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
2022-12-15	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, Anti-Burst, Terminal Form and Lead Length & Lead Pitch. e.g.

RFKN	05S	5R1	J	A	M	B1
Type	Rated Wattage	Nominal Resistance	Tolerance	Anti-Burst	Terminal Form	Lead Length & Lead Pitch

2.1 Type :

Fusible Wire Wound Resistors, Flameproof/Anti-Burst are called "FKN".

2.2 Rated Wattage:

Shown by "05", such as 5W. S=Small size

2.3 Nominal Resistance:

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

Letter "5R1" indicates resistance value 5.1Ω.

2.4 Tolerance:

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

2.5 Anti-Burst:

Letter "A" indicates anti-burst.

2.6 Terminal Form:

Letter "M" indicates M form.

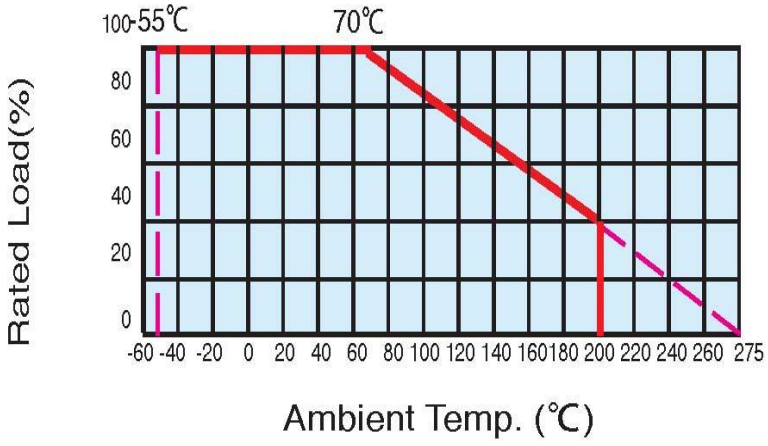
2.7 Lead Length & Lead Pitch:

Letter "B1" indicates special lead length & lead pitch.

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

3. Rated Power:

Rated power is the value of Max load power specified at the ambient temperature of 70℃, 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:

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

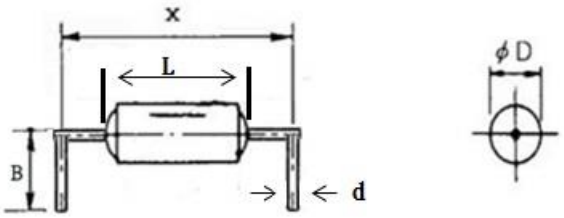
where E: rated voltage (V)

P: rated power (W)

R: total nominal resistance (Ω)

4. Dimension and structure:

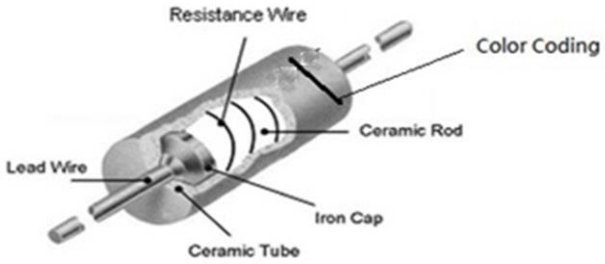
4.1 Dimension for FKN 5W 5R1 J A M B1:



Unit: mm

TYPE / FKN	D Max.	L ± 1	X ± 0.8	B ± 0.5	d ± 0.05	Resistance Value	Dielectric Withstanding Voltage
5W	5.9	13	16	7.0	0.8	5.1Ω	1000V

4.2 Structure:



4.2.1 Ceramic Rod:

It is made of alumina ceramic of the kind.

4.2.2 Iron Cap:

It is made of tin plated iron base.

4.2.3 Lead Wire:

It is made of hot-dipped tin coated copper wire.

4.2.4 Resistance Wire:

It is made of suitable special alloy with fusing performance.

4.2.5 Ceramic Tube:

It is made of alumina ceramic with high dielectric withstanding voltage up to 1kV.

4.2.6 Color Coding:

Marking is made on resistors surface by color coding.(green, brown, gold, gold, black)
1st, 2nd, 3rd : nominal resistance.
4th: tolerance.
5th: black color band for fusible wire wound resistors, flameproof.

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

6. Mechanical Performance:

6.1 Terminal tensile:

To fix the resistor body, a static load of 1kg.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 ±300ppm/℃.

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

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 2.5 times as much as rated voltage 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 10000MΩ.

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 70℃ 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 10 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 ±1%.

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:

The resistors will fuse when mains voltage of 120 VAC 60Hz is directly applied for 3 seconds maximum. No flames, no explosion, no sound and no arc happened.

7.12 Surge Voltage Withstanding:

The resistors are connect to transient generator producing a transient with a 6000 V peak, a rise time of less than 0.5 us and which decays 50 percent between peaks. The transient should be induced 90° into the positive half of the 60 Hz cycle. At 6 cycles per minute no less than 500 pulses (per UL 217).