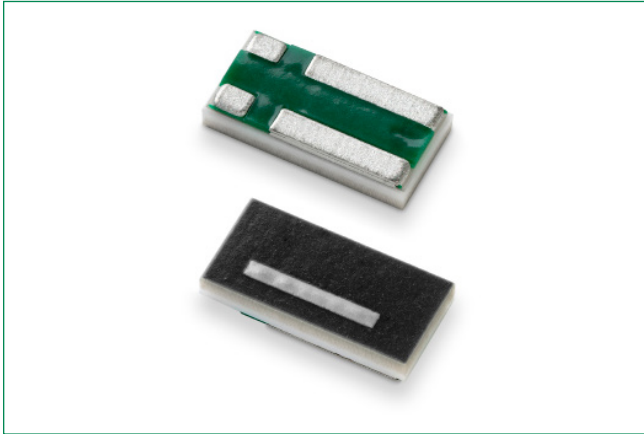


Four-Terminal Surface Mount Resistor

L4CA/C Series

HF **RoHS** **Pb**


Description

Littelfuse L4CA/C Series Kelvin sensing, low resistance, high power chip resistors exhibit excellent performance in resistance, noise performance, surface heat distribution, and have a lower surface temperature.

Features & Benefits

- Resistance range down to 0.5 mΩ
- Separate voltage sensing terminals
- Ceramic substrate
- Small size
- High voltage

Application

- Power management
- Low ESL

Additional Information



Resources



Accessories



Samples

Four-Terminal Surface Mount Resistor

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Electrical Specifications

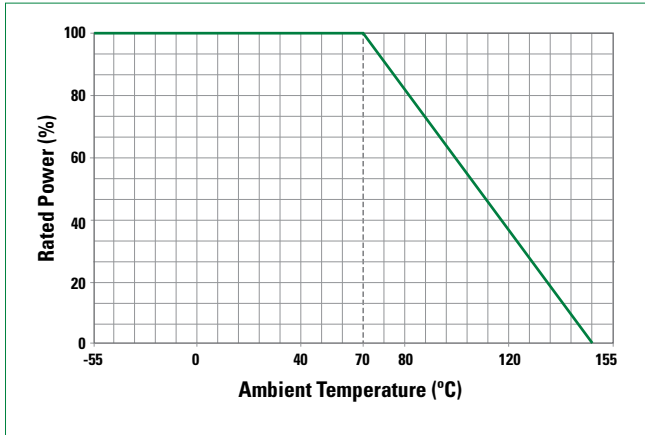
LF Seires	Part Number	Size		Resistance		Power (W)	TCR (ppm/°C)	Standard Package Qty
		Inch	mm	Ro (mΩ)	Rt (%)			
L4CC	L4CC0306RLR001FNR	0306	816	1	±1.0%	0.33	±100	5000
L4CC	L4CC0306RLR002FNR	0306	816	2	±1.0%	0.33	±100	5000
L4CC	L4CC0306QLR005FNR	0306	816	5	±1.0%	0.33	±50	5000
L4CC	L4CC0306QLR006FNR	0306	816	6	±1.0%	0.33	±50	5000
L4CC	L4CC0306QLR007FNR	0306	816	7	±1.0%	0.33	±50	5000
L4CC	L4CC0306QLR008FNR	0306	816	8	±1.0%	0.33	±50	5000
L4CC	L4CC0306QLR009FNR	0306	816	9	±1.0%	0.33	±50	5000
L4CC	L4CC0306QLR010FNR	0306	816	10	±1.0%	0.33	±50	5000
L4CC	L4CC0306QLR011FNR	0306	816	11	±1.0%	0.33	±50	5000
L4CC	L4CC0306QLR012FNR	0306	816	12	±1.0%	0.33	±50	5000
L4CC	L4CC0306QLR013FNR	0306	816	13	±1.0%	0.33	±50	5000
L4CC	L4CC0306QLR014FNR	0306	816	14	±1.0%	0.33	±50	5000
L4CC	L4CC0306QLR015FNR	0306	816	15	±1.0%	0.33	±50	5000
L4CC	L4CC0306QLR016FNR	0306	816	16	±1.0%	0.33	±50	5000
L4CC	L4CC0306QLR018FNR	0306	816	18	±1.0%	0.33	±50	5000
L4CC	L4CC0306QLR020FNR	0306	816	20	±1.0%	0.33	±50	5000
L4CC	L4CC0306QLR021FNR	0306	816	21	±1.0%	0.33	±50	5000
L4CC	L4CC0306QLR022FNR	0306	816	22	±1.0%	0.33	±50	5000
L4CC	L4CC0306QLR024FNR	0306	816	24	±1.0%	0.33	±50	5000
L4CC	L4CC0306QLR035FNR	0306	816	35	±1.0%	0.33	±50	5000
L4CC	L4CC0306QLR050FNR	0306	816	50	±1.0%	0.33	±50	5000
L4CA	L4CA0612L0M50FNR	0612	1632	0.5	±1.0%	1	±150	5000
L4CA	L4CA0612LR003FNR	0612	1632	3	±1.0%	1	±100	5000
L4CA	L4CA0612LR004FNR	0612	1632	4	±1.0%	1	±100	5000
L4CA	L4CA0612LR005FNR	0612	1632	5	±1.0%	1	±50	5000
L4CA	L4CA0612LR006FNR	0612	1632	6	±1.0%	1	±50	5000
L4CA	L4CA0612LR007FNR	0612	1632	7	±1.0%	1	±50	5000
L4CA	L4CA0612LR008FNR	0612	1632	8	±1.0%	1	±50	5000
L4CA	L4CA0612LR009FNR	0612	1632	9	±1.0%	1	±50	5000
L4CA	L4CA0612LR010FNR	0612	1632	10	±1.0%	1	±50	5000
L4CA	L4CA0612LR011FNR	0612	1632	11	±1.0%	1	±50	5000
L4CA	L4CA0612LR012FNR	0612	1632	12	±1.0%	1	±50	5000
L4CA	L4CA0612LR013FNR	0612	1632	13	±1.0%	1	±50	5000
L4CA	L4CA0612LR014FNR	0612	1632	14	±1.0%	1	±50	5000
L4CA	L4CA0612LR015FNR	0612	1632	15	±1.0%	1	±50	5000
L4CA	L4CA0612LR016FNR	0612	1632	16	±1.0%	1	±50	5000
L4CA	L4CA0612LR018FNR	0612	1632	18	±1.0%	1	±50	5000
L4CA	L4CA0612LR020FNR	0612	1632	20	±1.0%	1	±50	5000
L4CA	L4CA0612LR021FNR	0612	1632	21	±1.0%	1	±50	5000
L4CA	L4CA0612LR022FNR	0612	1632	22	±1.0%	1	±50	5000
L4CA	L4CA0612LR024FNR	0612	1632	24	±1.0%	1	±50	5000
L4CA	L4CA0612LR025FNR	0612	1632	25	±1.0%	1	±50	5000

Note: Resistors are available in steps of 1 mΩ/m. Ratings not indicated in the above table may be available on request.

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Temperature De-rating Curve



Storage / Environment Conditions

Products should be stored under the following environmental conditions.

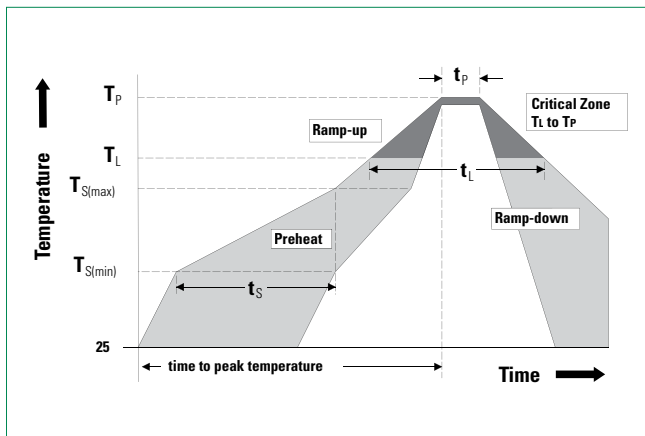
Temperature:	+5 to +35 °C
Humidity:	45 to 85% relative humidity
Moisture Sensitivity	Level: 1, J-STD-020

Do not keep products in environments where they may be subject to particulate contamination or harmful gases such as sulfuric acid or hydrogen chloride as it may cause oxidization on electrodes, resulting poor solderability.

Products should be stored in a space that does not expose to high temperatures, vibration, or direct sunlight.

Products should be stored in the original airtight packaging until use.

Soldering Parameters–Wave Soldering



Profile Feature	Pb-Free Assembly
Average Ramp-Up Rate ($T_{S(max)}$ to T_p)	3 °C / second max
Preheat	
Temperature Minimum ($T_{S(min)}$)	150 °C
Temperature Maximum ($T_{S(max)}$)	200 °C
Time ($T_{S(min)}$ to ($T_{S(max)}$)	60–180 seconds
Time maintained above	
Temperature Minimum (T_l)	217 °C
Time (t_l)	60–150 seconds
Peak Temperature (T_p)	260 +0 °C
Time within 5 °C of Actual Peak Temperature (t_p)	20–40 seconds
Ramp-Down Rate	6 °C / second Maximum
Time 25 °C to Peak Temperature	8 minutes Maximum

Four-Terminal Surface Mount Resistor

L4CA/C Series

Reliability Specifications

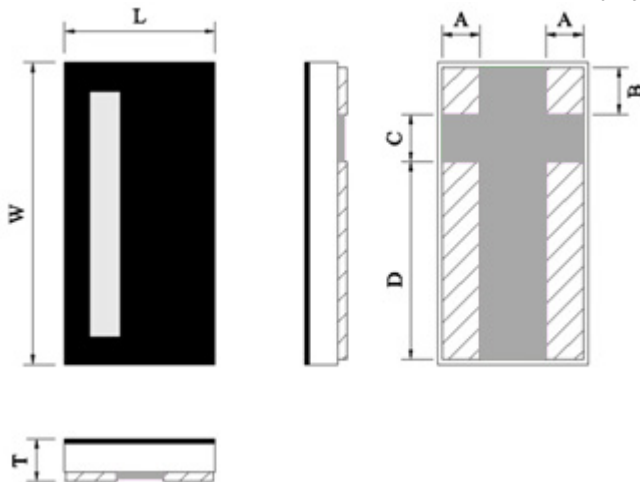
Test	Procedure	Specifications
Short Term Overload	2.5 times the rated voltage shall be applied for 5 sec.	±1.0% Appearance: Without distinct damage, and the marking shall be legible.
Load Life (Endurance) Test	Exposure at 70°C with full rated power applied 1,000 Hours	±1.0% Appearance: Without distinct damage, and the marking shall be legible.
Load Life (Endurance) Test (Power Cycling)	At temperature 70°C, rated power shall be repeatedly applied for 1.5hrs followed by a pause of 30 min. 1,000 Hours.	±1.0% Appearance: Without distinct damage, and the marking shall be legible.
Thermal Cycling (Air to Air) Test	Repeat 1,000 cycles as follows: -55°C (30 min.) / +155°C (30 min.) Transition Time =	±1.0% Appearance: Without distinct damage, and the marking shall be legible.
Temperature Humidity Test	Temperature of 60°C with relative humidity 90~95%. 1,000 hours.	±1.0% Appearance: Without distinct damage, and the marking shall be legible.
HAST (Autoclave)	30 PSIA, 121°C, 48h	±1.0% Appearance: Without distinct damage, and the marking shall be legible.
Vibration Test	Frequency 10 - 2000Hz/20min. Acceleration 15G X.Y.Z Direction each 12 cycles (12 hours total) (MIL-STD-202-Method 204 - Condition B)	±1.0% Appearance: Without distinct damage, and the marking shall be legible.
Mechanical Shock Test	50G's peak for 11 milliseconds (MIL-STD-202-Method 213 - Condition A)	±1.0% Appearance: Without distinct damage, and the marking shall be legible.
Terminal Strength	Applied force based on part size	±0.5% Appearance: Without distinct damage, and the marking shall be legible.
Flex Strength	Span 90mm, Flex of 2mm for 10 seconds	±1.0% Appearance: Without distinct damage, and the marking shall be legible.
Resistance to Soldering Heat (1)	Reflow soldering as per JEDEC-J-STD-020. Repeat for a total of 3 cycles.	±1.0% Parts must meet initial electrical specs. Appearance: Without distinct damage, and the marking shall be legible.
Resistance to Soldering Heat (2)	One reflow cycle as per JEDEC-J-STD-020 followed by cool down and then "hand soldering" which consists of dipping in 260°C solder for 10 seconds	±1.0% Parts must meet initial electrical specs. Appearance: Without distinct damage, and the marking shall be legible.
Solderability	Immersed in solder-molten bath at 245°C for 3±1sec.	A new solder shall cover minimum of 95%.

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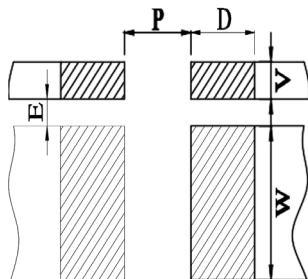
Dimensions

All dimensions in mm



Part Number	W	L	T	D	C	B	A
L4CA0612	3.20±0.20	1.55±0.20	0.50±0.20	2.16±0.20	0.50±0.20	0.46±0.20	0.41±0.20
L4CC0306	1.60±0.20	0.80±0.15	0.55±0.10	0.93±0.20	0.40±0.10	0.23±0.10	0.18±0.10

Recommended Land Pattern



Part Number	P	W	D	V	E	Loading
L4CA0612	0.762 mm	2.29 mm	1.014 mm	0.762 mm	0.381 mm	1.0 W
L4CC0306	0.35 mm	1.30 mm	0.40 mm	0.40 mm	0.20 mm	0.33 W

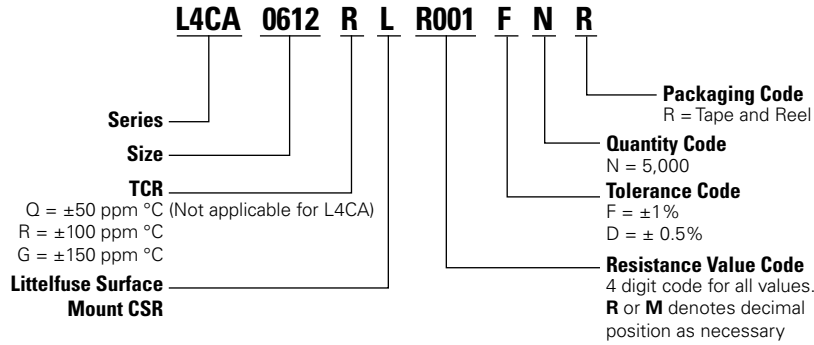
Packaging

Part Number	Halogen Free	Packaging Option	Quantity	Quantity & Packaging Codes
L4CA0612	Yes	Tape and Reel	5000	NR
L4CC0306	Yes	Tape and Reel	5000	NR

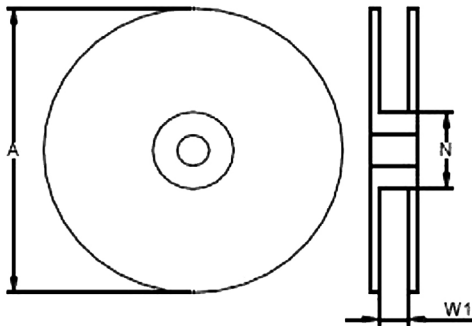
Four-Terminal Surface Mount Resistor

L4CA/C Series

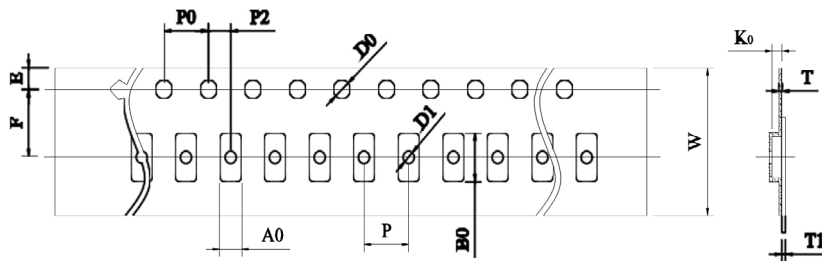
Part Numbering System



Tape and Reel Specifications



Part Number	A ± 5 (mm)	N ± 2 (mm)	W1 ± 1 (mm)
L4CA0612	178	60	9.0
L4CC0306	178	60	9.0



Part Number	W	P0	P	P2	A0	B0	D0	F	E	T	T1	K0
L4CA0612	8.00 \pm 0.30	4.00 \pm 0.10	4.00 \pm 0.10	2.00 \pm 0.10	1.90 \pm 0.20	3.50 \pm 0.20	1.50 \pm 0.10	3.50 \pm 0.10	1.75 \pm 0.10	0.20 \pm 0.10	Max. 0.1	0.85 \pm 0.20
L4CC0306	8.00 \pm 0.30	4.00 \pm 0.10	4.00 \pm 0.10	2.00 \pm 0.10	0.98 \pm 0.20	1.85 \pm 0.20	1.50 \pm 0.10	3.50 \pm 0.10	1.75 \pm 0.10	0.75 \pm 0.20		

Note: Tape and reel packaging in accordance to EIA-481

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