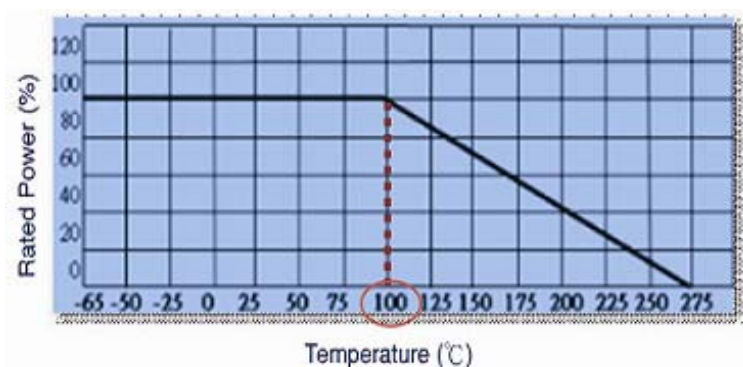
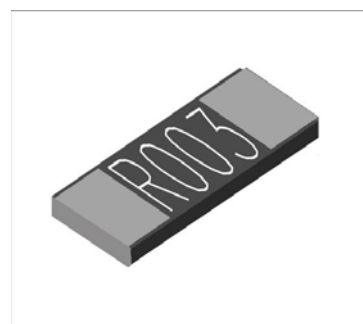


Ultra Low Ohm (Metal Strip) Chip Resistor – LR Series

Features

- Ideal for all types of current sensing, voltage division and pulse applications including and linear power supplies
- Proprietary processing technique produces extremely low resistance values.
- High-temperature performance (up to +275°C)
- Very Low Inductance 0.5nH to 5nH
- Excellent frequency response
- Low thermal EMF(1uV/°C)
- Lead(Pb) -free construction is ROHS-compliant



Applications

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

Part Numbering

LR
 12
 J
 T
 N
 S
 R003

① ② ③ ④ ⑤ ⑥ ⑦

① Product Type

Product Type	
LR	Ultra Low Ohm Metal Strip Chip Resistor

② Dimensions (L×W)

Codes	Dimensions (L×W)	EIA
LR06	3.15x1.60mm	1206
LR10	5.10x2.54mm	2010
LR12	6.25x3.30mm	2512
LR25	6.80x6.70mm	2725
LR28	6.70x7.20mm	2728

③ Resistance Tolerance

Codes	Resistance Tolerance
D	±0.5%
F	±1.0%
G	±2.0%
J	±5.0%

④ Packing

Codes	Type
T	Tape & Reel
B	Bulk Pack

⑤ TCR

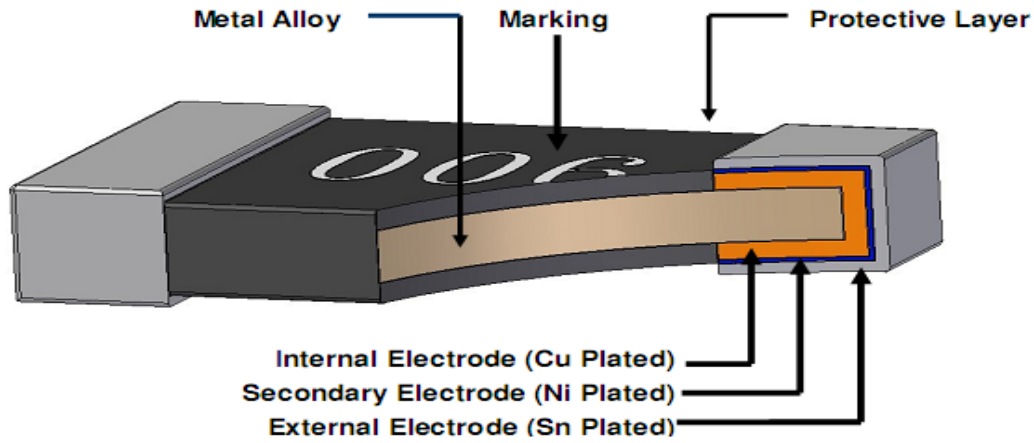
Codes	Type
N	±15PPM
C	±25PPM
D	±50PPM

⑥ Power Rating

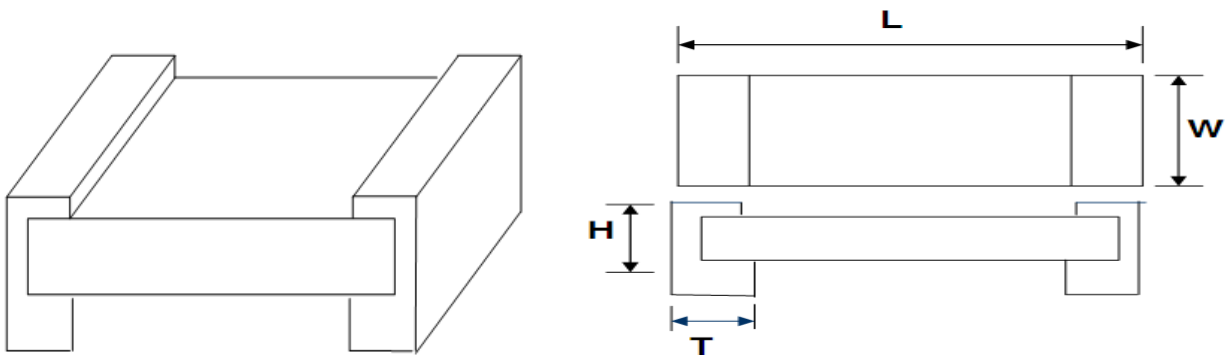
Codes	Type
T	1W
A	1.5W
S	2W
R	3W
C	3.5W
Q	4W

⑦ Resistance

Codes	Type
0005	0.5mΩ
R001	1mΩ
R010	10mΩ
R100	100mΩ

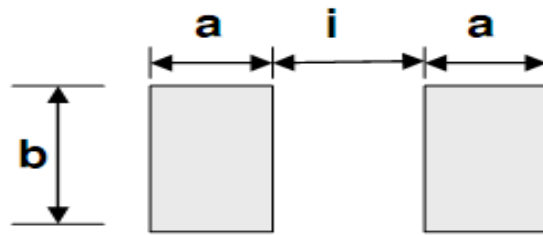


Dimensions



Unit: Inches (millimeters)

DIMENSIONS – in inches (millimeters)					
Model (W)	Resistance Range (mΩ)	L	W	H	T
LR1206 1.0W	1.0 ~ 50.0	0.12±0.01(3.15±0.254)	0.062±0.01(1.60±0.0254)	0.029±0.01(0.75±0.254)	0.02±0.01(0.5±0.254)
LR2010 1.0W	0.5 ~ 3.0	0.20±0.01 (5.1±0.254)	0.1±0.01 (2.54±0.254)	0.031±0.01 (0.8±0.254)	0.051±0.01 (1.6±0.254)
	3.1 ~ 100				0.031±0.01 (0.8±0.254)
LR2512 1.0&1.50W	0.5 ~ 4.0	0.246±0.01(6.25±0.254)	0.13±0.01(3.3±0.254)	0.031±0.01(0.8±0.254)	0.074±0.01(1.88±0.254)
	4.1 ~ 100.0				0.044±0.01(1.13±0.254)
LR2512 2.0W	0.5 ~ 4.0	0.246±0.01(6.25±0.254)	0.13±0.01(3.3±0.254)	0.031±0.01(0.8±0.254)	0.074±0.01(1.88±0.254)
	4.1 ~ 75.0				0.044±0.01(1.13±0.254)
LR2512 3.0W	0.5	0.246±0.01(6.25±0.254)	0.13±0.01(3.3±0.254)	0.031±0.01(0.8±0.254)	0.074±0.01(1.88±0.254)
	0.6 ~ 2.9 & 4.1~10.0				0.044±0.01(1.13±0.254)
	3.0 ~ 4.0				0.066±0.01(1.68±0.254)
LR2725 4.0W	0.25, 0.5	0.268±0.01(6.8±0.254)	0.264±0.01(6.7±0.254)	0.039±0.01(1.0±0.254)	0.085±0.01(2.15±0.254)
	1.0			0.043±0.01(1.1±0.254)	
	1.5			0.039±0.1(1.0±0.254)	
	2.0			0.035±0.01(0.9±0.254)	0.071±0.01(1.8±0.254)
	2.5				0.065±0.01(1.65±0.254)
	3.0				0.051±0.1(1.3±0.254)
LR2728 3, 3.5 & 4.0W	4.0 ~ 100.0	0.264±0.01(6.7±0.254)	0.283±0.01(7.2±0.254)	0.039±0.01(1.0±0.254)	0.045±0.01(1.15±0.254)



SOLDER PAD DIMENSIONS – in inches (millimeters)				
Type	Resistance Range (mΩ)	a	b	i
LR1206-1.0W	1.0 ~ 50.0	0.063(1.60)	0.086(2.158)	0.026(0.66)
LR2010-1.0W	0.5 ~ 3.0	0.071(1.80)	0.115(2.92)	0.048(1.22)
	3.1 ~ 100.0	0.090(2.29)		0.095(2.41)
LR2512-1.0 & 1.50W	0.5 ~ 4.0	0.120(3.05)	0.145(3.68)	0.050(1.27)
	4.1~100.0	0.083(2.11)		0.125(3.18)
LR2512-2.0W	0.5 ~ 4.0	0.120(3.05)		0.050(1.27)
	4.1 ~ 75.0	0.083(2.11)		0.125(3.18)
LR2512-3.0W	0.5 ~ 1.5	0.120(3.05)		0.050(1.27)
	1.6 ~ 10.0	0.083(2.11)		0.125(3.18)
LR2725-4.0W	0.25 ~ 3.0	0.125(3.18)	0.270(6.86)	0.052(1.32)
LR2728-3.0, 3.5 & 4.0W	4.0 ~ 100.0	0.108(2.75)	0.308(7.82)	0.138(3.51)

Standard Electrical Specifications

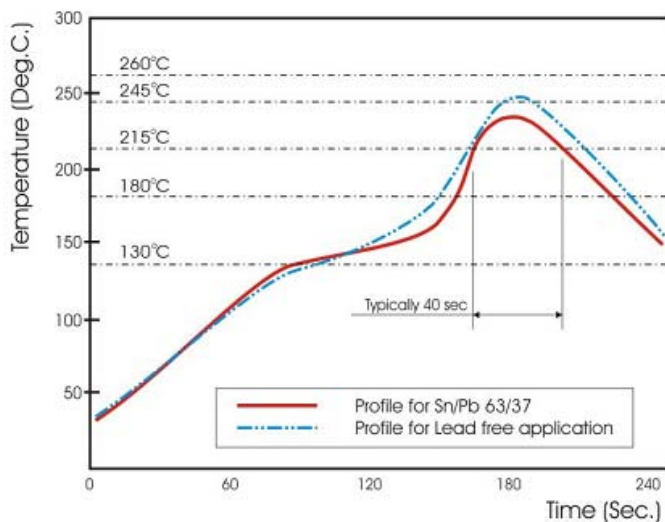
Modle	Power Rating At 100℃	MaxRating Current (A)	Max Overload Current(A)	TCR(PPM/℃)	Resistance Range (mΩ)		Operating Temperature
					±0.5%	±1%±2%±5%	
LR1206	1W	31.62	63.25	1.0 ~ 4.0mΩ : +50 4.1~15.0mΩ : -25 15.1~50.0mΩ : -15	7.0~50.0	1.0~50.0	-65℃ ~ +275℃
LR2010	1W	44.72	89.44	0.5~3.0mΩ : +50 3.1~6.9mΩ : -25 7.0~100mΩ : -15	3.0~100.0	0.5~100.0	
LR2512	1W	44.72	100.00		7.0~100.0	0.5~100.0	
	1.5W	54.77	122.48		7.0~75.0	0.5~75.0	
LR2512	2W	63.25	126.49	7.0~75.0			
LR2512	3W	77.46	134.16	0.5~2.0mΩ : +50 2.1~10.0mΩ : 25	7.0~10.0	0.5~10.0	
	LR2725	4W	126.49	252.95	0.25~0.9mΩ : +50 1.0~3.0mΩ : -25	-----	
LR2728	3W	27.39	47.43	4.0~7.0mΩ : -25 7.1~100mΩ : -15	4.0~100.0	4.0~100.0	
	3.5w	29.58	51.23				
	4W	31.62	63.25	4.0~7.0mΩ : -25 7.1~50mΩ : -15	4.0~50.0	4.0~50.0	

Performance

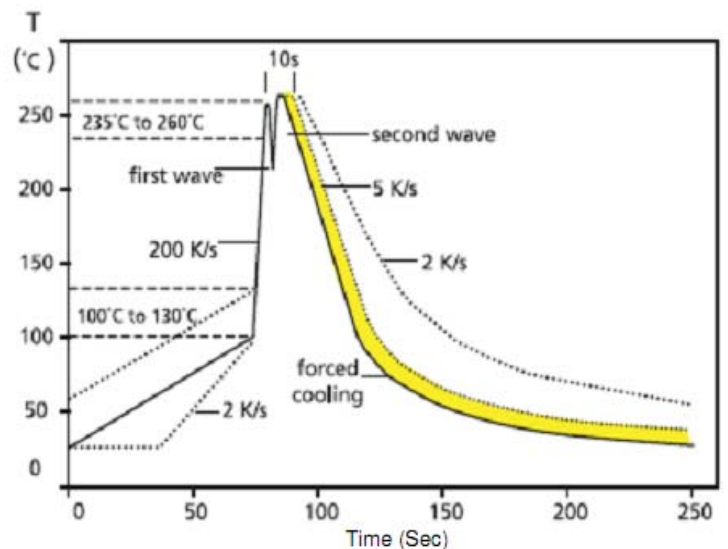
Test	Conditions of test	Test Limits
Thermal Shock	-55 °C ~ +150°C .1000cycles,15minutes at each extreme	$\pm(0.05\%+0.0005)\Delta R$
Short time overload	1W 5x , 2 W 4x, /3W 3x rated power for 5seconds	$\pm(0.05\%+0.0005)\Delta R$
Low temperature storage	-65 °C for 24hours	$\pm(0.05\%+0.0005)\Delta R$
High temperature exposure	1000 hours @ +170°C	$\pm(1.0\%+0.0005)\Delta R$
Bias Humidity	+85°C,85%RH,10% Bias,1000hours	$\pm(0.05\%+0.0005)\Delta R$
Mechanical Shock	100 grams for 6milliseconds,5 pulse	$\pm(0.05\%+0.0005)\Delta R$
Vibration	Frequency varied 10 to 2000 Hz in one minute,3 directors, 12 hours	$\pm(0.05\%+0.0005)\Delta R$
Load life	1000 hours @ rated power , + 100°C,1.5 hours "ON",0.5 hours "OFF"	$\pm(1.0\%+0.0005)\Delta R$
Resistance to solder heat	+ 260 Solder, 10~12 second dwell, 25 mm/second emergence	$\pm(0.05\%+0.0005)\Delta R$
Moisture Resistance	Mil-STS-202, Method 106, 0% power, 7a and 7b both required	$\pm(0.05\%+0.0005)\Delta R$

Recommend Soldering Conditions

Surface-mount components are tested for solder ability at a temperature of 25°C 3 seconds, typical examples of soldering processes that provide a reliable joints without any damage are given in below:



Recommended IR Reflow Soldering Profile



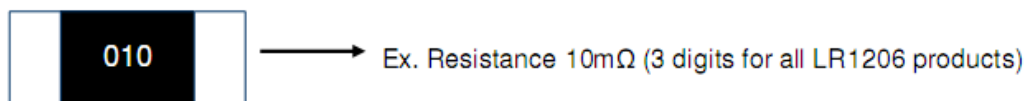
Recommended double-wave Soldering Profile

Typical values (solid line)

Process limits (dotted line)

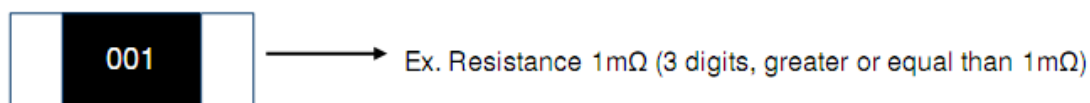
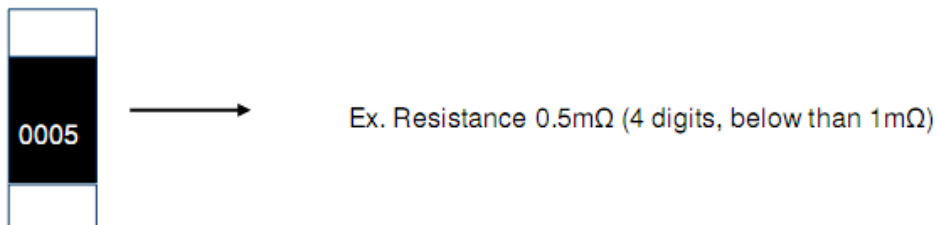
Marking

1. LR1206



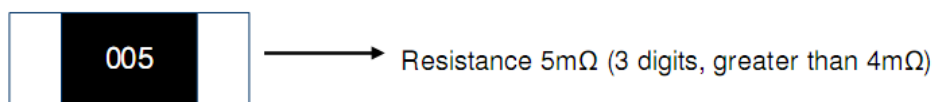
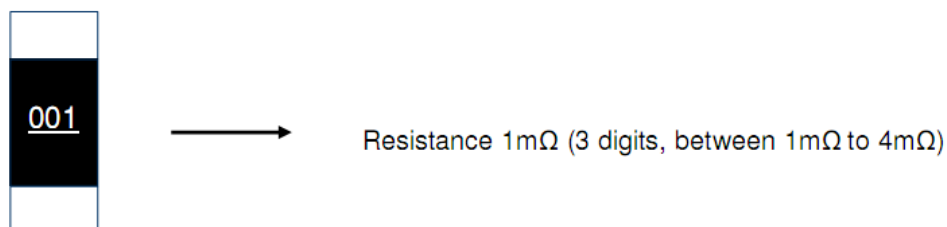
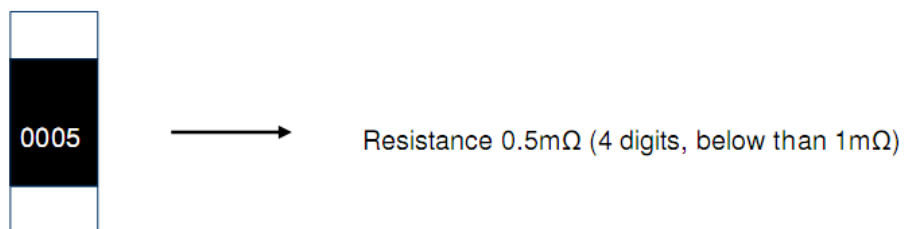
Note: The marking for the product of 001mΩ, 006mΩ, and 009mΩ will be under line for identification

2. LR2010



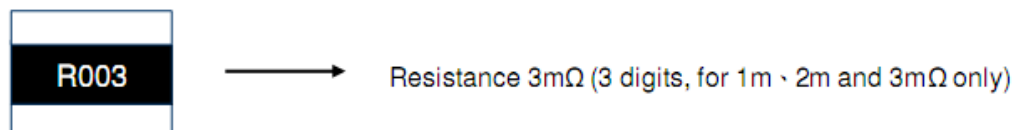
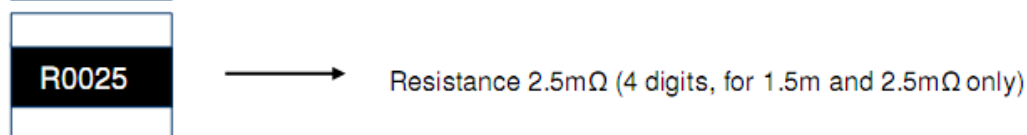
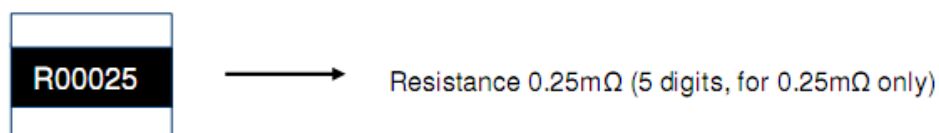
Note: The marking for the product of 001mΩ, 006mΩ, 009mΩ, 060mΩ, 090mΩ and 100mΩ will be under line for identification

3. LR2512



Note: The marking for the product of 001mΩ, 006mΩ, 009mΩ, 060mΩ, 090mΩ and 100mΩ will be under line for identification

4. LR2725

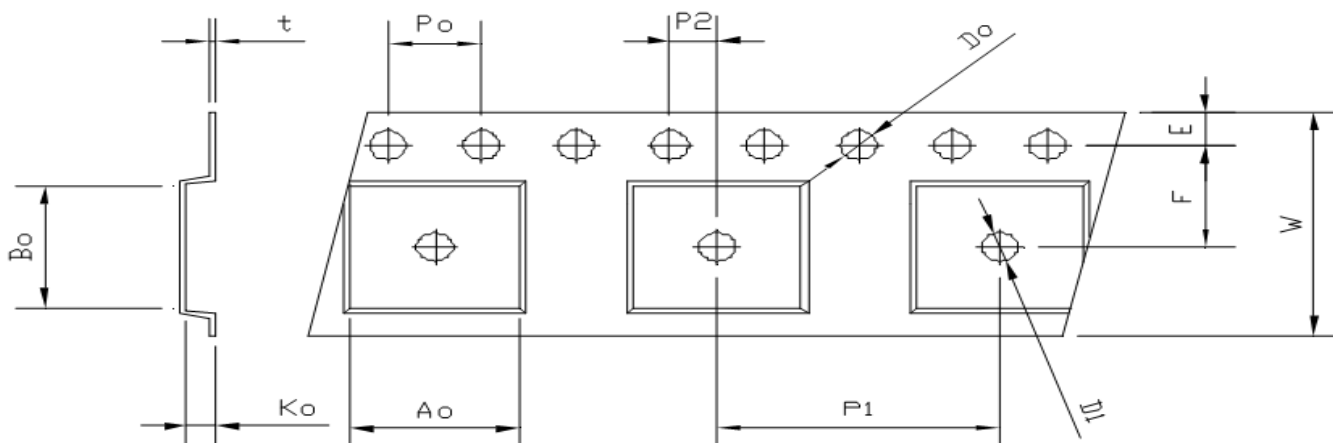


5.0 LR2728



Resistance 5mΩ (3 digits for all LR2728 products)

Packaging



Unit: mm

Item	W	P1	E	F	Do	D1	P0	Po*10	P2	Ao	Bo	Ko	t
LR1206	8.00	4.00	1.75	3.50	1.55	1.00	4.00	40.00	2.00	1.83	3.50	0.90	0.20
LR2010	12.00	4.00	1.75	5.50	1.50	1.50	4.00	40.00	2.00	2.90	5.45	1.10	0.23
LR2512	12.00	8.00	1.75	5.50	1.55	1.50	4.00	40.00	2.00	3.90	6.74	1.08	0.24
LR2725	12.00	8.00	1.75	5.50	1.50	1.50	4.00	40.00	2.00	6.75	7.15	1.70	0.25
LR2728	12.00	12.00	1.75	5.50	1.55	1.55	4.00	40.00	2.00	7.70	7.15	1.20	0.25
Tolerance	±0.15	±0.10	±0.10	±0.10	±0.05	±0.10	±0.10	±0.20	±0.10	±0.10	±0.10	±0.10	±0.05

Quantity for per Reel

Modle	LR1206	LR2010	LR2512	LR2725	LR2728
Quantity (Pieces/reel)	2000	2000	1000	1000	1000

Notice for application

- (1) Circumstance please avoid the conceive circumstance like the Ammonium, Ionic and Halogen gasses. These kinds of gasses erode the solder plating of electrode to trouble soldering and cause open circuit.
- (2) Soldering iron operation (inclusive of repair).
Soldering iron to shall be slowly applied so as not to float the chip. Tip temperature shall be under 310°C, time is within 3 seconds each. Iron Tip application to the same point shall be 3 times. For more than 3 times, please change the chip to fresh one.
- (3) Flow soldering
First please apply flux and then pre-heat (normally 130~150°C, 1~3 min) Soldering bath temperature shall be under 260°C, time be within 10 seconds, in case of double wave soldering, total time shall be within 10 sec.

(4) Positioning

Chip resistors shall be free from the bending and wrapping stress. Please avoid to place them nearly to the breaking line and high stress area. Please take that sometimes wiring resistance comes up to several percent of the chip's resistance into consideration.

(6) Coating treatment

The chip's resistance is sometimes affected by the resin coating or potting. Please confirm it prior to application.

(5) Thermal effect design

Please confirm thermal effects in using conditions because the resistor is a heat-up part.