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RoHS Compliant

Specifications

Type : Metal Film : 0.25W at 70°C Rated Power Max. Working Voltage : 250V Max. Overload Voltage : 500V : 500V **Dielectric Withstanding Voltage** Rated Ambient Temperature : 70°C Operating Temp. Range : -55°C to +155°C **Resistance Tolerance** : ±2% and ±5% **Temperature Coefficient** : ±200 PPM/°C **Resistance Range** : 10Ω to $20M\Omega$ for $\pm 2\%$ 1Ω to 9.1 Ω for ±5%

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 as shown in the below figure.

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:

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

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

P = Power Rating (W)

R = Nominal Resistance (Ω)

Note : Max. Working Voltage or $\sqrt{P} x R$ whichever is lesser Max. Overload Voltage or 2.5 $\sqrt{P} x R$ whichever is lesser

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



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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	Insulated epoxy resin (Colour : Green)		
7	Colour Code	Non-Flame Plaint		

Metal Film Fixed Resistors

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 1% of resistance tolerance
Temperature coefficient	±200 PPM/°C	Natural resistance change per temp. degree centigrade $\frac{R_2-R_1}{\frac{1}{R_1(t_2-t_1)}} \times 10^6$ (PPM/°C) R1: Resistance value at room temperature (t1) R2: Resistance value at room temp. plus 100°C (t2)
Short time overload	Resistance change rate is $\pm (0.5\% + 0.05\Omega)$ Max. 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 specified in the table 1. for $60 + 10/-0$ seconds
Pulse overload	Resistance change rate is $\pm(1\% + 0.05\Omega)$ Max. with no evidence of mechanical damage	Resistance change after 10,000 cycles (1 sec. "on" , 25 secs. "off") at 4 times RCWV
Terminal strength	No evidence of mechanical damage	Direct load: Resistance to a 2.5 kgs direct load for 10secs. 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
Resistance to soldering heat	Resistance change rate is $\pm(1\% + 0.05\Omega)$ Max. with no evidence of mechanical damage	Permanent resistance change when leads immersed to 3.2 to 4.8 mm from the body in $260^{\circ}C \pm 3^{\circ}C$ solder for $10 \pm 0/-1$ seconds
Solderability	95% coverage Min.	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



Characteristics	Limits		Test Methods(JIS C 5201-1)		
Resistance to solvent	No deterioration of p and markings	protective coatings	Specimens shall be immersed in bath of trichroethane completely for 3 mins. with ultrasonic		
	Resistance change rate is ±(1% + 0.05Ω) Max. with no evidence of mechanical damage		Resistance change after continuous 5 cycles for duty shown below:		
			Step	Temperature	Time
Temperature			1	-55°C ±3°C	30 mins
Cycling			2	Room temp.	10~15 mins
			3	+155°C ±2°C	30 mins
			4	Room temp.	10~15 mins
	Resistance value	ΔR/R	Resistance change after 1,000 hours		
Load life in humidity	Non-Flame type	±5%	(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		
	Resistance value	ΔR/R	Permanent resistance change after		
Load life	Non-Flame type	±5%	1,000 hours operating at RCWV with duty cycle of 70°C ±2°C ambient		

Dimension



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.





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Marking

Resistor

Resistors shall be marked with colour coding colours shall be in accordance with JIS C 0802



2. Label

Label shall be marked with following items:

- 1. Type and style
- 2. Nominal resistance
- 3. Resistance tolerance
- 4. Quantity
- 5. Lot number
- 6. PPM

Part Number Table

Description	Part Number	Description	Part Number
Axial Leaded Metal Film Resistor, 1/4W, 10R, ±2%	MP006856	Axial Leaded Metal Film Resistor, 1/4W, 120R, ±2%	MP006882
Axial Leaded Metal Film Resistor, 1/4W, 11R, ±2%	MP006857	Axial Leaded Metal Film Resistor, 1/4W, 130R, ±2%	MP006883
Axial Leaded Metal Film Resistor, 1/4W, 12R, ±2%	MP006858	Axial Leaded Metal Film Resistor, 1/4W, 150R, ±2%	MP006884
Axial Leaded Metal Film Resistor, 1/4W, 13R, ±2%	MP006859	Axial Leaded Metal Film Resistor, 1/4W, 160R, ±2%	MP006885
Axial Leaded Metal Film Resistor, 1/4W, 15R, ±2%	MP006860	Axial Leaded Metal Film Resistor, 1/4W, 180R, ±2%	MP006886
Axial Leaded Metal Film Resistor, 1/4W, 16R, ±2%	MP006861	Axial Leaded Metal Film Resistor, 1/4W, 200R, ±2%	MP006887
Axial Leaded Metal Film Resistor, 1/4W, 18R, ±2%	MP006862	Axial Leaded Metal Film Resistor, 1/4W, 220R, ±2%	MP006888
Axial Leaded Metal Film Resistor, 1/4W, 20R, ±2%	MP006863	Axial Leaded Metal Film Resistor, 1/4W, 240R, ±2%	MP006889
Axial Leaded Metal Film Resistor, 1/4W, 22R, ±2%	MP006864	Axial Leaded Metal Film Resistor, 1/4W, 270R, ±2%	MP006890
Axial Leaded Metal Film Resistor, 1/4W, 24R, ±2%	MP006865	Axial Leaded Metal Film Resistor, 1/4W, 300R, ±2%	MP006891
Axial Leaded Metal Film Resistor, 1/4W, 27R, ±2%	MP006866	Axial Leaded Metal Film Resistor, 1/4W, 330R, ±2%	MP006892
Axial Leaded Metal Film Resistor, 1/4W, 30R, ±2%	MP006867	Axial Leaded Metal Film Resistor, 1/4W, 360R, ±2%	MP006893
Axial Leaded Metal Film Resistor, 1/4W, 33R, ±2%	MP006868	Axial Leaded Metal Film Resistor, 1/4W, 390R, ±2%	MP006894
Axial Leaded Metal Film Resistor, 1/4W, 36R, ±2%	MP006869	Axial Leaded Metal Film Resistor, 1/4W, 430R, ±2%	MP006895
Axial Leaded Metal Film Resistor, 1/4W, 39R, ±2%	MP006870	Axial Leaded Metal Film Resistor, 1/4W, 470R, ±2%	MP006896
Axial Leaded Metal Film Resistor, 1/4W, 43R, ±2%	MP006871	Axial Leaded Metal Film Resistor, 1/4W, 510R, ±2%	MP006897
Axial Leaded Metal Film Resistor, 1/4W, 47R, ±2%	MP006872	Axial Leaded Metal Film Resistor, 1/4W, 560R, ±2%	MP006898
Axial Leaded Metal Film Resistor, 1/4W, 51R, ±2%	MP006873	Axial Leaded Metal Film Resistor, 1/4W, 620R, ±2%	MP006899
Axial Leaded Metal Film Resistor, 1/4W, 56R, ±2%	MP006874	Axial Leaded Metal Film Resistor, 1/4W, 680R, ±2%	MP006900
Axial Leaded Metal Film Resistor, 1/4W, 62R, ±2%	MP006875	Axial Leaded Metal Film Resistor, 1/4W, 750R, ±2%	MP006901
Axial Leaded Metal Film Resistor, 1/4W, 68R, ±2%	MP006876	Axial Leaded Metal Film Resistor, 1/4W, 820R, ±2%	MP006902
Axial Leaded Metal Film Resistor, 1/4W, 75R, ±2%	MP006877	Axial Leaded Metal Film Resistor, 1/4W, 910R, ±2%	MP006903
Axial Leaded Metal Film Resistor, 1/4W, 82R, ±2%	MP006878	Axial Leaded Metal Film Resistor, 1/4W, 1K, ±2%	MP006904
Axial Leaded Metal Film Resistor, 1/4W, 91R, ±2%	MP006879	Axial Leaded Metal Film Resistor, 1/4W, 1.1K, ±2%	MP006905
Axial Leaded Metal Film Resistor, 1/4W, 100R, ±2%	MP006880	Axial Leaded Metal Film Resistor, 1/4W, 1.2K, ±2%	MP006906
Axial Leaded Metal Film Resistor, 1/4W, 110R, ±2%	MP006881	Axial Leaded Metal Film Resistor, 1/4W, 1.3K, ±2%	MP006907



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Description	Part Number	Description	Part Number
Axial Leaded Metal Film Resistor, 1/4W, 1.4K, ±2%	MP006908	Axial Leaded Metal Film Resistor, 1/4W, 91K, ±2%	MP006949
Axial Leaded Metal Film Resistor, 1/4W, 1.6K, ±2%	MP006909	Axial Leaded Metal Film Resistor, 1/4W, 100K, ±2%	MP006950
Axial Leaded Metal Film Resistor, 1/4W, 1.8K, ±2%	MP006910	Axial Leaded Metal Film Resistor, 1/4W, 110K, ±2%	MP006951
Axial Leaded Metal Film Resistor, 1/4W, 2K, ±2%	MP006911	Axial Leaded Metal Film Resistor, 1/4W, 120K, ±2%	MP006952
Axial Leaded Metal Film Resistor, 1/4W, 2.2K, ±2%	MP006912	Axial Leaded Metal Film Resistor, 1/4W, 130K, ±2%	MP006953
Axial Leaded Metal Film Resistor, 1/4W, 2.4K, ±2%	MP006913	Axial Leaded Metal Film Resistor, 1/4W, 150K, ±2%	MP006954
Axial Leaded Metal Film Resistor, 1/4W, 2.7K, ±2%	MP006914	Axial Leaded Metal Film Resistor, 1/4W, 160K, ±2%	MP006955
Axial Leaded Metal Film Resistor, 1/4W, 3K, ±2%	MP006915	Axial Leaded Metal Film Resistor, 1/4W, 180K, ±2%	MP006956
Axial Leaded Metal Film Resistor, 1/4W, 3.3K, ±2%	MP006916	Axial Leaded Metal Film Resistor, 1/4W, 200K, ±2%	MP006957
Axial Leaded Metal Film Resistor, 1/4W, 3.6K, ±2%	MP006917	Axial Leaded Metal Film Resistor, 1/4W, 220K, ±2%	MP006958
Axial Leaded Metal Film Resistor, 1/4W, 3.9K, ±2%	MP006918	Axial Leaded Metal Film Resistor, 1/4W, 240K, ±2%	MP006959
Axial Leaded Metal Film Resistor, 1/4W, 4.3K, ±2%	MP006919	Axial Leaded Metal Film Resistor, 1/4W, 270K, ±2%	MP006960
Axial Leaded Metal Film Resistor, 1/4W, 4.7K, ±2%	MP006920	Axial Leaded Metal Film Resistor, 1/4W, 300K, ±2%	MP006961
Axial Leaded Metal Film Resistor, 1/4W, 5.1K, ±2%	MP006921	Axial Leaded Metal Film Resistor, 1/4W, 330K, ±2%	MP006962
Axial Leaded Metal Film Resistor, 1/4W, 5.6K, ±2%	MP006922	Axial Leaded Metal Film Resistor, 1/4W, 390K, ±2%	MP006963
Axial Leaded Metal Film Resistor, 1/4W, 6.2K, ±2%	MP006923	Axial Leaded Metal Film Resistor, 1/4W, 430K, ±2%	MP006964
Axial Leaded Metal Film Resistor, 1/4W, 6.8K, ±2%	MP006924	Axial Leaded Metal Film Resistor, 1/4W, 470K, ±2%	MP006965
Axial Leaded Metal Film Resistor, 1/4W, 7.5K, ±2%	MP006925	Axial Leaded Metal Film Resistor, 1/4W, 510K, ±2%	MP006966
Axial Leaded Metal Film Resistor, 1/4W, 8.2K, ±2%	MP006926	Axial Leaded Metal Film Resistor, 1/4W, 560K, ±2%	MP006967
Axial Leaded Metal Film Resistor, 1/4W, 9.1K, ±2%	MP006927	Axial Leaded Metal Film Resistor, 1/4W, 620K, ±2%	MP006968
Axial Leaded Metal Film Resistor, 1/4W, 10K, ±2%	MP006928	Axial Leaded Metal Film Resistor, 1/4W, 680K, ±2%	MP006969
Axial Leaded Metal Film Resistor, 1/4W, 11K, ±2%	MP006929	Axial Leaded Metal Film Resistor, 1/4W, 750K, ±2%	MP006970
Axial Leaded Metal Film Resistor, 1/4W, 12K, ±2%	MP006930	Axial Leaded Metal Film Resistor, 1/4W, 820K, ±2%	MP006971
Axial Leaded Metal Film Resistor, 1/4W, 13K, ±2%	MP006931	Axial Leaded Metal Film Resistor, 1/4W, 910K, ±2%	MP006972
Axial Leaded Metal Film Resistor, 1/4W, 15K, ±2%	MP006932	Axial Leaded Metal Film Resistor, 1/4W, 1M, ±2%	MP006973
Axial Leaded Metal Film Resistor, 1/4W, 16K, ±2%	MP006933	Axial Leaded Metal Film Resistor, 1/4W, 1.1M, ±2%	MP006974
Axial Leaded Metal Film Resistor, 1/4W, 18K, ±2%	MP006934	Axial Leaded Metal Film Resistor, 1/4W, 1.2M, ±2%	MP006975
Axial Leaded Metal Film Resistor, 1/4W, 20K, ±2%	MP006935	Axial Leaded Metal Film Resistor, 1/4W, 1.3M, ±2%	MP006976
Axial Leaded Metal Film Resistor, 1/4W, 22K, ±2%	MP006936	Axial Leaded Metal Film Resistor, 1/4W, 1.5M, ±2%	MP006977
Axial Leaded Metal Film Resistor, 1/4W, 24K, ±2%	MP006937	Axial Leaded Metal Film Resistor, 1/4W, 1.6M, ±2%	MP006978
Axial Leaded Metal Film Resistor, 1/4W, 27K, ±2%	MP006938	Axial Leaded Metal Film Resistor, 1/4W, 1.8M, ±2%	MP006979
Axial Leaded Metal Film Resistor, 1/4W, 30K, ±2%	MP006939	Axial Leaded Metal Film Resistor, 1/4W, 2M, ±2%	MP006980
Axial Leaded Metal Film Resistor, 1/4W, 33K, ±2%	MP006940	Axial Leaded Metal Film Resistor, 1/4W, 2.2M, ±2%	MP006981
Axial Leaded Metal Film Resistor, 1/4W, 36K, ±2%	MP006941	Axial Leaded Metal Film Resistor, 1/4W, 2.4M, ±2%	MP006982
Axial Leaded Metal Film Resistor, 1/4W, 43K, ±2%	MP006942	Axial Leaded Metal Film Resistor, 1/4W, 2.7M, ±2%	MP006983
Axial Leaded Metal Film Resistor, 1/4W, 47K, ±2%	MP006943	Axial Leaded Metal Film Resistor, 1/4W, 3M, ±2%	MP006984
Axial Leaded Metal Film Resistor, 1/4W, 51K, ±2%	MP006944	Axial Leaded Metal Film Resistor, 1/4W, 3.3M, ±2%	MP006985
Axial Leaded Metal Film Resistor, 1/4W, 62K, ±2%	MP006945	Axial Leaded Metal Film Resistor, 1/4W, 3.6M, ±2%	MP006986
Axial Leaded Metal Film Resistor, 1/4W, 68K, ±2%	MP006946	Axial Leaded Metal Film Resistor, 1/4W, 3.9M, ±2%	MP006987
Axial Leaded Metal Film Resistor, 1/4W, 75K, ±2%	MP006947	Axial Leaded Metal Film Resistor, 1/4W, 4.3M, ±2%	MP006988
Axial Leaded Metal Film Resistor, 1/4W, 82K, ±2%	MP006948	Axial Leaded Metal Film Resistor, 1/4W, 4.7M, ±2%	MP006989



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Description	Part Number	Description	Part Number
Axial Leaded Metal Film Resistor, 1/4W, 5.1M, ±2%	MP006990	Axial Leaded Metal Film Resistor, 1/4W, 1.6R, ±5%	MP007010
Axial Leaded Metal Film Resistor, 1/4W, 5.6M, ±2%	MP006991	Axial Leaded Metal Film Resistor, 1/4W, 1.8R, ±5%	MP007011
Axial Leaded Metal Film Resistor, 1/4W, 6.2M, ±2%	MP006992	Axial Leaded Metal Film Resistor, 1/4W, 2R, ±5%	MP007012
Axial Leaded Metal Film Resistor, 1/4W, 6.8M, ±2%	MP006993	Axial Leaded Metal Film Resistor, 1/4W, 2.2R, ±5%	MP007013
Axial Leaded Metal Film Resistor, 1/4W, 7.5M, ±2%	MP006994	Axial Leaded Metal Film Resistor, 1/4W, 2.4R, ±5%	MP007014
Axial Leaded Metal Film Resistor, 1/4W, 8.2M, ±2%	MP006995	Axial Leaded Metal Film Resistor, 1/4W, 2.7R, ±5%	MP007015
Axial Leaded Metal Film Resistor, 1/4W, 9.1M, ±2%	MP006996	Axial Leaded Metal Film Resistor, 1/4W, 3R, ±5%	MP007016
Axial Leaded Metal Film Resistor, 1/4W, 10M, ±2%	MP006997	Axial Leaded Metal Film Resistor, 1/4W, 3.3R, ±5%	MP007017
Axial Leaded Metal Film Resistor, 1/4W, 11M, ±2%	MP006998	Axial Leaded Metal Film Resistor, 1/4W, 3.6R, ±5%	MP007018
Axial Leaded Metal Film Resistor, 1/4W, 12M, ±2%	MP006999	Axial Leaded Metal Film Resistor, 1/4W, 3.9R, ±5%	MP007019
Axial Leaded Metal Film Resistor, 1/4W, 13M, ±2%	MP007000	Axial Leaded Metal Film Resistor, 1/4W, 4.3R, ±5%	MP007020
Axial Leaded Metal Film Resistor, 1/4W, 15M, ±2%	MP007001	Axial Leaded Metal Film Resistor, 1/4W, 4.7R, ±5%	MP007021
Axial Leaded Metal Film Resistor, 1/4W, 16M, ±2%	MP007002	Axial Leaded Metal Film Resistor, 1/4W, 5.1R, ±5%	MP007022
Axial Leaded Metal Film Resistor, 1/4W, 18M, ±2%	MP007003	Axial Leaded Metal Film Resistor, 1/4W, 5.6R, ±5%	MP007023
Axial Leaded Metal Film Resistor, 1/4W, 20M, ±2%	MP007004	Axial Leaded Metal Film Resistor, 1/4W, 6.2R, ±5%	MP007024
Axial Leaded Metal Film Resistor, 1/4W, 1R, ±5%	MP007005	Axial Leaded Metal Film Resistor, 1/4W, 6.8R, ±5%	MP007025
Axial Leaded Metal Film Resistor, 1/4W, 1.1R, ±5%	MP007006	Axial Leaded Metal Film Resistor, 1/4W, 7.5R, ±5%	MP007026
Axial Leaded Metal Film Resistor, 1/4W, 1.2R, ±5%	MP007007	Axial Leaded Metal Film Resistor, 1/4W, 8.2R, ±5%	MP007027
Axial Leaded Metal Film Resistor, 1/4W, 1.3R, ±5%	MP007008	Axial Leaded Metal Film Resistor, 1/4W, 9.1R, ±5%	MP007028
Axial Leaded Metal Film Resistor, 1/4W, 1.5R, ±5%	MP007009		

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