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SPECIFICATIONS

Low Ohm (Power Metal Strip) Chip Resistor

LRC Series

Version April 2019

Low Ohm (Metal Strip) Chip Resistor – LRC Series



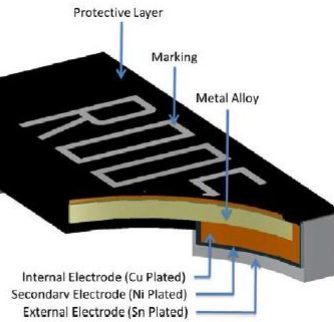
Features

- Low resistance / low TCR
- Excellent long term stability
- RoHS compliant and halogen free
- Lead free
- High precision current sensing and voltage division

Applications

- Entertainment Product
- Power Supply
- Measuring Instrument
- Industrial Product
- Battery Management System

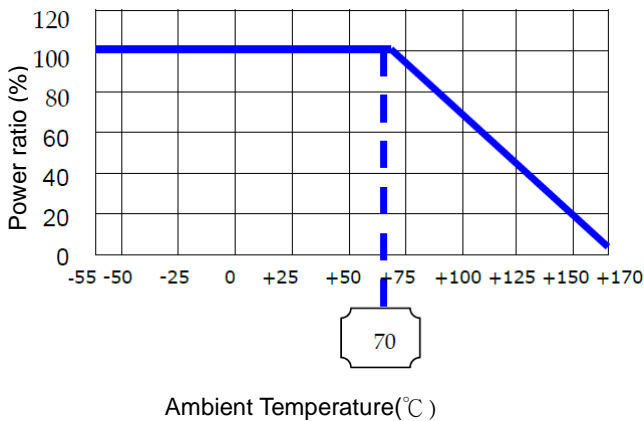
Construction



Part Numbering

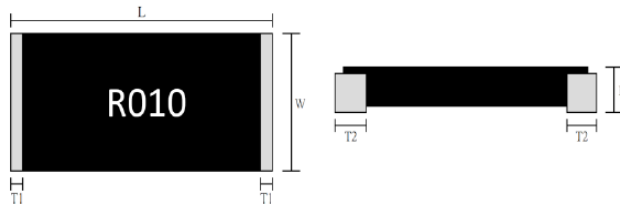
LRC	06	F	T	D	T	R005
Product Type	Dimensions (LxW)	Resistance Tolerance	Packaging Code	TCR (PPM/°C)	Power Rating	Resistance
	06: 1206 12: 2512 25: 2725 28: 2728 27: 4527	D: ±0.5% F: ±1% G: ±2% J: ±5%	T: Taping Reel	D: ±50	Q: 3/4W T: 1W S: 2W R: 3W H: 4W D: 5W	R001: 0.001Ω R010: 0.01Ω 0M50: 0.0005Ω

Derating Curve



Low Ohm (Metal Strip) Chip Resistor

■ Dimensions



Type	Size (Inch)	Power Rating	Resistance (mΩ)	L (mm)	W (mm)	H (mm)	T1 (mm)	T2 (mm)			
LRC06	1206	3/4W	51-100	3.200±0.254	1.650±0.254	0.350±0.254	0.400±0.254	0.508±0.254			
		1W	1-2	3.200±0.254	1.650±0.254	0.630±0.254	0.400±0.254	0.508±0.254			
			3-50	3.200±0.254	1.650±0.254	0.430±0.254	0.400±0.254	0.508±0.254			
LRC12	2512	1W 2W	0.5-1	6.350±0.254	3.050±0.254	0.650±0.254	1.050±0.254	2.200±0.254			
			1.5	6.350±0.254	3.050±0.254	0.510±0.254	1.050±0.254	2.200±0.254			
			2	6.350±0.254	3.050±0.254	0.510±0.254	1.050±0.254	1.400±0.254			
			2.5-75	6.350±0.254	3.050±0.254	0.510±0.254	1.050±0.254	1.100±0.254			
			76-200	6.350±0.254	3.050±0.254	0.510±0.254	0.750±0.254	1.100±0.254			
			201-500	6.350±0.254	3.050±0.254	0.410±0.254	0.750±0.254	0.850±0.254			
		3W	0.5-1	6.350±0.254	3.050±0.254	0.650±0.254	2.200±0.254	2.200±0.254			
			1.5	6.350±0.254	3.050±0.254	0.540±0.254	2.000±0.254	2.000±0.254			
			2	6.350±0.254	3.050±0.254	0.540±0.254	1.400±0.254	1.400±0.254			
			2.5-100	6.350±0.254	3.050±0.254	0.540±0.254	1.100±0.254	1.100±0.254			
			LRC25	2725	4W	0.25	6.800±0.254	6.350±0.254	0.770±0.254	0.200-1.500	2.300±0.254
						0.5	6.800±0.254	6.350±0.254	0.650±0.254	0.200-1.500	2.300±0.254
1	6.800±0.254	6.350±0.254				0.650±0.254	0.200-1.500	1.800±0.254			
LRC28	2728	4W	1.5-3	6.800±0.254	6.350±0.254	0.550±0.254	0.200-1.500	1.800±0.254			
			4-450	6.600±0.254	6.700±0.254	0.620±0.254	0.200-1.000	1.100±0.254			
			0.5	11.300±0.500	6.600±0.500	0.770±0.254	3.000±0.254	0.200-1.000			
LRC27	4527	2W	1-1.5	11.300±0.500	6.600±0.500	0.650±0.254	3.000±0.254	0.200-1.000			
			2-5	11.300±0.500	6.600±0.500	0.650±0.254	2.000±0.254	0.200-1.000			
			6-100	11.300±0.500	6.600±0.500	0.550±0.254	2.000±0.254	0.200-1.000			
			0.5	11.300±0.500	6.600±0.500	0.770±0.254	3.000±0.254	0.200-1.000			
		3W	1-1.5	11.300±0.500	6.600±0.500	0.650±0.254	3.000±0.254	0.200-1.000			
			2-5	11.300±0.500	6.600±0.500	0.650±0.254	2.000±0.254	0.200-1.000			
			6-60	11.300±0.500	6.600±0.500	0.550±0.254	2.000±0.254	0.200-1.000			
			0.5	11.300±0.500	6.600±0.500	0.770±0.254	3.000±0.254	0.200-1.000			
		5W	1-1.5	11.300±0.500	6.600±0.500	0.720±0.254	3.000±0.254	0.200-1.000			
			2-5	11.300±0.500	6.600±0.500	0.720±0.254	2.000±0.254	0.200-1.000			
			6-500	11.300±0.500	6.600±0.500	0.620±0.254	2.000±0.254	0.200-1.000			

Electrical Specifications

Item Type	Power Rating at 70°C	Operating Temp. Range	Max. Rating Current	Max. Overload Current	Resistance Range (mΩ)				TCR (PPM/°C)
					±0.5%	±1%	±2%	±5%	
LRC06 (1206)	3/4W	-55 ~ +170°C	3.83A	7.66A	51-100	51-100			±50
LRC06 (1206)	1W		31.62A	63.25A	7-50	1-50			
LRC12 (2512)	1W	-55 ~ +170°C	44.72A	100.00A	7-450	0.5-500			±50
	2W		63.25A	141.42A	7-450	0.5-450			
	3W		77.46A	154.91A	7-100	0.5-100			
LRC25 (2725)	4W	-55 ~ +170°C	126.49A	252.98A	-	0.25-3			±50
LRC28 (2728)	4W	-55 ~ +170°C	31.62A	54.77A	7-450	4-450			±50
LRC27 (4527)	2W	-55 ~ +170°C	63.25A	109.54A	7-100	0.5-100			±50
	3W		77.46A	134.16A	7-60	0.5-60			
	5W		100.00A	173.20A	7-500	0.5- 500			

Rating Current = $\sqrt{P/R}$

Resistance codes example

Resistance (4Marking)

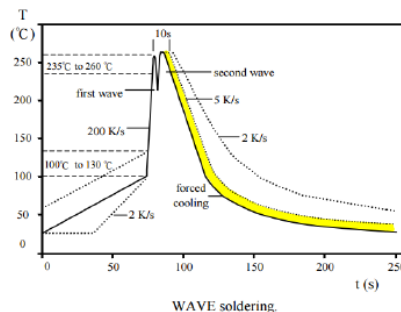
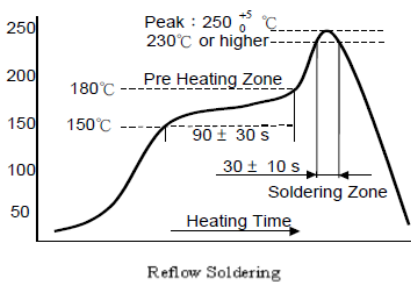
Resistance	0.5 mΩ	1mΩ	1.5mΩ	25mΩ	100mΩ
Codes	0m50	R001	1m50	R025	R100

Environmental Characteristics

Item	Requirement	Test Method
Temperature Coefficient of Resistance (T.C.R.)	As Spec.	JIS-C-5201-1 4.8 $T.C.R. (ppm/°C) = \frac{(R2-R1)}{R1 (T2-T1)} \times 10^6$ R1: resistance at room temperature (T1) R2: resistance at 150 °C (T2)
Short Time Overload	4527: $\Delta R/R1 \leq \pm 2.0\%$ Other sizes: $\Delta R/R1 \leq \pm 0.5\%$	JIS-C-5201-1 4.13 1206 3/4W: 4 times rated power for 5 seconds 1206 1W: 4 times rated power for 5 seconds 2512 1W : 5 times rated power for 5 seconds 2512 2W : 5 times rated power for 5 seconds 2725 4W: 4 times rated power for 5 seconds 2728 4W: 3 times rated power for 5 seconds 4527 2W: 5 times rated power for 5 seconds 4527 3W: 5 times rated power for 5 seconds 4527 5W: 3 times rated power for 5 seconds
High Temperature Exposure	4527: $\Delta R/R1 \leq \pm 2.0\%$ Other sizes: $\Delta R/R1 \leq \pm 1.0\%$	JIS-C-5201-1 4.23.2 at +170°C for 1000 hrs
Resistance to Soldering Heat	$\Delta R/R1 \leq \pm 0.5\%$	JIS-C-5201-1 4.18 260±5°C for 10±1 seconds
Temperature Cycling	$\Delta R/R1 \leq \pm 0.5\%$	JIS-C-5201-1 4.19 -55°C to +150°C, 1,000cycles, 15min at each extreme
Bias Humidity	$\Delta R/R1 \leq \pm 0.5\%$	JIS-C-5201-1 4.24 85°C, 85%RH, 10% Bias for 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF"
Load at Rated Power	4527: $\Delta R/R1 \leq \pm 2.0\%$ Other sizes: $\Delta R/R1 \leq \pm 1.0\%$	JIS-C-5201-1 4.25 70°C, 1000 hrs with 1.5 hrs "ON" and 0.5 hrs "OFF"
Solderability	95% min. coverage	JIS-C-5201-1 4.17 245±5°C for 2±0.5 seconds
Dielectric Withstanding Voltage	No short or burned on the appearance	JIS-C-5201-1 4.7 Applied 500VDC for 1 minute, and limit surge current 50mA (max)
Core Body Strength	No broken	JIS-C-5201-1 4.15 Central part pressurizing force: 5N, 10 seconds
Terminal Strength	No broken	JIS-C-5201-1 4.13 Pressurizing force: 17.7N, 10 seconds
Terminal Bending Strength	No broken $\Delta R/R1 \leq \pm 0.5\%$	JIS-C-5201-1 4.33 Bending once for 2mm, 10 seconds.
Moisture Resistance (Climatic Sequence)	$\Delta R/R1 \leq \pm 0.5\%$	MIL-STD 202 Method 106 T=24 hours / cycle, 10 cycles. Steps 7a & 7b not required. Unpowered.

Remark: $\Delta R = (\text{resistance after stress} - \text{resistance before stress})$; R1 means resistance before stress.

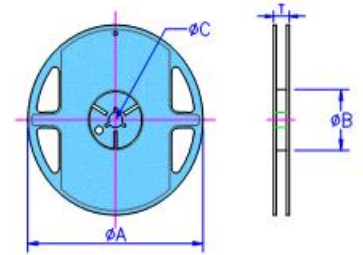
Soldering Condition



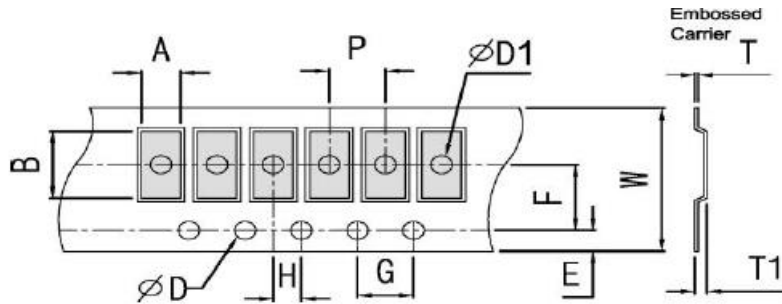
■ Packaging

Reel Specifications & Packaging Quantity

Type	Packaging Quantity		Tape Width	Reel Diameter	ΦA (mm)	ΦB (mm)	ΦC (mm)	T (mm)
LRC06	Embossed	5K	8mm	7 inch	178±1.0	60±0.5	13.2±0.5	12.0±0.5
LRC12	Embossed	4K	12mm	7 inch	178±1.0	60±0.5	13.5±0.5	16.2±0.5
LRC25	Embossed	2K	12mm	7 inch	178±1.0	60±0.5	13.5±0.5	16.2±0.5
LRC28	Embossed	2K	12mm	7 inch	178±1.0	60±0.5	13.5±0.5	16.2±0.5
LRC27	Embossed	1K	24mm	7 inch	178±1.0	60±0.5	13.2±0.5	24.4±2.0

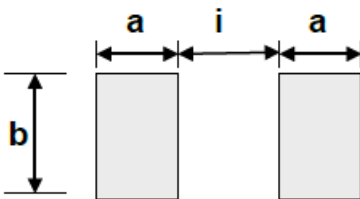


Embossed Plastic Tape Specifications



Type	A (mm)	B (mm)	W (mm)	E (mm)	F (mm)	G (mm)	P (mm)	H (mm)	ΦD (mm)	ΦD1 (mm)	T1 (mm)	T (mm)
LRC06	2.03±0.10	3.55±0.10	8.0±0.30	1.75±0.10	3.5±0.10	4.00±0.10	4.00±0.10	2.00±0.10	1.50+0.1/-0	1.00±0.10	0.70±0.10	0.20±0.05
LRC12	3.50±0.10	6.75±0.10	12.0±0.30	1.75±0.10	5.5±0.05	4.00±0.10	4.00±0.10	2.00±0.10	1.50+0.1/-0	1.55±0.10	0.90±0.10	0.20±0.05
LRC25	6.81±0.10	7.16±0.10	12.0±0.30	1.75±0.10	5.5±0.05	4.00±0.10	8.00±0.10	2.00±0.10	1.50+0.1/-0	1.55±0.10	1.05±0.10	0.25±0.05
LRC28	7.10±0.10	7.05±0.10	12.0±0.30	1.75±0.10	5.5±0.05	4.00±0.10	8.00±0.10	2.00±0.10	1.50+0.1/-0	1.55±0.10	0.95±0.10	0.20±0.05
LRC27	7.38±0.10	12.0±0.10	24.0±0.30	1.75±0.10	11.5±0.05	4.00±0.10	12.0±0.10	2.00±0.10	1.50+0.1/-0	1.50±0.10	1.05±0.10	0.30±0.10

■ Recommend Land Pattern



Type	a (mm)	b (mm)	i (mm)
LRC06	1.60	2.18	0.66
LRC12 (0.5-1.5mΩ)	3.05	3.68	1.27
LRC12 (2.0-3.5mΩ)	2.11	3.68	3.18
LRC12 (3.6-500mΩ)	1.90	3.68	3.50
LRC25 (0.25-0.5mΩ)	3.18	6.86	1.32
LRC25 (1-3mΩ)	2.34	6.86	3.00
LRC28	2.75	7.82	3.51
LRC27 (0.5-3mΩ)	4.50	8.74	4.50
LRC27 (3.5-100mΩ)	3.40	8.74	6.43
LRC27 (101-500mΩ)	2.93	8.74	7.63