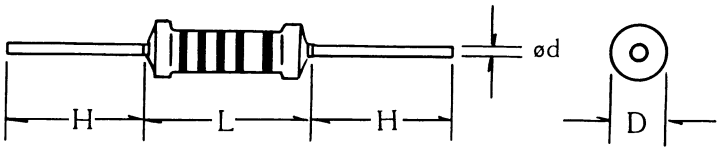
Precision Metal Film Fixed Resistors

Materials & Features

- Nichrome resistor element provides stable performance in various environments
- Wide precision range in small package
- Low temperature coefficient range
- Multiple epoxy coating on vacuum-deposited metal film provides superior moisture protection
- Flame retardant type available
- Low noise & voltage coefficient
- EIA standard color coding
- Too low or too high ohmic value can be supplied on a case to case basis

Dimension



Normal Size

	Rating	MIL-R 10509F	Dimension (mm)			
			L Max.	D Max.	d $^{+0.02}_{-0.05}$	H ± 3
12	0.125W	RN50	3.5	1.85	0.5	28
1/100 25	0.25W	RN55	6.8	2.50	0.6	28
50	0.5W	RN60	10.0	3.50	0.6	28
100	1W	RN65	12.0	5.00	0.7	28
200	2W	RN70	16.0	5.50	0.8	28
300	3W		17.5	6.50	0.8	28

Small Size

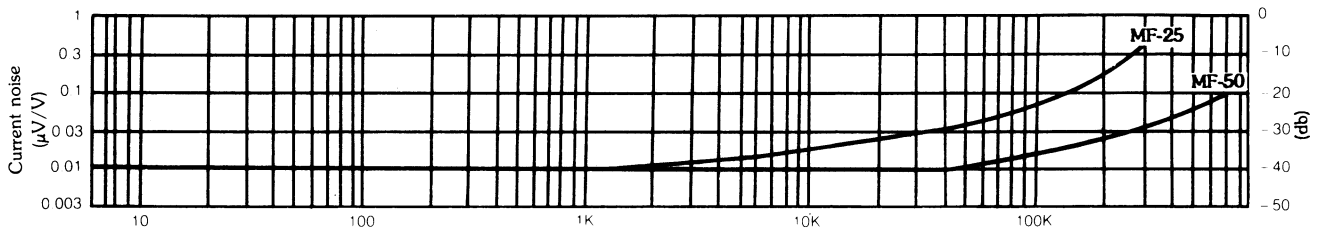
	Dimension (mm)				
	Rating	L Max.	D Max.	d $^{+0.02}_{-0.05}$	H ± 3
40-SS	0.4W	3.7	1.9	0.5	28
50-S	0.5W	9.0	3.0	0.6	28
50-SS	0.5W	6.8	2.5	0.6	28
60-S	0.6W	6.8	2.5	0.6	28

*40-SS is in non-flammable coating.

General Specification

	Rating Wattage	Max. Working V. (At 70°C)	Max. Overload V. (At 70°C)	Resistance Tolerance	T.C.R.	Resistance Range	Special Order		
							Resistance Tolerance	T.C.R.	Resistance Range
12 40-SS	0.125W 0.4W	200V	400V	±5%	±200ppm/°C	1 Ω~1MΩ	±0.25%	±15PPM	51.1Ω~200KΩ
				±2%	±100ppm/°C	10 Ω~1MΩ	±0.5%	±25PPM ±50PPM	51.1Ω~511KΩ
				±1%	± 50ppm/°C	10 Ω~1MΩ			
1/100 25 50-SS 60-S	0.25W 0.5W 0.6W	250V	500V	±5%	±200ppm/°C	1 Ω~1MΩ	±0.1%	±15PPM	100 Ω~100KΩ
				±2%	±100ppm/°C	10 Ω~1MΩ	±0.25%	±25PPM	51.1Ω~330KΩ
				±1%	± 50ppm/°C	10 Ω~1MΩ	±0.5%	±50PPM	10 Ω~ 1MΩ
50 50-S	0.5W	350V	700V	±5%	±200ppm/°C	1 Ω~1MΩ	±0.1%	±15PPM	100 Ω~330KΩ
				±2%	±100ppm/°C	10 Ω~1MΩ	±0.25%	±25PPM	51.1Ω~511KΩ
				±1%	± 50ppm/°C	10 Ω~1MΩ	±0.5%	±50PPM	10 Ω~ 1MΩ
100	1W	500V	1000V	±5%	±200ppm/°C	10 Ω~1MΩ	±0.1%	±15PPM	100 Ω~330KΩ
				±2%	±100ppm/°C	51.1Ω~1MΩ	±0.25%	±25PPM	51.1Ω~511KΩ
				±1%	± 50ppm/°C	51.1Ω~1MΩ	±0.5%	±50PPM	51.1Ω~ 1MΩ
200 300	2W 3W	500V	1000V	±5%	±200ppm/°C	10 Ω~1MΩ	±0.1%	±15PPM	100 Ω~330KΩ
				±2%	±100ppm/°C	51.1Ω~1MΩ	±0.25%	±25PPM	51.1Ω~511KΩ
				±1%	± 50ppm/°C	51.1Ω~1MΩ	±0.5%	±50PPM	51.1Ω~ 1MΩ

Current Noise Level

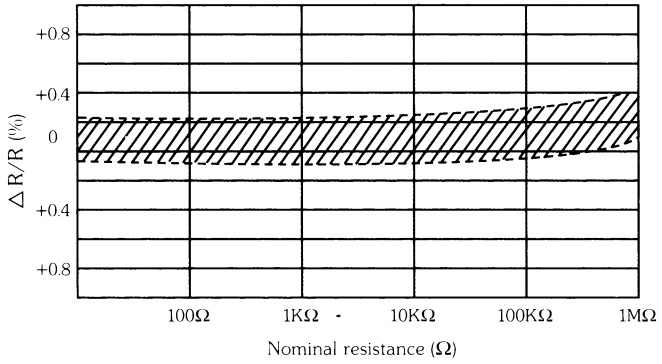


Precision Metal Film Fixed Resistors

Performance Specifications

Characteristics	Limits	Test Methods
Temperature coefficient JIS-C-5202 5.2	Within the temperature coefficient specified below Max. T: C. R. ± 15ppm/°C ± 100ppm/°C ± 25ppm/°C ± 200ppm/°C ± 50ppm/°C	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) Test Pattern: Room temp., Room temp. + 100°C
Dielectric withstanding voltage JIS-C-5202 5.7	No evidence of flashover mechanical damage, arcing or insulation break down	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.
Temperature cycling JIS-C-5202 7.4	Resistance change rate is ± (1% +0.05Ω) Max. with no evidence of mechanical damage	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±2°C / 30 minutes 4 / Room temp. / 10-15 minutes
Humidity (Steady state) JIS-C-5202 7.5	Resistance change rate is ± (0.5% +0.05Ω) Max. with no evidence of mechanical damage	Temporary resistance change after a 240 hours exposure in a humidity test chamber controlled at 40°C ± 2°C and 90 to 95% relative humidity.
Short-time overload JIS-C-5202 5.5	Resistance change rate is ± (0.5% +0.05Ω) Max. with no evidence of mechanical damage	Permanent resistance change after the application of a potential of 2.5 times RCWV for 5 seconds.
Pulse overload JIS-C-5202 5.8	Resistance change rate is ± (1% +0.05Ω) Max. with no evidence of mechanical damage	Resistance change after 10,000 cycles (1 second "ON", 25 seconds "OFF") at 4 times RCWV.
Load life in humidity JIS-C-5202 7.9	Resistance change rate is ± (1.5% +0.05Ω) Max. with no evidence of mechanical damage	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.
Load life JIS-C-5202 7.10	Resistance change rate is ± (1.5% +0.05Ω) Max. with no evidence of mechanical damage	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.
Terminal strength JIS-C-5202 6.1	With no evidence of mechanical damage	Direct load: Resistance to a 2.5kg 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 a 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.
Solderability JIS-C-5202 6.5	95% coverage Min.	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.
Resistance to solvent JIS-C-5202 6.9	No deterioration of protective coatings and markings.	Specimens shall be immersed in a bath of trichroethane completely for 3 minutes with ultrasonic.

Load Life



Derating Curve