



# SPECIFICATION FOR APPROVAL

**CUSTOMER :** STD

**CUSTOMER PART NO :**

**PRODUCTS :** Wire Wound Ferrite Chip Inductors

**PART NO:** MCQLC Series

**DATE:** 2019.08.28

**SALES:** 产品部

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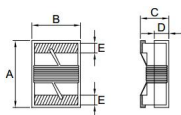
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## Wire Wound Ferrite Chip Inductors--MCQLC Series



PCB Pattern



### Featur

1. Ferrite core wire wound construction.
3. Small footprint as well as low profile.
4. Application for DC power line.
5. 100% Lead(Pb) & Halogen-Free and RoHS compliant.

### Application

Noise suppression for high frequency.

1. Personal computers, Hard disk drives.
2. ADSL modem and Cable modem.
3. Digital camera or portable product.
4. Measuring instruments.

### Product Identification

MC    QLC    1608Z    R10    K  
A       B       C       D       E

**A** Company code

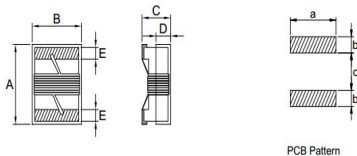
**D** Inductance. R10=0.10 uH

**B** Series name

**E** Tolerance.(K=±10%, M=±20%)

**C** Dimension.

## Wire Wound Ferrite Chip Inductors--MCQLC Series



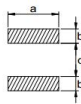
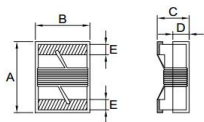
PCB Pattern

P/N	A (mm)	B (mm)	C (mm)	D (mm)	E (mm)	a (mm)	b (mm)	c (mm)
MCQLC 1608	1.80 MAX	1.20 MAX	1.20 MAX	0.38 ref	0.35 ± 0.10	1.02	0.64	0.64
MCQLC 2012	2.40 MAX	1.60 MAX	1.40 MAX	0.51 ref	0.44 ± 0.10	1.78	0.80	1.20
MCQLC 2520	2.90 MAX	2.50 MAX	2.10 MAX	1.20 ref	0.55±0.10	2.54	1.02	1.27
MCQLC 3225	3.60 MAX	2.80 MAX	2.60 MAX	0.80 ref	0.55±0.10	2.80	0.91	2.00

P/N	Characteristic Range (uH)				Rated Current (mA)	DCR (Ω)
	500mV					
	10	100	500	1000		
MCQLC 1608	0.047			10	180~1400	0.075~4.80
MCQLC 2012	0.5			33	145~750	0.20~4.34
MCQLC 2520	1.0			33	236~1000	0.13~2.47
MCQLC 3225	1.0			680	76~1200	0.12~22.00

## Wire Wound Ferrite Chip Inductors--MCQLC1608Z Series

### 1. Mechanical & Dimensions (UNIT: mm)



PCB Pattern

A	1.80 MAX
B	1.20 MAX
C	1.20 MAX
D	0.38 ref
E	0.35 ± 0.10
a	1.02
b	0.64
c	0.64

### 2. Electrical characteristics

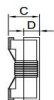
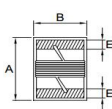
Part Number	Inductance (uH)	Tolerance	Test Frequency (Hz)	Q min.	Test Frequency (MHz)	Rated Current (mA) max.	DCR (Ω) max.	SRF (MHz) min.
MCQLC1608Z47N□	0.047	K,M	0.5V/7.96M	10	7.96	1400	0.075	1500
MCQLC1608ZR10□	0.10	K,M	0.5V/7.96M	10	7.96	1400	0.13	1150
MCQLC1608ZR15□	0.15	K,M	0.5V/7.96M	10	7.96	1300	0.15	1050
MCQLC1608ZR18□	0.18	K,M	0.5V/7.96M	10	7.96	1300	0.15	950
MCQLC1608ZR22□	0.22	K,M	0.5V/7.96M	10	7.96	950	0.15	800
MCQLC1608ZR24□	0.24	K,M	0.5V/7.96M	10	7.96	620	0.31	800
MCQLC1608ZR27□	0.27	K,M	0.5V/7.96M	10	7.96	710	0.20	775
MCQLC1608ZR33□	0.33	K,M	0.5V/7.96M	10	7.96	620	0.35	725
MCQLC1608ZR39□	0.39	K,M	0.5V/7.96M	10	7.96	600	0.39	620
MCQLC1608ZR47□	0.47	K,M	0.5V/7.96M	10	7.96	570	0.43	540
MCQLC1608ZR56□	0.56	K,M	0.5V/7.96M	10	7.96	550	0.47	525
MCQLC1608ZR68□	0.68	K,M	0.5V/7.96M	10	7.96	470	0.52	460
MCQLC1608ZR82□	0.82	K,M	0.5V/7.96M	10	7.96	400	0.69	410
MCQLC1608Z1R0□	1.0	K,M	0.5V/7.96M	10	7.96	400	0.81	190
MCQLC1608Z1R2□	1.2	K,M	0.5V/7.96M	10	7.96	370	0.87	160
MCQLC1608Z1R5□	1.5	K,M	0.5V/7.96M	10	7.96	350	0.96	100
MCQLC1608Z1R8□	1.8	K,M	0.5V/7.96M	10	7.96	350	1.10	80
MCQLC1608Z2R2□	2.2	K,M	0.5V/7.96M	10	7.96	320	1.20	68
MCQLC1608Z3R3□	3.3	K,M	0.5V/7.96M	10	7.96	280	1.50	42
MCQLC1608Z3R9□	3.9	K,M	0.5V/7.96M	10	7.96	280	1.50	40
MCQLC1608Z4R7□	4.7	K,M	0.5V/7.96M	10	7.96	260	2.10	34
MCQLC1608Z5R6□	5.6	K,M	0.5V/7.96M	10	7.96	240	2.60	32
MCQLC1608Z6R8□	6.8	K,M	0.5V/7.96M	16	7.96	200	3.10	31
MCQLC1608Z8R2□	8.2	K,M	0.5V/7.96M	16	7.96	190	4.40	26
MCQLC1608Z100□	10.0	K,M	0.5V/2.52M	14	2.52	180	4.80	25

□: K=±10%, M=±20%

### 3. Operating: -40°C ~ +125°C ( Including self-temperature rise)

## Wire Wound Ferrite Chip Inductors--MCQLC2012Z Series

### 1.Mechanical & Dimensions (UNIT: mm)



PCB Pattern

<b>A</b>	<b>2.40 MAX</b>
<b>B</b>	<b>1.60 MAX</b>
<b>C</b>	<b>1.40 MAX</b>
<b>D</b>	<b>0.51 ref</b>
<b>E</b>	<b>0.44 ± 0.10</b>
<b>a</b>	<b>1.78</b>
<b>b</b>	<b>0.80</b>
<b>c</b>	<b>1.20</b>

### 2.Electrical characteristics

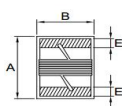
Part Number	Inductance (uH)	Tolerance	Test Frequency (Hz)	Q min.	Test Frequency (MHz)	Rated Current (mA)	DCR (Ω) max.	SRF (MHz) min.
MCQLC 2012ZR47□	0.47	K,M	0.5V/7.96M	10	7.96	750	0.20	720
MCQLC 2012ZR56□	0.56	K,M	0.5V/7.96M	10	7.96	730	0.21	665
MCQLC 2012ZR68□	0.68	K,M	0.5V/7.96M	10	7.96	670	0.28	565
MCQLC 2012ZR82□	0.82	K,M	0.5V/7.96M	10	7.96	650	0.31	545
MCQLC 2012Z1R0□	1.00	K,M	0.5V/7.96M	10	7.96	615	0.34	525
MCQLC 2012Z1R2□	1.20	K,M	0.5V/7.96M	10	7.96	550	0.39	473
MCQLC 2012Z1R5□	1.50	K,M	0.5V/7.96M	10	7.96	520	0.45	300
MCQLC 2012Z1R8□	1.80	K,M	0.5V/7.96M	10	7.96	500	0.48	230
MCQLC 2012Z2R2□	2.20	K,M	0.5V/7.96M	10	7.96	420	0.67	215
MCQLC 2012Z2R7□	2.70	K,M	0.5V/7.96M	10	7.96	410	0.74	140
MCQLC 2012Z3R3□	3.30	K,M	0.5V/7.96M	10	7.96	385	0.81	95
MCQLC 2012Z3R9□	3.90	K,M	0.5V/7.96M	10	7.96	372	0.88	57
MCQLC 2012Z4R7□	4.70	K,M	0.5V/7.96M	10	7.96	345	0.99	51
MCQLC 2012Z5R6□	5.60	K,M	0.5V/7.96M	10	7.96	335	1.06	44
MCQLC 2012Z6R8□	6.80	K,M	0.5V/7.96M	10	7.96	315	1.21	39
MCQLC 2012Z8R2□	8.20	K,M	0.5V/7.96M	10	7.96	295	1.33	33
MCQLC 2012Z100□	10.0	K,M	0.5V/2.52M	10	2.52	260	1.79	30
MCQLC 2012Z120□	12.0	K,M	0.5V/2.52M	10	2.52	250	1.98	27
MCQLC 2012Z150□	15.0	K,M	0.5V/2.52M	10	2.52	215	2.68	22
MCQLC 2012Z180□	18.0	K,M	0.5V/2.52M	10	2.52	195	3.12	20
MCQLC 2012Z220□	22.0	K,M	0.5V/2.52M	10	2.52	180	3.48	18
MCQLC 2012Z270□	27.0	K,M	0.5V/2.52M	10	2.52	170	3.84	16
MCQLC 2012Z330□	33.0	K,M	0.5V/2.52M	10	2.52	145	4.34	15

□: K=±10%, M=±20%

### 3.Operating: -40℃ ~ +125℃ ( Including self-temperature rise)

## Wire Wound Ferrite Chip Inductors--MCQLC2520Z Series

### 1.Mechanical & Dimensions (UNIT: mm)



PCB Pattern

A	2.90 MAX
B	2.50 MAX
C	2.10 MAX
D	1.20 ref
E	0.55±0.10
a	2.54
b	1.02
c	1.27

### 2.Electrical characteristics

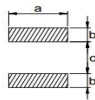
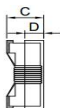
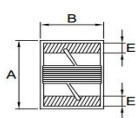
Part Number	Inductance (uH)	Tolerance	Test Frequency (Hz)	Q min.	Test Frequency (MHz)	Rated Current (mA) max.	DCR (Ω) max.	SRF (MHz) min.
MCQLC 2520Z1R0□	1.00	K,M	0.5V/7.96M	12	7.96	1000	0.13	345
MCQLC 2520Z1R5□	1.50	K,M	0.5V/7.96M	12	7.96	850	0.17	100
MCQLC 2520Z2R2□	2.20	K,M	0.5V/7.96M	12	7.96	775	0.21	78
MCQLC 2520Z3R3□	3.30	K,M	0.5V/7.96M	12	7.96	715	0.26	48
MCQLC 2520Z4R7□	4.70	K,M	0.5V/7.96M	12	7.96	505	0.52	46
MCQLC 2520Z6R8□	6.80	K,M	0.5V/7.96M	12	7.96	432	0.72	33
MCQLC 2520Z8R2□	8.20	K,M	0.5V/7.96M	12	7.96	410	0.76	30
MCQLC 2520Z100□	10.00	K,M	0.5V/2.52M	12	2.52	392	0.86	28
MCQLC 2520Z150□	15.00	K,M	0.5V/2.52M	12	2.52	342	1.09	21
MCQLC 2520Z220□	22.00	K,M	0.5V/2.52M	12	2.52	260	1.96	18
MCQLC 2520Z330□	33.00	K,M	0.5V/2.52M	12	2.52	236	2.47	15

□: K=±10%, M=±20%

### 3.Operating: -40℃ ~ +125℃ ( Including self-temperature rise)

## Wire Wound Ferrite Chip Inductors--MCQLC3225Z Series

### 1.Mechanical & Dimensions (UNIT: mm)



PCB Pattern

A	3.60 MAX
B	2.80 MAX
C	2.60 MAX
D	0.80 ref
E	0.55±0.10
a	2.80
b	0.91
c	2.00

### 2.Electrical characteristics

Part Number	Inductance (uH)	Tolerance	Test Frequency (Hz)	Q min.	Test Frequency (MHz)	Rated Current (mA) max.	DCR (Ω) max.	SRF (MHz) min.
MCQLC 3225Z1R0□	1.00	K,M	0.5V/7.96M	10	7.96	1200	0.12	290
MCQLC 3225Z1R5□	1.50	K,M	0.5V/7.96M	10	7.96	1000	0.13	260
MCQLC 3225Z2R2□	2.20	K,M	0.5V/7.96M	10	7.96	880	0.17	190
MCQLC 3225Z3R3□	3.30	K,M	0.5V/7.96M	10	7.96	775	0.22	64
MCQLC 3225Z4R7□	4.70	K,M	0.5V/7.96M	10	7.96	710	0.26	54
MCQLC 3225Z6R8□	6.80	K,M	0.5V/7.96M	10	7.96	660	0.30	34
MCQLC 3225Z100□	10.0	K,M	0.5V/2.52M	10	2.52	570	0.39	25
MCQLC 3225Z150□	15.0	K,M	0.5V/2.52M	10	2.52	440	0.66	17
MCQLC 3225Z220□	22.0	K,M	0.5V/2.52M	10	2.52	400	0.82	16
MCQLC 3225Z330□	33.0	K,M	0.5V/2.52M	10	2.52	285	1.50	12
MCQLC 3225Z390□	39.0	K,M	0.5V/2.52M	10	2.52	270	1.66	12
MCQLC 3225Z470□	47.0	K,M	0.5V/2.52M	10	2.52	260	1.90	10
MCQLC 3225Z680□	68.0	K,M	0.5V/2.52M	10	2.52	235	2.29	9.0
MCQLC 3225Z101□	100	K,M	0.5V/1M	10	1.00	190	3.48	7.0
MCQLC 3225Z151□	150	K,M	0.5V/1M	10	1.00	140	6.55	5.0
MCQLC 3225Z221□	220	K,M	0.5V/1M	10	1.00	115	8.23	4.0
MCQLC 3225Z331□	330	K,M	0.5V/1M	10	1.00	98	13.7	2.8
MCQLC 3225Z471□	470	K,M	0.5V/1M	10	1.00	86	18.1	2.6
MCQLC 3225Z681□	680	K,M	0.5V/1M	10	1.00	76	22.0	2.3

□: K=±10%, M=±20%

### 3.Operating: -40℃ ~ +125℃ ( Including self-temperature rise)





# SPECIFICATION FOR APPROVAL

## 4. Reliability and Testing Conditions / Pin Type Power Inductors

Item	Specification	Conditions															
Operating temperature range	-40°C ~ +125°C ( Including self-temperature rise)																
Storage temperature and humidity range	-40°C ~ +125°C , 70% RH Max																
Solderability	More than 90% of the terminal electrode should be covered with solder.	<p>Unit: Second</p>															
Solder Heat Resistance	Inductance within ±20% of initial value. No disconnection or short circuit. The appearance shall not break.	<p>Unit: Second</p>															
Heat resistance	Inductance within ±20% of initial value. No disconnection or short circuit. The appearance shall not break.	After 96 hours in 125±5°C and 2 hour drying under normal condition.															
Cold resistance	Inductance within ±20% of initial value. No disconnection or short circuit. The appearance shall not break.	After 96 hours in -40±5°C and 2 hour drying under normal condition.															
Thermal shock	Inductance within ±20% of initial value. No disconnection or short circuit. The appearance shall not break.	After 100 cycles of following condition. <table border="1" style="margin-left: 20px;"> <thead> <tr> <th>Step</th> <th>Temperature (°C)</th> <th>Times (min.)</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>-40±5°C</td> <td>30</td> </tr> <tr> <td>2</td> <td>Room Temperature</td> <td>Within 3</td> </tr> <tr> <td>3</td> <td>125±5°C</td> <td>30</td> </tr> <tr> <td>4</td> <td>Room Temperature</td> <td>Within 3</td> </tr> </tbody> </table>	Step	Temperature (°C)	Times (min.)	1	-40±5°C	30	2	Room Temperature	Within 3	3	125±5°C	30	4	Room Temperature	Within 3
Step	Temperature (°C)	Times (min.)															
1	-40±5°C	30															
2	Room Temperature	Within 3															
3	125±5°C	30															
4	Room Temperature	Within 3															
Humidity Resistance	Inductance within ±20% of initial value. No disconnection or short circuit. The appearance shall not break.	After 96 hours in 40±2°C and 90 to 95% humidity , and 2 hour drying under normal condition.															
Vibration Test	Inductance within ±5% of initial value and appearance shall not break.	After vibration for 1hour, In each of three orientations at sweep vibration (10~55~10Hz) with 1.52mm P-P Amplitudes.															
Terminal strength	The terminal electrode and the ferrite must not be damaged	Solder a chip to test substrate, and then laterally apply a load 10N in the arrow direction, Duration : 5s															

# Wire Wound Ferrite Chip Inductors--MCQLC Series

## 5.Recommended Soldering Conditions

Figure 1. Re-flow Soldering

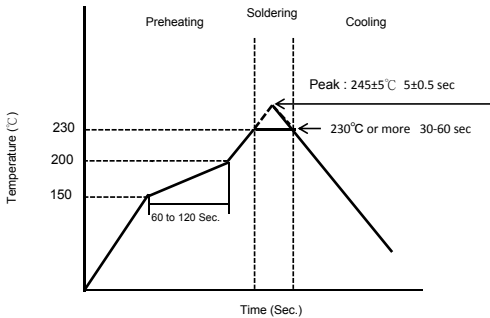


Figure 2. Hand Soldering

