Gold Aluminum-Cased Resistor Product Training

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Product Overview

What Is a Gold Aluminum-Cased Resistor?

Product Definition & Construction

A power-type resistor enclosed in an aluminum alloy housing, specifically designed to handle high power dissipation while ensuring stability under high-load conditions

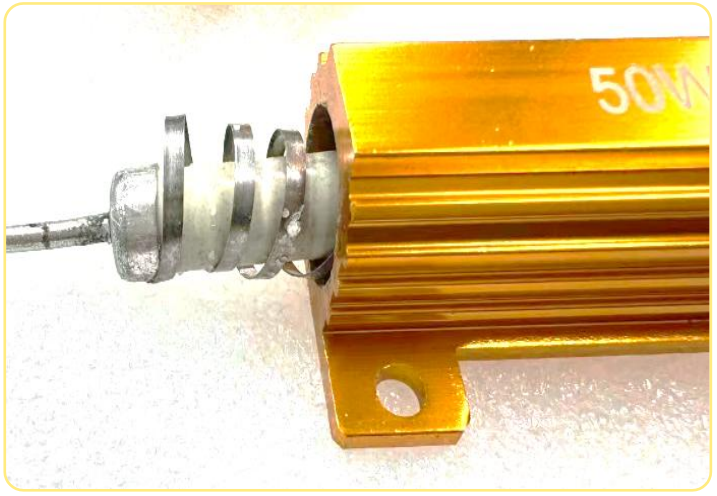
Core Advantages

Featuring superior heat dissipation capability, this resistor effectively absorbs energy and ensures stable circuit operation

Primary Application Scenarios

Widely used in power supplies, variable frequency drives (VFDs), servo drives, and similar equipment for power distribution, load testing, and energy absorption.

Product Structure Breakdown



Resistor Element

Manufactured from a high-resistivity alloy, the resistor element serves as the core component responsible for delivering the resistor's fundamental function.

Aluminum-cased

Formed through aluminum alloy extrusion and finished with a gold-plated surface, the housing simultaneously delivers heat dissipation, electrical insulation, and visual appeal

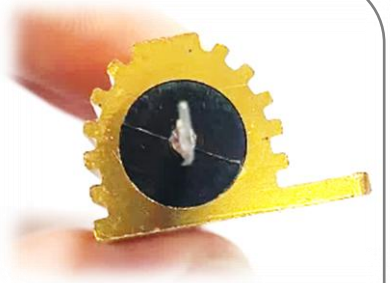
Heat Dissipation Substrate

The substrate increases the surface area for heat dissipation, ensuring efficient power dissipation and delivering improved operational stability

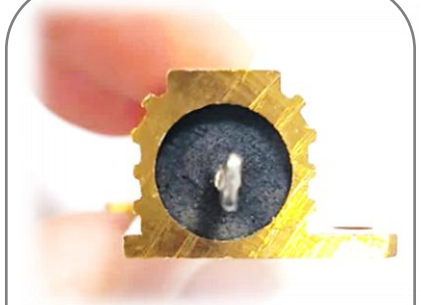
Terminals

The terminals are typically made of tin-plated copper, ensuring high conductivity and good solderability for reliable circuit connection

Product Structure Breakdown



◆ Molding Process



◆ Standard Process

Molding Process

Ceramic rod, alloy wire, **epoxy molding compound**, aluminum housing

Conventional Process

Ceramic rod, alloy wire, **quartz sand, silicone resin**, aluminum housing

Key Differentiators

Compared to conventional products, this solution offers ultra-low resistance, a low temperature coefficient (200 ppm), excellent vibration resistance, high heat dissipation efficiency, and high precision.

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Core Features

Core Features

Stable performance and high power rating

Made with high-quality alloy resistance wire and precision manufacturing processes, it ensures long-term resistance stability and can withstand high power levels ranging from 5W to 500W

Gold-plated surface

The unique golden finish offers great oxidation and corrosion resistance, ensuring a longer service life—in addition to its aesthetic appeal

Wide Temperature RangeStable

Performance from -55°C to +275°C, ideal for harsh operating environments.

High Precision Tolerance

±1% accuracy class, designed to meet the demands of precision circuits and guarantee accurate system performance

Non-Inductive Customization Available

Customizable non-inductive or low-inductance models available upon request. Ideal for high-frequency circuit applications.

Superior Thermal Performance

Aluminum alloy housing plus thermal substrate design enables fast heat dissipation and ensures reliable power output.

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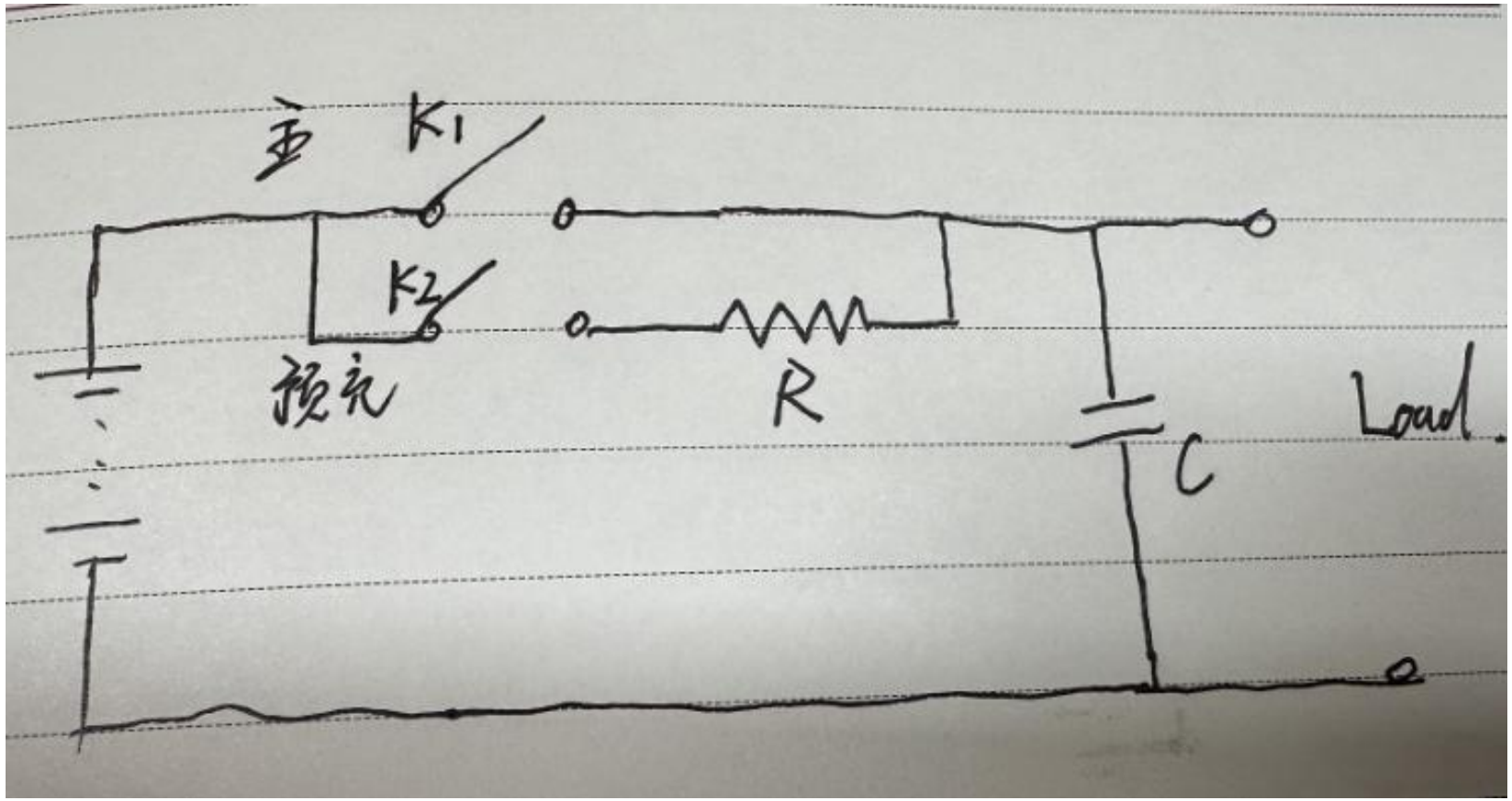
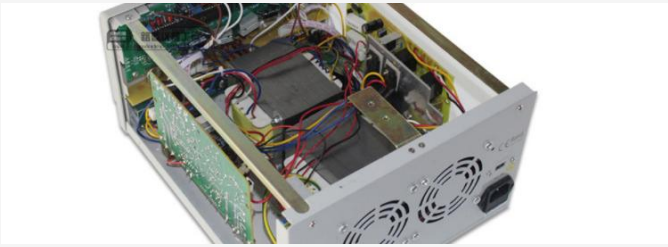
Application Scenarios

Main Application Field



Main Application Field



Power Equipment

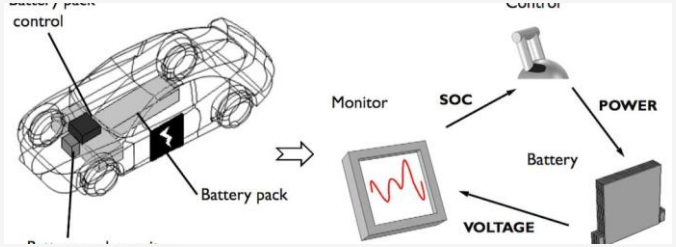
Used for loading, voltage dividing, current limiting, and other functions in power supplies.

Frequency Converter

Used for energy absorption and buffering in variable frequency circuits.

Welding machines

Used for current regulation and power distribution



New Energy Vehicle

Used in discharge systems and power conversion.

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Key parameters

Specifications, Dimensions, and Power Ratings

Part Number	Rated Power	L1 (mm)	L2 (mm)	W1 (mm)	Weight(g)
RX24-5W	5W	15.0	11.4	12.0	3
RX24-100W	100W	98.0	70.0	37.0	160
RX24-500W	500W	200.0	172.0	58.0	970

Note: Values are typical

Electrical Parameters

Resistance

0.01Ω ~ 82KΩ

Tolerance

±1%, ±5%

TCR

250/350/100 ppm/°C

Withstanding Voltage

1000V (5W-25W) / 2000V (30W-75W)
2500V (100W-500W)

Maximum Operating Temperature

+275°C

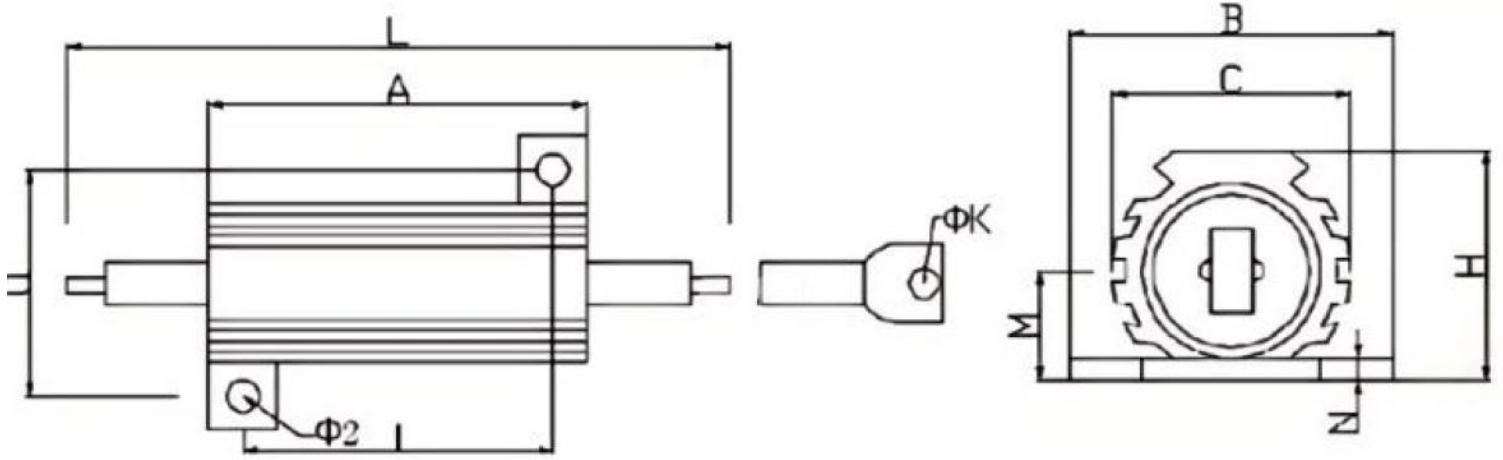
Electrical Parameters

■ Electrical parameters

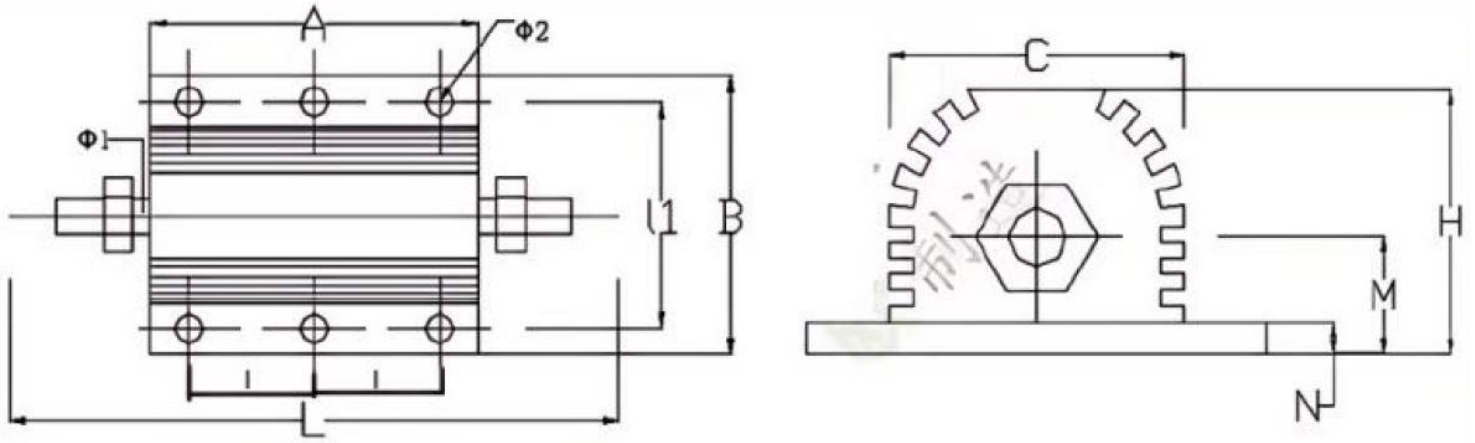
model number	Rated power at 25℃ (W)		Resistance Range(Ω)	temperature coefficient TCR(10/℃)	resistance error(%)	withstand voltage (V)
	With heat sink	Without heat sink				
RX	5	3	0.01~1K	±100	±1	1000
	10	8	0.01~1.5K			
	25	12.5	0.01~10K			
	30	15	0.01~27K			2000
	40	18	0.01~30K			
	50	20	0.01~33K			
	60	30	0.01~35K			
	75	45	0.01~39K			
	100	50	0.01~51K		±5	
	150	55	0.01~56K	±250		
	200	100	0.01~58K			
	250	120	0.01~75K	±350		2500
	300	150	0.01~75K			
	350	180	0.01~78K			
	500	200	0.01~82K			

Note: Customizable power rating up to 1000W,dimension 300*73*45

Electrical Parameters



Power Range: (5W~60W)



Power Range (75W~500W)

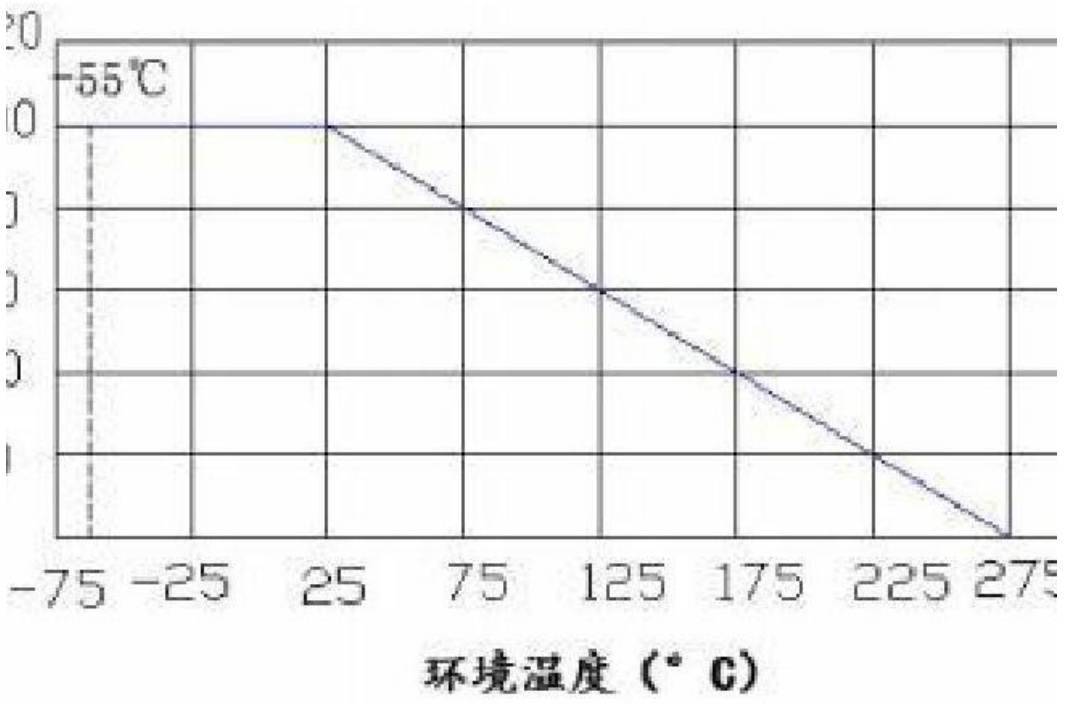
Power Derating Curve

Characteristics & Application Guide

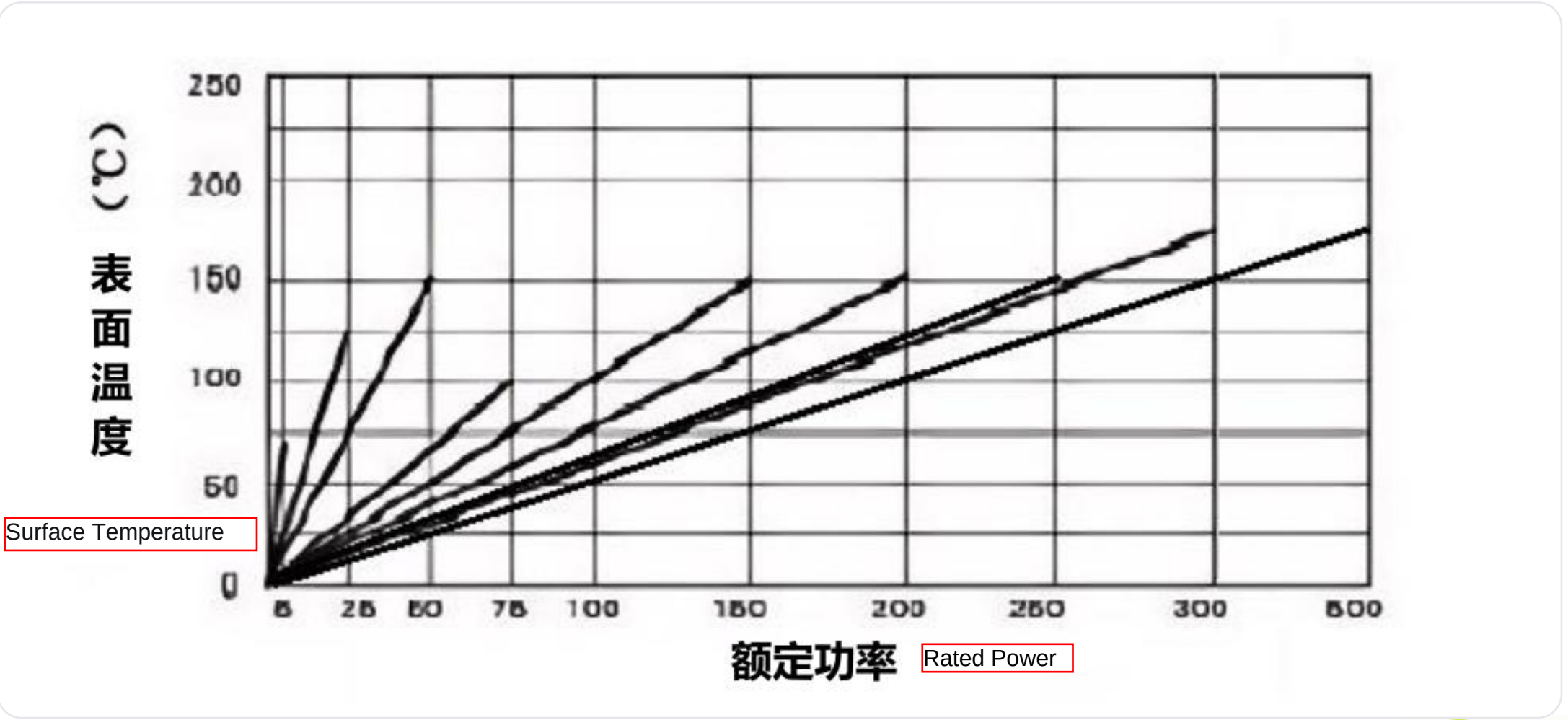
The chart shows that rated power is inversely proportional to ambient temperature —as temperature increases, allowable power decreases

Critical threshold: At an ambient temperature of 125°C, the resistor's actual power handling capability is reduced to 50% of its rated power

Design Consideration: Strict power derating is required in high-temperature environments to ensure device reliability and lifespan



Power-Temperature Rise Curve



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Production Process and Testing

Production Process Flow

01. Material Preparation

Prepare core components: resistor alloy wire, ceramic rod, aluminum alloy housing , and pins.

02.Resistor Core Manufacturing

Precision winding of resistance wire onto the ceramic rod to form a high-precision resistor core.

03. Welding and Assembly

Solder the resistor core to the lead pins, then enclose it within the aluminum alloy housing to ensure a robust structure.

04. Encapsulation and Filling

Internal filling and encapsulation are applied to ensure excellent thermal performance and electrical isolation.

05. Surface Plating

Anodize the housing to achieve the signature gold color and increase corrosion resistance

06. Performance Testing

Comprehensive tests such as resistance, power rating, and dielectric strength are carried out to verify that the product meets all performance standards

Key Performance Tests

Short-Time Overload Test

Apply 10 times the rated voltage for 5 seconds to test the resistor's surge withstand capability

Soldering Heat Resistance Test

The component is immersed in a 350°C solder bath for 2 to 3 seconds to test its stability under soldering conditions.

Temperature Cycling Test

Cycle between -55°C and +125°C for 5 cycles to test performance under temperature variation

Damp Heat Life Test

Rated voltage is applied for 1000 hours under conditions of 40°C and 90% relative humidity to evaluate long-term stability.

Temperature Life Test

Rated voltage is applied for 1000 hours at 70°C to evaluate the product's operational life under elevated temperatures.

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Selection Guide & Alternatives

Product Selection Guide

01 Determine Power Requirements

Calculate the necessary power according to the voltage and current in the circuit. A 1.5× power derating margin is recommended

02 Selecting the Right Resistance

Choose the appropriate resistance value and precision grade in accordance with circuit design requirements to guarantee that circuit performance achieves the desired standards

03 Temperature Coefficient Consideration

50ppm is only available for very low resistance values; for general product selection, a temperature drift of no more than 350ppm is acceptable; molded types can achieve 100ppm.

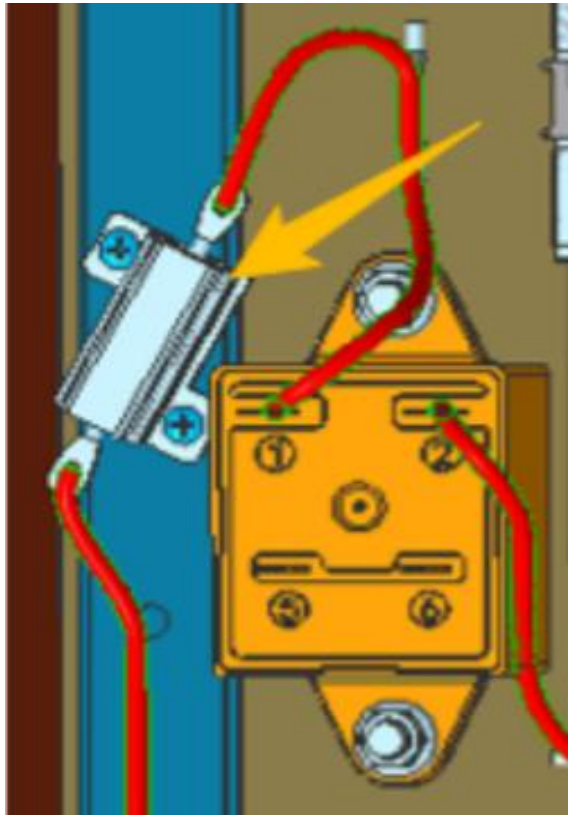
04 Mounting Dimension Considerations

Verify the equipment's installation space. Ensure that the resistor's package dimensions are compatible with the physical mounting requirements

05 Evaluate Thermal Conditions

Determine the final power selection based on actual heat dissipation conditions, referencing the power derating curve, to prevent overheating damage.

Product Installation Method



Round hole – solder wire

Screw terminal

Through-hole mounting

Alternative Product Comparison

Characteristic Dimension	Gold Aluminum Resistor	Cement Resistor	Non-Inductive Resistor
Power Range	High(5W-500W)	M-High (5W-50W)	(20W-150W)
Tolerance	High(±1%)	Low(±5%)	Middle(±1%)
Heat Dissipation Performance	Excellent(Gold Housing)	General(Cement Encapsulation)	General
High-Frequency Characteristics	Good (custom non-inductive available)	General	Good（non-inductive)
Physical Size	Relatively Large	Large	Small
Cost Level	Medium-High	Low	High
key Advantages	Good overall performance Excellent heat dissipation	Low cost, surge-resistant	Small size, non-inductive

Conclusion and Review

Key advantages

High power, high stability, excellent heat dissipation, and a wide operating temperature range ensure reliable performance in extreme environments.

Wide Application

Widely used in key industrial fields such as power supplies, frequency converters, servo drives, welding machines, and new energy vehicles.

Key Selection Considerations

When selecting, it is necessary to define power requirements, fully consider heat dissipation conditions, and reasonably reserve power margin to ensure system safety

Quality Assurance

By employing stringent production procedures and full-scale performance validation, each product is guaranteed to deliver exceptional reliability and consistency.

Thank you for your time and attention