深圳市銘瓏精密電子有限公司

ShenZhen MingLong Precision Electronics Co., Ltd.

CARBON FILM RESISTORS
(RD)
1/6、1/4、1/2、1、2W
RoHS COMPLIANT
LEAD FREE

APPROVAL SHEET
SPECIFICATION

承 認 圖

TO: ATTN:

COMPANY NAME: ShenZhen MingLong Precision Electronics Co., Ltd.
深圳市銘瓏精密電子有限公司

COUNTRY OF ORIGIN: TAIWAN ☐ CHINA ☑

PART NO.: RD???W xxxE G/J***
REMARK: ???=1/6、1/4、1/2、1、2(W)
xxx=Resistance(E=Ω)
G =±2%、J=±5%
***= BB、SM、SMF、SMK、U、UK、UKK、UB、UH、AVISERT、PANASERT、TP26/52/57(PACKAGE)
1/8W&1/16W were replaced by 1/6W

CUSTOMER APPROVE BY:
DATE:

DATE OF ISSUE	DRAWN BY	CHECKED BY
	MR.Qiu	MR.Guo

Ver: 2008 01 25

CARBON FILM RESISTORS(RD)

1.GENERAL PROVISIONS:

THIS RECOGNITION CHART APPLY TO TAIWAN OHM COATED INSULATED TYPE CARBON FILM FIXED RESISTORS (RD) WITH CHARACTERISTICS.

2.STYLE:(PART NO.)

THE RESISTORS ARE CLASSIFIED ACCORDING TO THE FOLLOWING:

RD	1/6W	100KΩ	J	BB
CLASSIFICATION	POWER RATING	PESISTANCE	TOLERANCE	TYPE

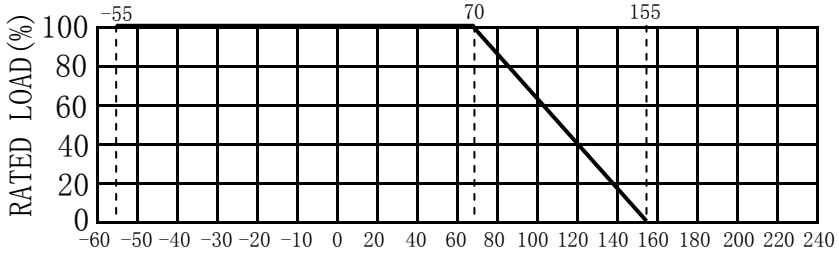
3.SPECIFICATIONS:

POWER RANGE(W) AT70℃	1/6	1/4	1/2	1	2
TYPE	RD				
MAX.WORKING VOLTAGE(V)	200	250	350	500	500
MAX.OVERLOAD VOLTAGE(V)	400	500	700	1000	1000
DIELECTRIC WITHSTANDING VOLTAGE(V)	200	250	350	500	500
AMBIENT TEMPERATURE RANGE	-55℃～155℃				
RESISTANCE VALUE RANGE(Ω)	10Ω～820KΩ(±2%)、1Ω～10MΩ(±5%) Remark:below 1Ω & over 10MΩ available				
NOMINAL RESISTANCE TOLERANCE(G、J)	G±2% & J±5%(E24)				

3-1.RATED POWER

YOU MAY GET A SATISFACTORY VOLTAGE DURING THE LOAD TEST WHEN THE AMBIENT TEMPERATURE IS AT70℃ HOWEVER,AS THE TEMPERATURE RAISES ABOVE70℃,THE RATED LOAD DERATED AS SHOWN ON THE CHART BELOW.

DERATING CURVE



AMBIENT TEMPERATURE℃

Remark:the ambient temperature is around the resistor surface anear,doer not room/ambient temperature.

Ver: 2008 01 25

3-2. RATED VOLTAGE

THE RATED CONTINUOUS WORKING VOLTAGE AND THE APPROXIMATE SINE-WAVE R. M. S. CONTINUOUS WORKING VOLTAGE AT COMMERCIAL LINE FREQUENCY ,SHALL BE DETERMINED BY THE FOLLOWING.

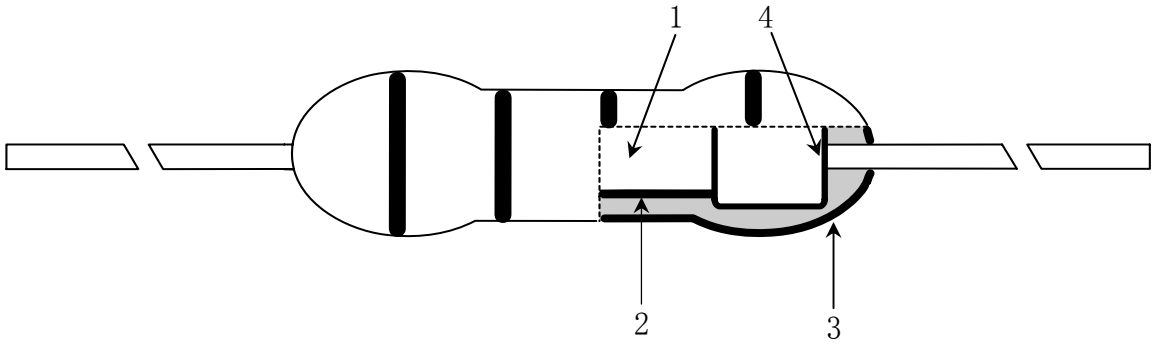
FORMULA:

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

WHERE : E=RATED VOLTAGE(V)
P=POWER RATING(W)
R=NOMINAL RESISTANCE(Ω)

IN NO CASE THE MAXIMUM CONTINUOUS WORKING VOLTAGE SHALL BE EXCEEDED.
IF THE VOLTAGE CALCULATED FROM THE ABOVE FORMULA IS HIGHER THAN THE RATED VOLTAGE, USE THE MAXIMUM WORKING VOLTAGE.

4. THE STRUCTURE OF THE RESISTORS



NO.	ITEM	MATERIAL	REMARK
1	RESISTOR BODY	CERAMIC	CERAMIC CORE
2	RESISTANCE	FILM	CARBON FILM
3	COATING	INSULATED EPOXY	COLOR:KHAKI
4	LEADS (LEAD FREE)	IRON CAPS	CAPS:TINNED ELECTROPLATED SURFACE
			LEADS:TINNED ELECTROPLATED SURFACE
		Cu WIRE (OF ELECTRICAL)	CAPS AND Cu WIRE ARE WELDED TOGETHER

Ver: 2008 01 25

4. CHARACTERISTICS:

4-1. PERFORMANCE

TEST CHARACTERISTICS	REQUIREMENTS		TEST METHOD JIS C 5202
TEMPERATURE COEFFICIENT (PPM/℃)	UNDER 3K9	±350PPM/℃	5.2 ROOM TEMPERATURE +100℃
	4.3K～560K	±700PPM/℃	
	620K～1.2M	0～-1000PPM/℃	
	1.3M～2.2M	0～-1200PPM/℃	
	2.4M～10M	0～-1500PPM/℃	
SHORT TIME OVERLOAD	WITHIN±(1% +0.05Ω)		5.5 RATED V.x2.5 OR MAX.OVERLOAD V.for 5 Sec.,whichever less
NOISE μV/V (Db)	UNDER 10K 0.3 V/V 11K～100K 0.6 V/V OVER 110K 1.0 V/V		5.9
PULSE OVERLOAD	WITHIN±(2% +0.05Ω)		5.8 NO LESS THAN 100Ω
RESISTANCE TO SOLDERING HEAT	WITHIN(±1% +0.05Ω)		6.4 DIP IN SOLDER POT OF 350±10℃ FOR 3 SECONDS
SOLDER ABILITY	OVER 95% OF COOPER WIRE COVERED WITH SOLDER		6.5 DIP IN SOLDER POT OF 235±5℃(WITHIN 3±0.5SEC.)
INSULATION RESISTANCE	OVER 1,000MΩ		5.6
DIELECTRIC WITHSTANDING VOLTAGE	NO EVIDENCE OF FLASHOVER OR BREAKDOWN		5.7
TEMPERATURE CYCLING	WITHIN ±(1%+0.05Ω)		JIS-C-5202 7.4 REPEAT FIVE TIMES
			TEMP. / TIME
			1 / -55±3℃ / 30 Min.
			2 / AMBIENT / 10-15 Min.
			3 / 155±3℃ / 30 Min.
			4 / AMBIENT / 10-15 Min.
LOAD LIFE IN HUMIDITY	±5%		7.9 APPLY1/10 RATED VOLTAGE FOR 90 Min.,OFF FOR 30Min.AT 40±2℃,90～95%RH.
LOAD LIFE	±5%		7.10 APPLY RATED VOLTAGE FOR 90Min.,OFF FOR 30Min.AT70℃
DC RESISTANCE	G±2%、J±5%		5.1

Remark: Shelflife (At room temperature) : One year

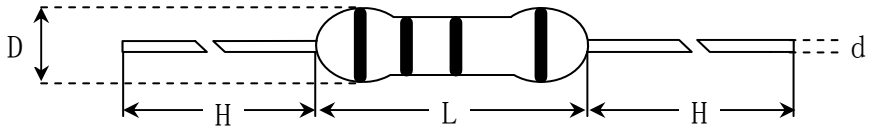
Ver: 2008 01 25

4-2. MECHANICAL CHARACTERISTICS.

ITEM	DIMENSION		TEST METHOD
Tensile Strength	2kgs.	5sec.	JIS-C-5202 6.1
Snapping Strength	360°	3times	JIS-C-5202 6.1
Bending Strength	0.25kgs.	2times	JIS-C-5202 6.1
Vibration	±(0.5%+0.05Ω)		6.3 Each 2 hour at 3 sides

5. TYPE AND DIMENSIONS.

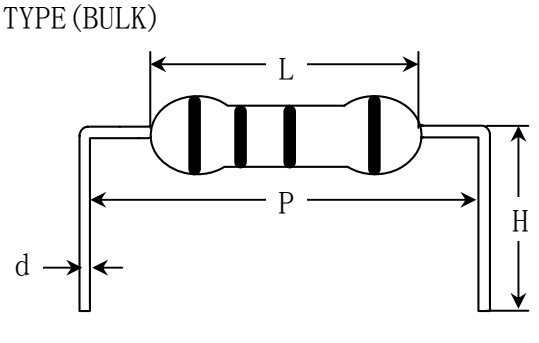
5-1. RD…BB TYPE(BULK)

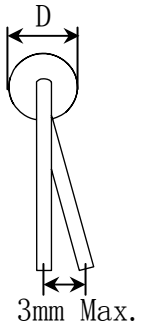


UNIT:mm

TYPE	L±1	D±1	H±3	d±0.05
RD1/6WxxxE J BB	3.3	1.8	28	0.40
RD1/4WxxxE J BB	6.3	2.5	28	0.48
RD1/2WxxxE J BB	9.5	3.3	28	0.50
RD1WxxxE J BB	11.5	4.5	28	0.70
RD2WxxxE J BB	15.5	5	28	0.70

5-2. RD…SM TYPE(BULK)





UNIT:mm

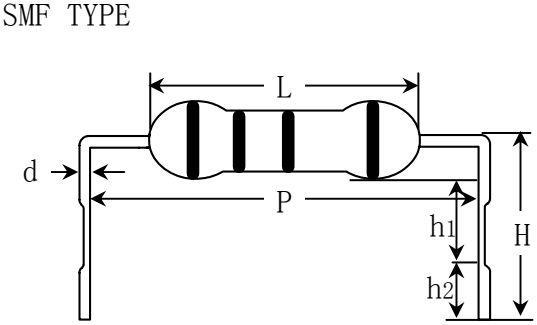
TYPE	L±1	D±1	H±3	P±1	d±0.05
RD1/6WxxxE J SM	3.3	1.8	8	5	0.40
RD1/4WxxxE J SM	6.3	2.5	8	10	0.48
RD1/2WxxxE J SM	9.5	3.3	8	12.5/15	0.50
RD1WxxxE J SM	11.5	4.5	13	15/20	0.70
RD2WxxxE J SM	15.5	5	16	20	0.70

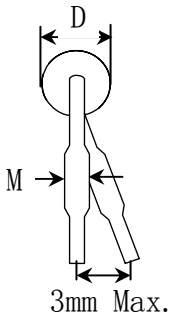
Design, Specifications are subject to change without notice. Ask factory for technical specifications before purchase and/or use.

Whenever a doubt about safety arises from this product, please inform us immediately for technical consultation without fail.

Ver: 2008 01 25

5-3. RD…SMF TYPE

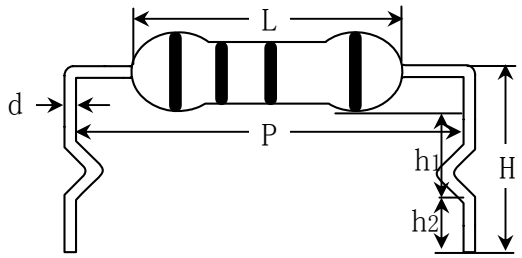


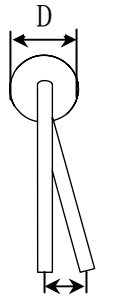


UNIT:mm

TYPE	L±1	D±1	H±3	P±1	h1±1	h2±1	d±0.05	M
RD1/2WxxxE J SMF	9.5	3.3	13	12.5/15	6.3	5	0.70	1.1-1.4
RD1WxxxE J SMF	11.5	4.5	13	15/20	5.7	5	0.70	1.1-1.4
RD2WxxxE J SMF	15.5	5	16	20	8.5	5	0.70	1.1-1.4

5-4. RD…SMK TYPE



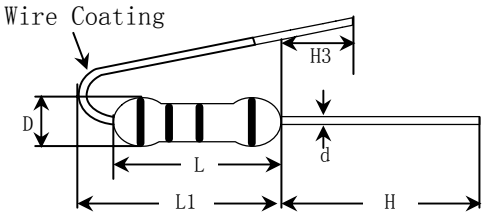


UNIT:mm

TYPE	L±1	D±1	H±2	P±1	h1±1	h2±1	d±0.05
RD1/4WxxxE J SMK	6.3	2.5	12	10	5.8	5	0.48
RD1/2WxxxE J SMK	9.5	3.3	13	12.5/15	6.3	5	0.50
RD1WxxxE J SMK	11.5	4.5	13	15/20	5.7	5	0.70
RD2WxxxE J SMK	15.5	5	16	20	8.3	5	0.70

Remark: H had different high available, please feel free inquire to us.

5-5. RD…U TYPE



UNIT:mm

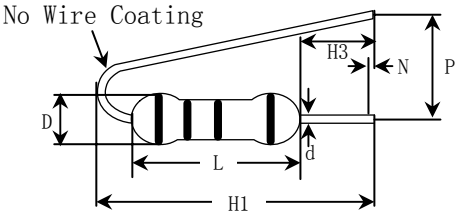
TYPE	L±1	L1±1	H±3	D±1	H3±3	d±0.05
RD1/6WxxxE J U	3.3	5.5Max.	28	1.8	20	0.40
RD1/4WxxxE J U	6.3	10Max.	28	2.5	14	0.48

Ver: 2008 01 25

5-5.RD…U TYPE

UNIT:mm

N Max.	2
P Min.	5



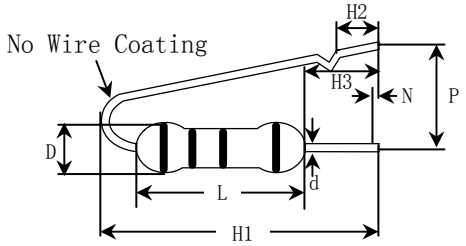
UNIT:mm

TYPE	L±1	D±1	H1±3	H2±1	H3±3	d±0.05
RD1/2WxxxE J U	9.5	3.5	17	—	8	0.50
RD1WxxxE J U	11.5	4.5	24	—	8	0.70
RD2WxxxE J U	15.5	5.5	27	—	8	0.70

5-6.RD…UK TYPE

UNIT:mm

N Max.	2
P Min.	5



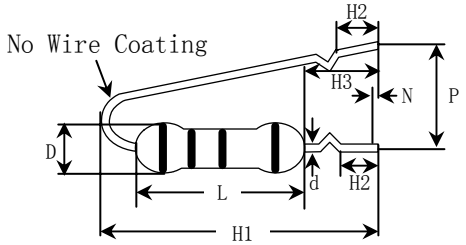
UNIT:mm

TYPE	L±1	D±1	H1±3	H2±1	H3±3	d±0.05
RD1/2WxxxE J UK	9.5	3.5	17	5	8	0.50
RD1WxxxE J UK	11.5	4.5	20	5	8	0.70
RD2WxxxE J UK	15.5	5.5	24	5	8	0.70

5-7.RD…UKK TYPE

UNIT:mm

N Max.	2
P Min.	5

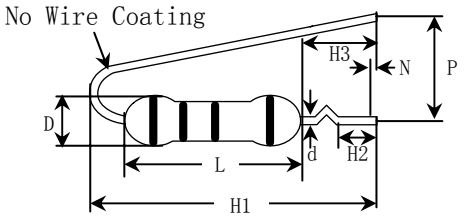


TYPE	L±1	D±1	H1±3	H2±1	H3±3	d±0.05
RD1/2WxxxE J UKK	9.5	3.5	17	5	8	0.50
RD1WxxxE J UKK	11.5	4.5	20	5	8	0.70
RD2WxxxE J UKK	15.5	5.5	24	5	8	0.70

5-8.RD…UB TYPE

UNIT:mm

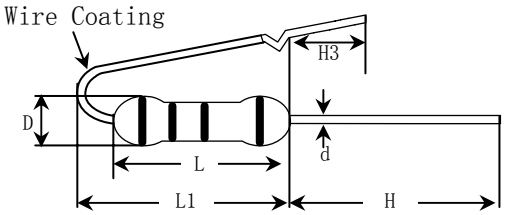
N Max.	2
P Min.	5



TYPE	L±1	D±1	H1±3	H2±1	H3±3	d±0.05
RD1/2WxxxE J UB	9.5	3.5	19	5	8	0.50
RD1WxxxE J UB	11.5	4.5	22	5	8	0.70
RD2WxxxE J UB	15.5	5.5	26	5	8	0.70

Ver: 2008 01 25

5-9.RD…UH TYPE

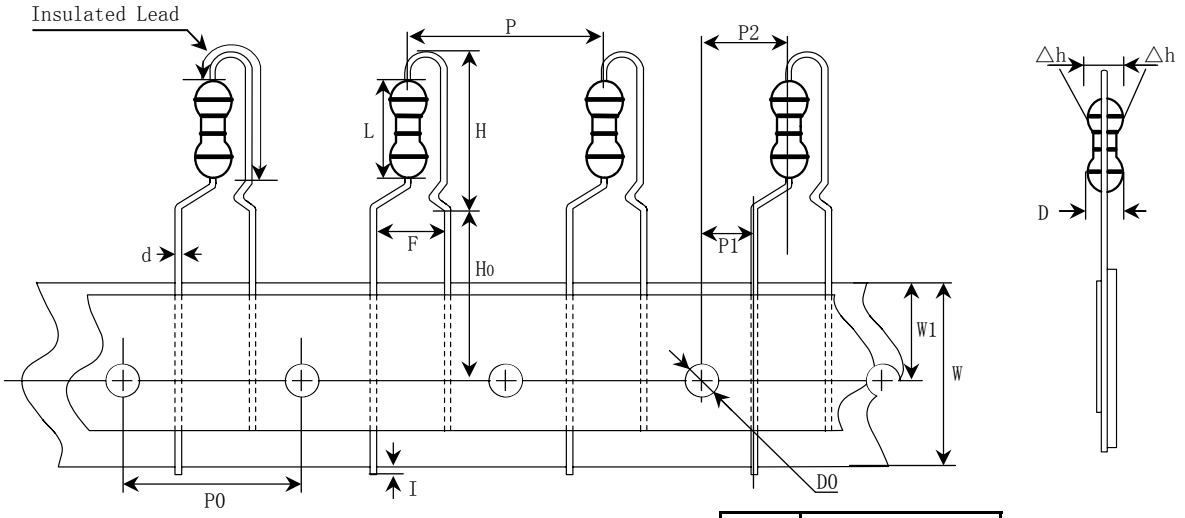


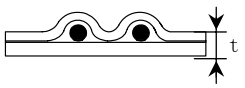
UNIT:mm

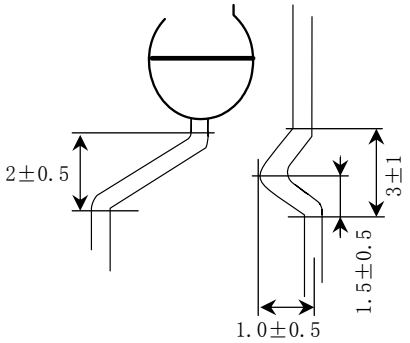
TYPE	L±1	L1	H±3	D±1	H3±3	d±0.05
RD1/4WxxxE J UH	6.3	10Max.	28	2.5	14	0.48

5-10.RD…PANASERT TYPE

This specification is applicable to RD/0.25(1/4W) of Carbon Film Fixed Resistors.







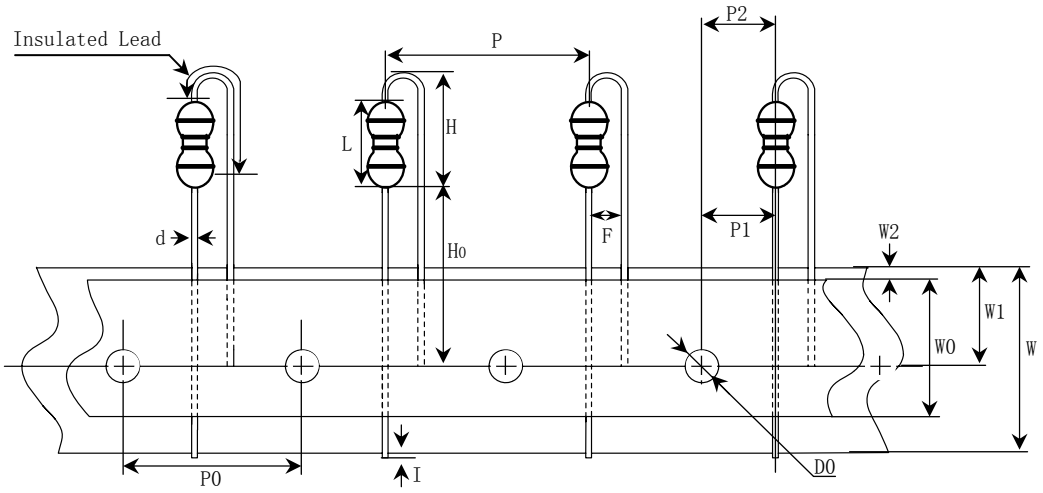
D	2.5Max.
L	6.5Max.
H	12Max.
d	0.6±0.05
P	12.7±1
P0	12.7±0.3
P1	3.85±0.7
P2	6.35±1.3
F	5±0.8
△h	0±2
W	18±1
W1	9±0.5
H0	16±0.5
D0	4±0.2
I	1.0Max.
t	0.5±0.2

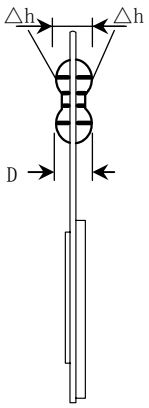
UNIT:mm

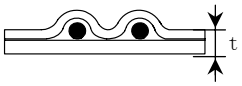
Ver: 2008 01 25

5-11.RD…AVISERT TYPE

This specification is applicable to RD1/6W & 1/4W of Carbon Film Fixed Resistors.





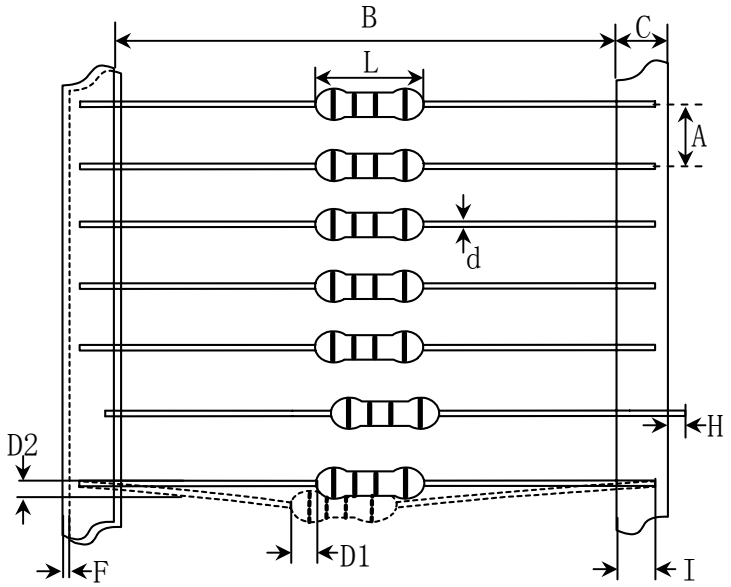


D	1/6W:1.8Max. 1/4W:2.5Max.
L	1/6W:3.2Max. 1/4W:6.5Max.
H	1/6W:7.0Max. 1/4W:10Max.
d	1/6W:0.5±0.05 1/4W:0.6±0.05
P	12.7±1
P0	12.7±0.3
P1	5.1±0.5
F	1/6W:2.5±1 1/4W:5±1
△h	0±1
W	18±1
W0	12.5Min
W1	9±0.5
W2	3Max.
H0	16.5Max.
D0	4±0.3
I	1.0Max.
t	0.5±0.2

UNIT:mm

Ver: 2008 01 25

5-12.RD…TP26/52/57 TYPE(Taping 26/52/57mm in Box)



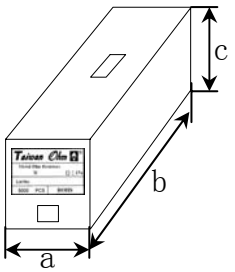
UNIT:mm

C	6±0.5
F	0.5Max.
I	3.2Min
H	0

UNIT:mm

TYPE	A±0.5	B±1	D1	D2	L±1	d±0.05
RD1/6WxxxE J TP26	5	26±1.5	0.8Max.	1.1Max.	3.3	0.40
RD1/6WxxxE J TP52	5	52	0.8Max.	1.1Max.	3.3	0.40
RD1/4WxxxE J TP26	5	26±1.5	0.8Max.	1.1Max.	6.3	0.48
RD1/4WxxxE J TP52	5	52	0.8Max.	1.1Max.	6.3	0.48
RD1/2WxxxE J TP52	5	52	0.8Max.	1.1Max.	9.5	0.50
RD1WxxxE J TP52	5	52	0.8Max.	1.1Max.	11.5	0.70
RD2WxxxE J TP52	10	57	0.8Max.	1.1Max.	15.5	0.70

6.Taping 26/52/57mm Packing Box Specifications



UNIT:mm

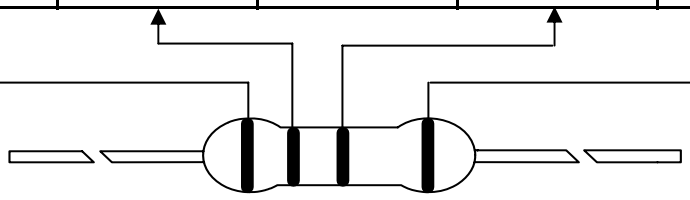
Taiwan Ohm Part No.	Standard Quantity	a	b	c
RD1/6WxxxE J TP26	5000pcs	49	254	70
RD1/6WxxxE J TP52	5000pcs	75	254	70
RD1/4WxxxE J TP26	5000pcs	49	254	105
RD1/4WxxxE J TP52	5000pcs	75	254	105
RD1/2WxxxE J TP52	2000pcs	75	254	105
RD1WxxxE J TP52	1000pcs	75	254	115
RD2WxxxE J TP52	1000pcs	75	254	105

Ver: 2008 01 25

7. INDICATION

THE RESISTANCE VALUE AND TOLERANCE OF THE RESISTORS ARE INDICATED WITH THE COLOR CODE, REFER TO JIS-C-0802.

COLOR	1 ST VALUE	2 ND VALUE	3 TH VALUE	MULTIPLIER	TOLERANCE
BLACK	0	0	0	10^0	
BROWN	1	1	1	10^1	
RED	2	2	2	10^2	±2%(G)
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	_	
GREY	8	8	8	_	
WHITE	9	9	9	_	
GOLD	_	_	_	10^{-1}	±5%(J)
SILVER	_	_	_	10^{-2}	



8. RoHS Instructions:

According to the EU RoHS requirements, our products are transported to EU must comply the below dangerous components content standards shown in the table from 1st Jan 2005.

RoHS Compliance Statement

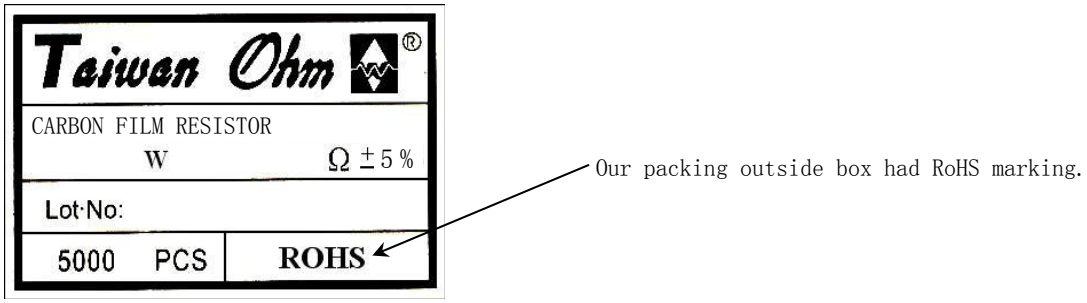
We Taiwan Ohm are fully aware of reducing the environmental impact of our products RD series. Resistors as mentioned below part numbers accordance with EU directive 2002/95/EC.

Part numbers:RD***

The above mentioned part numbers can meet RoHS standard as below table:

Carbon Film Resistors (Through-hole)	
1. Cadmium(Cd)	: < 100ppm
2. Lead(Pb)	: < 1000ppm
3. Mercury(Hg)	: < 1000ppm
4. Hexavalent Chormium(Cr6+)	: < 1000ppm
5. Polybrominated Blphenyls(PBBs)	: < 1000ppm
6. Polybrominated Diphenylethers(PBDEs)	: < 1000ppm

8-1.RoHS Marking Control



Remark:

We had control all main Raw Material to must comply RoHS & had Testing Reports support.If you want to have update Testing Reports, please feel free to ask our factory.All Testing Reports had effective one year.

Ver: 2008 01 25