

**Key Features** 

**Type ROX Series** 

High Power with Small Size for Space Saving

**Excellent Long Term Stability** 

Complete
Flameproof
Construction

Controlled Temperature Capability

Solvent Resistant Coat and Code

Special Lead Formations Possible



The resistive element comprises a metal oxide film deposited on a ceramic former. The element is protected by a flameproof coating which will withstand overload conditions without flame or mechanical damage. They are recommended for use in applications such as line protection etc

#### **Characteristics – Electrical**

		Б			5:1 .:	<b>.</b>	
		Rated	Max.	Max.	Dielectric	Resistance	Operating
	Type	Power @	Working	Overload	Withstand	Range	Temp.
		70°C	Voltage	Voltage	Voltage	Ω	Range
	ROX025	0.25W	250V	400V	250V	0.3 ~ 50K	
به	ROX05	0.5W	250V	400V	250V	0.3 ~ 330K	
Size	ROX1	1W	350V	600V	350V	0.1 ~ 470K	
اع	ROX2	2W	350V	600V	350V	0.1 ~ 560K	
Normal	ROX3	3W	500V	800V	500V	5.0 ~ 100K	
ž	ROX5	5W	750V	1000V	750V	5.0 ~ 150K	5°C
	ROX7	7W	750V	1000V	750V	20 ~ 150K	155
	ROX8	8W	750V	1000V	750V	30 ~ 200K	5
	ROX9	9W	750V	1000V	750V	50 ~ 200K	-55
	ROX05S	0.5W	250V	400V	250V	0.3 ~ 50K	٦,
Size	ROX1S	1W	350V	600V	350V	0.3 ~1M0	
S	ROX2S	2W	350V	600V	350V	0.3 ~ 1M0	
Small	ROX3S	3W	350V	600V	350V	0.3 ~ 1M0	
S	ROX4S	4W	500V	800V	500V	5.0 ~ 100K	
	ROX5SS	5W	500V	800V	500V	5.0 ~ 100K	
	ROX5S	5W	500V	800V	500V	5.0 ~ 150K	

Resistors shall have a rated direct-current (DC) continuous working voltage or an approximate sine-wave root-mean-square (RMS) alternating-current (AC) continuous working voltage at commercial line frequency and waveform corresponding to the power rating , as determined from the following formula :

 $RCWV = VP \times R$ 

Where: RCWV = Rated DC or RMS AC continuous working voltage at commercial-line frequency and waveform (volt)

P = Power Rating (watt)

R = Nominal Resistance (ohm)

Rated Voltage = RCWV or Max. Working Voltage, whichever is smaller



## **Environmental Characteristics**

Characteristics	Specifica	tion	Test Methods
DC. Resistance	Must be within the tolerance	specified	( JIS C 5201-1 ) 5.1 The limit of error of measuring apparatus shall not exceed allowable range or 5% of resistance tolerance
Temperature Coefficient	Range Ω  0.1Ω ~ 12Ω  12.1Ω ~ 100K  101K ~ 1M  1.1M ~ 10M	TCR (PPM/°C) ±200 ±350 -700 -1500	5.2 Natural resistance change per temp. degree centigrade.  R <sub>2</sub> -R <sub>1</sub> R <sub>1</sub> (t <sub>2</sub> -t <sub>1</sub> ) x 10 <sup>6</sup> (PPM/°C) R <sub>1</sub> : Resistance value at room temperature (t <sub>1</sub> ) R <sub>2</sub> : Resistance value at room temp. plus 100 °C (t <sub>2</sub> )
Short time overload	Resistance change r Normal Size : ± (1% Small Size : ± (2% + with no evidence of damage	+ 0.05Ω) Max. 0.05Ω) Max.	5.5 Permanent resistance change after the application of a potential of 2.5 times RCWV or the max. overload voltage respectively specified in the above list, whichever less for 5 seconds
Dielectric Withstanding Voltage	No evidence of flash mechanical damage insulation break do	e, arcing or	5.7 Resistors shall be clamped in the trough of a 90° metallic V- block and shall be tested at AC potential respectively specified in the electrical characteristics table for 60 + 10/ -0 seconds
Terminal Strength	No Evidence of med damage	chanical	6.1 Direct load: Resistance to a 2.5 kgs direct load for 10 secs. in the direction of the longitudinal axis of the terminal leads Twist test: Terminal leads shall be bent through 90 ° at point of about 6mm from the body of the resistor and shall be rotated through 360° about the original axis of the bent terminal in alternating direction for a total of 3 rotations.
Resistance to soldering heat	Resistance change r ± (1% + 0.05Ω) Max evidence of mechan	. with no	6.4 Permanent resistance change when leads immersed to 3.2 mm to 4.8 mm from the body in 350°C ± 10 °C solder for 3 ± 0.5 seconds
Solderability	95 % coverage Min.		6.5 The area covered with a new, smooth, clean, shiny and continuous surface free from concentrated pinholes.  Test temp. of solder: 245°C ± 3°C Dwell time in solder: 2 ~ 3 seconds

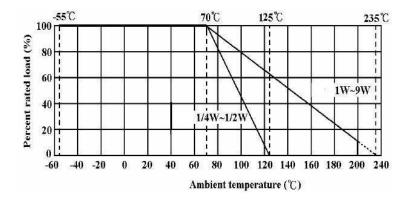


## **Environmental Characteristics (continued)**

Characteristics	Specific	cation	Test Methods ( JIS C 5201-1 )					
Resistance to Solvent		No deterioration of protective coatings and marking			6.9 Specimens shall be immersed in a bath of trichroethane completely for 3 minutes with ultrasonic			
		continuou shown be	7.4 Resistance change after continuous 5 cycles for duty shown below:					
Temperature	Resistance change		Step	Step	Step			
cycling	± (2% + 0.05Ω) Ma:		1	1	1			
, 0	evidence of mecha	2	2	2				
			3	3	3			
			4	4	4			
	Resistance Value Less than 100ΚΩ	7.9 Resistance change after 1,000 hours operating at RCWV with duty cycle of (1.5 hours "on", 0.5						
Load life in	100KΩ or more	± 5 % ± 10 %		') in a humi				
humidity	100K2 OF HIGH	chamber controlled at 40 °C ± 2 °C and 90 to 95 % relative humidity						
			7.10 Pern	7.10 Permanent resistance				
	Resistance Value	ΔR/R	change af	ter 1,000 h	ours			
Load life	Less than 100KΩ	±5%	operating	at RCWV w	vith duty			
	100KΩ or more	± 10 %			n", 0.5 hour			
			"off") at 7	′0°C ± 2°C a	mbient			
Pulse overload	Resistance change Normal Size: ± (2% Small Size: ± (5% + with no evidence of damage	5.8 Resistance change after 10,000 cycles (1 second "on", 25 seconds "off") at 4 times RCWV or the max. pulse overload voltage						

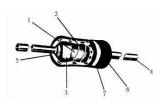
## **Derating:**

In ambient temperatures greater than 70°C the load shall de-rate as shown in the graph below:



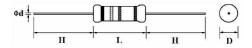


## **Construction:**



No.	Name	Material	Material					
1	Basic Body	Rod Type Ceramics						
		$0.1\Omega \le R \le 12\Omega$ : CNP film	For All Wattage					
		12.1Ω ≤ R ≤ 100KΩ: Metal oxide film	5 4/000 6 4/400					
		R > 100KΩ : Carbon film	For 1/2W-S, 1/4W					
		12.1Ω ≤ R ≤ 120KΩ: Metal oxide film	5 4/004/404/6					
_	5 5	R > 120KΩ : Carbon film	For 1/2W,1W-S					
2	Resistance Film	12.1Ω ≤ R ≤ 150KΩ: Metal oxide film	For 1W,2W-S,2W,					
		R > 150KΩ : Carbon film	3W-S,3W,4W-S,5W-SS					
		12.1Ω ≤ R ≤ 180ΚΩ: Metal oxide film	(5 5)4/ 5)4/ 6)					
		R > 180KΩ : Carbon film	(For 5W,5W-S)					
		12.1Ω ≤ R ≤ 200KΩ : Metal oxide film	(For 7W,8W,9W)					
3	End Cap	Steel (Tin plated iron surface)	1					
4	Lead Wire	Annealed copper wire coated with tin	Annealed copper wire coated with tin					
5	Joint	By welding	By welding					
6	Coating	Normal sizeInsulated & Non-Flame Pa						
		Small sizeInsulated & Non-Flame Pain	t (Color : Sea-Blue )					
7	Color Code	Non-Flame epoxy resin						

## **Dimensions:**

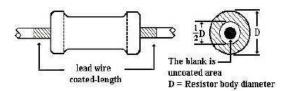


True		Dimensions (MM)						
	Туре	D (max.)	L (max.)	d ±0.05	H ±3			
	ROX025	2.5	7.5	0.54	28			
	ROX05	3.5	10	0.70	28			
e Ze	ROX1	5	12	0.70	25			
Size	ROX2	5.5	16	0.70	28			
nal	ROX3	6.5	17.5	0.75	28			
Normal	ROX5	8.5	26	0.75	38			
Z	ROX7	8.5	32	0.75	38			
	ROX8	8.5	41	0.75	38			
	ROX9	8.5	54	0.75	38			
	ROX05S	2.5	7.5	0.54	28			
	ROX1S	3.5	10	0.70	28			
Size	ROX2S	5	12	0.70	25			
	ROX3S	5.5	16	0.70	28			
Small	ROX4S	6.5	17.5	0.75	28			
S	ROX5SS	6.5	17.5	0.75	28			
	ROX5S	8	25	0.75	38			



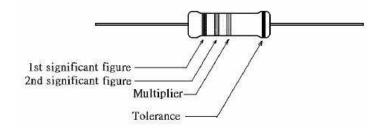
### Painting method:

Welding point, terminal and lead wire, is permissible to be exposed without the outer coated cover. The extent should be within 1/2 of the resistor body diameter.

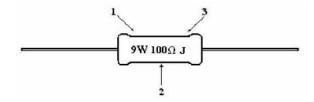


## Marking:

For 1/4W, 1/2W, 1W, 2W, 3W, 4W, 5W and all of small size Resistors shall be marked with color coding. colors shall be in accordance with JIS C 0802



For 7W, 8W, 9W marking shall be in text format:



Code description and regulation

- 1. Wattage rating.
- 2. Nominal resistance value.
- 3. Resistance Tolerance.

G: ± 2 %

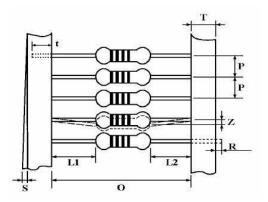
J: ± 5 %

K: ± 10 %



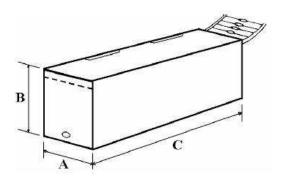
## **Packing Specification:**

### Taping:



	Туре	Style	O±1	Р	L1-L2	T	Z	R	t	S
au	ROX025	PT-52	52	5±0.3	1 Max	6±1	1 Max	0	4±1	0.5 max
Size	ROX05	PT-52	52	5±0.3	1 Max	6±1	1 Max	0	4±1	0.5 max
nal	ROX1	PT-52	52	5±0.3	1 Max	6±1	1 Max	0	4±1	0.5 max
Normal	ROX2	PT-64	64	10±0.5	1 Max	6±1	1 Max	0	5±1	0.5 max
Z	ROX3	PT-64	64	10±0.5	1 Max	6±1	1 Max	0	5±1	0.5 max
	ROX05S	PT-52	52	5±0.3	1 Max	6±1	1 Max	0	4±1	0.5 max
	ROX1S	PT-52	52	5±0.3	1 Max	6±1	1 Max	0	4±1	0.5 max
Size	ROX2S	PT-52	52	5±0.3	1 Max	6±1	1 Max	0	4±1	0.5 max
Small Si	ROX3S	PT-64	64	10±0.5	1 Max	6±1	1 Max	0	5±1	0.5 max
	ROX4S	PT-64	64	10±0.5	1 Max	6±1	1 Max	0	5±1	0.5 max
S	ROX5SS	PT-64	64	10±0.5	1 Max	6±1	1 Max	0	5±1	0.5 max

### Tape in box packing (Ammopack):

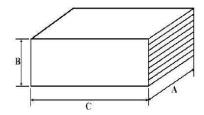


Туре	C ± 5	A ± 5	B ± 5	Pack Quantity
ROX025	250	75	96	5000
ROX05	260	85	70	1000
ROX1	262	86	80	1000
ROX2	262	92	108	1000
ROX3	256	92	80	500
ROX05S	250	75	96	5000
ROX1S	260	85	70	1000
ROX2S	262	86	80	1000
ROX3S	262	92	108	1000
ROX4S	256	92	80	500
ROX5SS	256	92	80	500

NB Certain products can be supplied reeled on request.

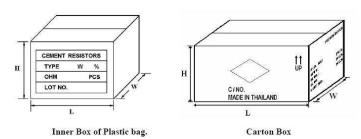


### Plastic cases in box:



Type	C±5	A +E	B ±5	Quar	ntity	
	C ±5	A ±5	D IO	Plastic Case	Box 1000	
ROX5S	36	20	8	100	1000	
ROX5	36	20	8	100	1000	

## Bulk packaging (plastic bag in inner box):



Type	Qty/Bag	Qty/Box	Qty/Carton	Box size	Carton size	Gross
	(Pcs)	(Pcs)	Pcs	LxWxH (±5)	LxWxH (±5)	wt
						±2 Kgs
ROX7	8	32	1600	150 x 75 x 33	432 x 308 x	9.5
					215	
ROX8	8	32	1600	150 x 75 x 33	432 x 308 x	11.5
					215	
ROX9	10	300	1800	200 x 171 x	520 x 215 x	15
				113	250	

### **How To Order**

ROX	15		J	100K	
Common Part	Power	Rating	Tolerance	Resistance Value	Special Request
ROX – Flame proof power metal oxide film resistor	Normal size 025 - 1/4W 05 - 1/2W 1 - 1W 2 - 2W 3 - 3W 5 - 5W 7 - 7W 8 - 8W 9 - 9W	05S - 1/2W 1S - 1W 2S - 2W 3S - 3W 4S - 4W 5SS - 5W 5S - 5W	G – 2% J – 5%	R33 -0.33Ω 1R0 - 1Ω 10R - 10Ω 100R - 100Ω 1K0 - 1KΩ (1000Ω) 100K - 100KΩ (100,000Ω)	BL * – Pre- formed Leads TR - Reeled

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