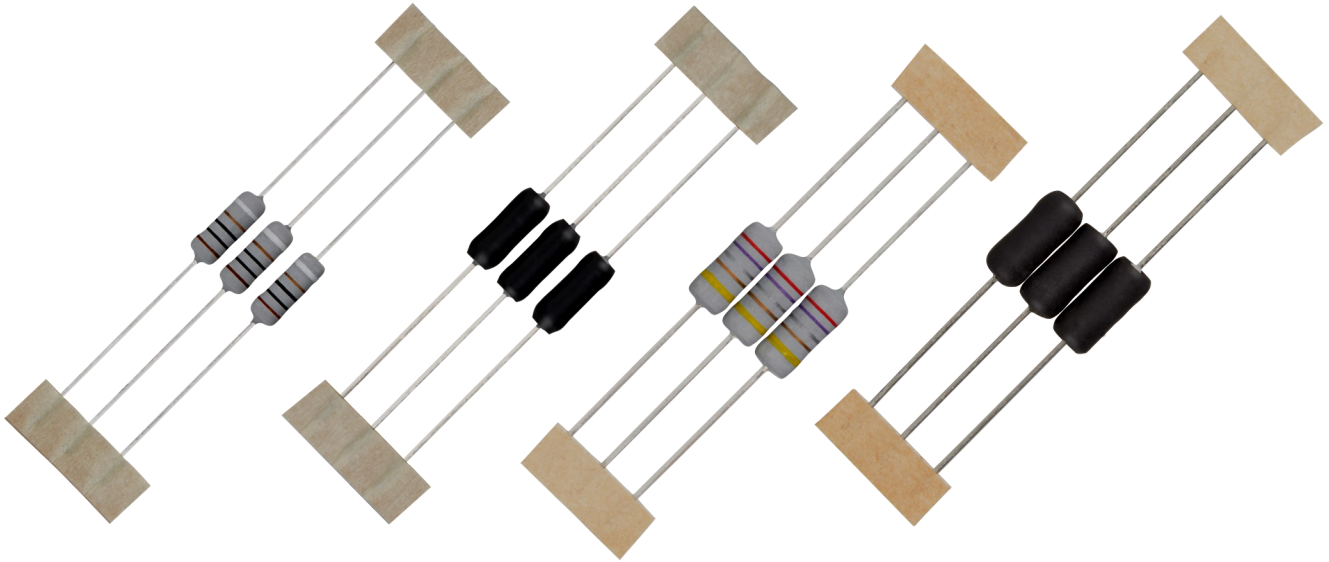


# 线绕熔断电阻器

Fusible Wirewound Resistor (RXF)



RXF

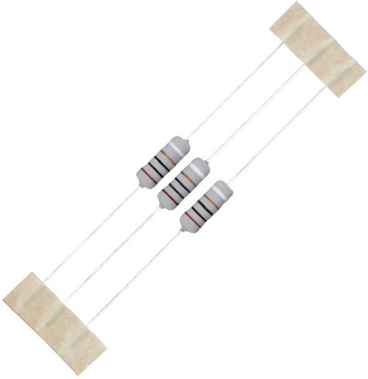

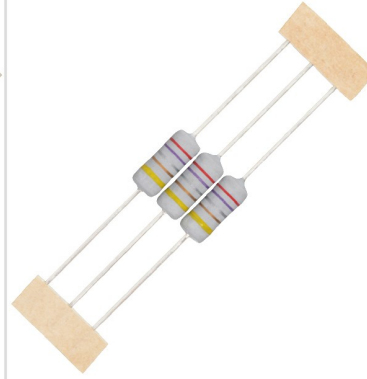

RXF

## 特征 Features

- |          |                           |
|----------|---------------------------|
| ● 过流保护   | Over Current Protection   |
| ● 抗雷击    | Surge Protection          |
| ● 开机浪涌保护 | Inrush Current Protection |
| ● 小型化产品  | Miniaturized Product      |
| ● 环保型产品  | RoHS & REACH Complaint    |

## 线绕熔断电阻器特征概览

### Fusible Wirewound Resistor (RXF) Features Overview

页码 Page	P8	P8	P12	P12
外形 Shape				
结构 Structure	涂覆型 Coating	套管型 With Tube	涂覆型 Coating	套管型 With Tube
$R$ 阻值 Resistance Range	0.47 $\Omega$ - 800 $\Omega$		0.27 $\Omega$ - 1000 $\Omega$	
$P$ 功率类型 Power Type	1 W		2 W	
尺寸 Dimensions	$\Phi 3.5 \text{ mm} \times 9.0 \text{ mm}$	$\Phi 3.8 \text{ mm} \times 10 \text{ mm}$	$\Phi 4.5 \text{ mm} \times 11 \text{ mm}$	$\Phi 4.8 \text{ mm} \times 12 \text{ mm}$
	参照标准：IEC60063-2015，阻值可根据客户需求定制。 According to IEC60063-2015, resistance can be customized.			
	引脚成型方式可根据客户需求定制。 The forming modes can be customized.			

# 线绕熔断电阻器

Fusible Wirewound Resistor (RXF)

## 产品描述 Description

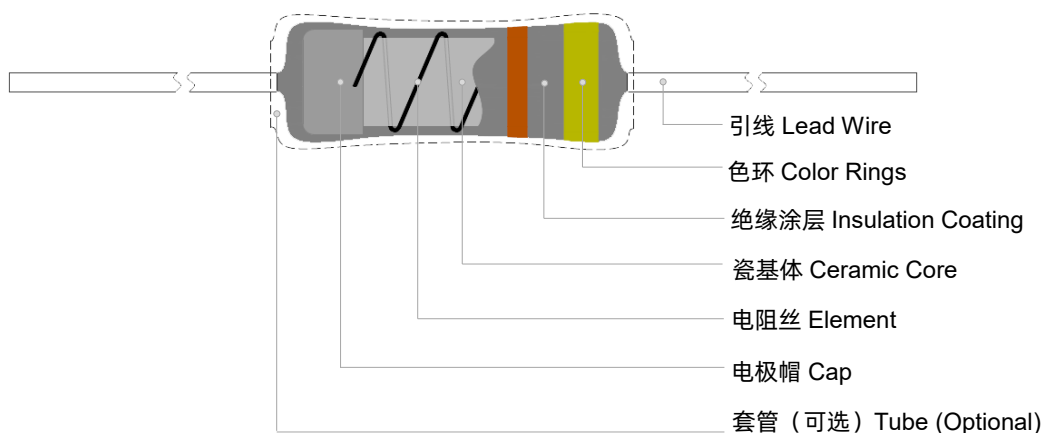
线绕熔断电阻器 (RXF) 是将电阻丝绕在瓷基体上再经过绝缘封装处理而成的功率型电阻器。正常工作时起固定电阻器作用，当电路出现明显过载时可以在规定时间内断开，作为电路保护元件使用。赛尔特公司 (SETsafe | SETfuse) 线绕熔断电阻器体积小，性能优异，已取得UL、cUL、CQC、VDE认证，并满足RoHS、REACH环保要求。

Fusible Wirewound Resistor (RXF) is a power resistor, which is made by winding a resistive element on a ceramic core, and the core is coated by insulation coating. As a Protective Component, RXF works as a fixed resistor in normal operation, and is designed to open the circuit under the overload condition. SETsafe | SETfuse RXF is attractive owing to its Miniaturized Size and Superior Properties and it has already been approved by UL, cUL, CQC, VDE. It also complies with RoHS, REACH.

## 应用 Applications

- 电源 Power Supply
- 通用照明 General Lighting
- 插座 Power Strip
- 个人护理电器 Personal Care Application
- 智能家居 Smart Home
- 安防 Security & Protection

## 结构图 Structure



备注：示意图颜色仅供参考

Note: The color of schematic diagram is for reference only

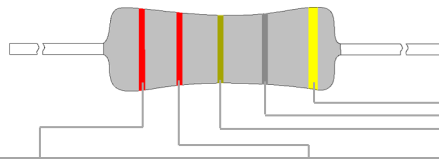
## 型号说明 Product Number System

RXF21S	C	4R7	J	-	T	60	M
类别 Type	额定功率 Rated Power (W)	标称电阻值 Rated Resistance (Ω)	阻值公差 Resistance Tolerance (%)		包装方式 Packaging	产品总长 Total Length (mm)	电阻温度系数 TCR (10 <sup>-6</sup> /°C)
	B: 1 C: 2	R47=0.47 4R7=4.7 47R=47	J: ±5 K: ±10		T: 编带Taping B: 散装Bulk	60 72	M: ± 350 T: 800 ~ 5000

# 线绕熔断电阻器

Fusible Wirewound Resistor (RXF)


## 产品标识 Marking



颜色 Color		第一位有效数字 The First Number	第二有效数字 The Second Number	倍率 Multiple	阻值公差 Resistance Tolerance	功率 <sup>a</sup> Power (W)
■	黑 Black	0	0	10 <sup>0</sup>	N/A	CP wire
■	棕 Brown	1	1	10 <sup>1</sup>	N/A	N/A
■	红 Red	2	2	10 <sup>2</sup>	N/A	N/A
■	橙 Orange	3	3	10 <sup>3</sup>	N/A	N/A
■	黄 Yellow	4	4	10 <sup>4</sup>	N/A	2
■	绿 Green	5	5	10 <sup>5</sup>	N/A	N/A
■	蓝 Blue	6	6	10 <sup>6</sup>	N/A	N/A
■	紫 Purple	7	7	10 <sup>7</sup>	N/A	N/A
■	灰 Grey	8	8	10 <sup>8</sup>	N/A	N/A
■	白 White	9	9	10 <sup>9</sup>	N/A	1
■	金 Gold	N/A	N/A	10 <sup>-1</sup>	J: ± 5%	N/A
■	银 Silver	N/A	N/A	10 <sup>-2</sup>	K: ± 10%	N/A

<sup>a</sup>: 引脚为CP线时，最后一个色环为黑色。When the lead is CP wire, the last color ring is black.

## 安规认证 Agency Approvals

认证信息 Agency Information		认证标准 Standards	文件号 No.
	cURus	UL1412	E324712
	VDE	IEC 62368-1	40035527
	CQC	SJ 2865	CQC10001049758 CQC10001049759 CQC10001049760

## 执行标准 Design to Standards

标准 Standards	标准名 Standards Name
IEC 60115-1	Fixed Resistors for Use in Electronic Equipment
IEC 62368-1	Audio/Video, Information and Communication Technology Equipment-Part 1: Safety Requirements
UL1412	Fusing Resistors and Temperature-Limited Resistors for Radio- and Television-Type Appliances
SJ 2865	《电子元件详细规范》Detail Specification for Electronic Components
GB/T 17626.5	《电磁兼容试验和测量技术浪涌(冲击)抗扰度试验》 Electromagnetic Compatibility-Testing and Measurement Techniques-Surge Immunity Test
GB/T 5729	《电子设备用固定电阻器总规范》Fixed Resistors for Use in Electronic Equipment

# 线绕熔断电阻器

Fusible Wirewound Resistor (RXF)

## 术语 Glossary

项目 Item	描述 Description
<b>R</b>	<b>标称阻值 Rated Resistance</b> 电阻器设计所确定的，通常在电阻器上标出的阻值。 Resistance value for which the resistor has been designed, and which is generally used for denomination of the resistor. — (GB/T 5729) — (IEC60115-1)
<b>U<sub>N</sub></b>	<b>额定电压 Rated Voltage</b> 用标称阻值和额定功耗乘积的平方根计算出来的直流电压或交流电压有效值。 The d.c. or a.c. r.m.s. voltage calculated from the square root of the product of the rated resistance and the rated dissipation. — (GB/T 5729) — (IEC60115-1)
<b>TCR</b>	<b>电阻温度系数 Temp. Coefficient of Resistance</b> 两个规定温度之间的阻值相对变化除以产生这个变化的温度之差。 Relative variation of resistance between two given temp. divided by the difference in the temp. producing it. — (GB/T 5729) — (IEC60115-1)

## 性能测试 Performance Test

### 机械性能测试 Mechanical Performance Test

项目 Item	试验条件 Test Condition	判定标准 Criterion
拉力测试 Tensile Test	对引线施加10 N的拉力，保持60 s。 A pin withstand 10 N × 60 s	无可见损伤 No Visible Damage $\Delta R \leq \pm (1\%R + 0.05 \Omega)$
扭转测试 Twist Test	引脚从根部折弯90°（折弯位置距本体2 mm），扭转180° × 2次。 A pin 2 mm away from body, bent 90°, twist 180° × 2 times.	无可见损伤 No Visible Damage $\Delta R \leq \pm (1\%R + 0.05 \Omega)$

### 环境试验 Environmental Test

项目 Item	试验条件 Test Condition	判定标准 Criterion
温度循环 Temp. Cycle	1. - 55 °C × 30 minutes 2. 室温 Room Temp. × (10 ~ 15) minutes 3. 85 °C × 30 minutes 4. 室温 Room Temp. × (10 ~ 15) minutes 5. 步骤1至4循环5次 5 Cycles from Step 1 to Step 4	$\Delta R \leq \pm (2\%R + 0.05 \Omega)$
25 °C耐久性 Endurance at 25 °C	在(25 ± 2) °C，额定电压1.5 h导通，0.5 h关断，持续1,000 h。 Rated Voltage 1.5 hours ON, 0.5 hours OFF at 25 °C ± 2 °C, total for 1,000 hours.	标识清晰，无可见损伤。 Legible Marking, No Visible Damage. $\Delta R \leq \pm (5\%R + 0.1 \Omega)$

# 线绕熔断电阻器

Fusible Wirewound Resistor (RXF)

## 电气特性测试 Electrical Performance Test

项目 Item	试验条件 Test Condition	判定标准 Criterion
电阻温度系数 TCR	$TCR = \frac{(R_2 - R_1)}{R_1(T_2 - T_1)} \times 10^6$ R <sub>1</sub> : 25 °C时的电阻值 Resistance Value at 25 °C R <sub>2</sub> : 125 °C时的电阻值 Resistance Value at 125 °C T <sub>1</sub> : 25 °C, T <sub>2</sub> : 125 °C	在规定值范围内 Within Specified Value
短时间过载 Short-Time Overload	通2.5倍的额定电压, 持续5 s。 2.5U <sub>N</sub> × 5 s	无可见损伤 No Visible Damage ΔR ≤ ± (2%R + 0.05 Ω)
绝缘电阻 Insulation Resistance	包箔法, 在引线与金属膜之间施加500 VDC。 Foil Method: Apply 500 VDC between both terminations of the resistor connected together as one pole and the metal foil as the other pole.	绝缘电阻: ≥1,000 MΩ Insulation Resistance ≥ 1,000 MΩ
耐压 Voltage Proof	包箔法, 引线与金属箔膜之间施加250 VAC (CP线产品) 或 350 VAC (涂覆型) 或900 VAC (套管型), 保持1 minute。 Foil Method: Apply 250 VAC × 1 minute (CP wire type) or 350 VAC × 1 minute (coating type) or 900 VAC × 1 minute (with tube) between terminations and the metal foil.	不得有弧光、击穿等现象发生 No Breakdown or Flashover
熔断测试 Fusing Test	对电阻器施加规定的测试电流 (恒流源) Apply specified test current to the resistor (constant current source)	Fusing Time ≤ 60 s
可焊性 Solderability	槽焊法 (非活性松香) 助焊剂: 25%松香酒精 锡炉温度: (255 ± 5) °C 浸入深度 (距安装面或元件主体): (1.5 ~ 2.0) mm 浸入时间: (2.5 ± 0.5) s Solder Bath (non-activated flux) Scaling Powder: 25% Rosin Alcohol Bath Temp.: (255 ± 5) °C Depth of Immersion (From the seating plane or component body): (1.5 to 2.0) mm Time of Immersion: (2.5 ± 0.5) s	引线焊锡面积覆盖率≥95% Soldering Area ≥ 95%
雷击浪涌测试 Surge Test	使用组合波发生器 (1.2/50 μs, 8/20 μs, 2 Ω)对电阻施加开路电压1.0 kV (R ≤ 10 Ω) 或 2.0 kV (R > 10 Ω), 冲击10次, 间隔1 minute。 Combination Wave Generator (1.2/50 μs, 8/20 μs, 2 Ω), apply open-circuit voltage 1.0 kV (R ≤ 10 Ω) or 2.0 kV (R > 10 Ω) to the resistor, 10 pulses test at 1 minute Interval.	试验后电阻无开路 Resistor shall not open after the test

# 线绕熔断电阻器

Fusible Wirewound Resistor (RXF)



## 注意 ATTENTION

### 冷电阻测试 Cold Resistance Test

1. 当产品电阻温度系数 $\geq 350$  ( $10^{-6}/^{\circ}\text{C}$ ), 对产品进行电阻测试时, 需要用电阻温度系数将阻值修正至基准温度 $25^{\circ}\text{C}$ 所对应的电阻值。  
If product TCR is not less than  $350$  ( $10^{-6}/^{\circ}\text{C}$ ), the measured resistance value shall be corrected as the relative resistance value under  $25^{\circ}\text{C}$  according to TCR formula.
2. 采用四端测试法。  
Resistance Measurement (4-terminal test).

### 使用方法 Usage

1. 通电情况下请勿用人体直接接触电阻器本体或引脚, 防止烫伤或触电。  
Do not touch the resistor body or pins directly when power is on, to avoid burn or electric shock.
2. 气压在 $80\text{ kPa}$ 到 $106\text{ kPa}$ , 对应海拔为 $2000\text{ m}$ 到 $-500\text{ m}$ 。  
When air pressure is from  $80\text{ kPa}$  to  $106\text{ kPa}$ , the relative altitude shall be  $2000\text{ m}$  to  $-500\text{ m}$ .

### 更换 Replacement

线绕熔断电阻器是不可修复的产品, 基于安全原因, 替换时应使用同类别同型号的产品。  
As RXF is a non-resettable product, for safety sake, please use the same type of RXF for replacement.

### 贮存 Storage

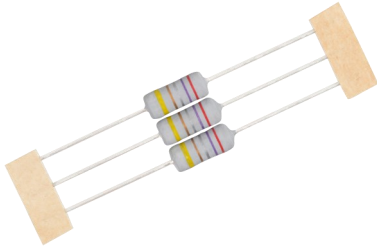
1. 将线绕熔断电阻器放置在温度 $10^{\circ}\text{C}$ 至 $30^{\circ}\text{C}$ , 相对湿度 $30\%$ 至 $75\%$ 的条件下保存。  
Please store RXF with ambient temp.  $10^{\circ}\text{C}$  to  $30^{\circ}\text{C}$  and relative humidity  $30\%$  to  $75\%$ .
2. 线绕熔断电阻器的贮存应避免高温、高湿、日光直射及腐蚀性气体的场合, 避免影响引脚的可焊性, 产品购入后请于1年内使用完毕。  
Do not store the RXF at the high temp., high humidity or corrosive gas environment, avoid influencing the solderability of the pins, please use them up within 1 year after receiving the goods.

# 线绕熔断电阻器

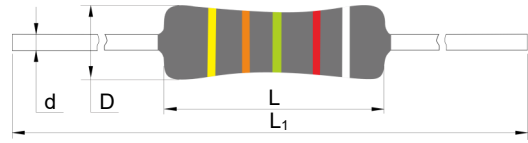
Fusible Wirewound Resistor (RXF)

RXF21SC 系列 Series

## 涂覆型 Coating

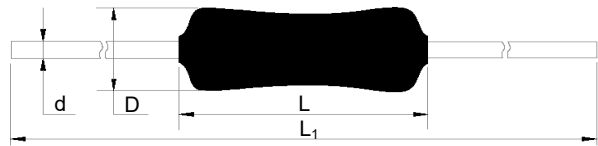


## 尺寸 Dimensions (mm)



L	L <sub>1</sub>	D	d
11.0 ± 1.0	60.0 / 72.0 ± 2.0	Φ4.5 ± 0.5	Φ0.70 / Φ0.55 ± 0.05

## 套管型 With Tube



L	L <sub>1</sub>	D	d
12.0 ± 1.0	60.0 / 72.0 ± 2.0	Φ4.8 ± 0.5	Φ0.70 / Φ0.55 ± 0.05

蓝色字体为赛尔特常规长度  
Blue font is SETsafe | SETfuse common length

## 引脚成型类型 Leads Forming Types

Type A		Type B		Type C		Type D	
H (mm)	F (mm)	H (mm)	F (mm)	H (mm)	F (mm)	L (mm)	F (mm)
3.5 ± 0.5	5.0 / 7.5 ± 0.5	3.5 ± 0.5	5.0 / 7.5 ± 0.5	3.5 ± 0.5	(14.0 ~ 18.0) ± 0.5	3.0 ± 0.5	13 ± 1
引脚成型方式及尺寸可根据客户需求定制 The forming modes and length of lead wires can be customized							

## 电性能参数 Electrical Characteristics

项目 Item	参数 Parameter
功率类型 Rated Power (P)	2 W
标称阻值 Rated Resistance (R)	(0.27 ~ 1000) Ω
阻值公差 Resistance Tolerance	5% (E24) , 10% (E12)
额定电流 Rated Current (I <sub>N</sub> )	$I_N = \sqrt{P/R}$
额定电压 Rated Voltage (U <sub>N</sub> )	$U_N = \sqrt{P \times R}$
浪涌 (仅供参考) Surge (For Reference Only)	2.0 kV (R > 10 Ω)
	1.0 kV (R ≤ 10 Ω)






# 线绕熔断电阻器

Fusible Wirewound Resistor (RXF)

RXF21SC 系列 Series

## 技术参数 Specifications

系列 Series	额定功率 Rated Power	标称阻值 Resistance Range	阻值公差 Resistance Tolerance	使用温度范围 Operating Temp. Range	安规认证 Agency Approvals			环保 Environmental Status	
					 US E324712	 CQC V019518	 VDE REG E012	RoHS	REACH
	(W)	(Ω)	(%)	(°C)	cURus	CQC	VDE		
RXF21SC	2	3 ~ 68	± 5, ± 10	- 55 ~ 155	●	●	●	●	●
		0.27 ~ 1000			●	N/A	●	●	●

可根据客户要求订制无感线绕电阻  
Non-inductive resistor can be customized as required

阻值选型表 (参照标准: IEC60063-2015, 蓝色字体为赛尔特常规阻值)  
Resistance Selection Table (According to IEC60063-2015, blue font is SETsafe | SETfuse common resistance)

标称阻值 Rated Resistance	代码 Code	标称阻值 Rated Resistance	代码 Code	标称阻值 Rated Resistance	代码 Code	标称阻值 Rated Resistance	代码 Code
(Ω)		(Ω)		(Ω)		(Ω)	
0.10	R10	1.0	1R0	10	10R	100	100R
0.11	R11	1.1	1R1	11	11R	110	110R
0.12	R12	1.2	1R2	12	12R	120	120R
0.13	R13	1.3	1R3	13	13R	130	130R
0.15	R15	1.5	1R5	15	15R	150	150R
0.16	R16	1.6	1R6	16	16R	160	160R
0.18	R18	1.8	1R8	18	18R	180	180R
0.20	R20	2.0	2R0	20	20R	200	200R
0.22	R22	2.2	2R2	22	22R	220	220R
0.24	R24	2.4	2R4	24	24R	240	240R
0.27	R27	2.7	2R7	27	27R	270	270R
0.30	R30	3.0	3R0	30	30R	300	300R
0.33	R33	3.3	3R3	33	33R	330	330R
0.36	R36	3.6	3R6	36	36R	360	360R
0.39	R39	3.9	3R9	39	39R	390	390R
0.43	R43	4.3	4R3	43	43R	430	430R
0.47	R47	4.7	4R7	47	47R	470	470R
0.51	R51	5.1	5R1	51	51R	510	510R
0.56	R56	5.6	5R6	56	56R	560	560R
0.62	R62	6.2	6R2	62	62R	620	620R
0.68	R68	6.8	6R8	68	68R	680	680R
0.75	R75	7.5	7R5	75	75R	750	750R
0.82	R82	8.2	8R2	82	82R	820	820R
0.91	R91	9.1	9R1	91	91R	910	910R

# 线绕熔断电阻器

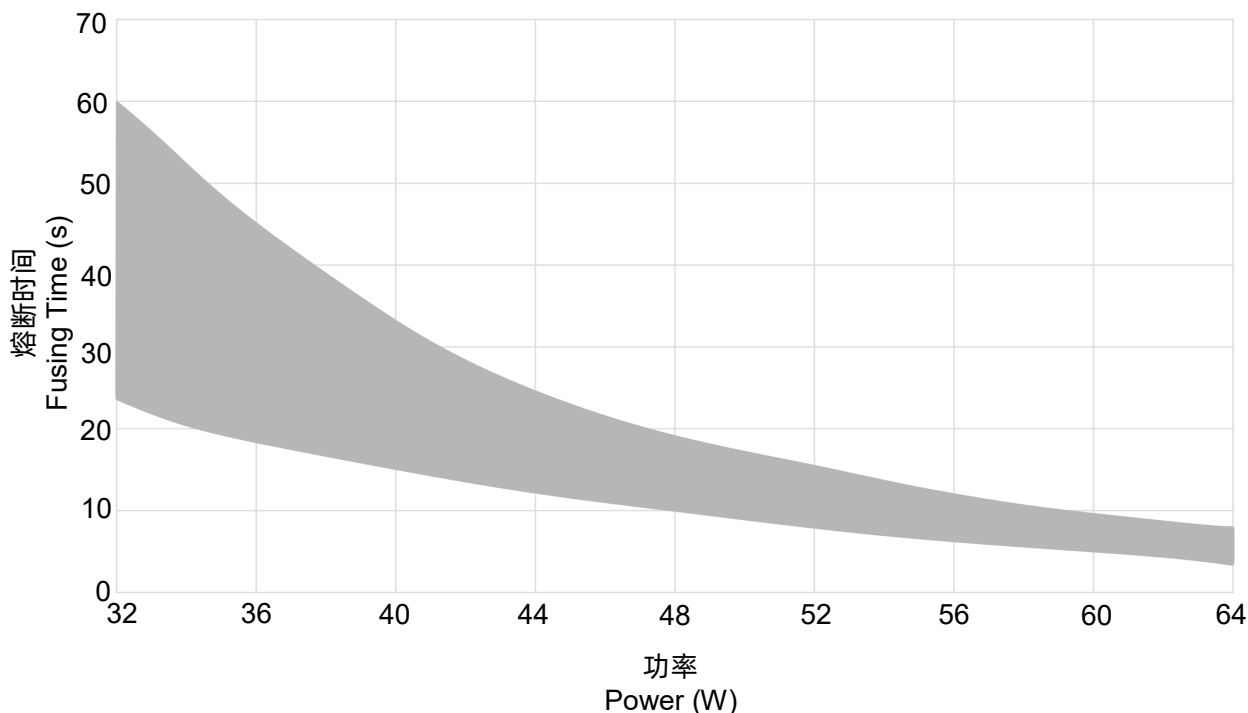
Fusible Wirewound Resistor (RXF)

RXF21SC 系列 Series

## 熔断曲线图 (仅供参考) Fusing Time Curve (For Reference Only)

线绕熔断电阻在不同功率倍数下熔断时间曲线如下所示。

Power & Time curve, showing fusing time at multi-times rated power (ambient temp.: 25 °C ± 2 °C).



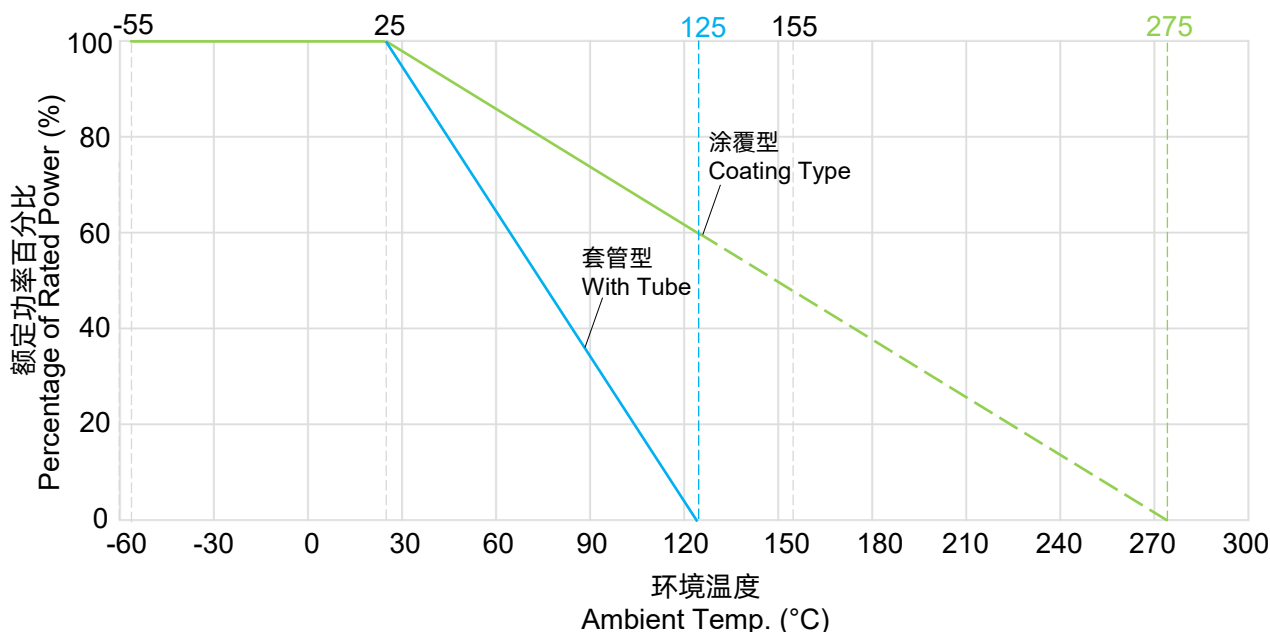
## 降额曲线 (仅供参考) Rated Power Derating Curve (For Reference Only)

当元器件周围的环境温度超过25 °C时, 额定功率随着环境温度的上升而下降情况如下图所示。

(聚烯烃套管最高工作温度为125 °C)

When the ambient temp. exceeds 25 °C, the rated power value declines as the following curve.

(The Max. working temp. of polyolefin tube is 125 °C)



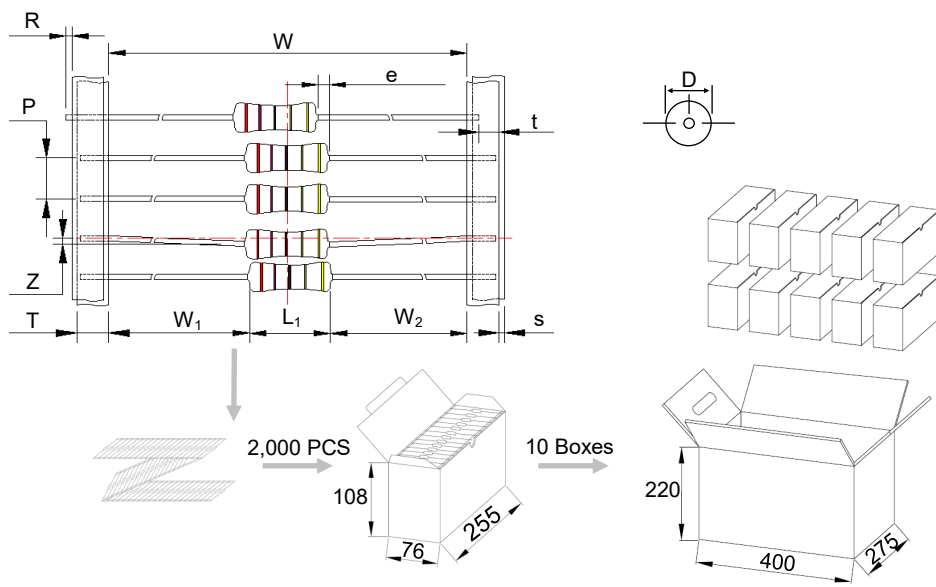
# 线绕熔断电阻器

Fusible Wirewound Resistor (RXF)

RXF21SC 系列 Series

## 包装信息 Packaging Information

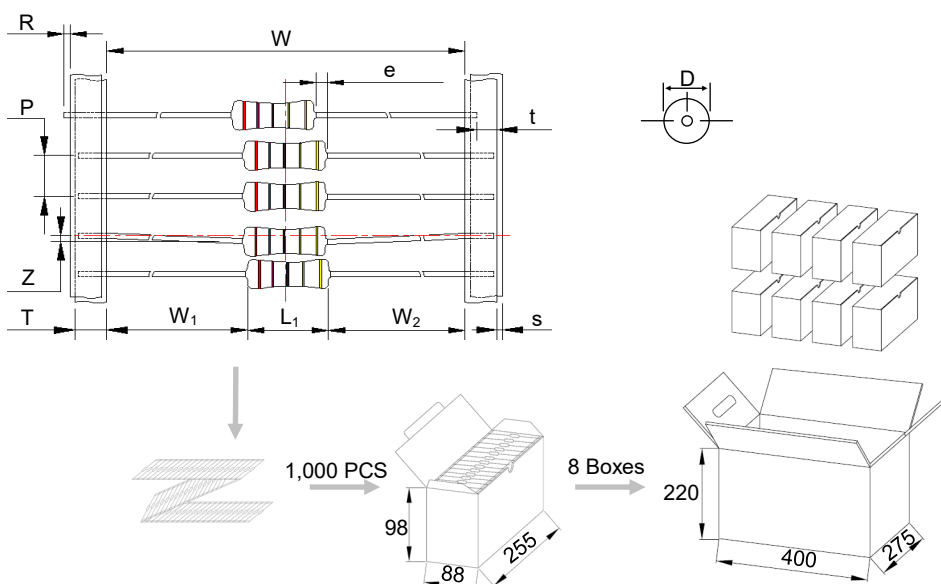
编带 Taping (产品总长 Total length: 60 mm)



符号 Symbol	尺寸 Dimensions (mm)
L <sub>1</sub>	11.0 ± 1.0
W	52 ± 2
D	Φ4.5 ± 0.5
P	5.0 ± 0.5
W <sub>1</sub> - W <sub>2</sub>	2.0 Max.
T	6.0 ± 0.5
Z	1.2 Max.
R	0.5 Max.
t	4.0 Max.
e	2.0 Max.
s	0.8 Max.

项目 Item	内盒 Box	外包装箱 Carton
尺寸 Dimensions (mm)	255 × 76 × 108	400 × 275 × 220
数量 Quantity (PCS)	1,000	10,000
毛重 Gross Weight (kg)		8.2 ± 10%

编带 Taping (产品总长 Total length: 72 mm)



符号 Symbol	尺寸 Dimensions (mm)
L <sub>1</sub>	11.0 ± 1.0
W	63 ± 2
D	Φ4.5 ± 0.5
P	5.0 ± 0.5
W <sub>1</sub> - W <sub>2</sub>	2.0 Max.
T	6.0 ± 0.5
Z	1.2 Max.
R	0.5 Max.
t	4.0 Max.
e	2.0 Max.
s	0.8 Max.

项目 Item	内盒 Box	外包装箱 Carton
尺寸 Dimensions (mm)	255 × 88 × 98	400 × 275 × 220
数量 Quantity (PCS)	1,000	8,000
毛重 Gross Weight (kg)		7.2 ± 10%

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