

# Lumimax Optoelectronic Technology

## MF Series

## Metal Film Fixed Resistors

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### Metal Film Resistor Sample Kits:

**MFR1/2WK:** Metal film 1/2W resistor sample kit, 1~1M ohm, 32 values \*

**MFR1/4WK:** Metal film 1/4W resistor sample kit, 0~10M ohm, 38 values \*

**MFR1/8WK:** Metal film 1/8W resistor sample kit, 10~1M ohm, 32 values \*

**MFR1WKA:** Metal film 1W resistor sample kit, 1~220 ohm, 20 values \*

**MFR1WKB:** Metal film 1W resistor sample kit, 1~1M ohm, 32 values \*

**MFR2WKA:** Metal film 2W resistor sample kit, 1~220 ohm, 20 values \*

**MFR2WKB:** Metal film 2W resistor sample kit, 270~22K ohm, 20 values \*

**MFR2WKC:** Metal film 2W resistor sample kit, 30K~1M ohm, 15 values \*

**MFR2WKD:** Metal film 2W resistor sample kit, 1~1M ohm, 17 values \*

**Note:** \* for Resistor values in each sample kit, please refer to the last page of the specification sheet for details.

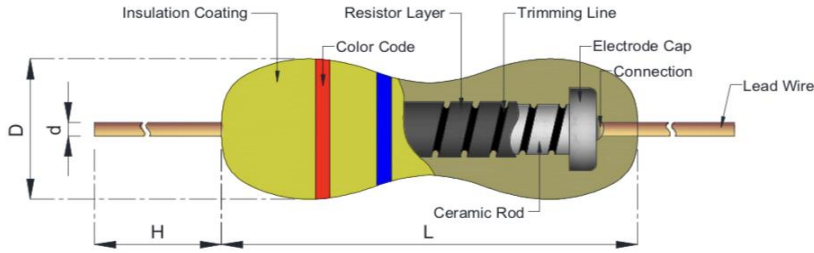
### Product Features

- Low Noise
- Low T.C.R. 200ppm, 100ppm, 50ppm, 25ppm, 15ppm, 10ppm
- High precision 1%, 0.5%, 0.25%, 0.1%
- Products with lead-free terminations meet EU RoHS and China RoHS requirements
- All general purpose and Power applications
- AECQ-200 Qualified



**Pb-Free and  
RoHS Compliant**

## Power rating and Dimensions

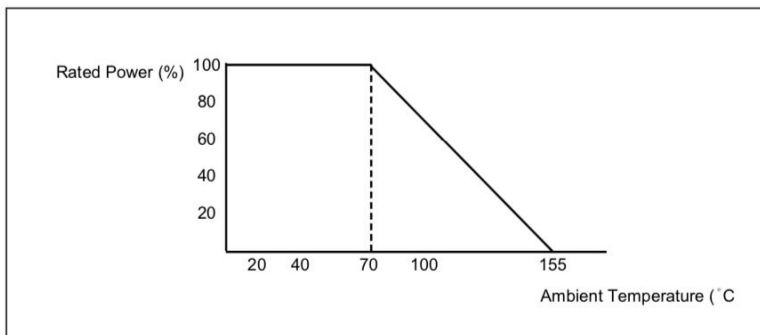


Style	Dimensions (mm)			
	L	D	H	d
CF-1/8W	3.3 + 0.4 ~-0.2	1.8 ± 0.3	29 ± 2.0	0.45 ± 0.03
CF-1/4W	6.3 ± 0.5	2.3 ± 0.3	28 ± 2.0	0.55 ± 0.03
CF-1/2W	9.0 ± 0.5	3.2 ± 0.5	26 ± 2.0	0.65 ± 0.03
CF-1W	11.5 ± 1.0	4.5 ± 0.5	35 ± 2.0	0.78 ± 0.03
CF-2W	15.5 ± 1.0	5.0 ± 0.5	32 ± 2.0	0.78 ± 0.03

## Electrical Characteristics

Power rating at 70°C	1/8W	1/4W	1/2W	1W	2W
Body Size (D x L mm)	1.8 x 3.3	2.3 x 6.3	3.2 x 9.0	4.5 x 11.5	5.0 x 15.5
(D x L inch)	0.071 x 0.13	0.091 x 0.248	0.126 x 0.354	0.177 x 0.453	0.197 x 0.61
Operating temp. range	-55°C + 155°C				
Max. working voltage	150V	250V	350V	450V	500V
Max. overload voltage	300V	500V	500V	700V	1000V
Dielectric withstanding voltage	300V	500V	500V	700V	1000V
Value range ± 1%	0.1Ω ~10M E24 series; 1Ω ~ 1MΩ E96 series				
Value range ±0.25%, ±0.1%, and ±0.05%	10Ω ~100KΩ E24 and E192 series				

## Derating Curve



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## Test and Requirements

Performance test	Test Method	Appraise
Short time overload	JIS-C-5202 5.5 2.5 times RCWV for 5 seconds	$\pm(0.25\%+0.05\Omega)$
Temperature Coefficient (TCR)	Resistance value at room temperature +25°C at room temperature +125°C	By type
Dielectric withstanding voltage	JIS-C5202 5.7 In V-Block for 60 seconds	By type
Pulse overload	JIS-C5202 5.8 4 times RCWV for 10000 cycles (1 sec. on, 25 secs. Off)	$\pm (1\% +0.05\Omega)$
Insulation resistance	JIS-C5202 5.6 In V-Block for 60 sec.	>10,000M $\Omega$
Load life	JIS-C5202 7.10 70°C at RCWV for 1000 hours (1.5 hrs on, 0.5 hrs. off)	$\pm (1.5\%+0.05\Omega)$
Load life in humidity	JIS-C5202 7.9 40°C $\pm$ 2°C 90~95% RH at RCWV for 1000 hours (1.5 hrs on, 0.5 hrs. off)	$\pm (1.5\%+0.05\Omega)$
Soler ability	JIS-C5202 6.5 260°C $\pm$ 5°C for 2 $\pm$ 0.5 seconds	95% min. coverage
Resistance to solvent	IPA for 5 $\pm$ 0.5 Min. with ultrasonic	No deterioration in coatings and markings
Terminal strength	Direct load for 10 sec. in the direction of the terminal leads.	Tensile: $\geq$ 2.5kg

**Note: RCWV:** Rated Continuous Working Voltage =  $\sqrt{\text{Power rating} \times \text{Resistance value}}$

## Resistor body color

Normal size 1/8W to 2W: Blue color

## Part Number

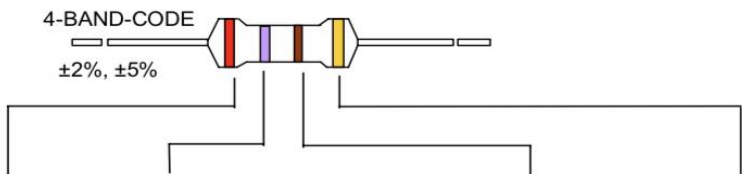
<b>MF</b>	<b>1W</b>	<b>2K</b>	<b>J</b>	<b>T</b>
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Type	Power rating	Resistance	Tolerance	Packaging
MF – Metal film	1/8W	1R = 1Ω	F = ± 1%	TB = Taping in box
	1/4W	10R = 10Ω	J = ± 5%	TR = Taping in reel
	1/2W	2K = 2KΩ	D = ± 0.5%	BU = Bulk
	1W	3K3 = 3.3KΩ	C = ± 0.25%	T = Cut Taped
	2W	10M = 10MΩ	B = ± 0.1%	
	3W	22M = 22MΩ	A = ± 0.05%	
	1/6W			

## Tape on box packing

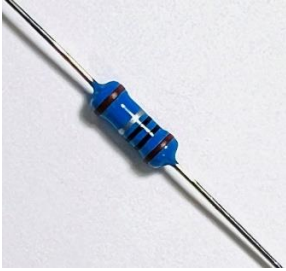
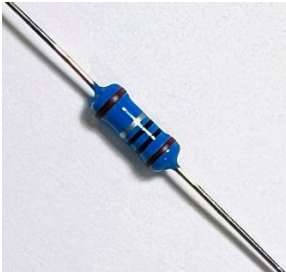
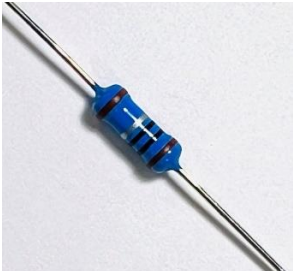
1/2W, 1W and 2W Resistor	Quantity per box: 1000pcs
1/4W and 1/8W Resistor	Quantity per box: 5000pcs

## MARKING

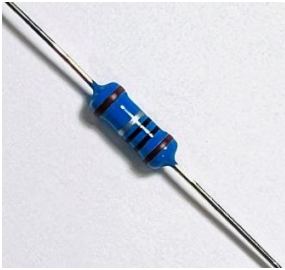


COLOR	1st BAND	2nd BAND	3rd BAND	MULTIPLIER	TOLERANCE
BLACK	0	0	0	1Ω	
BROWN	1	1	1	10Ω	
RED	2	2	2	100Ω	± 2% ( G )
ORANGE	3	3	3	1KΩ	
YELLOW	4	4	4	10KΩ	
GREEN	5	5	5	100K	
BLUE	6	6	6	1MΩ	
VIOLET	7	7	7	10MΩ	
GREY	8	8	8	0.001Ω	
WHITE	9	9	9	0.0001Ω	
GOLD				0.1Ω	± 5% ( J )
SILVER				0.01Ω	

## Metal Film Resistor Sample Kit Values:

<p><b>MFR1WKA</b></p> 	<p>Metal film 1W Resistor kit, 1~220 ohm, tol: 1% 20 values, 5pc/value. RoHS Total 100pcs</p> <p>20 Resistance values (ohm) are:</p> <p>① 1 ② 2 ③ 2.2 ④ 3.3 ⑤ 4.7 ⑥ 5.1 ⑦ 6.8 ⑧ 8.2 ⑨ 10 ⑩ 15 ⑪ 22 ⑫ 30 ⑬ 39 ⑭ 47 ⑮ 51 ⑯ 68 ⑰ 75 ⑱ 100 ⑲ 150 ⑳ 220</p>
<p><b>MFR1WKB</b></p> 	<p>Metal film 1W Resistor kit, 1~1M ohm, tol: 1% 32 values, 5pc/value. RoHS Total 160pcs</p> <p>32 Resistance values (ohm) are:</p> <p>① 1 ② 10 ③ 15 ④ 22 ⑤ 30 ⑥ 39 ⑦ 47 ⑧ 51 ⑨ 100 ⑩ 150 ⑪ 220 ⑫ 300 ⑬ 390 ⑭ 470 ⑮ 510 ⑯ 1K ⑰ 2K ⑱ 2K2 ⑲ 3K ⑳ 3K3 ㉑ 3K9 ㉒ 4K7 ㉓ 5K1 ㉔ 10K ㉕ 15K ㉖ 22K ㉗ 33K ㉘ 47K ㉙ 51K ㉚ 100K ㉛ 220K ㉜ 1M</p>
<p><b>MFR2WKA</b></p> 	<p>Metal film 2W Resistor kit, 1~220 ohm, tol: 1% 20 values, 5pc/value. RoHS. Total 100pcs</p> <p>20 Resistance values (ohm) are:</p> <p>① 1 ② 2 ③ 2.2 ④ 3.3 ⑤ 4.7 ⑥ 5.1 ⑦ 6.8 ⑧ 8.2 ⑨ 10 ⑩ 15 ⑪ 22 ⑫ 30 ⑬ 39 ⑭ 47 ⑮ 51 ⑯ 68 ⑰ 75 ⑱ 100 ⑲ 150 ⑳ 220</p>

**MFR2WKB**

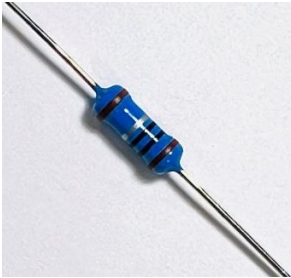


Metal film 2W Resistor kit, 270~22K ohm, tol: 1%  
20 values, 5pc/value. RoHS  
Total 100pcs

20 Resistance values (ohm) are:

- ① 270 ② 300 ③ 330 ④ 360 ⑤ 390
- ⑥ 470 ⑦ 510 ⑧ 680 ⑨ 1K ⑩ 2K
- ⑪ 2K2 ⑫ 3K ⑬ 3K3 ⑭ 3K9 ⑮ 4K7
- ⑯ 5K1 ⑰ 6K8 ⑱ 10K ⑲ 15K ⑳ 22K

**MFR2WKC**

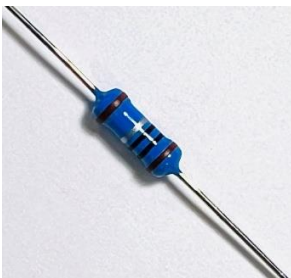


Metal film 2W Resistor kit, 30K~1M ohm, tol: 1%  
15 values, 5pc/value. RoHS  
Total 75pcs

15 Resistance values (ohm) are:

- ① 30K ② 33K ③ 39K ④ 47K ⑤ 51K
- ⑥ 68K ⑦ 100K ⑧ 220K ⑨ 300K ⑩ 330K
- ⑪ 390K ⑫ 470K ⑬ 510K ⑭ 680K ⑮ 1M

**MFR2WKD**

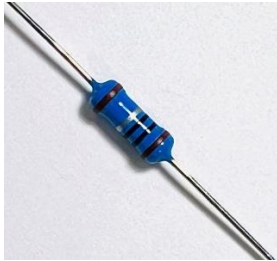


Metal film 2W Resistor kit, 1~1M ohm, tol: 1%  
17 values, 5pc/value. RoHS  
Total 85pcs

17 Resistance values (ohm) are:

- ① 1 ② 10 ③ 22 ④ 47 ⑤ 100
- ⑥ 220 ⑦ 470 ⑧ 1K ⑨ 2K2 ⑩ 4K7
- ⑪ 10K ⑫ 22K ⑬ 47K ⑭ 100K ⑮ 220K
- ⑯ 470K ⑰ 1M

### MFR1/4WK

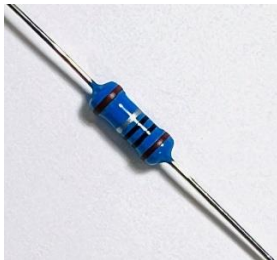


Metal film 1/4W Resistor kit, 0~10M ohm, tol: 1%  
38 values, 5pc/value. RoHS  
Total 190pcs

38 Resistance values (ohm) are:

- ① 0 ② 10 ③ 15 ④ 22 ⑤ 30 ⑥ 39
- ⑦ 47 ⑧ 68 ⑨ 75 ⑩ 100 ⑪ 150 ⑫ 220
- ⑬ 270 ⑭ 330 ⑮ 360 ⑯ 470 ⑰ 510
- ⑱ 680 ⑲ 1K ⑳ 2K ㉑ 2K2 ㉒ 3K3
- ㉓ 4K7 ㉔ 5K1 ㉕ 6K8 ㉖ 10K ㉗ 15K
- ㉘ 22K ㉙ 30K ㉚ 47K ㉛ 51K ㉜ 68K
- ㉝ 100K ㉞ 220K ㉟ 300K ㊱ 470K ㊲ 680K ㊳ 1M

### MFR1/8WK

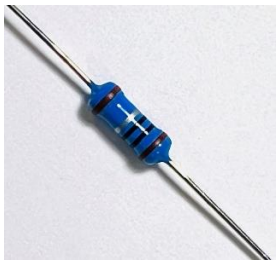


Metal film 1/8W Resistor kit, 10~1M ohm, tol: 1%  
32 values, 5pc/value. RoHS  
Total 160pcs

32 Resistance values (ohm) are:

- ① 10 ② 15 ③ 22 ④ 47 ⑤ 51 ⑥ 75
- ⑦ 100 ⑧ 150 ⑨ 220 ⑩ 470 ⑪ 510
- ⑫ 680 ⑬ 1K ⑭ 2K ⑮ 2K2 ⑯ 3K
- ⑰ 4K7 ⑱ 5K1 ⑲ 6K8 ⑳ 10K ㉑ 22K
- ㉒ 30K ㉓ 33K ㉔ 47K ㉕ 51K ㉖ 100K
- ㉗ 220K ㉘ 300K ㉙ 470K ㉚ 510K ㉛ 680K ㉜ 1M

### MFR1/2WK



Metal film 1/2W Resistor kit, 1~1M ohm, tol:1%  
32 values, 5pc/value. RoHS  
Total 160pcs

- ① 1 ② 10 ③ 15 ④ 22 ⑤ 30 ⑥ 39
- ⑦ 47 ⑧ 51 ⑨ 100 ⑩ 150 ⑪ 220
- ⑫ 300 ⑬ 330 ⑭ 470 ⑮ 510 ⑯ 1K
- ⑰ 2K ⑱ 2K2 ⑲ 3K ⑳ 3K3 ㉑ 4K7
- ㉒ 5K1 ㉓ 10K ㉔ 22K ㉕ 30K ㉖ 33K
- ㉗ 47K ㉘ 51K ㉙ 100K ㉚ 220K ㉛ 470K ㉜ 1M

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