Aillen®
EXPERT IN PASSIVE PARTS

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(型号)**:**
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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ALTERATION HISTORY RECORDS 变更记录

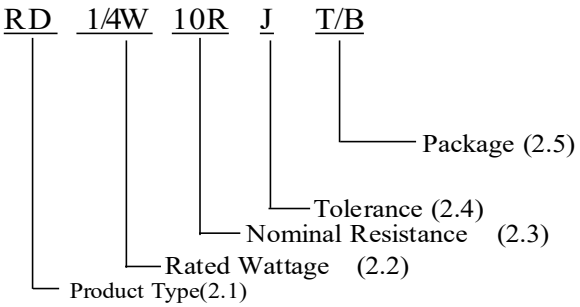
Date	Version	Mark	Page	Description	Drafter	Approver
2025-12-15	B	/	/	Revised edition release	Doris Chang	/

1.Applicable Scope:

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

2.Part Number System:

It is composed by Type, Rated Wattage,Nominal Resistance, Tolerance and Package/Terminal Form. e.g.



2.1 Product Type

Code	RD	RDN
Product Type	Carbon Film Resistors	Flameproof Carbon Film Resistors

2.2 Rated Wattage code

Code	1/8W	1/6W	1/4W	1/2W	1W	2W
Rated Power (W)	1/8W	1/6W	1/4W	1/2W	1W	2W

2.3 Nominal Resistance

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

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

2.4 Resistance tolerance

Code	G	J	K
Tolerance Range	±2%	±5%	±10%

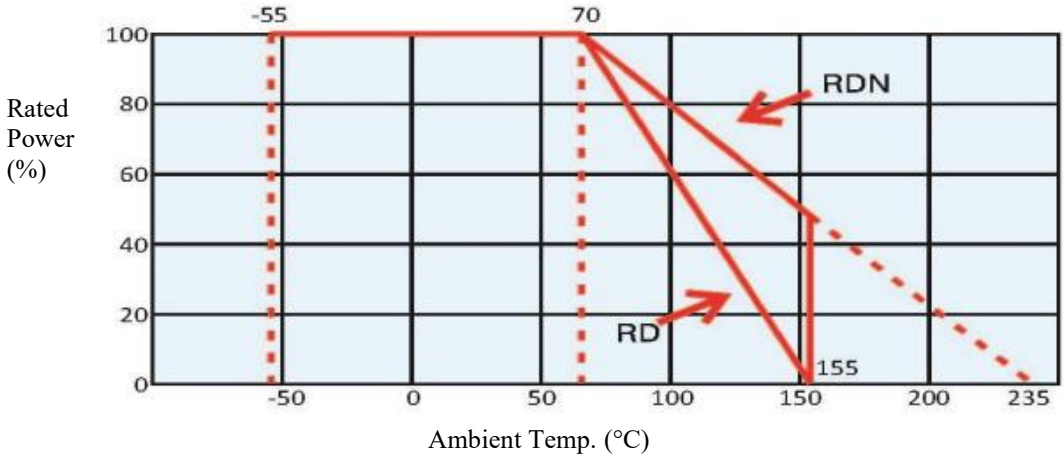
2.5 Package

Code	T/B	NIL	T26	T76
packaging method	Tape in box	Bulk	26 mm width special tape in box	76 mm width special tape in box

Remark: RD Series Resistors are RoHS & Halogen Free Compliant.

3. Rated Power:

Rated power is the value of Max load wattage specified at the ambient temperature of 70℃, and shall meet the functions of electrical and mechanical performance. When the ambient temperature surpasses above mentioned temperature, the value declines as per following DERATING CURVE



3.1 Rated Voltage:

It is calculated through the following formula:

$$E = \sqrt{PxR}$$

Where E: rated voltage (V)

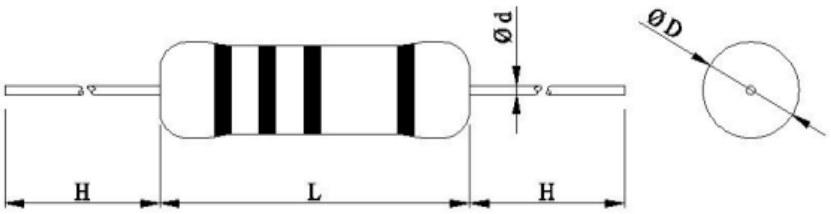
P: rated power (W)

R: total nominal resistance (Ω)

Remark: 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.

4.Dimension and Structure:

4.1 Dimension:



Unit: mm

TYPE	D±1	L±1	H±3	d±0.1	Resistance Range	Max Working Voltage
RD 1/8W,1/6W(1/4WS)	1.7±0.2	3.7max	28	0.45	3.9Ω~4.7MΩ	200V
RD 1/4W(1/2WS)	2.4±0.5	6.4	28	0.6	3.9Ω~10MΩ	250V
RD 1/2W	3.5	9	28	0.65	3.9Ω~10MΩ	350V
RDN 1W	4.5	11	28	0.8	3.9Ω~10MΩ	500V
RDN 2W	5	15	28	0.8	3.9Ω~10MΩ	750V

◎ Notes: 1. too low or too high ohm value can be supplied only case by case.
2. Max Overload Voltage is 2 times of Max Working voltage.
3. Resistance value over 4.7MΩ (≧4.7MΩ), while RD 1/8W is ≧1MΩ, the tolerance shall be ±10%.
4.RD 1/4W,1/2W can also supply flameproof form (RDN).

4.2 STRUCTURE:

4.2.1 Ceramic Rod:
It is made of Forsterite imported.

4.2.2 Carbon Film:
Under high vacuum and high temperature to split and oxidize the pure carbon-hydric.

4.2.3 Terminal:
Terminal is to be firmly connected with resistors element, both electrically and mechanically, and allow easy soldering.

4.2.4 Coating:
Coating is done by EPOXY insulating paint which is solid enough to be free from looseness, crack and easy breakage. The paint shall be limited within 1mm of lead wires from resistors body while the rated wattage is 2W the paint is limited within 2mm. RDN type is coated by flameproof paint which is resistant to 800℃ without causing looseness, crack and easy breakage.

4.2.5 Marking:
Marking is made by color coding on surface.

5. Operating Temperature Range: -55℃~155℃

6.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%

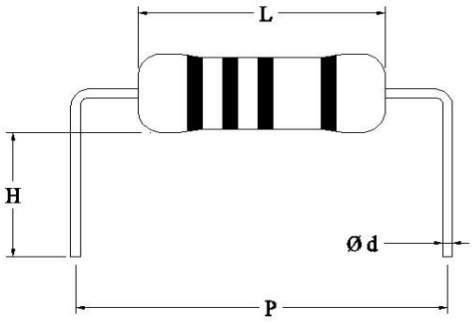
7. Test And Requirements:

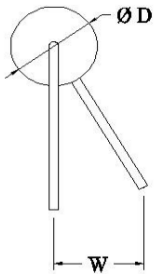
<table>
<tr><th colspan="2">Test</th><th>Test Method</th><th>Condition</th><th>Criteria</th></tr>
<tr><td rowspan="2">Mechanical Performance</td><td>Terminal tensile</td><td rowspan="2">IEC 60115-14.16</td><td>To fix the resistor body, a static load of 1.5kg.（1/8W & 1/4W axial form:1kg.) is to be gradually applied into the terminal for 10 seconds</td><td>Without causing any looseness and fall.</td></tr>
<tr><td>Twist withstand</td><td>To bend the lead wire at the point of about 6mm from resistor body to 90°, then catch the wire at 1.2 ±0.4mm apart from the bent point end and turn it (clockwise) by 360 degrees perpendicular to the
resistor axis at speed of 5 seconds per turn, and do the same counterclockwise again which constitute a whole turn. Repeat the turn 2 times</td><td>Without causing any break and looseness.</td></tr>
<tr><td colspan="2">Resistance Temperature Coefficient:</td><td>IEC 60115-1 4.8</td><td>T.C (ppm/℃) = 〔(R2 － R1) ÷R1〕 × 〔1÷(T2－T1)〕×10⁶
where
R1: resistance value at reference temperature
R2: resistance value at test temp.
T1: reference temp.
T2: test temp.</td><td>It shall be as following:
<table>
<tr><th>T.C / TYPE</th><th>0 ~ -450</th><th>0 ~ -700</th></tr>
<tr><td>1/6W,1/8W</td><td>≤47KΩ</td><td>51KΩ~100KΩ</td></tr>
<tr><td>1/4W & OVER</td><td>≤100KΩ</td><td>110KΩ~1MΩ</td></tr>
<tr><th>T.C / TYPE</th><th>0 ~ -1000</th><th>0 ~ -1300</th></tr>
<tr><td>1/6W, 1/8W</td><td>110KΩ~330KΩ</td><td>360KΩ~1MΩ</td></tr>
<tr><td>1/4W & OVER</td><td>1.1MΩ~2.2MΩ</td><td>2.4MΩ~4.7MΩ</td></tr>
</table></td></tr>
<tr><td colspan="2">Solder-ability</td><td>IEC 60115-1 4.17</td><td>The leads with flux are dipped in a melted solder of 235 ±5℃ for 2 seconds,</td><td>more than 95% of the circumference of the lead wires shall be covered with solder.</td></tr>
</table>

Test	Test Method	Condition	Criteria
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 Steps / Temperature (℃) / Time (minutes) 1st step: -55 ± 3 / 30 2nd step: Room temp. / 3 3rd step: 155 ± 3 / 30 4th step: Room temp. / 3	The resistance value change rate between pre-and-post test shall be within ±1%
Short Time Over Load	IEC 60115-14.13	When the resistors are applied 2.5 times as much as rated voltage for 5 seconds continuously, it shows no evidence of arc, flame...etc. Removing the voltage and place the resistors to the normal condition for 30 minutes,	The resistance value change rate between pre-and-post test shall be within 1% .
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	Measuring the Insulation Resistance which shall be over 10000MΩ
Voltage Withstanding	IEC 60115-1 4.7	Resistors are located in a V-shaped metal trough. RD: applying Max overload voltage for one minute (RDN 1W & 2W: applying 350V AC for one minute).	The resistance should find no physical damage to the resistors, such as arc, char...etc.
Load Life	IEC 60115-14.25	The resistors arrayed are sent into the 70℃ oven, applying rated voltage at the cycle of 1.5 hours ON, 0.5 hour OFF for 1000^{+48}_{-0} hours in total. Then, after removing the voltage, take the resistors out of the oven and left under normal temp. for one hour cooling.	The resistance value change rate between pre-and-post test shall be within ±5%.
Moisture-proof Load Life	IEC 60115-14.24	The resistors arrayed are placed into a constant temp./humidity oven at the temp. of 40 ±2℃ and the humidity of 90～95%, then rated power is applied for 1.5 hours and cut off for 0.5 hour. The similar cycle will be repeated for 500^{+24}_{-0} hours in total (including cut-off time). Then remove the voltage,taking the resistors out of the oven and leaving them at room temp. for one hour.	The resistance value change rate between pre-and-post test shall be within ±5%. There also shall be no evidence of remarkable change on appearance, and the marking shall not be illegible.
Resistance to Soldering Heat	IEC 60115-1 4.18	Two leads are together dipped in a melted solder of 270±5℃ for 10±1 seconds, or 350±10℃ for 3.5 ±0.5 seconds, Then remove the resistors and leaving them at room temp. for one hour.	The resistance value change rate between pre-and-post test shall be within ±1%.
Nonflammability: (only for RDN)	JIS - C 5201-4.26	The resistors are applied the power of 16 times the rated wattage for 5 min.	The resistance shall not get flame.

8. Others:

8.1 M form：

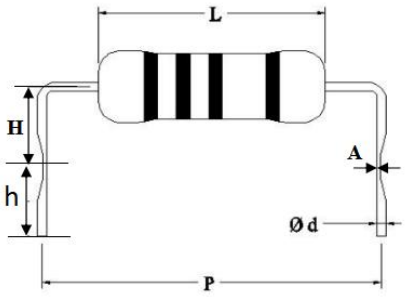


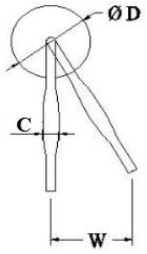


Unit: mm

Wattage	L±1	D±1	P	H±0.5
1/8W、1/6W、1/4WS	3.7max	1.7±0.2	5±0.5	3.5
1/4W、1/2WS	6.4	2.4±0.5	10±1	3.5
1/2W	9	3.5	15±1.5	3.5
1W	11	4.5	15±1.5	3.5
2W	15	5	20±2	3.5

8.2 MG form：

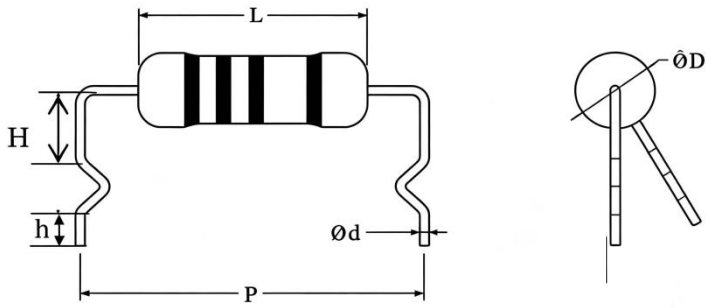




Unit: mm

Wattage	L±1	D±1	P	H	h±1	A±0.1	Φ d± 0.1	W Max	C±0.2
1/2W	9	3.5	15±1.5	8.75±1	4.5	0.23		3.0	1.2
1W	11	4.5	15±1.5	9.25±1	4.5	0.25	0.65	3.0	1.4
2W	15	5	20±2	12.5±2	4.5	0.25	0.80	3.0	1.4

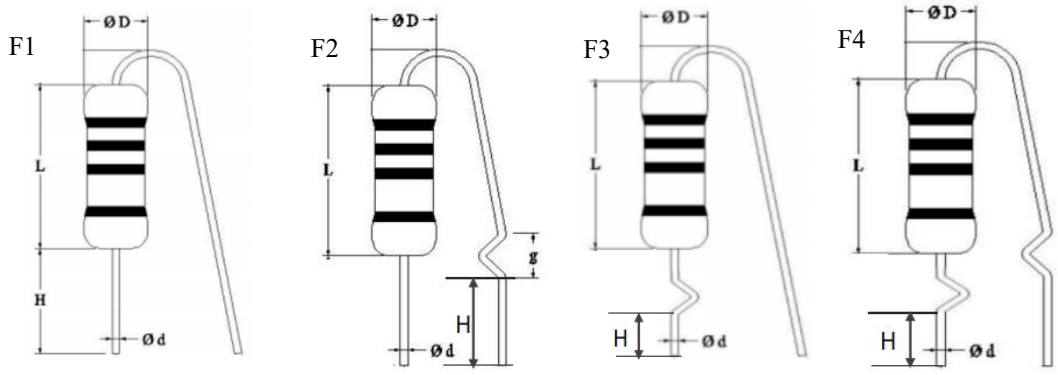
8.3 MB form：



Unit: mm

Wattage	D±1	L±1	P	H±0.5	h± 1.0	W Max
1/2W	3.5	9	15±1.5	6.5	2	1
1W	4.5	11	15±1.5	6.5	2	1
2W	5	15	20±2	6.5	2	1

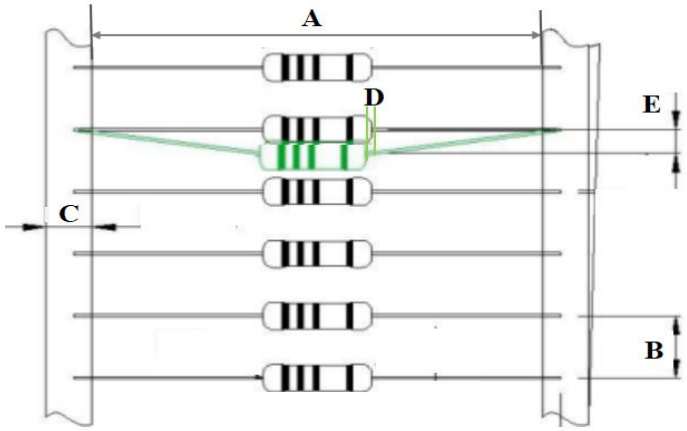
8.4）F Form:



Unit: mm

Wattage	L±1	D±1	H±1.0
1/2W	9	3.5	3.5
1W	11	4.5	3.5
2W	15	5	3.5

8.5 Taping Specifications:



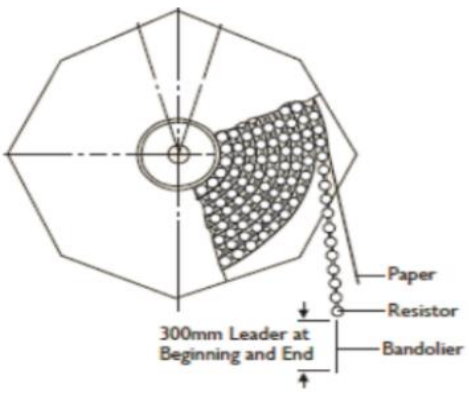
Unit: mm

Wattage	Size / Type	A	B	C±1	D Max	E Max
≦ 1/4W	T26	26 + 1 -0	5±0.5	6	0.6	1.2
	T/B,T/R	52±1	5±0.5	6	0.6	1.2
1/2W	T/B,T/R	52±1	5±0.5	6	0.6	1.2
1W	T/B,T/R	63±1	5±0.5	6	0.6	1.2
2W	T/B,T/R	63±1	10±1	6	0.6	1.2
	T76, R76	76±1.5	10±1	6	0.6	1.2

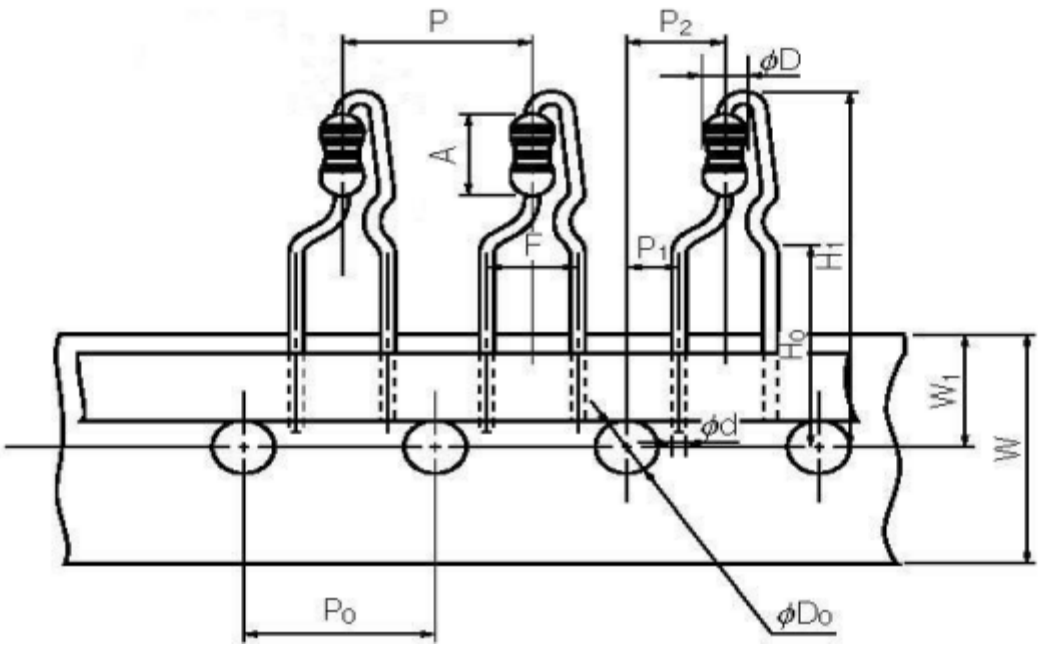
Tape in box



Tape in reel



8.6 Radial type lead taping(PA):



Unit: mm

Wattage	P±1	P_0±0.3	P_1±0.7	P_2±1	F±0.8	W±0.5	W_1±0.5	H_1max	H_0±0.5	φD_0±0.2	A±1	φd±0.1	φD±1	REMARK
1/4W (1/2WS)	12.7	12.7	3.85	6.35	5	18	9	32	16	4	6.4	0.6	2.4±0.5	
1/2W	12.7	12.7	3.85	6.35	5	18	9	32	16	4	9	0.65	3.5	
1W	12.7	12.7	3.85	6.35	5	18	9	38	16	4	11	0.8	4.5	
2W	12.7	12.7	3.85	6.35	5	18	9	38	16	4	15	0.8	5	

9. Precautions In Use:

To prevent electric corrosion risk (10 ppm defect rate over 1 year use).the resistance value over 100K**Ω** should be limited at 50V when ambient temperature and humidity is higher than 85**℃**/85**%.**