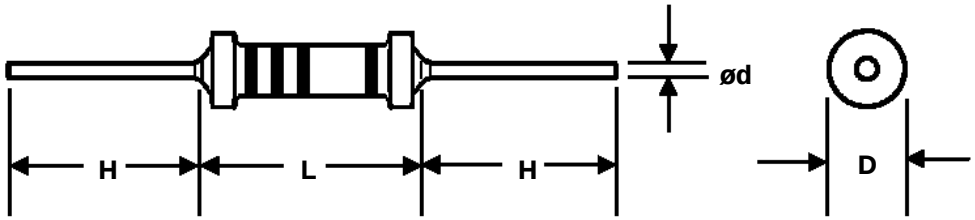
Metal Oxide Film Resistors

Features:

- High safety standard
- Excellent flame retardant coating
- Stable performance in diverse environments
- High purity ceramic core
- Non-Inductive type available
- Meet EIAJ-RC2655A requirements
- Availability of Very low or Very high ohmic value available upon request

General Specifications & Dimensions



Normal Size (RSF)

Style	Power Rating at 70°C	Dimension (mm)				Max. Working Voltage	Max. Overload Voltage	Dielectric Withstanding Voltage	Resistance Range
		D±1	L Max.	H±3	d $^{+0.02}_{-0.05}$				
RSF 1/4	1/4W (0.25W)	2.5	7.5	28	0.6	250V	400V	250V	.1Ω ~ 1Meg Ω
RSF 1/2	1/2W (0.5W)	3.5	10.0	28	0.6	250V	400V	250V	.1Ω ~ 1Meg Ω
RSF 1	1W	5.0	12.0	28	0.7	350V	600V	350V	.1Ω ~ 1Meg Ω
RSF 2	2W	5.5	16.0	28	0.8	350V	600V	350V	.1Ω ~ 1Meg Ω
RSF 3	3W	6.5	17.5	28	0.8	500V	800V	500V	.5Ω ~ 1Meg Ω
RSF 5	5W	8.5	26.0	38	0.8	750V	1000V	750V	5Ω ~ 150KΩ
RSF 7	7W	8.5	32.0	38	0.8	750V	1000V	750V	20Ω ~ 150KΩ
RSF 8	8W	8.5	41.0	38	0.8	750V	1000V	750V	30Ω ~ 200KΩ
RSF 9	9W	8.5	54.0	38	0.8	750V	1000V	750V	50Ω ~ 200KΩ

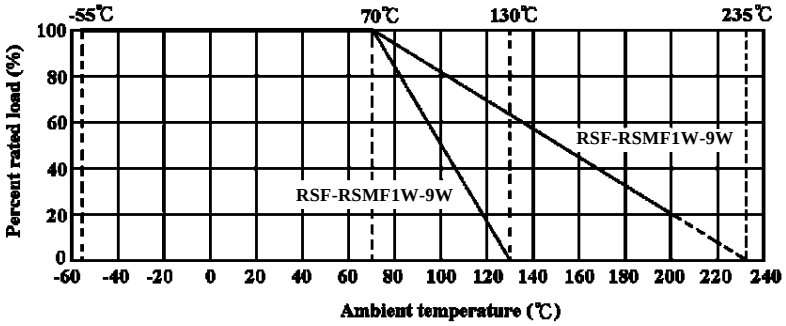
Small Size (RSMF and RSMFS)

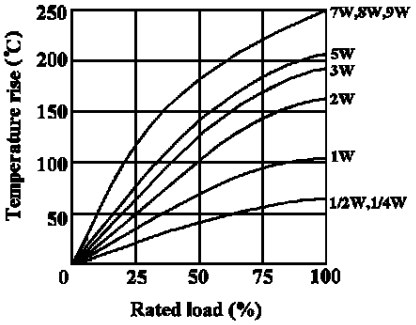
Style	Power Rating at 70°C	Dimension (mm)				Max. Working Voltage	Max. Overload Voltage	Dielectric Withstanding Voltage	Resistance Range
		D±1	L Max.	H±3	d $^{+0.02}_{-0.05}$				
RSMF 1/2	1/2W (0.5W)	2.5	7.5	28	0.6	250V	400V	250V	.1Ω ~ 1Meg Ω
RSMF 1	1W	4.0	10.0	28	0.7	350V	600V	350V	.1Ω ~ 1Meg Ω
RSMF 2	2W	5.0	12.0	28	0.7	350V	600V	350V	.1Ω ~ 1Meg Ω
RSMF 3	3W	5.5	16.0	28	0.8	350V	600V	350V	.1Ω ~ 1Meg Ω
RSMFS 5	5W	6.5	17.5	28	0.8	500V	800V	500V	.1Ω ~ 1Meg Ω
RSMF 5	5W	8.0	25.0	38	0.8	500V	800V	500V	.1Ω ~ 1Meg Ω

Characteristics

Requirements	Performance	Test Method	
		JIS-C-5202	MIL-STD-202
Operating Temp. Range	-55°C ~ +155°C	———	———
Temp. Coefficient (ppm/°C)	± 350*	5.2	Method 304
Short Time Overload	ΔRmax ≤ ±(1% + 0.05Ω)	5.5 - A	———
Resistance to Soldering Heat	ΔRmax ≤ ±(1% + 0.05Ω)	6.4. 350°C 3 Sec.	Method 210
Temp. Cycling	ΔRmax ≤ ±(1% + 0.05Ω)	7.4. -55°C/85°C, 5 cycles	Method 107
Moisture Resistance	ΔRmax ≤ ± 5%	7.9 95% RH on-off 1,000 hr.	Method 106
Load Life	ΔRmax ≤ ± 5%	7.10 70°C on-off 1,000 hr.	Method 108
Dielectric Withstanding Voltage	ΔRmax ≤ ±(0.5% + 0.05Ω)	5.7 -A	Method 301
Insulation Resistance	> 10^4 MΩ	5.6 - A	———
Non-Combustibility	The resistor shall withstand Overload test in accordance with Article UL 492.2.13 without producing a fire hazard.		

*** Note:** TCR ±200 PPM is also available, consult factory.





Part Numbering System

RSF — **Type**

Type
RSF
RSMF
RSMFS

2W — **Rated Power**

Rated Power
1/4 W ↓ 10W

103 — **Nominal Resistance**

Resistors	3-Digit	E24 Series EX 2.2Ω=2R2 100Ω=101
	4-Digit	E96 Series EX 10.2R=10R2 10kΩ=1002

J — **Resistance Tolerance**

J	±5%
G	±2%
F	±1%

T — **Packaging**

B	Bulk
T	Tape & Reel
TB	Tape & Box
A	Ammo

Performance Specifications

Characteristics	Test Methods	Limits
Temperature coefficient JIS - C - 5202 5.2	Natural resistance change per temp. degree centigrade. $\frac{R_2 - R_1}{R_1 (t_2-t_1)} \times 10^6$ (PPM / °C) R_1 : Resistance value at room temperature (t_1) R_2 : Resistance value at room temp. plus 100 °C (t_2)	± 350 PPM / °C
Dielectric withstanding voltage JIS - C - 5202 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 above list for 60+ 10 / -0 seconds.	No evidence of flashover, mechanical damage, arcing or insulation break down.
Temperature cycling JIS - C - 5202 7.4	Resistance change after continuous five cycles for duty cycle specified below: **Step** / **Temperature** / **Time** 1 / -55°C ± 3°C / 30 minutes 2 / Room temp / 10~15 minutes 3 / + 155°C ± 3°C / 30 minutes 4 / Room temp / 10~15 minutes	Resistance change rate is ± 2% + 0.05Ω). No evidence of mechanical damage
Short - time overload JIS - C - 5202 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 is less for 5 seconds.	Resistance change rate is N: ± (1% + 0.05Ω) S: ± (2% + 0.05Ω) No evidence of mechanical damage
Pulse overload JIS - C - 5202 5.8	Resistance change after 10,000 cycles (1 second “on”, 25 seconds “off”) at 4 times RCWV or the max. pulse overload voltage.	Resistance change rate is N: ± (2% + 0.05Ω) S: ± (5% + 0.05Ω) No evidence of mechanical damage
Load life in humidity JIS - C - 5202 7.9	Resistance change after 1,000 hours (1.5 hours “on” 0.5 hour “off”) at RCWV in a humidity chamber controlled at 40°C ± 2°C and 90 to 95% relative humidity.	**Resistance value** / **▲R/R** Less than 100KΩ / ± 5% 100KΩ or more / ± 10%
Load life JIS - C - 5202 7.10	Permanent resistance change after 1,000 hours operating at RCWV, with duty cycle of 1.5 hours “on”, 0.5 hour “off” at 70°C ± 2°C ambient.	**Resistance value** / **▲R/R** Less than 100KΩ / ± 5% 100KΩ or more / ± 10%
Terminal strength JIS - C - 5202 6.1	**Direct load :** Resistance to a 2.5 kgs direct load for 10 seconds 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.	No evidence of mechanical damage
Resistance to soldering heat JIS - C - 5202 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	Resistance change rate is ± (1% + 0.05W). No evidence of mechanical damage
Solderability JIS - C - 5202 6.5	The area covered with a new, smooth, clean, shiny and continuous surface free from concentrated pinholes. Test temp. of solder : 235°C ± 5°C Dwell time in solder : 3 + 0.5 / - 0 seconds	95% coverage Min.
Resistance to solvent JIS - C - 5202 6.9	Specimens shall be immersed in a bath of trichloroethane completely for 3 minutes with ultrasonic.	No deterioration of protective coatings and markings
Flame retardant JIS - C - 5202 7.12	Resistors shall resist flaming or arcing when overloaded up to 16 times RCWV.	No evidence of flaming or arcing

*RCWV = Rated Continuous Working Voltage = $\checkmark$ Rated Power x Resistance Value