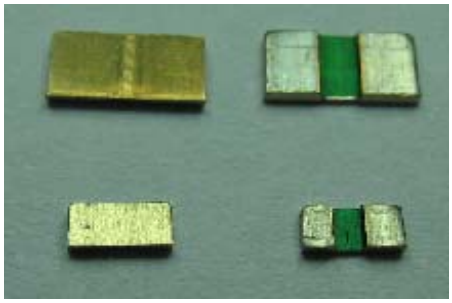
LIEAN GIMN ENTERPRISE CO., LTD.

Data Sheet

Customer：	
Product Type：	Ultra Low Chip Resistor -LR (Metal Strip)
Part No.：	LR series
Issued Date：	25-Mar-08
Document No	LR Series REV.B



Pb RoHS Compliant

Produced by (QC)	Checked by (QC)	Approved by (QC)	Prepared by (Sales)	Accepted by (Customer)
25-Mar-08	25-Mar-08	25-Mar-08	25-Mar-08	
Kris	***Roland***	***Judy***		

Tel: +886-2-2793-6715／Fax: +886-2-2793-6716
4F, No. 163, Shing Ming Road, Nei Hu, Taipei, Taiwan. R.O.C.114

Ultra Low Chip Resistor (Metal Strip)

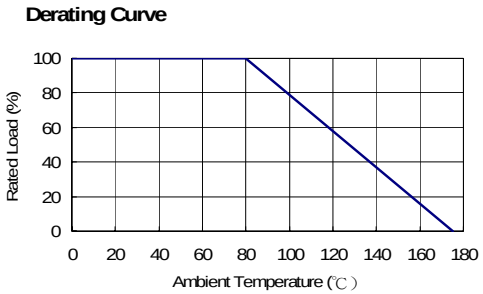
（LR Series）

1. Scope

This specification applies to all sizes of rectangular-type fixed chip resistors with alloy as material.

2. Features

- High power rating up to 3watts
- Low TCR down ±50 PPM/℃
- Resistance values from 0.5 to 20 m ohms
- Without laser trimmed with very low inductance
- Customized resistance available
- Wide range package sizes 1206 / 2010 / 2512



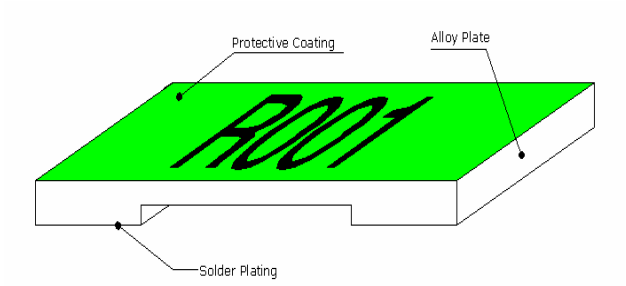
3. Applications

- NB (for Power Management)
- MB (for Power Management)
- SWPS (DC-DC Converter, Charger, Adaptor)
- Monitor (for Power Management)

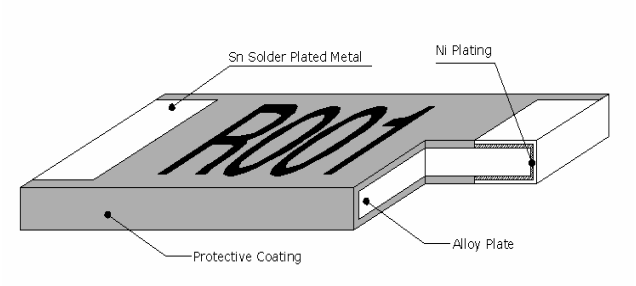
4.Construction

4.1 2512

(Green Coating)

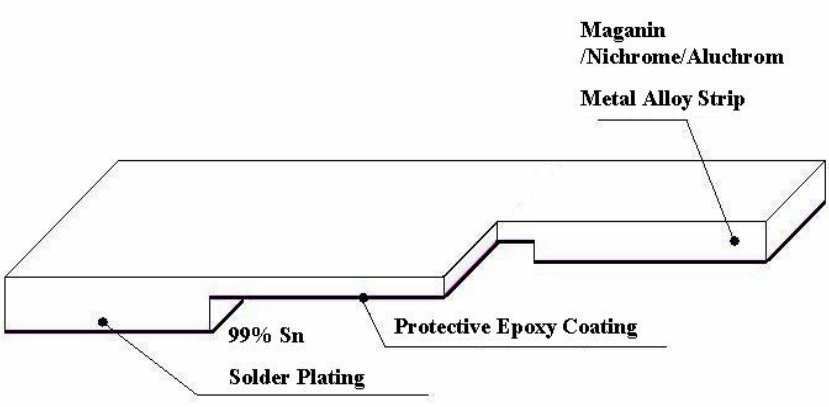


(Black Coating)



4.2 1206 & 2010

TYPE	Material
R001~ R003	Manganese, Copper
R004 ~ R010	Aluminum ,Iron , Copper



Tel: +886-2-2793-6715／Fax: +886-2-2793-6716
4F, No. 163, Shing Ming Road, Nei Hu, Taipei, Taiwan. R.O.C.114

5. Product Identification

LR	12	J	T	E	S	R003	G
①	②	③	④	⑤	⑥	⑦	⑧

① Product Type

Product Type	
LR	Ultra Low Ohm Metal Strip Chip Resistor

② Dimensions (L×W)

Codes	Dimensions (L×W)	EIA
LR06	3.2×1.6mm	1206
LR10	5.1×2.5mm	2010
LR12	6.3×3.1mm	2512

③ Resistance Tolerance

Codes	Resistance Tolerance
J	±5%
H	±3%
G	±2%
F	±1%

④ Packaging

Code	Type
T	Taping Reel

⑤ TCR

Codes	Type
D	±50 PPM/℃
W	±75 PPM/℃
E	±100 PPM/℃
K	±150 PPM/℃

⑥Power Rating

Codes	Type
	Standard
A	(1.5W)
S	(2W)
R	(3W)
B	(2.5W)

⑦ Resistance

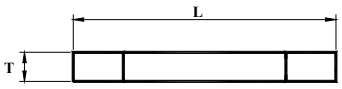
Codes	Type
0M50	0.00050Ω
0M75	0.00075Ω
1M50	0.0015Ω
R002	0.0020Ω

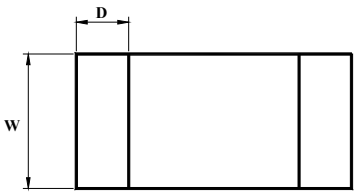
⑧ Protective Coating

Codes	Type
	Black Coating
G	Green Coating

2010/1206 No coating / marking

6. Dimensions





Unit: mm

Part No.	Resistance(m Ω)	L	W	T	D
LR06□T□□□□□	1.0~10	3.20±0.254	1.60±0.104	0.6±0.20	0.98±0.38
LR10□T□□□□□	1.0~10	5.08±0.254	2.54±0.15	0.60±0.20	1.665±0.625
LR12□T□0M50G	0.50	6.35±0.254	3.18±0.35	0.60±0.20	2.675±0.254
LR12□T□0M75G	0.75	6.35±0.254	3.18±0.35	0.60±0.20	2.475±0.254
LR12□T□□□□□G	1.0~1.5	6.35±0.254	3.18±0.35	0.60±0.20	1.425±0.254
LR12□T□□□□□G	2.0~3.0	6.35±0.254	3.18±0.35	0.60±0.20	1.175±0.254
LR12□T□R004G	4.00	6.35±0.254	3.18±0.35	0.60±0.20	2.175±0.254
LR12□T□□□□□G	5.0~6.0	6.35±0.254	3.18±0.35	0.60±0.20	1.925±0.254
LR12□T□R007G	7.00	6.35±0.254	3.18±0.35	0.60±0.20	1.425±0.254
LR12□T□□□□□G	8.0~20	6.35±0.254	3.18±0.35	0.60±0.20	1.175±0.254
LR12□T□0M50	0.50	6.35±0.254	3.18±0.254	1.40±0.20	1.425±0.377
LR12□T□0M75	0.75	6.35±0.254	3.18±0.254	1.00±0.20	1.425±0.377
LR12□T□R001	1.00	6.35±0.254	3.18±0.254	0.80±0.20	1.425±0.377
LR12□T□1M50	1.50	6.35±0.254	3.18±0.254	0.65±0.20	1.425±0.377

Tel: +886-2-2793-6715／Fax: +886-2-2793-6716
4F, No. 163, Shing Ming Road, Nei Hu, Taipei, Taiwan. R.O.C.114

LR12□T□R002	2.00	6.35±0.254	3.18±0.254	0.50±0.20	1.425±0.377
LR12□T□2M50	2.50	6.35±0.254	3.18±0.254	1.00±0.20	1.425±0.377
LR12□T□R003	3.00	6.35±0.254	3.18±0.254	0.70±0.20	1.425±0.377
LR12□T□R004	4.00	6.35±0.254	3.18±0.254	0.60±0.20	1.425±0.377
LR12□T□R005	5.00	6.35±0.254	3.18±0.254	0.50±0.20	1.425±0.377
LR12□T□R006	6.00	6.35±0.254	3.18±0.254	0.50±0.20	1.425±0.377
LR12□T□6M50	6.50	6.35±0.254	3.18±0.254	0.45±0.20	1.425±0.377
LR12□T□R007	7.00	6.35±0.254	3.18±0.254	0.45±0.20	1.425±0.377

7. Specification

Standard Electrical Specifications

Item / Type	Power Rating at 80℃	Operating Temp. Range	Resistance Tolerance (±%)	Resistance (mΩ)	TCR (PPM/℃)
LR12□TK□□□□	1W	-55℃～+170℃	1,3,5	2.5～3.0	150
LR12□TE□□□□	1W	-55℃～+170℃	1,3,5	4.0～5.0	100
LR12□TW□□□□	1W	-55℃～+170℃	1,3,5	6.0～7.0	75
LR12□TD□□□□G	1W	-55℃～+170℃	1,3,5	11.0～20.0	50
LR06□TD□□□□	1W	-55℃～+170℃	1,3,5	1.0～10.0	50

Operating Current I=√(P/R):Operating Voltage V=√(P*R)

High Power Rating Electrical Specifications

Item / Type	Power Rating at 80℃	Operating Temp. Range	Resistance Tolerance (±%)	Resistance (mΩ)	TCR (PPM/℃)
LR10□TDA□□□□	1.5W	-55℃～+170℃	1,3,5	1.0~10	50
LR12□TDS□□□□	2.0W	-55℃～+170℃	1,3,5	0.5～2.0	50
LR12□TDS□□□□G	2.0W	-55℃～+170℃	1,3,5	7.0～10.0	50
LR12□TDB□□□□G	2.5W	-55℃～+170℃	1,3,5	4.0～6.0	50
LR12□TDR□□□□G	3.0W	-55℃～+170℃	1,3,5	1.0～3.0	50
LR12□TER□□□□G	3.0W	-55℃～+170℃	1,3,5	0.5～0.75	100

Operating Current I=√(P/R),Operating Voltage V=√(P*R)

※※ We have the ability of manufacture following options based on customer's requirement.

7-2 Resistance codes example

7-2-1 Resistance (3Marking)

Resistance	0.5mΩ	0.75mΩ
Codes	M50	M75

7-2-2 Resistance (4Marking)

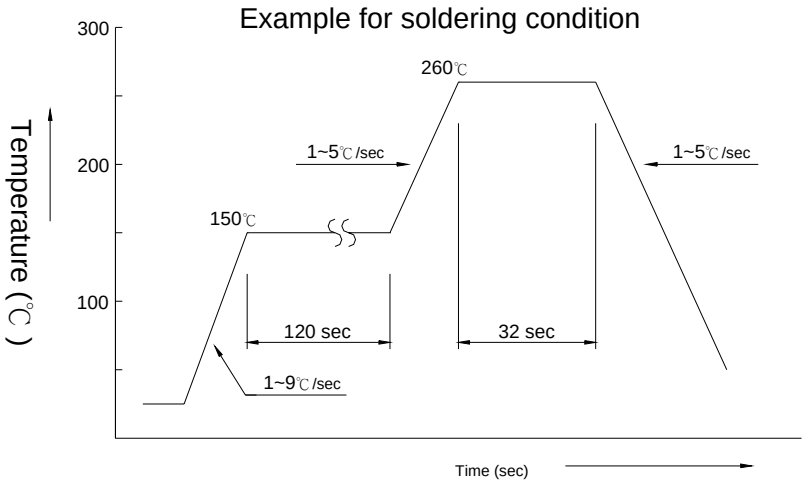
Resistance	1mΩ	1.5mΩ	2mΩ	7mΩ	10
Codes	R001	1M50	R002	R007	R010

8. Electrical Characteristics

Item		Specification		Test Method
		Black coating	Green coating	
1	Temperature Coefficient of Resistance	As Spec.		**MIL-STD-202F- Method 304** +25/-55/+25/+125/+25℃
2	Thermal Shock	±0.5%	±1%	**MIL-STD-202F- Method 107G** -55℃~150℃,100 cycles
3	Short Time Overload	±0.5%	±1%	**JIS-C-5202-5.5** 5×rated power，5 seconds
4	Resistance to Dry Heat	±1%	±1%	**JIS-C-5202-7.2** 96 hours @ +155℃ without load
5	Load Life	±1%	±1%	**MIL-STD-202F-Method 108A** RCWV,70℃ ,1.5 hours on, 0.5 hours off, total 1000~1048 hours
6	Resistance to Soldering Heat	±0.5%	±1%	**MIL-STD-202F-Method 210E** 260±5℃,10±1seconds
7	Solderability	95% min coverage		**MIL-STD-202F-Method 208H** 245±5℃,3±0.5seconds

※Storage Temperature :25±3℃; Humidity <80%RH

9. Reflow



Solder : Sn96.5/Ag3/Cu0.5

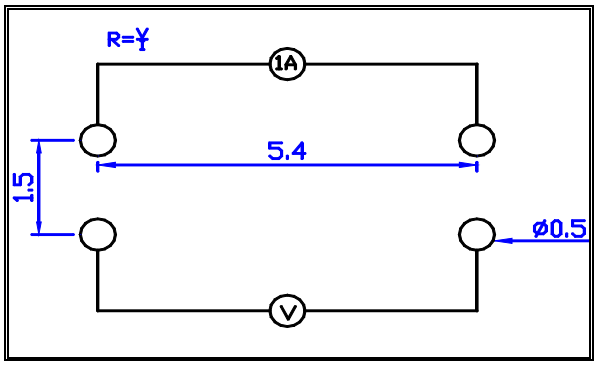
※ **Green coating** ” Reflow Air Convection ” is available

※ **Green coating can't be working with wave soldering bath**

10.Measurements

10-1. LR12 4-wire precision measurement

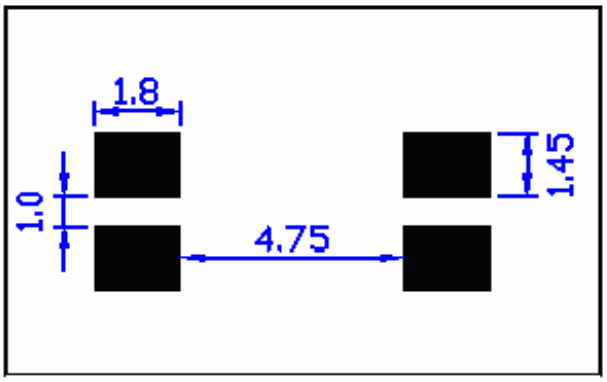
- Equipment: ADEX AX-1152D DC Low Ohm Meter
- Excitation Current: 3A (0.5mΩ~1.5 mΩ)
  1A (2mΩ~7mΩ)



Unit: mm

10-2. LR12 4-wire pad layout (recommended for precision current sensing)

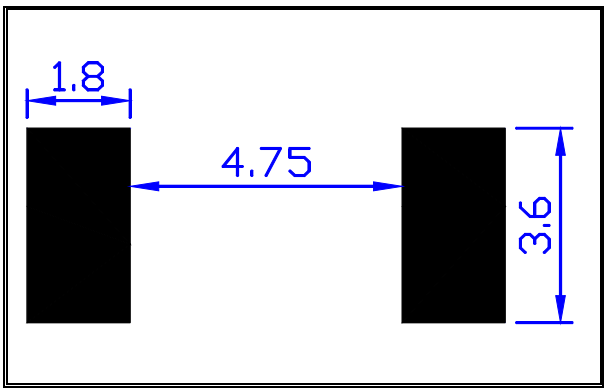
- Note: No circuits between pads to avoid short circuit



Unit: mm

10-3 LR12 2-wire pad layout

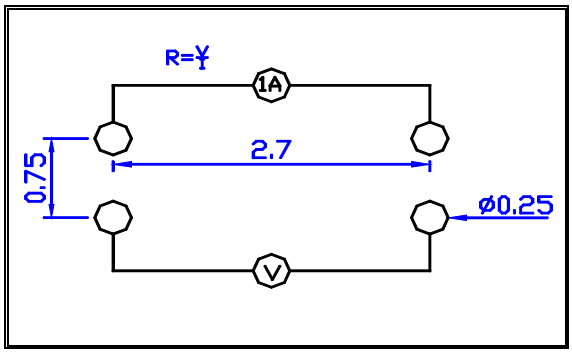
- Note: No circuits between pads to avoid short circuit



Unit: mm

10.4 LR06 4-wire precision measurement

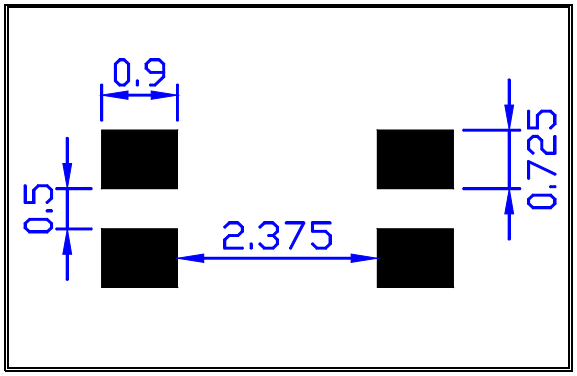
- Equipment: ADEX AX-1152D DC Low Ohm Meter
- Excitation Current: 1A (1mΩ~10mΩ)



unit:mm

10.5 LR06 4-wire pad layout (recommended for precision current sensing)

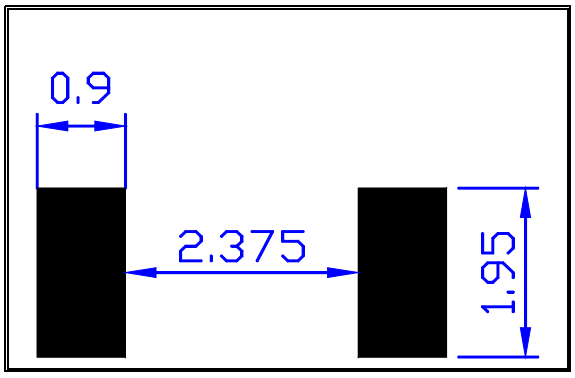
Note: No circuits between pads to avoid short circuit



unit:mm

10.6 LR06 2-wire pad layout

Note: No circuits between pads to avoid short circuit

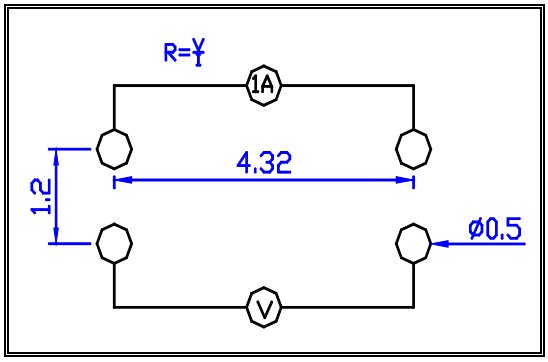


unit:mm

10.7 LR10 4-wire precision measurement

Equipment: ADEX AX-1152D DC Low Ohm Meter

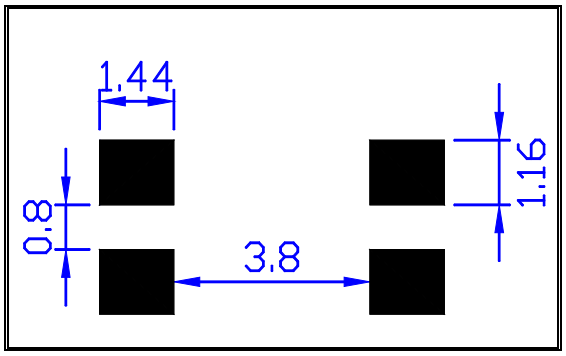
Excitation Current: 1A (1mΩ~10mΩ)



unit:mm

10.8 LR10 4-wire pad layout (recommended for precision current sensing)

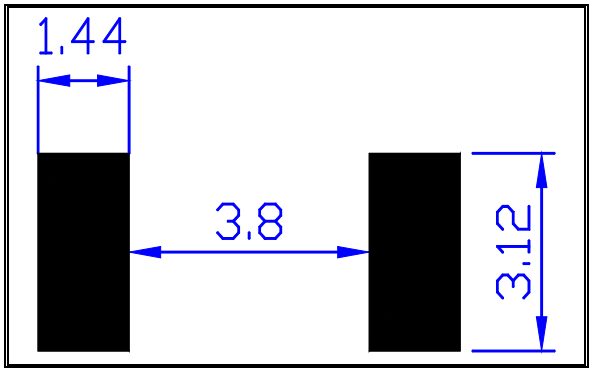
Note: No circuits between pads to avoid short circuit



unit:mm

10.9 LR10 2-wire pad layout

Note: No circuits between pads to avoid short circuit



unit: mm

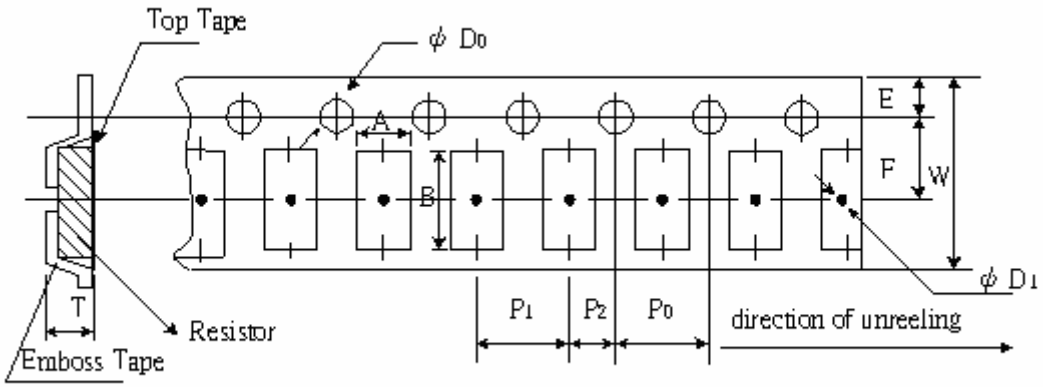
11. Packaging

11-1 Package Quantity

Unit: pcs

Packaging / Series	Emboss Plastic Tape
LR06	2000
LR10	2000
LR12	2000

11-2. Emboss Plastic Tape Specifications



Unit: mm

	Resistance (mΩ)	A	B	W	E	F	P_0	P_1	P_2	ΦD_1	ΦD_0	T
LR06	1.0~10	1.90±0.1	3.60±0.1	8.0±0.2	1.75±0.1	3.5±0.05	4.0±0.1	4.0±0.1	2.0±0.05	1.0min	1.55±0.05	0.87±0.1
LR10	1.0~10	2.85±0.1	5.55±0.1	12.0±0.2	1.75±0.1	5.5±0.05	4.0±0.1	4.0±0.1	2.0±0.05	1.4min	1.55±0.05	0.85±0.1
LR12	0.50~7	3.40±0.1	6.73±0.1	12.0±0.1	1.75±0.1	5.5±0.05	4.0±0.1	4.0±0.1	2.0±0.05	1.4min	1.50+0.1	0.81±0.1
	0.50~20	3.40±0.1	6.75±0.1	12.0±0.1	1.75±0.1	5.5±0.05	4.0±0.1	4.0±0.1	2.0±0.05	1.4min	1.55±0.05	0.80±0.1

Notice:

1. The cumulative tolerance of 10 sprocket hole pitch is ±0.2mm.
2. Carrier camber shall be not more than 1mm per 100mm through a length of 250mm.
3. A & B measured 0.3mm from the bottom of the packet
4. t measured at a point on the inside bottom of the packet to the top surface of the carrier.
5. Pocket position relative to sprocket hole is measured as the true position of the pocket and not the pocket hole.