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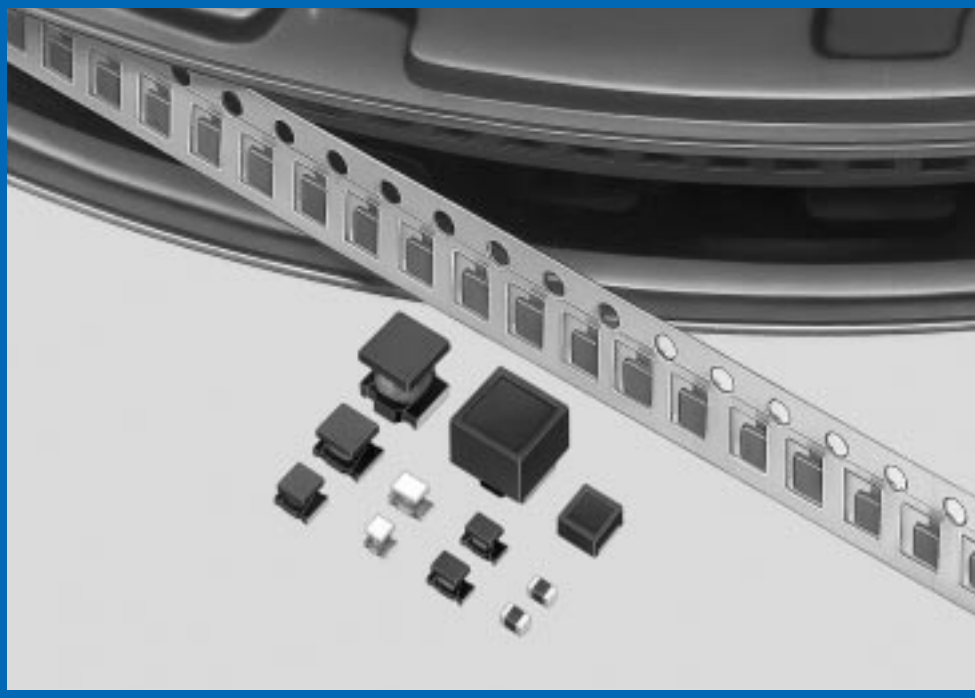
CHIP COIL

CHIP COIL



muRata Innovator in Electronics

Murata
Manufacturing Co., Ltd.

Cat.No.O05E-4

■CHIP COIL GUIDE

Murata's LQ□ series of chip coils consists of compact, high-performance inductors. Their innovative coil and case structures mean low DC resistance and outstanding high-frequency characteristics. The series is designed for a variety of applications, facilitating component selection for individual circuit requirements.

■PRODUCTS GUIDE

Application	Part Number	Structure	Dimensions (mm)	Dimensions (inch)	Inductance Range (H) 1n 10n 100n 1µ 10µ 100µ 1m 10m	Page
General Frequency Range	LQH1N	Wound coil (ferrite core)	3.2 × 1.6	1206		3–7
	LQH3N		3.2 × 2.5	1210		
	LQH(N)4N		4.5 × 3.2	1812		
	LQG21N	Magnetically shielded multilayer	2.0 × 1.25	0805		8–9
Tight inductance tolerance	LQS33N	Magnetically shielded	3.2 × 3.5	1214		10–11
High-frequency Range	LQG10A NEW	Multilayer	1.0 × 0.5	0402		12–13
	LQG11A		1.6 × 0.8	0603		14–15
Tight inductance tolerance	LQP10A	Thin film	1.0 × 0.5	0402		16–19
	LQP11A		1.6 × 0.8	0603		
	LQP21A		2.0 × 1.25	0805		
	LQW1608A NEW	Wound coil (air core)	1.6 × 0.8	0603		20–21
	LQN21A		2.0 × 1.5	0805		22–24
	LQN1A		3.2 × 1.6	1206		
	LQN1H	Wound coil (ferrite core)	3.2 × 1.6	1206		25
Chokes	LQH1C	Wound coil	3.2 × 1.6	1206		26–28
	LQH3C		3.2 × 2.5	1210		
	LQH4C NEW		4.5 × 3.2	1812		
	LQG21C	Magnetically shielded multilayer	2.0 × 1.25	0805		29
	LQN6C	Wound coil	5.7 × 5.0	2220		30–32
	LQS66C	Magnetically shielded	6.3 × 6.3	2525		

■PART NUMBERING

(Please specify the part number when ordering.)

(Ex.)

LQ	H	3	N	331	K	34
❶	❷	❸	❹	❺	❻	❼

LQ	N	21	A	10N	J	04
❶	❷	❸	❹	❺	❻	❼

LQ	G	21	N	R10	K	10	T1
❶	❷	❸	❹	❺	❻	❼	❽

❶Chip Coil

❷Form ·Structure

Mark	Form .Structure
H	With coating
N	Without coating
S	Shielded
P	Thin film
G	Multilayer
W	Horizontal winding

❸Size

Mark	Size
1	3.2X1.6mm
3	3.2X2.5mm
4	4.5X3.2mm
6	5.7X5.0mm
10	1.0X0.5mm
11	1.6X0.8mm
21	2.0X1.25 (1.5) mm
33	3.2X3.5mm
66	6.3X6.3mm
1608	1.6X0.8mm

❹Characteristic · Applications

Mark	Characteristic ·Applications
N	General use
C	Choke coil
A	Air coil
H	High Q

❺Inductance

Example : 330μH→331 33nH→33N
33μH→330 3.3nH→3N3
3.3μH→3R3
0.33μH→R33

❻Inductance Tolerance

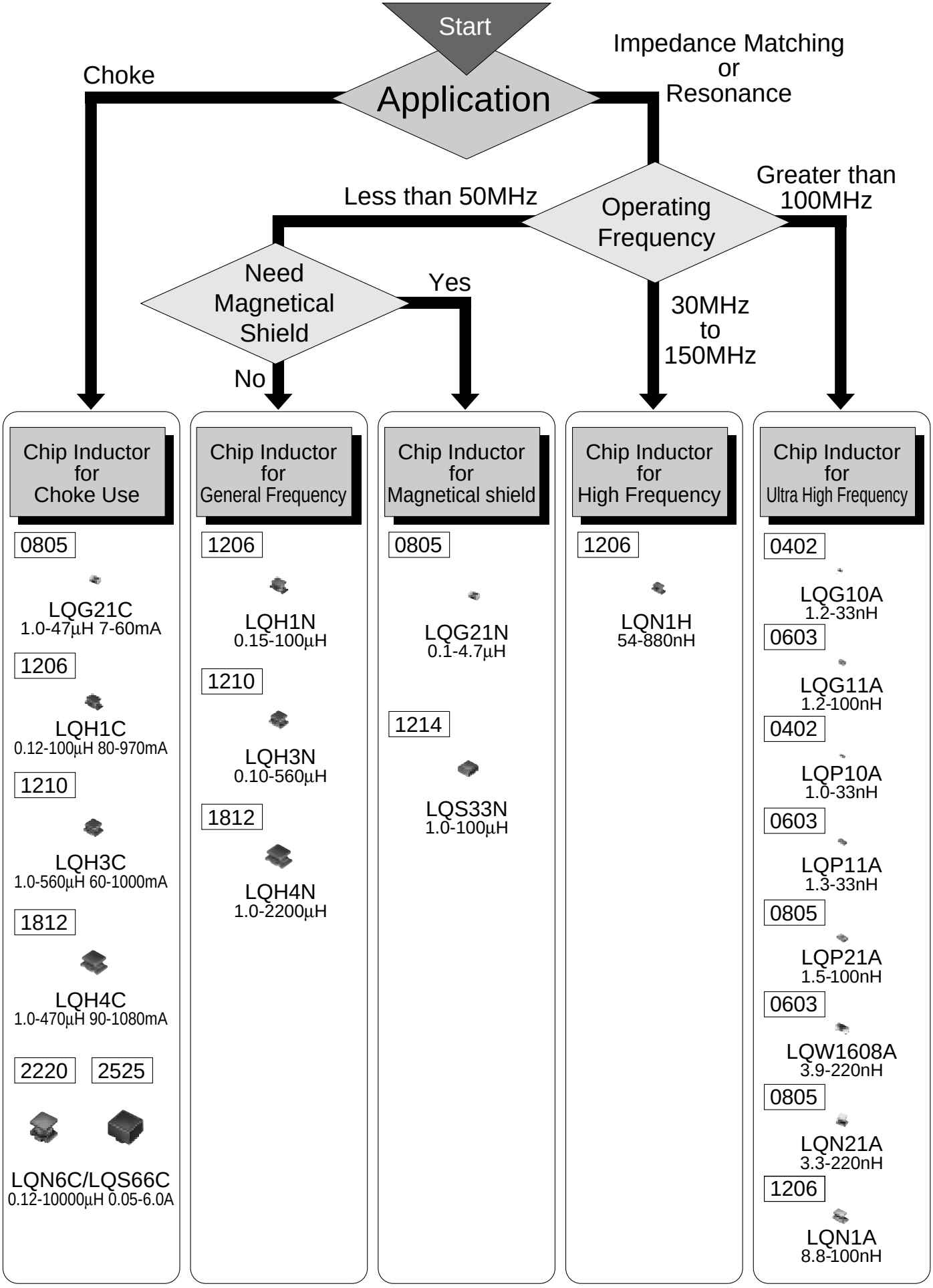
Mark	Tolerance
G	± 2%
J	± 5%
K	±10%
M	±20%
N	±30%
C	±0.2nH
S	±0.3nH
D	±0.5nH

❼Additional Number

❽Packaging Code
(LQG21N/21C/LQP10A/11A/
LQG10A/11A/LQW1608A)

Mark	Packaging
T1	Taped (ϕ180mm Reel)
T2	Taped (ϕ330mm Reel)
B1	Bulk package

CHIP INDUCTOR SELECTION

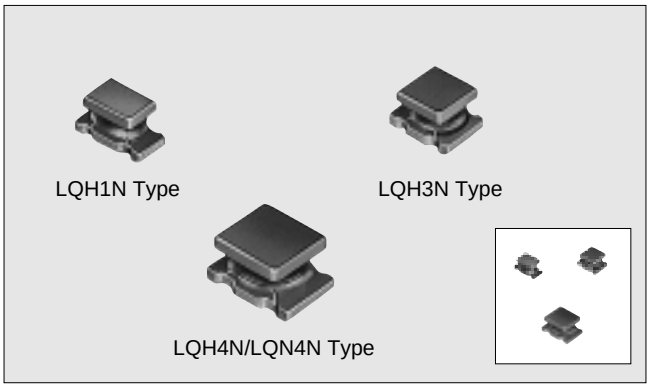


CHIP COIL

Standard Chip Coil **LQH1N/LQH3N/LQH(N)4N** Series

Wire Wound Chip Coil with High Q Value at High Frequencies and Low DC Resistance

The chip coil LQH/LQN series consists of miniature chip inductors wound on a special ferrite core and are made possible by an automatic winding technique developed by Murata. These inductors have a high Q at high frequencies and low DC resistance, making them very well suited to enhancing the performance of electronic circuits in video, communications, and audio equipment.



■FEATURES

1. There are three different inductor types : the LQH1N, LQH3N, and LQH(N)4N series. These three series cover a wide inductance range (from 0.1µH to 2.2mH).
2. The series has outstanding frequency characteristics and a high Q value at high frequencies.
3. The low DC resistance permits high current flow.
4. The series has excellent solder heat resistance. Both flow and reflow soldering methods can be employed.

● LQH1N

Miniature size (3.2×1.6×1.8mm) allows parallel mounting at 2.5mm pitch. The series is suitable for portable audio-visual equipment.

● LQH3N

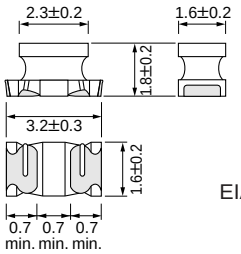
A high Q value makes this series suitable for circuits up to 100MHz in frequency. The series is excellent for video equipment.

● LQH(N)4N

This series offers high inductance values and high current capacity. At 10µH, up to 450mA designs are possible, resulting in excellent performance when the inductors are used as choke coils.

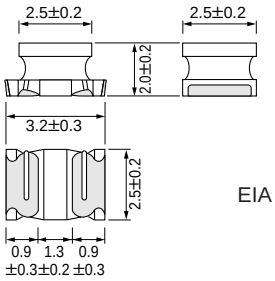
■DIMENSIONS

LQH1N Type



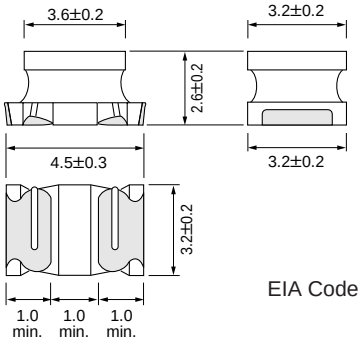
EIA Code : 1206

LQH3N Type



EIA Code : 1210

LQH4N/LQN4N Type



EIA Code : 1812

(in mm)

■SPECIFICATIONS

LQH1N

Part Number	Inductance			Q		DC Resistance (Ω)	Self-resonant Frequency (MHz min.)	Allowable Current (mA)	Operating Temp. Range
	Nominal Value (μH)	Tolerance (%)	Test Frequency	Nominal Value (min.)	Test Frequency				
LQH1NR15K04	0.15	±10	1MHz	20	25MHz	0.39±40%	250	250	−25℃ to +85℃
LQH1NR22K04	0.22					0.43±40%		240	
LQH1NR33K04	0.33			30		0.45±40%		230	
LQH1NR47K04	0.47					0.83±40%	200	215	
LQH1NR56K04	0.56					0.61±40%	180	200	
LQH1NR68K04	0.68					0.67±40%	160	190	
LQH1NR82K04	0.82					0.73±40%	120	185	
LQH1N1R0K04	1.0			35	10MHz	0.49±30%	100	175	
LQH1N1R2K04	1.2					0.9 ±30%	90	165	
LQH1N1R5K(J)04	1.5	±10 (±5)				1.0 ±30%	75	155	
LQH1N1R8K(J)04	1.8					1.6 ±30%	60	150	
LQH1N2R2K(J)04	2.2					0.7 ±30%	50	140	
LQH1N2R7K(J)04	2.7					0.55±30%	43	135	
LQH1N3R3K(J)04	3.3				8MHz	0.61±30%	38	130	
LQH1N3R9K(J)04	3.9					1.5 ±30%	35	125	
LQH1N4R7K(J)04	4.7					1.7 ±30%	31	120	
LQH1N5R6K(J)04	5.6					1.8 ±30%	28	115	
LQH1N6R8K(J)04	6.8					2.0 ±30%	25	110	
LQH1N8R2K(J)04	8.2					2.2 ±30%	23	105	
LQH1N100K(J)04	10				5MHz	2.5 ±30%	20	100	
LQH1N120K(J)04	12					2.7 ±30%	18	95	
LQH1N150K(J)04	15					3.0 ±30%	16	90	
LQH1N180K(J)04	18					3.4 ±30%	15	85	
LQH1N220K(J)04	22			40	2.5MHz	3.1 ±30%	14		
LQH1N270K(J)04	27					3.4 ±30%	13		
LQH1N330K(J)04	33					3.8 ±30%	12	80	
LQH1N390K(J)04	39					7.2 ±30%	11	55	
LQH1N470K(J)04	47					8.0 ±30%	10		
LQH1N560K(J)04	56					8.9 ±30%	9.0	50	
LQH1N680K(J)04	68					9.9 ±30%	8.5		
LQH1N820K(J)04	82					11 ±30%	7.5	45	
LQH1N101K(J)04	100					12 ±30%	7.0		

LQH3N

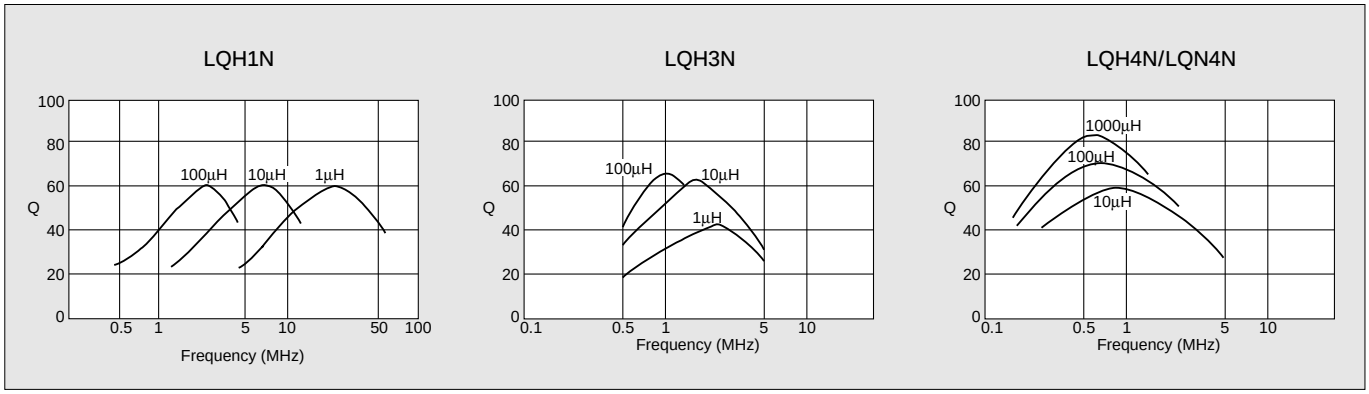
Part Number	Inductance			Q		DC Resistance (Ω max.)	Self-resonant Frequency (MHz min.)	Allowable Current (mA)	Operating Temp. Range
	Nominal Value (μH)	Tolerance (%)	Test Frequency	Nominal Value (min.)	Test Frequency				
LQH3NR10M34	0.10	±20	1MHz	20	25.2MHz	0.25	200	700	−25℃ to +85℃
LQH3NR18M34	0.18							650	
LQH3NR27M34	0.27			25				600	
LQH3NR39M34	0.39							530	
LQH3NR56M34	0.56			30			160		
LQH3NR68M34	0.68							470	
LQH3NR82M34	0.82						120	450	
LQH3N1R0M34	1.0			20	1MHz	0.5	100	445	
LQH3N1R2M34	1.2					0.6		425	
LQH3N1R5K34	1.5	±10					75	400	
LQH3N1R8K34	1.8					0.7	60	390	
LQH3N2R2K34	2.2					0.8	50	370	
LQH3N2R7K34	2.7					0.9	43	320	
LQH3N3R3K34	3.3					1.0	38	300	
LQH3N3R9K34	3.9					1.1	35	290	
LQH3N4R7K34	4.7					1.2	31	270	
LQH3N5R6K34	5.6					1.3	28	250	
LQH3N6R8K34	6.8					1.5	25	240	
LQH3N8R2K34	8.2					1.6	23	225	
LQH3N100K(J)34	10	±10 (±5)		35		1.8	20	190	
LQH3N120K(J)34	12					2.0	18	180	
LQH3N150K(J)34	15					2.2	16	170	
LQH3N180K(J)34	18					2.5	15	165	
LQH3N220K(J)34	22					2.8	14	150	
LQH3N270K(J)34	27					3.1	13	125	
LQH3N330K(J)34	33			40		3.5	12	115	
LQH3N390K(J)34	39					3.9	11	110	
LQH3N470K(J)34	47					4.3		100	
LQH3N560K(J)34	56					4.9	10	85	
LQH3N680K(J)34	68					5.5	9.0	80	
LQH3N820K(J)34	82					6.2	8.5	70	
LQH3N101K(J)34	100				796kHz	7.0	8.0	80	
LQH3N121K(J)34	120					8.0	7.5	75	
LQH3N151K(J)34	150					9.3	7.0	70	
LQH3N181K(J)34	180					10.2	6.0	65	
LQH3N221K(J)34	220					11.8	5.5		
LQH3N271K(J)34	270					12.5	5.0		
LQH3N331K(J)34	330					13.0			
LQH3N391K(J)34	390			50		22.0		50	
LQH3N471K(J)34	470		1kHz			25.0		45	
LQH3N561K(J)34	560					28.0		40	

LQH4N/LQN4N

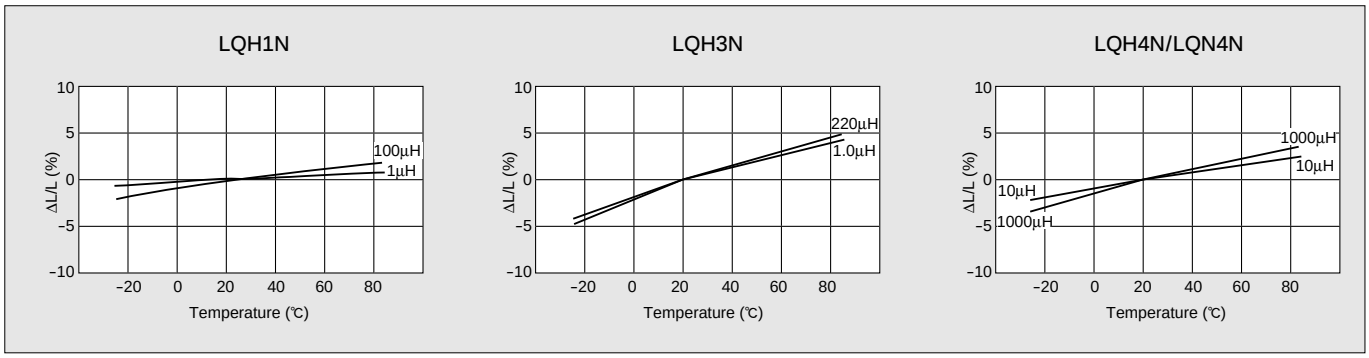
Part Number	Inductance			Q		DC Resistance (Ω max.)	Self-resonant Frequency (MHz min.)	Allowable Current (mA)	Operating Temp. Range
	Nominal Value (μH)	Tolerance (%)	Test Frequency	Nominal Value (min.)	Test Frequency				
LQH4N1R0M04	1.0	±20	1MHz	20	1MHz	0.20	120	500	−25℃ to +85℃
LQH4N1R2M04	1.2						100		
LQH4N1R5M04	1.5					0.30	85		
LQH4N1R8M04	1.8						75		
LQH4N2R2M04	2.2						62		
LQH4N2R7M04	2.7					0.32	53		
LQH4N3R3M04	3.3					0.35	47		
LQH4N3R9M04	3.9					0.38	41		
LQH4N4R7K04	4.7	±10		30		0.40	38		
LQH4N5R6K04	5.6					0.47	33		
LQH4N6R8K04	6.8					0.50	31	450	
LQH4N8R2K04	8.2					0.56	27		
LQH4N100K(J)04	10	±10 (±5)		35			23	400	
LQH4N120K(J)04	12					0.62	21	380	
LQH4N150K(J)04	15					0.73	19	360	
LQH4N180K(J)04	18					0.82	17	340	
LQH4N220K(J)04	22					0.94	15	320	
LQH4N270K(J)04	27					1.1	14	300	
LQH4N330K(J)04	33					1.2	12	270	
LQH4N390K(J)04	39					1.4	11	240	
LQH4N470K(J)04	47					1.5	10	220	
LQH4N560K(J)04	56					1.7	9.3	200	
LQH4N680K(J)04	68					1.9	8.4	180	
LQH4N820K(J)04	82					2.2	7.5	170	
LQH4N101K(J)04	100			40	796kHz	2.5	6.8	160	
LQH4N121K(J)04	120					3.0	6.2	150	
LQH4N151K(J)04	150					3.7	5.5	130	
LQH4N181K(J)04	180					4.5	5.0	120	
LQH4N221K(J)04	220					5.4	4.5	110	
LQH4N271K(J)04	270					6.8	4.0	100	
LQH4N331K(J)04	330					8.2	3.6	95	
LQH4N391K(J)04	390					9.7	3.3	90	
LQH4N471K(J)04	470		1kHz			11.8	3.0	80	
LQH4N561K(J)04	560					14.5	2.7	70	
LQH4N681K(J)04	680					17.0	2.5	65	
LQH4N821K(J)04	820					20.5	2.2	60	
LQH4N102K(J)04	1000				252kHz	25.0	2.0	50	
LQH4N122K(J)04	1200					30.0	1.8	45	
LQH4N152K(J)04	1500					37.0	1.6	40	
LQN4N182K(J)04	1800					45.0	1.5	35	
LQN4N222K(J)04	2200					50.0	1.3	30	

■TYPICAL ELECTRICAL CHARACTERISTICS

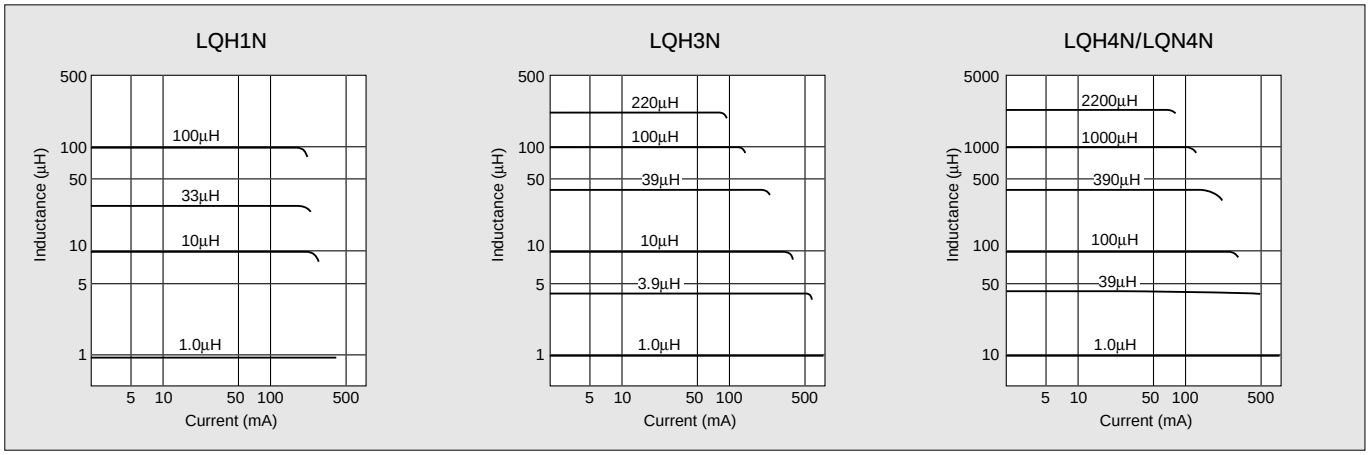
●Q-Frequency Characteristics



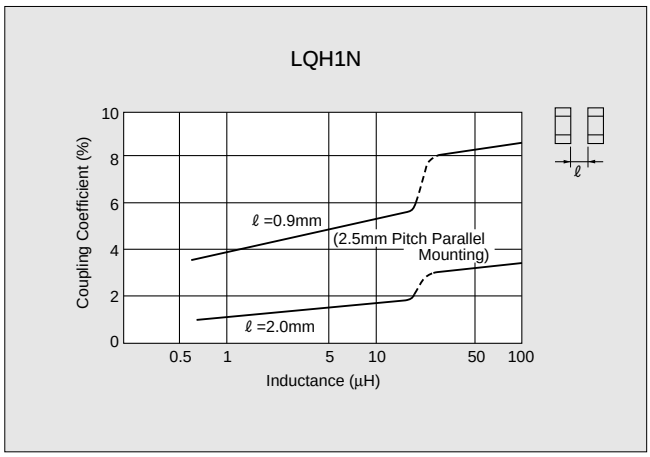
●Inductance-Temperature Characteristics



●Inductance-Current Characteristics



●Coupling Coefficient

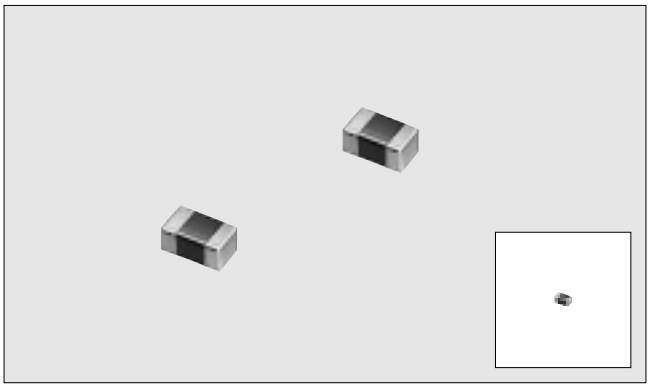


CHIP COIL

Multilayer Chip Coil **LQG21N** Series

Magnetically Shielded Multilayer Chip Coil Low Drift Excellent for High Density Mounting

The LQG21N series consists of magnetically shielded chip coils developed using original Murata multilayer process technology and magnetic materials.
The coils occupy one quarter the volume of conventional chip coils and feature high reliability.



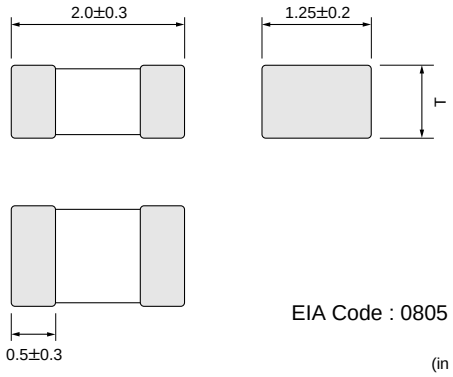
■FEATURES

1. Magnetically shielded structure provides excellent crosstalk characteristics.
2. Compact (2.0×1.25mm) and lightweight.
3. Low inductance drift resulting from soldering, environmental tests, etc.
4. Outstanding solder heat resistance. Either flow or reflow soldering can be used.

■APPLICATIONS

- Hard-disk drivers
- Audio-Visual equipment
- Telecommunications equipment

■DIMENSIONS



EIA Code : 0805

(in mm)

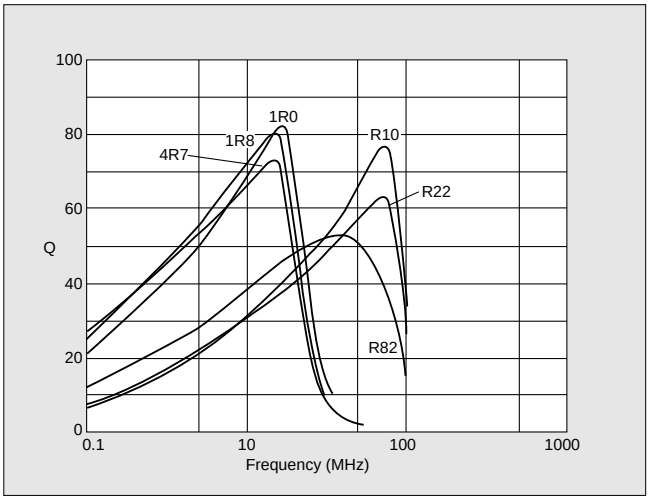
Part Number	T
LQG21NR10K10—2R2K10	0.85±0.2
LQG21N2R7K10—4R7K10	1.25±0.2

■SPECIFICATIONS

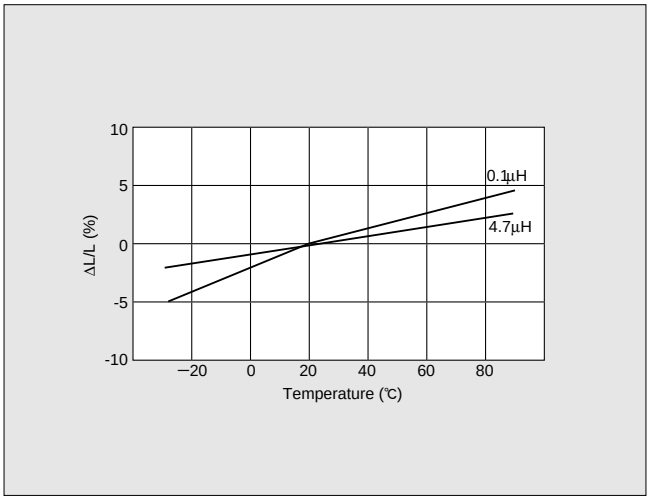
Part Number	Inductance			Q		DC Resistance (Ω max.)	Self-resonant Frequency (MHz min.)	Allowable Current (mA)	Operating Temp. Range
	Nominal Value (μH)	Tolerance (%)	Test Frequency	Nominal Value (min.)	Test Frequency				
LQG21NR10K10	0.10	±10	25MHz	20	25MHz	0.26	340	250	−25℃ to +85℃
LQG21NR12K10	0.12					0.29	310		
LQG21NR15K10	0.15					0.32	270		
LQG21NR18K10	0.18					0.35	250		
LQG21NR22K10	0.22					0.38	220		
LQG21NR27K10	0.27					0.42	200		
LQG21NR33K10	0.33					0.48	180		
LQG21NR39K10	0.39			25		0.53	165	200	
LQG21NR47K10	0.47					0.57	150		
LQG21NR56K10	0.56					0.63	140	150	
LQG21NR68K10	0.68					0.72	125		
LQG21NR82K10	0.82					0.81	115		
LQG21N1R0K10	1.0		10MHz	45	10MHz	0.40	107	50	
LQG21N1R2K10	1.2					0.47	97		
LQG21N1R5K10	1.5					0.50	87		
LQG21N1R8K10	1.8					0.57	80		
LQG21N2R2K10	2.2					0.63	71	30	
LQG21N2R7K10	2.7					0.69	66		
LQG21N3R3K10	3.3					0.80	59		
LQG21N3R9K10	3.9					0.89	53		
LQG21N4R7K10	4.7					1.00	47		

■TYPICAL ELECTRICAL CHARACTERISTICS

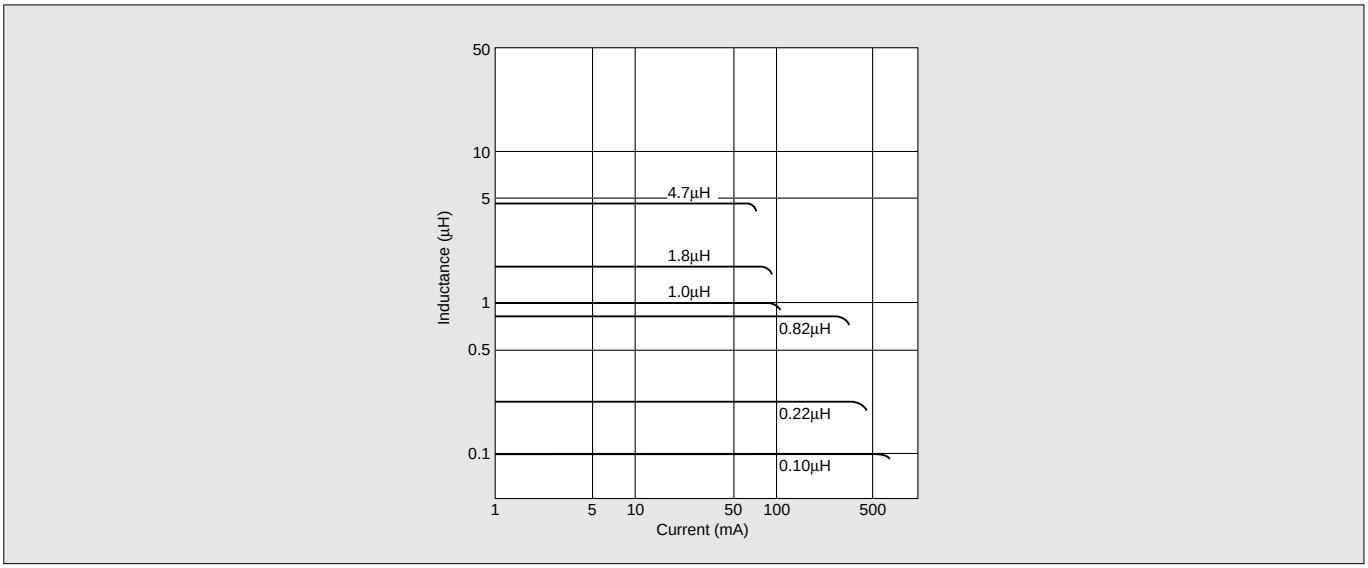
●Q-Frequency Characteristics



●Inductance - Temperature Characteristics



●Inductance - Current Characteristics

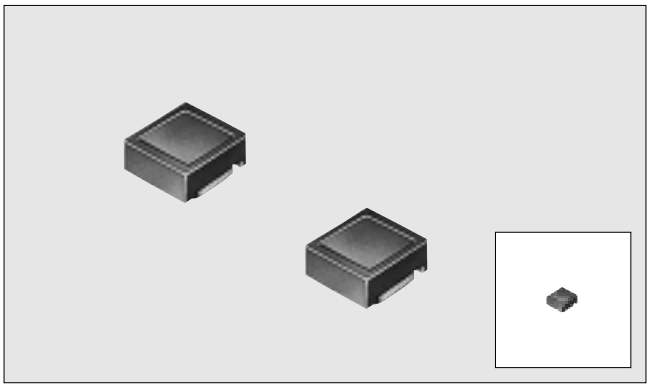


CHIP COIL

Small Tolerance Chip Coil **LQS33N** Series for Oscillation Circuits

High Q, Magnetically Shielded Chip Coil with Tight Inductance Tolerance (±2%), Perfect in Oscillation Circuits

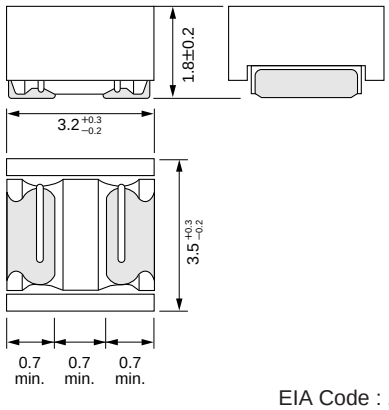
The LQS33N series consists of closed, magnetically shielded chip inductors wound on ferrite bobbins developed by Murata.
Their high Q value virtually eliminates interference with nearby circuits. This, combined with their tight inductance tolerance, makes these chip inductors excellent in resonant circuits.



■FEATURES

1. Their coil's outstanding stability yields a reduction in inductor tolerance to within ±2%.
2 Its high Q (typically greater than 80) is present at all inductance values and is the basis of this chip coil's outstanding low loss circuit characteristics.
3. The ferrite core shielding structure both eliminates external interference and facilitates high mounting density.
4. Small inductance variation with respect to temperature change makes these coils applicable in traps or LC filters for stable frequency characteristics.
5. This series is thin and compact, with a thickness of merely 1.8mm.

■DIMENSIONS



EIA Code : 1214

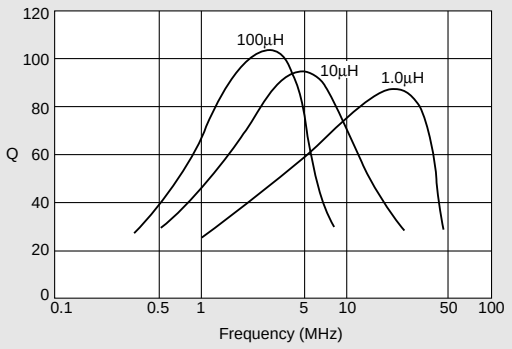
(in mm)

■SPECIFICATIONS

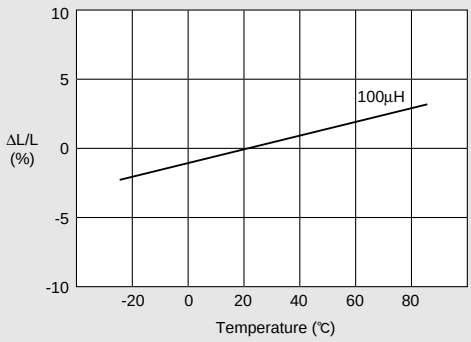
Part Number	Inductance			Q			DC Resistance (Ω)	Self-resonant Frequency (MHz min.)	Allowable Current (mA)	Operating Temp. Range
	Nominal Value (μH)	Tolerance (%)	Test Frequency	Peak Value (Typ.)	Min. Value	Test Frequency				
LQS33N1R0G (J) 04	1.0	±2 (±5)	7.96 MHz	85	60	7.96 MHz	0.19±30%	120	70	−25℃ to +85℃
LQS33N1R2G (J) 04	1.2						0.22±30%	100		
LQS33N1R5G (J) 04	1.5						0.26±30%	80		
LQS33N1R8G (J) 04	1.8						0.28±30%	70		
LQS33N2R2G (J) 04	2.2			90			0.33±30%	60	50	
LQS33N2R7G (J) 04	2.7						0.39±30%	55		
LQS33N3R3G (J) 04	3.3						0.43±30%	50		
LQS33N3R9G (J) 04	3.9						0.45±30%	45		
LQS33N4R7G (J) 04	4.7						0.52±30%	40	30	
LQS33N5R6G (J) 04	5.6						0.56±30%	37		
LQS33N6R8G (J) 04	6.8						0.62±30%	35		
LQS33N8R2G (J) 04	8.2						0.69±30%	32		
LQS33N100G (J) 04	10		2.52 MHz		70	2.52 MHz	0.94±30%	30	15	
LQS33N120G (J) 04	12						1.1 ±30%	27		
LQS33N150G (J) 04	15						1.2 ±30%	25		
LQS33N180G (J) 04	18						1.3 ±30%	23		
LQS33N220G (J) 04	22						1.5 ±30%	20	10	
LQS33N270G (J) 04	27			95			1.7 ±30%	18		
LQS33N330G (J) 04	33				80		2.4 ±30%	16		
LQS33N390G (J) 04	39						2.6 ±30%	15		
LQS33N470G (J) 04	47						3.0 ±30%	14		
LQS33N560G (J) 04	56			100			3.3 ±30%	13		
LQS33N680G (J) 04	68						5.3 ±30%	12		
LQS33N820G (J) 04	82						5.8 ±30%	11		
LQS33N101G (J) 04	100						6.6 ±30%	10		

■TYPICAL ELECTRICAL CHARACTERISTICS

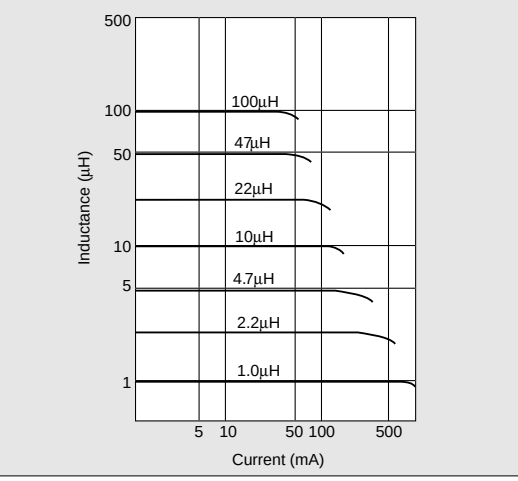
●Q-Frequency Characteristics



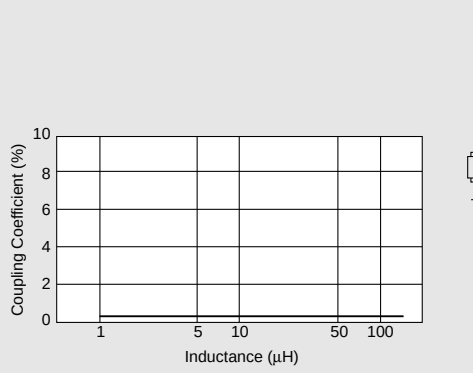
●Inductance - Temperature Characteristics



●Inductance - Current Characteristics



●Coupling Coefficient

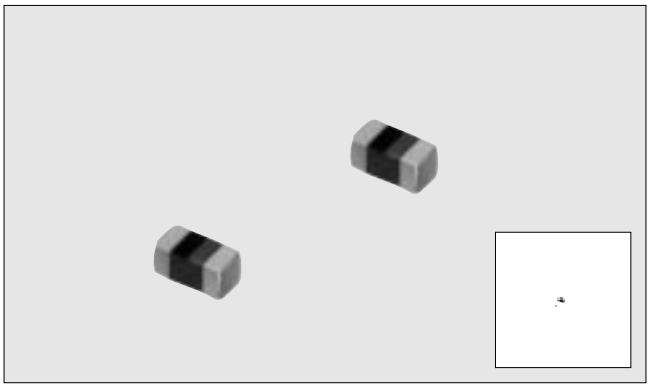


CHIP COIL

Multilayer Chip Inductor **LQG10A** Series for High Frequency

High-Q, Stable Inductance in High Frequency Range Small Size Multilayer Chip Inductor for High Frequency Range

The LQG10A series are chip inductors specifically designed for high frequency applications. The LQG10A series is designed to realize stable characteristics in high frequency range applying integrated multilayer process. The integrated multilayer process enables a wide range of inductance values with tight tolerance.



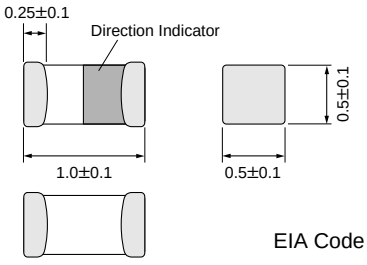
■FEATURES

1. High-Q, stable inductance in high frequency is achieved by the unique low-capacitance structure. It is suitable for mobile communication equipment.
2. The small size of LQG10A (1.0×0.5×0.5mm) is ideal for small mobile equipment.
3. The external electrodes with nickel barrier structure provide excellent solder heat resistance.

■APPLICATIONS

● High frequency circuit of telecommunication equipment such as CDMA, DECT, PHS, PCS, PCN, GSM and DCS.

■DIMENSIONS



EIA Code : 0402

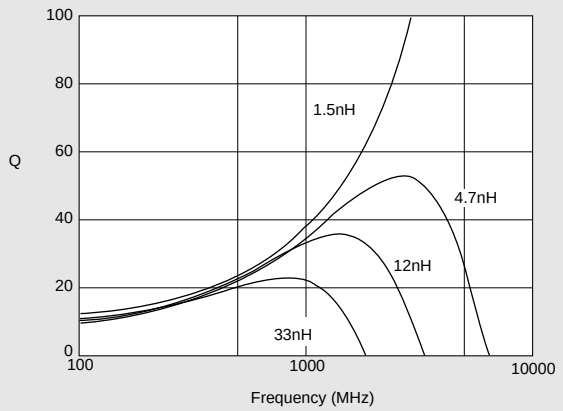
(in mm)

■SPECIFICATIONS

Part Number	Inductance			Q					DC Resistance (Ω max.)	Self-resonant Frequency (MHz min)	Allowable Current (mA)	Operating Temp. Range
	Nominal Value (nH)	Tolerance	Test Frequency (MHz)	Nominal Value (min.)	Test Frequency (MHz)	500MHz (typ.)	800MHz (typ.)	1GHz (typ.)				
LQG10A1N2S00	1.2	±0.3nH	100	8	100	25	35	38	0.10	6000	200	−40℃ to +85℃
LQG10A1N5S00	1.5						33					
LQG10A1N8S00	1.8					24	31	34				
LQG10A2N2S00	2.2					22	30	33	0.15			
LQG10A2N7S00	2.7						29	32	0.17			
LQG10A3N3S00	3.3								0.19			
LQG10A3N9S00	3.9							33				
LQG10A4N7S00	4.7					23	30		0.23			
LQG10A5N6S00	5.6						29		0.26	5300		
LQG10A6N8J00	6.8	±5%						32	0.29	4200		
LQG10A8N2J00	8.2					24	31	34	0.33	3600		
LQG10A10NJ00	10						30		0.35	3200		
LQG10A12NJ00	12						31		0.41	2800		
LQG10A15NJ00	15						30	33	0.46	2300		
LQG10A18NJ00	18						29	32	0.51	2100		
LQG10A22NJ00	22						28	31	0.58	1800		
LQG10A27NJ00	27					23	27	27	0.67	1600		
LQG10A33NJ00	33					22	23	24		1500		

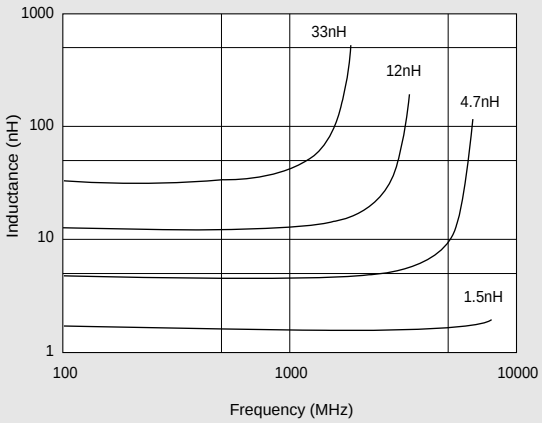
■TYPICAL ELECTRICAL CHARACTERISTICS

●Q - Frequency Characteristics



Measuring instrument Q : HP8720C, SMA connector (MM1215-3CC)

●Inductance - Frequency Characteristics



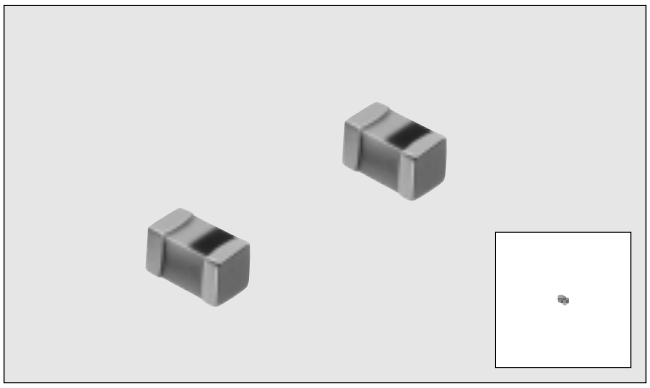
Measuring instrument L : HP8720C, SMA connector (MM1215-3CC)

CHIP COIL

Multilayer Chip Coil **LQG11A** Series for High Frequency

High-Q, Stable Inductance in High Frequency Range
Compact Size Multilayer Chip Inductor for High Frequency Range

The LQG11A series is designed to realize stable characteristics in high frequency range applying integrated multilayer process.



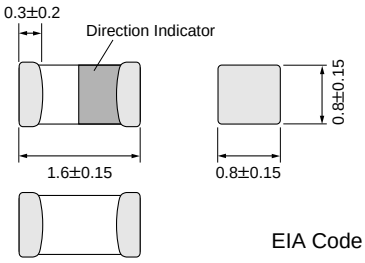
■FEATURES

1. High-Q, stable inductance in high frequency is available due to its original low-capacitance structure. It is suitable for mobile communication equipments.
2. Small size of LQG11A (1.6×0.8×0.8mm) is suitable for small hand held equipment, especially for card size equipment.
3. The external electrodes with nickel barrier structure provide excellent solder heat resistance.

■APPLICATIONS

● High frequency circuit of telecommunication equipment, such as DECT, PHS, PCS, PCN, GSM, CDMA.

■DIMENSIONS



EIA Code : 0603

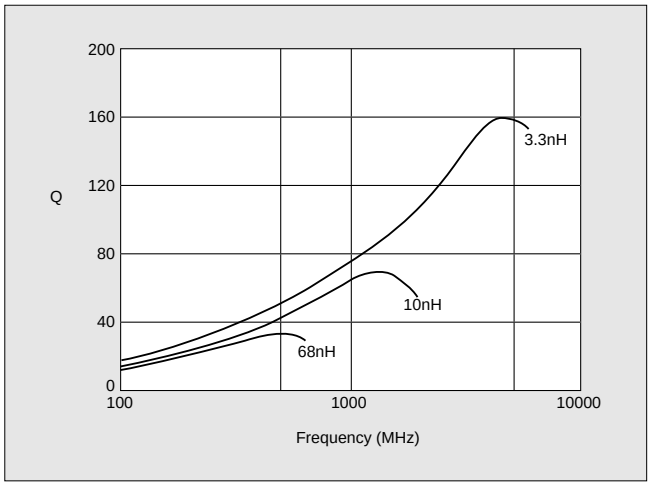
(in mm)

■SPECIFICATIONS

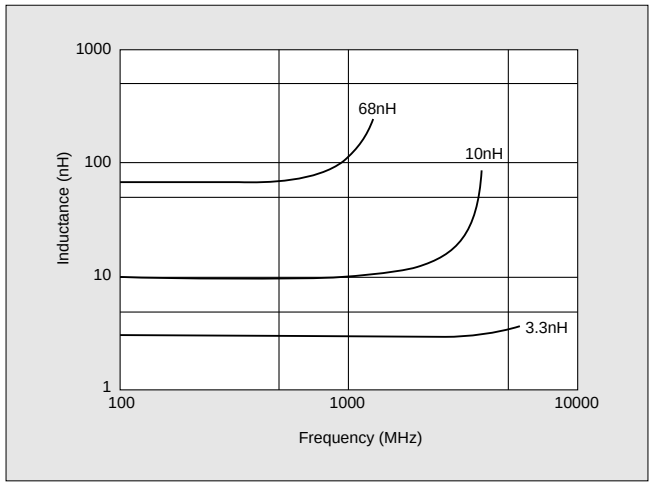
Part Number	Inductance			Q		DC Resistance (Ω max.)	Self-resonant Frequency (MHz min.)	Allowable Current (mA)	Operating Temp. Range
	Nominal Value (nH)	Tolerance	Test Frequency (MHz)	Nominal Value (min.)	Test Frequency (MHz)				
LQG11A1N2S00	1.2	±0.3nH	100	12	100	0.10	6000	300	−40℃ to +85℃
LQG11A1N5S00	1.5								
LQG11A1N8S00	1.8								
LQG11A2N2S00	2.2								
LQG11A2N7S00	2.7					0.15			
LQG11A3N3S00	3.3								
LQG11A3N9S00	3.9								
LQG11A4N7S00	4.7					0.20			
LQG11A5N6S00	5.6						5000		
LQG11A6N8J(K)00	6.8	±5% (±10%)				0.25			
LQG11A8N2J(K)00	8.2						4000		
LQG11A10NJ(K)00	10					0.30	3500		
LQG11A12NJ(K)00	12					0.35	3000		
LQG11A15NJ(K)00	15					0.40	2800		
LQG11A18NJ(K)00	18					0.45	2600		
LQG11A22NJ(K)00	22					0.50	2300		
LQG11A27NJ(K)00	27					0.55	2000		
LQG11A33NJ(K)00	33					0.60	1700		
LQG11A39NJ(K)00	39					0.65	1500		
LQG11A47NJ(K)00	47					0.70	1200		
LQG11A56NJ(K)00	56					0.75	1100		
LQG11A68NJ(K)00	68					0.80	1000		
LQG11A82NJ(K)00	82					0.85	900		
LQG11AR10J(K)00	100					0.90	800		

■TYPICAL ELECTRICAL CHARACTERISTICS

●Q-Frequency Characteristics



●Inductance - Frequency Characteristics



CHIP COIL

Thin Film Chip Coil **LQP10A/LQP11A/LQP21A** Series for High Frequency

Tight Inductance Tolerance Chip Coil for High Frequency Application Small Size and Tight Inductance Tolerance (±0.2nH or ±2%)

The LQP10A/LQP11A/LQP21A series consists of chip coils with a tight inductance tolerance (±0.2nH or ±2%) achieved even in low inductance region.

■FEATURES

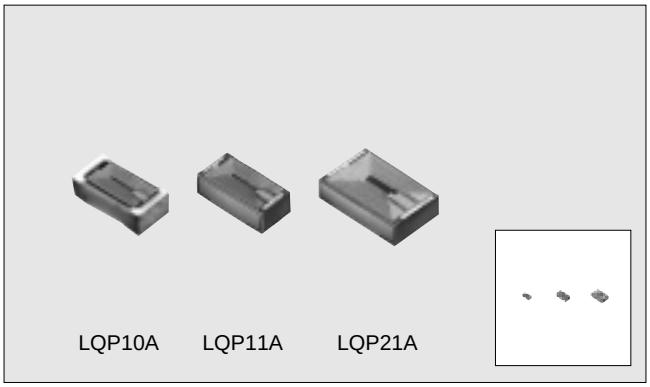
1. Tight inductance tolerance (±0.2nH, ±2%) realized by thin-film technology enables assemble with no tuning.
2. High self resonant frequency due to low stray capacitance and close inductance distribution provide stable inductance in high frequency circuit such as telecommunication equipment.
3. The external electrodes with nickel barrier structure provide excellent solder heat resistance.

● LQP10A
Ultra-Small size 0402 inductor which is low, and lightest weight (hall of multilayer type) enables to miniaturize mobile telephone.

● LQP11A/LQP21A
Small size of 0603 (LQP11A), 0805 (LQP21A) is suitable for small hand held equipment, especially for card size equipment.

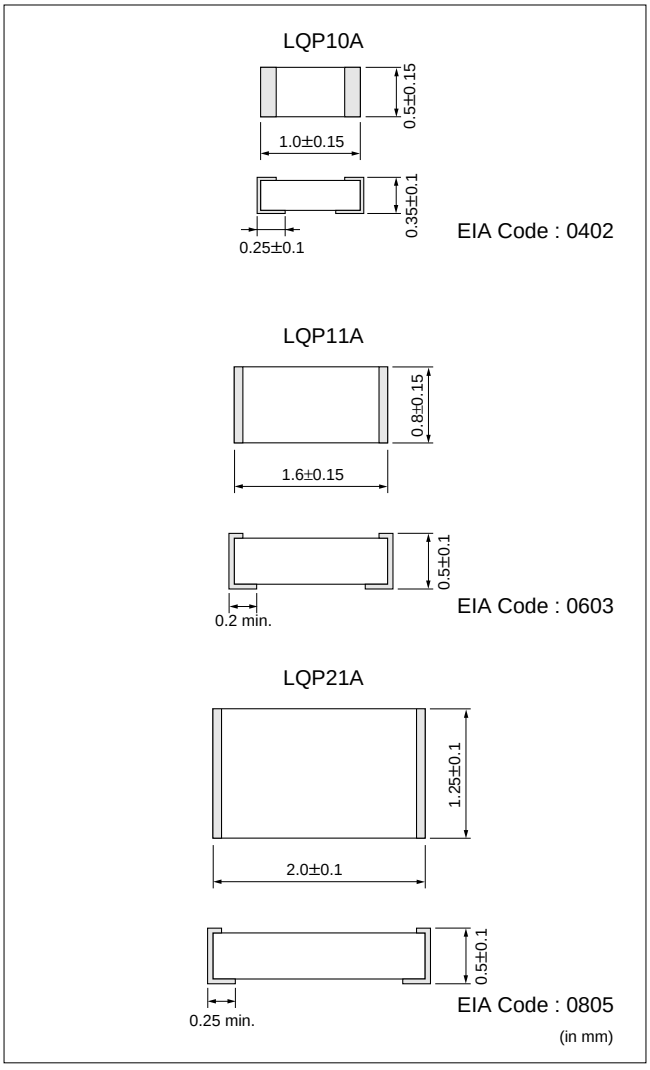
■APPLICATIONS

● High frequency circuit of telecommunication equipment, such as DECT, PHS, PCS, PCN, GSM, DCS, CDMA.



The appearance of coil pattern depends on the part number.

■DIMENSIONS



Use plastic tweezers when treating with tweezers.

■SPECIFICATIONS

LQP10A

Part Number	Inductance			Q			DC Resistance (Ω max.)	Self-resonant Frequency (MHz min.)	Allowable Current (mA)	Operating Temp. Range
	Nominal Value (nH)	Tolerance	Test Frequency (MHz)	Typical @1GHz	Min. Value	Test Frequency (MHz)				
LQP10A1N0C00	1.0	±0.2nH	500	30	13	500	0.1	6000	400	−40℃ to +85℃
LQP10A1N2C00	1.2								390	
LQP10A1N5C00	1.5						0.2		280	
LQP10A1N8C00	1.8									
LQP10A2N2C00	2.2			29			0.3		220	
LQP10A2N7C00	2.7			28						
LQP10A3N3C00	3.3						0.4		190	
LQP10A3N9C00	3.9						0.5		170	
LQP10A4N7C(J)00	4.7	±0.2nH (±5%)		29			0.6		160	
LQP10A5N6C(J)00	5.6			26			0.7		140	
LQP10A6N8C(J)00	6.8						0.9		130	
LQP10A8N2C(J)00	8.2						1.1	5500	110	
LQP10A10NG(J)00	10	±2% (±5%)		24			1.3	4500	100	
LQP10A12NG(J)00	12			25			1.6	3700	90	
LQP10A15NG(J)00	15			23			1.8	3300		
LQP10A18NG(J)00	18			22			2.0	3100	80	
LQP10A22NG(J)00	22			21			2.6	2800	70	
LQP10A27NG(J)00	27						3.1	2500		
LQP10A33NG(J)00	33			23			3.8	2100	60	

LQP11A

Part Number	Inductance			Q			DC Resistance (Ω max.)	Self-resonant Frequency (MHz min.)	Allowable Current (mA)	Operating Temp. Range
	Nominal Value (nH)	Tolerance	Test Frequency (MHz)	Peak Value (Typ.)	Min. Value	Test Frequency (MHz)				
LQP11A1N3C00	1.3	±0.2nH	500	160	17	500	0.3	6000	300	−40℃ to +85℃
LQP11A1N5C00	1.5			140						
LQP11A1N8C00	1.8			120			0.4		250	
LQP11A2N2C00	2.2			100						
LQP11A2N7C00	2.7			90						
LQP11A3N3C00	3.3			85						
LQP11A3N9C00	3.9			80			0.5	5900	200	
LQP11A4N7C00	4.7			75				5200		
LQP11A5N6C00	5.6			65			0.6	4700		
LQP11A6N8C00	6.8			63			0.7	4300		
LQP11A8N2C00	8.2			57			0.8	3600	150	
LQP11A10NG00	10	±2%		55			1.0	3400		
LQP11A12NG00	12			50				3000		
LQP11A15NG00	15			43			1.3	2700		
LQP11A18NG00	18			39			1.5	2300	100	
LQP11A22NG00	22			38			1.9	2100		
LQP11A27NG00	27			32			2.4	1900		
LQP11A33NG00	33			30			2.8	1700		

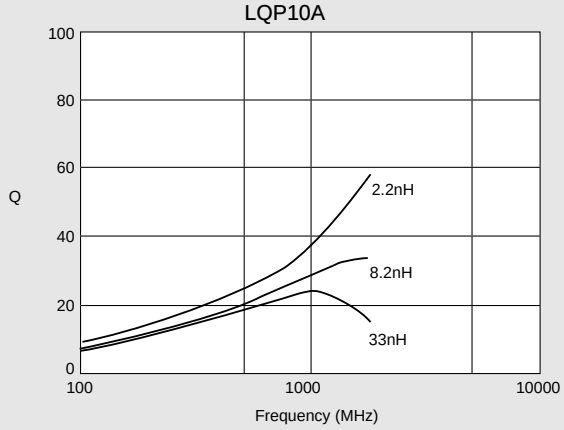
LQP21A

Part Number	Inductance			Q			DC Resistance (Ω max.)	Self-resonant Frequency (MHz min.)	Allowable Current (mA)	Operating Temp. Range
	Nominal Value (nH)	Tolerance	Test Frequency (MHz)	Peak Value (Typ.)	Min. Value	Test Frequency (MHz)				
LQP21A1N5C14	1.5	±0.2nH	300	300	15	300	0.15	6000	550	−40℃ to +85℃
LQP21A1N8C14	1.8			250			0.2		500	
LQP21A2N2C14	2.2			200			0.25		450	
LQP21A2N7C14	2.7			150						
LQP21A3N3C14	3.3			125						
LQP21A3N9C14	3.9			120					400	
LQP21A4N7C14	4.7			115	17		0.3	5400		
LQP21A5N6C14	5.6			110				4500		
LQP21A6N8C14	6.8			100			0.35	4000	350	
LQP21A8N2C14	8.2			95			0.4	3400		
LQP21A10NG14	10	±2%		85				3200		
LQP21A12NG14	12			70			0.45	2900	300	
LQP21A15NG14	15			68			0.55	2500		
LQP21A18NG14	18			60			0.7	2300	250	
LQP21A22NG14	22			42			0.9	1800	200	
LQP21A27NG14	27			40			1.1	1600		
LQP21A33NG14	33			39			1.5	1500	150	
LQP21A39NG14	39			36				1300		
LQP21A47NG14	47			35			1.7	1200		
LQP21A56NG14	56			34			2.9	1100	100	
LQP21A68NG14	68			32			3.7	1000		
LQP21A82NG14	82			31			4.5	900		
LQP21AR10G14	100			24			6.0	700	90	

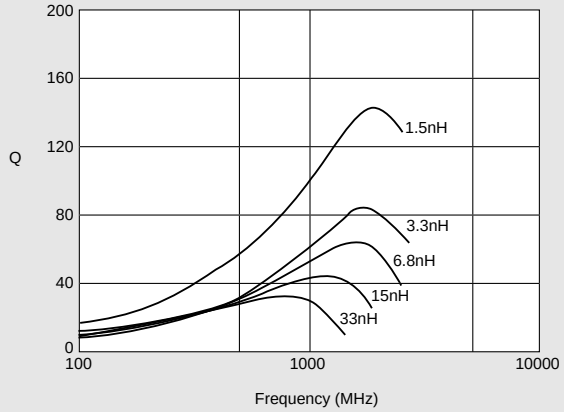
■TYPICAL ELECTRICAL CHARACTERISTICS

●Q-Frequency Characteristics

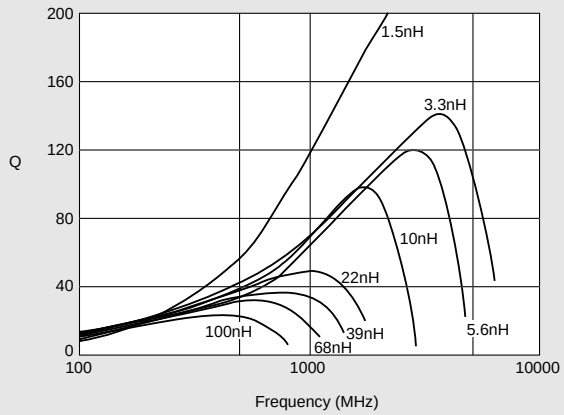
LQP10A



LQP11A

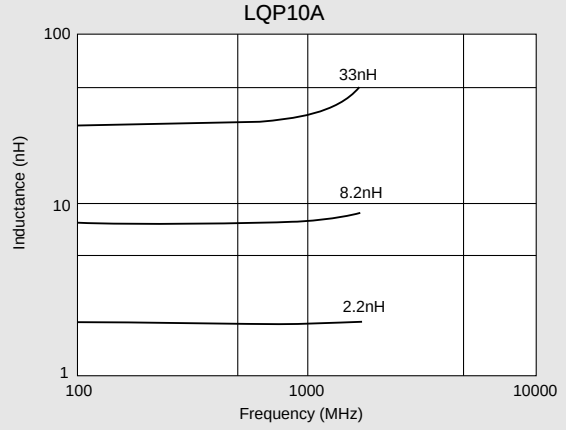


LQP21A

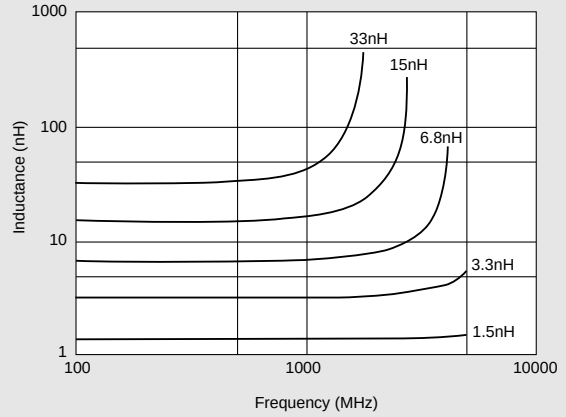


●Inductance - Frequency Characteristics

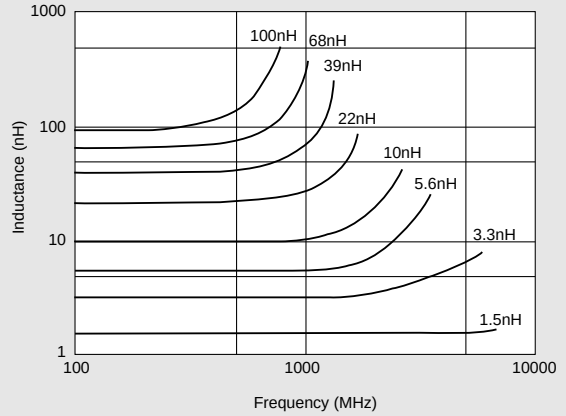
LQP10A



LQP11A



LQP21A

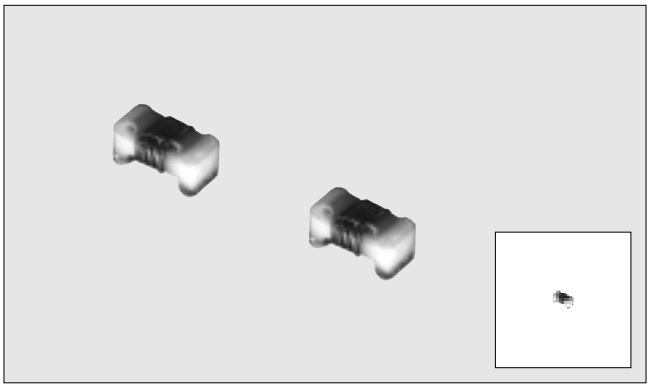


CHIP COIL

Wire Wound Chip Coil **LQW1608A** Series for High Frequency

High-Q and Tight Inductance Tolerance (±0.2nH or ±2%) Ultra Small Wire Wound Air-core Chip Coil

The LQW1608A series which consists of air-core chip coil using a miniature alumina core.
The tight inductance tolerance (±0.2nH, ±2%) is available due to Murata's original winding technology. The series has high Q value and high self resonant frequency in high frequency range. It is suitable for high frequency circuits which are used in telecommunication equipment.



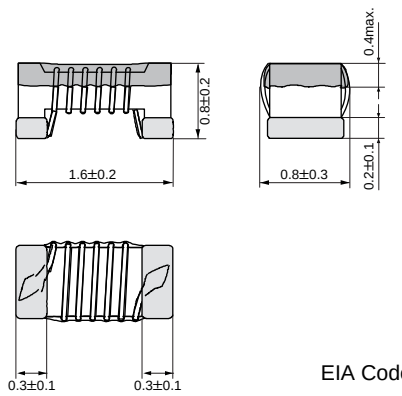
■FEATURES

1. Horizontal winding structure enables tight inductance tolerance (±0.2nH, ±2%). Stable circuit operation is possible.
2. Broad range of inductance (3.9nH to 220nH).
3. The subminiature dimensions (1.6×0.8mm) allow high density mounting.
4. The high self resonant frequency realizes high-Q value and stable inductance at high frequency.
5. Low DC resistance design is ideal for low loss, high output and low power consumption.
4. Resin-coated surface enables excellent mounting.

■APPLICATIONS

● High frequency circuit in telecommunication equipment, such as DECT, PHS, PCS, PCN, GSM and CDMA.

■DIMENSIONS



EIA Code : 0603

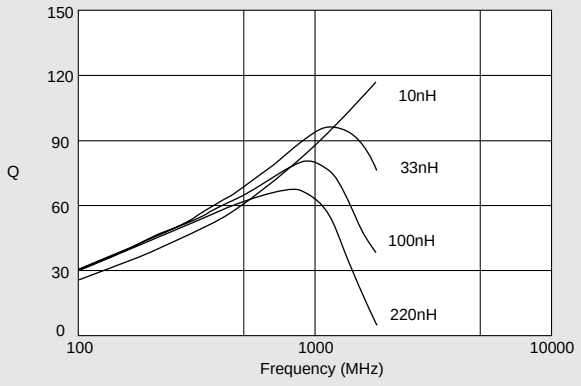
(in mm)

■SPECIFICATIONS

Part Number	Inductance			Q					DC Resistance (Ω max.)	Self-resonant Frequency (MHz min.)	Allowable Current (mA)	Operating Temp. Range
	Nominal Value (nH)	Tolerance	Test Frequency (MHz)	Nominal Value (min.)	Test Frequency (MHz)	300(MHz) Typical	800(MHz) Typical	1.5(GHz) Typical				
LQW1608A3N9D(C)00	3.9	±0.5nH(±0.2nH)	100	35	250	40	75	95	0.059	6000	850	−25℃ to +85℃
LQW1608A4N7D00	4.7	±0.5nH										
LQW1608A5N6D(C)00	5.6	±0.5nH(±0.2nH)				45	80	100	0.081		750	
LQW1608A6N8D(C)00	6.8											
LQW1608A8N2D00	8.2	±0.5nH							0.10		650	
LQW1608A10NJ(G)00	10	±5%(2%)										
LQW1608A12NJ(G)00	12					50	85		0.13		600	
LQW1608A15NJ(G)00	15			40		55	90	105				
LQW1608A18NJ(G)00	18								0.15	5500	550	
LQW1608A22NJ(G)00	22								0.17	4600	500	
LQW1608A27NJ(G)00	27					50	85	95	0.20	3700	440	
LQW1608A33NJ(G)00	33							90	0.23	3200	420	
LQW1608A39NJ(G)00	39								0.25	2800	400	
LQW1608A47NJ(G)00	47			38	200			75	0.29	2600	380	
LQW1608A56NJ(G)00	56								0.35	2400	360	
LQW1608A68NJ(G)00	68								0.37	2200	340	
LQW1608A82NJ(G)00	82			34	150		80	55	0.60	2000	250	
LQW1608AR10J(G)00	100					45	75	50	0.67	1800	220	
LQW1608AR12J(G)00	120			32					1.3	1600	180	
LQW1608AR15J(G)00	150						70	−	1.4	1400	160	
LQW1608AR18J(G)00	180			25	100		60		2.2	1300	140	
LQW1608AR22J(G)00	220								2.5	1200	120	

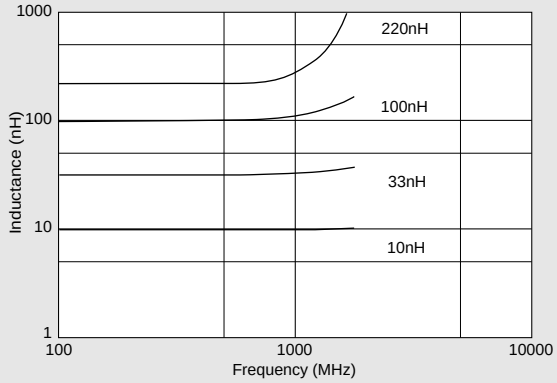
■TYPICAL ELECTRICAL CHARACTERISTICS

●Q - Frequency Characteristics



Measuring instrument Q : HP4291A + 16193A

●Inductance - Frequency Characteristics



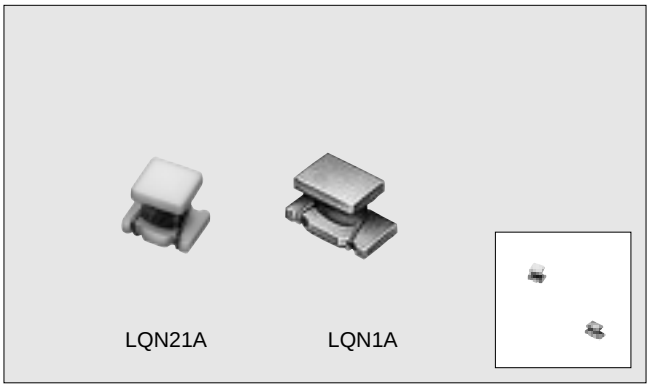
Measuring instrument L : HP4291A + 16193A

CHIP COIL

Wire Wound Chip Coil **LQN21A/LQN1A** Series for High Frequency

Small Winding-type Air-core Chip Coil with High Q Value at High Frequencies and Low DC Resistance

The LQN21A/LQN1A series consists of air-core chip coil using a sub-miniature alumina core as a bobbin. The high Q value at high frequencies and high self-resonant frequencies make this coil perfect for use in the high frequency circuits of communications equipment.



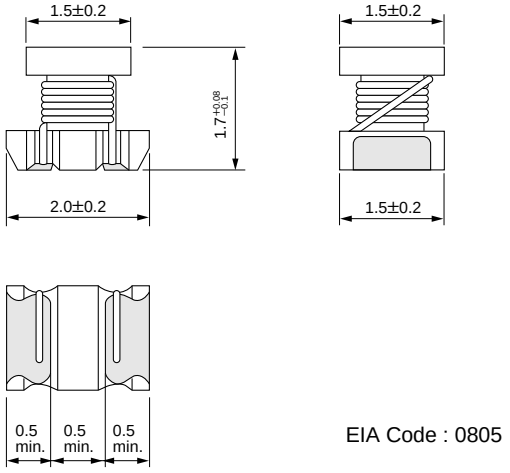
■FEATURES

1. There are two different inductor types : the LQN21A and LQN1A series. These two series cover a wide inductance range (from 3.3nH to 220nH).
2. Their high self-resonant frequency characteristic yields a high Q value and highly stable inductance at high frequencies.
3. The series has excellent solder heat resistance. Both flow and reflow soldering methods can be employed.

- LQN21A
  Inductance tolerance ±0.5nH (8.2nH max.), ±5% (10nH to 220nH) is realized.
  The sub miniature dimensions (2.0×1.5mm) allow high density mounting.
- LQN21A (Tight inductance tolerance)
  Tight inductance tolerance of ±2% is available.
- LQN1A
  Miniature size (3.2×1.6×1.8mm) allows parallel mounting at 2.5mm pitch.
  Inductance tolerance ±5% realized.

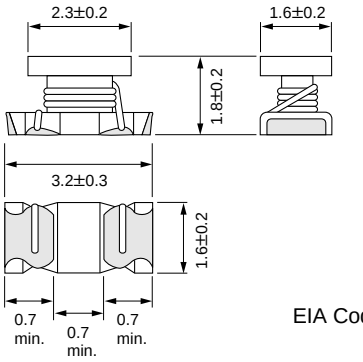
■DIMENSIONS

LQN21A



EIA Code : 0805

LQN1A



EIA Code : 1206

(in mm)

■SPECIFICATIONS

LQN21A

Part Number	Inductance			Q ∗1			DC Resistance (Ω max.)	∗2 Self-resonant Frequency (MHz min.)	Allowable Current (mA)	Operating Temp. Range
	Nominal Value (nH)	Tolerance	Test Frequency (MHz)	Peak Value (Typ.)	Min. Value	Test Frequency (MHz)				
LQN21A3N3D04	3.3	±0.5nH	100	70	10	250	0.05	6000	910	−25℃ to +85℃
LQN21A6N8D (K) 04	6.8	±0.5nH			20		0.11	5400	680	
LQN21A8N2D (K) 04	8.2	(±10%)					0.12	3900	630	
LQN21A10NJ (K) 04	10	±5% (±10%)		80	30		0.03	3300	1320	
LQN21A12NJ (K) 04	12			65			0.11	3200	680	
LQN21A15NJ (K) 04	15						0.12	2700	630	
LQN21A18NJ (K) 04	18			70			0.10	2600	690	
LQN21A22NJ (K) 04	22						0.09	2100	720	
LQN21A27NJ (K) 04	27				40		0.17	2300	540	
LQN21A33NJ (K) 04	33			65			0.15	1900	570	
LQN21A39NJ (K) 04	39			80			0.09	1700	730	
LQN21A47NJ (K) 04	47			65		200	0.23	1600	450	
LQN21A56NJ (K) 04	56			70			0.26	1500	430	
LQN21A68NJ (K) 04	68			65			0.23	1200	460	
LQN21A82NJ (K) 04	82			60		150	0.42	1100	320	
LQN21AR10J (K) 04	100			70			0.38	900	350	
LQN21AR12J (K) 04	120			50			0.40	750	320	
LQN21AR15J (K) 04	150			45	30		0.47	350	390	
LQN21AR18J (K) 04	180			50	35	100	0.71	700	250	
LQN21AR22J (K) 04	220						0.70	500	240	

LQN21A (Tight inductance tolerance)

Part Number	Inductance			Q ∗1			DC Resistance (Ω max.)	∗2 Self-resonant Frequency (MHz min.)	Allowable Current (mA)	Operating Temp. Range
	Nominal Value (nH)	Tolerance	Test Frequency (MHz)	Peak Value (Typ.)	Min. Value	Test Frequency (MHz)				
LQN21A33NG04	33	±2%	100	65	40	250	0.15	1900	570	−25℃ to +85℃
LQN21A39NG04	39			80			0.09	1700	730	
LQN21A47NG04	47			65		200	0.23	1600	450	
LQN21A56NG04	56			70			0.26	1500	430	
LQN21A68NG04	68			65			0.23	1200	460	
LQN21A82NG04	82			60		150	0.42	1100	320	
LQN21AR10G04	100			55	35		0.55	900	270	
LQN21AR12G04	120			50	40		0.40	750	320	
LQN21AR15G04	150			55	30		0.68	350	260	
LQN21AR18G04	180			50	35	100	0.71	700	250	
LQN21AR22G04	220						0.70	500	240	

∗1 Measured with LCR meter YHP4191A, measuring tap 16193A.
∗2 Measured with Network Analyzer HP8753C.

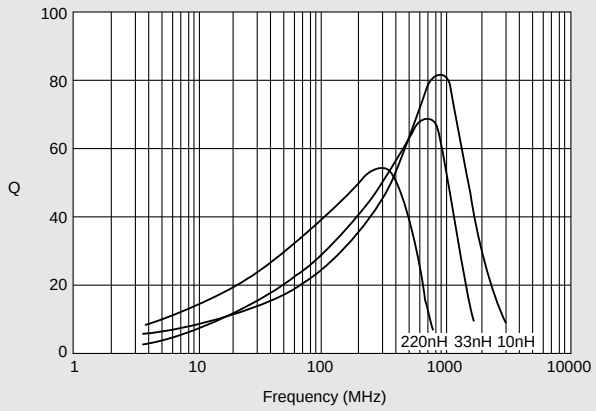
LQN1A

Part Number	Inductance			Q			DC Resistance (Ω)	Self-resonant Frequency (MHz min.)	Allowable Current (mA)	Operating Temp. Range
	Nominal Value (nH)	Tolerance (%)	Test Frequency	Peak Value (Typ.)	Min. Value	Test Frequency				
LQN1A8N8J (K) 04	8.8	±5 (±10)	100MHz	100	50	436MHz	0.029±40%	1000	750	−25℃ to +85℃
LQN1A15NJ (K) 04	14.7				60		0.035±40%		680	
LQN1A17NJ (K) 04	17						0.037±40%		650	
LQN1A23NJ (K) 04	23						0.046±40%		590	
LQN1A27NJ (K) 04	27						0.051±40%		560	
LQN1A33NJ (K) 04	33						0.057±40%		530	
LQN1A39NJ (K) 04	39						0.067±40%		490	
LQN1A47NJ (K) 04	47			90			0.110±40%		380	
LQN1A56NJ (K) 04	56						0.140±40%		330	
LQN1A64NJ (K) 04	64			80			0.180±40%		290	
LQN1A84NJ (K) 04	84			70			0.280±40%		240	
LQN1AR10J (K) 04	100						0.300±40%	900	230	

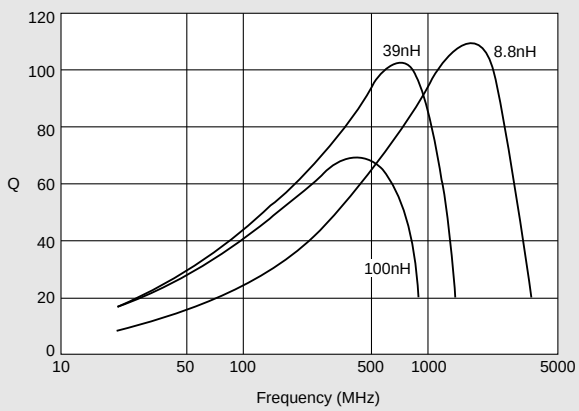
■TYPICAL ELECTRICAL CHARACTERISTICS

●Q-Frequency Characteristics

LQN21A



LQN1A

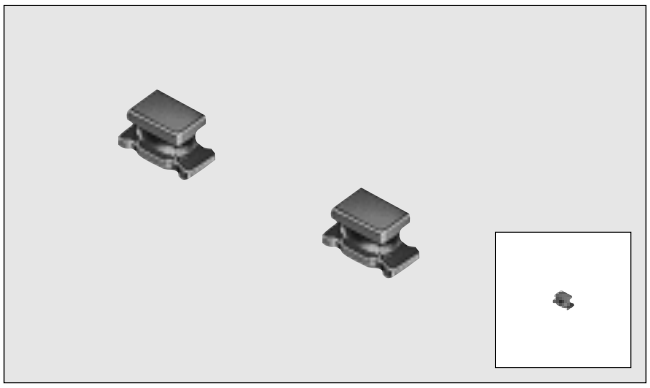


CHIP COIL

High Q Chip Coil **LQN1H** Series for High Frequency

Wire Wound Chip Coil with High Q from 30MHz to 150MHz and Stable Inductance

The LQN1H series consists of wire wound chip coils which use ferrite cores for high frequency application. Their high Q values from 30MHz to 150MHz and low DC resistance make them suitable in high-frequency resonator circuits.



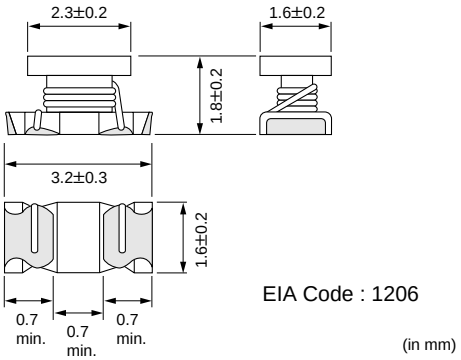
■FEATURES

1. Same dimensions as LQN1A/LQH1N/LQH1C series enables design flexibility.
2. Broad range of inductance 54nH to 880nH.
3. High Q value and stable inductance at high frequency (30MHz to 150MHz).
4. Both flow and reflow soldering methods are applicable due to excellent solder heat resistance.
5. Miniature size (3.2×1.6×1.8mm) allows parallel mounting at 2.5mm pitch.

■APPLICATIONS

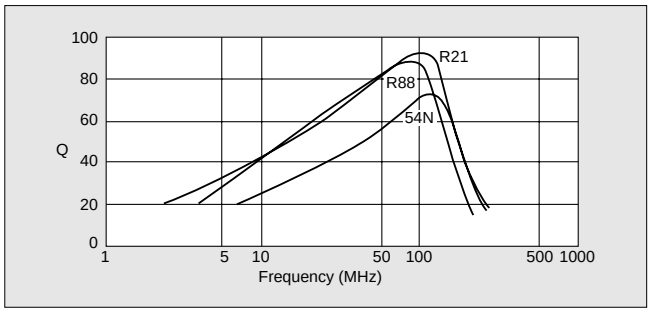
● Voltage controlled oscillators, traps, and filter circuits in mobile communication equipments, cordless phones, various radio equipment, FM radio turners, TV turners (VHF low), VIF circuits.

■DIMENSIONS



■TYPICAL ELECTRICAL CHARACTERISTICS

●Q-Frequency Characteristics



■SPECIFICATIONS

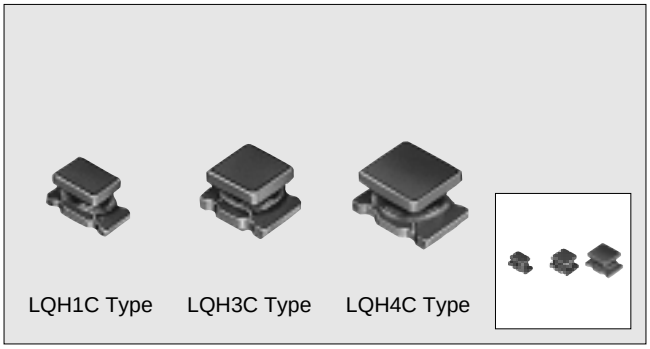
Part Number	Inductance			Q			DC Resistance (Ω)	Self-resonant Frequency (MHz min.)	Allowable Current (mA)	Operating Temp. Range
	Nominal Value (nH)	Tolerance (%)	Test Frequency	Peak Value (Typ.)	Min. Value	Test Frequency				
LQN1H54NK04	54	±10	1MHz	65	50	100MHz	0.035±30%	800	920	−25℃ to +85℃
LQN1H95NK04	95			75	60		0.047±30%	650	790	
LQN1HR14K(J)04	145	±10 (±5)		80			0.061±30%	500	700	
LQN1HR21K(J)04	215			85			0.11 ±30%	430	520	
LQN1HR29K(J)04	290						0.17 ±30%	360	420	
LQN1HR39K(J)04	390						0.26 ±30%	300	330	
LQN1HR50K(J)04	500						0.44 ±30%	270	260	
LQN1HR61K(J)04	610						0.48 ±30%	240	250	
LQN1HR75K(J)04	750						0.79 ±30%	220	190	
LQN1HR88K(J)04	880			90			0.86 ±30%	200	180	

CHIP COIL

Miniature Chip Coil **LQH1C/LQH3C/LQH4C** Series for Power Line Choke

Miniature Chip Coil for Power Line Choke Has High Current Capacity, Low DC Resistance, Large Inductance

The LQH1C, LQH3C and LQH4C series consist of miniature chip coils with low DC resistance, high current capacity, and high impedance characteristics.
These features are made possible by the development of Murata's innovative automatic winding techniques. They are excellent for use as choke coils in DC power supply circuits.



■FEATURES

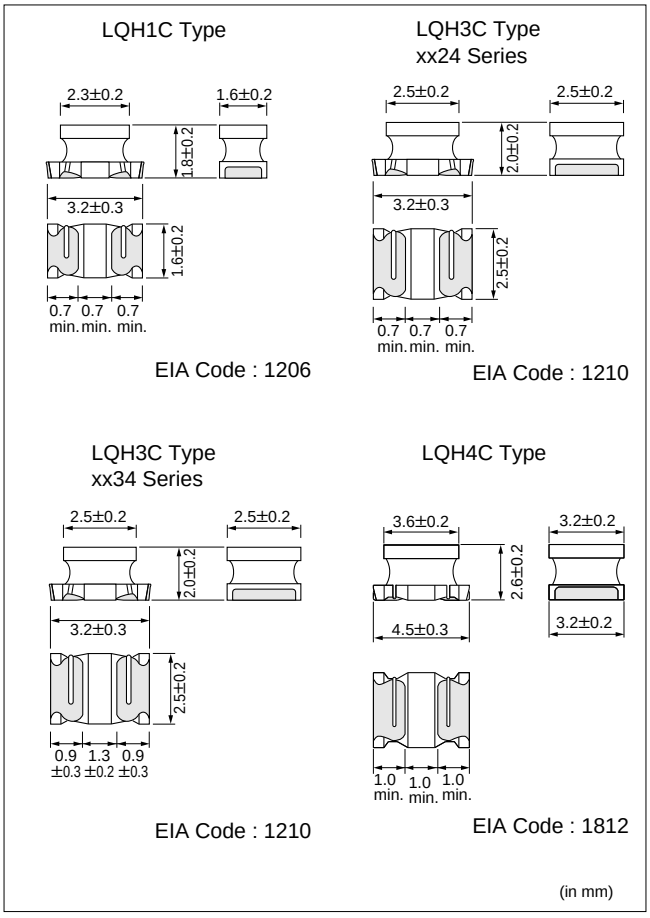
1. The LQH1C, LQH3C and LQH4C series have an open magnetic structure. The series have a combined inductance range of 0.12µH to 560µH and are applicable in a wide variety of applications.
2. The series exhibit low voltage drops and small variations in inductance with respect to temperature rise and DC current level. This makes them excellent for use as power supply line choke coils.
3. The series has excellent solder heat resistance. Both flow and reflow soldering methods can be employed.

● LQH1C
Miniature size (3.2×1.6×1.8mm) allows parallel mounting at 2.5mm pitch. Despite their small size, at 0.12µH these coils have a maximum current rating of 970mA.

● LQH3C
The low DC resistance means high current and high inductance.
For inductance ranging from 1.0µH to 10µH, LQH3C coils have very low DC resistance.

● LQH4C
The LQH4C has miniature size 4.5mm×3.2mm and realized low height 2.8mm max.

■DIMENSIONS



■SPECIFICATIONS

LQH1C

Part Number	Inductance			DC Resistance (Ω)	Self-resonant Frequency (MHz)		Allowable Current (mA)	Operating Temp. Range
	Nominal Value (μH)	Tolerance (%)	Test Frequency		Typ.	Min.		
LQH1CR12M04	0.12	±20	1MHz	0.08±40%	900	250	970	−25℃ to +85℃
LQH1CR22M04	0.22			0.10±40%	570		850	
LQH1CR47M04	0.47			0.15±40%	310	180	700	
LQH1C1R0M04	1.0			0.28±30%	190	100	510	
LQH1C2R2M04	2.2			0.41±30%	110	50	430	
LQH1C4R7M04	4.7			0.65±30%	67	31	340	
LQH1C100K04	10	±10		1.3 ±30%	42	20	230	
LQH1C220K04	22			3.0 ±30%	26	14	160	
LQH1C470K04	47			8.0 ±30%	18	10	100	
LQH1C101K04	100			12.0 ±30%	12	7	80	

LQH3C

Part Number	Inductance			DC Resistance (Ωmax.)	Self-resonant Frequency (MHz)		Allowable Current (mA)	Operating Temp. Range
	Nominal Value (μH)	Tolerance (%)	Test Frequency		Typ.	Min.		
LQH3C1R0M24*	1.0	±20	1MHz	0.060±30%	200	100	1000	−25℃ to +85℃
LQH3C2R2M24*	2.2			0.097±30%	120	64	790	
LQH3C4R7M24*	4.7			0.15 ±30%	77	43	650	
LQH3C100K24*	10	±10		0.30 ±30%	50	26	450	
LQH3C1R0M34	1.0	±20		0.09 ±30%	150	96	800	
LQH3C2R2M34	2.2			0.13 ±30%	100	64	600	
LQH3C4R7M34	4.7			0.20 ±30%	66	43	450	
LQH3C100K34	10	±10		0.44 ±30%	40	26	300	
LQH3C220K34	22			0.71 ±30%	27	19	250	
LQH3C470K34	47			1.3 ±30%	19	15	170	
LQH3C101K34	100			3.5 ±30%	13	10	100	
LQH3C221K34	220			8.4 ±30%	8.5	6.8	70	
LQH3C331K34	330			10.0 ±30%	7.0	5.6	60	
LQH3C391K34	390			17.0 ±30%	6.6	5.0		
LQH3C471K34	470		1kHz	19.0 ±30%	6.2			
LQH3C561K34	560			22.0 ±30%	5.7			

*Low DC Resistance type.

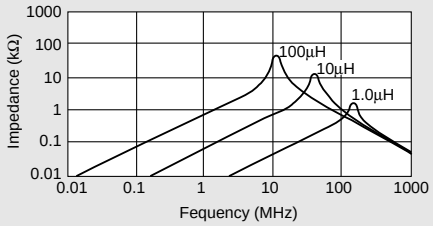
LQH4C

Part Number	Inductance			DC Resistance (Ωmax.)	Self-resonant Frequency (MHz)	Allowable Current (mA)	Operating Temp. Range
	Nominal Value (μH)	Tolerance (%)	Test Frequency				
LQH4C1R0M04	1.0	±20	1MHz	0.08	100	1080	−25℃ to +85℃
LQH4C1R5M04	1.5			0.09	85	1000	
LQH4C2R2M04	2.2			0.11	60	900	
LQH4C3R3M04	3.3			0.13	47	800	
LQH4C4R7M04	4.7			0.15	35	750	
LQH4C6R8M04	6.8			0.20	30	720	
LQH4C100K04	10	±10		0.24	23	650	
LQH4C150K04	15			0.32	20	570	
LQH4C220K04	22			0.6	15	420	
LQH4C330K04	33			1.0	12	310	
LQH4C470K04	47			1.1	10	280	
LQH4C680K04	68			1.7	8.4	220	
LQH4C101K04	100			2.2	6.8	190	
LQH4C151K04	150			3.5	5.5	130	
LQH4C221K04	220			4.0	4.5	110	
LQH4C331K04	330			6.8	3.6	100	
LQH4C471K04	470		1kHz	8.5	3.0	90	

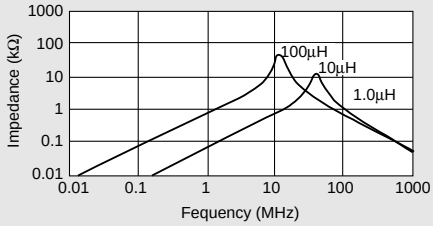
■TYPICAL ELECTRICAL CHARACTERISTICS

●Impedance - Frequency Characteristics

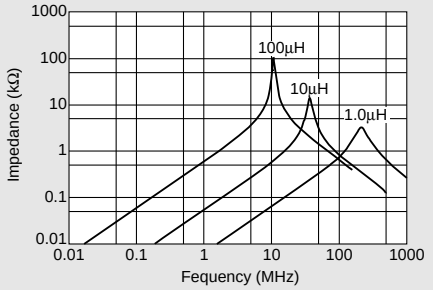
LQH1C



LQH3C

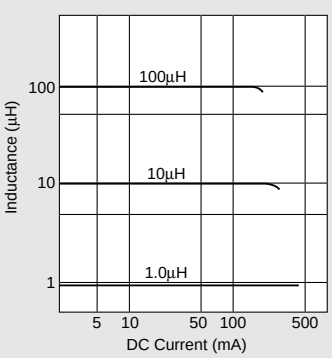


LQH4C

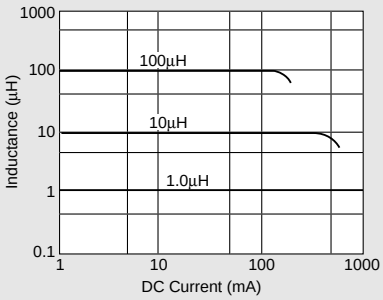


●Direct Current Characteristics

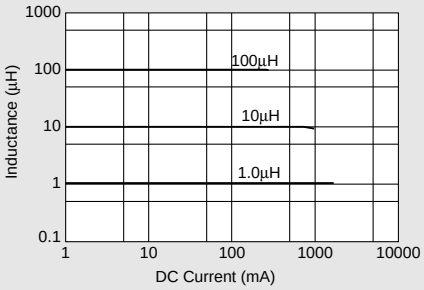
LQH1C



LQH3C



LQH4C

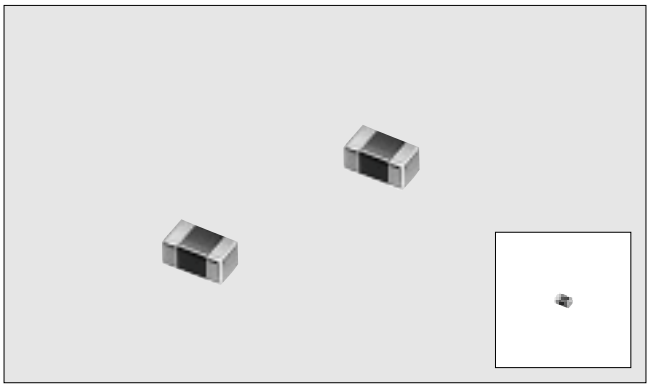


CHIP COIL

Multilayer Chip Coil **LQG21C** Series

Low DC Resistance Choke for Power Lines Has Magnetically Shielded Structure

The LQG21C series consists of magnetically shielded chip coil developed with original Murata multilayer process technology and incorporating magnetic materials. It has less than half the DC resistance of our conventional multilayer chip coils as well as high inductance.



■FEATURES

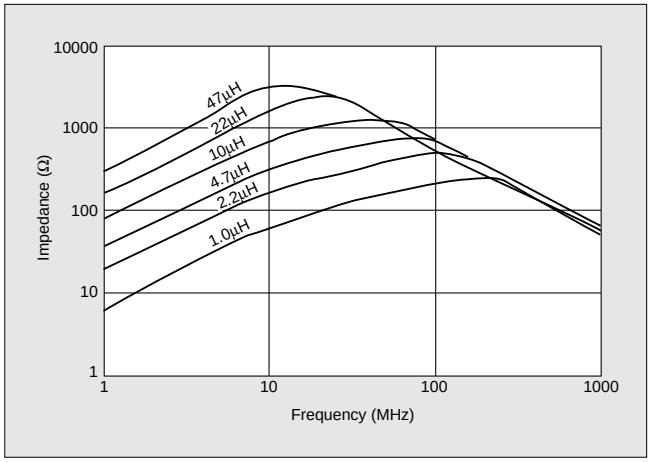
1. The inductors have very low DC resistance.
2. The series has an inductance range of 1.0µH to 47µH.
3. Magnetically shielded structure provides excellent crosstalk characteristics.
4. Compact (2.0×1.25mm) and lightweight.
5. Outstanding solder heat resistance. Either flow or reflow soldering methods can be employed.

■APPLICATIONS

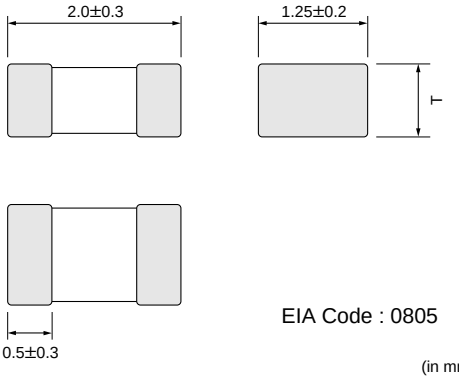
● Power lines (for choke use)

■TYPICAL ELECTRICAL CHARACTERISTICS

● Impedance-Frequency Characteristics



■DIMENSIONS



Part Number	T
LQG21C1R0N00—100N00	0.85±0.2
LQG21C220N00—470N00	1.25±0.2

■SPECIFICATIONS

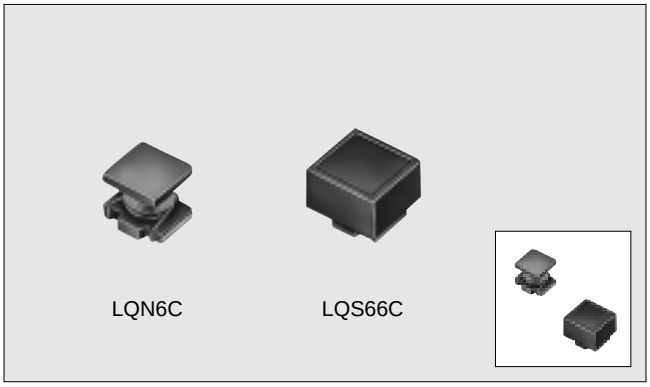
Part Number	Inductance			DC Resistance (Ω max.)	Self-resonant Frequency (MHz)		Allowable Current (mA)	Operating Temp. Range
	Nominal Value (µH)	Tolerance (%)	Test Frequency		Typ.	Min.		
LQG21C1R0N00	1.0	±30	1MHz	0.10	150	75	60	−40℃ to +85℃
LQG21C2R2N00	2.2			0.17	100	50	40	
LQG21C4R7N00	4.7			0.30	70	35	30	
LQG21C100N00	10			0.50	45	24	15	
LQG21C220N00	22			0.65	20	16	13	
LQG21C470N00	47			1.20	-	7.5	7	

CHIP COIL

Large Current Choke Coil **LQN6C/LQS66C** Series

Choke Coil for DC/DC Converters and DC Power Lines with Low DC Resistance, Large Current Capacity and Large Inductance

The LQN6C/LQS66C series are choke coils which have achieved low direct current resistance, large current capacity and large inductance by using high performance thick wire wrapping technology.
Because the LQS66C series has a shielded construction, it can be mounted in high density without interference occurring between peripheral components.
They are optimum for use as choke coils in DC/DC converters and DC power supply circuits.



■FEATURES

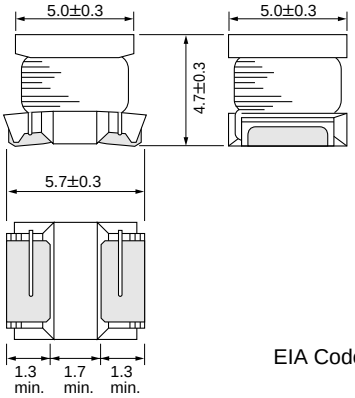
1. Both the LQN6C series with its open magnetic path construction and the LQS66C series with its magnetic shielding construction allow application to a wide variety of uses.
2. The inductance range covers from 0.12µH up to 10000µH allowing minute compatibility with the E6 series at 1µH to 1000µH.
3. Because the direct current resistance is small as well as the voltage drop and power consumption being small also, they are optimum for use as choke coils for DC power supply circuits.

■APPLICATIONS

- Camcorders, portable AV equipment, etc.
- DC/DC converters and DC power supplies.

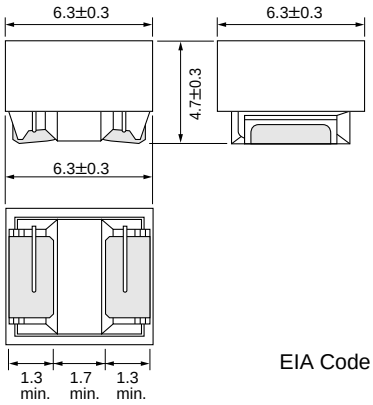
■DIMENSIONS

LQN6C



EIA Code : 2220

LQS66C



EIA Code : 2525

(in mm)

■SPECIFICATIONS

LQN6C

Part Number	Inductance			DC Resistance (Ω±40%)	Self-resonant Frequency (MHz min.)	Allowable Current (A)	Operating Temp. Range
	Nominal Value (μH)	Tolerance (%)	Test Frequency				
LQN6CR12M04	0.12	±20	1MHz	0.007	450	6.0	−25℃ to +80℃
LQN6CR27M04	0.27			0.010	300	5.3	
LQN6CR47M04	0.47			0.013	200	4.8	
LQN6C1R0M04	1.0			0.019	150	4.0	
LQN6C1R5M04	1.5			0.022	110	3.7	
LQN6C2R2M04	2.2			0.029	80	3.2	
LQN6C3R3M04	3.3			0.036	40	2.9	
LQN6C4R7M04	4.7			0.041	30	2.7	
LQN6C6R8M04	6.8			0.074	25	2.0	
LQN6C100M04	10			0.093	20	1.7	
LQN6C150M04	15			0.15	17	1.4	
LQN6C220M04	22			0.19	15	1.2	
LQN6C330M04	33			0.32	12	0.9	
LQN6C470M04	47			0.40	10	0.8	
LQN6C680M04	68			0.67	7.6	0.64	
LQN6C101M04	100		100kHz	0.86	6.5	0.56	
LQN6C151M04	150			1.9	5.0	0.42	
LQN6C221M04	220			2.4	4.0	0.32	
LQN6C331M04	330			4.4	3.1	0.27	
LQN6C471M04	470			5.4	2.4	0.24	
LQN6C681M04	680			8.1	1.9	0.19	
LQN6C102M04	1000		10kHz	10.3	1.7	0.15	
LQN6C222M04	2200			21.5	1.2	0.10	
LQN6C472M04	4700			43.6	0.8	0.07	
LQN6C103M04	10000			100	0.5	0.05	

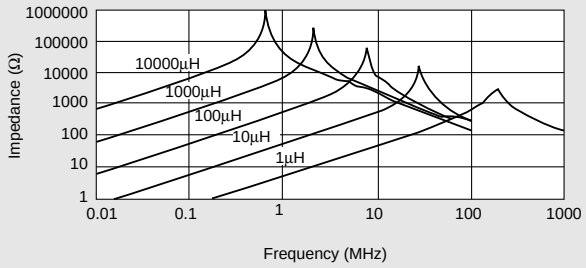
LQS66C

Part Number	Inductance			DC Resistance (Ω±40%)	Self-resonant Frequency (MHz min.)	Allowable Current (A)	Operating Temp. Range
	Nominal Value (μH)	Tolerance (%)	Test Frequency				
LQS66CR27M04	0.27	±20	1MHz	0.007	300	6.0	−25℃ to +80℃
LQS66CR68M04	0.68			0.010	180	5.3	
LQS66C1R0M04	1.0			0.013	150	4.7	
LQS66C1R5M04	1.5			0.016	110	3.8	
LQS66C2R2M04	2.2			0.019	80	3.3	
LQS66C3R3M04	3.3			0.022	40	2.6	
LQS66C4R7M04	4.7			0.025	30	2.2	
LQS66C6R8M04	6.8			0.029	25	1.8	
LQS66C100M04	10			0.036	20	1.6	
LQS66C150M04	15			0.069	17	1.3	
LQS66C220M04	22			0.087	15	1.1	
LQS66C330M04	33			0.14	12	0.86	
LQS66C470M04	47			0.17	10	0.76	
LQS66C680M04	68			0.29	7.6	0.60	
LQS66C101M04	100		100kHz	0.36	6.5	0.52	
LQS66C151M04	150			0.63	5.0	0.42	
LQS66C221M04	220			0.79	4.0	0.35	
LQS66C331M04	330			1.8	3.2	0.28	
LQS66C471M04	470			2.2	2.5	0.24	
LQS66C681M04	680			3.9	2.0	0.20	
LQS66C102M04	1000		10kHz	4.9	1.7	0.16	
LQS66C222M04	2200			9.4	1.2	0.10	
LQS66C472M04	4700			19.5	0.8	0.07	
LQS66C103M04	10000			39.7	0.5	0.05	

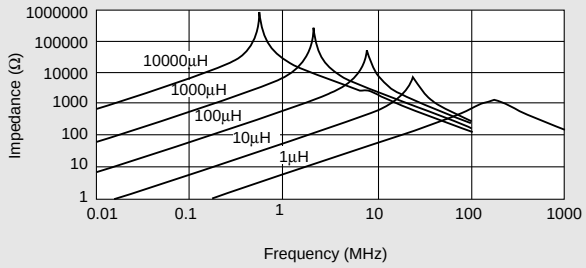
■TYPICAL ELECTRICAL CHARACTERISTICS

●Impedance - Frequency Characteristics

LQN6C

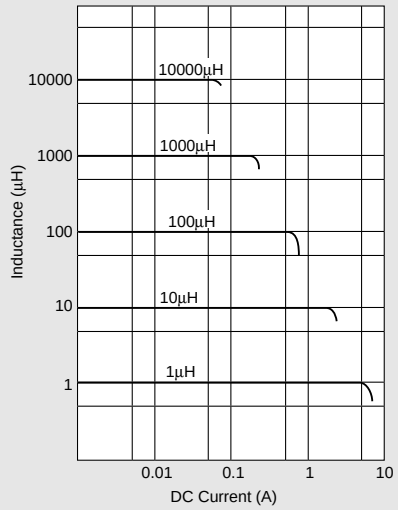


LQS66C

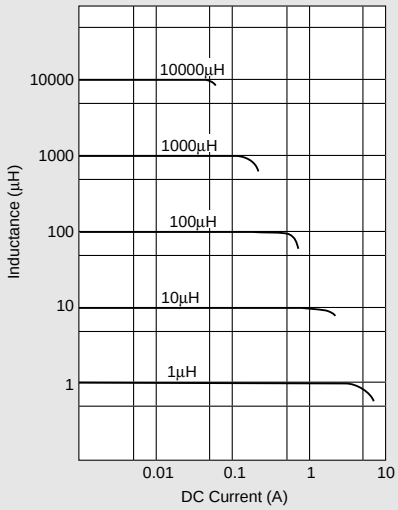


●Direct Current Characteristics

LQN6C



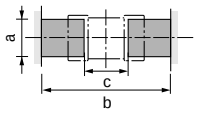
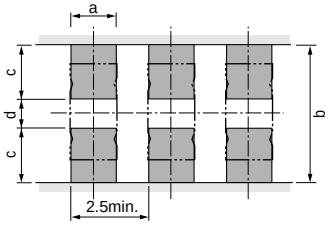
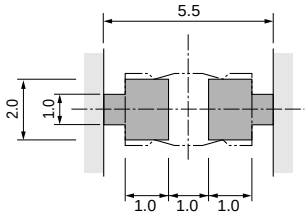
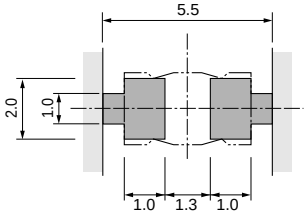
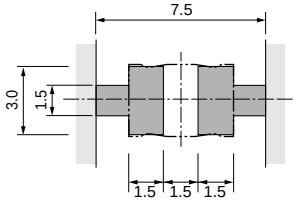
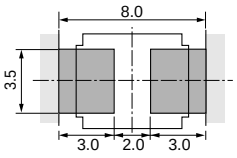
LQS66C



1. Standard Land Dimensions

A high Q value is achieved when the PCB electrode land pattern is designed so that it does not project beyond the chip coil electrode.

Land Solder Resist (in mm)

Series	Standard Land Dimensions (Flow and Reflow)
LQG21N LQG21C LQP10A LQP11A LQP21A LQG10A LQG11A 	 (LQP10A/11A/21A/LQG10A/11A : Reflow soldering should be applied.)
LQH1N/1C LQN1A/1H LQN21A LQW1608A 	If mounted at 2.5mm intervals as indicated in the diagram at left, attention should be paid to potential magnetic coupling effects when using the coil as a resonator. Refer to the coupling factor graph in the typical electrical characteristics section.  (LQW1608A : Reflow soldering should be applied.)
LQH3Cxx24 Series LQS33N 	 (LQS33N : Reflow soldering should be applied.)
LQH3N LQH3Cxx34 Series 	
LQH4N LQN4N LQH4C 	
LQN6C LQS66C 	 (LQN6C/LQS66C : Reflow soldering should be applied.)

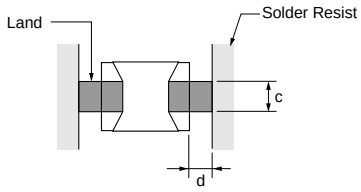
Type	a	b	c
LQG10A	0.5–0.6	1.4–1.5	0.4
LQG11A	0.6–0.8	1.8–2.2	0.6–0.8
LQG21N/21C	1.0	3.0–4.0	1.2
LQP10A	0.5–0.6	1.4–1.5	0.4
LQP11A	0.7	2.6	0.6
LQP21A	1.65	4.0	1.2

Type	a	b	c	a
LQH1N/1C LQN1A/1H	1.5	4.5	1.75	1.0
LQN21A	1.2	3.0	1.1	0.8
LQW1608A	0.7–1.0	1.8–2.0	0.6–0.7	0.6–0.8

2. Mounting Instructions

①Land Pattern Dimensions

Large lands reduce Q of the mounted chip. Also, large protruding land areas (bordered by lines having dimensions c and d shown below) cause floating and electrode cracks.

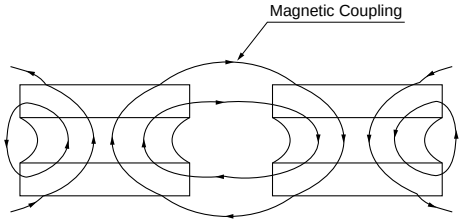


②Magnetic Coupling

Since some chip coils are constructed like an open magnetic circuit, narrow spacing between coils may cause magnetic coupling.

(Please refer to Page 37 for coil-to-coil spacing and coupling coefficient.)

The LQS and LQG series have a magnetically shielded structure. The structure makes their coupling coefficient smaller than that of conventional chip coils. In particular, the LQS33N series has a very small coupling coefficient.



③PCB Warping

Arrange chip coils to minimize stress caused by PCB warping.

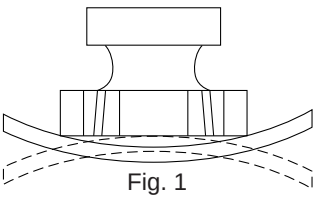


Fig. 1

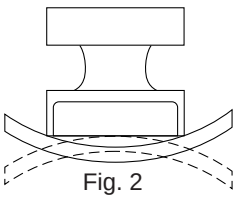
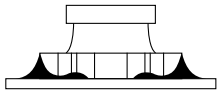


Fig. 2

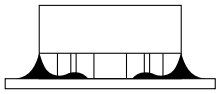
The arrangement shown in Fig. 2 is more effective in preventing stress than that shown in Fig. 1.

④Amount of Solder Paste

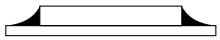
Excessive solder causes electrode corrosion, while insufficient solder causes low electrode bonding strength. Adjust the amount of solder paste so that solder is applied as shown below.



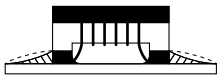
LQH/LQN



LQS



LQP/LQG

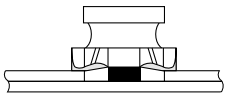


LQW

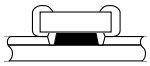
● Standard thickness of solder paste : 200 to 300µm (LQG Series, LQP10A : 100µm, LQP11A/21A/LQW1608A : 100µm to 150µm)

⑤Amount of Adhesive

If too much adhesive is applied, then it may overflow into the land or termination areas and yield poor solderability. In contrast, if insufficient adhesive is applied, or if the adhesive is not sufficiently hardened, then the chip may become detached during flow soldering. Apply the adhesive in accordance with the following conditions.



LQH/LQN



LQG

	Typical Application Amount (in mg)		
	MR-8153RA	NF-3000	UVS-50R-2
LQG21N/21C	0.15—0.20	0.20—0.25	0.20—0.25
LQN21A	0.16—0.18	0.21—0.23	0.21—0.23
LQH1N/1C LQN1A/1H	0.18—0.20	0.20—0.25	0.20—0.25
LQH3N/3C	0.20—0.23	0.27—0.35	0.27—0.35
LQH(N)4N	0.45—0.50	0.60—0.80	0.60—0.80

3. Standard Soldering Conditions

①Soldering Method

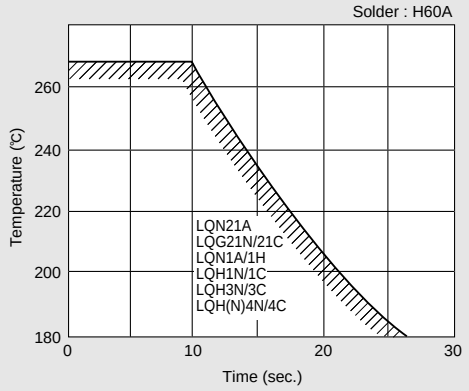
Chip coils can be flow or reflow soldered. (LQS33N, LQS66C and LQP11A/21A should only be reflow soldered)

Please contact Murata regarding other soldering methods. The volume of solder can cause minor fluctuations in inductance value. Therefore, carefully control the amount of solder when soldering the LQP10A/11A/21A, LQG10A/11A and LQW1608A series.

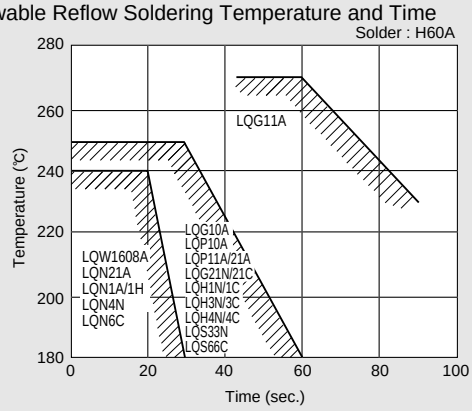
②Soldering Temperature and Time

Solder within the temperature and time combinations indicated by the slanted lines in the following graphs. If soldering is repeated, please note that the allowed time is the accumulated time.

● Allowable Flow Soldering Temperature and Time



● Allowable Reflow Soldering Temperature and Time



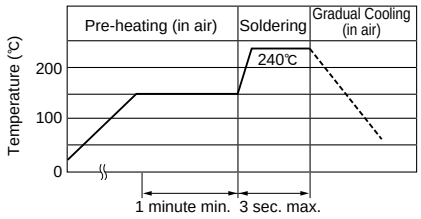
③Solder and Flux

Solder : Use H60A, H63A, (JIS Z 3282) or equivalent. Use solder paste equivalent to H60A for LQP10A/11A/21A and LQG10A/11A.

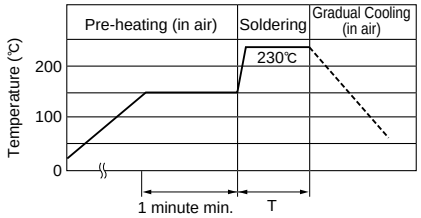
Flux : Use rosin-based flux, but not strongly acidic flux (with chlorine content exceeding 0.2wt%). Do not use water-soluble frux.

④Standard Soldering Conditions

● Flow Solder



● Reflow Solder



Series	Pre-heating (150℃)	Soldering Time (T)	Soldering Temp. (℃)
LQG21N/21C LQP21A LQH1N/1C LQN1A/1H LQW1608A LQN21A LQH3N/3C LQH4N/LQN4N/LQH4C LQS33N LQN6C/LQS66C	60 sec. min.	10 sec. max.	230
LQG10A/11A/LQP10A/11A		20 sec. max.	

⑤Reworking with Soldering Iron

Preheating at 150℃ for 1minute is required. Do not directly touch the ceramic element with the tip of the soldering iron. The reworking soldering conditions are as follows.

Soldering iron power output : 30W max.
Temperature of soldering iron tip : 280℃
Diameter of soldering iron end : 3.0mm max.
Soldering time : within 3 sec.

4. Cleaning

The following conditions should be observed when cleaning chip coils.

①Cleaning Temperature : 60℃ max. (40℃ max. for CFC alternatives and alcohol cleaning agents)

②Ultrasonic

Output : 20W/ℓ max.
Duration : 5 minutes max.
Frequency : 28 to 40kHz
Care should be taken not to cause resonance of the PCB and mounted products.

③Cleaning Agent

The following cleaning agents have been tested on individual components. Evaluation in complete assembly should be done prior to production.

a) CFC alternatives and alcohol cleaning agents
- Isopropyl alcohol (IPA)
- HCFC-225

b) Aqueous cleaning agents
- Surface active agent (Clean Thru 750H)
- High grade alcohol (Pine Alpha ST-100S)
- Hydrocarbon (Techno Cleaner 335)
- Alkaline saponifier (Aqua Cleaner 240-cleaner should be diluted to 20% using deionized water.)

LQS series : Aqueous agents should not be used because they may cause quality deterioration.
LQH series : Surface active agent and high grade alcohol can be used.

④Ensure that flux residue is completely removed.

Component should be thoroughly dried after aqueous agents have been removed with deionized water.
For additional cleaning methods, please contact Murata.

5. Resin Coating

When coating products with resin, the relatively high resin curing stress may change inductance values.
For exterior coating, select resin carefully so that electrical and mechanical performance of the product is not affected.

6. Caution for Use

This item is designed to have sufficient strength, but handle with care not to make it chipped or broken due to its ceramic structure.

● LQW Series
- In some mounting machines, when picking up components, support pin pushes up the components from the bottom of base tape. In this case, please remove the support pin. The support pin may damage the components and break wire.

● LQH/LQN Series
- Sharp material, such as a pair of tweezers, shall not touch to the winding portion to prevent the breaking of wire.
- Mechanical shock should not be applied to the products mounted on the board to prevent the breaking of the core.

● LQP Series
- The pattern of the chip coil is covered with the protection film. But the handling the chip coil shall be taken care so that the chip coil would not be damaged with the pick-up nozzle, the sharp substance and so on.

● LQG 21N/21C Series
- There is possibility that the inductance value change due to magnetism. Don't use a magnet or a pair of tweezers with magnetism when chip coil are handled. (The tip of the tweezers should be molded with resin or pottery.)

7. Handling

①Avoid applying excessive stress to products to prevent damage.

②Do not touch winding with sharp objects such as tweezers to prevent wire breakage.

③Do not apply excessive force to products mounted on boards to prevent core breakage.

8. Operating Environment

Do not use products in corrosive gases atmosphere such as chlorine gas, acid or sulfide gas.

9. Storage Requirements

①Storage Period

Products should be used within 6 months of receipt.
Solderability should be verified if this period is exceeded.
(LQH, LQN series should be used within 12 months.)

②Storage conditions

a) Store products in a warehouse in compliance with the following conditions :

Temperature : −10 to 40℃
Humidity : 30 to 70%
(relative humidity)

Do not subject products to rapid changes in temperature and humidity.
Do not store them in corrosive gases atmosphere such as one containing sulfurous acid gas or alkaline gas.
This will prevent electrode oxidation which causes poor solderability and possible corrosion of coils.

b) Do not store products in bulk packaging to prevent collision among coils which causes core chipping and wire breakage.

c) Store products on pallets to protect from humidity, dust, etc.

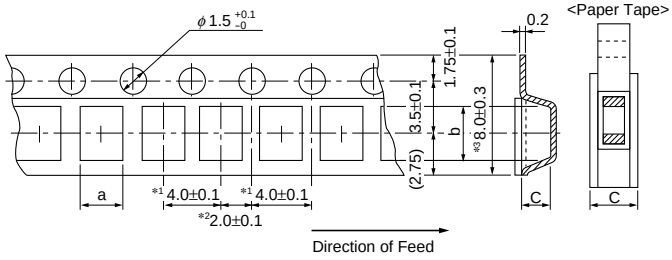
d) Avoid heat shock, vibration, direct sunlight, etc.

10. Transportations

Do not apply excessive vibration or mechanical shock to products.

Dimensions of Taping

LQG21N/21C, LQG10A/11A, LQH1N/1C, LQN1A/1H, LQN21A, LQH3N/3C, LQP10A/11A/21A, LQW1608A (8mm Tape)



LQG10A/LQP10A/LQW1608A
*1 : 2.0±0.05
*2 : 1.0±0.05
*3 : 8.0±0.2

●Paper Tape

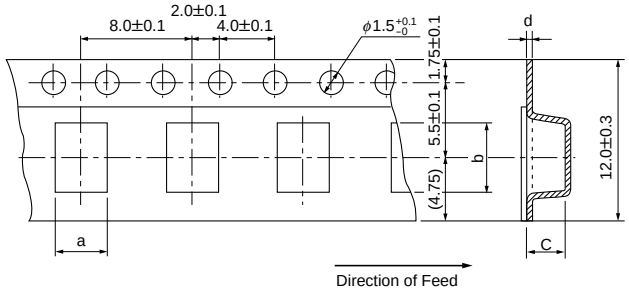
Series	a	b	c	Minimum Quantity	
				ϕ180mm Reel	ϕ330mm Reel
LQG21NR10K10-2R2K10 LQG21C1R0N00-100N00	1.45	2.25	1.1	4,000	10,000
LQG10A	0.62	1.12	1.0	10,000	50,000
LQG11A	1.05	1.85		4,000	10,000
LQP10A	0.70	1.20		10,000	—
LQP11A	1.19	2.00		4,000	10,000
LQW1608A	1.10	1.00	1.1		

●Plastic Tape

Series	a	b	c	Minimum Quantity	
				ϕ180mm Reel	ϕ330mm Reel
LQG21N2R7K10–4R7K10 LQG21C220N00–470N00	1.55	2.3	1.3	3,000	10,000
LQH1N/1C · LQN1A/1H	1.90	3.6	2.0	2,000	7,500
LQN21A	1.75	2.3			
LQH3N/LQH3C	2.90	3.6	2.1		
LQP21A	1.60	2.4	0.75	4,000	10,000

(in mm)

LQS33N, LQH(N)4N, LQH4C, LQN6C, LQS66C (12mm Tape)



Series	a	b	c	d	Minimum Quantity	
					ϕ180mm Reel	ϕ330mm Reel
LQS33N	3.9	3.7	1.9	0.3	1,000	—
LQH(N)4N/LQH4C	3.6	4.9	2.7		500	2,500
LQN6C	5.4	6.1	5.0	0.4	350	—
LQS66C	6.7	6.7	5.2			

(in mm)

CHIP COIL

Design Kit

■DESIGN KIT

Various chip coils are available in design kits assembled according to application.

<Design Kit for High Frequency Range>
Part Number : EKLB11EB
Contents : LQW1608A/LQN21A/LQN1H/
LQP10A/LQP11A/LQP21A

EKLB11EB

No.	Part Number	QTY. (pcs.)
1	LQW1608A3N9D00	20
2	LQW1608A4N7D00	20
3	LQW1608A5N6D00	20
4	LQW1608A6N8D00	20
5	LQW1608A8N2D00	20
6	LQW1608A10NJ00	20
7	LQW1608A12NJ00	20
8	LQW1608A15NJ00	20
9	LQW1608A18NJ00	20
10	LQW1608A22NJ00	20
11	LQW1608A27NJ00	20
12	LQW1608A33NJ00	20
13	LQW1608A39NJ00	20
14	LQW1608A47NJ00	20
15	LQW1608A56NJ00	20
16	LQW1608A68NJ00	20
17	LQW1608A82NJ00	20
18	LQW1608AR10J00	20
19	LQW1608AR12J00	20
20	LQW1608AR15J00	20
21	LQW1608AR18J00	20
22	LQW1608AR22J00	20
23	LQN21A3N3D04	20
24	LQN21A6N8D04	20
25	LQN21A8N2D04	20
26	LQN21A10NJ04	20
27	LQN21A12NJ04	20
28	LQN21A15NJ04	20
29	LQN21A18NJ04	20
30	LQN21A22NJ04	20
31	LQN21A27NJ04	20
32	LQN21A33NJ04	20
33	LQN21A39NJ04	20
34	LQN21A47NJ04	20
35	LQN21A56NJ04	20
36	LQN21A68NJ04	20
37	LQN21A82NJ04	20
38	LQN21AR10J04	20
39	LQN21AR12J04	20
40	LQN21AR15J04	20
41	LQN21AR18J04	20
42	LQN21AR22J04	20
43	LQN1H54NK04	20
44	LQN1H95NK04	20
45	LQN1HR14K04	20
46	LQN1HR21K04	20
47	LQN1HR29K04	20
48	LQN1HR39K04	20
49	LQN1HR50K04	20
50	LQN1HR61K04	20
51	LQN1HR75K04	20
52	LQN1HR88K04	20
53	LQP10A1N0C00	20
54	LQP10A1N2C00	20
55	LQP10A1N5C00	20
56	LQP10A1N8C00	20
57	LQP10A2N2C00	20
58	LQP10A2N7C00	20
59	LQP10A3N3C00	20
60	LQP10A3N9C00	20
61	LQP10A4N7C00	20
62	LQP10A5N6C00	20
63	LQP10A6N8C00	20
64	LQP10A8N2C00	20
65	LQP10A10NG00	20
66	LQP10A12NG00	20
67	LQP10A15NG00	20
68	LQP10A18NG00	20
69	LQP10A22NG00	20
70	LQP10A27NG00	20
71	LQP10A33NG00	20
72	LQP11A1N3C00	20
73	LQP11A1N5C00	20
74	LQP11A1N8C00	20
75	LQP11A2N2C00	20
76	LQP11A2N7C00	20
77	LQP11A3N3C00	20
78	LQP11A3N9C00	20
79	LQP11A4N7C00	20
80	LQP11A5N6C00	20
81	LQP11A6N8C00	20
82	LQP11A8N2C00	20
83	LQP11A10NG00	20
84	LQP11A12NG00	20
85	LQP11A15NG00	20
86	LQP11A18NG00	20
87	LQP11A22NG00	20
88	LQP11A27NG00	20
89	LQP11A33NG00	20

● Please use the products in this Design Kit for experiment or test production, but do not use for mass production. When useing for mass production, please order them after confirming detailed specifications by approving the appropriate individual specifications sheet.

CHIP COIL

Design Kit

<Design Kit for General Frequency Range>
Part Number : EKLB21EB
Contents : LQH3C/LQH3N/LQH4C/LQH4N/LQPN4N

EKLB21EB

No.	Part Number	QTY. (pcs.)
1	LQH3C1R0M34	20
2	LQH3C2R2M34	20
3	LQH3C4R7M34	20
4	LQH3C100K34	20
5	LQH3C470K34	20
6	LQH3C221K34	20
7	LQH3C391K34	20
8	LQH3C561K34	20
9	LQH3NR10M34	20
10	LQH3NR18M34	20
11	LQH3NR27M34	20
12	LQH3NR39M34	20
13	LQH3NR56M34	20
14	LQH3NR68M34	20
15	LQH3NR82M34	20
16	LQH3N1R0M34	20
17	LQH3N1R5K34	20
18	LQH3N2R2K34	20
19	LQH3N3R3K34	20
20	LQH3N4R7K34	20
21	LQH3N6R8K34	20
22	LQH3N100K34	20
23	LQH3N120K34	20
24	LQH3N150K34	20
25	LQH3N220K34	20
26	LQH3N330K34	20
27	LQH3N470K34	20
28	LQH3N680K34	20
29	LQH3N101K34	20
30	LQH3N121K34	20
31	LQH3N181K34	20
32	LQH3N271K34	20
33	LQH3N391K34	20
34	LQH3N561K34	20
35	LQH4C1R0M04	20
36	LQH4C1R5M04	20
37	LQH4C2R2M04	20
38	LQH4C3R3M04	20
39	LQH4C4R7M04	20
40	LQH4C6R8M04	20
41	LQH4C100K04	20
42	LQH4C150K04	20
43	LQH4C220K04	20

No.	Part Number	QTY. (pcs.)
44	LQH4C330K04	20
45	LQH4C470K04	20
46	LQH4C680K04	20
47	LQH4C101K04	20
48	LQH4C151K04	20
49	LQH4C221K04	20
50	LQH4C331K04	20
51	LQH4C471K04	20
52	LQH4N180K04	20
53	LQH4N270K04	20
54	LQH4N390K04	20
55	LQH4N560K04	20
56	LQH4N820K04	20
57	LQH4N121K04	20
58	LQH4N221K04	20
59	LQH4N331K04	20
60	LQH4N471K04	20
61	LQH4N681K04	20
62	LQH4N821K04	20
63	LQH4N102K04	20
64	LQH4N122K04	20
65	LQH4N152K04	20
66	LQH4N182K04	20
67	LQH4N222K04	20

<Design Kit for Individual Series>

Part Number	Contents
EKLM11UA	LQP11A
EKLM12UA	LQN21A
EKLM13UA	LQG11A
EKLM14UA	LQP10A
EKLM15UA	LQG10A
EKLM16UA	LQW1608A 2% (0.2nH) tolerance
EKLM17UA	LQW1608A 5% (0.5nH) tolerance
EKLM21UA	LQG21N/LQG21C

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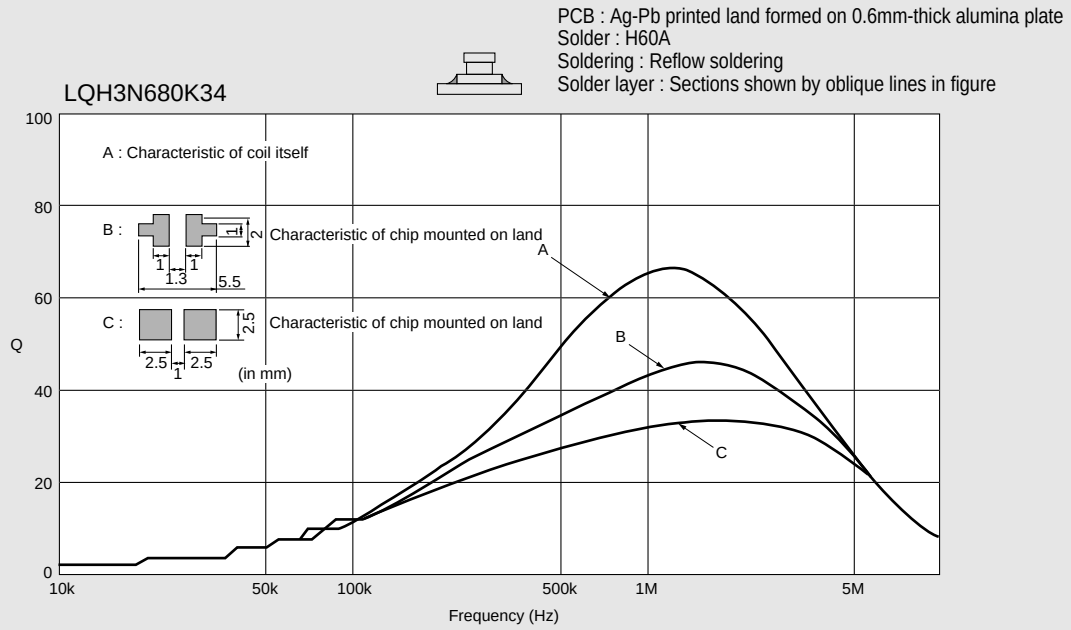
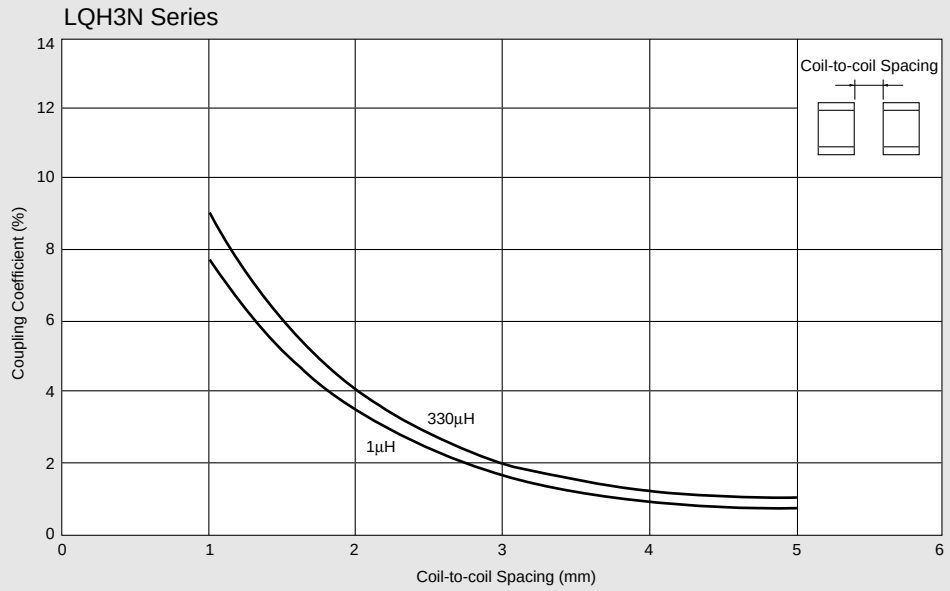
1. Land Area and Q-F Characteristics



2. Coupling coefficient versus Coil-to-coil Spacing



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   ③ Undersea equipment
   ④ Medical equipment
   ⑤ Transportation equipment (automobiles, trains, ships,etc.)
   ⑥ Traffic signal equipment
   ⑦ Disaster prevention / crime prevention equipment
   ⑧ Data-processing equipment
   ⑨ Applications of similar complexity or with reliability requirements comparable to the applications listed in the above
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