



*Viking*

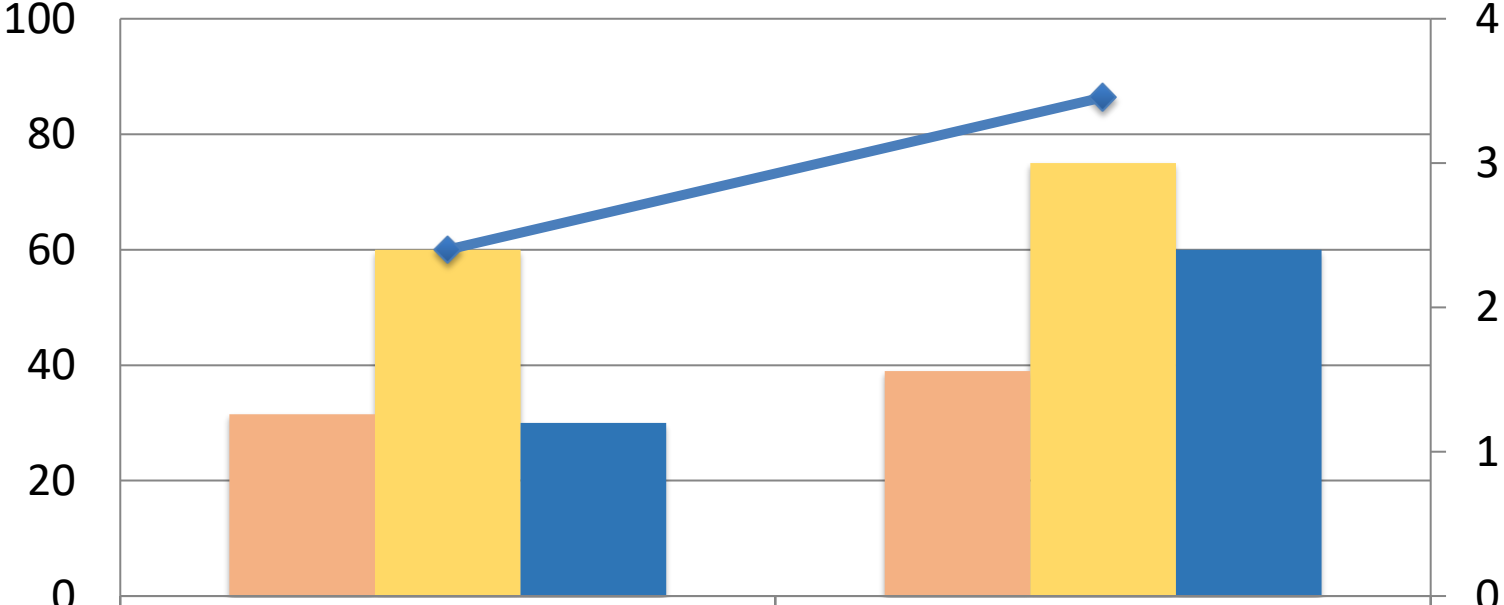
**Inductors 2023**

# Inductors

# TECHNOLOGIES



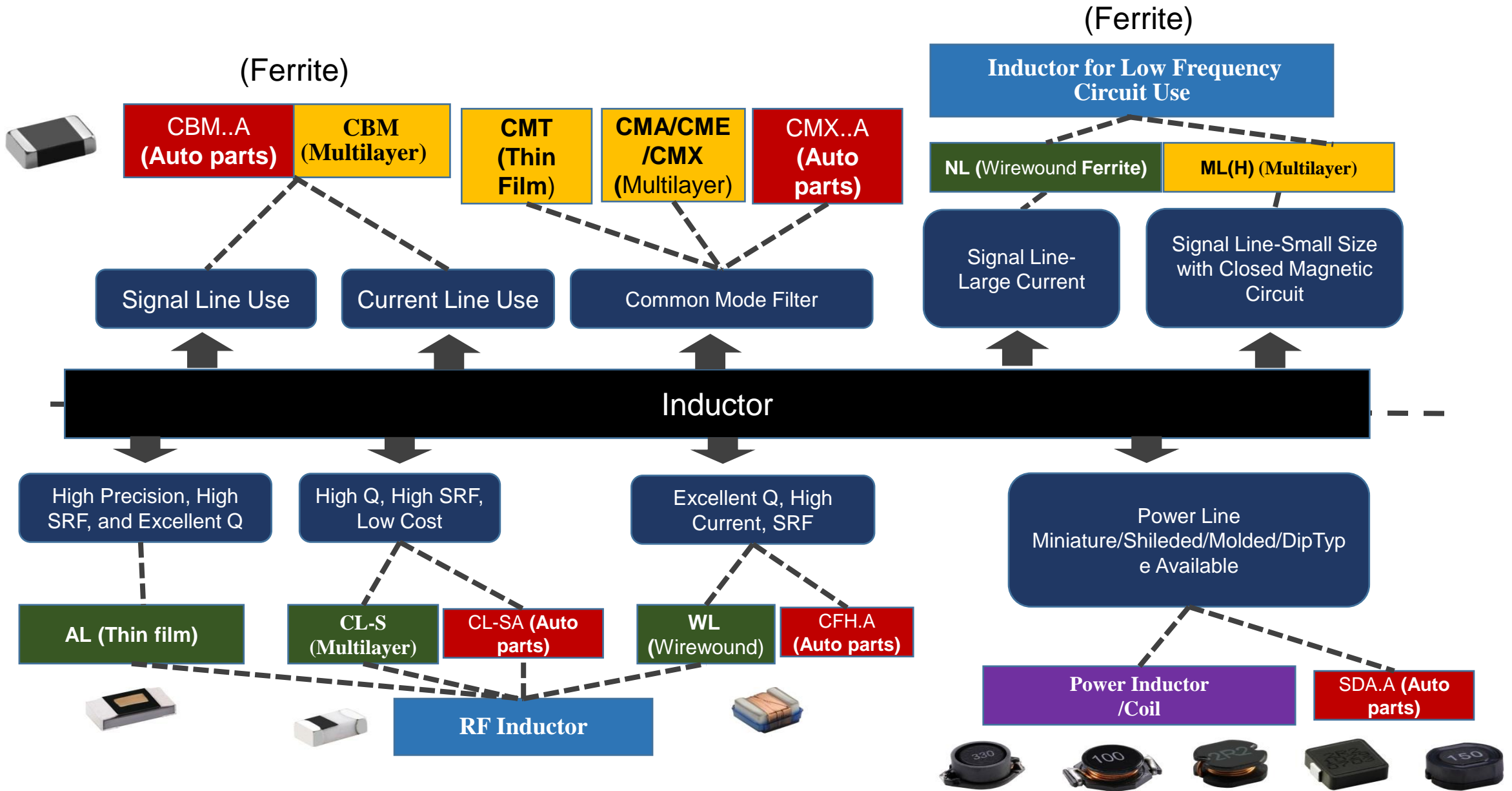
# Production Capacity



	2022 Billion/ Year	2023 Billion/ Year
Wire-wound	1,26	1,56
Standard type Power Inductor	2,4	3
Molding type Power Inductor	1,2	2,4
Multilayer	60	86,4



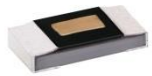
# Main Features



# RF Inductors

## Features

High Precision, High SRF, and Excellent Q



**AL Series**

### Thin Film Technology

Accurate Low Inductance  
Miniature Size

High Q, High SRF, Low Cost



**CL-S series**

### Multilayer Technology

Wide Range of Inductance  
Low Cost



Excellent Q, High Current, SRF



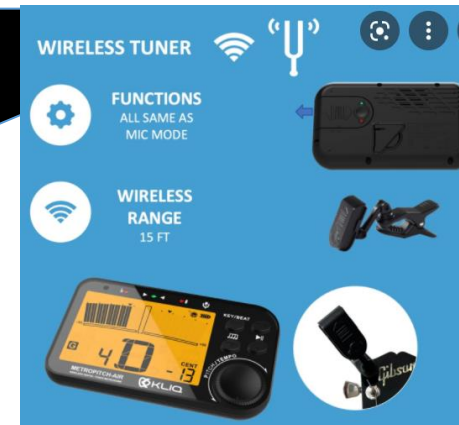
**WL Series**

### Wirewound Technology

Wide Range Inductance & Size  
Large Current

mobile communication,  
WLANS, AC router,  
Base station, Bluetooth, Tuner  
wireless function devices

## Wireless LAN



# EMI Solution

CBM  
CM

CBM

Normal (Differential) Mode Filter



**Ferrite Bead** is served as filter for noises in power/signal lines in electronics circuits, such as **mobile phones, laptops, set-top-box, videos players, DVDs, game consoles, e-books and others.**



EMI  
Filter

CM

Common Mode Filter



**Common Mode Filter** is for reductions of radiations noise of high speed interface. Such applications involves **LVDS, IEEE1394 and USB2.0** in electronics devices.

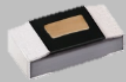


# Technologies Solutions

## Thin Film

RF

Accurate low inductance  
Miniature size  
Tight tolerance  
Excellent Q  
High SRF



## Molding



POWER

DC-DC Converters  
Mobile phone & Wearable  
LCD, LED Display  
Tablet, PC, Laptop



## Multilayer



RF

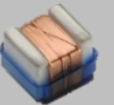
Wide range of inductance  
Low cost  
Tight tolerance  
Excellent Q  
High SRF



## Wire Wound

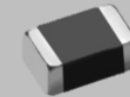
RF

Wide range of inductance  
Wide range of size  
Large current  
Tight tolerance  
Excellent Q  
High SRF



EMI

Serve as filter for noises in  
power/signal lines in  
electronics circuits.



EMI

For reductions of radiations  
noise of high-speed  
interface.

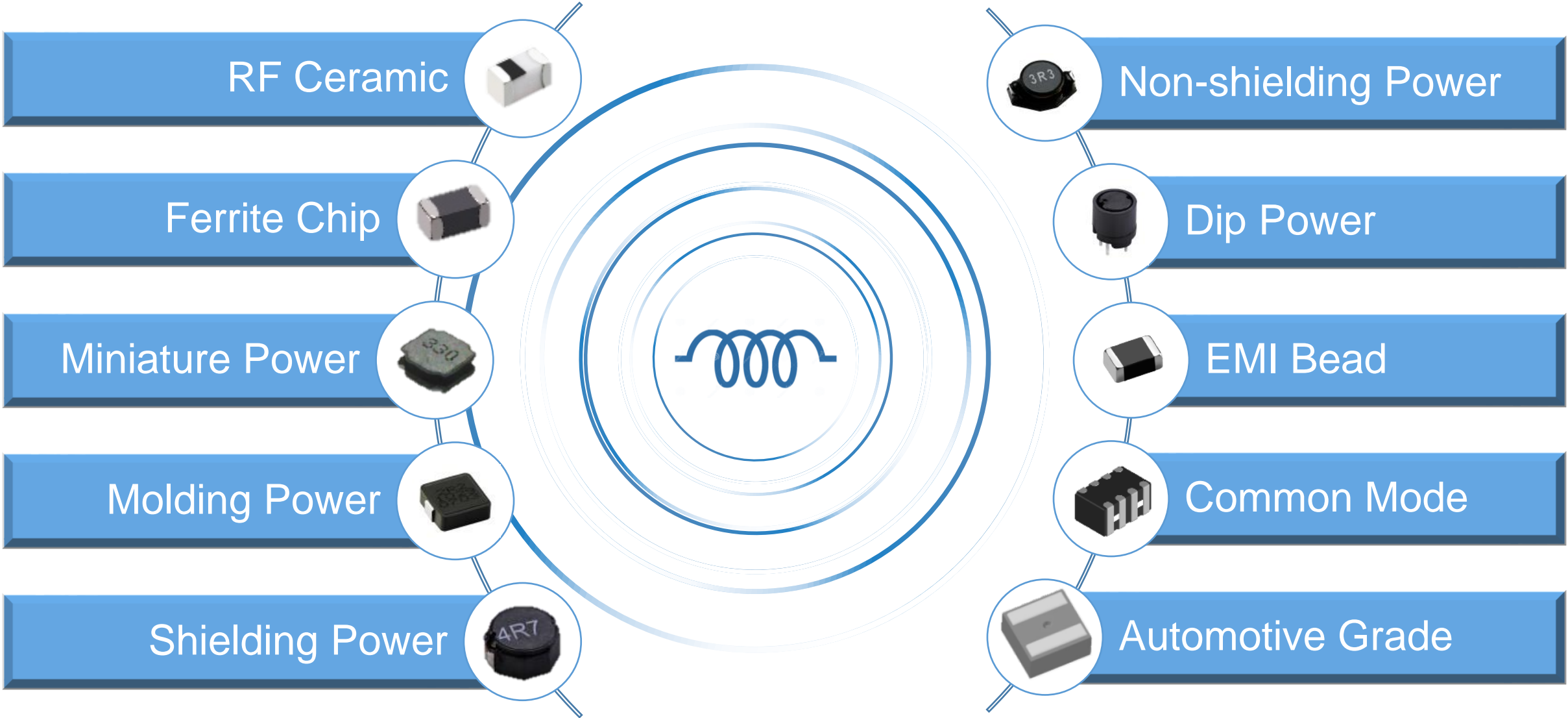


POWER

Tablet, PC, Laptop  
Mobile phone & Wearable  
Automotive  
Consumer Electronics



# Inductors Product Range





# RF Ceramic Inductors

Size (inch)



**CL-S high Q**  
 Size  
 0201/0402  
 Inductance  
 0.6 up to 100 nH

**CL-S high frequency**  
 Size  
 0402/0603  
 Inductance  
 1 up to 180 nH

**CL-S standard**  
 Size  
 0402/0603  
 Inductance  
 1 up to 680 nH

**For** RF circuit in telecommunication and other equipment

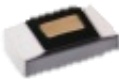


**WL high current**  
 Size  
 0402~1008  
 Inductance  
 1.6 up to 24 nH

**WL high Q**  
 Size  
 0402~1008  
 Inductance  
 1 up to 51 nH

**WL standard**  
 Size  
 0201~1206  
 Inductance  
 0.5 up to 15000 nH

**For** USB 3.0, IEEE1394, CATV filter, set top box, antenna matching and filter, GPS receiver, Wi-Fi, Bluetooth, Zigbee, base station, repeater, VCO module, RF module, wireless products(mouse/keyboard/earphone), mobile phone, security system



**AL high Q**  
 Size  
 0201/0402  
 Inductance  
 0.1 up to 10 nH

**AL standard**  
 Size  
 0201/0402  
 Inductance  
 0.1 up to 33 nH

**AL high current**  
 Size  
 0201  
 Inductance  
 0.1 up to 10 nH

**For** wireless LAN, Bluetooth module, communication appliance, VCO circuit, TCXO circuit, RF transceiver module, mobile phone, GPS products

Inductance  
 → (nH)

**Inductance Range: 0.1 up to 15,000 nH**

# Ferrite Chip Inductors

Size (inch)



**MLH high current**  
 Size  
 0805/0806/1008  
 Inductance  
 470 up to 4700 nH

**For portable equipment, DSC, DVC, DVD, HDD, CD-ROM, hard disk**



**NLD**  
 Size  
 0402/0603  
 Inductance  
 1000 up to 10000 nH

**For wearable smart device, wireless headphone, game controller**



**ML standard**  
 Size  
 0603/0805/1206  
 Inductance  
 47 up to 47000 nH

**For portable equipment, DSC, DVC, DVD, HDD, CD-ROM, hard disk**



**NL standard**  
 Size  
 0402~1812  
 Inductance  
 18 up to 820000 nH

**For portable VCR, car stereo, mobile phone, radio, and other electronic device**



**NL large current**  
 Size  
 0603~1812  
 Inductance  
 47 up to 820000 nH

**For portable VCR, car stereo, mobile phone, radio, and other electronic device**

Inductance  
 (nH)

**Inductance Range: 18 up to 820,000 nH**

# Miniature Power Inductors

Size (inch)



**SDIM**  
 Size  
 2.0\*1.0~4.0\*1.2  
 Inductance  
 0.24 up to 10  $\mu$ H  
 Rated current  
 1.0~8.0 A

**For** smart phone, digital camera, GPS, portable device



**SMP**  
 Size  
 4.0\*4.0\*1.8  
 Inductance  
 0.33 up to 22  $\mu$ H  
 Rated current  
 0.33~2.2 A

**For** smart phone, LCD monitor



**SDIA**  
 Size  
 3.0\*1.0~8.0\*4.2  
 Inductance  
 1.0 up to 680  $\mu$ H  
 Rated current  
 0.22~10.0 A

**For** LCD display, small DC-DC converters, PDA




**SDIA-G**  
 Size  
 2.5\*1.25~6.0\*4.5  
 Inductance  
 0.33 up to 1000  $\mu$ H  
 Rated current  
 0.21~11.0 A

**For** audio equipment, office automation equipment, and general electronic device



**VLH**  
 Size  
 2.5\*2.0\*1.0~5.7\*5.0\*4.7  
 Inductance  
 0.12 up to 10000  $\mu$ H  
 Rated current  
 0.03~6.0 A

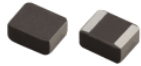
**For** high freq communication product, disk driver, computer peripheral, DC power supply circuit

Inductance  
 (nH)

**Inductance Range: 0.12 up to 10,000  $\mu$ H**

# Molding Power Inductors

Size (inch)



### MLP high current

Size  
2.0\*1.6\*1.0~2.5\*2.0\*1.2  
Inductance  
0.33 up to 2.2  $\mu$ H

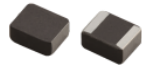
**For** thin-type power supply module, smart phone, PAD, DC-DC converter



### SDB

Size  
4.1\*2.1~13.0\*6.5  
Inductance  
0.1 up to 10  $\mu$ H  
Rated current  
4.0~120 A

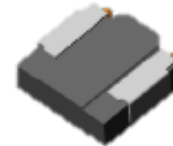
**For** thin-type on-board power supply module for exchanger, laptop



### MLP standard

Size  
2.0\*1.2\*0.8/2.0\*1.2\*1.0  
Inductance  
0.24 up to 4.7  $\mu$ H

**For** HDD, DSC, PAD, LCD & LED display



### SMA

Size  
3.1\*1.0~6.7\*2.0  
Inductance  
0.47 up to 10  $\mu$ H  
Rated current  
1.4~21 A

**For** smart phone, laptop



### SDN

Size  
4.2\*1.0~10.0\*3.8  
Inductance  
0.15 up to 33  $\mu$ H  
Rated current  
2.2~75 A

**For** VRM, SSD module, battery power system, graphic card



### SDA

Size  
4.4\*4.4\*1.9~17.5\*16.5\*12.7  
Inductance  
0.33 up to 33  $\mu$ H  
Rated current  
4.8~49 A

**For** commercial applications

Inductance  
→ (nH)

**Inductance Range: 0.1 up to 33  $\mu$ H**



# Shielding Power Inductors

Size (inch)



**SCDA**



Size  
3.2\*3.2\*1.05~4.2\*4.2\*1.8  
Inductance  
0.47 up to 100 μH  
Rated current  
0.18~3.90 A

**For** hard disk drive, mobile phone, DSC, other electronic equipment

**SDRH**



Size  
8.0\*8.0\*4.5  
Inductance  
1.0 up to 330 μH  
Rated current  
0.65~9.0 A

**For** LCD TV, DC-DC converter, laptop

**SCDS**



Size  
3.8\*3.8\*2.0~6.7\*6.7\*4.0  
Inductance  
1.0 up to 680 μH  
Rated current  
0.13~6.15 A

**For** power supply of VTR, OA equipment, portable communication equipment, DC-DC converter

**PCDS**



Size  
6.2\*5.6\*3.2~12.6\*11.6\*5.4  
Inductance  
4.7 up to 820 μH  
Rated current  
0.16~3.15 A

**For** power supply of VTR, portable communication equipment, LCD TV

**PCS**



Size  
6.2\*6.6\*3.0~12.0\*12.0\*8.0  
Inductance  
1.0 up to 1000 μH  
Rated current  
0.14~25.5 A

**For** power supply of VTR, portable communication equipment, LCD TV

**PSDB**



Size  
6.2\*6.3\*3.0~10.3\*10.4\*5.0  
Inductance  
0.56 up to 1000 μH  
Rated current  
0.23~10.5 A

**For** power supply of VTR, portable communication equipment, LCD TV

**PS**



Size  
6.6\*4.45\*2.92~18.54\*15.24\*7.62  
Inductance  
1.0 up to 10000 μH  
Rated current  
0.02~20.0 A

**For** mobile phone, PC, DC-DC converter, other various electronic appliance

**PCDR**



Size  
6.0\*2.8~12.5\*7.5  
Inductance  
1.0 up to 1500 μH  
Rated current  
0.10~13 A

**For** mobile phone, PC, DC-DC converter, other various electronic appliance

Inductance  
→ (nH)

**Inductance Range: 0.47 up to 10,000 μH**

# Non-Shielding Power Inductors

Size (inch)



**PD**

Size

6.6\*4.45\*2.92~18.54\*15.24\*7.11

Inductance

0.47 up to 1000  $\mu$ H

Rated current

0.1~20 A

---

**For** mobile phone, PC, DC-DC converter, other various electronic appliance



**PCD**

Size

3.5\*3.0\*1.15~10.0\*9.0\*7.5

Inductance

0.5 up to 3300  $\mu$ H

Rated current

0.07~11.0 A

---

**For** VTR power supply, LCD TV, PC, handheld communication equipment

Inductance  
→ (nH)

**Inductance Range: 0.47 up to 3300  $\mu$ H**

# Dip Power Inductors

Size (inch)



**DRGR**  
Size  
6.0\*6.5\*4.0~10.5\*10.5\*3.5  
Inductance  
10 up to 10000  $\mu$ H  
Rated current  
0.074~3.51 A

**For** battery power equipment,  
PC, DC power supply circuit



**DRGH**  
Size  
6.0\*6.5\*4.0~10.0\*10.5\*3.5  
Inductance  
10 up to 47000  $\mu$ H  
Rated current  
0.038~5.30 A

**For** battery power equipment, PC,  
DC power supply circuit

Inductance  
→ (nH)

**Inductance Range: 10 up to 47000  $\mu$ H**

# EMI Bead (CMB)<sub>1</sub>

Signal Line			Current Line	
General	High Speed	Ultra High Speed	Medium	High
<p><b>A Material</b></p> <ul style="list-style-type: none"> <li>• 0201~1812</li> <li>• 10 up to 1800 Ω</li> <li>• DCR: 0.05~0.9 Ω</li> <li>• RC: 50~800 mA</li> <li>• Test Freq: 100 MHz</li> </ul>	<p><b>B Material</b></p> <ul style="list-style-type: none"> <li>• 0402~1812</li> <li>• 5 up to 2700 Ω</li> <li>• DCR: 0.07~1.5 Ω</li> <li>• RC: 50~700 mA</li> <li>• Test Freq: 100 MHz</li> </ul>	<p><b>H Material</b></p> <ul style="list-style-type: none"> <li>• 0402~1812</li> <li>• 5 up to 2700 Ω</li> <li>• DCR: 0.07~1.5 Ω</li> <li>• RC: 50~700 mA</li> <li>• Test Freq: 100 MHz</li> </ul>	<p><b>A Material</b></p> <ul style="list-style-type: none"> <li>• A: 0402~1812</li> <li>• 10 up to 1500 Ω</li> <li>• DCR: 0.02~0.3 Ω</li> <li>• RC: 1000~4000 mA</li> <li>• Test Freq: 100 MHz</li> </ul>	<p><b>A Material</b></p> <ul style="list-style-type: none"> <li>• 0402~1812</li> <li>• 17 up to 150 Ω</li> <li>• DCR: 0.07~1.5 Ω</li> <li>• RC: 50~700 mA</li> <li>• Test Freq: 100 MHz</li> </ul>
<p><b>K Material</b> [Freq higher than A]</p> <ul style="list-style-type: none"> <li>• 0402~1204</li> <li>• 30 up to 5000 Ω</li> <li>• DCR: 0.15~1.5 Ω</li> <li>• RC: 50~800 mA</li> <li>• Test Freq: 50~100 MHz</li> </ul>	<p><b>For</b> computer &amp; peripheral equipment, mobile phone, digital communication equipment, various electronic equipment</p>		<p><b>H Material</b></p> <ul style="list-style-type: none"> <li>• 0603/0805</li> <li>• 10 Ω</li> <li>• DCR: 0.03 Ω</li> <li>• RC: 3000 mA</li> <li>• Test Freq: 100 MHz</li> </ul>	<p><b>K Material</b></p> <ul style="list-style-type: none"> <li>• 1812</li> <li>• 880 Ω</li> <li>• DCR: 0.03 Ω</li> <li>• RC: 4000 mA</li> <li>• Test Freq: 100 MHz</li> </ul>
			<p><b>K Material</b></p> <ul style="list-style-type: none"> <li>• 0805/1812</li> <li>• 600 up to 2000 Ω</li> <li>• DCR: 0.03~0.05 Ω</li> <li>• RC: 1000~3000 mA</li> <li>• Test Freq: 100 MHz</li> </ul>	<p><b>I Material</b></p> <ul style="list-style-type: none"> <li>• 2220</li> <li>• 150/170/800 Ω</li> <li>• DCR: 0.01~0.03 Ω</li> <li>• RC: 4k/5k/8k mA</li> <li>• Test Freq: 100 MHz</li> </ul>





# EMI Bead (CMB)<sub>2</sub>

## High Frequency Line

### A Material

- 0402/0603
- 300 up to 1800  $\Omega$  (@100MHz)
- 500 up to 1700  $\Omega$  (@1GHz)
- DCR: 0.7~2.2  $\Omega$
- RC: 50~500 mA

### B Material

- 0603
- 600  $\Omega$  (@100MHz)
- 1000  $\Omega$  (@1GHz)
- DCR: 1.5  $\Omega$
- RC: 100 mA

### H Material

- 0603
- 120/220/330  $\Omega$  (@100MHz)
- 500/1100/1300  $\Omega$  (@1GHz)
- DCR: 0.5/0.8/1.2  $\Omega$
- RC: 200/100/50 mA

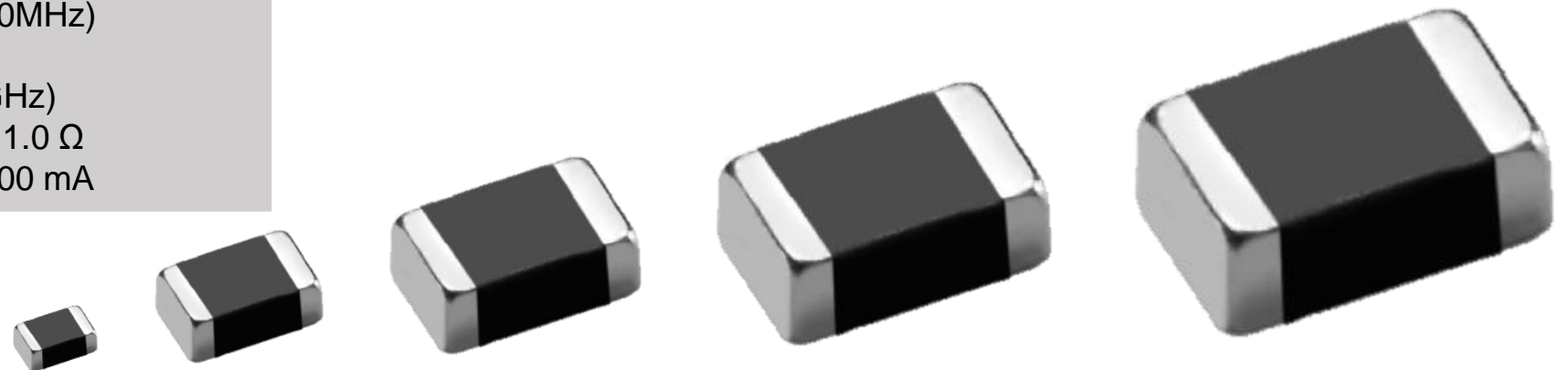
## High Frequency & Current Line

### I Material

- 2220
- 550  $\Omega$
- DCR: 0.035  $\Omega$
- RC: 4000 mA
- Test Freq: 100 MHz

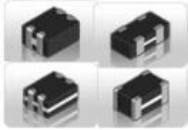
### K Material

- 0603
- 1000  $\Omega$  (@100MHz)
- 900  $\Omega$  (@1GHz)
- DCR: 1.0  $\Omega$
- RC: 100 mA



# Common Mode Filter

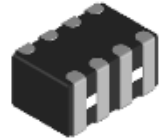
Size (inch)



**CMX high cut-off frequency**

Size  
0504/0805  
Impedance @100MHz  
50 up to 120 Ω

For USB, LVDS, MIPI, MHL, HDMI, serial interface in mobile device



**CMA**

Size  
1206  
Impedance @100MHz  
90 up to 180 Ω

For USB, LVDS



**PCM**

Size  
7.0\*6.0\*3.8/  
9.0\*7.0\*4.8 mm  
Impedance @100MHz  
300 up to 1020 Ω

For power line noise countermeasure of various electronic equipment, noise countermeasure of laptop and PC



**CMX general**

Size  
0504/0805/1206  
Impedance @100MHz  
67 up to 220 Ω

For USB, LVDS, MIPI, MHL, HDMI, serial interface in mobile device



**CMC**

Size  
4.8\*5.0\*2.3 mm  
Impedance  
@10MHz  
20 up to 100 Ω  
@100MHz  
250 up to 1500 Ω

For power line countermeasure of electronic equipment



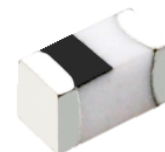
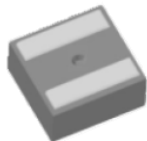
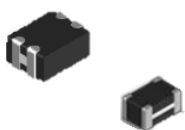
**CM**

Size  
0805/1206  
Impedance @100MHz  
30 up to 2200 Ω

For EMI radiation noise suppression, USB, LVDS, DVC, STB

Inductance  
→ (nH)

Impedance Range @100MHz: 15 up to 2200 Ω



## CMX..A

size  
0504/0805 inch  
impedance  
67 up to 220  $\Omega$

**For** USB, LVDS,  
MIPI, MHL serial  
interface in mobile  
device

## SDA..A

size  
7.2\*6.9\*2.8 mm  
inductance  
0.18 up to 4.5  $\mu$ H  
DCR  
1.6~23 m $\Omega$

**For** DC-DC converter,  
PC power system  
including IMVP-6

## SDE..A

size  
4.45\*4.06\*1.8~17.6\*16.9\*6.7 mm  
inductance  
1.0 up to 47  $\mu$ H  
DCR  
12~215 m $\Omega$

**For** DC-DC converter,  
PC power system including IMVP-6

## CFH..A

size  
1210/1812 inch  
impedance  
550 up to 5800  $\Omega$   
Inductance  
11 up to 100  $\mu$ H  
DCR  
0.4~2.0  $\Omega$

**For** DSI, BST, CAN-bus,  
flex-ray

## CL-SA

size  
0201/0402 inch  
inductance  
0.3 up to 100 nH

**For** RF & wireless  
communication, low –  
voltage power supply  
module

## CBM..A

(General/High Speed/High Current)  
size  
0402~1808 inch  
impedance  
70 up to 2500  $\Omega$   
DCR  
0.1~1.5  $\Omega$   
RC  
50~6000 mA

**For** circuit where a stable ground is  
unavailable, and same as CBM

# Application 1

## EV Charging



Molding



Bead



SDIA Inductor



CMH Common Mode Inductor



MLH Low Freq. Inductor



WL High Freq. Inductor



CBM Bead



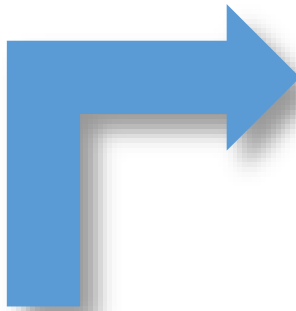
## Network Communication





# Application 2

Outdoor Power Supply



SDB Molding Inductor



SDIA Inductor



WL High Freq. Inductor



MLH Low Freq. Inductor



CBM Bead



Automotive



Molding Inductor



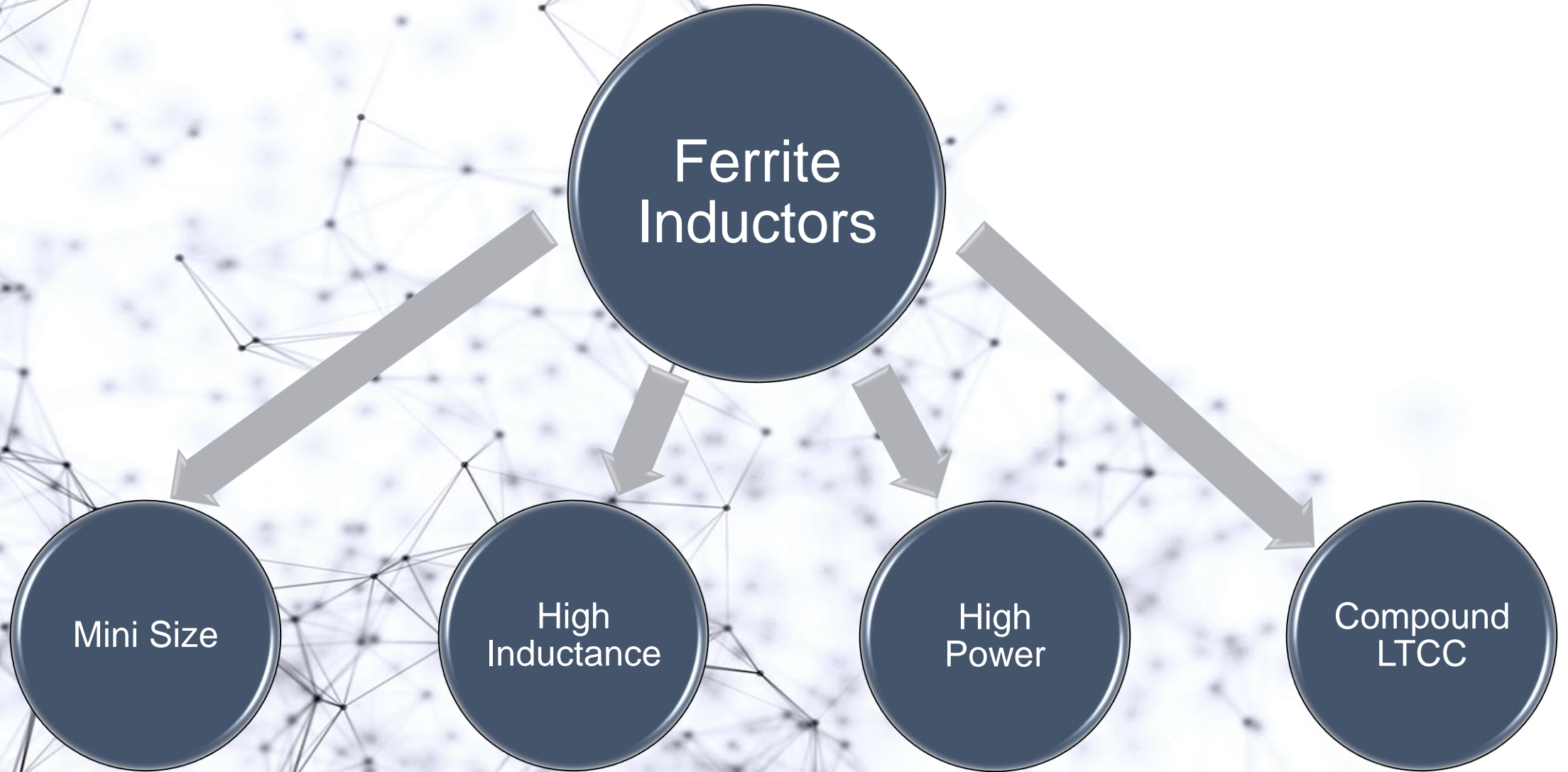
WL High Freq. Inductor



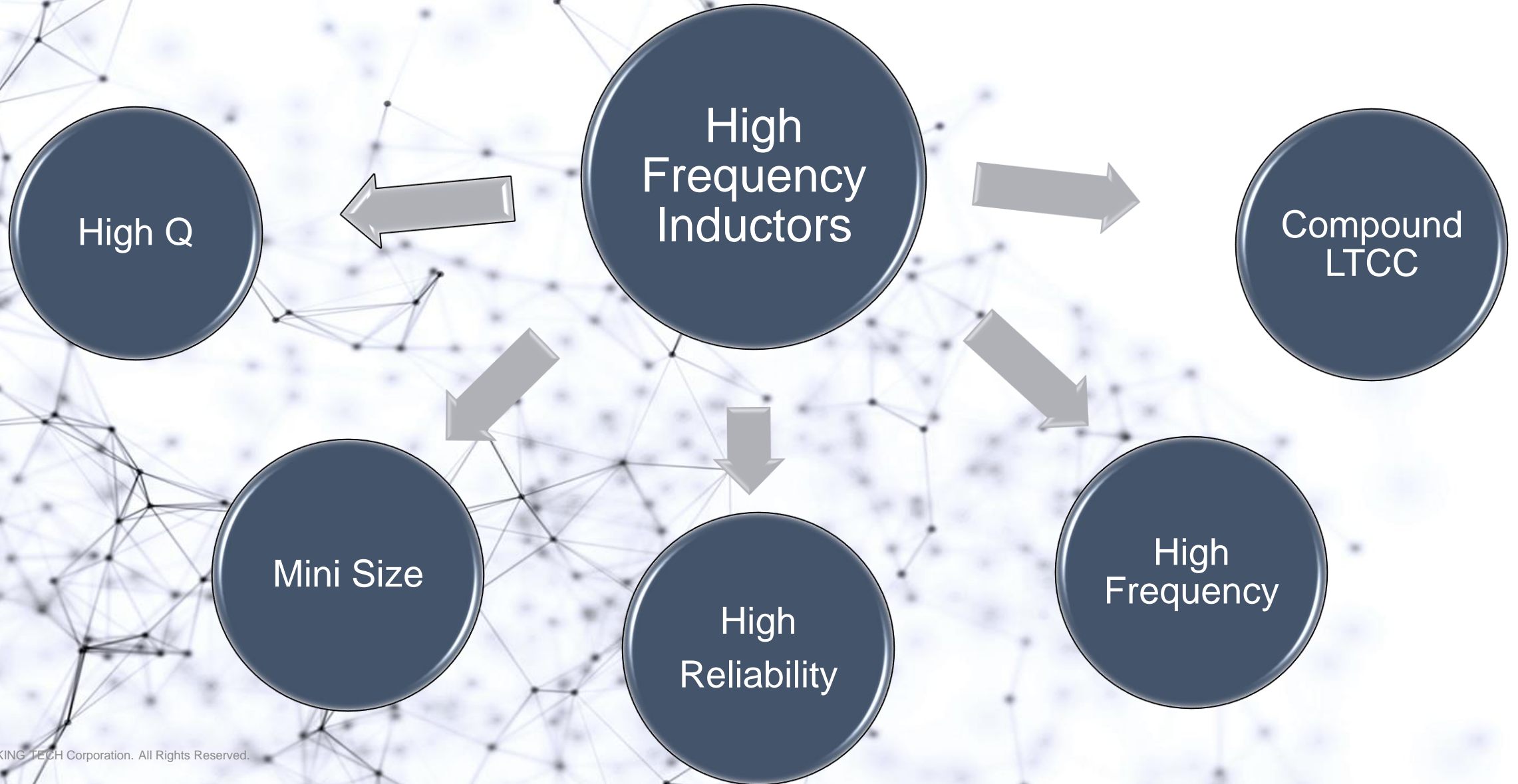
CBM Bead



# Roadmap Ferrite Inductors

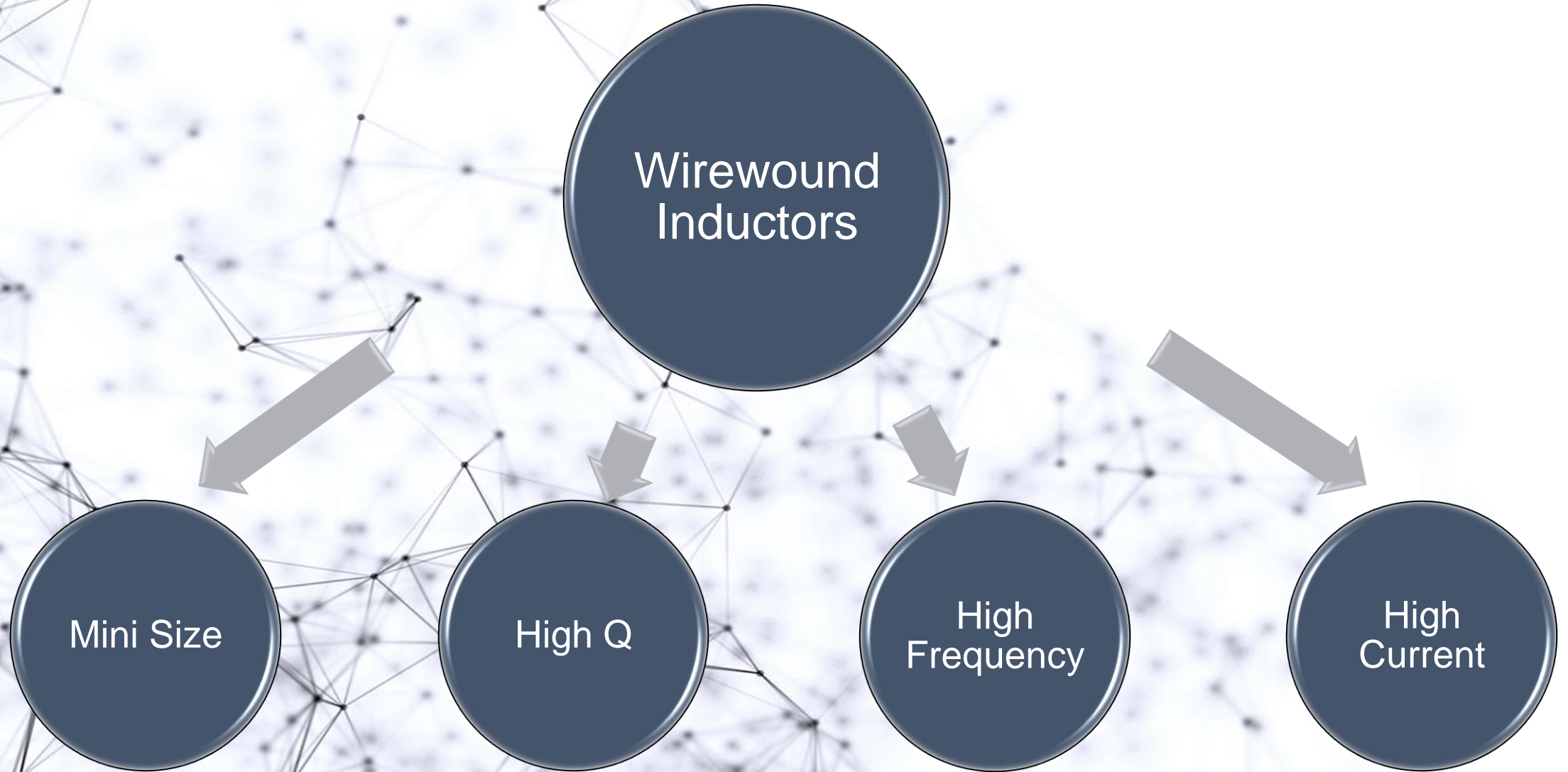


# Roadmap High Frequency Inductors





# Roadmap Wirewound Inductors





# Cross Reference

Type	RF Inductor	Equivalent series					
	Viking P/N	Murata	TDK	TOKO	Coil craft	Taiyo-Yuden	KOA
Thin film	AL0201(0603)	LQP03T	-	-	-	-	KL731H (0603)
Thin film	AL0402(1005)	LQP15M/T	-	-	-	-	KL731E(1005)
Thin film	AL0603(1608)	LQP18M	-	-	-	-	KL731J(1608)
Multilayer	CL0402 (1005)	LQG15H	MLG1005	LL1005	-	HK1005	MHL1E(1005)
Multilayer	CL0603(1608)	LQG18H	MLG1608	LL1608	-	HK1608	MHL1J(1608)
Multilayer	CL0805(2012)	-	-	LL2012	-	HK2015	-
Ceramic/Wire Wound	WL0402(1005)	LQW15A	-	LLQ1005	0402CS	-	KQT0402
Ceramic/Wire Wound	WL0603(1608)	LQW18A	-	LLQ1608	0603CS/HC	-	KQ0603/KQC
Ceramic/Wire Wound	WL0805(2012)	LQW2BH	-	LLQ2012	0805CS/HQ/HT	-	KQ0805
Ceramic/Wire Wound	WL1008(2520)	-	-	-	1008CS/HQ/HT	-	KQ1008
Ceramic/Wire Wound	WL1206(3216)	LQW31H	-	-	1206CS	-	-
Ferrite /Wire wound	NL05(2012)	-	-	-	0805LS	LB2012	-
Ferrite /Wire wound	NL08(2520)	-	NLV25T	LLM2520	1008LS	LB2518	-
Ferrite /Wire wound	NL10(3225)	-	NLV32T	LLM3225	-	LB3218	-
Ferrite /Wire wound	NL12(4532)	-	NL453232T	-	1812LS	-	KL32
Ferrite /Wire wound	NL20(5650)	-	NL565050T	-	-	-	-
Multilayer/Ferrite	ML0603(1608)	LQM18N	MLF1608	-	-	LK1608	MCL1J
Multilayer/Ferrite	ML0805(2012)	LQM21N	MLF2012	-	-	LK2125	MCL2A
Multilayer/Ferrite	ML1206(3216)	-	-	-	-	-	MCL2B



**【CL-S Series】**

**Multilayer Chip Inductor**



VIKING	Murata	Taiyo Yuden	TDK	Chilisin	Sunlord	INPAQ
CL01Q-S	-	HK0603	MLG0603S	BSCH_060303	SDCL0603Q_02	MCI0603HQ
CL01-SM02(風華) CL01Q-SS(佳邦)	LQP03TN	HKQ0603W	MLG0603P	BSCQ_060303	SDCL0603Q_B03	MCI0603TN
CL02-S	LQG15HS	HK1005	MLG1005S	BSCH00100505	SDCL1005C	MCI1005HQ
CL03-S	LQG18HN	HK1608		BSCH00160808	SDCL1608C	MCI1608HQ
CL02Q-S/CL02F-S	-	-	-	-	HQ1005/SDHL1005	-
CL03F-S	-	-	-	-	SDHL1608	-
CL02-SA(佳邦) CL02-GA(風華)	LQG15HH_02	HK1005	MLG1005S	ASCH100505	ASDCL1005D	MCI1005HZ
CL03-SA(佳邦) CL03-GA(風華)	LQG18HH_00	-	-	ASCH160808	ASDCL1608D	MCI1608HZ
CL01Q-SA	LQP03TN_Z2	HK0603	MLG0603S	ASCQ060303	ASDCL0603Q	MCI0603NZ