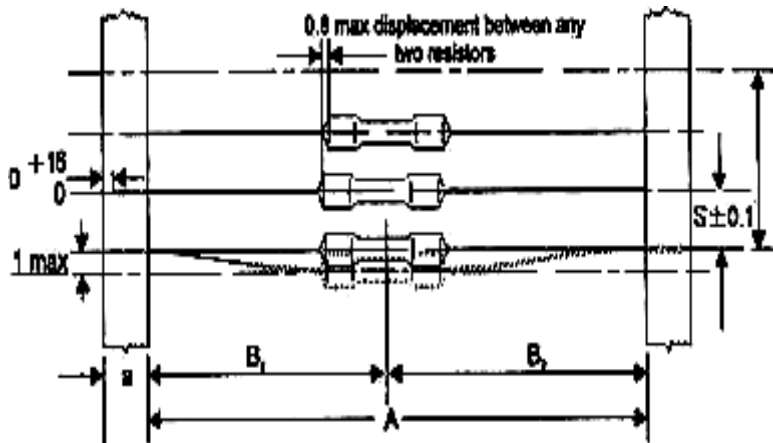
FKK-TYPE



WATTS	DIMENSIONS(mm)						
	L	P±1.0	D	d±0.05	h+1/-0	H±1.0	E <sub>max</sub>
1/2W/1WS	9.0±0.5	5-7	3.2±0.5	0.52	8	18	3.5
1W/2WS	11.0±1.0	5-9	4.2±0.5	0.65	8	20	3.5
2W/3WS	15.0±1.0	5-9	5.0±0.5	0.72	8	25	3.5

8. Taping

Dimensions:



STYLE		DIMENSIONS(mm)				
Normal	Miniature	a	A	B1-B2	S (Spacing)	T (Max. deviation of spacing)
FR-1/6W	FR-1/4WS	6±0.5	52.5±1.5	1.2	5	1 mm per 10 spacings 0.5mm per 5 spacings
			26.0±1.5			
FR-1/4W	FR-1/2WS	6±0.5	52.5±1.5	1.2	5	
			26.0±1.5			
FR-1/2W	FR-1WS	6±0.5	52.5±1.5	1.2	5	
FR-1W	FR-2WS	6±0.5	73.0±1.5	1.5	5	
FR-2W	FR-3WS	6±0.5	73.0±1.5	1.5	10	

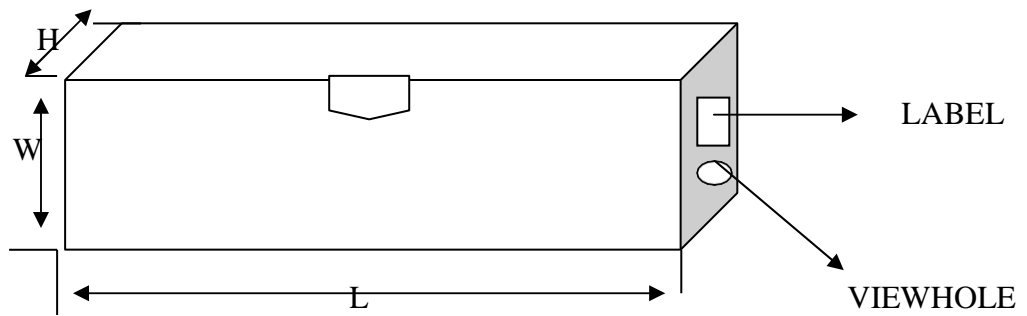


9 PACKING

9-1. TAPING TYPE

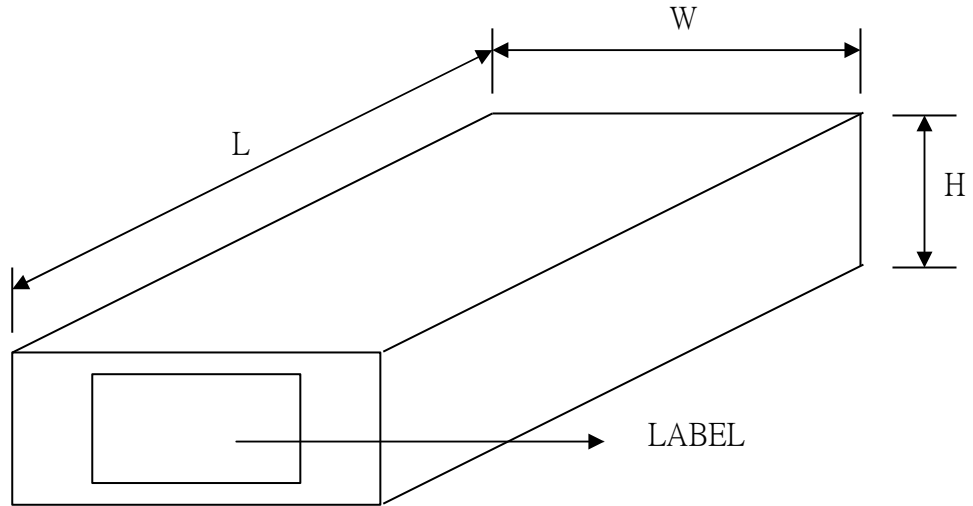
LABEL SPECIFICATION

- |                       |                    |
|-----------------------|--------------------|
| 1. TYPE               | 2. WATTS TOLERANCE |
| 3 .RESISTANT QUANTITY | 4 .P/N             |
| 5 .LOT NO.            |                    |



TYPE	WATTS	W(mm)	H(mm)	L(mm)	Q·TY(pcs)
T-26	1/6W 1/8W 1/16W 1/4WS	50	67	260	5000
	1/4W/ 1/2WS	50	100	260	5000
T-52	1/6W / 1/8W 1/16W 1/4WS	80	72	260	5000
	1/4W/ 1/2WS	80	100	260	5000
	1/2W/ 1WS	80	85	260	2000
T-73	1W/ 2WS	110	80	270	1000
	2WS/ 3WS	110	92	270	1000

9-2 BULK



WATTS		TYPE	L(mm)	W(mm)	H(mm)	POLY BOG	BOX(pcs)
1/6W 1/8W	1/16W 1/4WS	P	240	140	76	1000	20000
1/4W	1/2WS	P	240	140	76	500	10000
1/2W	1WS	P	240	140	76	500	5000
1W	2WS	P	240	140	76	200	2000
2W	3WS	P	240	140	76	100	1500