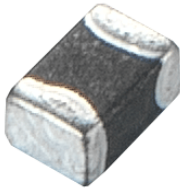


## Cautions and Warnings

Please be noted that this spec is only for reference if you have projects designed with the product number listed in. If you are looking for new project design-in, please find BSCL Series specification/datasheet on Chilisin website. Or you may find our sales contact for more information on old part number at your convenience. Appreciated your attention and understanding.

**Note:** Please be sure to request approval specifications that provide further details of the products. Kindly note that the content of these specifications are subject to change or may be discontinued without prior notice. This product may not be designed/used in medical or high risk applications without Chilisin approval. Please contact our sales department before ordering.

## CL Series



The SMD multi-layered ferrite chip inductors provide a cost-effective solution for densely packed PC board designs. CL series comes in 4 sizes and is suitable for low frequency applications.

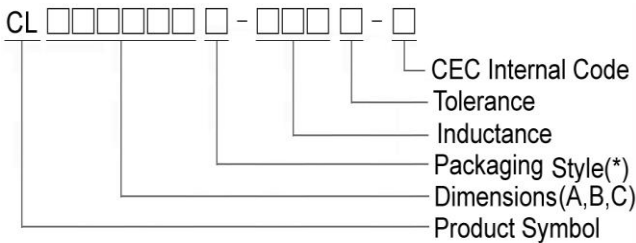
### Features

- RoHS compliant
- 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

### Applications

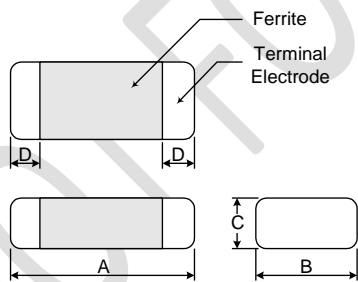
- Personal computers, HDDs, other various electronic devices
- Any portable device where compact size and high mounting densities are required

### Product Identification

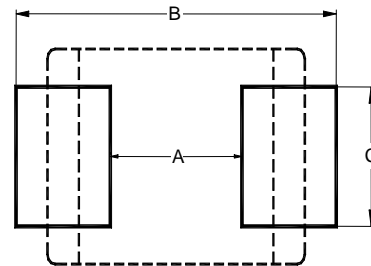


- Packaging : T : Tape and Reel ; B : Bulk

### Shape and Dimensions



### Recommended Pattern



Dimensions in mm

TYPE	A	B	C	D
CL160808	1.6±0.20	0.80±0.20	0.80±0.20	0.3±0.20
CL201209	2.0±0.20	1.25±0.20	0.90±0.20	0.5±0.30
CL201212	2.0±0.20	1.25±0.20	1.25±0.20	0.5±0.30
CL321611	3.2±0.20	1.60±0.20	1.10±0.20	0.5±0.30

Dimensions in mm

TYPE	A	B	C
CL160808	0.7 ~ 0.8	1.8 ~ 2.0	0.6 ~ 0.8
CL201209	1.0 ~ 1.2	2.6 ~ 4.0	1.0 ~ 1.2
CL201212	1.0 ~ 1.2	2.6 ~ 4.0	1.0 ~ 1.2
CL321611	2.0	4.2 ~ 5.2	1.2

## SMD Multilayer Ferrite Chip Inductors – CL Series

### Electrical Characteristics

Part Number	Inductance ( $\mu$ H)	Tolerance ( $\pm$ %)	Q Min	Test Frequency (MHz)	SRF (MHz) Min	RDC ( $\Omega$ ) Max	IDC (mA) Max
CL160808T-10N□-N	0.010	20	15	50	300	0.2	50
CL160808T-33N□-N	0.033	20	15	50	270	0.2	50
CL160808T-47N□-N	0.047	20	15	50	260	0.3	50
CL160808T-56N□-N	0.056	20	15	50	255	0.3	50
CL160808T-68N□-N	0.068	20	15	50	250	0.3	50
CL160808T-82N□-N	0.082	20	15	50	245	0.3	50
CL160808T-R10□-N	0.10	20 / 15 / 10	25	25	240	0.5	50
CL160808T-R12□-N	0.12	20 / 15 / 10	25	25	205	0.5	50
CL160808T-R15□-N	0.15	20 / 15 / 10	25	25	180	0.6	50
CL160808T-R18□-N	0.18	20 / 15 / 10	25	25	165	0.6	50
CL160808T-R22□-N	0.22	20 / 15 / 10	25	25	150	0.8	50
CL160808T-R27□-N	0.27	20 / 15 / 10	25	25	136	0.8	50
CL160808T-R33□-N	0.33	20 / 15 / 10	25	25	125	0.85	35
CL160808T-R39□-N	0.39	20 / 15 / 10	25	25	110	1.00	35
CL160808T-R47□-N	0.47	20 / 15 / 10	25	25	105	1.35	35
CL160808T-R56□-N	0.56	20 / 15 / 10	25	25	95	1.50	35
CL160808T-R68□-N	0.68	20 / 15 / 10	25	25	85	1.70	35
CL160808T-R82□-N	0.82	20 / 15 / 10	25	25	75	2.10	35
CL160808T-1R0□-N	1.0	20 / 15 / 10	35	10	65	0.60	25
CL160808T-1R2□-N	1.2	20 / 15 / 10	35	10	60	0.80	25
CL160808T-1R5□-N	1.5	20 / 15 / 10	35	10	55	0.80	25
CL160808T-1R8□-N	1.8	20 / 15 / 10	35	10	50	0.95	25
CL160808T-2R2□-N	2.2	20 / 15 / 10	35	10	45	1.00	15
CL160808T-2R7□-N	2.7	20 / 15 / 10	35	10	40	1.15	15
CL160808T-3R3□-N	3.3	20 / 15 / 10	35	10	38	1.30	15
CL160808T-3R9□-N	3.9	20 / 15 / 10	35	10	36	1.50	15
CL160808T-4R7□-N	4.7	20 / 15 / 10	35	10	33	1.60	15
CL160808T-5R6□-N	5.6	20 / 15 / 10	35	4	22	1.10	5
CL160808T-6R8□-N	6.8	20 / 15 / 10	35	4	20	1.30	5
CL160808T-8R2□-N	8.2	20 / 15 / 10	30	4	18	1.50	5
CL160808T-100□-N	10	20 / 15 / 10	30	2	17	1.70	5
CL160808T-120□-N	12	20 / 15 / 10	30	2	15	1.80	3
CL160808T-150□-N	15	20 / 15 / 10	20	1	14	1.50	1
CL160808T-220□-N	22	20 / 15 / 10	20	1	11	1.70	1

**Note: When ordering, please specify tolerance code. Tolerance : K= $\pm$ 10% , L= $\pm$ 15% , M= $\pm$ 20%**

- Operating temperature range - 40°C ~ 125°C(Including self - temperature rise)
- IDC : Applied the current to coils, the inductance shall be less than 10% initial value
- Measure Equipment :  
 L & Q : HP4291A  
 SRF : Agilent HP8753D/Agilent E4991A  
 RDC : HP4338B or CHEN HWA 502

## SMD Multilayer Ferrite Chip Inductors – CL Series

### Electrical Characteristics

Part Number	Inductance ( $\mu$ H)	Tolerance ( $\pm$ %)	Q Min	Test Frequency (MHz)	SRF MHz) Min	RDC ( $\Omega$ ) Max	IDC (mA) Max
CL201209T-22N□-N	0.022	20	20	50	320	0.20	300
CL201209T-33N□-N	0.033	20 / 15	20	50	320	0.20	300
CL201209T-47N□-N	0.047	20 / 15	20	50	320	0.20	300
CL201209T-56N□-N	0.056	20 / 15	20	50	320	0.20	300
CL201209T-68N□-N	0.068	20 / 15	20	50	280	0.20	300
CL201209T-82N□-N	0.082	20 / 15	20	50	255	0.20	300
CL201209T-R10□-N	0.10	20 / 15 / 0	25	25	235	0.30	250
CL201209T-R12□-N	0.12	20 / 15 / 10	25	25	220	0.30	250
CL201209T-R15□-N	0.15	20 / 15 / 10	25	25	200	0.40	250
CL201209T-R18□-N	0.18	20 / 15 / 10	25	25	185	0.40	250
CL201209T-R22□-N	0.22	20 / 15 / 10	25	25	170	0.50	250
CL201209T-R27□-N	0.27	20 / 15 / 10	25	25	150	0.50	250
CL201209T-R33□-N	0.33	20 / 15 / 10	25	25	145	0.55	250
CL201209T-R39□-N	0.39	20 / 15 / 10	25	25	135	0.65	250
CL201209T-R47□-N	0.47	20 / 15 / 10	25	25	125	0.65	250
CL201209T-R56□-N	0.56	20 / 15 / 10	25	25	115	0.75	150
CL201209T-R68□-N	0.68	20 / 15 / 10	25	25	105	0.80	150
CL201209T-R82□-N	0.82	20 / 15 / 10	25	25	100	1.00	150
CL201209T-1R0□-N	1.0	20 / 15 / 10	45	10	75	0.40	50
CL201209T-1R2□-N	1.2	20 / 15 / 10	45	10	65	0.50	50
CL201209T-1R5□-N	1.5	20 / 15 / 10	45	10	60	0.50	50
CL201209T-1R8□-N	1.8	20 / 15 / 10	45	10	55	0.60	50
CL201209T-2R2□-N	2.2	20 / 15 / 10	45	10	50	0.65	30

**Note: When ordering, please specify tolerance code. Tolerance : K= $\pm$ 10% , L= $\pm$ 15% , M= $\pm$ 20%**

- Operating temperature range - 40°C ~ 125°C(Including self - temperature rise)
- IDC : Applied the current to coils, the inductance shall be less than 10% initial value
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SRF : Agilent HP8753D/Agilent E4991A  
RDC : HP4338B or CHEN HWA 502

## SMD Multilayer Ferrite Chip Inductors – CL Series

### Electrical Characteristics

Part Number	Inductance ( $\mu\text{H}$ )	Tolerance ( $\pm\%$ )	Q Min	Test Frequency (MHz)	SRF (MHz) Min	RDC ( $\Omega$ ) Max	IDC (mA) Max
CL201212T-2R7□-N	2.7	20 / 15 / 10	45	10	45	0.75	30
CL201212T-3R3□-N	3.3	20 / 15 / 10	45	10	41	0.80	30
CL201212T-3R9□-N	3.9	20 / 15 / 10	45	10	38	0.90	30
CL201212T-4R7□-N	4.7	20 / 15 / 10	45	10	35	1.00	30
CL201212T-5R6□-N	5.6	20 / 15 / 10	45	4	32	0.90	15
CL201212T-6R8□-N	6.8	20 / 15 / 10	45	4	29	1.00	15
CL201212T-8R2□-N	8.2	20 / 15 / 10	45	4	26	1.10	15
CL201212T-100□-N	10	20 / 15 / 10	45	2	24	1.10	15
CL201212T-120□-N	12	20 / 15 / 10	45	2	22	1.20	15
CL201212T-150□-N	15	20 / 15 / 10	30	1	19	0.80	5
CL201212T-180□-N	18	20 / 15 / 10	30	1	18	0.90	5
CL201212T-220□-N	22	20 / 15 / 10	30	1	16	1.1	5

**Note: When ordering, please specify tolerance code. Tolerance : K= $\pm 10\%$  , L= $\pm 15\%$  , M= $\pm 20\%$**

- Operating temperature range - 40°C ~ 125°C(Including self - temperature rise)
- IDC : Applied the current to coils, the inductance shall be less than 10% initial value
- Measure Equipment :  
L & Q : HP4291A  
SRF : Agilent HP8753D/Agilent E4991A  
RDC : HP4338B or CHEN HWA 502

# SMD Multilayer Ferrite Chip Inductors – CL Series

## Electrical Characteristics

Part Number	Inductance ( $\mu$ H)	Tolerance ( $\pm$ %)	Q Min	Test Frequency (MHz)	SRF (MHz) Min	RDC ( $\Omega$ ) Max	IDC (mA) Max
CL321611T-47N□-N	0.047	20	20	50	320	0.15	300
CL321611T-56N□-N	0.056	20	20	50	280	0.25	300
CL321611T-68N□-N	0.068	20	20	50	280	0.25	300
CL321611T-82N□-N	0.082	20	20	50	250	0.25	300
CL321611T-R10□-N	0.10	20 / 15 / 10	25	25	235	0.25	250
CL321611T-R12□-N	0.12	20 / 15 / 10	25	25	220	0.30	250
CL321611T-R15□-N	0.15	20 / 15 / 10	25	25	200	0.30	250
CL321611T-R18□-N	0.18	20 / 15 / 10	25	25	185	0.40	250
CL321611T-R22□-N	0.22	20 / 15 / 10	25	25	170	0.40	250
CL321611T-R27□-N	0.27	20 / 15 / 10	25	25	150	0.50	250
CL321611T-R33□-N	0.33	20 / 15 / 10	25	25	145	0.60	250
CL321611T-R39□-N	0.39	20 / 15 / 10	25	25	135	0.50	200
CL321611T-R47□-N	0.47	20 / 15 / 10	25	25	125	0.60	200
CL321611T-R56□-N	0.56	20 / 15 / 10	25	25	115	0.70	150
CL321611T-R68□-N	0.68	20 / 15 / 10	25	25	105	0.80	150
CL321611T-R82□-N	0.82	20 / 15 / 10	25	25	100	0.90	150
CL321611T-1R0□-N	1.0	20 / 15 / 10	45	10	75	0.40	100
CL321611T-1R2□-N	1.2	20 / 15 / 10	45	10	65	0.50	100
CL321611T-1R5□-N	1.5	20 / 15 / 10	45	10	60	0.50	80
CL321611T-1R8□-N	1.8	20 / 15 / 10	45	10	55	0.50	70
CL321611T-2R2□-N	2.2	20 / 15 / 10	45	10	50	0.60	60
CL321611T-2R7□-N	2.7	20 / 15 / 10	45	10	45	0.60	60
CL321611T-3R3□-N	3.3	20 / 15 / 10	45	10	41	0.70	60
CL321611T-3R9□-N	3.9	20 / 15 / 10	45	10	38	0.80	50
CL321611T-4R7□-N	4.7	20 / 15 / 10	45	10	35	0.90	50
CL321611T-5R6□-N	5.6	20 / 15 / 10	45	4	32	0.70	25
CL321611T-6R8□-N	6.8	20 / 15 / 10	45	4	29	0.80	25
CL321611T-8R2□-N	8.2	20 / 15 / 10	45	4	26	0.90	25
CL321611T-100□-N	10	20 / 15 / 10	45	2	24	1.00	25
CL321611T-120□-N	12	20 / 15 / 10	45	2	22	1.00	15
CL321611T-150□-N	15	20 / 15 / 10	35	1	19	0.70	5
CL321611T-180□-N	18	20 / 15 / 10	35	1	18	0.75	5
CL321611T-220□-N	22	20 / 15 / 10	35	1	16	0.90	5
CL321611T-270□-N	27	20 / 15 / 10	35	1	14	0.90	5

**Note: When ordering, please specify tolerance code. Tolerance : K= $\pm$ 10% , L= $\pm$ 15% , M= $\pm$ 20%**

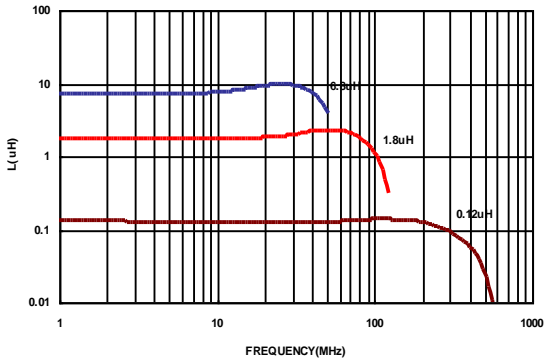
- Operating temperature range - 40°C ~ 125°C(Including self - temperature rise)
- IDC : Applied the current to coils, the inductance shall be less than 10% initial value
- Measure Equipment :  
L & Q : HP4291A  
SRF : Agilent HP8753D/Agilent E4991A  
RDC : HP4338B or CHEN HWA 502

# SMD Multilayer Ferrite Chip Inductors – CL Series

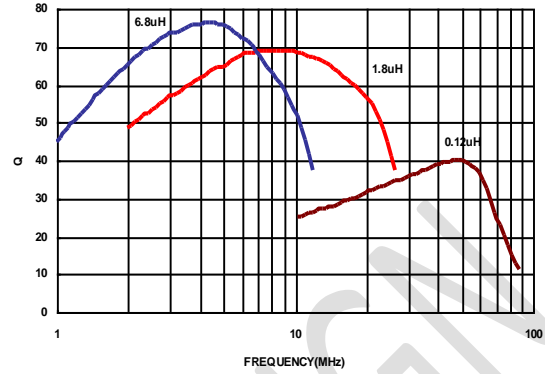
Test Instruments : Agilent E4991A Impedance / Material Analyzer

## CL160808

INDUCTANCE vs. FREQUENCY CHARACTERISTICS

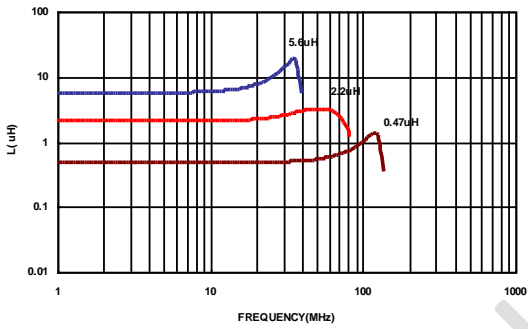


Q vs. FREQUENCY CHARACTERISTICS

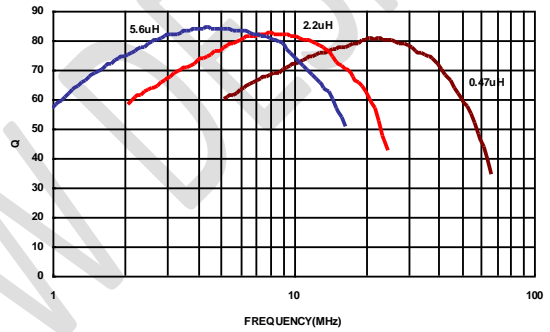


## CL201209

INDUCTANCE vs. FREQUENCY CHARACTERISTICS

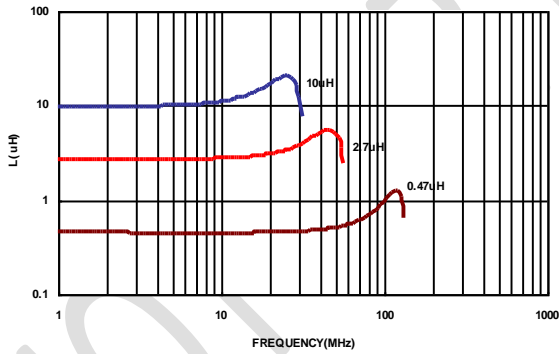


Q vs. FREQUENCY CHARACTERISTICS

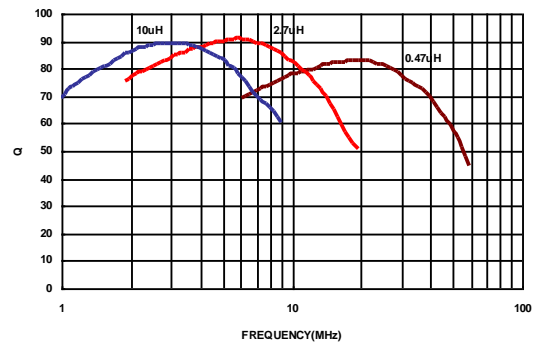


## CL321611

INDUCTANCE vs. FREQUENCY CHARACTERISTICS

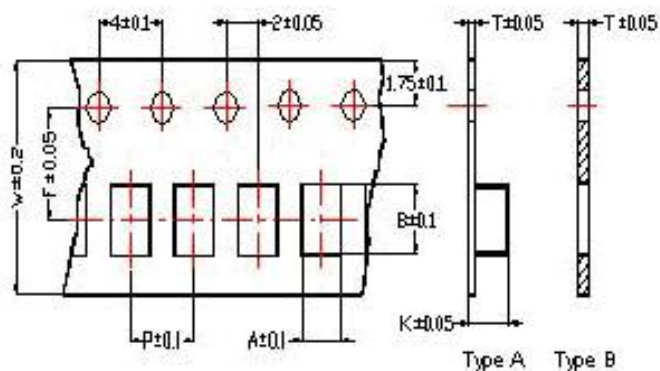


Q vs. FREQUENCY CHARACTERISTICS

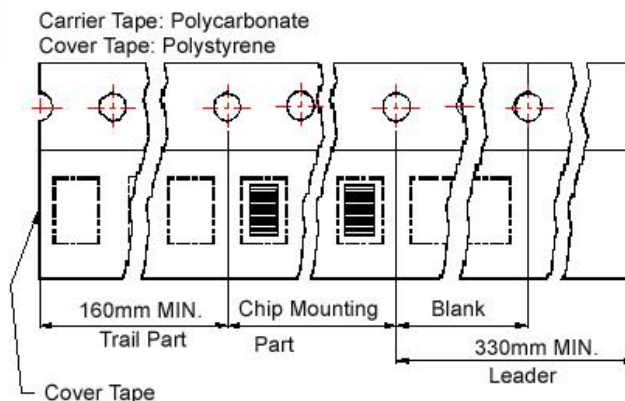


## Packaging Specifications

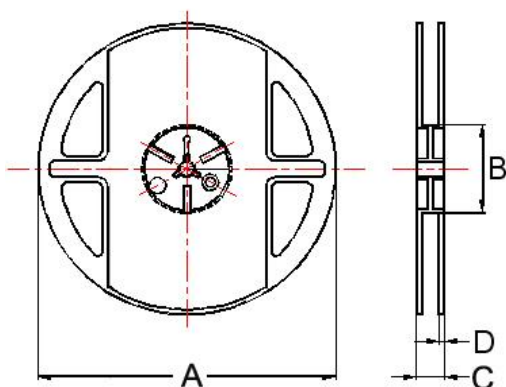
### Tape Dimensions



### Tape Material



### Reel Dimensions



Dimensions in mm

TYPE	Tape Dimensions								Tape	Reel Dimensions				Quantity PCS / Reel
	A	B	T	W	P	F	K	A		B	C	D		
CL160808	1.05	1.85	0.95	8.0	4.0	3.5	-	B	178	60	12	1.5	4000	
CL201209	1.50	2.30	0.97	8.0	4.0	3.5	-	B	178	60	12	1.5	4000	
CL201212	1.35	2.25	0.22	8.0	4.0	3.5	1.35	A	178	60	12	1.5	3000	
CL321611	1.88	3.50	0.22	8.0	4.0	3.5	1.27	A	178	60	12	1.5	3000	