

Metal Strip Current Sense Chip Resistors

**Ultra Low Ohm Resistor Save Space, Time,
and Money (LRC)**

▶ Preview

Providing design engineers with an economical low ohmic value, current sense metal strip chip resistor with high quality performance, Token Electronics LRC Series is suitable for applications in the automotive sector for applications that require high power handling (Up to 3W) and low resistance 0.5mΩ.

From a certified supplier offering the automotive quality, Token's LRC Series gives all round superior performance for current sensing in lamp detection, mirrors, window lift, steering and seat controls.

As a first instance, the LRC Series displays enhanced power handling capabilities, against other technologies.

Thermal conductivity is important for chip resistors - little heat is dissipated directly into the air, and instead, is conducted out through the solder pads.

The heat generated from the specially constructed LRC resistor is more readily dispersed, therefore preventing localised heating, which contributes to TCR and thermal EMF errors, premature aging and possible scorching of the PC board.

They are rated for ambient operation from -55°C to +170°C.

The LRC Series is RoHS compliant and lead free. Contact us with your specific needs.



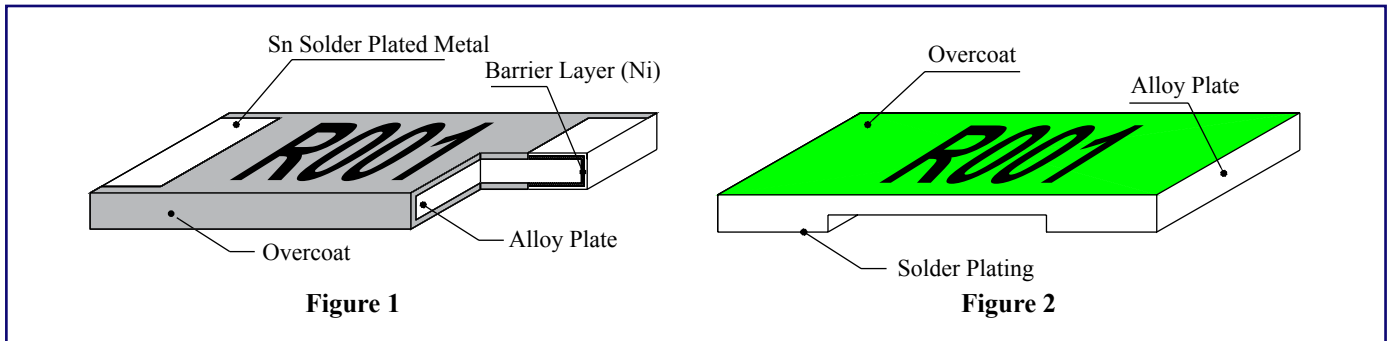
▶ Features

- Low TCR $\pm 50, \pm 100$ PPM/°C
- High Wattage Rating Up to 3W
- Customized Resistance Available
- Resistance Values from 0.5m ohms to 20m ohms
- Without Laser Trimmed with Very Low Inductance

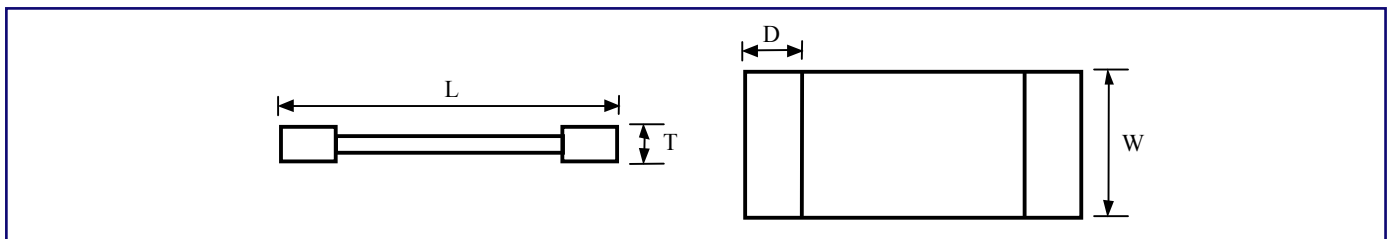
▶ Applications

- For NB power management.
- For MB power management.
- For Monitor power management.
- SWPS: DC-DC converter, Charger, Adaptor.

Low Ohmic (LRC) Construction



SMD 2512, 2010, 1206 (LRC) Dimensions



Type	Resistance (mΩ)	L(mm)	W(mm)	T(mm)	D(mm)
LRC12*T*0M50G	0.50	6.35±0.25	3.00±0.20	0.60±0.20	2.68±0.25
LRC12*T*0M75G	0.75	6.35±0.25	3.00±0.20	0.60±0.20	2.48±0.25
LRC12*T*R001G	1.0	6.35±0.25	3.00±0.20	0.60±0.20	1.93±0.25
LRC12*T*1M50G	1.5	6.35±0.25	3.00±0.20	0.60±0.20	1.43±0.25
LRC12*T***G	2.0~3.0	6.35±0.25	3.00±0.20	0.60±0.20	1.18±0.25
LRC12*T*R004G	4.00	6.35±0.25	3.00±0.20	0.60±0.20	2.18±0.25
LRC12*T***G	5.0~6.0	6.35±0.25	3.00±0.20	0.60±0.20	1.93±0.25
LRC12*T*R007G	7.00	6.35±0.25	3.00±0.20	0.60±0.20	1.43±0.25
LRC12*T***G	8.0~15	6.35±0.25	3.00±0.20	0.60±0.20	1.18±0.25
LRC12*T*0M50	0.50	6.35±0.25	3.18±0.25	1.40±0.20	1.43±0.38
LRC12*T*0M75	0.75	6.35±0.25	3.18±0.25	1.00±0.20	1.43±0.38
LRC12*T*R001	1.00	6.35±0.25	3.18±0.25	0.80±0.20	1.43±0.38
LRC12*T*1M50	1.50	6.35±0.25	3.18±0.25	0.65±0.20	1.43±0.38
LRC12*T*R002	2.00	6.35±0.25	3.18±0.25	0.50±0.20	1.43±0.38
LRC12*T*2M50	2.50	6.35±0.25	3.18±0.25	1.00±0.20	1.43±0.38
LRC12*T*R003	3.00	6.35±0.25	3.18±0.25	0.70±0.20	1.43±0.38
LRC12*T*R004	4.00	6.35±0.25	3.18±0.25	0.60±0.20	1.43±0.38
LRC12*T*R005	5.00	6.35±0.25	3.18±0.25	0.50±0.20	1.43±0.38
LRC12*T*R006	6.00	6.35±0.25	3.18±0.25	0.50±0.20	1.43±0.38
LRC12*T*6M50	6.50	6.35±0.25	3.18±0.25	0.45±0.20	1.43±0.38
LRC12*T*R007	7.00	6.35±0.25	3.18±0.25	0.45±0.20	1.43±0.38
LRC10*T***	1.0~10	5.08±0.25	2.54±0.15	0.60±0.20	1.67±0.63
LRC06*T***	1.0~10	3.20±0.25	1.60±0.10	0.60±0.20	0.98±0.38

Notice : TOKEN is capable of manufacturing the optional spec based on customer's requirement.

▶ SMD 2512, 1206 (LRC) Standard Electrical Specifications

Type	Power Rating at 80°C	Operating Temp. Range	Resistance Tolerance (±%)	Resistance (mΩ)	TCR (±PPM/°C)
LRC12*TK**	1W	-55°C ~ +170°C	1, 3, 5	2.5~3.5	150
LRC12*TE**	1W			4.0~5.5	100
LRC12*TW**	1W			6.0~7.0	75
LRC12*TD**G	1W			11.0~15.0	50
LRC12*TD**	1W			0.5~2.0	50
LRC06*TD**	1W			1.0~10.0	50

Remark : Operating Current $I = \sqrt{P/R}$, Operating Voltage $V = \sqrt{P * R}$

▶ SMD 2512, 2010 (LRC) High Power Rating Electrical Specifications

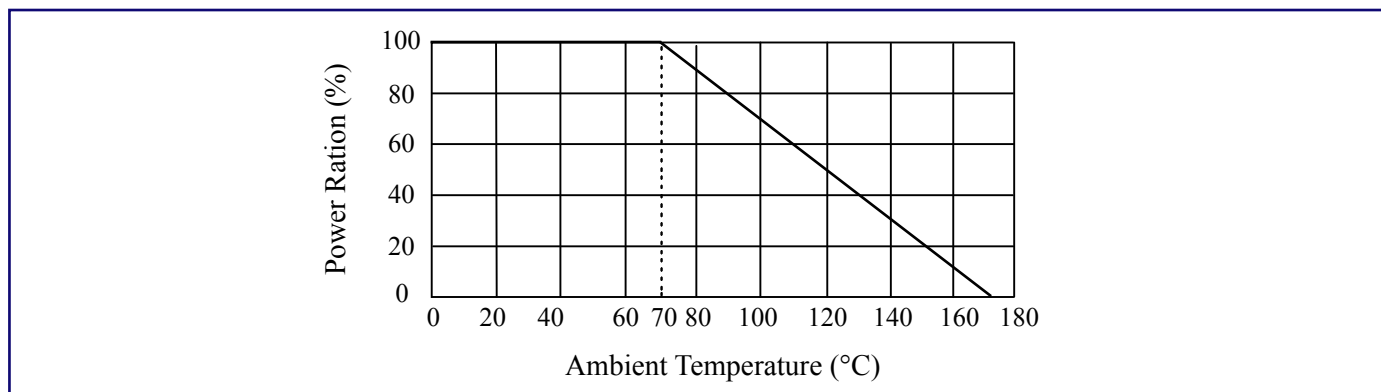
Type	Power Rating at 80°C	Operating Temp. Range	Resistance Tolerance (±%)	Resistance (mΩ)	TCR (±PPM/°C)
LRC12*TDS*	2.0W	-55°C ~ +170°C	1, 3, 5	0.5~2.0	50
LRC12*TDS*G	2.0W			3.5	50
LRC12*TDS*G	2.0W			6.5~10.0	50
LRC12*TDB*G	2.5W			4.0~6.0	50
LRC12*TDR*G	3.0W			1.0~3.0	50
LRC12*TER*G	3.0W			0.5~0.75	100
LRC10*TDA*	1.5W			1.0~10.0	50

Remark : Operating Current $I = \sqrt{P/R}$, Operating Voltage $V = \sqrt{P * R}$

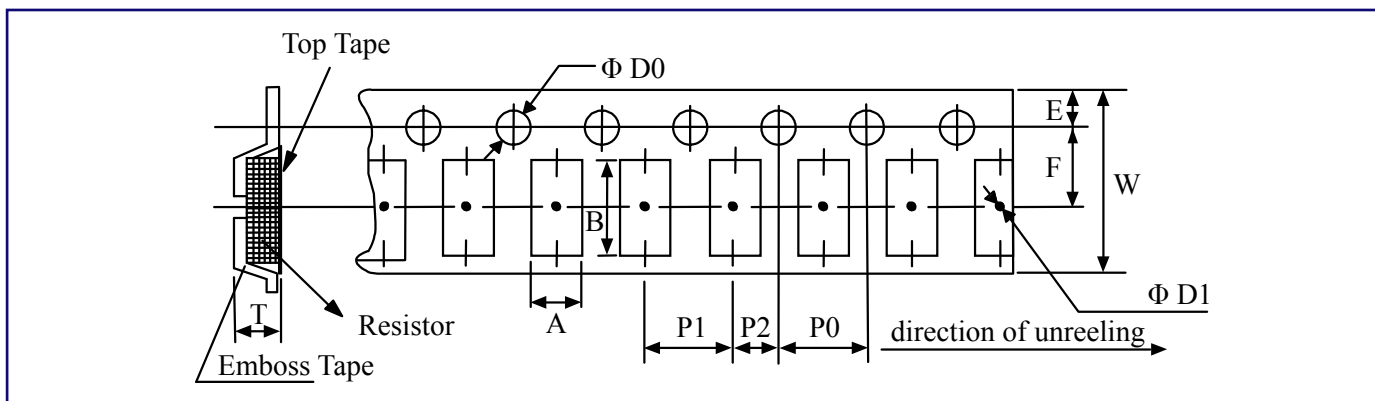
▶ Surface Mount Chips (LRC) Packing Quantity

Type	Emboss Plastic Tape
LRC12 (2512)	2,000
LRC10 (2010)	2,000
LRC06 (1206)	2,000

▶ (LRC) Derating Curve



▶ Surface Mount (LRC) Emboss Plastic Tape Specifications



Size	Resistance (mΩ)	A	B	W	E	F	P0	P1	P2	ΦD0	ΦD0	T
LRC12	0.50~7	3.40±0.1	6.73±0.1	12.0±0.1	1.75±0.1	5.5±0.05	4.0±0.1	4.00±0.1	2.0±0.05	1.50±0.10	1.4min	0.81±0.1
	0.50~15	3.40±0.1	6.75±0.1	12.0±0.1	1.75±0.1	5.5±0.05	4.0±0.1	4.00±0.1	2.0±0.05	1.55±0.05	1.4min	0.80±0.1
LRC10	1~10	2.85±0.1	5.55±0.1	12.0±0.2	1.75±0.1	5.5±0.05	4.0±0.1	4.00±0.1	2.0±0.05	1.55±0.05	1.4min	0.85±0.1
LRC06	1~10	1.90±0.1	3.60±0.1	8.0±0.2	1.75±0.1	3.5±0.05	4.0±0.1	4.00±0.1	2.0±0.05	1.55±0.05	1.0min	0.87±0.1

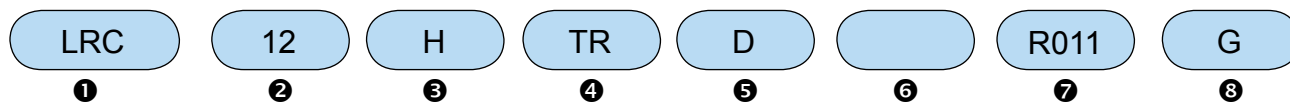
- Notice:**
1. The cumulative tolerance of 10 sprocket hole pitch is $\pm 0.2\text{mm}$.
 2. Carrier camber shall be not more than 1mm per 100mm through a length of 250mm.
 3. A & B measured 0.3mm from the bottom of the packet.
 4. t measured at a point on the inside bottom of the packet to the top surface of the carrier.
 5. Pocket position relative to sprocket hole is measured as the true position of the pocket and not the pocket hole.

▶ Low Ohmic (LRC) Environmental Characteristics

Item	Specification		Test Method
	Black coating	Green coating	
Temperature Coefficient of Resistance	As Spec.		MIL-STD-202 Method 304 +25/-30/+25/+130/+25°C
Thermal Shock	$\pm 0.5\% + 0.5\text{m}\Omega$	$\pm 1\%$	MIL-STD-202 Method 107G -55°C~150°C, 100 cycles
Short Time Overload	$\pm 0.5\% + 0.5\text{m}\Omega$	$\pm 1\%$	JIS-C-5202-5.5 RCWV*2.5 or Max Overloading Voltage, 5 seconds
Resistance to Dry Heat	$\pm 1\% + 0.5\text{m}\Omega$	$\pm 1\%$	JIS-C-5202-7.2 96 hours @ +125°C without load
Load Life	$\pm 1\% + 0.5\text{m}\Omega$	$\pm 1\%$	MIL-STD-202 M108 RCWV, 70°C, 1.5 hours on, 0.5 hours off 1000~1048 hours
Resistance to Soldering Heat	$\pm 0.5\% + 0.5\text{m}\Omega$	$\pm 1\%$	MIL-STD-202F Method 210E 260±5°C, 10±1second
Solderability	95%min coverage		MIL-STD-202F Method 210E 260±5°C, 2±0.5second

Remark: Green coating can't be work with wave soldering bath. Humidity < 80%RH; Storage Temperature: 25±3°C

How to Order



1 Part Number

2 Dimensions (L×W)

Code	Dimensions (L×W)
12	EIA2512 6.3×3.1mm
10	EIA2010 5.1×2.5mm
06	EIA1206 3.2×1.6mm

3 Resistance Tolerance

Code	Resistance Tolerance
J	±5%
H	±3%
F	±1%

4 Package

Code	Packaging
TR	Taping Reel

5 TCR

Code	TCR
D	±50PPM /°C
W	±75PPM/°C
E	±100PPM /°C
K	±150PPM /°C

6 Power Rating

Code	Power Rating
	Standard (1W)
A	(1.5W)
S	(2W)
R	(3W)
B	(2.5W)

7 Resistance

Code	Resistance
0M50	0.00050Ω
0M75	0.00075Ω
1M50	0.00150Ω
R002	0.00200Ω
R010	0.01000Ω

8 Protective Coating

Code	Packaging
	Black Coating
G	Green Coating
**2010/1206	No coating / marking

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