

Data Sheet

Customer: _____

Product: Automotive Grade Low Ohm (Metal Strip) Chip Resistor –
LRP..A Series

Size: 1206/2010/2512

Issued Date: 01-Sep-23

Edition: REV.A5-1



VIKING TECH CORPORATION
光頤科技股份有限公司
No.70 Guangfu N. Rd., Hukou
Township, Hsinchu County 303,
Taiwan

TEL:886-3-5972931
FAX:886-3-5972935•886-3-5973494
E-mail:sales@viking.com.tw

VIKING TECH CORPORATION KAOHSIUNG BRANCH
光頤科技股份有限公司高雄分公司
No.248-3, Sin-Sheng Rd., Cian-Jhen Dist., Kaohsiung,
806, Taiwan

TEL:886-7-8217999
FAX:886-7-8228229
E-mail:sales@viking.com.tw

VIKING ELECTRONICS (WUXI) CO., LTD.
光頤電子(無錫)有限公司
No.22 Xixia Road, Machinery & Industry Park,
National Hi-Tech Industrial Development Zone
of Wuxi, Wuxi, Jiangsu Province, China
Zip Code:214028
TEL:86-510-85203339
FAX:86-510-85203667•86-510-85203977
E-mail:china@viking.com.tw

Produced by (QC)	Checked (QC)	Approved by (QC)	Prepared by (Sales)	Accepted by (Customer)
01-Sep-23	01-Sep-23	01-Sep-23		
Alice Hsiao	Susan Huang	Susan Huang		

Automotive Grade Low Ohm (Metal Strip) Chip Resistor- LRP..A Series

Features

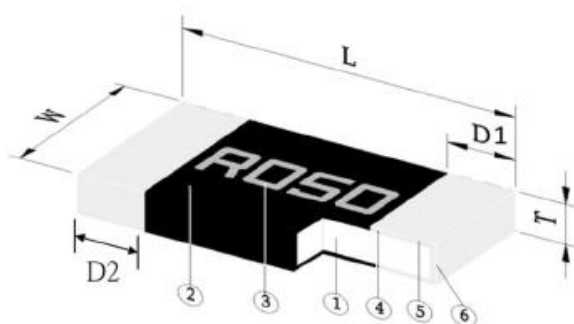
- Low TCR down to ± 25 PPM/ $^{\circ}$ C
- Customized resistance available
- Low inductance < 5 nH
- AEC-Q200 Compliance
- Sulfur resistance unaffected by sulfur environments
- Lead-free and RoHS compliant
- 100% CCD inspection



Applications

- NB (for Power Management)
- MB (for Power Management)
- SWPS (DC-DC Converter, Charger, Adaptor)
- Monitor (for Power Management)
- Industrial / Power supply
- Automotive

Construction



① Alloy Plate	④ Internal Electrode
② Overcoat	⑤ Barrier Layer
③ Marking	⑥ Solder Plating

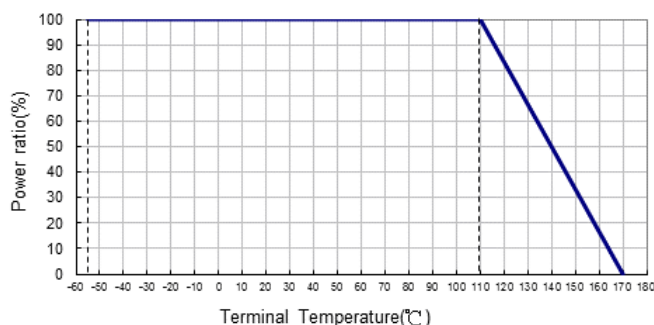
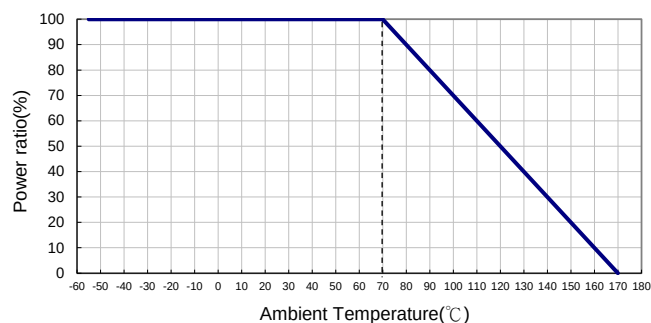
Dimensions

Type	Size (Inch)	L (mm)	W (mm)	T (mm)	D (mm)	D2 (mm)	Weight (g) (1000pcs)
LRP06	1206	3.15 $\pm$ 0.10	1.45 $\pm$ 0.10	0.55 $\pm$ 0.10	0.55 $\pm$ 0.15	0.55 $\pm$ 0.15	10.5
LRP10	2010	5.00 $\pm$ 0.15	2.40 $\pm$ 0.15	0.55 $\pm$ 0.15	0.80 $\pm$ 0.20	0.80 $\pm$ 0.20	40.0
LRP12 (2~200m Ω)	2512	6.40 $\pm$ 0.25	3.20 $\pm$ 0.25	0.70 $\pm$ 0.20	0.90 $\pm$ 0.30	0.90 $\pm$ 0.30	52.6
LRP12 (1.5m Ω)	2512	6.40 $\pm$ 0.25	3.20 $\pm$ 0.25	0.70 $\pm$ 0.20	0.90 $\pm$ 0.30	1.45 $\pm$ 0.30	52.6
LRP12 (1m Ω)	2512	6.40 $\pm$ 0.25	3.20 $\pm$ 0.25	0.70 $\pm$ 0.20	0.90 $\pm$ 0.30	1.85 $\pm$ 0.30	52.6

Part Numbering

LRP	12	F	T	D	S	R015	A	059
Product Type	Dimensions (L×W)	Resistance Tolerance	Packaging Code	TCR (PPM/ $^{\circ}$ C)	Power Rating	Resistance	Marking	Internal
	06: 1206 10: 2010 12: 2512	D: $\pm 0.5\%$ F: $\pm 1\%$ J: $\pm 5\%$	T: Taping Reel	C: ± 25 D: ± 50 W: ± 75 E: ± 100	R: 3W S: 2W T: 1W	R015: 0.015 Ω R050: 0.05 Ω	A: Automotive Grade	

Derating Curve



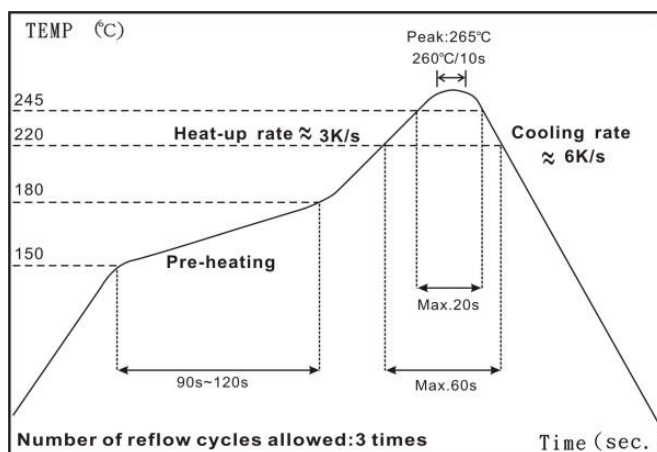
Electrical Specifications

Type \ Item	Power Rating at 70°C	Rated Terminal Temperature	Operating Temp. Range	Resistance Range (mΩ)			TCR (PPM/°C)
				±0.5%	±1%	±5%	
LRP06 (1206)	1W	110°C	-55 ~ +170°C	8, 10, 12, 15, 20, 25, 30, 33, 40			±50
				3, 4, 5, 7, 8, 10, 12, 15, 20, 25, 30, 33, 40			±75 ±100
LRP10 (2010)	1W	110°C	-55 ~ +170°C	4, 5, 10, 15, 20, 30, 50, 68, 75, 100			±75
	2W	110°C		4, 5, 10, 15, 20, 30, 50, 68, 75			
LRP12 (2512)	2W, 3W	110°C	-55 ~ +170°C	3, 4, 5, 6, 7, 18, 20, 22, 25, 30, 33, 35, 39, 40, 47, 50, 60, 68, 70, 75, 80, 82, 90, 91, 100, 120, 150, 180, 200			±25
				1, 1.5, 2, 2.5, 3, 4, 5, 6, 7, 8, 8.5, 9, 10, 12, 15, 18, 20, 22, 25, 30, 33, 35, 39, 40, 47, 50, 60, 68, 70, 75, 80, 82, 90, 91, 100, 120, 150, 180, 200			±50 ±75

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

■ Viking is capable of manufacturing the optional spec based on customer's requirement.

Soldering Condition



IR Reflow Soldering

(1) Time of IR reflow soldering at maximum temperature point 260°C : 10s

■Environmental Characteristics

Item	Requirement	Test Method
Temperature Coefficient of Resistance (T.C.R.)	As Spec.	IEC60115-1 4.8 JIS-C-5201-1 4.8 +25°C ~125°C, 25°C is the reference temperature
Short Time Overload	±1.0%	IEC60115-1 4.13 JIS-C-5201-1 4.13 5*rated power for 5 seconds
Insulation Resistance	≥10G	IEC60115-1 4.6 JIS-C-5201-1 4.13 100V DC for 1 minute
Endurance	±1.0%	IEC60115-1 4.25 JIS-C-5201-1 4.25.1 70±2°C, rated power for 1000 hrs with 1.5 hrs "ON" and 0.5 hr "OFF"
Biased Humidity	±1.0%	MIL-STD-202 Method 103 1000 hrs 85°C/85%RH 10% of operating power
High Temperature Exposure	±1.0%	MIL-STD-202 Method 108 at +170°C for 1000 hrs
Board Flex	±1.0%	AEC-Q200-005 Bending once for 60 seconds 3mm
Solderability	95% min. coverage	JIS-C-5201-1 4.17 IEC-60115-1 4.17 245±5°C for 3 seconds
Resistance to Soldering Heat	±0.5%	JIS-C-5201-1 4.18 IEC-60115-1 4.18 260±5°C for 10 seconds
Temperature Cycling	±1.0%	JESD22 Method JA-104 -55°C to +125°C, 1000 cycles
Low Temperature Storage	±1.0%	IEC60115-1 4.23.4 JIS-C-5201-1 4.23.4 at -55°C for 2 hrs
Mechanical Shock	±(0.25%+0.05Ω)	MIL-STD-202 Method 213 Wave Form: Tolerance for half sine shock pulse. Peak value is 100g's. Normal duration (D) is 6.
Vibration	±(0.5%+0.05Ω)	MIL-STD-202 Method 204 5 g's for 20 min., 12 cycles each of 3 orientations, 10-2000 Hz
ESD	±(3%+0.05Ω)	AEC-Q200-002 Human body model: 2KV
Resistance to Solvents	No visible damage on appearance and marking.	MIL-STD-202 Method 215 Add Aqueous wash chemical - OKEM Clean or equivalent. Do not use banned solvents.
Terminal Strength	No broken	AEC-Q200-006 Force of 1.8kg for 60 seconds.
Flammability	No ignition of the tissue paper or scorching or the pinewood board	UL-94 V-0 or V-1 are acceptable. Electrical test not required.

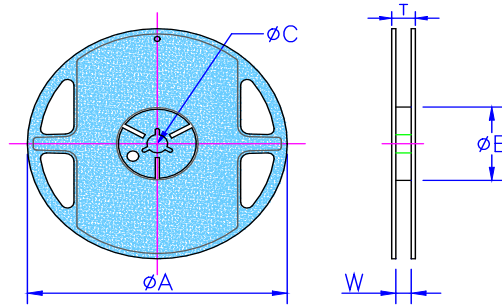
RCWV(Rated Continuous Working Voltage)= $\sqrt{(P \times R)}$ or Max. Operating Voltage whichever is lower.

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

■Shelf Life: 2 years from production date.

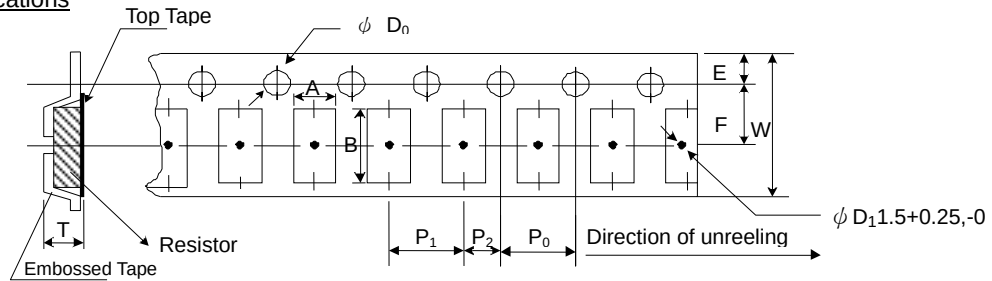
Packaging

Reel Specifications & Packaging Quantity



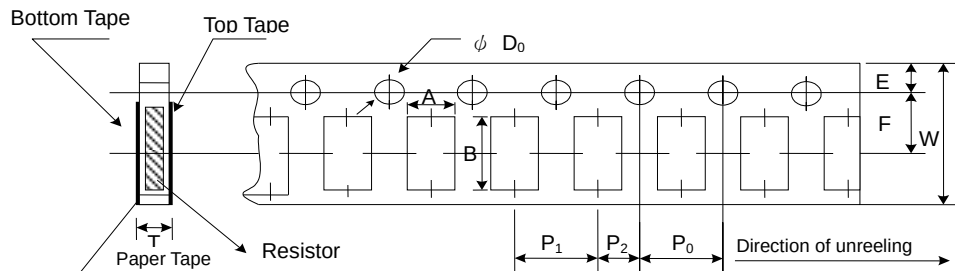
Type	Resistance (mΩ)	Packaging Quantity		Tape Width	Reel Diameter	ΦA (mm)	ΦB (mm)	ΦC (mm)	W (mm)	T (mm)
LRP06	3~40	Paper	5K	8mm	7 inch	178.5±1.5	60 ^{+1/-0}	13.0±0.2	9.0±0.5	12.5±0.5
LRP10	4~100	Embossed	4K	12mm	7 inch	178.5+/-1.5	60±1.0	13.0±0.5	13.0±1.0	15.5±0.5
LRP12	1~200	Embossed	4K	12mm	7 inch	178.5+/-1.5	60±1.0	13.0±0.5	13.0±1.0	15.5±0.5

Embossed Plastic Tape Specifications



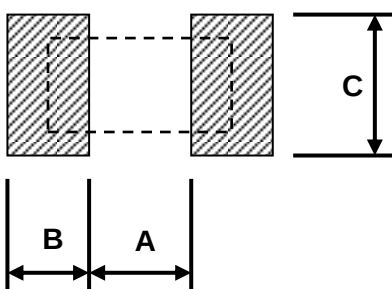
Type	A (mm)	B (mm)	W (mm)	E (mm)	F (mm)	P ₀ (mm)	P ₁ (mm)	P ₂ (mm)	ΦD ₀ (mm)	T (mm)
LRP10	2.80±0.10	5.40±0.20	12.0±0.30	1.75±0.10	5.5±0.05	4.00±0.10	4.00±0.10	2.00±0.05	1.50+0.1, -0	1.20+0
LRP12	3.50±0.10	6.70±0.10	12.0±0.30	1.75±0.10	5.5±0.05	4.00±0.10	4.00±0.10	2.00±0.05	1.50+0.1, -0	1.20+0

Paper Tape Specifications



Type	A (mm)	B (mm)	W (mm)	E (mm)	F (mm)	P ₀ (mm)	P ₁ (mm)	P ₂ (mm)	ΦD ₀ (mm)	T (mm)
LRP06	1.90±0.10	3.50±0.20	8.0±0.20	1.75±0.10	3.50±0.05	4.00±0.10	4.00±0.05	2.00±0.05	1.50+0.1, -0	0.85±0.10

Recommend Land Pattern



Type	A (mm)	B (mm)	C (mm)
LRP06	1.50	1.40	1.70
LRP10	3.60	1.40	2.50
LRP12 (2~200mΩ)	4.00	2.00	3.50
LRP12 (1~1.5mΩ)	2.30	2.65	3.50

* FR4 copper board, 100μm of copper pad thickness