INNOVATOR IN ELECTRONICS

MURATA PRODUCTS
Lineup 2021

K70E.pdf
Jan.6,2021

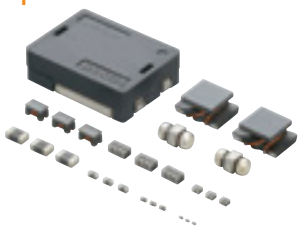
2021 MURATA PRODUCTS Lineup

Capacitors

p2

Noise Suppression Products/EMI Suppression Filters

p43



Inductors (Coils)

p50

Resistors

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Timing Devices

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Filters

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RF Components

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Sensors

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Thermistors

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Power Devices

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Batteries

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Sound Components (Buzzer)

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Others

Application Guides

Capacitors

The most comprehensive product lineup in the industry, providing ideal solutions, responding to all possible requirements.

Summary

Using Murata' s unique ceramic material technology, we offer a wide lineup of products. Murata also offers technical support that includes design kits and a comprehensive set of software tools to simulate virtually any circuit condition, satisfying the demands of many applications. We are also expanding our lineup of products that use non-ceramic dielectric materials, such as silicon capacitors, to support various applications.

Lineup

- ●Ceramic Capacitors (SMD, lead type)
- ●Polymer Aluminum Electrolytic Capacitors
- ●Single-Layer Microchip Capacitors
- ●Thin Film Circuit Substrates (RUSUB) ●Variable Capacitors
- ●Silicon Capacitors ●Film Capacitors

https://www.murata.com/en-global/products/capacitor

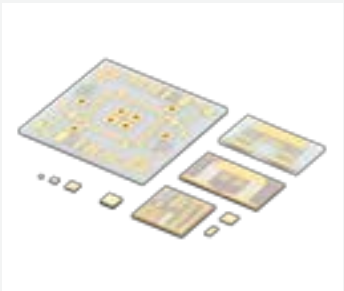
Ceramic Capacitors

p4

Murata offers the No. 1 most abundant lineup in the industry, responding to all possible needs, and proposing ideal solutions.

Polymer Aluminum Electrolytic Capacitors

These are high-capacity capacitors that are characterized by a low profile and low ESR. They handle the stabilization of voltage in circuits where serious voltage control is demanded, and contribute to the advanced features in customer products.



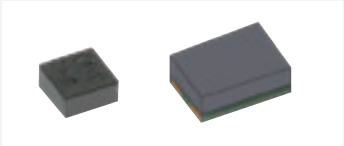
Single-Layer Microchip Capacitors

p32

Simple single-layer structure provides very reliable performance and excellent frequency characteristics. A wide selection of sizes from 0.25mm square enables the miniaturization of the circuit and higher density.

Thin Film Circuit Substrates (RUSUB)

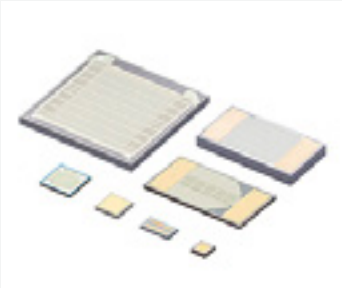
RUSUB technology combines capacitor and thin film resistor in one chip.
Custom specifications (dimensions, capacitance values, etc.) are also available upon request.



Variable Capacitors

p36

Variable capacitors can carry out the variable of the capacitor by adjusting the tuning voltage.
They are designed for frequency matching use for HF band (13.56MHz).



Silicon Capacitors

p36

Murata High-Density Silicon Capacitors are based on a MOS Semiconductor technology and utilize a 3D structure that substantially increases their performance and enables compact design. Silicon Capacitors offer small size and low thickness, superior reliability, and stability over high temperatures and high frequencies. They are the ideal choice for all demanding markets, such as Networking (RF Power and Broadband), Medical (Implantable devices), Automotive, or High-Reliability applications. Murata can provide customized Silicon Capacitors or Integrated Passive Devices (IPDs) to optimize your design.

Film Capacitors

p42

The FH series uses materials with high heat resistance. Therefore, it has a higher allowable ripple current under a higher temperature environment than conventional PP film capacitors.
This feature is more prominent in the high-frequency range. For example, when the ambient temperature is at 105°C, the PP film capacitors would be already at its limit for allowable ripple current, but because of the higher heat resistance of the FH series, the allowable ripple current can be increased drastically.

WEB Product Search Engine

https://www.murata.com/search/productsearch?cate=cgsubCeramicCapacitors

You can search for products in a variety of ways, including part number, specifications, and lineup.

1 Search by Part Number

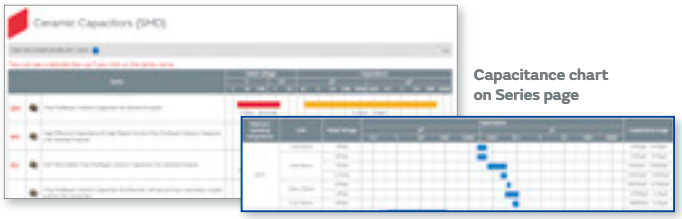
You can search for capacitors by specifying the alphanumeric characters in the part number. The packing codes shown contain the substitute character "#". If you enter the official packing code, part numbers that contain that packing code will be matched.

2 Search by Specifications

You can search for SMD or lead type capacitors by indicating specifications such as application, capacitance, rated voltage, or temperature characteristics.
You can narrow your search by entering values of ranges, and by specifying product characteristics. The items for narrowing searches are linked, so specifying one condition causes selectable options for the other items to allow input only of conditions that match the relevant part numbers.

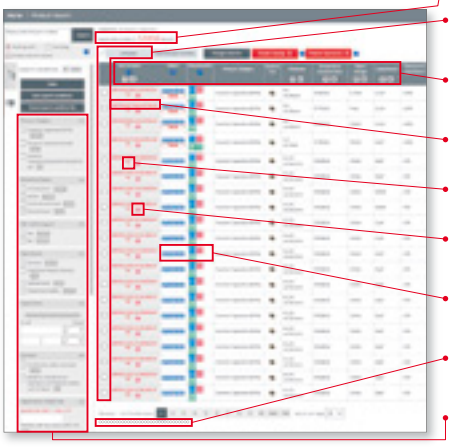
3 Search in the Lineups

You can search for capacitors by specifying the series lineup.
You can also confirm items such as characteristics and applications on each series page.



Capacitance chart on Series page

Search results



- Displays the number of hits for the current search conditions in real time.
- Compares the characteristics of the checked ☑part numbers.
- Click the ▲mark for each item to switch between ascending and descending display.
- Click a product name to display a details page listing more in-depth information.
- You can download detailed spec sheets.
- For same products it is possible to request a free sample.
- Icons enable you to check the status and characteristics of products at a glance.
- You can confirm the current conditions for narrowing the search results.
- You narrow the search results to match the selected condition in real time.

Ceramic Capacitors, Polymer Aluminum Electrolytic Capacitors

Icons

General	For applications that do not require a particular reliability, such as general equipment.
Info-tainment	Infotainment for Automotive Products for entertainment equipment like car navigation, car audio, and body control equipment like wipers and power windows.
Power-train	Powertrain/Safety for Automotive Products used for applications (running, turning, stopping, and safety devices) that particularly concern human life, such as in devices for automotive.
Medical Device	Medical-grade products for Implanted Medical Devices These products are intended for use in implanted medical devices such as cardiac pacemakers, cochlear implants, insulin pumps, and gastric electrostimulators. They are suitable for use in non-critical circuits.*1 *1 Non-critical circuits This term refers to circuits in implanted medical devices that are not directly linked to life support, i.e., circuits that will not directly endanger the life of the patient should the functionality of the device be reduced or halted by failure of the circuit.
AEC-Q200	AEC-Q200 compliant product
Safety standard	Products that acquired safety standard certification IEC60384-14.
Japanese Safety Law	Products that are based on the Electrical Appliance and Material Safety Law of Japan.
High Q	Low dissipation for high frequency By devising ceramic materials and electrode materials, low dissipation is achieved in frequency bands of VHF, UHF, and microwave or beyond.
Low ESL	Low inductance This capacitor is designed so that the parasitic inductance component (ESL) that the capacitor has on the high frequency side becomes lower.
Deflecting crack	Product resistant to deflection cracking This capacitor is designed to prevent failures as much as possible by short mode caused by cracking when there is board deflection.
Soldering crack	Product with solder cracking suppression This capacitor is configured with metal terminals and leads connected to the chip. The metal terminals and leads relieve the stress from expansion and contraction of the solder, to suppress solder cracking.
Low acoustic noise	Product suitable for acoustic noise reduction and low distortion This product suppresses acoustic noise, which occurs when a ceramic capacitor is used, by devising the materials and configuration.
Effective Cap	No DC bias characteristics Polymer capacitor is no capacitance change with DC bias due to aluminum oxidized film for dielectric.
EMI Filter	Low-inductance product suitable for noise suppression This product has extremely low ESL and is suitable for suppression of noise, including high frequencies.
Bonding	Product for bonding Since gold is used for the external electrodes, the capacitor can be mounted by die bonding/wire bonding.
Limited to conductive glue mounting	Limited to Conductive Glue Mounting Since silver palladium is used for the external electrodes, the capacitor can be mounted by conductive adhesive.

Product Lineup

For general

General

SMD

Solder mounting

Chip type

GRM			p6
GR3	Low acoustic noise	High effective capacitance & high ripple current	p8
GRJ	Deflecting crack	Soft termination	p8
GR4		For information devices only	p9
GJM	High Q		p9
GQM	High Q		p10
GA2	Japanese Safety Law	Based on the Electrical Appliance and Material Safety Law of Japan	p10
GA3	Safety standard		p10
LLL	Low ESL	LW reversed	p11
LLA	Low ESL	8 terminals	p12
LLM	Low ESL	10 terminals	p12
LLR	Low ESL	LW reversed controlled ESR	p12
NFM	Low ESL, EMI Filter	3 terminals	p12
GJ4	Low acoustic noise	Low distortion	p13

On interposer board

ZRA	Low acoustic noise		p13
ZRB	Low acoustic noise		p13

Metal terminal type

KRM	Low acoustic noise, Deflecting crack, Soldering crack		p14
KR3	Low acoustic noise, Deflecting crack, Soldering crack	High effective capacitance & high ripple current	p14

Resin molding SMD type

DK1	Safety standard		p30

Polymer Aluminum Electrolytic Capacitors

ECAS	Low acoustic noise, Deflecting crack, Effective Cap		p31

Wire bonding mounting

Bonding

Chip type

GMA		Microchip	p14
GMD			p15

Lead type

Solder mounting

RDE	Low acoustic noise, Deflecting crack, Soldering crack		p24
DE1	Safety standard	X1/Y1 Class certified product	p26
DE2	Safety standard	X1/Y2 Class certified product	p27

Infotainment for automotive

Infotainment, AEC-Q200

SMD

Solder mounting

Chip type

GRT			p15
NFM	Low ESL, EMI Filter	3 terminals	p17

Powertrain/Safety for automotive

Powertrain, AEC-Q200

SMD

Solder mounting

Chip type

GCM			p17
GC3	Low acoustic noise	High effective capacitance & high ripple current	p18
GCJ	Deflecting crack	Soft termination	p19
GCQ	High Q		p20
GCD	Deflecting crack	MLSC design	p20
GCE	Deflecting crack	Soft termination MLSC design	p20
LLC	Low ESL	LW reversed	WEB
NFM	Low ESL, EMI Filter	3 terminals	p20

Metal terminal type

KCM	Low acoustic noise, Deflecting crack, Soldering crack		p21
KC3	Low acoustic noise, Deflecting crack, Soldering crack	High effective capacitance & high ripple current	p21
KCA	Safety standard, Low acoustic noise, Deflecting crack, Soldering crack		p21

Limited to Conductive Glue Mounting

Limited to conductive glue mounting

Chip type

GCB	Deflecting crack, Soldering crack	Ni plating + Pd plating termination conductive glue mounting	p22
GCG	Deflecting crack, Soldering crack	AgPd termination conductive glue mounting	p22

Lead type

Solder mounting

RCE	Low acoustic noise, Deflecting crack, Soldering crack		p28
RHE	Low acoustic noise, Deflecting crack, Soldering crack	150°C operation leaded	p29
RHS	Low acoustic noise, Deflecting crack, Soldering crack	200°C operation leaded	p30
DE6	Safety standard		p30

Medical-grade products for implanted medical devices

Medical Device

SMD

Solder mounting

Chip type

GCH			p23

Ceramic capacitors SMD type For General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose

GRM

Temperature Compensating Type

General

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
			0.1p 1p 10p 100p 1000p 10000p 0.1μ 1μ 10μ 100μ 1000μ
GRM01	0.25X0.125 <008004>	25	0.20pF – 100pF
		16	0.20pF – 100pF
GRM02	0.4X0.2 <01005>	50	0.20pF – 100pF
		35	100pF
		25	0.20pF – 220pF
		16	0.20pF – 220pF
		10	51pF – 220pF
		6.3	51pF – 220pF
GRM03	0.6X0.3 <0201>	100	0.10pF – 100pF
		50	0.10pF – 1000pF
		25	0.10pF – 1000pF
GRM15	1.0X0.5 <0402>	100	120pF – 1000pF
		50	270pF – 8200pF
		35	10000pF
		25	10000pF
		10	2400pF – 4700pF
GRM18	1.6X0.8 <0603>	250	10pF – 47pF
		100	1000pF – 3900pF
		50	1000pF – 10000pF
		10	5600pF – 33000pF
		6.3	24000pF – 33000pF
GRM21	2.0X1.25 <0805>	630	10pF – 2200pF
		250	10pF – 10000pF
		200	10pF – 5600pF
		100	1000pF – 22000pF
		50	2400pF – 47000pF
		10	33000pF – 0.10μF
GRM31	3.2X1.6 <1206>	2000	10pF – 68pF
		1000	10pF – 1000pF
		630	10pF – 10000pF
		500	10pF – 4700pF
		250	6800pF – 22000pF
		200	6800pF – 10000pF
		100	4300pF – 0.10μF
		50	11000pF – 0.22μF
		25	0.15μF – 0.22μF
GRM32	3.2X2.5 <1210>	2000	82pF – 220pF
		1000	1200pF – 2200pF
		630	1200pF – 33000pF
		500	1200pF – 10000pF
GRM42	4.5X2.0 <1808>	3150	10pF – 100pF
GRM43	4.5X3.2 <1812>	1000	2700pF – 4700pF
		630	12000pF – 22000pF
		500	12000pF – 22000pF
GRM55	5.7X5.0 <2220>	1000	5600pF – 10000pF
		630	27000pF – 47000pF
		500	27000pF – 47000pF

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High Dielectric Constant Type

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GRM01	0.25X0.125 <008004>	10	100pF – 680pF
		6.3	1000pF – 10000pF
		4	3300pF – 10000pF
GRM02	0.4X0.2 <01005>	16	56pF – 10000pF
		10	56pF – 0.10μF
		6.3	680pF – 0.47μF
		4	15000pF – 0.47μF
		2.5	0.10μF – 0.47μF
GRM03	0.6X0.3 <0201>	50	100pF – 1500pF
		35	0.10μF
		25	100pF – 0.22μF
		16	100pF – 2.2μF
		10	1000pF – 2.2μF
		6.3	1200pF – 4.7μF
		4	12000pF – 4.7μF
		2.5	0.22μF – 4.7μF
GRM15	1.0X0.5 <0402>	100	220pF – 0.10μF
		50	2200pF – 1.0μF
		35	0.22μF – 2.2μF
		25	22000pF – 2.2μF
		16	22000pF – 2.2μF
		10	47000pF – 22μF
		6.3	22000pF – 22μF
		4	0.47μF – 22μF
		2.5	2.2μF – 22μF
GRM18	1.6X0.8 <0603>	100	10000pF – 0.10μF
		50	0.22μF – 2.2μF
		35	0.47μF – 10μF
		25	0.22μF – 10μF
		16	0.47μF – 10μF
		10	2.2μF – 22μF
		6.3	2.2μF – 47μF
		4	2.2μF – 47μF
		2.5	10μF – 47μF
GRM21	2.0X1.25 <0805>	100	47000pF – 1.0μF
		50	0.47μF – 10μF
		35	1.0μF – 10μF
		25	2.2μF – 22μF
		16	4.7μF – 22μF
		10	4.7μF – 47μF
		6.3	10μF – 100μF
		4	22μF – 100μF
		2.5	47μF – 100μF
GRM31	3.2X1.6 <1206>	100	4.7μF
		50	4.7μF – 10μF
		35	10μF
		25	10μF – 22μF
		16	22μF – 47μF
		10	22μF – 100μF
		6.3	22μF – 220μF
		4	22μF – 220μF
		2.5	220μF
GRM32	3.2X2.5 <1210>	100	10μF
		25	22μF
		16	22μF – 47μF

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Ceramic Capacitor, Polymer Aluminum Electrolytic Capacitors

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GRM32	3.2X2.5 <1210>	10	47µF 100µF
		6.3	47µF 220µF
		4	100µF 330µF
		2.5	220µF 330µF
GRM43	4.5X3.2 <1812>	1250	33000pF 47000pF
		1000	33000pF 0.10µF
		630	68000pF 0.10µF
		500	0.15µF 0.22µF
		250	0.15µF 0.47µF
GRM55	5.7X5.0 <2220>	1250	68000pF 0.10µF
		1000	68000pF 0.22µF
		630	0.15µF 0.22µF
		500	0.33µF 0.47µF
		250	0.33µF 1.0µF
		200	0.33µF 1.0µF
GRMJN	1.8X1.0 <0704>	16	20µF 22µF
		6.3	43µF
GRMMD	0.5X0.25 <015008>	6.3	1.0µF

High Effective Capacitance & High Ripple Current Chip Multilayer Ceramic Capacitors for General Purpose

GR3

General | Low acoustic noise

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GR321	2.0X1.25 <0805>	250	10000pF 22000pF
GR331	3.2X1.6 <1206>	630	10000pF 15000pF
		450	10000pF 47000pF
		250	33000pF 68000pF
GR332	3.2X2.5 <1210>	630	22000pF 47000pF
		450	68000pF 0.10µF
		250	0.10µF 0.15µF
GR343	4.5X3.2 <1812>	630	68000pF
		450	0.15µF
		250	0.22µF 0.33µF
GR355	5.7X5.0 <2220>	630	0.10µF 0.22µF
		450	0.22µF 0.47µF
		250	0.47µF 1.0µF

Chip Multilayer Ceramic Capacitors with Soft Termination for General Purpose

GRJ

General | Deflecting crack

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GRJ03	0.6X0.3 <0201>	10	1.0µF
		6.3	1.0µF
GRJ15	1.0X0.5 <0402>	6.3	10µF
GRJ18	1.6X0.8 <0603>	10	10µF
		6.3	4.7µF 10µF
GRJ21	2.0X1.25 <0805>	100	1.0µF

Continued on the following page.↗

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GRJ21	2.0X1.25 <0805>	25	10μF
GRJ31	3.2X1.6 <1206>	100	4.7μF
		50	4.7μF
GRJ32	3.2X2.5 <1210>	25	22μF
		10	47μF
GRJ43	4.5X3.2 <1812>	1000	33000pF 47000pF
		630	68000pF 0.10μF
		250	0.15μF 0.47μF
GRJ55	5.7X5.0 <2220>	1000	68000pF 0.10μF
		630	0.15μF 0.22μF
		250	0.33μF 1.0μF

Chip Multilayer Ceramic Capacitors for Ethernet LAN and primary-secondary coupling of DC-DC converters

GR4

General

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GR442	4.5X2.0 <1808>	2000	100pF 1500pF
GR443	4.5X3.2 <1812>	2000	1800pF 4700pF
GR455	5.7X5.0 <2220>	2000	10000pF

Chip Multilayer Ceramic Capacitors for Splitter Circuit of G-Fast, xDSL

GR4

General

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GR431	3.2X1.6 <1206>	630	1000pF 4700pF
GR432	3.2X2.5 <1210>	630	5600pF 15000pF

High Q Chip Multilayer Ceramic Capacitors for General Purpose (≤100Vdc)

GJM

General High Q

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GJM02	0.4X0.2 <01005>	25	0.20pF 22pF
		16	0.20pF 22pF
GJM03	0.6X0.3 <0201>	100	0.30pF 15pF
		50	0.20pF 15pF
		25	0.20pF 33pF
		6.3	22pF 33pF
GJM15	1.0X0.5 <0402>	50	0.10pF 47pF

Continued on the following page. ↗

High Q Chip Multilayer Ceramic Capacitors for General Purpose (>100Vdc)

GQM

General High Q

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GQM15	1.0X0.5 <0402>	200	0.10pF – 33pF
GQM18	1.6X0.8 <0603>	250	0.10pF – 100pF
GQM21	2.0X1.25 <0805>	500	0.20pF – 22pF
		250	0.20pF – 150pF
GQM22	2.8X2.8 <1111>	500	0.30pF – 100pF

Based on the Electrical Appliance and Material Safety Law of Japan Chip Multilayer Ceramic Capacitors for General Purpose

GA2

General Japanese Safety Law

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vac (r.m.s.))	Capacitance Range (F)
GA242	4.5X2.0 <1808>	250	470pF – 1000pF
GA243	4.5X3.2 <1812>	250	2200pF – 47000pF
GA255	5.7X5.0 <2220>	250	0.10μF

Safety Standard Certified Chip Multilayer Ceramic Capacitors for General Purpose Type GB / IEC60384-14 Class X2

GA3 Type GB

General Safety standard

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vac (r.m.s.))	Capacitance Range (F)
GA355	5.7X5.0 <2220>	250	10000pF – 56000pF

Safety Standard Certified Chip Multilayer Ceramic Capacitors for General Purpose Type GD / UL60950-1

GA3 Type GD

Temperature Compensating Type

General Safety standard

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vac (r.m.s.))	Capacitance Range (F)
GA342	4.5X2.0 <1808>	250	10pF – 82pF

High Dielectric Constant Type

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vac (r.m.s.))	Capacitance Range (F)
GA342	4.5X2.0 <1808>	250	100pF – 1500pF
GA343	4.5X3.2 <1812>	250	1800pF – 4700pF

Continued on the following page. ↗

Safety Standard Certified Chip Multilayer Ceramic Capacitors for General Purpose Type GF / IEC60384-14 Class X1/Y2 and UL60950-1

GA3 Type GF

Temperature Compensating Type

General Safety standard

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vac (r.m.s.))	Capacitance Range (F)
GA342	4.5X2.0 <1808>	250	10pF – 82pF

High Dielectric Constant Type

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vac (r.m.s.))	Capacitance Range (F)
GA342	4.5X2.0 <1808>	250	100pF – 1000pF
GA352	5.7X2.8 <2211>	250	100pF – 1500pF
GA355	5.7X5.0 <2220>	250	1800pF – 4700pF

LW Reversed Low ESL Chip Multilayer Ceramic Capacitors for General Purpose

LLL

General Low ESL

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
LLL15	0.5X1.0 <0204>	10	0.10µF
		6.3	0.10µF – 0.22µF
		4	0.10µF – 1.0µF
		2.5	0.10µF – 1.0µF
LLL1U	0.6X1.0 <02404>	4	4.3µF
		2.5	4.3µF
LLL18	0.8X1.6 <0306>	50	2200pF – 4700pF
		25	10000pF – 22000pF
		16	10000pF – 47000pF
		10	0.10µF – 0.22µF
		6.3	0.22µF – 2.2µF
		4	0.22µF – 4.7µF
LLL21	1.25X2.0 <0508>	50	10000pF – 22000pF
		25	10000pF – 0.10µF
		16	22000pF – 0.22µF
		10	0.22µF – 1.0µF
		6.3	0.47µF – 1.0µF
		4	1.0µF – 2.2µF
LLL31	1.6X3.2 <0612>	50	10000pF – 0.10µF
		25	22000pF – 0.47µF
		16	22000pF – 1.0µF
		10	0.47µF – 2.2µF
		6.3	2.2µF – 10µF

Continued on the following page. ↗

8 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose

LLA

General Low ESL

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
			0.1p 1p 10p 100p 1000p 10000p 0.1μ 1μ 10μ 100μ 1000μ
LLA18	1.6X0.8 <0603>	4	0.10μF – 2.2μF
LLA21	2.0X1.25 <0805>	25	10000pF – 47000pF
		16	47000pF – 0.22μF
		10	47000pF – 0.47μF
		6.3	0.22μF – 1.0μF
		4	22000pF – 4.7μF

10 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose

LLM

General Low ESL

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
			0.1p 1p 10p 100p 1000p 10000p 0.1μ 1μ 10μ 100μ 1000μ
LLM21	2.0X1.25 <0805>	25	10000pF – 22000pF
		16	47000pF – 0.10μF
		6.3	0.22μF – 0.47μF
		4	1.0μF

LW Reversed Controlled ESR Low ESL Chip Multilayer Ceramic Capacitors for General Purpose

LLR

General Low ESL

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	ESR (mΩ)				Capacitance Range
			100	220	470	1000	
LLR18	0.8X1.6 <0306>	4					1.0μF

3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose

NFM

General Low ESL EMI Filter

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
			0.1p 1p 10p 100p 1000p 10000p 0.1μ 1μ 10μ 100μ 1000μ
NFM15	1.0X0.5 <0402>	16	2200pF – 47000pF
		10	2200pF – 0.22μF
		6.3	0.10μF – 1.0μF
		4	0.47μF – 14μF
		2.5	4.3μF – 9.1μF
NFM18	1.6X0.8 <0603>	16	100pF – 0.10μF
		10	2.2μF
		6.3	0.22μF – 10μF
NFM21	2.0X1.25 <0805>	50	220pF – 22000pF
		25	0.10μF
		16	0.22μF – 1.0μF
		10	1.0μF – 4.7μF
		6.3	2.2μF – 10μF

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Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
NFM3D	3.2X1.25 <1205>	50	220pF – 22000pF
NFM31	3.2X1.6 <1206>	100	10000pF – 0.10μF
		50	10000pF – 0.10μF
		6.3	27μF
NFM41	4.5X1.6 <1806>	100	470pF – 22000pF
		50	1.5μF
		25	1.5μF
NFMJM	1.2X0.9 <05035>	4	15μF – 22μF
		2.5	22μF

Low Distortion Chip Multilayer Ceramic Capacitors for General Purpose

GJ4

General | Low acoustic noise

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GJ421	2.0X1.25 <0805>	25	0.10μF – 0.33μF
GJ431	3.2X1.6 <1206>	100	0.10μF
		25	0.47μF – 1.0μF

Low Acoustic Noise Chip Multilayer Ceramic Capacitors on Interposer Board for General Purpose

ZRA

General | Low acoustic noise

Series	LXW (mm)	Rated Voltage (Vdc)	Capacitance Range (F)
ZRA21	2.4X1.65	25	22μF
		16	22μF
		6.3	47μF
		4	47μF

Low Acoustic Noise Chip Multilayer Ceramic Capacitors on Interposer Board for General Purpose

ZRB

General | Low acoustic noise

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
ZRB15	1.0X0.5 <0402>	25	2.2μF
		16	2.2μF
		10	2.2μF – 10μF
		6.3	4.7μF – 10μF
ZRB18	1.6X0.8 <0603>	35	4.7μF
		25	4.7μF – 10μF
		16	10μF
		10	10μF – 22μF
		6.3	10μF – 47μF
		4	22μF

Continued on the following page. ↗

Metal Terminal Type Multilayer Ceramic Capacitors for General Purpose

KRM

Temperature Compensating Type

General | Deflecting crack | Soldering crack | Low acoustic noise

Series	LXW (mm)	Rated Voltage (Vdc)	Capacitance Range (F)
KRM55	6.1X5.1	1250	8200pF – 10000pF
		1000	8200pF – 20000pF
		630	15000pF – 94000pF

High Dielectric Constant Type

Series	LXW (mm)	Rated Voltage (Vdc)	Capacitance Range (F)
KRM21	2.2X1.25	25	10μF – 22μF
		16	10μF
KRM31	3.5X1.7	100	1.0μF
		50	4.7μF
		35	10μF
		25	10μF
	3.6X1.7	50	2.2μF
	3.7X1.85	100	2.2μF
KRM55	6.1X5.3	1000	68000pF – 0.22μF
		630	0.15μF – 0.47μF
		450	0.33μF – 1.0μF
		250	0.68μF – 2.2μF
		100	4.7μF – 22μF
		63	4.7μF – 22μF
		50	4.7μF – 33μF
		35	10μF – 47μF
		25	15μF – 100μF

High Effective Capacitance & High Allowable Ripple Current Metal Terminal Type Multilayer Ceramic Capacitors for General Purpose

KR3

General | Deflecting crack | Soldering crack | Low acoustic noise

Series	LXW (mm)	Rated Voltage (Vdc)	Capacitance Range (F)
KR355	6.1X5.3	630	0.10μF – 0.56μF
		450	0.22μF – 1.2μF
		250	0.47μF – 2.2μF

Wire Bonding Mount Multilayer Microchip Capacitors for General Purpose

GMA

General | Bonding

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GMA0D	0.38X0.38 <015015>	6.3	10000pF
		10	820pF – 10000pF

Continued on the following page. ↗

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
			0.1p 1p 10p 100p 1000p 10000p 0.1μ 1μ 10μ 100μ 1000μ
GMA05	0.5X0.5 <0202>	100	100pF – 1000pF
		50	100pF – 1000pF
		25	1500pF – 4700pF
		16	430pF – 4700pF
		10	6800pF – 22000pF
		6.3	6800pF – 0.10μF
GMA08	0.8X0.8 <0303>	100	330pF – 6800pF
		50	330pF – 6800pF
		25	10000pF – 22000pF
		16	1000pF – 22000pF
		10	33000pF – 0.10μF
		6.3	33000pF – 0.47μF

Wire Bonding/AuSn Soldering Mount Chip Multilayer Ceramic Capacitors for General Purpose

GMD

General Bonding

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
			0.1p 1p 10p 100p 1000p 10000p 0.1μ 1μ 10μ 100μ 1000μ
GMD03	0.6X0.3 <0201>	25	100pF – 1500pF
		16	1800pF – 3300pF
		10	3900pF – 10000pF
		6.3	56000pF – 0.10μF
GMD15	1.0X0.5 <0402>	50	220pF – 4700pF
		25	5600pF – 47000pF
		16	56000pF – 0.10μF
		10	0.12μF – 0.47μF
		6.3	1.0μF

Ceramic capacitors SMD type For Automotive

AEC-Q200 Compliant Chip Multilayer Ceramic Capacitors for Infotainment

GRT

Temperature Compensating Type

Info-tainment AEC-Q200

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
			0.1p 1p 10p 100p 1000p 10000p 0.1μ 1μ 10μ 100μ 1000μ
GRT03	0.6X0.3 <0201>	100	0.10pF – 100pF
		50	0.10pF – 220pF
		25	0.10pF – 1000pF
GRT15	1.0X0.5 <0402>	100	0.20pF – 100pF
		50	0.11pF – 1000pF
		25	10pF – 1000pF
GRT18	1.6X0.8 <0603>	100	120pF – 1500pF
		50	1200pF – 10000pF
		25	1200pF – 10000pF
GRT21	2.0X1.25 <0805>	100	1800pF – 3300pF
		50	18000pF – 22000pF

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Ceramic Capacitor, Polymer Aluminum Electrolytic Capacitors

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GRT21	2.0X1.25 <0805>	25	1800pF 2200pF
GRT31	3.2X1.6 <1206>	100	3900pF 0.10μF
		50	56000pF 0.10μF
		25	0.10μF 0.12μF
		16	0.12μF

High Dielectric Constant Type

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GRT03	0.6X0.3 <0201>	35	0.10μF
		25	100pF 0.10μF
		16	10000pF 0.10μF
		10	1500pF 1.0μF
		6.3	2200pF 1.0μF
		4	68000pF 1.0μF
		2.5	1.0μF
GRT15	1.0X0.5 <0402>	50	220pF 0.10μF
		35	0.22μF 1.0μF
		25	5600pF 2.2μF
		16	10000pF 2.2μF
		10	0.22μF 4.7μF
		6.3	22000pF 4.7μF
		4	0.22μF 4.7μF
		2.5	10μF
GRT18	1.6X0.8 <0603>	100	3300pF 10000pF
		50	1.0μF 2.2μF
		35	1.0μF 4.7μF
		25	0.15μF 10μF
		16	0.33μF 10μF
		10	10μF 22μF
		6.3	10μF 22μF
		4	1.0μF 22μF
		2.5	22μF
GRT21	2.0X1.25 <0805>	100	47000pF
		50	0.47μF 4.7μF
		35	4.7μF
		25	2.2μF 22μF
		16	2.2μF 22μF
		10	3.3μF 22μF
		6.3	3.3μF 47μF
		4	47μF
		2.5	47μF
GRT31	3.2X1.6 <1206>	50	1.0μF 10μF
		35	10μF
		25	1.5μF 10μF
		16	1.5μF 22μF
		10	47μF
		6.3	15μF 47μF
GRT32	3.2X2.5 <1210>	50	3.3μF 4.7μF
		25	6.8μF
		16	47μF
		10	47μF
		6.3	33μF 100μF
		4	100μF

Continued on the following page. ↗

AEC-Q200 Compliant 3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for Infotainment

NFM

Info-tainment | Low ESL | EMI Filter

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F) 0.1p 1p 10p 100p 1000p 10000p 0.1μ 1μ 10μ 100μ 1000μ
NFM15	1.0X0.5 <0402>	4	1.0μF
NFM18	1.6X0.8 <0603>	4	10μF

Chip Multilayer Ceramic Capacitors for Automotive

GCM

Power-train | AEC-Q200

Temperature Compensating Type

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F) 0.1p 1p 10p 100p 1000p 10000p 0.1μ 1μ 10μ 100μ 1000μ
GCM03	0.6X0.3 <0201>	50	0.10pF – 100pF
		25	0.10pF – 100pF
GCM15	1.0X0.5 <0402>	50	0.10pF – 1000pF
GCM18	1.6X0.8 <0603>	100	0.47pF – 10000pF
		80	1600pF – 3900pF
		63	1600pF – 3900pF
		50	1000pF – 10000pF
GCM21	2.0X1.25 <0805>	630	10pF – 2200pF
		250	10pF – 10000pF
		100	1000pF – 3300pF
		80	4300pF – 22000pF
		50	3000pF – 22000pF
GCM31	3.2X1.6 <1206>	1000	10pF – 1000pF
		630	10pF – 10000pF
		250	6800pF – 22000pF
		100	1600pF – 0.10μF
		80	27000pF – 33000pF
		50	11000pF – 0.10μF
GCM32	3.2X2.5 <1210>	1000	1200pF – 2200pF
		630	1200pF – 33000pF
GCM43	4.5X3.2 <1812>	1000	2700pF – 4700pF
		630	12000pF – 22000pF
GCM55	5.7X5.0 <2220>	1000	5600pF – 10000pF
		630	27000pF – 47000pF

High Dielectric Constant Type

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F) 0.1p 1p 10p 100p 1000p 10000p 0.1μ 1μ 10μ 100μ 1000μ
GCM03	0.6X0.3 <0201>	25	100pF – 3300pF
		16	330pF – 3300pF
		10	1200pF – 10000pF
GCM15	1.0X0.5 <0402>	100	220pF – 4700pF
		50	220pF – 0.10μF
		25	4700pF – 0.10μF
		16	15000pF – 0.22μF
		10	0.10μF – 1.0μF
GCM18	1.6X0.8 <0603>	100	1000pF – 22000pF
		50	1000pF – 0.22μF

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Ceramic Capacitor, Polymer Aluminum Electrolytic Capacitors

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GCM18	1.6X0.8 <0603>	25	68000pF – 1.0µF
		16	0.12µF – 1.0µF
		6.3	2.2µF – 10µF
		4	10µF
GCM21	2.0X1.25 <0805>	100	10000pF – 1.0µF
		50	10000pF – 1.0µF
		35	0.68µF – 4.7µF
		25	0.15µF – 4.7µF
		16	0.27µF – 10µF
		10	2.2µF – 10µF
		6.3	10µF
GCM31	3.2X1.6 <1206>	100	0.22µF – 2.2µF
		50	0.22µF – 4.7µF
		35	10µF
		25	0.47µF – 10µF
		16	4.7µF – 10µF
		10	22µF
		6.3	22µF
GCM32	3.2X2.5 <1210>	100	4.7µF
		50	4.7µF – 10µF
		35	10µF
		25	10µF – 22µF
		16	22µF
		10	10µF – 47µF
		6.3	47µF
		2.5	100µF

High Effective Capacitance & High Ripple Current Chip Multilayer Ceramic Capacitors for Automotive

GC3

Power-train | AEC-Q200 | Low acoustic noise

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GC321	2.0X1.25 <0805>	250	10000pF – 22000pF
GC331	3.2X1.6 <1206>	630	10000pF – 15000pF
		450	10000pF – 47000pF
		250	33000pF – 68000pF
GC332	3.2X2.5 <1210>	630	22000pF – 47000pF
		450	68000pF – 0.10µF
		250	0.10µF – 0.15µF
GC343	4.5X3.2 <1812>	630	68000pF
		450	0.15µF
		250	0.22µF – 0.33µF
GC355	5.7X5.0 <2220>	630	0.10µF – 0.22µF
		450	0.22µF – 0.47µF
		250	0.47µF – 1.0µF

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Soft Termination Chip Multilayer Ceramic Capacitors for Automotive

GCJ

Power-train | AEC-Q200 | Deflecting crack

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
			0.1p 1p 10p 100p 1000p 10000p 0.1μ 1μ 10μ 100μ 1000μ
GCJ18	1.6X0.8 <0603>	100	1000pF – 0.10μF
		50	1000pF – 0.22μF
		35	33000pF – 68000pF
		25	1000pF – 1.0μF
		16	27000pF – 0.47μF
		10	0.22μF
		6.3	2.2μF – 4.7μF
GCJ21	2.0X1.25 <0805>	250	1000pF – 22000pF
		100	27000pF – 1.0μF
		50	82000pF – 1.0μF
		35	0.12μF – 0.47μF
		25	0.12μF – 2.2μF
		16	0.27μF – 4.7μF
		10	2.2μF – 10μF
GCJ31	3.2X1.6 <1206>	1000	1000pF – 10000pF
		630	1000pF – 22000pF
		250	15000pF – 0.10μF
		100	0.15μF – 2.2μF
		50	0.47μF – 4.7μF
		35	0.47μF – 10μF
		25	2.2μF – 10μF
		16	1.5μF – 10μF
		10	6.8μF – 22μF
		6.3	22μF
GCJ32	3.2X2.5 <1210>	1000	15000pF – 22000pF
		630	6800pF – 47000pF
		250	68000pF – 0.22μF
		100	2.2μF – 4.7μF
		50	4.7μF – 10μF
		25	4.7μF – 22μF
		16	6.8μF – 22μF
		6.3	47μF
GCJ43	4.5X3.2 <1812>	1000	33000pF – 47000pF
		630	33000pF – 0.10μF
		250	0.15μF – 0.47μF
GCJ55	5.7X5.0 <2220>	1000	68000pF – 0.10μF
		630	0.10μF – 0.22μF
		250	0.33μF – 1.0μF

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High Q Chip Multilayer Ceramic Capacitors for Automotive

GCQ

Power-train | AEC-Q200 | High Q

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
			0.1p 1p 10p 100p 1000p 10000p 0.1μ 1μ 10μ 100μ 1000μ
GCQ15	1.0X0.5 <0402>	50	0.10pF – 47pF

MLSC Design Chip Multilayer Ceramic Capacitors for Automotive

GCD

Power-train | AEC-Q200 | Deflecting crack

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
			0.1p 1p 10p 100p 1000p 10000p 0.1μ 1μ 10μ 100μ 1000μ
GCD18	1.6X0.8 <0603>	100	1000pF – 22000pF
		50	1000pF – 22000pF
		25	27000pF – 47000pF
GCD21	2.0X1.25 <0805>	100	27000pF – 0.10μF
		50	27000pF – 0.10μF
		16	0.47μF

Soft Termination MLSC Design Chip Multilayer Ceramic Capacitors for Automotive

GCE

Power-train | AEC-Q200 | Deflecting crack

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
			0.1p 1p 10p 100p 1000p 10000p 0.1μ 1μ 10μ 100μ 1000μ
GCE18	1.6X0.8 <0603>	100	1000pF – 22000pF
		50	1000pF – 22000pF
		25	27000pF – 47000pF
GCE21	2.0X1.25 <0805>	100	27000pF – 0.10μF
		50	27000pF – 0.10μF

3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for Automotive

NFM

Power-train | AEC-Q200 | Low ESL | EMI Filter

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
			0.1p 1p 10p 100p 1000p 10000p 0.1μ 1μ 10μ 100μ 1000μ
NFM15	1.0X0.5 <0402>	4	1.0μF
NFM18	1.6X0.8 <0603>	16	1.0μF
		6.3	1.0μF
		4	10μF
NFM21	2.0X1.25 <0805>	50	220pF – 22000pF
		16	1.0μF
		10	0.10μF – 0.47μF
NFM31	3.2X1.6 <1206>	100	10000pF
		50	10000pF – 0.10μF

Continued on the following page. ↗

Metal Terminal Type Multilayer Ceramic Capacitors for Automotive

KCM

Temperature Compensating Type

Power-train | AEC-Q200 | Deflecting crack | Soldering crack | Low acoustic noise

Series	LXW (mm)	Rated Voltage (Vdc)	Capacitance Range (F)
KCM55	6.1X5.1	1000	8200pF – 20000pF
		630	15000pF – 94000pF

High Dielectric Constant Type

Series	LXW (mm)	Rated Voltage (Vdc)	Capacitance Range (F)
KCM55	6.1X5.3	100	4.7μF – 22μF
		63	4.7μF – 22μF
		50	4.7μF – 33μF
		35	10μF – 47μF
		25	15μF – 100μF

High Effective Capacitance & High Allowable Ripple Current Metal Terminal Type Multilayer Ceramic Capacitors for Automotive

KC3

Power-train | AEC-Q200 | Deflecting crack | Soldering crack | Low acoustic noise

Series	LXW (mm)	Rated Voltage (Vdc)	Capacitance Range (F)
KC355	6.1X5.3	630	0.10μF – 1.2μF
		450	0.22μF – 2.2μF
		250	0.47μF – 2.2μF

Safety Standard Certified Metal Terminal Type Multilayer Ceramic Capacitors for Automotive

KCA

Power-train | AEC-Q200 | Safety standard | Deflecting crack | Soldering crack | Low acoustic noise

Series	LXW (mm)	Rated Voltage (Vac (r.m.s.))	Capacitance Range (F)
KCA55	6.1X5.1	250	100pF – 10000pF

Continued on the following page. ↗

Ni Plating + Pd Plating termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive

GCB

Power-train | AEC-Q200 | Deflecting crack | Soldering crack | Limited to conductive glue mounting

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
			0.1p 1p 10p 100p 1000p 10000p 0.1μ 1μ 10μ 100μ 1000μ
GCB15	1.0X0.5 <0402>	100	1000pF – 10000pF
		50	1000pF – 47000pF
		25	6800pF – 0.10μF
		16	15000pF – 0.10μF

AgPd Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive

GCG

Power-train | AEC-Q200 | Deflecting crack | Soldering crack | Limited to conductive glue mounting

Temperature Compensating Type

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
			0.1p 1p 10p 100p 1000p 10000p 0.1μ 1μ 10μ 100μ 1000μ
GCG15	1.0X0.5 <0402>	50	1.0pF – 470pF
GCG18	1.6X0.8 <0603>	100	10pF – 10000pF
		50	10pF – 2200pF
GCG21	2.0X1.25 <0805>	50	1000pF – 10000pF

High Dielectric Constant Type

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
			0.1p 1p 10p 100p 1000p 10000p 0.1μ 1μ 10μ 100μ 1000μ
GCG15	1.0X0.5 <0402>	50	220pF – 4700pF
		25	5600pF – 10000pF
		16	15000pF – 0.10μF
GCG18	1.6X0.8 <0603>	100	1000pF – 0.10μF
		50	1000pF – 0.22μF
		25	0.12μF – 0.47μF
		16	0.15μF – 1.0μF
		10	2.2μF
		6.3	2.2μF
GCG21	2.0X1.25 <0805>	50	0.15μF – 1.0μF
		35	0.68μF – 1.0μF
		25	0.27μF – 1.0μF
		16	0.33μF – 4.7μF
		10	10μF
		6.3	10μF
GCG31	3.2X1.6 <1206>	50	0.22μF – 0.33μF
		25	1.0μF – 4.7μF
		16	0.68μF – 4.7μF
		6.3	22μF
GCG32	3.2X2.5 <1210>	50	10μF
		35	10μF
		25	10μF – 22μF
		16	6.8μF – 10μF
		6.3	47μF

Continued on the following page. ↗

Ceramic capacitors SMD type For Medical Devices

Chip Multilayer Ceramic Capacitors for Implantable Medical devices (Non Life support circuit)

GCH

Temperature Compensating Type

Medical Device

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GCH15	1.0X0.5 <0402>	50	1.0pF – 1000pF
GCH18	1.6X0.8 <0603>	100	1.0pF – 1500pF
		50	1500pF – 3300pF
GCH21	2.0X1.25 <0805>	630	10pF – 2200pF
		100	2200pF – 3300pF
		50	4700pF – 22000pF
GCH31	3.2X1.6 <1206>	100	4700pF – 10000pF
		50	33000pF – 0.10μF

High Dielectric Constant Type

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GCH03	0.6X0.3 <0201>	25	1000pF
GCH15	1.0X0.5 <0402>	100	220pF – 4700pF
		50	220pF – 0.10μF
		25	10000pF – 47000pF
		16	47000pF – 0.22μF
		10	0.10μF – 1.0μF
GCH18	1.6X0.8 <0603>	100	10000pF – 22000pF
		50	3300pF – 0.22μF
		25	0.10μF – 1.0μF
		16	0.47μF – 4.7μF
		10	2.2μF
		6.3	2.2μF
GCH21	2.0X1.25 <0805>	100	47000pF – 1.0μF
		50	0.47μF – 1.0μF
		35	1.0μF – 4.7μF
		25	2.2μF – 4.7μF
		16	2.2μF – 4.7μF
		10	4.7μF – 10μF
		6.3	10μF
GCH31	3.2X1.6 <1206>	100	0.22μF
		50	2.2μF
		16	10μF
GCH32	3.2X2.5 <1210>	50	4.7μF
		10	22μF
		6.3	47μF

Continued on the following page. ↗

Ceramic capacitors lead type For General Purpose

Leaded MLCC for General Purpose

RDE RDE RDE

General | Deflecting crack | Soldering crack | Low acoustic noise

Temperature Compensating Type

Series	LXW (mm)	Rated Voltage (Vdc)	Capacitance Range (F)
RDE5C	4.0X3.5	100	1.0pF – 1500pF
		50	1.0pF – 3900pF
	4.5X3.5	630	10pF – 2200pF
		250	10pF – 10000pF
		100	1800pF – 3300pF
		50	4700pF – 22000pF
	5.0X3.5	100	1.0pF – 3300pF
		50	1.0pF – 22000pF
	5.5X4.0	1000	10pF – 1000pF
		630	10pF – 4700pF
		250	10pF – 22000pF
		100	3900pF – 22000pF
		50	27000pF – 0.10μF
RDE7U	4.5X3.5	250	100pF – 4700pF
	5.5X4.0	1000	10pF – 1000pF
		630	10pF – 4700pF
		250	6800pF – 22000pF
	5.5X5.0	1000	1500pF – 2200pF
		630	6800pF – 10000pF
		250	33000pF – 47000pF
	7.5X5.5	1000	3300pF – 4700pF
		630	15000pF – 22000pF
	7.5X8.0	1000	6800pF – 10000pF
		630	33000pF – 47000pF
	7.7X13.0	1000	20000pF
		630	94000pF

High Dielectric Constant Type

Series	LXW (mm)	Rated Voltage (Vdc)	Capacitance Range (F)
RDEC7	4.0X3.5	25	0.22μF – 1.0μF
	4.5X3.5	50	1.0μF
		25	2.2μF
	5.0X3.5	50	1.0μF
		25	0.22μF – 2.2μF
	5.5X4.0	50	4.7μF
		25	4.7μF – 10μF
	5.5X5.0	100	1.5μF – 2.2μF
		50	10μF
		25	22μF
	5.5X7.5	100	4.7μF
		50	22μF
		25	47μF
RDED7	5.5X4.0	630	10000pF – 15000pF
		450	10000pF – 47000pF

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Series	LXW (mm)	Rated Voltage (Vdc)	Capacitance Range (F)
			0.1p 1p 10p 100p 1000p 10000p 0.1μ 1μ 10μ 100μ 1000μ
RDED7	5.5X4.0	250	33000pF 68000pF
	5.5X5.0	630	22000pF 47000pF
		450	68000pF 0.10μF
		250	0.10μF 0.15μF
	7.5X5.5	630	68000pF
		450	0.15μF
		250	0.22μF 0.33μF
	7.5X7.5	450	0.22μF 0.56μF
		250	0.47μF 1.0μF
	7.5X8.0	630	0.10μF 0.27μF
	7.7X12.5	450	1.0μF 1.2μF
		250	2.2μF
	7.7X13.0	630	0.47μF 0.56μF
RDER7	4.0X3.5	100	220pF 22000pF
		50	220pF 0.10μF
		25	0.10μF
	4.5X3.5	500	1000pF 10000pF
		250	1000pF 22000pF
		100	33000pF 0.47μF
		50	0.15μF 0.47μF
	5.0X3.5	100	220pF 0.47μF
		50	220pF 0.47μF
		25	0.10μF
	5.5X4.0	1000	470pF 10000pF
		630	1000pF 22000pF
		500	15000pF 47000pF
		250	33000pF 0.10μF
		100	0.15μF 1.0μF
		50	0.68μF 2.2μF
	5.5X5.0	1000	15000pF 22000pF
		630	33000pF 47000pF
		500	68000pF 0.10μF
		250	0.15μF 0.22μF
		50	3.3μF
	7.5X5.5	1000	33000pF 47000pF
		630	68000pF 0.10μF
		500	0.15μF 0.22μF
		250	0.33μF 0.47μF
	7.5X7.5	500	0.33μF 0.47μF
		250	0.68μF 1.0μF
	7.5X8.0	1000	68000pF 0.10μF
		630	0.15μF 0.22μF
	7.7X12.5	500	0.68μF 1.0μF
		250	2.2μF
	7.7X13.0	1000	0.22μF
		630	0.47μF

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Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose Type RA [500Vac (r.m.s.) product] / IEC60384-14 Class X1/Y1

DE1 Type RA

Temperature Compensating Type

General Safety standard

Series	Rated Voltage	D (mm)	Capacitance Range (F)
DE11X	X1: 500Vac (r.m.s.), Y1: 500Vac (r.m.s.)	6.0 to 9.0	10pF – 68pF

High Dielectric Constant Type

Series	Rated Voltage	D (mm)	Capacitance Range (F)
DE1B3	X1: 500Vac (r.m.s.), Y1: 500Vac (r.m.s.)	6.0 to 9.0	100pF – 680pF
DE1E3	X1: 500Vac (r.m.s.), Y1: 500Vac (r.m.s.)	8.0 to 14.0	1000pF – 4700pF

Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose Type RA [250Vac, 300Vac rated] / IEC60384-14 Class X1/Y1

DE1 Type RA

Temperature Compensating Type

General Safety standard

Series	Rated Voltage	D (mm)	Capacitance Range (F)
DE11X	X1: 440Vac (r.m.s.), Y1: 300Vac (r.m.s.)	6.0 to 8.0	10pF – 68pF
	X1: 440Vac (r.m.s.), Y1: 250Vac (r.m.s.)	6.0 to 8.0	10pF – 68pF

High Dielectric Constant Type

Series	Rated Voltage	D (mm)	Capacitance Range (F)
DE1B3	X1: 440Vac (r.m.s.), Y1: 300Vac (r.m.s.)	6.0 to 8.0	100pF – 680pF
	X1: 440Vac (r.m.s.), Y1: 250Vac (r.m.s.)	6.0 to 8.0	100pF – 680pF
DE1E3	X1: 440Vac (r.m.s.), Y1: 300Vac (r.m.s.)	7.0 to 12.0	1000pF – 4700pF
	X1: 440Vac (r.m.s.), Y1: 250Vac (r.m.s.)	7.0 to 12.0	1000pF – 4700pF

Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose Type RB [X1:760Vac(r.m.s)product] / IEC60384-14 Class X1/Y1

DE1 Type RB

Temperature Compensating Type

General Safety standard

Series	Rated Voltage	D (mm)	Capacitance Range (F)
DE11X	X1: 760Vac (r.m.s.), Y1: 500Vac (r.m.s.)	6.0 to 9.0	10pF – 68pF

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High Dielectric Constant Type

Series	Rated Voltage	D (mm)	Capacitance Range (F)
DE1B3	X1: 760Vac (r.m.s.), Y1: 500Vac (r.m.s.)	6.0 to 9.0	100pF – 680pF
DE1E3	X1: 760Vac (r.m.s.), Y1: 500Vac (r.m.s.)	8.0 to 14.0	1000pF – 4700pF

Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose Type SA [400Vac (r.m.s.) product] / IEC60384-14 Class X1/Y2

DE2 Type SA

General Safety standard

Temperature Compensating Type

Series	Rated Voltage	D (mm)	Capacitance Range (F)
DE21X	X1: 440Vac (r.m.s.), Y2: 400Vac (r.m.s.)	6.0 to 9.0	10pF – 68pF

High Dielectric Constant Type

Series	Rated Voltage	D (mm)	Capacitance Range (F)
DE2B3	X1: 440Vac (r.m.s.), Y2: 400Vac (r.m.s.)	6.0 to 8.0	100pF – 680pF
DE2E3	X1: 440Vac (r.m.s.), Y2: 400Vac (r.m.s.)	7.0 to 17.0	1000pF – 10000pF

Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose Type SA [250Vac, 300Vac rated] / IEC60384-14 Class X1/Y2

DE2 Type SA

General Safety standard

Temperature Compensating Type

Series	Rated Voltage	D (mm)	Capacitance Range (F)
DE21X	X1: 300Vac (r.m.s.), Y2: 300Vac (r.m.s.)	6.0 to 8.0	10pF – 68pF
	X1: 300Vac (r.m.s.), Y2: 250Vac (r.m.s.)	6.0 to 8.0	10pF – 68pF

High Dielectric Constant Type

Series	Rated Voltage	D (mm)	Capacitance Range (F)
DE2B3	X1: 300Vac (r.m.s.), Y2: 300Vac (r.m.s.)	6.0 to 7.0	100pF – 680pF
	X1: 300Vac (r.m.s.), Y2: 250Vac (r.m.s.)	6.0 to 7.0	100pF – 680pF
DE2E3	X1: 300Vac (r.m.s.), Y2: 300Vac (r.m.s.)	6.0 to 15.0	1000pF – 10000pF
	X1: 300Vac (r.m.s.), Y2: 250Vac (r.m.s.)	6.0 to 15.0	1000pF – 10000pF

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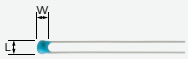
Ceramic capacitors lead type For Automotive

Leaded MLCC for Automotive



RCE

Temperature Compensating Type

Power-train | AEC-Q200 | Deflecting crack | Soldering crack | Low acoustic noise

Series	LXW (mm)	Rated Voltage (Vdc)	Capacitance Range (F)
RCE5C	3.6X3.5	100	1.0pF – 1500pF
		50	1.0pF – 3900pF
	4.0X3.5	630	10pF – 2200pF
		250	10pF – 10000pF
		100	1800pF – 3300pF
		50	4700pF – 22000pF
	5.5X4.0	1000	10pF – 1000pF
		630	10pF – 4700pF
		250	10pF – 22000pF
		100	3900pF – 10000pF
		50	27000pF – 0.10μF
RCE7U	4.0X3.5	250	100pF – 4700pF
	5.5X4.0	1000	10pF – 1000pF
		630	10pF – 4700pF
		250	6800pF – 10000pF
	5.5X5.0	1000	1500pF – 2200pF
		630	6800pF – 10000pF
	7.5X5.5	1000	3300pF – 4700pF
		630	15000pF – 22000pF
	7.5X8.0	1000	6800pF – 10000pF
		630	33000pF – 47000pF
	7.7X13.0	1000	20000pF
		630	94000pF

High Dielectric Constant Type

Series	LXW (mm)	Rated Voltage (Vdc)	Capacitance Range (F)
RCEC7	4.0X3.5	50	1.0μF
	5.5X4.0	50	4.7μF
	5.5X5.0	100	1.5μF – 2.2μF
		50	10μF
	5.5X7.5	100	4.7μF
		50	22μF
RCER7	3.6X3.5	100	220pF – 22000pF
		50	220pF – 0.10μF
		25	0.10μF – 0.22μF
	4.0X3.5	250	1000pF – 22000pF
		100	33000pF – 0.33μF
		50	0.15μF – 0.47μF
		25	0.33μF – 1.0μF
	5.5X4.0	1000	1000pF – 10000pF
		630	1000pF – 22000pF
		250	33000pF – 0.10μF
		100	0.15μF – 1.0μF
		50	0.68μF – 2.2μF
		25	1.5μF – 4.7μF

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Series	LXW (mm)	Rated Voltage (Vdc)	Capacitance Range (F)
RCER7	5.5X5.0	1000	15000pF 22000pF
		630	33000pF 47000pF
		250	0.15μF 0.22μF
		50	3.3μF 4.7μF
		25	10μF
	5.5X7.5	50	10μF
		25	22μF
	7.5X5.5	1000	33000pF 47000pF
		630	68000pF 0.10μF
		250	0.33μF 0.47μF
	7.5X7.5	250	0.68μF 1.0μF
	7.5X8.0	1000	68000pF 0.10μF
		630	0.15μF 0.22μF
	7.7X12.5	250	2.2μF
	7.7X13.0	1000	0.22μF
		630	0.47μF

150°C Operation Leaded MLCC for Automotive

RHE

Temperature Compensating Type

Power-train | AEC-Q200 | Deflecting crack | Soldering crack | Low acoustic noise

Series	LXW (mm)	Rated Voltage (Vdc)	Capacitance Range (F)
RHE5G	3.6X3.5	100	100pF 1500pF
		50	100pF 3900pF
	4.0X3.5	100	1800pF 3300pF
		50	4700pF 10000pF

High Dielectric Constant Type

Series	LXW (mm)	Rated Voltage (Vdc)	Capacitance Range (F)
RHEL8	3.6X3.5	100	220pF 22000pF
		50	220pF 0.10μF
		25	0.10μF 0.22μF
	4.0X3.5	100	33000pF 0.10μF
		50	0.15μF 0.33μF
		25	0.33μF 1.0μF
	5.5X4.0	100	0.15μF 0.22μF
		50	0.47μF 2.2μF
		25	1.5μF 4.7μF
	5.5X5.0	50	3.3μF 4.7μF
		25	10μF
	5.5X7.5	50	10μF
		25	22μF

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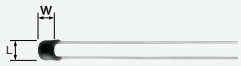
200°C Operation Leaded MLCC for Automotive



RHS

Temperature Compensating Type

Power-train | AEC-Q200 | Deflecting crack | Soldering crack | Low acoustic noise

Series	LXW (mm)	Rated Voltage (Vdc)	Capacitance Range (F)
RHS7G	3.9X3.5	100	100pF – 1500pF
	4.2X3.5	100	1800pF – 3300pF
RHS7J		200	100pF – 4700pF
	5.5X4.0	500	100pF – 4700pF
		200	6800pF – 10000pF

High Dielectric Constant Type

Series	LXW (mm)	Rated Voltage (Vdc)	Capacitance Range (F)
RHSQ9	3.9X3.5	100	4700pF – 22000pF
	4.2X3.5	100	33000pF – 0.10μF
	5.5X4.0	100	0.15μF – 0.22μF

Safety Standard Certified Lead Type Disc Ceramic Capacitors for Automotive

DE6

Power-train | AEC-Q200 | Safety standard

Series	Rated Voltage	D (mm)	Capacitance Range (F)
DE6E3	X1: 440Vac (r.m.s.), Y2: 300Vac (r.m.s.)	7.0 to 12.0	1000pF – 4700pF

Resin Molding SMD Type Ceramic Capacitors

Safety Standard Certified Resin Molding SMD Type Ceramic Capacitors for General Purpose

DK1

Temperature Compensating Type

General | Safety standard | Deflecting crack | Soldering crack

Series	Rated Voltage	LXW (mm)	Capacitance Range (F)
DK11X	X1: 440Vac (r.m.s.), Y1: 300Vac (r.m.s.)	11.4X6.0	10pF – 47pF
	X1: 440Vac (r.m.s.), Y1: 250Vac (r.m.s.)	11.4X6.0	10pF – 47pF

High Dielectric Constant Type

Series	Rated Voltage	LXW (mm)	Capacitance Range (F)
DK1B3	X1: 440Vac (r.m.s.), Y1: 300Vac (r.m.s.)	11.4X6.0	100pF – 680pF
	X1: 440Vac (r.m.s.), Y1: 250Vac (r.m.s.)	11.4X6.0	100pF – 680pF
DK1E3	X1: 440Vac (r.m.s.), Y1: 300Vac (r.m.s.)	11.4X6.0	1000pF – 1500pF
	X1: 440Vac (r.m.s.), Y1: 250Vac (r.m.s.)	11.4X6.0	1000pF – 1500pF

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Polymer Aluminum Electrolytic Capacitors

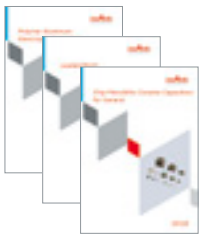
ECAS

General | Deflecting crack | Low acoustic noise | Effective Cap

Series	LxW (mm)	Rated Voltage (Vdc)	Capacitance Range (F)
			0.1p 1p 10p 100p 1000p 10000p 0.1µ 1µ 10µ 100µ 1000µ
ECAS	7.3X4.3	25	10µF – 33µF
		20	33µF – 47µF
		16	6.8µF – 68µF
		10	10µF – 150µF
		6.3	10µF – 330µF
		4	68µF – 330µF
		2.5	330µF – 470µF
		2	100µF – 470µF

Detailed Catalogs

For more details, please refer to our printed catalogs and the PDF catalogs on our website.



- Chip Multilayer Ceramic Capacitors for General — Cat. No. C02E
- Chip Multilayer Ceramic Capacitors for Automotive — Cat. No. C03E
- Lead Type Disc Ceramic Capacitors (Safety Standard Certified, DC2k to DC6.3kV) Resin Molding SMD Type Ceramic Capacitors (Safety Standard Certified) — Cat. No. C85E
- Polymer Aluminum Electrolytic Capacitors — Cat. No. C90E
- Leaded MLCC — Cat. No. C49E

Single-Layer Microchip Capacitors, Thin Film Circuit Substrates (RUSUB)

Single-Layer Microchip Capacitors

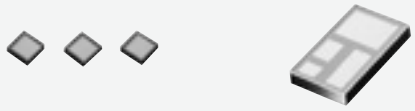
Very reliable performance and excellent frequency characteristics

Temperature Compensating Type

Capacitance Change (Temperature Range)	Series	Size (mm)	Rated Voltage (Vdc)	Capacitance Range at 25°C (pF)	Operating Temperature Range (°C)
0±30ppm/°C (-25 to 85°C)	**CLB0A**	0.25X0.25	100	0.1	-55 to 125
	CLB0C	0.35X0.25	100	0.2	-55 to 125
	CLB0D	0.38X0.38	100	0.2 0.4	-55 to 125
	CLB05	0.50X0.50	100	0.3 0.6	-55 to 125
	CLB0E	0.55X0.38	100	0.5 0.6	-55 to 125
	CLB0F	0.64X0.64	100	0.6 1.0	-55 to 125
	CLB0G	0.70X0.50	100	0.7 1.0	-55 to 125
	CLB0H	0.71X0.38	100	0.7 0.8	-55 to 125
	CLB0J	0.76X0.76	100	0.9 1.3	-55 to 125
	CLB09	0.90X0.90	100	1.0 1.8	-55 to 125
	CLB1A	1.00X0.64	100	1.1 1.6	-55 to 125
	CLB1B	1.09X0.76	100	1.5 2.0	-55 to 125
	CLB1C	1.27X1.27	100	2.2 3.6	-55 to 125
	CLB1E	1.49X0.90	100	2.0 2.7	-55 to 125
	CLB1G	1.73X1.27	100	3.9 4.7	-55 to 125
	CLB1H	1.78X1.78	100	3.9 6.8	-55 to 125
	CLB2C	2.19X1.27	100	5.1	-55 to 125
	CLB2E	2.29X2.29	100	6.2 10	-55 to 125
	CLB2L	2.95X1.78	100	7.5 10	-55 to 125
	CLB3G	3.71X2.29	100	11 16	-55 to 125
-750±60ppm/°C (-25 to 85°C)	**CLB0A**	0.25X0.25	100	0.3 0.7	-55 to 125
	CLB0B	0.30X0.25	100	0.8	-55 to 125
	CLB0C	0.35X0.25	100	0.9	-55 to 125
	CLB0D	0.38X0.38	100	0.9 1.6	-55 to 125
	CLB05	0.50X0.50	100	1.0 2.4	-55 to 125
	CLB0E	0.55X0.38	100	1.8 2.4	-55 to 125
	CLB0F	0.64X0.64	100	2.0 4.3	-55 to 125
	CLB0G	0.70X0.50	100	2.7 3.0	-55 to 125
	CLB0H	0.71X0.38	100	2.7	-55 to 125
	CLB0J	0.76X0.76	100	3.0 6.2	-55 to 125
	CLB09	0.90X0.90	100	3.3 6.8	-55 to 125
	CLB1A	1.00X0.64	100	4.7 6.2	-55 to 125
	CLB1B	1.09X0.76	100	6.8 7.5	-55 to 125
	CLB1C	1.27X1.27	100	7.5 15	-55 to 125
	CLB1E	1.49X0.90	100	7.5 9.1	-55 to 125
	CLB1H	1.78X1.78	100	13 15	-55 to 125
	CLB2E	2.29X2.29	100	20	-55 to 125

All Single Layer Microchip Capacitors are produced after receiving an order.

High Dielectric Constant Type



Capacitance Change (Temperature Range)	Series	Size (mm)	Rated Voltage (Vdc)	Capacitance Range at 25°C (pF) 0.1 1 10 100 1000	Operating Temperature Range (°C)
±10% (-25 to 85°C)	**CLB0A**	0.25X0.25	100	5.6 12	-55 to 125
	CLB0B	0.30X0.25	100	13 15	-55 to 125
	CLB0C	0.35X0.25	100	16 18	-55 to 125
	CLB0D	0.38X0.38	100	18 30	-55 to 125
	CLB05	0.50X0.50	100	22 43	-55 to 125
	CLB0E	0.55X0.38	100	33 43	-55 to 125
	CLB0F	0.64X0.64	100	43 75	-55 to 125
	CLB0G	0.70X0.50	100	47 68	-55 to 125
	CLB0H	0.71X0.38	100	47 56	-55 to 125
	CLB0J	0.76X0.76	100	68 110	-55 to 125
	CLB09	0.90X0.90	100	68 130	-55 to 125
	CLB1A	1.00X0.64	100	82 120	-55 to 125
	CLB1C	1.27X1.27	100	160 200	-55 to 125
	CLB1E	1.49X0.90	100	150 160	-55 to 125
	CLB1G	1.73X1.27	100	300	-55 to 125
	CLB1H	1.78X1.78	100	300 430	-55 to 125
	CLB2E	2.29X2.29	100	470 620	-55 to 125
+30, -80% (-25 to 85°C)	**CLB0A**	0.25X0.25	100	27 33	-55 to 125
	CLB0B	0.30X0.25	100	36 39	-55 to 125
	CLB0C	0.35X0.25	100	43 51	-55 to 125
	CLB0D	0.38X0.38	100	62 82	-55 to 125
	CLB05	0.50X0.50	100	75 130	-55 to 125
	CLB0E	0.55X0.38	100	91 120	-55 to 125
	CLB0F	0.64X0.64	100	130 220	-55 to 125
	CLB0G	0.70X0.50	100	150 200	-55 to 125
	CLB0H	0.71X0.38	100	130 150	-55 to 125
	CLB0J	0.76X0.76	100	200 300	-55 to 125
	CLB09	0.90X0.90	100	200 390	-55 to 125
	CLB1A	1.00X0.64	100	240 360	-55 to 125
+30, -90% (-25 to 85°C)	**CLB0A**	0.25X0.25	100	36 56	-55 to 125
	CLB0D	0.38X0.38	100	91 150	-55 to 125
	CLB05	0.50X0.50	100	130 220	-55 to 125
	CLB0F	0.64X0.64	100	220 390	-55 to 125
	CLB0J	0.76X0.76	100	330 560	-55 to 125
	CLB09	0.90X0.90	100	390 680	-55 to 125

All Single Layer Microchip Capacitors are produced after receiving an order.

Thin Film Circuit Substrates (RUSUB)

Customizable capacitors for impedance matching for RF power amplifiers and decoupling for optical communication devices.

Features

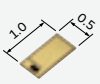
- Single-layer structure enhances self-resonant frequency, which allows stable operation even at a high frequency range.
- RUSUB technology achieves miniaturization of the device by combining a single-layer capacitor and a thin film resistor. In addition, it contributes to attenuation of unnecessary noise.
- By utilizing Au electrodes, die bonding with AuSn and wire bonding with gold wire are possible.
- A wide selection of substrate materials meets customers' requirements. (Please refer to the following table.)

Function	Dielectric Constant (ε_r) *1	Size min. (mm) (LxWxT) *2	Temperature Characteristics of Capacitance (ppm/°C) *3	Through Hole	TaN Resistance	L/S min. (μm) *4	Coefficient of Thermal Expansion (ppm/°C) *1	Temperature Conductivity (ppm/(m·°C)) *1
Impedance Matching	9	0.25X0.25X0.10	-	○	○	30/30 (Au thickness 4μm)	4.6	200.0
	10	0.25X0.25X0.20	-	○	○		7.0	33.5
	39	0.25X0.25X0.10	0±30	×	○		6.6	1.9
	90	0.25X0.25X0.10	-330±120	×	○		9.2	2.3
	150	0.25X0.25X0.10	-750±120	×	○		11.7	2.0
	250	0.25X0.25X0.10	-750±600	×	○		12.2	4.0
Decoupling	3000	0.25X0.25X0.10	±10%	×	○	50/50 (Au thickness 8μm)	10.7	2.5
	10000	0.25X0.25X0.10	+30, -80%	×	×		10.5	1.6
	15000	0.25X0.25X0.10	+30, -90%	×	×		14.0	2.4
	30000	0.25X0.25X0.25	±25%	×	○		11.2	7.35

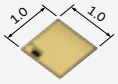
*1 : Typical value
*2 : L = length, W = width, T = thickness
*3 : Temperature Range: -25 to 85°C, Reference Temperature: 25°C
*4 : L = line, S = space

Single-Layer Microchip Capacitors, Thin Film Circuit Substrates (RUSUB)

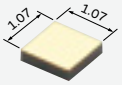
Thirteen types of standard products suitable for decoupling are also available.



RUCYT101 Series



RUCYT201 Series



RUCQD Series

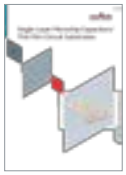
(in mm)

Part Number	Size (mm) (LxWxT)	Capacitor			Resistor	
		Capacitance (pF)	Temperature Characteristics of Capacitance (-25 to 85°C)	Rated Voltage (V)	Resistance (Ω)	Temperature Coefficient of Resistance (ppm/°C)
RUCYT101K00009GNTC	1.0X0.5X0.11	100	±10%	100	50±20%	-70±50
RUCYT101K00011GNTC	1.0X0.5X0.11	100			100±20%	
RUCYT101K00012GNTC	1.0X0.5X0.11	100			200±20%	
RUCYT201K00010GNTC	1.0X1.0X0.12	200			50±20%	
RUCYT201K00013GNTC	1.0X1.0X0.12	200			100±20%	
RUCYT201K00014GNTC	1.0X1.0X0.12	200			200±20%	
RUCQD101RCC007GNTC	0.34X0.34X0.25	100	±25%	65	-	-
RUCQD431RCC001GNZB	0.70X0.70X0.25	430				
RUCQD471RCC002GNZB	0.73X0.73X0.25	470				
RUCQD511RCC003GNZB	0.76X0.76X0.25	510				
RUCQD561RCC004GNZB	0.80X0.80X0.25	560				
RUCQD102RCC008GNZB	1.07X1.07X0.25	1000				
RUCQD201ZCC005GNZB	1.10X0.60X0.25	200×4				

*Several samples for impedance matching are also available for your evaluation. Please find the details at the following link: https://www.murata.com/en-global/products/capacitor/rusub/matching

Detailed Catalogs

For more details, please refer to our printed catalogs and the PDF catalogs on our website.



▪ Single-Layer Microchip Capacitors/Thin Film Circuit Substrates
Cat. No. C01E

Variable Capacitors

Variable capacitors can carry out the variable of the capacitor by adjusting the tuning voltage.
They are designed for frequency matching use for HF band (13.56MHz).

LXRW_V Series

LXRW0YV Series

LXRW19V Series

(in mm)

Series	LXW (mm)	Rated Voltage (Vdc)	Capacitance Range (F) 0.1p 1p 10p 100p 1000p 10000p 0.1μ 1μ 10μ 100μ 1000μ
LXRW0Y	0.6X0.6	CSP	33pF – 200pF
LXRW19	1.3X0.9	DFN	33pF – 200pF

Silicon Capacitors

Murata High-Density Silicon Capacitors are based on a MOS Semiconductor technology and utilize a 3D structure that substantially increases their performance and enables compact design. Silicon Capacitors offer small size and low thickness, superior reliability, and stability over high temperatures and high frequencies. They are the ideal choice for all demanding markets, such as Networking (RF Power and Broadband), Medical (Implantable devices), Automotive, or High-Reliability applications. Murata can provide customized Silicon Capacitors or Integrated Passive Devices (IPDs) to optimize your design.

Product Lineup

	Thickness	Standard (150°C)	High temp.	Operating Frequency
 Solder Mounting	100μm	LPSC (R) (All) p37		XBSC (100GHz+) UBSC (60GHz+) BBSC (40GHz) ULSC (20GHz) UBDC (60GHz+) (B) p38, 39
	400μm	HSSC (All) p37	HTSC (200°C) XTSC (250°C) (H) p37	
 Wire-bonding vertical	100μm	WLSC (P) (A) (B) p40		UWSC (26GHz+) (down to 10pH) (B) (P) p40
	250μm	WBSC (P) (A) (B) p40	WTSC (200°C) WXSC (250°C) (A) (P) (H) p40	
 Wire-bonding /Embedded horizontal	100μm	EMSC (All) MGSC (M) p37, 41		UBEC (60GHz+) BBEC (40GHz) ULEC (20GHz) (B) p39
	250μm		ETSC (200°C) EXSC (250°C) (H) ATSC (200°C) (A) p38, 41	

Target application | (A) Automotive (H) High Reliability (B) BroadBand (M) Medical (All) All applications (P) Power Amp for RF (R) RFID

High stability and reliability Si capacitors (HSSC)

BV 11V | BV 30V

Series	Size (inch)	Size (mm)	Capacitance Range (F)
HSSC	1812	4.70X3.60	
	1206	3.40X1.80	
	0805	2.20X1.40	
	0603	1.80X1.10	
	0402	1.20X0.70	
	0201	0.80X0.60	

47p 100p 470p 1n 10n 22n 33n 47n 100n 1µ 3.3µ

(1) 0201 - 10nF available in BV 11 and BV 30.

Low-profile Si capacitors down to 100µm (LPSC)

BV 11V | BV 30V

Series	Size (inch)	Size (mm)	Capacitance Range (F)
LPSC	1206	3.40X1.80	
	0805	2.20X1.40	
	0603	1.80X1.10	
	0402	1.20X0.70	
	0402	1.20X0.70	
	0201	0.80X0.60	
	0201	0.80X0.60	

47p 100p 330p 470p 1n 10n 22n 33n 47n 100n 1µ

Xtreme temperature Si capacitors up to 250°C (HTSC/XTSC)

BV 11V | BV 30V

Series	Size (inch)	Size (mm)	Capacitance Range (F)
HTSC XTSC	1812	4.70X3.60	
	1206	3.40X1.80	
	0603	1.80X1.10	
	0402	1.20X0.70	
	0201	0.80X0.60	

47p 100p 470p 1n 10n 22n 33n 47n 100n 1µ 3.3µ

Wire-bondable or embedded low-profile Si capacitors down to 100µm (EMSC)

BV 11V | BV 30V

Series	Size (inch)	Size (mm)	Capacitance Range (F)
EMSC	1208	3.07X2.07	
	0605	1.59X1.32	
	0505	1.32X1.32	
	0404	1.07X1.07	
	0202	0.63X0.63	

390p 470p 680p 1n 10n 33n 47n 100n 220n 1µ

△ Available parts. For other values, contact your Murata sales representative. △ Under development.

Silicon Capacitors

Extreme temperature wire-bondable Si capacitors up to 250°C (ETSC/EXSC)

BV 11V | BV 30V

Series	Size (inch)	Size (mm)	Capacitance Range (F)
			390p 470p 680p 1n 10n 33n 47n 100n 220n 1µ 2.2µ 3.3µ 4.7µ
ETSC EXSC	2016	5.07X4.07	△
	1616	4.07X4.07	△ △
	1612	4.07X3.07	△
	1208	3.07X2.07	△
	0605	1.59X1.32	△
	0505	1.32X1.32	△ △
	0404	1.07X1.07	△ △
	0202	0.63X0.63	△ △ △ △ △

Ultra broadband surface mounted Si capacitor up to 100GHz+ (XBSC)

BV 11V | BV 30V

Series	Size (inch)	Size (mm)	Capacitance Range (F)
			1n 5.6n 10n 22n
XBSC	0201	0.60X0.30	△ △
	0201M	0.60X0.30	△ △ △

Ultra broadband surface mounted Si capacitors up to 60GHz+ (UBSC)

BV 11V | BV 30V

Series	Size (inch)	Size (mm)	Capacitance Range (F)
			1n 5.6n 10n 22n 47n 100n
UBSC	0402	1.20X0.70	△ △
	0201	0.80X0.60	△ △ △ △
	0201M	0.60X0.30	△ △ △ △

Ultra broadband surface mounted Si capacitors up to 40GHz (BBSC)

BV 11V | BV 30V

Series	Size (inch)	Size (mm)	Capacitance Range (F)
			1n 5.6n 10n 22n 47n 100n
BBSC	0402	1.20X0.70	△ △
	0201	0.80X0.60	△ △ △ △
	0201M	0.60X0.30	△ △ △ △

△ Available parts. For other values, contact your Murata sales representative. △ Under development.

Ultra broadband surface mounted Si capacitors up to 20GHz (ULSC)

BV 11V BV 30V

Series	Size (inch)	Size (mm)	Capacitance Range (F)
			1n 5.6n 10n 22n 47n 100n
ULSC	0603	1.80X1.10	
	0402	1.20X0.70	
	0201	0.80X0.60	
	0201M	0.60X0.30	

Ultra Broadband surface mounted differential Si capacitors pairs up to 60GHz+ (UBDC)

BV 11V BV 30V

Series	Size (inch)	Size (mm)	Capacitance Range (F)
			2x5.6n 2x10n
UBDC	0402M	1.00X0.50	
UBDC	0302M	0.80X0.50	

Ultra broadband wire-bondable embedded Si capacitors up to 60GHz+ (UBEC)

BV 11V BV 30V

Series	Size (inch)	Size (mm)	Capacitance Range (F)
			1n 3.3n 5.6n 10n 33n 100n
UBEC	0404	1.07X1.07	
	0201M	0.60X0.30	

Ultra broadband wire-bondable embedded Si capacitors up to 40/20GHz (BBEC/ULEC)

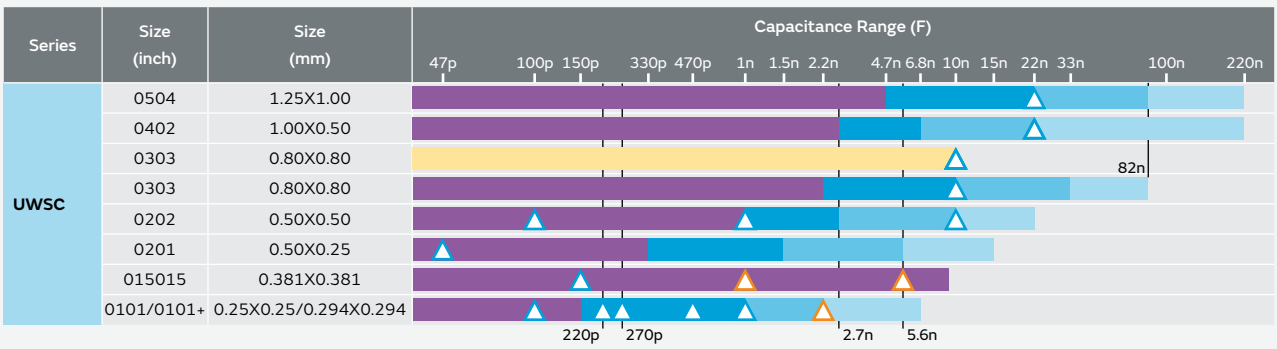
BV 11V BV 30V

Series	Size (inch)	Size (mm)	Capacitance Range (F)
			1n 5.6n 10n 33n 100n
BBEC ULEC	0404	1.07X1.07	
	0201M	0.60X0.30	

△ Available parts. For other values, contact your Murata sales representative. △ Under development.

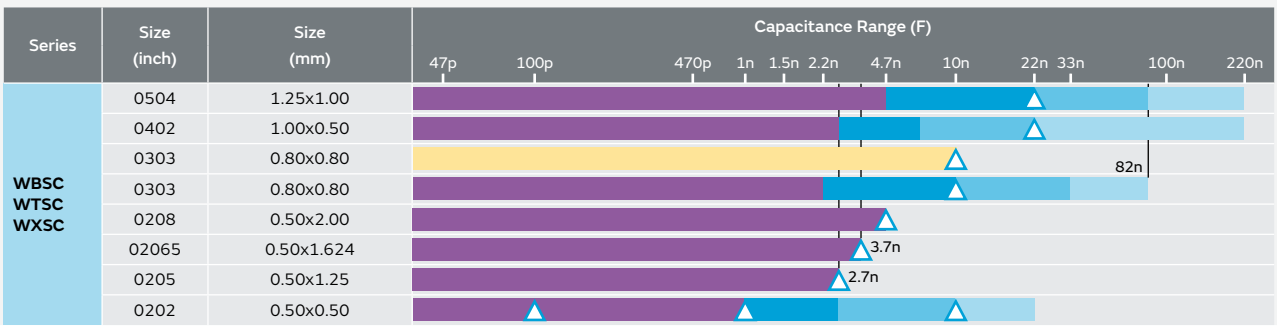
Silicon Capacitors

Ultra large-band wire-bondable vertical Si capacitors up to 26GHz+ (UWSC)



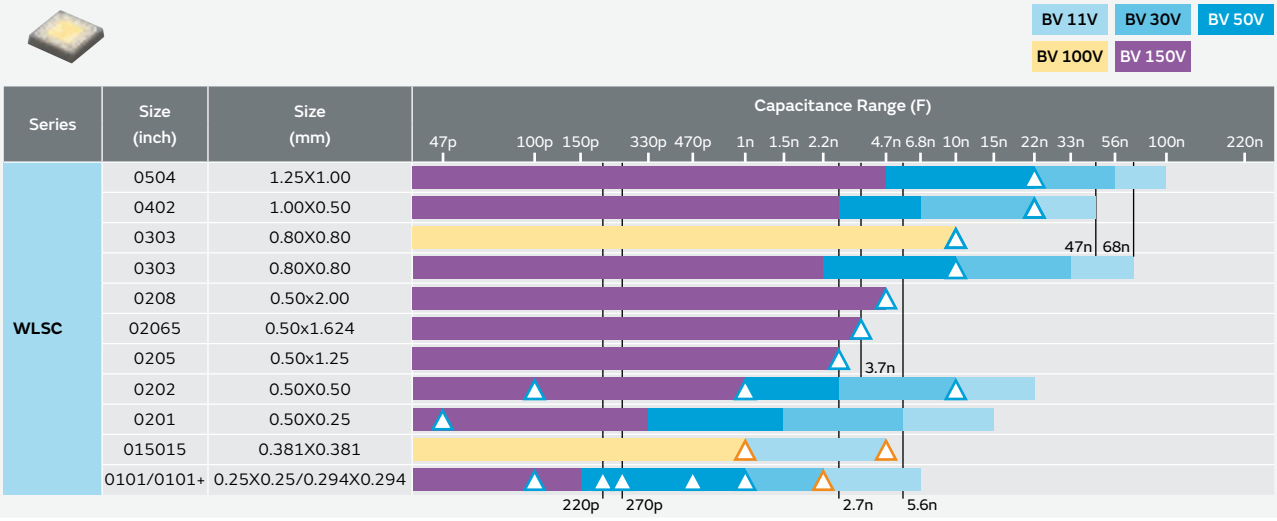
Series	Size (inch)	Size (mm)
UWSC	0504	1.25X1.00
	0402	1.00X0.50
	0303	0.80X0.80
	0303	0.80X0.80
	0202	0.50X0.50
	0201	0.50X0.25
	015015	0.381X0.381
	0101/0101+	0.25X0.25/0.294X0.294

Wire-bondable vertical Si capacitors up to 250°C (WBSC/WTSC/WXSC)



Series	Size (inch)	Size (mm)
WBSC WTSC WXSC	0504	1.25x1.00
	0402	1.00x0.50
	0303	0.80x0.80
	0303	0.80x0.80
	0208	0.50x2.00
	02065	0.50x1.624
	0205	0.50x1.25
	0202	0.50x0.50

Wire-bondable vertical low-profile Si capacitors down to 100µm (WLSC)



Series	Size (inch)	Size (mm)
WLSC	0504	1.25X1.00
	0402	1.00X0.50
	0303	0.80X0.80
	0303	0.80X0.80
	0208	0.50x2.00
	02065	0.50x1.624
	0205	0.50x1.25
	0202	0.50X0.50
	0201	0.50X0.25
	015015	0.381X0.381
	0101/0101+	0.25X0.25/0.294X0.294

△ Available parts. For other values, contact your Murata sales representative. △ Under development.

Automotive high temperature Si capacitors up to 200°C (ATSC)

BV 30V

Series	Size (inch)	Size (mm)	Capacitance Range (F)
			390p 470p 680p 1n 4.7n 10n 47n 100n 1µ
ATSC	1616	4.07X4.07	△
	0605	1.59X1.32	△
	0505	1.32X1.32	△
	0202	0.63X0.63	△ △ △ △ △

Medical grade Si capacitors (MGSC)

BV 30V

Series	Size (inch)	Size (mm)	Capacitance Range (F)
			1n 10n 47n 100n 1µ
MGSC	1616	4.07X4.07	△
	0605	1.59X1.32	△
	0505	1.32X1.32	△
	0202	0.63X0.63	△ △

△ Available parts. For other values, contact your Murata sales representative. △ Under development.

Film Capacitors

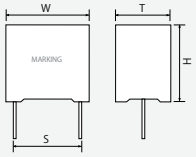
The FH series uses materials with high heat resistance. Therefore, it has a higher allowable ripple current under a higher temperature environment than conventional PP film capacitors.
This feature is more prominent in the high-frequency range. For example, when the ambient temperature is at 105°C, the PP film capacitors would be already at its limit for allowable ripple current, but because of the higher heat resistance of the FH series, the allowable ripple current can be increased drastically.

FHA50Y156KS
FHA50Y106KS

FHA50Y206KS

Specifications

Items	Basic Specifications
Rated Capacitance	10,15,20μF
Rated Voltage	500V
Operational Life	125°C/500V 2000h
Biased Humidity	85°C/85%RH/500V 1000h
Temperature Cycling	-40~+125°C/1000cycles



Dimensions

Part Number	Capacitance	Dimensions (mm)			
		W	H	T	S
FHA50Y206KS	20μF	33.0	37.0	18.0	30.0
FHA50Y156KS	15μF	33.0	35.5	14.5	30.0
FHA50Y106KS	10μF				

Noise Suppression Products/ EMI Suppression Filters

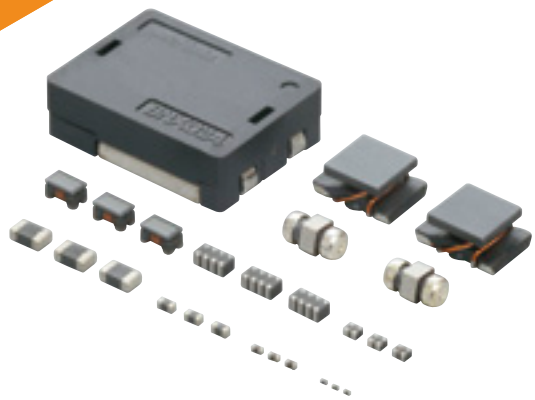
Broad lineup of Noise Suppression Products and EMI Suppression Filters

Summary

Using Murata's ceramic processing technology and unique materials, we offer a variety of Noise Suppression Products and EMI Suppression Filters.

Lineup

- ●EMI (chip and lead type)
- ●Noise Suppression Products for Automotive
- ●ESD Protection Devices



https://www.murata.com/en-global/products/emc

Chip Ferrite Bead

			Series	Size Code inch (mm)	Max. Rated Current (mA)	Impedance at 100MHz (Rated Current)
For General Band Noise	Universal Type [Power Lines/Signal Lines]		BLM02AX	01005 (0402)	750	10Ω to 330Ω (0.15A to 0.75A)
			BLM03AX	0201 (0603)	1000	10Ω to 1000Ω (0.2A to 1A)
			BLM15AX	0402 (1005)	1740	10Ω to 1000Ω (0.35A to 1.74A)
	Signal Lines Type	For General Signal Lines	BLM03AG	0201 (0603)	-	10Ω to 1000Ω
			BLM15AG	0402 (1005)	-	10Ω to 1000Ω
			BLM18AG	0603 (1608)	-	120Ω to 1000Ω
			BLM18TG	0603 (1608)	-	120Ω to 1000Ω
			BLM21AG	0805 (2012)	-	120Ω to 1000Ω
			BLA2AA (4 circuits array)	0804 (2010)	-	120Ω to 1000Ω
			BLA31AG (4 circuits array)	1206 (3216)	-	30Ω to 1000Ω
		For High Speed Signal Lines	BLM02BX*	01005 (0402)	-	120Ω to 240Ω
			BLM02BB/BC	01005 (0402)	-	10Ω to 100Ω
			BLM03BX	0201 (0603)	-	1000Ω to 1800Ω
			BLM03BB/BC/BD	0201 (0603)	-	10Ω to 600Ω
			BLM15BA/BB/BC/BD	0402 (1005)	-	5Ω to 1800Ω
			BLM15BX	0402 (1005)	-	75Ω to 1800Ω
			BLM18BA/BB/BD	0603 (1608)	-	5Ω to 2500Ω
			BLM21BB/BD	0805 (2012)	-	5Ω to 2700Ω
			BLA2AB (4 circuits array)	0804 (2010)	-	10Ω to 1000Ω
			BLA31BD (4 circuits array)	1206 (3216)	-	120Ω to 1000Ω
		For Digital Interface Lines	BLM18RK	0603 (1608)	-	120Ω to 1000Ω
			BLM21RK	0805 (2012)	-	120Ω to 1000Ω

* The derating of rated current is required for some items according to the operating temperature.
For automotive grade products, please refer to the catalog C51E, "EMI Suppression Filters (for DC)/Chip Inductors for Automotive."

Continued on the following page.↗

Chip Ferrite Bead

		Series	Size Code inch (mm)	Max. Rated Current (mA)	Impedance at 100MHz (Rated Current)
For General Band Noise	Power Lines Type	BLM02KX*	01005 (0402)	1500	10Ω to 18Ω (1.2A to 1.5A)
		BLM02PX*	01005 (0402)	1100	10Ω to 60Ω (0.5A to 1.1A)
		BLM03PX*	0201 (0603)	1800	22Ω to 120Ω (0.9A to 1.8A)
		BLM03PG	0201 (0603)	900	22Ω to 33Ω (0.75A to 0.9A)
		BLM15KD*	0402 (1005)	3800	20Ω to 120Ω (1.5A to 3.8A)
		BLM15PX*	0402 (1005)	3000	33Ω to 600Ω (0.9A to 3A)
		BLM15PD*	0402 (1005)	2200	30Ω to 120Ω (1.3A to 2.2A)
		BLM15PG	0402 (1005)	1000	10Ω (1A)
		BLM18SN*/SP* (Low DC Resistance Type)	0603 (1608)	8000	22Ω to 1000Ω (1.2A to 8A)
		BLM18SG*/SD* (Low DC Resistance Type)	0603 (1608)	6000	22Ω to 330Ω (1.5A to 6A)
		BLM18KG* (Low DC Resistance Type)	0603 (1608)	6000	26Ω to 1000Ω (1A to 6A)
		BLM18PG*	0603 (1608)	3000	30Ω to 470Ω (1A to 3A)
		BLM21SN*/SP* (Low DC Resistance Type)	0805 (2012)	8500	30Ω to 1000Ω (1.6A to 8.5A)
		BLM21PG*	0805 (2012)	6000	22Ω to 330Ω (1.5A to 6A)
		BLM31SN* (Low DC Resistance Type)	1206 (3216)	12000	50Ω (12A)
		BLM31KN*	1206 (3216)	6000	120Ω to 1000Ω (2A to 6A)
		BLM31PG*	1206 (3216)	6000	33Ω to 600Ω (1.5A to 6A)
		BLM41PG*	1806 (4516)	6000	60Ω to 1000Ω (1.5A to 6A)
For GHz Band Noise	Universal Type [Power Lines/Signal Lines]	BLM03EB*	0201 (0603)	600	25Ω to 50Ω (0.4A to 0.6A)
		BLM15EG*	0402 (1005)	1500	120Ω to 220Ω (0.7A to 1.5A)
		BLM15EX*	0402 (1005)	1800	120Ω to 470Ω (0.95A to 1.8A)
		BLM18EG*	0603 (1608)	2000	100Ω to 600Ω (0.5A to 2A)
		BLM18HE*	0603 (1608)	800	600Ω to 1500Ω (0.5A to 0.8A)
	Signal Lines Type	BLM03HG	0201 (0603)	-	600Ω to 1200Ω
		BLM03HD	0201 (0603)	-	330Ω to 1800Ω
		BLM03HB	0201 (0603)	-	190Ω to 400Ω
		BLM15HG	0402 (1005)	-	600Ω to 1000Ω
		BLM15HD	0402 (1005)	-	600Ω to 1800Ω
		BLM15HB	0402 (1005)	-	120Ω to 220Ω
		BLM18HG	0603 (1608)	-	470Ω to 1000Ω
		BLM18HD	0603 (1608)	-	470Ω to 1000Ω
		BLM18HB	0603 (1608)	-	120Ω to 330Ω
		BLM18HK	0603 (1608)	-	330Ω to 1000Ω
For High-GHz Band Noise	Signal Lines Type	BLM15GG	0402 (1005)	-	220Ω to 470Ω
		BLM15GA	0402 (1005)	-	75Ω
		BLM18GG	0603 (1608)	-	470Ω
	Power Lines Type	BLM18DN*	0603 (1608)	1400	150Ω to 600Ω (0.7A to 1.4A)

		Series	Size Code inch (mm)	Max. Rated Current (A)	Impedance at 100MHz (Rated Current)
For General Band Noise	Large Current Type Power Lines Type	BLT5BPT*	2020 (5050)	11	68Ω (11A)

* The derating of rated current is required for some items according to the operating temperature.
For automotive grade products, please refer to the catalog C51E, "EMI Suppression Filters (for DC)/Chip Inductors for Automotive."

Application Specified Noise Filter

	Series	Size Code inch (mm)	Max. Rated Current (mA)	Impedance at 900MHz	Impedance at 1.7GHz
For Audio Lines	NFZ03SG_10	0201 (0603)	305	330Ω to 1600Ω	400Ω to 1200Ω
	NFZ15SG_10	0402 (1005)	500	770Ω to 4600Ω	900Ω to 1800Ω
	NFZ15SG_11	0402 (1005)	1100	100Ω to 330Ω	160Ω to 540Ω

	Series	Size Code inch (mm)	Max. Rated Current (mA)	Impedance at 100MHz	Impedance at 900MHz
For Audio Lines	NFZ15SF_10	0402 (1005)	-	1000Ω	-
	NFZ15SR_10	0402 (1005)	-	200Ω to 500Ω	1500Ω to 3500Ω
	NFZ18SM_10*	0603 (1608)	-	120Ω to 700Ω	-
	NFZ2MSM_10	0806 (2016)	-	100Ω to 600Ω	-
	NFZ32SW_10	1210 (3225)	-	300Ω to 900Ω	-

	Series	Size Code inch (mm)	Max. Rated Current (mA)	Impedance at 10MHz
For Audio Lines	NFZ2MSD_10*	0806 (2016)	-	15Ω to 130Ω

	Series	Size Code inch (mm)	Max. Rated Current (mA)	Impedance at 1MHz
For LED Lighting Equipments	NFZ5BBW_LN10*	2020 (5050)	4000	2.9Ω to 140Ω
	NFZ2HBM_10	1008 (2520)	1200	1.5Ω to 60Ω
	NFZ32BW_10*	1210 (3225)	2550	3.6Ω to 880Ω
	NFZ32BW_11*	1210 (3225)	2900	3.3Ω to 150Ω

		Series	Size Code inch (mm)	Max. Rated Current (A)	Impedance at 700MHz
Frequency Specified Noise Filters	For 700MHz Band	BLF02JD*	01005 (0402)	-	360Ω to 470Ω
		BLF02GD	01005 (0402)	-	1600Ω
		BLF03JD*	0201 (0603)	-	420Ω

		Series	Size Code inch (mm)	Max. Rated Current (A)	Impedance at 2.4GHz
Frequency Specified Noise Filters	For 2.4GHz Band	BLF02RD*	01005 (0402)	-	330Ω to 470Ω

		Series	Size Code inch (mm)	Max. Rated Current (A)	Impedance at 5GHz
Frequency Specified Noise Filters	For 5GHz Band	BLF03VK*	0201 (0603)	1.2	60Ω to 220Ω

* The derating of rated current is required for some items according to the operating temperature.
For automotive grade products, please refer to the catalog C51E, "EMI Suppression Filters (for DC)/Chip Inductors for Automotive."

Continued on the following page. ↗

		Series	Size Code inch (mm)	Max. Rated Current (mA)	Impedance at 100MHz (Rated Current)
For General Band Noise	Power Lines Type	BLE18PS*	0603 (1608)	8000	8.5Ω (8A)
		BLE18PK*	0603 (1608)	6000	10Ω to 16Ω (5A to 6A)
		BLE32PN	1210 (3225)	10000	26Ω to 30Ω (10A)

LC Combined Filter

	Series	Size Code inch (mm)	Max. Rated Current (mA)	Nominal Cut-off Frequency
Signal Lines Type	NFL18ST	0603 (1608)	-	50MHz to 500MHz
	NFL18SP	0603 (1608)	-	150MHz to 500MHz
	NFL21SP	0805 (2012)	-	10MHz to 500MHz
	NFA18SL (4 circuits array)	0603 (1608)	-	50MHz to 480MHz
	NFA18SD (4 circuits array)	0603 (1608)	-	180MHz to 200MHz
	NFA21SL (4 circuits array)	0805 (2012)	-	50MHz to 330MHz
	NFW31SP	1206 (3216)	-	10MHz to 500MHz

	Series	Size Code inch (mm)	Max. Rated Current (mA)	Capacitance
Universal Type [Power Lines/Signal Lines]	NFE31PT	1206 (3216)	6000	22pF to 2200pF
	NFE61PT	2706 (6816)	2000	33pF to 4700pF

* The derating of rated current is required for some items according to the operating temperature.
For automotive grade products, please refer to the catalog C51E, "EMI Suppression Filters (for DC)/Chip Inductors for Automotive."

Common Mode Choke Coil/Common Mode Noise Filter

		Series	Size Code inch (mm)	Max. Rated Current (mA)	Common Mode Impedance at 100MHz
Signal Lines Type	For Audio Lines	DLM11GN	0504 (1210)	-	600Ω
	For Ultra-High-Speed Signal Lines	NFG0NCN (3 Lines)	03025 (0806)	-	25Ω
		NFG0QHB	025020 (0605)	-	(5Ω) to (15Ω)
		DLM0QSN	025020 (0605)	-	50Ω to 90Ω
		DLM0QSB	025020 (0605)	-	12Ω to 35Ω
		DLM0NSN	03025 (0806)	-	50Ω to 90Ω
		DLM0NSM	03025 (0806)	-	90Ω
		DLM0NSB	03025 (0806)	-	12Ω to 28Ω
		DLM11SN	0504 (1210)	-	45Ω to 90Ω
		DLP11SN	0504 (1210)	-	67Ω to 330Ω
		DLP11SA	0504 (1210)	-	35Ω to 90Ω
		DLP11RN	0504 (1210)	-	45Ω
		DLP11RB	0504 (1210)	-	15Ω to 40Ω
		DLP11TB	0504 (1210)	-	80Ω
		DLP31SN	1206 (3216)	-	120Ω to 550Ω
		DLP1NDN (2 circuits array)	05025 (1506)	-	35Ω to 90Ω
		DLP2ADA (2 circuits array)	0804 (2010)	-	35Ω to 90Ω
		DLP2ADN (2 circuits array)	0804 (2010)	-	67Ω to 280Ω
		DLP31DN (2 circuits array)	1206 (3216)	-	90Ω to 440Ω
		DLW21S	0805 (2012)	-	67Ω to 920Ω
		DLW21H	0805 (2012)	-	67Ω to 180Ω
		DLW31S	1206 (3216)	-	90Ω to 2200Ω
Universal Type [Power Lines/Signal Lines]		DLW44S*	1515 (4040)	3100	(100Ω) to (2400Ω)
		DLW5AH/DLW5BS*	2014 / 2020 (5036) / (5050)	5000	(190Ω) to (4000Ω)
		DLW5AT*/DLW5BT*	2014 / 2020 (5036) / (5050)	6000	(50Ω) to (2700Ω)

	Series	Size Code inch (mm)	Max. Rated Current (A)	Common Mode Impedance at 10MHz
Large Current Type for Automotive Available	PLT5BPH*	2020 (5050)	5.6	100Ω to 500Ω
	PLT10HH*	-	18	45Ω to 1000Ω

	Series	Size Code inch (mm)	Max. Rated Current (mA)	Common Mode Impedance at 100MHz
Large Current Type for Automotive Available	UCMH0907	3527 (9070)	5000	(700Ω)

* The derating of rated current is required for some items according to the operating temperature.
For automotive grade products, please refer to the catalog C51E, "EMI Suppression Filters (for DC)/Chip Inductors for Automotive."

Block Type EMIFIL

		Series	Height (mm)	Rated Voltage (Vdc)	Rated Current (A)
Power Lines Type	SMD Type	 BNX022*	3.1	50	20
		 BNX023*	3.1	100	20
		 BNX024*	3.5	50	20
		 BNX025*	3.5	25	20
		 BNX026*	3.5	50	20
		 BNX027*	3.5	16	20
		 BNX028*	3.5	16	20
		 BNX029*	3.5	6.3	20
	Lead Type	 BNX002	12.5 max.	50	10
		 BNX003	12.5 max.	150	10
		 BNX005	13.0 max.	50	15
		 BNX012*	8.5 max.	50	15
		 BNX016*	8.5 max.	25	15

* The derating of rated current is required for some items according to the operating temperature.
For automotive grade products, please refer to the catalog C51E, "EMI Suppression Filters (for DC)/Chip Inductors for Automotive."

Noise Suppression Filters (Lead Type), Others

	Series		
Lead Type EMIFIL	 DSS1		
Common Mode Choke Coils	 PLT09H	 PLT10HN*	

* The derating of rated current is required for some items according to the operating temperature.

ESD Protection Devices

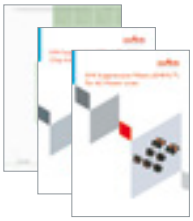
Support ESD protection for various kinds of electronic devices.

Silicon ESD Protection Devices LXES_T Series

Applying accumulated design technology for excellent ESD suppression performance.


Detailed Catalogs

For more details, please refer to our printed catalogs and the PDF catalogs on our website.



- EMI Suppression Filters (for DC)/Chip Inductors for Automotive Cat. No. C51E
- Noise Suppression by EMIFIL Digital Equipment Application Manual Cat. No. C33E
- Noise Suppression by EMIFIL Application Guide Application Manual Cat. No. C35E
- Application Manual for Power Supply Noise Suppression and Decoupling for Digital ICs Cat. No. C39E

Inductors (Coils)

Broad Lineup of Chip Inductors and Power Inductors

Summary

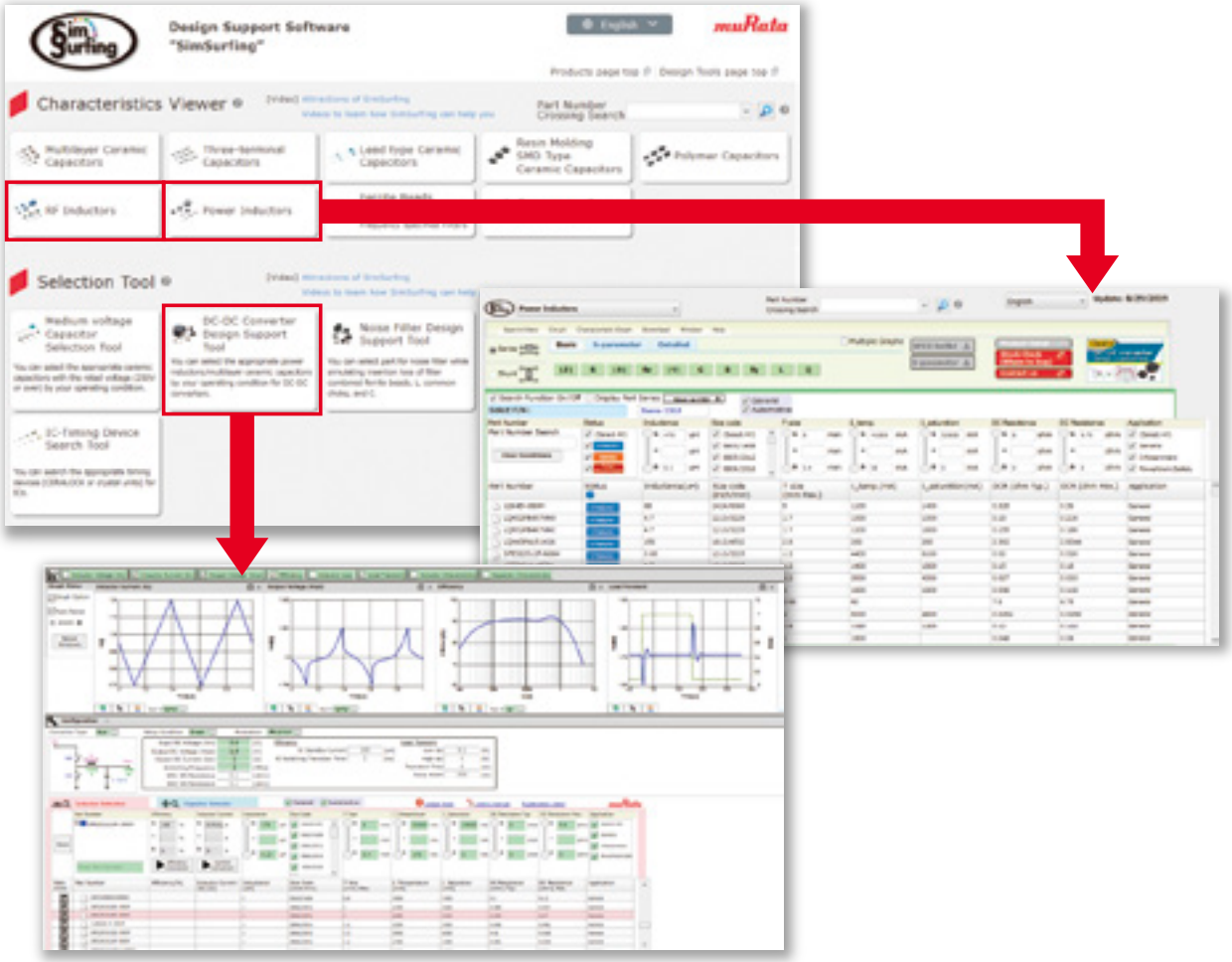
Murata's chip inductors are optimally designed, making full use of multiple construction techniques, such as the multilayer construction technique, film construction technique, and the wire wound construction technique according to the application. We offer an extensive lineup of inductors for power supplies to high frequency.
In addition, newly adopted metal alloy material has extended the power inductor lineup.

Lineup

●Inductors for Power Lines ●RF Inductors
●General Circuit Inductors ●Variable Inductors

Online design support tool: SimSurfing

You can view inductor characteristics and select appropriate power inductors for DC-DC converters



https://ds.murata.co.jp/simsurfing/

Inductors for Power Lines

Main Type:

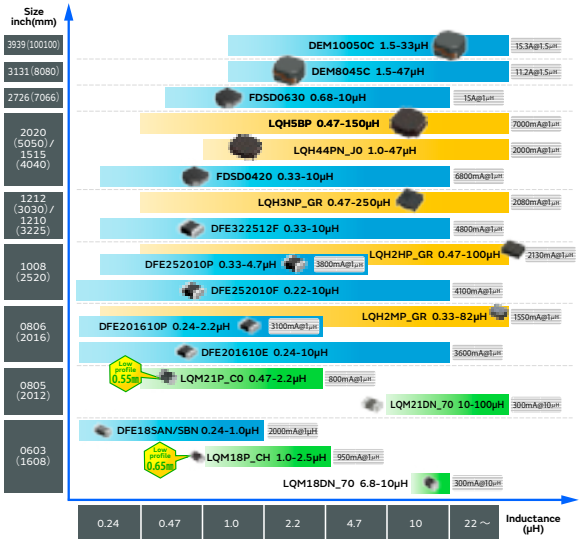
▪ Wound Metal Alloy ▪ Multilayer Type ▪ Wound Ferrite Core

We have an extensive lineup of inductors covering a wide range of sizes from 1.6 mm x 0.8 mm to 12 mm square, which are manufactured using multiple techniques that include metal alloy wire wound construction technique and ferrite multilayer technique.
We offer the optimum inductors for a wide range of applications including wearable devices, smartphones, medical applications, industrial electronics, and on board devices.

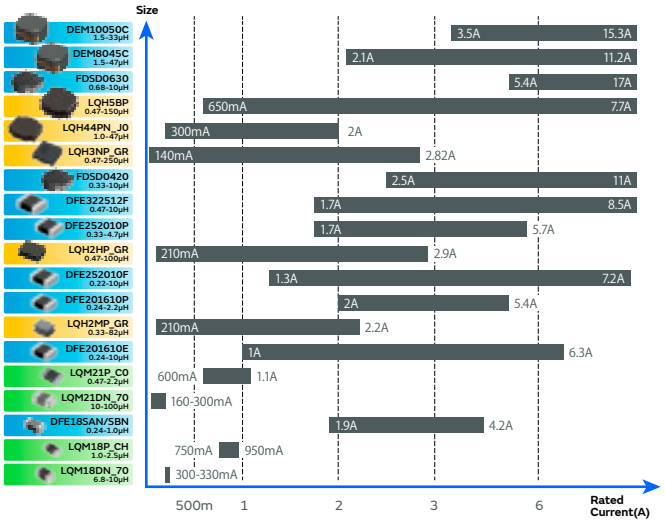
Structure	Description	Series
Wound Metal Alloy	Supports high current by using metal materials in which magnetic saturation does not occur so easily. This product can be used for a wide range of high current power circuits from smart phones to industrial electronics and automotive device applications.	DFEC/DFES series FDSD series
Multilayer Type	The features of this product is its small size and low profile. For example, 2012 or smaller footprint and 0.6mm height. This is ideal for low power circuits, including wearable devices and smartphones.	LQM series
Wound Ferrite Core	A feature of this product is the extensive lineup which supports an inductance of 100 uH or more. It is suitable for step-up power supply circuits in backlights, and choke applications.	LQH series DEM series

Recommended Lineup (General)

List of inductance values

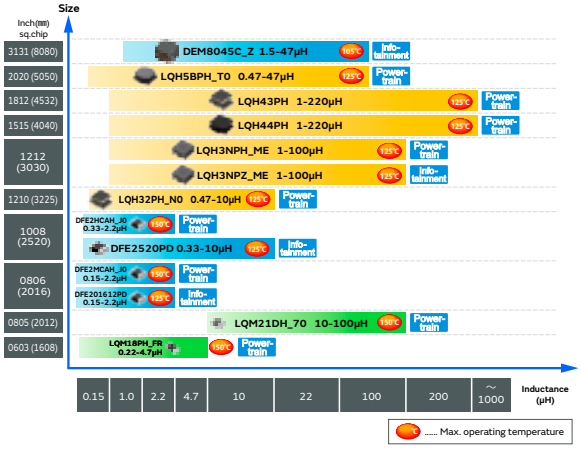


List of rated current values

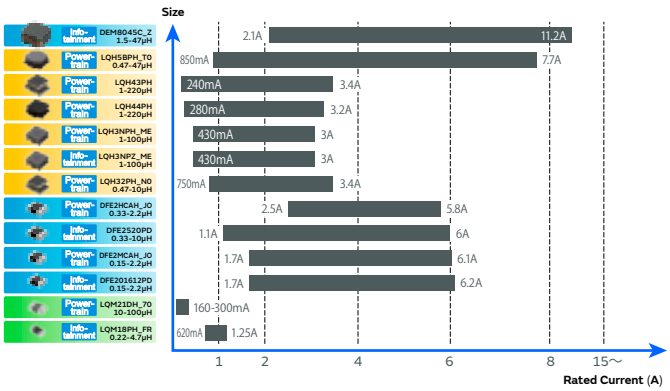


Recommended Lineup (For Automotive)

List of inductance values



List of rated current values



For Power Circuits (For General)

Structure	Size Code inch (mm)	Short Series Name/View		Series	Thickness (mm/max.)	Inductance Range	Rated Current Range
Wound Metal Alloy	0603 (1608)	DFE18SAN		DFE18SAN_E0	0.8	240nH to 1μH	2A to 4.2A
				DFE18SAN_G0	1.0	240nH to 1μH	2.1A to 4.9A
		DFE18SBN		DFE18SBN_E0	0.8	1μH	1.9A
Multilayer Type		LQM18DN		LQM18DN_70	0.95	6.8μH to 10μH	300mA to 330mA
		LQM18PN		LQM18PN_B0	0.4	1.5μH	600mA
				LQM18PN_C0	0.55	470nH to 2.2μH	700mA to 850mA
				LQM18PN_D0	0.75	2.5μH	700mA
				LQM18PN_DH	0.75	2.2μH	650mA
				LQM18PN_F0	0.95	1μH	600mA
				LQM18PN_FH	0.95	470nH to 2.2μH	700mA to 1.4A
				LQM18PN_FR	0.95	220nH to 4.7μH	620mA to 1.25A
				LQM18PN_GH	1.0	1μH to 3.3μH	1.05A
				LQM18PW_CH	0.65	1μH to 2.5μH	750mA to 950mA
Wound Metal Alloy	0805 (2012)	DFE2012		DFE201210U	1.0	240nH to 2.2μH	2A to 6.5A
Multilayer Type		LQM21PN		LQM21PN_C0	0.55	470nH to 2.2μH	600mA to 1.1A
				LQM21PN_CA	0.65	2.2μH	1.05A
				LQM21PN_CH	0.55	470nH to 2.2μH	1.05A to 1.6A
				LQM21PN_EH	0.8	240nH to 2.2μH	1.1A to 2.8A
				LQM21PN_G0	1.0	470nH to 3.3μH	800mA to 1.3A
				LQM21PN_GC	1.0	1μH to 2.2μH	800mA to 900mA
				LQM21PN_GH	1.0	470nH to 4.7μH	1A to 2.4A
				LQM21PN_GR	1.0	1μH to 4.7μH	800mA to 1.3A
				LQM21PN_GS	1.0	2.2μH to 4.7μH	750mA to 950mA
Wound Metal Alloy	0806 (2016)	DFE2016		DFE201610C	1.0	560nH to 2.2μH	1.5A to 2.8A
				DFE201610E	1.0	240nH to 10μH	1A to 6.3A
				DFE201610P	1.0	240nH to 2.2μH	2A to 5.4A
				DFE201612C	1.2	470nH to 2.2μH	1.6A to 3.4A
				DFE201612E	1.2	240nH to 4.7μH	1.8A to 6.6A
				DFE201612P	1.2	240nH to 2.2μH	2.1A to 6.5A
Wound Ferrite Core		LQH2MCN		LQH2MCN_02	0.95	1μH to 82μH	90mA to 485mA
				LQH2MCN_52	0.7	1μH to 22μH	130mA to 595mA
		LQH2MPN		LQH2MPN_GR	0.95	330nH to 82μH	210mA to 2.2A
Multilayer Type		LQM2MPN		LQM2MPN_DH	0.7	2.2μH	1.27A
				LQM2MPN_EH	0.8	240nH to 2.2μH	1.1A to 4.1A
				LQM2MPN_G0	1.0	470nH to 4.7μH	1.1A to 1.6A
				LQM2MPN_GH	1.0	160nH to 2.2μH	1.3A to 5A

Continued on the following page. ↗

Structure	Size Code inch (mm)	Short Series Name/View		Series	Thickness (mm/max.)	Inductance Range	Rated Current Range
Wound Metal Alloy	1008 (2520)	DFE2520		DFE252007F	0.7	470nH to 4.7μH	1.2A to 3.3A
				DFE252008C	0.8	470nH to 4.7μH	1.1A to 3A
				DFE252008U	0.8	470nH to 10μH	1A to 4.5A
				DFE252010C	1.0	470nH to 10μH	1A to 3.5A
				DFE252010F	1.0	220nH to 10μH	1.7A to 7.2A
				DFE252010P	1.0	330nH to 4.7μH	1.7A to 5.7A
				DFE252012C	1.2	470nH to 10μH	1A to 3.8A
				DFE252012F	1.2	330nH to 10μH	1.4A to 7.6A
				DFE252012P	1.2	330nH to 4.7μH	2A to 6.6A
Wound Ferrite Core		LQH2HPN		LQH2HPN_DR	0.6	470nH to 22μH	270mA to 1.67A
				LQH2HPN_GR	1.0	470nH to 100μH	210mA to 2.9A
				LQH2HPN_JR	1.2	470nH to 22μH	540mA to 3.5A
Multilayer Type		LQM2HPN		LQM2HPN_CH	0.55	240nH to 2.2μH	850mA to 2.55A
				LQM2HPN_E0	0.8	560nH	1.5A
				LQM2HPN_EH	0.8	240nH to 2.2μH	1.3A to 4.5A
				LQM2HPN_G0	1.0	470nH to 4.7μH	1.1A to 1.8A
				LQM2HPN_GC	1.0	1μH to 4.7μH	800mA to 1.5A
				LQM2HPN_GH	1.0	240nH to 2.2μH	1.5A to 5A
				LQM2HPN_GS	1.0	2.2μH to 4.7μH	1A to 1.1A
				LQM2HPN_J0	1.2	1μH to 3.3μH	1A to 1.5A
				LQM2HPN_JH	1.2	470nH to 2.2μH	1.5A to 3.2A
Wound Ferrite Core	3mm square	DEM28/DEM35		DEM2812C	1.2	470nH to 12μH	760mA to 3.1A
				DEM2815C	1.5	470nH to 15μH	800mA to 3.9A
				DEM2818C	1.8	470nH to 12μH	1A to 4.7A
				DEM3512C	1.2	680nH to 22μH	530mA to 2.5A
				DEM3518C	1.8	560nH to 22μH	880mA to 3.4A
		LQH3NPN		LQH3NPN_GR	1.0	470nH to 250μH	140mA to 2.82A
				LQH3NPN_JR	1.2	680nH to 47μH	570mA to 2.86A
				LQH3NPN_ME	1.5	1μH to 100μH	430mA to 3A
Multilayer Type	1206 (3216)	LQM31PN		LQM31PN_00	0.95	470nH to 4.7μH	700mA to 1.4A
Wound Metal Alloy	1210 (3225)	DFE3225		DFE322510C	1.0	470nH to 10μH	1A to 3.8A
				DFE322512C	1.2	470nH to 10μH	1.2A to 4.7A
				DFE322512F	1.2	330nH to 10μH	1.7A to 8.5A
Wound Ferrite Core		LQH32P		LQH32PB_N0	1.7	470nH to 120μH	200mA to 3.4A
				LQH32PB_NC	1.7	470nH to 22μH	650mA to 4.4A
				LQH32PN_N0	1.7	470nH to 120μH	200mA to 3.4A
				LQH32PN_NC	1.7	470nH to 22μH	650mA to 4.4A
Multilayer Type		LQM32PN		LQM32PN_G0	1.0	1μH	1.8A
				LQM32PN_GC	1.0	1μH	2.2A

Continued on the following page. ↗

Inductors for Power Lines

Structure	Size Code inch (mm)	Short Series Name/View		Series	Thickness (mm/max.)	Inductance Range	Rated Current Range
Wound Metal Alloy	4mm square	FDSD04		FDSD0412	1.2	330nH to 4.7μH	2.5A to 7.5A
				FDSD0415	1.5	220nH to 4.7μH	2.9A to 12A
				FDSD0420	2.0	330nH to 10μH	2.5A to 11A
				FDSD0420W	2.0	15μH to 22μH	1.5A to 1.9A
Wound Ferrite Core		LQH44PN		LQH44PN_J0	1.2	1μH to 47μH	380mA to 2A
				LQH44PN_P0	1.8	1μH to 22μH	800mA to 2.95A
		LQH43P		LQH43PB_26	2.8	1μH to 220μH	240mA to 3.4A
				LQH43PN_26	2.8	1μH to 220μH	240mA to 3.4A
		DEM4518		DEM4518C	1.8	1.2μH to 22μH	1A to 3.5A
Wound Ferrite Core	5mm square	LQH5BP		LQH5BPB_T0	2.2	470nH to 22μH	1.4A to 7.7A
				LQH5BPN_38	4.0	1μH to 150μH	650mA to 7A
				LQH5BPN_T0	2.2	470nH to 22μH	1.4A to 7.7A
		D52LC/D53LC		D52LC	2.0	1.2μH to 100μH	260mA to 2.44A
				D53LC	3.0	1.1μH to 220μH	350mA to 3.87A
Wound Metal Alloy		FDSD05		FDSD0512	1.2	1μH to 6.8μH	2.3A to 6.1A
				FDSD0515	1.5	1μH to 4.7μH	3.2A to 7A
				FDSD0518	1.8	680nH to 10μH	2.7A to 9A
Wound Ferrite Core	6 to 9mm square	DG60		DG6028C	2.8	1μH to 22μH	1.7A to 5.8A
				DG6045C	4.5	1μH to 100μH	900mA to 9.5A
				DG6050C	5.0	1.2μH to 100μH	1.2A to 9.8A
		D63		D63LCB	3.0	1μH to 150μH	440mA to 4.52A
		DS75LC		DS75LC	5.0	1μH to 470μH	430mA to 9.2A
		DEM80		DEM8030C	3.0	2.2μH to 47μH	1.3A to 6.2A
				DEM8040C	4.0	1.5μH to 33μH	2.4A to 10A
				DEM8045C	4.5	1.5μH to 47μH	2.1A to 11.2A
		DG80		DG8040C	4.0	1μH to 100μH	1.3A to 10.4A
Wound Metal Alloy		FCUL05		FCUL0530	3.0	360nH to 470nH	16A to 18A
		FDSD06		FDSD0630	3.0	680nH to 10μH	5.4A to 17A
		FCUL06		FCUL0624	2.4	220nH to 470nH	17A to 24A
				FCUL0630	3.0	120nH to 680nH	15A to 32A
Wound Ferrite Core	10mm square and over	DEM10050		DEM10050C	5.0	1.5μH to 33μH	3.5A to 15.3A
				DEM10050C_DD	5.0	1.5μH to 33μH	3.5A to 15.3A
		DS10/DS12		DS104C2	4.8	1.1μH to 120μH	970mA to 11.7A
				DS106C2	6.8	1.2μH to 330μH	690mA to 12A
				DS126C2	6.8	1.7μH to 680μH	580mA to 11.8A
Wound Metal Alloy		FDA10/FDA12		FDA1055	5.5	560nH to 5.6μH	8A to 27.7A
				FDA1254	5.4	680nH to 8μH	9.1A to 29.1A
		FCUL10		FCUL1040	4.0	180nH to 420nH	34A to 53A
				FCUL1060	6.0	360nH to 560nH	34A to 41A

For Choke Circuits (For General)

Structure	Size Code inch (mm)	Short Series Name/View		Series	Thickness (mm/max.)	Inductance Range	Rated Current Range
Wound Ferrite Core	0402 (1005)	**LQW15DN**		**LQW15DN_00**	0.7	10μH to 15μH	100mA to 120mA
Multilayer Type	0603 (1608)	**LQM18FN**		**LQM18FN_00**	0.9	1μH to 10μH	50mA to 150mA
	0805 (2012)	**LQM21DN**		**LQM21DN_00**	1.05	1μH to 47μH	7mA to 60mA
				LQM21DN_70	1.45	10μH to 100μH	160mA to 300mA
		LQM21FN		**LQM21FN_00**	1.45	1μH to 47μH	7mA to 220mA
				LQM21FN_80	1.45	4.7μH to 10μH	100mA to 120mA
Wound Ferrite Core	1206 (3216)	**LQH31CN**		**LQH31CN_03**	2.0	120nH to 100μH	80mA to 970mA
	1210 (3225)	**LQH32CN**		**LQH32CN_23**	2.2	1μH to 560μH	60mA to 800mA
				LQH32CN_33	2.2	150nH to 10μH	450mA to 1.45A
				LQH32CN_53	1.7	1μH to 100μH	100mA to 1A
		LQH32DN		**LQH32DN_23**	2.2	1μH to 560μH	60mA to 800mA
				LQH32DN_53	1.7	1μH to 100μH	100mA to 1A
	4mm square	**LQH43CN**		**LQH43CN_03**	2.8	1μH to 470μH	90mA to 1.08A
				LQH43CN_33	2.8	560nH to 3.9μH	1.6A to 2.95A
	5mm square	**LQH55DN**		**LQH55DN_03**	5.0	120nH to 10mH	50mA to 6A
	6 to 9mm square	**LQH66SN**		**LQH66SN_03**	5.0	270nH to 10mH	50mA to 6A

For Power Circuits (Infotainment)

Structure	Size Code inch (mm)	Short Series Name/View		Series	Thickness (mm/max.)	Inductance Range	Rated Current Range
Multilayer Type	0603 (1608)	LQM18PZ		LQM18PZ_CH	0.6	1μH to 2.5μH	750mA to 950mA
				LQM18PZ_DH	0.75	2.2μH	650mA
				LQM18PZ_FH	0.95	2.2μH	700mA
	0805 (2012)	LQM21PZ		LQM21PZ_C0	0.55	470nH to 2.2μH	600mA to 1.1A
				LQM21PZ_G0	1.0	470nH to 3.3μH	800mA to 1.3A
				LQM21PZ_GC	1.0	1μH to 2.2μH	800mA to 900mA
				LQM21PZ_GR	1.0	1μH to 4.7μH	800mA to 1.3A
Wound Metal Alloy	0806 (2016)	DFE2016		DFE201612P_D	1.2	150nH to 2.2μH	1.7A to 6.2A
Wound Ferrite Core		LQH2MPZ		LQH2MPZ_GR	0.95	330nH to 82μH	210mA to 2.2A
Multilayer Type		LQM2MPZ		LQM2MPZ_G0	1.0	470nH to 4.7μH	1.1A to 1.6A
				LQM2MPZ_JH	1.2	100nH	4A
Wound Ferrite Core	1008 (2520)	LQH2HPZ		LQH2HPZ_DR	0.6	470nH to 22μH	270mA to 1.67A
				LQH2HPZ_GR	1.0	470nH to 22μH	460mA to 2.9A
				LQH2HPZ_JR	1.2	470nH to 22μH	540mA to 3.5A
Multilayer Type		LQM2HPZ		LQM2HPZ_E0	0.8	560nH	1.5A
				LQM2HPZ_G0	1.0	470nH to 4.7μH	1.1A to 1.8A
				LQM2HPZ_GC	1.0	1μH to 4.7μH	800mA to 1.5A
				LQM2HPZ_GS	1.0	2.2μH to 4.7μH	1A to 1.1A
				LQM2HPZ_J0	1.2	1μH to 3.3μH	1A to 1.5A
Wound Metal Alloy		DFE2520		DFE252012P_D	1.2	330nH to 10μH	1.1A to 6A
Wound Ferrite Core	3mm square	LQH3NPZ		LQH3NPZ_GR	1.0	470nH to 47μH	460mA to 2.82A
				LQH3NPZ_JR	1.2	680nH to 47μH	570mA to 2.86A
				LQH3NPZ_ME	1.5	1μH to 100μH	430mA to 3A
Wound Metal Alloy	1210 (3225)	DFE3225		DFE322520F_D	2.0	1μH to 4.7μH	3.4A to 7.5A
Wound Ferrite Core		LQH32PZ		LQH32PZ_N0	1.7	470nH to 120μH	200mA to 3.4A
				LQH32PZ_NC	1.7	470nH to 22μH	650mA to 4.4A
	4mm square	LQH43PZ		LQH43PZ_26	2.8	1μH to 220μH	240mA to 3.4A
	5mm square	LQH5BPZ		LQH5BPZ_T0	2.2	470nH to 22μH	1.4A to 7.7A
	6 to 9mm square	DEM80		DEM8045C_Z	4.5	1.5μH to 47μH	2.1A to 11.2A

For Power Circuits (Powertrain)

Structure	Size Code inch (mm)	Short Series Name/View		Series	Thickness (mm/max.)	Inductance Range	Rated Current Range
Multilayer Type	0603 (1608)	LQM18PH		LQM18PH_FR	0.95	220nH to 4.7μH	620mA to 1.25A
	0805 (2012)	LQM21PH		LQM21PH_G0	1.0	0.47μH to 0.54μH	1.3A
				LQM21PH_GC	1.0	1.0μH to 2.2μH	800mA to 1A
Wound Metal Alloy	0806 (2016)	DFE2MCAH		DFE2MCAH_J0	1.2	0.15μH to 2.2μH	1.7A to 6.1A
	1008 (2520)	DFE2HCAH		DFE2HCAH_J0	1.2	330nH to 2.2μH	2.5A to 5.8A
Wound Ferrite Core	1212 (3030)	LQH3NPH		LQH3NPH_ME	1.5	1μH to 100μH	430mA to 3A
	1210 (3225)	LQH32PH		LQH32PH_N0	1.7	470nH to 10μH	750mA to 3.4A
				LQH32PH_NC	1.7	470nH to 22μH	650mA to 4.4A
	4mm square	LQH44PH		LQH44PH_PR	1.8	1μH to 220μH	330mA to 4.3A
		LQH43PH		LQH43PH_26	2.8	1μH to 220μH	240mA to 3.4A
	5mm square	LQH5BPH		LQH5BPH_T0	2.2	0.47μH to 47μH	850mA to 7.7A

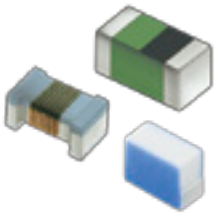
For Choke Circuits (Infotainment)

Structure	Size Code inch (mm)	Short Series Name/View		Series	Thickness (mm/max.)	Inductance Range	Rated Current Range
Wound Ferrite Core	1210 (3225)	LQH32D		LQH32DZ_23	2.2	1μH to 470μH	60mA to 800mA
				LQH32DZ_53	1.7	1μH to 100μH	100mA to 1A

For Choke Circuits (Powertrain)

Structure	Size Code inch (mm)	Short Series Name/View		Series	Thickness (mm/max.)	Inductance Range	Rated Current Range
Multilayer Type	0805 (2012)	LQM21DH		LQM21DH_70	1.45	10μH to 100μH	160mA to 300mA
Wound Ferrite Core	1210 (3225)	LQH32C		LQH32CH_23	2.2	1μH to 22μH	250mA to 800mA
				LQH32CH_33	2.2	150nH to 10μH	450mA to 1.45A
				LQH32CH_53	1.7	1μH to 22μH	250mA to 1A
		LQW32F		LQW32FT_0H	2.5	10μH to 47μH	500mA to 700mA

RF Inductors



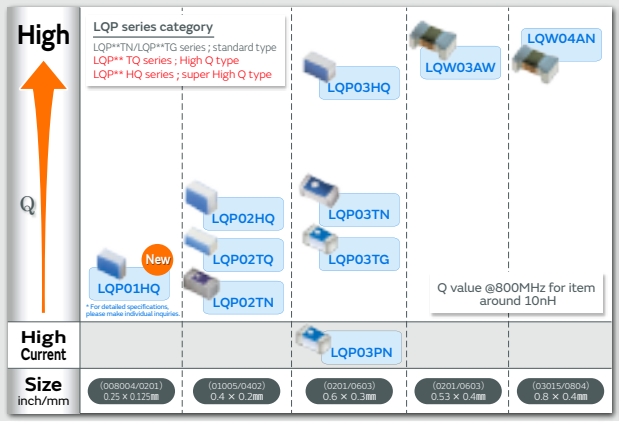
Main Type:

▪ Film Type ▪ Wire Wound Type ▪ Multilayer Type

An RF inductor is used for matching applications and choke applications in the RF section which has wireless communication functions. By using three characteristic methods, you can select the optimum series for the intended application. For a smartphone or a module film type LQP series which is compact and also has high Q characteristics is optimum. For an RF inductor of size 1005 mm or more, the high Q wound type LQW series which has a large rated current value is recommended for use in a base station or STB. While the multilayer LQG series has a good balance between cost and performance, it is recommended for a wide range of automotive applications, based on our market achievements over many years. Products that are suitable for choke circuits using magnetic materials, such as the LQW_CN series, LQW_H series and other series are also available for power lines. You can select the optimum series from our lineup, based on either the intended application or the relationship between the size and Q characteristics.

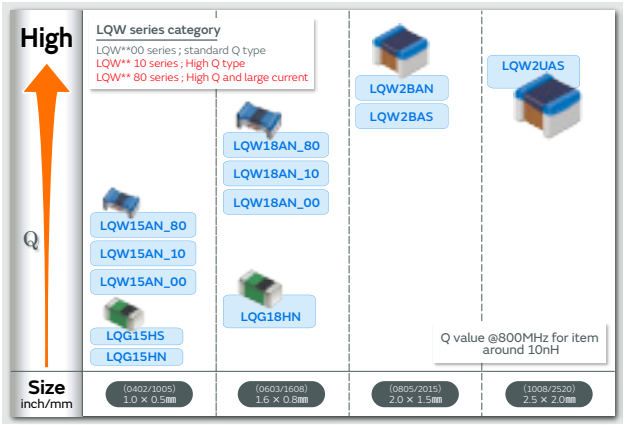
General (0.8×0.4 mm or less)

Lineup list



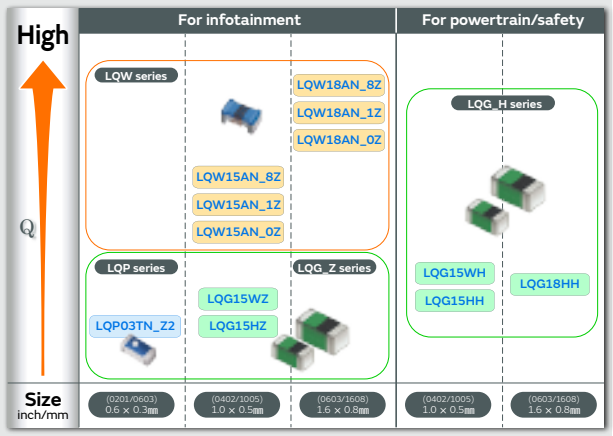
General (1.0×0.5 mm or more)

Lineup list



For Automotive

Lineup list



RF Circuits (0.8 x 0.4 mm or less)

Structure	Size Code inch (mm)	Short Series Name/View		Series	Thickness (mm/max.)	Inductance Range	Rated Current Range
Wound non-magnetic type	0201 (0603)	LQW03A		LQW03AW_00	0.45	1nH to 15.5nH	230mA to 900mA
	03019 (0805)	LQW04A		LQW04AN_00	0.45	0.8nH to 33nH	140mA to 1.8A
				LQW04AN_10	0.45	36nH to 56nH	180mA to 200mA
				LQW04AN_20	0.45	36nH to 56nH	120mA to 155mA
Film type	008004 (0201)	LQP01		LQP01HQ	0.213	0.3nH to 2.7nH	200mA to 500mA
	01005 (0402)	LQP02		LQP02HQ_02	0.32	0.2nH to 56nH	100mA to 1A
				LQP02TQ_02	0.22	0.2nH to 22nH	120mA to 990mA
				LQP02TN_02	0.22	0.2nH to 39nH	90mA to 320mA
	0201 (0603)	LQP03		LQP03HQ_02	0.42	0.5nH to 470nH	50mA to 1.1A
				LQP03TN_02	0.33	0.6nH to 270nH	60mA to 850mA
				LQP03TG_02	0.33	0.1nH to 120nH	80mA to 850mA
				LQP03PN_02	0.33	2.2nH to 4.7nH	900mA to 1.4A

RF Circuits (1.0 x 0.5 mm or more)

Structure	Size Code inch (mm)	Short Series Name/View		Series	Thickness (mm/max.)	Inductance Range	Rated Current Range
Wound non-magnetic type	0402 (1005)	LQW15A		LQW15AN_00	0.6	1.5nH to 120nH	110mA to 1A
				LQW15AN_10	0.6	1.3nH to 8.4nH	640mA to 1.2A
				LQW15AN_80	0.6	1.3nH to 75nH	320mA to 3.15A
				LQW15AW_80	0.66	51nH to 220nH	220mA to 480mA
	0603 (1608)	LQW18A		LQW18AN_00	1.0	2.2nH to 470nH	75mA to 850mA
				LQW18AN_10	1.0	2.2nH to 33nH	550mA to 1.4A
				LQW18AN_80	1.0	2.2nH to 390nH	190mA to 3.2A
				LQW18AS_00	1.0	1.2nH to 390nH	100mA to 700mA
				LQW18AS_0C	1.0	1.6nH to 390nH	100mA to 700mA
	0806 (2016)	LQW2B		LQW2BAN_00	1.52	3.2nH to 200nH	750mA to 3.8A
				LQW2BAS_00	1.52	2.7nH to 1μH	170mA to 910mA
				LQW2BHN_03	1.78	3.3nH to 470nH	160mA to 1.32A
				LQW2BHN_13	1.78	2.7nH to 27nH	900mA to 1.9A
	1008 (2520)	LQW2U		LQW2UAS_00	2.03	12nH to 4.7μH	260mA to 1A
				LQW2UAS_0C	2.03	12nH to 8.2μH	170mA to 1A
	1206 (3216)	LQW31H		LQW31HN_03	2.0	8.8nH to 100nH	230mA to 750mA
Multilayer Type	0402 (1005)	LQG15H		LQG15HN_02	0.55	1nH to 120nH	150mA to 1A
				LQG15HS_02	0.55	1nH to 270nH	110mA to 1A
	0603 (1608)	LQG18H		LQG18HN_00	0.95	1.2nH to 100nH	350mA to 1.1A

For Choke/Tuner Circuits (1.0 x 0.5 mm or more)

Structure	Size Code inch (mm)	Short Series Name/View		Series	Thickness (mm/max.)	Inductance Range	Rated Current Range
Wound Ferrite Core type	0402 (1005)	LQW15C		LQW15CN_00	0.6	18nH to 200nH	390mA to 1.4A
				LQW15CN_10	0.6	20nH to 3.3μH	130mA to 2.2A
	0402 (1005)	LQW15D		LQW15DN_00	0.7	10μH to 15μH	100mA to 120mA
	0603 (1608)	LQW18C		LQW18CN_00	0.95	4.9nH to 650nH	430mA to 2.6A
	0805 (2012)	LQW21H		LQW21HN_00	1.0	470nH to 2.2μH	75mA to 160mA
	1206 (3216)	LQH31H		LQH31HN_03	2.0	54nH to 880nH	180mA to 920mA

For Choke/Tuner Circuits (Infotainment)

Structure	Size Code inch (mm)	Short Series Name/View		Series	Thickness (mm/max.)	Inductance Range	Rated Current Range
Wound Ferrite Core type	0402 (1005)	LQW15C		LQW15CN_0Z	0.6	18nH to 200nH	390mA to 1.4A
				LQW15CN_1Z	0.6	20nH to 560nH	300mA to 2.2A
	0603 (1608)	LQW18C		LQW18CN_0Z	0.95	4.9nH to 650nH	430mA to 2.6A
	1206 (3216)	LQH31H		LQH31HZ_03	2.0	54nH to 880nH	180mA to 920mA

For RF Circuits (Infotainment)

Structure	Size Code inch (mm)	Short Series Name/View		Series	Thickness (mm/max.)	Inductance Range	Rated Current Range
Wound non-magnetic type	0402 (1005)	LQW15A		LQW15AN_0Z	0.6	1.5nH to 120nH	110mA to 1A
				LQW15AN_1Z	0.6	1.3nH to 8.4nH	640mA to 1.2A
				LQW15AN_8Z	0.6	1.3nH to 75nH	320mA to 3.15A
	0603 (1608)	LQW18A		LQW18AN_0Z	1.0	2.2nH to 470nH	75mA to 850mA
				LQW18AN_1Z	1.0	2.2nH to 33nH	550mA to 1.4A
				LQW18AN_8Z	1.0	2.2nH to 390nH	190mA to 3.2A
				LQW18AS_0Z	1.0	1.6nH to 390nH	100mA to 700mA
Film type	0201 (0603)	LQP03T		LQP03TN_Z2	0.33	0.6nH to 120nH	80mA to 850mA
Multilayer Type	0402 (1005)	LQG15H		LQG15HZ_02	0.55	1nH to 270nH	110mA to 1A
		LQG15W		LQG15WZ_02	0.6	0.7nH to 150nH	110mA to 1.2A

For RF Circuits (Powertrain)

Structure	Size Code inch (mm)	Short Series Name/View		Series	Thickness (mm/max.)	Inductance Range	Rated Current Range
Multilayer Type	0402 (1005)	LQG15H		LQG15HH_02	0.55	1nH to 270nH	110mA to 1A
		LQG15W		LQG15WH_02	0.6	0.7nH to 150nH	110mA to 1.2A
	0603 (1608)	LQG18H		LQG18HH_00	0.95	1.2nH to 270nH	200mA to 1.1A

LC trap filter

Part number	Impedance (Ω Typ.)			Insertion Loss Characteristic (dB Typ.)			DC Resistance Max.(Ω)	Rated Current (mA)	Self Resonant Frequency (GHz Typ.)
	at 2.40GHz	at 2.44GHz	at 2.50GHz	at 2.40GHz	at 2.44GHz	at 2.50GHz			
LQZ02HQ242A02	460	600	345	15.0	15.7	13.0	0.55	200	2.44

General Circuit Inductors

Main Type:

▪ Multilayer Type ▪ Wire-wound Type ▪ 2in1 Type

We have an extensive lineup of general purpose inductors for a variety of circuits.
You can select an inductor to match your particular application. Wire-wound type LQH_M, LQH_N series are suitable for large inductance, multilayer type LQM_M, LQM_N series are suitable for small size.
In addition, we have the 2-in-1 type HEAWS series inductors for digital audio amplifiers.

General Purpose (For General)

Structure	Size Code inch (mm)	Short Series Name/View		Series	Thickness (mm/max.)	Inductance Range	Rated Current Range
Wound Ferrite Core type	0402 (1005)	**LQW15CA**		**LQW15CA_00**	0.66	22nH to 2μH	130mA to 1.3A
	0603 (1608)	**LQW18CA**		**LQW18CA_00**	0.95	32nH to 580nH	450mA to 2.2A
	1206 (3216)	**LQH31MN**		**LQH31MN_03**	2.0	150nH to 100μH	45mA to 250mA
	1210 (3225)	**LQH32MN**		**LQH32MN_23**	2.2	1μH to 560μH	40mA to 445mA
	4mm square	**LQH44NN**		**LQH44NN_03**	4.5	510nH to 470μH	145mA to 4.5A
		LQH43M/N		**LQH43MN_03**	2.8	1μH to 1.5mH	40mA to 500mA
				LQH43NN_03	2.8	1μH to 2.4mH	25mA to 500mA
Multilayer Type	0402 (1005)	**LQB15NN**		**LQB15NN_10**	0.55	220nH to 560nH	300mA to 380mA
	0603 (1608)	**LQB18NN**		**LQB18NN_10**	0.95	220nH to 560nH	300mA to 450mA
		LQM18JN		**LQM18JN_00**	0.65	100nH to 160nH	550mA to 650mA
		LQM18NN		**LQM18NN_00**	0.95	47nH to 2.2μH	15mA to 50mA
	0805 (2012)	**LQM21NN**		**LQM21NN_10**	1.05	100nH to 4.7μH	30mA to 250mA

General Purpose (For Automotive Infotainment)

Structure	Size Code inch (mm)	Short Series Name/View		Series	Thickness (mm/max.)	Inductance Range	Rated Current Range
Wound Ferrite Core type	1210 (3225)	**LQH32NZ**		**LQH32NZ_23**	2.2	1μH to 470μH	45mA to 445mA
	4mm square	**LQH43NZ**		**LQH43NZ_03**	2.8	1μH to 2.4mH	25mA to 500mA
2in1 Type	10mm square and over	**HEAWS**		**HEAWS**	10.0	3.3μH to 10μH	5A to 8A

General Purpose (For Automotive Powertrain)

Structure	Size Code inch (mm)	Short Series Name/View		Series	Thickness (mm/max.)	Inductance Range	Rated Current Range
Wound Ferrite Core type	1210 (3225)	**LQH32NH**		**LQH32NH_23**	2.2	1μH to 560μH	40mA to 780mA
	4mm square	**LQH43NH**		**LQH43NH_03**	2.8	1μH to 2.2mH	30mA to 1.3A

Variable Inductors

Variable inductor products are coil products that allow the inductance to be easily varied by changing the position of the ferrite core in a threaded structure.
The interior is covered by a metal case that is magnetically shielded, while a resin molded structure protects the windings with a high degree of reliability.

5CCEG

6.5×5.9×6.0(H) mm MAX.

Supported inductance range: 0.05 to 2.7μH
Features
- High reliability that conforms to automotive standards
- Operating temperature range: -40°C to +85°C

Applications
- Ideal for use as RF matching transformers for car tuners

FSDVA

5.8×5.8×5.5(H) mm MAX.

Supported inductance range:
0.1 to 52mH(1 to 7 mH for corner sensor applications)
Features
- Resistant to mechanical stress
- Operating temperature range:
  Up to 20 mH (-40°C to +105°C)
  20 mH or more (-40°C to +85°C)
- High reliability that conforms to automotive standards
- Lead coplanarity guaranteed within 0.1 mm

5CCEG Series

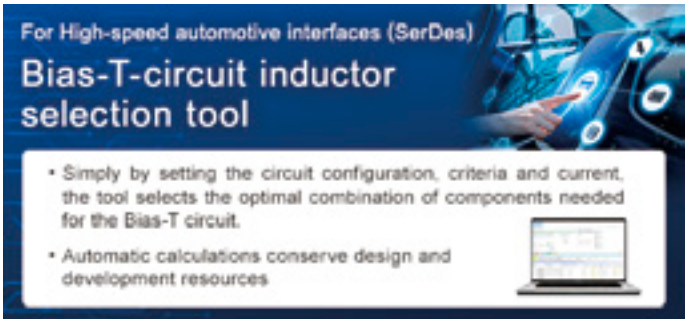
Winding Connection (Bottom View)	Part Number	Test Frequency (MHz)	Resonance Capacitor Range (pF)	Unloaded Q
	**#A1313B-0029GGH=P3**	100	11.4+3/-3%	72+/-20%
	**#A1313B-0030GRG=P3**	100	11.4+5/-2%	61+/-20%
	#A1313B-0031GRG=P3	100	11.4+2/-4%	54+/-20%
	**#A1313B-0032GGH=P3**	100	11.7+3/-3%	72+/-20%

FSDVA Series

Winding Connection (Bottom View)	Part Number	Test Frequency (kHz)	Inductance Range (mH)	Unloaded Q
	**N1342JC-0143UG=P3**	252	4.4±3%	25 min.
	**N1342LE-0144BQE=P3**	252	2.5±5%	25 min.

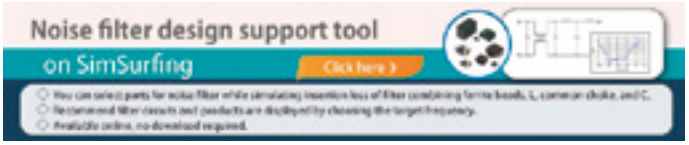
Bias-T Inductor Design Support Tool

To use this tool, go to
https://ds.murata.co.jp/bist/?lcid=en-us



Noise Filter Design Support Tool

To use this tool, go to
https://ds.murata.co.jp/nfst/



DC-DC Converter Design Support Tool

To use this tool, go to
https://ds.murata.co.jp/mpst/

Detailed Catalogs

For more details, please refer to our printed catalogs and the PDF catalogs on our website.

- Chip Inductors (Chip Coils) Cat. No. 005E
- EMI Suppression Filters (for DC)/Chip Inductors for Automotive Cat. No. C51E

Resistors

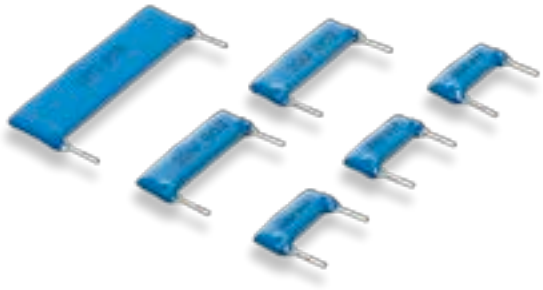
Full lineup for various applications

Summary

Using Murata's ceramic processing technology and unique materials, we offer a series of resistor products.

Lineup

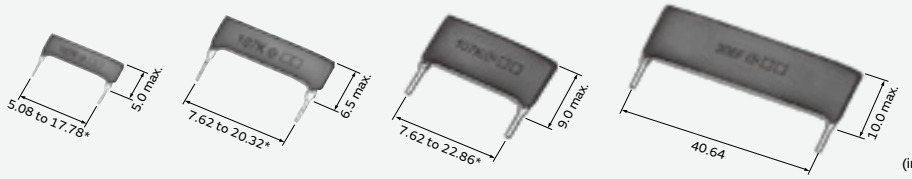
●High Voltage Resistors



https://www.murata.com/en-global/products/resistor

High Voltage Resistors

Featuring thick-film resistors, the Murata MHR series of high-voltage resistors is available in compact and thin SIP packages. Variants with small deviations are also available on request.



MHR03 Series　MHR04 Series　MHR06 Series　MHR0844 Series

(in mm)

*The terminal pitch is an integral multiple of 2.54mm.

Series	Resistance (min.) (MΩ)	Resistance (max.) (MΩ)	Maximum Operating Voltage (Single Use) (kV)	Maximum Operating Voltage (Molded Use) (kV)	Rated Power (W)
MHR03	1	1000 to 2000	2 to 8	3 to 14	0.3 to 1.0
MHR04	1	1000 to 2000	3.5 to 10	10 to 18	0.6 to 1.7
MHR06	1	1000 to 10000	3.5 to 10	10 to 20	0.8 to 1.6
MHR0844	1	2000	20	35	2.5

Resistance 2 element type is also available.
For resistance value and ratio, please contact us.

Timing Devices

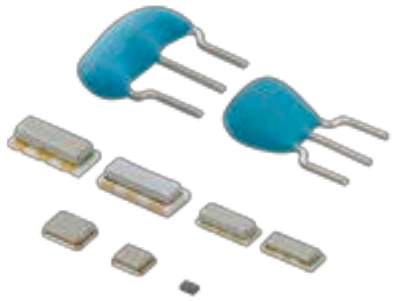
A stable timing source for microprocessors in various electronic devices

Summary

Murata's ceramic processing technology and unique piezoelectric material has led to the development of a range of small and thin ceramic timing devices that offer high oscillation frequency and remarkable oscillation tolerance.

Lineup

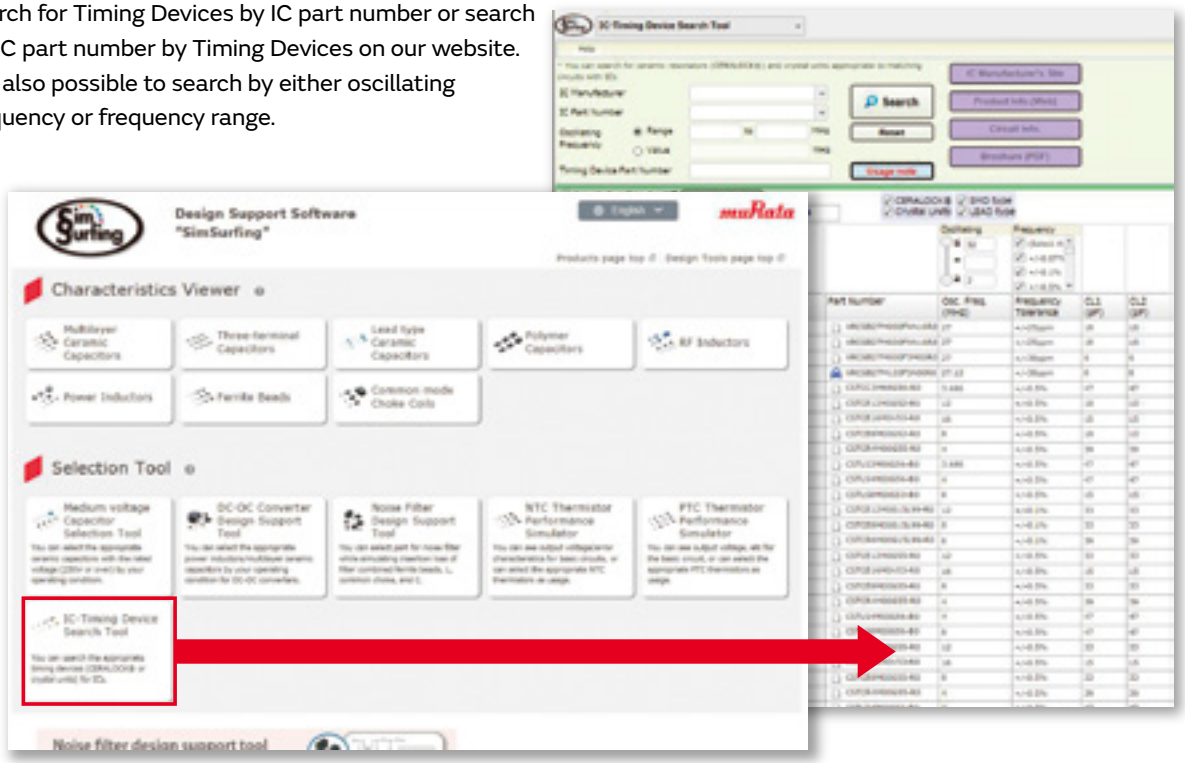
●MEMS Resonator ●Crystal Units
●Ceramic Resonators CERALOCK



https://www.murata.com/en-global/products/timingdevice

IC Part Number - Timing Devices Search

Search for Timing Devices by IC part number or search for IC part number by Timing Devices on our website. It is also possible to search by either oscillating frequency or frequency range.



https://ds.murata.co.jp/simsurfing/

Detailed Catalogs

For more details, please refer to our printed catalogs and the PDF catalogs on our website.

▪ Ceramic Resonators (CERALOCK)	Cat. No. P16E
▪ Ceramic Resonator (CERALOCK) Application Manual	Cat. No. P17E
▪ Crystal Units	Cat. No. P79E

MEMS Resonator

The ultra small-sized and highly reliable resonator is realized with Murata's MEMS technology.
The small size makes the resonator suitable for a variety of applications such as miniature IoT devices, wireless modules, medical devices, and industrial equipment.
The resonator package is silicon based with low form factor which enables embedding with IC in over molded packages.

For Consumer/Industrial

WMRAG

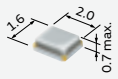
(in mm)

Series	Frequency (kHz)	Frequency Tolerance (ppm)	Operating Temperature Range (°C)
	0 10 20 30 40 50 60 70	0 20 40 60 80 100	
WMRAG	32.768	±20	-40 to 125

Crystal Units

Crystals Unit utilize highly accurate frequency-based high-grade quartz crystal elements.
We offer a wide lineup of Crystal Units using Murata's proven package technology for small digital devices, automotive, etc.

For Consumer/Industrial



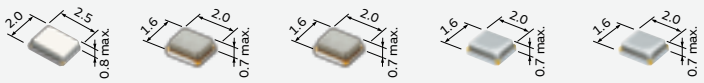
XRCGB

XRCHA

(in mm)

Series	Type	Seal	Frequency (MHz)	Frequency Tolerance (ppm)	Frequency Shift by Temperature (ppm max.)	Operating Temperature Range (°C)
			0 10 20 30 40 50 60	0 20 40 60 80 100		
XRCGB-F-S	HCR2016	Resin	24.0000	±8	±12	-30 to 85
			26.0000 40.0000	±10	±10	-30 to 85
XRCGB-F-P	HCR2016	Resin	16.0000 38.4000	±20	±20	-30 to 85
XRCGB-F-M	HCR2016	Resin	16.0000 32.0000	±30	±40	-30 to 85
			33.8688 50.0000	±45	±40	-30 to 85
XRCGB-F-L	HCR2016	Resin	16.0000 50.0000	±100	±50	-30 to 85
XRCHA-F-L	HCR2520	Resin	16.0000 20.0000	±100	±100	-30 to 85

For Automotive Applications



XRCHA-F-A XRCGE-F-A XRCGB-F-A XRCGB-F-C XRCGB-F-G

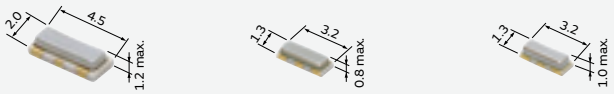
(in mm)

Series	Type	Seal	Frequency (MHz)	Frequency Tolerance (ppm)	Frequency Shift by Temperature (ppm max.)	Operating Temperature Range (°C)
XRCHA-F-A	HCR2520	Resin	16.0000 – 24.0000	±100	±100	-40 to 125
XRCGE-F-A	HCR2016	Resin	20.0000 – 23.9999	±30	±45	-40 to 125
			24.0000 – 27.6000	±15	±35	-40 to 125
			30.0000 – 40.0000	±30	±45	-40 to 125
XRCGB-F-A	HCR2016	Resin	24.0000 – 29.9999	±30	±35	-40 to 125
			30.0000 – 48.0000	±50	±65	-40 to 125
XRCGB-F-C	HCR2016	Resin	24.0000 – 27.6000	±20	±20	-30 to 85
XRCGB-F-G	HCR2016	Resin	24.0000 – 48.0000	±30 ±45 ±100	±50	-40 to 85

Ceramic Resonators CERALOCK

Wide product lineup of SMD and lead type versions for automotive and consumer applications.

MHz Chip Type for Automotive (Tight Frequency Tolerance)

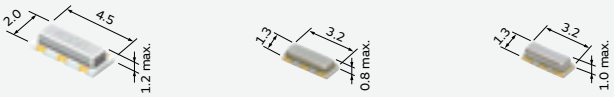


CSTNR_GH5C CSTNE_GH5C CSTNE_VH3C

(in mm)

Series	Frequency (MHz)	Frequency Tolerance (%)	Frequency Shift by Temperature (% max.)	Operating Temperature Range (°C)
CSTNR_GH5C	4.00 – 7.99	±0.07	±0.13	-40 to 125
CSTNE_GH5C	8.00 – 13.99	±0.07	±0.13	-40 to 125
CSTNE_VH3C	14.00 – 20.00	±0.07	±0.13	-40 to 125

MHz Chip Type for Automotive (Standard Frequency Tolerance)

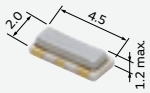


CSTCR_G_B CSTNE_G_A CSTNE_V_C

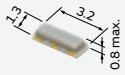
(in mm)

Series	Frequency (MHz)	Frequency Tolerance (%)	Frequency Shift by Temperature (% max.)	Operating Temperature Range (°C)
CSTCR_G_B	4.00 – 7.99	±0.5	±0.15	-40 to 125
CSTNE_G_A	8.00 – 13.99	±0.5	±0.20	-40 to 125
CSTNE_V_C	14.00 – 20.00	±0.5	±0.15	-40 to 125

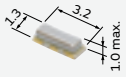
MHz Chip Type for Consumer Electronics (Tight Frequency Tolerance)



CSTNR_GH5L



CSTNE_GH5L

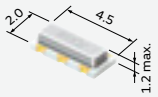


CSTNE_VH3L

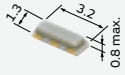
(in mm)

Series	Frequency (MHz) 0 10 20 30 40 50 60 70	Frequency Tolerance (%) 0 1	Frequency Shift by Temperature (% max.)	Operating Temperature Range (°C)
CSTNR_GH5L	4.00 – 7.99	±0.07	±0.11	-20 to 85
CSTNE_GH5L	8.00 – 13.99	±0.07	±0.11	-40 to 85
CSTNE_VH3L	14.00 – 20.00	±0.07	±0.11	-40 to 85

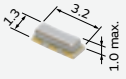
MHz Chip Type for Consumer Electronics (Standard Frequency Tolerance)



CSTCR_G



CSTNE_G

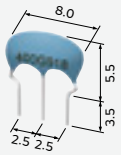


CSTNE_V

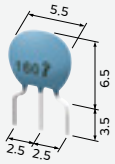
(in mm)

Series	Frequency (MHz) 0 10 20 30 40 50 60 70	Frequency Tolerance (%) 0 1	Frequency Shift by Temperature (% max.)	Operating Temperature Range (°C)
CSTCR_G	4.00 – 7.99	±0.5	±0.20	-20 to 80
CSTNE_G	8.00 – 13.99	±0.5	±0.20	-40 to 85
CSTNE_V	14.00 – 20.00	±0.5	±0.30	-40 to 85

MHz Lead Type for Consumer Electronics (Standard Frequency Tolerance)



CSTLS_G



CSTLS_X

(in mm)

Series	Frequency (MHz) 0 10 20 30 40 50 60 70	Frequency Tolerance (%) 0 1	Frequency Shift by Temperature (% max.)	Operating Temperature Range (°C)
CSTLS_G	3.40 – 10.00	±0.5	±0.20 (15pF) -0.40/+0.20 (47pF)	-20 to 80
CSTLS_X	16.00 – 70.00	±0.5	±0.20	-20 to 80

Filters

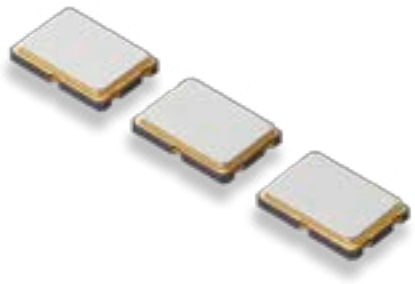
Broad lineup of Filters for video, audio, RF/Local, Duplexers, and Filters for IF

Summary

Using Murata's ceramic proccessing technology and unique materials, we offer miniaturized filters with excellent properties for advanced digital audio/visual systems and communication equipment.

Lineup

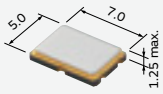
●Crystal Filters ●SAW Filters for Mobile Communications
●Dielectric Filters GIGAFIL ●Chip Multilayer LC Filters



https://www.murata.com/en-global/products/filter

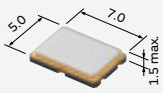
Crystal Filters

Our original wafer-thin technology has made it possible to make highly reliable filters in various applications such as radio communication worldwide.



(in mm)

XDCAF / XDCAG / XDCAH Series



(in mm)

XDCAE Series

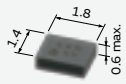
Series	Type	Frequency Range (MHz)	Number of Poles
XDCAF	TM7050F	20 to 80 [Fundamental] 70 to 150 [3rd overtone]	2
XDCAG	TM7050G		4
XDCAH	TM7050H		4
XDCAE	TM7050E		4

*Please be sure to consult with our sales representative or engineer if you require other center frequency.

SAW Filters for Mobile Communications

SAW Duplexers

Low loss, high attenuation performance, small size, highly selective pass band, chip size package



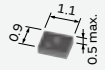
(in mm)

SAYEY Series

RF Filters

Low loss, high attenuation performance, small size, highly selective pass band, chip size package

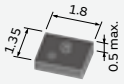
Single Filter



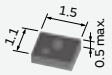
(in mm)

SAFFB Series

Dual Filter



SAWEN Series



SAWFD Series

(in mm)

SAW Filters and SAW Duplexers may be used only in the following equipment:
Mobile phones, cordless telephones (except automobile telephone), smartphones, tablet PC, PC (including laptop/netPC), game machines, cameras (except for business use and for security), STB, electronic dictionaries, and digital audio instruments.
Please contact us for other usages.

Dielectric Filters GIGAFIL

This is a high frequency dielectric filter for Wi-Fi routers, accespoints, for example.
It employs a unique plate construction which enables the filter to be compact and have a low profile.

DFCT Series

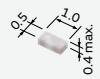
	Series	Frequency Range (MHz) 100 1000 2000 3000 4000 5000 6000 7000	Number of Resonators	Input Power Range
RF Filter	**DFCT**	2000 – 6000	2 to 6	1W*

*Power depends upon specifications.

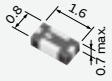
Chip Multilayer LC Filters

Ultra-small and low-profile filters based on ceramic multilayer technology.

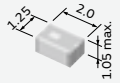
Band Pass Filters



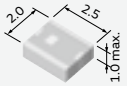
LFB15 Series



LFB18 Series



LFB21 Series



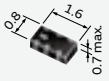
LFB2H Series

LFB31 Series

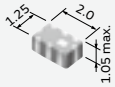
(in mm)

Low Pass Filters

LFL15 Series



LFL18 Series



LFL21 Series

(in mm)

Detailed Catalogs

For more details, please refer to our printed catalogs and the PDF catalogs on our website.

- Ceramic Filters (CERAFIL)/Crystal Filters — Cat. No. P51E
- Ceramic Filters (CERAFIL) Application Manual — Cat. No. P11E

RF Components

Broad lineup of RF Components for RF/Local circuits in communications equipment

Summary

To enhance the technical advantages of communication equipment, Murata offers miniaturized, sophisticated components to meet the demands of many applications.

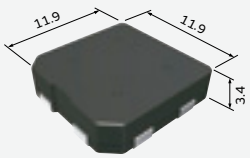
Lineup

- ●Antennas
- ●Baluns (Chip Multilayer and Wire Wound/Film type)
- ●Couplers (Chip Multilayer) ●Chip Multilayer Hybrid Dividers
- ●Chip Multilayer Diplexers
- ●Microwave Connectors

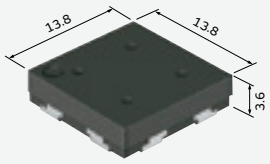
Antennas

Antenna Coils

Rx 3D-ANT



SA3D12 Series



SA3D14 Series

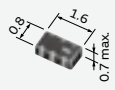
(in mm)

Series		Inductance (mH)	Q (Reference)
SA3D12	X	1.0 to 6.3	20
	Y	1.0 to 6.3	20
	Z	1.0 to 9.0	20
SA3D14	X	1.0 to 6.3	20
	Y	1.0 to 6.3	20
	Z	1.0 to 9.0	20

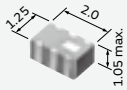
Baluns

SMD baluns constructed with a copper conductor and ceramic material. Ideal for high-frequency applications. Small-size and low-loss baluns can be customized for balance impedance of 50Ω to 200Ω.

Chip Multilayer Type



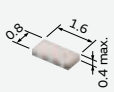
LDB18 Series



LDB21 Series

LDM0Q Series

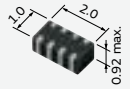
LDM15 Series



LDM18 Series

(in mm)

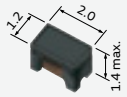
Film Type



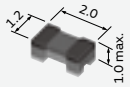
DXP2AB Series

(in mm)

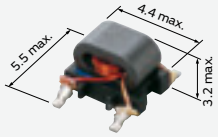
Wire Wound Type



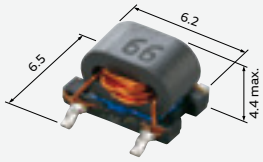
DXW21B Series



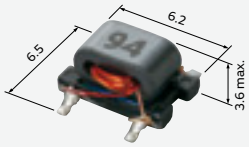
DXW21H Series



B4F Series



B5F Series



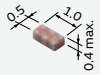
B5FL Series

(in mm)

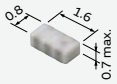
Couplers

An ultra-small, low-profile directional coupler based on ceramic multilayer technology.
This coupler achieves ultra-small size, low insertion loss, and high isolation.

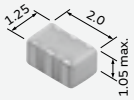
Chip Multilayer Type



LDC15 Series
LDJ15 Series



LDC18 Series
LDJ18 Series



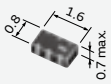
LDC21 Series
LDJ21 Series

*It is available with Integrated LPF for **LDC21 Series**.

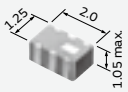
(in mm)

Chip Multilayer Hybrid Dividers

Power divider with a multilayer low pass filter in an ultra-compact package.



LDD18 Series

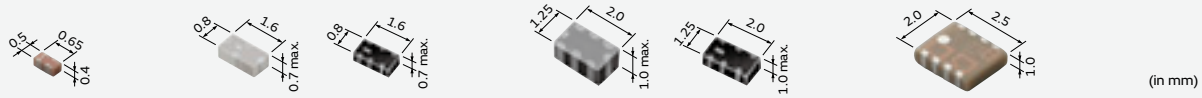


LDD21 Series

(in mm)

Chip Multilayer Diplexers

A diplexer branching low and high band.
Suitable for band-switching for dual-band system.



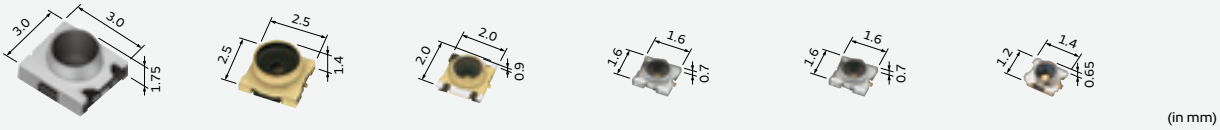
LFD15 Series | LFD18 Series | LFD21 Series | LFD2H Series

(in mm)

Microwave Connectors

Microwave Coaxial Connectors with Switch

The coaxial connector with switch is very useful for the measurement of characteristics in communication devices such as mobile terminals and microwave circuits.



MM8430-2610 | MM8130-2600 | MM8030-2610 | MM8930-2600 | MM8930-2620 | MM8830-2600

(in mm)

Type	Receptacle Part Number	Frequency Rating (GHz)	Voltage Standing Wave Ratio	Standard Measurement Probe Part Number
SWD	**MM8430-2610**	up to 6	1.2 max. (DC to 3GHz) 1.3 max. (3GHz to 6GHz)	**MM126320** **MXHS83QE3000**
SWF	**MM8130-2600**	up to 6	1.2 max. (DC to 3GHz) 1.3 max. (3GHz to 6GHz)	
SWG	**MM8030-2610**	up to 11	1.2 max. (DC to 3GHz) 1.3 max. (3GHz to 6GHz) 1.5 max. (6GHz to 11GHz)	**MM126330** **MXHQ87WJ3000**
SWH	**MM8930-2600**	up to 12	1.1 max.(DC to 3GHz) 1.2 max.(3GHz to 6GHz) 1.3 max. (6GHz to 9GHz) 1.6 max. (9GHz to 12GHz)	**MM126515** **MXHQ87PA3000**
SWH-2Way	**MM8930-2620**	up to 12	1.2 max.(DC to 3GHz) 1.2 max.(3GHz to 6GHz) 1.4 max. (6GHz to 9GHz) 1.6 max. (9GHz to 12GHz)	**RF: MM126526** **ANT: MM126517** **RF: MXHQ87PN3000** **ANT: MXHQ87PP3000**
SWJ	**MM8830-2600**	up to 9	1.2 max. (DC to 8GHz) 1.3 max. (8GHz to 9GHz)	**MXFQB1PY1000** **MXHQ87PK3000**

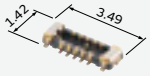
Nominal Impedance: 50Ω ; Rated Voltage: 30Vrms ; Temperature Range: -40 to 85°C

Microwave Multi Line Connectors

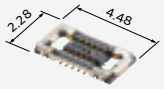
Multi line connectors transmit signals from board to board. The connectors can transmit not only digital signals but also RF signals.

MM3529-2700A06

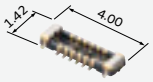
MM3531-2701A06



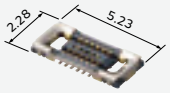
MM3529-2700A10



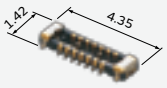
MM3531-2701A10



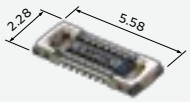
MM3529-2700A12



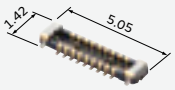
MM3531-2700A12



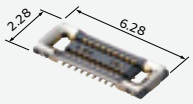
MM3529-2700A14



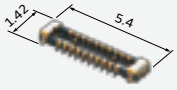
MM3531-2700A14



MM3529-2700A18

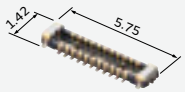


MM3531-2700A18

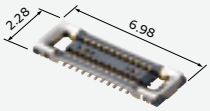


MM3529-2700A20

MM3531-2700A20



MM3529-2700A22



MM3531-2700A22

(in mm)

Type	Receptacle Part Number	Plug Receptacle Part Number	Mating Height (mm)	Pitch (mm)	Frequency Rating (GHz)	Voltage Standing Wave Ratio
MLF06	MM3529-2700A06	MM3531-2701A06	0.6 typ	0.35 typ	up to 20	1.2 max. (DC to 3GHz) 1.2 max. (3GHz to 6GHz) 1.3 max. (6GHz to 9GHz) 1.3 max. (9GHz to 12GHz) 1.35 max. (12GHz to 15GHz) 1.5 max. (15GHz to 18GHz) 1.65 max. (18GHz to 20GHz)
MLF10	MM3529-2700A10	MM3531-2701A10				
MLF12	MM3529-2700A12	MM3531-2700A12				
MLF14	MM3529-2700A14	MM3531-2700A14				
MLF18	MM3529-2700A18	MM3531-2700A18				
MLF20	MM3529-2700A20	MM3531-2700A20				
MLF22	MM3529-2700A22	MM3531-2700A22				

Nominal Impedance: 50Ω ; Rated Voltage: 30Vrms ; Temperature Range: -40 to 85°C

Detailed Catalogs

For more details, please refer to our printed catalog and the PDF catalog on our website.

▪ Microwave Connectors

Cat. No. O30E

Sensors

Summary

Murata pursued sensing functions making full use of MEMS and processing technology, and magnetoresistive elements including ceramic material technology in order to develop highly efficient and highly reliable devices, modules, and systems.
A lineup of various sensors respond to the sensing needs of various applications for automobile, wearable, medical care, and health care.

Lineup

●Infrared Sensors ●Ultrasonic Sensors
●AMR Sensors (Magnetic Sensors) ●TMR Sensors (Magnetic Sensors)
●Accelerometers ●Inclinometers ●Gyro Sensors
●Temperature Sensors (Thermistors)

https://www.murata.com/en-global/products/sensor

Sensor Guide (Select by Method/Principle)

Temperature

Thermistors: The resistance changes with the temperature.

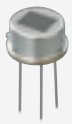
NC_ Series

PR_ Series

NX Series

Infrared

Pyroelectric infrared sensors: The sensor reacts to the infrared radiation emitted from the human body to output an electric charge.



IRA Series

For more details on Thermistors, please refer to p. 80

Detailed Catalogs

For more details, please refer to our printed catalogs and the PDF catalogs on our website.

▪ MEMS Sensors & Sensing Elements	Cat. No. S47E
▪ NTC Thermistors	Cat. No. R44E
▪ POSISTOR for Circuit Protection	Cat. No. R90E
▪ NTC/PTC Thermistors for Automotive	Cat. No. R03E

Distance

Ultrasonic sensors: The sensor sends and receives ultrasonic waves in order to detect distances from the state of the reflected wave.

MA300D1-1
(for Dual Use)

MA40S4R (for Receiver)
MA40S4S (for Transmitter)

MA58MF14-7N
(for Dual Use)

MA40H1S-R
(for Dual Use)

Magnetic/ Open and Shut

Magnetic switches: This switch switches built-in ICs when the magnetoresistive element detects the magnetic proximity.

MR Series

CT Series

Inertial force

Accelerometers: This sensor detects the acceleration from the change of the capacitance that occurs in the 3DMEMS element.

SCA Series

Inclinometers: This sensor detects the gravitational acceleration of the Earth to calculate the angle of gradient.

SCA Series
SCL Series

Gyro sensors: This sensor detects the angular velocity from the change in the capacitance that occurs in the 3DMEMS element.

SCC Series
SCR Series

Lineup

Detection	Murata's Sensors			Applications											
				AV Equipment					Communications Devices						
	Products	Series or Main Part Number	Dimensions (mm)	TV	Audio	DVD, CD	Digital Video Camera	Digital Camera	PC	Scanner	Multifunction Machine	Printer	FAX	Electronic Bulletin Board	
Infrared	Pyroelectric Infrared Sensors	**IRA Series**	 ø9.2 H4.7	●	●	●			●	●	●	●	●	●	
Ultrasonic	Open Structure Type Ultrasonic Sensors	**MA40S4R** (for Receiver) **MA40S4S** (for Transmitter)	 ø9.9 H7.1											●	
		MA40H1S-R (SMD/for Dual Use)	 5.2X5.2X1.15	●					●		●			●	
	Drip-proof Type Ultrasonic Sensors	**MA58MF14-7N** (for Dual Use)	 ø14.0 H9.0												
	High Frequency Type Ultrasonic Sensors	**MA300D1-1** (for Dual Use)	 ø9.9 H7.3							●	●	●			
Magnetic	AMR Sensors (Magnetic Sensors)	**MR Series**	 MRMS201A-001: 2.8X2.9X1.1 MRMS501A-001: 1.45X1.45X0.55			●	●	●	●						
	TMR Sensors (Magnetic Sensors)	**CT Series**	 CT100: 1.5X1.5X0.45 CT310: 2.0X2.0X0.45												
Acceleration	Accelerometers	**SCA Series**	 7.6X8.6X3.3												
	Inclinometers	**SCA Series** **SCL Series**	 7.6X8.6X3.3								●				
Angle Velocity	Gyro Sensors	**SCC Series** **SCR Series**	 12.1X15.0X4.35												
Temperature	NTC Thermistors	**Chip Type NC_ Series**	 NCP02: 0.4X0.2X0.2 NCP03: 0.6X0.3X0.3 NC_15: 1.0X0.5X0.5 NC_18: 1.6X0.8X0.8	●	●	●	●	●	●	●	●	●	●	●	
		Lead Type NX Series	 NXF: ø1.2 L25 to 150 NXR: ø4.0 L10 to 40	●	●	●	●	●	●	●	●	●	●	●	
	PTC Thermistors POSISTOR	**Chip Type PR_ Series**	 PRF15: 1.0X0.5X0.5 PRF18: 1.6X0.8X0.8 PRF21: 2.0X1.25X0.9	●	●	●	●	●	●	●	●	●	●	●	

Applications																															Murata's Sensors
Home Electronics												Security				Car Electronics			Toy		Others								Wearable		
Refrigerator	Electric Rice-cooker	Air Conditioner	Air Purification System	Humidifier	Cleaner	Laundry Machine	Food Fan	Water Heater	Toilet Seats with a Warm-water Shower Feature	Lighting	Security Camera	Security Light	Indoor Security Sensor	Intrusion Detection Sensor	Navigation System	Climate Control	Parking Assist	Radio Control (Attitude Control)	Game Controller	Machine Tool	ATM, CD	Vending Machine	Amusement Machine	Construction Machinery	Farm Machinery	Railroad Equipment	Motor				Products
●	●	●	●							●	●	●	●	●							●	●	●							Pyroelectric Infrared Sensors
●		●			●					●	●	●	●	●							●	●	●							Open Structure Type Ultrasonic Sensors
●		●			●					●	●	●	●	●							●	●	●							
																	●													Drip-proof Type Ultrasonic Sensors
																					●									High Frequency Type Ultrasonic Sensors
●	●	●	●	●	●	●	●	●	●	●				●						●	●	●	●							AMR Sensors (Magnetic Sensors)
																											●			TMR Sensors (Magnetic Sensors)
																				●			●	●	●					Accelerometers
																				●				●	●					Inclinometers
															●					●			●	●	●					Gyro Sensors
	●	●	●	●	●	●	●	●	●	●					●	●	●	●	●	●	●		●						●	NTC Thermistors
●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●						●	
●	●	●	●	●	●	●	●	●	●	●					●	●	●		●				●							PTC Thermistors POSISTOR

Thermistors

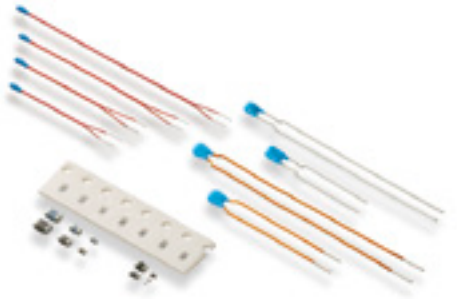
Facilitate your designs and products utilizing our thermal design and thermistor products.

Summary

Murata's semi-conductive ceramics and electrode printing technologies, such as PTC and NTC Thermistors, provide vital protection and sensing within electronic equipment. Simulation software tools are also available for your convenience.

Lineup

●NTC Thermistors for temperature sensor/compensation, and automotive
●PTC Thermistors POSISTOR for overheat sensing, overcurrent protection, and automotive



https://www.murata.com/en-global/products/thermistor

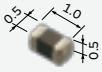
NTC Thermistors for Temperature Sensor/ Temperature Compensation

Chip Type

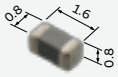
Chip NTC Thermistors have Ni barrier terminations, provide excellent solderability, and offer high stability in harsh environments due to their unique inner construction.

NCP02 Series

NCP03 Series



NCP15 Series
NCU15 Series



NCP18 Series
NCU18 Series

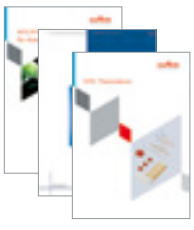
(in mm)

Series	Size Code inch (mm)	Resistance (25°C) (Ω)	B-Constant (25-50°C) (K)	Maximum Operating Current for Sensor (25°C) (mA)	Maximum Voltage (V)	Typical Dissipation Constant (25°C) (mW/°C)	Operating Temperature Range (°C)
NCP02	01005 (0402)	10k to 470k	3380 to 4250	0.015 to 0.100	5	1	-40 to 125
NCP03	0201 (0603)	1.0k to 470k	3380 to 4485	0.015 to 0.316	5	1	-40 to 125
NCP15	0402 (1005)	220 to 470k	3380 to 4500	0.015 to 0.674	5	1	-40 to 125
NCU15	0402 (1005)	10k to 470k	3380 to 4500	0.032 to 0.100	5	1	-40 to 125
NCP18	0603 (1608)	220 to 470k	3380 to 4500	0.015 to 0.674	5	1	-40 to 125
NCU18	0605 (1608)	10k to 470k	3380 to 4500	0.015 to 0.100	5	1	-40 to 125

Maximum Operating Current for Sensor raises the Thermistor's temperature by 0.1°C.
There are also items for automotive applications in the NCP/NCU Series.

Detailed Catalogs

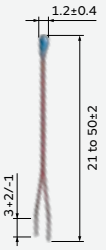
For more details, please refer to our printed catalogs and the PDF catalogs on our website.



- NTC Thermistors — Cat. No. R44E
- POSISTOR for Circuit Protection — Cat. No. R90E
- NTC/PTC Thermistors for Automotive — Cat. No. R03E

Thermo String Type

Small flexible lead type NTC Thermistors with a small head and a thin lead wire.



(in mm)

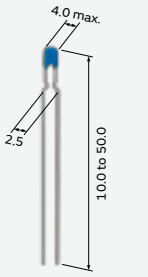
Without twist
NXFT_AB Series

Series	Resistance (25°C) (Ω)	B-Constant (25-50°C) (K)	Maximum Operating Current for Sensor (25°C) (mA)	Thermal Time Constant (25°C) (s)	Full Length (mm)	Operating Temperature Range (°C)
NXFT15_AB_ (Nickel Cooper wire type)	3k to 100k	3380 to 4250	0.024 to 0.14	3	21 to 50	-40 to 125

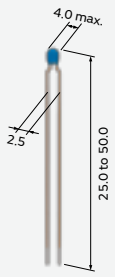
Maximum Operating Current for Sensor raises the Thermistor's temperature by 0.1°C.
There are also items for automotive applications in the NXF Series.

Lead Type

This product is a thermistor for normal temperature level sensors having self-subsistence due to strong lead strength based on chip NTC.



NXRT15_1B_ Series



NXRT15_5B_/Insulation Series*

(in mm)

Series	Resistance (25°C) (Ω)	B-Constant (25-50°C) (K)	Maximum Operating Current for Sensor (25°C) (mA)	Thermal Time Constant (25°C) (s)	Full Length (mm)	Operating Temperature Range (°C)
NXRT15_1B_	2k to 100k	3380 to 4250	0.04 to 0.27	4	10 to 50	-40 to 125
NXRT15_5B_ (Insulation*)	2k to 100k	3380 to 4250	0.05 to 0.36	4	25 to 50	-40 to 125

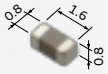
Maximum Operating Current for Sensor raises the Thermistor's temperature by 0.1°C.
There are also items for automotive applications in the NXR Series.
*Insulation: Lead wire insulation type.

PTC Thermistors POSISTOR for Overheat Sensing

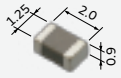
Chip Type

For overheat sensing for power transistors, power diodes, and power ICs in hybrid circuits.

PRF15 Series



PRF18 Series



PRF21 Series

(in mm)

Series	Sensing Temperature Range (°C) 60 70 80 90 100 110 120 130 140 150	Sensing Temperature Tolerance (°C)	Maximum Voltage (V)	Size Code inch (mm)
PRF15	●●●●●●●●●●●●	±3/±5	32	0402 (1005)
PRF18	●●●●●●●●●●●●	±3/±5	32	0603 (1608)
PRF21	●●●●●●●●●	±5	32	0805 (2012)

There are also items for automotive applications in the PRF Series.

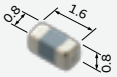
PTC Thermistors POSISTOR for Overcurrent Protection

Chip Type

Overcurrent Protection device with resettable function suitable for current-limiting resistors.

PRG03 Series

PRG15 Series



PRG18 Series

PRG21 Series

(in mm)

Series	Maximum Voltage (V)	Hold Current (60°C) (mA)	Trip Current (-20°C) (mA)	Maximum Current (mA)	Resistance (Ω)	Size Code inch (mm)
PRG03	13	8	46	93	180	0201 (0603)

Series	Maximum Voltage (V)	Hold Current (60°C) (mA)	Trip Current (-10°C) (mA)	Maximum Current (A)	Resistance (25°C) (Ω)	Size Code inch (mm)
PRG15	6 to 30	17 to 88	65 to 318	0.6 to 3.5	2.2 to 68	0402 (1005)
PRG18	6 to 30	7 to 220	25 to 850	0.06 to 7.5	1.0 to 470	0603 (1608)
PRG21	6 to 32	30 to 500	110 to 2000	0.59 to 37	0.2 to 42	0805 (2012)

Maximum Current shows typical transformer capacities that can be used.
There are also items for automotive applications in the PRG Series.

Power Devices

Eco-friendly and high-quality power devices

Summary

To meet consumer needs Murata offers power supply products and energy devices that can be used with a variety of equipment, such as video equipment, household information appliances, and communication/transfer equipment. Murata provides standard and customized products using highly reliable. Murata makes components utilizing advanced design and high-density packaging technology.

Lineup

- DC-DC Converters
- Ballast Power Supplies
- Power supplies for LED lighting

https://www.murata.com/en-global/products/power

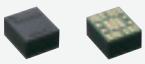
DC-DC Converters

DC-DC converters are vital to the demands of electronic equipment.
Murata offers DC-DC converters that set the standard for miniaturization, low-profile, high-efficiency, power-saving and low-noise power supplies. Murata also provides standard products and customized products, ultra-low-profile products, and products for FPGAs.

Non-isolated Type

MYMGK00504ERSR
MYMGK1R804ERSR

MYMGK00506ERSR
MYMGK1R806FRSR



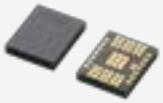
MYMGK1R820ERSR
MYMGK1R820FRSR

MYSGK1R830FRSR
MYSGK4R030ERSR

MYLSM00502ERPL

MYSGK02506BRSR

MYMGA5R04RELA5RA



MYMGC series

OKL-T/20 series
OKL2-T/20 series

OKL-T/12 series
OKL2-T/12 series

OKL-T/3 series
OKL2-T/3 series

OKL-T/6 series
OKL2-T/6 series

MYSSM02406BEPL

MYUSP3R303FMP

MYMGM1R816ELA5RA
MYMGM1R824ELA5RA

Part number	Output Current (A)	Input Voltage (V)	Output Voltage (V)	Efficiency (%)	I2C or PMBus	Package	Size (mm)		
							W	L	T
MYLSM00502ERPL	2.5	4.5 to 17	1 to 5.25	88	Not available	SMD	7.9	7.9	2.3
MYMGK1R804FRSR	4	4.5 to 8	0.7 to 1.8	93	Not available	SMD	7.5	9.0	5.0
MYMGK00504ERSR	4	8 to 15	0.7 to 5	96.1	Not available	SMD	7.5	9.0	5.0
MYMGK1R806FRSR	6	4.5 to 8	0.7 to 1.8	90.4	Not available	SMD	7.5	9.0	5.0
MYMGK00506ERSR	6	8 to 15	0.7 to 5	95.4	Not available	SMD	7.5	9.0	5.0
MYMGK1R812FRSR	12	4.5 to 8	0.7 to 1.8	92	Not available	SMD	9.0	10.5	5.6
MYMGK1R812ERSR	12	8 to 15	0.7 to 1.8	90.4	Not available	SMD	9.0	10.5	5.6
MYMGM1R816ELA5RA	16	7.5 to 15	0.7 to 1.8	91.8	PMBus	SMD	9.0	10.5	5.0

These are just a few examples of our large assortment of power products.

Continued on the following page. ↗

Part number	Output Current (A)	Input Voltage (V)	Output Voltage (V)	Efficiency (%)	I2C or PMBus	Package	Size (mm)		
							W	L	T
MYMGK1R820FRSR	20	4.5 to 8	0.7 to 1.8	89.2	Not available	SMD	9.0	10.5	5.6
MYMGK1R820ERSR	20	8 to 15	0.7 to 1.8	87.8	Not available	SMD	9.0	10.5	5.6
MYMGM1R824ELA5RA	24	7.5 to 15	0.7 to 1.8	89.2	PMBus	SMD	9.0	10.5	5.0
MYSGK1R830FRSR	30	4.5 to 15	0.7 to 1.8	89.7	Not available	SMD	14.0	11.0	8.3
MYSGK4R030ERSR	30	4.5 to 15	0.7 to 4	94.4	Not available	SMD	14.0	11.0	8.3
MYSGK02506BRSR	6	13.5 to 42	5 to 25	98	Not available	SMD	14.7	16.3	7.5
MYMGA5R04RELA5RA	4	8.0 to 16.0	3.3 to 5	94	Not available	SMD	9.0	10.5	5.5
MYMGC0R88RFLF2RV	8	3.3 to 5.5	0.85	81	I2C	SMD	11.9	15.0	2.4
MYMGC1R83BFPF2RV (Quad output)	3.2 0.5 0.5 1.5	3.3 to 5.5	0.85 0.85 1.2 1.8	81	I2C	SMD	11.9	15.0	2.4
MYMGC3R32EFPF2RV (Quad output)	2.5 1 2 1.5	4.3 to 5.5	1.2 1.8 3.3 2.5	91	I2C	SMD	11.9	15.0	2.4
OKL-T/3-W12	3	4.5 to 14	0.591 to 5.5	93	Not available	SMD	12.2	12.2	6.2
OKL-T/6-W12	6	4.5 to 14	0.591 to 5.5	93	Not available	SMD	12.2	12.2	7.2
OKL2-T/12-W12	12	4.5 to 14	0.69 to 5.5	95	Not available	SMD	20.32	11.43	8.55
OKL2-T/20-W12	20	4.5 to 14	0.69 to 5.5	94	Not available	SMD	33.02	13.46	8.7
MYSSM01206BEPL	6	17 to 40	5 to 12	95	Not available	SMD	30.2	20.9	8.3
MYSSM02406BEPL	6	30.5 to 40	12 to 24	98	Not available	SMD	30.2	20.9	8.3
MYSDM1R512EENL (Dual output)	13 1.2	10.2 to 15.8	0.9 to 1.25 0.9 to 1.5	81	Not available	SMD	30.2	20.9	7.0
MYSTM3R32EEEPL (Triple output)	1.5 1.5 2.5	10.2 to 15.8	1.8 1.23 to 1.8 3.3	84	Not available	SMD	30.2	20.9	7.0
MYUSP3R303FMP	3	3 to 5.5	0.7 to 3.3	94	Not available	SMD	11.0	8.5	5.6

These are just a few examples of our large assortment of power products.

Isolated DC-DC Converter for PoE

MYBSP0055AABFT
MYBSP0122BABFT

MYBSP0055AABF
MYBSP0122BABF

MYBSP00502ABF
MYBSP01201ABF

MYBTA00512ABT

MYBSC0128CAZT

MYBSS054R6EBF

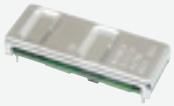
Part number	Output Power (W)	Input Voltage (V)	Output Voltage (V)	Efficiency (%)	PoE controller	Package	Size (mm)		
							W	L	T
MYBSP00502ABF	10	37 to 57	5	80	Available	SMD	26.0	14.8	6.2
MYBSP01201ABF	12	37 to 57	12	84	Available	SMD	26.0	14.8	6.2
MYBSP0055AABF	25.5	42.5 to 57	5	90.5	Available	SMD	35.5	22.4	10.55
MYBSP0122BABF	25.5	42.5 to 57	12	92.5	Available	SMD	35.5	22.4	10.55
MYBSP0055AABFT	25.5	37 to 57	5	90.5	Available	SMD	35.5	22.4	10.55
MYBSP0122BABFT	25.5	37 to 57	12	92.5	Available	SMD	35.5	22.4	10.55

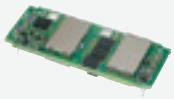
Continued on the following page. ↗

Part number	Output Power (W)	Input Voltage (V)	Output Voltage (V)	Efficiency (%)	PoE controller	Package	Size (mm)		
							W	L	T
MYBTA00512ABT	60	36 to 75	5	92	Not available	SMD	23.36	19.05	12.7
MYBSC0128CAZT	100	36 to 75	12	92.5	Not available	Insert	33.0	23.2	9.32
MYBSS054R6EBF	30	10.8 to 27	54	90	Not available	SMD	35.5	22.4	8.9

Isolated Type


MYBEA01212AZT


MYBEA01212AZTB
MYBEA01210CZTB


MYBEA01210CZT


MYBEB01212AZTB

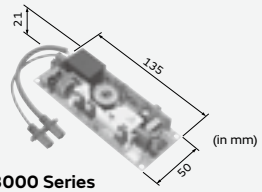

MYBSC0128CAZT


MYBTA00512ABT

Part number	Output Power (W)	Input Voltage (V)	Output Voltage (V)	Efficiency (%)	Footprint (Brick)	Package	Size (mm)		
							W	L	T
MYBEA01212AZT	140	36 to 75	12	92.5	1/8	Insert	58.4	22.8	8.46
MYBEA01212AZTB	140	36 to 75	12	92.5	1/8	Insert	58.4	22.8	11.3
MYBEA01210CZT	120	18 to 36	12	93	1/8	Insert	58.4	22.8	8.46
MYBEA01210CZTB	120	18 to 36	12	93	1/8	Insert	58.4	22.8	11.3
MYBEB01212AZTB	100	36 to 75	12	91.5	1/8	Insert	58	22.8	12.2
MYBTA00512ABT	60	36 to 75	5	92	1/32	SMD	23.36	19.05	12.7
MYBSC0128CAZT	100	36 to 75	12	92.5	1/16	Insert	33.0	23.2	9.32

These are just a few examples of our large assortment of power products.

Ballast Power Supplies



MPL3000 Series

Series	Applications	Input Voltage Vin	Output Power	Other Specification
MPL3000	Projector	320 to 420V DC	550W	For extra-high pressure mercury lamp

For more details on our products, please contact us.

Power supplies for LED lighting

LED Lighting

Type	Input Voltage	Output Voltage	Output Current (Max)	Number of Outputs	Safety Standard	Dimming
MPA1948	90 to 267V AC	30 to 50V	300 to 720mA	1ch	PSE, EN61347-1, EN61347-2-13	DALI, PWM
MPA1954	90 to 267V AC	30 to 56V	270 to 600mA	1ch	PSE, EN61347-1, EN61347-2-13	-
MPA1960	90 to 267V AC	30 to 60V	1000 to 1400mA	1ch	PSE	DALI, PWM
MPA1968	90 to 267V AC	30 to 50V	750 to 1050mA	1ch	PSE	DALI, PWM
MPL0039	45.6 to 50.4V DC	8 to 40V	450 to 900mA	2ch	-	Radio control
MPL0076DD	90 to 267V AC	10 to 50V	350 to 720mA	1ch	PSE	DALI

For more details on our products, please contact us.

For Ionizer Modules, please refer to p. 102.

Batteries

Battery solutions for energy storage systems and various small devices

Summary

Murata offers battery solutions for a wide range of applications from IoT & wearable devices to energy storage systems for enterprise and household use.

Lineup

- ●Laminated Type Lithium Ion Secondary Batteries
- ●Cylindrical Type Lithium Ion Secondary Batteries
- ●Small Lithium ion secondary batteries
- ●FORTELION 24V Battery Module
- ●FORTELION Battery System ●Micro Batteries

Laminated Type Lithium Ion Secondary Batteries

Laminated type lithium ion secondary battery has laminate film for packaging. These batteries are known for their excellent safety, thinner form factors, and size flexibility.

Standard Long Life

Model Name	Nominal Voltage (V)	Minimum Capacity (mAh)	Thickness (mm)	Width (mm)	Height (mm)	Weight (g)	Charging Voltage (V)	Chemical System (LCO, NCM, NCA)
US253450A10S	3.7	425	2.53	34	50.5	8.7	4.2	LCO
US373651A10S	3.7	765	3.63	36	51.2	14.2	4.2	LCO
US394549A10S	3.7	1,045	3.87	44.1	48.2	18.9	4.2	LCO
US634038A10S	3.7	1,110	6.3	39.32	37.85	19.6	4.2	LCO
US354775A10S	3.7	1,420	3.5	47	75	27	4.2	LCO
US454261A8TS	3.7	1,530	4.6	42	61.5	26.8	4.2	LCO
US525354A10S	3.7	1,830	5.25	53.15	54.3	33.8	4.2	LCO
US505456A10S	3.7	1,880	5.05	53.5	56.4	34.5	4.2	LCO
US374981K6S	3.7	1,950	3.65	49	81	33.9	4.2	LCO
US673864K6S	3.7	2,010	6.65	38	64	36.5	4.2	LCO
US2764A0K6S	3.7	2,040	2.65	64.1	99.5	37.9	4.2	LCO
US595676K5S	3.7	3,020	5.85	55.9	75.5	55.5	4.2	LCO
US486588K5S	3.7	3,360	4.8	65	88	62	4.2	LCO
US616484K6S	3.7	4,040	6.1	64	84	74.4	4.2	LCO
US31A0B8A10S	3.7	4,750	3.03	99.5	118	91.5	4.2	LCO
US666588K6S	3.7	4,800	6.55	65	88	88.4	4.2	LCO

Continued on the following page. ↗

High Voltage High Capacity

Model Name	Nominal Voltage (V)	Minimum Capacity (mAh)	Thickness (mm)	Width (mm)	Height (mm)	Weight (g)	Charging Voltage (V)	Chemical System (LCO, NCM, NCA)
US476483BH9	3.83	4,010	4.63	63.9	82.45	58.3	4.4	LCO
US426487CH9P	3.85	3,920	4.12	63.48	86.2	51.9	4.43	LCO
US525775CH9P	3.85	3,720	5.1	56.53	74.3	48.5	4.43	LCO
US2980F9H2	3.8	4,670	2.81	79.8	159	87	4.35	LCO
US275361H5	3.8	1,040	2.65	53	60.5	18.1	4.35	LCO
US4032B3BH5	3.8	1,900	3.92	31.9	113	33	4.35	LCO
US325991H5	3.8	2,410	3.18	58.7	90.5	40.4	4.35	LCO
US456067H5	3.8	2,590	4.45	59.73	66.92	42.8	4.35	LCO
US395189BH7	3.8	2,630	3.83	50.78	88.45	40.9	4.35	LCO
US414499BH7	3.8	2,630	4.02	43.08	98.95	41	4.35	LCO
US415085BH7	3.8	2,690	4.1	49.78	84.64	41.7	4.35	LCO
US455676H5	3.8	2,710	4.41	55.3	76	43.4	4.35	LCO
US395292H5	3.8	2,790	3.89	52	91.5	43.8	4.35	LCO
US515569H5	3.8	2,790	5.09	54.16	68.7	44.4	4.35	LCO
US495473BH7	3.8	2,980	4.9	53.78	72.6	46.9	4.35	LCO
US445977H5	3.8	3,000	4.31	58.3	76.8	46.9	4.35	LCO
US416775H5	3.8	3,010	4.08	66.5	74.2	48.5	4.35	LCO
US436177H5	3.8	3,020	4.21	60.9	76.7	46.3	4.35	LCO
US525077BH7P	3.8	3,120	5.17	49.28	76.45	48	4.35	LCO
US396479H5	3.8	3,050	3.9	63	78.7	46.7	4.35	LCO
US504588H5	3.8	3,050	4.91	43.8	88	46.1	4.35	LCO
US366685BH7	3.8	3,090	3.57	65.2	84.9	47.2	4.35	LCO
US495577BH7	3.8	3,130	4.81	54.78	76.35	49.1	4.35	LCO
US446770H7	3.8	3,170	4.4	66.55	69.1	52.8	4.35	LCO
US396283BH7	3.8	3,160	3.84	61.8	82.8	47.2	4.35	LCO
US416189H2	3.8	3,200	4.12	60.9	89	52.4	4.35	LCO
US269099H5	3.8	3,310	2.57	89.9	99	55.3	4.35	LCO
US526367BH7	3.8	3,325	5.17	62.68	66.65	55.4	4.35	LCO
US496178H5	3.8	3,400	4.83	60.9	77.85	55.6	4.35	LCO
US386587BH7	3.8	3,485	3.75	64.95	86.96	51.5	4.35	LCO
US289490BH7	3.8	3,510	2.8	94	90	56.2	4.35	LCO
US456386H5	3.8	3,540	4.5	62.2	85.02	61	4.35	LCO
US485490H5K	3.8	3,570	4.8	54	90	56.4	4.35	LCO
US406787BH7	3.8	3,720	3.98	66.4	86.5	55	4.35	LCO
US446484BH7	3.8	3,720	4.32	63.6	83.4	56.7	4.35	LCO
US486588H3K	3.8	3,760	4.8	65	88	63	4.35	LCO
US508168H5K	3.8	4,110	5	81	67.6	66.9	4.35	LCO
US3978A4H5K	3.8	4,720	3.9	77.4	103.5	78	4.35	LCO
US25A2F2H3	3.8	5,180	2.5	102.15	151.8	86.2	4.35	LCO

Continued on the following page. ↗

Small Cell Wearable

Model Name	Nominal Voltage (V)	Minimum Capacity (mAh)	Thickness (mm)	Width (mm)	Height (mm)	Weight (g)	Charging Voltage (V)	Chemical System (LCO, NCM, NCA)
US491222A10S	3.7	81	4.9	11.8	22	2.1	4.2	LCO
US80285A10S	3.7	121	7.63	7.93	28.5	2.6	4.2	LCO
US501424A10S	3.7	126	5.05	13.8	24	3	4.2	LCO
US321741A10S	3.7	180	3.2	16.5	40.5	4.2	4.2	LCO
US302135H5	3.8	215	3	20.2	35	4.2	4.35	LCO
US322830A10S	3.7	235	3.22	28	30	5	4.2	LCO
US552131A10S	3.7	320	5.5	21.11	30.75	6.5	4.2	LCO
US97500A10S	3.7	392	9.6	9.9	50	7.8	4.2	LCO

Camera & Game

Model Name	Nominal Voltage (V)	Minimum Capacity (mAh)	Thickness (mm)	Width (mm)	Height (mm)	Weight (g)	Charging Voltage (V)	Chemical System (LCO, NCM, NCA)
US773038A12	3.7	1,030	7.62	29.3	37.7	17.5	4.2	LCO
US533144N2S	3.6	880	5.3	30.2	43.9	14.7	4.2	NCA
US783038E1S	3.65	960	7.77	29.4	37.35	17	4.2	NCM
US613143N2Y	3.6	1,080	6.1	30.9	43	17.9	4.2	NCA
US523350N2Y	3.6	1,185	5.2	33	50	19.6	4.2	NCA

Cylindrical Type Lithium Ion Secondary Batteries

Cylindrical type lithium ion batteries are packaged in metal cans. These batteries can be used at high rate and maintain high capacity.

Model	Nominal Capacity (mAh)	Positive Electrode Material	Negative Electrode Material	Nominal (Rated) Voltage (V)	Weight (g)	Diameter (mm)	Height (mm)	Continuous Max Discharge Current (A)	Features
US14500FT1 (Under development)	530	LFP	Gr	3.2	17.6	φ14	49	5	life, safety, small
US18650VTC4	2,100	NCM	Gr	3.6	45	φ18	65	30	power
US18650VTC4A	2,100	NCM	Gr	3.7	46.8	φ18	65	35	power
US18650VTC5	2,600	NCA	Gr	3.6	44.3	φ18	65	30	power
US18650VTC5A	2,600	NCA	Gr, SiO	3.6	47.1	φ18	65	35	power
US18650VTC5D	2,800	NCA	Gr, SiO	3.6	46.7	φ18	65	35	power
US18650VTC6	3,120	NCA	Gr, SiO	3.6	46.6	φ18	65	30	power
US18650VC7	3,500	NCA	Gr, SiO	3.6	47.2	φ18	65	8	runtime
US18650FTC1	1,100	LFP	Gr	3.2	38.8	φ18	65	20	life, safety
US18650FTC2 (Under development)	1,450	LFP	Gr	3.2	40	φ18	65	20	life, safety
US21700VTC6A	4,100	NCA	Gr, SiO	3.6	67.5	φ21	70	40	power
US26650FTC1A	3,000	LFP	Gr	3.2	84	φ26	66	25	life, safety

Small Lithium ion Secondary Batteries

Murata's Small Lithium ion secondary batteries (CT04120) are rechargeable batteries which can be charged-discharged at high rate, used safely.

Part Number	Nominal Voltage	Charge Voltage	Cut-off Voltage	Nominal Capacity	Max. Discharge Current	ESR@ 1kHz	Operating Temperature Range	Size
BACT04120P003V01	2.3V	2.7V	1.8V	3mAh	30mA (10C)	1000mΩ	-20°C to 70°C	φ4mm×12mm

FORTELION 24V Battery Module

Murata's FORTELION 24V Battery Module is built with olivine-type lithium ion iron phosphate secondary batteries (FORTELION), which are known for their longevity, safety, and fast-charging capability.
Murata's FORTELION 24V Battery Module is capable of monitoring each Battery Module's Voltage, Current, Temperature & Capacity Value through CAN communication.
It is possible to customize voltage and capacity in order to meet the requirements of wide range of applications including Robot, AGV, E-Cart, Forklift, etc.

Separate type

Items	Specifications
Model Name	LIPY032WWPCSY6(Battery Module) LIA1020WWPACSY6(BMU)
System configuration	Battery Module+BMU
Nominal Voltage / Capacity (per module)	25.6V / 24Ah / 614Wh
Max Discharge Current	50A / 40A / 30A (5sec / 25sec / cont.)
Max Charge Current	24A (1C)
Module Max Configuration	2s10p
Battery Communication I/F	CAN Bus (Murata original format)
Dust and Water proof	Not supported
Safety regulation	IEC62133 CE (EMC, RoHS)
Dimension (module)	259(L) x 71(W) x 245(H) (mm)
Weight (module)	7.3kg (Module)

All-in-one type

Items	Specifications
Model Name	LIPY041WWPCSY6
System configuration	All-in-one (BMU function is included)
Nominal Voltage / Capacity (one module)	25.6V / 21Ah / 537Wh
Max Discharge Current	100A / 80A / 60A (5sec / 25sec / cont.)
Max Charge Current	42A (2C)
Module Max Configuration	2s10p
Battery Communication I/F	CAN Bus, U-art (Murata original format)
Dust and Water proof	IP54 rating
Safety regulation	IEC/UL62133, IEC62619 UL2271 (Light EV battery) CE (EMC, RoHS)
Dimension	195(L) x 132(W) x 180(H) (mm)
Weight	6.5kg

FORTELION Battery System

Possible to customize capacity in order to meet wide usage

FORTELION High Output Battery Module

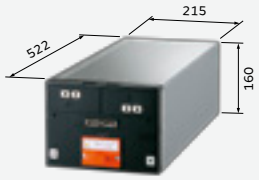
This energy storage module utilizes FORTELION olivine type lithium iron phosphate lithium ion secondary batteries. A high-input, high-output energy storage module capable of 200A continuous discharge (6C equivalent) and 100A continuous charge (3C equivalent), it is ideal for applications requiring high input and high output, such as countermeasures to deal with momentary voltage drops during natural disasters, backup systems, and stabilization of renewable energy sources.

(in mm)

(Excluding terminal)
MPRMH1701
26kg

Model Name	Rated Capacity	Nominal Voltage	Maximum Discharge Current	Maximum Charge Current	Operating Temperature Range	Safety Standard
MPRMH1701	1.75kWh	51.2V	200A	100A	-20 to 50°C	UL1973

FORTELION 2.1kWh Battery Module



(in mm)

(Excluding terminal)
IJ1101M
27kg

Model Name	Nominal Capacity	Rated Capacity	Nominal Voltage	Maximum Discharge Current	Charge Voltage	Maximum Charge Current	Safety Standard
IJ1101M	2.1kWh (42.0Ah)	2.0kWh (39.5Ah)	51.2V	50A	56.0V	40A	UL 1973 FCC Part 15 Class B

Storage Temperature: -20 to 45°C (Recommended room temperature)
Operating Ambient Temperature: Discharge: -20 to 40°C (Discharge current ≦ 50.0A)
40 to 50°C (Discharge current ≦ 40.0A)
Charge: 10 to 45°C (Charge current ≦ 40.0A)
0 to 10°C (Charge current ≦ 12.0A)

Battery Management Unit (BMU)

(Excluding terminal)
IJ5101C
12kg

*use for Japan market

(Excluding terminal)
IJ8101C
14kg

(in mm)

Model Name	Operating Voltage	Operating Current	Communication Interface	Configuration	Safety Standard
IJ5101C	60 to 420V	0 to 100A	RS232C/RS485C	Series: to 7 series Mix Combination: to 6 series and to 2 parallels Maximum module connections: 32 modules	-
IJ8101C	300 to 1000V	0 to 100A	RS232C/RS485C	Series: to 16 series Mix Combination: to 16 series and to 2 parallels	UL 1973 FCC Part 15 Class B *It is certificated along with IJ1101M. *UL 1973 is certified for maximum of 90 A.

Storage Temperature: -20 to 65°C (Recommended room temperature)
Operating Ambient Temperature: -20 to 50°C (Recommended room temperature)

BMU-HUB

(in mm)

(Excluding terminal)
IJ1101K
3.4kg

Model Name	Operating Voltage	Purpose	Configuration	Safety Standard
IJ1101K	DC12V, DC24 to 60V	Interface unit to connect IJ8101C for utility	Parallel: to 64BMU Maximum module connections: 64X32=2048 modules (maximum 4.3MWh)	EU EMC Directive FCC Part 15 Class B

Storage Temperature: -20 to 65°C (Storage and use at room temperature is recommended)
Operating Ambient Temperature: -20 to 60°C (Storage and use at room temperature is recommended)

Cable

Model Name	Type	Specification
IJT-102F	Communication Cable 20cm	RS485
IJT-103F	Communication Cable 30cm	RS485
IJT-115F	Communication Cable 150cm	RS485
IJT-130F	Communication Cable 300cm	RS485
IJD-103F/R	Thicker Power Cable 30cm (red)	AWG4
IJD-103F/B	Thicker Power Cable 30cm (black)	AWG4
IJD-110F/R	Thicker Power Cable 100cm (red)	AWG4
IJD-110F/B	Thicker Power Cable 100cm (black)	AWG4

Coin Manganese Dioxide Lithium Batteries

Coin manganese dioxide lithium batteries are small-sized primary batteries for various applications such as TPMS (Tire Pressure Monitoring System) or smart entry systems for automobile, IoT devices, and backup power source for memory.

Standard

A lineup of 11 models is offered from small size and thin models to high-capacity models.

Model	Electrical Characteristics			Dimensions			Operating Temperature Range (°C)
	Nominal Voltage (V)	Nominal Capacity (mAh)	Standard Discharge Current (mA)	Diameter (mm)	Height (mm)	Weight (g)	
CR1216	3	30	0.1	12.5	1.6	0.67	-30 to 70
CR1220	3	40	0.1	12.5	2.0	0.77	-30 to 70
CR1616	3	60	0.1	16.0	1.6	1.1	-30 to 70
CR1620	3	80	0.1	16.0	2.0	1.3	-30 to 70
CR1632	3	140	0.2	16.0	3.2	1.9	-30 to 70
CR2016	3	90	0.1	20.0	1.6	1.8	-30 to 70
CR2025	3	160	0.2	20.0	2.5	2.6	-30 to 70
CR2032	3	220	0.2	20.0	3.2	3.1	-30 to 70
CR2430	3	300	0.2	24.5	3.0	4.4	-30 to 70
CR2450	3	610	0.2	24.5	5.0	6.5	-30 to 70

Nominal capacity indicates duration until discharge voltage drops down to 2.0V when discharged at nominal discharge current at 23ºC.
Data is not guaranteed, and is provided for reference purposes only.

Heat-resistant

Ideal for devices used in severe operating temperature environments including automobiles and FA, etc.

Model	Electrical Characteristics			Dimensions			Operating Temperature Range (°C)
	Nominal Voltage (V)	Nominal Capacity (mAh)	Recommended Continuous Discharge Current (mA)	Diameter (mm)	Height (mm)	Weight (g)	
CR2032W	3	210	≦1	20.0	3.2	3.1	-40 to 125
CR2050W	3	345	≦1	20.0	5.0	4.2	-40 to 125
CR2450W	3	550	≦1	24.5	5.0	6.7	-40 to 125
CR2477W	3	1000	≦1	24.5	7.7	11	-40 to 125

Data is not guaranteed, and is provided for reference purposes only.

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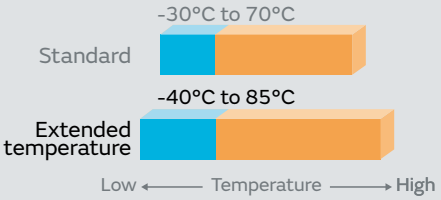
Extended Temperature

Designed for automotive devices and outdoor IoT systems, including smart meters and FA control systems. Recommended as an alternative smaller and thinner solution to conventional cylindrical lithium batteries.

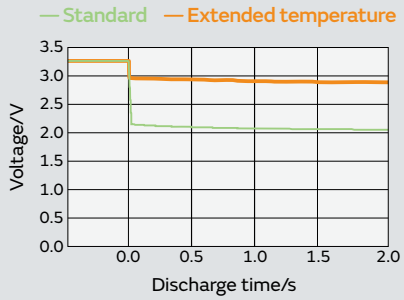
Model	Electrical Characteristics				Dimensions			Operating Temperature Range (°C)
	Nominal Voltage (V)	Nominal Capacity (mAh)	Recommended Continuous Discharge Current (mA)	Maximum pulse discharge current*1 (mA)	Diameter (mm)	Height (mm)	Weight (g)	
CR2032X	3.0	220	≦1	30	20.0	3.2	3.0	-40 to 85
CR2450X	3.0	600	≦1	30	24.5	5.0	6.2	-40 to 85
CR2477X	3.0	1000	≦1	30	24.5	7.7	9.5	-40 to 85
CR3677X	3.0	2000	≦1	80	36.5	7.7	20	-40 to 85

*1 Current for maintaining minimum 2V voltage with pulsed discharge of 3 seconds and 50% nominal capacity discharged (ambient temperature 23ºC)
Data is not guaranteed, and is provided for reference purposes only.

Operating temperature



Voltage comparison after 85˚C storage



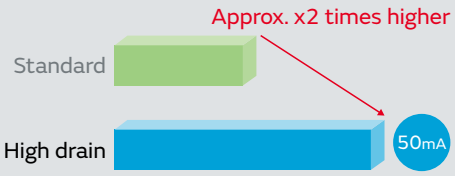
High Drain

Ideal for tracking devices for logistics and asset management by adopting Low Power Wide Area (LPWA) networks such as LoRa and SIGFOX as well as for outdoor infrastructures, FA control systems, and environment monitoring sensors.

Model	Electrical Characteristics				Dimensions			Operating Temperature Range (°C)
	Nominal Voltage (V)	Nominal Capacity (mAh)	Recommended Continuous Discharge Current (mA)	Maximum pulse discharge current*1 (mA)	Diameter (mm)	Height (mm)	Weight (g)	
CR2032R	3.0	200	≦3	50	20.0	3.2	3.0	-30 to 70
CR2450R	3.0	500	≦3	50	24.5	5.0	6.2	-30 to 70

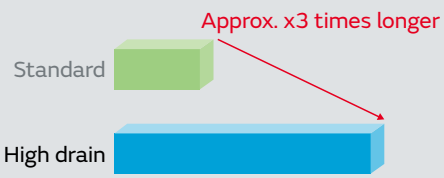
*1 Current for maintaining minimum 2V voltage with pulsed discharge of 3 seconds and 50% nominal capacity discharged (ambient temperature 23ºC)
Data is not guaranteed, and is provided for reference purposes only.

Max. pulse discharge current



*50% depth of discharge battery's maximum pulse discharge current over 2V for 3s (23°C)

Discharge time (45mA pulse discharge)



*Pulse discharge condition:
45mA x 3s, 33s off, 2V cut off (23°C)

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Tab-welder

Mounting Direction		H			V	M
Tab Specification	Shape	E		O	E	P
	Width of Negative Tab Tip (mm)	0.75	0.75	1.8	0.75	2.0
	Width of Positive Tab Tip (mm)	0.75X2	0.75X2	2.8	0.75X2	2.0
	Pitch (mm)	17.8	20.5	20.5	N/A	N/A
Standard	CR2032	CR2032-HE8 	CR2032-HE1 	CR2032-HO6 	CR2032-VE3 	
	CR2430	CR2430-HE1 	CR2430-HE2 	CR2430-HO1 	CR2430-VE1 	
	CR2450	CR2450-HE5 	CR2450-HE6 	CR2450-HO5 	CR2450-VE6 	
Extended Temperature	CR2032X		CR2032X-HE1 	CR2032X-HO6 		
	CR2450X		CR2450X-HE6 	CR2450X-HO5 		
	CR2477X		CR2477X-HE2 	CR2477X-HO4 		
Heat-resistant	CR2032W		CR2032W-HE1 	CR2032W-HO6 		
	CR2050W					CR2050W-MP6 
	CR2450W		CR2450W-HE6 	CR2450W-HO5 		CR2450W-MP1 
	CR2477W		CR2477W-HE2 	CR2477W-HO4 		
High Drain	CR2032R		CR2032R-HE1 	CR2032R-HO6 		
	CR2450R		CR2450R-HE6 	CR2450R-HO5 		

For tab shapes or specifications not included in the above list, please consult your sales representative.

Silver Oxide Batteries & Alkaline Manganese Batteries

Standard Silver Oxide Batteries

Silver oxide batteries are small-sized primary batteries with high capacity and stable discharge characteristics. They are suitable for medical devices and precision instruments. All models are 100% made in Japan, and environmentally friendly (0% mercury).

Model	Electrical Characteristics		Dimensions			Operating Temperature Range (°C)
	Nominal Voltage (V)	Nominal Capacity (mAh)	Diameter (mm)	Height (mm)	Weight (g)	
SR621	1.55	20	6.8	2.15	0.32	-10 to 60
SR626	1.55	28	6.8	2.60	0.40	-10 to 60
SR721	1.55	29	7.9	2.10	0.42	-10 to 60
SR726	1.55	35	7.9	2.60	0.50	-10 to 60
SR41	1.55	45	7.9	3.60	0.65	-10 to 60
SR48	1.55	75	7.9	5.40	1.2	-10 to 60
SR920	1.55	40	9.5	2.05	0.59	-10 to 60
SR927	1.55	60	9.5	2.70	0.79	-10 to 60
SR936	1.55	75	9.5	3.60	1.1	-10 to 60
SR1120	1.55	60	11.6	2.05	0.92	-10 to 60
SR1130	1.55	85	11.6	3.05	1.4	-10 to 60
SR43	1.55	110	11.6	4.20	1.8	-10 to 60

Data is not guaranteed, and is provided for reference purposes only.
Please contact us for other models.

Standard Alkaline Manganese Batteries

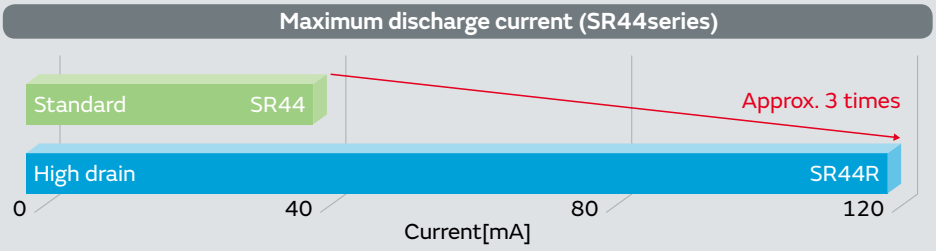
Alkaline manganese batteries are small-sized primary batteries with high performance. They are suitable for various applications such as toys, medical devices and health appliances. All models are 100% made in Japan, and environmentally friendly (0% mercury).

Model	Electrical Characteristics		Dimensions			Operating Temperature Range (°C)
	Nominal Voltage (V)	Nominal Capacity (mAh)	Diameter (mm)	Height (mm)	Weight (g)	
LR41	1.5	45	7.9	3.60	0.57	-10 to 60
LR1130	1.5	70	11.6	3.05	1.2	-10 to 60
LR43	1.5	110	11.6	4.20	1.6	-10 to 60
LR44	1.5	120	11.6	5.40	2.0	-10 to 60

Data is not guaranteed, and is provided for reference purposes only.
Please contact us for other models.

High Drain Silver Oxide Batteries (SR) & Alkaline Manganese Batteries (LR)

High drain SR/LR batteries are ideal for high-performance medical devices that require large current loads for communication, lighting, camera, mechanical driving, etc.



*Output current condition: Maximum discharge current to maintain min. 1.2V at 100ms upon DOD 0% (23°C)

Model	Electrical Characteristics		Dimensions			Operating Temperature Range (°C)
	Nominal Voltage (V)	Nominal Capacity (mAh)	Diameter (mm)	Height (mm)	Weight (g)	
SR927R (Under development)	1.55	45	9.5	2.7	0.7	-10 to 60
SR44R	1.55	150	11.6	5.4	2.2	-10 to 60
LR44R	1.50	150	11.6	5.4	2.0	-10 to 60

Data is not guaranteed, and is provided for reference purposes only.

Sound Components (Buzzer)

Piezoelectric ceramic materials that expand and shrink by applying voltage are used in piezoelectric sound components.

Summary

Using Murata's unique ceramic material, we offer a variety of piezoelectric sound components.

Lineup

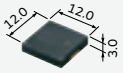
- SMD Piezoelectric Sounders
- Pin Type Piezoelectric Sounders
- Piezoelectric Buzzers
- Piezoelectric Diaphragms

https://www.murata.com/en-global/products/sound

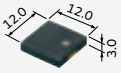
SMD Piezoelectric Sounders

Low power consumption, lightweight.
Optimized for small devices such as blood glucose meters, clinical thermometers, photoflashes for cameras, and portable terminals.
Applicable for automotive usage based on our design and manufacturing technology.

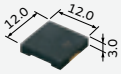
PKMCS1818E20



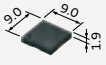
PKLCS1212E20



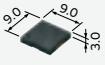
PKLCS1212E24



PKLCS1212E40



PKMCS0909E40



PKMCS0909E48

(in mm)

Applications	Mounting Type	Drive Type	Main Part Number	Sound Pressure Level (typ.)	Measurement Condition of Sound Pressure Level
For Automotive	Surface Mounting Type	External Drive	**PKMCS1818E20A0-R1**	100dB	12Vo-p, 2.0kHz, square wave, 10cm
			PKLCS1212E20A0-R1	76dB	±1.5Vo-p, 2.0kHz, square wave, 10cm
			PKLCS1212E24A0-R1	80dB	±1.5Vo-p, 2.4kHz, square wave, 10cm
			PKLCS1212E40A1-R1	84dB	±1.5Vo-p, 4.0kHz, square wave, 10cm
For Consumer			**PKLCS1212E2000-R1**	76dB	±1.5Vo-p, 2.0kHz, square wave, 10cm
			PKLCS1212E2400-R1	80dB	±1.5Vo-p, 2.4kHz, square wave, 10cm
			PKLCS1212E4001-R1	84dB	±1.5Vo-p, 4.0kHz, square wave, 10cm
			PKMCS0909E4000-R1	72dB	±1.5Vo-p, 4.0kHz, square wave, 10cm
			PKMCS0909E48H0-R1	75dB	±2.5Vo-p, 4.8kHz, square wave, 10cm

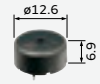
Detailed Catalogs

For more details, please refer to our printed catalogs and the PDF catalogs on our website.

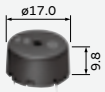
▪ Piezoelectric Sound Components Cat. No. P37E

Pin Type Piezoelectric Sounders

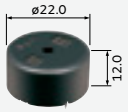
Low power consumption, lightweight.
These products are optimized for operation confirmation sounds and warning sounds in household appliances such as air conditioners, washers, and refrigerators.



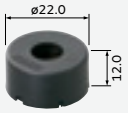
PKM13EPYH



PKM17EPP



PKM22EPPH20



PKM22EPPH40

(in mm)

Packaging	Mounting Type	Drive Type	Main Part Number	Sound Pressure Level (typ.)	Measurement Condition of Sound Pressure Level
Taping	Pin Type	External Drive	**PKM13EPYH4000-A0**	78dB	±1.5Vo-p, 4.0kHz, square wave, 10cm
Bulk			**PKM13EPYH4002-B0**	78dB	±1.5Vo-p, 4.0kHz, square wave, 10cm
			PKM17EPP-2002-B0	79dB	3.0Vo-p, 2.0kHz, square wave, 10cm
			PKM22EPPH2001-B0	79dB	±1.5Vo-p, 2.0kHz, square wave, 10cm
			PKM22EPPH4007-B0	92dB	±1.5Vo-p, 4.0kHz, square wave, 10cm

Piezoelectric Buzzers

This is a unified piezoelectric sounder connected to a built-in self-drive circuit, and it easily generates sound with only a DC power supply.
Suitable for gas detector alarms/burglar alarms/home-electronic appliances.

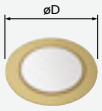
PKB24SPCH

(in mm)

Mounting Type	Drive Type	Main Part Number	Sound Pressure Level (min.)	Measurement Condition of Sound Pressure Level
Pin Type	Self Drive	**PKB24SPCH3601-B0**	90dB	12Vdc, 10cm

Piezoelectric Diaphragms

Low power consumption, lightweight.
Suitable for clocks/calculators/digital cameras/burglar alarms, and various alarms.



7BB-□□-□

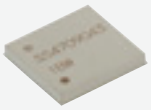
Drive Type	Main Part Number	Plate Size (øD)
External Drive	**7BB-12-9**	ø12.0mm
	7BB-15-6	ø15.0mm
	7BB-20-6	ø20.0mm
	7BB-27-4	ø27.0mm

□: Indicates Metal Plate Diameter and Resonant Frequency Type.

Wireless Communication Modules

Available for a wide range of applications such as automotive, mobile computing devices, and household appliances.

Wi-Fi Modules/ Bluetooth® · Wi-Fi Combo Modules



Features
Compact, highly efficient, and flexible custom-made correspondence

Applications
Mobile phones, automotive, tablet PC, POS, HT, electric equipment, smart grid, etc.

Bluetooth® Modules/ Bluetooth® Low Energy Modules

Features
Compact, highly efficient, and flexible custom-made correspondence

Applications
Mobile phones, automotive, PMP, POS, HT, healthcare, wireless remote control, etc.

Low Power Wide Area Network (LPWAN) Wireless Module

Features
LPWA Wireless Technology-Low-Power consumption, wide area coverage, enables IoT applications. Compact, high efficient, support various communication standards.

Applications
Positioning Tracking, Smart Houses, Agriculture, Healthcare/Medical, Industrial, Logistics, Utilities (Water, Gas Metering), etc.

Micromechatronics

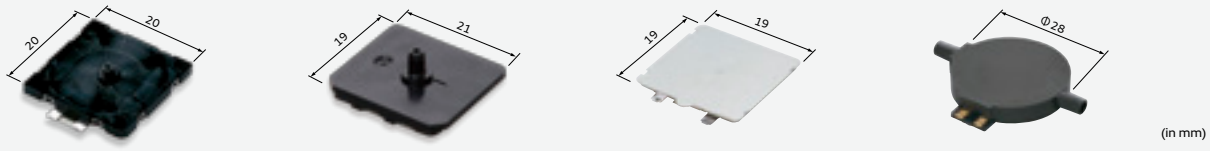
Utilizing the vibration and deformation properties of piezoelectric materials

Microblowers

Tiny air blowers/pumps without a motor

Features

The structure is designed to operate as a blower and pump by applying the ultrasonic vibrations of the ceramic as the drive source. This is achieved in an extremely compact, thin, and silent device with a high flow rate.



MZB1001T02 MZB3004T04 MZB3005T06 MZB4001T05

Part Number	MZB1001T02	MZB3004T04	MZB3005T06	MZB4001T05
Size	20(W) x 20(L) x 1.85(H) (Nozzle Height 1.6)	21(W) x 19(L) x 3.4(H) (Nozzle Height 4.5)	19(W) x 19(L) x 2.3(H)	Φ28 x 5(H) (Each Nozzle Length 6.5)
Flow rate (@0kPa)	1.2L/min (@21Vdc)	0.2L/min (@18Vdc)	0.2L/min (@18Vdc)	1.3L/min (@28Vdc)
Pressure (@0L/min)	2.5kPa (@21Vdc)	60kPa (@19.5Vdc)	60kPa (@19.5Vdc)	-20kPa (@28Vdc)
Resonance frequency	26kHz	23kHz	23kHz	21kHz
Input Voltage (*1)	11.5Vdc to 21Vdc	8Vdc to 19.5Vdc (*2)	8Vdc to 19.5Vdc (*2)	20Vdc to 28Vdc
Operating Temperature range	0°C to 70°C	0°C to 45°C (*3)(*4)	0°C to 45°C (*3)(*4)	5°C to 50°C (*3)(*5)

*The above value shows typical characteristics.

(*1) A drive circuit is required for the operation. Driving circuits are not common. The voltage is the voltage applied to them.
(*2) Only when the back pressure condition is 10kPa or more; it can be driven with a voltage of 18Vdc or more.
(*3) When operated continuously, sufficient performance may not be demonstrated due to the generation of heat.
(*4) Please use in environments where the temperature of the metal surface (marking surface) is 60°C or less.
(*5) Please use in environments where the temperature of the resin surface is 60°C or less.

· The microblower cannot be used for automobile applications (including accessories).
Please refrain from use for automobile applications.
· If the microblower is used for medical applications, Murata requires a special contract to cover the use in the medical application to be agreed upon before the start of mass production.
· Please contact us for other details.

Application Examples

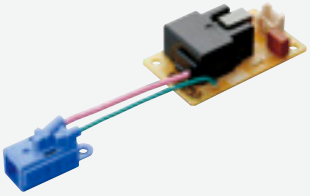
Aroma diffuser, gas/breath suction equipment, blood pressure measuring, breast pump, liquid transfer equipment by air pressure

Ionizer Modules: Ionissimo

High-concentration ion, compact design, ozone control

Ionissimo is an ionizer module with unprecedented compactness and high efficiency, capable of generating a large number of ions owing to Murata's own high-voltage technology and structural design. The ion generator is connected to the driving power supply for modularization and ease of incorporating into equipment.

MHM Series



Features

· A large number of ions will be created by the original structure.
· Compact equipment may be designed due to small ionizer element and driving power supply.
· Ozone amounts may be optimized for specific applications by controlling the generation of ozone without changing the number of ions.

Applications

Air conditioner, air purifier, static eliminator, vacuum cleaner, etc.

Items	MHM305 Type	MHM314 Type	MHM306 Type	MHM400 Type	MHM402 Type	MHM403 Type
Input Voltage (VDC)	12.0 (10.8 to 13.2)	12.0 (10.8 to 13.2)	12.0 (10.8 to 13.2)	12.0 (10.8 to 13.2)	-	-
Input Voltage (VAC)	-	-	-	-	220/240 (210 to 250)	100 (85 to 110)
Power (W typ.)	0.4	0.9	0.6	0.6	0.4	-
Ion Polarity	Nagative	Nagative	Nagative	Positive	Negative	Positive & Negative
Initial value of Ion amount (pcs/cc typ.) (*1)	5,000,000	8,000,000	5,000,000	5,000,000	4,000,000	-
Initial value of Ozone amount (mg/H)	<0.15	<0.15	0.6 typ.	<0.15	0.4 typ.	-
Operating Temp. (°C)	-10 to 50	-10 to 50	-10 to 50	-10 to 50	-10 to 50	-10 to 50
Operating Humidity (%RH) (*2)	20 to 80	20 to 80	20 to 80	20 to 80	20 to 80	20 to 80

(*1) Measuring distance : 20cm
(*2) No dew deposit

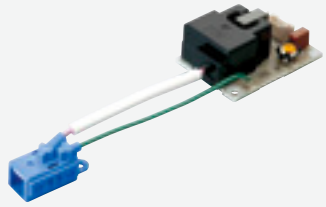
View a demonstration video of Ionissimo Ionizer Modules on our website.

Others

Ozonizer Modules: Ionissimo

By using low-temperature co-fired ceramic substrate (LTCC) for the discharger ozone will be generated stably.

MHM Series



Features

· Stable ozone generation.
· MHM501 type can be used under high humidity conditions.
· Small size

Applications

Refrigerator, vacuum cleaner, dishwasher, clothes washer, etc.

Items	MHM500 Type	MHM501 Type	MHM502 Type	MHM503 Type
Input Voltage (VDC)	12.0 (10.8 to 13.2)	12.0 (10.8 to 13.2)	12.0 (10.8 to 13.2)	12.0 (10.8 to 13.2)
Power (W) (*1)	2.0	2.4	4.6	1.5
Ozone Level (mg/H typ.) (*1)	3.5 typ.	3 typ.	45 typ.	2 typ.
Max Duty (%)	30	30	100 (*3)	10 (*4)
Operating Temp. (°C)	-10 to 50	-10 to 50	5 to 60	-10 to 50
Operating Temp (%RH) (*2) High-voltage power supply area	20 to 80	20 to 80	20 to 80	20 to 80
Operating Humidity (%RH) (*2) Ozone generator area	20 to 80	20 to 95	20 to 90	20 to 95
Ozone generator area Supports high humidity	-	○	○	○

(*1) measurement result at Duty: 100%
(*2) No dew deposit
(*3) 100% Operation Only
(*4) The duty can be up to 15%.at Ta: 45°C

View a demonstration video of Ionissimo Ozonizer Modules on our website.

Others

RFID Devices

RFID for transferring identification data by wireless communication. The state-of-the-art technology allows IC tags to be attached to places where traditional barcode and QR code technology could suffer from aging. Murata offers a comprehensive range of items required to introduce RFID, from IC tags to high-quality antennas, reader/writers, and software applications. With the complete kits from Murata, RFID is seamlessly and reliably implemented.

HF band RFID tag

Part number	LXMS33HCNG-134	LXMS33HCNK-171
Application	Small product management	
Appearance		
RFID standard	ISO15693 NFC Forum Type5	ISO14443 TypeA NFC Forum Type2
Frequency	13.56MHz	
IC	NXP ICODE SLIX	NXP NTAG210
UID memory	64bit	
NDEF memory	896bit	384bit
Size(L x W x H)	3.2 x 3.2 x 0.7 mm	3.2 x 3.2 x 0.75 mm
Read range*	20mm	15mm

*Reference

UHF band RFID tag

Part number	LXMSJZNCMD-217	LXMSJZNCMF-210	LXMS21ACMF-218	LXMS21ACMD-220	LXTBKZMCMG-010
Application	Small product management		Electronic equipment management		Metal product management
Appearance					
RFID standard	ISO18000-63 and EPC Global Gen2v2				
Frequency	865-928MHz				865-928MHz
IC	Impinj Monza 4QT	Impinj Monza R6	Impinj Monza R6	Impinj Monza 4QT	Impinj Monza R6P
UID memory	128bit	96bit	96bit	128bit	128bit
NDEF memory	512bit	NA	NA	512bit	32bit
Size(L x W x H)	1.2 x 1.2 x 0.55 mm		2.0 x 1.2 x 0.5 mm		6 x 2.0 x 2.3mm
Read range*	10mm		9m	7m	1.5m

*Reference

Note: Monza is a registered trademark of USA-based Impinj, Inc. in the United States and/or in other countries.
Note: ICODE and NTAG are registered trademarks of USA-based NXP Semiconductors N.V. in the United States and/or in other countries.

Femtet, CAE Software

User-Friendly Simulation Software Tailored for a Wide Range of Engineering Challenges

Femtet is a Multiphyiscs CAE software with multiple functionalities developed by Murata Manufacturing Co, Ltd.

Features

Femtet

Femtet is simulation software based on the finite element method. Its easy operation and comprehensive functionality make stress-free analysis environment possible.

Eight Solvers and Multiphysics

Solves eight major physical phenomena and multiphysics.

Efficient Designing

Capable of batch processing and parametric analysis that are essential for tuning and optimization of design.
VBA macro function is available to realize optimum design.

Comprehensive Functionalities

Equipped with comprehensive modules needed for modeling (CAD), meshing, simulations, and results display, it supports cost-effective simulation activities.

Database Management

Manages databases of materials, boundary conditions, body attributes, and models.
The database can be shared and used among a group of users.

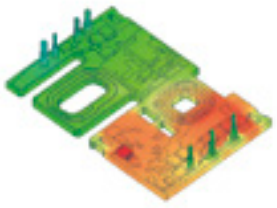
CAD Translator

Lets you use the CAD data on hand right away by supporting various kinds of CAD formats to import and export.

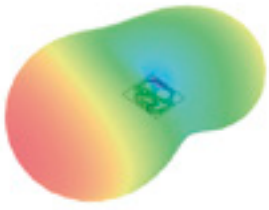
Examples

Mechanical Stress

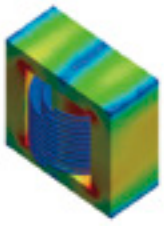
Thermal Conductivity



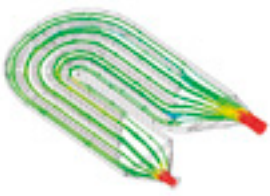
Electromagnetic Waves



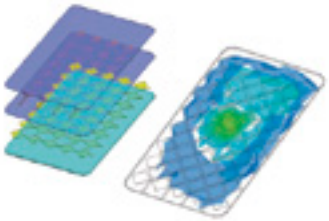
Magnetic Fields



Fluid

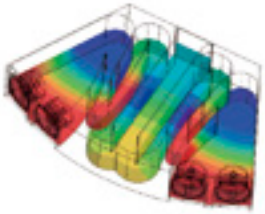


Electric Fields



Piezoelectricity

Acoustic Waves

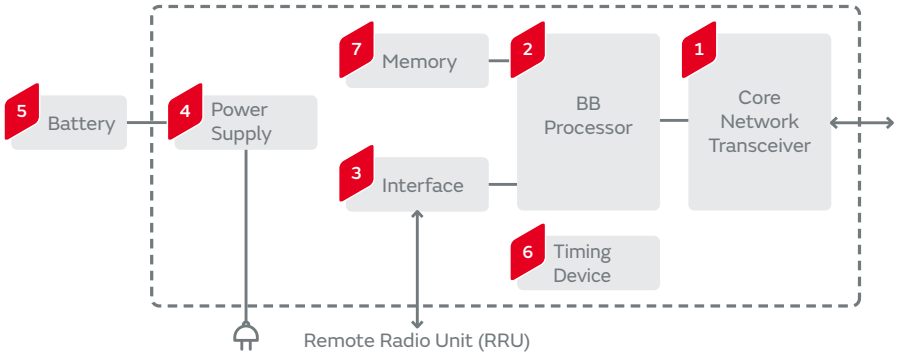


Murata Software

Memo

Application Guides

Baseband unit (BBU) DU / CU



1 Core Network Transceiver

Wire Bonding Mount Multilayer Microchip Capacitors for General Purpose
GMA Series

Wire Bonding/AuSn Soldering Mount Chip Multilayer Ceramic Capacitors for General Purpose
GMD Series

Single-Layer Microchip Capacitors
CLB Series

Thin Film Circuit Substrates (RUSUB)
RU Series

Silicon Capacitors

Chip Inductors (Chip Coils)
FCUL/FDSD Series

Chip Inductors (Chip Coils)
LQM/LQH/DFE Series

Thermistors
NCU Series

2 BB Processor

Chip Ferrite Beads
BLM Series

Chip Ferrite Beads
BLE Series

3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose
NFM Series

Thermistors
NCU Series

3 Interface

Low ESL Chip Multilayer Ceramic Capacitors for General Purpose
LLL/LLA/LLM Series

Silicon ESD Protection Devices
LXES**T Series

Chip Common Mode Choke Coils/ Common Mode Noise Filters
DLW/NFG/DLM Series

4 Power Supply

Isolated DC-DC Converters
MYB Series

Non-Isolated DC-DC Converters
MYMGK/MYSGK/OKL/MYLSM Series

Isolated DC-DC Converters
DSE/DAE/DCE/DSQ/DAQ/DCQ series

AC-DC Converter
1U Frond End
D1U Series

Metal Terminal Type Multilayer
Ceramic Capacitors for General Purpose
KRM Series

Polymer Aluminum Electrolytic Capacitors
ECAS Series

Thermistors
PRF/NCU Series

Chip Inductors (Chip Coils)
LQM/LQH/DFE Series

Isolated DC-DC Converters for PoE+PD
MYBSP Series

Safety Standard Certified Resin Molding SMD Type
Ceramic Capacitors for General Purpose
DK1 Series

Safety Standard Certified Lead Type
Disc Ceramic Capacitors for General Purpose
DE1/DE2 Series

5 Battery

FORTELION High Output Battery Module
MPRMH1701

FORTELION 2.1kWh Battery Module System
IJ1101M/IJ8101C/IJ1101k

Cylindrical Type Lithium Ion
Secondary Batteries

6 Timing Device

Crystal Units
XRC Series

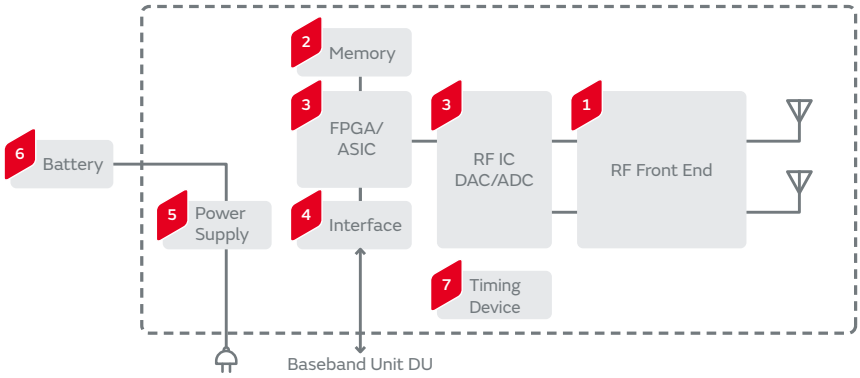
7 Memory

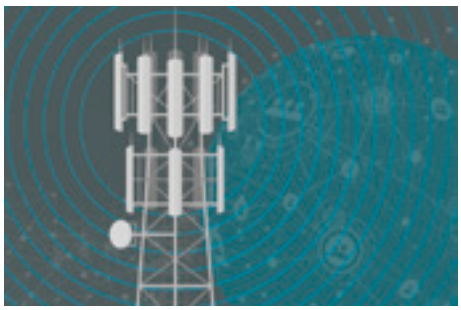
Chip Ferrite Beads
BLM Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GQM / GJM Series	High Frequency Filter Circuit
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression/Decoupling
Polymer Aluminum Electrolytic Capacitors	ECAS Series	Smoothing /Transient Backup
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching /Resonance
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
Feed Through Chip EMI Filters	NFE Series	Noise Suppression
Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLM Series	Noise Suppression
Piezoelectric Sounders	PKLCS/PKMCS Series	Sound Component
Coin Manganese Dioxide Lithium Batteries	Standard Type	Battery Backup

Remote radio unit (RRU) mmWave band





1 RF Front End

Silicon ESD Protection Devices
LXES**T Series

Thermistors
NCU Series

Chip Inductors (Chip Coils)
LQW/LQP/LQG Series

Silicon Capacitors

2 Memory

Chip Ferrite Beads
BLM Series

3 RF IC/DAC/ADC, FPGA/ASIC

Chip Ferrite Beads
BLM Series

3 Terminals Low ESL Chip Multilayer
Ceramic Capacitors for General Purpose
NFM Series

Chip Ferrite Beads
BLE Series

Thermistors
NCU Series

4 Interface

Low ESL Chip Multilayer Ceramic
Capacitors for General Purpose
LLL/LLA/LLM Series

Silicon ESD Protection Devices
LXES**T Series

Chip Common Mode Choke Coils/
Common Mode Noise Filters
DLW/NFG/DLM Series

5 Power Supply

Isolated DC-DC Converters
MYB Series

Non-Isolated DC-DC Converters
MYMGK/MYSGK/OKL/MYLSM Series

Isolated DC-DC Converters
DSE/DAE/DCE/DSQ/
DAQ/DCQ series

Metal Terminal Type Multilayer
Ceramic Capacitors for General Purpose
KRM Series

Polymer Aluminum
Electrolytic Capacitors
ECAS Series

Thermistors
PRF/NCU Series

6 Battery

FORTELION High Output Battery Module
MPRMH1701

FORTELION 2.1kWh Battery Module System
IJ1101M/IJ8101C/IJ1101k

Cylindrical Type Lithium Ion Secondary Batteries

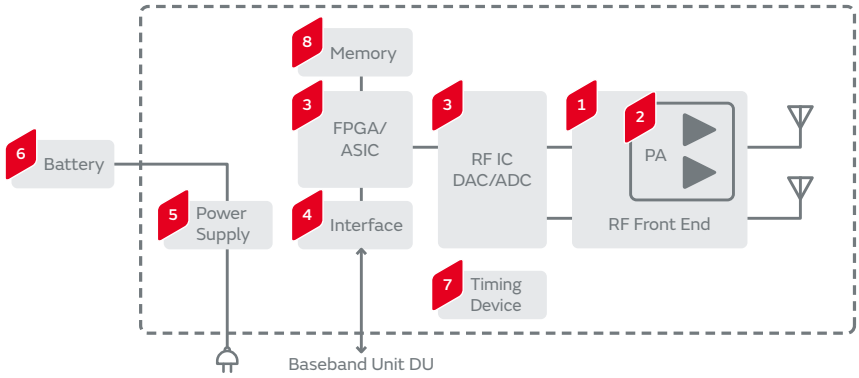
7 Timing Device

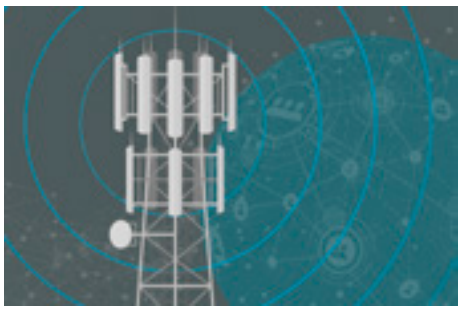
Crystal Units
XRC Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GQM / GJM Series	High Frequency Filter Circuit
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression/Decoupling
Polymer Aluminum Electrolytic Capacitors	ECAS Series	Smoothing /Transient Backup
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching /Resonance
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
Feed Through Chip EMI Filters	NFE Series	Noise Suppression
Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLM Series	Noise Suppression
Piezoelectric Sounders	PKLCS/PKMCS Series	Sound Component
Coin Manganese Dioxide Lithium Batteries	Standard Type	Battery Backup

Remote radio unit (RRU) less than sub-6GHz band





1 RF Front End

Chip Multilayer Diplexers
LFD Series

Chip Multilayer LC Filters
LF Series

Chip Multilayer Hybrid Baluns
LDB/LDM Series

Chip Multilayer Hybrid Couplers
LDC/LDJ Series

SAW Filters
SAF Series

SAW Duplexers
SAY Series

Chip Inductors (Chip Coils)
LQW/LQP/LQG Series

Thermistors
NCU Series

2 PA

Chip Inductors (Chip Coils)
LQW/LQP/LQG Series

Silicon Capacitors

Single-Layer Microchip Capacitors
CLB Series

Thin Film Circuit Substrates (RUSUB)
RU Series

High Q Chip Multilayer Ceramic Capacitors for General Purpose
GQM/GJM Series

Thermistors
NCU Series

3 RF IC/DAC/ADC, FPGA/ASIC

Chip Ferrite Beads
BLM Series

3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose
NFM Series

Thermistors
NCU Series

Chip Ferrite Beads
BLE Series

4 Interface

Low ESL Chip Multilayer Ceramic Capacitors for General Purpose
LLL/LLA/LLM Series

Silicon ESD Protection Devices
LXES**T Series

Chip Common Mode Choke Coils/ Common Mode Noise Filters
DLW/NFG/DLM Series

5 Power Supply

Isolated DC-DC Converters
MYB Series

Non-Isolated DC-DC Converters
MYMGK/MYSGK/OKL/MYLSM Series

Metal Terminal Type Multilayer Ceramic Capacitors for General Purpose
KRM Series

Polymer Aluminum Electrolytic Capacitors
ECAS Series

Chip Inductors (Chip Coils)
FCUL/FDSD Series

Chip Inductors (Chip Coils)
LQM/LQH/DFE Series

Thermistors
PRF/NCU Series

6 Battery

FORTELION High Output Battery Module
MPRMH1701

FORTELION 2.1kWh Battery Module System
IJ1101M/IJ8101C/IJ1101k

Cylindrical Type Lithium Ion Secondary Batteries

7 Timing Device

Crystal Units
XRC Series

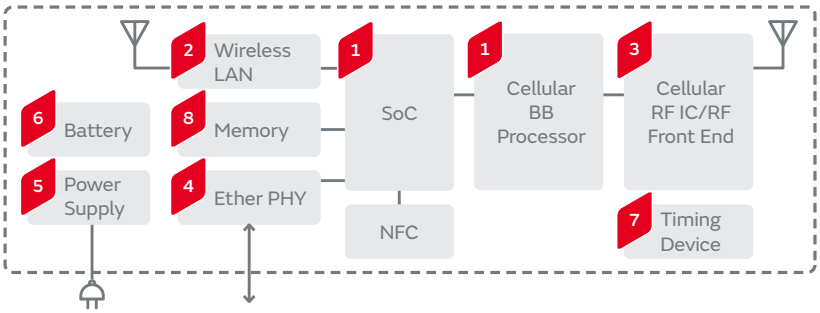
8 Memory

Chip Ferrite Beads
BLM Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GQM / GJM Series	High Frequency Filter Circuit
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression/Decoupling
Polymer Aluminum Electrolytic Capacitors	ECAS Series	Smoothing /Transient Backup
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching /Resonance
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
Feed Through Chip EMI Filters	NFE Series	Noise Suppression
Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLM Series	Noise Suppression
Piezoelectric Sounders	PKLCS/PKMCS Series	Sound Component
Coin Manganese Dioxide Lithium Batteries	Standard Type	Battery Backup

CPE (FWA device)



1 SoC/Cellular BB Processor

Thermistors
NCP/NCU Series

2 Wireless LAN

Wi-Fi Modules

SAW Filters
SAF Series

Chip Multilayer LC Filters
LF Series

Chip Multilayer Hybrid Baluns
LDB/LDM Series

Chip Multilayer Diplexers
LFD Series

Chip Multilayer Hybrid Couplers
LDC/LDJ Series

Microwave Coaxial Connectors with Switch

Microwave Multi Line Connectors

3 Cellular RF IC/RF Front End

Chip Multilayer Diplexers
LFD Series

SAW Duplexers
SAY Series

SAW Filters
SAF Series

Chip Multilayer LC Filters
LF Series

Chip Multilayer Hybrid Baluns
LDB/LDM Series

Chip Multilayer Hybrid Dividers
LDD Series

Chip Multilayer Hybrid Couplers
LDC/LDJ Series

Microwave Coaxial Connectors with Switch

Microwave Multi Line Connectors

4 Ether PHY

Low ESL Chip Multilayer Ceramic Capacitors for General Purpose
LLL/LLA/LLM Series

Chip Common Mode Choke Coils/ Common Mode Noise Filters
DLW/NFG/DLM Series

Silicon ESD Protection Devices
LXES**T Series

5 Power Supply

Low Acoustic Noise Chip Multilayer Ceramic Capacitors on Interposer Board for General Purpose
ZRB Series

Metal Terminal Type Multilayer Ceramic Capacitors for General Purpose
KRM Series

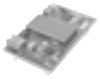
Polymer Aluminum Electrolytic Capacitors
ECAS Series

Chip Inductors (Chip Coils)
FCUL/FDSD Series

Chip Inductors (Chip Coils)
LQM/LQH/DFE Series

Thermistors
NCP/NCU/PRF Series

Isolated DC-DC Converters for PoE+PD
MYBSP Series



6 Battery

Thermistors
NCP/NCU/PRF Series

7 Timing Device

Crystal Units
XRC Series

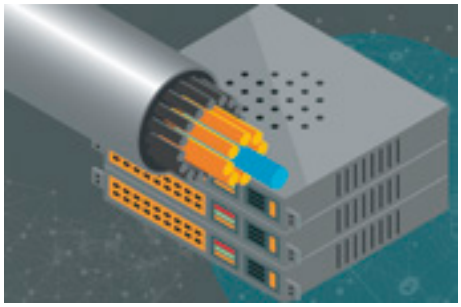
8 Memory

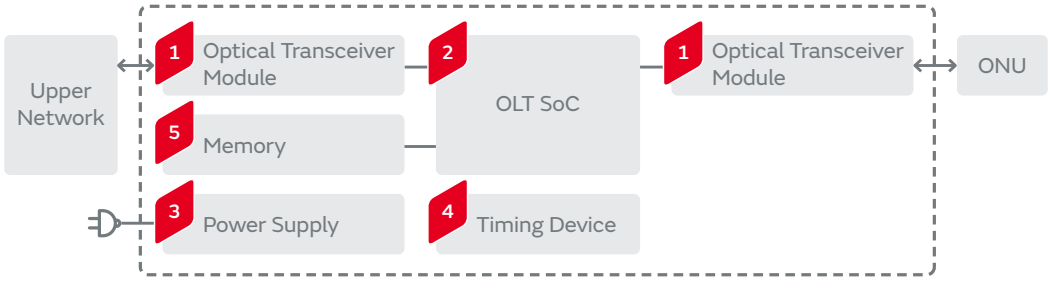
Chip Ferrite Beads
BLM Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GQM / GJM Series	High Frequency Filter Circuit
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression/Decoupling
Polymer Aluminum Electrolytic Capacitors	ECAS Series	Smoothing /Transient Backup
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching /Resonance
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
Feed Through Chip EMI Filters	NFE Series	Noise Suppression
Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLM Series	Noise Suppression
Piezoelectric Sounders	PKLCS/PKMCS Series	Sound Component
Coin Manganese Dioxide Lithium Batteries	Standard Type	Battery Backup

OLT (Optical line terminal)





1 Optical Transceiver Module

Wire Bonding Mount Multilayer Microchip Capacitors for General Purpose
GMA Series

Wire Bonding/AuSn Soldering Mount Chip Multilayer Ceramic Capacitors for General Purpose
GMD Series

Single-Layer Microchip Capacitors
CLB Series

Thin Film Circuit Substrates (RUSUB)
RU Series

Silicon Capacitors

Chip Inductors (Chip Coils)
LQW/LQP/LQG Series

Chip Inductors (Chip Coils)
LQM/LQH/DFE Series

2 OLT SoC

Thermistors
NCP/NCU Series

Chip Ferrite Beads
BLM Series

4 Timing Device

Crystal Units
XRC Series

5 Memory

Chip Ferrite Beads
BLM Series

3 Power Supply

Isolated DC-DC Converters
MYB Series

Non-Isolated DC-DC Converters
MYMGK/MYSGK/OKL/MYLSM Series

Isolated DC-DC Converters for PoE+PD
MYBSP Series

Polymer Aluminum Electrolytic Capacitors
ECAS Series

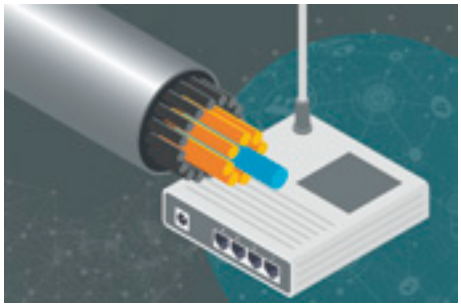
Thermistors
NCP/NCU/PRF Series

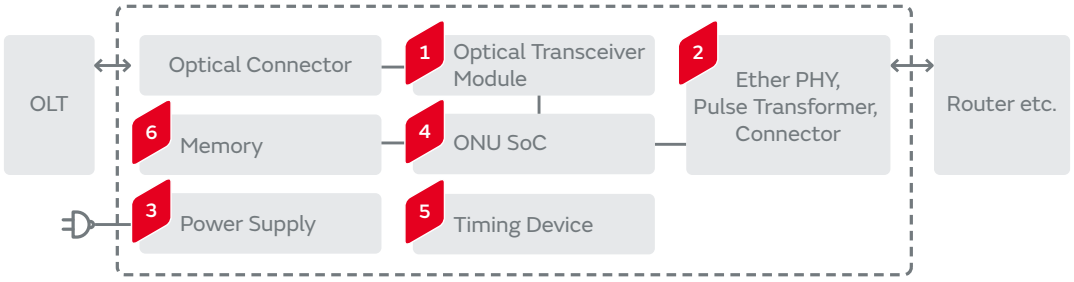
Silicon ESD Protection Devices
LXES**T Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GQM / GJM Series	High Frequency Filter Circuit
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression/Decoupling
Polymer Aluminum Electrolytic Capacitors	ECAS Series	Smoothing /Transient Backup
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching /Resonance
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
Feed Through Chip EMI Filters	NFE Series	Noise Suppression
Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLM Series	Noise Suppression
Piezoelectric Sounders	PKLCS/PKMCS Series	Sound Component
Coin Manganese Dioxide Lithium Batteries	Standard Type	Battery Backup

ONU (Optical network units)





1 Optical Transceiver Module

Wire Bonding Mount Multilayer Microchip Capacitors for General Purpose
GMA Series

Wire Bonding/AuSn Soldering Mount Chip Multilayer Ceramic Capacitors for General Purpose
GMD Series

Single-Layer Microchip Capacitors
CLB Series

Thin Film Circuit Substrates (RUSUB)
RU Series

Silicon Capacitors

Thermistors
NCP/NCU Series

Chip Inductors (Chip Coils)
LQW/LQP/LQG Series

Chip Inductors (Chip Coils)
LQM/LQH/DFE Series

2 Ether PHY, Pulse Transformer, Connector

Low ESL Chip Multilayer Ceramic Capacitors for General Purpose
LLL/LLA/LLM Series

Chip Common Mode Choke Coils/ Common Mode Noise Filters
DLW/NFG/DLM Series

Silicon ESD Protection Devices
LXES**T Series

3 Power Supply

Isolated DC-DC Converters
MYB Series

Non-Isolated DC-DC Converters
MYMGK/MYSGK/ OKL/MYLSM Series

Isolated DC-DC Converters for PoE+PD
MYBSP Series

Polymer Aluminum Electrolytic Capacitors
ECAS Series

Thermistors
NCP/NCU/PRF Series

Silicon ESD Protection Devices
LXES**T Series

4 ONU SoC

Thermistors
NCP/NCU Series

Chip Ferrite Beads
BLM Series

5 Timing Device

Crystal Units
XRC Series

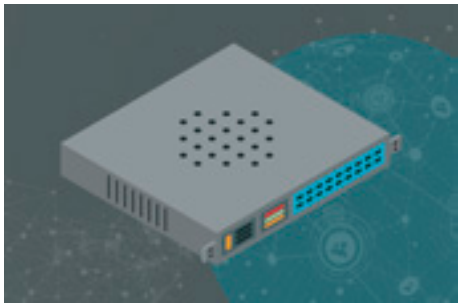
6 Memory

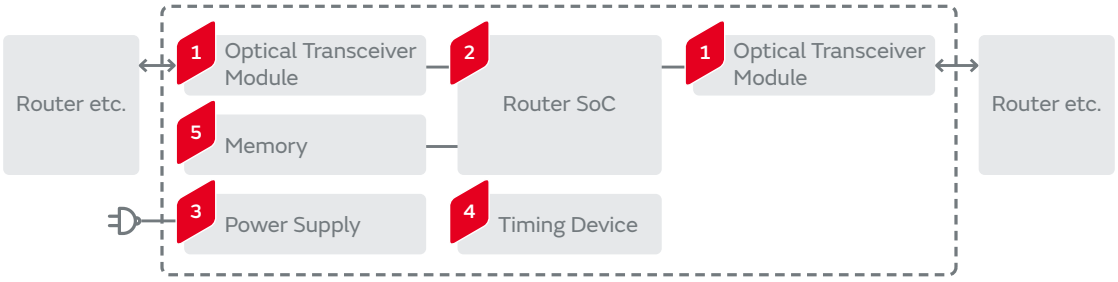
Chip Ferrite Beads
BLM Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GQM / GJM Series	High Frequency Filter Circuit
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression/Decoupling
Polymer Aluminum Electrolytic Capacitors	ECAS Series	Smoothing /Transient Backup
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching /Resonance
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
Feed Through Chip EMI Filters	NFE Series	Noise Suppression
Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLM Series	Noise Suppression
Piezoelectric Sounders	PKLCS/PKMCS Series	Sound Component
Coin Manganese Dioxide Lithium Batteries	Standard Type	Battery Backup

Core router





1 Optical Transceiver Module

Wire Bonding Mount Multilayer Microchip Capacitors for General Purpose
GMA Series

Wire Bonding/AuSn Soldering Mount Chip Multilayer Ceramic Capacitors for General Purpose
GMD Series

Single-Layer Microchip Capacitors
CLB Series

Thin Film Circuit Substrates (RUSUB)
RU Series

Silicon Capacitors

Chip Inductors (Chip Coils)
LQW/LQP/LQG Series

Chip Inductors (Chip Coils)
LQM/LQH/DFE Series

2 Router SoC

Chip Ferrite Beads
BLM Series

Thermistors
NCP/NCU Series

4 Timing Device

Crystal Units
XRC Series

5 Memory

Chip Ferrite Beads
BLM Series

3 Power Supply

Isolated DC-DC Converters
MYB Series

Non-Isolated DC-DC Converters
MYMGK/MYSGK/OKL/MYLSM Series

Isolated DC-DC Converters for PoE+PD
MYBSP Series

Polymer Aluminum Electrolytic Capacitors
ECAS Series

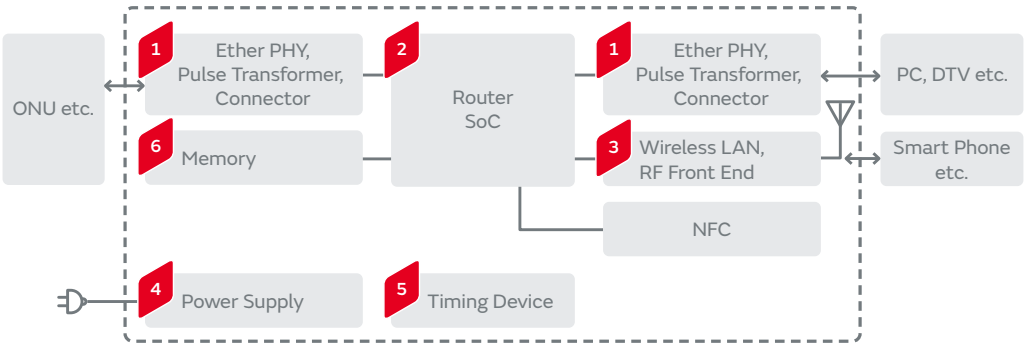
Thermistors
NCP/NCU/PRF Series

Silicon ESD Protection Devices
LXES**T Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GQM / GJM Series	High Frequency Filter Circuit
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression/Decoupling
Polymer Aluminum Electrolytic Capacitors	ECAS Series	Smoothing /Transient Backup
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching /Resonance
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
Feed Through Chip EMI Filters	NFE Series	Noise Suppression
Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLM Series	Noise Suppression
Piezoelectric Sounders	PKLCS/PKMCS Series	Sound Component
Coin Manganese Dioxide Lithium Batteries	Standard Type	Battery Backup

Home router



1 Ether PHY, Pulse Transformer, Connector

- Low ESL Chip Multilayer Ceramic Capacitors for General Purpose — LLL/LLA/LLM Series
- Chip Common Mode Choke Coils/ Common Mode Noise Filters — DLW/NFG/DLM Series
- Silicon ESD Protection Devices — LXES**T Series
- Silicon Capacitors

2 Router SoC

- Chip Ferrite Beads — BLM Series
- Thermistors — NCP/NCU Series

3 Wireless LAN, RF Front End

- Microwave Coaxial Connectors with Switch
- Chip Multilayer Diplexers — LFD Series
- Chip Multilayer Hybrid Couplers — LDC/LDJ Series
- Chip Multilayer LC Filters — LF Series
- Chip Multilayer Hybrid Baluns — LDB/LDM Series

4 Power Supply

- Isolated DC-DC Converters — MYB Series
- Non-Isolated DC-DC Converters — MYMGK/MYSGK/ OKL/MYLSM Series
- Isolated DC-DC Converters for PoE+PD — MYBSP Series
- Polymer Aluminum Electrolytic Capacitors — ECAS Series
- Thermistors — NCP/NCU/PRF Series
- Silicon ESD Protection Devices — LXES**T Series
- Chip Inductors (Chip Coils) — LQM/LQH/DFE Series

5 Timing Device

- Crystal Units — XRC Series

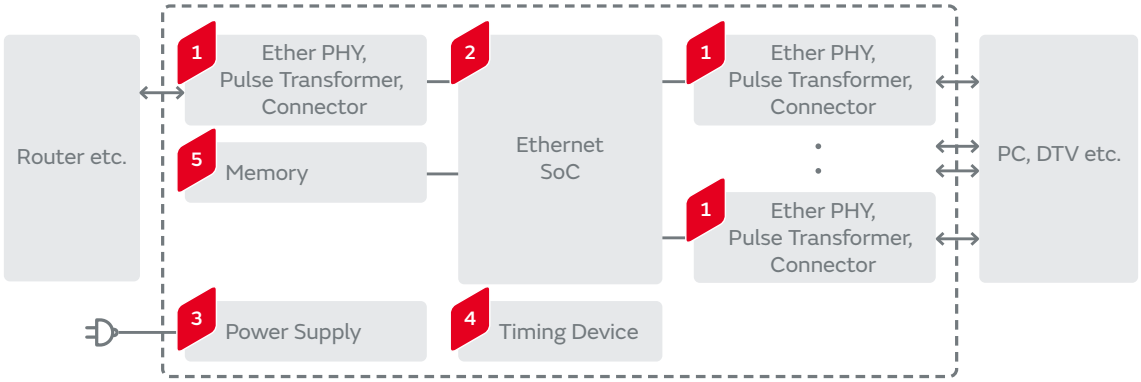
6 Memory

- Chip Ferrite Beads — BLM Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GQM / GJM Series	High Frequency Filter Circuit
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression/Decoupling
Polymer Aluminum Electrolytic Capacitors	ECAS Series	Smoothing /Transient Backup
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching /Resonance
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
Feed Through Chip EMI Filters	NFE Series	Noise Suppression
Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLM Series	Noise Suppression
Piezoelectric Sounders	PKLCS/PKMCS Series	Sound Component
Coin Manganese Dioxide Lithium Batteries	Standard Type	Battery Backup

Switch



1 Ether PHY, Pulse Transformer, Connector

- Low ESL Chip Multilayer Ceramic Capacitors for General Purpose — LLL/LLA/LLM Series
- Chip Common Mode Choke Coils/ Common Mode Noise Filters — DLW/NFG/DLM Series
- Silicon ESD Protection Devices — LXES**T Series
- Silicon Capacitors

2 Ethernet SoC

- Chip Ferrite Beads — BLM Series
- Thermistors — NCP/NCU Series

3 Power Supply

- Isolated DC-DC Converters — MYB Series
- Isolated DC-DC Converters for PoE+PD — MYBSP Series
- Polymer Aluminum Electrolytic Capacitors — ECAS Series
- Thermistors — NCP/NCU/PRF Series
- Silicon ESD Protection Devices — LXES**T Series
- Chip Inductors (Chip Coils) — LQM/LQH/DFE Series
- Non-Isolated DC-DC Converters — MYMGK Series
- Non-Isolated DC-DC Converters — MYMGM Series
- Non-Isolated DC-DC Converters — MYTN Series

4 Timing Device

- Crystal Units — XRC Series

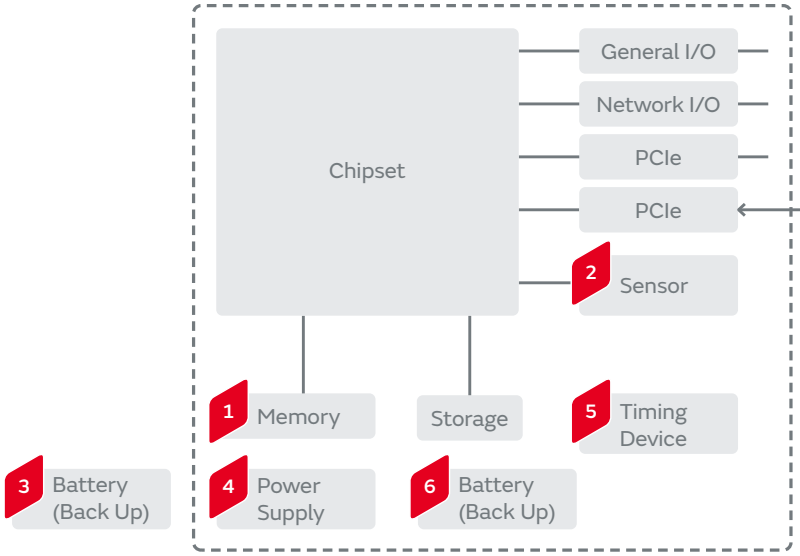
5 Memory

- Chip Ferrite Beads — BLM Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GQM / GJM Series	High Frequency Filter Circuit
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression/Decoupling
Polymer Aluminum Electrolytic Capacitors	ECAS Series	Smoothing /Transient Backup
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching /Resonance
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
Feed Through Chip EMI Filters	NFE Series	Noise Suppression
Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLM Series	Noise Suppression
Piezoelectric Sounders	PKLCS/PKMCS Series	Sound Component
Coin Manganese Dioxide Lithium Batteries	Standard Type	Battery Backup

Server



1 Memory

Chip Ferrite Beads
BLM Series

2 Sensor

Thermistors
NCU/PRF/NXF/NXR Series

3 Battery (Back up)

FORTELION High Output Battery Module
MPRMH1701

FORTELION 2.1kWh Battery Module System
IJ1101M/IJ8101C/IJ1101k

Cylindrical Type Lithium Ion
Secondary Batteries

4 Power Supply

Polymer Aluminum Electrolytic Capacitors
ECAS Series

Non-Isolated DC-DC Converters
MYMGK Series

Non-Isolated DC-DC Converters
MYMGM Series

Non-Isolated DC-DC Converters
MYTN Series

Isolated DC-DC Converters
DRE/RBS/DRQ Series

AC-DC Converter 1U Frond End
D1U Series

Silicon ESD Protection Devices
LXES**T Series

Chip Inductors (Chip Coils)
FCUL/FDA Series

Thermistors
PRF/NCU Series

*Centralized power supply systems
https://www.murata.com/en-global/products/power/open-compute

5 Timing Device

MEMS Resonators
WMRAG Series

Crystal Units
XRC Series

6 Battery (Back up)

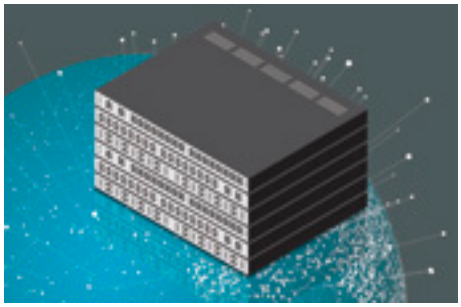
Coin Manganese Dioxide Lithium Batteries
Heat-resistant Type/
Extended Temperature Type

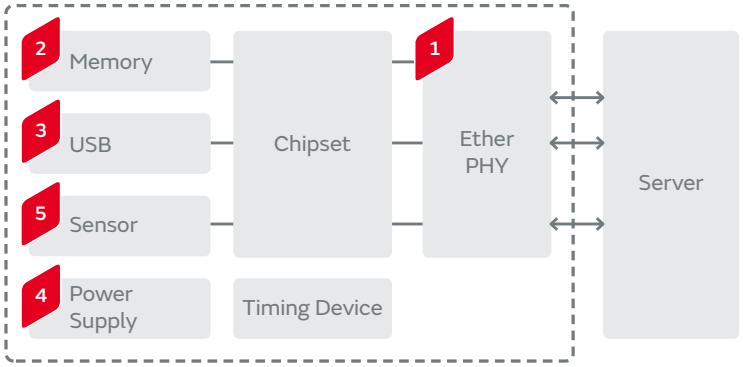
Cylindrical Type Lithium Ion
Secondary Batteries

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GQM / GJM Series	High Frequency Filter Circuit
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression/Decoupling
Polymer Aluminum Electrolytic Capacitors	ECAS Series	Smoothing /Transient Backup
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching /Resonance
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
Feed Through Chip EMI Filters	NFE Series	Noise Suppression
Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLM Series	Noise Suppression
Piezoelectric Sounders	PKLCS/PKMCS Series	Sound Component
Coin Manganese Dioxide Lithium Batteries	Standard Type	Battery Backup

Network switch





1 Ether PHY

Low ESL Chip Multilayer Ceramic Capacitors for General Purpose
LLL/LLA/LLM Series

Chip Common Mode Choke Coils/ Common Mode Noise Filters
DLW/NFG/DLM Series

Silicon ESD Protection Devices
LXES**T Series

Silicon Capacitors

2 Memory

Chip Ferrite Beads
BLM Series

3 USB

Chip Common Mode Choke Coils/ Common Mode Noise Filters
DLW/NFG/DLM Series

4 Power Supply

Isolated DC-DC Converters
MYB Series

Non-Isolated DC-DC Converters
MYMGK Series

Non-Isolated DC-DC Converters
MYMGM Series

Non-Isolated DC-DC Converters
MYTN Series

Isolated DC-DC Converters
DRE/RBS/DRQ Series

AC-DC Converter 1U Frond End
D1U Series

Isolated DC-DC Converters for PoE+PD
MYBSP Series

Polymer Aluminum Electrolytic Capacitors
ECAS Series

Thermistors
PRF/NCU Series

Silicon ESD Protection Devices
LXES**T Series

5 Sensor

Thermistors
NCU/PRF/NXF/NXR Series

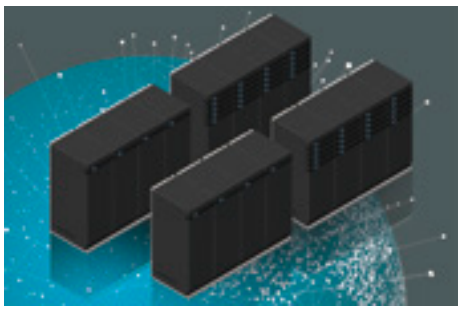
General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GQM / GJM Series	High Frequency Filter Circuit
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression/Decoupling
Polymer Aluminum Electrolytic Capacitors	ECAS Series	Smoothing /Transient Backup
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching /Resonance
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
Feed Through Chip EMI Filters	NFE Series	Noise Suppression
Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLM Series	Noise Suppression
Piezoelectric Sounders	PKLCS/PKMCS Series	Sound Component
Coin Manganese Dioxide Lithium Batteries	Standard Type	Battery Backup

DCIM (Data center infrastructure management)

1 Environmental Monitoring

- Air Conditioner
- Security
- Controller
- Gateway



1 Environmental Monitoring

Wi-Fi Modules

LPWA Modules

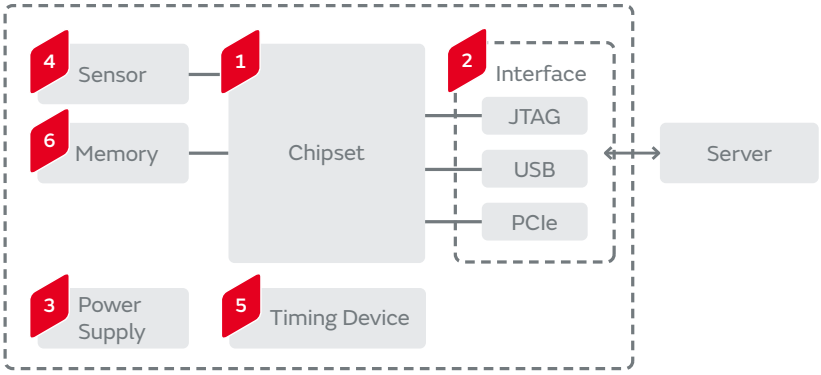
Magnetic Sensors (TMR Sensors)
CT Series

Thermistors
NCU Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GQM / GJM Series	High Frequency Filter Circuit
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression/Decoupling
Polymer Aluminum Electrolytic Capacitors	ECAS Series	Smoothing /Transient Backup
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching /Resonance
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
Feed Through Chip EMI Filters	NFE Series	Noise Suppression
Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLM Series	Noise Suppression
Piezoelectric Sounders	PKLCS/PKMCS Series	Sound Component
Coin Manganese Dioxide Lithium Batteries	Standard Type	Battery Backup

Hardware accelerator



1 Chipset

3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose
NFM Series

Low ESL Chip Multilayer Ceramic Capacitors for General Purpose
LLL/LLA/LLM Series

2 Interface

Chip Common Mode Choke Coils/ Common Mode Noise Filters
DLW/NFG/DLM Series

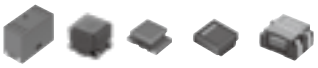
3 Power Supply

Polymer Aluminum Electrolytic Capacitors
ECAS Series

Low ESL Chip Multilayer Ceramic Capacitors for General Purpose
LLL/LLA/LLM Series

Chip Inductors (Chip Coils)
LQM/LQH/DFE Series

Large-current Common Mode Choke Coils
PLT10/PLT5B/DLW5A/DLW5B/UCMH Series



Thermistors
PRF/NCU Series

Non-Isolated DC-DC Converters
MYMGK Series

Non-Isolated DC-DC Converters
MYMGM Series

Non-Isolated DC-DC Converters
MYTN Series

4 Sensor

Thermistors
NCU/PRF/NXF/NXR Series

5 Timing Device

MEMS Resonators
WMRAG Series

Crystal Units
XRC Series

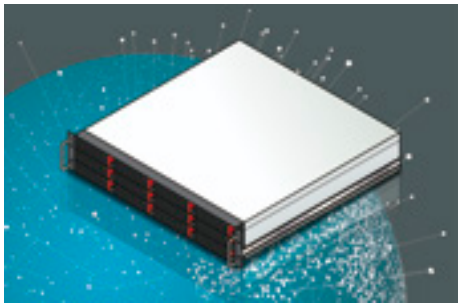
6 Memory

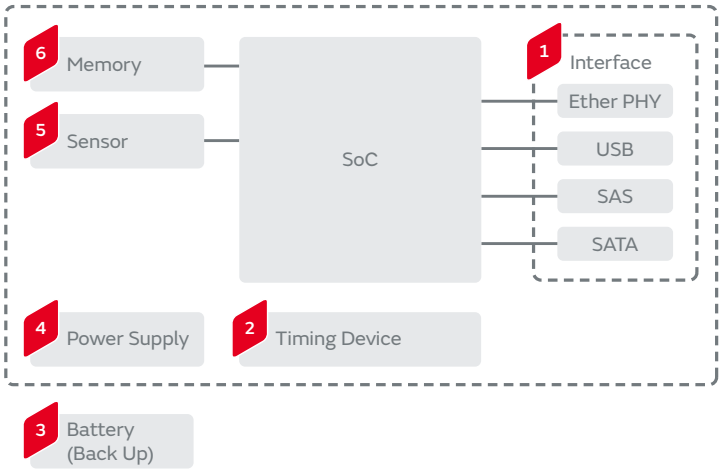
Chip Ferrite Beads
BLM Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GQM / GJM Series	High Frequency Filter Circuit
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression/Decoupling
Polymer Aluminum Electrolytic Capacitors	ECAS Series	Smoothing /Transient Backup
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching /Resonance
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
Feed Through Chip EMI Filters	NFE Series	Noise Suppression
Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLM Series	Noise Suppression
Piezoelectric Sounders	PKLCS/PKMCS Series	Sound Component
Coin Manganese Dioxide Lithium Batteries	Standard Type	Battery Backup

Storage system





1 Interface

Low ESL Chip Multilayer Ceramic Capacitors for General Purpose
LLL/LLA/LLM Series

Chip Common Mode Choke Coils/ Common Mode Noise Filters
DLW/NFG/DLM Series

Silicon ESD Protection Devices
LXES**T Series

2 Timing Device

Crystal Units
XRC Series

3 Battery (Back up)

FORTELION High Output Battery Module
MPRMH1701

FORTELION 2.1kWh Battery Module System
IJ1101M/IJ8101C/IJ1101k

Cylindrical Type Lithium Ion Secondary Batteries

4 Power Supply

Polymer Aluminum Electrolytic Capacitors
ECAS Series

Low ESL Chip Multilayer Ceramic Capacitors for General Purpose
LLL/LLA/LLM Series

Chip Inductors (Chip Coils)
LQM/LQH/DFE Series

Thermistors
PRF/NCU Series

Isolated DC-DC Converters
DRE/RBS/DRQ Series

AC-DC Converter 1U Frond End
D1U Series

Silicon ESD Protection Devices
LXES**T Series

5 Sensor

Thermistors
NCU/PRF/NXF/NXR Series

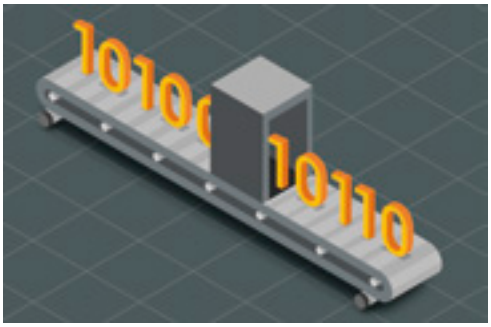
6 Memory

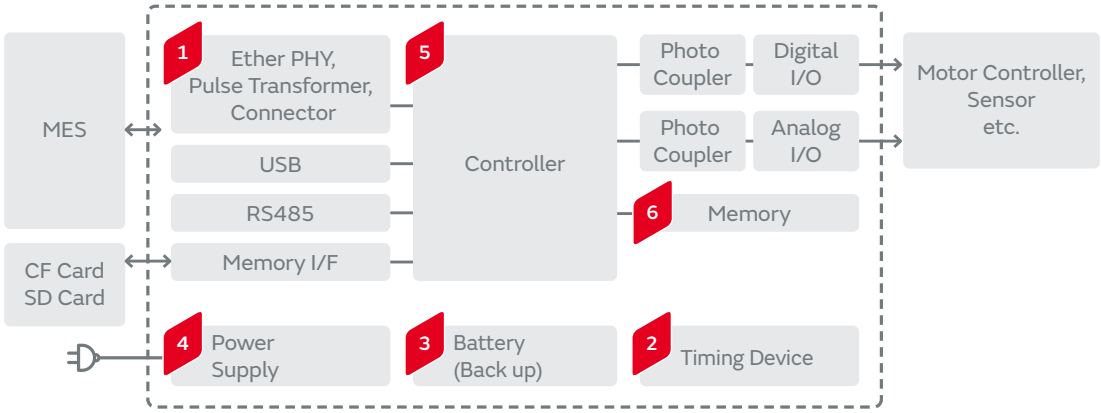
Chip Ferrite Beads
BLM Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GQM / GJM Series	High Frequency Filter Circuit
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression/Decoupling
Polymer Aluminum Electrolytic Capacitors	ECAS Series	Smoothing /Transient Backup
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching /Resonance
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
Feed Through Chip EMI Filters	NFE Series	Noise Suppression
Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLM Series	Noise Suppression
Piezoelectric Sounders	PKLCS/PKMCS Series	Sound Component
Coin Manganese Dioxide Lithium Batteries	Standard Type	Battery Backup

PLC (Programmable logic controller)





1 Ether PHY, Pulse Transformer, Connector

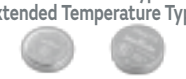
Low ESL Chip Multilayer Ceramic Capacitors for General Purpose
LLL/LLA/LLM Series

Chip Common Mode Choke Coils/ Common Mode Noise Filters
DLW/NFG/DLM Series

Silicon ESD Protection Devices
LXES**T Series

3 Battery (Back Up)

Coin Manganese Dioxide Lithium Batteries
Heat-resistant Type/ Extended Temperature Type



2 Timing Device

Crystal Units
XRC Series

Ceramic Resonators CERALOCK
CST Series

MEMS Resonators
WMRAG Series

4 Power Supply

Isolated DC-DC Converters
MYB Series

Non-Isolated DC-DC Converters
MYMGK/MYSGK/OKL/MYLSM Series

Isolated DC-DC Converters for PoE+PD
MYBSP Series

Polymer Aluminum Electrolytic Capacitors
ECAS Series

Thermistors
NCP/NCU/PRF Series

Silicon ESD Protection Devices
LXES**T Series

Chip Inductors (Chip Coils)
LQM/LQH/DFE Series

5 Controller

Chip Ferrite Beads
BLM Series

Thermistors
NCP/NCU Series

6 Memory

Chip Ferrite Beads
BLM Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GQM / GJM Series	High Frequency Filter Circuit
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression/Decoupling
Polymer Aluminum Electrolytic Capacitors	ECAS Series	Smoothing /Transient Backup
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching /Resonance
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
Feed Through Chip EMI Filters	NFE Series	Noise Suppression
Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLM Series	Noise Suppression
Piezoelectric Sounders	PKLCS/PKMCS Series	Sound Component
Coin Manganese Dioxide Lithium Batteries	Standard Type	Battery Backup

AGV (Automatic guided vehicle)

1 Timing Device

Crystal Units
XRC Series

MEMS Resonators
WMRAG Series

2 Wireless LAN Module

Microwave Coaxial Connectors with Switch

Chip Multilayer Diplexers
LFD Series

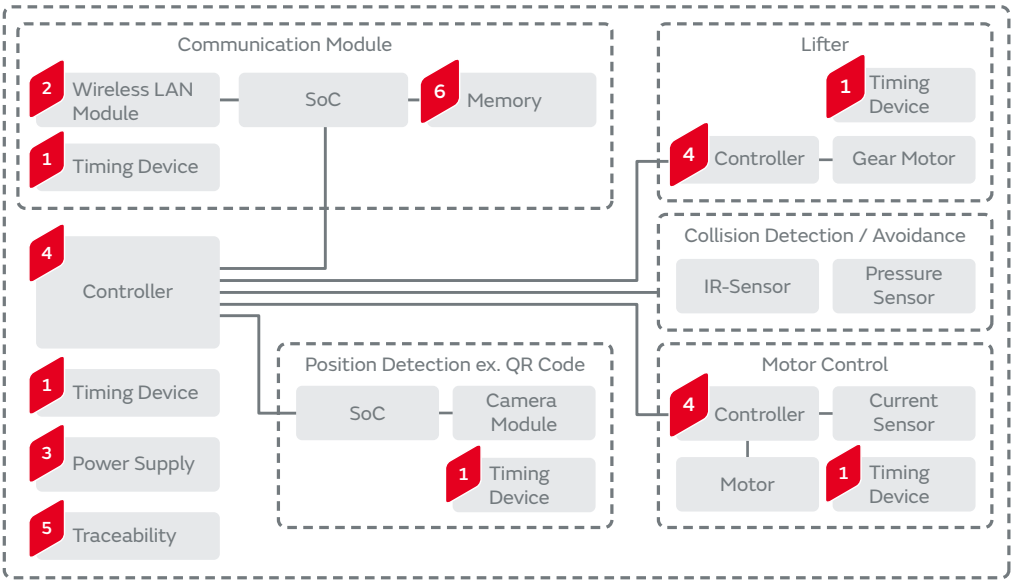
Chip Multilayer Hybrid Couplers
LDC/LDJ Series

Chip Multilayer LC Filters
LF Series

Chip Multilayer Hybrid Baluns
LDB/LDM Series

5 Traceability

RFID Tag
LXMS/LXTB Series

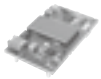


3 Power Supply

Isolated DC-DC Converters
MYB Series

Non-IsolatedDC-DC Converters
MYMGK/MYSGK/
OKL/MYLSM Series

Isolated DC-DC Converters for PoE+PD
MYBSP Series



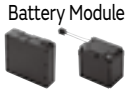
Polymer Aluminum Electrolytic Capacitors
ECAS Series

Thermistors
NCP/NCU/PRF Series

Silicon ESD Protection Devices
LXES**T Series

Chip Inductors (Chip Coils)
LQM/LQH/DFE Series

FORTELION 24V Battery Module



FORTELION High Output Battery Module
MPRMH1701

FORTELION 2.1kWh Battery Module System
IJ1101M/IJ8101C/IJ1101k

Cylindrical Type Lithium Ion Secondary Batteries

4 Controller

Chip Ferrite Beads
BLM Series

Thermistors
NCP/NCU Series

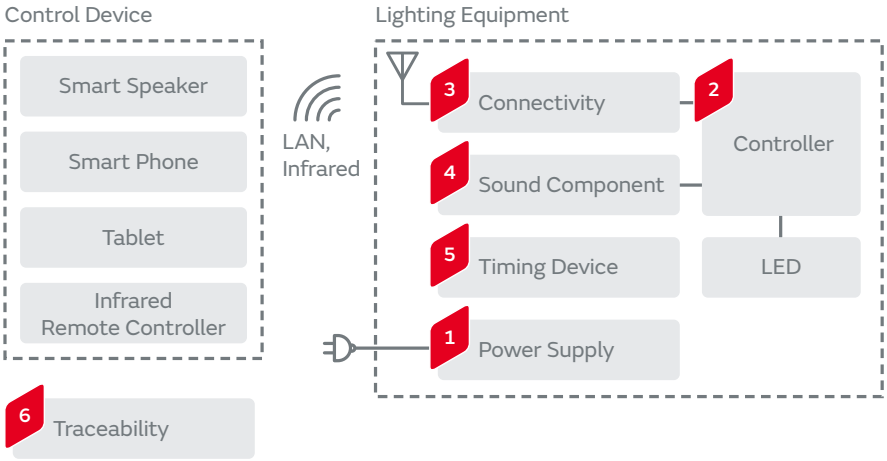
6 Memory

Chip Ferrite Beads
BLM Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GQM / GJM Series	High Frequency Filter Circuit
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression/Decoupling
Polymer Aluminum Electrolytic Capacitors	ECAS Series	Smoothing /Transient Backup
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching /Resonance
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
Feed Through Chip EMI Filters	NFE Series	Noise Suppression
Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLM Series	Noise Suppression
Piezoelectric Sounders	PKLCS/PKMCS Series	Sound Component
Coin Manganese Dioxide Lithium Batteries	Standard Type	Battery Backup

Lighting



1 Power Supply

Ballast for LED Lighting

2 Controller

Chip Multilayer Ceramic Capacitors for General Purpose
GR/GA Series

Safety Standard Certified Resin Molding SMD Type Ceramic Capacitors for General Purpose
DK1 Series

Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose
DE1/DE2 Series

Thermistors
NCP/PRF/PRG Series

3 Connectivity

Wi-Fi Modules

LPWA Modules

Microwave Coaxial Connectors with Switch

4 Sound Component

Piezoelectric Sounders
PKLCS/PKMCS Series

5 Timing Device

Crystal Units
XRC Series

MEMS Resonators
WMRAG Series

Ceramic Resonators CERALOCK
CST Series

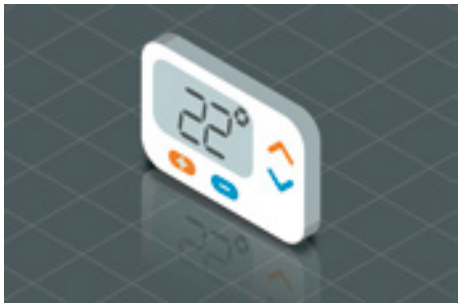
6 Traceability

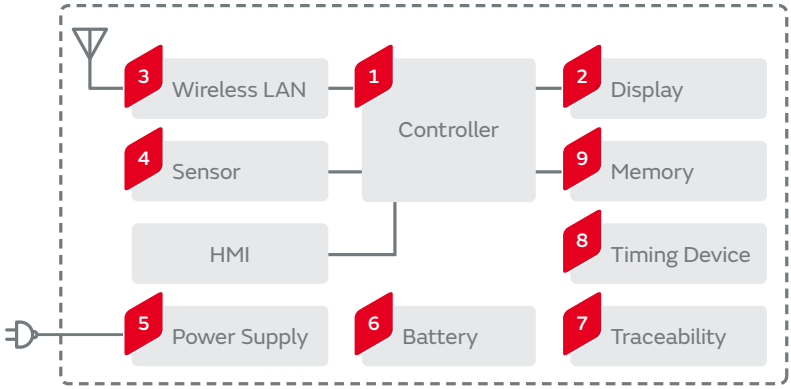
RFID Tag
LXMS/LXTB Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GQM / GJM Series	High Frequency Filter Circuit
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression/Decoupling
Polymer Aluminum Electrolytic Capacitors	ECAS Series	Smoothing /Transient Backup
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching /Resonance
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
Feed Through Chip EMI Filters	NFE Series	Noise Suppression
Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLM Series	Noise Suppression
Piezoelectric Sounders	PKLCS/PKMCS Series	Sound Component
Coin Manganese Dioxide Lithium Batteries	Standard Type	Battery Backup

Thermostat





1 Controller

Low ESL Chip Multilayer Ceramic Capacitors for General Purpose
LLL/LLA/LLM Series

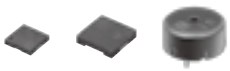
Thermistors
NCP/PRF Series

2 Display

Metal Terminal Type Multilayer Ceramic Capacitors for General Purpose
KRM Series

Polymer Aluminum Electrolytic Capacitors
ECAS Series

Piezoelectric Sounders
PKMCS/PKLCS/PKM Series



Thermistors
NCP/PRF Series

3 Wireless LAN

Bluetooth® Modules

LPWA Modules

Wi-Fi Modules

Chip Inductors (Chip Coils)
LQM/LQH/LQB Series

Microwave Coaxial Connectors with Switch

4 Sensor

Thermistors
NCP/PRF/PRG Series

5 Power Supply

Chip Multilayer Ceramic Capacitors for General Purpose
GR/GA Series

Safety Standard Certified Resin Molding SMD Type Ceramic Capacitors for General Purpose
DK1 Series

Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose
DE1/DE2 Series

Thermistors
NCP/PRF/PRG Series

Polymer Aluminum Electrolytic Capacitors
ECAS Series

6 Battery

Thermistors
NCP/PRF/PRG Series

Laminated Type
Lithium Ion Secondary Batteries

7 Traceability

RFID Tag
LXMS/LXTB Series

8 Timing Device

Crystal Units
XRC Series

MEMS Resonators
WMRAG Series

Ceramic Resonators CERALOCK
CST Series

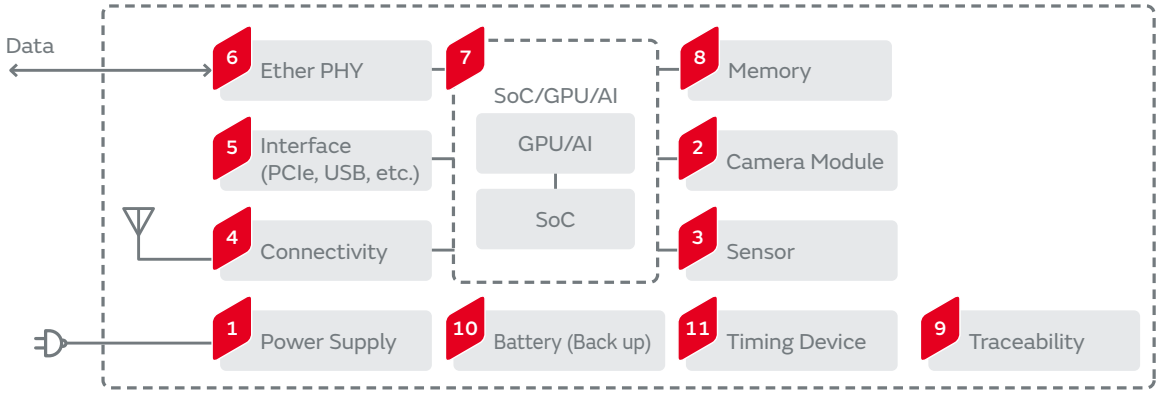
9 Memory

Chip Ferrite Beads
BLM Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GQM / GJM Series	High Frequency Filter Circuit
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression/Decoupling
Polymer Aluminum Electrolytic Capacitors	ECAS Series	Smoothing /Transient Backup
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching /Resonance
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
Feed Through Chip EMI Filters	NFE Series	Noise Suppression
Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLM Series	Noise Suppression
Piezoelectric Sounders	PKLCS/PKMCS Series	Sound Component
Coin Manganese Dioxide Lithium Batteries	Standard Type	Battery Backup

Security camera



1 Power Supply

Metal Terminal Type Multilayer Ceramic Capacitors for General Purpose
KRM Series

Polymer Aluminum Electrolytic Capacitors
ECAS Series

Power Inductors
LQH/DFE Series

Thermistors
NCP/NCU/PRF Series

Laminated Type Lithium Ion Secondary Batteries

Isolated DC-DC Converters for PoE+PD
MYBSP Series

Silicon ESD Protection Devices
LXES**T Series

2 Camera Module

Chip Ferrite Beads
BLM Series

Thermistors
NCP/NCU Series

3 Sensor

Pyroelectric Infrared Sensors
IRA-S Series

Ultrasonic Sensors
MA40 Series

Low Acoustic Noise Chip Multilayer Ceramic Capacitors on Interposer Board for General Purpose
ZRB Series

Thermistors
NCP/NCU Series

4 Connectivity

Wi-Fi Modules

Chip Inductors (Chip Coils)
LQW/LQP/LQG Series

Chip Multilayer LC Filters
LF Series

Chip Multilayer Diplexers
LFD Series

Chip Multilayer Hybrid Baluns
LDB/LDM Series

Chip Multilayer Hybrid Couplers
LDC/LDJ Series

LPWA Modules

5 Interface (PCIe, USB, etc.)

Low ESL Chip Multilayer Ceramic Capacitors for General Purpose
LLL/LLA/LLM Series

Silicon ESD Protection Devices
LXES**T Series

Chip Common Mode Choke Coils/ Common Mode Noise Filters
DLW/NFG/DLM Series

6 Ether PHY

Low ESL Chip Multilayer Ceramic Capacitors for General Purpose
LLL/LLA/LLM Series

Silicon ESD Protection Devices
LXES**T Series

Chip Common Mode Choke Coils/ Common Mode Noise Filters
DLW/NFG/DLM Series

7 SoC/GPU/AI

3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose
NFM Series

Thermistors
NCP/NCU Series

8 Memory

Chip Ferrite Beads
BLM Series

9 Traceability

RFID Tag
LXMS/LXTB Series

10 Battery (Back Up)

Coin Manganese Dioxide Lithium Batteries
Standard Type/Heat-resistant Type

11 Timing Device

MEMS Resonators
WMRAG Series

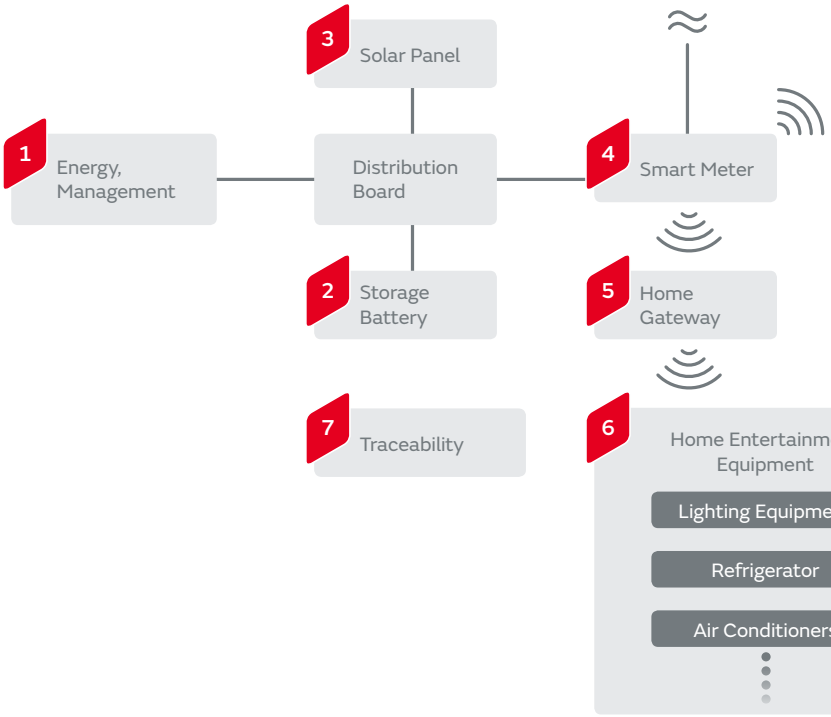
Crystal Units
XRC Series

Ceramic Resonators CERALOCK
CST Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GQM / GJM Series	High Frequency Filter Circuit
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression/Decoupling
Polymer Aluminum Electrolytic Capacitors	ECAS Series	Smoothing /Transient Backup
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching /Resonance
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
Feed Through Chip EMI Filters	NFE Series	Noise Suppression
Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLM Series	Noise Suppression
Piezoelectric Sounders	PKLCS/PKMCS Series	Sound Component
Coin Manganese Dioxide Lithium Batteries	Standard Type	Battery Backup

HEMS (Home energy management system)



1 Energy, Management

Crystal Units
XRC Series

3 Solar Panel

Isolated DC-DC Converters
MYB Series

Non-Isolated DC-DC Converters
MYMGK/MYSGK/OKL/MYLSM Series

Chip Multilayer Ceramic Capacitors
for General Purpose
GR/GA Series

2 Storage Battery

Thermistors
PRF/PRG/NCU Series

Isolated DC-DC Converters
MYB Series

Non-Isolated DC-DC Converters
MYMGK/MYSGK/OKL/MYLSM Series

Chip Multilayer Ceramic Capacitors
for General Purpose
GR/GA Series

Safety Standard Certified Resin Molding
SMD Type Ceramic Capacitors for General Purpose
DK1 Series

Safety Standard Certified Lead Type Disc
Ceramic Capacitors for General Purpose
DE1/DE2 Series

FORTELION 2.1kWh Battery Module System
IJ1101M/IJ8101C/IJ1101k

Cylindrical Type Lithium Ion
Secondary Batteries

4 Smart Meter

Chip Multilayer LC Filters
LF Series

Chip Multilayer Hybrid Baluns
LDB/LDM Series

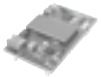
Wi-Fi Modules

LPWA Modules

Isolated DC-DC Converters
MYB Series

Non-Isolated DC-DC Converters
MYMGK/MYSGK/OKL/MYLSM Series

Isolated DC-DC Converters
for PoE + PD
MYBSP Series



Chip Multilayer Ceramic Capacitors for Ethernet LAN
and Primary - Secondary Coupling of DC-DC Converters
GR4 Series

MEMS Resonators
WMRAG Series

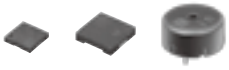
Safety Standard Certified Resin Molding
SMD Type Ceramic Capacitors for General Purpose
DK1 Series

Safety Standard Certified Lead Type Disc
Ceramic Capacitors for General Purpose
DE1/DE2 Series

Ceramic Resonators CERALOCK
CST Series

Crystal Units
XRC Series

Piezoelectric Sounders
PKMCS/PKLCS/PKM Series



Coin Manganese Dioxide Lithium Batteries
Heat-resistant Type/Extended Temperature Type

Microwave Coaxial
Connectors with Switch

5 Home Gateway

Wi-Fi
Modules

Bluetooth®
Modules

LPWA
Modules

Microwave Coaxial
Connectors with Switch

Isolated DC-DC Converters
for PoE + PD
MYBSP Series

Crystal Units
XRC Series

MEMS Resonators
WMRAG Series

6 Home Entertainment Equipment

Bluetooth® Modules

Wi-Fi Modules

LPWA Modules

Ultrasonic Sensors
MA40 Series

Magnetic Sensors (AMR Sensors)
MR Series

Isolated DC-DC Converters
MYB Series

Non-Isolated DC-DC Converters
MYMGK/MYSGK/OKL/MYLSM Series

Crystal Units
XRC Series

MEMS Resonators
WMRAG Series

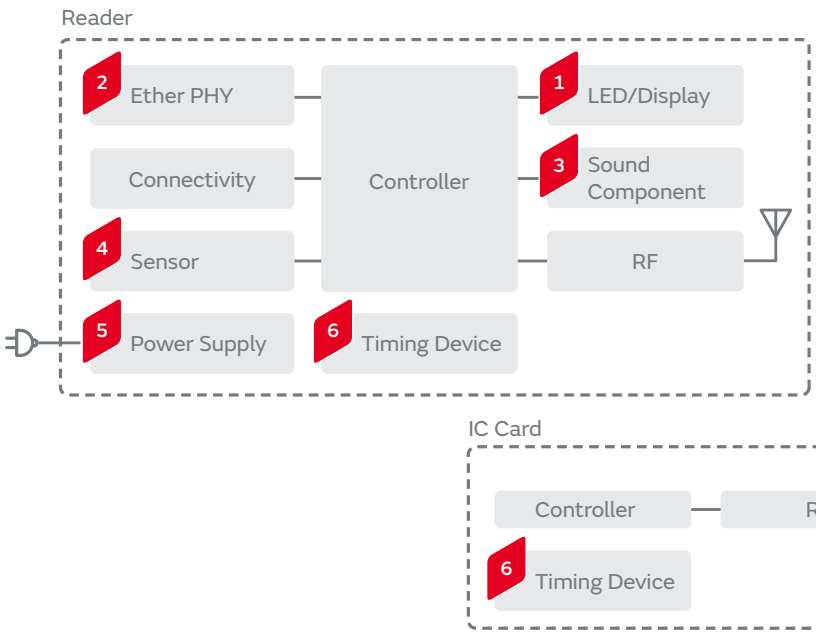
7 Traceability

RFID Tag
LXMS/LXTB Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GQM / GJM Series	High Frequency Filter Circuit
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression/Decoupling
Polymer Aluminum Electrolytic Capacitors	ECAS Series	Smoothing /Transient Backup
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching /Resonance
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
Feed Through Chip EMI Filters	NFE Series	Noise Suppression
Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLM Series	Noise Suppression
Piezoelectric Sounders	PKLCS/PKMCS Series	Sound Component
Coin Manganese Dioxide Lithium Batteries	Standard Type	Battery Backup

Entrance and exit management system



1 LED/Display

Silicon ESD Protection Devices
LXES**T Series

Thermistors
NCP/PRF Series

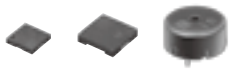
2 Ether PHY

Silicon ESD Protection Devices
LXES**T Series

Thermistors
PRG Series

3 Sound Component

Piezoelectric Sounders
PKMCS/PKLCS/PKM Series



4 Sensor

Ultrasonic Sensors
MA40 Series

Magnetic Sensors (AMR Sensors)
MR Series

Pyroelectric Infrared Sensors
IRA-S Series

5 Power Supply

Polymer Aluminum Electrolytic Capacitors
ECAS Series

Metal Terminal Type Multilayer Ceramic Capacitors for General Purpose
KRM Series

Non-Isolated DC-DC Converters
MYMGK/MYSGK/OKL/MYLS M Series

Isolated DC-DC Converters for PoE + PD
MYBSP Series

Thermistors
NCP/PRF Series

Chip Multilayer Ceramic Capacitors for General Purpose
GR/GA Series

Safety Standard Certified Resin Molding SMD Type Ceramic Capacitors for General Purpose
DK1 Series

Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose
DE1/DE2 Series

6 Timing Device

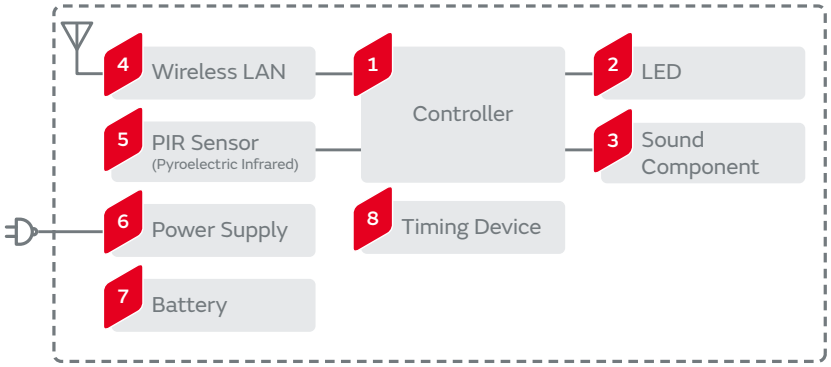
Crystal Units
XRC Series

Ceramic Resonators CERALOCK
CST Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GQM / GJM Series	High Frequency Filter Circuit
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression/Decoupling
Polymer Aluminum Electrolytic Capacitors	ECAS Series	Smoothing /Transient Backup
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching /Resonance
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
Feed Through Chip EMI Filters	NFE Series	Noise Suppression
Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLM Series	Noise Suppression
Piezoelectric Sounders	PKLCS/PKMCS Series	Sound Component
Coin Manganese Dioxide Lithium Batteries	Standard Type	Battery Backup

Human detection



1 Controller

Low ESL Chip Multilayer Ceramic Capacitors for General Purpose
LLL/LLA/LLM Series

Thermistors
NCP/PRF Series

2 LED

Chip Multilayer Ceramic Capacitors for General Purpose
GR/GA Series

Safety Standard Certified Resin Molding SMD Type Ceramic Capacitors for General Purpose
DK1 Series

Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose
DE1/DE2 Series

Thermistors
NCP/PRF/PRG Series

3 Sound Component

Piezoelectric Sounders
PKMCS/PKLCS/PKM Series

4 Wireless LAN

Wi-Fi Modules

Chip Inductors (Chip Coils)
LQW/LQP/LQG Series

5 PIR Sensor (Pyroelectric Infrared)

Pyroelectric Infrared Sensors
IRA-S Series

Ultrasonic Sensors
MA40 Series

6 Power Supply

Chip Multilayer Ceramic Capacitors for General Purpose
GR/GA Series

Safety Standard Certified Resin Molding SMD Type Ceramic Capacitors for General Purpose
DK1 Series

Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose
DE1/DE2 Series

Chip Common Mode Choke Coils/ Common Mode Noise Filters
DLW/DLM Series

Thermistors
NCP/PRF/PRG Series

Polymer Aluminum Electrolytic Capacitors
ECAS Series

Isolated DC-DC Converters for PoE + PD
MYBSP Series

7 Battery

Coin Manganese Dioxide Lithium Batteries
Standard Type

Thermistors
NCP/PRF/PRG Series

8 Timing Device

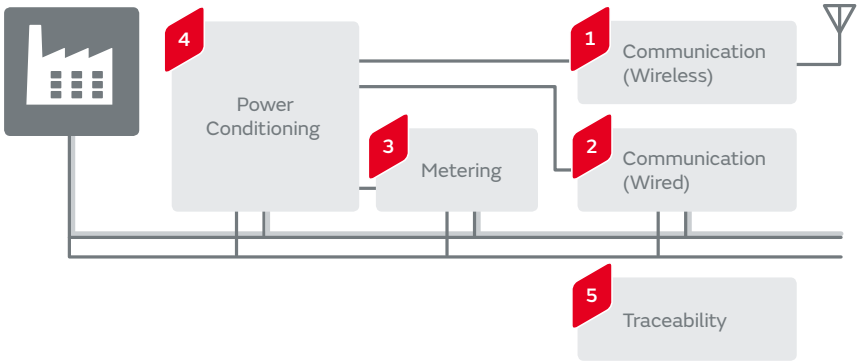
Crystal Units
XRC Series

Ceramic Resonators CERALOCK
CST Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GQM / GJM Series	High Frequency Filter Circuit
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression/Decoupling
Polymer Aluminum Electrolytic Capacitors	ECAS Series	Smoothing /Transient Backup
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching /Resonance
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
Feed Through Chip EMI Filters	NFE Series	Noise Suppression
Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLM Series	Noise Suppression
Piezoelectric Sounders	PKLCS/PKMCS Series	Sound Component
Coin Manganese Dioxide Lithium Batteries	Standard Type	Battery Backup

Smart meter



1 Communication (Wireless)

Wi-Fi Modules

LPWA Modules

Chip Multilayer LC Filters
LF Series

Chip Multilayer Hybrid Baluns
LDB/LDM Series

Microwave Coaxial Connectors with Switch

Thermistors
NCP/PRF/PRG/NCU Series

Crystal Units
XRC Series

Chip Inductors (Chip Coils)
LQW/LQP/LQG Series

MEMS Resonators
WMRAG Series

2 Communication (Wired)

Chip Multilayer Ceramic Capacitors for General Purpose
GR/GA Series

Safety Standard Certified Resin Molding SMD Type Ceramic Capacitors for General Purpose
DK1 Series

Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose
DE1/DE2 Series

Leaded MLCC for General Purpose
RDE Series

Thermistors
NCP/PRF/PRG/NCU Series

Ceramic Resonators CERALOCK
CST Series

Crystal Units
XRC Series

Silicon ESD Protection Devices
LXES**T Series

3 Metering

Chip Common Mode Choke Coils/ Common Mode Noise Filters
DLW/DLM Series

Thermistors
NCP/PRF/PRG/NCU Series

Ceramic Resonators CERALOCK
CST Series

Crystal Units
XRC Series

Piezoelectric Sounders
PKMCS/PKLCS/PKM Series

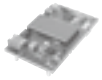
Magnetic Sensors (AMR Sensors)
MR Series

MEMS Resonators
WMRAG Series

4 Power Conditioning

Non-Isolated DC-DC Converters
MYMGK/MYSGK/ OKL/MYSLM Series

Isolated DC-DC Converters for PoE + PD
MYBSP Series



Chip Multilayer Ceramic Capacitors for General Purpose
GR/GA Series

Safety Standard Certified Resin Molding SMD Type Ceramic Capacitors for General Purpose
DK1 Series

Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose
DE1/DE2 Series

Leaded MLCC for General Purpose
RDE Series

Power Inductors
LQH Series

Thermistors
NCP/PRF/PRG/NCU Series

Polymer Aluminum Electrolytic Capacitors
ECAS Series

Coin Manganese Dioxide Lithium Batteries
Heat-resistant Type/Extended Temperature Type

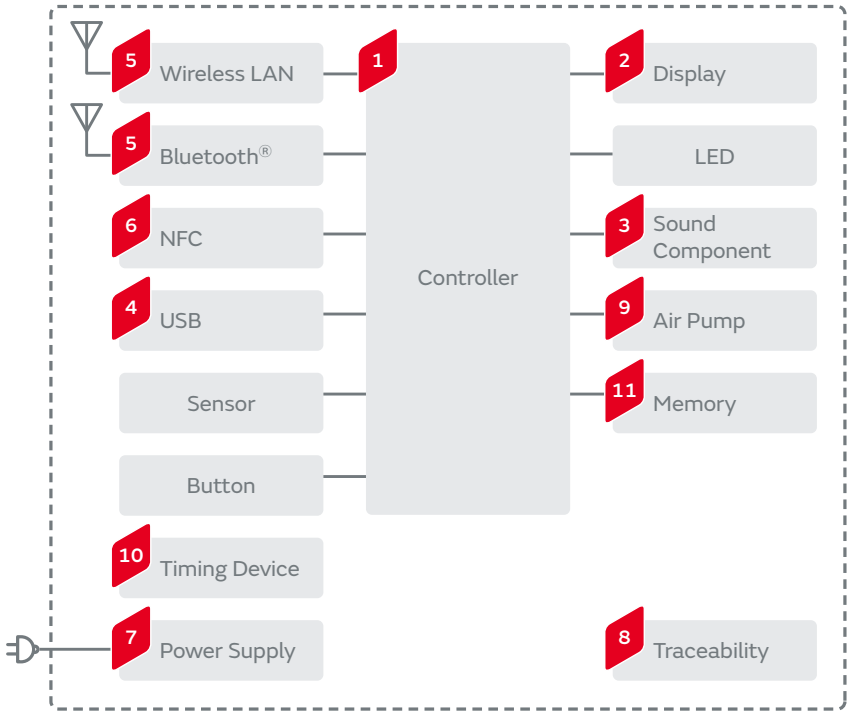
5 Traceability

RFID Tag
LXMS/LXTB Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GQM / GJM Series	High Frequency Filter Circuit
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression/Decoupling
Polymer Aluminum Electrolytic Capacitors	ECAS Series	Smoothing /Transient Backup
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching /Resonance
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
Feed Through Chip EMI Filters	NFE Series	Noise Suppression
Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLM Series	Noise Suppression
Piezoelectric Sounders	PKLCS/PKMCS Series	Sound Component
Coin Manganese Dioxide Lithium Batteries	Standard Type	Battery Backup

Blood pressure monitor



1 Controller

Chip Ferrite Beads
BLM Series

Thermistors
NCP Series

Thermistors
NCP/NXR Series

2 Display

3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose
NFM Series

Chip Ferrite Beads
BLM Series

Thermistors
NCP Series

3 Sound Component

Piezoelectric Sounders
PKMCS/PKLCS/PKM Series

4 USB

Silicon ESD Protection Devices
LXES**T Series

Thermistors
PRG Series

6 NFC

Chip Ferrite Beads
BLM Series

Chip Inductors (Chip Coils)
LQW18C/LQM18J Series

5 Wireless LAN, Bluetooth®

Silicon ESD Protection Devices
LXES**T Series

Bluetooth® Smart Modules
LBCA/LBMA Series

Wi-Fi Modules

Thermistors
PRG Series

7 Power Supply

Thermistors
NCP Series

Thermistors
PRF/PRG Series

Coin Manganese Dioxide
Lithium Batteries
Standard Type

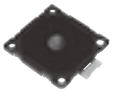
Polymer Aluminum
Electrolytic Capacitors
ECAS Series

8 Traceability

RFID Tag
LXMS/LXTB Series

9 Air Pump

Microblowers



10 Timing Device

MEMS Resonators
WMRAG Series

Crystal Units
XRC Series

Ceramic Resonators
CERALOCK
CST Series

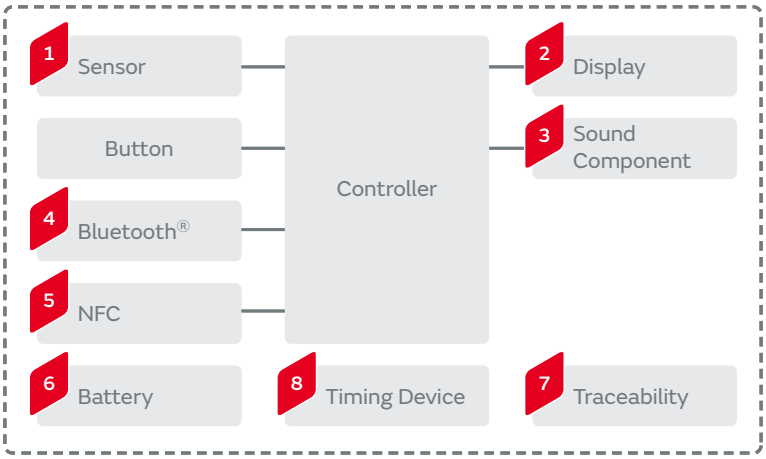
11 Memory

Chip Ferrite Beads
BLM Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GQM / GJM Series	High Frequency Filter Circuit
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression/Decoupling
Polymer Aluminum Electrolytic Capacitors	ECAS Series	Smoothing /Transient Backup
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching /Resonance
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
Feed Through Chip EMI Filters	NFE Series	Noise Suppression
Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLM Series	Noise Suppression
Piezoelectric Sounders	PKLCS/PKMCS Series	Sound Component
Coin Manganese Dioxide Lithium Batteries	Standard Type	Battery Backup

Thermometer



1 Sensor

Thermistors
NXF Series

2 Display

Thermistors
NCP Series

3 Sound Component

Piezoelectric Sounders
PKLCS/PKMCS Series

4 Bluetooth®

Bluetooth® Smart Modules
LBCA/LBMA Series

5 NFC

Chip Ferrite Beads
BLM Series

Chip Inductors (Chip Coils)
LQW18C/LQM18J Series

6 Battery

Coin Manganese Dioxide Lithium Batteries
Standard Type

Alkaline Manganese Batteries

7 Traceability

RFID Tag
LXMS/LXTB Series

8 Timing Device

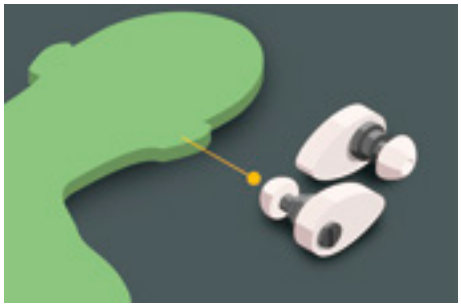
Crystal Units
XRC Series

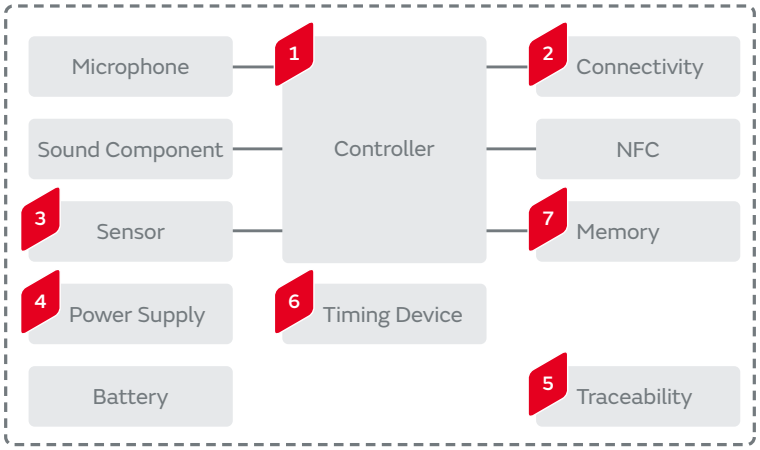
Ceramic Resonators CERALOCK
CST Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GQM / GJM Series	High Frequency Filter Circuit
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression/Decoupling
Polymer Aluminum Electrolytic Capacitors	ECAS Series	Smoothing /Transient Backup
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching /Resonance
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
Feed Through Chip EMI Filters	NFE Series	Noise Suppression
Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLM Series	Noise Suppression
Piezoelectric Sounders	PKLCS/PKMCS Series	Sound Component
Coin Manganese Dioxide Lithium Batteries	Standard Type	Battery Backup

Hearing aid





1 Controller

Thermistors
NCP Series

2 Connectivity

Bluetooth® Modules

Wi-Fi Modules

Thermistors
NCP Series

Chip Multilayer LC Filters
LF Series

3 Sensor

Thermistors
NCP Series

4 Power Supply

Thermistors
NCP Series

5 Traceability

RFID Tag
LXMS/LXTB Series

6 Timing Device

MEMS Resonators
WMRAG Series

Crystal Units
XRC Series

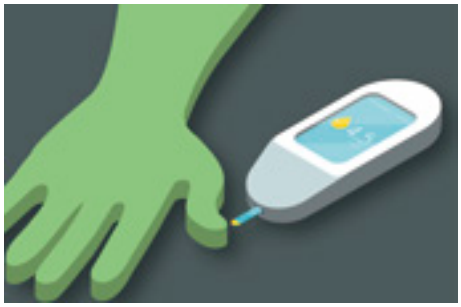
7 Memory

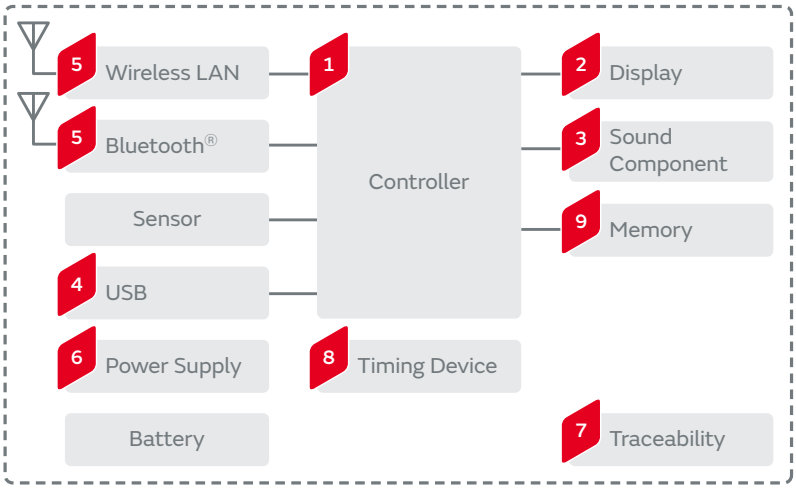
Chip Ferrite Beads
BLM Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GQM / GJM Series	High Frequency Filter Circuit
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression/Decoupling
Polymer Aluminum Electrolytic Capacitors	ECAS Series	Smoothing /Transient Backup
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching /Resonance
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
Feed Through Chip EMI Filters	NFE Series	Noise Suppression
Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLM Series	Noise Suppression
Piezoelectric Sounders	PKLCS/PKMCS Series	Sound Component
Coin Manganese Dioxide Lithium Batteries	Standard Type	Battery Backup

Blood glucose meter





3 Sound Component

Piezoelectric Sounders
PKLCS/PKMCS Series

4 USB

Thermistors
PRG Series

Silicon ESD Protection Devices
LXES**T Series

1 Controller

Chip Ferrite Beads
BLM Series

Thermistors
NCP Series

2 Display

3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose
NFM Series

Chip Ferrite Beads
BLM Series

5 Wireless LAN, Bluetooth®

Bluetooth® Smart Modules
LBCA/LBMA Series

Wi-Fi Modules

Thermistors
NCP Series

6 Power Supply

Coin Manganese Dioxide Lithium Batteries
Standard Type

Thermistors
NCP Series

Polymer Aluminum Electrolytic Capacitors
ECAS Series

7 Traceability

RFID Tag
LXMS/LXTB Series

8 Timing Device

MEMS Resonators
WMRAG Series

Crystal Units
XRC Series

Ceramic Resonators CERALOCK
CST Series

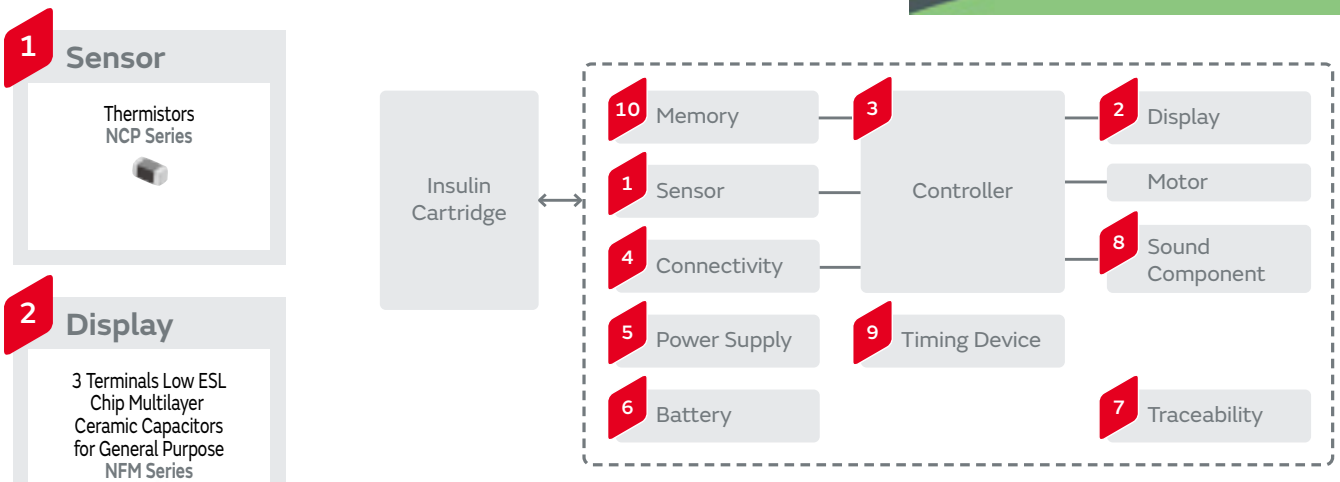
9 Memory

Chip Ferrite Beads
BLM Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GQM / GJM Series	High Frequency Filter Circuit
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression/Decoupling
Polymer Aluminum Electrolytic Capacitors	ECAS Series	Smoothing /Transient Backup
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching /Resonance
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
Feed Through Chip EMI Filters	NFE Series	Noise Suppression
Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLM Series	Noise Suppression
Piezoelectric Sounders	PKLCS/PKMCS Series	Sound Component
Coin Manganese Dioxide Lithium Batteries	Standard Type	Battery Backup

Insulin pump



1 Sensor

Thermistors
NCP Series

2 Display

3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose
NFM Series

Chip Ferrite Beads
BLM Series

3 Controller

Thermistors
NCP Series

4 Connectivity

Bluetooth® Smart Modules
LBCA/LBMA Series

Wi-Fi Modules

Thermistors
NCP Series

5 Power Supply

Thermistors
NCP Series

6 Battery

Alkaline Manganese Batteries

7 Traceability

RFID Tag
LXMS/LXTB Series

8 Sound Component

Piezoelectric Sounders
PKLCS/PKMCS Series

9 Timing Device

MEMS Resonators
WMRAG Series

Crystal Units
XRC Series

Ceramic Resonators CERALOCK
CST Series

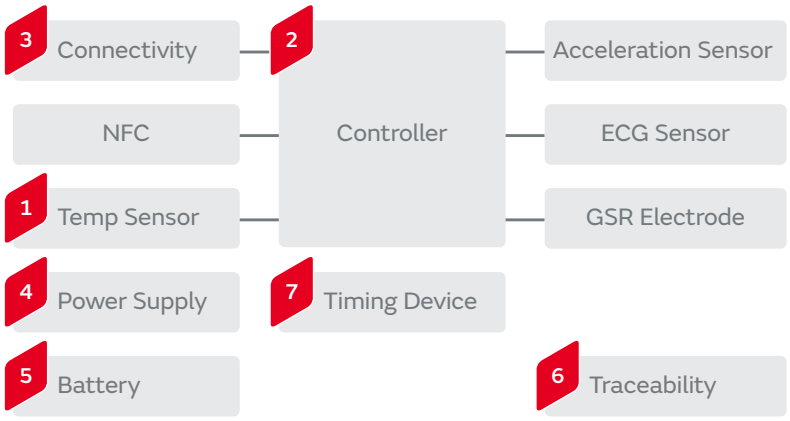
10 Memory

Chip Ferrite Beads
BLM Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GQM / GJM Series	High Frequency Filter Circuit
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression/Decoupling
Polymer Aluminum Electrolytic Capacitors	ECAS Series	Smoothing /Transient Backup
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching /Resonance
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
Feed Through Chip EMI Filters	NFE Series	Noise Suppression
Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLM Series	Noise Suppression
Piezoelectric Sounders	PKLCS/PKMCS Series	Sound Component
Coin Manganese Dioxide Lithium Batteries	Standard Type	Battery Backup

Skin patch



1 Temp Sensor

Thermistors
NCP/NXF Series

2 Controller

Thermistors
NCP Series

3 Connectivity

Bluetooth® Smart Modules
LBCA/LBMA Series

Wi-Fi Modules

Thermistors
NCP Series

4 Power Supply

Thermistors
NCP Series

5 Battery

Coin Manganese Dioxide
Lithium Batteries
Standard Type

6 Traceability

RFID Tag
LXMS/LXTB Series

7 Timing Device

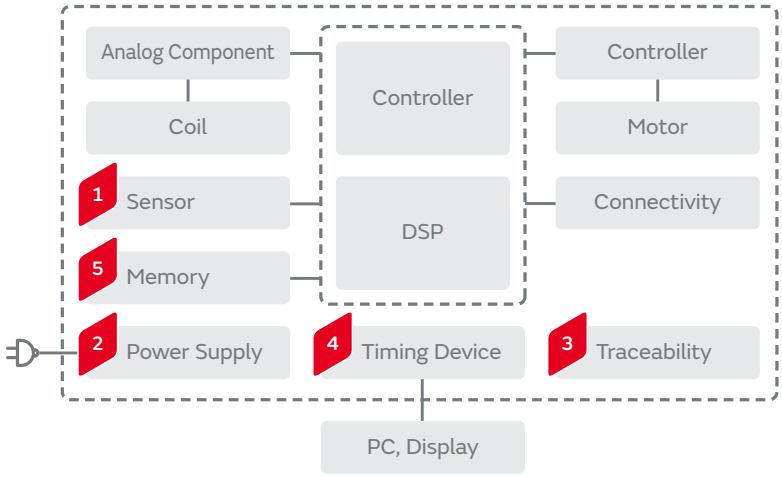
MEMS Resonators
WMRAG Series

Crystal Units
XRC Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GQM / GJM Series	High Frequency Filter Circuit
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression/Decoupling
Polymer Aluminum Electrolytic Capacitors	ECAS Series	Smoothing /Transient Backup
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching /Resonance
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
Feed Through Chip EMI Filters	NFE Series	Noise Suppression
Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLM Series	Noise Suppression
Piezoelectric Sounders	PKLCS/PKMCS Series	Sound Component
Coin Manganese Dioxide Lithium Batteries	Standard Type	Battery Backup

Diagnostic imaging apparatus



1 Sensor

Thermistors
NCP/PRF Series

2 Power Supply

Isolated DC-DC Converters
MYB Series

Non-Isolated DC-DC Converters
MYMGK/MYSGK/
OKL/MYLSM Series

Metal Terminal Type
Multilayer Ceramic Capacitors
for General Purpose
KRM Series

Polymer Aluminum
Electrolytic Capacitors
ECAS Series

Chip Multilayer Ceramic Capacitors
for General Purpose
GR/GA Series

Safety Standard Certified Resin Molding SMD Type Ceramic
Capacitors for General Purpose
DK1 Series

Safety Standard CertifiedLead Type
Disc Ceramic Capacitors for General Purpose
DE1/DE2 Series

Thermistors
NCP/PRF Series

High Voltage Resistors
MHR Series

3 Traceability

RFID Tag
LXMS/LXTB Series

4 Timing Device

Crystal Units
XRC Series

Ceramic Resonators CERALOCK
CST Series

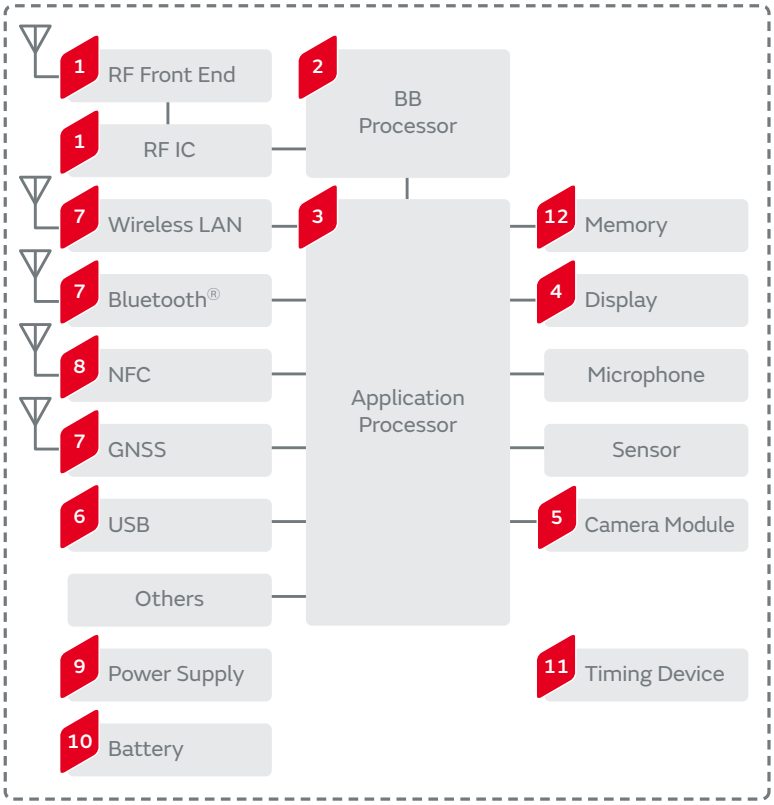
5 Memory

Chip Ferrite Beads
BLM Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GQM / GJM Series	High Frequency Filter Circuit
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression/Decoupling
Polymer Aluminum Electrolytic Capacitors	ECAS Series	Smoothing /Transient Backup
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching /Resonance
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
Feed Through Chip EMI Filters	NFE Series	Noise Suppression
Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLM Series	Noise Suppression
Piezoelectric Sounders	PKLCS/PKMCS Series	Sound Component
Coin Manganese Dioxide Lithium Batteries	Standard Type	Battery Backup

Smart phone



1 RF Front End, RF IC

SAW Duplexers
SAY Series

SAW Filters
SAF Series

Chip Multilayer LC Filters
LF Series

Chip Multilayer Diplexers
LFD Series

Chip Multilayer Hybrid Baluns
LDB/LDM Series

Chip Multilayer Hybrid Dividers
LDD Series

Chip Multilayer Hybrid Couplers
LDC/LDJ Series

Microwave Coaxial Connectors with Switch

Microwave Multi Line Connectors

Chip Inductors (Chip Coils)
LQW/LQP Series

Band-Selectable Phase Adjustment Device (B-SPADE)

Thermistors
NCP/PRF Series

2 BB Processor

3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose
NFM Series

Chip Common Mode Choke Coils/ Common Mode Noise Filters
DLW/DLM Series

Frequency Specified Noise Filters
BLF Series

Chip LC Trap Filters
LQZ02HQ Series

Thermistors
NCP/PRF Series

3 Application Processor

Chip Ferrite Beads
BLM Series

3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose
NFM Series

Thermistors
NCP/PRF Series

4 Display

EMI Suppression Filters EMIFIL
NFA Series

Chip Common Mode Choke Coils/ Common Mode Noise Filters
DLW/DLM Series

Silicon ESD Protection Devices
LXES**T Series

Thermistors
NCP/PRF Series

5 Camera Module

Chip Multilayer Ceramic Capacitors for Camera Flash Circuit Only
GR7 Series

Chip Ferrite Beads
BLM Series

Silicon ESD Protection Devices
LXES**T Series

Thermistors
NCP/PRF Series

6 USB

Chip Common Mode Choke Coils/ Common Mode Noise Filters
DLW/NFG/DLM Series

Chip Ferrite Beads
BLM Series

Silicon ESD Protection Devices
LXES**T Series

Thermistors
NCP/PRF Series

7 Wireless LAN, Bluetooth®, GNSS

Chip Multilayer Diplexers
LFD Series

Chip Multilayer Hybrid Couplers
LDC/LDJ Series

Bluetooth® Modules

Wi-Fi Modules

Bluetooth® - Wi-Fi Combo Modules

SAW Filters
SAF Series

Chip Multilayer LC Filters
LF Series

Chip Multilayer Hybrid Baluns
LDB/LDM Series

Microwave Coaxial Connectors with Switch

Microwave Multi Line Connectors

Thermistors
NCP/PRF Series

8 NFC

Chip Ferrite Beads
BLM Series

Chip Inductors (Chip Coils)
LQW18C/LQM18J Series

Variable Capacitors
LXRW Series

9 Power Supply

Low Acoustic Noise Chip Multilayer Ceramic Capacitors on Interposer Board for General Purpose
ZRB Series

Metal Terminal Type Multilayer Ceramic Capacitors for General Purpose
KRM Series

Thermistors
NCP/PRF Series

Chip Multilayer Ceramic Capacitors for General Purpose
GR/GA Series

Safety Standard Certified Resin Molding SMD Type Ceramic Capacitors for General Purpose
DK1 Series

Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose
DE1/DE2 Series

Chip Inductors (Chip Coils)
LQM/LQH/DFE Series

10 Battery

Thermistors
NCP/PRF/PRG Series

11 Timing Device

MEMS Resonators
WMRAG Series

Crystal Units
XRC Series

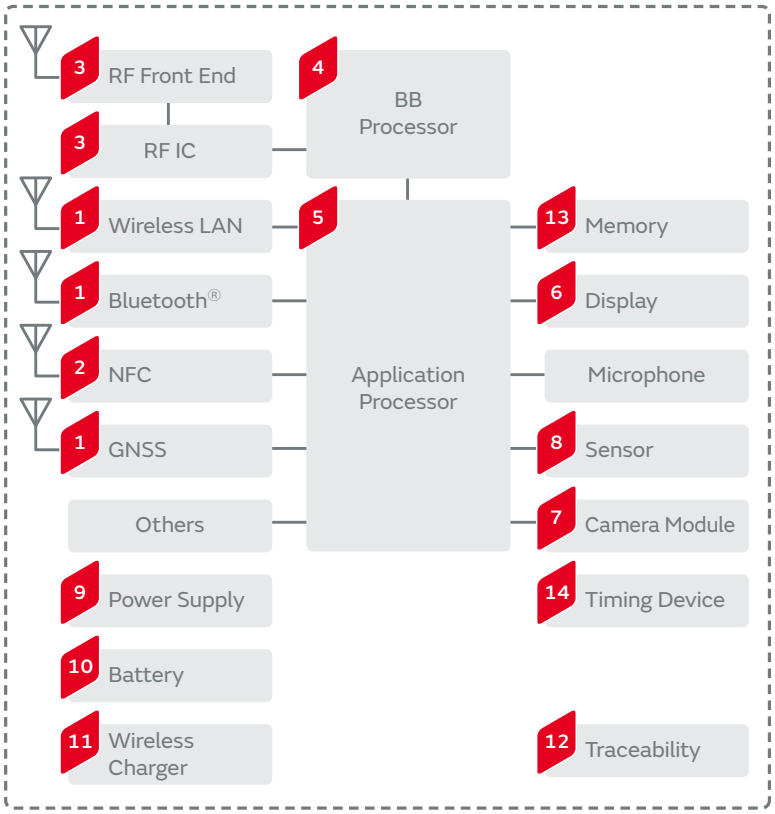
12 Memory

Chip Ferrite Beads
BLM Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GQM / GJM Series	High Frequency Filter Circuit
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression/Decoupling
Polymer Aluminum Electrolytic Capacitors	ECAS Series	Smoothing /Transient Backup
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching /Resonance
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
Feed Through Chip EMI Filters	NFE Series	Noise Suppression
Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLM Series	Noise Suppression
Piezoelectric Sounders	PKLCS/PKMCS Series	Sound Component
Coin Manganese Dioxide Lithium Batteries	Standard Type	Battery Backup

Smart watch / health tracker



1 Wireless LAN, Bluetooth®, GNSS

- Chip Common Mode Choke Coils/ Common Mode Noise Filters — DLW/NFG/DLM Series
- Silicon ESD Protection Devices — LXES**T Series
- Thermistors — NCP/PRF Series
- Bluetooth® Modules
- Wi-Fi Modules
- Bluetooth® - Wi-Fi Combo Modules
- SAW Filters — SAF Series
- Chip Multilayer LC Filters — LF Series
- Chip Multilayer Hybrid Baluns — LDB/LDM Series
- Chip Multilayer Diplexers — LFD Series
- Chip Multilayer Hybrid Couplers — LDC/LDJ Series
- Microwave Coaxial Connectors with Switch
- Microwave Multi Line Connectors

2 NFC

- Chip Inductors (Chip Coils) — LQW18C/LQM18J Series
- Variable Capacitors — LXRW Series

3 RF Front End, RF IC

- Chip Multilayer Diplexers — LFD Series
- SAW Duplexers — SAY Series
- SAW Filters — SAF Series
- Chip Multilayer LC Filters — LF Series
- Chip Multilayer Hybrid Baluns — LDB/LDM Series
- Chip Multilayer Hybrid Dividers — LDD Series
- Chip Multilayer Hybrid Couplers — LDC/LDJ Series
- Microwave Coaxial Connectors with Switch
- Microwave Multi Line Connectors
- Band-Selectable Phase Adjustment Device (B-SPADE)
- Thermistors — NCP/PRF Series

4 BB Processor

Thermistors
NCP/PRF Series

5 Application Processor

Thermistors
NCP/PRF Series

6 Display

Silicon ESD Protection Devices
LXES**T Series

Thermistors
NCP/PRF Series

Piezoelectric Sounders
PKLCS/PKMCS Series

7 Camera Module

Chip Multilayer Ceramic Capacitors for Camera Flash Circuit Only
GR7 Series

Silicon ESD Protection Devices
LXES**T Series

Thermistors
NCP/PRF Series

8 Sensor

Thermistors
NCP/PRF Series

9 Power Supply

Low Acoustic Noise
Chip Multilayer Ceramic Capacitors
on Interposer Board
for General Purpose
ZRB Series

Metal Terminal Type
Multilayer Ceramic Capacitors
for General Purpose
KRM Series

Thermistors
NCP Series

10 Battery

Coin Manganese Dioxide Lithium Batteries
Standard Type

Laminated Type
Lithium Ion Secondary Batteries

Thermistors
NCP/PRF/PRG Series

11 Wireless Charger

LW Reversed Low ESL Chip
Multilayer Ceramic Capacitors
for General Purpose
LLL Series

Thermistors
NCP/PRF Series

12 Traceability

RFID Tag
LXMS/LXTB Series

13 Memory

Chip Ferrite Beads
BLM Series

14 Timing Device

MEMS Resonators
WMRAG Series

Crystal Units
XRC Series

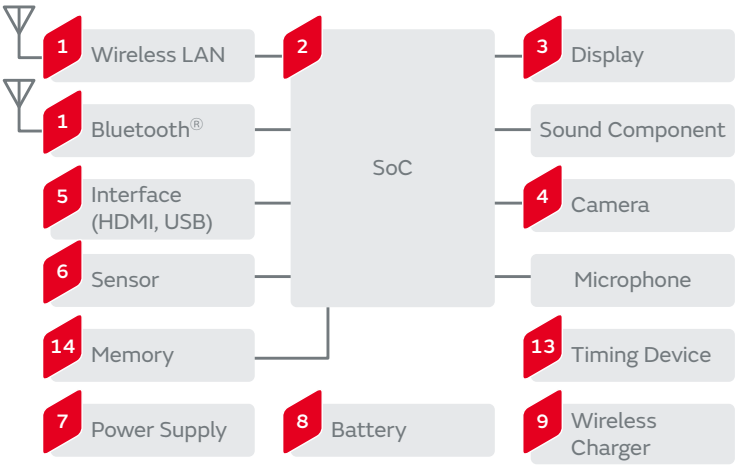
Ceramic Resonators CERALOCK
CST Series

General Purpose

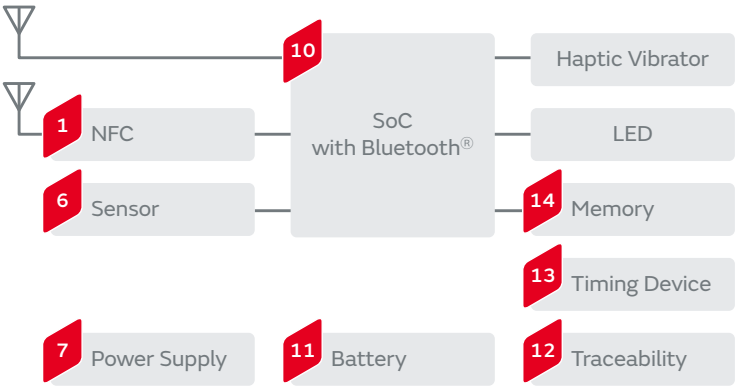
Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GQM / GJM Series	High Frequency Filter Circuit
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression/Decoupling
Polymer Aluminum Electrolytic Capacitors	ECAS Series	Smoothing /Transient Backup
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching /Resonance
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
Feed Through Chip EMI Filters	NFE Series	Noise Suppression
Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLM Series	Noise Suppression
Piezoelectric Sounders	PKLCS/PKMCS Series	Sound Component
Coin Manganese Dioxide Lithium Batteries	Standard Type	Battery Backup

AR / VR

AR/VR Device



VR Controller



1 Wireless LAN, Bluetooth®, NFC

Bluetooth® Modules

Wi-Fi Modules

Bluetooth® - Wi-Fi Combo Modules

SAW Filters
SAF Series

Chip Multilayer LC Filters
LF Series

Chip Multilayer Hybrid Baluns
LDB/LDM Series

Chip Multilayer Diplexers
LFD Series

Chip Multilayer Hybrid Couplers
LDC/LDJ Series

Microwave Coaxial Connectors with Switch

Microwave Multi Line Connectors

Thermistors
NCP/PRF Series

2 SoC

Thermistors
NCP/PRF Series

Chip Ferrite Beads
BLM Series

3 Display

Silicon ESD Protection Devices
LXES**T Series

Thermistors
NCP Series

4 Camera

Chip Multilayer Ceramic Capacitors for Camera Flash Circuit Only
GR7 Series

Silicon ESD Protection Devices
LXES**T Series

Thermistors
NCP Series

Chip Common Mode Choke Coils/ Common Mode Noise Filters
DLW/NFG/DLM Series

5 Interface (HDMI, USB)

Chip Common Mode Choke Coils/ Common Mode Noise Filters
DLW/NFG/DLM Series

Silicon ESD Protection Devices
LXES**T Series

Thermistors
NCP Series

6 Sensor

Thermistors
NCP Series

7 Power Supply

Low Acoustic Noise Chip Multilayer Ceramic Capacitors on Interposer Board for General Purpose
ZRB Series

Metal Terminal Type Multilayer Ceramic Capacitors for General Purpose
KRM Series

Polymer Aluminum Electrolytic Capacitors
ECAS Series

Thermistors
NCP/PRF Series

8 Battery

Laminated Type Lithium Ion Secondary Batteries

9 Wireless Charger

LW Reversed Low ESL Chip Multilayer Ceramic Capacitors for General Purpose
LLL Series

Thermistors
NCP/PRF Series

10 SoC with Bluetooth®

RF Inductors
LQP02HQ/LQW15AN Series

Microwave Coaxial Connectors with Switch

Microwave Multi Line Connectors

Chip Multilayer LC Filters
LF Series

Chip Multilayer Hybrid Baluns
LDB/LDM Series

Chip Multilayer Diplexers
LFD Series

Chip Multilayer Hybrid Couplers
LDC/LDJ Series

Chip LC Trap Filters
LQZ02HQ Series

Frequency Specified Noise Filters
BLF02RD Series

11 Battery

Coin Manganese Dioxide Lithium Batteries
Standard Type

Thermistors
NCP/PRF/PRG Series

12 Traceability

RFID Tag
LXMS/LXTB Series

13 Timing Device

MEMS Resonators
WMRAG Series

Crystal Units
XRC Series

Ceramic Resonators CERALOCK
CST Series

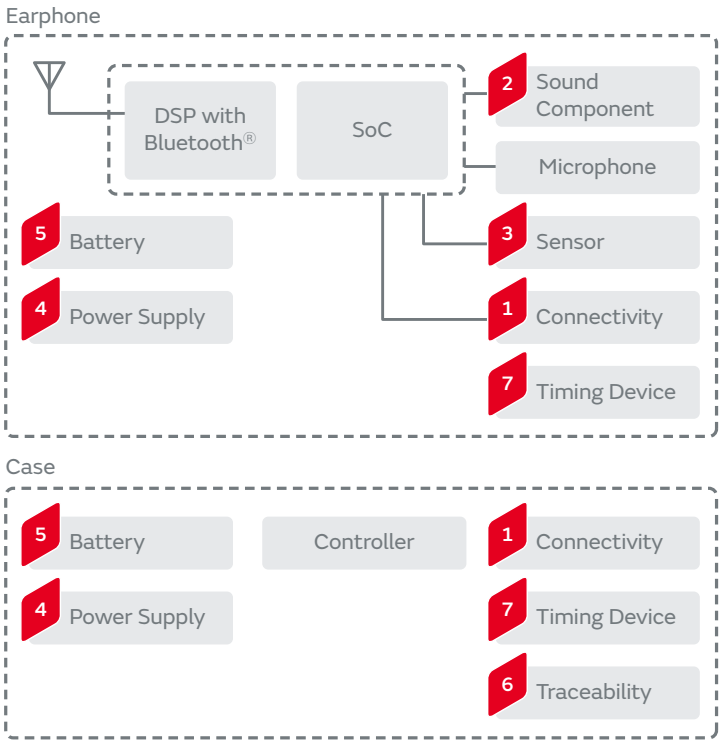
14 Memory

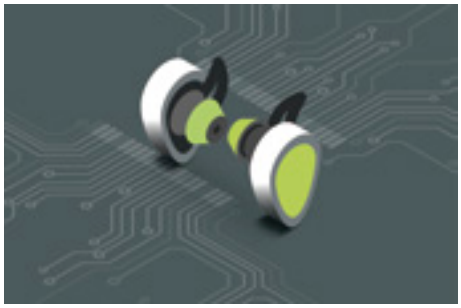
Chip Ferrite Beads
BLM Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GQM / GJM Series	High Frequency Filter Circuit
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression/Decoupling
Polymer Aluminum Electrolytic Capacitors	ECAS Series	Smoothing /Transient Backup
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching /Resonance
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
Feed Through Chip EMI Filters	NFE Series	Noise Suppression
Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLM Series	Noise Suppression
Piezoelectric Sounders	PKLCS/PKMCS Series	Sound Component
Coin Manganese Dioxide Lithium Batteries	Standard Type	Battery Backup

True wireless stereo (non-medical use)





1 Connectivity

RF Inductors
LQP02HQ/LQW15AN Series

Microwave Coaxial Connectors with Switch

Chip Multilayer LC Filters
LF Series

Chip Multilayer Hybrid Baluns
LDB/LDM Series

Chip Multilayer Diplexers
LFD Series

Chip Multilayer Hybrid Couplers
LDC/LDJ Series

Chip LC Trap Filters
LQZ02HQ Series

Frequency Specified Noise Filters
BLF02RD Series

2 Sound Component

Chip LC Trap Filters
LQZ02HQ Series

Frequency Specified Noise Filters
BLF02 Series

3 Sensor

Thermistors
NCP03 Series

4 Power Supply

Power Inductors
DFE18SAN Series

5 Battery

Thermistors
NCP03 Series

6 Traceability

RFID Tag
LXMS/LXTB Series

7 Timing Device

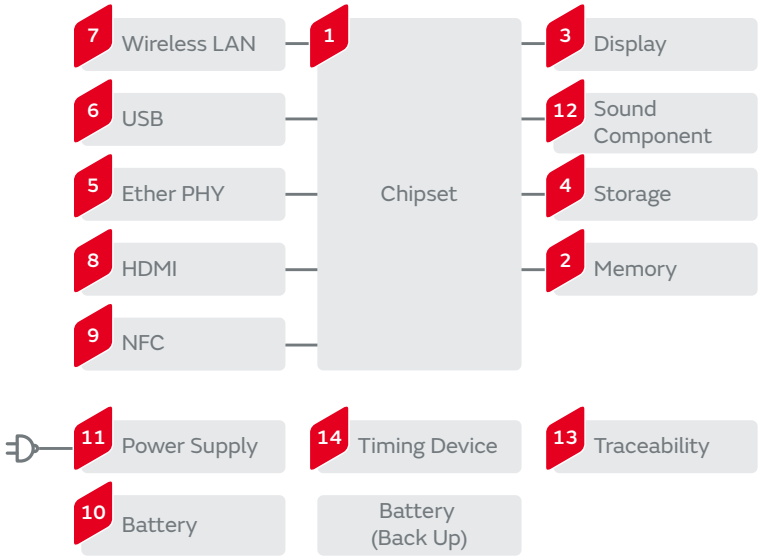
MEMS Resonators
WMRAG Series

Crystal Units
XRC Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GQM / GJM Series	High Frequency Filter Circuit
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression/Decoupling
Polymer Aluminum Electrolytic Capacitors	ECAS Series	Smoothing /Transient Backup
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching /Resonance
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
Feed Through Chip EMI Filters	NFE Series	Noise Suppression
Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLM Series	Noise Suppression
Piezoelectric Sounders	PKLCS/PKMCS Series	Sound Component
Coin Manganese Dioxide Lithium Batteries	Standard Type	Battery Backup

PC



1 Chipset

- Low ESL Chip Multilayer Ceramic Capacitors for General Purpose — LLL/LLA/LLM Series
- Chip Ferrite Beads — BLM Series
- 3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose — NFM Series
- Thermistors — NCP/PRF Series

2 Memory

- Chip Ferrite Beads — BLM Series

3 Display

- Metal Terminal Type Multilayer Ceramic Capacitors for General Purpose — KRM Series
- Polymer Aluminum Electrolytic Capacitors — ECAS Series
- Thermistors — PRF/PRG Series
- Ultrasonic Sensors — MA40 Series

4 Storage

- Thermistors — NCP Series
- Polymer Aluminum Electrolytic Capacitors — ECAS Series
- Actuators
- Thermistors — NCP/PRF Series

5 Ether PHY

- Silicon ESD Protection Devices — LXES**T Series
- Thermistors — NCP/PRF Series
- Chip Common Mode Choke Coils/ Common Mode Noise Filters — DLW/NFG/DLM Series

6 USB

- Polymer Aluminum Electrolytic Capacitors — ECAS Series
- Chip Ferrite Beads — BLM Series
- Thermistors — PRG Series
- Silicon ESD Protection Devices — LXES**T Series

7 Wireless LAN

- Bluetooth® Modules
- Wi-Fi Modules
- Bluetooth® - Wi-Fi Combo Modules
- SAW Filters — SAF Series
- Chip Multilayer LC Filters — LF Series
- Chip Multilayer Hybrid Baluns — LDB/LDM Series
- Chip Multilayer Diplexers — LFD Series
- Chip Multilayer Hybrid Couplers — LDC/LDJ Series
- Microwave Coaxial Connectors with Switch
- Microwave Multi Line Connectors

8 HDMI

Silicon ESD Protection Devices
LXES**T Series

Thermistors
PRG Series

9 NFC

Chip Ferrite Beads
BLM Series

Chip Inductors (Chip Coils)
LQW18C/LQM18J Series

Variable Capacitors
LXRW Series

10 Battery

Thermistors
NXR/PRF/PRG Series

Laminated Type
Lithium Ion Secondary Batteries

11 Power Supply

Non-Isolated DC-DC Converters
MYMGK/MYSGK/
OKL/MYLSM Series

Power Inductors
LQH Series

Chip Multilayer Ceramic Capacitors for Ethernet LAN and Primary-secondary Coupling of DC-DC converters
GR4 Series

Metal Terminal Type Multilayer Ceramic Capacitors for General Purpose
KRM Series

Polymer Aluminum Electrolytic Capacitors
ECAS Series

Low Acoustic Noise Chip Multilayer Ceramic Capacitors on Interposer Board for General Purpose
ZRB Series

Thermistors
NCP/PRF Series

Chip Multilayer Ceramic Capacitors for General Purpose
GR/GA Series

Safety Standard Certified Resin Molding SMD Type Ceramic Capacitors for General Purpose
DK1 Series

Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose
DE1/DE2 Series

12 Sound Component

Silicon ESD Protection Devices
LXES**T Series

Ultrasonic Sensors
MA40 Series

13 Traceability

RFID Tag
LXMS/LXTB Series

14 Timing Device

MEMS Resonators
WMRAG Series

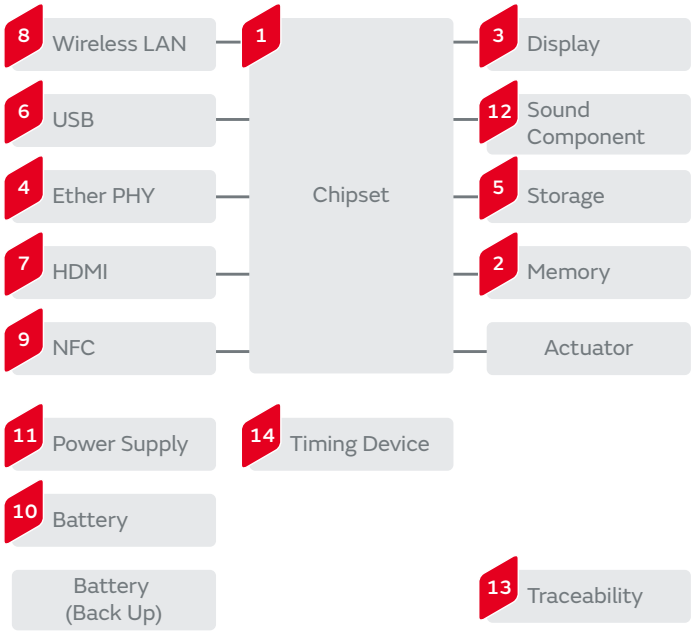
Crystal Units
XRC Series

Ceramic Resonators
CERALOCK
CST Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GQM / GJM Series	High Frequency Filter Circuit
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression/Decoupling
Polymer Aluminum Electrolytic Capacitors	ECAS Series	Smoothing /Transient Backup
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching /Resonance
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
Feed Through Chip EMI Filters	NFE Series	Noise Suppression
Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLM Series	Noise Suppression
Piezoelectric Sounders	PKLCS/PKMCS Series	Sound Component
Coin Manganese Dioxide Lithium Batteries	Standard Type	Battery Backup

Tablet PC



1 Chipset

Low ESL Chip Multilayer Ceramic Capacitors for General Purpose
LLL/LLA/LLM Series

Chip Ferrite Beads
BLM Series

3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose
NFM Series

Thermistors
NCP/PRF Series

2 Memory

Chip Ferrite Beads
BLM Series

3 Display

Metal Terminal Type Multilayer Ceramic Capacitors for General Purpose
KRM Series

Polymer Aluminum Electrolytic Capacitors
ECAS Series

Power Inductors
LQH Series

Thermistors
PRF/PRG Series

4 Ether PHY

Chip Common Mode Choke Coils/ Common Mode Noise Filters
DLW/NFG/DLM Series

Silicon ESD Protection Devices
LXES**T Series

Thermistors
NCP/PRF Series

5 Storage

Polymer Aluminum Electrolytic Capacitors
ECAS Series

Actuators

Thermistors
NCP/PRF Series

6 USB

Polymer Aluminum Electrolytic Capacitors
ECAS Series

Chip Common Mode Choke Coils/ Common Mode Noise Filters
DLW/NFG/DLM Series

Chip Ferrite Beads
BLM Series

Silicon ESD Protection Devices
LXES**T Series

Thermistors
PRG Series

7 HDMI

Silicon ESD Protection Devices
LXES**T Series

Thermistors
PRG Series

8 Wireless LAN

Bluetooth® Modules

Wi-Fi Modules

Bluetooth® - Wi-Fi Combo Modules

SAW Filters
SAF Series

Chip Multilayer LC Filters
LF Series

Chip Multilayer Hybrid Baluns
LDB/LDM Series

Chip Multilayer Diplexers
LFD Series

Chip Multilayer Hybrid Couplers
LDC/LDJ Series

Microwave Coaxial Connectors with Switch

Microwave Multi Line Connectors

9 NFC

Chip Ferrite Beads
BLM Series

Chip Inductors (Chip Coils)
LQW18C/LQM18J Series

Variable Capacitors
LXRW Series

10 Battery

Thermistors
NXR/PRF/PRG Series

Laminated Type Lithium Ion Secondary Batteries

11 Power Supply

Metal Terminal Type Multilayer Ceramic Capacitors for General Purpose
KRM Series

Polymer Aluminum Electrolytic Capacitors
ECAS Series

Low Acoustic Noise Chip Multilayer Ceramic Capacitors on Interposer Board for General Purpose
ZRB Series

Chip Multilayer Ceramic Capacitors for General Purpose
GR/GA Series

Safety Standard Certified Resin Molding SMD Type Ceramic Capacitors for General Purpose
DK1 Series

Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose
DE1/DE2 Series

Thermistors
NCP/PRF Series

12 Sound Component

Silicon ESD Protection Devices
LXES**T Series

13 Traceability

RFID Tag
LXMS/LXTB Series

14 Timing Device

MEMS Resonators
WMRAG Series

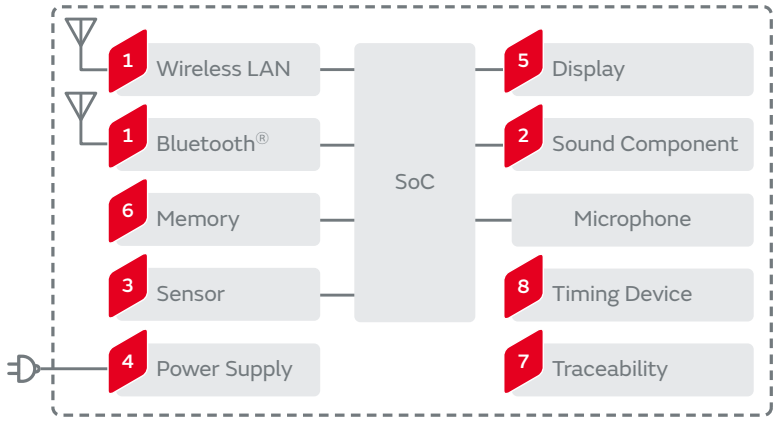
Crystal Units
XRC Series

Ceramic Resonators CERALOCK
CST Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GQM / GJM Series	High Frequency Filter Circuit
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression/Decoupling
Polymer Aluminum Electrolytic Capacitors	ECAS Series	Smoothing /Transient Backup
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching /Resonance
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
Feed Through Chip EMI Filters	NFE Series	Noise Suppression
Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLM Series	Noise Suppression
Piezoelectric Sounders	PKLCS/PKMCS Series	Sound Component
Coin Manganese Dioxide Lithium Batteries	Standard Type	Battery Backup

AI speaker



1 Wireless LAN, Bluetooth®

Chip Common Mode Choke Coils
DLM0N Series

Microwave Coaxial Connectors with Switch

Chip Multilayer LC Filters
LF Series

Chip Multilayer Hybrid Baluns
LDB/LDM Series

Chip Multilayer Diplexers
LFD Series

Chip Multilayer Hybrid Couplers
LDC/LDJ Series

Wi-Fi Smart Modules
LBWA1UZ1GC-TEMP Series

Chip Inductors (Chip Coils)
LQP03HQ/LQW18AN Series

2 Sound Component

Frequency Specified Noise Filters
BLF02 Series

Chip LC Trap Filters
LQZ02HQ Series

3 Sensor

Pyroelectric Infrared Sensors
IRA-S Series

Ultrasonic Sensors
MA40 Series

4 Power Supply

Power Inductors
DFEC/DFES/LQH3NP Series

Thermistors
NCP03/NXR Series

Chip Ferrite Beads
BLM18/21 Series

Chip Common Mode Choke Coils
DLW5AT/5BT Series

5 Display

Metal Terminal Type Multilayer Ceramic Capacitors for General Purpose
KRM Series

Thermistors
NCP03/NXR Series

Polymer Aluminum Electrolytic Capacitors
ECAS Series

Ultrasonic Sensors
MA40 Series

6 Memory

Chip Ferrite Beads
BLM Series

7 Traceability

RFID Tag
LXMS/LXTB Series

8 Timing Device

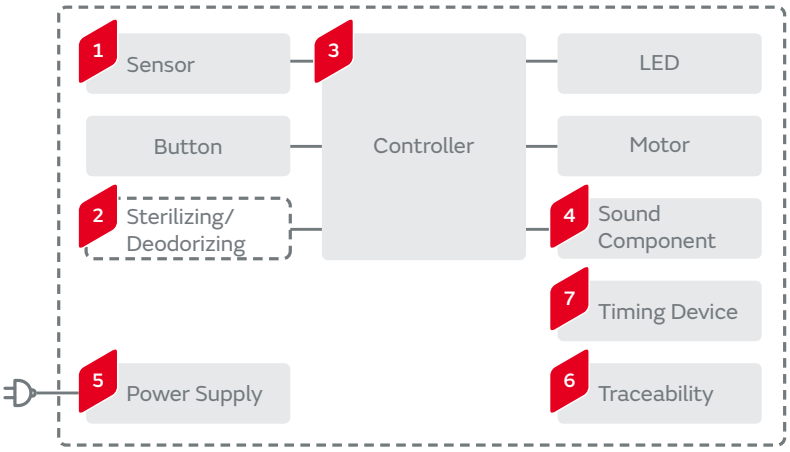
MEMS Resonators
WMRAG Series

Crystal Units
XRC Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GQM / GJM Series	High Frequency Filter Circuit
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression/Decoupling
Polymer Aluminum Electrolytic Capacitors	ECAS Series	Smoothing /Transient Backup
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching /Resonance
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
Feed Through Chip EMI Filters	NFE Series	Noise Suppression
Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLM Series	Noise Suppression
Piezoelectric Sounders	PKLCS/PKMCS Series	Sound Component
Coin Manganese Dioxide Lithium Batteries	Standard Type	Battery Backup

Vacuum cleaner



1 Sensor

Ultrasonic Sensors
MA40 Series

Thermistors
NCP Series

Magnetic Sensors (AMR Sensors)
MR Series

2 Sterilizing/Deodorizing

Ionizer Modules Ionissimo
MHM300 Series

Ozonizer ModulesIonissimo
MHM500 Series

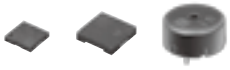
High Voltage Resistors
MHR Series

3 Controller

Thermistors
NCP/NXP/PRF Series

4 Sound Component

Piezoelectric Sounders
PKMCS/PKLCS/PKM Series



5 Power Supply

Chip Multilayer Ceramic Capacitors for General Purpose
GR/GA Series

Safety Standard Certified Resin Molding SMD Type Ceramic Capacitors for General Purpose
DK1 Series

Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose
DE1/DE2 Series

Cylindrical Type Lithium Ion Secondary Batteries

Non-Isolated DC-DC Converters
MYMGK/MYSGK/
OKL/MYLSM Series

6 Traceability

RFID Tag
LXMS/LXTB Series

7 Timing Device

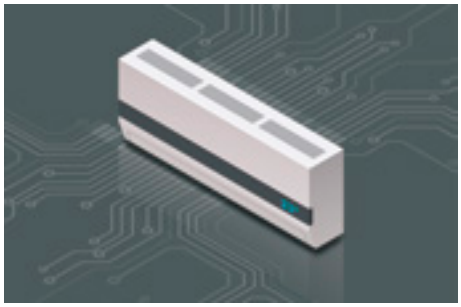
Crystal Units
XRC Series

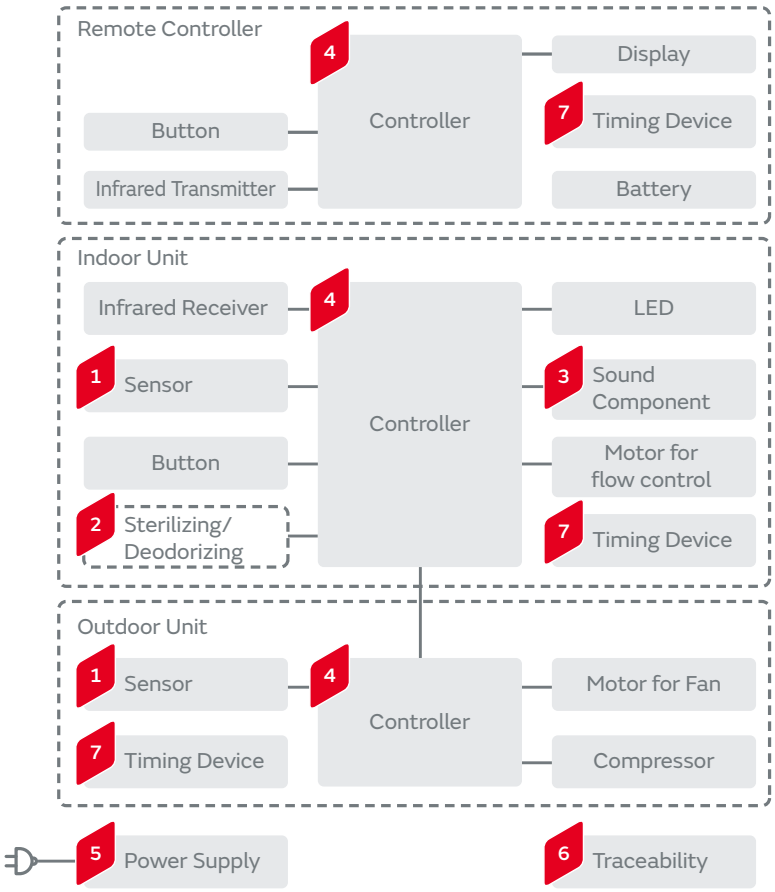
Ceramic Resonators
CERALOCK
CST Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GQM / GJM Series	High Frequency Filter Circuit
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression/Decoupling
Polymer Aluminum Electrolytic Capacitors	ECAS Series	Smoothing /Transient Backup
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching /Resonance
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
Feed Through Chip EMI Filters	NFE Series	Noise Suppression
Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLM Series	Noise Suppression
Piezoelectric Sounders	PKLCS/PKMCS Series	Sound Component
Coin Manganese Dioxide Lithium Batteries	Standard Type	Battery Backup

Air conditioner





1 Sensor

Ultrasonic Sensors
MA40 Series

Thermistors
NCP/NXR/PRF Series

Magnetic Sensors
(AMR Sensors)
MR Series

Pyroelectric
Infrared Sensors
IRA-S Series

2 Sterilizing/Deodorizing

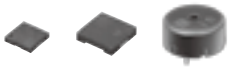
Ionizer Modules Ionissimo
MHM300 Series

Ozonizer Modules Ionissimo
MHM500 Series

High Voltage Resistors
MHR Series

3 Sound Component

Piezoelectric Sounders
PKMCS/PKLCS/PKM Series



4 Controller

Thermistors
NCP/NXR/PRF Series

5 Power Supply

Chip Multilayer Ceramic Capacitors for General Purpose
GR/GA Series

Safety Standard Certified Resin Molding SMD Type Ceramic Capacitors for General Purpose
DK1 Series

Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose
DE1/DE2 Series

Non-Isolated DC-DC Converters
MYMGK/MYSGK/
OKL/MYLSM Series

6 Traceability

RFID Tag
LXMS/LXTB Series

7 Timing Device

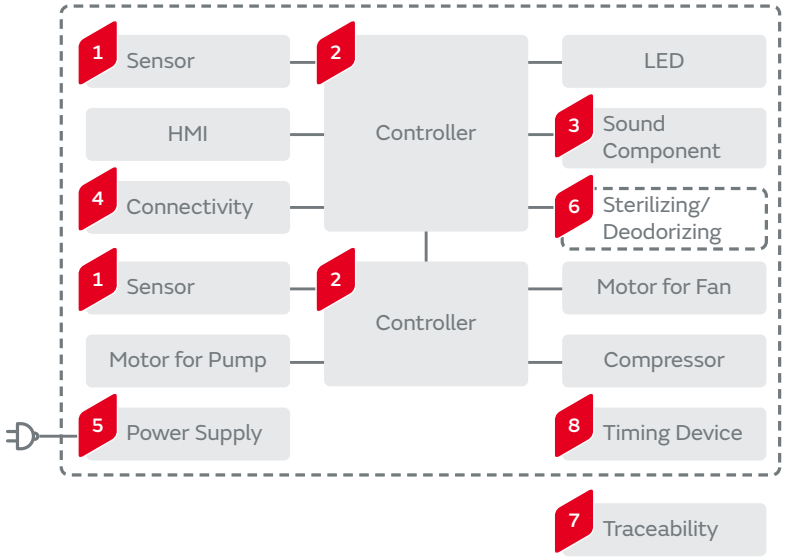
Crystal Units
XRC Series

Ceramic Resonators CERALOCK
CST Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GQM / GJM Series	High Frequency Filter Circuit
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression/Decoupling
Polymer Aluminum Electrolytic Capacitors	ECAS Series	Smoothing /Transient Backup
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching /Resonance
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
Feed Through Chip EMI Filters	NFE Series	Noise Suppression
Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLM Series	Noise Suppression
Piezoelectric Sounders	PKLCS/PKMCS Series	Sound Component
Coin Manganese Dioxide Lithium Batteries	Standard Type	Battery Backup

Washing machine



1 Sensor

Thermistors
NCP/NXR/PRF Series

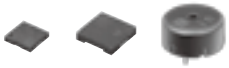
Magnetic Sensors (AMR Sensors)
MR Series

2 Controller

Thermistors
NCP/NXR/PRF Series

3 Sound Component

Piezoelectric Sounders
PKMCS/PKLCS/PKM Series



4 Connectivity

Bluetooth® Modules

Wi-Fi Modules

LPWA Modules

Microwave Coaxial Connectors with Switch

5 Power Supply

Chip Multilayer Ceramic Capacitors for General Purpose
GR/GA Series

Safety Standard Certified Resin Molding SMD Type Ceramic Capacitors for General Purpose
DK1 Series

Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose
DE1/DE2 Series

Non-Isolated DC-DC Converters
MYMGK/MYSGK/
OKL/MYLSM Series

6 Sterilizing/Deodorizing

Ozonizer Modules Ionissimo
MHM500 Series

High Voltage Resistors
MHR Series

7 Traceability

RFID Tag
LXMS/LXTB Series

8 Timing Device

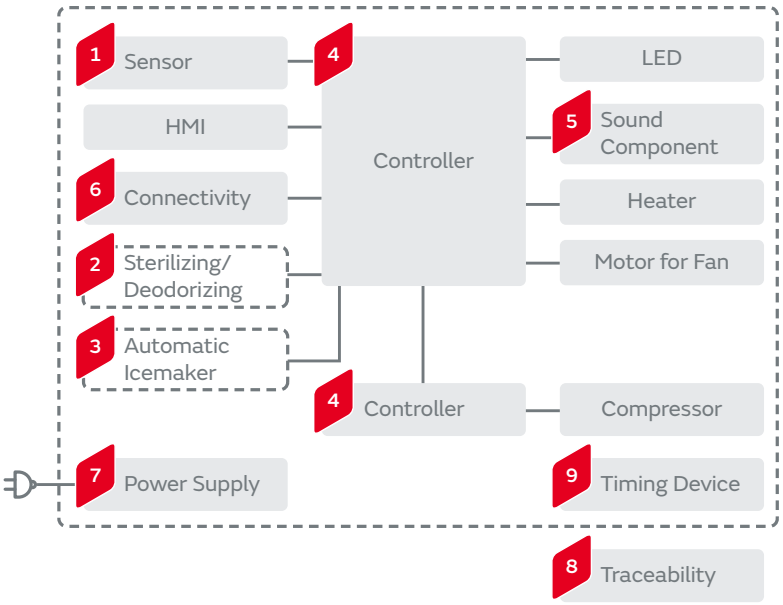
Crystal Units
XRC Series

Ceramic Resonators CERALOCK
CST Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GQM / GJM Series	High Frequency Filter Circuit
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression/Decoupling
Polymer Aluminum Electrolytic Capacitors	ECAS Series	Smoothing /Transient Backup
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching /Resonance
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
Feed Through Chip EMI Filters	NFE Series	Noise Suppression
Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLM Series	Noise Suppression
Piezoelectric Sounders	PKLCS/PKMCS Series	Sound Component
Coin Manganese Dioxide Lithium Batteries	Standard Type	Battery Backup

Refrigerator



1 Sensor

Thermistors
NCP/NXR/PRF Series

Magnetic Sensors (AMR Sensors)
MR Series

Pyroelectric Infrared Sensors
IRA-S Series

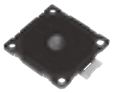
Ultrasonic Sensors
MA40 Series

2 Sterilizing/Deodorizing

Ozonizer Modules Ionissimo
MHM500 Series

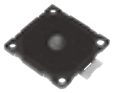
High Voltage Resistors
MHR Series

Microblowers



3 Automatic Icemaker

Microblowers



4 Controller

Thermistors
NCP/NXR/PRF Series

5 Sound Component

Piezoelectric Sounders
PKMCS/PKLCS/PKM Series

6 Connectivity

Bluetooth® Modules

Wi-Fi Modules

LPWA Modules

Microwave Coaxial Connectors with Switch

7 Power Supply

Chip Multilayer Ceramic Capacitors for General Purpose
GR/GA Series

Safety Standard Certified Resin Molding SMD Type Ceramic Capacitors for General Purpose
DK1 Series

Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose
DE1/DE2 Series

Non-Isolated DC-DC Converters
MYMGK/MYSGK/ OKL/MYLSM Series

8 Traceability

RFID Tag
LXMS/LXTB Series

9 Timing Device

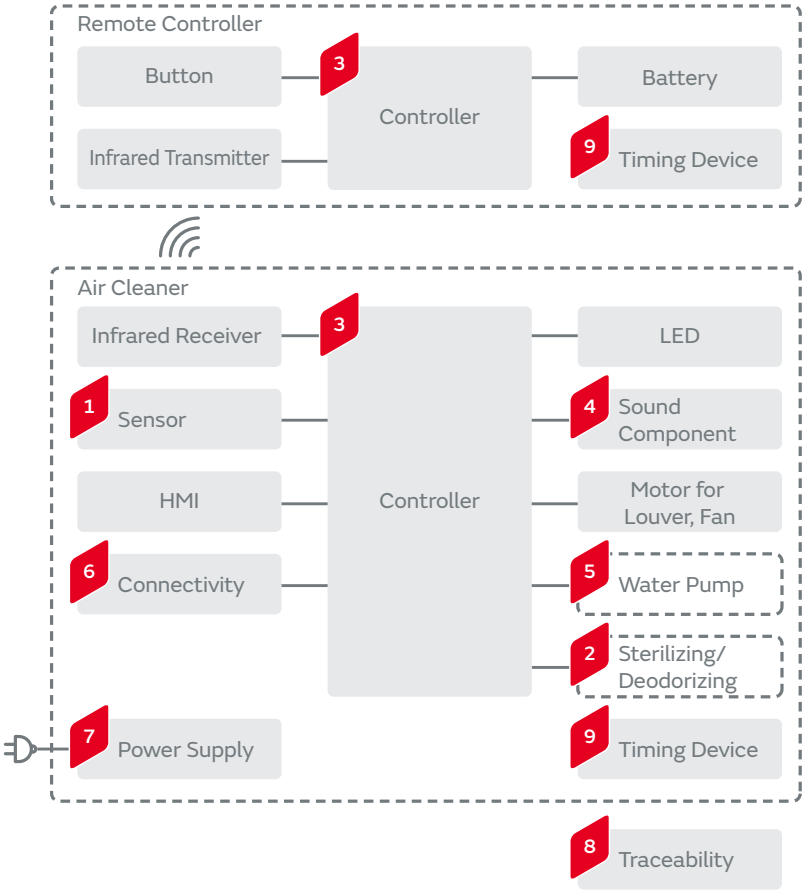
Crystal Units
XRC Series

Ceramic Resonators CERALOCK
CST Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GQM / GJM Series	High Frequency Filter Circuit
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression/Decoupling
Polymer Aluminum Electrolytic Capacitors	ECAS Series	Smoothing /Transient Backup
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching /Resonance
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
Feed Through Chip EMI Filters	NFE Series	Noise Suppression
Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLM Series	Noise Suppression
Piezoelectric Sounders	PKLCS/PKMCS Series	Sound Component
Coin Manganese Dioxide Lithium Batteries	Standard Type	Battery Backup

Air purifier



1 Sensor

Ultrasonic Sensors
MA40 Series

Thermistors
NCP/NXR/PRF Series

Magnetic Sensors
(AMR Sensors)
MR Series

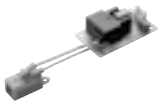
Pyroelectric Infrared Sensors
IRA-S Series

3 Controller

Thermistors
NCP/NXR/PRF Series

2 Sterilizing/Deodorizing

Ionizer Modules Ionissimo
MHM300 Series

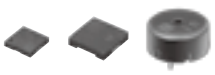


Ozonizer Modules Ionissimo
MHM500 Series

High Voltage Resistors
MHR Series

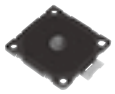
4 Sound Component

Piezoelectric Sounders
PKMCS/PKLCS/PKM Series



5 Water Pump

Microblowers



6 Connectivity

Bluetooth® Modules

Wi-Fi Modules

LPWA Modules

Microwave Coaxial Connectors with Switch

7 Power Supply

Chip Multilayer Ceramic Capacitors for General Purpose
GR/GA Series

Safety Standard Certified Lead Type DiscCeramic Capacitors for General Purpose
DE1/DE2 Series

Safety Standard Certified Resin Molding SMD Type Ceramic Capacitors for General Purpose
DK1 Series

Non-Isolated DC-DC Converters
MYMGK/MYSGK/ OKL/MYLSM Series

8 Traceability

RFID Tag
LXMS/LXTB Series

9 Timing Device

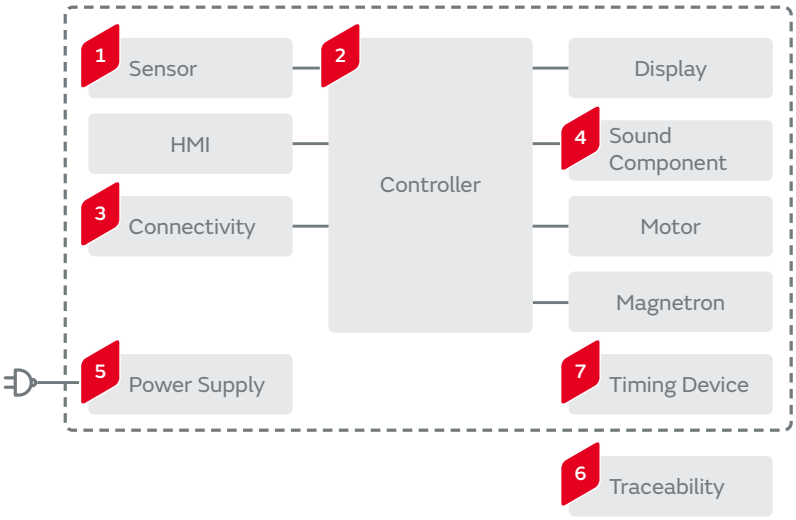
Crystal Units
XRC Series

Ceramic Resonators CERALOCK
CST Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GQM / GJM Series	High Frequency Filter Circuit
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression/Decoupling
Polymer Aluminum Electrolytic Capacitors	ECAS Series	Smoothing /Transient Backup
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching /Resonance
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
Feed Through Chip EMI Filters	NFE Series	Noise Suppression
Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLM Series	Noise Suppression
Piezoelectric Sounders	PKLCS/PKMCS Series	Sound Component
Coin Manganese Dioxide Lithium Batteries	Standard Type	Battery Backup

Microwave oven



1 Sensor

Thermistors
NCP/NXR/PRF Series

Magnetic Sensors (AMR Sensors)
MR Series

2 Controller

Thermistors
NCP/NXR/PRF Series

3 Connectivity

Bluetooth® Modules

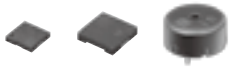
Wi-Fi Modules

LPWA Modules

Microwave Coaxial Connectors with Switch

4 Sound Component

Piezoelectric Sounders
PKMCS/PKLCS/PKM Series

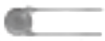


5 Power Supply

Chip Multilayer Ceramic Capacitors for General Purpose
GR/GA Series

Safety Standard Certified Resin Molding SMD Type Ceramic Capacitors for General Purpose
DK1 Series

Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose
DE1/DE2 Series



Non-Isolated DC-DC Converters
MYMGK/MYSGK/
OKL/MYLSM Series

6 Traceability

RFID Tag
LXMS/LXTB Series

7 Timing Device

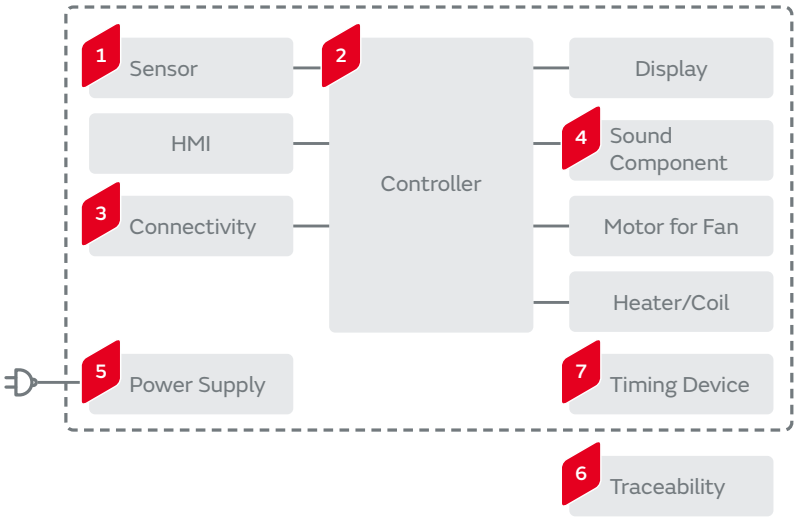
Crystal Units
XRC Series

Ceramic Resonators CERALOCK
CST Series

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GQM / GJM Series	High Frequency Filter Circuit
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression/Decoupling
Polymer Aluminum Electrolytic Capacitors	ECAS Series	Smoothing /Transient Backup
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching /Resonance
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
Feed Through Chip EMI Filters	NFE Series	Noise Suppression
Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLM Series	Noise Suppression
Piezoelectric Sounders	PKLCS/PKMCS Series	Sound Component
Coin Manganese Dioxide Lithium Batteries	Standard Type	Battery Backup

IH rice cooker



1 Sensor

Thermistors
NCP/NXR/PRF Series

Magnetic Sensors (AMR Sensors)
MR Series

2 Controller

Thermistors
NCP/NXR/PRF Series

3 Connectivity

Bluetooth® Modules

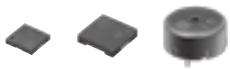
Wi-Fi Modules

LPWA Modules

Microwave Coaxial Connectors with Switch

4 Sound Component

Piezoelectric Sounders
PKMCS/PKLCS/PKM Series



5 Power Supply

Chip Multilayer Ceramic Capacitors for General Purpose
GR/GA Series

Safety Standard Certified Resin Molding SMD Type Ceramic Capacitors for General Purpose
DK1 Series

Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose
DE1/DE2 Series

Non-Isolated DC-DC Converters
MYMGK/MYSGK/
OKL/MYLSM Series

6 Traceability

RFID Tag
LXMS/LXTB Series

7 Timing Device

MEMS Resonators
WMRAG Series

Crystal Units
XRC Series

Ceramic Resonators CERALOCK
CST Series

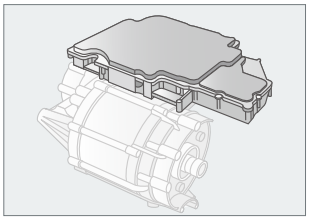
General Purpose

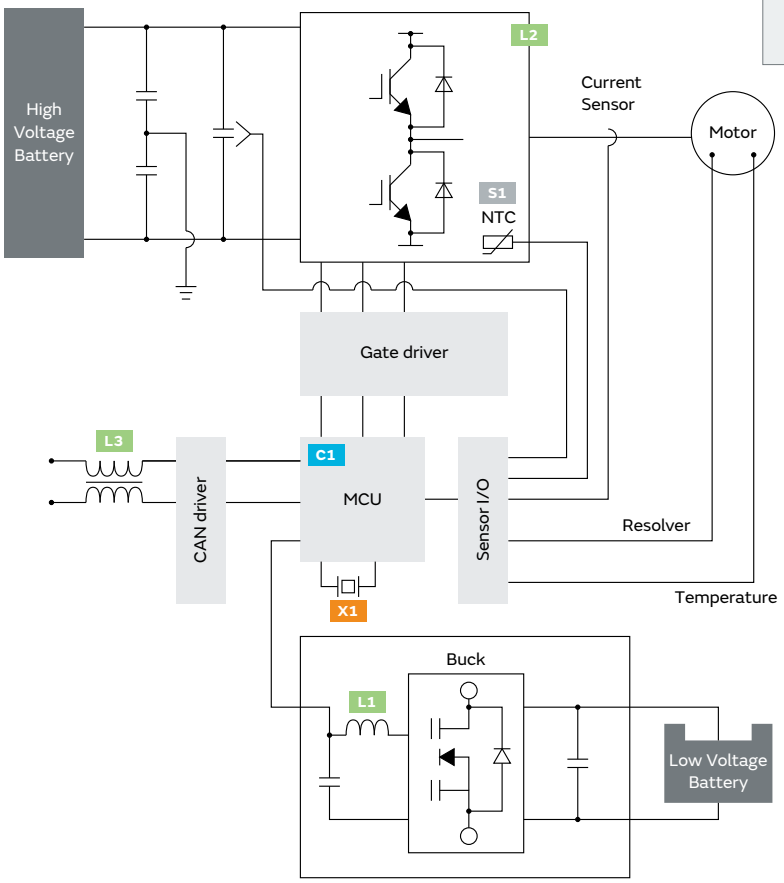
Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GQM / GJM Series	High Frequency Filter Circuit
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression/Decoupling
Polymer Aluminum Electrolytic Capacitors	ECAS Series	Smoothing /Transient Backup
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching /Resonance
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
Feed Through Chip EMI Filters	NFE Series	Noise Suppression
Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLM Series	Noise Suppression
Piezoelectric Sounders	PKLCS/PKMCS Series	Sound Component
Coin Manganese Dioxide Lithium Batteries	Standard Type	Battery Backup

Electrified

1. Inverter
2. BMS (Battery management system)
3. OBC (On board charger)
4. DC-DC converter
5. Engine ECU

1 Inverter





MCU

C1 Chip Multilayer Ceramic Capacitors for Automotive GCM Series

DC-DC

L1 Power Inductors LQH/DFE Series

IGBT

L2 Chip Ferrite Beads BLM Series

S1 Thermistors NCU Series

CAN

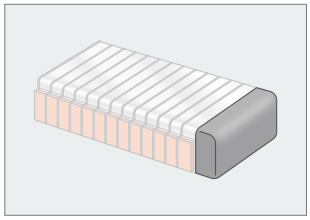
L3 Chip Common Mode Choke Coils DLW32SH Series

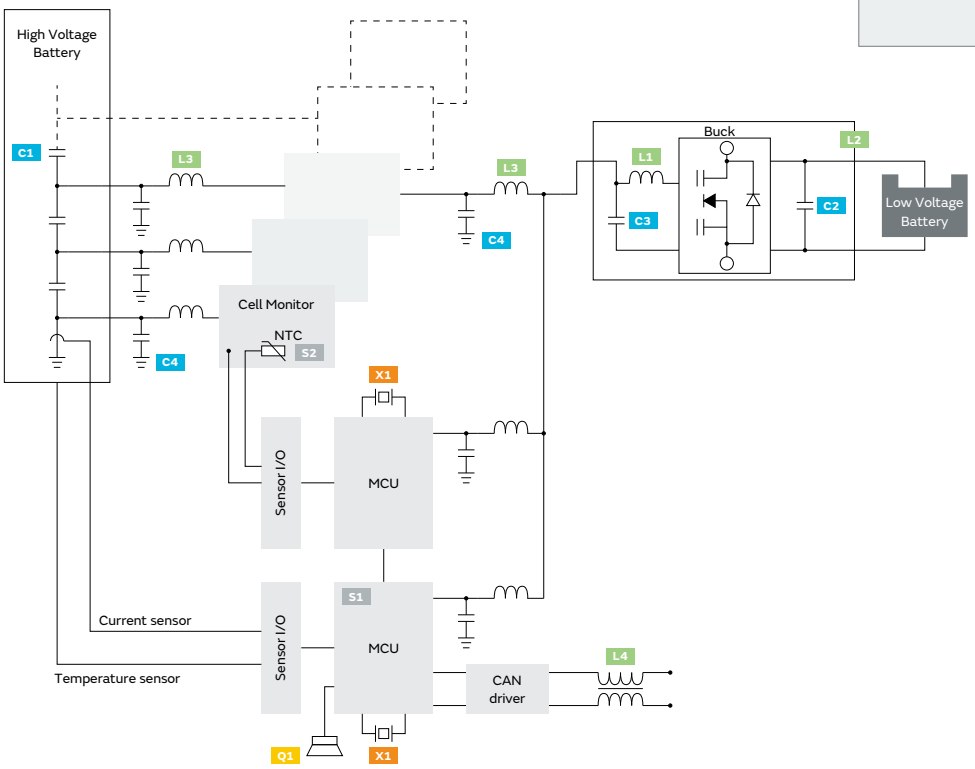
L3 Chip Common Mode Choke Coils DLW43SH Series

Timing Device

X1 Ceramic Resonators CERALOCK CST Series

2 BMS (Battery management system)





MCU

S1	Thermistors NCU Series	
Q1	Piezoelectric Sounders PKLCS/PKMCS Series	

Cell Monitor

C4	Chip Multilayer Ceramic Capacitors for Automotive GCM Series	
C4	Soft Termination Chip Multilayer Ceramic Capacitors for Automotive GCJ Series	
C4	Metal Terminal Type Multilayer Ceramic Capacitors for Automotive KCM Series	
L3	Chip Ferrite Beads BLM Series	
S2	Thermistors NCU Series	

Battery

C1	Chip Multilayer Ceramic Capacitors for Automotive GCM Series	
C1	Soft Termination Chip Multilayer Ceramic Capacitors for Automotive GCJ Series	
C1	Metal Terminal Type Multilayer Ceramic Capacitors for Automotive KCM Series	

DC-DC

C2	Soft Termination Chip Multilayer Ceramic Capacitors for Automotive GCJ Series	
C2	Metal Terminal Type Multilayer Ceramic Capacitors for Automotive KCM Series	
C3	Chip Multilayer Ceramic Capacitors for Automotive GCM Series	
C2	MLSC Design Chip Multilayer Ceramic Capacitors for Automotive GCD Series	

DC-DC

C3	Soft Termination MLSC Design Chip Multilayer Ceramic Capacitors for Automotive GCE Series	
L1	Power Inductors LQH/DFE Series	
L2	Large-current Common Mode Choke Coils PLT10HH/PLT5BP Series	
L2	Chip Common Mode Choke Coils DLW Series	

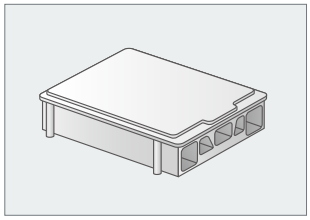
CAN

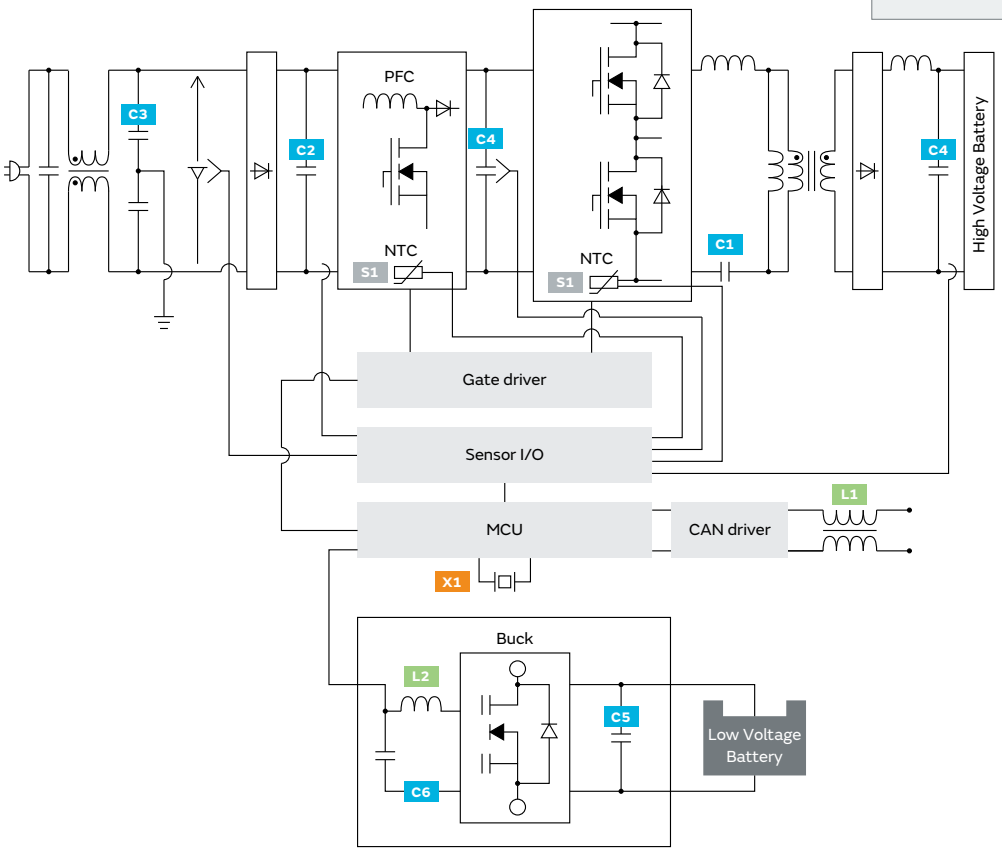
L4	Chip Common Mode Choke Coils DLW32SH Series	
L4	Chip Common Mode Choke Coils DLW43SH Series	

Timing Device

X1	Ceramic Resonators CERALOCK CST Series	

3 OBC (On board charger)





Filter

C1	Chip Multilayer Ceramic Capacitors for Automotive GCM Series	
C1	Metal Terminal Type Multilayer Ceramic Capacitors for Automotive KCM Series	
C2	High Effective Capacitance & High Allowable Ripple Current Metal Terminal Type Multilayer Ceramic Capacitors for Automotive KC3 Series	

AC-DC

C3	Metal Terminal Type Multilayer Ceramic Capacitors for Automotive KCM Series	
C3	Safety Standard Certified Metal Terminal Type Multilayer Ceramic Capacitors for Automotive KCA Series	
C3	Safety Standard Certified Lead Type Disc Ceramic Capacitors for Automotive DE6 Series	

Smoothing

C4	High Temperature Film Capacitors for Automotive FH Series	
C4	High Effective Capacitance & High Allowable Ripple Current Metal Terminal Type Multilayer Ceramic Capacitors for Automotive KC3 Series	

DC-DC

C5	Soft Termination Chip Multilayer Ceramic Capacitors for Automotive GCJ Series	
C5	Metal Terminal Type Multilayer Ceramic Capacitors for Automotive KCM Series	
L2	Power Inductors LQH/DFE Series	
C6	Chip Multilayer Ceramic Capacitors for Automotive GCM Series	

CAN

L1	Chip Common Mode Choke Coils DLW32SH Series	
L1	Chip Common Mode Choke Coils DLW43SH Series	

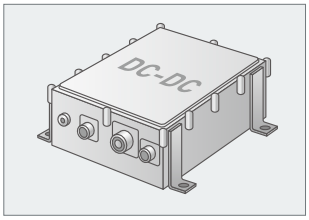
PFC

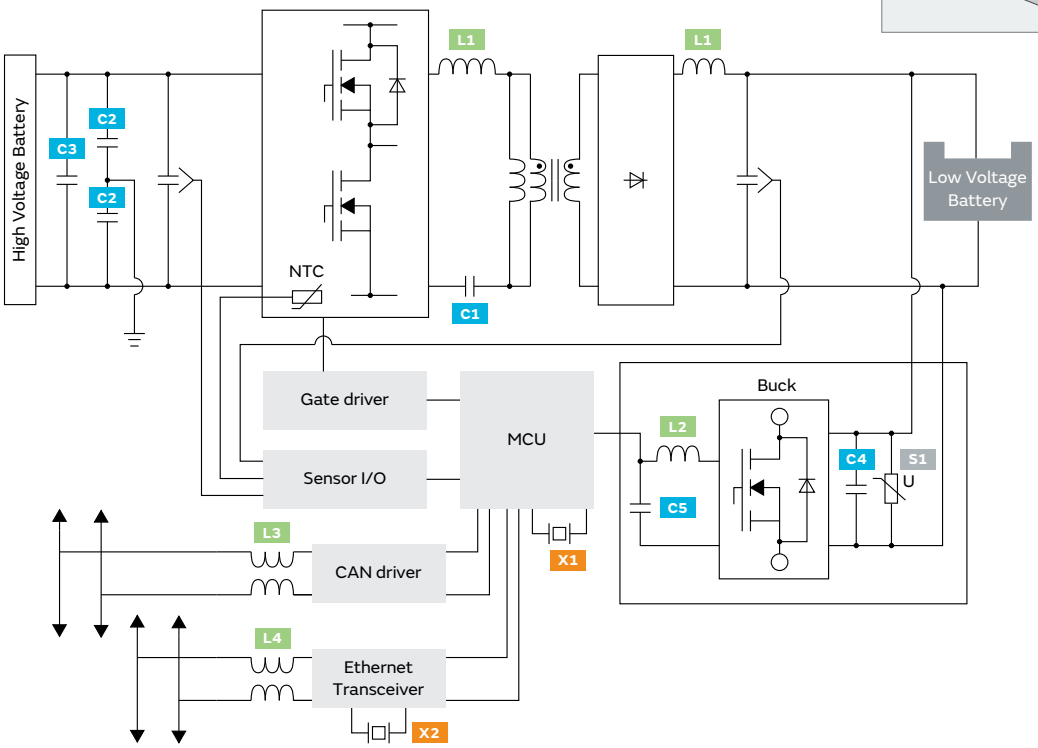
S1	Thermistors NCU Series	

Timing Device

X1	Ceramic Resonators CERALOCK CST Series	

4 DC-DC converter





Power line	
C1	High Effective Capacitance & High Allowable Ripple Current Metal Terminal Type Multilayer Ceramic Capacitors for Automotive KC3 Series
C3	High Temperature Film Capacitors for Automotive FH Series
C3	Safety Standard Certified Metal Terminal Type Multilayer Ceramic Capacitors for Automotive KCA Series
C2	Safety Standard Certified Lead Type Disc Ceramic Capacitors for Automotive DE6 Series
L1	Chip Ferrite Beads BLM Series
L1	Power Inductors LQH/DFE Series

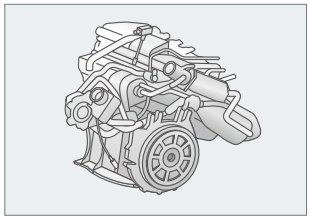
MCU/Sub MCU	
X1	Ceramic Resonators CERALOCK CST Series
X1	Crystal Units XRC Series

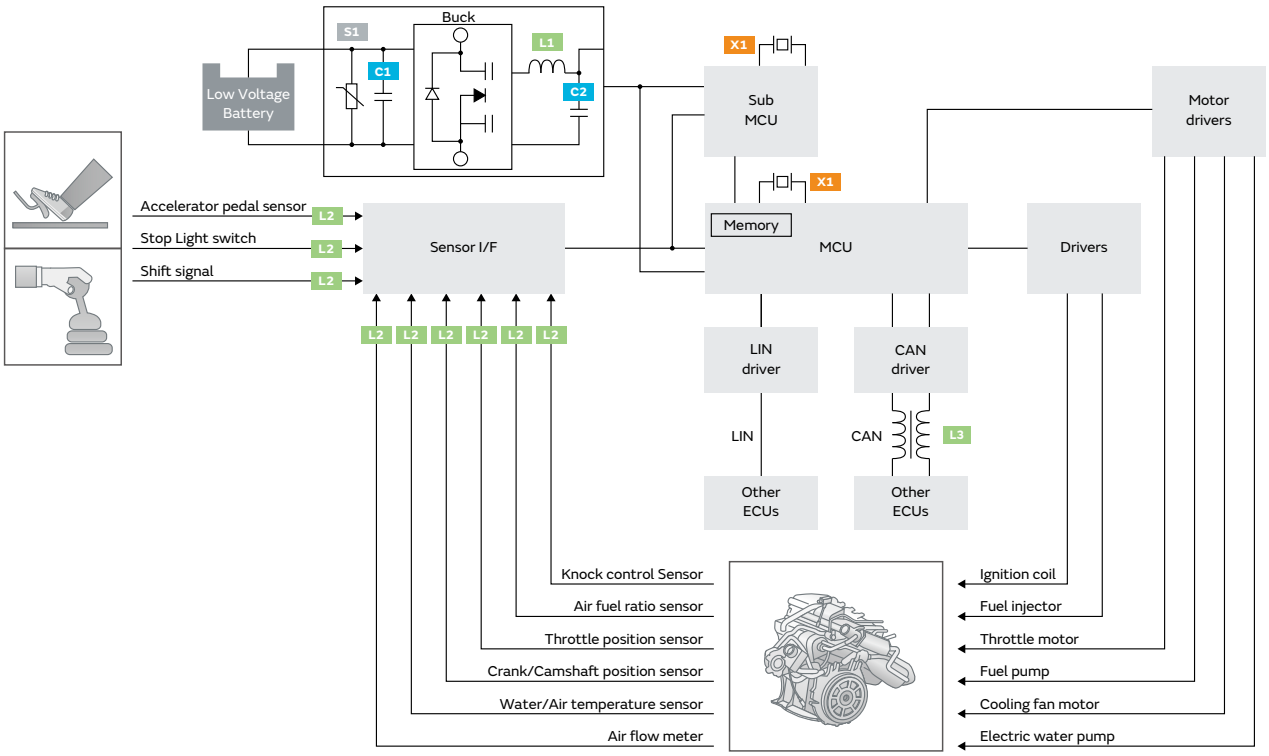
CAN	
L3	Chip Common Mode Choke Coils DLW32SH Series
L3	Chip Common Mode Choke Coils DLW43SH Series

Ethernet	
L4	Chip Common Mode Choke Coils DLW32MH Series
L4	Chip Common Mode Choke Coils DLW43MH Series
X2	Crystal Units XRC Series

DC-DC	
C4	Soft Termination MLSC Design Chip Multilayer Ceramic Capacitors for Automotive GCE Series
C4	MLSC Design Chip Multilayer Ceramic Capacitors for Automotive GCD Series
C4	Soft Termination Chip Multilayer Ceramic Capacitors for Automotive GCJ Series
C4	Metal Terminal Type Multilayer Ceramic Capacitors for Automotive KCM Series
C5	Chip Multilayer Ceramic Capacitors for Automotive GCM Series
S1	Thermistors NCU Series
L2	Power Inductors LQH/DFE Series

5 Engine ECU





DC-DC		
C1	MLSC Design Chip Multilayer Ceramic Capacitors for Automotive GCD Series	
C1	Soft Termination MLSC Design Chip Multilayer Ceramic Capacitors for Automotive GCE Series	
C1	Soft Termination Chip Multilayer Ceramic Capacitors for Automotive GCJ Series	
C1	Metal Terminal Type Multilayer Ceramic Capacitors for Automotive KCM Series	
L1	Chip Ferrite Beads BLM Series	
L1	Power Inductors LQH/DFE Series	

DC-DC		
C2	Chip Multilayer Ceramic Capacitors for Automotive GCM Series	
S1	Thermistors NCU Series	

Signal Line		
L2	Chip Ferrite Beads BLM Series	

MCU/Sub MCU		
X1	Ceramic Resonators CERALOCK CST Series	
X1	Crystal Units XRC Series	

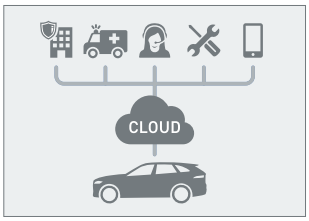
CAN		
L3	Chip Common Mode Choke Coils DLW32SH Series	
L3	Chip Common Mode Choke Coils DLW43SH Series	

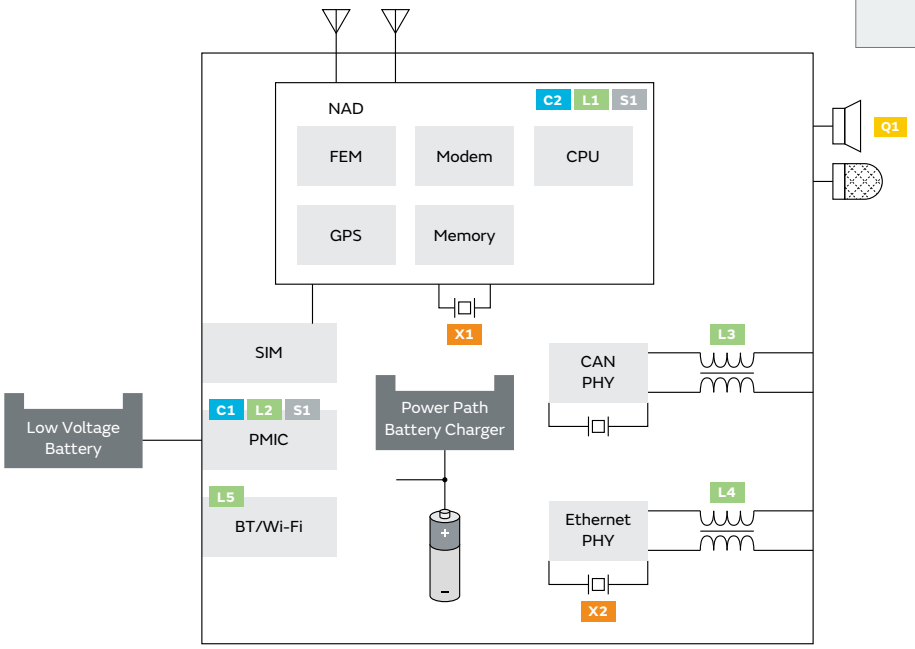
Connected

1 TCU (Telematics control unit)

2 IVI (In vehicle infotainment)

1 TCU (Telematics control unit)





PMIC

- C1 Soft Termination Chip Multilayer Ceramic Capacitors for Automotive GCJ Series
- C1 Metal Terminal Type Multilayer Ceramic Capacitors for Automotive KCM Series
- C1 Chip Multilayer Ceramic Capacitors for Automotive GCM Series
- C1 AEC-Q200 Compliant 3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for Infotainment NFM Series
- L2 Chip Inductors (Chip Coils) LQM/LQH/DFE Series
- L2 Chip Ferrite Beads BLM Series
- S1 Thermistors NCU Series

BT/Wi-Fi

- L5 Chip Inductors (Chip Coils) LQW/LQP/LQG Series

NAD

- C2 AEC-Q200 Compliant 3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for Infotainment NFM Series
- C2 Chip Multilayer Ceramic Capacitors for Automotive GCM Series
- L1 Chip Inductors (Chip Coils) LQW/LQP/LQG Series
- S1 Thermistors NCU Series
- Q1 Piezoelectric Sounders PKLCS/PKMCS Series

CAN

- L3 Chip Common Mode Choke Coils DLW32SH Series
- L3 Chip Common Mode Choke Coils DLW43SH Series

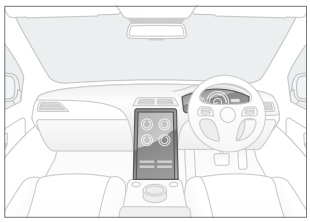
Ethernet

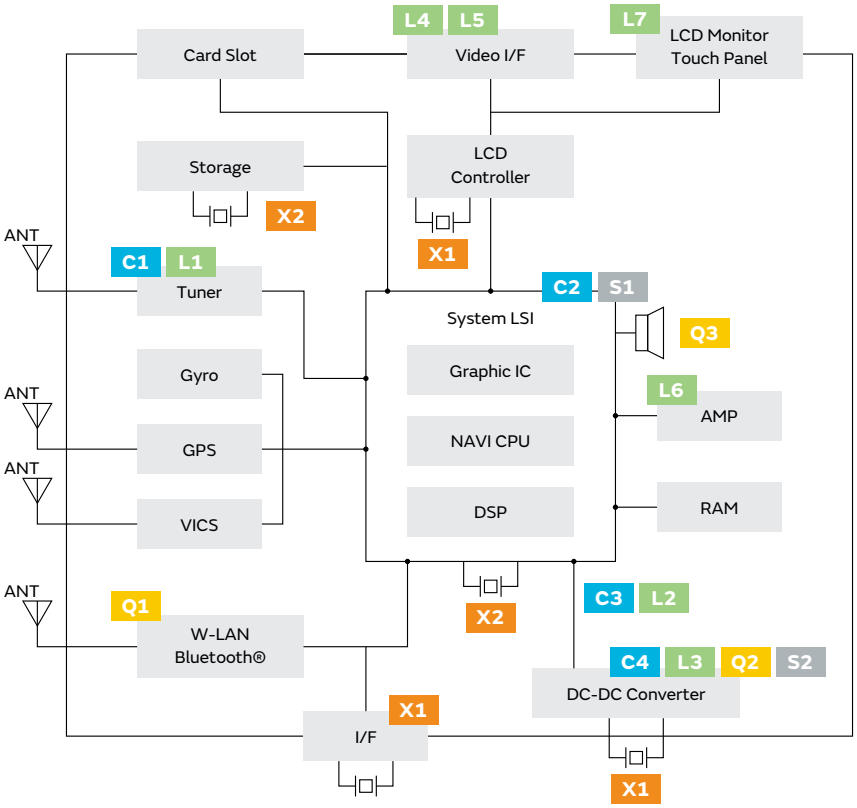
- L4 Chip Common Mode Choke Coils DLW32MH Series
- L4 Chip Common Mode Choke Coils DLW43MH Series

Timing Device

- X1 Ceramic Resonators CERALOCK CST Series
- X2 Crystal Units XRC Series

2 IVI (In vehicle infotainment)





Tuner		
C1	High Q Chip Multilayer Ceramic Capacitors for Automotive GCQ Series	
L1	Chip Inductors (Chip Coils) LQW/LQP/LQG Series	
L1	Variable inductors 5CCEG Series	

Video I/F		
L4	Chip Common Mode Choke Coils DLW21SZ Series	
L4	Chip Inductors (Chip Coils) LQW18C/LQM18J Series	
L4	Chip Inductors (Chip Coils) LQW32FT Series	
L4	Chip Inductors (Chip Coils) LQH Series	
L5	Chip Common Mode Choke Coils DLW32MH Series	
L5	Chip Common Mode Choke Coils DLW43MH Series	

System LSI		
C2	AEC-Q200 Compliant 3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for Infotainment NFM Series	
C2	AEC-Q200 Compliant Chip Multilayer Ceramic Capacitors for Infotainment GRT Series	
S1	Thermistors NCU Series	
Q1	Piezoelectric Sounders PKLCS/PKMCS Series	

AMP

L6	Power Inductors LQH/DEM/DFE Series	
L6	Large-current Common Mode Choke Coils PLT10/PLT5B/DLW5A/ DLW5B/UCMH Series	

DC-DC Converter

C4	AEC-Q200 Compliant Chip Multilayer Ceramic Capacitors for Infotainment GRT Series	
C4	AEC-Q200 Compliant 3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for Infotainment NFM Series	
C4	Polymer Aluminum Electrolytic Capacitors ECAS Series	
L3	Large-current Common Mode Choke Coils PLT10/PLT5B/DLW5A/ DLW5B/UCMH Series	
L3	Chip Ferrite Beads BLM Series	
S2	Thermistors NCU Series	
Q2	Non-Isolated DC-DC Converters MYMGK/MYSGK/OKL/ MYLSM Series	

Secondary

C3	AEC-Q200 Compliant 3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for Infotainment NFM Series	
C3	AEC-Q200 Compliant Chip Multilayer Ceramic Capacitors for Infotainment GRT Series	
C3	Polymer Aluminum Electrolytic Capacitors ECAS Series	
L2	Chip Inductors (Chip Coils) LQM/LQH/DFE Series	
L2	Chip Ferrite Beads BLM Series	

Timing Device

X1	Ceramic Resonators CERALOCK CST Series	
X2	Crystal Units XRC Series	

Connectivity

Q3	Bluetooth® - Wi-Fi Combo Modules	

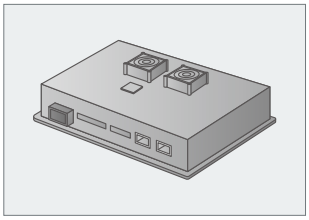
LCD Monitor Touch Panel

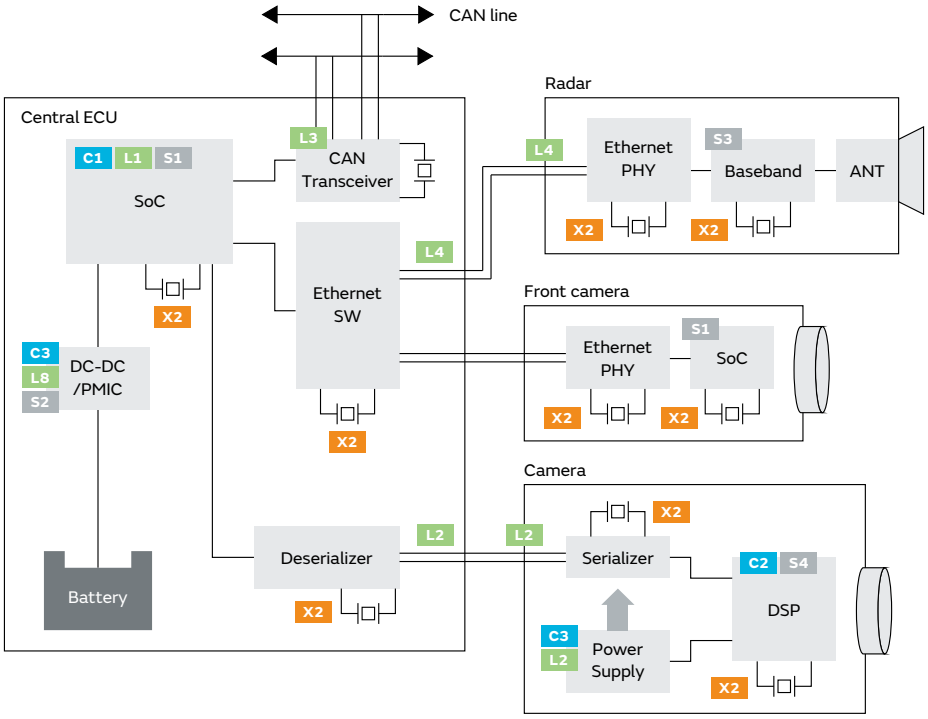
L7	LC combined filters NFL Series	

AD & ADAS

1. ADAS (Advanced driver assist system)
2. IPA (Intelligent parking assist)
3. Lidar
4. Radar
5. Front camera

1 ADAS (Advanced driver assist system)





SoC	
C1	3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for Automotive NFM Series
C1	Chip Multilayer Ceramic Capacitors for Automotive GCM Series
L1	Chip Ferrite Beads BLM Series
S1	Thermistors NCU Series

DC-DC/PMIC	
C3	Soft Termination Chip Multilayer Ceramic Capacitors for Automotive GCJ Series
C3	Metal Terminal Type Multilayer Ceramic Capacitors for Automotive KCM Series
C3	Chip Multilayer Ceramic Capacitors for Automotive GCM Series
C3	3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for Automotive NFM Series

DC-DC/PMIC	
L8	Power Inductors LQH/DFE Series
S2	Thermistors NCU Series

Power Supply

C3	Soft Termination Chip Multilayer Ceramic Capacitors for Automotive GCJ Series	
C3	Metal Terminal Type Multilayer Ceramic Capacitors for Automotive KCM Series	
C3	Chip Multilayer Ceramic Capacitors for Automotive GCM Series	
C3	3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for Automotive NFM Series	
L2	Chip Ferrite Beads BLM Series	
L2	Chip Inductors (Chip Coils) LQW18C/LQM18J Series	
L2	Chip Inductors (Chip Coils) LQW32FT Series	
L2	Chip Inductors (Chip Coils) LQH Series	

Baseband

S3	Thermistors NCU Series	

Timing Device

X1	Ceramic Resonators CERALOCK CST Series	
X2	Crystal Units XRC Series	

DSP

C2	AEC-Q200 Compliant Chip Multilayer Ceramic Capacitors for Infotainment GRT Series	
C2	3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for Automotive NFM Series	
S4	Thermistors NCU Series	

SerDes

L2	Chip Ferrite Beads BLM Series	
L2	Chip Inductors (Chip Coils) LQW18C/LQM18J Series	
L2	Chip Inductors (Chip Coils) LQW32FT Series	
L2	Chip Inductors (Chip Coils) LQH Series	

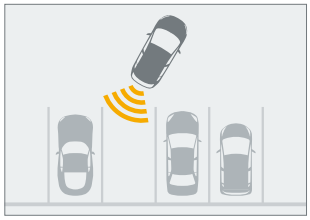
CAN Transceiver

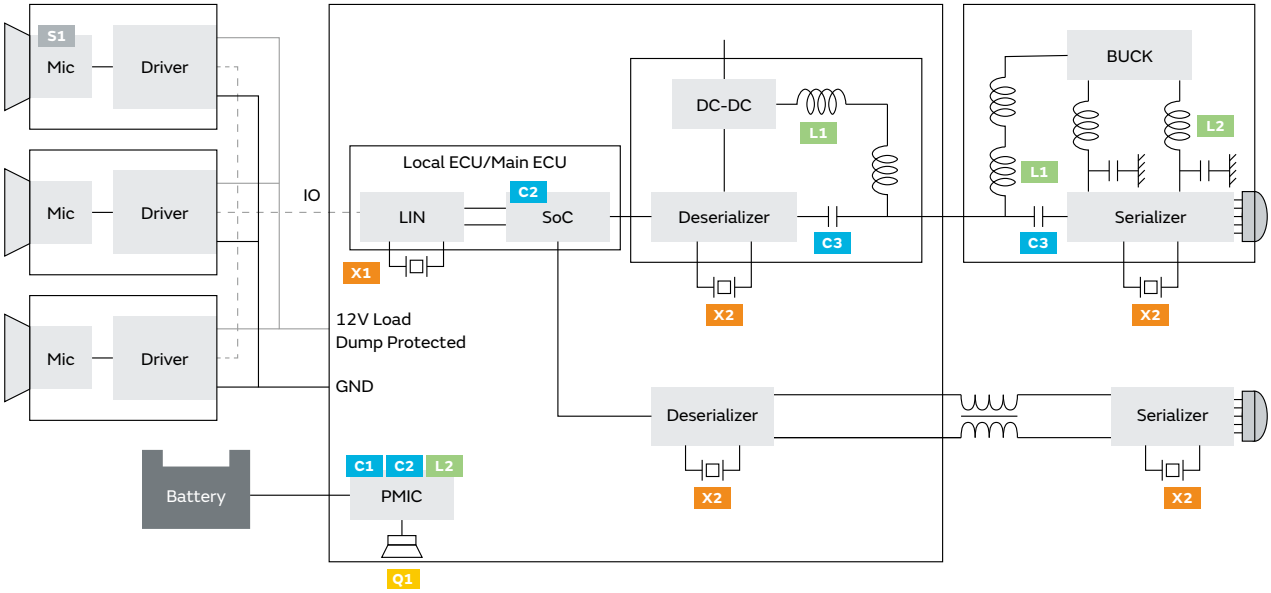
L3	Chip Common Mode Choke Coils DLW32SH Series	
L3	Chip Common Mode Choke Coils DLW43SH Series	

Ethernet

L4	Chip Common Mode Choke Coils DLW32MH Series	
L4	Chip Common Mode Choke Coils DLW43MH Series	

2 IPA (Intelligent parking assist)





Mic

S1	Ultrasonic Sensors MA58 Series	

PMIC

C1	Soft Termination Chip Multilayer Ceramic Capacitors for Automotive GCJ Series	
C1	Metal Terminal Type Multilayer Ceramic Capacitors for Automotive KCM Series	
C1	Chip Multilayer Ceramic Capacitors for Automotive GCM Series	
C2	3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for Automotive NFM Series	
L2	Chip Inductors (Chip Coils) LQM/LQH/DFE Series	
Q1	Piezoelectric Sounders PKLCS/PKMCS Series	

SoC

C2	3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for Automotive NFM Series	
C2	Chip Multilayer Ceramic Capacitors for Automotive GCM Series	

PoC

C3	Chip Multilayer Ceramic Capacitors for Automotive GCM Series	
L1	Chip Ferrite Beads BLM Series	
L1	Chip Inductors (Chip Coils) LQW18C/LQM18J Series	
L1	Chip Inductors (Chip Coils) LQW32FT Series	
L1	Chip Inductors (Chip Coils) LQH Series	

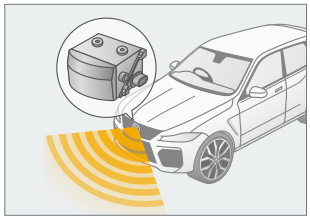
DC-DC

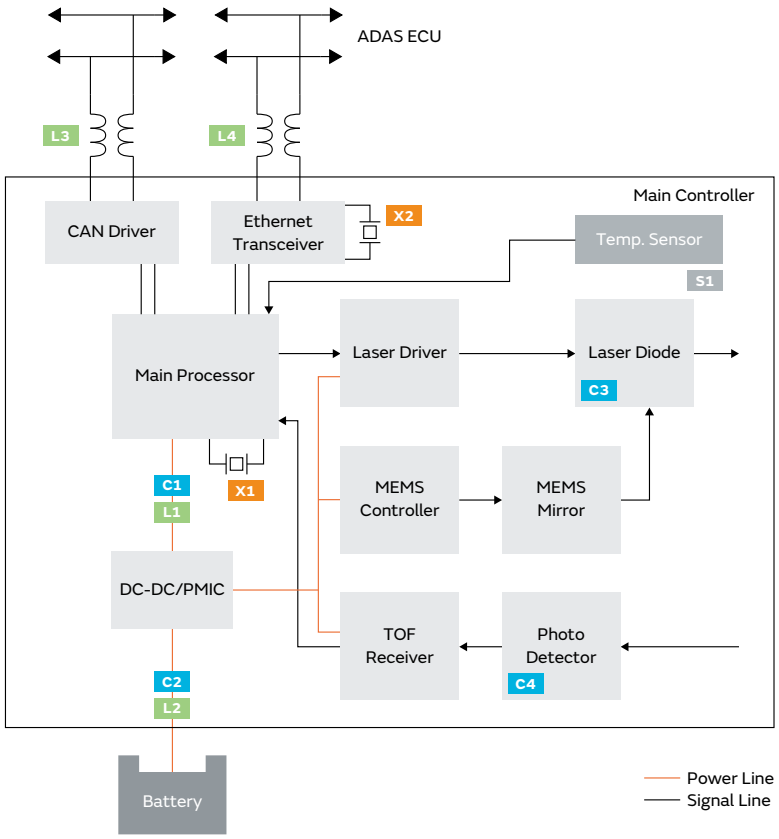
L2	Chip Inductors (Chip Coils) LQM/LQH/DFE Series	

Timing Device

X1	Ceramic Resonators CERALOCK CST Series	
X2	Crystal Units XRC Series	

3 Lidar





Battery Line

- L2 Chip Common Mode Choke Coils DLW Series
- L2 Chip Ferrite Beads BLM Series

Temperature Control

- S1 Thermistors NCU Series

Gate Driver

- C3 3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for Automotive NFM Series
- C3 Silicon Capacitors

APD Bias Cap.

- C4 Chip Multilayer Ceramic Capacitors for Automotive GCM Series
- C4 Soft Termination Chip Multilayer Ceramic Capacitors for Automotive GCJ Series

CAN

- L3 Chip Common Mode Choke Coils DLW32SH Series
- L3 Chip Common Mode Choke Coils DLW43SH Series

Ethernet

- L4 Chip Common Mode Choke Coils DLW32MH Series
- L4 Chip Common Mode Choke Coils DLW43MH Series
- X2 Crystal Units XRC Series

Main Processor

- X1 Ceramic Resonators CERALOCK CST Series
- X1 Crystal Units XRC Series

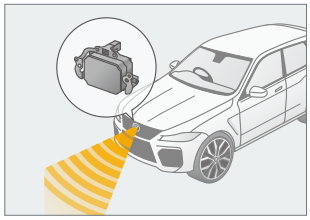
DC-DC/PMIC

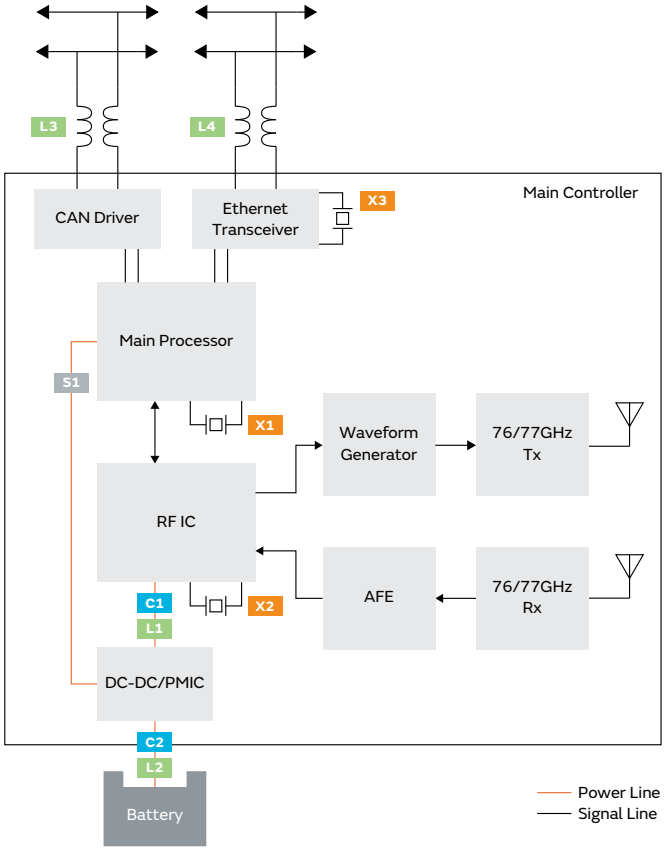
- C1 3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for Automotive NFM Series
- C1 Chip Multilayer Ceramic Capacitors for Automotive GCM Series
- L1 Chip Inductors (Chip Coils) LQM/LQH/DFE Series

Battery Line

- C2 MLSC Design Chip Multilayer Ceramic Capacitors for Automotive GCD Series
- C2 Soft Termination MLSC Design Chip Multilayer Ceramic Capacitors for Automotive GCE Series
- C2 Soft Termination Chip Multilayer Ceramic Capacitors for Automotive GCJ Series
- C2 Metal Terminal Type Multilayer Ceramic Capacitors for Automotive KCM Series
- C2 Chip Multilayer Ceramic Capacitors for Automotive GCM Series
- L2 Large-current Common Mode Choke Coils PLT10HH/PLT5BP Series

4 Radar





Battery Line

L2	Chip Common Mode Choke Coils DLW Series	
L2	Chip Ferrite Beads BLM Series	

Temperature Control

S1	Thermistors NCU Series	

RFIC

X2	Crystal Units XRC Series	

CAN

L3	Chip Common Mode Choke Coils DLW32SH Series	
L3	Chip Common Mode Choke Coils DLW43SH Series	

Ethernet

L3	Chip Common Mode Choke Coils DLW32MH Series	
L3	Chip Common Mode Choke Coils DLW43MH Series	
X3	Crystal Units XRC Series	

Main Processor

X1	Ceramic Resonators CERALOCK CST Series	
X1	Crystal Units XRC Series	

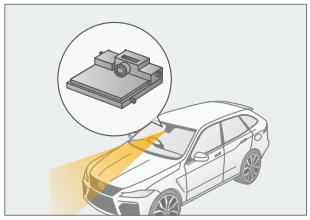
DC-DC/PMIC

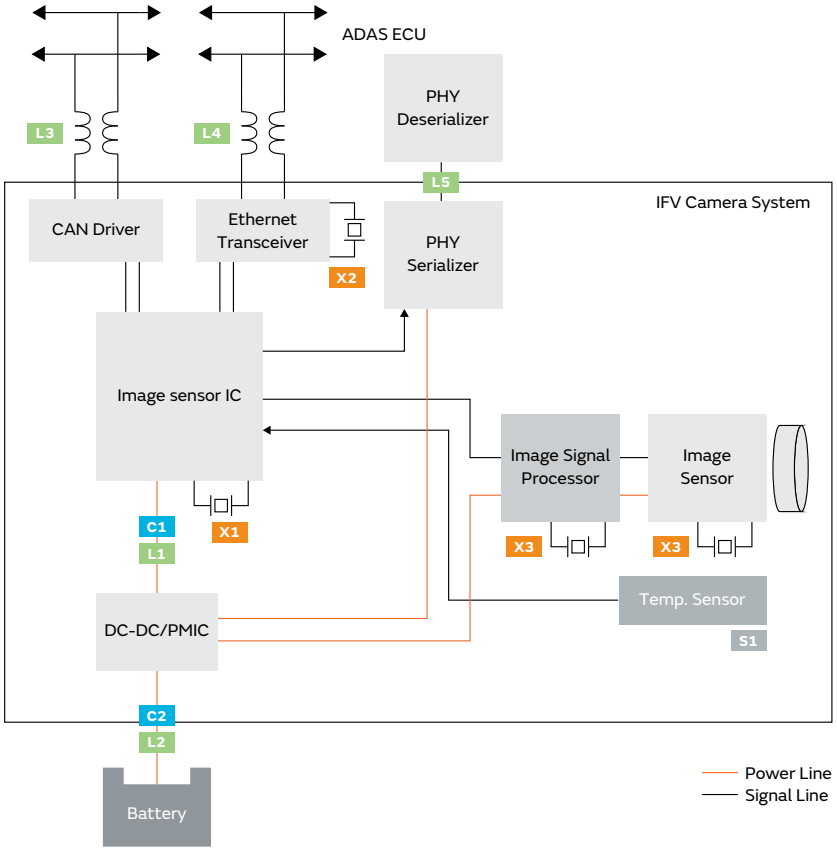
C1	3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for Automotive NFM Series	
C1	Chip Multilayer Ceramic Capacitors for Automotive GCM Series	
L1	Chip Inductors (Chip Coils) LQM/LQH/DFE Series	

Battery Line

C2	MLSC Design Chip Multilayer Ceramic Capacitors for Automotive GCD Series	
C2	Soft Termination MLSC Design Chip Multilayer Ceramic Capacitors for Automotive GCE Series	
C2	Soft Termination Chip Multilayer Ceramic Capacitors for Automotive GCJ Series	
C2	Metal Terminal Type Multilayer Ceramic Capacitors for Automotive KCM Series	
C2	Chip Multilayer Ceramic Capacitors for Automotive GCM Series	
L2	Large-current Common Mode Choke Coils PLT10HH/PLT5BP Series	

5 Front camera





Battery Line

L2	Large-current Common Mode Choke Coils PLT10HH/PLT5BP Series	
L2	Chip Common Mode Choke Coils DLW Series	
L2	Chip Ferrite Beads BLM Series	

Power over Coax

L5	Chip Inductors (Chip Coils) LQW Series	

Temperature Control

S1	Thermistors NCU Series	

Image Sensor/ISP

X3	Crystal Units XRC Series	

CAN

L3	Chip Common Mode Choke Coils DLW32SH Series	
L3	Chip Common Mode Choke Coils DLW43SH Series	

Ethernet

L4	Chip Common Mode Choke Coils DLW32MH Series	
L4	Chip Common Mode Choke Coils DLW43MH Series	
X2	Crystal Units XRC Series	

Image sensor IC

X1	Crystal Units XRC Series	

DC-DC/PMIC

C1	3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for Automotive NFM Series	
C1	Chip Multilayer Ceramic Capacitors for Automotive GCM Series	
L1	Chip Inductors (Chip Coils) LQM/LQH/DFE Series	

Battery Line

C2	MLSC Design Chip Multilayer Ceramic Capacitors for Automotive GCD Series	
C2	Soft Termination MLSC Design Chip Multilayer Ceramic Capacitors for Automotive GCE Series	
C2	Soft Termination Chip Multilayer Ceramic Capacitors for Automotive GCJ Series	
C2	Metal Terminal Type Multilayer Ceramic Capacitors for Automotive KCM Series	
C2	Chip Multilayer Ceramic Capacitors for Automotive GCM Series	

Other

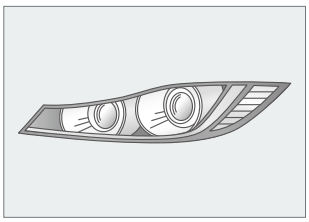
1 Automotive lighting

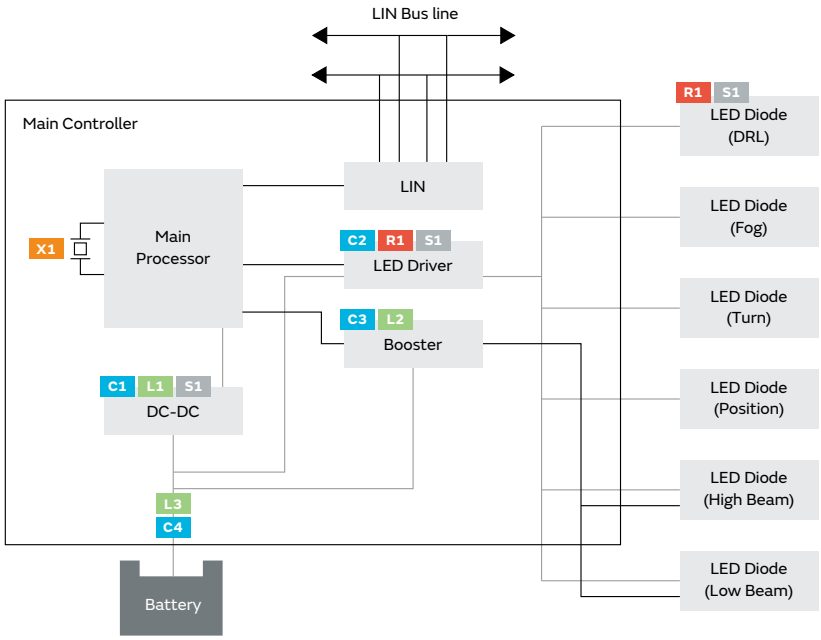
2 EPS (Electric power steering)

3 PKE / TPMS

4 Gateway / in-vehicle LAN

1 Automotive lighting





Booster

- C3 Chip Multilayer Ceramic Capacitors for Automotive GCM Series
- L2 Power Inductors LQH Series

LED Diode (DRL)

- R1 Thermistors PRF/PRG Series
- S1 Thermistors NCU Series

Primary

- C4 Metal Terminal Type Multilayer Ceramic Capacitors for Automotive KCM Series
- L3 Chip Ferrite Beads BLM Series
- L3 Large-current Common Mode Choke Coils PLT10HH/PLT5BP Series
- L3 Chip Common Mode Choke Coils DLW Series

Timing Device

- X1 Ceramic Resonators CERALOCK CST Series

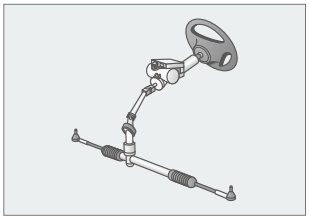
DC-DC

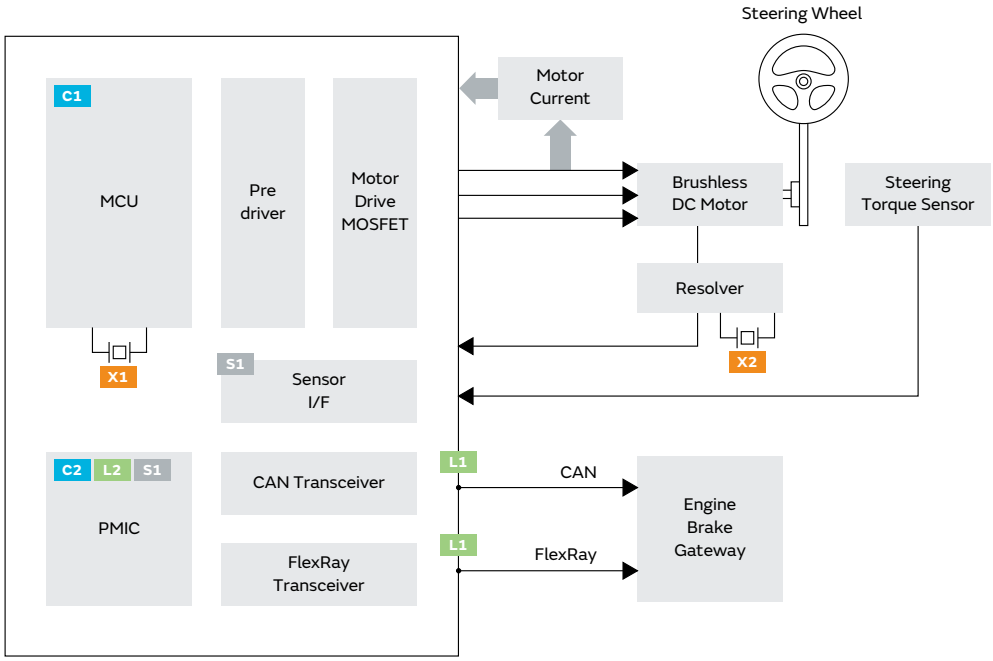
- C1 Soft Termination Chip Multilayer Ceramic Capacitors for Automotive GCJ Series
- C1 Metal Terminal Type Multilayer Ceramic Capacitors for Automotive KCM Series
- C1 Chip Multilayer Ceramic Capacitors for Automotive GCM Series
- L1 Power Inductors LQH Series
- S1 Thermistors NCU Series

LED Driver

- C2 Chip Multilayer Ceramic Capacitors for Automotive GCM Series
- C2 Metal Terminal Type Multilayer Ceramic Capacitors for Automotive KCM Series
- R1 Thermistors PRF/PRG Series
- S1 Thermistors NCU Series

2 EPS (Electric power steering)





MCU

C1	Chip Multilayer Ceramic Capacitors for Automotive GCM Series	

Timing Device

X1	Ceramic Resonators CERALOCK CST Series	
X1	Crystal Units XRC Series	
X2	Ceramic Resonators CERALOCK CST Series	

PMIC

C2	Soft Termination Chip Multilayer Ceramic Capacitors for Automotive GCJ Series	
C2	Metal Terminal Type Multilayer Ceramic Capacitors for Automotive KCM Series	
C2	Chip Multilayer Ceramic Capacitors for Automotive GCM Series	
L2	Chip Ferrite Beads BLM Series	
S1	Thermistors NCU Series	

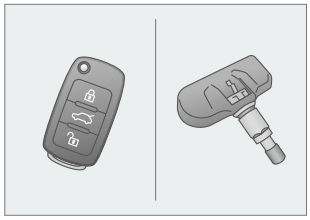
PHY

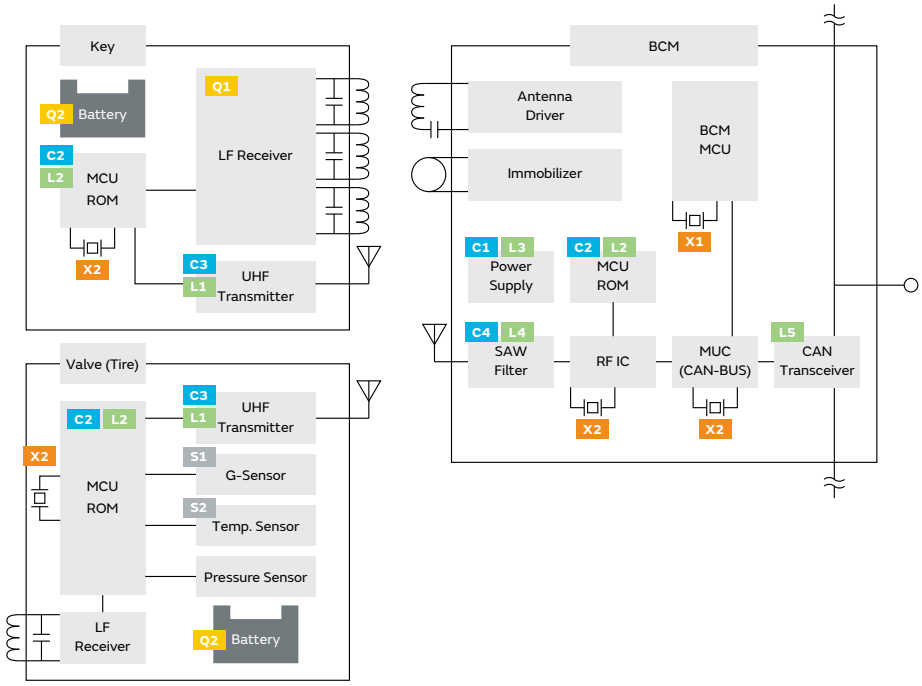
L1	Chip Common Mode Choke Coils DLW32SH Series	
L1	Chip Common Mode Choke Coils DLW43SH Series	

Sensor I/F

S1	Thermistors NCU Series	

3 PKE / TPMS





LF Receiver

Q1 Antenna Coil
SA3D12/SA3D14 Series

UHF Transmitter

C3 High Q Chip Multilayer Ceramic Capacitors for Automotive
GCQ Series

L1 Chip Inductors (Chip Coils)
LQW/LQP/LQG/LQB Series

MCU ROM

L2 Chip Inductors (Chip Coils)
LQW/LQP/LQG/LQB Series

C2 Chip Multilayer Ceramic Capacitors for Automotive
GCM Series

G-Sensor

S1 Chip Multilayer Ceramic Capacitors for Automotive
GCM Series

Temp. Sensor

S2 Thermistors
NCU Series

Power Supply

C1 Soft Termination Chip Multilayer Ceramic Capacitors for Automotive
GCJ Series

C1 Metal Terminal Type Multilayer Ceramic Capacitors for Automotive
KCM Series

C1 Chip Multilayer Ceramic Capacitors for Automotive
GCM Series

L3 Chip Inductors (Chip Coils)
LQM/LQH/DFE Series

L3 Chip Ferrite Beads
BLM Series

SAW Filter

C4 High Q Chip Multilayer Ceramic Capacitors for Automotive
GCQ Series

L4 Chip Inductors (Chip Coils)
LQW/LQP/LQG/LQB Series

CAN Transceiver

L5 Chip Common Mode Choke Coils
DLW32SH Series

L5 Chip Common Mode Choke Coils
DLW43SH Series

Timing Device

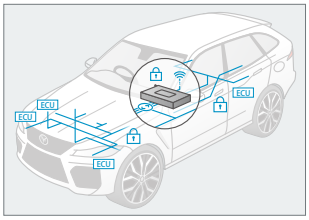
X1 Ceramic Resonators CERALOCK
CST Series

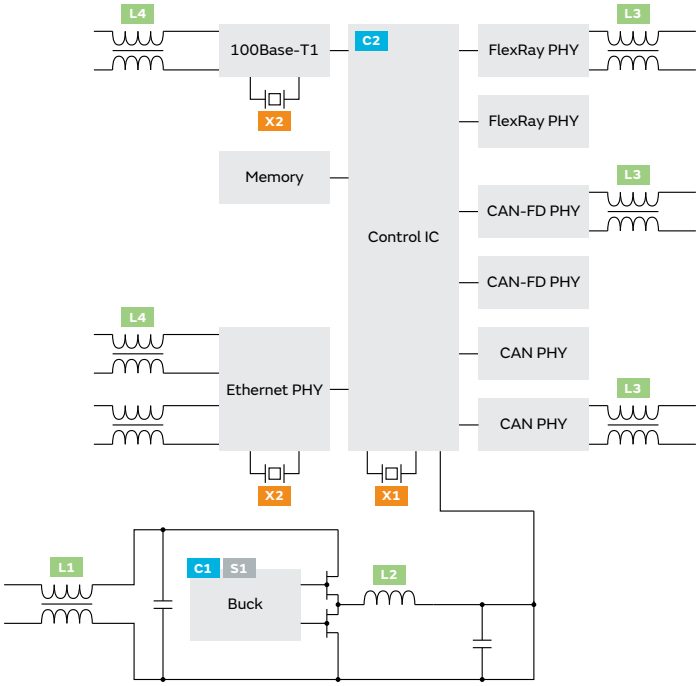
X2 Crystal Units
XRC Series

Battery

Q2 Coin Manganese Dioxide Lithium Batteries
Heat-resistant Type/ Extended Temperature Type

4 Gateway / in-vehicle LAN





DC-DC

C1	Soft Termination Chip Multilayer Ceramic Capacitors for Automotive GCJ Series	
C1	Metal Terminal Type Multilayer Ceramic Capacitors for Automotive KCM Series	
C1	Chip Multilayer Ceramic Capacitors for Automotive GCM Series	
L1	Large-current Common Mode Choke Coils PLT10HH/PLT5BP Series	
L1	Chip Common Mode Choke Coils DLW Series	
L2	Chip Inductors (Chip Coils) LQM/LQH/DFE Series	
S1	Thermistors NCU Series	

Control IC

C2	Chip Multilayer Ceramic Capacitors for Automotive GCM Series	
C2	3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for Automotive NFM Series	

FlexRay/CAN/CAN-FD

L3	Chip Common Mode Choke Coils DLW32SH Series	
L3	Chip Common Mode Choke Coils DLW43SH Series	

OBC/Ethernet

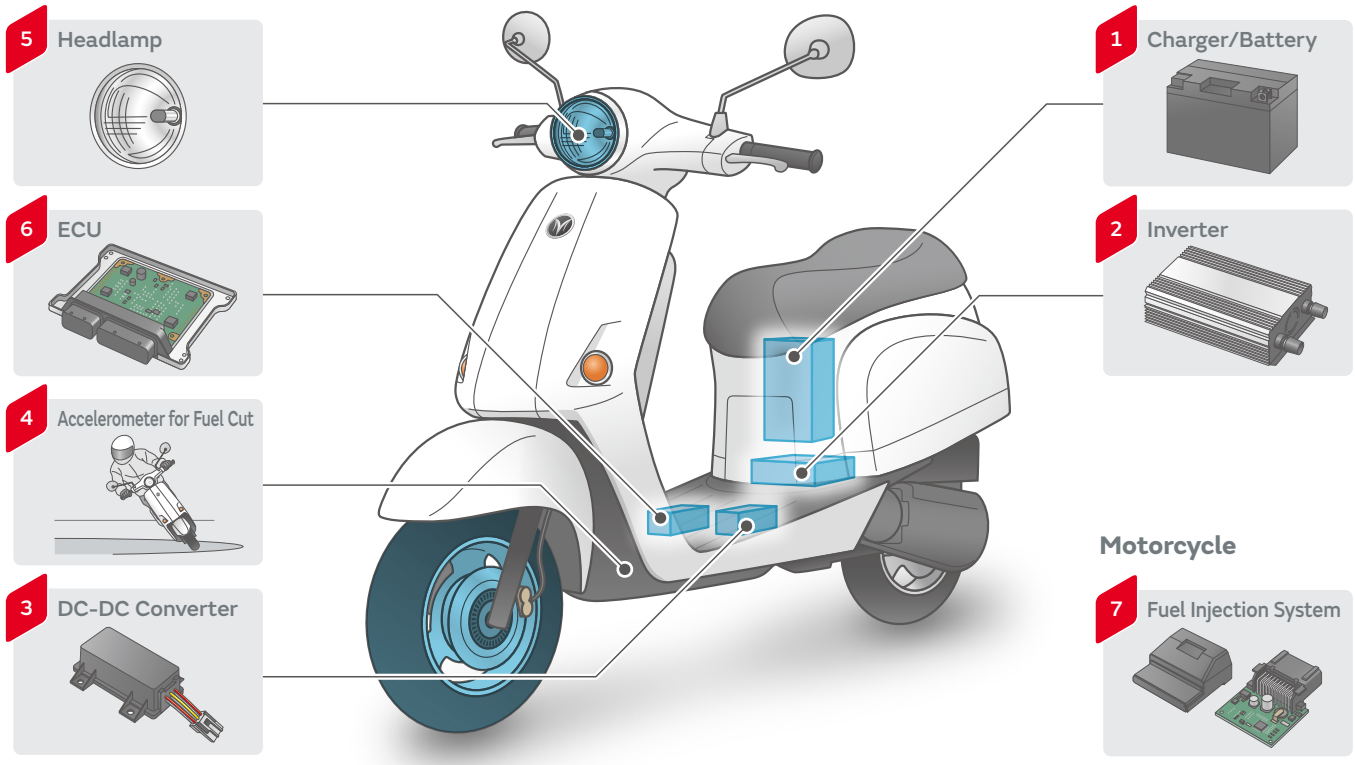
L4	Chip Common Mode Choke Coils DLW32MH Series	
L4	Chip Common Mode Choke Coils DLW43MH Series	

Timing Device

X1	Ceramic Resonators CERALOCK CST Series	
X2	Crystal Units XRC Series	

Motorcycle

E-Motorcycle



1 Charger/Battery

- Metal Terminal Type Multilayer Ceramic Capacitors for Automotive KCM Series
- Chip Multilayer Ceramic Capacitors for Automotive GCM Series
- Soft Termination Chip Multilayer Ceramic Capacitors for Automotive GCJ Series
- Safety Standard Certified Lead Type Disc Ceramic Capacitors for Automotive DE6 Series
- Ceramic Resonators CERALOCK CST Series
- Crystal Units XRC Series
- Large-current Common Mode Choke Coils PLT10HH/PLT5BP Series
- Thermistors PRF/NCU Series
- High Reliability Chip Ferrite Beads BLM_SH1/BH1/TH1/JH1 Series

2 Inverter

- Chip Multilayer Ceramic Capacitors for Automotive GCM Series
- Soft Termination Chip Multilayer Ceramic Capacitors for Automotive GCJ Series
- AgPd Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive GCG Series
- Ni Plating + Pd Plating Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive GCB Series
- Crystal Units XRC Series
- 150°C/ 200°C Operation Leaded MLCC for Automotive RH Series
- Large-current Common Mode Choke Coils PLT10HH/PLT5BP Series
- Ceramic Resonators CERALOCK CST Series
- High Reliability Chip Ferrite Beads BLM_SH1/BH1/TH1/JH1 Series
- Thermistors PRF/NCU Series

3 DC-DC converter

Non-Isolated DC-DC Converters
MYPMA Series

Metal Terminal Type Multilayer Ceramic Capacitors for Automotive
KCM Series

Soft Termination Chip Multilayer Ceramic Capacitors for Automotive
GCJ Series

Chip Multilayer Ceramic Capacitors for Automotive
GCM Series

AgPd Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive
GCG Series

Ni Plating + Pd Plating Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive
GCB Series

Ceramic Resonators CERALOCK
CST Series

High Reliability Chip Ferrite Beads
BLM_SH1/BH1/TH1/JH1 Series

Thermistors
PRF/NCU Series

Large-current Common Mode Choke Coils
PLT10HH/PLT5BP Series

Crystal Units
XRC Series

Chip Inductors (Chip Coils)
LQM/LQH/DFE Series

4 Accelerometer for Fuel Cut

Accelerometers
SCA Series

Gyro Sensors
SCC Series

Chip Multilayer Ceramic Capacitors for Automotive
GCM Series

Ceramic Resonators CERALOCK
CST Series

Metal Terminal Type Multilayer Ceramic Capacitors for Automotive
KCM Series

Soft Termination Chip Multilayer Ceramic Capacitors for Automotive
GCJ Series

AgPd Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive
GCG Series

Ni Plating + Pd Plating Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive
GCB Series

Crystal Units
XRC Series

Thermistors
NCU Series

High Reliability Chip Ferrite Beads
BLM_SH1/BH1/TH1/JH1 Series

5 Headlamp

Chip Multilayer Ceramic Capacitors for Automotive
GCM Series

Ceramic Resonators CERALOCK
CST Series

Soft Termination Chip Multilayer Ceramic Capacitors for Automotive
GCJ Series

Crystal Units
XRC Series

High Reliability Chip Ferrite Beads
BLM_SH1/BH1/TH1/JH1 Series

Thermistors
NCU/PRG Series

6 ECU

Chip Ferrite Beads
BLM Series

Power Inductor
LQH/DFE Series

Thermistors
PRF/NCU Series

Ceramic Resonators CERALOCK
CST Series

Crystal Units
XRC Series

7 Fuel Injection ECU

Metal Terminal Type Multilayer Ceramic Capacitors for Automotive
KCM Series

Chip Multilayer Ceramic Capacitors for Automotive
GCM Series

Soft Termination Chip Multilayer Ceramic Capacitors for Automotive
GCJ Series

Ceramic Resonators CERALOCK
CST Series

Ni Plating + Pd Plating Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive
GCB Series

AgPd Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive
GCG Series

Thermistors
NXF/NXR Series

High Reliability Chip Ferrite Beads
BLM_SH1/BH1/TH1/JH1 Series

Crystal Units
XRC Series

General Purpose

General Purpose

AEC-Q 200 Compliant Chip Multilayer Ceramic Capacitors for Infortainment	GRT Series	Coupling/Decoupling					125°c
Chip Multilayer Ceramic Capacitors for Automotive	GCM Series	Coupling/Decoupling				125°c	150°c
Soft Termination Chip Multilayer Ceramic Capacitors for Automotive	GCJ Series	Coupling/Decoupling/For Step-up				125°c	150°c
High Q Chip Multilayer Ceramic Capacitors for Automotive	GCQ Series	High Frequency Filter Circuit					125°c
MLSC Design Chip Multilayer Ceramic Capacitors for Automotive	GCD Series	Coupling/Decoupling/For Step-up					125°c
Soft Termination MLSC Design Chip Multilayer Ceramic Capacitors for Automotive	GCE Series	Coupling/Decoupling/For Step-up					125°c
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for Automotive	NFM Series	Noise Suppression/Decoupling					125°c
AgPd Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive	GCG Series	Coupling/Decoupling/For Step-up				125°c	150°c
Leaded MLCC for Automotive	RCE Series	Noise Suppression/Decoupling					125°c
150°C/200°C Operation Leaded MLCC for Automotive	RH Series	Noise Suppression/Decoupling	125°c	150°c	175°c	200°c	
Polymer Aluminum Electrolytic Capacitors	ECAS Series	Smoothing /Transient Backup				105°c	125°c
Chip Ferrite Beads	BLM Series	Noise Suppression		125°c	150°c	175°c	
Chip Ferrite Beads	NFZ Series	Noise Suppression				105°c	125°c
EMI Suppression Filters EMIFIL	NFL Series	Noise Suppression					125°c
EMI Suppression Filters EMIFIL	NFE Series	Noise Suppression					125°c
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion	85°c	105°c	125°c	150°c	
Chip Inductors (Chip Coils)	LQW Series	Matching/High Frequency Choke					125°c
Piezoelectric Sounders	PKLCS/PKMCS Series	Sound Component					

Memo

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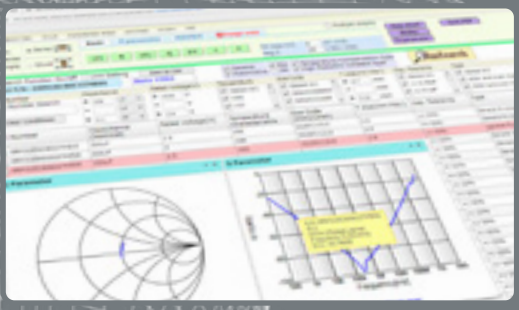
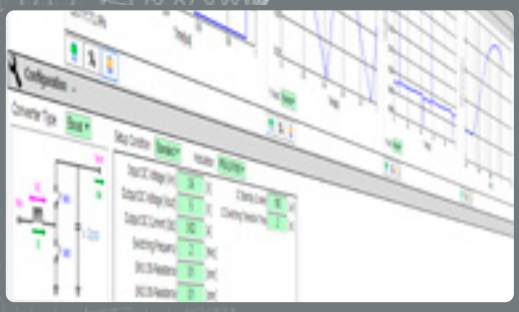
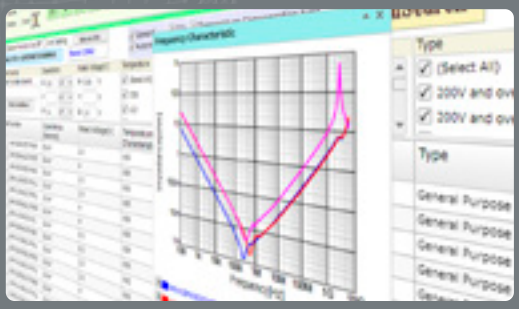
The best partner for your circuit design







SimSurfing is a web application which allows circuit designers to see our components' characteristics data, and to select the one that best suits the requirement.

View and download data
You can see various characteristics graphs for our products with easy operation, or download data files including s-parameter, spice models, etc.

Simulate circuit conditions
Simsurfing includes advanced equivalent circuit models which show the characteristics data close to actual measurement (for some components including MLCC & RF inductors).

Compare characteristics
Easily compare characteristics data on the same graph.

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INNOVATOR IN ELECTRONICS

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Global Locations

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⚠Note

1 Export Control

For customers outside Japan

Murata requests customers to ensure that no Murata products are used or sold, through any channels, for use in the design, development, production, utilization, maintenance or operation of, or otherwise contribution to Weapons of Mass Destruction (nuclear, chemical or biological weapons or missiles), conventional weapons, or items specially designed for them.

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5. *Medical equipment*
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7. *Traffic signal equipment*
8. *Disaster prevention / crime prevention equipment*
9. *Data-processing equipment*
10. *Application of similar complexity and/or reliability requirements to the applications listed above*

3 Product specifications in this catalog are as of September 2020. They are subject to change or our products in it may be discontinued without advance notice. Please check with our sales representatives or product engineers before ordering. If there are any questions, please contact our sales representatives or product engineers.

4 Please read rating and ⚠CAUTION (for storage, operating, rating, soldering, mounting and handling) in this catalog to prevent smoking and/or burning, etc.

5 This catalog has only typical specifications. Therefore, please approve our product specifications or transact the approval sheet for product specifications before ordering.

6 Please note that unless otherwise specified, we shall assume no responsibility whatsoever for any conflict or dispute that may occur in connection with the effect of our and/or a third party's intellectual property rights and other related rights in consideration of your use of our products and/or information described or contained in our catalogs. In this connection, no representation shall be made to the effect that any third parties are authorized to use the rights mentioned above under licenses without our consent.

7 No ozone depleting substances (ODS) under the Montreal Protocol are used in our manufacturing process.

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