



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



■ Features

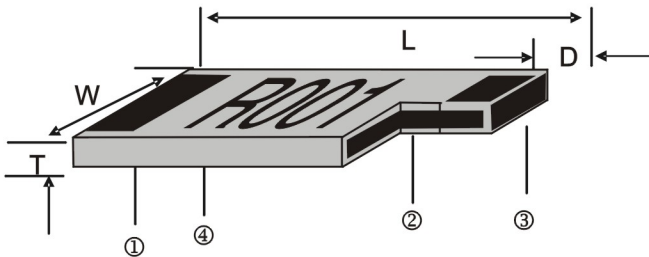
- High power rating up to 3 Watts
- Low TCR down to ± 50 PPM/ $^{\circ}\text{C}$
- Resistance values from 0.5m to 15m ohm
- Customized resistance available
- Wide range package sizes 1206 / 2010 / 2512

■ Applications

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

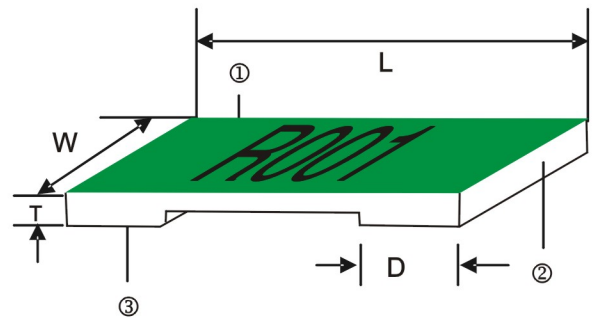
■ Construction & Dimension

2512



Black – Wave or IR reflow soldering

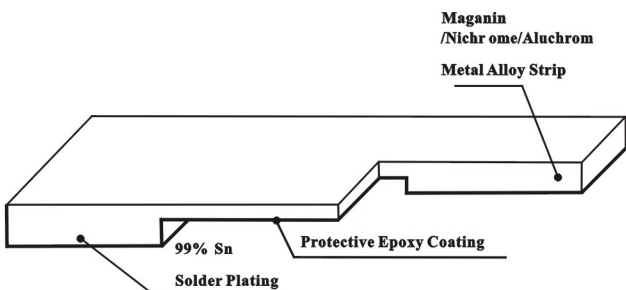
① Solder Plating (Sn)	③ Barrier Layer (Ni)
② Alloy Plate	④ Overcoat



Green – IR reflow soldering only

① Overcoat	③ Solder Plating
② Alloy Plate	

1206 & 2010



Type	Material
0M50~ R003	Manganese, Copper
3M5~ R010	Aluminum, Iron, Chromium



■ Dimensions

Unit: mm

Part No.	Resistance (mΩ)	L	W	T	D	Weight (g) (1000pcs)
LR06□TF0M50	0.5	3.20±0.25	1.60±0.10	0.60±0.20	1.35±0.25	22.6
LR06□TD0M75	0.75	3.20±0.25	1.60±0.10	0.60±0.20	1.23±0.25	22.6
LR06□T□□□□□	1.0, 3.5, 4.0, 5.0, 6.0	3.20±0.25	1.60±0.10	0.60±0.20	1.10±0.25	22.6
LR06□T□□□□□	2.0, 3.0, 10	3.20±0.25	1.60±0.10	0.60±0.20	0.60±0.25	22.6
LR06□T□□□□□	1.2, 1.5, 7.0, 8.0, 9.0	3.20±0.25	1.60±0.10	0.60±0.20	0.90±0.25	22.6
LR10□TEA0M50	0.5	5.08±0.25	2.54±0.15	0.60±0.20	2.17±0.25	42.3
LR10□TDA0M75	0.75	5.08±0.25	2.54±0.15	0.60±0.20	2.04±0.25	42.3
LR10□TDAR001	1.0	5.08±0.25	2.54±0.15	0.60±0.20	1.84±0.25	42.3
LR10□TDA□□□□	2.0, 6.0, 7.0, 8.0	5.08±0.25	2.54±0.15	0.60±0.20	1.54±0.25	42.3
LR10□TDAR003	3.0	5.08±0.25	2.54±0.15	0.60±0.20	1.04±0.25	42.3
LR10□TDA□□□□	4.0, 5.0	5.08±0.25	2.54±0.15	0.60±0.20	1.84±0.25	42.3
LR10□TDA□□□□	9.0, 10	5.08±0.25	2.54±0.15	0.60±0.20	1.29±0.25	42.3
LR12□T□□0M50G	0.50	6.35±0.25	3.00±0.20	0.60±0.20	2.68±0.25	59.13
LR12□T□□0M75G	0.75	6.35±0.25	3.00±0.20	0.60±0.20	2.48±0.25	59.13
LR12□T□□□□□□G	1.0, 6.0	6.35±0.25	3.00±0.20	0.60±0.20	1.93±0.25	59.13
LR12□T□□□□□□G	1.5, 6.5, 7.0	6.35±0.25	3.00±0.20	0.60±0.20	1.43±0.25	59.13
LR12□T□□□□□□G	2.0, 2.5, 3.0, 3.5	6.35±0.25	3.00±0.20	0.60±0.20	1.18±0.25	59.13
LR12□T□□□□□□G	4.0, 4.5	6.35±0.25	3.00±0.20	0.60±0.20	2.18±0.25	59.13
LR12□T□□□□□□G	5.0, 6.0	6.35±0.25	3.00±0.20	0.60±0.20	1.93±0.25	59.13
LR12□T□□□□□□G	8.0 - 10	6.35±0.25	3.00±0.20	0.60±0.20	1.18±0.25	59.13
LR12□T□□□□□G	11-15	6.35±0.25	3.00±0.20	0.60±0.20	1.18±0.25	59.13
LR12□T□□0M50	0.50	6.35±0.254	3.18±0.254	1.25±0.20	1.30±0.38	181.10
LR12□T□□0M75	0.75	6.35±0.254	3.18±0.254	0.75±0.20	1.30±0.38	127.06
LR12□T□□R001	1.00	6.35±0.254	3.18±0.254	0.65±0.20	1.30±0.38	108.81
LR12□T□□1M50	1.50	6.35±0.254	3.18±0.254	0.45±0.20	1.30±0.38	63.92
LR12□T□□R002	2.00	6.35±0.254	3.18±0.254	0.35±0.20	1.30±0.38	46.92
LR12□T□□2M50	2.50	6.35±0.254	3.18±0.254	0.65±0.20	1.30±0.38	97.95
LR12□T□□R003	3.00	6.35±0.254	3.18±0.254	0.55±0.20	1.30±0.38	83.49
LR12□T□□R004	4.00	6.35±0.254	3.18±0.254	0.45±0.20	1.30±0.38	62.59
LR12□T□□R005	5.00	6.35±0.254	3.18±0.254	0.35±0.20	1.30±0.38	49.84
LR12□T□□R006	6.00	6.35±0.254	3.18±0.254	0.32±0.20	1.30±0.38	41.76
LR12□T□□6M50	6.50	6.35±0.254	3.18±0.254	0.30±0.20	1.30±0.38	35.85
LR12□T□□R007	7.00	6.35±0.254	3.18±0.254	0.27±0.20	1.30±0.38	34.01
LR12□T□□R010	10.00	6.35±0.254	3.18±0.254	0.25±0.20	1.30±0.38	25.97

■ Part Numbering

LR	12	J	T	E	S	R002	G
Product Type	Dimensions (L×W)	Resistance Tolerance	Packaging Code	TCR (PPM/°C)	Power Rating	Resistance	Marking
LR LRP	06: 1206 10: 2010 12: 2512	F: ±1% H: ±3% J: ±5%	T: Taping Reel	D: ±50 E: ±100 W: ±75 F: ±200 K: ±150	: Standard A: 1.5W B: 2.5W R: 3W S: 2W T: 1W	R002: 0.002Ω R010: 0.01Ω 0M50: 0.0005Ω 1M50: 0.0015Ω	: Black Coating G: Green Coating **2010/1206 No coating / marking



Standard Electrical Specifications

Item Part No.	Power Rating at 80 °C	Operating Temp. Range	Resistance Range (mΩ)			TCR (PPM/°C)
			±1%	±3%	±5%	
LR06□TF0M50	1W	-55°C ~ +170°C	0.5			±200
LR06□TD□□□□	1W		0.75 - 10			±50
LR12□TD□□□□	1W		0.5, 0.75, 1, 1.5, 2			±50
LR12□TW□□□□	1W		6, 6.5, 7			±75
LR12□TE□□□□	1W		4, 5, 10			±100
LR12□TK□□□□	1W		2.5, 3			±150
LR12□TD□□□□G	1W		11, 12, 13, 14, 15			±50

Operating Current= $\sqrt{P/R}$, Operating Voltage= $\sqrt{P*R}$

High Power Rating Electrical Specifications

Item Part No.	Power Rating at 80 °C	Operating Temp. Range	Resistance Range (mΩ)			TCR (PPM/°C)
			±1%	±3%	±5%	
LR10□TEA0M50	1.5W	-55°C ~ +170°C	0.5			±100
LR10□TDA□□□□	1.5W		0.75 - 10			±50
LR12□TDS□□□□	2W		0.5, 0.75, 1, 1.5, 2			±50
LR12□TWS□□□□	2W		6, 6.5, 7			±75
LR12□TES□□□□	2W		4, 5, 10			±100
LR12□TKS□□□□	2W		2.5, 3			±150
LR12□TDS□□□□G	2W		6.5, 7, 8, 9, 10			±50
LR12□TDB□□□□G	2.5W		4, 4.5, 5, 6			±50
LR12□TDR□□□□G	3W		1, 1.5, 2, 2.5, 3, 3.5			±50
LR12□TER□□□□G	3W		0.5, 0.75			±100

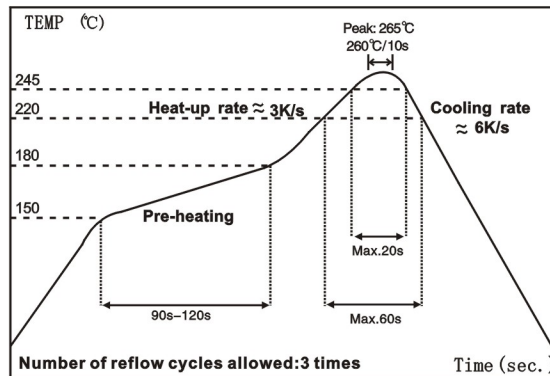
Operating Current = $\sqrt{P/R}$, Operating Voltage= $\sqrt{P*R}$

Thunder has the ability of manufacture following options based on customer's requirement.

High Power Rating Up To 3 Watts Low TCR To ±75PPM

Item Part No.	Power Rating at 70 °C	Operating Temp. Range	Resistance Range (mΩ)			TCR (PPM/°C)
			±1%	±3%	±5%	
LPR12(2512)	1W,2W,3W	-55°C ~ +170°C	7-100			± 75
			15-100			± 50

■ Reflow



- Green coating “Reflow Air Convection” is available
- Green coating can't be working with wave soldering bath

■ Environmental Characteristics

Item	Requirement		Test Method
	Black coating	Green coating	
Temperature Coefficient of Resistance (T.C.R.)	As Spec.		MIL-STD-202 Method 304 +25/-55/+25/+125/+25°C
Short Time Overload	$\pm 0.5\%$	$\pm 1\%$	JIS-C-5201-1 5.5 5*rated power for 5 seconds
Endurance	$\pm 1\%$	$\pm 1\%$	MIL-STD-202 Method 108A 70 $\pm 2^\circ\text{C}$, Max. working voltage for 1000 hrs with 1.5 hrs “ON” and 0.5 hrs “OFF”
Dry Heat	$\pm 1\%$	$\pm 1\%$	JIS-C-5201-1 7.2 at +170°C for 1000 hrs
Solderability	95% min. coverage		MIL-STD-202 Method 208H 245 $\pm 5^\circ\text{C}$ for 3 seconds
Resistance to Soldering Heat	$\pm 0.5\%$	$\pm 1\%$	MIL-STD-202 Method 210E 260 $\pm 5^\circ\text{C}$ for 10 seconds
Thermal Shock	$\pm 0.5\%$	$\pm 1\%$	MIL-STD-202 Method 107G -55°C ~ 150°C, 100 cycles

**Green coating can't be work with wave soldering bath.

■ Storage Temperature: 25 $\pm 3^\circ\text{C}$; Humidity < 80%RH

■ Derating Curve

