Resistors

Carbon film resistors

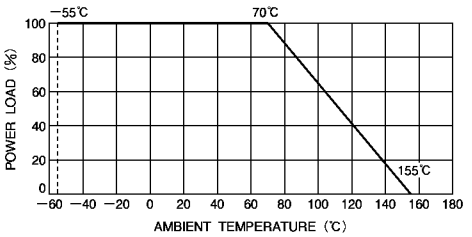
R25X (6.3 × ϕ 2.4 size: 1 / 3W)

ROHM resistors are produced using an integrated production system for parts and materials, and state of the art technology to ensure high precision productivity, and quality.
ROHM resistors are ISO-9001 certified.
The design and specifications are subject to change without prior notice. Before ordering or use, please cheak the technical specification sheets.

●Features

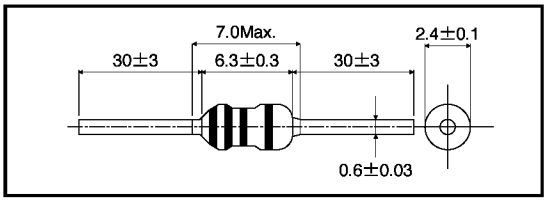
1) All ceramic rods are made from the same material to yield consistent quality.
2) Unique production methods provide outstanding mechanical strength characteristics.
3) Superb accuracy of axial taping for excellent high-speed automatic insertion performance.
4) Though miniaturized, the R25X retains the high pulse resistance of its predecessor chips.
5) Soft copper wire with solder plating offers superior solderability.
6) Both insulator coating and its color codes are highly resistant to solvents, and steam cleaning is no problem.
7) Highly nonflammable insulation coating (UL94V-0).

●Ratings

Item		R25X	
Rated power (70℃)		1 / 3W (0.33W)	
	Power derating curve	 Power must be derated according to the power derating curve in the accompanying figure when ambient temperature exceeds 70 °C.	
Rated voltage		Rated voltage is equal to the lesser of the value obtained by the formula $\sqrt{\text{rated voltage x nominal resistance}}$ or maximum operating voltage.	
	Maximum voltage	300V	
Resistance	Resistance tolerance		J (±5℃)
	Resistance temperature coefficient	Nominal resistance	Resistance temperature coefficient
		Less than 10 Ω	0 to +300ppm / ℃
		10Ω to 300kΩ	0 to −400ppm / ℃
		330kΩ to 910kΩ	0 to −600ppm / ℃
		1MΩ to 1.3MΩ	0 to −700ppm / ℃
		1.5MΩ to 3.3MΩ	0 to −1000ppm / ℃
	Resistance range		0.47Ω to 3.3MΩ
	Nominal resistance	E24 series	
	Maximum overload voltage	600V	
	Maximum intermittent overload voltage	750V	
	Operating temperature	−55℃ to 155℃	
	Weight	230mg	

Note: This product meets the specifications given in this specification sheet, but it is influenced by the applied voltage and ambient conditions. For this reason, if the product is to be used in equipment that must be extremely reliable, pay careful consideration to the load rate on the component when designing the equipment.
In cases such as this, we recommend that you design the circuit so that the voltage on the component is no more than half of its rated value. In particular, when the component is used in AC circuits, take steps to ensure that the peak voltage applied to the component is less than the maximum operating voltage.

●External dimensions (Units: mm)



●Structure and materials

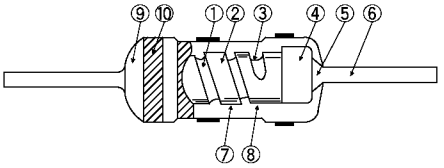


Fig.1

(1) Substrate: Alumina magnetic rod
Alumina is superior to regular mullite or forsterite with respect to mechanical strength, thermal conductivity, and thermal stability.

(2) Resistive elements
0Ω: Copper film
Less than 10Ω: Nickel film. In addition to their high stability, these resistors are designed to cut off safely in the event of a voltage spike.
10Ω and above: Carbon film. This type of film offers superior uniformity and stability.

(3) Cutting groove
The groove is cut to a uniform depth and width across the whole element, and there are no chips or cracks in the finished product.

(4) Terminals: Tin-plated copper, steel cap
This material provides a solid physical and electrical connection.

(5) Connections: Spot-welded
Spot welding ensures a solid, durable connection between the terminal and the terminal wire.

(6) Terminal wires: Solder-plated copper wire
Can be soldered effectively even after a long time.

(7) Protective film
For resistors of 10Ω or more, a special inorganic material guarantees the long-term stability of the dielectric film.

(8) Under coating: Phenolic resin
The dielectric film is protected by a coat of high-purity phenolic resin.

(9) Outer coating: Epoxy resin (color: light brown)
This coating offers superior resistance to heat, the elements, and solvents, and is a good insulator. It is also very safe, meeting the UL94V-0 standard for nonflammability.

(10) Markings: Color coding using thermo-hardened paint
Markings offer outstanding resistance to solvents and chemicals, and do not fade.

●Reference standards

ROHM's pioneering products meet the following domestic and international standards.

- •JIS C 5202: Regulations on test methods for fixed resistors
- •JIS C 5003: Regulations on test methods for malfunction rates
- •JIS C 6402: Resistors, fixed, carbon film
- •MIL-R-11: Resistors, fixed, composition (insulated)
- •MIL-R-10509: Resistors, fixed, film (high stability)
- •MIL-R-22684: Resistors, fixed, film, insulated
- •EIA-RS-196: Fixed film resistors-precision and semi-precision
- •DIN-44052: Resistors, fixed, lacquered, cracked carbon film, high stability, with axial leads

●Pulse voltage limits

The pulse voltage rating (1) is determined by the following formula. However, if the value obtained from the formula exceeds the maximum pulse voltage (2) or the resistance-limited voltage peak value (3), the lowest value must be taken as the pulse voltage rating.

(1) Pulse voltage rating

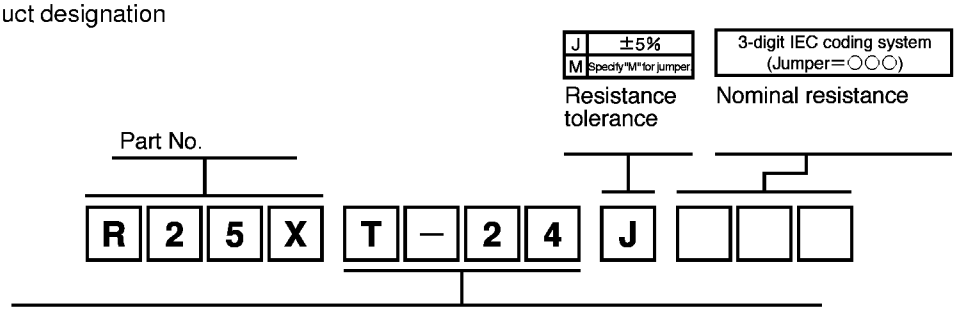
$$V_p = \sqrt{\frac{P \times R}{f \times t}}$$

P:Rated power (W) f: repetition frequency (Hz)
R: nominal resistance (Ω) t: pulse width (s)

(2) Maximum pulse voltage R20× 600V
R25× 750V

(3) Resistance-limited voltage peak
Less than 10Ω
Up to four times the rated DC voltage
10Ω or more
Up to seven times the rated DC voltage
It is assumed that the pulse width is less than 10ms.

●Product designation



Packaging specifications (carbon film resistors)

Part No.	Code	Package style	Tape inner width	Case	Standard ordering unit (pcs)	Shipped to
R25X	T-24	Axial taping	26mm	Ammo box	2000	JAPAN, KOREA
	T-29	Axial taping	52mm	Ammo box	2000	JAPAN only
	T-04	Axial taping	52mm	Ammo box	5000	EUROPE, BRAZIL, KOREA
	T-68	Axial taping	52mm	Reel	5000	USA only

●Electrical characteristics

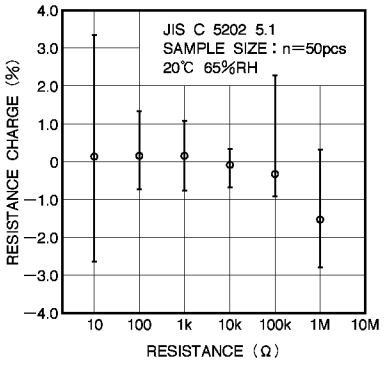


Fig.2 DC resistance

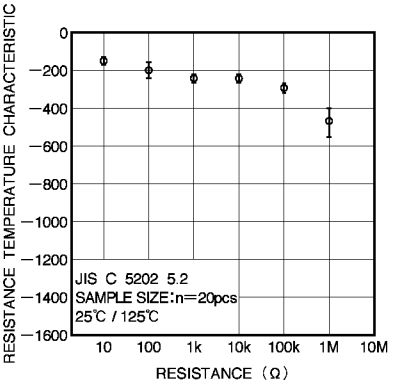


Fig.3 Resistance temperature characteristics

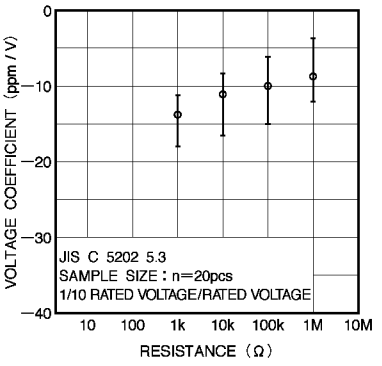


Fig.4 Voltage coefficient

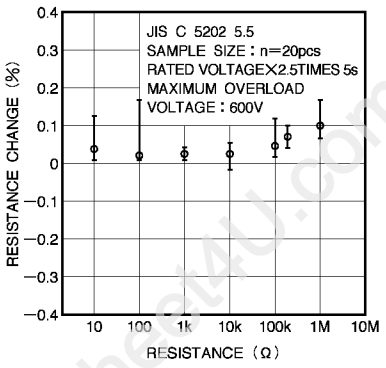


Fig.5 Short time overload

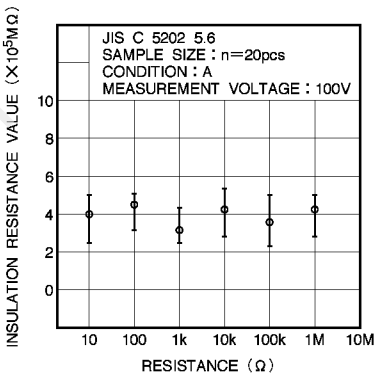


Fig.6 Insulation resistance

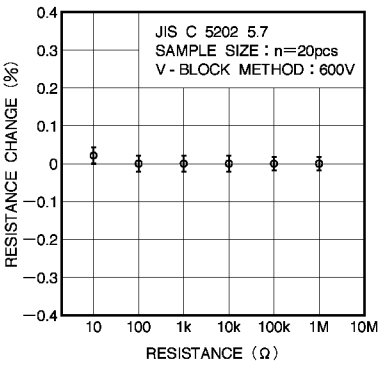


Fig.7 Withstand voltage