

Low Ohm (Metal Strip) Chip Resistor- LRP Series

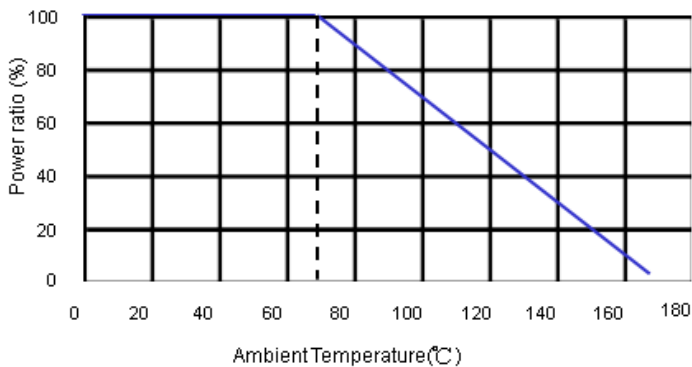
■ Features

- High power rating up to 3 Watts
- Low TCR down to ± 50 PPM/ $^{\circ}$ C
- Resistance values from $3\text{m}\Omega$ to $200\text{m}\Omega$
- Customized resistance available
- Low inductance $< 5\text{nH}$
- AEC-Q200 Compliance (LRP12 $3\text{m}\Omega$ to $200\text{m}\Omega$)
- Sulfur resistance unaffected by sulfur environments

■ Applications

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

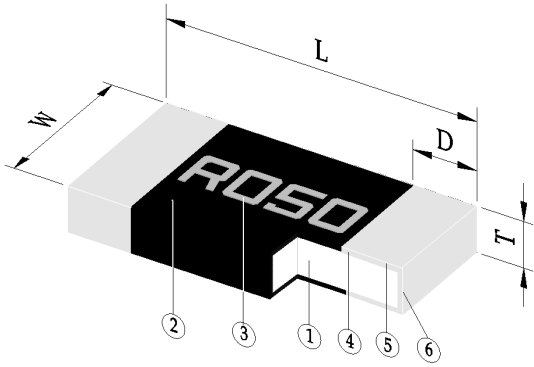
■ Derating Curve



■ Part Numbering

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

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)	Weight (g) (1000pcs)
LRP06	1206	3.10±0.10	1.60±0.10	0.60±0.10	0.45±0.15	10.5
LRP12	2512	6.40±0.25	3.20±0.25	0.70±0.20	0.90±0.30	52.6

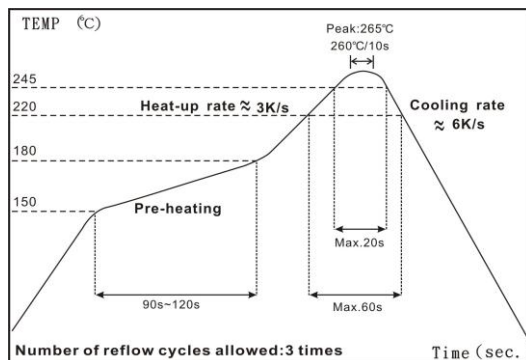
Electrical Specifications

Type	Item	Power Rating at 70°C	Operating Temp. Range	Resistance Range (mΩ)			TCR (PPM/°C)
				±0.5%	±1%	±5%	
LRP06 (1206)		1W	-55 ~ +170°C	8、10、12、15、20			±100
LRP12 (2512)		2W, 3W	-55 ~ +170°C	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
				3, 4, 5, 6, 7, 8, 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			±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 (Reflow Soldering Only)



IR Reflow Soldering

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

Notice : Wave soldering and hand soldering are not available.

■ 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
Dry Heat	±1.0%	IEC60115-1 4.23.2 JIS-C-5201-1 4.23.2 at +170°C for 1000 hrs
Bending Strength	±1.0%	JIS-C-5201-1 4.33 IEC-60115-1 4.33 Bending width 2mm once for 5 seconds
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
Rapid Change of Temperature	±1.0%	JIS-C-5201-1 4.19 IEC-60115-1 4.19 -55°C to +155°C, 5 cycles
Low Temperature Storage	±1.0%	IEC60115-1 4.23.4 JIS-C-5201-1 4.23.4 at -55°C for 2 hrs

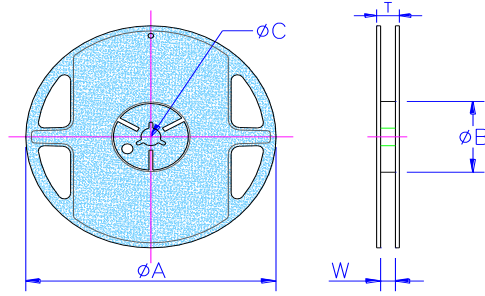
RCWV(Rated Continuous Working Voltage)= $\sqrt{P \cdot R}$ or Max. Operating Voltage whichever is lower.

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

Low Ohm (Metal Strip) Chip Resistor

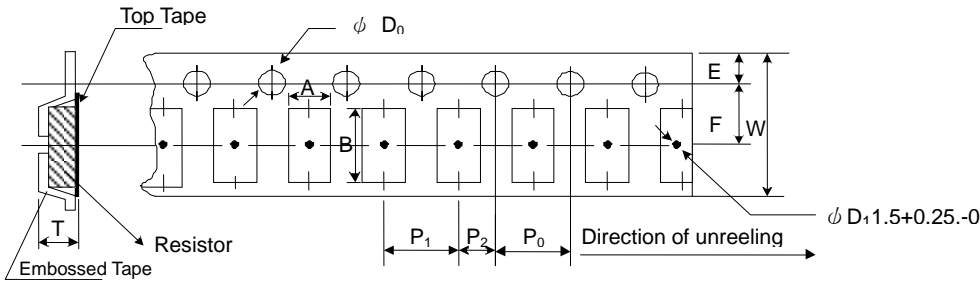
■ Packaging

Reel Specifications & Packaging Quantity



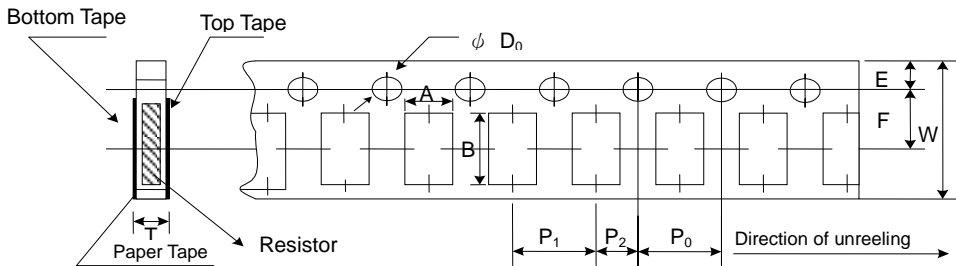
Type	Resistance (mΩ)	Packaging Quantity		Tape Width	Reel Diameter	ΦA (mm)	ΦB (mm)	ΦC (mm)	W (mm)	T (mm)
LRP06	8~20	Paper	5K	8mm	7 inch	178.5±1.5	60 ^{+1/-0}	13.0±0.2	9.0±0.5	12.5±0.5
LRP12	4~200	Embossed	4K	12mm	7 inch	178.5+/-1.5	60±1.0	13.0±0.5	13.0±1.0	15.5±0.5
LRP12	3	Embossed	2K	12mm	7 inch	178.5+/-1.5	60±1.0	13.0±0.5	13.0±1.0	15.5±0.5

Embossed Plastic Tape Specifications



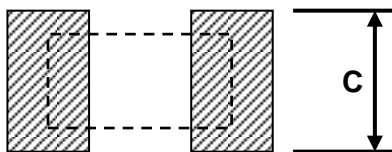
Type	A (mm)	B (mm)	W (mm)	E (mm)	F (mm)	P ₀ (mm)	P ₁ (mm)	P ₂ (mm)	ΦD ₀ (mm)	T (mm)
LRP12	3.50±0.10	6.70±0.10	12.0±0.30	1.75±0.10	5.5±0.05	4.00±0.10	4.00±0.10	2.00±0.05	1.50+0.1, -0	1.20+0
LRP12 (3mΩ)	3.50±0.10	6.70±0.10	12.0±0.30	1.75±0.10	5.5±0.05	4.00±0.10	4.00±0.10	2.00±0.05	1.50+0.1, -0	1.45±0.2

Paper Tape Specifications

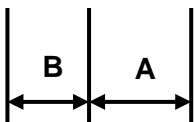


Type	A (mm)	B (mm)	W (mm)	E (mm)	F (mm)	P ₀ (mm)	P ₁ (mm)	P ₂ (mm)	ΦD ₀ (mm)	T (mm)
LRP06	1.90±0.10	3.50±0.20	8.0±0.20	1.75±0.10	3.50±0.05	4.00±0.10	4.00±0.05	2.00±0.05	1.50+0.1,-0	0.85±0.10

■ Recommend Land Pattern



Type	A (mm)	B (mm)	C (mm)
LRP06	1.50	1.40	1.70
LRP12	4.00	2.00	3.50



* FR4 copper board, 100μm of copper pad thickness

REVISION HISTORY

REVISION	DATE	CHANGE NOTIFICATION	DESCRIPTION
Version A	Apr 30, 2015	-	- First issue of this specification
Version A1	Jul 30, 2015	-	- Add 0.5% Resistance Range
Version A2	Nov 27, 2015	-	- Change TCR75 ppm Resistance Range 10mR~100mR →7mR~100mR
Version A3	Jul 15, 2016	-	- Remove Material Description - Modify Storage Temperature
Version A4	Jun 01, 2017	-	- Add 1206 Size Resistance Range - Add 2512 Size R003~R006 TCR75ppm
Version A5	Nov 02, 2017	-	- Features Item Add AEC-Q200 Compliance (LRP12 7mΩ to 100mΩ)
Version A6	Jan 12, 2018	-	- Environmental Characteristics update - Electrical Specifications update
Version A7	Aug 03, 2018	-	- Electrical Specifications update
Version A8	Oct 21, 2019	-	- Features: Add sulfur resistance instructions
Version A9	Mar 23, 2020	-	- Increase product weight
Version B	Jul 06, 2020	-	- Features Increase Low inductance < 5nH