

## Data Sheet

Customer:

Product: Low Ohm (Metal Strip) Chip Resistor – LRP Series

Size: 1206 / 2512

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## Low Ohm (Metal Strip) Chip Resistor- LRP Series

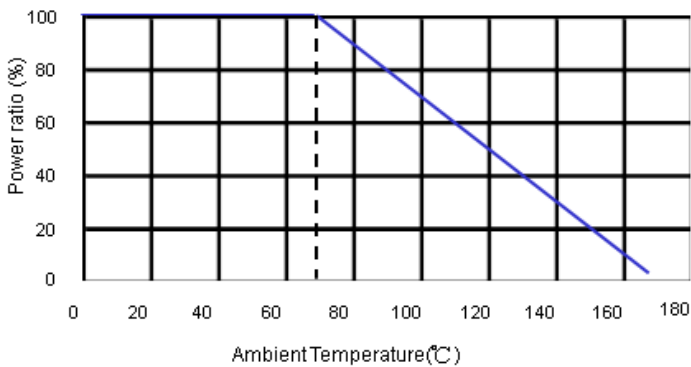
### ■ Features

- High power rating up to 3 Watts
- Low TCR down to  $\pm 50$  PPM/ $^{\circ}$ C
- Resistance values from  $3\text{m}\Omega$  to  $200\text{m}\Omega$
- Customized resistance available
- AEC-Q200 Compliance ( LRP12  $3\text{m}\Omega$  to  $200\text{m}\Omega$  )

### ■ Applications

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

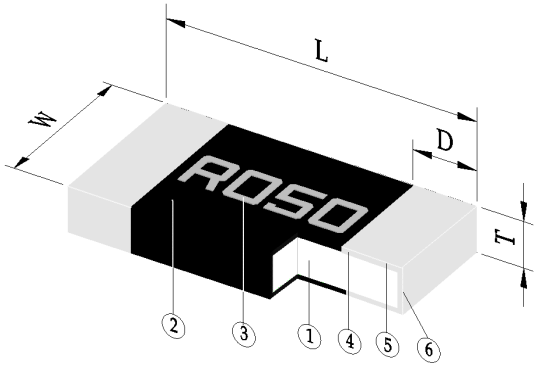
### ■ Derating Curve



### ■ 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: $\pm 50$ W: $\pm 75$ E: $\pm 100$	R: 3W S: 2W T: 1W	R015: $0.015\Omega$ R050: $0.05\Omega$

**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)
LRP06	1206	3.10±0.10	1.60±0.10	0.60±0.10	0.45±0.15
LRP12	2512	6.40±0.25	3.20±0.25	0.70±0.20	0.90±0.30

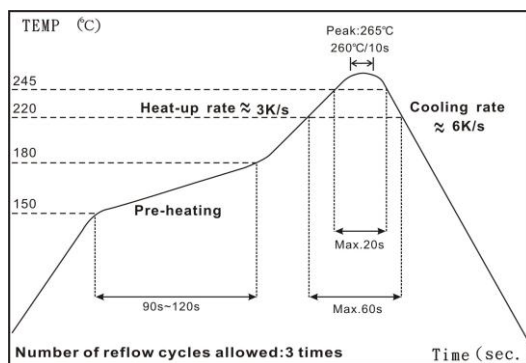
**Electrical Specifications**

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.	<b>IEC60115-1 4.8</b> <b>JIS-C-5201-1 4.8</b> +25°C ~125°C, 25°C is the reference temperature
Short Time Overload	±1.0%	<b>IEC60115-1 4.13</b> <b>JIS-C-5201-1 4.13</b> 5*rated power for 5 seconds
Insulation Resistance	≥10G	<b>IEC60115-1 4.6</b> <b>JIS-C-5201-1 4.13</b> 100V DC for 1 minute
Endurance	±1.0%	<b>IEC60115-1 4.25</b> <b>JIS-C-5201-1 4.25.1</b> 70±2°C, rated power for 1000 hrs with 1.5 hrs "ON" and 0.5 hr "OFF"
Biased Humidity	±1.0%	<b>MIL-STD-202 Method 103</b> 1000 hrs 85°C/85%RH 10% of operating power
Dry Heat	±1.0%	<b>IEC60115-1 4.23.2</b> <b>JIS-C-5201-1 4.23.2</b> at +170°C for 1000 hrs
Bending Strength	±1.0%	<b>JIS-C-5201-1 4.33</b> <b>IEC-60115-1 4.33</b> Bending width 2mm once for 5 seconds
Solderability	95% min. coverage	<b>JIS-C-5201-1 4.17</b> <b>IEC-60115-1 4.17</b> 245±5°C for 3 seconds
Resistance to Soldering Heat	±0.5%	<b>JIS-C-5201-1 4.18</b> <b>IEC-60115-1 4.18</b> 260±5°C for 10 seconds
Rapid Change of Temperature	±1.0%	<b>JIS-C-5201-1 4.19</b> <b>IEC-60115-1 4.19</b> -55°C to +155°C, 5 cycles
Low Temperature Storage	±1.0%	<b>IEC60115-1 4.23.4</b> <b>JIS-C-5201-1 4.23.4</b> at -55°C for 2 hrs

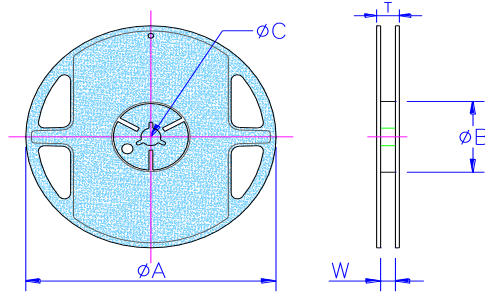
RCWV(Rated Continuous Working Voltage)=  $\sqrt{P \cdot R}$  or Max. Operating Voltage whichever is lower.

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

**Low Ohm (Metal Strip) Chip Resistor**

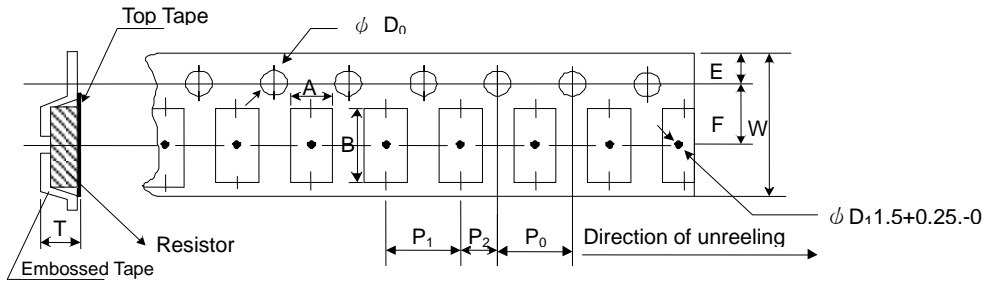
**■ Packaging**

Reel Specifications & Packaging Quantity



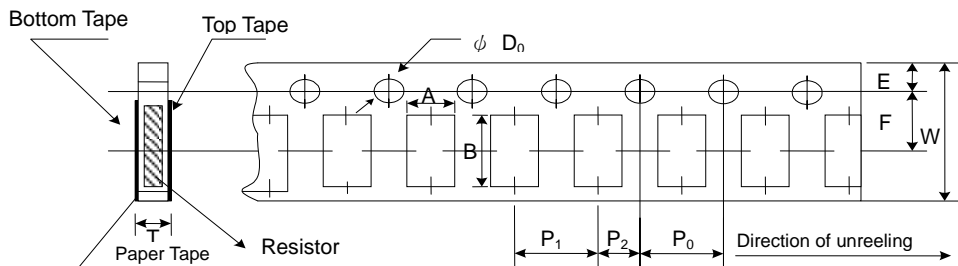
Type	Resistance (mΩ)	Packaging	Quantity	Tape Width	Reel Diameter	ΦA (mm)	ΦB (mm)	ΦC (mm)	W (mm)	T (mm)
LRP06	8~20	Paper	5K	8mm	7 inch	178.5±1.5	60 <sup>+1/-0</sup>	13.0±0.2	9.0±0.5	12.5±0.5
LRP12	4~200	Embossed	4K	12mm	7 inch	178.5+/-1.5	60±1.0	13.0±0.5	13.0±1.0	15.5±0.5
LRP12	3	Embossed	2K	12mm	7 inch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

**Embossed Plastic Tape Specifications**



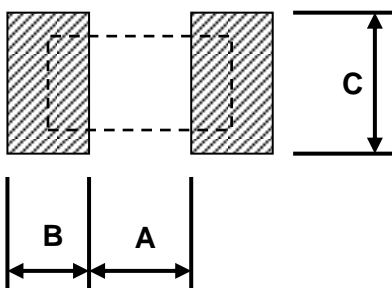
Type	A (mm)	B (mm)	W (mm)	E (mm)	F (mm)	P <sub>0</sub> (mm)	P <sub>1</sub> (mm)	P <sub>2</sub> (mm)	ΦD <sub>0</sub> (mm)	T (mm)
LRP12	3.50±0.10	6.70±0.10	12.0±0.30	1.75±0.10	5.5±0.05	4.00±0.10	4.00±0.10	2.00±0.05	1.50+0.1, -0	1.20+0
LRP12 (3mΩ)	3.50±0.10	6.70±0.10	12.0±0.30	1.75±0.10	5.5±0.05	4.00±0.10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

<b>REVISION</b>	<b>DATE</b>	<b>CHANGE NOTIFICATION</b>	<b>DESCRIPTION</b>
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