

LRE Series

Metal Alloy Low-Resistance Resistor

This specification is applicable to lead-free and halogen-free LRE series metal alloy low-resistance resistors. Miniature size suitable for compact Printed Circuit Boards in high-precision electronic products. Applications include: Power Supply, Battery Pack, Measuring Instruments, LED Driver, and others.



■ GENERAL SPECIFICATIONS

Model	Number of Terminals	Max. Rating Power at 70°C	Max. Rating Current	Max. Overload Current	TCR [PPM/°C]	Resistance Range[mΩ]		Operating Temp. Range
						±0.5% (D)	±1.0% (F) ±2.0% (G) ±5.0% (J)	
LRE0306	2	1/2W	22.3A	44.7A	≒ ±300	-	1 ≤ R < 5	-55~150°C
	4	1/3W	18.25A	36.5A	≒ ±100	-	5 ≤ R ≤ 10	
LRE0402	2	1/6W	10.5A	21.0A	≒ ±300	-	1 ≤ R ≤ 10	
					≒ ±600	-	1.5 ≤ R < 3	
					≒ ±200	-	3	
					≒ ±125	-	4~5	
	2	1/5W	11.5A	23.0A	≒ ±50	-	10	
					≒ ±600	-	1.5 ≤ R < 3	
					≒ ±200	-	3	
					≒ ±125	-	4~5	
2	1/4W	9.1A	18.2A	≒ ±50	-	10		
				≒ ±200	-	3		
				≒ ±125	-	4~5		
				≒ ±50	-	10		
LRE0508	2	3/4W	19.3A	38.6A	≤ ±50	-	2 ≤ R ≤ 14	
LRE0603	2	1/3W	18.3A	36.5A	≒ ±450	-	1 ≤ R < 4	
					≒ ±75	-	4 ≤ R < 8	
	2	1/2W	15.8A	31.6A	≒ ±50	10 ≤ R ≤ 60	8 ≤ R ≤ 60	
					≒ ±450	-	2 ≤ R < 4	
LRE0612	2	1W	31.6A	63.2A	≒ ±75	-	4 ≤ R < 8	
					≒ ±50	10 ≤ R ≤ 15	8 ≤ R ≤ 15	
	4	1W	31.6A	63.2A	≒ ±450	-	2 ≤ R < 4	
					≒ ±75	-	4 ≤ R < 8	
LRE0805	2	1/2W	15.8A	31.6A	≒ ±50	5 ≤ R ≤ 70	5 ≤ R ≤ 70	
					≒ ±100	-	2 ≤ R < 3	
					≒ ±75	-	3 ≤ R < 5	
	2	3/4W	19.36A	38.72A	≒ ±100	-	2 ≤ R < 3	
					≒ ±75	-	3 ≤ R < 5	
					≒ ±50	5 ≤ R ≤ 10	5 ≤ R ≤ 10	
LRE1206	2	1/2W	22.3A	44.6A	≒ ±100	-	2 ≤ R < 3	
					≒ ±75	-	3 ≤ R < 5	
					≒ ±50	10 ≤ R ≤ 75	4 ≤ R ≤ 56	
	2	1W	31.6A	63.2A	≒ ±400	-	1 ≤ R < 2	
					≒ ±75	-	2 ≤ R < 4	
					≒ ±50	10 ≤ R ≤ 75	4 ≤ R ≤ 56	

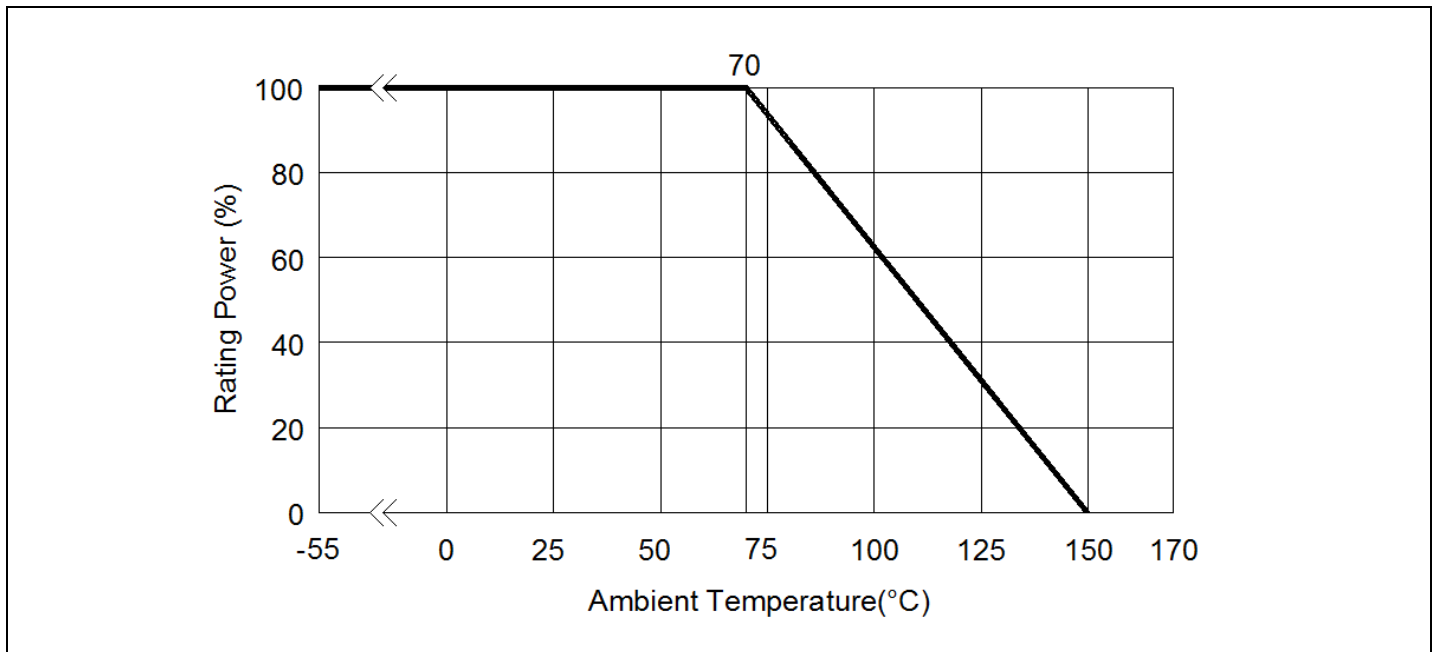


CHARACTERISTICS

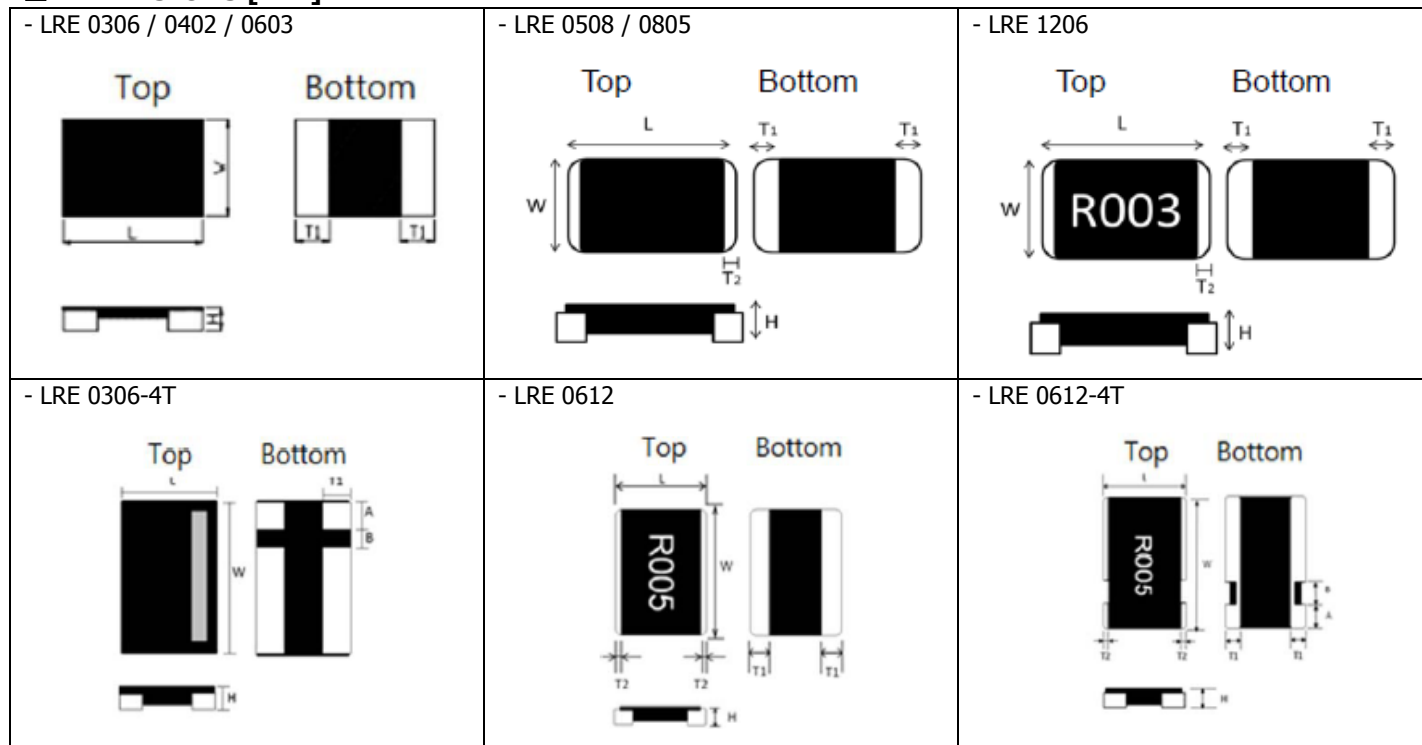
Temperature Coefficient of Resistance	Refer to Paragraph general specifications	JIS C 5201 4.8 Method; $TCR(ppm/^{\circ}C) = \{(R2-R1)/R1(T2-T1)\} \times 10^6$ R1 : Resistance of room temp.(T1), R2 : Resistance of 150°C(T2)
Short Time Overload	LRE0612 : $(\Delta R/R1) \leq \pm 1.0\%$ Others : $(\Delta R/R1) \leq \pm 0.5\%$	4times rated power, 5 seconds
Insulation Resistance	$\geq 10^8 \Omega$	JIS C 5201 4.6 Method; DC100V _{DC} for 1minute
Dielectric Withstanding Voltage	No short or burned on the appearance	JIS C 5201 4.7 Method; Applied AC300V _{AC} for 1minute, Limit surge current maximum 50mA
Resistance to Solder Heat	$(\Delta R/R1) \leq \pm 0.5\%$	JIS C 5201-1 4.18 Method; Solder temperature/immersion time : 260±5°C, 10±1seconds
Solderability test	95% coverage	JIS C 5201-1 4.17 Method; 245±5°C, 3±0.5 seconds
Vibration	$(\Delta R/R1) \leq \pm 0.5\%$	JIS C 5201-1 4.22
Resistance to solvent	$(\Delta R/R1) \leq \pm 0.5\%$	JIS C 5201-1 4.29 Method : Immersion time : 60 seconds, @20°C~25°C
Low Temperature Exposure(Storage)	$(\Delta R/R1) \leq \pm 0.5\%$	JIS C 5201-1 4.23.4 Method : 1,000hours, @-55°C
High Temperature Exposure(Storage)	$(\Delta R/R1) \leq \pm 1.0\%$	JIS C 5201-1 4.23.2 Method : 1,000hours, 150±5°C
Temperature Cycling (Rapid Temp. Change)	$(\Delta R/R1) \leq \pm 1.0\%$	JIS C 5201-1 4.19 Method : -55°C to +150°C, 1,000cycles,
Moisture Resistance (Climatic Sequence)	$(\Delta R/R1) \leq \pm 0.5\%$	Mil-STD-202, Method 106
Bias Humidity	$(\Delta R/R1) \leq \pm 1.0\%$	JIS C 5201-1 4.24 Method : +85°C,85% RH, 10% Bias, 1.5 hours On, 0.5 hours Off. Extended Life Test : 1,000 hours.
Load Life	$(\Delta R/R1) \leq \pm 1.0\%$	JIS C 5201-1 4.25 Method : Test temperature 70±2°C Rated working voltage 1.5hours On, 0.5hours Off. Extended Life Test : 1,000 hours

* Remark: ΔR = (resistance after stress – resistance before stress); R1 means resistance before stress

DERATING CURVE



■ DIMENSIONS [mm]



Model	Max. Power Rating[W]	Resistance Range[mΩ]	DIMENSIONS - in inches (millimetres)						
			L	W	H	T1	T2	A	B
LRE0306	1/2	1~10	0.033±0.004 (0.85±0.10)	0.063±0.004 (1.60±0.10)	0.010±0.004 (0.25±0.10)	0.008±0.004 (0.20±0.10)	-	-	-
LRE0306-4T	1/3	1~10					-	0.012±0.004 (0.30±0.10)	0.012±0.004 (0.30±0.10)
LRE0402	1/6 & 1/5	1.5~5 10	0.039±0.004 (1.00±0.10)	0.020±0.004 (0.50±0.10)	0.010±0.004 (0.25±0.10)	0.010±0.004 (0.25±0.10)	-	-	-
	1/4	3~5 10					-	-	-
LRE0508	1	2~14	0.05±0.008 (1.270±0.20)	0.08±0.008 (2.032±0.20)	0.012±0.004 (0.30±0.10)	0.014±0.006 (0.35±0.15)	-	-	-
LRE0603	1/3	1~60	0.063±0.008 (1.60±0.20)	0.031±0.008 (0.80±0.20)	0.010±0.004 (0.25±0.10)	0.012±0.006 (0.30±0.15)	-	-	-
	1/2	2~15					-	-	-
LRE0612	1	1~25	0.063±0.008 (1.60±0.20)	0.126±0.008 (3.20±0.20)	0.010±0.004 (0.25±0.10)	0.014±0.006 (0.35±0.15)	0.008±0.006 (0.20±0.15)	-	-
LRE0612-4T	1	1~15				0.016±0.006 (0.40±0.15)		0.020±0.006 (0.50±0.15)	0.020±0.006 (0.50±0.15)
LRE0805	1/2 & 3/4	2	0.08±0.008 (2.032±0.20)	0.05±0.008 (1.270±0.20)	0.014±0.002/- 0.004 (0.35±0.05/- 0.10)	0.02±0.006 (0.50±0.15)	0.008±0.006 (0.20±0.15)	-	-
	1/2	3~70			0.012±0.002/- 0.004 (0.30±0.05/- 0.10)	0.014±0.008 (0.35±0.20)		-	-
	3/4	3~10			-	-		-	
LRE1206	1/2	1 ≤ R < 3	0.126±0.008 (3.20±0.20)	0.063±0.008 (1.60±0.20)	0.016±0.008 (0.40±0.20)	0.035±0.008 (0.90±0.20)	0.008±0.006 (0.20±0.15)	-	-
		3 ≤ R < 4				0.024±0.008 (0.60±0.20)		-	-
		4 ≤ R ≤ 56				0.014±0.008 (0.35±0.20)		-	-

■ SOLDER PAD DIMENSIONS

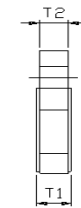
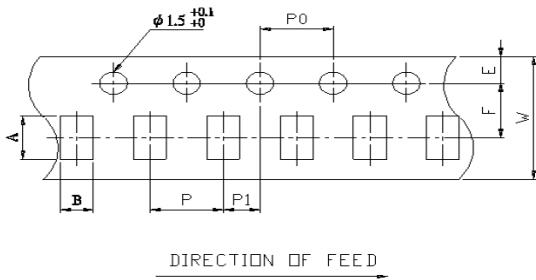
	Type	Max. Power Rating [W]	Resistance Range [mΩ]	SOLDER PAD Dimension in millimetres				
				a	b	c	D	i
- 2 terminals 	LRE0306	1/2	1~10	0.40	1.80	-	-	0.40
	LRE0306-4T	1/3	1~10	0.50	1.90	0.40	0.25	0.20
	LRE0402	1/6 & 1/5	1.5~5 · 10	0.65	0.50	-	-	0.50
		1/4	3~5 · 10					
	LRE0508	1.0	2~14	1.45	2.20	-	-	0.50
LRE0603	1/3	1~60	1.00	1.27	-	-	0.50	
	1/2	2~15						
- 4 terminals 	LRE0612	3/4	1~25	1.00	3.50	-	-	0.50
		1.0	1~25					
	1.5	5~10						
LRE0612-4T	1.0	1~10	1.00	3.50	0.80	0.40	0.50	
LRE0805	1/2	2~70	1.45	1.78	-	-	0.66	
	3/4	2~10						
LRE1206	1/2 & 1.0	1 ≤ R < 3	1.65	2.18	-	-	0.60	
		3 ≤ R < 4					0.90	
		4 ≤ R ≤ 56					1.00	

■ Measurement Point

	Type	A	B
<p>Bottom electrode</p> <p>⊙ Current Terminal</p> <p>⊖ Voltage Terminal</p>	LRE0306	0.63±0.05	0.33±0.05
	LRE0306-4T	0.65±0.05	0.90±0.05
	LRE0402	0.65±0.05	0.20±0.05
	LRE0508	0.90±0.05	0.46±0.05
	LRE0603	1.25±0.05	0.30±0.05
	LRE0612	1.20±0.05	0.46±0.05
	LRE0612-4T	1.20±0.05	1.78±0.05
	LRE0805	1.65±0.05	0.42±0.05
	LRE1206	2.70±0.05	0.42±0.05

PACKAGING

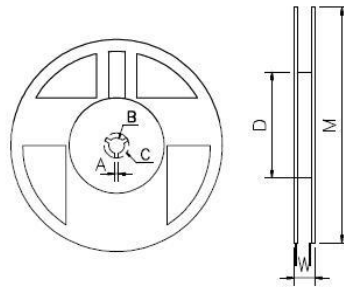
• Tape Dimensions :



CARRIER TAPE

Packaging	Model	Dimensions [mm]									
		A	B	W	E	F	T1	T2	P	P0	P1
Tape Dimensions	LRE0306 (-4T)	1.80±0.10	1.00±0.10	8.0±0.20	1.75±0.10	3.5±0.05	0.4+0.2/-0	0.40±0.10	4.0±0.10	4.0±0.10	2.0±0.05
	LRE0402	1.15±0.05	0.65±0.05	8.0±0.20	1.75±0.10	3.5±0.05	0.4+0.2/-0	0.40±0.05	2.0±0.10	4.0±0.05	2.0±0.05
	LRE0508	2.30±0.10	1.55±0.10	8.0±0.20	1.75±0.10	3.5±0.05	0.4+0.2/-0	0.40±0.05	4.0±0.10	4.0±0.10	2.0±0.05
	LRE0603	1.80±0.10	1.00±0.10	8.0±0.20	1.75±0.10	3.5±0.05	0.4+0.2/-0	0.40±0.05	4.0±0.10	4.0±0.10	2.0±0.05
	LRE0612 (-4T)	3.50±0.20	1.90±0.20	8.0±0.20	1.75±0.10	3.5±0.05	0.6+0.2/-0	0.60±0.05	4.0±0.10	4.0±0.10	2.0±0.05
	LRE0805	2.30±0.10	1.55±0.10	8.0±0.20	1.75±0.10	3.5±0.05	0.4+0.2/-0	0.40±0.05	4.0±0.10	4.0±0.10	2.0±0.05
	LRE1206	3.50±0.20	1.90±0.20	8.0±0.20	1.75±0.10	3.5±0.05	0.6+0.2/-0	0.60±0.05	4.0±0.10	4.0±0.10	2.0±0.05

• Reel Dimensions :



Reel Dimensions	Model	Reel Type / Tape	W	M	A	B	C	D
	LRE series	7" reel for 8mm tape	12.00±0.5	178±1.0	2.0±0.5	13.2±0.5	17.7±0.5	60.0±1.0

***Packaging Quantity**

Type	Tape width	Max. Packaging Quantity (pcs/reel)	
		2mm pitch	4mm pitch
LRE0306	8mm	-	5,000 pcs
LRE0306-4T		-	5,000 pcs
LRE0402		10,000 pcs	-
LRE0508		-	5,000 pcs
LRE0603		-	5,000 pcs
LRE0612		-	5,000 pcs
LRE0612-4T		-	5,000 pcs
LRE0805		-	5,000 pcs
LRE1206		-	5,000 pcs

MARKING FORMAT : (All the products marking are 4 digits)

<p>a. "R" designated the decimal location in ohms. Ex) For 1mΩ the product marking is R001; For 25mΩ the product marking is R025; For 100mΩ the product marking is R100.</p> <p>b. "m" designated the decimal location in milliohms. Ex) For 0.25mΩ the product marking is 0m25; For 0.5mΩ the product marking is 0m50; For 5.5mΩ the product marking is 5m50; For 25.5mΩ the product marking is 25m5.</p> <p>c. LRE0306-4T : Bar (Marking is square and marking by laser)</p> <p>d. LRE0306, LRE0402, LRE0508, LRE0603, LRE0805 No Marking.</p> <p>e. Marking image (Please refer to right)</p>	<p>- LRE 0306-4T</p>	<p>- LRE 0612</p>
	<p>- LRE 0612-4T</p>	<p>- LRE 1206</p>

ODERING PROCEFURE EXAMPLE

LRE	0603	2	F	R005	F	5
Model #	Size (inch)	Number or terminals	Rated power	Resistance (EX) : R005 = 5mΩ	Tolerance	Packaging
	0306 0402 0508 0603 0612 0805 1206	2 : 2 4 : 4	P = 1/6W H = 1/5W G = 1/4W F = 1/3W C = 1/2W E = 3/4W 1 = 1.0W A = 1.5W 2 = 2.0W		D : ±0.5% F : ±1.0% G : ±2.0% J : ±5.0%	4 = 4,000pcs 5 = 5,000pcs TH = 10,000pcs