

PRODUCT SPECIFICATION

规格书

Customer (客户名称):

Customer P/N (客户料号):

Aillen P/N(爱伦料号):

CATEGORY(品名):

DESCRIPTION(描述):

Spec No.(承认书编号):

Date(发行日期):

AILLEN	
PREPARED (拟定)	CHECKED (审核)

CUSTOMER	
Please sign a copy after accepting	
APPROVAL (批准)	SIGNATURE (签名)

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ALTERNATION HISTORY RECORDS变更记录

Date	Version	Mark	Page	Description	Drafter	Approver
2025-12-24	B	/	/	Reissue with a new version	Doris Chang	/

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1.Features:

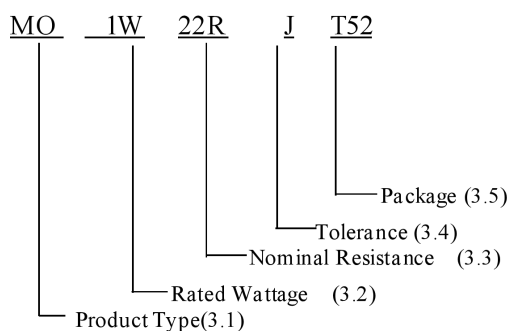
Excellent flame retardant coating
Overload capability
Good performance in moisture resistance, anti-oxidization,
Good thermal stability

2.Applicable Scope:

This standard specification is for use in consumer electronics, computers, telecommunications, control instruments...etc.

3. Part Number System:

According the Resistors type, To mark the Rated power, Tolerance, Resistance value,and forming type.



3.1 Product Type

Code	MO
Product Type	Metal Oxide Film Resistors

3.2 Rated Wattage code

Code	1W	2W	3W	5W
Wattage (W)	Rated Power:1W	Rated Power:2W	Rated Power:3W	Rated Power:5W

3.3 Nominal Resistance

Code	22R	10K	100K
Resistance	22Ω	10KΩ	100KΩ

Remark:Ω is its unit which be in accordance with JIS-C6409 article 6 (EIARS-196A) series.

3.4 Resistance tolerance

Code	F	G	J
Tolerance Range	±1%	±2%	±5%

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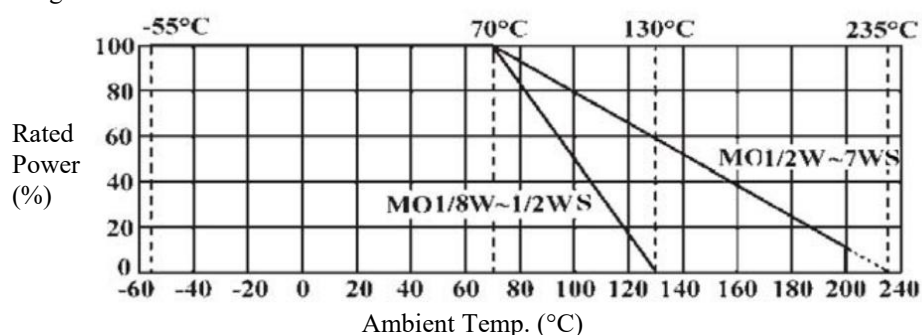
3.5 Package

Code	T/B	T/R	T52	R52	Nil
Inner Code	Standard Tape in box	Standard Tape in reel	52 mm width special tape in box	52 mm width special tape in reel	Bulk

Remark: MO Series Resistors are RoHS Compliant.

4. Rated Power:

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



4.1 Rated Voltage:

It is calculated through the following formula:

$$E = \sqrt{P \times R}$$

where E: rated voltage (V)

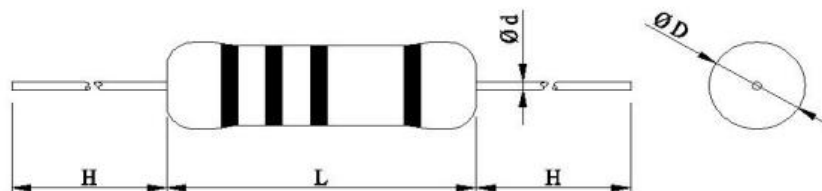
P: rated power (W)

R: total nominal resistance (Ω)

However, in case the voltage calculated exceeds the maximum load voltage, such the maximum load voltage shall be regarded as its rated voltage, means whichever less.

5. Dimension & Structure:

5.1 Dimension:



Unit: mm

Type	L±1	D±1	H±1	d±0.06	Resistance range(Ω)	Tolerance (%)	Max continuous working voltage(V)	Max overload voltage (V)	Insulation resistance Voltage (V)
1/8W 1/4S	3.5*	1.7*	27	0.45	0Ω& 0.1~10M	F: ±1 G: ±2 J: ±5	200	400	300
1/4W 1/2WS	6.5*	2.4*	27	0.50	0Ω& 0.1~10M		250	400	350
1/2W 1WS	9.2	3.3	26	0.60	0Ω& 0.1~10M		250	500	350
1W 2WS	11	4.5	28	0.70	0.1~1M		350	700	500
2W 3WS	15	5.0	32	0.78	0.1~1M		350	700	500
3W 5WS	18	6.0	33	0.78	0.1~1M		500	1000	700
5W 6W 7WS	25	8.0	35	0.78	0.1~1M		750	1000	750

Remark:

- ① “*” means “±0.5”.
- ② Special requirements such as color code resistance to solvent cleaning must be specified when placing an order; products can be manufactured according to customer requirements.
- ③ For vertical mounting, the length of the paint at the lead root shall be ≤ 1.5 mm. This parameter does not apply to horizontal mounting products.
- ④ For rated voltage specifications, please refer to Clause 4.1 of this specification.

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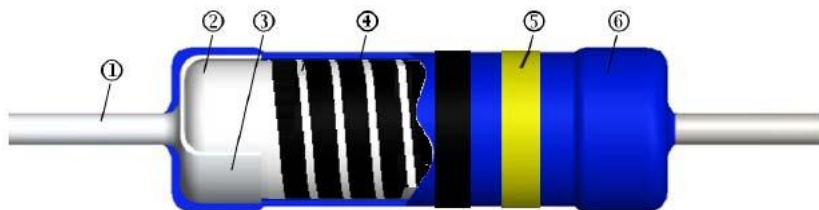
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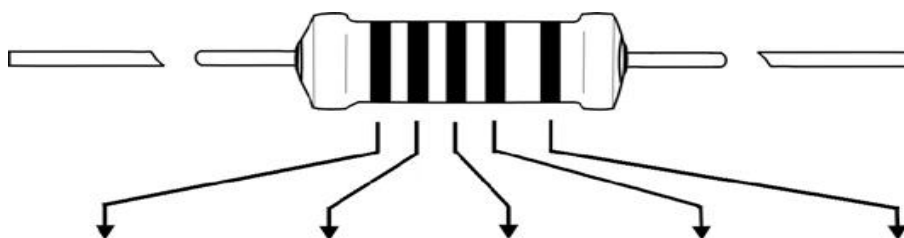
5.2 Structure:

5.2.1 Structural diagram:



- ① Tinned copper lead wire
- ② High heat exchanged ceramic base
- ③ Tin-plated steel caps
- ④ High stability Electric conduction film
- ⑤ Color ring Mark
- ⑥ Silicon resin coating

5.2.2 Explanation of color:



Color	1ND band	2ND band	3NDband	Multiple	Tolerane%
Black	0	0	0	10^0	
Brawn	1	1	1	10^1	F($\pm 1\%$)
Red	2	2	2	10^2	G($\pm 2\%$)
Orange	3	3	3	10^3	
Yellow	4	4	4	10^4	
Green	5	5	5	10^5	
Blue	6	6	6	10^6	
Violet	7	7	7	10^7	
Gray	8	8	8	10^8	
White	9	9	9	10^9	
Gold				10^{-1}	J($\pm 5\%$)
Silver				10^{-2}	

Remark: 0Ω mark with one Black color.

6. Operating Temperature Range:

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1/8W~1/2WS: -55℃ ~ +130℃

1/2W~7WS : -55℃ ~ +235℃

7.Storage Conditions:

The resistors with appropriate package would have a preservative duration of 1 year, under the following conditions.

T=5℃ ~ 35℃

H=40% ~ 75%

8.Test And Requirements:

Applicable specification 《JIS C5201-2011》 and 《GB/T 5729-2003/IEC 60115-1:2001》

Applicable Specification: "IEC 60115-1" and "GB/T 3729-2005/IEC 60115-1:2001"

Test	Test Method	Condition	Criteria															
Resistance Temperature Coefficient:	IEC 60115-1 4.8	T.C (PPM/°C) = ((R2－R1) ÷R1) × (1÷(T2－T1)) ×10 ⁶ where R1: resistance value at reference temperature R2: resistance value at test temp. T1: reference temp. (usu. 25°C) T2: test temp. (about 100°C)	<table><tr><th>Resistance range(Ω)</th><th>T.C.R (PPM/°C)</th></tr><tr><td>≤100k</td><td>±350</td></tr><tr><td>>100k</td><td>±500</td></tr></table>	Resistance range(Ω)	T.C.R (PPM/°C)	≤100k	±350	>100k	±500									
Resistance range(Ω)	T.C.R (PPM/°C)																	
≤100k	±350																	
>100k	±500																	
Temperature Cycle	IEC 60115-1 4.19	Following temp. cycles are to be made 5 times and then put at room temp. for one hour <table><tr><th>Steps</th><th>Temperature (°C)</th><th>Time (minutes)</th></tr><tr><td>1st step</td><td>-25 ± 3</td><td>30</td></tr><tr><td>2nd step</td><td>Room temp.</td><td>10~15</td></tr><tr><td>3rd step</td><td>85 ± 2</td><td>30</td></tr><tr><td>4th step</td><td>Room temp.</td><td>10~15</td></tr></table>	Steps	Temperature (°C)	Time (minutes)	1 st step	-25 ± 3	30	2 nd step	Room temp.	10~15	3 rd step	85 ± 2	30	4 th step	Room temp.	10~15	Resistance change rate ± (1%R+0.05 Ω) Max With no evidence of mechanical damage.
Steps	Temperature (°C)	Time (minutes)																
1 st step	-25 ± 3	30																
2 nd step	Room temp.	10~15																
3 rd step	85 ± 2	30																
4 th step	Room temp.	10~15																
Electric Withstanding Voltage	IEC 60115-1 4.7	Resistance shall be clamped in the trough of a 90 metallic v-block and shall be test at specified in the above list for 60 seconds.	Resistance change ±(0.5%R±0.05Ω).No evidence of flashover mechanical damage, Arcing or insulation breakdown.															
Short Time Over Load	IEC 60115-14.13	2.5 times the rated voltage or maximum overload voltage (whichever is less), testing 5 seconds	±(0.5%R+0.05Ω)															

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Test	Test Method	Condition	Criteria
Insulation Character	IEC 60115-1 4.6	Resistors are located in a V-shaped metal trough. Using the DC 100V or 500V megger instrument 2 poles to clutch either side of lead wires and metal trough,	1000MΩ or more
Resistance to Soldering Heat	IEC 60115-1 4.18	Two leads are together dipped in a melted solder of 270±5°C for 10±1 seconds, or 350±10°C for 3.5 ±0.5 seconds, Then remove the resistors and leaving them at room temp. for one hour.	Resistance change is ±(1%R+0.05Ω).Max. With no evidence of mechanical damage.
Solder-ability	IEC 60115-1 4.17	Test temperatures of solder 260±5°C Dwell time in solder: 3±0.5 sec	more than 95% of the circumference of the lead wires shall be covered with solder.
Load Life	IEC 60115-14.25	Resistance change after 1000hrs operating at rated voltage or Max continuous working voltage (Whichever is the less.)with duty cycle of 1.5hrs ON 0.5hrs OFF at 70°C±2°C .	Resistance change rate ±(5%R+0.05Ω) Max With no evidence of mechanical damage.
Join intensity	/	Bending strength load 90° reciprocation twice	No terminal wire loosening and breakage shall occur.

7. Glossary:

7.1 Rated resistance: Designed resistance value usually indicated on the resistor;

7.2 Rated Ambient Temperature: Maximum ambient temperature at which the power rating may be applied continuously. The rated ambient temperature refers to the temperature around the resistor mounted inside the equipment, not to the air temperature outside the equipment;

7.3 Rated power: At 70 °C ambient temperature durability test, and the change in resistance does not exceed the value of the test allows the maximum power allowed;

7.4 Critical Resistance: The maximum nominal resistance value at which the rated power can be applied without exceeding the maximum working voltage. The rated voltage is equal to the max. working voltage at the critical resistance value;

7.5 Maximum Working Voltage: Maximum D.C. or A.C. voltage(rms) that can be continuously applied to the terminations of a resistor. However, the maximum value of the applicable voltage is the rated voltage at the critical resistance value or lower;

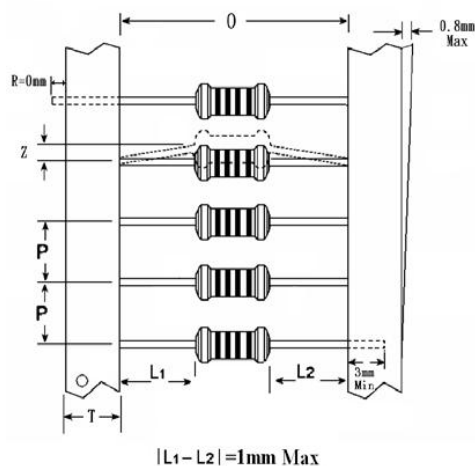
7.6 Allowable voltage: which is applied in 5 sec. under short time overload test. Overload voltage shall be 2.5

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times of rated voltage or max. overload voltage, whichever is lower.

8. Package:

8.1 Taping Specifications:

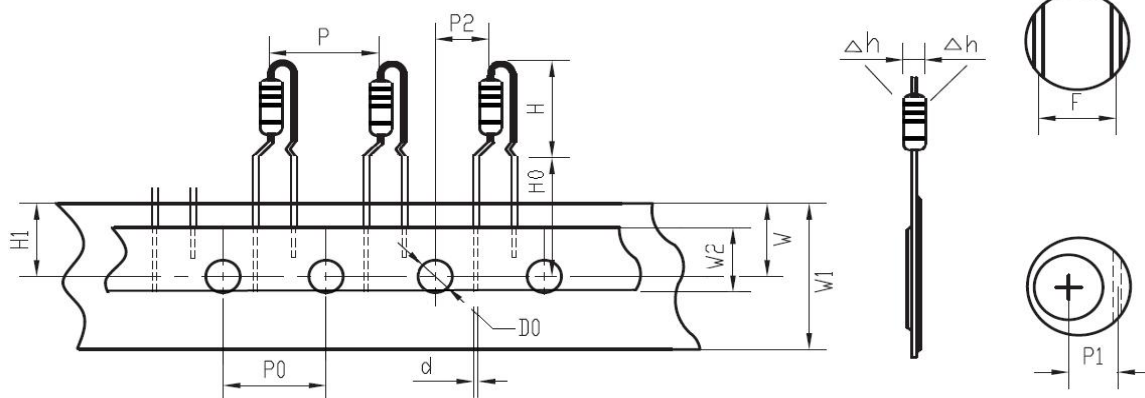


Unit: mm

Type	Size Package	O	L1-L2	P	T	Z	Minimum number of packages
1/8W 1/4WS	T-52	52±1	1max	5±0.2	5±1	1max	5000pcs
1/4W 1/2WS	T-52	52±1	1max	5±0.2	5±1	1max	5000pcs
1/2W 1WS	T-52	52±1	1max	5±0.2	5±1	1max	2000pcs
1W 2WS	T-52	52±1	1max	5±0.2	5±1	1max	1000pcs
1W 2WS	T-63	63±3	1max	5±0.5	5±1	2max	1000pcs
1W 2WS	T-73	73±5	1max	5±0.5	5±1	2max	1000pcs
2W 3WS	T-73	73±5	1max	5±0.5 10±0.5	5±1	2max	1000pcs 500pcs
3W 5WS	T-73	73±5	1max	10±0.5	5±1	2max	500pcs
5W 6W 7WS	T-83	83±5	1max	10±0.5	5±1	2max	250pcs

8.2 FT - Avisertv Type

8.2.1 Straight-leg outward-bent double KIN type



Unit: mm

FT-Size Type	H±1	d ±0.6	P±1	P0 ±0.3	P1 ±0.7	P2 ±1.3	F±1	Δh	W ±0.5	W1 ±1	W2	H0	D0 ±0.3
1/4W 1/2WS	11.5	0.50	12.7	12.7	3.85	6.35	5	0±1	9	18	10 Min	7Min	4
1/2W 1WS	15.5	0.60	12.7	12.7	3.85	6.35	5	0±1	9	18	10 Min	7Min	4
1W 2WS	17.5	0.70	12.7	12.7	3.85	6.35	5	0±2	9	18	10 Min	7Min	4
2W 3WS	21.5	0.78	12.7	12.7	3.85	6.35	5	0±2	9	18	10 Min	7Min	4

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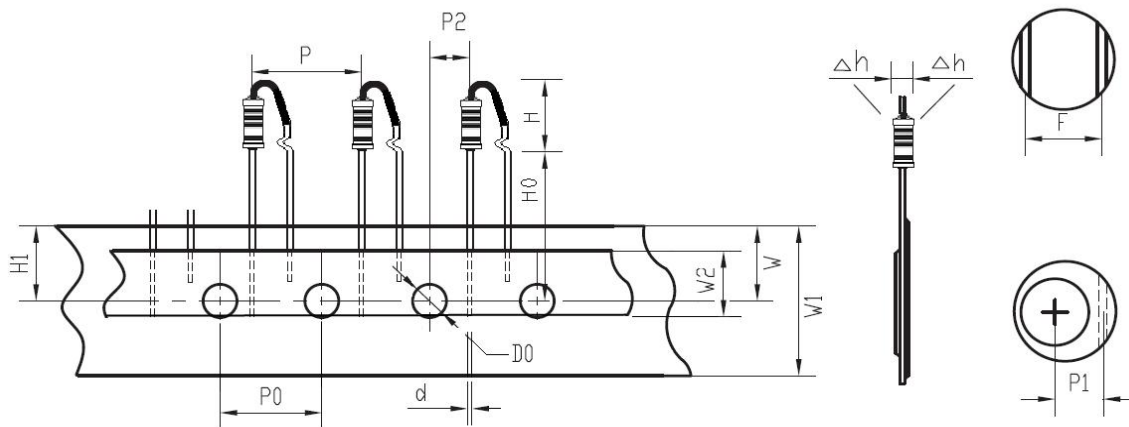
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8.2.2 Bend your feet and press the KIN shape:

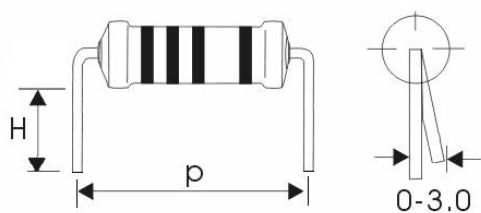


Unit: mm

FT-Size Type	H±1	d ±0.06	P±1	P0 ±0.3	P1 ±0.7	P2 ±1.3	F±1	Δh	W ±0.5	W1 ±1	W2 Min	H0	D0 ±0.3
1/4W 1/2WS	9	0.50	12.7	12.7	3.85	6.35	5	0±1	9	18	10	7Min	4
1/2W 1WS	11.5	0.60	12.7	12.7	3.85	6.35	5	0±1	9	18	10	7Min	4
1W 2WS	14	0.70	12.7	12.7	3.85	6.35	5	0±2	9	18	10	7Min	4
2W 3WS	18	0.78	12.7	12.7	3.85	6.35	5	0±2	9	18	10	7Min	4

8.2 M-Type

Unit: mm

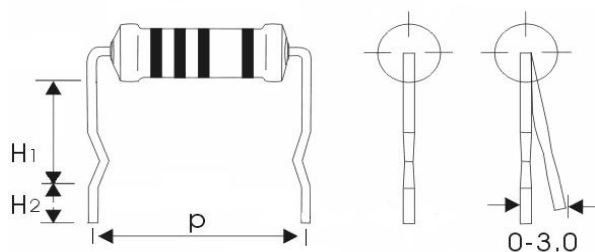


Type	P±1	H±1
1/4W 1/2WS	10	3.2~10
1/2W 1WS	12.5	3.2~10
1W 2WS	15	3.2~10
2W 3WS	20	3.2~10
3W 5WS	25	3.2~10

Remark: "H" can be manufactured according to the customer's required dimensions.

8.3 MK-Type

Unit: mm



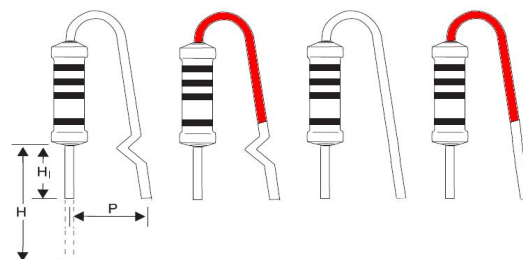
Type	P±1	H1±1	H2±1
1/4W 1/2WS	10	5/8	3.5~6
1/2W 1WS	12.5	5/8	3.5~6
1W 2WS	15	5/8	3.5~6
2W 3WS	20	5/8	3.5~6
3W 5WS	25	5/8	3.5~6

Remark:: The dimension of P can be processed according to the customer's requirements.

Minimum length:

1/4W: 8 mm; 1/2W: 12.5 mm; 1W: 15 mm; 2W: 20 mm; 3W: 23 mm

8.4 F-Type



Unit: mm

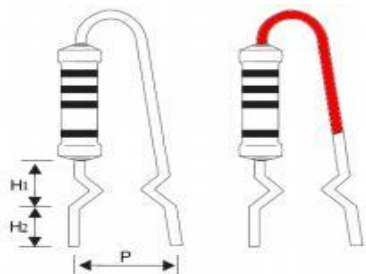
Type	H±3	H1±1	P
1/4W 1/2WS	26max	3.2~10	5~8
1/2W 1WS	24max	3.2~10	5~8
1W 2WS	28max	3.2~10	5~8
2W 3WS	32max	3.2~10	5~10
3W 5WS	32max	3.2~10	6~10

Note : The "H" part can be cut, but its length must not be less than 3.2mm

The size of "P" is used as a reference item.

Copper pins may have significant dimensional errors due to elasticity during processing, as well as bending and deformation caused by packaging, storage, transportation, and usage. In case of any dispute, the test point shall be 3.5±1mm below the main body

8.5 F-Type Hit "KIN" with a straight foot (Single & double KIN)



Type		H1±1	H2±1	P
1/2W	1WS	3.5/6	3.2~10	5~8
1W	2WS	3.5/6	3.2~10	5~8
2W	3WS	3.5/6	3.2~10	5~10
3W	5WS	3.5/6	3.2~10	6~10

Note: The "H" part can be cut, but its length must not be less than 3.2mm
The size of "P" is used as a reference item. Copper pins may have significant dimensional errors due to elasticity during processing, as well as bending and deformation caused by packaging, storage, transportation, and usage. In case of any dispute, the test point shall be 3.5±1mm below the main body