

# 规格承认书

APPROVED SHEET

客户 CUSTOMER:

粤翔标准版承认书

品名 PRODUCT :

保险丝绕线型电阻

规格 TYPE :

FRKNP 1/4W-5WS

客户承认印  
CUSTOMER APPROVED



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一式二份

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出图  
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# FRKNP

FUSING WIREWOUND NONFLAME RESISTORS 保险丝绕线型电阻器

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FRKNP ( 1/2W, 1WS, 1W, 2WS, 2W, 3WS, 3W, 5WS, 5W, 7WS)

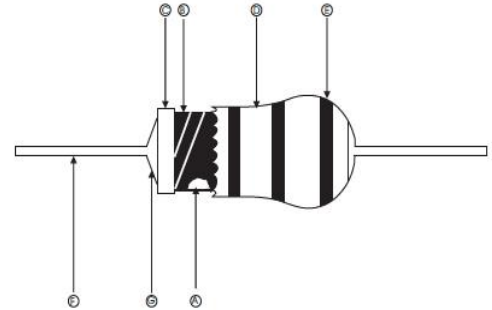
## FEATURES 特点

- 1 THE ACCURATE FUSIBILITY IS APPLICABLE TO SAFETY CIRCUITS IN THE WIDE RANGE OF ELECTRONIC SETS.  
熔断之特性以保护广大电子设备
- 2 SMALL IN SIZE, LIGHT IN WEIGHT  
小型及易于安装于精密轻巧之电路
- 3 LOW TEMPERATURE COEFFICIENT. (UNDER  $\pm 200\text{PPM}/^\circ\text{C}$ )  
温度系数低
- 4 NONCOMBUSTIBLE INSULATING COAT.  
不燃性绝缘涂装



## CONSTRUCTION 结构图

- 1 CERAMIC CORE (HIGH CONDUCTIVITY)  
陶瓷棒心 (高热传导)
- 2 HIGH STABILITY FILM  
高稳定性皮膜
- 3 END CAP (HIGH RELIABILITY FITTING BY ORIGINAL CAP-PRESSING METHOD)  
端帽 (卯和度信赖性高)
- 4 HIGH INSULATION AND NON-COMBUSTIBILITY OF FROG RESIN COATING.  
(BULK POWERDIMMED, MINIATURIZED TO BRICK RED)  
高绝缘及不燃性之硅树脂涂料 (本体功率为灰色, 小型化为砖红色)
- 5 COLOR CODE (PER MIL & EIA STANDARDS).  
符合MIL & EIA规定之标准色码带。
- 6 LEAD WIRE (EXCELLENT SOLDER ABILITY)  
焊锡性良好的镀锡铜线
- 7 WELDING (LONG RELIABILITY GUARANTEE)  
信赖性良好的焊接



## SPECIFICATION: 规格描述

EXAMPLE 例: FRKNP1W-9Ω ±5%-TT52

FRKNP	1W	9Ω	±5%	T	T52
品名 PRODUCT	额定功率 RATED POWER	阻值范围 RESISTANCE RANGE	误差值 TOLERANCE	线径 WIRE DIAMETER	形状 SHAPE
CR 碳膜电阻 MF 金膜电阻 MO 氧化膜电阻 MGR 高压玻璃釉电阻 KNP 绕线电阻 NKNP 无感绕线电阻 FR 保险电阻 FRKNP 绕线保险电阻 SCF 高压脉冲电阻	1/8W 1/4WS 1/4W 1/2WS 1W 1WS 2W 3WS 3W 5WS 5W 7WS	0Ω 0.05-1KΩ 阻值表示方法 RESISTANCE VALUE REPRESENTATION 阻值单位按 Ω, K, M 1000Ω=1K 1000K=1M 例: 9Ω 1/5K6/4M7	±10% ±5% ±2% ±1%	0:0.43CU S:0.43CP 2:0.53CU X:0.53CP 6:0.63CU T:0.63CP 9:0.73CU Q:0.73CP C:0.83CU D:0.83CP A:0.75CU	T26 编带26MM T52 编带52MM T63 编带63MM T73 编带73MM T93 编带93MM P 散装 M、F 成型 FK/MB/TF 成型

NOTE: KNP TYPE UP TO 100Ω (NKNP TYPE UP TO 100Ω)  
备注: KNP阻抗范围0.05Ω-1KΩ (NKNP 则为0.05Ω-1KΩ)

# FRKNP

FUSING WIREWOUND NONFLAME RESISTORS 保险丝绕线型电阻器

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CHARACTERISTICS 特性项目	SPECIFICATIONS 规格值	TEST METHODS JIS C 5202 测试方法 JIS C 5202标准															
DC RESISTANCE 直流阻抗	J (±5%)	TESTING VOLTAGE 测试电压如下表															
		RESISTANCE VOLTAGE MAX															
		0.4 Ω TO 99 Ω 0.3V DC 100 Ω TO 999 Ω 1V DC															
T. C. R温度系数	<table border="1"> <tr> <td>1/4W</td> <td>1/2WS</td> <td rowspan="5">±350PPM</td> </tr> <tr> <td>1/2W</td> <td>1WS</td> </tr> <tr> <td>1W</td> <td>2WS</td> </tr> <tr> <td>2W</td> <td>3WS</td> </tr> <tr> <td>3W</td> <td>5WS 5W</td> </tr> <tr> <td></td> <td>7WS</td> <td></td> </tr> </table>	1/4W	1/2WS	±350PPM	1/2W	1WS	1W	2WS	2W	3WS	3W	5WS 5W		7WS		$\frac{R2-R1}{R1(T2-T1)} \times 10^6 \text{PPM}/^\circ\text{C}$ R1: RESISTANCE VALUE AT ROOM TEMPERATURE (T1) 常温 (T1) 阻抗值 R2: RESISTANCE VALUE AT ROOM TEMPERATURE +100°C (T2) 常温+100°C 阻抗值	
1/4W	1/2WS	±350PPM															
1/2W	1WS																
1W	2WS																
2W	3WS																
3W	5WS 5W																
	7WS																
LOAD LIFE IN HUMIDITY 湿度寿命	RESISTANCE CHANGE RATE ±(1.5%+0.05 Ω) WITH NO EVIDENCE OF RESISTOR DAMAGE. 阻抗值变化率±(1.5%+0.05 Ω), 电阻器不可有损伤	RESISTANCE CHANGE AFTER 1000H (1.5H ON, 0.5H OFF) AT RATED VOLTAGE IN A HUMIDITY CHAMBER CONTROLLED AT 40+/-2°C AND 90-95% RELATIVE HUMIDITY. (when the test voltage exceeds the working voltage, considering the working voltage) 温度40+/-2°C, 相对湿度90-95%于恒温恒湿箱中, 加额定直流电压测试1.5小时停止0.5小时, 连续1000小时。(当实验电压超过最高使用电压, 采用最高使用电压)															
LOAD LIFE 温度寿命	RESISTANCE CHANGE RATE ±(1.5%+0.05 Ω) MAX WITH NO EVIDENCE OF RESISTOR DAMAGE. 阻抗值变化率±(1.5%±0.05 Ω), 电阻器不可有损伤	RESISTANCE CHANGE AFTER 1000H OPERATING AT RATED VOLTAGE WITH DUTY CYCLE OF 1.5H ON 0.5H OFF AT 70°C ±2°C (when the test voltage exceeds the working voltage, considering the working voltage) 温度70+/-2°C, 加额定直流电压测试1.5小时停止0.5小时, 连续1000小时(当实验电压超过最高使用电压时, 采用最高使用电压)															
SHORT TIME OVER LOAD 短时间过负荷	±(1%+0.05 Ω)	RESISTANCE CHANGE AFTER THE APPLICATION OF A POTENTIAL OF 10T RATED VOLTAGE FOR 5 SE (when the test voltage exceeds the maximum overload, consider using the maximum overload voltage) 额定功率X10倍, 测试5秒(当实验电压超过最高过负荷电压时, 采用最高过负荷电压)															
PULSE OVER LOAD 断续过负荷	1/4W, 1/2W, 1W, 2W, 3W,	RESISTANCE CHANGE AFTER 10000C (1SEC ON, 25SEC OFF) AT 4T RATED VOLTAGE (AC) when the test voltage exceeds the maximum overload, consider using the maximum overload voltage) 额定电压*4倍(交流电压), 测试1秒停止25秒, 测试10000次。(当实验电压超过最高过负荷电压, 采用最高过负荷电压)															
	1/2WS, 1WS, 2WS, 3WS, 5WS,	RESISTANCE CHANGE AFTER 10000C (1SEC ON, 25SEC OFF) AT 4T RATED VOLTAGE (AC) when the test voltage exceeds the maximum overload, consider using the maximum overload voltage) 额定电压*4倍(交流电压), 测试1秒停止25秒, 测试10000次。(当实验电压超过最高过负荷电压, 采用最高过负荷电压)															
RESISTANCE TO SOLVENT 耐溶剂性	NO VISIBLE DAMAGES TO PROTECTIVE COATING AND MARKING (外观无异常, 标识能够清楚易辨)	SOAK 3MIN IN THE MELTING AGENT TO AGAIN AND AGAIN WIPE 10 TIMES (三氯乙稀浸泡3分钟, 再用湿布反复擦拭10次)															
INSULATION RESISTANCE 绝缘阻抗	>100M Ω																
ELECTRIC WITHSTANDING VOLTAGE 绝缘耐电压	RESISTANCE CHANGE RATE ±(1%+0.05 Ω) WITH NO EVIDENCE OR RESISTOR DAMAGE. 阻抗值变化率±(1%+0.05 Ω), 电阻器不可有损伤	ELECTRIC RESISTANCE BOTH ENDS THE CONJUNCTION LINE PUT ON THE METALS V TYPE THE SLOT, ACCORDING TO THE ELECTRIC VOLTAGE PROVISION OF THE CHARACTERISTIC WATCH 60 SECONDS INFLECTION 电阻两端导线置于金属V型槽上, 依特性表之电压规定施加60秒															
TEMPERATURE CYCLING 温度循环	RESISTANCE CHANGE RATE IS ±(1%+0.05 Ω) MAX, WITH NO EVIDENCE OF RESISTOR DAMAGE. 阻抗值变化率±(1%+0.05 Ω) 以内, 电阻器不可有损伤	<table border="1"> <thead> <tr> <th>STEP 步骤、</th> <th>TEMPERATURE 温度</th> <th>TIME (MIN) 放置时间</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>-25°C ±2°C</td> <td>30</td> </tr> <tr> <td>2</td> <td>ROOM TEMP 室温</td> <td>10-15</td> </tr> <tr> <td>3</td> <td>85°C ±2°C</td> <td>30</td> </tr> <tr> <td>4</td> <td>ROOM TEMP 室温</td> <td>10-15</td> </tr> </tbody> </table>	STEP 步骤、	TEMPERATURE 温度	TIME (MIN) 放置时间	1	-25°C ±2°C	30	2	ROOM TEMP 室温	10-15	3	85°C ±2°C	30	4	ROOM TEMP 室温	10-15
STEP 步骤、	TEMPERATURE 温度	TIME (MIN) 放置时间															
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2	ROOM TEMP 室温	10-15															
3	85°C ±2°C	30															
4	ROOM TEMP 室温	10-15															
RESISTANCE TO SOLDERING HEAT 耐热性	RESISTANCE CHANGE RATE IS ±(1%+0.05 Ω) MAX, WITH NO EVIDENCE OF RESISTOR DAMAGE. 阻抗值变化率(1%±0.05 Ω) 以内, 电阻器不可有损伤	PUT THE LEAD LINE OF RESISTANCE INTO THE SOLDERING ABOUT 3.2 TO 4.8MM PLEASE TAKE IMPLEMENTATION ON THE BASIS OF THE TABLE BELOW 将电阻两端导线浸入锡炉约3.2至4.8mm依下表规定实施 <table border="1"> <thead> <tr> <th>TEMPERATURE 温度</th> <th>DIP TIME 放置时间</th> </tr> </thead> <tbody> <tr> <td>350°C ±10°C</td> <td>3 ±0.5 SEC</td> </tr> <tr> <td>260°C ±5°C</td> <td>10 ±1.0 SEC</td> </tr> </tbody> </table>	TEMPERATURE 温度	DIP TIME 放置时间	350°C ±10°C	3 ±0.5 SEC	260°C ±5°C	10 ±1.0 SEC									
TEMPERATURE 温度	DIP TIME 放置时间																
350°C ±10°C	3 ±0.5 SEC																
260°C ±5°C	10 ±1.0 SEC																
SOLDERABILITY 焊锡性	95% COVERAGE MINIMUM 95%覆盖于导线上	TEST TEMPERATURE OF SOLDER: 230°C ±5°C DWELL TIME IN SOLDER: 3 ±0.5 SEC 锡炉温度: 230°C ±5°C 浸锡时间: 3 ±0.5 秒															
SOLDER JOINT PULL 焊点拉力	PULLING TEST FOR 1/8W ≥1.8KG, 1/4W ≥3.8KG, 1/2W BIGGER THAN ≥5KG 拉力强度 1/8W ≥1.8KG, 1/4W ≥3.8KG, 1/2W 含以上 ≥5KG	SECURE BOTH LEAD WIRE ON EACH SIDE OF PULLING MACHING AND THEN PULL IT 将成品电阻铜线一端夹在拉力器的一端, 铜线另一端也夹在拉力器上, 再摇动拉力器															
Life & failure rate 寿命失效率	Under the rated condition Use Life ≥ 10000H 额定条件下使用寿命 ≥10000小时	failure rate ≤10PPM 失效率 ≤10PPM															

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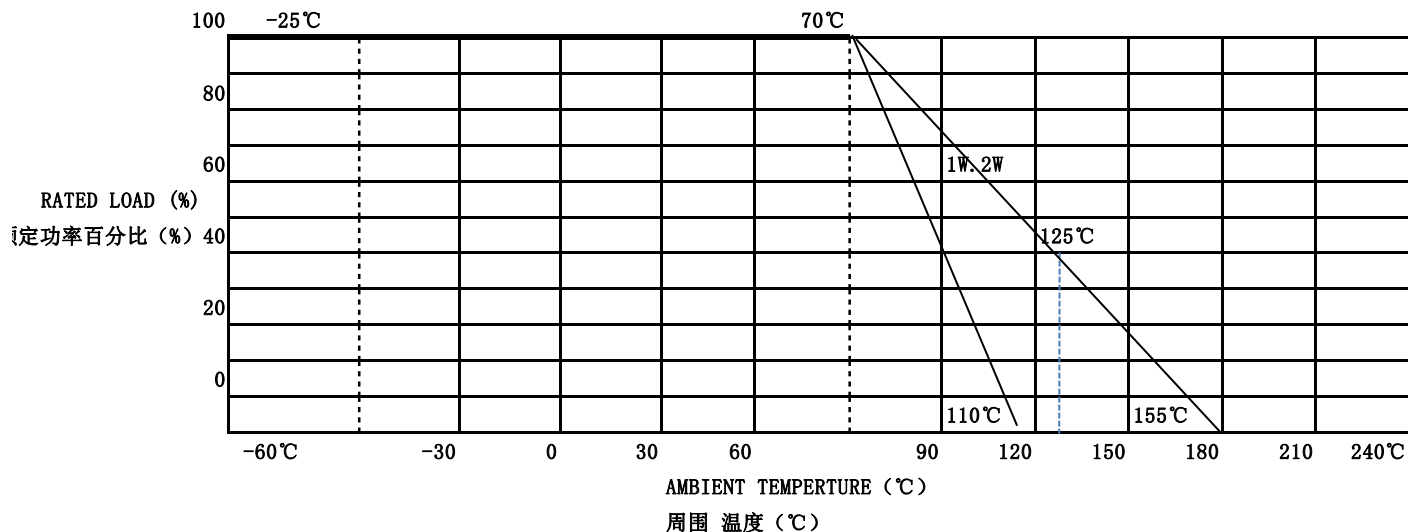
## POWER CHARACTERISTIC 电力特性

POWER PATED 额定功率 ITEM 项目	0.25W (1/4W)	0.5WS (1/2WS)	0.5W (1/2W)	1WS	1W	2WS	2W	3WS	3W	5WS
MAX WORKING VOLTAGE 最高使用电压	500V	500V	500V	500V	500V	500V	500V	500V	500V	500V
MAX OVERLOAD VOLTAGE 最高过负荷电压	1000V	1000V	1000V	1000V	1000V	1000V	1000V	1000V	1000V	1000V
MAX INTERMITTENCE OVER LOAD VOLTAGE 最高断续过负荷	1000V	1000V	1000V	1000V	1000V	1000V	1000V	1000V	1000V	1000V
ELECTRIC WITHSTANDING VOLTAGE 绝缘耐电压	300V	300V	300V	300V	350V	350V	400V	400V	500V	500V
RESISTANCE TOLERANCE 阻抗误差值	K (±10%) J (±5%) G (±2%) F (±1%)									
RANGE (OHM) 阻抗值范围	MIN	0 Ω 1	0 Ω 1	0 Ω 1	0 Ω 1	0 Ω 05	0 Ω 05	0 Ω 05	0 Ω 05	0 Ω 05
	MAX	200 Ω	100 Ω	200 Ω	200 Ω	200 Ω	200 Ω	500 Ω	500 Ω	700 Ω

## FUSING CHARACTERISTIC 熔断特性

CHARACTERISTICS 特性项目	SECIFICATION 规格值		TEST METHODS JIS C 5202 测试方法 JIS C 5202标准
FUSING CHARACTERISICS 熔断特性	RESISTANCE RANGE 阻抗值范围	TESTING VOLTAGE 熔断恒压	WITH IN 60 SECRETARY AT TESTING VOLTAGE 以熔断恒压负载60秒 NOTE : FRXING TEME SHALL BE MEASUTED AS THE DUTATION CIRCUIT CURRENT S DECREASED TO A 1/50. THE INTITAL EEST CURRENT OR LESS. 备注：保险丝电阻需在规定时间内， 使电流降低至初始电流的1/50
	0.1 Ω   1.0 Ω	RESISTOR MULTIPLY POWER MULTIPLY 32T $\sqrt{\text{阻值} \times \text{功率} \times 49 \text{倍}}$	
	1.1 Ω   2.0 Ω	RESISTOR MULTIPLY POWER MULTIPLY 25T $\sqrt{\text{阻值} \times \text{功率} \times 36 \text{倍}}$	
	2.1 Ω   10.0 Ω	RESISTOR MULTIPLY POWER MULTIPLY 16T $\sqrt{\text{阻值} \times \text{功率} \times 25 \text{倍}}$	
	10.1 Ω   1K Ω	RESISTOR MULTIPLY POWER MULTIPLY 12T $\sqrt{\text{阻值} \times \text{功率} \times 16 \text{倍}}$	

POWER DERATING CURVE 负载衰减曲线



NOTE注解:

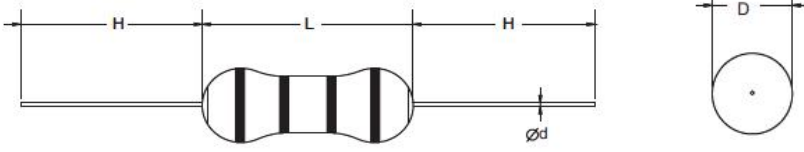
- 1 RATED AMBIENT TEMPERATURE : 70°C  
额定周围温度: 70°C
- 2 OPERATING TEMPERATURE RANGE: -25°C ~ +155°C  
使用温度范围: -25°C ~ +155°C
- 3 FOR RESISTORS OPERATED IN AMBIENT TEMPERATURE OVER 70°C, POWER RATING SHALL BE DERATED IN ACCORDANCE WITH THE FIGURE  
周围温度70°C以上使用时, 根据降功率曲线将减轻额定功率

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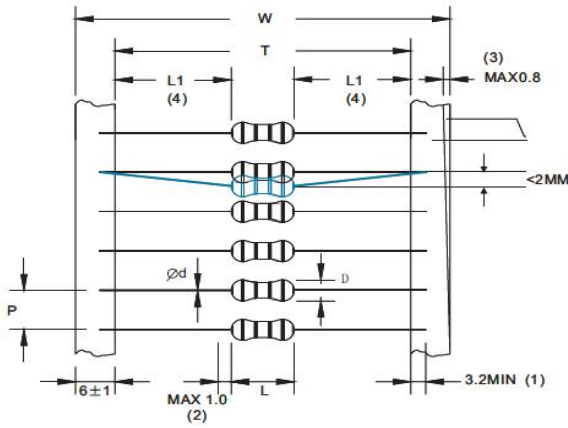
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## BULK TYPE DIMENSION (TO TYPE)



TYPE	LEAD TYPING DIMENSION (mm)			
	L±1.0	D±1.0	Φd±0.05	H±3.0
1/4W 1/2WS	6.2	2.7	0.43	26
1/2W 1WS	9	3.5	0.53	26
1W 2WS	11	4.5	0.63	31
2W 3WS	15.5	5	0.73	31
3W 5WS	17.5	6	0.73	31

## TO TYPE



TYPE	LEAD TYPING DIMENSION (mm)					
	T +1.5 -0.0	D±1.0	Φd±0.05	P±0.3	L±1.0	W+2.0
1/4W 1/2WS	26	2.7	0.43	5	6.2	38
	52					64
1/2W 1WS	52	3.5	0.53	5	9	64
1W 2WS	63	4.5	0.63	5	11	75
2W 3WS	73	5	0.73	10	15.5	85
3W 5WS	73	6	0.73	10	17.5	85

- 1 LEAD DIMENSIONS INCLUDED IN TAPE  
纸带内缘导线长度
- 2 LEAD PAINT DIMENSION  
涂漆于导线上的长度
- 3 DIFFERENCE OF A & B  
A带与B带的位差
- 4 [L1-L2] < 1.0MM  
左右边差小于1.0MM