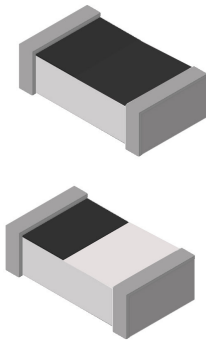
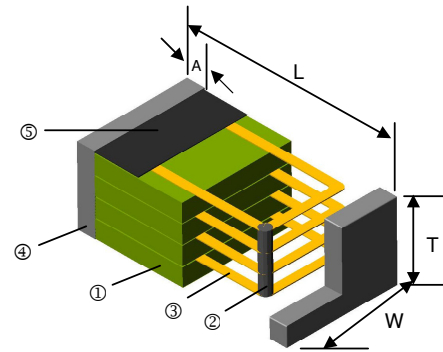


Multilayer Chip Inductor – CL Series



Construction



① Ceramic Material	③ Inner Electrode (Ag)	⑤ Direction Mark
② Through Hole	④ End-termination (Ag/Ni/Sn)	

Features

- A ceramic material construction for high frequency application up to 10GHz
- Tight tolerance physical dimensions (+/-0.05mm)
- Tight inductance tolerance and excellent Q value
- Available in three compact sizes of 0402, 0603

Applications

- High Frequency Application
- Cellular Phone, Pagers
- EMI Countermeasure in High Frequency Circuits and Computer Communication etc.
- WLAN and RF module

Electrical Specifications

CL02 Multilayer Chip Inductors Type

Inductance (nH)	Inductance Tolerance (nH or %)	L/Q Freq. (MHz)	Quality Factor min.	Q (Typical) Freq. (MHz)			SRF (GHz) min.	DCR (Ω) max.	IDC (mA) max.
				100	500	800			
1.0	±0.3nH	100	8	11	33	37	10.0	0.12	300
1.2	±0.3nH	100	8	11	29	26	10.0	0.12	300
1.5	±0.3nH	100	8	12	29	40	6.00	0.13	300
1.8	±0.3nH	100	8	11	26	34	6.00	0.14	300
2.2	±0.3nH	100	8	11	26	36	6.00	0.16	300
2.7	±0.3nH	100	8	12	29	38	6.00	0.17	300
3.3	±0.3nH, ±10%	100	8	11	28	37	6.00	0.19	300
3.9	±0.3nH, ±10%	100	8	11	26	32	4.00	0.22	300
4.7	±0.3nH, ±10%	100	8	12	28	37	4.00	0.24	300
5.6	±0.3nH, ±10%	100	8	11	26	35	4.00	0.27	300
6.8	±5, ±10%	100	8	11	26	34	3.90	0.32	300
8.2	±5, ±10%	100	8	12	26	34	3.50	0.37	300
10	±5, ±10%	100	8	11	25	31	3.20	0.42	300
12	±5, ±10%	100	8	11	25	31	2.60	0.50	300
15	±5, ±10%	100	8	11	24	30	2.30	0.55	300
18	±5, ±10%	100	8	11	24	30	2.00	0.65	300
22	±5, ±10%	100	8	12	24	30	1.60	0.80	300
27	±5, ±10%	100	8	11	24	28	1.40	0.90	300
33	±5, ±10%	100	8	12	23	26	1.20	1.00	200
39	±5, ±10%	100	8	11	21	24	1.10	1.20	150

Dimensions

Unit: mm

Type	Size (Inch)	L	W	T	A (min. / max.)	Weight (g) (1000pcs)
CL02	0402	1.0±0.10	0.5±0.10	0.5±0.10	0.1 / 0.3	8.2
CL03	0603	1.6±0.15	0.8±0.15	0.8±0.15	0.2 / 0.6	3.2

Part Numbering

CL	02	J	T	10N
Product Type	Dimensions	Inductance Tolerance	Packaging Code	Inductance
	02: 0402 03: 0603	J: ±5% K: ±10% S: ±0.3nH	T: Taping Reel	1N0: 1.0nH 39N: 39nH R10: 100nH

CL02 Multilayer Chip Inductors Type

Inductance (nH)	Tolerance	L/Q Freq. (MHz)	Quality Factor min.	Q (Typical) Freq. (MHz)			SRF (GHz) min.	DCR (Ω) max.	IDC (mA) max.
				100	500	800			
47	±5, ±10%	100	8	11	21	23	0.90	1.30	150
56	±5, ±10%	100	8	12	21	21	0.75	2.00	150
68	±5, ±10%	100	8	11	19	19	0.75	2.20	100
82	±5, ±10%	100	8	10	19	16	0.60	2.50	100
100	±5, ±10%	100	8	10	18	-	0.60	2.50	100
120	±5, ±10%	100	8	-	-	-	0.60	2.70	100

CL03 Multilayer Chip Inductors Type

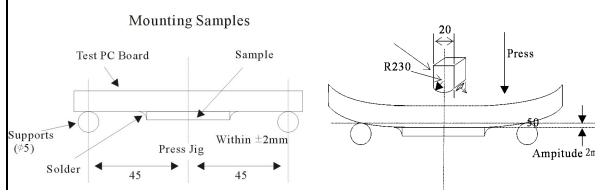
Inductance (nH)	Inductance Tolerance (nH or %)	L/Q Freq. (MHz)	Quality Factor min.	Q (Typical) Freq. (MHz)			SRF (GHz) min.	DCR (Ω) max.	IDC (mA) max.
				100	500	800			
1.0	±0.3nH	100	8	15	36	49	6.0	0.10	500
1.2	±0.3nH	100	8	15	36	49	6.0	0.10	500
1.5	±0.3nH	100	8	14	34	47	6.0	0.10	500
1.8	±0.3nH	100	8	17	40	55	6.0	0.10	500
2.2	±0.3nH	100	8	15	38	49	6.0	0.10	500
2.7	±0.3nH	100	8	14	37	48	6.0	0.10	500
3.3	±0.3nH, ±10%	100	10	16	40	51	6.0	0.13	500
3.9	±0.3nH, ±10%	100	10	14	36	48	6.0	0.15	500
4.7	±0.3nH, ±10%	100	10	14	37	48	4.0	0.20	500
5.6	±0.3nH, ±10%	100	10	14	36	46	4.0	0.23	500
6.8	±5, ±10%	100	10	15	37	48	3.75	0.25	500
8.2	±5, ±10%	100	10	16	39	50	3.30	0.28	500
10	±5, ±10%	100	12	16	37	47	3.0	0.30	300
12	±5, ±10%	100	12	15	36	45	2.6	0.35	300
15	±5, ±10%	100	12	16	38	48	2.3	0.40	300
18	±5, ±10%	100	12	17	38	47	2.0	0.45	300
22	±5, ±10%	100	12	18	40	49	1.6	0.50	300
27	±5, ±10%	100	12	18	40	47	1.4	0.55	300
33	±5, ±10%	100	12	17	40	46	1.2	0.60	300
39	±5, ±10%	100	12	19	40	46	1.1	0.65	300
47	±5, ±10%	100	12	17	36	39	0.9	0.70	300
56	±5, ±10%	100	12	18	36	37	0.9	0.75	300
68	±5, ±10%	100	12	18	35	36	0.7	0.85	300
82	±5, ±10%	100	12	18	33	29	0.6	1.00	300
100	±5, ±10%	100	12	18	28	16	0.6	1.20	300
120	±5, ±10%	50	8	-	-	-	0.5	2.3	250
150	±5, ±10%	50	8	-	-	-	0.5	2.4	250
180	±5, ±10%	50	8	-	-	-	0.4	2.7	250
220	±5, ±10%	50	8	-	-	-	0.4	3.0	250

Environmental Characteristics

Electrical Performance Test

Item	Requirement	Test Condition
Inductance	In Within specified tolerance	a. Temperature: 25±1 °C b. Relative Humidity: 45 to 85%RH c. Atmospheric Pressure: 86 to 106kpa d. Measuring equipment and fixture: 0402: HP4291B+Agilent16193A 0603: HP4291B+Agilent16192A
Q Value	In accordance with electrical specification	a. Temperature: 25±1 °C b. Relative Humidity: 45 to 85%RH c. Atmospheric Pressure: 86 to 106kpa
DC Resistance	In accordance with electrical specification	a. Temperature: 25±1 °C b. Relative Humidity: 45 to 85%RH c. Atmospheric Pressure: 86 to 106kpa d. Measuring equipment: HP 4338
Temperature Characteristics	Within specified tolerance	a. Temperature range: -30 to+ 85 °C b. Reference temperature: 25 °C

Mechanical Characteristics Test

Item	Requirement	Test Condition
Bending Strength	No mechanical damage shall be observed	<p>Solder the chip to test jig then apply a force in the direction shown in below. The soldering shall be done with the reflow method and shall be conducted with care so that the soldering is uniform and free of defects such as heat shock.</p> 
Solderability	More than 75% of the terminal electrode part shall be covered with fresh solder	Immerse a test sample into a methanol solution containing rosin, preheat it at 150 to 180 °C for 3 to 5 seconds and immerse into molten solder of 245±5 °C for 5±0.5 seconds.
Resistance to Soldering Heat	No visible damage	Immerse a test sample into a methanol solution containing resin, preheat it at 150 to 180 °C for 2 to 3 minutes and immerse into molten solder of 260±5 °C for 10±0.5 seconds so that both terminal electrodes are completely submerged.
Appearance	In accordance with specification	Inductors shall be visually inspected for visible evidence of defect
Dimension	In accordance with dimension specification	Dimension shall be measured with caliper or micrometer

Climatic Test

Item	Requirement	Test Condition
Thermal Shock	No visible damage Inductance variation within 10% Q variation within 20%	Solder a test sample to printed circuit board, and conduct 100 cycles of test under the conditions shown as below. Cycle: 100°C/1hr -40°C/1hr
High Humidity State Life	No visible damage Inductance variation within 10% Q variation within 20%	Keep a test sample in an atmosphere with a temperature of 70±2°C, 90~95%RH for 500±12 hours. After the test, keep the test sample at a normal temperature for 1 to 2 hours, and then carry out measurement.
High Humidity Load Life	No visible damage Inductance variation within 10% Q variation within 20%	Solder a test sample to printed circuit board then keep the test sample in an atmosphere with a temperature of 70±2°C, 90~95%RH for 500±12 hours while supplying the rated current. After the test, keep the test sample at a normal temperature for 1 to 2 hours, and then carry out measurement.
High Temperature State Life	No visible damage Inductance variation within 10% Q variation within 20%	Keep a test sample in an atmosphere with a temperature of 100±2°C for 500±12 hours. After the test, keep the test sample at a normal temperature for 1 to 2 hours, and then carry out measurement.
High Temperature Load	No visible damage Inductance variation within 10% Q variation within 20%	Solder a test sample to printed circuit board then keep the test sample in an atmosphere with a temperature of 100±2°C for 500±12 hours while supplying the rated current. After the test, keep the test sample at a normal temperature for 1 to 2 hours, and then carry out measurement.

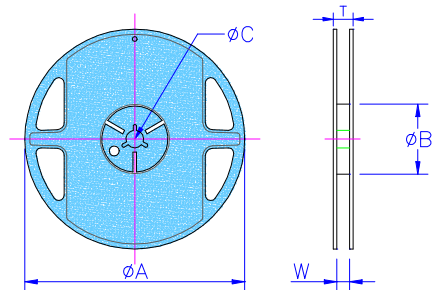
■ Storage Temperature: 25±3°C; Humidity < 80%RH

■ Packaging

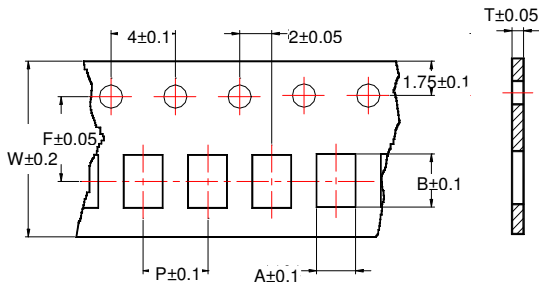
Reel Dimensions

Unit: mm

Type	A	B	C	W	T	Quantity (EA)
CL02	178±1	60.2±0.5	13.0±0.20	9.00±0.5	12.0±0.15	10,000
CL03	178±1	60.0±0.5	13.0±0.20	9.00±0.5	12.0±0.15	4,000



Paper Tape Specifications



Unit: mm

Type	A	B	T	W	P	F	K
CL02	0.65	1.12	0.60	8	2	3.5	—
CL03	1.10	1.80	0.95	8	4	3.5	—