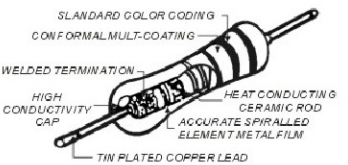
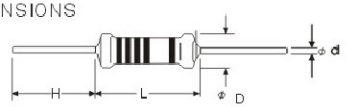
INTRODUCTION:

MF series is a group of metal film-fixed resistors applying high Aluminum content base material vacuum sputtered by Ni-Cr alloy and excellent heat-and wet-proof special resin for protective coating. Those resistors are manufactured through integrated automatic production system and then have good stable and uniform property. Furthermore, they show excellent performance regardless open in air.

MF系列是一組鋁材經鎳鎘合金真空噴灑及特殊樹脂表被防火、防潮的金屬膜固定電阻。這些電阻由整體自動化系統製造，所以有穩定及均勻品質。而且，即使暴露在空氣中仍有極佳的品質。



DIMENSIONS



GENERAL SPECIFICATIONS

MIL STYLE	STYLE	POWER RATING(W)	DIMENSION (mm)				MAX WORKING VOLTAGE	MAX OVERLODAD
			L	D	H(MIN)	d		
RN-50	MF-12	0.125W	3.7 ±0.4	1.8 ±0.2	27	0.46 ±0.02	200	400
RN-50	MF-16	0.125W	3.7 ±0.4	1.8 ±0.2	27	0.46 ±0.02	200	400
RN-55	MF-25	0.25W	6.8 ±0.5	2.5 ±0.2	27	0.58 ±0.02	250	500
RN-60	MF-50	0.5W	9.0 ±1.0	3.5 ±0.5	25	0.68 ±0.02	350	700
RN-65	MF-100	1W	12 ±1.0	4.5 ±0.5	33	0.80 ±0.03	500	1000
RN-70	MF-200	2W	16 ±1.0	5.5 ±0.5	33	0.80 ±0.03	500	1000
RN-75	MF-300	3W	17 ±1.0	6.0 ±0.5	30	0.80 ±0.03	600	1000

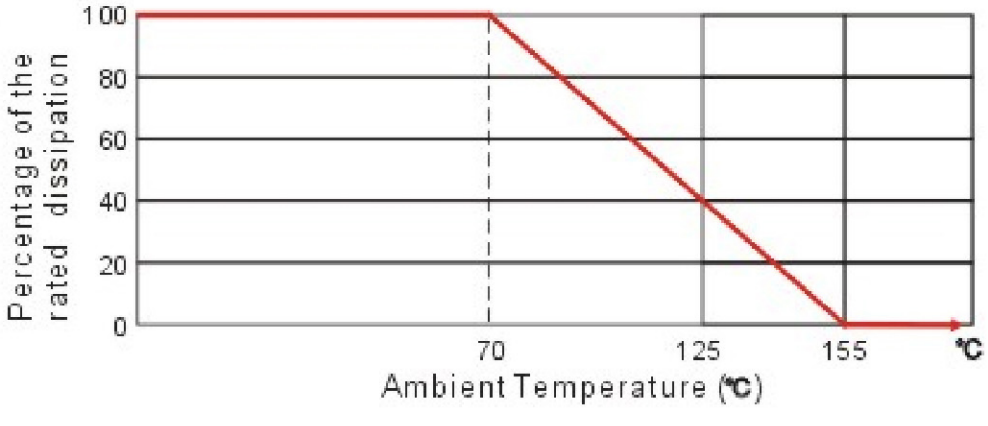
RESISTANCE RANGE

MIL STYLE	STYLE	TOLERANCE	TC ±25PPM/℃	TC ±100PPM/℃ TC ±50PPM/℃
RN-50	MF-12 MF-16	±1% ±0.5% ±0.25% ±0.1%	10Ω~1MΩ 100Ω~1MΩ 51.1Ω~470KΩ 51.1Ω~470KΩ	1Ω~10MΩ 51.1Ω~470KΩ
RN-55	MF-25	±1% ±0.5% ±0.25% ±0.1%	0.1Ω~10MΩ 0.1Ω~10MΩ 10Ω~470KΩ 10Ω~470KΩ	0.1Ω~10MΩ 0.1Ω~10MΩ
RN-60	MF-50	±1% ±0.5% ±0.25% ±0.1%	0.1Ω~10MΩ 0.1Ω~10MΩ 10Ω~470KΩ 10Ω~470KΩ	0.1Ω~10MΩ 0.1Ω~10MΩ
RN-65	MF-100	±1% ±0.5% ±0.25% ±0.1%	0.1Ω~10MΩ 0.1Ω~10MΩ 10Ω~470KΩ 10Ω~470KΩ	0.1Ω~10MΩ 0.1Ω~10MΩ
RN-70	MF-200	±1% ±0.5% ±0.25% ±0.1%	0.1Ω~10MΩ 0.1Ω~10MΩ 10Ω~470KΩ 10Ω~470KΩ	0.1Ω~10MΩ 0.1Ω~10MΩ
RN-75	MF-300	±1% ±0.5% ±0.25% ±0.1%	0.1Ω~10MΩ 0.1Ω~10MΩ 10Ω~470KΩ 10Ω~470KΩ	0.1Ω~10MΩ 0.1Ω~10MΩ

METAL FILM FIXED RESISTORS

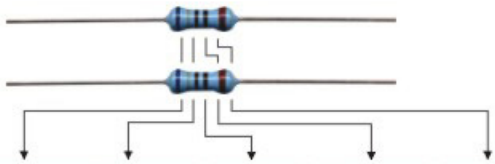
Characteristic	Specification	Test Method
		(All resistance measurements should be performed after stabilisation or conditioning periods) .
DC RESISTANCE	Within specified tolerance.	MIL-STD-202 Method 303
TEMPERATURE COEFPICIENT	As buyer requested ±25PPM/℃, ± 100PPM/℃, ±50PPM/℃	MIL-STD-202 Method 304
DIELECTRIC STRENGTH	No flashover or damage	MIL-STD-202 Method 301 1/8W 300V 1 minute 1/4W 500V 1 minute 1/2W 700V 1 minute 1.2W 750V 1 minute
INSULATION RESISTANCE	at least 1,000MΩ	MIL-STD-202 Method 302 1000V 1 minute
CURRENT NOISE TEST	below 10KΩ below 0.05 μV/V 10KΩ~below 0.1 μV/V below 1M7 below 0.2 μV/V	MIL-STD-202 Method 308
VIBRATION	ΔR within ± (0.25% +0.05Ω)	MIL-STD-202 Method 201 10~HZ X.Y.Z. 3directions 2 hours each
TORMINAL STRENGTH	Lead is not break or loose	MIL-STD-202 Method 211
RESISTANCE TO SOLDERING HEAT	ΔR within ± (0.25% +0.05Ω)	MIL-STD-202 Method 210 350℃,3 ±0.05 sec
SOLDERABILITY	At least 95% coverage	MIL-STD-202 Method 208 230℃,5 sec
THERMAL SHOCK	ΔR within ± (0.5% +0.05Ω)	MIL-STD-202 Method 107 -55℃, +155℃ 5cycles
SHORT TIME OVERLOAD	ΔR within ± (0.5% +0.05%Ω)	MIL-R-10509 Para,4,6,6, 2.5times rated working voltage, 5 seconds
HUMI DITY	ΔR within ± (1% +0.05Ω) NO mechanical damage	MIL-STD-202 Method 103 40℃, RH95% 500
LOW TEMPERATURE OPERATION	ΔR within ± (0.5% +0.05Ω)	MIL-R-10509 Para 4,6,5 rated working voltage, at-65℃ 45minutes.
LOAD LIFE	ΔR within ± (1% +0.05Ω)	MIL-STD-202 method 108 Rated working voltage 1.5 hours on.0.5 hours off for total 1000 hours
RESISTANCE TO SOVENT	Color bands legible No mechanical damage	MIL-STD-202 method 215

DERATING CURVE



GENERAL SPECIFICATION OF RESISTORS

E24 E96
E192



COLOR	1ST BAND	2ND BAND	3RD BAND	MULITIPLIER	TOLERANCE
BLACK	0	0	0	10^0	
BROWN	1	1	1	10^1	F(±1%)
RED	2	2	2	10^2	G(±2%)
ORANGE	3	3	3	10^3	
YELLOW	4	4	4	10^4	
GREEN	5	5	5	10^5	D (±0.5%)
BLUE	6	6	6	10^6	C (±0.25%)
VIOLET	7	7	7	10^7	B (±0.1%)
GRAY	8	8	8		
WHITE	9	9	9	10^{-3}	
GOLD				10^{-1}	J (±5%)
SILVER				10^{-2}	K (±10%)
PLAIN					M (±20%)

TEMPERATURE COEFFICIENT

UNIT/PPM/°C

SYMBOL	T	E	C	K	J	L	D
T.C.R	±10	±25	±50	±100	±150	±200	+200 -500

RESISTANCE TOLERANCE

UNIT/%

SYMBOL	A	B	C	D	F	G	J	K	M
RESISTANCE TOLERANCE	±0.05	±0.1	±0.25	±0.5	±1	±2	±5	±10	±20

HOW TO APPLY RESISTORS CORRECTLY

▲THE CHARACTERISTICS OF RESISTOR HAVE RELATIONS TO TEMPERATURE MOISTURE AND VOLTAGE.

▲THE RATING OF RESISTOR IS SPECIFIED ON THE BASIS OF TEMPERATURE.

▲THE POWER RATING OF RESISTOR IS ALL SPECIFIED WITH A DIRECT-CURRENT (D.C.)CONTINUOUS WORKING VOLTAGE OR SINE-WAVE ROOT-MEAN-SQUARE (RMS) CONTINUOUS WORKING VOLTAGE AT COMMERCIAL-LINE FREQUENCY.

▲THE TESTS REGARDING CHARACTERISTICS OF RESISTOR, IS PRINCIPALLY SPECIFIED ON THE BASIS OF MOISTURE.

▲MAXIMUM RATED VOLTAGE AND MAXIMUM OVERLOAD VOLTAGE ARE LIMITED FOR EACH STYLE OF RESISTOR.(1)GENERALLY, RATED VOLTAGE= $\sqrt{P.R}$ WHERE, E=VOLT, P=WATT, R=OHM. (2)GENERALLY, OVERLOAD VOLTAGE ET=$\sqrt{P.R}$x2.5, APPLICATION TIME=5 SECS.
NOTE/MAX. RATED AND MAX. OVERLOAD VOLTAGE ARE SPECIFIED IN EACH SPECIFICATION, SO IF THE VOLTAGE VALUE COMPUTED, IS OVER THAN SPECI-FIED VOLTAGE VALUE, THE SPECIFIED VALUE SHOULD BE APPLIED TO RESISTOR..

▲IN THE COMPLICATED OR HIGH DENSITY CIRCUIT, IT IS RECOMMENDED THAT THE WATTAGE OR OHMIC VALUES OF RESISTOR SHOULD HAVE A LARGE REDUNDANCY FROM A VIEW POINT OF RELIABILITY.

▲IT IS NECESSARY THAT THE HANDLING OR WIRING OF RESISTOR TO THE CIRCUIT, IS CAREFULLY AND PLEASE DO NOT INFLICT ANY STRESS TO RESISTOR WITH OVER, HEATING APPOLICTION.

▲TO RISE THE RELIABILITY OF RESISTOR, IT IS BETTER TO PRERER RESISTOR WITH UNFORM QUALITY THAN TAKING RESISTOR MET WITH SEVERE SPECIFI-CATION.

▲TO RISE THE STABILITY OF RESISTOR, IT IS VERY IMPORTANT TO TAKE RESISTOR MET WITH CIRCUIT CONDITIONS AND IS ALSO ECONOMICAL NO TO HAVE UNREASONABLE DESIGE FROM A POINT OF PRICING OF RESISTOR.

▲GENERALLY, FAILURE OF RESISTOR TAKES A CONCENTRATED TREND IN THE IMPULSE CIRCUIT WITH COMPLICATED PULSE WAVE FORM OF LC CIRCUIT GENERATED HIGH VOLTAGE WITH TRANSIENT PHENOMENA, THEREFORE, IT IS VERY IMPORTANT FOR DESIGNERS TO CONSIDER. THESE CONDITIONS IN THE CIRCUIT DESIGN, IF THE RESISTOR IS APPLIED IN THESE CIRCUIT.

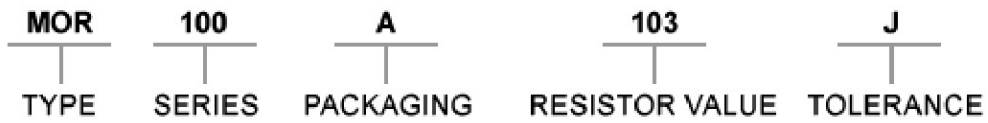
±2%, ±5%	±1%	±0.5%, ±0.1%
E24	E96	E192
100	100	100
		101
	102	102
		104
	105	105
		106
	107	107
		108
		109
110	110	110
		111
	113	113
		114
	115	115
		117
	118	118
120		120
	121	121
		123
	124	124
		126
	127	127
		129
130	130	130
		132
	133	133
		135
	137	137
		138
	140	140
		142
	143	143
		145
	147	147
		149
150	150	150
		152
	154	154
		156
	158	158
160		160
	162	162
		164
	165	165
		167
	169	169
		172
	174	174
		176
	178	178
180		180
	182	182
		184
	187	187
		189
	191	191
		193
	196	196
		198
200	200	200
		203
	205	205
		208
	210	210
		213
	215	215
		218
220		
	221	221
		223
	226	226
		229
	232	232
		234
	237	237
240		240
	243	243
		246
249	249	249
		252
	255	255
		258
	261	261
		264
	267	267
270		
		271
	274	274
		277
	280	280
		284
	287	287
		291
	294	294
		298
300		
	301	301
		305
	309	309
		312
	316	316
		320
	324	324
		328

±2%, ±5%	±1%	±0.5%, ±0.1%
E24	E96	E192
330		
	332	332
		336
	340	340
		344
	348	348
		352
	357	357
360		
		361
	365	365
		370
	374	374
		379
	383	383
		388
390		
	392	392
		397
	402	402
		407
	412	412
		417
	422	422
		427
430		
	432	432
		437
	442	442
		448
	453	453
		459
	464	464
470		470
	475	475
		481
	487	487
		493
	499	499
		505
510		
	511	511
		517
	523	523
		530
	536	536
		542
	549	549
		556
560		
	562	562
		569
	576	576
		583
	590	590
		597
	604	604
		612
	619	619
620		
		626
	634	634
		642
	649	649
		657
	665	665
		673
680		
	681	681
		690
	698	698
		706
	715	715
		723
	732	732
		741
750	750	750
		759
	768	768
		777
	787	787
		796
	806	806
		816
820		
	825	825
		835
	845	845
		856
	866	866
		876
	887	887
		898
	909	909
910		
		920
	931	931
		942
	953	953
		965
	976	976
		988

EXAMPLE:

DESCRIPTION	MOR	1W	10K	5%

SERIAL NUMBER



TYPE
METAL OXIDE FILM RESISTORS (MOR)
METAL FILM FIXED RESISTORS (MF)
CARBON FILM FIXED RESISTORS (CR)

SERIES	
12	1/8W
25	1/4W
50	1/2W
100	1W
200	2W
300	3W
500	5W
100S	1W (SMALL SIZE)

PACKAGING	
A	Tape Box
R	Tape Reel
B	Bulk
C	Forming
hor120Ntal Type	

TOLERANCE	
F	±1%
G	±2%
J	±5%
B	±0.1%

RESISTOR VALUE	
E24 Series 5% 3Digits	
2R2	2.2Ω
101	100Ω
103	10k
105	1M

RESISTOR VALUE	
E96 Series 1% 4Digits	
2R20	2.2Ω
1000	100Ω
1002	10K
1004	1M