

Suzhou LiShengDa Electronic Technology Co., Ltd

Document No.: NQ-APS-042



LRLN series Current sensing Resistor Data Sheet

Rev.: A0

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Issue date :2023-01-16



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Issue Date	2023-01-16	LRLN series Current sensing Resistor Data Sheet	Page	2 of 10
Update Date			No.	NQ-APS-042
Document status	Open		Rev.	A0

◆1. Description:

- Metal Alloy Long Terminal Low-Resistance Resistor
- Low thermal EMF
- Low TCR
- Low inductance

◆2. Applications :

- Battery pack
- Inverter/Converter
- Consumer electronics
- Notebook

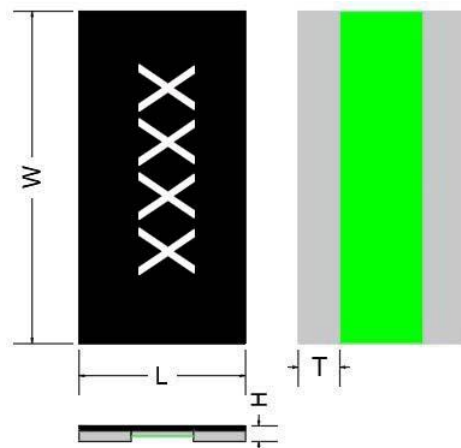
◆3.Part Number:

EX.

LRL	N	06	C	F	T	R005	A				
Series	Material	Size	Power	Tolerance	Packing	Resistance (Ω)	Terminals				
LRL: Metal alloy Long terminal Resistor	N: Metal Alloy	0612	C	1W	F	1%	T	Peper	R005	5mΩ	A: 2 terminal B: 4 terminal
		0508			G	2%			R001	1mΩ	
					J	5%					

Issue Date	2023-01-16	LRLN series Current sensing Resistor Data Sheet	Page	3 of 10
Update Date			No.	NQ-APS-042
Document status	Open		Rev.	A0

◆4. Physical dimension:



Unit: mm

Size	R Value	L	W	H	T
0612	1mΩ	1.60±0.20	3.20±0.20	Max 0.40	0.40±0.15
0612	1.5mΩ~25 mΩ	1.60±0.20	3.20±0.20	Max 0.35	0.40±0.15
0508	1mΩ	1.26±0.20	2.06±0.20	Max 0.40	0.35±0.15
0508	1.5mΩ~10 mΩ	1.26±0.20	2.06±0.20	Max 0.35	0.35±0.15

Marking Instructions

For 0612 Size is marked with four digit. We have two different ways of marking :

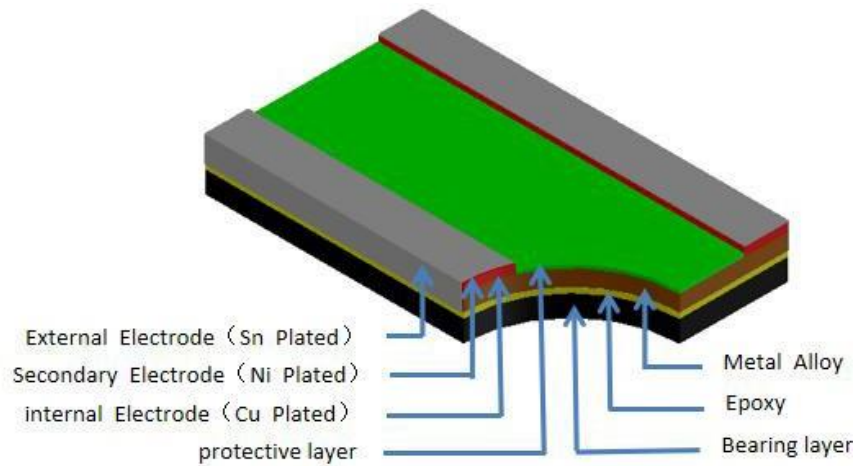
- “R” designates the decimal location in ohms, e.g. 1mΩ : R001; 10mΩ : R010;
- “m” designates the decimal location in milliohms, e.g. 0.5mΩ : 0m50; 5.5mΩ : 5m50;

For 0508 Size is marked with three digit. We have two different ways of marking :

- “R” designates the decimal location in ohms, e.g. 1mΩ : 001; 10mΩ : 010
- “m” designates the decimal location in milliohms, e.g. 0.5mΩ : 0m5; 1.5mΩ : 1m5

Issue Date	2023-01-16	LRLN series Current sensing Resistor Data Sheet	Page	4 of 10
Update Date			No.	NQ-APS-042
Document status	Open		Rev.	A0

◆5. Construction:



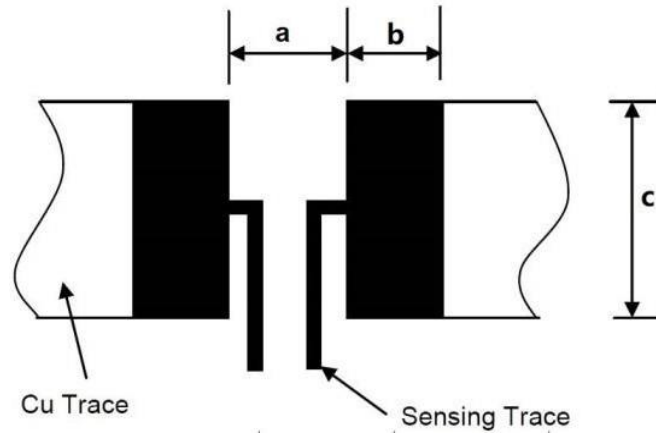
◆6. Electrical Characteristics:

Size	Power Rating at 70C°(W)	Resistance Range (mΩ)	TCR (ppm/C°)	Resistance Tolerance (%)	Rating Current	Operation Temperature Range
0612	1	1~2	±70	±1.0	(P/R) ^{1/2}	-55C°~+150C°
		3~25	±50			
0508	1	1~2	±100			
		3~10	±70			

Note: P=Rating Power ; R=Resistance Value

◆7.Recommended Solder Pad Layout :

Issue Date	2023-01-16	LRLN series Current sensing Resistor Data Sheet	Page	5 of 10
Update Date			No.	NQ-APS-042
Document status	Open		Rev.	A0

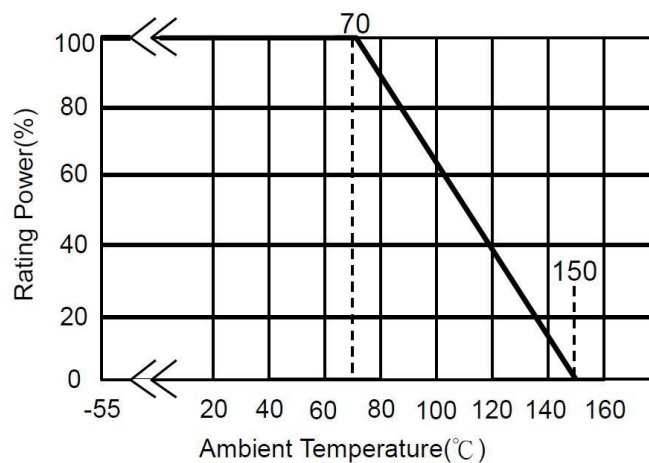


Unit:mm

Size	a	b	c
0612	0.80	1.00	3.50
0508	0.50	0.90	2.30

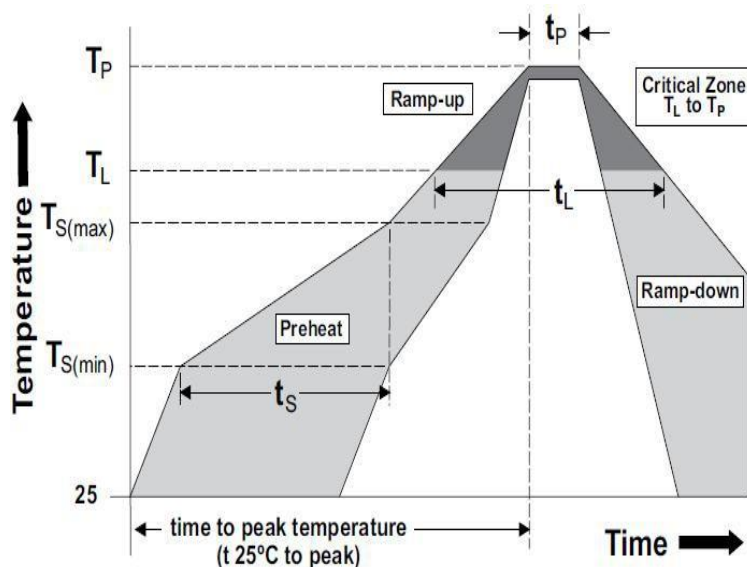
◆ 8. Power Derating Curve:

For resistors operated in ambient temperatures 70°C, power rating shall be derated in according with the curve below:



Issue Date	2023-01-16	LRLN series Current sensing Resistor Data Sheet	Page	6 of 10
Update Date			No.	NQ-APS-042
Document status	Open		Rev.	A0

◆ 9. Recommended Solder curve:

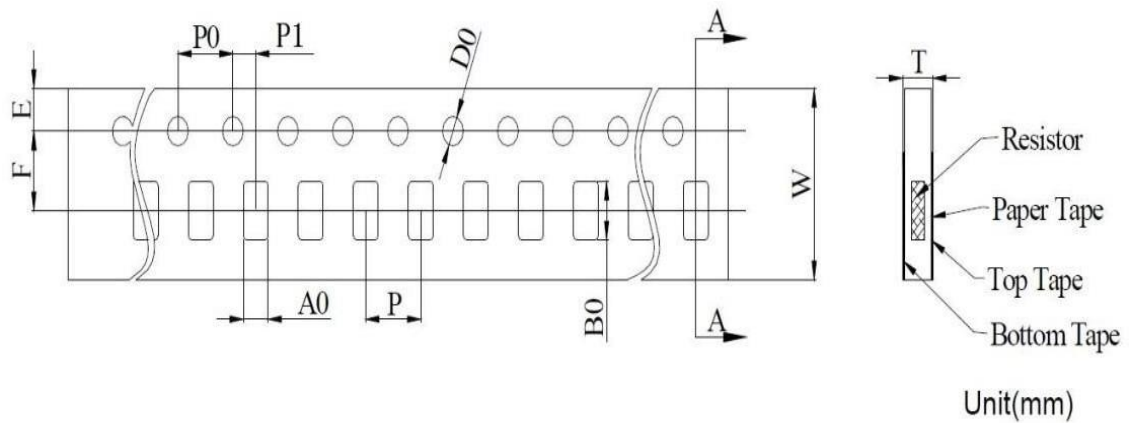


Reflow Condition		Pb – Free assembly
Pre heat	- Temperature Min (Ts(min))	150°C
	- Temperature Max (Ts(max))	200°C
	- Time (Min to Max) (ts)	60 – 120 secs
Reflow	Average ramp up rate (Liquidus Temp (TL) to peak	5°C/second max
	TS(max) to TL - Ramp-up Rate	5°C/second max
	- Temperature (TL) (Liquidus)	217°C
	- Temperature (tL)	60 – 150 seconds
	Peak Temperature (TP)	260°C
	Time within 5°C of actual peak Temperature (tp)	20 – 40 seconds
	Ramp-down Rate	5°C/second max
	Time 25°C to peak Temperature (TP)	8 minutes Max.
Wave Soldering		Not applicable
Hand Soldering		350°C, 5 seconds max.

Issue Date	2023-01-16	LRLN series Current sensing Resistor Data Sheet	Page	7 of 10
Update Date			No.	NQ-APS-042
Document status	Open		Rev.	A0

◆10.Packing:

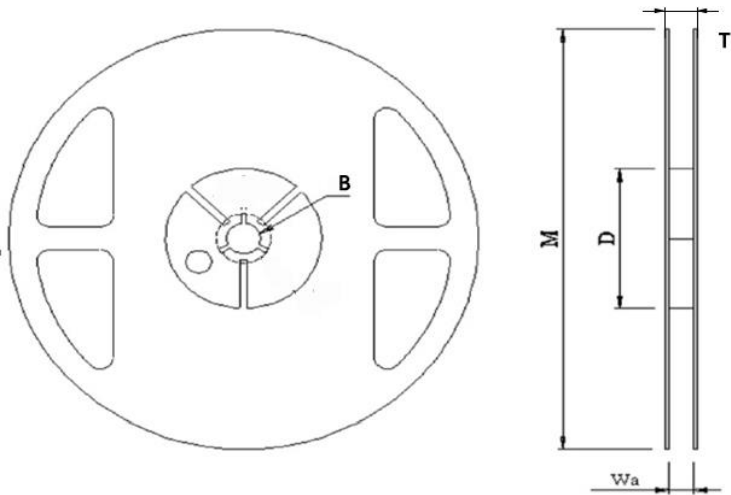
Carrier tape Specification:



Size	0612	0508
A0	2.00±0.20	1.66±0.20
B0	3.60±0.20	2.46±0.20
E	1.75±0.10	1.75±0.10
F	3.50±0.05	3.50±0.05
W	8.00±0.20	8.00±0.20
P0	4.00±0.10	4.00±0.10
P	4.00±0.10	4.00±0.10
P1	2.00±0.05	2.00±0.05
D0	1.50±0.10	1.50±0.10
T	0.55±0.20	0.55±0.20

Reel Dimensions:

Issue Date	2023-01-16	LRLN series Current sensing Resistor Data Sheet	Page	8 of 10
Update Date			No.	NQ-APS-042
Document status	Open		Rev.	A0



Unit: mm

Size	M	W	A	B	C	D
0612/0508	178.0±2.0	8.4+0.5/-0	2.0±0.5	13.2±0.5	17.70±0.5	60.0±1.0

Quantity of Package : 5000pcs/Reel for 0612 size and 0805 size

◆ 11. Label:



Issue Date	2023-01-16	LRLN series Current sensing Resistor Data Sheet	Page	9 of 10
Update Date			No.	NQ-APS-042
Document status	Open		Rev.	A0

◆12.Reliability test item:

Item	Test condition/ Methods	Limited	Standard		
Temperature coefficient of resistance	TCR =(R-R ₀)/R ₀ (T ₂ -T ₁)X 10 ⁶ R ₀ : resistance of room temperature R: resistance of 125℃ T ₁ : Room temperature T ₂ : Temperature at 125℃	Refer to Spec	MIL-STD-202 Method 304		
Short time Overload	Applied Overload for 5 seconds, then measure its resistance variance rate. (Test condition refer to below):	≤±1.0%	IEC60115-1 4.13		
	TypeResistance(mΩ)Rated power				
	0612			1≤R≤10	4 times
				10 < R≤25	3 times
	0508			1≤R≤10	3 times
Resistance to Soldering Heat	260℃± 5℃ time: 12sec± 0.5sec	≤±0.5%	MIL-STD-202 Method 210		
Solderability	Temperature of Solder: 245± 5℃ Dipping time:3±0.5s	Solder coverage over 95%	IEC60115-1 4.17		
Temperature Cycling	-55℃ (15min)/+150℃(15min), 300 cycles	≤±1.0%	MIL-STD-202 Method107G		
Low temperature Storage	-55℃ for 1000hours, No power	≤±1.0%	IEC60115-1 4.23.4		
High Temperature Storage	150℃ for 1000hours, No power	≤±1.0%	IEC60115-1 4.25		
Bias Humidity	+85℃ , 85% RH, 10%bias, 1000hours	≤±1.0%	MIL-STD-202 Method103		
Vibration	The frequency varies from 10HZ to 55HZ and return to 10HZ, shall be transferred in 1 min. Amplitude : 1.5mm, 3 directions, and 12 hours	≤±0.5%	MIL-STD-202 Method 201		
Operational life	70℃± 2℃, 1000 hours, at rated power 1.5 hours “ON”, 0.5 hours “OFF”	≤±1.0%	MIL-STD-202 Method 108		
Moisture resistance	MIL-STD-202,method106, No power, 7b not required	≤±0.5%	MIL-STD-202 Method 106		

Note : Measurement at 24±4 hours after test conclusion for all reliability tests-parts.

Issue Date	2023-01-16	LRLN series Current sensing Resistor Data Sheet	Page	10 of 10
Update Date			No.	NQ-APS-042
Document status	Open		Rev.	A0

◆13. Storage :

The temperature condition must be controlled less than 40C°, The R.H. must be controlled less than 75%. Store in accordance with this requirement, and the validity period is two years after the date of manufacture. Please avoid the mentioned harsh environment below when storing to ensure product performance and its' weldability. Places exposed to sea breeze or other corrosive gas, such as Cl2, H2S, NH3, SO2 and NO2. When the product is moved and stored, please ensure the correct orientation of the box. Do not drop or squeeze the box. Otherwise, the electrode or the body of the product may be damaged.

◆14. Manufacturing Country & City :

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◆15. Remarks :

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