

Low Ohm (metal Strip) Chip Resistors MCLRP Series

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**RoHS
Compliant**



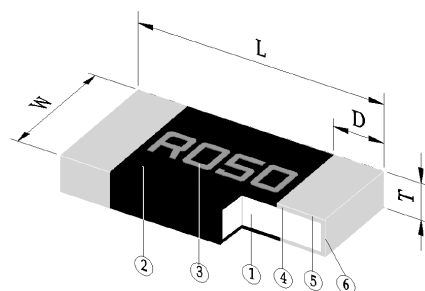
Features

- High power rating up to 3 Watts
- Low TCR down to ± 50 PPM/ $^{\circ}\text{C}$
- Resistance values from $3\text{m}\Omega$ to $100\text{m}\Omega$
- 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
2	Overcoat
3	Marking

4	Internal Electrode
5	Barrier Layer
6	Solder Plating

Dimensions

Type	Size (Inch)	L (mm)	W (mm)	T (mm)	D (mm)
MCLRP06	1206	3.1 ± 0.1	1.6 ± 0.1	0.6 ± 0.1	0.45 ± 0.15
MCLRP12	2512	6.4 ± 0.25	3.2 ± 0.25	0.7 ± 0.2	0.9 ± 0.3

Electrical Specifications

Type	Item	Power Rating at 70°C	Operating Temp. Range	Resistance Range ($\text{m}\Omega$)			TCR (PPM/ $^{\circ}\text{C}$)
				$\pm 0.5\%$	$\pm 1\%$	$\pm 5\%$	
MCLRP06 (1206)		1W	$-55^{\circ}\text{C} \sim +170^{\circ}\text{C}$	8, 10, 12, 15, 20			± 100
MCLRP12 (2512)		1W, 2W, 3W	$-55^{\circ}\text{C} \sim +170^{\circ}\text{C}$	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			± 75
				15, 18, 20, 22, 25, 30, 33, 35, 39, 40, 47, 50, 60, 68, 70, 75, 80, 82, 90, 91, 100			± 50

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

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Environmental Characteristics

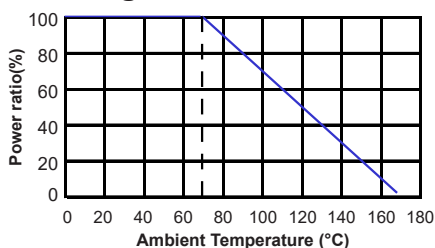
Item	Requirement	Test Method
Temperature Coefficient of Resistance (T.C.R.)	As Spec.	IEC60115-1 4.8 JIS-C-5201-1 4.8 +25°C ~ 125°C, 25°C is the reference temperature
Short Time Overload	±1%	IEC60115-1 4.13 JIS-C-5201-1 4.13 5*rated power for 5 seconds
Insulation Resistance	≥10G	IEC60115-1 4.6 JIS-C-5201-1 4.13 100V DC for 1 minute
Endurance	±1%	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%	MIL-STD-202 Method 103 1000 hrs 85°C/85%RH 10% of operating power
Dry Heat	±1%	IEC60115-1 4.23.2 JIS-C-5201-1 4.23.2 at +170°C for 1000 hrs
Bending Strength	±1%	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%	JIS-C-5201-1 4.19 IEC-60115-1 4.19 -55°C to +155°C, 5 cycles
Low Temperature Storage	±1%	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

Derating Curve



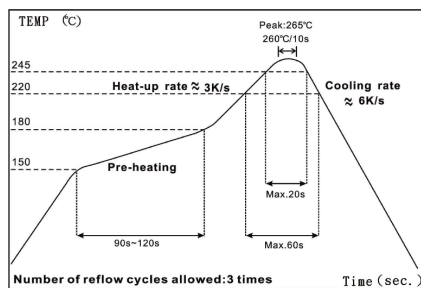
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Soldering Condition (Reflow Soldering Only)

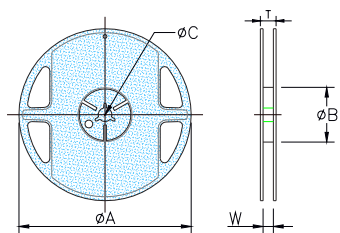


IR Reflow Soldering

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

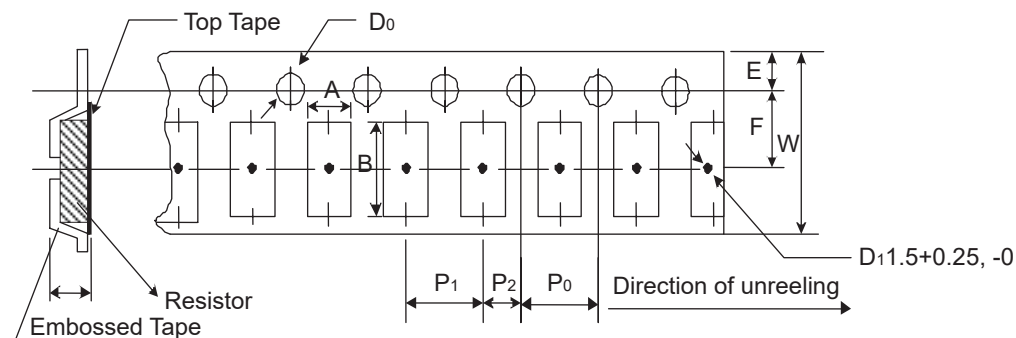
Packaging

Reel Specifications & Packaging Quantity



Type	Resistance (mΩ)	Packaging Quantity		Tape Width	Reel Diameter	ΦA (mm)	ΦB (mm)	ΦC (mm)	W (mm)	T (mm)
MCLRP06	8 ~ 20	Paper	5K	8mm	7 inch	178.5 ±1.5	60 ^{+/-0}	13 ±0.2	9 ±0.5	12.5 ±0.5
MCLRP12	4 ~ 100	Embossed	4K	12mm	7 inch	178.5 ±1.5	60 ±1	13 ±0.5	13 ±1	15.5 ±0.5
	3	Embossed	2K	12mm	7 inch	178.5+/-1.5	60 ±1	13 ±0.5	13 ±1	15.5 ±0.5

Embossed Plastic Tape Specifications



Type	A (mm)	B (mm)	W (mm)	E (mm)	F (mm)	P0 (mm)	P1 (mm)	P2 (mm)	D0 (mm)	T (mm)
MCLRP12	3.5 ±0.1	6.7 ±0.1	12 ±0.3	1.75 ±0.1	5.5 ±0.05	4 ±0.1	4 ±0.1	2 ±0.05	1.5 +0.1, -0	1.2 +0

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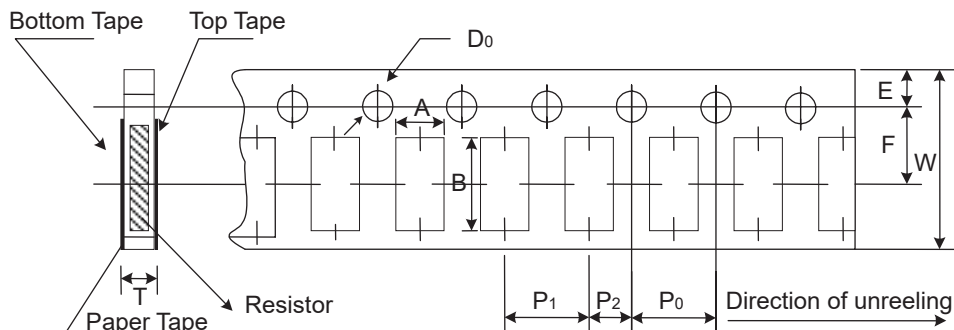
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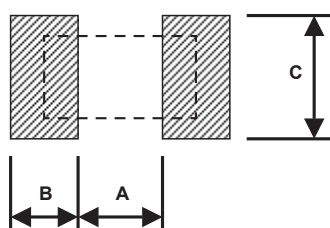
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Paper Tape Specifications



Type	A (mm)	B (mm)	W (mm)	E (mm)	F (mm)	P ₀ (mm)	P ₁ (mm)	P ₂ (mm)	D ₀ (mm)	T (mm)
MCLRP06	1.9 ±0.1	3.5 ±0.2	8 ±0.2	1.75 ±0.1	3.5 ±0.05	4 ±0.1	4 ±0.05	2 ±0.05	1.5 +0.1,-0	0.85 ±0.1

Recommend Land Pattern



Type	A (mm)	B (mm)	C (mm)
MCLRP06	1.5	1.4	1.7
MCLRP12	4	2	3.5

FR4 copper board, 100µm of copper pad thickness

Part Number Explanation

MCLRP	12	F	T	E	X	1003
<u>Series Type</u>	<u>Dimensions (L×W)</u>	<u>Resistance Tolerance</u>	<u>Packaging Code</u>	<u>TCR (PPM/°C)</u>	<u>Power Rating</u>	<u>Resistance</u>
	06: 1206	D: ±0.5%	T: Taping Reel	D: ±50	R: 3W	R015: 0.015Ω
	12: 2512	F: ±1%		W: ±75	S: 2W	R050: 0.05Ω
		J: ±5%		E: ±100	T: 1W	

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