ALTERNATION HISTORY RECORDS 变更记录

Date 日期	Version 版本	Mark 标记	Page 页码	Description 描述	Drafter 制定者	Approver 审批者
2023-02-24	A	/		First release 首次发行	Doris Chang	/

1. Applicable Scope:

This standard specification is for use in consumer electronics, computers, telecommunications, control instruments...etc.

2. Part Number:

It is composed by Type, Rated Wattage, Nominal Resistance, Tolerance, Safety Version, Marking, Package and Coating Color.
e.g.

FKN	5WS	22R	J	S	M	T63	C2
Type	Rated Wattage	Nominal Resistance	Tolerance	Safety Version	Marking	Package	Coating Color

2.1 Type :

Fusible Wire Wound Resistors, Flameproof / Safety Version are called "FKN".

2.2 Rated Wattage:

Shown by "W", such as 5WS.

2.3 Nominal Resistance:

Ω is its unit, which be in accordance with JIS-C6409 article 6 (EIA RS-196A) series.

Letter "22R" indicates resistance value 22Ω.

2.4 Tolerance:

It is measured by Bridge-method at room temperature and expressed by a capital letter.
J=±5%.

2.5 Safety Version:

Letter "S" indicates Safety Version.

2.6 Marking:

M: marking.

2.7 Package:

T63=63 mm width special tape in box; Nil=Bulk.

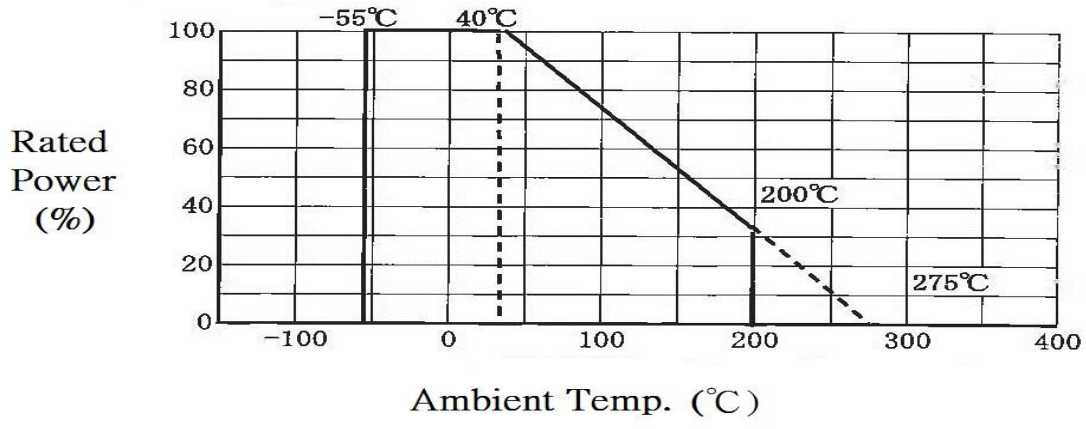
2.8 Coating Color:

Letter "C2" indicates light gray coating color.

※Remark: FKN Series Resistors are RoHS & Halogen Free Compliant.

3. Rated Power:

Rated power is the value of Max load wattage specified at the ambient temperature of 40℃, and shall meet the functions of electrical and mechanical performance. When the ambient temperature surpasses above mentioned temperature, the value declines as per following DERATING CURVE.



3.1 Rated Voltage:

It is calculated through the following formula:

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

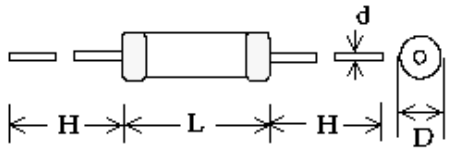
where E: rated voltage (V)

P: rated power (W)

R: total nominal resistance (Ω)

4. Dimension and structure:

4.1 Dimension:



Unit: mm

TYPE / FKN	D Max.	L Max.	H ± 3	d ± 0.1	Resistance Value	Dielectric Withstanding Voltage
5WS	7.5	17	27	0.8	22Ω 47Ω	500V

4.2 Structure:

4.2.1 Terminal:

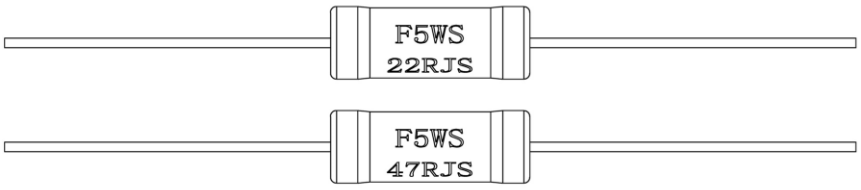
Terminal is to be firmly connected with resistors element, both electrically and mechanically, and allow easy soldering.

4.2.2 Coating:

Coating is done by light gray flameproof paint (resistant to 800℃)or Silicon Resin which is solid enough to be free from looseness, crack and easy breakage. It is also resistant to cleaning and industrial solvents.

4.2.3 Marking:

Marking is made on resistors surface based on the following alphanumeric characters:



1. "F" is Fusible wire wound resistors.
2. "5WS" is Rated Wattage.
3. "22R", "47R" indicates resistance value 22Ω or 47Ω.
4. "J" is capital letter of tolerance.(±5%)
5. "S" is Safety Version.

5. Operating Temperature Range: -55℃～200℃

6. Mechanical Performance:

6.1 Terminal tensile:

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

6.2 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 ±0.4mm apart from the bent point end and turn it (clockwise) by 360 degrees perpendicular to the resistor axis at speed of 10 seconds per turn, and do the same counterclockwise again which constitute a whole turn. Repeat the turn 2 times without causing any break and looseness.

7. Electrical Performance:

7.1 Resistance Temperature Coefficient:

It shall be within ±200ppm/℃.

$T.C\ (ppm/℃) = 〔(R2-R1)\div R1〕\times〔1\div(T2-T1)〕\times10^6$

where R1: resistance value at reference temperature

R2: resistance value at test temp.

T1: reference temp.

T2: test temp.

7.2 Temperature Cycle:

Following temp. cycles are to be made 5 times and then put at room temp. for one hour, the resistance value change rate between pre-and-post test shall be within ±1%.

Steps	Temperature(℃)	Time (minutes)
1st step	-55 ± 3	30
2nd step	Room temp.	3
3rd step	200 ± 3	30
4th step	Room temp.	3

7.3 Short Time Over Load:

When the resistors are applied 5 times as much as rated wattage for 5 seconds continuously, it shows no evidence of arc, flame...etc. Removing the voltage and place the resistors to the normal condition for 30 minutes, the resistance value change rate between pre-and-post test shall be within ±2%.

7.4 Insulation Character :

Resistors are located in a V-shaped metal trough. Using the DC 500V megger instrument 2 poles to clutch either side of lead wires and metal trough, measuring the Insulation Resistance which shall be over 1000MΩ.

7.5 Voltage Withstanding:

Resistors are located in a V-shaped metal trough. Applying suitable voltage listed on DIMENSION for one minute and should find no physical damage to the resistors, such as arc, char...etc.

7.6 Load Life:

The resistors arrayed are sent into the 40℃ oven, applying rated voltage at the cycle of 1.5 hours ON, 0.5 hour OFF for 1000^{+48}_{-0} hours in total. Then, after removing the voltage, take the resistors out of the oven and left under normal temp. for one hour cooling. The resistance value change rate between pre-and-post test shall be within ±5%.

7.7 Damp Heat (Steady State):

The resistors arrayed are placed into a constant temp./humidity oven at the temp. of 40±2℃ and the humidity of 90～95% for 56 days in total. The DC voltage to be applied shall be selected from the following series:

0V, 4V, 6.3V, 10V, 16V, 25V, 40V, 63V and 100V

The DC voltage selected shall be the next lower value to that derived from a calculation of the voltage required so that the resistor is dissipating 0.01 times the rated dissipation, or shall be 0.1 times the limiting element voltage, whichever is the smaller. Then remove the voltage, taking the resistors out of the oven and leaving them at room temp. for one hour. The resistance value change rate between pre-and-post test shall be within ±5%. There also shall be no evidence of remarkable change on appearance, and the marking shall not be illegible.

7.8 Solder-ability:

The leads with flux are dipped in a melted solder of 235 ±5℃ for 2 seconds, more than 95% of the circumference of the lead wires shall be covered with solder.

7.9 Resistance to Soldering Heat:

Two leads are together dipped in a melted solder of 270 ±5℃ for 10 ±1 seconds, or 350 ±10℃ for 3.5 ±0.5 seconds, Then remove the resistors and leaving them at room temp. for one hour. The resistance value change rate between pre-and-post test shall be within ±0.5%.

7.10 Nonflammability:

The resistors are applied the power of 16 times the rated wattage for 5 min. and shall not get flame.

7.11 Fusing Characteristics:

7.11.1 The resistors are applied the power of 20 times the rated wattage and shall be fusing within 60 sec.

7.11.2 The resistors will fuse when mains voltage of 240 VAC is directly applied for 2 seconds maximum.

No flames, no explosion, no sound and no arc happened. The resistance value after fusing shall be over 100K ohm.

7.12 Surge Withstanding:

The resistors are designed to withstand 6kV, 1.2/50μs pulse according to IEC61000-4-5, 10 pulses per voltage, 60 seconds between each pulse.

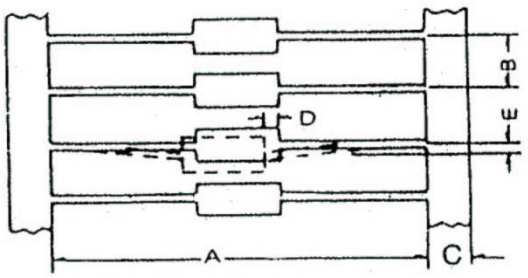
The resistance value change rate between pre-and-post test shall be within ±5%.

7.13 Storage Conditions:

The resistors with appropriate package would have a preservative duration of 1 year, under the following conditions.

T=5℃ ~ 35℃
H=40% ~ 75%

8. Taping Specifications:



Unit: mm

FKN	Package	A±1	B±1	C±1	D Max	E Max
5WS	T63	63	10	6	0.6	1.2