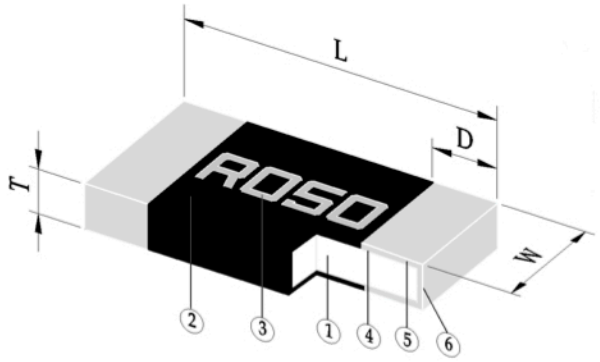
Low Ohm (Metal Strip) Chip Resistor - LOR Series

■Construction



■Features

- High power rating up to 3 Watts
- Low TCR down to ±75 PPM/℃
- Resistance values from 10m to 50m ohm
- Customized resistance available

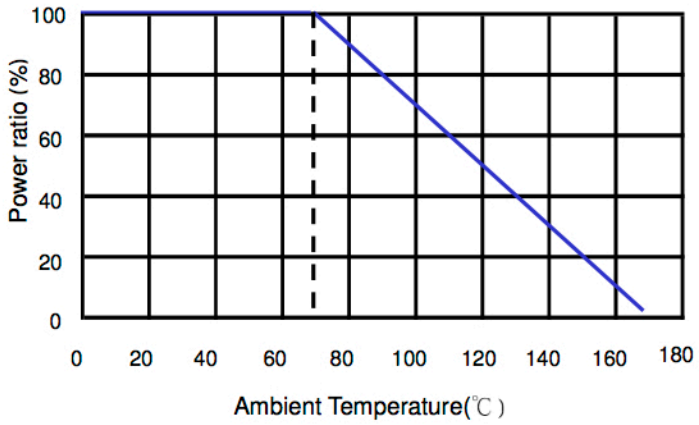
■Applications

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

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

■Derating Curve



■Dimensions

Type	Size (Inch)	L (mm)	W (mm)	T (mm)	D (mm)	Weight (g) (1000pcs)
LOR10	0805	2.00±0.10	1.25±0.10	0.60±0.20	0.40±0.20	15.00
LOR12	1206 (1mΩ)	3.20±0.20	1.60±0.20	0.75±0.20	1.10±0.30	18.80
LOR12	1206 (2-30mΩ)	3.20±0.20	1.60±0.20	0.60±0.20	0.50±0.30	18.80

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LOR20	2010	5.00±0.20	2.50±0.20	0.60±0.20	0.60±0.30	40.50
LOR25	2512 (0.5-0.75mΩ)	6.40±0.20	3.20±0.20	0.60±0.20	2.60±0.20	90.90
LOR25	2512 (1-3mΩ)	6.40±0.20	3.20±0.20	0.60±0.20	2.00±0.20	90.90
LOR25	2512 (4-50mΩ)	6.40±0.20	3.20±0.20	0.60±0.20	0.90±0.20	90.90
LOR25	2512 (2-4mΩ)	6.40±0.20	3.20±0.20	0.70±0.20	2.0±0.20	90.90
LOR25	2512 (10-100mΩ)	6.40±0.20	3.20±0.20	0.70±0.20	0.90±0.20	90.90

■Part Numbering

LOR	12	J	R010	CT	E	S	M
Product Type	Dimensions (L×W)	Resistance Tolerance	Resistance	Packaging Code	TCR (PPM/°C)	Power Rating	Marking
	10: 0805 12: 1206 20: 2010 25: 2512	F: ±1% G: ±2% J: ±5%	R001: 0.001Ω R010: 0.01Ω R050: 0.05Ω	CT: Taping Reel	3: ±275 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	: NiCu Material M: MnCu Material N: No Marking

■Electrical Specifications

For MnCu Material

Item / Type	Power Rating at 70℃	Operating Temp. Range	Resistance Range (mΩ)		TCR (PPM/℃)
			±1%	±5%	
LOR10 (0805)	1/8W 1/4W 1/2W	-55 ~ +170°C	5, 9,10, 20		±100
LOR12 (1206)	1/4W 1/2W 1W	-55 ~ +170°C	1		±200
			2, 3, 5, 6, 7, 10		±100
			15, 20, 25, 30		±75
LOR25 (2512)	1W 2W	-55 ~ +170°C	0.5, 0.75		±200
			5,10,		±100
	1W		20, 25, 30, 40, 50		±75

For NiCu Material

Item / Type	Power Rating at 70℃	Operating Temp. Range	Resistance Range (mΩ)		TCR (PPM/℃)
			±1%	±5%	
LOR20 (2010)	1/2W 3/4W 1W 1.5W	-55 ~ +170°C	5, 6,10		±100
			15, 20		±75
LOR25 (2512)	1W 2W	-55 ~ +170°C	1, 1.5		±275
			2, 3, 4, 5, 6, 7, 8,10		±100
	1W		12, 15, 18, 20, 25, 30, 33, 35, 40, 50		±75
	1W 2W 3W		2, 3, 4, 10, 12, 15, 18, 20, 25, 30, 39, 40, 50, 60, 70, 80, 100		±75

Operating Current =√(P/R) , Operationg Voltage=√(P*R)

■ Cal-Chip is capable of manufacturing the optional spec based on customer's requirement.

■Environmental Characteristics

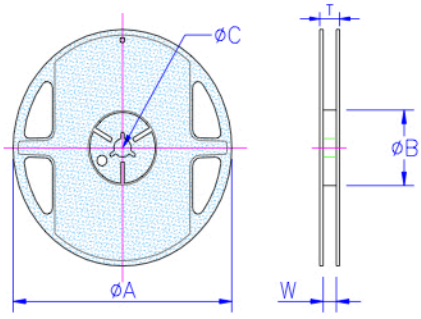
Item	Requirement	Test Method
Temperature Coefficient of Resistance (T.C.R.)	As Spec.	**IEC60115-1 4.8** **JIS-C-5201-1 4.8** +25/-55/+25/+125/+25℃
Short Time Overload	0805 & 2010 & 2512: ±0.5% 1206: ±1%	**IEC60115-1 4.13** **JIS-C-5201-1 4.13** 5*rated power for 5 seconds
Insulation Resistance	>100MΩ	**IEC60115-1 4.6** **JIS-C-5201-1 4.13** 100V DC for 1 minute
Endurance	±1.0%	**IEC60115-1 4.25.1** **JIS-C-5201-1 4.25.1** 70±2°C, rated power for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF"
Damp Heat no Load	2512 0.5mΩ, 0.75mΩ & 1206: ±0.5% Other sizes: ±1.0%	**IEC60115-1 4.24.2.1a** **JIS-C-5201-1 4.24.2.1a** 85°C, 85%RH, 1000 hrs
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 2 seconds
Resistance to Soldering Heat	±0.5%	**JIS-C-5201-1 4.18** **IEC-60115-1 4.18** 0805&2010: 260±5°C for 10 seconds 1206&2512: 260±5°C for 20 seconds
Thermal Shock	0805 & 2010: ±0.5% 1206 & 2512: ±1%	**JIS-C-5201-1 4.19** **IEC-60115-1 4.19** -55°C ~ 150°C, 300 cycles, 15min per extreme condition.
Low Temperature Storage	0805 & 2010 & 2512: ±0.5% 1206 : ±1%	**IEC60115-1 4.23.4** **JIS-C-5201-1 4.23.4** at -55°C for 1000 hrs

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

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

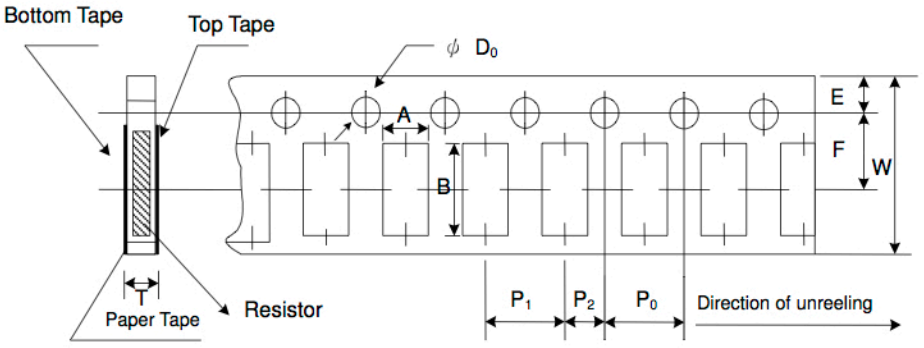
■Packaging



Reel Specifications & Packaging Quantity

Type	Packaging Quantity		Tape Width	Reel Diameter	ΦA (mm)	ΦB (mm)	ΦC (mm)	W (mm)	T (mm)
LOR10	Paper	5K	8mm	7 inch	178±2.0	60±1.0	13.0±1.0	9.0±1.0	11.4±1.0
LOR12	Paper	5K	8mm	7 inch	178±2.0	60±1.0	13.0±1.0	9.0±1.0	11.5±1.0
LOR20	Embossed	4K	12mm	7 inch	178±2.0	60±1.0	13.0±1.0	13.0±1.0	15.5±1.0
LOR25	Embossed	4K	12mm	7 inch	180+0/-3	60±1.0	13.0±1.0	13.0±1.0	15.4±2.0

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)
LOR10	1.60±0.15	2.40±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	0.84±0.10
LOR12	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	0.84±0.10

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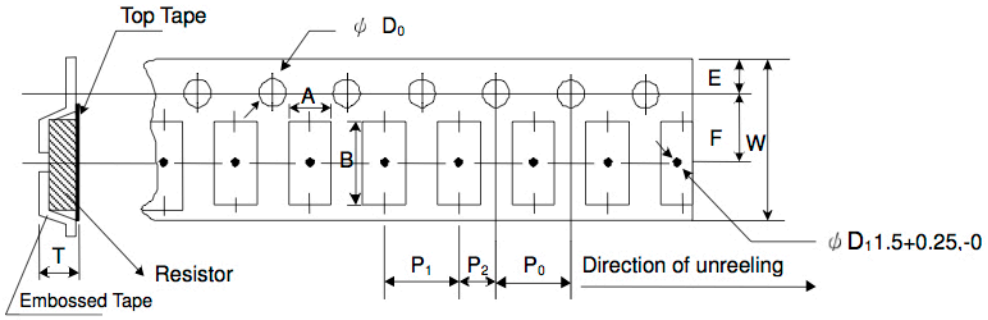
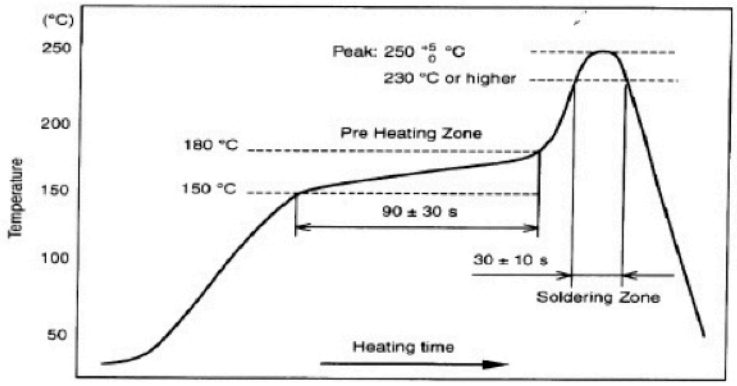
Embossed Plastic Tape Specifications

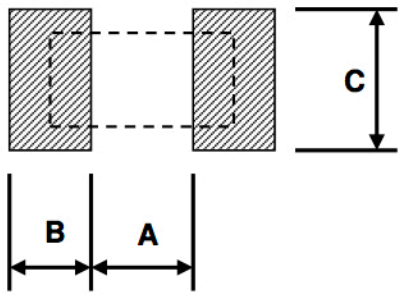


Type	A (mm)	B (mm)	W (mm)	E (mm)	F (mm)	P_0 (mm)	P_1 (mm)	P_2 (mm)	ΦD_0 (mm)	T (mm)
LOR20	2.80±0.20	5.30±0.20	12.0±0.20	1.75±0.10	5.5±0.05	4.00±0.10	4.00±0.10	2.00±0.05	1.50+0.1, -0	0.85±0.15
LOR25 (1-50mΩ)	3.60±0.20	6.90±0.20	12.0±0.30	1.75±0.10	5.5±0.05	4.00±0.10	4.00±0.10	2.00±0.05	1.50+0.1, -0	0.85±0.15
LOR25 (2-100mΩ)	3.60±0.20	6.90±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±0.15

■Soldering Condition



■Recommend Land Pattern



Type	A (mm)	B (mm)	C (mm)
LOR10	1.20	1.15	1.40
LOR12 (1mΩ)	1.00	2.30	1.80
LOR12 (2-30mΩ)	1.60	1.70	1.80
LOR20	3.50±0.2	1.50±0.2	3.40±0.2
LOR25 (0.5-3mΩ)	1.30	3.10	4.00
LOR25 (4-100mΩ)	4.10	2.10	4.00

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