

Data Sheet

Customer:

Product: Ultra Low Ohm (Metal Strip) Chip Resistor -LR Series

Size: 2512

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Ultra Low Ohm (Metal Strip) Chip Resistor



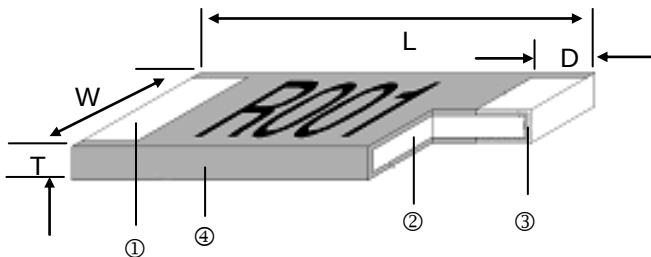
■Features

- High power rating up to 3 Watts
- Low TCR down to ± 50 PPM/ $^{\circ}\text{C}$
- Resistance values from 0.5m to 10m ohm
- Customized resistance available
- Wide range package sizes 2512
- AEC-Q200 Compliance

■Applications

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

■Construction & Dimension



Black – Wave or Reflow soldering

① Solder Plating	③ Barrier Layer
② Alloy Plate	④ Overcoat

■Part Numbering

LR	12	J	T	E	S	R002	
Product Type	Dimensions (L×W)	Resistance Tolerance	Packaging Code	TCR (PPM/ $^{\circ}\text{C}$)	Power Rating	Resistance	Marking
	12: 2512	F: $\pm 1\%$ H: $\pm 3\%$ J: $\pm 5\%$	T: Taping Reel	D: ± 50 E: ± 100 W: ± 75 K: ± 150	: Standard R: 3W S: 2W	R002: 0.002 Ω R010: 0.01 Ω 0M50: 0.0005 Ω 1M50: 0.0015 Ω	: Black Coating

■ Dimensions

Part No.	Resistance (mΩ)	L	W	T	D	Weight (g) (1000pcs)
LR12□T□□0M50	0.50	6.35±0.254	3.18±0.254	1.25±0.20	1.85±0.38	184.11
LR12□T□□0M75	0.75	6.35±0.254	3.18±0.254	0.75±0.20	1.55±0.38	131.11
LR12□T□□R001	1.00	6.35±0.254	3.18±0.254	0.65±0.20	1.55±0.38	110.85
LR12□T□□1M50	1.50	6.35±0.254	3.18±0.254	0.45±0.20	1.55±0.38	67.16
LR12□T□□R002	2.00	6.35±0.254	3.18±0.254	0.35±0.20	1.55±0.38	49.30
LR12□T□□2M50	2.50	6.35±0.254	3.18±0.254	0.65±0.20	1.40±0.38	97.95
LR12□T□□R003	3.00	6.35±0.254	3.18±0.254	0.55±0.20	1.40±0.38	83.49
LR12□T□□R004	4.00	6.35±0.254	3.18±0.254	0.45±0.20	1.40±0.38	62.59
LR12□T□□R005	5.00	6.35±0.254	3.18±0.254	0.35±0.20	1.40±0.38	49.84
LR12□T□□R006	6.00	6.35±0.254	3.18±0.254	0.32±0.20	1.40±0.38	41.76
LR12□T□□6M50	6.50	6.35±0.254	3.18±0.254	0.30±0.20	1.40±0.38	35.85
LR12□T□□R007	7.00	6.35±0.254	3.18±0.254	0.27±0.20	1.40±0.38	34.01
LR12□T□□R010	10.00	6.35±0.254	3.18±0.254	0.25±0.20	1.40±0.38	25.97

■ Standard Electrical Specifications

Item Part No.	Power Rating at 70°C	Operating Temp. Range	Resistance Range (mΩ)			TCR (PPM/°C)
			±1%	±3%	±5%	
LR12□TD□□□□	1W	-55°C ~ +170°C	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

■ High Power Rating Electrical Specifications

Item Part No.	Power Rating at 70°C	Operating Temp. Range	Resistance Range (mΩ)			TCR (PPM/°C)
			±1%	±3%	±5%	
LR12□TDS□□□□	2W	-55°C ~ +170°C	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□TDR□□□□	3W		0.5, 0.75, 1, 1.5, 2			±50
LR12□TWR□□□□	3W		6, 6.5, 7			±75
LR12□TER□□□□	3W		4, 5, 10			±100
LR12□TKR□□□□	3W		2.5, 3			±150

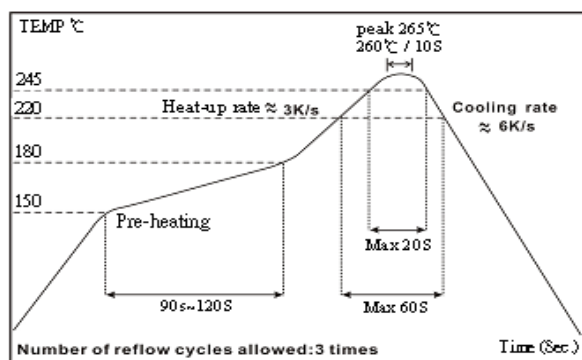
Operating Current = $\sqrt{(P/R)}$, Operating Voltage = $\sqrt{(P \cdot R)}$

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

■ Resistance codes example

Resistance	0.5mΩ	1.5mΩ	1mΩ	2mΩ	7mΩ	10mΩ
Marking	0M50	1M50	R001	R002	R007	R010

Reflow



■ Green coating "Reflow Air Convection" is available

■ Green coating can't be working with wave soldering bath

Environmental Characteristics

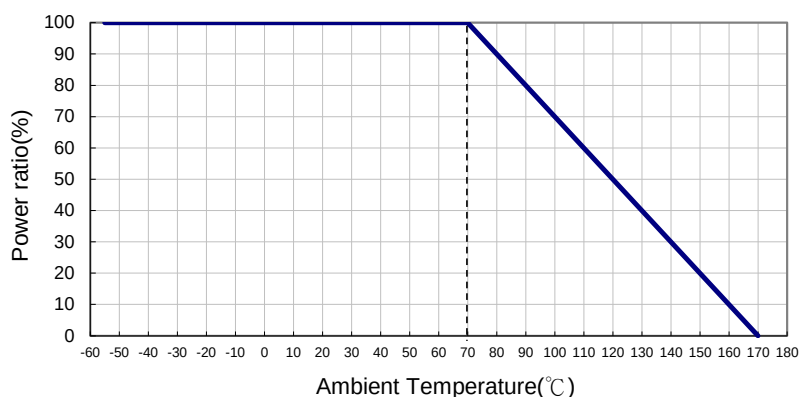
Item	Requirement	Test Method
Temperature Coefficient of Resistance (T.C.R.)	As Spec.	MIL-STD-202 Method 304 +25°C ~125°C, 25°C is the reference temperature
Short Time Overload	$\pm 0.5\%$	JIS-C-5201-1 5.5 5*rated power for 5 seconds
Endurance	$\pm 1\%$	MIL-STD-202 Method 108A 70 $\pm 2^\circ\text{C}$, RCWV for 1000 hrs with 1.5 hrs "ON" and 0.5 hr "OFF"
Dry Heat	$\pm 1\%$	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	$\pm 0.5\%$	MIL-STD-202 Method 210E 260 $\pm 5^\circ\text{C}$ for 10 seconds
Thermal Shock	$\pm 0.5\%$	MIL-STD-202 Method 107G -55°C ~ 150°C, 100 cycles

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

RCWV(Rated Continuous Working Voltage)= $\sqrt{P \cdot R}$ or Max. Operating Voltage whichever is lower

■ Storage Temperature: 15~28°C; Humidity < 80%RH

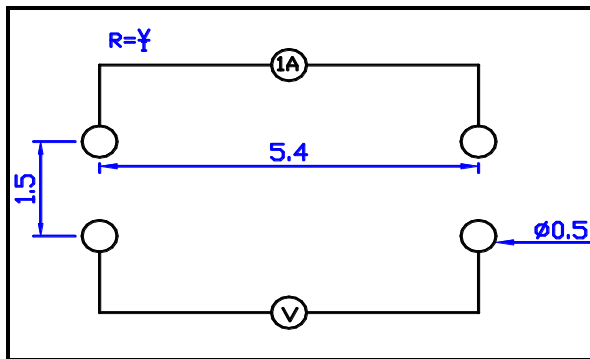
Derating Curve



■ Measurements

1. LR12 4-wire precision measurement

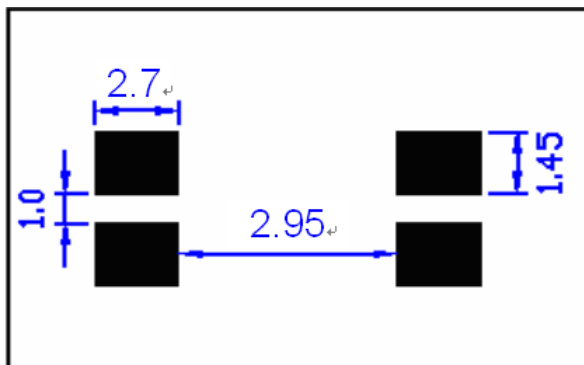
- Equipment: ADEX AX-1152D DC Low Ohm Meter
- Excitation Current: 3A (0.5mΩ~1.5 mΩ)
1A (2mΩ~10mΩ)



Unit: mm

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

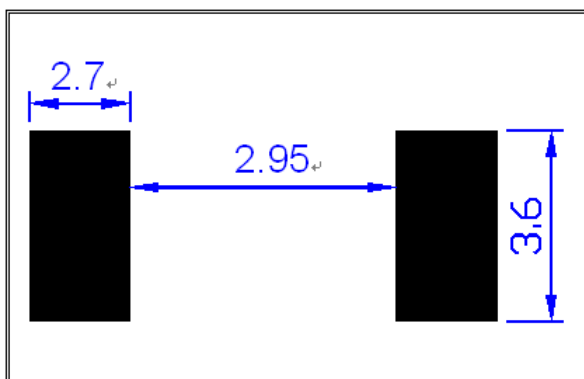
- Note: No circuits between pads to avoid short circuit



Unit: mm

3. LR12 2-wire pad layout

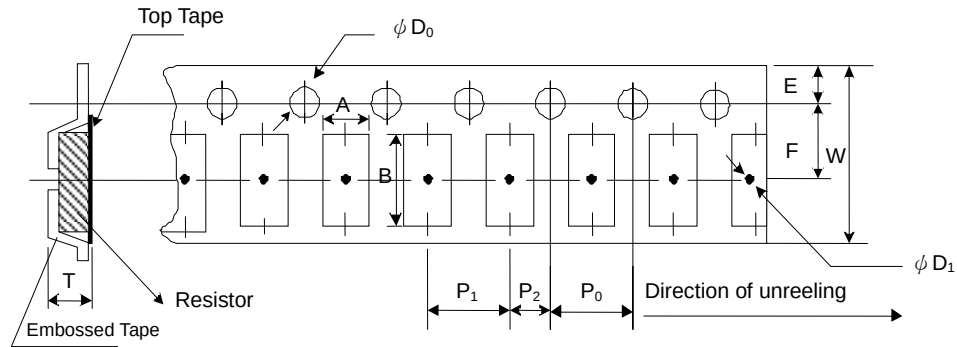
- Note: No circuits between pads to avoid short circuit



Unit: mm

■ Packaging

Embossed Plastic Tape Specifications



Unit: mm

Type	Resistance (mΩ)	A	B	W	E	F	P ₀	P ₁	P ₂	ΦD ₀	ΦD ₁	T	Quantity (EA)
LR12	0.50 - 0.75	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	1.55±0.05	1.4min.	1.45±0.2	2,000
	1 - 10											0.81±0.1	

1. The cumulative tolerance of 10 sprockets hole pitch is $\pm 0.2\text{mm}$.
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.