

#### Key Features

es 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**

		Rated	Max.	Max.	Dielectric	Resistance	Operating
	Туре	Power @	Working	Overload	Withstand	Range	Temp.
		70°C	Voltage	Voltage	Voltage	Ω	Range
	ROX025	0.25W	250V	400V	250V	0.3 ~ 50K	
e	ROX05	0.5W	250V	400V	250V	0.3 ~ 330K	
Size	ROX1	1W	350V	600V	350V	0.1~470K	
	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	°.c
	ROX7	7W	750V	1000V	750V	20 ~ 150K	155°C
	ROX8	8W	750V	1000V	750V	30 ~ 200K	2
	ROX9	9W	750V	1000V	750V	50 ~ 200K	-55
	ROX05S	0.5W	250V	400V	250V	0.3 ~ 50K	71
Size	ROX1S	1W	350V	600V	350V	0.3~1M0	
II 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

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Dimensions in millimetres unless otherwise specified Dimensions Shown for reference purposes only. Specifications subject to change



### **Environmental Characteristics**

Characteristics	Specifica	tion	Test Methods
DC. Resistance	Must be within the tolerance		(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. $\frac{R_2-R_1}{R_1(t_2-t_1)} \times 10^6 \text{ (PPM/°C)}$ R1: Resistance value at room temperature (t <sub>1</sub> ) R2: 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 flasl mechanical damage insulation break dov	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 mec damage	hanical	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 <b>Twist test:</b> 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 mechar	. with no	6.4 Permanent resistance change when leads immersed to 3.2 mm to 4.8 mm from the body in $350^{\circ}C \pm 10^{\circ}C$ solder for $3 \pm 0.5$ 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

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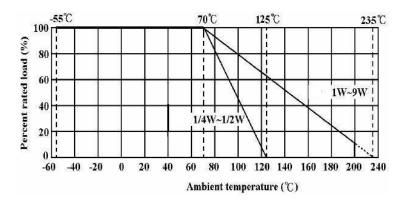


Characteristics	Specific	cation		Test Metho ( JIS C 5201				
Resistance to Solvent		No deterioration of protective coatings and marking			6.9 Specimens shall be immersed in a bath of trichroethane completely for 3 minutes with ultrasonic			
		continuou shown be		or duty				
Temperature	Resistance change	Step	Step	Step				
cycling	± (2% + 0.05Ω) Ma		1	1	1			
6,68	evidence of mecha	2	2	2				
		3	3	3				
		4	4	4				
	Resistance Value	7.9 Resistance change after 1,000 hours operating at RCWV with						
	Less than 100KΩ	<b>∆R/R</b> ±5%	duty cycle of (1.5 hours "on", 0.5					
Load life in	100KΩ or more	± 10 %		hour "off") in a humidity test				
humidity		chamber controlled at 40 °C ± 2 °C and 90 to 95 % relative humidity						
			7.10 Perm	7.10 Permanent resistance				
	Resistance Value	∆R/R	change af	ter 1,000 ho	ours			
Load life	Less than 100KQ	±5%		at RCWV w	,			
	100KΩ or more	± 10 %			n", 0.5 hour			
			"off") at 70°C ± 2°C ambient					
Pulse overload	Resistance change Normal Size : ± (2% Small Size : ± (5% +	5.8 Resistance change after 10,000 cycles (1 second "on", 25 seconds "off") at 4 times RCWV						
	with no evidence o damage	•	or the max. pulse overload voltage					

# **Environmental Characteristics (continued)**

### **Derating:**

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

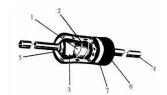


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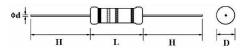


### **Construction:**



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

### **Dimensions:**



Туре			Dimensio	ns (MM)	
		D (max.)	L (max.)	d ±0.05	H ±3
	ROX025	2.5	7.5	0.54	28
Size	ROX05	3.5	10	0.70	28
	ROX1	5	12	0.70	25
	ROX2	5.5	16	0.70	28
nal	ROX3	6.5	17.5	0.75	28
Normal	ROX5	8.5	26	0.75	38
Ž	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
IIS	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

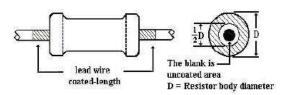
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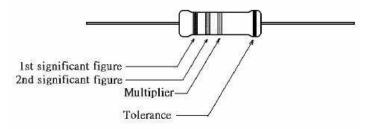
### **Painting method:**

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.

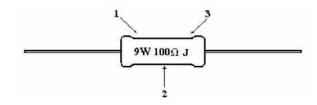


### Marking:

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 %

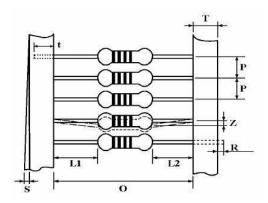
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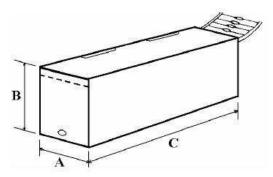
# Packing Specification:

Taping:



	Туре	Style	O±1	Р	L1-L2	Т	Z	R	t	S
d)	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
	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

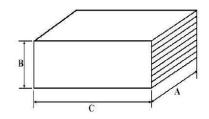
NB Certain products can be supplied reeled on request.

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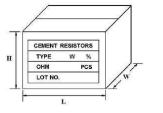


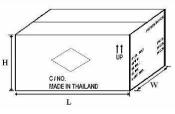
### Plastic cases in box:



Туре	C ±5	A +E	B ±5	Quar	itity
	C ±5	A ±5	CT d	Plastic Case	Box
ROX5S	36	20	8	100	1000
ROX5	36	20	8	100	1000

Bulk packaging (plastic bag in inner box):





Inner Box of Plastic bag.

Carton Box

Туре	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	1S		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	Small size 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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TE Connectivity: ROX5SSJ9K1