

Data Sheet

Customer: _____

Product: Low Ohm (Metal Strip) Chip Resistor - HLR Series _____

Size : 1206 / 2010 / 2512 _____

Issued Date: 06-Oct.-2023 _____

Edition: Ver. 2 _____

Record of change

Date	Ver.	Description	Page
01-Feb.-2016	1		
06-Oct.-2023	2	Add size 1206 & 2010	1,2

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06-Oct.-2023	06-Oct.-2023	06-Oct.-2023	
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Low Ohm (Metal Strip) Chip Resistor

HLR Series

Features

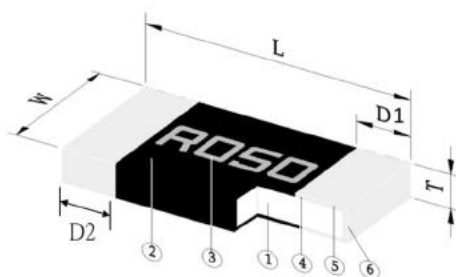
- Low TCR down to ± 25 PPM/ $^{\circ}$ C
- Customized resistance available
- Low inductance < 5nH
- Sulfur resistance unaffected by sulfur environments
- Lead-free and RoHS compliant



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
② Overcoat	⑤ Barrier Layer
③ Marking	⑥ Solder Plating

Dimensions

Type	Size (Inch)	L (mm)	W (mm)	T (mm)	D1 (mm)	D2 (mm)
HLR1206	1206	3.15 $\pm$ 0.10	1.45 $\pm$ 0.10	0.55 $\pm$ 0.10	0.55 $\pm$ 0.15	0.55 $\pm$ 0.15
HLR2010	2010	5.00 $\pm$ 0.15	2.40 $\pm$ 0.15	0.55 $\pm$ 0.15	0.80 $\pm$ 0.20	0.80 $\pm$ 0.20
HLR2512 (2~200m Ω)	2512	6.40 $\pm$ 0.25	3.20 $\pm$ 0.25	0.70 $\pm$ 0.20	0.90 $\pm$ 0.30	0.90 $\pm$ 0.30
HLR2512 (1.5m Ω)	2512	6.40 $\pm$ 0.25	3.20 $\pm$ 0.25	0.70 $\pm$ 0.20	0.90 $\pm$ 0.30	1.45 $\pm$ 0.30
HLR2512 (1m Ω)	2512	6.40 $\pm$ 0.25	3.20 $\pm$ 0.25	0.70 $\pm$ 0.20	0.90 $\pm$ 0.30	1.85 $\pm$ 0.30

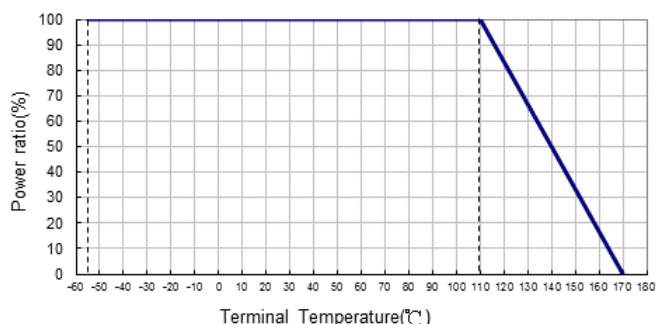
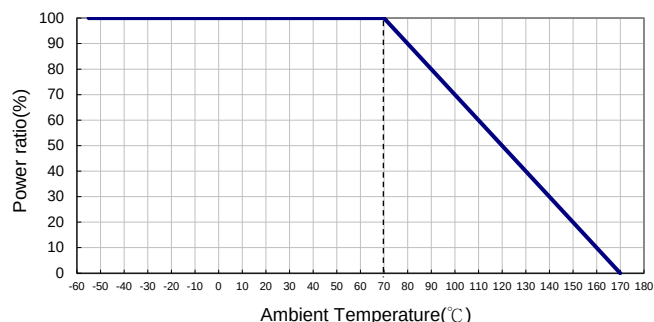
Part Numbering

HLR	2512	F	T	S	-	R015
Type	Size	Tolerance	Packing	Watt		R Value
	1206	D: $\pm 0.5\%$	Tape/Reel	T : 1W		
	2010	F: $\pm 1\%$		S : 2W		4 digit
	2512	J : $\pm 5\%$		R : 3W		R015=15m Ω R020-20m Ω

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Derating Curve

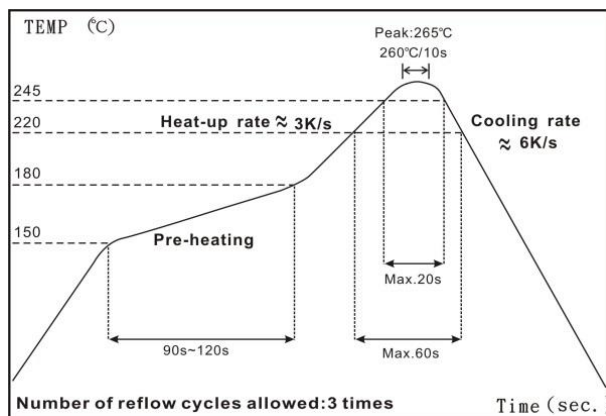


Electrical Specifications

Item Type	Power Rating at 70°C	Rated Terminal Temperature	Operating Temp. Range	Resistance Range (mΩ)			TCR (PPM/°C)
				±0.5%	±1%	±5%	
HLR1206	1W	110°C	-55 ~ +170°C	8, 10, 12, 15, 20, 25, 30, 33, 40			±50
				3, 4, 5, 7, 8, 10, 12, 15, 20, 25, 30, 33, 40			±75 ±100
HLR2010	1W	110°C	-55 ~ +170°C	4, 5, 10, 15, 20, 30, 50, 68, 75, 100			±75
	2W			4, 5, 10, 15, 20, 30, 50, 68, 75			
HLR2512	2W, 3W	110°C	-55 ~ +170°C	3, 4, 5, 6, 7, 18, 20, 22, 25, 30, 33, 35, 39, 40, 47, 50, 60, 68, 70, 75, 80, 82, 90, 91, 100, 120, 150, 180, 200			±25
		110°C		1, 1.5, 2, 2.5, 3, 4, 5, 6, 7, 8, 8.5, 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			±50 ±75

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

Soldering Condition



IR Reflow Soldering

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

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Environmental Characteristics

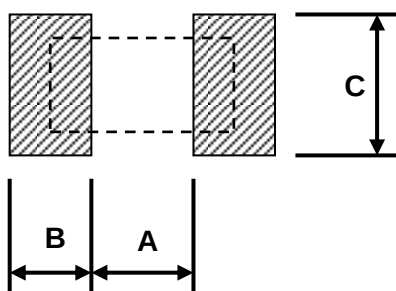
Item	Requirement	Test Method
Temperature Coefficient of Resistance (T.C.R.)	As Spec.	IEC60115-1 4.8 JIS-C-5201-1 4.8 +25°C ~125°C, 25°C is the reference temperature
Short Time Overload	±1.0%	IEC60115-1 4.13 JIS-C-5201-1 4.13 5*rated power for 5 seconds
Insulation Resistance	≥10G	IEC60115-1 4.6 JIS-C-5201-1 4.13 100V DC for 1 minute
Endurance	±1.0%	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	±1.0%	MIL-STD-202 Method 103 1000 hrs 85°C/85%RH 10% of operating power
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 60 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	±1.0%	JIS-C-5201-1 4.19 IEC-60115-1 4.19 -55°C to +155°C, 5 cycles
Low Temperature Storage	±1.0%	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

■Shelf Life: 2 years from production date.

Recommend Land Pattern



Type	A (mm)	B (mm)	C (mm)
HLR1206	1.50	1.40	1.70
HLR2010	3.60	1.40	2.50
HLR2512 (2~200mΩ)	4.00	2.00	3.50
HLR2512 (1~1.5mΩ)	2.30	2.65	3.50

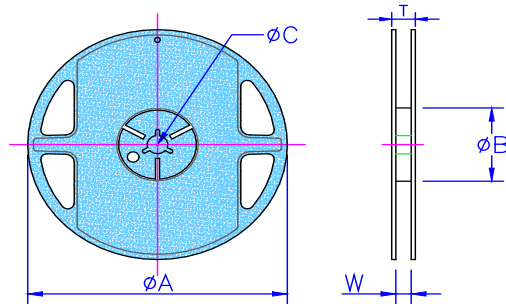
* FR4 copper board, 100μm of copper pad thickness

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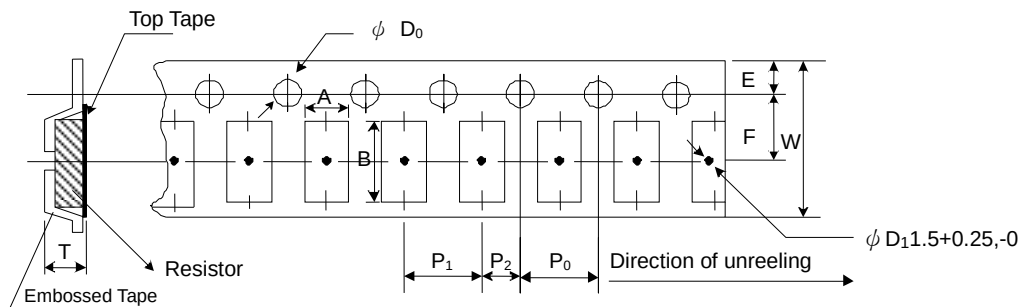
■ Packaging

Reel Specifications & Packaging Quantity



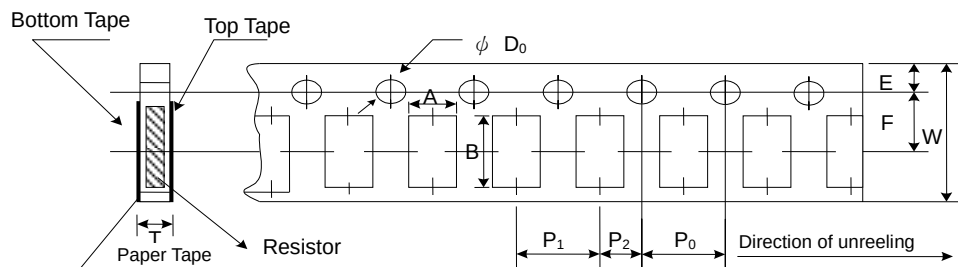
Type	Resistance (mΩ)	Packaging Quantity		Tape Width	Reel Diameter	ΦA (mm)	ΦB (mm)	ΦC (mm)	W (mm)	T (mm)
HLR1206	3~40	Paper	5K	8mm	7 inch	178.5±1.5	60 ^{+1/-0}	13.0±0.2	9.0±0.5	12.5±0.5
HLR2010	4~100	Embossed	4K	12mm	7 inch	178.5±1.5	60±1.0	13.0±0.5	13.0±1.0	15.5±0.5
HLR2512	1~200	Embossed	4K	12mm	7 inch	178.5±1.5	60±1.0	13.0±0.5	13.0±1.0	15.5±0.5

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)
HLR2010	2.80±0.10	5.40±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
HLR2512	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

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)
HLR1206	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