

SINLOON®

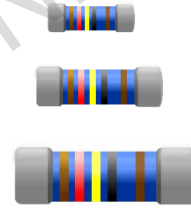
金屬膜晶圓電阻
Tolerance: $\pm 1\% \sim \pm 5\%$

MELF - MMF Series
Metal Film MELF Resistor

FEATURES

- ◆ SMD enabled structure
- ◆ Excellent Solderability Termination
- ◆ Tolerance precision: $\pm 1\%$, $\pm 5\%$.
- ◆ Advanced Metal Film technology.
- ◆ Lead (Pb)-free and RoHS compliant .
- ◆ Pure Sn termination on Ni barrier layer.
- ◆ Conformal Multi-layer Coating Humidity
- ◆ Force fitted steel caps, tin plated on nickel barrier.
- ◆ Tolerance $\pm 5\%$ is 3-band coded, $\pm 1\%$ and under is 4-band codes
- ◆ Compatible with lead (Pb)-free and lead containing soldering processes.

Figure

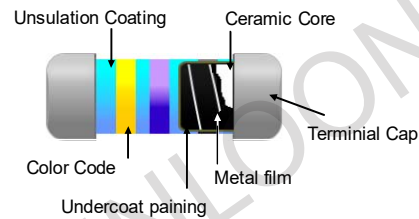


APPLICATIONS

MMF Resistor are widely applied in high fidelity stereo Electronic calculators, Computers, Testing instruments, Meters, Auto controlled equipment, Military devices and Aerospace equipment.

(MMF金屬膜晶圓電阻器採用陶瓷棒經過特殊處理的金屬膜塗層，其瓷棒的兩端鍍有貴重金屬，以確保低噪音，低溫差。)

STRUCTURE DIAGRAM



ORDERING INFORMATION

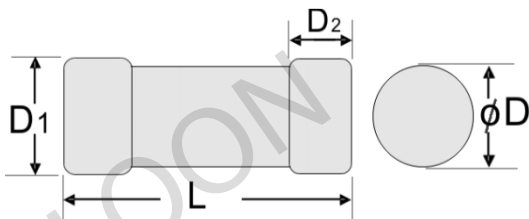
Example: V-MMF07D10R0FTR (1/4W 10R Tol. $\pm 1\%$ TCR ± 50 ppm Tape Reel)

Power 功率	Size 型號	Type 型號	T.C.R (ppm/°C)	Resistance (電阻值)		Tolerance 誤差值	Package 包裝	Quantity
				E96	E24			Tape Reel
1/8WS	0102	W-MMF02	N= ± 15 ppm	1R = 1R00	1R = 1R0	F= $\pm 1\%$	TR = T/Reel	5K Pcs
1/8W	0204	W-MMF04	C= ± 25 ppm	10R=10R0	10R=100	J= $\pm 5\%$	B = Bulk	3K Pcs
1/4WS	0204	V-MMF04	D= ± 50 ppm	100R=100R	100R=101	K= $\pm 10\%$		3K Pcs
1/4W	0207	V-MMF07	E= ± 100 ppm	1K = 1001	100R=102			2K pcs
1/2WS	0207	U-MMF07		10K = 1002	10K = 103			2K pcs
1WS	0207	S-MMF07		100K=1003	100K=104			2K pcs
1WS	0309	S-MMF09		1M=1-004	1M=105			2.5K pcs
2WS	0411	Q-MMF11		10M=1005	10M=106			2K Pcs
3WS	0515	N-MMF15		100M=1006	100M=107			1.5K Pcs

DIMENSION

Unit: mm

Power	Size	Type	L	ΦD	D ₁	D ₂
1/8WS	0102	S-MMF02	2.0 \pm 0.1	1.3 \pm 0.1	1.4 \pm 0.05	0.55 \pm 0.1
1/8W	0204	W-MMF04	3.5 \pm 0.2	1.45 \pm 0.1	1.6 \pm 0.2	0.70 \pm 0.1
1/4WS	0204	V-MMF04S	3.5 \pm 0.2	1.45 \pm 0.1	1.6 \pm 0.2	0.70 \pm 0.1
1/4W	0207	V-MMF07	5.7 \pm 0.2	2.2 \pm 0.1	2.4 \pm 0.3	0.80 \pm 0.2
1/2WS	0207	U-MMF07S	5.7 \pm 0.2	2.2 \pm 0.1	2.4 \pm 0.3	0.80 \pm 0.2
1WS	0207	S-MMF07S	5.7 \pm 0.2	2.2 \pm 0.1	2.4 \pm 0.3	0.80 \pm 0.2
1WS	0309	S-MMF09S	8.5 \pm 0.3	3.0 \pm 0.3	3.3 \pm 0.3	1.70 \pm 0.2
2WS	0411	Q-MMF11S	10.5 \pm 0.3	4.0 \pm 0.3	4.3 \pm 0.2	2.30 \pm 0.2
3WS	0515	N-MMF15S	14.5 \pm 0.3	4.5 \pm 0.3	4.8 \pm 0.2	2.30 \pm 0.2



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Tolerance: ±1% ~ ±5%

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Metal Film MELF Resistor

RATED SPECIFICATION

Type	Size	Rating Power	Maximum Voltage		Resistance Range (Ω)		T.C.R. (°C)
			Working	Overload	±1%	±5%	
S-MMF02	0102	1/8WS	150V	300V	1R ~ 1M	0.22R~2M	±15ppm
W-MMF04	0204	1/8W	150V	300V	1R ~ 1M	0.22R~2M	±25ppm
V-MMF04	0204	1/4WS	200V	400V	1R ~ 1M	0.5R~2M	±50ppm
V-MMF07	0207	1/4W	200V	400V	1R ~ 5M	0.22R~5M	±100ppm
U-MMF07	0207	1/2WS	300V	600V	1R ~ 5M	0.22R~5M	
S-MMF07	0207	1WS	400V	600V	1R ~ 5M	0.5R~2M	
S-MMF09	0309	1WS	500V	1KV	1R ~ 1M	0.1R~1M	±50ppm
Q-MMF11	0411	2WS	500V	1KV	1R ~ 1M	0.1R~1M	±100ppm
N-MMF15	0515	3WS	500V	1KV	1R ~ 1M	0.1R~1M	

Rated continuous Working Voltage (RCWV) = $\sqrt{\text{POWER RATING} \cdot \text{RESISTANCE VALUE}}$

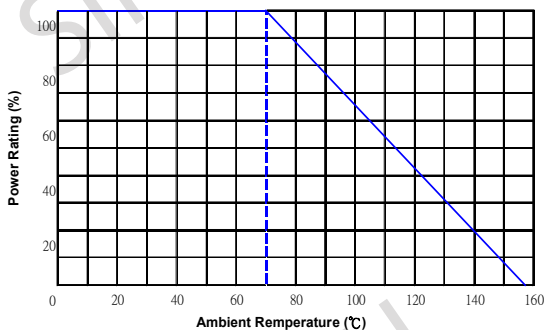
CHARACTERISTICS

Items	Test Method	Characteristics
Operating tem.Range		-55°C ~ +155°C
Temperature Coefficient	JIS-C5202 5.2	±100ppm/°C ; ±50ppm/°C ; ±25ppm/°C ; ±15ppm/°C .
Short Time Overload	Rating voltage*2.5 or Max.overload voltage for 5 sec Whichever less	±(0.5%+0.05Ω)
Pulse Overload	Rating voltage*3 or Max.overload voltage for 10,000 cycle (1 sec [ON], 25 sec [OFF]) Whichever Less	±(0.5%+0.05Ω)
Temperature Cycling	-55°C (30min.) / +85°C (30min.) for 5 cycle	±(0.5%+0.05Ω)
Load Life Humidity	40°C±2°C, 90%~95% RH. 1000h, 1.5h [ON] 0.5h [OFF] cycle.	±(1%+0.05Ω)
Load Life	70°C±2°C, 1000h, 1.5h [ON] 0.5h [OFF] cycle.	±(1%+0.05Ω)
Resistance to Soldering Heat	260°C±5°C, 5sec±1sec.	±(0.5%+0.05Ω)
Solderability	235°C±5°C, 2sec±0.5sec.	90% Coverage / Min.
Bending test	Holding point width 90mm, Bending 5mm.	±(0.5%+0.05Ω)
Non-Combustibility	The resistor shall withstand overload test in accordance with article UL-94, V-0 without producing a fire hazard.	
Operating Temperature Range:		-55°C ~ +155°C

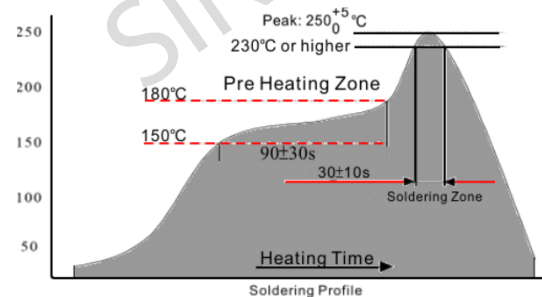
* Rated power is maximum power which can continuously loaded at specified ambient temperature 70 °C, however when the ambient temperature exceeds 70 °C, rated power should be determined from the derating curve of below.

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POWER DERATING CURVE



IR Reflow




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Tolerance: $\pm 1\% \sim \pm 5\%$

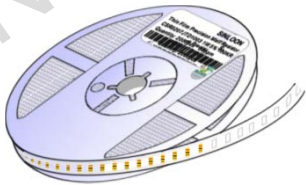
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Metal Film MELF Resistor

PACKAGE SPECIFICATION

Part Number Type	Rated Power	Package Quantity (ea)			SINLOON®	
		Tape Reel	Inner Box	Carton		
S-MMF02	1/8WS	Φ178mm	5000 pcs	50K Pcs	300K Pcs	 <p>品質承諾標誌 QUALITY COMMITMENT</p>
W-MMF04	1/8W		3000 pcs	30K Pcs	180K Pcs	
V-MMF04	1/4WS		3000 pcs	30K Pcs	180K Pcs	
V-MMF07	1/4W		2000 pcs	20K Pcs	120K Pcs	
U-MMF07	1/2WS		2000 pcs	20K Pcs	120K Pcs	
S-MMF07	1WS		2000 pcs	20K Pcs	120K Pcs	
S-MMF09	1WS	Φ330mm	2500 pcs	5K Pcs	25K Pcs	
Q-MMF11	2WS		2000 pcs	4K Pcs	20K Pcs	
N-MMF15	3WS		1500 pcs	3K Pcs	15K Pcs	

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Φ178mm Tape Reel



Inner Box



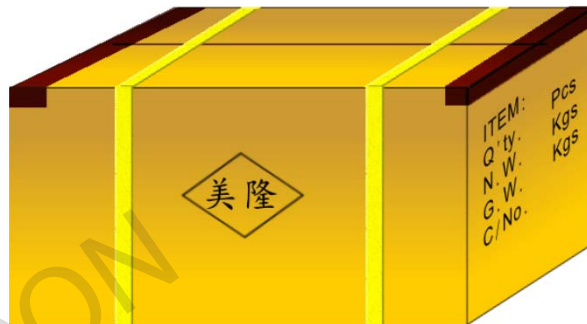
Φ330mm Tape Reel



Figure



Carton Package



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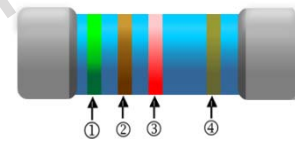
Tolerance: ±1% ~ ±5%

MELF - MMF Series
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Standard Resistor Color Code E24 Series (4 band code)

Color	1st digit	2nd digit	3rd Multiplier	4 Tolerance
Black	0	0	$\times 10^0$	
Brown	1	1	$\times 10^1$	±1% (F)
Red	2	2	$\times 10^2$	±2% (G)
Orange	3	3	$\times 10^3$	
Yellow	4	4	$\times 10^4$	
Green	5	5	$\times 10^5$	±0.5% (D)
Blue	6	6	$\times 10^6$	±0.25%(C)
Violet	7	7	$\times 10^7$	±0.1% (B)
Gray	8	8	$\times 10^8$	±0.05% (A)
White	9	9	$\times 10^9$	
Gold			$\times 0.1$	±5% (J)
Silver			$\times 0.01$	±10% (K)
None				±20% (M)

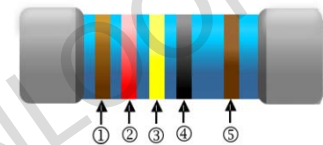
Example : Value : 5.1K Ω ±5%



Standard Resistor Color Code E96 Series (5 band code)

Color	1st digit	2nd digit	3rd digit	4 Multiplier	5 Tolerance
Black	0	0	0	$\times 10^0$	
Brown	1	1	1	$\times 10^1$	±1% (F)
Red	2	2	2	$\times 10^2$	±2% (G)
Orange	3	3	3	$\times 10^3$	
Yellow	4	4	4	$\times 10^4$	
Green	5	5	5	$\times 10^5$	±0.5% (D)
Blue	6	6	6	$\times 10^6$	±0.25%(C)
Violet	7	7	7	$\times 10^7$	±0.1% (B)
Gray	8	8	8	$\times 10^8$	±0.05% (A)
White	9	9	9	$\times 10^9$	
Gold				$\times 0.1$	±5% (J)
Silver				$\times 0.01$	±10% (K)
None					±20% (M)

Example : Value : 12.4Ω ±1%



STANDARD RESISTANCE VALUE IN A DECADE
For Resistance According to IEC Publication 63

E24	E96			
10	100	178	316	562
11	102	182	324	576
12	105	187	332	590
13	107	191	340	604
15	110	196	348	619
16	113	200	357	634
18	115	205	365	649
20	118	210	374	665
22	121	215	383	681
24	124	221	392	698
27	127	226	402	715
30	130	232	412	732
33	133	237	422	750
36	137	243	432	768
39	140	249	442	787
43	143	255	453	806
47	147	261	464	825
51	150	267	475	845
56	154	274	487	866
62	158	280	499	887
68	162	287	511	909
75	165	294	523	931
82	169	301	536	953
91	174	309	549	976

Example :

E24 Series:	10
Resistance:	0.1R; 1R0; 10R; 100R; 1K; 10K; 100K; 1M; 100M.
E26 Series:	102
Resistance:	0.102R; 1.02R; 10.2R; 102R; 1K02; 10K2; 102K; 1M02; 10M2; 102M.

ORDERING RESISTANCE CODE

E96 (±1%)		E24 (±5%)	
Resistance (Ω) Code		Resistance (Ω) Code	
m5=R0005Ω	1K = 1001	m5=R0005Ω	1K=102
5m=R005Ω	10K = 1002	5m=R005Ω	10K = 103
50m=R05Ω	100K=1003	50m=R05Ω	100K=104
100m=R1Ω	1M=1-004	100m=R1Ω	1M=105
1000m=1Ω	10M=1005	1000m=1Ω	10M=106
1R = 1R00	100M=1006	1R = 1R0	100M=107
10R=10R0	1G = 1007	10R=100	1G=108
100R=100R	10G = 1008	100R=101	10G=109

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※Mayloon characteristic parameters of electronic product specification changes or updates without notice to improve.