

# METAL FILM RESISTORS

# MFR-S SERIES

## Feature

- Superior electrical performance
- Excellent overall stability
- Extremely low TCR down to  $\pm 15\text{PPM}/^\circ\text{C}$
- Standard Value: 10R-1Meg in E24/E96 series
- Very tight tolerance down to  $\pm 0.05\%$
- Operating Temperature :  $-55^\circ\text{C} \sim +155^\circ\text{C}$

## Material

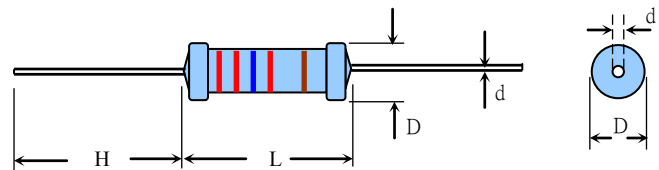
Element: Vacuum-deposited Ni-Cr Alloy

Core: High purity ceramic  $\text{Al}_2\text{O}_3$

Termination: Standard solder-plated cooper lead

Coating: Epoxy

## Dimension



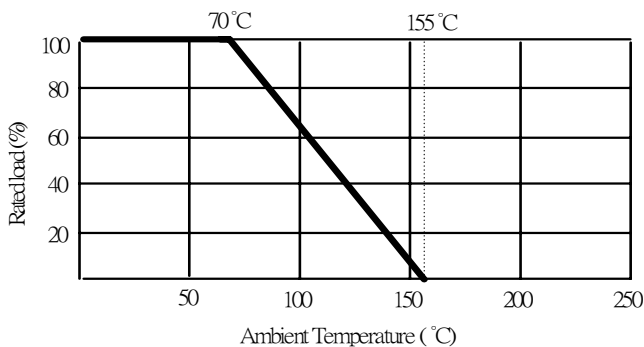
## General Specification

TYPE	DIMENSION(mm)				POWER RATING	MAXIMUM WORKING VOLTAGE	MAXIMUM OVERLOAD VOLTAGE	RESISTANCE RANGE $\pm 1\%$
	L	D	H	$d \pm 0.05$				
MFR025S	$3.2 \pm 0.2$	$1.5 \pm 0.2$	$28 \pm 3.0$	0.45	1/4W	200V	400V	$10\Omega - 1\text{M}\Omega$
MFR040S	$3.2 \pm 0.2$	$1.5 \pm 0.2$	$28 \pm 3.0$	0.45	0.4W	200V	400V	$10\Omega - 1\text{M}\Omega$
MFR050S	$6.0 \pm 0.5$	$2.3 \pm 0.3$	$28 \pm 3.0$	0.55	1/2W	250V	500V	$10\Omega - 1\text{M}\Omega$
MFR060S	$6.0 \pm 0.5$	$2.3 \pm 0.3$	$28 \pm 3.0$	0.55	0.6W	350V	700V	$10\Omega - 1\text{M}\Omega$
MFR100S	$9.0 \pm 0.5$	$3.2 \pm 0.5$	$28 \pm 3.0$	0.65	1W	350V	700V	$10\Omega - 1\text{M}\Omega$
MFR200S	$11 \pm 1.0$	$4.0 \pm 0.5$	$33 \pm 3.0$	0.75	2W	500V	1000V	$10\Omega - 1\text{M}\Omega$
MFR300S	$15 \pm 1.0$	$5.0 \pm 0.5$	$33 \pm 3.0$	0.75	3W	500V	1000V	$10\Omega - 1\text{M}\Omega$

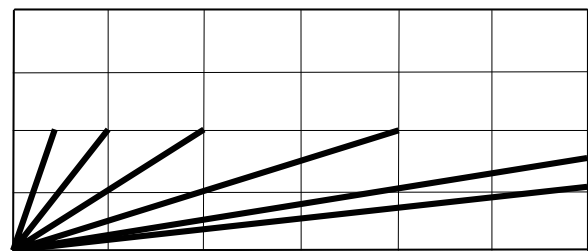
\* Maximum Working Voltage determined by  $E = \sqrt{P \cdot R}$ , where E should not exceed value listed in column above.

\*\*Maximum Overload Voltage equals to 2.5XE, but should not exceed value listed in column above.

## Derating Curve



## Temperature Rise



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## Characteristics

Item	Requirement	Test Method
Short Time Overload	±0.5%	JIS-C-5201-1 5.5 RCWV*2.5 or Max. overload voltage for 5 seconds
Insulation Resistance	> 10,000MΩ	JIS-C-5201-1 5.6 Apply 100VDC for 1 minute
Endurance	±0.2%	JIS-C-5201-1 7.10 70±2°C, Max. RCWV for 1000 hrs with 1.5 hrs "ON" and 0.5hrs "OFF"
Damp Heat with Load	±0.3%	JIS-C-5201-1 7.9 40±2°C, 90~95% R.H. RCWV for 1000 hrs with 1.5 hrs "ON" and 0.5hrs "OFF"
Solderability	90% min. Coverage	JIS-C-5201-1 6.5 245±5°C for 3 seconds
Dielectric Withstanding Voltage	By Type	JIS-C-5201-1 5.7 Apply Max. Overload Voltage for 1 minute
Temperature Coefficient	50ppm 10Ω~1MΩ 100ppm <10Ω, >1MΩ	Resistance value at room temperature and room Temperature+100°C
Pulse Overload	±0.75%	JIS-C-5201-1 5.8 4 times RCWV for 10000 cycles with 1 second "ON" and 25 seconds "OFF"
Resistance To Solvent	No deterioration of coatings and markings	JIS-C-5201-1 6.9 Trichroethane for 1 min. with ultrasonic
Terminal Strength	Tensile: ≥2.5 kg	Direct Load for 10 seconds In the direction off the terminal leads
Shelf Life	ΔR=±0.1%	12 months at room temperature 25±3°C, 80%RH Max.

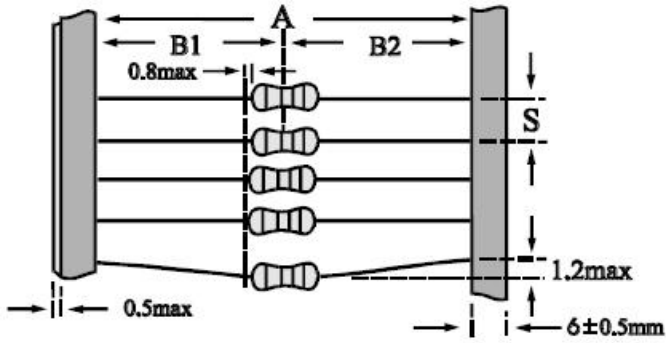
## Part Numbering

<b>MFR025S</b>	<b>F</b>	<b>TB</b>	<b>=</b>	<b>10R</b>
↓	↓	↓	↓	↓
Type/Power	Tol.	Package	ppm	Resistance
MFR025S	A=±0.05%	B=Bulk	- = Based on spec.	10R = 10Ω
MFR040S	B=±0.1%	TB=Tape/box	E=+/-50ppm	1K2R = 1.2KΩ
MFR050S	C=±0.25%	TR=Tape/reel	D=+/-25ppm	1MR = 1MΩ
MFR060S	D=±0.5%	Lead forming	C=+/-15ppm	
MFR100S	F=±1%	M		
MFR200S	J=±5%	F		

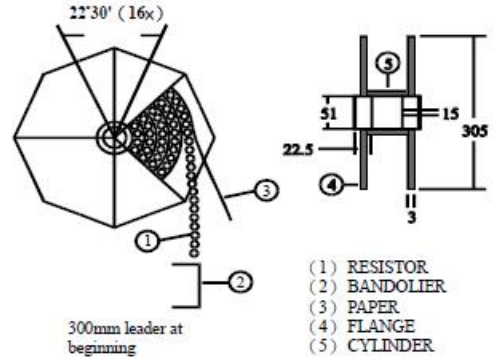
# METAL FILM RESISTORS MFR/FMFR SERIES

## Taping/Packing Specification

**Packing Methods**

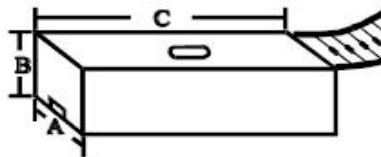


**Reel Packing**



TYPE	PACKING METHOD			REEL PACKING	
	A	B1-B2 Max	S	Across Flange (A)	Q'TY
MFR025S,MFR040S	52+1/-0	1.2	5	72	5000
MFR050S,MFR060S	52+1/-0	1.2	5	72	5000
MFR100S	52+1/-0	1.2	5	72	2000
MFR200S	52+1/-0	1.2	5	72	1000
	73+1/-0	1.5	5	72	1000
MFR300S	52+1/-0	1.2	10	95	1000
	73+1/-0	1.5	10	95	1000

**Ammo Packing**



TYPE	PACKING METHOD			AMMO PACKING			
	A	B1-B2 Max	S	A	B	C	Q'TY
MFR025S,MFR040S	52+1/-0	1.2	5	80	68	255	5000
MFR050S,MFR060S	52+1/-0	1.2	5	75	22	267	1000
		1.2	5	85	103	263	5000
MFR100S	52+1/-0	1.2	5	85	95	263	2000
MFR200S	52+1/-0, 73+1/-0	1.2, 1.5	5	85,103	102,85	263	1000
MFR300S	52+1/-0, 73+1/-0	1.2, 1.5	10	85, 103	102,95	265	1000