MFR – Electronic Components Pvt. Ltd.

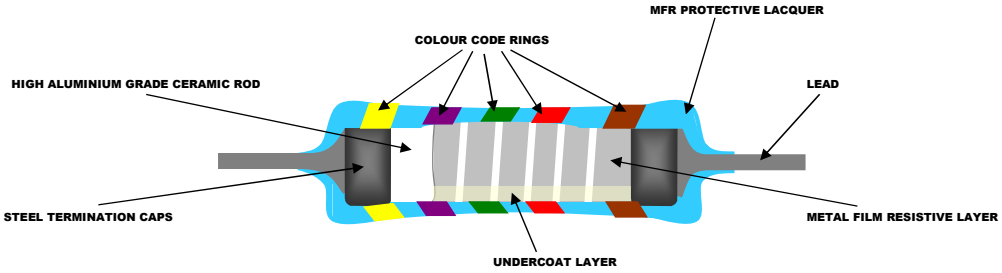
METAL FILM RESISTORS

Series : MF & MFS

Features:

- Meet performance requirements of JSS Std. & MIL Std.
- Flameproof Coating available on request.
- Miniature Size available for Space savings.
- TCR Available **5,10,15,25,50,100,200 ppm/°C.**
- Available ranges from **1 Ohm ~ 10 MOhms.**
- **RoHS** Compliant directive 2002/95/EC
- Lead (Pb)-free solder contacts.
- Low cost & miniature size

Construction :



Technical specification:

DESCRIPTION	GENERAL SERIES				MINIATURE SERIES			
	MF25	MF50	MF100	MF200	MFS60	MFS100	MFS200	MFS300
Resistance range	±1% ;1Ω ~ 10MΩ							
Resistance tolerance	±1%, E24/E96 series; ±2% & ±5%, E24 series							
Temperature coefficient	5 ppm/°C ~ 200 ppm/°C							
Maximum dissipation @ 70°C	0.25W	0.5W	1W	2W	0.6W	1W	2W	3W
Maximum permissible voltage	250V	350V	500V	500V	300	350	500	500
Operating Temperature	**-55° ~ 150°C**							
Filure Rate	**1% / 1000 hrs**							
COMPLYING STD	**JSS 50401**							
Ideal Storage Temperature	**+10°C to +30°C**							
Climatic category	55/155/56							
Stability, R max.								
Load	△ R±(2% +0.05Ω)							
Climatic test	△ R±(1% +0.05Ω)							
Soldering	△ R±(0.5% +0.05Ω)							
Short time overload	△ R±(0.5% +0.05Ω)							

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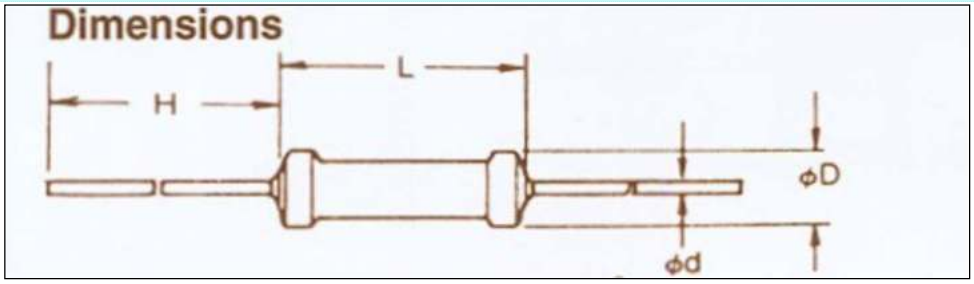
Dimensions :



Physical Data:

1.0 GENERAL SERIES SPECIFICATION :

TYPE	WATT. @ 70°C	TOL.	TCR PPM/°C	DIMENSIONS (mm) L	D	d ± 0.05	H	RESISTANCE RANGE	MAX. WORKING VOLTAGE	MAX. OVERLOAD VOLTAGE
MF25	0.25W	±1%, ±2% & ±5%	10 ~ 200	6.5± 0.5	2.3 ±0.2	0.6	25 min	1 Ω ~ 10MΩ	250V	500 V
MF50	0.5W	±1%, ±2% & ±5%	10 ~ 200	9.5± 1	3.5 ±0.5	0.6	25 min	1 Ω ~ 10MΩ	350V	700 V
MF100	1W	±1%, ±2% & ±5%	10 ~ 200	12± 1	4.5 ±0.5	0.8	24 min	1 Ω ~ 10MΩ	500V	1000 V
MF200	2W	±1%, ±2% & ±5%	10 ~ 200	16± 1	5.5 ±0.5	0.8	25 min	1 Ω ~ 10MΩ	500V	1000 V

Note :1.0 Lower & higher resistance value other than spcified above are available on request.

:2.0 Working voltage is $\sqrt{P \times R}$ where P is power & R is resistance in Ohms

2.0 MINITURE SERIES SPECIFICATION:

TYPE	WATT. @ 70°C	TOL.	TCR PPM/°C	DIMENSIONS (mm) L	D	d ± 0.05	H	RESISTANCE RANGE	MAX. WORKING VOLTAGE	MAX. OVERLOAD VOLTAGE
MFS60	0.6W	±1%, ±2% & ±5%	10 ~ 200	6.5± 0.5	2.3 ±0.2	0.6	25 min	1 Ω ~ 10MΩ	300V	600 V
MFS100	1W	±1%, ±2% & ±5%	10 ~ 200	9.5± 1	3.5 ±0.5	0.6	25 min	1 Ω ~ 10MΩ	350V	700 V
MFS200	2W	±1%, ±2% & ±5%	10 ~ 200	12± 1	4.5 ±0.5	0.8	24 min	1 Ω ~ 10MΩ	500V	1000 V
MFS300	3W	±1%, ±2% & ±5%	10 ~ 200	16± 1	5.5 ±0.5	0.8	25 min	1 Ω ~ 10MΩ	500V	1000 V

Note :1.0 Lower & higher resistance value other than spcified above are available on request.

:2.0 Working voltage is $\sqrt{P \times R}$ where P is power & R is resistance in Ohms

Marking:

The MF & MFS series / type, the nominal resistance & tolerance are marked on the resistor body using four or five coloured bands in accordance with IEC publication 60062 "color codes for fixed resistors"

Material Specifications:

Element : Vacuum-deposited nickel-chrome alloy

Core : Fire cleaned high purity ceramic

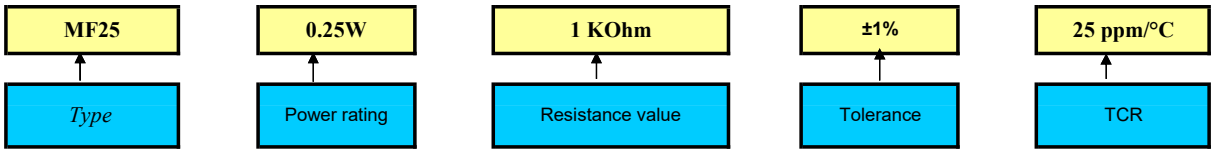
End caps : Steel caps

Coating : Specially formulated epoxy compound

Standard Terminals : Solderable - tinplated copper

Part Numbering Information:

Part Number : Type number, power rating, resistance value, tolerance, tcr.



Examples: **PART NO. : MF25, 0.25W, 1 KOhm, ±1%, 25ppm/°C**

Packing Information:

TYPE	Pcs Per Poly Bag/ Blue box	Pcs Per Brown Box		Pcs Per Real
MF25 / MFS60	1,000	1,000	5,000	5000
MF50 / MFS100	500	500	2,500	2500
MF100 / MFS200	---	---	1,500	2500
MF200 / MFS300	---	---	1,000	2500

Performance Data (Procedure & Requirements):

TEST	PROCEDURE	REQUIREMENTS
Robustness Of Termination		
1. Tensile Test	Load 10 N for 10 sec.	No visual damage
2. Bend Test	Load 5 N 90° , 180°, 90°	No visual damage
3. Torsion Test	3 X 360° in opposite directions	No visual damage △R/R max.: ±(0.25% +0.05 Ω)
Solderability Test	16 hrs steam or 16 hrs. at 155°C 2 sec. ±0.5 sec. in solder at 235° ±5°C Using flux	>95% coverage covered (good tinning) & no damage
Resistance To Soldering Heat	at 260°C±5°C for 10 sec., 6mm from the body	△R/R max.: ±(0.50% +0.05 Ω)
Temperature Cycling	30 minutes at -55°C & 30 minutes at 150°C Total 5 number of cycles.	No visual damage △R/R max.: ±(1.0% +0.05 Ω)
Dry Heat Test	16 hrs at 150°C	△R/R max.: ±(1.0% +0.05 Ω)
Cold Test	2 hrs at -55°C	△R/R max.: ±(0.25% +0.05 Ω)
Short Time Overload	2.5 X Rated voltage for 5 sec. @ 25°C	△R/R max.: ±(0.50 +0.05 Ω)
Endurance @ 70°C	2000 hrs. load with Pn (power nominal) 1.5 hr. ON & 0.5 hr. OFF	No visual damage △R/R max.: ±(2.0% +0.05 Ω)
Endurance @ Upper Category Temperature	1000 hrs. at 150°C with no load	No visual damage △R/R max.: ±(2.0% +0.05 Ω)
Temperature Rise Test	Horizontally mounted, loaded with Pn	Hot spot temperature less than maximum body temperature
Damp Heat Steady State	56 days, 40°C; 90 to 95% Rh; dissipation ≤ 0.01Pn	No visual damage △R/R max.: ±(1% +0.05 Ω)
Temperature Coefficient	At 25/-55/25 °C & 25/150/25 °C	Within specified limits
Insulation Resistance	V- Block method for 1 minute duration At 500 V dc	> 10^3 MΩ
Voltage proof test	V- Block method for 1 minute duration At 500 V	No flash over or break down should observed

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Thermal Performance Data: