

**Low Ohm (Metal Strip) Chip Resistor- LRM Series**

**■ Features**

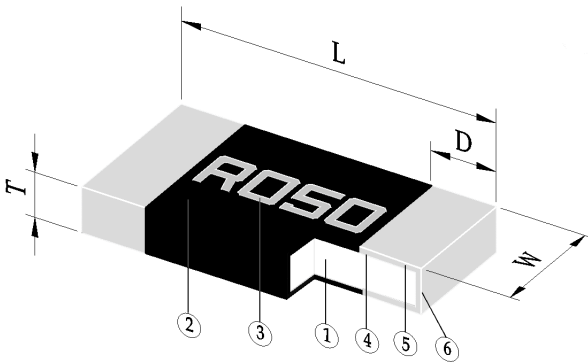
- High power rating up to 3 Watts
- Low TCR down to  $\pm 100$  PPM/ $^{\circ}$ C
- Resistance values from 10m to 50m ohm
- Customized resistance available

**■ Applications**

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



**■ Construction**



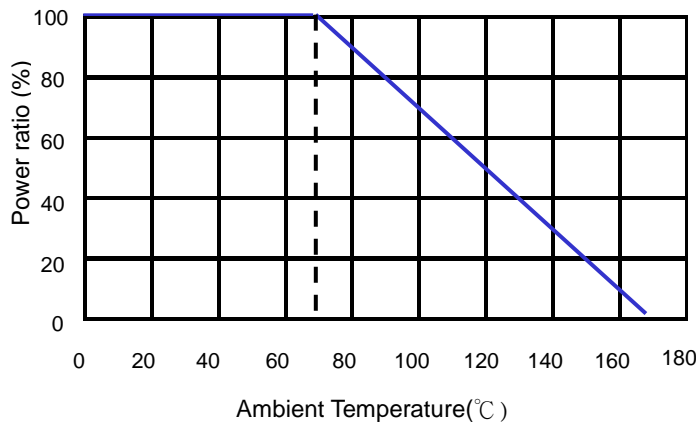
① Alloy Plate	④ Internal Electrode (Cu)
② Overcoat (molding)	⑤ Barrier Layer (Ni)
③ Marking	⑥ Solder Plating (Sn)

Black – Wave or IR reflow soldering

**■ Dimensions**

Type	Size (Inch)	L (mm)	W (mm)	T (mm)	D (mm)	Weight (g) (1000pcs)
LRM06	1206	3.20 $\pm$ 0.20	1.60 $\pm$ 0.20	0.60 $\pm$ 0.20	0.50 $\pm$ 0.30	18.80
LRM10	2010	5.00 $\pm$ 0.20	2.50 $\pm$ 0.20	0.60 $\pm$ 0.20	0.60 $\pm$ 0.30	40.50
LRM12	2512	6.20 $\pm$ 0.20	3.20 $\pm$ 0.20	0.60 $\pm$ 0.20	1.10 $\pm$ 0.30	90.90

**■ Derating Curve**



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

**Part Numbering**

LRM	12	J	T	E	S	R010	
Product Type	Dimensions (LxW)	Resistance Tolerance	Packaging Code	TCR (PPM/°C)	Power Rating	Resistance	Marking
	06: 1206 10: 2010 12: 2512	F: ±1% G: ±2% J: ±5%	T: Taping Reel	E: ±100 W: ±75	R: 3W S: 2W A: 1.5W T: 1W Q: 3/4W U: 1/2W O: 1/3W V: 1/4W W: 1/8W	R010: 0.01Ω R050: 0.05Ω R100: 0.1Ω	: Black Coating N: No Marking

**Standard Electrical Specifications**

Item Type	Power Rating at 70°C	Operating Temp. Range	Resistance Range (mΩ)			TCR (PPM/°C)
			±1%	±2%	±5%	
LRM06 (1206)	1/4W 1/2W 1W	-55 ~ +170°C	5-10			±100
			11-30			±75
LRM10 (2010)	3/4W 1W	-55 ~ +170°C	5-10			±100
			11-30			±75
LRM12 (2512)	1W 2W	-55 ~ +170°C	10-100			±75

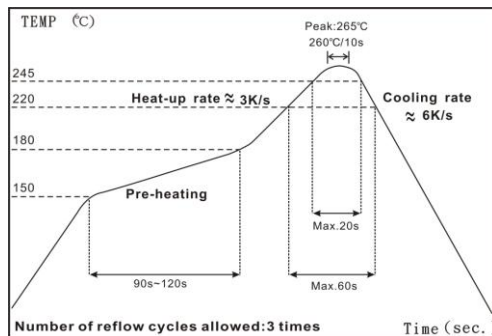
**High Power Rating Electrical Specifications**

Item Type	Power Rating at 70°C	Operating Temp. Range	Resistance Range (mΩ)			TCR (PPM/°C)
			±1%	±2%	±5%	
LRM10 (2010)	1.5W	-55 ~ +170°C	10-30			±75
LRM12 (2512)	3W	-55 ~ +170°C	10-100			±75

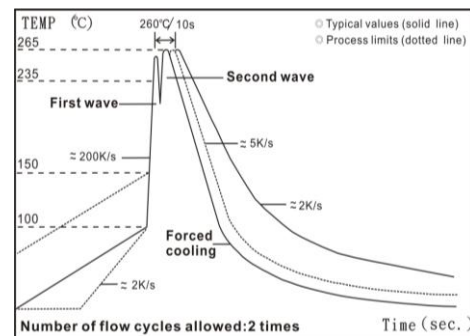
Operating Current =  $\sqrt{P/R}$  , Operating Voltage =  $\sqrt{P \cdot R}$

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

**Soldering Condition**



IR Reflow Soldering



Wave Soldering (Flow Soldering)

- (1) Time of IR reflow soldering at maximum temperature point 260°C : 10s
- (2) Time of wave soldering at maximum temperature point 260°C : 10s
- (3) Time of soldering iron at maximum temperature point 410°C : 5s

**■ Environmental Characteristics**

Item	Requirement	Test Method
Temperature Coefficient of Resistance (T.C.R.)	As Spec.	<b>MIL-STD-202 Method 304</b> +25/-55/+25/+125/+25°C
Short Time Overload	±0.5%	<b>JIS-C-5201-1 5.5</b> 5*rated power for 5 seconds
Insulation Resistance	≥1G	<b>JIS-C-5201-1 4.6</b> <b>IEC-60115-1 4.6</b> Max. Overload Voltage for 1 minute
Endurance	±1.0%	<b>MIL-STD-202 Method 108A</b> 70±2°C, RCWV for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF"
Dry Heat	±1.0%	<b>JIS-C-5201-1 7.2</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>MIL-STD-202 Method 208H</b> 245±5°C for 3 seconds
Resistance to Soldering Heat	±0.5%	<b>MIL-STD-202 Method 210E</b> 260±5°C for 10 seconds
Thermal Shock	±0.5%	<b>MIL-STD-202 Method 107G</b> -55°C ~ 150°C, 100 cycles

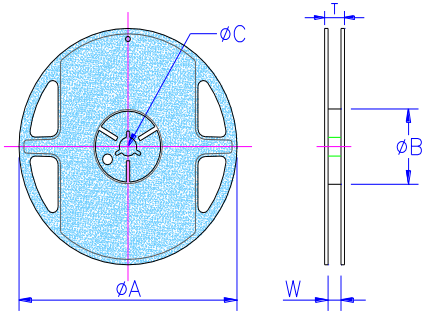
RCWV(Rated continuous working voltage)=  $\sqrt{P \cdot R}$  or Max. Operating voltage whichever is lower

**■ Storage Temperature: 25±3°C; Humidity < 80%RH**

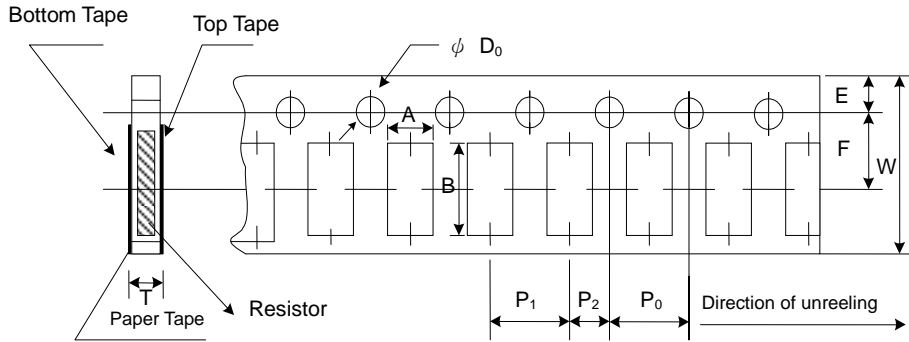
**■ Packaging**

Reel Specifications & Packaging Quantity

Type	Packaging Quantity	Tape Width	Reel Diameter	ΦA (mm)	ΦB (mm)	ΦC (mm)	W (mm)	T (mm)	
LRM06	Paper	5K	8mm	7 inch	178.5±1.5	60 <sup>+1/-0</sup>	13.0±0.5	9.0±0.5	11.5±0.5
LRM10	Embossed	4K	12mm	7 inch	178.5±1.5	60 <sup>+1/-0</sup>	13.0±0.5	13.0±0.5	15.5±0.5
LRM12	Embossed	4K	12mm	7 inch	178.5±1.5	60 <sup>+1/-0</sup>	13.0±0.5	13.0±0.5	15.5±0.5

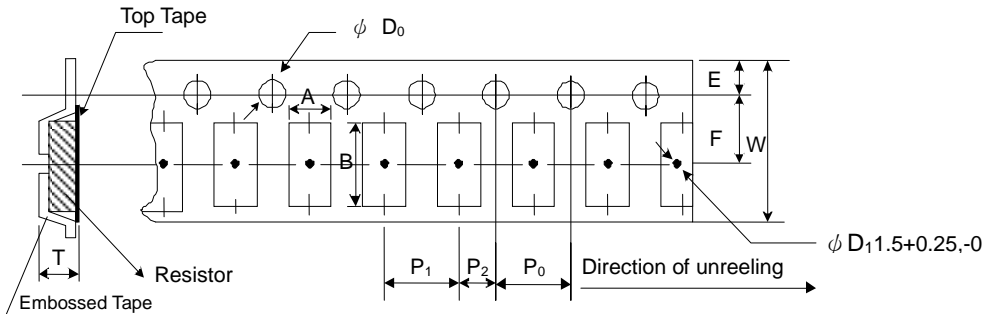


Paper Tape Specifications



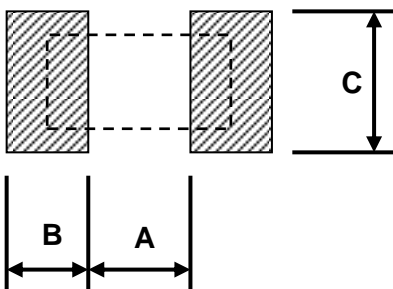
Type	A (mm)	B (mm)	W (mm)	E (mm)	F (mm)	P <sub>0</sub> (mm)	P <sub>1</sub> (mm)	P <sub>2</sub> (mm)	ΦD <sub>0</sub> (mm)	T (mm)
LRM06	2.00±0.15	3.60±0.20	8.00±0.20	1.75±0.10	3.50±0.05	4.00±0.10	4.00±0.10	2.00±0.05	1.50+0.1/-0	0.85±0.10

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)
LRM10	2.80±0.20	5.30±0.20	12.0±0.20	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	1.2 <sup>+0</sup>
LRM12	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	1.2 <sup>+0</sup>

**■ Recommend Land Pattern**



Type	A (mm)	B (mm)	C (mm)
LRM06	1.40	1.90	1.80
LRM10	3.50	1.50	2.80
LRM12 (10-50mΩ)	3.80	1.60	3.50
LRM12 (51-100mΩ)	4.10	2.10	4.00
LRM12 (High Power)	4.10	2.10	4.00