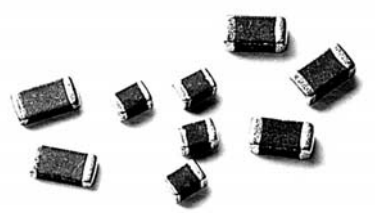
Multilayer Chip Inductors

CL Series



PRODUCT IDENTIFICATION

CL □□□□□□□-□□□□-□

- Internal No.
- Tolerance (***)
- Inductance (**)
- Packaging Style (*)
- Dimensions (A, B, C)
- Product Symbol

* B: Bulk ; T: Tape and Reel

** Example : 47N = 47nH
R10 = 0.1μH 1R0 = 1.0μH

*** K = ±10% M = ±20%

APPLICATIONS

Personal computers, HDDs, or other various electronic appliances.

Any general circuit of portable equipment in which compact size and high mounting densities are required.

OUTLINE

Yageo's SMD multi-layered chip inductors provide a cost effective solution for densely packed PC board designs. Using Ferrite or CL / CLH series ceramic materials are available in broad band and high frequency circuits. The ferrite structure is suited for lower frequency applications and the ceramic one , CLH series , is designed to meet the needs of higher frequency circuits.

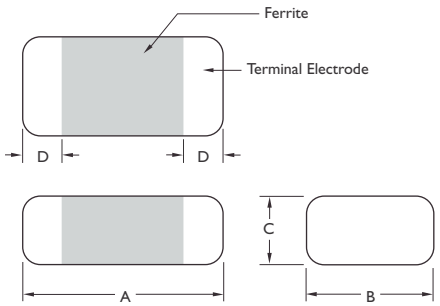
FEATURES

High mounting density of compact circuit due to crosstalk elimination that results from a closed magnetic flux in a ferrite material.

Suitable for Flow and Re-flow Soldering

Available in 5 Sizes

SHAPES AND DIMENSIONS



Dimensions : mm

TYPE	A	B	C	D
CL160808	1.6 ± 0.20	0.80 ± 0.15	0.80 ± 0.15	0.3 ± 0.2
CL201209	2.0 ± 0.20	1.25 ± 0.20	0.90 ± 0.20	0.5 ± 0.3
CL201212	2.0 ± 0.20	1.25 ± 0.20	1.25 ± 0.20	0.5 ± 0.3
CL321611	3.2 ± 0.20	1.60 ± 0.20	1.10 ± 0.20	0.5 ± 0.3

ELECTRICAL CHARACTERISTICS CL160808 (0603) SERIES

PART NO.	INDUCTANCE (μH)	TOLERANCE (±%)	Q Min.	TEST FREQUENCY (MHz)	SRF (MHz) Min.	DC RESISTANCE (Ω) Max.	IDC (mA) Max.
CL160808T-10NM-S	0.010	20%	15	50	300	0.20	50
CL160808T-33NM-S	0.033	20%	15	50	270	0.20	50
CL160808T-47NM-S	0.047	20%	15	50	260	0.30	50
CL160808T-68NM-S	0.068	20%	15	50	250	0.30	50
CL160808T-82NM-S	0.082	20%	15	50	245	0.30	50
CL160808T-R10☐-S	0.10	20 or 10%	25	25	240	0.50	50
CL160808T-R12☐-S	0.12	20 or 10%	25	25	205	0.50	50
CL160808T-R15☐-S	0.15	20 or 10%	25	25	180	0.60	50
CL160808T-R18☐-S	0.18	20 or 10%	25	25	165	0.60	50
CL160808T-R22☐-S	0.22	20 or 10%	25	25	150	0.80	50
CL160808T-R27☐-S	0.27	20 or 10%	25	25	136	0.80	50
CL160808T-R33☐-S	0.33	20 or 10%	25	25	125	0.85	35
CL160808T-R39☐-S	0.39	20 or 10%	25	25	110	1.00	35
CL160808T-R47☐-S	0.47	20 or 10%	25	25	105	1.35	35
CL160808T-R56☐-S	0.56	20 or 10%	25	25	95	1.50	35
CL160808T-R68☐-S	0.68	20 or 10%	25	25	85	1.70	35
CL160808T-R82☐-S	0.82	20 or 10%	25	25	75	2.10	35
CL160808T-1R0☐-S	1.0	20 or 10%	35	10	65	0.60	25
CL160808T-1R2☐-S	1.2	20 or 10%	35	10	60	0.80	25
CL160808T-1R5☐-S	1.5	20 or 10%	35	10	55	0.80	25
CL160808T-1R8☐-S	1.8	20 or 10%	35	10	50	0.95	25
CL160808T-2R2☐-S	2.2	20 or 10%	35	10	45	1.10	15
CL160808T-2R7☐-S	2.7	20 or 10%	35	10	40	1.30	15
CL160808T-3R3☐-S	3.3	20 or 10%	35	10	38	1.50	15
CL160808T-3R9☐-S	3.9	20 or 10%	35	10	36	1.70	15
CL160808T-4R7☐-S	4.7	20 or 10%	35	10	33	2.10	15
CL160808T-5R6☐-S	5.6	20 or 10%	35	4	22	1.50	5
CL160808T-6R8☐-S	6.8	20 or 10%	35	4	20	1.70	5
CL160808T-8R2☐-S	8.2	20 or 10%	30	4	18	2.10	5
CL160808T-100☐-S	10	20 or 10%	30	2	17	2.55	5

ELECTRICAL CHARACTERISTICS CL201209, CL201212 (0805) SERIES

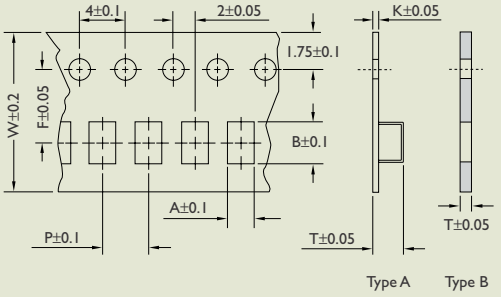
PART NO.	INDUCTANCE (μH)	TOLERANCE (±%)	Q Min.	TEST FREQUENCY (MHz)	SRF (MHz) Min.	DC RESISTANCE (Ω) Max.	IDC (mA) Max.
CL201209T-47NM-S	0.047	20%	20	50	320	0.20	300
CL201209T-68NM-S	0.068	20%	20	50	280	0.20	300
CL201209T-82NM-S	0.082	20%	20	50	255	0.20	300
CL201209T-R10☐-S	0.10	20 or 10%	25	25	235	0.30	250
CL201209T-R12☐-S	0.12	20 or 10%	25	25	220	0.30	250
CL201209T-R15☐-S	0.15	20 or 10%	25	25	200	0.40	250
CL201209T-R18☐-S	0.18	20 or 10%	25	25	185	0.40	250
CL201209T-R22☐-S	0.22	20 or 10%	25	25	170	0.50	250
CL201209T-R27☐-S	0.27	20 or 10%	25	25	150	0.50	250
CL201209T-R33☐-S	0.33	20 or 10%	25	25	145	0.55	250
CL201209T-R39☐-S	0.39	20 or 10%	25	25	135	0.65	250
CL201209T-R47☐-S	0.47	20 or 10%	25	25	125	0.65	250
CL201209T-R56☐-S	0.56	20 or 10%	25	25	115	0.75	150
CL201209T-R68☐-S	0.68	20 or 10%	25	25	105	0.80	150
CL201209T-R82☐-S	0.82	20 or 10%	25	25	100	1.00	150
CL201209T-1R0☐-S	1.0	20 or 10%	45	10	75	0.40	50
CL201209T-1R2☐-S	1.2	20 or 10%	45	10	65	0.50	50
CL201209T-1R5☐-S	1.5	20 or 10%	45	10	60	0.50	50
CL201209T-1R8☐-S	1.8	20 or 10%	45	10	55	0.60	50
CL201209T-2R2☐-S	2.2	20 or 10%	45	10	50	0.65	30
CL201212T-2R7☐-S	2.7	20 or 10%	45	10	45	0.75	30
CL201212T-3R3☐-S	3.3	20 or 10%	45	10	41	0.80	30
CL201212T-3R9☐-S	3.9	20 or 10%	45	10	38	0.90	30
CL201212T-4R7☐-S	4.7	20 or 10%	45	10	35	1.00	30
CL201212T-5R6☐-S	5.6	20 or 10%	45	4	32	0.90	15
CL201212T-6R8☐-S	6.8	20 or 10%	45	4	29	1.00	15
CL201212T-8R2☐-S	8.2	20 or 10%	45	4	26	1.10	15
CL201212T-100☐-S	10	20 or 10%	45	2	24	1.10	15
CL201212T-120☐-S	12	20 or 10%	45	2	22	1.20	15
CL201212T-150☐-S	15	20 or 10%	30	1	19	0.80	5
CL201212T-180☐-S	18	20 or 10%	30	1	18	0.90	5
CL201212T-220☐-S	22	20 or 10%	30	1	16	1.10	5

ELECTRICAL CHARACTERISTICS CL321611 (1206) SERIES

PART NO.	INDUCTANCE (μH)	TOLERANCE (±%)	Q Min.	TEST FREQUENCY (MHz)	SRF (MHz) Min.	DC RESISTANCE (Ω) Max.	IDC (mA) Max.
CL321611T-47NM-S	0.047	20%	20	50	320	0.15	300
CL321611T-68NM-S	0.068	20%	20	50	280	0.25	300
CL321611T-82NM-S	0.082	20%	20	50	250	0.25	300
CL321611T-R10☐-S	0.10	20 or 10%	25	25	235	0.25	250
CL321611T-R12☐-S	0.12	20 or 10%	25	25	220	0.30	250
CL321611T-R15☐-S	0.15	20 or 10%	25	25	200	0.30	250
CL321611T-R18☐-S	0.18	20 or 10%	25	25	185	0.40	250
CL321611T-R22☐-S	0.22	20 or 10%	25	25	170	0.40	250
CL321611T-R27☐-S	0.27	20 or 10%	25	25	150	0.50	250
CL321611T-R33☐-S	0.33	20 or 10%	25	25	145	0.60	250
CL321611T-R39☐-S	0.39	20 or 10%	25	25	135	0.50	200
CL321611T-R47☐-S	0.47	20 or 10%	25	25	125	0.60	200
CL321611T-R56☐-S	0.56	20 or 10%	25	25	115	0.70	150
CL321611T-R68☐-S	0.68	20 or 10%	25	25	105	0.80	150
CL321611T-R82☐-S	0.82	20 or 10%	25	25	100	0.90	150
CL321611T-1R0☐-S	1.0	20 or 10%	45	10	75	0.40	100
CL321611T-1R2☐-S	1.2	20 or 10%	45	10	65	0.50	100
CL321611T-1R5☐-S	1.5	20 or 10%	45	10	60	0.50	80
CL321611T-1R8☐-S	1.8	20 or 10%	45	10	55	0.50	70
CL321611T-2R2☐-S	2.2	20 or 10%	45	10	50	0.60	60
CL321611T-2R7☐-S	2.7	20 or 10%	45	10	45	0.60	60
CL321611T-3R3☐-S	3.3	20 or 10%	45	10	41	0.70	60
CL321611T-3R9☐-S	3.9	20 or 10%	45	10	38	0.80	50
CL321611T-4R7☐-S	4.7	20 or 10%	45	10	35	0.90	50
CL321611T-5R6☐-S	5.6	20 or 10%	45	4	32	0.70	25
CL321611T-6R8☐-S	6.8	20 or 10%	45	4	29	0.80	25
CL321611T-8R2☐-S	8.2	20 or 10%	45	4	26	0.90	25
CL321611T-100☐-S	10	20 or 10%	45	2	24	1.00	25
CL321611T-120☐-S	12	20 or 10%	45	2	22	1.00	15
CL321611T-150☐-S	15	20 or 10%	35	1	19	0.70	5
CL321611T-180☐-S	18	20 or 10%	35	1	18	0.75	5
CL321611T-220☐-S	22	20 or 10%	35	1	16	0.90	5
CL321611T-270☐-S	27	20 or 10%	35	1	14	0.90	5
CL321611T-330☐-S	33	20 or 10%	35	1	13	1.05	5

TAPE DIMENSIONS

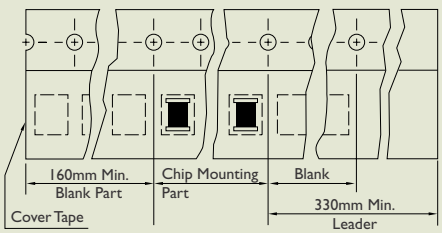
Dimensions : mm



TYPE	A	B	T	W	P	F	K	TAPE TYPE
CL160808	1.05	1.9	0.95	8.0	4.0	3.5	–	B
CL201209	1.54	2.30	1.05	8.0	4.0	3.5	0.2	A
CL201212	1.40	2.25	1.40	8.0	4.0	3.5	0.2	A
CL321611	1.88	3.50	1.27	8.0	4.0	3.5	0.2	A

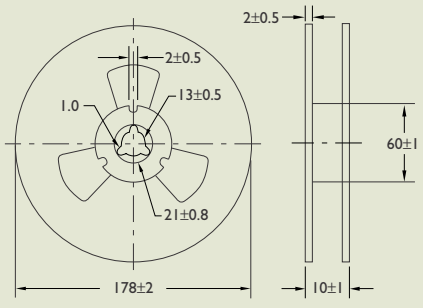
TAPE MATERIAL

Carrier Tape : Polystyrene (for 201209, 201212, 321611 Series), Paper (for 160808)
Cover Type : Polyethyiene



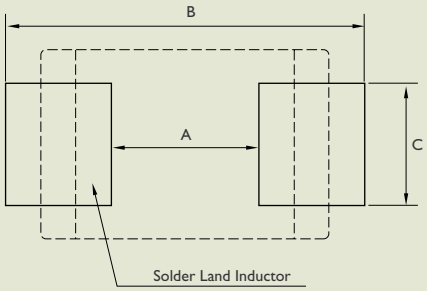
REEL DIMENSIONS

Dimensions : mm



RECOMMENDED PATTERN

Dimensions : mm



TYPE	A	B	C
CL160808	0.8	2.4 ~ 3.4	0.6
CL201209	1.2	3.0 ~ 4.0	1.0
CL201212	1.2	3.0 ~ 4.0	1.0
CL321611	2.0	4.2 ~ 5.2	1.2

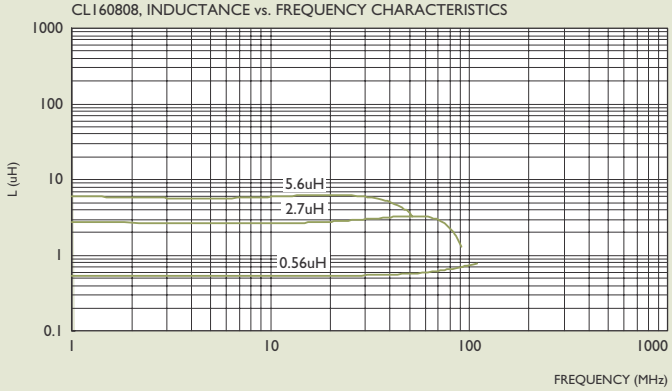
PACKAGING QUANTITY

TYPE	BULK	QUANTITY/REEL
CL160808	√	4000
CL201209	√	4000
CL201212	√	3000
CL321611	√	3000

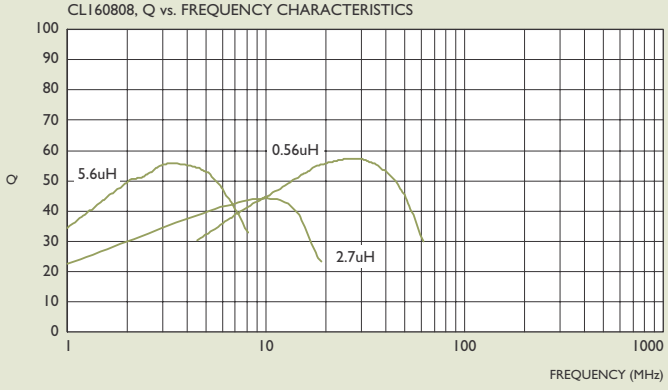
TYPICAL ELECTRICAL CHARACTERISTICS

Test Instruments : HP4291A Impedance / Material Analyzer

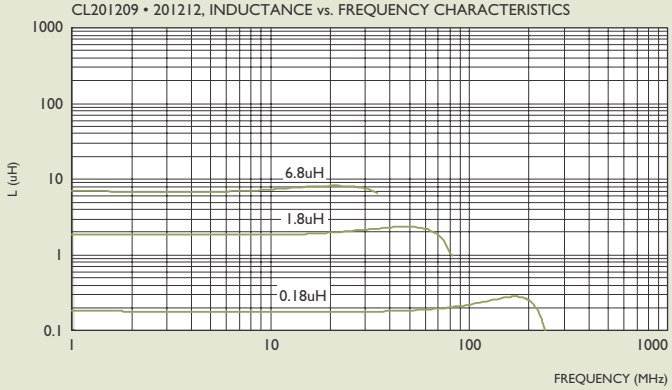
CL160808, INDUCTANCE vs. FREQUENCY CHARACTERISTICS



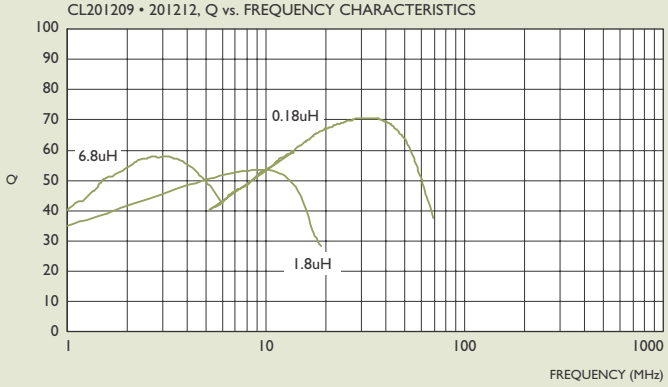
CL160808, Q vs. FREQUENCY CHARACTERISTICS



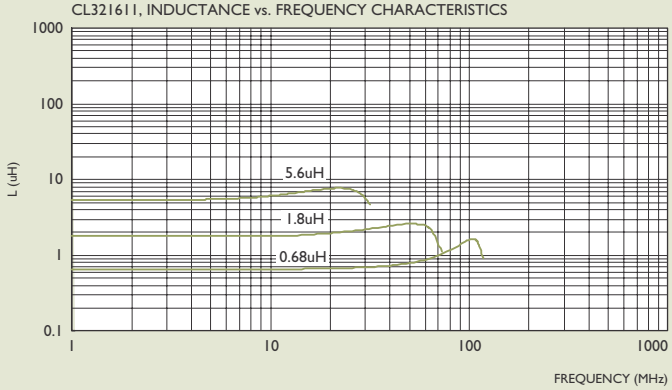
CL201209 • 201212, INDUCTANCE vs. FREQUENCY CHARACTERISTICS



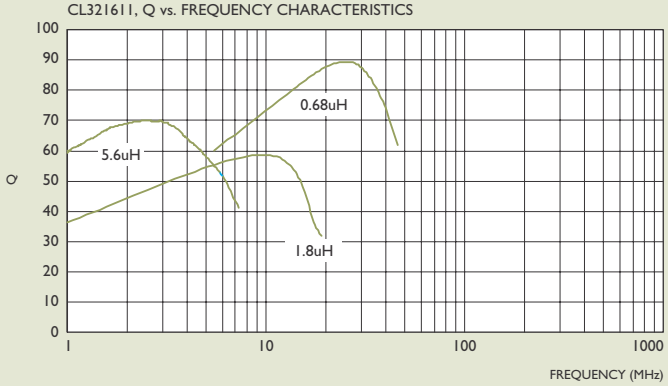
CL201209 • 201212, Q vs. FREQUENCY CHARACTERISTICS



CL321611, INDUCTANCE vs. FREQUENCY CHARACTERISTICS



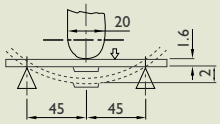
CL321611, Q vs. FREQUENCY CHARACTERISTICS



CL SERIES RELIABILITY TEST

1-1 MECHANICAL PERFORMANCE

NO.	ITEM	SPECIFICATION	TEST CONDITIONS
1-1-1	Flexure Strength	Appearance : No Damage L Change : within ±10% Q Change : within ±30%	Test device shall be soldered on the substrate. Substrate Dimension : 100 x 40 x 1.6mm Deflection : 2.0mm Keeping Time : 30Sec. * For 100505, substrate dimension is 100 x 40 x 0.8mm.
1-1-2	Vibration		Test device shall be soldered on the substrate. Oscillation Frequency : 10 to 55 to 10Hz for 1Min. Amplitude : 1.5mm Time : 2Hrs. for each Axis (X,Y & Z), Total 6Hrs.
1-1-3	Resistance to Soldering Heat	Appearance : No Damage	Pre-heating : 150°C, 1Min. Solder Composition : Sn/Pb = 63/37 Solder Temperature : 260 ± 5°C Immersion Time : 10 ± 1Sec.
1-1-4	Solderability	The electrodes shall be at least 90% covered with new solder coating.	Pre-heating : 150°C, 1Min. Solder Composition : Sn/Pb = 63/37 Solder Temperature : 230 ± 5°C Immersion Time : 4 ± 1Sec.



1-2 ENVIRONMENTAL PERFORMANCE

NO.	ITEM	SPECIFICATION	TEST CONDITIONS
1-2-1	Temperature Cycle	Appearance : No Damage L Change : within ±10% Q Change : within ±30%	One Cycle Step / Temperature (°C) / Time (Min.) 1 / -25 ± 3 / 30 2 / 25 ± 2 / 3 3 / 85 ± 3 / 30 4 / 25 ± 2 / 3 Total : 100 Cycles Measured after Exposure in the Room Condition for 24Hrs.
1-2-2	Humidity Resistance		Temperature : 40 ± 2°C Relative Humidity : 90 ~ 95% Time : 1000Hrs. Measured after Exposure in the Room Condition for 24Hrs.
1-2-3	High Temperature Resistance		Temperature : 85 ± 3°C Relative Humidity : 20% Applied Current : Rated Current Time : 1000Hrs. Measured after Exposure in the Room Condition for 24Hrs.
1-2-4	Low Temperature Resistance		Temperature : -25 ± 3°C Relative Humidity : 0% Time : 1000Hrs. Measured after Exposure in the Room Condition for 24Hrs.