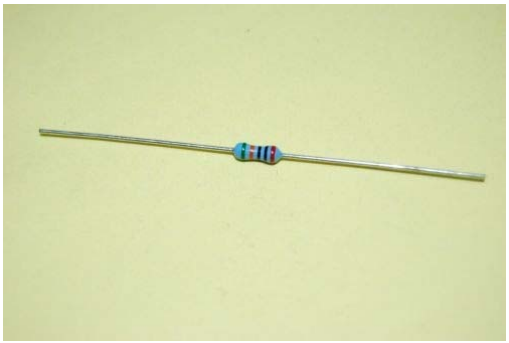
MCMF0W4 Series

Precision Metal Film Fixed Resistors



Scope:

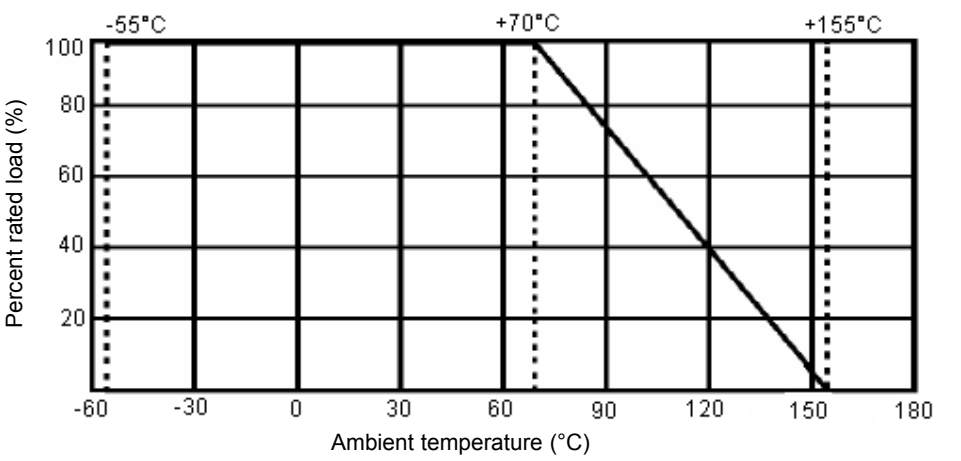
This specification for approval relates to metal film fixed resistors.

Ratings:

Type	MF
Rated Power	0.25Ω at 70°C
Maximum Working Voltage	250V
Maximum Overload Voltage	500V
Dielectric Withstanding Voltage	500V
Rated Ambient Temperature	70°C
Operating Temperature Range	- 55Ω to + 155Ω
Resistance Tolerance	±0.5%
Resistance Range	10Ω to 1MΩ

Power Rating:

Resistors shall have a power rating based on continuous full load operation at an ambient temperature of 70°C. For temperature in excess of 70°C , the load shall be derated.



Voltage rating:

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 commercialline frequency and waveform curresponding to the power rating, as determined from the following formula :

$$RCWV = \sqrt{P} \times R$$

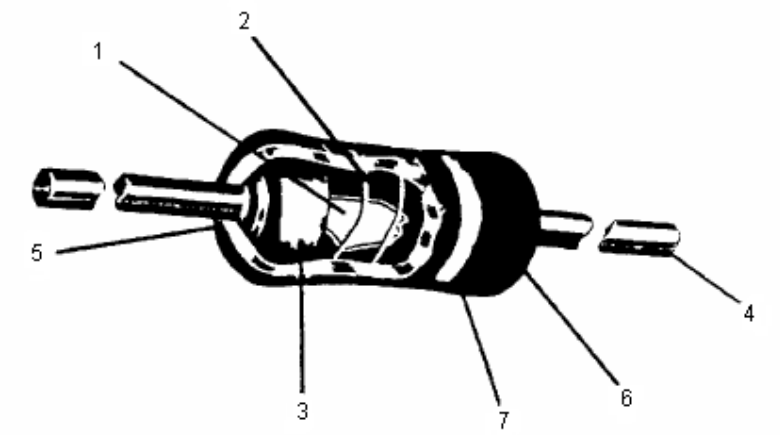
Where : RCWV = Rated DC or RMS AC continuous working voltage at commercial-line frequency and waveform (volt).
P = Power rating (watt)
R = Nominal resistance (ohm)

In no case shall the rated DC or RMS AC continuous working voltage be greater than the applicable maximum value.

Nominal resistance :

Effective figures of nominal resistance shall be in accordance with E-96 series, and resistance tolerance.

Construction:

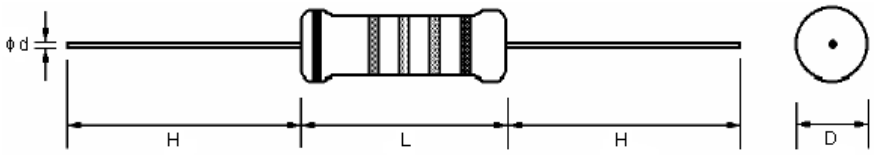


No.	Name	Material
1	Basic Body	Rod type ceramics
2	Resistance Film	Metal film
3	End Cap	Steel (tin plated iron surface)
4	Lead Wire	Annealed copper wire coated with tin
5	Joint	By welding
6	Coating	Epoxy insulated resin (colour : sky blue)
7	Color Code	Epoxy resin

Characteristics	Limits	Test Methods (JIS C 5201-1)
DC resistance	Must be within the specified tolerance.	The limit of error of measuring apparatus shall not exceed allowable range or 0.5% of resistance tolerance.
Temperature coefficient	Within the temperature coefficient specified below : ±50PPM/°C maximum.	Natural resistance change per temperature degree centigrade R2-R1/ R1 (t2-t1) x 10^6 (PPM/°C). R1 : Resistance value at room temperature (t1). R2 : Resistance value at room temperature plus 100°C (t2).
Short time overload	Resistance change rate is ±(0.5% + 0.05Ω) maximum with no evidence of mechanical damage.	Permanent resistance change after the application of a potential of 2.5 times RCWV for 5 seconds.
Dielectric withstanding voltage	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.
Pulse overload	Resistance change rate is ±(1% + 0.05Ω) maximum with no evidence of mechanical damage.	Resistance change after 10,000 cycles 1 second "on", 25 seconds "off" at 4 times RCWV.
Terminal strength	No evidence of mechanical damage.	**Direct load :** Resistance to a 2.5kgs 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.
Resistance to soldering heat	Resistance change rate is ±(1% + 0.05Ω) maximum with no evidence of mechanical damage.	Permanent resistance change when leads immersed to 3.2 to 4.8 mm from the body in 350°C ±10°C solder for 3 ±0.5 seconds.
Solderability	95% coverage minimum	The area covered with a new, smooth, clean, shiny and continuous surface free from concentrated pinholes. Test temperature of solder : 245°C ±3°C. Dwell time in solder : 2 to 3 seconds.
Resistance to solvent	No deterioration of protective coatings and markings.	Specimens shall be immersed in bath of trichroethane completely for 3 minutes with ultrasonic.

Characteristics	Limits	Test Methods (JIS C 5201-1)
Temperature cycling	Resistance change rate is ±(1% + 0.05Ω) maximum with no evidence of mechanical damage.	Resistance change after continuous 5 cycles for duty shown below: Step 1: -55°C ± 3°C, 30 minutes Step 2: Room temperature, 10 to 15 minutes Step 3: +155°C ±2°C, 30 minutes Step 4: Room temperature, 10 to 15 minutes
Load life in humidity	Resistance Value: Normal type; Δ R/R: ±1.5 %	Resistance change after 1000 hours (1.5 hours "on", 0.5 hour "off") at RCWV in a humidity test chamber controlled at 40°C ±2°C and 90 to 95% relative humidity.
Load life	Resistance Value: Normal type; Δ R/R: ±1.5 %	Permanent resistance change after 1000 hours operating at RCWV with duty cycle of (1.5 hours "on", 0.5 hour "off") at 70°C ±2°C ambient.

Dimensions:



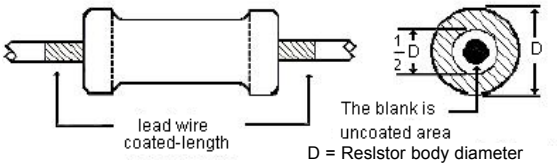
Dimensions : Millimetres

Type	Power Rating	D (Maximum)	L (Maximum)	d ±0.05	H ±3
MF	1/4 W	2.5	6.8	0.54	28

Dimensions : Millimetres

Painting method:

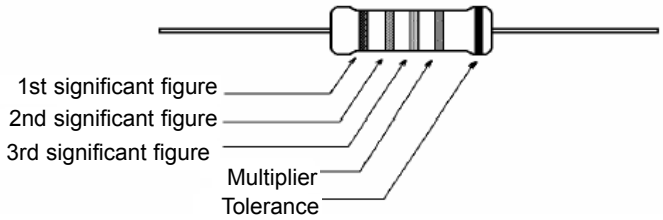
Welding point, terminal and lead wire, is permissible to be exposed without the outer coated cover. The extent should be within 1/2 of the are angle.



Marking :

Resistor :

Resistors shall be marked with color coding colors shall be in accordance with JIS C 0802.



Resistance Preferred Value Range

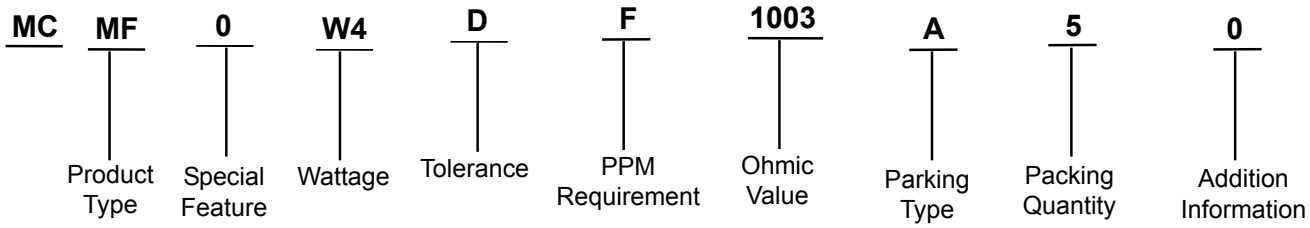
E6	E12	E24	E96	E6	E12	E24	E96	E6	E12	E24	E96
10	10	10	10.0				21.5				46.4
			10.2	22	22	22	22.1	47	47	47	47.5
			10.5				22.6				48.7
			10.7				23.2				49.9
		11	11.0				23.7			51	51.1
			11.3			24	24.3				52.3
			11.5				24.9				53.6
			11.8				25.5				54.9
	12	12	12.1				26.1		56	56	56.2
			12.4				27.7				57.6
			12.7		27	27	27.4				59.0
		13	13.0				28.0				60.4
			13.3				28.7			62	61.9
			13.7				29.4				63.4
			14.0			30	30.1				64.9
			14.3				30.9				66.5
			14.7				31.6	68	68	68	68.1
15	15	15	15.0				32.4				69.8
			15.4	33	33	33	33.2				71.5
			15.8				34.0				73.2
		16	16.2				34.8			75	75.0
			16.5				35.7				76.8
			16.9			36	36.5				78.7
			17.4				37.4				80.6
			17.8				38.3		82	82	82.5
	18	18	18.2		39	39	39.2				84.5
			18.7				40.2				86.6
			19.1				41.2				88.7
			19.6				42.2			91	90.9
		20	20.0			43	43.2				93.1
			20.5				44.2				95.3
			21.0				45.3				97.6

Above values in accordance with IEC Publication 63 (1963) and BS2488

Part Number Table

Description	Part Number
Resistor, 100K , 0.25W 0.5% 50PPM	MCMF0W4DF1003A50

Part Number Explanation:



Product Type : MF = Metal Film Fixed Resistor.
Special Feature : 0 = Standard Product.
Wattage : W4 = 1/4W.
Tolerance : D = ±0.5%.
PPM Requirement : F = ±50PPM.
Ohmic Value : Where R = Ohms = Ω.
K = Kiloohms = KΩ.
M = Megaohms = MΩ.
And replaces the decimal point.
eg: 1R5 = 1.5Ω.
4K7 = 4.7KΩ.
6M8 = 6.8MΩ.
Parking Type : A = Tape/Box.
Packing Quantity : 5 = 5000pcs.
Addition Information : 0 = PT-52mm.

Stocked Values

Tolerance	Wattage (W)	Preferred Value Range	Range Value
5%	0.25	E24	10R - 1M

Notes:

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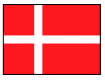

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