



APPROVAL SHEET

1. Applicable Scope

Applicable Scope: This KNPA is for use in consumer electronics, computer, telecommunication equipments.....etc.

2. Part Number

It is composed by Type, Rated Wattage, Terminal Form, Characteristic, and Nominal Resistance and Tolerance.e.g.

2-1	2-2	2-3	2-4	2-5	2-6
KNPA	T81(P.M.F)	1W	1R	J	350PPM
Type	Terminal Form	Rate Wattage	Nominal Resistance	Tolerance	Temperature Coefficient

2-1. Type

Anti-surge wire Wound Resistor is called “KNPA”

KNPA ---Copper wire product

KNPA-CP ---CP wire product

2-2. Terminal Form

Upon the shape of terminal, it has T81, T60, P, M and F form

2-3. Rated Wattage

Shown by “W”、such as 1/2W、1W、2WS、.....20W。

2-4. Nominal Resistance:

R,K Ω are its unit which is in accordance with JIS-C6402(E-24)series, such as 1R, 0R1, 0R47, 1K.

2-5. Tolerance

It is measured by Bridge-method at room temperature and expressed by a capital letter.

F ± 1% G ±2% J ±5%

2-6. Temperature Coefficient

Temperature Coefficient is identified by specific numerical values, such as:

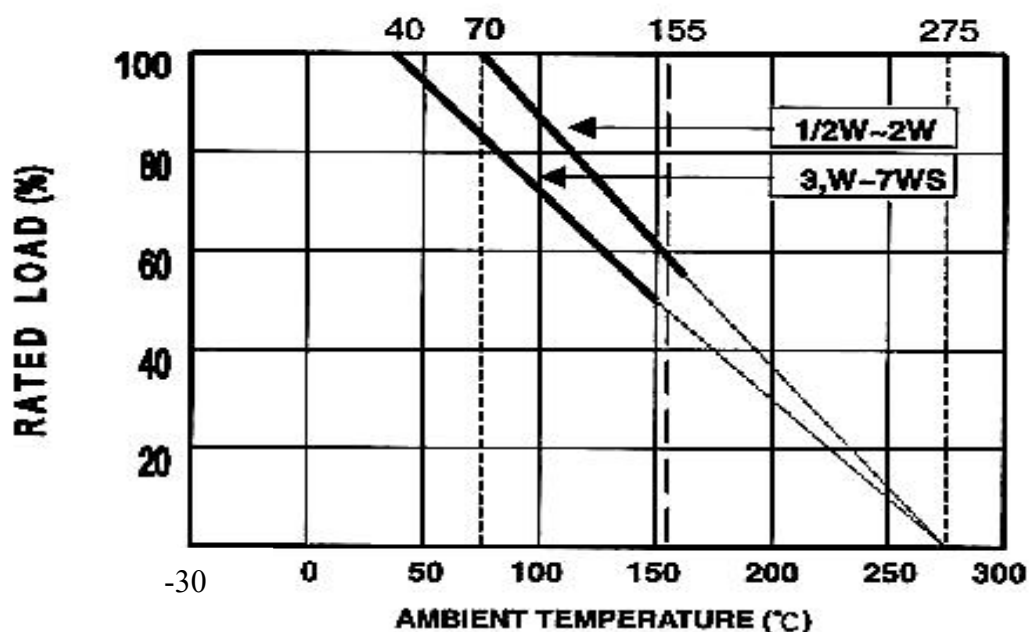
300PPM, 350PPM, 400PPM(Only when required)

3, Rated power

Rated power is the value of Max load voltage specified at the ambient temperature of 70°C and shall meet the functions of electrical and mechanical performance. When the ambient temp. surpasses above

Mentioned temperature. The value declines as following:

DERATING CURVE:



3-1. Rated Voltage

It is calculated as the following formula $E = \sqrt{PR}$

*However, in case the voltage calculated exceeds the maximum load voltage, such the maximum load. Voltage shall be regarded as its rated voltage, means whichever less.

E=Rated Continuous Working Voltage(V)

P=Rated Power(W)

R=Nominal Resistance Value(Ω)

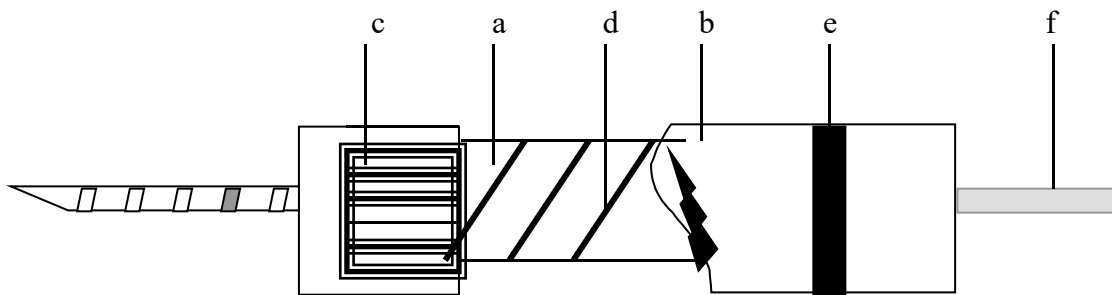
3-2 Notes

1. K N P resistance range : 0.01 Ω -1K Ω (N K N P: 0.01 Ω -100 Ω).

2. NKNP characteristics

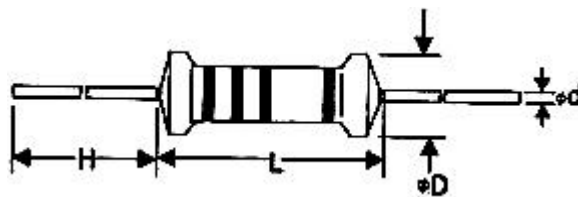
This product can reduce the noise or instantaneous breakthrough of various electronic circuits. For example, when used in DPS or UPS equipment, it could minimized the noise interference, increasing the vibration frequency or reducing the volume of the previous product, saving material costs, and preventing oscillation. Breaking through and reducing can naturally reduce electromagnetic interference.

4. CONSTRUCTOION



- a. CERAMIC CORE (HIGH CONDUCTIVITY)
- b. (NONFLAME PAINT WITH SOL VENT-PROOF)
- c. END CAP(HIGH RELIABILITY FITTING BY ORIGINAL CAP-PRESSING METHOD)
- d. COPPER-NICKEL ALLOY WIRE WOUND FILM(HIGH STABILITY)
- e. COLOR CODE(PER MIL&ELA STAND ARDS PERMANENT)
- f. LEAD WIRE

5. SPECIFICATIONS



POWER RATING	DIMENSION(mm)					RESISTANCE RANGE
	L	D	H	d ±0.05	DIELECTRIC WITHSTANDING	
2WS	11.0 ±1.0	4.2 ±0.5	35 ±3.0	0.65	350	0.01Ω-360Ω

SURGE RATING	Low resistance range	Maximum surge voltage	Medium resistance range	Maximum surge voltage	High resistance range	Maximum surge voltage
2WS	10R~50R	3KV	51R~240R	4KV	270R~1K	5KV

Note: For KNPA series

Max. working voltage: 500V

Max. overload voltage 1,000V

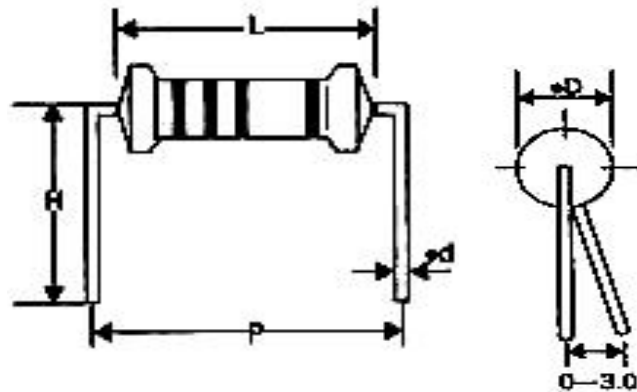
Dielectric withstanding voltage :

Dimension \leq 3 . 5 x 10 : 350V ,

Dimension $>$ 3 . 5 x 1 0 : 500V

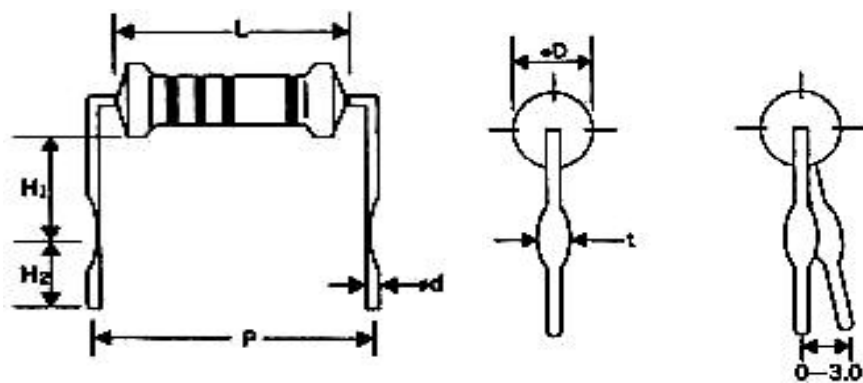
5-1 Formed Dimensions

M-TYPE



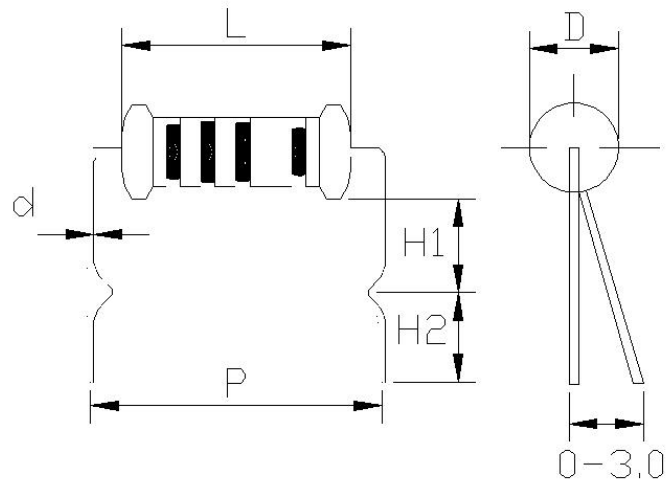
WATTS	DIMENSIONS(mm)				
	L	P \pm 1.0	D	d \pm 0.02	H \pm 1.0
2WS	11.0 \pm 1.0	15	4.2 \pm 0.5	0.65	10

MB-TYPE



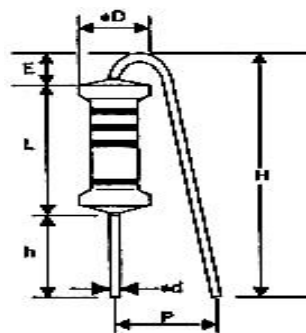
WATTS	DIMENSIONS (mm)						
	L	P \pm 1.0	D	d \pm 0.02	H1 \pm 1.0	H2 \pm 1.0	t \pm 0.2
2WS	11.0 \pm 1.0	15	4.2 \pm 0.5	0.65	10.5	5.0	1.25

MK-TYPE



WATTS	DIMENSIONS (mm)			
	P±0.5	H1±1.0	H2±1.0	t±0.1
2WS	15	10.5	5.0	1.25

F-TYPE

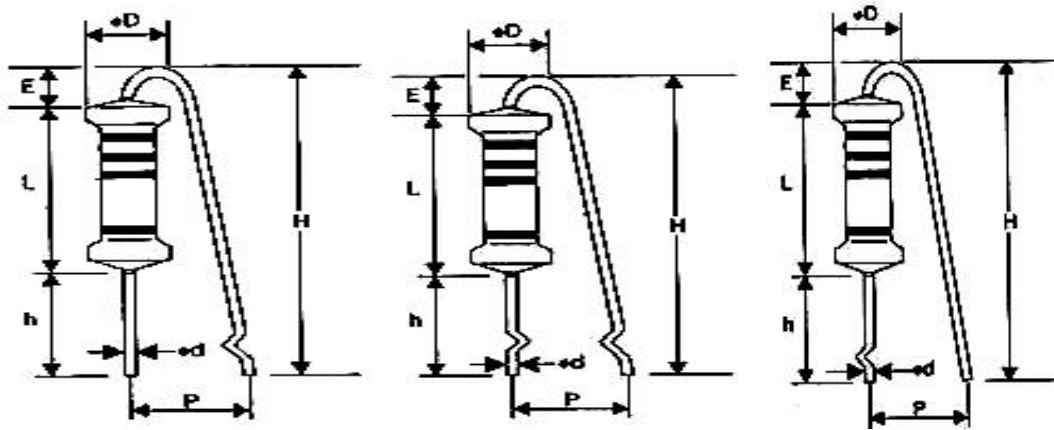


WATTS	DIMENSIONS(mm)					
	L	P±1.0	D	d±0.05	h±1.0	E _{max}
2WS	11.0±1.0	7-10	4.2±0.5	0.65	5	3.5

FK2-TYPE

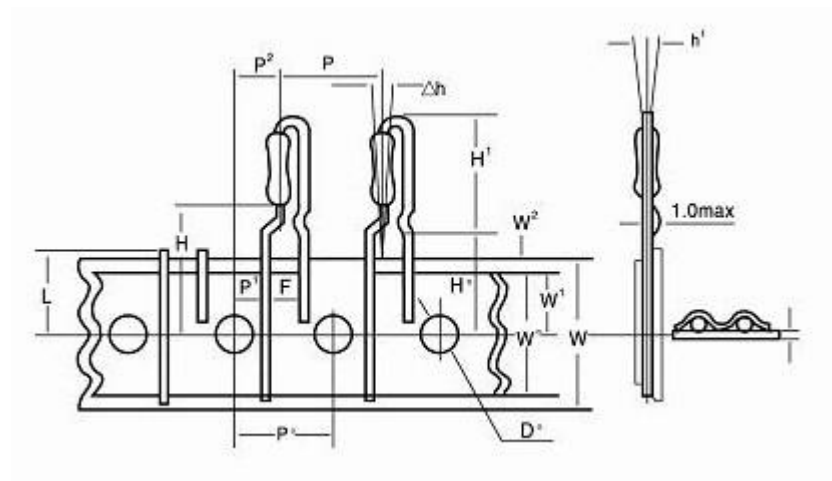
FKK-TYPE

FK1-TYPE



WATTS	DIMENSIONS (mm)						
	L	P±1.0	D	d±0.05	h+1/-0	H±1.0	E _{max}
2WS	11.0±1.0	5-9	4.2±0.5	0.65	8	20	3.5

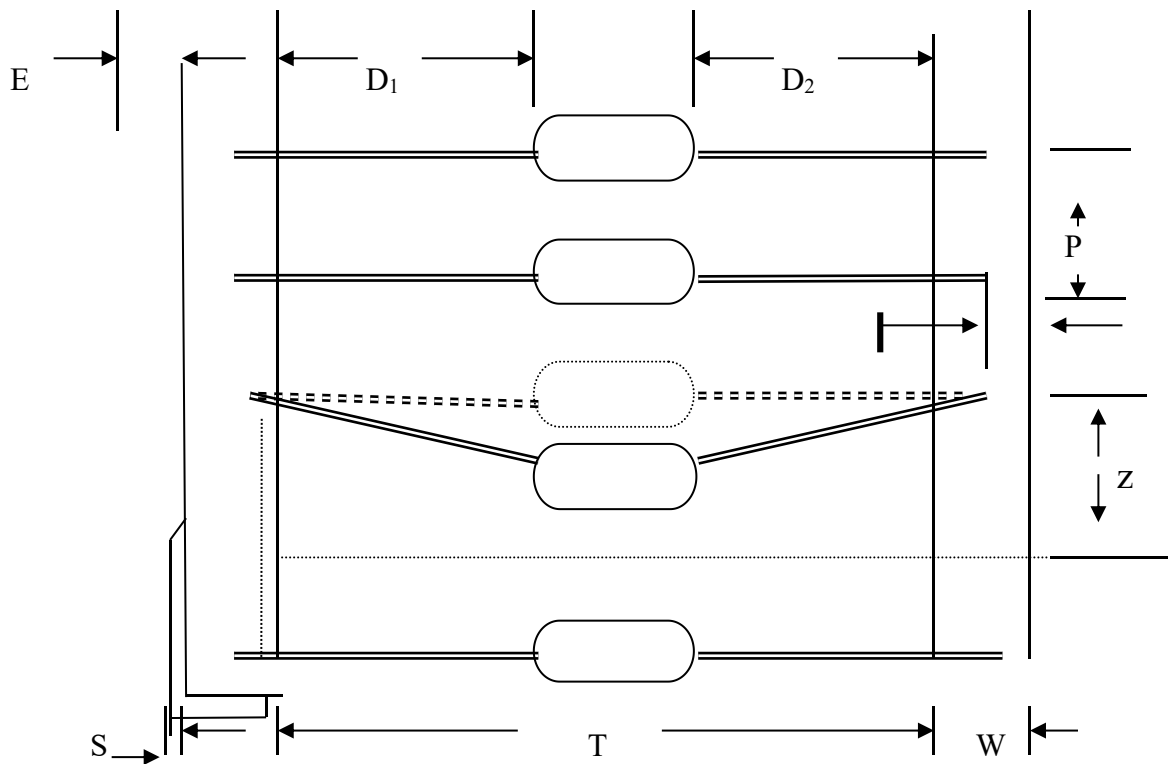
PANA TYPE



DIMENSIONS					
P	12.7±1.0	Δh	0±0.5	H°	16.0±0.5
P°	12.7±0.3	W	18.0 ^{+1.0} _{-0.5}	H¹	12.0max
P¹	3.35±0.7	W°	12.5mm	D°	4.0±0.3
P²	6.35±1.0	W¹	9.0±0.5	t	0.7±0.2
F	5.0±0.5	W²	max	L	11.0max
Δh	0±2.0	H	20.0±0.5		

Unit:mm

5-2 Taping Dimensions



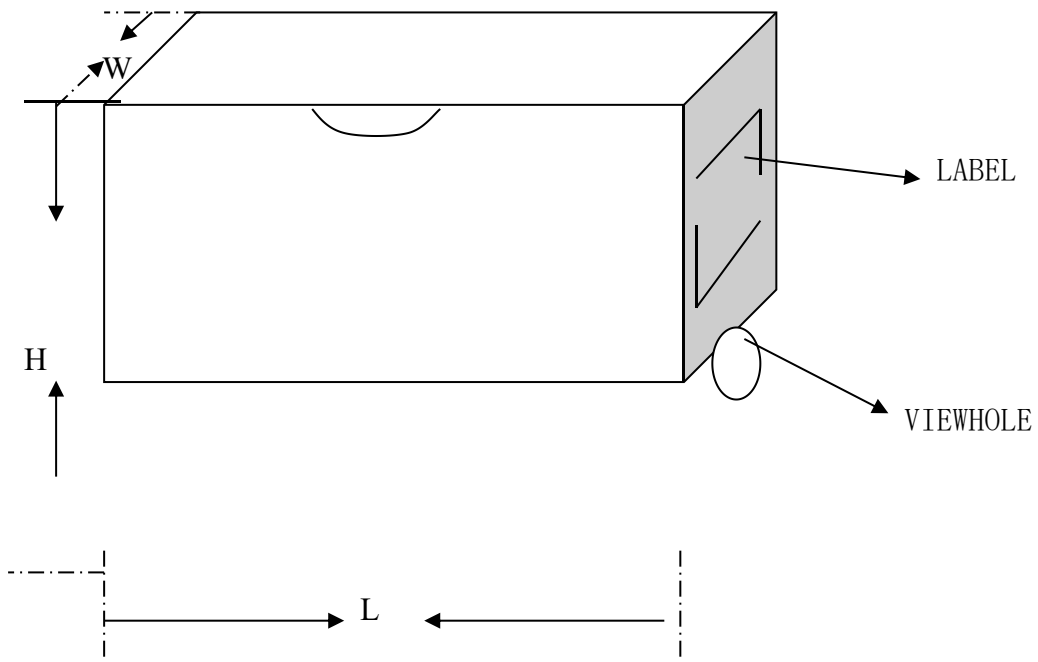
WATTS	Type	T	p±0.5	W±0.5	D1-D2 MAX	E MAX	Z MAX	S MAX	I MAX
1/4W	T- 26	26±1.5	5	6	0.8	0	1.2	0.8	3.2
1/2WS	T- 52	52±1.5	5	6	0.8	0	1.2	0.8	3.2
1/2W/1WS	T- 52	52±1.5	5	6	0.8	0	1.2	0.8	3.2
1W/2WS	T- 73	73±1.5	5	6	0.8	0	1.4	0.8	3.2
2W/3WS	T- 73	73±1.5	10	6	0.8	0	1.4	0.8	3.2
3W/5WS	T- 73	73±1.5	10	6	0.8	0	1.4	0.8	3.2

5-3 Packing Dimensions

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-73(81)	2WS	90	95	260	1000

6. Mechanical Performance

6-1. Terminal Bend

The terminal shall withstand 4 bends of 90° rotation without any breakage or damage, when the Resistor is fixed in vertical position.

6-2. Terminal Tensile

Fixing the resistor body, a static load of 2.5Kg is to be gradually applied into the terminal for 10seconds without causing any looseness and fall.

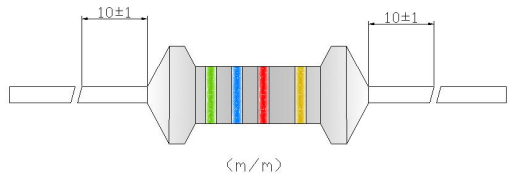
6-3 Twist Withstand

To bend the lead wire at the point of about 6mm from resistor body to 90°, then catch the wire at 1.2 ± 0.4 mm apart from the bend point end and turn it (clockwise) by 360 degrees Perpendicular to the resistor axis at speed of sane 5 seconds per turn, and do the same Counterclockwise again which constitute a whole turn. Repeat the turn for 2 times without Causing any break and looseness.

7. Operating Temperature Range

-50°C ~ 275°C

8. ELECTRICAL PERFORMANCE

ITEM	SPECIFICATIONS	TEST METHODS (JIS C5202)
DC RESISTANCE	ALLOWED UNDER R RATE TOLERANCE	
SHORT TIME OVER LOAD	$\pm(2\%+0.05 \Omega)$ 以内 $\pm(2\%+0.05 \Omega)$ LESS THAN	PERMANENT RESISTANCE CHANGE AFTER THE APPLICATION OF A POTENTIAL OF 2.5 TIME RCWV FOR 5 SECONDS
DIELECTRIC WITHSTANDING VOLTAGE	NO EVIDENCE OF FLASHOO-VER MECHANICAL DAMAGE ARCTIN OR INSULATION BREAKDOWN	RESISTORS SHALL BE CLAMPED IN V-BLOCK AND SHALL BE TEST AT SPECIFIED IN THE ABOVE LIST ROR 60 SECONDS

ADHESION OF SOLDERABILITY	3/4 SURFACE OF TERMINAL COVERED BY SOLDER	6.5	235 ±5°C	3 ±0.5(sec)
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9. Color Coding



KNPA (black)

NKNPA (green)

Color	1 the significant	2 nd significant	Multiplier	Tolerance
Silver			0.01	±10%(K)
Golden			0.1	±5%(J)
Black	0	0	1	
Brown	1	1	10	±1%(F)
Red	2	2	100	±2%(G)
Pink	3	3	1K	
Yellow	4	4	10K	
Green	5	5	100K	±0.5%(D)
Blue	6	6	1M	±0.25%(C)

Purple	7	7	10M	±0.1%(B)
Grey	8	8		
White	9	9		

10. REQUIREMENTS IN USE

1. IN THE HIGH HUMIDITY SITUATION, IT WILL MAKE THE SOLDER ABILITY WORST. PLEASE PRESERVE THE RESISTORS IN 40°C ,70 RH BELOW
2. PLEASE DON'T OPEN THE MINE PACKAGE WHEN YOU PRESERVE IT
3. WHEN IN THE HIGH TEMPERATURE SITUATION, PLEASE ACCORD TO THE PICTURE OF "POWER DERATING CURVE" REDUCE THE USE OF POWER RATING
4. YOU SHOULD AVOID THE CONNECTOR OF RESISTANCE REPLACED BY LARGE VOLTAGE AND POWER
5. DUE TO ITS SPECIAL MATERIAL OF PAINT, YOU MUST BE CAREFUL TO ITS WEAK APPEARANCE
6. AFTER CLEANING THE BODY, IT WILL MAKE THE FILM WEAKER. BUT IF YOU LET IT NATURE DRY WITHOUT TOUCHING OR PAINTING ANYTHING, THE RESISTORS WILL RECOVER ITS STRENGTH BY 20 MINUTES
7. THE RESISTORS ARE REQUESTED NOT TO PLACE BY THE OTHER HEATING ACCESSORIES, WHICH WILL OBSTRUCT THEIR HEAT DISSIPATION