

SINLOON®

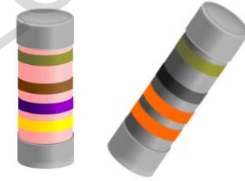
金屬氧化膜晶圓電阻
Power Range: 1/4W~3WS

MELF - MMO Series
Metal Oxide MELF Resistor

FEATURES

- ◆ SMD enabled structure
- ◆ Excellent Solderability Termination
- ◆ Lead (Pb)-free and RoHS compliant .
- ◆ Pure Sn termination on Ni barrier layer.
- ◆ Compatible with lead (Pb)-free and lead containing soldering processes.
- ◆ Metal glaze resistor elements provide high stable performance against environmental conditions and overload.

Figure



INTRODUCTION

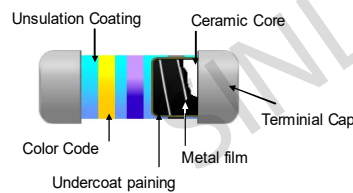
MMO For Metal Oxide Resistor to show long-term stability under high temperature, the unit area of resistance film must withstand larger loads, The small-sized high-performance metal oxide film Resistor are made of high-quality ceramic core with size greatly reduced in comparison with RS, while having the same performance of large-sized Resistor.

(MMO 對於電阻長期穩定的高溫下,電阻薄膜的面積必須承受更大的負荷,小型高性能金屬氧化物薄膜電阻器是由高品質陶瓷棒大大降低了與RS的比較,而它具有相同大型電阻相同的性能。)

APPLICATIONS

- ◆ Military
- ◆ Automotive
- ◆ Telecommunication
- ◆ Medical equipment.
- ◆ Avionics
- ◆ Space

STRUCTURE DIAGRAM



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ORDERING INFORMATION

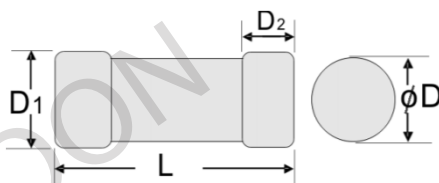
Example: V-MMO07101JTR (1/4W 100R Tol. ±5% Tape Reel)

Power 功率	Size 型號	Type 型號	Resistance E24	Tolerance 誤差值	Package 包裝	Package Quantity	
						Bulk/Plastic	Tape Reel
1/4W	0207	V-MMO07	0R5=0R5	G= ±2% J= ±5% K= ±10%	TR=Reel B = Bulk		2000 pcs
1/2WS	0207	U-MMO07	1R0=1R0			2000 pcs	
1/2W	0309	U-MMO07	10R=100			2500 pcs	
1WS	0309	S-MMO07	100R=101			2500 pcs	
1W	0411	S-MMO11	100R=102			2000 pcs	2000 pcs
2WS	0411	Q-MMO11	10K = 103			1000 pcs	2000 pcs
3WS	0515	N-MMO15	100K=104			500 pcs	1500 pcs

DIMENSION

Unit: mm

Power	Size	Type	L	ΦD	D ₁	D ₂
1/4W	0207	V-MMO07	5.7±0.2	2.2±0.1	2.4±0.3	0.80±0.2
1/2WS	0207	U-MMO07	5.7±0.2	2.2±0.1	2.4±0.3	0.80±0.2
1/2W	0309	U-MMO07	8.5±0.3	3.0±0.3	3.3±0.3	1.70±0.2
1WS	0309	S-MMO07	8.5±0.3	3.0±0.3	3.3±0.3	1.70±0.2
1W	0411	S-MMO11	10.5±0.3	4.0±0.3	4.3±0.2	2.30±0.2
2WS	0411	Q-MMO11	10.5±0.3	4.0±0.3	4.3±0.2	2.30±0.2
3WS	0515	N-MMO15	14.5±0.3	4.5±0.3	4.8±0.2	2.30±0.2



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☐ RATED SPECIFICATION

Type 型號	Size 尺寸	Power 功率	Maximun Voltage		Resistance (E24)Range (Ω)	
			Working	Overload	±2%	±5%
V-MMO07	0207	1/4W	250V	500V	0.5R~56K	0.5R~56K
U-MMO07	0207	1/2WS	300V	500V	0.5R~56K	0.5R~56K
U-MMO07	0309	1/2W	350V	600V	0.5R~82K	0.5R~82K
S-MMO07	0309	1WS	350V	600V	0.5R~82K	0.5R~82K
S-MMO11	0411	1W	400V	700V	0.5R~100K	0.5R~100K
Q-MMO11	0411	2WS	400V	700V	0.5R~100K	0.5R~100K
N-MMO15	0515	3WS	400V	800V	0.5R~120K	0.5R~120K



Coating : Grey Color
Marking: Color 3 Bands
E24 Code: See Page 4

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

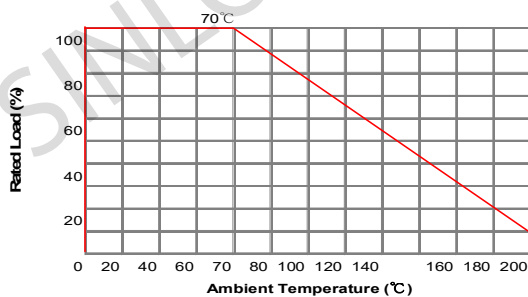
☐ CHARACTERISTICS

Items	Test Method	Characteristics
Temperature Coefficient	JIS-C-5202.2	±350ppm/°C
Short Time Overload	Rating voltage*2.5 or Max.overload voltage for 5 sec Whichever less	±1%
Pulse Overload	Rating voltage*4 or Max.overload voltage for 10,000 cycle (1 sec [ON], 25 sec [OFF]) Whichever Less	±2%
Temperature Cycling	-55°C (30min.) / +85°C (30min.) for 5 cycle	±5%
Load Life Humidity	40°C±2°C, 90%~95% RH. 1000h, 1.5h [ON] 0.5h [OFF] cycle.	±5%
Load Life Humidity	70°C±2°C, 1000h, 1.5h [ON] 0.5h [OFF] cycle.	±5%
Resistance to Soldering Heat	260°C±5°C, 5sec±1sec.	±2%
Solderability	235°C±5°C, 2sec±0.5sec.	90% Coverage / Min.
Bending test	Holding point width 90mm, Bending 5mm 1 time	±1%
High Temp. exposure	155°C±5°C, 2 hours	±2%
Non-Combustibility	The resistor shall withstand overload test in accordance with article UL-94, V-0 without producing a fire hazard.	
Operating Temperature Range:	-40°C ~ +200°C	

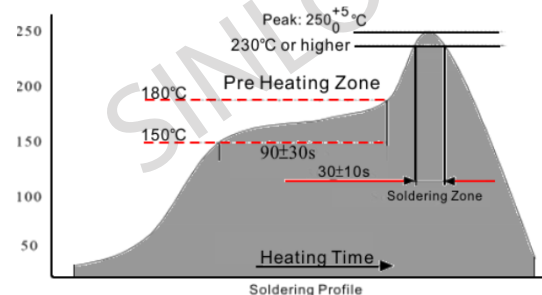
* Rated power is maximum power which can continuously loaded at specified ambient temerrmined 70 °C, however when the ambient temperture exveeds 70 °C, rated power should be determined from the derating curve of below.

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☐ POWER DERATING CURVE



☐ IR Reflow




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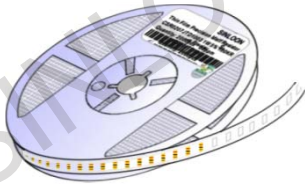
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□ PACKAGE SPECIFICATION

Part Number Type	Size	Rated Power	Quantity (ea)			SINLOON®	
			Tape Reel	Inner Box	Carton		
V-MMO07	0207	1/4W	178mm	2000 pcs	20K Pcs	120K Pcs	
U-MMO07	0207	1/2WS	178mm	2000 pcs	20K Pcs	120K Pcs	
U-MMO07	0309	1/2W	178mm	2500 pcs	20K Pcs	120K Pcs	
S-MMO07	0309	1WS	178mm	2500 pcs	5K Pcs	25K pcs	
S-MMO11	0411	1W	330mm	2000 pcs	4K Pcs	20K Pcs	
Q-MMO11	0411	2WS	330mm	2000 pcs	4K Pcs	20K Pcs	
N-MMO15	0515	3WS	330mm	1500 pcs	3K Pcs	15K Pcs	

Φ178mm Tape Reel



Inner Box



Φ330mm Tape Reel

Figure



Carton Package



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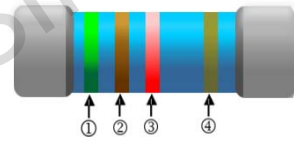
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□ Standard Resistor Color Code E24 Series (4 band code)

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)

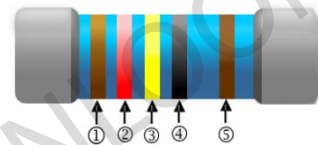
Example : Value : 5.1K Ω ±5%



□ 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%



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

E24	E96				Example :			
10	100	178	316	562	E24 Series: 10			
11	102	182	324	576	Resistance: 0.1R; 1R0; 10R; 100R;			
12	105	187	332	590	1K; 10K; 100K; 1M; 100M.			
13	107	191	340	604	E26 Series: 102			
15	110	196	348	619	Resistance: 0.102R; 1.02R; 10.2R;			
16	113	200	357	634	102R; 1K02; 10K2;			
18	115	205	365	649	102K; 1M02; 10M2;			
20	118	210	374	665	102M.			
22	121	215	383	681	□ ORDERING RESISTANCE CODE			
24	124	221	392	698	E96 (±1%) E24 (±5%)			
27	127	226	402	715	Resistance (Ω) Code Resistance (Ω) Code			
30	130	232	412	732	m5=R0005Ω	1K = 1001	m5=R0005Ω	1K=102
33	133	237	422	750	5m=R005Ω	10K = 1002	5m=R005Ω	10K = 103
36	137	243	432	768	50m=R05Ω	100K=1003	50m=R05Ω	100K=104
39	140	249	442	787	100m=R1Ω	1M=1-004	100m=R1Ω	1M=105
43	143	255	453	806	1000m=1Ω	10M=1005	1000m=1Ω	10M=106
47	147	261	464	825	1R = 1R00	100M=1006	1R = 1R0	100M=107
51	150	267	475	845	10R=10R0	1G = 1007	10R=100	1G=108
56	154	274	487	866	100R=100R	10G = 1008	100R=101	10G=109
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				

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