muRata
INNOVATOR IN ELECTRONICS

MURATA PRODUCTS
Lineup 2016

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2016 MURATA PRODUCTS Lineup

Capacitors

Noise Suppression Products/EMI Suppression Filters

Inductors (Coils)

Resistors

Timing Devices

Filters

RF Components

Sensors

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Thermistors

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Power Devices

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Energy Devices

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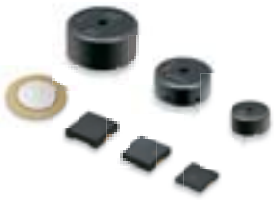
Sound Components



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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 material technology, we offer a variety of capacitors covering a wide range of voltages. 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.

Lineup

- ●Ceramic Capacitors (SMD, lead type, mold type)
- ●Polymer Aluminum Electrolytic Capacitors
- ●Ceramic Trimmer Capacitors ●Supercapacitors (EDLC)

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

WEB Product Search Engine

1 Search by part number

The applicable capacitors can be searched by alphanumeric characters.

2 Search by specifications

Capacitors can be searched by various specifications, such as the capacitance, rated voltage, and temperature characteristics.

3 Search by features

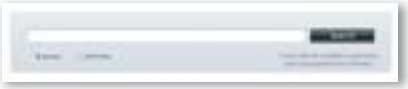
The applicable capacitors can be searched by the shape, maximum operating temperature, applications, benefits, and mounting.

4 Search in the lineups

Capacitors applicable to the conditions can be searched from the lineup of each series.

5 Cross reference

The Murata part number applicable to the assumed specification can be searched using a competitor's part number for chip monolithic ceramic capacitors.



Search result

The number of cases applicable to the current search conditions is always displayed in real time.

Click each search condition button to display the menu. The search results will change in real time with the selected conditions.

Clicking the "Current search conditions" opens a menu, and the filtered conditions can be checked.

The results can be sorted by clicking the ▲ button of the search results items.

Clicking the product name opens the details page, and more detailed information can be acquired.

A simple specification sheet can be downloaded without opening the details page.

The icons clearly indicate the status and the features of the product.

Icons

General	For applications that do not require a particular reliability. such as general equipment.
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 automobiles.
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	Safety Standard Certified Product Products that acquired safety standard certification IEC60384-14 and products based on the Electrical Appliance and Material Safety Law of Japan.
Ultra-compact	LXW dimension: products of 0.6X0.3 mm or less
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.
Fail safe	Fail safe product This capacitor is designed to prevent failures as much as possible by short mode.
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.
Anti-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.
Ultrahigh-voltage	Product of 10 to 40kV rated voltage
Large Cap	Over 220µF
Effective Cap	No DC bias characteristics Polymer capacitor is no capacitance change with DC bias due to aluminum oxidized film for dielectric.
Bonding	Product for bonding Since gold is used for the external electrodes, the capacitor can be mounted by die bonding/wire bonding.

Product Lineup

			Safety standard	Ultra-compact	High Q	Low ESL	Fail safe	Deflecting crack	Soldering crack	Anti-noise	Ultrahigh-voltage	Large Cap	Effective Cap	Bonding	Specific Applications
General	GRM	P5		●											
	GRM	P10													For LCD backlight only
	GA2	P11	●												
	GA3	P12	●												
	GJM	P8		●	●										
	GMA	P9		●										●	
	GMD	P9		●										●	
	GQM	P9			●										
	GRJ	P10						●							
	GR3	P11								●					
	GR4	P11													For communication / information devices
	GR7	P11													Limited to camera flashes
	KRM	P12						●	●	●					
	KR3	P13						●	●	●					
	LLA	P8				●									
	LLL	P7				●									
	LLM	P8				●									
	LLR	P8				●									
	DE1	P20	●												
	DE2	P20	●												
	DEJ	P21	●												
	DHR	P21						●	●		●				
	RDE	P18						●	●	●					
	DHK	P24									●				
	DHS	P23									●				
	ECAS	P24										●	●		
Power-train AEC-Q200	GCM	P13		●											
	GCD	P15					●	●							
	GCE	P15					●	●							
	GCG	P16						●	●						
	GCJ	P14					●	●							
	GC3	P16								●					
	KCM	P17						●	●	●					
	KC3	P17						●	●	●					
	DE6	P23	●												
	RCE	P21						●	●	●					
	RH	P22						●	●	●					
Medical Device	GCH	P17													For Implanted Medical Devices

Chip Monolithic Ceramic Capacitors For General Purpose

For General Purpose

Temperature Compensating Type

GRM

General Ultra-compact

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
GRM02	0.4X0.2 <01005>	50	17pF – 100pF
		35	100pF
		25	18pF – 220pF
		16	0.20pF – 220pF
		10	56pF – 220pF
		6.3	56pF – 220pF
GRM03	0.6X0.3 <0201>	100	0.10pF – 15pF
		50	0.10pF – 220pF
GRM15	1.0X0.5 <0402>	100	0.10pF – 100pF
		50	0.10pF – 1000pF
		10	1200pF – 4700pF
GRM18	1.6X0.8 <0603>	100	0.50pF – 1500pF
		50	0.50pF – 10000pF
		10	5600pF – 22000pF
GRM21	2.0X1.25 <0805>	250	10pF – 5600pF
		200	10pF – 5600pF
		100	100pF – 3300pF
		50	1200pF – 47000pF
		10	56000pF – 0.10μF
GRM31	3.2X1.6 <1206>	2k	10pF – 68pF
		1k	10pF – 1000pF
		630	10pF – 4700pF
		500	10pF – 4700pF
		250	390pF – 22000pF
		200	2700pF – 10000pF
		100	1800pF – 22000pF
		50	12000pF – 0.10μF
		25	0.12μF
		16	0.12μF
GRM32	3.2X2.5 <1210>	2k	82pF – 220pF
		1k	1200pF – 2200pF
		630	1200pF – 10000pF
		500	1200pF – 10000pF
		250	27000pF – 47000pF
GRM42	4.5X2.0 <1808>	3.15k	10pF – 100pF
GRM43	4.5X3.2 <1812>	1k	2700pF – 4700pF
		630	12000pF – 22000pF
		500	12000pF – 22000pF
GRM55	5.7X5.0 <2220>	1k	5600pF – 10000pF
		630	27000pF – 47000pF
		500	27000pF – 47000pF

Capacitors

High Dielectric Constant Type

GRM

General | Ultra-compact

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GRM02	0.4X0.2 <01005>	16	100pF – 1000pF
		10	100pF – 10000pF
		6.3	1000pF – 0.10μF
		4	15000pF – 0.10μF
		2.5	0.10μF
GRM03	0.6X0.3 <0201>	50	100pF – 1500pF
		35	0.10μF
		25	100pF – 0.10μF
		16	2200pF – 0.10μF
		10	4700pF – 0.22μF
		6.3	4700pF – 0.22μF
		4	0.22μF
GRM15	1.0X0.5 <0402>	100	220pF – 4700pF
		50	220pF – 0.10μF
		35	0.22μF – 1.0μF
		25	2200pF – 2.2μF
		16	3300pF – 2.2μF
		10	15000pF – 4.7μF
		6.3	0.10μF – 4.7μF
		4	0.10μF – 10μF
		2.5	0.10μF – 10μF
GRM18	1.6X0.8 <0603>	250	220pF – 2200pF
		200	220pF – 2200pF
		100	220pF – 0.10μF
		50	220pF – 2.2μF
		35	2.2μF – 4.7μF
		25	10000pF – 10μF
		16	0.15μF – 10μF
		10	0.33μF – 10μF
		6.3	4.7μF – 22μF
		4	10μF – 22μF
GRM21	2.0X1.25 <0805>	500	1000pF – 10000pF
		250	1000pF – 22000pF
		200	1000pF – 22000pF
		100	10000pF – 0.47μF
		50	10000pF – 4.7μF
		35	2.2μF – 10μF
		25	68000pF – 22μF
		16	0.33μF – 22μF
		10	2.2μF – 47μF
		6.3	10μF – 100μF
		4	10μF – 100μF
		2.5	47μF – 100μF
GRM31	3.2X1.6 <1206>	1k	470pF – 10000pF
		630	1000pF – 22000pF
		500	15000pF – 47000pF
		250	15000pF – 0.10μF
		200	15000pF – 0.10μF
		100	0.47μF – 2.2μF
		50	0.47μF – 10μF
		35	10μF
		25	0.33μF – 22μF

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
GRM31	3.2X1.6 <1206>	16	4.7μF 22μF
		10	22μF 47μF
		6.3	22μF 150μF
		4	47μF 220μF
		2.5	150μF 220μF
GRM32	3.2X2.5 <1210>	1k	6800pF 22000pF
		630	22000pF 47000pF
		500	68000pF 0.10μF
		250	68000pF 0.22μF
		200	68000pF 0.22μF
		100	1.0μF 4.7μF
		80	4.7μF
		63	10μF
		50	4.7μF 10μF
		35	10μF
		25	10μF 22μF
		16	22μF 47μF
		10	47μF 100μF
		6.3	47μF 100μF
		4	100μF
GRM43	4.5X3.2 <1812>	1k	33000pF 47000pF
		630	68000pF 0.10μF
		500	0.15μF 0.22μF
		250	0.15μF 0.47μF
		200	0.15μF 0.47μF
GRM55	5.7X5.0 <2220>	1k	68000pF 0.10μF
		630	0.15μF 0.22μF
		500	0.33μF 0.47μF
		250	0.33μF 1.0μF
		200	0.33μF 1.0μF

Low ESL Type

LW Reversed Type

LLL

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
LLL15	0.5X1.0 <0204>	6.3	0.10μF 0.22μF
		4	0.47μF 1.0μF
LLL18	0.8X1.6 <0306>	50	2200pF 4700pF
		25	10000pF 22000pF
		16	22000pF 47000pF
		10	0.10μF 0.22μF
		4	0.22μF 2.2μF
LLL1U	0.6X1.0 <02404>	4	4.3μF
LLL21	1.25X2.0 <0508>	50	10000pF 22000pF
		25	22000pF 0.10μF
		16	47000pF 0.22μF
		10	0.22μF 1.0μF
		6.3	0.47μF
		4	1.0μF 2.2μF
LLL31	1.6X3.2 <0612>	50	10000pF 0.10μF
		25	47000pF 0.47μF

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Capacitors

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
LLL31	1.6X3.2 <0612>	16	0.22µF – 1.0µF
		10	0.47µF – 2.2µF
		6.3	2.2µF – 10µF

Controlled ESR Type

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

8 Terminal Type

LLA

General Low ESL

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
LLA18	1.6X0.8 <0603>	4	0.10µF – 2.2µF
LLA21	2.0X1.25 <0805>	25	10000pF – 47000pF
		16	47000pF – 0.22µF
		10	0.22µF – 0.47µF
		6.3	0.47µF – 1.0µF
		4	1.0µF – 4.7µF
LLA31	3.2X1.6 <1206>	16	0.22µF – 1.0µF
		10	0.47µF – 2.2µF
		6.3	1.0µF – 2.2µF

10 Terminal Type

LLM

General Low ESL

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
LLM21	2.0X1.25 <0805>	6.3	0.22µF – 0.47µF
		4	1.0µF
LLM31	3.2X1.6 <1206>	16	0.10µF – 0.22µF
		10	0.47µF
		6.3	2.2µF

High Q Type for High Frequency

GJM

General Ultra-compact High Q

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GJM02	0.4X0.2 <01005>	25	0.20pF – 22pF
GJM03	0.6X0.3 <0201>	50	0.20pF – 3.9pF
		25	0.20pF – 33pF
GJM15	1.0X0.5 <0402>	50	0.10pF – 47pF

High Q Type for High Frequency and High Power

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
		100	36pF – 47pF
GQM18	1.6X0.8 <0603>	250	1.0pF – 47pF
		100	1.0pF – 6.8pF
		50	7.0pF – 100pF
GQM21	2.0X1.25 <0805>	250	1.0pF – 100pF
		100	1.0pF – 18pF
		50	20pF – 100pF
GQM22	2.8X2.8 <1111>	500	1.0pF – 100pF

Product for Bonding/AuSn Soldering

GMD

General Ultra-compact Bonding

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
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

Top & Bottom Electrode Type for Bonding

GMA

General Ultra-compact Bonding

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GMA05	0.5X0.5 <0202>	100	100pF – 1000pF
		25	1500pF – 4700pF
		10	6800pF – 22000pF
		6.3	0.10μF
GMA08	0.8X0.8 <0303>	100	1500pF – 6800pF
		25	10000pF – 22000pF
		10	33000pF – 0.10μF
		6.3	0.47μF
GMA0D	0.38X0.38 <015015>	10	1000pF – 10000pF

Resin External Electrode Type

GRJ

General | Deflecting crack

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GRJ18	1.6X0.8 <0603>	100	1000pF – 0.10μF
		50	1000pF – 0.22μF
		25	47000pF – 1.0μF
		16	0.47μF
		6.3	2.2μF – 4.7μF
GRJ21	2.0X1.25 <0805>	250	1000pF – 22000pF
		100	220pF – 1.0μF
		50	470pF – 1.0μF
		25	1.0μF – 2.2μF
		16	4.7μF
		10	10μF
GRJ31	3.2X1.6 <1206>	1k	470pF – 10000pF
		630	1000pF – 22000pF
		250	15000pF – 0.10μF
		100	0.10μF – 1.0μF
		50	0.10μF – 4.7μF
		25	2.2μF – 10μF
		16	2.2μF – 10μF
		10	10μF – 22μF
		6.3	22μF
GRJ32	3.2X2.5 <1210>	1k	6800pF – 22000pF
		630	22000pF – 47000pF
		250	68000pF – 0.22μF
		100	2.2μF – 4.7μF
		50	4.7μF – 10μF
		25	10μF
		16	22μF
		10	22μF
		6.3	47μF
GRJ43	4.5X3.2 <1812>	1k	33000pF – 47000pF
		630	68000pF – 0.10μF
		250	0.15μF – 0.47μF
GRJ55	5.7X5.0 <2220>	1k	68000pF – 0.10μF
		630	0.15μF – 0.22μF
		250	0.33μF – 1.0μF

For LCD Backlight Inverter Circuit Only

GRM

General

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GRM42	4.5X2.0 <1808>	3.15k	5.0pF – 47pF

High Effective Capacitance & High Ripple Resistance

GR3

General Anti-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 0.27μF
		450	0.22μF 0.56μF
		250	0.47μF 1.0μF

For Ethernet LAN & 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>	2k	100pF 1500pF
GR443	4.5X3.2 <1812>	2k	1800pF 4700pF
GR455	5.7X5.0 <2220>	2k	10000pF

For Camera Flash Units Only

GR7

General

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GR721	2.0X1.25 <0805>	350	10000pF 27000pF
GR731	3.2X1.6 <1206>	350	10000pF 47000pF

Safety Standard Certified

The Electrical Appliance and Material Safety Law of Japan

GA2

General Safety standard

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (V)	Capacitance Range (F)
GA242	4.5X2.0 <1808>	AC250 (r.m.s.)	470pF 1000pF
GA243	4.5X3.2 <1812>	AC250 (r.m.s.)	2200pF 47000pF
GA255	5.7X5.0 <2220>	AC250 (r.m.s.)	0.10μF

Continued on the following page. ↗

Capacitors

Type GF (IEC60384-14 Y2, X1/Y2 Class)

GA3

General Safety standard

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (V)	Capacitance Range (F)
GA342	4.5X2.0 <1808>	AC250 (r.m.s.)	10pF – 1000pF
GA352	5.7X2.8 <2211>	AC250 (r.m.s.)	100pF – 1500pF
GA355	5.7X5.0 <2220>	AC250 (r.m.s.)	1800pF – 4700pF

Type GD (IEC60384-14 Y3 Class)

GA3

General Safety standard

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (V)	Capacitance Range (F)
GA342	4.5X2.0 <1808>	AC250 (r.m.s.)	10pF – 1500pF
GA343	4.5X3.2 <1812>	AC250 (r.m.s.)	1800pF – 4700pF

Type GB (UL, IEC60384-14 X2 Class)

GA3

General Safety standard

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (V)	Capacitance Range (F)
GA355	5.7X5.0 <2220>	AC250 (r.m.s.)	10000pF – 56000pF

Metal Terminal Type

High Effective Capacitance

KRM

General Deflecting crack Soldering crack Anti-noise

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	1k	68000pF – 0.22µF
		630	0.15µF – 0.47µF
		250	0.68µF – 2.2µF
		100	4.7µF – 22µF
		63	4.7µF – 22µF
		50	4.7µF – 33µF
		35	10µF – 47µF
		25	15µF – 68µF

Continued on the following page. ↗

High Effective Capacitance & High Ripple Resistance

KR3

General | Deflecting crack | Soldering crack | Anti-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

Chip Monolithic Ceramic Capacitors For Automotive

For Automotive (General Purpose)

Temperature Compensating Type

GCM

Power-train | AEC-Q200 | Ultra-compact

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GCM03	0.6X0.3 <0201>	25	1.0pF – 100pF
GCM15	1.0X0.5 <0402>	50	1.0pF – 470pF
GCM18	1.6X0.8 <0603>	100	1.0pF – 1500pF
		50	1.0pF – 3900pF
GCM21	2.0X1.25 <0805>	250	100pF – 5600pF
		100	100pF – 3300pF
		80	15000pF – 22000pF
		63	15000pF – 22000pF
		50	1000pF – 22000pF
GCM31	3.2X1.6 <1206>	1k	10pF – 1000pF
		630	10pF – 4700pF
		250	10pF – 15000pF
		100	1800pF – 10000pF
		80	33000pF
		63	33000pF
		50	3900pF – 56000pF
GCM32	3.2X2.5 <1210>	1k	1200pF – 2200pF
		630	1200pF – 10000pF
GCM43	4.5X3.2 <1812>	1k	2700pF – 4700pF
		630	12000pF – 22000pF
GCM55	5.7X5.0 <2220>	1k	5600pF – 10000pF
		630	27000pF – 47000pF

High Dielectric Constant Type

GCM

Power-train | AEC-Q200 | Ultra-compact

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GCM03	0.6X0.3 <0201>	25	100pF – 1500pF
		16	2200pF – 3300pF
		10	4700pF – 10000pF

Continued on the following page. ↗

Capacitors

Series	LxW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GCM15	1.0X0.5 <0402>	100	220pF – 4700pF
		50	220pF – 0.10μF
		25	10000pF – 47000pF
		16	33000pF – 0.22μF
		10	0.47μF – 1.0μF
GCM18	1.6X0.8 <0603>	100	1000pF – 22000pF
		50	1000pF – 0.22μF
		25	33000pF – 1.0μF
		16	0.10μF – 1.0μF
		6.3	2.2μF
GCM21	2.0X1.25 <0805>	100	6800pF – 1.0μF
		50	33000pF – 1.0μF
		35	0.68μF – 4.7μF
		25	0.15μF – 4.7μF
		16	0.68μF – 4.7μF
		10	2.2μF – 10μF
		6.3	10μF – 22μF
GCM31	3.2X1.6 <1206>	100	0.10μF – 2.2μF
		50	0.33μF – 4.7μF
		25	2.2μF – 10μF
		16	4.7μF – 10μF
		10	10μF – 22μF
		6.3	22μF
GCM32	3.2X2.5 <1210>	100	4.7μF
		50	1.0μF – 10μF
		35	10μF
		25	4.7μF – 10μF
		16	10μF – 22μF
		10	22μF
		6.3	47μF

Resin External Electrode Type

GCJ

Power-train | AEC-Q200 | Fail safe | Deflecting crack

Series	LxW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GCJ18	1.6X0.8 <0603>	100	1000pF – 0.10μF
		50	1000pF – 0.22μF
		35	33000pF – 68000pF
		25	1000pF – 1.0μF
		16	10000pF – 0.47μF
		10	0.12μF – 0.22μF
		6.3	2.2μF – 4.7μF
GCJ21	2.0X1.25 <0805>	250	1000pF – 22000pF
		100	220pF – 1.0μF
		50	330pF – 1.0μF
		35	0.12μF – 0.47μF
		25	470pF – 2.2μF
		16	0.27μF – 4.7μF
		10	2.2μF – 10μF
GCJ31	3.2X1.6 <1206>	1k	1000pF – 10000pF
		630	1000pF – 22000pF
		250	15000pF – 0.10μF

Continued on the following page. ↗

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GCJ31	3.2X1.6 <1206>	100	0.10µF – 1.0µF
		50	0.10µF – 4.7µF
		35	0.56µF – 1.0µF
		25	0.10µF – 10µF
		16	1.0µF – 10µF
		10	6.8µF – 22µF
		6.3	22µF
GCJ32	3.2X2.5 <1210>	1k	15000pF – 22000pF
		630	6800pF – 47000pF
		250	68000pF – 0.22µF
		100	2.2µF – 4.7µF
		50	4.7µF – 10µF
		25	4.7µF
		16	22µF
		6.3	47µF
GCJ43	4.5X3.2 <1812>	1k	33000pF – 47000pF
		630	33000pF – 0.10µF
		250	0.15µF – 0.47µF
GCJ55	5.7X5.0 <2220>	1k	68000pF – 0.10µF
		630	0.10µF – 0.22µF
		250	0.33µF – 1.0µF

Specially Designed Product to Reduce Shorts

GCD

Power-train | AEC-Q200 | Fail safe | Deflecting crack

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

Specially Designed Product to Reduce Shorts & Resin Electrode Product

GCE

Power-train | AEC-Q200 | Fail safe | Deflecting crack

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

Conductivity Adhesive Compatible Type

Temperature Compensating Type

GCG

Power-train | AEC-Q200 | Deflecting crack | Soldering 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
GCG15	1.0X0.5 <0402>	50	120pF – 470pF
GCG18	1.6X0.8 <0603>	50	10pF – 2200pF
GCG21	2.0X1.25 <0805>	50	100pF – 10000pF

High Dielectric Constant Type

GCG

Power-train | AEC-Q200 | Deflecting crack | Soldering 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
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	220pF – 0.22μF
		25	1000pF – 0.47μF
		16	68000pF – 1.0μF
		6.3	2.2μF
GCG21	2.0X1.25 <0805>	100	10000pF
		50	10000pF – 0.47μF
		25	10000pF – 1.0μF
		16	0.33μF – 4.7μF
GCG31	3.2X1.6 <1206>	50	0.15μF – 0.33μF
		25	0.15μF – 4.7μF
		16	0.68μF – 4.7μF
GCG32	3.2X2.5 <1210>	25	3.3μF – 10μF

High Effective Capacitance & High Ripple Resistance

GC3

Power-train | AEC-Q200 | Anti-noise

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
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 – 0.27μF
		450	0.22μF – 0.56μF
		250	0.47μF – 1.0μF

Metal Terminal Type

High Effective Capacitance

KCM

Power-train | AEC-Q200 | Deflecting crack | Soldering crack | Anti-noise

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 – 68µF

High Effective Capacitance & High Ripple Resistance

KC3

Power-train | AEC-Q200 | Deflecting crack | Soldering crack | Anti-noise

Series	LXW (mm)	Rated Voltage (Vdc)	Capacitance Range (F)
KC355	6.1X5.3	630	0.10µF – 0.56µF
		450	0.22µF – 1.2µF
		250	0.47µF – 2.2µF

Chip Monolithic Ceramic Capacitors For Medical Devices

For Implanted Medical Devices

Temperature Compensating Type

GCH

Medical Device

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GCH15	1.0X0.5 <0402>	50	1.0pF – 470pF
GCH18	1.6X0.8 <0603>	100	1.0pF – 1500pF
		50	1.0pF – 3300pF
GCH21	2.0X1.25 <0805>	100	100pF – 3300pF
		50	1000pF – 22000pF
GCH31	3.2X1.6 <1206>	100	2200pF – 10000pF
		50	4700pF – 47000pF

High Dielectric Constant Type

GCH

Medical Device

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GCH15	1.0X0.5 <0402>	100	220pF – 4700pF
		50	220pF – 0.10µF

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Capacitors

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

Lead Type Ceramic Capacitors For General Purpose

Radial Lead Type

Temperature Compensating Type

RDE

General | Deflecting crack | Soldering crack | Anti-noise

Series	LxW (mm)	Rated Voltage (Vdc)	Capacitance Range (F)
RDE5C	4.0X3.5	100	1.0pF – 1500pF
		50	1.0pF – 3900pF
	4.5X3.5	100	1800pF – 3300pF
		50	4700pF – 22000pF
	5.0X3.5	100	1.0pF – 3300pF
		50	1.0pF – 22000pF
	5.5X4.0	100	3900pF – 22000pF
		50	27000pF – 0.10µF
RDE7U	4.5X3.5	250	100pF – 4700pF
	5.5X4.0	1k	10pF – 1000pF
		630	10pF – 4700pF
		250	6800pF – 22000pF
	5.5X5.0	1k	1500pF – 2200pF

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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
RDE7U	5.5X5.0	630	6800pF 10000pF
		250	33000pF 47000pF
	7.5X5.5	1k	3300pF 4700pF
		630	15000pF 22000pF
	7.5X8.0	1k	6800pF 10000pF
		630	33000pF 47000pF
	7.7X13.0	1k	20000pF
		630	94000pF

High Dielectric Constant Type

RDE RDE RDE

General | Deflecting crack | Soldering crack | Anti-noise

Series	LxW (mm)	Rated Voltage (Vdc)	Capacitance Range (F)
			0.1p 1p 10p 100p 1000p 10000p 0.1μ 1μ 10μ 100μ 1000μ
RDEC7	4.0X3.5	25	0.22μF 1.0μF
	4.5X3.5	25	2.2μF
	5.0X3.5	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
		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 0.1μF
		25	0.1μF
	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	0.1μF
	5.5X4.0	1k	470pF 10000pF
		630	1000pF 22000pF
		500	15000pF 47000pF
		250	33000pF 0.10μF

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Capacitors

Series	LxW (mm)	Rated Voltage (Vdc)	Capacitance Range (F)
RDER7	5.5X4.0	100	0.15µF – 1.0µF
		50	0.68µF – 2.2µF
	5.5X5.0	1k	15000pF – 22000pF
		630	33000pF – 47000pF
		500	68000pF – 0.10µF
		250	0.15µF – 0.22µF
		50	3.3µF
	7.5X5.5	1k	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	1k	68000pF – 0.10µF
		630	0.15µF – 0.22µF
	7.7X12.5	500	0.68µF – 1.0µF
		250	2.2µF
	7.7X13.0	1k	0.22µF
		630	0.47µF

Disc Type (Safety Standard Certified Type)

DE2/DE1/DEJ

Type KY (Basic Insulation Type) -IEC60384-14 X1/Y2 Class

General Safety standard

Series	D (mm)	Rated Voltage (V)	Capacitance Range (F)
DE21X	8.0	AC250 (r.m.s.)	10pF – 68pF
DE2B3	7.0 to 8.0	AC300 (r.m.s.)	100pF – 680pF
	7.0 to 8.0	AC250 (r.m.s.)	100pF – 680pF
DE2E3	7.0 to 10.0	AC300 (r.m.s.)	1000pF – 4700pF
	7.0 to 10.0	AC250 (r.m.s.)	1000pF – 4700pF
DE2F3	14.0	AC300 (r.m.s.)	10000pF
	14.0	AC250 (r.m.s.)	10000pF

Type KX (Reinforced Insulation Type) -IEC60384-14 X1/Y1 Class

General Safety standard

Series	D (mm)	Rated Voltage (V)	Capacitance Range (F)
DE11X	9.0	AC250 (r.m.s.)	10pF – 68pF
DE1B3	7.0 to 8.0	AC300 (r.m.s.)	100pF – 680pF
	7.0 to 8.0	AC250 (r.m.s.)	100pF – 680pF
DE1E3	7.0 to 12.0	AC300 (r.m.s.)	1000pF – 4700pF
	7.0 to 12.0	AC250 (r.m.s.)	1000pF – 4700pF

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The Electrical Appliance and Material Safety Law of Japan

General Safety standard

Series	D (mm)	Rated Voltage (V)	Capacitance Range (F)
DEJE3	7.0 to 11.0	AC250 (r.m.s.)	1000pF – 4700pF
DEJF3	8.0 to 11.0	AC250 (r.m.s.)	4700pF – 10000pF

Disc Type (Ultra-high-voltage)

DHR

General Deflecting crack Soldering crack Ultrahigh-voltage

Series	D (mm)	Rated Voltage (Vdc)	Capacitance Range (F)
DHR4E	8.0 to 18.0	15k	100pF – 1000pF
	8.0 to 16.0	12k	100pF – 1000pF
	8.0 to 15.0	10k	100pF – 1000pF
DHRB3	8.0 to 18.0	15k	100pF – 1000pF
	8.0 to 16.0	12k	100pF – 1000pF
	8.0 to 15.0	10k	100pF – 1000pF

Lead Type Ceramic Capacitors For Automotive

Powertrain/Safety (AEC-Q200)

Temperature Compensating Type

RCE

Power-train AEC-Q200 Deflecting crack Soldering crack Anti-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	100	1800pF – 3300pF
		50	4700pF – 22000pF
	5.5X4.0	100	3900pF – 10000pF
		50	27000pF – 0.10μF
RCE7U	4.0X3.5	250	100pF – 4700pF
	5.5X4.0	1k	10pF – 1000pF
		630	10pF – 4700pF
		250	6800pF – 10000pF
	5.5X5.0	1k	1500pF – 2200pF
		630	6800pF – 10000pF
	7.5X5.5	1k	3300pF – 4700pF
		630	15000pF – 22000pF
	7.5X8.0	1k	6800pF – 10000pF
		630	33000pF – 47000pF
	7.7X13.0	1k	20000pF
		630	94000pF

Continued on the following page. ↗

Capacitors

High Dielectric Constant Type

RCE

Power-train | AEC-Q200 | Deflecting crack | Soldering crack | Anti-noise

Series	LXW (mm)	Rated Voltage (Vdc)	Capacitance Range (F)
RCEC7	5.5X5.0	100	1.5µF 2.2µF
	5.5X7.5	100	4.7µF
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	1k	1000pF 10000pF
		630	1000pF 22000pF
		250	33000pF 0.10µF
		100	0.15µF 1.0µF
		50	0.68µF 2.2µF
		25	1.5µF 4.7µF
	5.5X5.0	1k	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	1k	33000pF 47000pF
		630	68000pF 0.10µF
		250	0.33µF 0.47µF
	7.5X7.5	250	0.68µF 1.0µF
	7.5X8.0	1k	68000pF 0.10µF
		630	0.15µF 0.22µF
	7.5X12.5	250	2.2µF
	7.7X13.0	1k	0.22µF
		630	0.47µF

Powertrain/Safety (AEC-Q200) 150°C Max.

Temperature Compensating Type

RH

Power-train | AEC-Q200 | Deflecting crack | Soldering crack | Anti-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

Continued on the following page. ↗

High Dielectric Constant Type

RH

Power-train | AEC-Q200 | Deflecting crack | Soldering crack | Anti-noise

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

Safety Standard Certified for Automotive

Type KJ -IEC60384-14 X1/Y2 Class

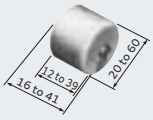
DE6

Power-train | AEC-Q200 | Safety standard

Series	D (mm)	Rated Voltage (V)	Capacitance Range (F)
DE6B3	8.0 to 9.0	AC300 (r.m.s.)	100pF – 680pF
DE6E3	7.0 to 12.0	AC300 (r.m.s.)	1000pF – 4700pF

High Voltage Ceramic Capacitors

Ultra-high-voltage



DHS

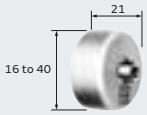
(in mm)

General | Ultrahigh-voltage

Series	LXW (mm)	Rated Voltage (Vdc)	Capacitance Range (F)
DHS4E	-	40k	140pF – 2000pF
		30k	190pF – 2700pF
		20k	280pF – 4000pF
		15k	370pF – 5300pF
		10k	560pF – 8000pF
DHSF4	-	40k	340pF – 2700pF
		30k	460pF – 3600pF
		20k	600pF – 4800pF

Capacitors

High Voltage AC Rated Type



DHK

(in mm)

General | Ultrahigh-voltage

Series	LXW (mm)	Rated Voltage (V)	Capacitance Range (F) 0.1p 1p 10p 100p 1000p 10000p 0.1μ 1μ 10μ 100μ 1000μ
DHK3V	-	AC10k (r.m.s.)	100pF – 1000pF

Polymer Aluminum Electrolytic Capacitors

ECAS

General | Large Cap | Effective Cap

Series	LXW (mm)	Rated Voltage (Vdc)	Capacitance Range (F) 0.1p 1p 10p 100p 1000p 10000p 0.1μ 1μ 10μ 100μ 1000μ
ECASD	7.3X4.3	16	6.8μF – 47μF
		12.5	10μF – 100μF
		10	10μF – 150μF
		6.3	10μF – 330μF
		4	68μF – 330μF
		2	100μF – 560μF

Trimmer Capacitors

Trimmer Capacitors are variable capacitance capacitors, used for adjusting characteristics of electronic equipment.

Mounting Method	Soldering Method	Series	Max. Height	Size (WXL)	Rated Voltage	Operating Temperature Range	Remarks
Surface Mounting	Reflow Soldering Methods	 TZR1	0.9mm max.	1.5X1.7mm	25V	-25 to 85°C	
		 TZY2	1.25mm max.	2.5X3.2mm	25V	-25 to 85°C	
		 TZC3	1.7mm max.	3.2X4.5mm	100V	-25 to 85°C	
		 TZW4	2.6mm max.	4.2X5.2mm	250V	-55 to 125°C	for High Frequency Power
		 TZB4_AA	3.2mm max.	4.0X4.5mm	100V/50V	-25 to 85°C	
		 TZB4_BA	3.2mm max.	4.0X4.5mm	100V/50V	-25 to 85°C	
	Flow Soldering Methods	 TZB4_AB	3.2mm max.	4.0X4.5mm	100V/50V	-25 to 85°C	with Cover Film
		 TZB4_BB	3.2mm max.	4.0X4.5mm	100V/50V	-25 to 85°C	with Cover Film

Please refer to p. 72 for Supercapacitors (EDLC).

Detailed Catalogs

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

- Chip Monolithic Ceramic Capacitors Cat. No. C02E
- Chip Monolithic Ceramic Capacitors for Automotive Cat. No. C03E
- Safety Standard Certified Ceramic Capacitors/ High Voltage Ceramic Capacitors Cat. No. C85E
- Ceramic Trimmer Capacitors Cat. No. T13E
- Polymer Aluminum Electrolytic Capacitors Cat. No. C90E
- Radial Lead Type Monolithic Ceramic Capacitors Cat. No. C49E
- High Performance Supercapacitors (EDLC) DMF Series Cat. No. O83E
- High Performance Supercapacitors (EDLC) DMT Series Cat. No. O84E

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 material, 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 ●AC Line Filters ●Ferrite Cores

Noise Suppression Filters (Chip Ferrite Bead)

			Series	Size Code inch (mm)	Max. Rated Current (mA)	Impedance (Ω) at 100MHz	Effective Frequency Range (Hz) (For Reference Only)
For General Band Noise	Universal Type [Power Lines / Signal Lines]		BLM02AX	01005 (0402)	750	10 70 120 240	
			BLM03AX	0201 (0603)	1000	10 80 120 240 600 1000	
			BLM15AX	0402 (1005)	1740	10 30 70 120 220 600 1000	
	Signal Lines Type	For General Signal Lines	BLM03AG	0201 (0603)	-	10 80 70 120 240 600 1000	
			BLM15AG	0402 (1005)	-	10 70 120 220 600 1000	
			BLM18AG	0603 (1608)	-	120 150 220 330 470 600 1000	
			BLM21AG	0805 (2012)	-	120 150 220 330 470 600 700 800 900 1000	
			BLM18TG	0603 (1608)	-	120 220 600 1000	
			BLA2AA (4 circuits array)	0804 (2010)	-	120 220 600 1000	
			BLA31AG (4 circuits array)	1206 (3216)	-	30 60 120 220 600 1000	
		For High Speed Signal Lines	BLM02BX*	01005 (0402)	-	120 150 240	
			BLM03BX	0201 (0603)	-	1800 1000	
			BLM03B	0201 (0603)	-	10 22 33 47 56 75 80 120 240 600 470	
			BLM15B	0402 (1005)	-	5 10 22 33 47 75 120 220 240 600 470 1800 1000	
			BLM18B	0603 (1608)	-	5 10 22 47 60 75 140 120 150 200 220 250 300 330 420 600 470 1500 1000 2200 1800 2500	
			BLM21B	0805 (2012)	-	5 60 75 120 150 200 220 250 300 330 420 350 470 600 750 1000 1500 1800 2200 2250 2700	
			BLA2AB (4 circuits array)	0804 (2010)	-	10 22 47 75 120 220 600 470 1000	
			BLA31BD (4 circuits array)	1206 (3216)	-	120 220 600 470 1000	
		For Digital Interface Lines	BLM18RK	0603 (1608)	-	120 220 600 470 1000	
			BLM21RK	0805 (2012)	-	120 220 600 470 1000	

* 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 (Ω) at 100MHz	Effective Frequency Range (Hz) (For Reference Only)
					10 100 1000	10k 100k 1M 10M 100M 1G 10G
For General Band Noise	Power Lines Type	BLM02PX*	01005 (0402)	1100	10(1.1A) 22(0.75A) 60 (0.5A) 33 (0.55A)	
		BLM03PX*	0201 (0603)	1800	33 (1.5A) 22 (1.8A) 80 (1A)	
		BLM03PG	0201 (0603)	900	33 (0.75A) 22 (0.9A)	
		BLM15P*	0402 (1005)	3000	33(3A) 80(1.5A/2.3A) 180(1.5A) 220(1.4A) 470(1A) 10(1A) 30(2.2A) 60(1.7A/2.5A) 120(1.3A/2A) 330(1.2A) 600(0.9A)	
		BLM18PG*	0603 (1608)	3000	33 (3A) 120 (2A) 220 (1.4A) 470 (1A) 30 (1A) 60 (0.5A) 180 (1.5A) 330 (1.2A)	
		BLM21PG*	0805 (2012)	6000	30 (4A) 220 (2A) 22 (6A) 60 (3.5A) 120 (3A) 330 (1.5A)	
		BLM31PG*	1206 (3216)	6000	50 (3.5A) 390 (2A) 33 (6A) 120 (3.5A) 600 (1.5A)	
		BLM41PG*	1806 (4516)	6000	75 (3.5A) 470 (2A) 60 (6A) 180 (3.5A) 1000 (1.5A)	
		BLM18SN* (Low DC Resistance Type)	0603 (1608)	8000	22 (8A)	
		BLM18KG* (Low DC Resistance Type)	0603 (1608)	6000	30 (5A) 70 (3.5A) 220 (2.2A) 470 (1.5A) 26 (6A) 100 (3A) 120 (3A) 330 (1.7A) 600 (1.3A)	
		BLM18SG* (Low DC Resistance Type)	0603 (1608)	6000	70 (4A) 220 (2.5A) 26 (6A) 120 (3A) 330 (1.5A)	
		BLE32PN	1220 (3225)	10000	30 (10A)	
For GHz Band Noise	Universal Type [Power Lines / Signal Lines]	BLM03EB*	0201 (0603)	600	25 (0.6A) 50 (0.4A)	
		BLM15EG*	0402 (1005)	1500	220 (0.7A) 120 (1.5A)	
		BLM15EX*	0402 (1005)	1800	220 (1.3A) 120 (1.8A) 330 (1.1A) 470 (0.95A)	
		BLM18EG*	0603 (1608)	2000	120(2A) 330(0.5A) 470(0.5A) 100(2A) 220(2A/1A) 390(0.5A) 600(0.5A)	
		BLM18HE*	0603 (1608)	800	1000(0.6A) 600(0.8A) 1500(0.5A)	
	Signal Lines Type	BLM03HG	0201 (0603)	-	1000 600 1200	
		BLM03HD	0201 (0603)	-	600 330 470 1000	
		BLM03HB	0201 (0603)	-	190	
		BLM15HG	0402 (1005)	-	600 1000	
		BLM15HD	0402 (1005)	-	600 1000 1800	
		BLM15HB	0402 (1005)	-	120 220	
		BLM18HG	0603 (1608)	-	600 470 1000	
		BLM18HD	0603 (1608)	-	600 470 1000	
		BLM18HB	0603 (1608)	-	120 220 330	
		BLM18HK	0603 (1608)	-	600 330 470 1000	
For High-GHz Band Noise	Signal Lines Type	BLM15GG	0402 (1005)	-	220 470	
		BLM15GA	0402 (1005)	-	75	
		BLM18GG	0603 (1608)	-	470	

Noise Suppression Filters (Chip 3 Terminal Capacitor)

	Series	Size Code inch (mm)	Max. Rated Current (mA)	Capacitance (F)	Effective Frequency Range (Hz) (For Reference Only)
				10p 100p 1000p 10000p 0.1µ 1µ 10µ	10k 100k 1M 10M 100M 1G 10G
Signal Lines Type	NFM15CC	0402 (1005)	-	2200 22000	
	NFM18CC	0603 (1608)	-	470 2200 22 47 100 220 1000 22000	

* 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. ↗

Noise Suppression Products/EMI Suppression Filters

	Series	Size Code inch (mm)	Max. Rated Current (mA)	Capacitance (F) 10p 100p 1000p 10000p 0.1µ 1µ 10µ	Effective Frequency Range (Hz) (For Reference Only) 10k 100k 1M 10M 100M 1G 10G
Signal Lines Type	NFM21CC	0805 (2012)	-	22 47 100 220 470 1000 2200 22000	
	NFM3DCC	1205 (3212)	-	22 47 100 220 470 1000 2200 22000	
	NFM41CC	1806 (4516)	-	22 47 100 220 470 1000 2200 22000	
	NFA31CC (4 circuits array)	1206 (3216)	-	22 47 100 220 470 1000 2200 22000	
Power Lines Type	NFM15PC	0402 (1005)	2000	0.1 0.47 1.0 4.3 7.5 9.1 47000	
	NFM18PS	0603 (1608)	2000	0.47 1.0	
	NFM18PC	0603 (1608)	4000	0.1 0.47 1.0 2.2	
	NFM21PS	0805 (2012)	4000	10	
	NFM21PC	0805 (2012)	6000	0.1 0.47 1.0 2.2 4.7	
	NFM3DPC*	1205 (3212)	2000	22000	
	NFM31PC	1206 (3216)	6000	27	
	NFM31KC*	1206 (3216)	10000	15000 22000 0.1	
	NFM41PC	1806 (4516)	6000	0.2 1.5	
Universal Type [Power Lines / Signal Lines]	NFE31PT	1206 (3216)	6000	22 47 100 220 470 1500 2200	
	NFE61PT	2706 (6816)	2000	33 68 100 180 360 680 1000 4700	

Noise Suppression Filters (Chip LC/RC Filter)

	Series	Size Code inch (mm)	Max. Rated Current (mA)	Cut-off Frequency (MHz) 10 100 500	Effective Frequency Range (Hz) (For Reference Only) 10k 100k 1M 10M 100M 1G 10G
Signal Lines Type	NFL15ST	0402 (1005)	-	150 200 300 500	
	NFL18ST	0603 (1608)	-	50 70 100 200 300 500	
	NFL18SP	0603 (1608)	-	150 200 300 500	
	NFL21SP	0805 (2012)	-	10 20 50 70 100 150 200 300 400 500	
	NFA18SL (4 circuits array)	0603 (1608)	-	50 130 180 200 220 300 350 400 480	
	NFA18SD (4 circuits array)	0603 (1608)	-	180 200	
	NFA21SL (4 circuits array)	0805 (2012)	-	50 80 200 280 300 310 330	
	NFW31SP	1206 (3216)	-	10 20 50 100 150 200 300 400 500	
	NFR21GD	0805 (2012)	-		
	NFA31GD (4 circuits array)	1206 (3216)	-		

Noise Suppression Filters (Chip EMIFIL®)

	Series	Size Code inch (mm)	Max. Rated Current (mA)	Impedance (Ω) at 1MHz 1 10 100 1000	Effective Frequency Range (Hz) (For Reference Only) 10k 100k 1M 10M 100M 1G 10G
Signal Lines Type	NFZ5BBW_LN10	2020(5050)	-	2.9 4.5 6.7 7.6 10 14 17 22 31 45 52 61 97 140	
Universal Type [Power Lines / Signal Lines]	NFZ2HBM_10	1008 (2520)	1200	1.5 2.9 4.4 6.1 8.4 11 17 24 33 60	
	NFZ32BW_10*	1210 (3225)	2550	3.6 7.4 9.0 15 21 32 42 70 110 150 220 290 450 620 880	
	NFZ32BW_11*	1210 (3225)	2900	3.3 6.8 8.4 9.8 12 19 21 31 52 65 100 150	

* 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."

	Series	Size Code inch (mm)	Max. Rated Current (mA)	Impedance (Ω) at 100MHz	Effective Frequency Range (Hz) (For Reference Only)
				100 1000	10k 100k 1M 10M 100M 1G 10G
Signal Lines Type	NFZ32SW_10	1210 (3225)	-	300 900	
Universal Type [Power Lines / Signal Lines]	NFZ18SM_10	0603 (1608)	1250	120	
	NFZ2MSM_10	0806 (2016)	4000	100 180 300 600	

	Series	Size Code inch (mm)	Max. Rated Current (mA)	Impedance (Ω) at 900MHz	Impedance (Ω) at 1.7GHz	Effective Frequency Range (Hz) (For Reference Only)
				100 1000 5000	100 1000 5000	10k 100k 1M 10M 100M 1G 10G
Signal Lines Type	NFZ15SG_10	0402 (1005)	-	1500 4600 770 2600	1200 1800 900 1450	
	NFZ15SG_11	0402 (1005)	-	150 100 330	250 160 540	

Noise Suppression Filters (Chip Common Mode Choke Coil)

		Series	Size Code inch (mm)	Max. Rated Current (mA)	Common Mode Impedance (Ω) at 10MHz	Effective Frequency Range (Hz) (For Reference Only)
					100 500 1000	100k 1M 10M 100M 1G 10G
Signal Lines Type	For Audio Lines	DLM11G	0504 (1210)	-	600	
	For Ultra-High-Speed Signal Lines	DLM0QSN	025020(0605)	-	90	
		DLM0NSN	03025 (0806)	-	90	
		DLM11S	0504 (1210)	-	45 90	
		DLP0QSA	025020(0605)	-	15 7 35	
		DLP0NSC	03025 (0806)	-	28 90	
		DLP0NSN	03025 (0806)	-	35 90 67 120	
		DLP0NSA	03025 (0806)	-	15 7	
		DLP11SN	0504 (1210)	-	67 240 90 120 160 200 280 330	
		DLP11SA	0504 (1210)	-	35 90 67	
		DLP11RN	0504 (1210)	-	45	
		DLP11RB	0504 (1210)	-	15 40	
		DLP11TB	0504 (1210)	-	80	
		DLP31S	1206 (3216)	-	120 220 550	
		DLP1NDN (2 circuits array)	05025 (1506)	-	35 90 67	
		DLP2ADA (2 circuits array)	0804 (2010)	-	35 90 67	
		DLP2ADN (2 circuits array)	0804 (2010)	-	90 240 67 120 160 200 280	
		DLP31DN (2 circuits array)	1206 (3216)	-	90 130 200 320 440	
		DLW21S	0805 (2012)	-	90 490 67 120 180 260 370 500 920	
		DLW21H	0805 (2012)	-	90 67 120 180	
		DLW31SN	1206 (3216)	-	90 160 260 600 1000 2200	
		DLW43SH	1812 (4532)	-		
Universal Type [Power Lines / Signal Lines]		DLW44S*	1515 (4040)	3100	100 850 2200 250 400 1700 2400	
		DLW5AH/DLW5BS*	2014 /2020 (5036)/(5050)	5000	500 800 1500 4000 190 350 600 1000 3000	
		DLW5AT*/DLW5BT*	2014 /2020 (5036)/(5050)	6000	50 110 230 330 500 1000 1400 100 150 250 400 850 1100 2700	

* 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.↗

Noise Suppression Products/EMI Suppression Filters

	Series	Size Code inch (mm)	Max. Rated Current (mA)	Common Mode Impedance (Ω) at 10MHz	Effective Frequency Range (Hz) (For Reference Only)
Large Current Type for Automotive Available	PLT5BP*	2020(5050)	-	100 200 300 500	100k 1M 10M 100M 1G 10G
	PLT10H*	-	-	45 100 400 500 900 1000	

Noise Suppression Filters (Block Type)

		Series	Height (mm)	Rated Voltage (Vdc)	Rated Current (A)	Effective Frequency Range (Hz) (For Reference Only)
Power Lines Type	SMD Type	BNX022*	3.1	50	10	10k 100k 1M 10M 100M 1G 10G
		BNX023*	3.1	100	15	
		BNX024*	3.5	50	15	
		BNX025*	3.5	25	15	
		BNX026*	3.5	50	15	
		BNX027*	3.5	16	15	
		BNX028*	3.5	16	15	
		BNX029*	3.5	6.3	15	
	Lead Type	BNX002	13 max.	50	10	
		BNX003	13 max.	150	10	
		BNX005	13.5 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."

ESD Protection Devices

Support ESD protection for various kinds of electronic devices.

Ceramic ESD Protection Devices LXES_A Series

Applying Murata's original ceramic technology for excellent ESD suppression performance and ultra-small capacitance value.


Silicon ESD Protection Devices LXES_B Series

Applying accumulated design technology for excellent ESD suppression performance.





Silicon ESD Protection Devices LXES_T Series

Applying accumulated design technology for excellent ESD suppression performance.


ESD Protection Devices with Common Mode Choke Coil LXES_D Series

Applying Murata's original ceramic technology for excellent ESD suppression performance, small capacitance value, and common mode filter performance.


Noise Suppression Filters (Lead Type), Others

	Series	Effective Frequency Range (Hz) (For Reference Only) 10k 100k 1M 10M 100M 1G 10G
Lead Type EMIFIL®	 BLL18AG  BL01  BL02  BL03  DSS1  DSN6  DSN9(H)  DSS6  DST9(H)	
EMIGUARD®	 VFC2H  VFR3V  VFS6V  VFS9V	
AC Line Filters — Common Mode Choke Coil	 PLA10AN  PLA10AH  PLH10AN	
AC Line Filters — Hybrid Common Mode Choke Coil	 PLY10AN  PLY10AH  PLY17BN	
Common Mode Choke Coils	 PLT09H	
Microwave Absorbers	 EA10  EA20/21/30	
Ferrite Core	FSRH FSRB  FSRC  FSSA	

Detailed Catalogs

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

- SMD/BLOCK Type EMI Suppression Filters EMIFIL® Cat. No. C31E
- EMI Suppression Filters (for DC)/Chip Inductors for Automotive Cat. No. C51E
- EMI Suppression Filters (Lead Type EMIFIL®) Cat. No. C30E
- EMI Suppression Filters (EMIFIL®) for AC Power Lines Cat. No. C09E
- 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
- Ferrite Core for EMI Suppression Microwave Absorber Cat. No. O63E

Inductors (Coils)

Broad lineup of Chip Inductors and Power Inductors

Summary

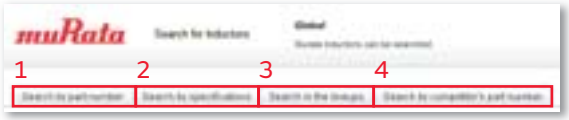
Murata's chip inductors are optimally designed, making full use of multiple construction techniques, such as the multilayer construction technique, film construction technique, and the wire wound construction technique according to the application, and realized small size and high-performance inductors. We offer an extensive lineup of inductors for power supplies to high frequency.

Lineup

●RF Inductors ●RF Inductors/For Power Lines
●For Power Lines/General Circuit Inductors

http://psearch.en.murata.com/inductor/partnumber/

WEB Product Search Engine



1 Search by part number

The applicable inductors can be searched by alphanumeric characters.

2 Search by specifications

Inductors can be searched by various specifications, such as the Inductance, DC Resistance, and Rated Current.

3 Search in the lineups

Inductors applicable to the conditions can be searched from the lineup of each series.

Lineup chart-in Series page

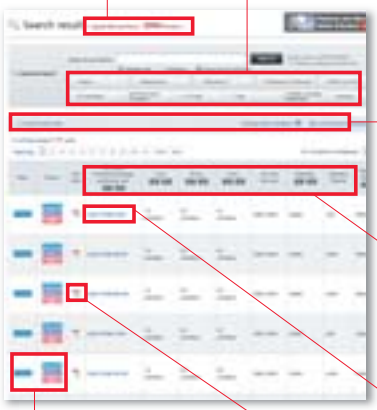
4 Search by competitor's part number (Cross reference)

The Murata part number applicable to the assumed specification can be searched by the competitor's part number for the Inductors.

Search result

The number of cases applicable to the current search conditions is always displayed in real time.

Click each search condition button to display the menu. The search results will change in real time with the selected conditions.



Clicking the "Current search conditions" opens a menu, and the filtered conditions can be checked.

The results can be sorted by clicking the ▲ button of the search results items.

Clicking the product name opens the details page, and more detailed information can be acquired.

The icons clearly indicate the status and the features of the product.

A simple specification sheet can be downloaded without opening the details page.

RF Inductors

Film Type LQP Series

The film inductors in the LQP series have a different set of features, since micromachining of the coil patterns is enabled by forming the electrodes using a photolithography technique. The inductors can have smaller sizes and high Q characteristics, while at the same time the series offers a lineup of inductors with inductance values that both deviate minimally and are finely graded. The lineup consists of a wide range of inductors in the 0201/0603 size, which is becoming the mainstream, and in the 01005/0402 size, which is the smallest in the industry, both sizes support the trend toward miniaturized sizes. These inductors are used in the matching and resonance circuits of RF units that require miniaturized sizes, minimal tolerance in inductance, and finely graded inductance levels. They are also used in choke circuits that demand miniaturized sizes and low Rdc.

Features

· Ultra-miniature size

· High Q value and small size

The feature of the film type is also the Q factor, which is higher than the monolithic method that is adopted by other companies in the same industry. Murata offers the film type in the small 0201/0603 size and the 01005/0402 size. (Figure 1)

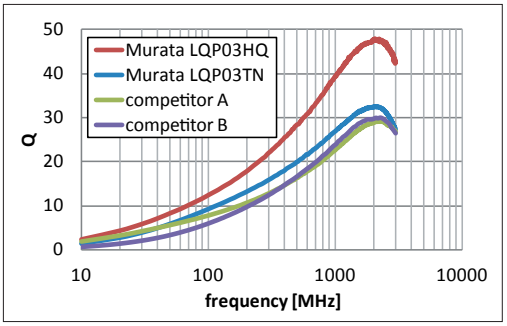


Figure 1: Comparison of Q Characteristics between 0603 Size, LQP03 Series and Monolithic Products of Other Companies (both 10 nH)

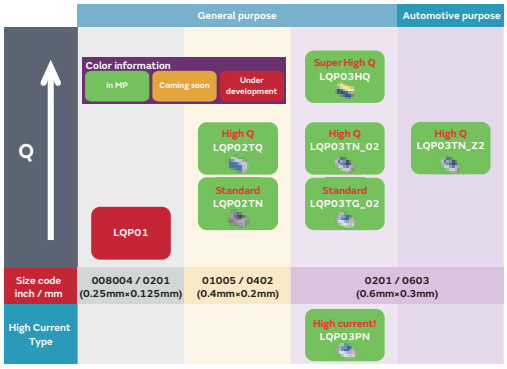


Figure 2: Lineup of Small Products

· Minimal tolerance in inductance, finely graded inductance levels

The tolerance between the monolithic structure and the film structure products of high frequency coils and L value lineup are shown in the following table. Compared with the monolithic type, the position accuracy of the film type is more accurate when forming the coil. Therefore, there is less variation in the L value, which allows for less tolerance and tighter steps.

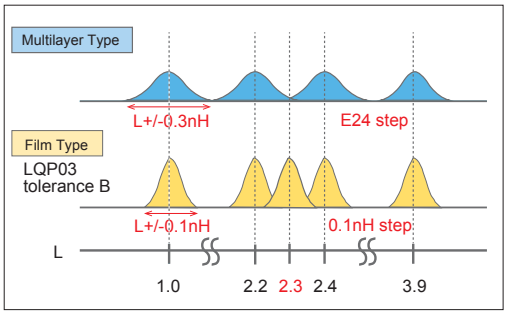


Figure 3: Step and Tolerance of Inductance

Uses and Applications

· Matching circuts of power amplifiers, RF matching circuits that require small sizes, minimal tolerance in inductance and high Q

Continued on the following page. ↗

General

Series	Size Code inch (mm)	Applications	Inductance (H) 0.1n 1n 10n 100n 1µ 10µ 100µ 1m 10m	Rated Current Range
LQP	01005 (0402)	General	0.2nH – 39nH	90mA to 990mA
	0201 (0603)	General	0.1nH – 270nH	50mA to 1.4A
	0402 (1005)	General	1nH – 33nH	60mA to 400mA
	0603 (1608)	General	1.3nH – 100nH	50mA to 300mA

Automotive

Series	Size Code inch (mm)	Applications	Inductance (H) 0.1n 1n 10n 100n 1µ 10µ 100µ 1m 10m	Rated Current Range
LQP	0201 (0603)	Infotainment	0.6nH – 120nH	80mA to 850mA

Multilayer Type LQG Series

The multilayer structure of the LQG series enables a smaller shape and lower cost than a wound structure.
While the Q factor is lower than that of the wire wound structure, the multilayer structure provides good overall balance between the L value tolerance, rated current, size, price, and other characteristics, enabling use in a wide range of applications.
The multilayer structure is suitable for various applications such as RF circuit matching, choke, and resonance for mobile communication equipment.
Based on the long market results, this product realizes high reliability to meet automotive market demands.

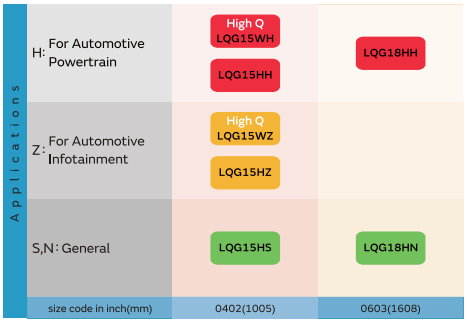
Features

· Lineup with a wide range of inductance values
· Higher reliability

Uses and Applications

· Matching circuits of RF units, choke circuits

Selection Tool



LQG series selection chart

General

Series	Size Code inch (mm)	Applications	Inductance (H) 0.1n 1n 10n 100n 1µ 10µ 100µ 1m 10m	Rated Current Range
LQG	0402 (1005)	General	1nH – 270nH	110mA to 1A
	0603 (1608)	General	1.2nH – 100nH	350mA to 1.1A

Automotive

Series	Size Code inch (mm)	Applications	Inductance (H) 0.1n 1n 10n 100n 1µ 10µ 100µ 1m 10m	Rated Current Range
LQG	0402 (1005)	Infotainment	1nH – 270nH	110mA to 1.2A
		PowerTrain	1nH – 270nH	110mA to 1.2A
	0603 (1608)	PowerTrain	1.2nH – 270nH	200mA to 1.1A

RF Inductors/For Power Lines

Wire Wound Type LQW Series

The wire wound inductors in the LQW series feature a high Q value. Inductors with high Q values are used in the matching circuits of RF units because their high Q values give them excellent attenuation characteristics inside the pass band of the filters. They are also frequently used in the matching applications of antennas for maintaining the transmission and reception sensitivity of the antennas. Furthermore, since they have low Rdc characteristics, they are also employed in choke circuits in which high current levels flow.

Features

· Two types of structure are available for various applications (Figure 1)
· Extremely high Q (Quality factor) value
The frequency characteristics of the Q are shown in the graph by structure (wire wound, monolithic) of high frequency coil 1005 size. As shown in Figure 2, the feature of the wire wound type is the very high Q factor compared with the monolithic type.
· Large currents can be supported

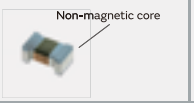
	Wound inductor for high frequency	Wound inductor for power lines / general circuits
Structure		
Features	Owing to its thick coil wire rather than film type or multilayer type inductors, it gains very high Q values.	The process of winding on a magnetic core enables the gain inductance and inpedance efficiently. According to this advantage, this product can be used as a high current, high performance noise filter.
Appli-cation	・RF matching circuits or antenna matching circuits, which require high Q characteristics.	・Noise suppression in power lines ・Radiation noise suppression in audio lines ・NFC circuits

Figure 1: Features of Each Wound Inductor

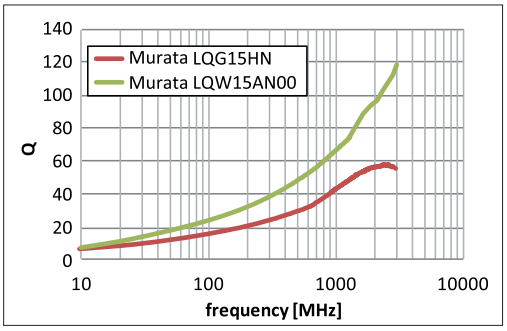
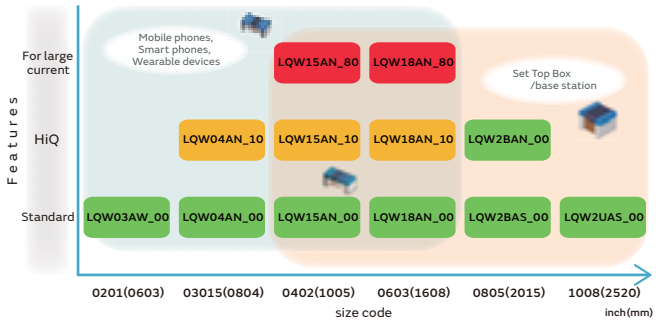


Figure 2: Comparison of Q Characteristics between Monolithic LQG15 Series and Wire Wound LQW15 Series (both 2.7 nH)

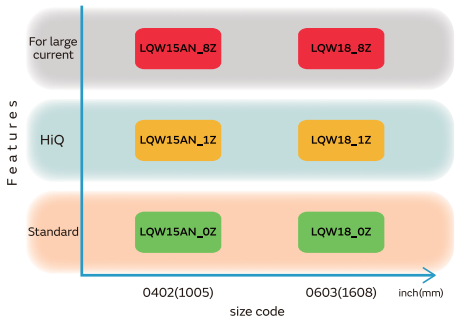
Uses and Applications

· RF matching circuits requiring Q value characteristics, choke circuits that support large currents levels, antenna matching circuits

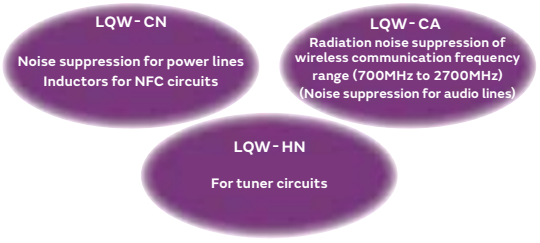
Selection Tool



Selection chart of non-magnetic core wound inductors for general applications



Selection chart of non-magnetic core wound inductors for automotive applications



Classification of RF circuits non-magnetic core wound inductors

Continued on the following page. ↗

General

Series	Size Code inch (mm)	Applications	Inductance (H) 0.1n 1n 10n 100n 1µ 10µ 100µ 1m 10m	Rated Current Range
LQW	0201 (0603)	General	1nH – 16nH	230mA to 900mA
	03015 (0804)	General	1.1nH – 510nH	140mA to 990mA
	0402 (1005)	General	1.3nH – 2000nH	110mA to 3.15A
	0603 (1608)	General	1.6nH – 650nH	75mA to 3.2A
	0805 (2012)	General	470nH – 2200nH	75mA to 160mA
	0805 (2015)	General	2.7nH – 820nH	160mA to 3.8A
	1008 (2520)	General	12nH – 4700nH	260mA to 1A
	1206 (3216)	General	8.8nH – 100nH	230mA to 750mA

Automotive

Series	Size Code inch (mm)	Applications	Inductance (H) 0.1n 1n 10n 100n 1µ 10µ 100µ 1m 10m	Rated Current Range
LQW	0402 (1005)	Infotainment	1.3nH – 120nH	110mA to 3.15A
	0603 (1608)	Infotainment	1.6nH – 470nH	75mA to 3.2A

For Power Lines/General Circuit Inductors

Multilayer Type LQM Series

The monolithic inductor consists of a sintered alternately layered ceramic material and coil conductor. Compared with the wound structure, small sizes/low profiles are possible.
Along with the progression of the high frequency of switching frequencies, the required inductance of the monolithic inductor for power inductors where mobile phones are the main market tends to be deteriorating, and cases where the monolithic inductor can be applied are expected to increase further.

Features

· Ideal for small size/low profile areas
· Magnetic shielded structure

Uses and Applications

· Mobile phones, digital cameras, TVs, HDD, game machines

Wire Wound Type LQH Series

The wire wound inductor consists of a copper wire spirally wound around the ferrite core. Most wire wound inductors for power circuits are coated with various resins over the copper wire wound around the ferrite core. The purpose of the coating resin is to improve the strength of the product.
The merits of using a wire wound product are demonstrated when used in large current areas and high inductance areas. The applicable markets vary from mobile phones to TVs and digital cameras.

Features

· Lineup of various sizes
· Can be used for high inductance values, and is ideal for power supply booster circuits.

Uses and Applications

· Mobile phones, digital cameras, TVs, HDD, game machines

Chip Inductors -Series Lineup by Chip Size

Size Code inch (mm)	0603 (1608)	0805 (2012)	0806 (2016)	1008 (2520)	1212 (3030)	1206 (3216)	1210 (3225)	1812 (4532)	1515 (4040)	2020 (5050)	2220 (5750)	2525 (6363)
Multilayer Type (Ferrite Core)	LQM18	LQM21	LQM2M	LQM2H		LQM31	LQM32					
Wire wound Type (Ferrite Core)			LQH2M	LQH2H	LQH3N	LQH31	LQH32	LQH43	LQH44	LQH5B	LQH55	LQH66

Continued on the following page. ↗

General (Multilayer Type LQM Series)

Series	Size Code inch (mm)	Thickness (mm/max.)	Applications	Inductance (H) 0.1n 1n 10n 100n 1µ 10µ 100µ 1m 10m	Rated Current Range
LQM	0603 (1608)	Less than 1.0	General	0.047µH – 10µH	15mA to 1.4A
		1.0 to 1.2	General	1µH – 3.3µH	1.05A
	0805 (2012)	Less than 1.0	General	0.24µH – 2.2µH	600mA to 2.4A
		1.0 to 1.2	General	0.1µH – 10µH	15mA to 2.4A
		Greater than 1.2	General	2.7µH – 47µH	7mA to 120mA
	0806 (2016)	Less than 1.0	General	0.24µH – 2.2µH	1.1A to 2.6A
		1.0 to 1.2	General	0.16µH – 4.7µH	1A to 4A
	1008 (2520)	Less than 1.0	General	0.24µH – 2.2µH	1.3A to 3A
		1.0 to 1.2	General	0.24µH – 4.7µH	800mA to 3.3A
	1206 (3216)	Less than 1.0	General	0.47µH – 4.7µH	700mA to 1.4A
	1210 (3225)	1.0 to 1.2	General	1µH	1.8A

General (Wire Wound Type LQH Series)

Series	Size Code inch (mm)	Thickness (mm/max.)	Applications	Inductance (H) 0.1n 1n 10n 100n 1µ 10µ 100µ 1m 10m	Rated Current Range
LQH	0806 (2016)	Less than 1.0	General	0.33µH – 82µH	90mA to 1.13A
	1008 (2520)	1.0 to 1.2	General	0.47µH – 100µH	130mA to 2.75A
		Greater than 1.2	General	2.2µH – 4.7µH	800mA to 1.25A
	1212 (3030)	1.0 to 1.2	General	0.47µH – 250µH	130mA to 2.86A
		Greater than 1.2	General	1µH – 100µH	240mA to 2.15A
	1206 (3216)	Greater than 1.2	General	0.054µH – 100µH	45mA to 970mA
	1210 (3225)	Greater than 1.2	General	0.15µH – 560µH	40mA to 2.9A
	1515 (4040)	1.0 to 1.2	General	0.68µH – 47µH	380mA to 2.5A
		Greater than 1.2	General	0.51µH – 470µH	145mA to 4.5A
	1812 (4532)	Greater than 1.2	General	0.56µH – 2400µH	25mA to 3.3A
	2020 (5050)	Greater than 1.2	General	0.47µH – 150µH	630mA to 4.6A
	2220 (5750)	Greater than 1.2	General	0.12µH – 10000µH	50mA to 6A
	2525 (6363)	Greater than 1.2	General	0.27µH – 10000µH	50mA to 6A

Automotive (Multilayer Type LQM Series)

Series	Size Code inch (mm)	Thickness (mm/max.)	Applications	Inductance (H) 0.1n 1n 10n 100n 1µ 10µ 100µ 1m 10m	Rated Current Range
LQM	0805 (2012)	Less than 1.0	Infotainment	0.47µH – 2.2µH	600mA to 1.1A
		1.0 to 1.2	Infotainment	0.47µH – 4.7µH	800mA to 1.3A
			PowerTrain	2.2µH	800mA
	0806 (2016)	1.0 to 1.2	Infotainment	0.47µH – 4.7µH	1.1A to 1.6A
	1008 (2520)	Less than 1.0	Infotainment	0.56µH	1.5A
		1.0 to 1.2	Infotainment	0.47µH – 4.7µH	800mA to 1.8A

Continued on the following page. ↗

Automotive (Wire Wound Type LQH Series)

Series	Size Code inch (mm)	Thickness (mm/max.)	Applications	Inductance (H) 0.1n 1n 10n 100n 1µ 10µ 100µ 1m 10m	Rated Current Range
LQH	0806 (2016)	Less than 1.0	Infotainment	0.33µH – 82µH	150mA to 1.13A
	1008 (2520)	1.0 to 1.2	Infotainment	0.47µH – 22µH	430mA to 2.75A
	1212 (3030)	1.0 to 1.2	Infotainment	0.47µH – 47µH	460mA to 2.86A
	1206 (3216)	Greater than 1.2	Infotainment	0.054µH – 0.88µH	180mA to 920mA
	1210 (3225)	Greater than 1.2	Infotainment	0.47µH – 330µH	60mA to 2.9A
			PowerTrain	0.15µH – 22µH	250mA to 2.9A
	1515 (4040)	1.0 to 1.2	Infotainment	0.68µH – 47µH	410mA to 2.5A
	1812 (4532)	Greater than 1.2	Infotainment	1µH – 2200µH	30mA to 3.3A
			PowerTrain	1µH – 220µH	240mA to 3.3A
	2020 (5050)	Greater than 1.2	Infotainment	0.47µH – 22µH	1.05A to 4A

Effective Use of Power Inductors

The product group of Murata's inductors for power circuits consists of the wire wound type and the monolithic type. For the applications of power inductors, Murata has prepared the "Murata Power Inductor Selection Tool," which can calculate and display the performance of inductors based on actual use conditions.
The application of power inductors greatly contributes to the loss of inductors in the conversion efficiency of a set.
The loss of inductors can also be estimated in the frequency and current values actually used, by using the "Murata Power Inductor Selection Tool." The inductors mounted in sets that increase the conversion efficiency of a power supply to the maximum can easily be selected.

URL: http://www.murata.com/products/inductor/chip/learn/apply/power

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

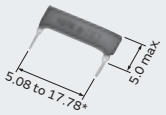
Using Murata's ceramic processing technology and unique material, we offer a series of resistor products.

Lineup

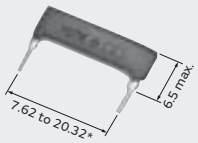
●High Voltage Resistors

High Voltage Resistors

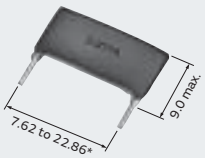
Featuring thick-film resistors, the Murata MHR series of high-voltage resistors is available in compact and thin SIP packages. Variants with small deviations are also available on request.



MHR03 Series



MHR04 Series



MHR06 Series

(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	500 to 1000	2 to 8	3 to 14	0.3 to 1.0
MHR04	1	1000	3.5 to 9	10 to 16	0.6 to 1.3
MHR06	1	1000	3.5 to 10	10 to 20	0.8 to 1.6

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

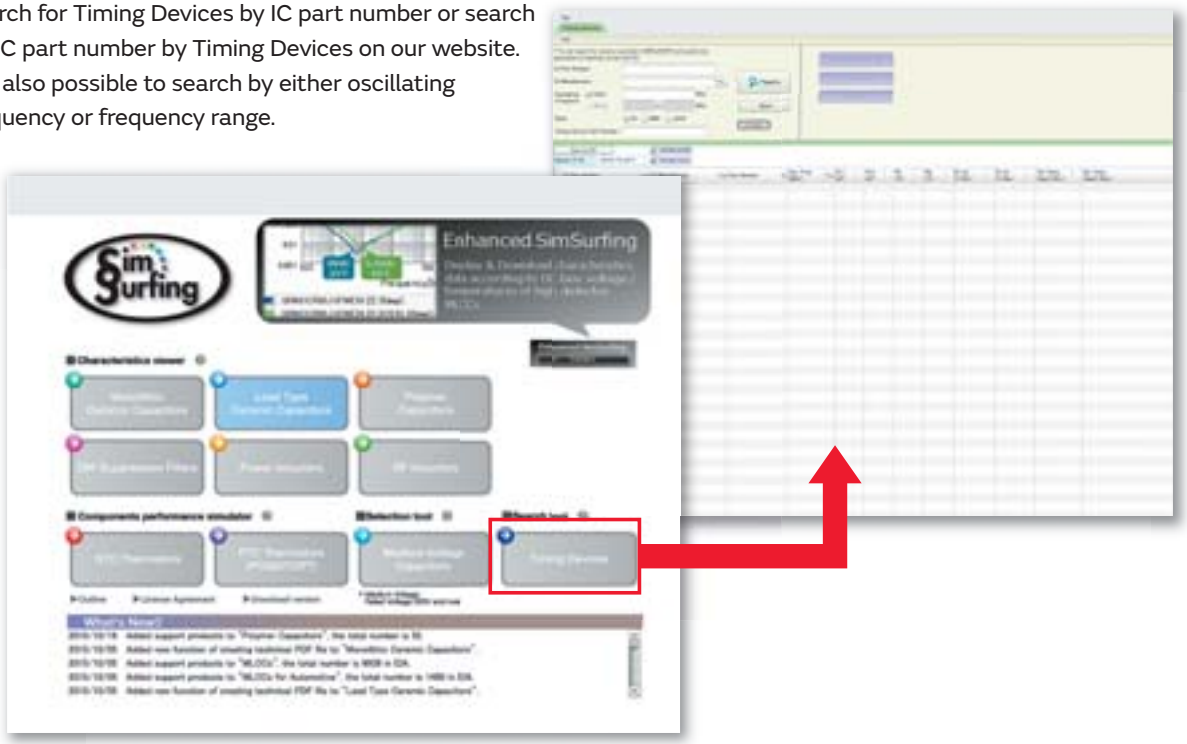
Murata's ceramic processing technology and unique piezoelectric material has led to the development of a range of small and thin ceramic timing devices that offer high oscillation frequency and remarkable oscillation tolerance.

Lineup

●Crystal Units ●Crystal Oscillators
●Ceramic Resonators CERALOCK®

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.



http://www.murata.com/simsurfing/

Detailed Catalogs

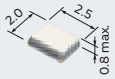
For more details, please refer to our printed catalogs and the PDF catalogs on our website.

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

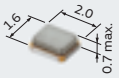
Crystal Units

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

For Automotive



XRCHA-F-A

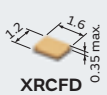


XRCGB-F-A

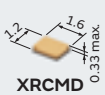
(in mm)

Series	Seal	Frequency (MHz)	Frequency Shift by Temperature (ppm max.)	Operating Temperature Range (°C)
XRCHA-F-A	Resin	16.0000±100ppm – 24.0000±100ppm	±100	-40 to 125
XRCGB-F-A	Resin	24.0000±30ppm – 29.9999±30ppm	±35	-40 to 125
		30.0000±50ppm – 48.0000±50ppm	±65	-40 to 125

For Consumer/Industrial



XRCFD



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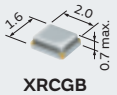
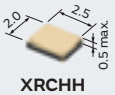
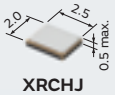


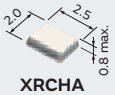
XRCGB



XRCHH



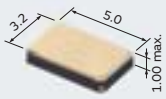
XRCHJ



XRCHA

XRCJH

XRCJK



XRCLH

XRCLK

(in mm)

Series	Seal	Frequency (MHz)	Frequency Shift by Temperature (ppm max.)	Operating Temperature Range (°C)
XRCFD	Metal	24.0000±10ppm – 31.9999±10ppm	±10	-20 to 70
XRCMD	Metal	32.0000±10ppm – 48.0000±10ppm	±10	-20 to 70
XRCGB-F-P	Resin	24.0000±20ppm – 32.0000±20ppm	±20	-30 to 85
XRCGB-F-M	Resin	24.0000±30ppm – 32.0000±30ppm	±40	-30 to 85
		33.8688±45ppm – 50.0000±45ppm	±40	-30 to 85
XRCGB-F-L	Resin	24.0000±100ppm – 50.0000±100ppm	±50	-30 to 85
XRCGB-F-Z	Resin	24.0000±100ppm – 50.0000±100ppm	±100	-40 to 105
XRCHH	Metal	16.0000±10ppm – 52.0000±10ppm	±15	-30 to 85
XRCHJ	Seam	16.0000±10ppm – 52.0000±10ppm	±15	-30 to 85
XRCHA-F-L	Resin	16.0000±100ppm – 23.9999±100ppm	±100	-30 to 85
XRCHA-F-Z	Resin	16.0000±100ppm – 23.9999±100ppm	±100	-40 to 105
XRCJH	Metal	13.0000±10ppm – 52.0000±10ppm	±15	-30 to 85
XRCJK	Seam	12.0000±10ppm – 52.0000±10ppm	±15	-30 to 85
XRCLH	Metal	10.0000±10ppm – 52.0000±10ppm	±15	-30 to 85
XRCLK	Seam	10.0000±10ppm – 52.0000±10ppm	±15	-30 to 85

Crystal Oscillators

We offer a varied lineup of Crystal Oscillators using highly reliable crystal units, circuit engineering, superior temperature compensation method and measurment fostered by our long experience and activity.

For Consumer/Industrial

XNCHH XNCJH XTCHH XTCJH XTCLH_E XTCLH_J

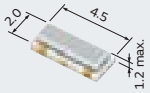
(in mm)

Series	Type	VC Function	Frequency (MHz) 1 5 10 20 30 40 50 70 100	Frequency Shift by Temperature (ppm max.)	Frequency Aging (ppm max./year)	Operating Temperature Range (°C)
XNCHH	TTS27NSC-A7	-	10.0000±1ppm — 52.0000±1ppm	±0.5	±1.0	-30 to 85
XNCJH	TTS18NSH-A7	-	10.0000±1ppm — 52.0000±1ppm	±0.5	±1.0	-30 to 85
XTCHH	TTS27VSC-A7	●	10.0000±1ppm — 52.0000±1ppm	±0.5	±1.0	-30 to 85
XTCJH	TTS18VSH-A7	●	10.0000±1ppm — 52.0000±1ppm	±0.5	±1.0	-30 to 85
XTCLH_E	TTS14VSE-A13	●	10.0000±1ppm — 40.0000±1ppm	±0.5	±1.0	-30 to 85
XTCLH_J	TTS14VSH	●	10.0000±0.5ppm — 52.0000±0.5ppm	±0.2	±0.5	-30 to 85

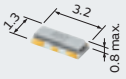
Ceramic Resonators CERALOCK®

Wide product lineup for automotive and consumer applications with SMD and lead package.

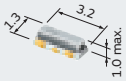
MHz Chip Type for Automotive (Tight Frequency Tolerance)



CSTCR_G15C



CSTCE_G15C

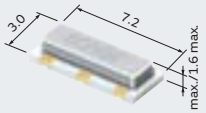


CSTCE_V13C

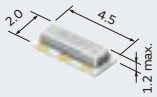
(in mm)

Series	Frequency (MHz) 1 2 3 4 5 6 7 8 9 10 20 30 40 50 70 100	Frequency Shift by Temperature (% max.)	Operating Temperature Range (°C)
CSTCR_G15C	4.00±0.1% – 7.99±0.1%	±0.13	-40 to 125
CSTCE_G15C	8.00±0.1% – 13.99±0.1%	±0.13	-40 to 125
CSTCE_V13C	14.00±0.1% – 20.00±0.1%	±0.13	-40 to 125

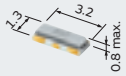
MHz Chip Type for Automotive (Standard Frequency Tolerance)



CSTCC_G_A



CSTCR_G_B



CSTCE_G_A

CSTCE_V_C

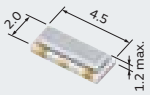
CSTCV_X_Q

CSACV_X_Q

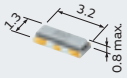
(in mm)

Series	Frequency (MHz) 1 2 3 4 5 6 7 8 9 10 20 30 40 50 70 100	Frequency Shift by Temperature (% max.)	Operating Temperature Range (°C)
CSTCC_G_A	2.00±0.5% – 3.99±0.5%	±0.4 (15pF) -0.6/+0.3 (47pF)	-40 to 125
CSTCR_G_B	4.00±0.5% – 7.99±0.5%	±0.15	-40 to 125
CSTCE_G_A	8.00±0.5% – 13.99±0.5%	±0.2	-40 to 125
CSTCE_V_C	14.00±0.5% – 20.00±0.5%	±0.15	-40 to 125
CSTCV_X_Q	20.01±0.5% – 70.00±0.5%	±0.3	-40 to 125
CSACV_X_Q (No built-in load capacitance)	20.01±0.5% – 70.00±0.5%	±0.3	-40 to 125

MHz Chip Type for Consumer Electronics (Tight Frequency Tolerance)

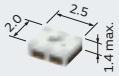


CSTCR_G15L



CSTCE_G15L

CSTCE_V13L

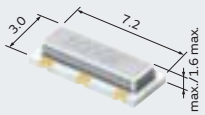


CSTCW_X11

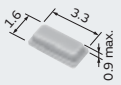
(in mm)

Series	Frequency (MHz)	Frequency Shift by Temperature (% max.)	Operating Temperature Range (°C)
CSTCR_G15L	4.00±0.1% – 7.99±0.1%	±0.08	0 to 70
CSTCE_G15L	8.00±0.1% – 13.99±0.1%	±0.08	0 to 70
CSTCE_V13L	14.00±0.1% – 20.00±0.1%	±0.08	0 to 70
CSTCW_X11	20.01±0.1% – 48.00±0.1%	±0.1	0 to 70

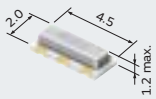
MHz Chip Type for Consumer Electronics (Standard Frequency Tolerance)



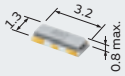
CSTCC_G



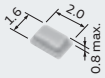
CSACN_G



CSTCR_G



CSTCE_G



CSACM_G

CSTCE_V

CSTCW_X

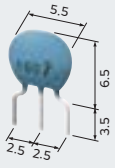
CSACW_X

(in mm)

Series	Frequency (MHz)	Frequency Shift by Temperature (% max.)	Operating Temperature Range (°C)
CSTCC_G	2.00±0.5% – 3.99±0.5%	±0.3 (15pF) ±0.4 (47pF)	-20 to 80
CSACN_G (No built-in load capacitance)	6.00±0.5%	-0.25/+0.2	-20 to 85
CSTCR_G	4.00±0.5% – 7.99±0.5%	±0.2	-20 to 80
CSTCE_G	8.00±0.5% – 13.99±0.5%	±0.2	-20 to 80
CSACM_G (No built-in load capacitance)	8.00±0.5%, 10.00±0.5%, 12.00±0.5%	-0.25/+0.2	-20 to 85
CSTCE_V	14.00±0.5% – 20.00±0.5%	±0.3	-20 to 80
CSTCW_X	20.01±0.5% – 70.00±0.5%	±0.2	-20 to 80
CSACW_X (No built-in load capacitance)	20.01±0.5% – 70.00±0.5%	±0.2	-20 to 80

MHz Lead Type for Consumer Electronics (Standard Frequency Tolerance)

CSTLS_G



CSTLS_X

(in mm)

Series	Frequency (MHz)	Frequency Shift by Temperature (% max.)	Operating Temperature Range (°C)
CSTLS_G	3.40±0.5% – 10.00±0.5%	±0.2 (15pF) -0.4/+0.2 (47pF)	-20 to 80
CSTLS_X	16.00±0.5% – 70.00±0.5%	±0.2	-20 to 80

Filters

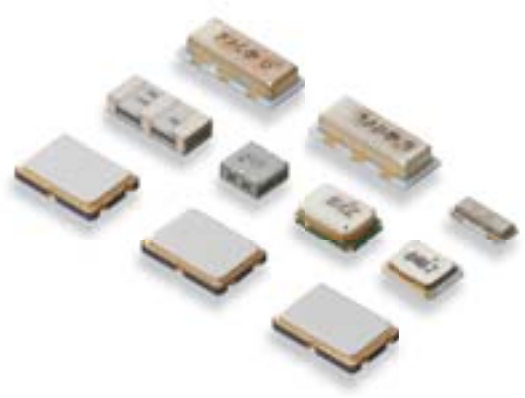
Broad lineup of Filters for video, audio, RF/Local, Duplexers, and Filters for IF

Summary

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

Lineup

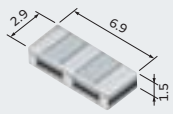
●Ceramic Filters CERAFIL® (Filters, Traps and Discriminators)
●Crystal Filters ●SAW Traps
●SAW Filters for Mobile Communications
●Dielectric Filters GIGAFIL® ●Chip Multilayer LC Filters



Ceramic Filters CERAFIL®

CERAFIL® 10.7MHz Chip Type

Small and lightweight filters for IF in communications or AV equipment using unique piezo-electric material.



SFECK / SFECV Series

(in mm)

Type	Series	3dB Bandwidth (kHz)		
		E	J	K
		330	150	110
High-reliability Type	SFECK10M7☐	-	●	●
Standard Type	SFECV10M7☐	-	●	●
Standard Type	SFECV15M0☐	●	-	-

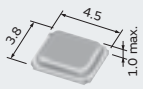
☐ is filled with the letter designating the required 3dB bandwidth.

SFECF Series

(in mm)

Type	Series	3dB Bandwidth (kHz)				
		D	E	F	G	H
		350	330	280	230	180
Standard Type	SFECF10M7☐	●	●	●	●	●

☐ is filled with the letter designating the required 3dB bandwidth.



SFSCE Series

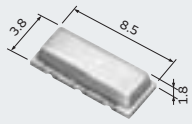
(in mm)

Type	Series	3dB Bandwidth (kHz) min.		
		03	04	05
		±500	±400	±325
Wide Bandwidth	SFSCE10M7WF☐☐	●	●	●

☐ is filled with the letter designating the required 3dB bandwidth.

CERAFIL® 2.3 to 6.5MHz Chip Type

SFSKA Series has distinctive features such as wide bandwidth and stable filter performance, enabling customers to design smaller products.
SFSKB Series is suitable for low frequency range.



SFSKA Series

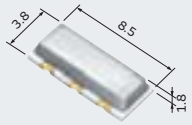
SFSKB Series

(in mm)

Series	Center Frequency (MHz)												3dB Bandwidth (kHz)
	2.3	2.8	3.2	3.8	4.3	4.5	4.8	5.2	5.5	5.7	6.0	6.5	
SFSKA	–	–	–	–	–	●	–	–	●	–	●	●	±60 min.
SFSKB	●	●	●	●	●	–	●	●	–	●	–	–	±75 min.

Ceramic Traps

The TPSKA Series has distinctive features such as high attenuation and high performance group delay time, enabling customers to design smaller products.



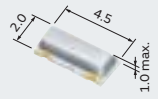
TPSKA Series

(in mm)

Series	Center Frequency (MHz)	Attenuation (dB)
TPSKA	4.500/5.500/6.000/6.500	35 min.

Ceramic Discriminators

In combination with ICs, this type obtains stable demodulation characteristics in a wide bandwidth.



CDSCB Series

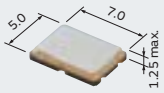
(in mm)

Series	Center Frequency
CDSCB	10.700MHz±30kHz

Recommended part number depends on IC specifications. Please contact us with the IC part number to be applied.

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

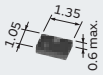
Series	Type	Frequency Range (MHz)	Number of Pole
XDCAF	TM7050F	20 to 80 [Fundamental] 70 to 150 [3rd overtone]	2
XDCAG	TM7050G		4
XDCAH	TM7050H		4

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

SAW Traps

Wide pass band width, Highly selective attenuation band, high performance, small size, chip size package

SAEEA / SAEEL Series



SAEEB Series

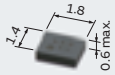
(in mm)

SAW Filters and SAW Duplexers must 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.

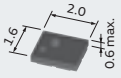
SAW Filters for Mobile Communications

SAW Duplexers

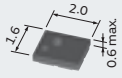
Low loss, high attenuation performance, small size, highly selective pass band, chip size package



SAYEY Series



SAYFH Series



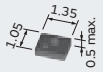
SAYRF Series

(in mm)

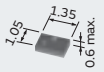
RF Filters

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

Single Filter



SAFEA Series

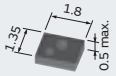


SAFEB Series

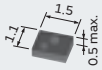
SAFFB Series

(in mm)

Dual Filter



SAWEN Series



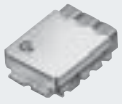
SAWFD Series

(in mm)

Dielectric Filters GIGAFIL®

Suitable for cellular base stations and other telecom infrastructure systems.
Custom parts within the range below are available upon request.

DFYH Series



DFCH Series

	Series	Frequency Range (MHz) 100 1000 2000 3000 4000 5000	Number of Resonators	Input Power Range
Duplexers	DFYH	700 – 2600	5 to 10	1 to 10W*
RF/IF/Local Filter	DFCH	600 – 3800	2 to 6	1 to 10W*

*Power depends upon specifications.

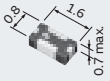
Characteristic customization is available. You can contact us also through our website.

Chip Multilayer LC Filters

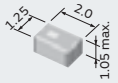
Ultra-small and low-profile filters based on ceramic multilayer technology.

Band Pass Filters

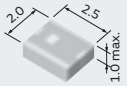
LFB15 Series



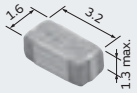
LFB18 Series



LFB21 Series



LFB2H Series

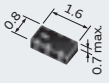


LFB31 Series

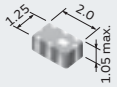
(in mm)

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®)/Crystal Filters 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.

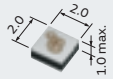
Lineup

●Isolators ●Baluns (Chip Multilayer and Wire Wound/ Film type) ●Couplers (Chip Multilayer and Film type) ●Chip Multilayer Hybrid Dividers ●Chip Multilayer Diplexers ●Microwave Coaxial Connectors ●Single Layer Microchip Capacitors ●Thin Film Circuit Substrate RUSUB®

Isolators

Passing signals in the forward direction and blocking signals in the reverse direction

For Mobile Phones



CEG23 Series

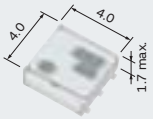
(in mm)

Series	Adaptive Frequency Range (MHz) 100 1000 2000 3000	Size (mm)	Rating Power (W)
CEG23	700 – 2600	2.0X2.0X1.0 max.	1.2 max.

For Base Stations

CES20 Series

CES30 Series



CES40 Series

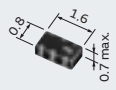
(in mm)

Series	Adaptive Frequency Range (MHz) 100 1000 2000 3000	Size (mm)	Rating Power (W)
CES20	1900 – 2600	3.2X2.5X1.2 max.	5 max.
CES30	1700 – 2200	3.2X3.2X1.6 max.	5 max.
CES40	800 – 950	4.0X4.0X1.7 max.	5 max.

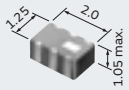
Baluns

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

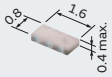


LDB18 Series



LDB21 Series

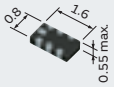
LDM15 Series



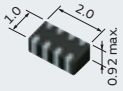
LDM18 Series

(in mm)

Film Type



DXP18B Series

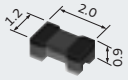


DXP2AB Series

(in mm)

Wire Wound Type

DXW21B Series



DXW21H Series

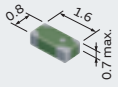
(in mm)

Couplers

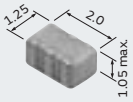
An ultra-small, low-profile directional coupler based on ceramic multilayer technology.
This coupler achieves ultra-small size, low insertion loss, and high isolation.

Chip Multilayer Type

LDC15 Series



LDC18 Series



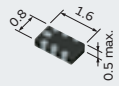
LDC21 Series

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

LDC32 Series
(3dB Hybrid)

(in mm)

Film Type

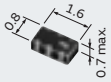


DXP18C Series

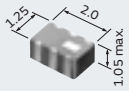
(in mm)

Chip Multilayer Hybrid Dividers

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



LDD18 Series

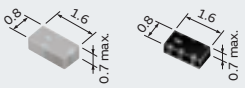


LDD21 Series

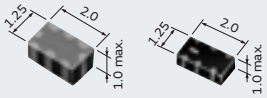
(in mm)

Chip Multilayer Diplexers

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



LFD18 Series



LFD21 Series

(in mm)

Microwave Coaxial Connectors

Microwave Coaxial Cable Connectors

The mating height is only 1.0mm maximum due to our new mechanical design.
Suitable for low profile design.

MM4829-2702

MXHP32_____

MM5829-2700

MXJA01_____

MM6829-2700

MXKGB3_____

MM7829-2700

MXLAB3_____

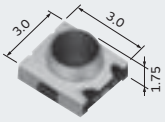
(in mm)

Type	Receptacle Part Number	Rated Voltage (Vrms)	Frequency Rating (GHz)	Temperature Range	VSWR	Cable Number	Mating Height (mm)
HSC	**MM4829-2702**	30	to 6	-40 to 85°C	1.3 max. (DC to 3GHz)	**MXHP32_____**	1.2 max.
JSC	**MM5829-2700**	30	to 12	-40 to 85°C	1.3 max. (DC to 3GHz)	**MXJA01_____**	1.0 max.
KSC	**MM6829-2700**	30	to 6	-40 to 85°C	1.3 max. (DC to 3GHz)	**MXKGB3_____**	0.8 max.
LSC	**MM7829-2700**	30	to 6	-40 to 85°C	1.3 max. (DC to 3GHz)	**MXLAB3_____**	0.8 max.

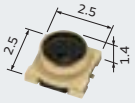
Nominal Impedance: 50Ω

Microwave Coaxial Connectors with Switch

The coaxial connector with switch is very useful for characteristic measurement in cellular phones and microwave circuits.



MM8430-2610



MM8130-2600

MM8030-2610

MM8930-2600

MM8830-2600

(in mm)

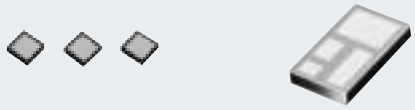
Type	Receptacle Part Number	Rated Voltage (Vrms)	Frequency Rating (GHz)	Temperature Range	VSWR	Standard Measurement Probe Part Number
SWD	**MM8430-2610**	30	to 6	-40 to 85°C	1.2 max. (DC to 3GHz)	**MM126320 MXHS83QE3000**
SWF	**MM8130-2600**	30	to 6	-40 to 85°C	1.2 max. (DC to 3GHz)	
SWG	**MM8030-2610**	30	to 11	-40 to 85°C	1.2 max. (DC to 3GHz)	**MM126320 MXHQ87WJ3000**
SWH	**MM8930-2600**	30	to 6	-40 to 85°C	1.2 max. (DC to 3GHz)	**MM126515 MXHQ87PA3000**
SWJ	**MM8830-2600**	30	to 6	-40 to 85°C	1.2 max. (DC to 3GHz)	**MM126715 MXHQ87PK3000**

Nominal Impedance: 50Ω

Single Layer Microchip Capacitors

Very reliable performance and excellent frequency characteristics

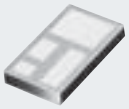
Temperature Compensation Type



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)
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	0.5X0.5	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	0.3 1.0	-55 to 125
	CLB0G	0.7X0.5	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	0.4 1.3	-55 to 125
	CLB09	0.9X0.9	100	0.5 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	1.0 3.6	-55 to 125
	CLB1E	1.49X0.9	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	1.8 6.8	-55 to 125
	CLB2C	2.19X1.27	100	5.1	-55 to 125
	CLB2E	2.29X2.29	100	3.0 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	0.5X0.5	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	0.7X0.5	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	0.9X0.9	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	1.49X0.9	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	0.5X0.5	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	0.7X0.5	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	0.9X0.9	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	1.49X0.9	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	0.5X0.5	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	0.7X0.5	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	0.9X0.9	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	0.5X0.5	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	0.9X0.9	100	390 – 680	-55 to 125

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

Detailed Catalogs

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

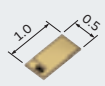
▪ High Frequency Single Layer Microchip Capacitors Cat. No. C01E

Thin Film Circuit Substrate RUSUB®

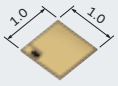
Suitable for photo diode module.

Features

- RUSUB® technology provides a single-layer capacitor and thin film resistor formed in one chip. It reduces not only the number of parts to build a device, but also the assembly costs. It will also contribute to making a device smaller.
- The single-layer structure makes its self-resonant frequency higher. It allows stable operation even at a high frequency range.
- The short distance between the capacitor and thin film resistor makes the residue inductance smaller and contributes to attenuating unnecessary noise so the device can work at its best characteristics.
- Since it has a gold electrode, it is feasible to be installed inside a module, and it allows wire-bonding with gold wire.
- AuSn pre-coating finish is also available.
- It is very suitable for APD (Avalanche Photo Diode), because the capacitor has a withstanding voltage of 100V.



RUCYT101 Series



RUCYT201 Series

(in mm)

- Six types of standard samples of RUSUB® C+R (Capacitor + Resistor) are available.
- Custom substrate size, capacity, resistance value, and electrode pattern shape is available upon request.

Part Number	Size (mm) (LXWXT)	Capacitance (pF)	Resistance (Ω)	Temperature Characteristics of Capacitance at -25 to 85°C	Capacitor Rated Voltage (V)	Temperature Coefficient of Resistance (ppm/°C)	Resistor Rated Power (mW/mm²)
RUCYT101K00009GNTC	1.0X0.5X0.11	100±10%	50±20%	±10%	100	-70±50	100
RUCYT101K00011GNTC	1.0X0.5X0.11	100±10%	100±20%				
RUCYT101K00012GNTC	1.0X0.5X0.11	100±10%	200±20%				
RUCYT201K00010GNTC	1.0X1.0X0.12	200±10%	50±20%				
RUCYT201K00013GNTC	1.0X1.0X0.12	200±10%	100±20%				
RUCYT201K00014GNTC	1.0X1.0X0.12	200±10%	200±20%				

Detailed Catalogs

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

- Thin Film Circuit Substrate (RUSUB®) Cat. No.M04E

Sensors

Sensing elements for various applications

Summary

Using our piezoelectric ceramics and magnetic resistive elements, Murata has developed a range of sensing technologies that can detect heat, infrared, ultrasonic waves, vibration, acceleration, angular velocity, angular rotation, rotation, magnetism, and electrical fields. These products are used in a variety of applications such as white goods, audio/visual electronics, and especially automotive, to name a few, improving the user's experience.

Lineup

●Infrared Sensors ●Ultrasonic Sensors ●Rotary Sensors ●Magnetic Pattern Recognition Sensors ●AMR Sensors (Magnetic Sensors) ●Shock Sensors ●Accelerometers ●Inclinometers ●Gyro Sensors ●Rotary Position Sensors ●Temperature Sensors (Thermistors)

Product Pickup

Magnetic Pattern Recognition Sensors

Magnetic pattern recognition sensors are suitable for differentiation of bank note types and patterns printed with magnetic ink.
Murata's magnetic pattern recognition sensors combine InSb (indium antimonide) magnetoresistive elements with a permanent magnet, enabling weak magnetic information to be easily detected. The features of these sensors are wide dynamic range, wide gap characteristic, and high output, enabling detection of either ferromagnetic or magnetic patterns.

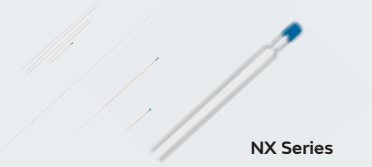
BS05 Series

BS05 Series

Temperature Sensors NTC/PTC Thermistors

NTC/PTC Thermistors are used to detect overheating.
Murata offers a variety of thermistor products to meet the demands of various temperatures.

NCP Series



NX Series

PRF Series

PTF Series

For more details on Thermistors, please refer to p. 62.

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
- Rotary Position Sensors — Cat. No. R51E
- Pyroelectric Infrared Sensors — Cat. No. S21E
- NTC Thermistors — Cat. No. R44E
- POSISTOR® for Circuit Protection — Cat. No. R90E

Rotary Position Sensors

The output voltage of contact type rotary position sensors are proportional to the rotational angle of a rotor in potentiometer fashion.

SV Series

AMR Sensors (Magnetic Sensors)

AMR sensors are switches that are used for opening and shutting detection in products such as cellular phones, notebook PCs, and digital cameras.
You can choose the best product from our wide range of features such as the direction of the magnetic field detection, the package, the sampling period, and the sensitivity standard.

MR Series

Accelerometers

Accelerometers are based on the company's proprietary 3-D MEMS technology.
Accelerometers have excellent performance and reliability in a humid environment and at temperature cycling, making high accuracy acceleration detection possible.

SCA Series

Gyro Sensors

Gyroscope components and combined sensors (including gyroscope and 3 axes accelerometers) based on the company's proven 3-D MEMS technology and highly integrated electronics.
High accuracy and high performance sensors are optimum for navigation systems and motion analysis.

SCC 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	**IRS Series**	4.9X4.7X2.4	●										●
		IRA Series	ø9.2 H4.7	●	●	●		●	●	●	●	●	●	●
Ultrasonic	Open Structure Type Ultrasonic Sensors	**MA40S4R** (for Receiver) **MA40S4S** (for Transmitter)	ø9.9 H7.1											●
		MA40H1S	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	Rotary Sensors	**FR05CM21AR**	ø12.7 H20											
	Magnetic Pattern Recognition Sensors	**BS05 Series**	11.15X8.8X12.5 193.0X16.0X7.5											
	AMR Sensors (Magnetic Sensors)	**MR Series**	MRMS201A: 2.8X2.9X1.1 MRMS501A: 1.45X1.45X0.55				●	●	●					
Acceleration	Shock Sensors	**PKGS Series**	3.2X2.0X1.05						●					
	Accelerometers	**SCA Series**	10.48X11.31X5.08											
	Inclinometers	**SCA Series**	15.58X11.31X5.08								●			
Angle Velocity	Gyro Sensors	**SCC Series** **SCR Series**	8.5X18.7X4.5											
Angle	Rotary Position Sensors	**SV Series**	11X12X2.1	●				●			●	●		
Temperature	NTC Thermistors	**Chip Type NCP Series**	NCP03: 0.6X0.3X0.3 NCP15: 1.0X0.5X0.5 NCP18: 1.6X0.8X0.8 NCP21: 2.0X1.25X0.85	●	●	●	●	●	●	●	●	●	●	●
		Lead Type NX Series	NXF: ø1.2 L25 to 150 NXR: ø4.0 L10 to 40	●	●				●	●	●	●	●	●
	PTC Thermistors POSISTOR®	**Chip Type PRF Series**	PRF15: 1.0X0.5X0.5 PRF18: 1.6X0.8X0.8 PRF21: 2.0X1.25X0.9	●	●	●	●	●	●	●	●	●	●	●
		Lead Type PTF Series	ø5.0 max. T4.0 max. ø7.5 T3.0	●	●				●	●	●	●	●	●

Applications																									
	Home Electronics											Security				Car Electronics			Toy		Others				Murata's Sensors
Products	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	
Pyroelectric Infrared Sensors																									
	●	●	●	●	●		●		●	●	●	●	●	●	●							●	●	●	
Open Structure Type Ultrasonic Sensors			●			●					●				●						●	●	●	●	
	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●				●	●	●	●	●	●	
Drip-proof Type Ultrasonic Sensors																		●							
High Frequency Type Ultrasonic Sensors																						●			
Rotary Sensors																					●				
Magnetic Pattern Recognition Sensors																						●	●		
AMR Sensors (Magnetic Sensors)	●	●		●	●	●	●			●					●						●	●		●	
Shock Sensors																									
Accelerometers							●														●			●	
Inclinometers																					●				
Gyro Sensors							●									●					●			●	
Rotary Position 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, inrush current suppression, and automotive
●PTC Thermistors POSISTOR® for overheat sensing, overcurrent protection, inrush current suppression, and automotive

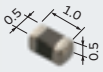
NTC Thermistors for Temperature Sensor/ Temperature Compensation

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.

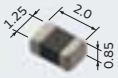
NCP02 Series

NCP03 Series



NCP15 Series

NCP18 Series



NCP21 Series

(in mm)

Series	Size Code inch (mm)	Resistance (25°C) (Ω)	B-Constant (25-50°C) (K)	Permissive Operating Current (25°C) (mA)	Rated Electric Power (25°C) (mW)	Typical Dissipation Constant (25°C) (mW/°C)	Operating Temperature Range (°C)
NCP02	01005 (0402)	10k/100k	3380/4250	0.31/0.01	100	1	-40 to 125
NCP03	0201 (0603)	1.0k to 220k	3500 to 4485	0.06 to 9.5	100	1	-40 to 125
NCP15	0402 (1005)	22 to 470k	3100 to 4500	0.04 to 6.7	100	1	-40 to 125
NCP18	0603 (1608)	100 to 470k	3250 to 4500	0.04 to 3.1	100	1	-40 to 125
NCP21	0805 (2012)	220 to 100k	3500 to 4250	0.14 to 3.0	200	2	-40 to 125

Rated Electric Power shows the required electric power that causes the Thermistor's temperature to rise to 125°C by self heating, at ambient temperature of 25°C.

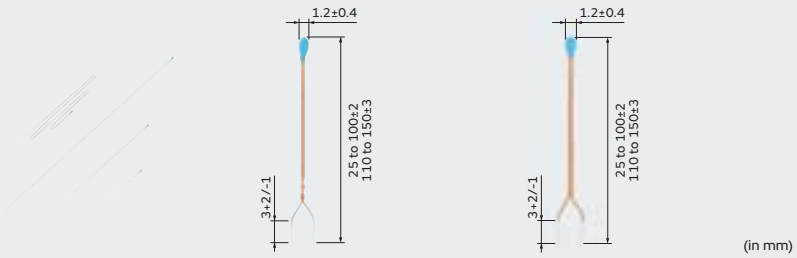
Detailed Catalogs

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

Thermo String Type

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



Twist
NXFT15_1B Series

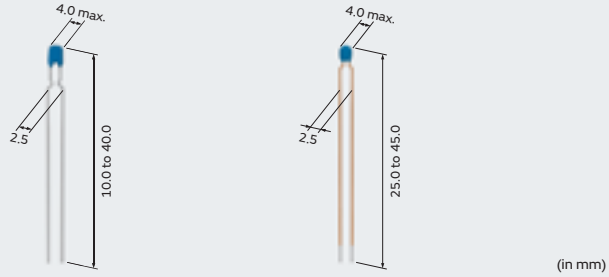
Without twist
NXFT15_2B Series

Series	Resistance (25°C) (Ω)	B-Constant (25-50°C) (K)	Operating Current for Sensor (25°C) (mA)	Thermal Time Constant (25°C) (s)	Full Length (mm)	Operating Temperature Range (°C)
NXFT15	10k to 100k	3380 to 4250	0.04 to 0.12	4	25 to 150	-40 to 125

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 Series

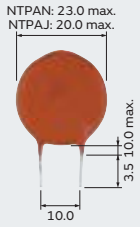
NXRT15/Insulation Series*

Series	Resistance (25°C) (Ω)	B-Constant (25-50°C) (K)	Operating Current for Sensor (25°C) (mA)	Thermal Time Constant (25°C) (s)	Full Length (mm)	Operating Temperature Range (°C)
NXRT15	2k to 100k	3380 to 4250	0.04 to 0.27	4	10 to 40	-40 to 125
NXRT15 (Insulation*)	2k to 100k	3380 to 4250	0.05 to 0.36	4	25 to 50	-40 to 125

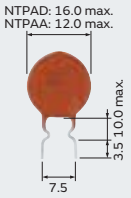
Operating Current for Sensor raises the Thermistor's temperature by 0.1°C.
There are also items for automotive applications in the NXR Series.
*Insulation: Lead wire insulation type.

NTC Thermistors for Inrush Current Suppression

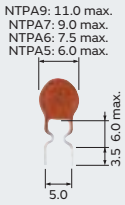
Effectively suppresses surge currents that are generated when switching power regulators are turned on.



NTPAN / J Series



NTPAD / A Series



NTPA5 / 6 / 7 / 9 Series

(in mm)

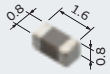
Series	Resistance (25°C) (Ω)	Permissible Max. Current (25°C) (A)	Permissible Max. Current (55°C) (A)	Thermal Time Constant (25°C) (s)	Permissible Electrolytic Capacitor (100V) (μF)	Operating Temperature Range (°C)
NTPAN / J	3 to 10	2.6 to 5.4	2.2 to 4.7	125 to 135	5000 to 8600	-20 to 160
NTPAD / A	2.2 to 16.0	1.7 to 3.7	1.5 to 3.2	65 to 100	1400 to 2700	-20 to 160
NTPA5 / 6 / 7 / 9	4.0 to 22.0	1.0 to 2.5	0.9 to 2.2	20 to 65	346 to 800	-20 to 160

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

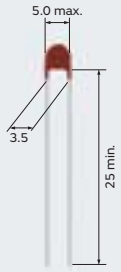
(in mm)

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)

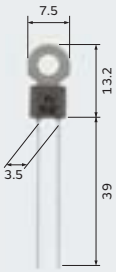
There are also items for automotive applications in the PRF Series.

Lead Type

For protecting power transistors, stereo main amplifiers, etc., from overheating, and also for sensing the temperature of other components that may be overheated.



PTFL Series



PTFM Series

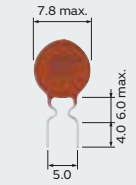
(in mm)

Series	Sensing Temperature Range (TS) (°C) 60 70 80 90 100 110 120 130 140 150	Maximum Voltage (V)	Resistance (25°C) (max.) (Ω)	Resistance (TS-10°C) (max.) (Ω)	Resistance (TS°C) (min.) (Ω)
PTF□_471Q	●—●—●—●—●—●—●	16	100	330	470
PTF□_222Q	●—●—●—●—●—●—●	16	330	1.5k	2.2k

The blank is filled with type codes. (L: Lead type, M: with lug-terminal)
Operating Temperature Range is -10 to TS+10°C.

PTC Thermistors POSISTOR® for Inrush Current Suppression

This series is able to support overcurrent or inrush current issues on the power supply circuit.



PTGL07AS Series

PTGL14 to 20AS Series

(in mm)

Series	Resistance (25°C) (Ω)	Maximum Voltage (V)	Maximum Inrush Current (Ao-p)	Maximum Charge Energy (J)	Operating Temperature Range (°C)
PTGL07AS	120 to 200	280	5.66 to 8.46	7.8 (105°C)	-40 to 105
PTGL14 to 20AS	33 to 100	280	13 to 39	56.9 to 181.7 (65 to 85°C)	-20 to 85

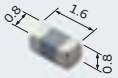
Maximum Inrush Current shows the maximum inrush current value introduced into the Posistor at operating temperature range.

PTC Thermistors POSISTOR® for Overcurrent Protection

Chip Type

Overcurrent Protection device with resettable function suitable for current limiting resistor.

PRG15 Series



PRG18 Series

PRG21 Series

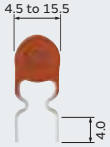
(in mm)

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	78 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	2.2 to 470	0603 (1608)
PRG21	6 to 30	30 to 500	110 to 2000	1.1 to 10	0.2 to 22	0805 (2012)

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

Lead Type

Best suited to meet the requirements of power supplies and motor protection.
Error-free operation is ensured by rush current.



(in mm)

PTGL Series
*The Lead shape is an example.

Series	Maximum Voltage (V)	Hold Current (60°C) (mA)	Trip Current (-10°C) (mA)	Maximum Current (A)	Resistance (25°C) (Ω)
PTGL	16	370 to 1200	1040 to 3360	2.0 to 10.0	0.15 to 1.0
	24	80 to 180	320 to 710	2.0	2.2 to 10
	30	122 to 685	240 to 1900	0.7 to 7.0	0.8 to 13
	32	30 to 60	140 to 240	1.5	15 to 47
	51	168 to 592	332 to 1168	1.0 to 5.0	1.2 to 10
	56	90 to 380	240 to 980	1.0 to 2.5	3.3 to 22
	60	88 to 439	175 to 867	1.0 to 5.0	2.2 to 22
	80	50 to 310	135 to 860	0.7 to 5.5	3.7 to 55
	125	30 to 420	75 to 1050	0.3 to 2.0	3.3 to 180
	140	74 to 340	147 to 780	0.5 to 3.5	4.7 to 56
	250	90 to 100	280 to 300	0.5 to 0.6	12 to 39
	265	28 to 300	78 to 830	0.2 to 4.1	6.0 to 180

Maximum Current shows typical transformer capacities that can be used. There are also items for automotive applications in the PTGL 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-made components utilizing advanced design and high-density packaging technology.

Lineup

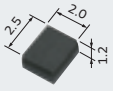
●Micro DC-DC Converters ●DC-DC Converters
●High Voltage Transformers ●High Voltage Power Supplies
●Switching Power Supplies

Micro DC-DC Converters

Murata's micro DC-DC converters are small power modules that utilize a unique ferrite substrate with an embedded power inductor, and incorporate the I/O capacitors onto the same package.
Ultra-compact size and superior noise suppression make these devices ideal for cellular/smart phones, tablets, wearable devices, communication applications, and portable products.

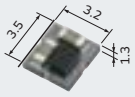
General Buck Converter

LXDC2HL Series



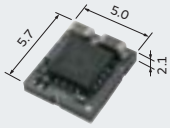
LXDC2HN Series

LXDC2UR Series

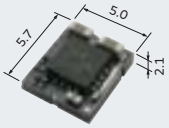


LXDC3EP Series

LXDC2XQ Series



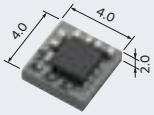
LXDC55F Series



LXDC55K Series

(in mm)

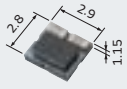
Boost Converter



LXDC44A Series

(in mm)

Buck-Boost



LXDC2SC Series

(in mm)

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, low-noise power supplies. Murata provides standard products and customized products, ultra-low-profile products, and products for FPGA.

Non-isolated Type

MPDRX307S
MPDRX308S

MPDRX312S

MPDTY461S
MPDTY462S

MYGTM01210BZN

MYSSM01806BENL

MYUSP3R303FMP

OKL-T/3-W5N-C

OKL-T/6-W12P-C

OKL2-T/12-W5N-C

OKL2-T/12-W12N2-C

OKL2-T/20-W5N-C
OKL2-T/20-W5P-C

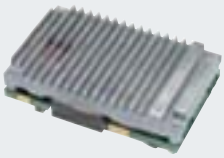
OKL2-T/20-W12N2-C
OKL2-T/20-W12P2-C

Part Number	Package	Input Voltage (V)	Nominal Output Power (W)	Output Voltage (V)	Current (A)	Efficiency (%)	Size (mm) LXWXH
MPDRX307S	SMD	6.2 to 13.2	23.6	1.8 to 3.63	6.5	91	17.6X20.2X4.2
MPDRX308S	SMD	6.2 to 13.2	10.7	0.8 to 1.65	6.5	82	17.6X20.2X4.2
MPDRX312S	SMD	3 to 5.5	28.8	0.8 to 1.8	16	86.5	27.8X15.4X4.2
MPDTY461S	SMD	4.5 to 14	94	1.6 to 3.63	26	90.5	33.02X13.46X4.2
MPDTY462S	SMD	4.5 to 14	43	0.75 to 1.65	26	85.5	33.02X13.46X4.2
MYGTM01210BZN	SIL	17 to 40	120	5 to 12	10	97.3	40X40.3X29.2
MYSSM01806BENL	SMD	25 to 40	108	5 to 18	6	96.5	30.2X20.9X12
MYUSP3R303FMP	SMD	3 to 5.5	9.9	0.7 to 3.3	3	94	11X8.5X5.6
OKL-T/3-W5N-C	SMD	2.7 to 5.5	10.9	0.6 to 3.63	3	95.3	12.2X12.2X6.2
OKL-T/6-W12P-C	SMD	4.5 to 14	33	0.591 to 5.5	6	93	12.2X12.2X7.2
OKL2-T/12-W5N-C	SMD	2.4 to 5.5	39.6	0.6 to 3.63	12	94	20.32X11.43X8.55
OKL2-T/12-W12N2-C	SMD	4.5 to 14	60	0.69 to 5.5	12	95	20.32X11.43X8.55
OKL2-T/20-W5N-C	SMD	2.4 to 5.5	66	0.6 to 3.63	20	93.1	33.02X13.46X8.75
OKL2-T/20-W5P-C	SMD	2.4 to 5.5	66	0.6 to 3.63	20	93.1	33.02X13.46X8.75
OKL2-T/20-W12N2-C	SMD	4.5 to 14	100	0.69 to 5.5	20	94	33.02X13.46X8.75
OKL2-T/20-W12P2-C	SMD	4.5 to 14	100	0.69 to 5.5	20	94	33.02X13.46X8.75

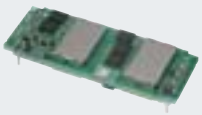
These are just a few examples of our large assortment of power products.

Isolated Type

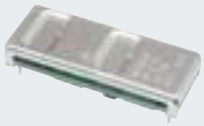
MYBQC01138AZTB



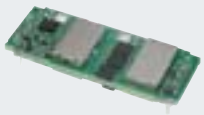
MYBQC01138AZTF



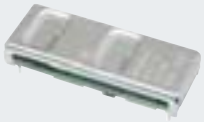
MYBEA01212AZT



MYBEA01212AZTB



MYBEA01210CZT



MYBEA01210CZTB

MYBEB00520AZT

MYBEB01212AZTB

Part Number	Package	Input Voltage (V)	Nominal Output Power (W)	Output Voltage (V)	Current (A)	Efficiency (%)	Isolation Voltage (VDC)	Footprint (Brick)	Size (mm) LXWXH
MYBQC01138AZTB	Insert	48V (36V to 75V)	400	10.6±6%	38	95	1500	1/4	58.4X36.8X14 max.
MYBQC01138AZTF	Insert	48V (36V to 75V)	400	10.6±6%	38	95	1500	1/4	58.4X36.8X17 max.
MYBEA01212AZT	Insert	48V (36V to 75V)	140	12±3%	12	92.5	1500	1/8	58.4X22.8X9 max.
MYBEA01212AZTB	Insert	48V (36V to 75V)	140	12±3%	12	92.5	1500	1/8	58.4X22.8X9 max.
MYBEA01210CZT	Insert	24V (18V to 36V)	120	12±3%	10	93	1500	1/8	58.4X22.8X9 max.
MYBEA01210CZTB	Insert	24V (18V to 36V)	120	12±3%	10	93	1500	1/8	58.4X22.8X9 max.
MYBEB00520AZT	Insert	48V (36V to 75V)	100	5±3%	20	93	1500	1/8	57X22.8X10 max.
MYBEB01212AZTB	Insert	48V (36V to 75V)	100	12±3%	8.3	92	2250	1/8	58X22.8X12.7 max.

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

High Voltage Transformers


QF Type


QP Type


WP Type

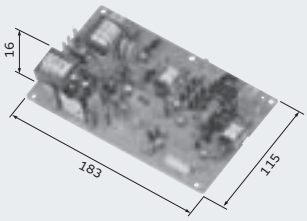

NU Type


WR Type

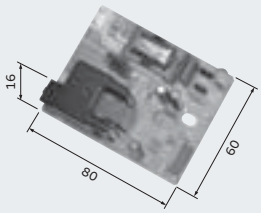

AK Type

Series	Type	Features	Output Voltage Vout	Output Current Iout	Drive Frequency	Dimensions (mm) LXWXH
MSH	QF	Small Size	Max. 6kV	0.3mA	35 to 70kHz	39X24X13
	QP	Standard	Max. 8.5kV	0.4mA	35 to 70kHz	41X26X16
	WP	Low Profile	Max. 8.5kV	0.4mA	35 to 70kHz	44X27X11
	NU	High Power	Max. 8.5kV	1mA	30 to 70kHz	44X27X17
	WR	High Voltage	Max. 13kV	0.5mA	30 to 70kHz	49X25X27
	AK	High Voltage High Power	Max. 10kV	2mA	20 to 70kHz	27X55X26

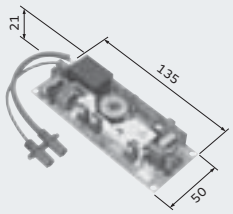
High Voltage Power Supplies



MPH7000 Series



MPH4000 Series
(for Air Purifier/Air Conditioner)



MPL3000 Series
(AC/DC Ballast)

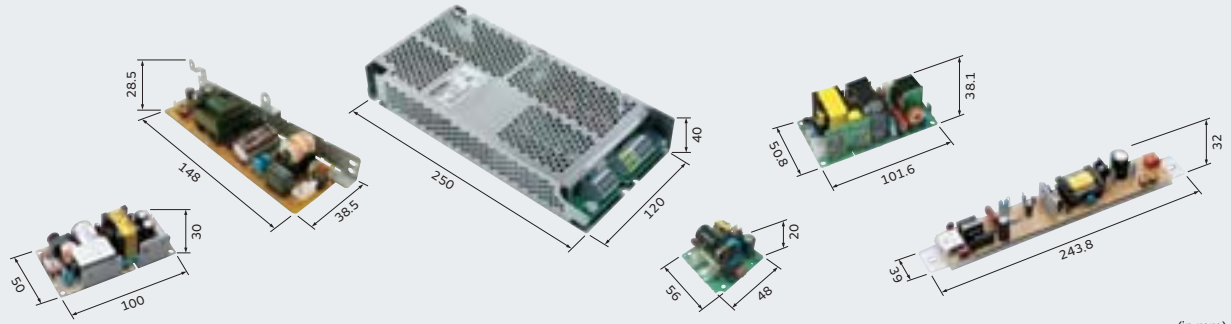
(in mm)

Series	Input Voltage Vin	Power Supply Type		Output Voltage Vout	Output Current Iout	Adjustable Range
MPH7000	24V DC	DC Constant Current		(6kV)	250μA	Iout: 200 to 300μA
		DC Constant Voltage		0.6kV	(1μA)	Vout: 550 to 650kV
		Switching	DC Constant Current	(-1.5kV)	-3μA	Iout: -2 to -4μA
			DC Constant Voltage	1.5kV	(0.5μA)	Vout: 1.4 to 1.6kV
		AC Constant Voltage		1.5kV rms	(250μA rms)	Vout: 1.3 to 1.7kV rms
MPH4000 (for Air Purifier/Air Conditioner)		DC Constant Voltage		±6kV	±400μA	-
		DC Constant Current		(±6kV)	±400μA	-

Series	Applications	Input Voltage Vin	Output Power	Other Specification
MPL3000 (AC/DC Ballast)	Projector	250 to 420V DC	to 350W	For extra-high pressure mercury lamp

For more details on our products, please contact us.

Switching Power Supplies



Medical Equipment | SOHO Equipment | Industrial and Measurement Equipment | Energy Management Equipment | PBX | LED Lighting

Applications	Input Voltage	Output Voltage	Safety Standard	EMI Standard	Remarks
Medical Equipment	90 to 264V AC	5V 12V 24V 48V	UL, IEC	CISPR	
SOHO Equipment	90 to 264V AC	5V 12V 24V 48V	UL, IEC	CISPR	Models that provide a power-saving standby mode are also available.
Industrial and Measurement Equipment	90 to 264V AC	24V	UL, IEC	VCCI	150W/300W
Energy Management Equipment	60 to 225V AC	3.3V 24V	UL, IEC	VCCI, CISPR	
PBX	90 to 264V AC	12V 48V	UL, IEC	CISPR	Operating Ambient Temperature 80°C
LED Lighting	90 to 264V AC	24V	IEC, PSE	VCCI, CISPR	PWM Dimming, Accepted for DALI, UART

For more details on our products, please contact us.

For Ionizer Modules, please refer to p. 79.

Energy Devices

Solutions for power lines of low-power devices

Summary

Murata offers various energy devices that can be used for low-power devices such as portable or wearable devices. Murata's supercapacitor (EDLC), having ultra-low ESR and high reliability, can be used as a small auxiliary power supply for peak power assist or backup. Murata's small energy device is a secondary battery having high-rate charge-discharge characteristics and long cycle life. It can be used as a power supply of low-power devices.

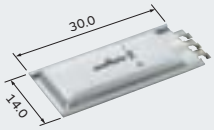
Lineup

- Supercapacitors (EDLC)
- Small Energy Device (Lithium Ion Battery)

Supercapacitors (EDLC)

Supercapacitors (EDLC) are energy storage devices with high power density characteristics. Murata has focused its R&D efforts on electrical double layer energy devices, and also established collaboration with the component design and manufacturing firm CAP-XX Limited (CAP-XX). This has led to Murata's development of an Supercapacitor technology resulting in low ESR and high capacitance in a very small package.

DMT3L4R2U224M3DTA0
DMT334R2S474M3DTA0
DMF3Z5R5H474M3DTA0



DMF4B5R5G105M3DTA0

(in mm)

Series	Main Part Number	Thickness (mm)	Capacitance (mF)	Rated Voltage (V)	ESR (mΩ)	Operating Temperature (°C)
DMT (General-Purpose Type)	DMT3L4R2U224M3DTA0	2.0	220	4.2	300	-40 to 85
	DMT334R2S474M3DTA0	3.5	470	4.2	130	-40 to 85
DMF (High Peak Power Type)	DMF3Z5R5H474M3DTA0	3.2	470	5.5 (Peak Voltage)	45	-40 to 70
	DMF4B5R5G105M3DTA0	3.7	1000	5.5 (Peak Voltage)	40	-40 to 70

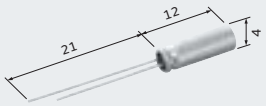
Detailed Catalogs

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

- High Performance Supercapacitor (EDLC) DMF Series Cat. No. O83E
- High Performance Supercapacitor (EDLC) DMT Series Cat. No. O84E

Small Energy Device (Lithium Ion Battery)

Murata's small energy device is a miniature device with a high energy storage capacity, low ESR, fast charging and discharging and the ability to withstand load fluctuations. It may be used as a secondary battery in the same way as a capacitor. This energy device achieves better charge/discharge characteristics and has an extended service life superior to conventional batteries. Well suited as a power supply for wearable devices or sensor nodes for wireless sensor networks, this device maintains flat voltage characteristics while accommodating a wide range of load characteristics.



(in mm)

UMAC040130A003TA01

Series	Part Number	Nominal Voltage (V)	Charge Voltage (V)	Cut-off Voltage (V)	Nominal Capacity (mAh)	Max. Discharge Current	ESR (mΩ)	Operating Temperature Range (°C)
UMAC (Cylinder Type)	**UMAC040130A003TA01**	2.3	2.7	1.8	3	30mA (10C)	800	-20 to 70

Sound Components

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

Summary

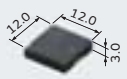
Using Murata's unique ceramic material, we offer a variety of piezoelectric sound components.

Lineup

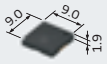
●Piezoelectric Sounders ●Piezoelectric Buzzers
●Piezoelectric Diaphragms

Piezoelectric Sounders

Low power consumption, lightweight
Suitable for office equipment/home appliances/audio equipment



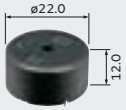
PKLCS1212E2400



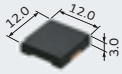
PKMCS0909E4000

PKM13EPYH

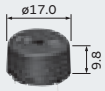
PKM22EPH



PKM22EPPH



PKLCS1212E4001



PKM17EPP

(in mm)

Drive Type	Mounting Type	Main Part Number	Sound Pressure Level (dB)	Measurement Condition of Sound Pressure Level
External Drive	Surface Mounting Type	**PKLCS1212E2400-R1**	75 min.	±1.5Vo-p, 2.4kHz, square wave, 10cm
		PKLCS1212E4001-R1	75 min.	±1.5Vo-p, 4.0kHz, square wave, 10cm
		PKMCS0909E4000-R1	65 min.	±1.5Vo-p, 4.0kHz, square wave, 10cm
	Pin Type	**PKM13EPYH4000-A0**	70 min.	±1.5Vo-p, 4.0kHz, square wave, 10cm
		PKM17EPP-2002-B0	70 min.	±3.0Vo-p, 2.0kHz, square wave, 10cm
		PKM22EPH2001	75 min.	±1.5Vo-p, 2.0kHz, square wave, 10cm
		PKM22EPPH2001-B0	70 min.	±1.5Vo-p, 2.0kHz, square wave, 10cm
		PKM22EPPH4007-B0	85 min.	±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

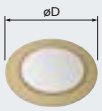
PKB24SPCH

(in mm)

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

Detailed Catalogs

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

▪ Piezoelectric Sound Components Cat. No. P37E

Others

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.

Others

Variable Capacitors

Capacitance value can be adjusted by the tuning voltage.

LXRW_V Series

LXRW0YV Series

(in mm)

LXRW19V Series

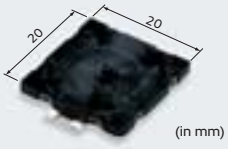
Thin film variable capacitors can carry out the variable of the capacitor by adjusting the tuning voltage.
It is designed for use as frequency matching for HF band (13.56MHz).

Micromechatronics

Utilizing the vibration and deformation properties of piezoelectric materials.

Microblowers

Tiny air pumps without a motor



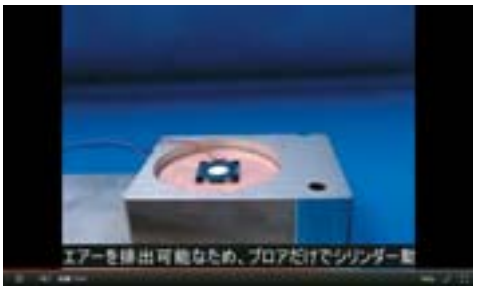
Features

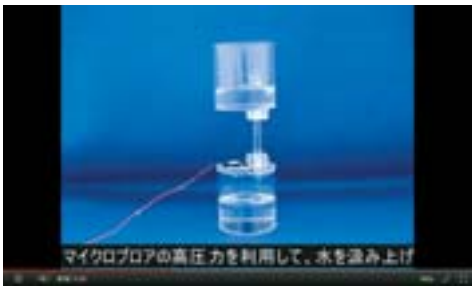
Microblowers are designed to function as an air pump,
using the ultrasonic vibrations of piezoelectric ceramics,
which can generate high pressure air from a thin and extremely compact unit.

Applications

Aroma/diffuser, gas & alcohol sensor, air ionizer, amusement, etc.

Part Number	Size	Air Flow	Static Pressure	Voltage of Operation
MZB1001T02	20(W)X20(L)X1.85(H)mm without the nozzle	≧0.7L/min@15Vp-p	≧1.42kPa@15Vp-p	10 to 20Vp-p





For more details on Microblowers, please refer to our website.

Piezoelectric Actuators

Quick response and high-accuracy position control.

*Please contact us for custom specifications.

Features

Piezoelectric actuators employ piezoelectric ceramics,
which are widely used for positioning devices.

Ceramic Applied Products

Contribution to high integration and miniaturization requirements of the automotive industry and RF modules.

Low Temperature Co-fired Ceramics (LTCC) Multi-layer Module Boards

LTCC, Low Temperature Co-fired Ceramics, is a multi-layer, glass ceramic substrate that is co-fired with low resistance metal conductors. What makes Murata's LTCC special is our unique "Zero Shrinking Sintering Process," which restricts the ceramic shrinkage to only thickness.
Murata's LTCC multilayer substrates LFC® are useful in a wide range of electronic equipment such as substrates for highly reliable electronic control units equipping vehicles and functional substrates for miniaturized high-frequency modules in cellular phones.

LFC® Series

Murata's LFC® Series LTCC substrate meets high integration and miniaturization requirements necessary for automotive applications.

AWG Series

Utilized in low-profile, small outline RF modules, the AWG Series features ultra-thin ceramic tapes, multiple material tape lamination, and enhanced board strength.

Cat.No. N20E

Others

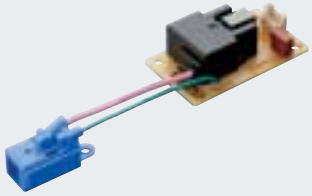
Ionizer Modules Ionissimo®

High-concentration ion, compact design, ozone control

Ionissimo® is an ionizer module with unprecedented compactness and high efficiency, capable of generating the largest number of ions in the industry* 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.

*Surveyed by Murata (as of March 2011)

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.

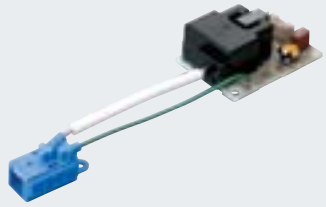
Items	MHM305 Type	MHM306 Type	MHM400 Type
Input Voltage (VDC)	+10.8 to 13.2	←	←
Power	0.4W	0.6W	0.6W
Ion Polarity	Negative	←	Positive
Ion Amount	>20000000pcs/cc	←	←
Ozone Level	<0.1mg/H	<1.0mg/H	<0.1mg/H
Operating Temp.	-10 to 50℃	←	←
Operating Humidity	20 to 80%RH (without dewdrop)	←	←

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

Ozonizer Modules Ionissimo®

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

MHM Series



Features

· Ozone will be generated stably.
· 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
Input Voltage (VDC)	+11 to 13	←	←
Power	1.0W	1.0W (with heater)	6.0W
Ozone Level	<2.5mg/H	<2.5mg/H	<60mg/H
Operating Temp.	-10 to 50℃	←	←
Operating Humidity	20 to 80%RH (without dewdrop)	20 to 95%RH	20 to 85%RH (without dewdrop)

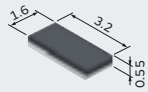
View a demonstration video of Ozonizer Modules Ionissimo® on our website.

RFID Devices

Built-in IC modules for high functional and robust small RFID tags

UHF-band MAGICSTRAP®

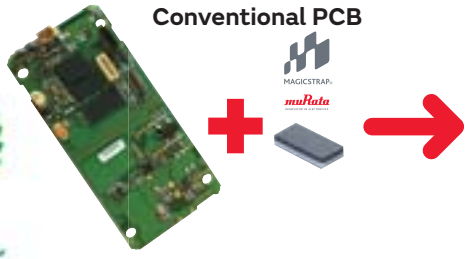
LXMS31 Series



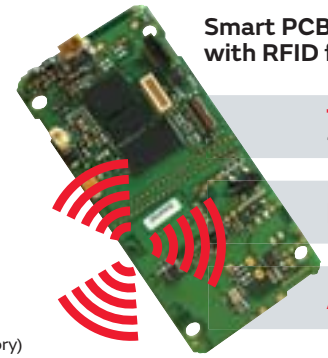
(in mm)

MAGICSTRAP® can be easily assembled by means of reflow soldering and adhesive (electrically conductive or non-conductive). Even if non-conductive adhesive is used, communication will take place when MAGICSTRAP® is bonded onto the antenna, and the RFID tag will function correctly.
MAGICSTRAP® complies with international standard EPC/gC1G2. It is an ultra-miniature (3.2X1.6X0.55mm) robust package with impedance transformation function. MAGICSTRAP® can be bonded onto the antenna over a wide range (±500μm). In addition, MAGICSTRAP® supports wide UHF band (860-960MHz) for worldwide use in a single design.

Green IT AWARD 2013
Green IT Promotion Council
Green IT Promotion Council Chairman's Awards



- Standard SMT component
- Complient with EPC/g C1G2
- Read and Write capability
  (ex. write inline test result into user memory)



Traceability
"from cradle to grave"

Inventory Control

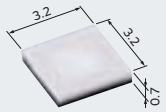
Anti-Counterfeit

RFID Devices

Built-in IC modules for high functional and robust small RFID tags

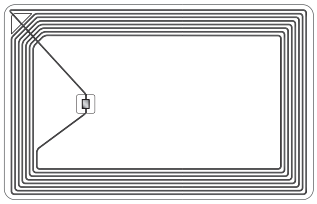
HF-band MAGICSTRAP®

LXMS33 Series



(in mm)

HF-band MAGICSTRAP® is one of the world's smallest HF-band RFID tags (3.2X3.2X0.7mm).
Murata has applied its proprietary multi-layer circuit board technology and high-frequency module technology, with which the successful miniaturization of an RFID tag to one-tenth the size of an RFID tag composed of plane surface, was achieved.
Furthermore, the new RFID product uses a ceramic module structure that makes it highly resistant to the environment and enables it to achieve stable operation under various environmental conditions.



Horizontal

Miniaturization !

Multi-layer

Applications

Small appliance/object tracking, management, certification, authentication, etc.

Electrical Characteristics

Read range: 15mm
(reader/writer output: 200mW, antenna size: 35X54mm)

For more details on RFID Devices, please refer to our website.

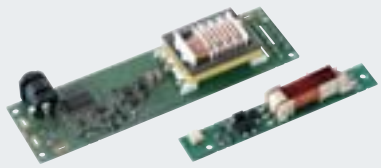
Wireless Power Transmission Modules

Realization of wireless charging systems

Murata has begun mass production of the capacitive coupling type* of wireless power transmission modules capable of charging at 10W.
This module makes wireless charging systems a reality. (Wireless charging systems are capable of charging equipment placed on a charging pad without the need for cable connection.)

*Capacitive coupling system
The capacitive coupling system is a method that involves transmitting energy using the electrical fields generated between these electrodes.
Since the electric field is generated between the electrodes, it is also called an electric field coupling system.

LXWS Series



Features
· Wide charging area
· Ease of mounting
· No heat generation in the wireless power transmission area

View demonstration videos of Wireless Power Transmission Modules on our website.

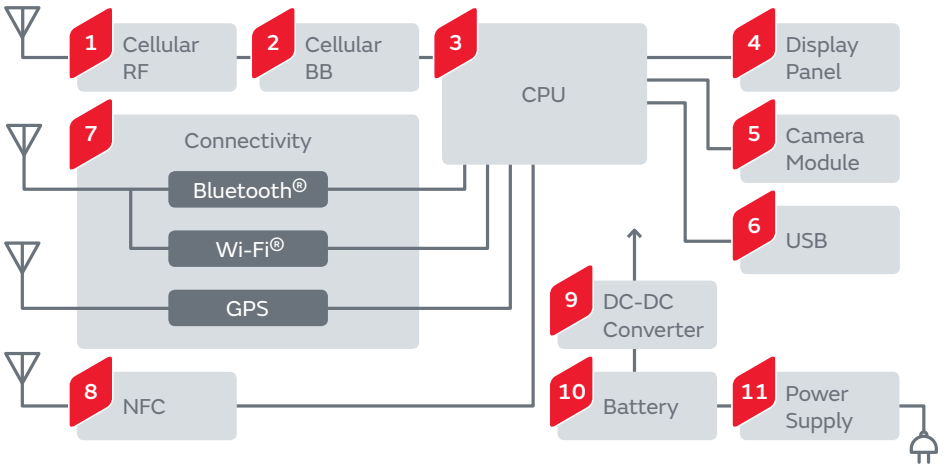
Memo

Application Guides

muRata

K70E.pdf
Dec.25,2015

Smart Phones



1 Cellular RF

- Chip Multilayer Diplexers — LFD Series
- SAW Duplexers — SAY Series
- SAW Filters — SAF Series
- Chip Multilayer LC Filters
- Chip Multilayer Hybrid Baluns — LDB/LDM Series
- Chip Multilayer Hybrid Dividers — LDD Series
- High-Frequency Matching Transformers — SMST Series
- Microwave Coaxial Connectors
- Isolators — CEG23 Series
- Micro DC-DC Converters — LXDC Series
- Chip Inductors (Chip Coils) — LQW/LQP Series
- Trimmer Capacitors — TZY2 Series
- ESD Protection Devices — LXES Series
- Thermistors — NCP/PRF Series

2 Cellular BB

- Micro DC-DC Converters — LXDC Series
- 3 Terminal Capacitors — NFM Series
- Chip Common Mode Choke Coils — DLW/DLP Series
- Thermistors — NCP/PRF Series

3 CPU

- Crystal Units — XRCGB Series
- Chip Ferrite Beads — BLM Series
- 3 Terminal Capacitors — NFM Series
- Thermistors — NCP/PRF Series

4 Display Panel

- Micro DC-DC Converters — LXDC Series
- Ceramic Resonators CERALOCK® — CSTCE Series
- EMI Suppression Filters EMIFIL® — NFA Series
- Chip Common Mode Choke Coils — DLW/DLP Series
- ESD Protection Devices — LXES Series
- Thermistors — NCP/PRF Series

5 Camera Module

- Micro DC-DC Converters — LXDC Series
- Supercapacitors (EDLC) — DMF Series
- Monolithic Ceramic Capacitors for Medium Voltage — GR7 Series
- Actuators
- Chip Ferrite Beads — BLM Series
- ESD Protection Devices — LXES Series
- Thermistors — NCP/PRF Series

6 USB

Micro DC-DC Converters
LXDC Series

Chip Common Mode Choke Coils
DLW/DLP Series

Chip Ferrite Beads
BLM Series

ESD Protection Devices
LXES Series

Thermistors
NCP/PRF Series

7 Connectivity

Bluetooth® Modules

Wi-Fi® Modules

Bluetooth® - Wi-Fi® Combo Modules

SAW Filters
SAF Series

Chip Multilayer LC Filters

Chip Multilayer Hybrid Baluns
LDB/LDM Series

Microwave
Coaxial Connectors

Micro DC-DC Converters
LXDC Series

ESD Protection Devices
LXES Series

Thermistors
NCP/PRF Series

8 NFC

NFC Antennas
FLAN Series

Crystal Units
XRCGB Series

Chip Ferrite Beads
BLM Series

Chip Inductors (Chip Coils)
LQM/LQH Series

Trimmer Capacitors
TZY2 Series

Variable Capacitors
LXRW Series

ESD Protection Devices
LXES Series

9 DC-DC Converter

Micro DC-DC Converters
LXDC Series

Metal Terminal Type Monolithic Ceramic Capacitors
KRM Series

Polymer Aluminum Electrolytic Capacitors
ECAS Series

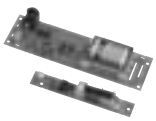
Thermistors
NCP/PRF Series

10 Battery

Thermistors
NCP/PRF/PRG Series

11 Power Supply

Wireless Power
Transmission Modules



Monolithic Ceramic Capacitors
for Medium Voltage
GR/GA Series

Chip Inductors (Chip Coils)
LQM/LQH Series

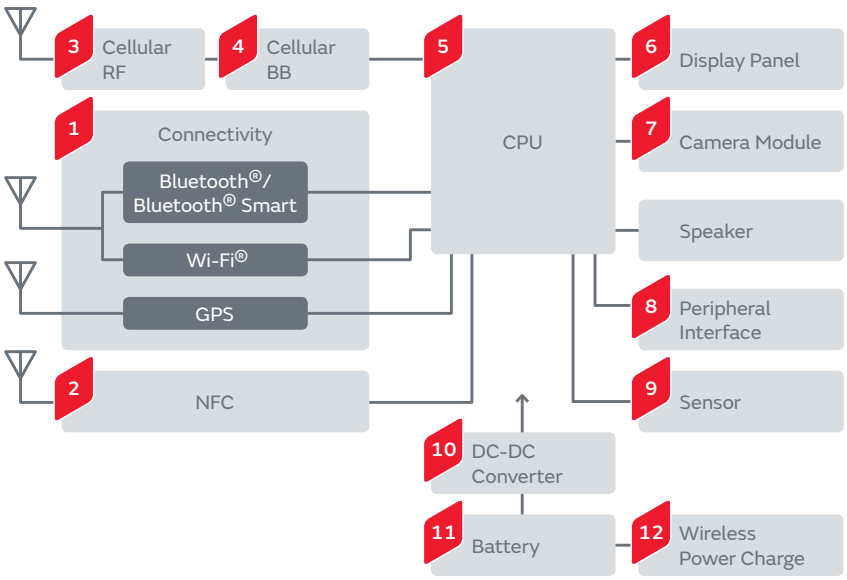
Medium High Voltage
Ceramic Capacitors
DEA/DES Series

Safety Standard Certified
Ceramic Capacitors
Type KX/KY

General Purpose

Monolithic Ceramic Capacitors	GRM/GJM Series	High Frequency Filter Circuit	
Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling/For Step-up	
Resin External Electrode Monolithic Ceramic Capacitiors	GRJ Series	Coupling/Decoupling/For Step-up	
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 Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminal Capacitors	NFM/NFE Series	Noise Suppression	
Chip Common Mode Choke Coils	DLW/DLP Series	Noise Suppression	
Microwave Absorbers	EA Series	Noise Suppression	
Ferrite Cores	FS Series	Noise Suppression	
Thin Type Sandwich Cores	FSSA Series	Noise Suppression	

Wearable Devices



1 Connectivity

- Bluetooth® Modules
- Wi-Fi® Modules
- Bluetooth® - Wi-Fi® Combo Modules
- SAW Filters SAF Series
- Chip Multilayer LC Filters
- Chip Multilayer Hybrid Baluns LDB/LDM Series
- Microwave Coaxial Connectors with Switch SWH Type
- Microwave Coaxial Cable Connectors JSC Type
- Micro DC-DC Converters LXDC Series
- Crystal Units XRCGB/XRCPB Series
- Crystal Units XRCMD/XRCFD Series
- ESD Protection Devices LXES Series
- Thermistors NCP/PRF Series

2 NFC

- NFC Antennas FLAN Series
- Micro DC-DC Converters LXDC Series
- Crystal Units XRCGB/XRCPB Series
- Crystal Units XRCMD/XRCFD Series
- Chip Inductors (Chip Coils) LQM/LQH/LQB Series
- Trimmer Capacitors TZY2 Series
- Variable Capacitors LXRW Series
- ESD Protection Devices LXES Series

3 Cellular RF

- Chip Multilayer Diplexers LFD Series
- SAW Duplexers SAY Series
- SAW Filters SAF Series
- Chip Multilayer LC Filters
- Chip Multilayer Hybrid Baluns LDB/LDM Series
- Chip Multilayer Hybrid Dividers LDD Series
- High-Frequency Matching Transformers SMST Series
- Microwave Coaxial Connectors
- Isolators CEG23 Series
- Micro DC-DC Converters LXDC Series
- Trimmer Capacitors TZY2 Series
- ESD Protection Devices LXES Series
- Thermistors NCP/PRF Series

4 Cellular BB

- Micro DC-DC Converters LXDC Series
- Thermistors NCP/PRF Series

5 CPU

Crystal Units
XRCGB/XRCPB Series

Crystal Units
XRCMD/XRCFD Series

Thermistors
NCP/PRF Series

6 Display Panel

Micro DC-DC Converters
LXDC Series

Ceramic Resonators CERALOCK®
CSTCW Series

Ceramic Resonators CERALOCK®
CSACM Series

Crystal Units
XRCGB/XRCPB Series

Crystal Units
XRCMD/XRCFD Series

ESD Protection Devices
LXES Series

Thermistors
NCP/PRF Series

7 Camera Module

Micro DC-DC Converters
LXDC Series

Monolithic Ceramic Capacitors
for Medium Voltage
GR7 Series

Supercapacitors (EDLC)
DMF Series

Actuators

ESD Protection Devices
LXES Series

Thermistors
NCP/PRF Series

8 Peripheral Interface

Micro DC-DC Converters
LXDC Series

Ceramic Resonators CERALOCK®
CSTCW Series

Crystal Units
XRCGB/XRCPB Series

Crystal Units
XRCMD/XRCFD Series

Chip Common Mode Choke Coils
DLW/DLP Series

ESD Protection Devices
LXES Series

Thermistors
NCP/PRF Series

9 Sensor

Proximity and
Illuminance Sensors
LT Series

Pressure Sensors
ZPA Series

Shock Sensors
PKGS Series

Thermistors
NCP/PRF Series

10 DC-DC Converter

Micro
DC-DC Converters
LXDC Series

Metal Terminal Type
Monolithic Ceramic Capacitors
KRM Series

Polymer Aluminum
Electrolytic Capacitors
ECAS Series

Thermistors
NCP Series

11 Battery

Small Energy Devices
UMAC Series

Thermistors
NCP/PRF/PRG Series

12 Wireless Power Charge

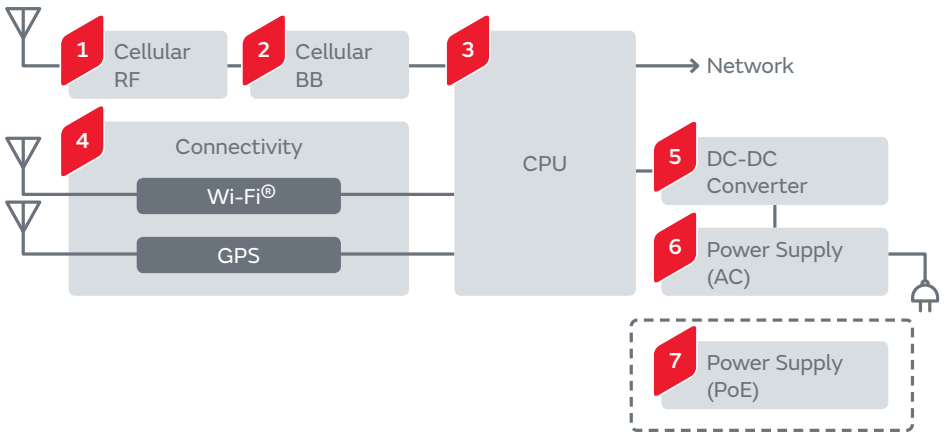
Low ESL
Monolithic Ceramic Capacitors
LLL Series

Thermistors
NCP/PRF Series

General Purpose

Monolithic Ceramic Capacitors	GRM/GJM Series	High Frequency Filter Circuit
Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling/For Step-up
Resin External Electrode Monolithic Ceramic Capacitiors	GRJ Series	Coupling/Decoupling/For Step-up
Polymer Aluminum Electrolytic Capacitors	ECAS Series	Smoothing/Transient Backup
Supercapacitors (EDLC)	DMF/DMT Series	Power Line/Battery Peak Assist
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching/Resonance
Chip Inductors (Chip Coils)	LQM/LQH Series	Voltage Conversion
Chip Ferrite Beads	BLM Series	Noise Suppression
3 Terminal Capacitors	NFM/NFE Series	Noise Suppression
Chip LC Fiter	NFA Series	Noise Suppression
Chip Common Mode Choke Coils	DLW/DLP Series	Noise Suppression
Microwave Absorbers	EA Series	Noise Suppression
Ferrite Cores	FS Series	Noise Suppression
Thin Type Sandwich Cores	FSSA Series	Noise Suppression
Piezoelectric Sounders	PKMCS Series	Sound component
Piezoelectric Diaphragms	7BB Series	Sound component

Base Stations



1 Cellular RF

- Chip Multilayer Diplexers LFD Series
- Duplexers DFYH Series
- Dielectric Filters GIGAFIL® DFCH Series
- Chip Multilayer Hybrid Baluns LDB/LDM Series
- Chip Multilayer Hybrid Couplers LDC Series
- Isolators CES Series
- Chip Inductors (Chip Coils) LQW/LQP Series
- Trimmer Capacitors TZY2 Series
- ESD Protection Devices LXES Series
- Thermistors PRF Series

2 Cellular BB

- 3 Terminal Capacitors NFM Series
- Chip Common Mode Choke Coils DLW/DLP Series
- Thermistors PRF Series

3 CPU

- Crystal Units XRCGB Series
- Chip Ferrite Beads BLM Series
- 3 Terminal Capacitors NFM Series
- Thermistors PRF Series

4 Connectivity

- Wi-Fi® Modules
- Chip Multilayer LC Filters
- Chip Multilayer Hybrid Baluns LDB/LDM Series
- Micro DC-DC Converters LXDC Series
- ESD Protection Devices LXES Series
- Thermistors PRF Series

5 DC-DC Converter

- DC-DC Converters MYB Series
- DC-DC Converters OKL Series
- Micro DC-DC Converters LXDC Series
- Metal Terminal Type Monolithic Ceramic Capacitors KRM Series
- Polymer Aluminum Electrolytic Capacitors ECAS Series
- Thermistors PRF Series

6 Power Supply (AC)

- Monolithic Ceramic Capacitors for Medium Voltage GR/GA Series
- Medium High Voltage Ceramic Capacitors DEA/DES Series
- Safety Standard Certified Ceramic Capacitors Type KX/KY
- Chip Inductors (Chip Coils) LQM/LQH Series

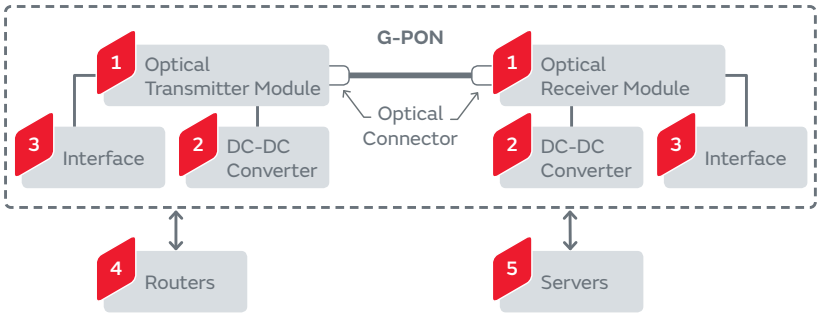
7 Power Supply (PoE)

Monolithic Ceramic Capacitors for Medium Voltage GR/GA Series	Medium High Voltage Ceramic Capacitors DEA/DES Series	Metal Terminal Type Monolithic Ceramic Capacitors KRM Series	Crystal Units XRCGB Series	Chip Inductors (Chip Coils) LQM/LQH Series
				

General Purpose

Monolithic Ceramic Capacitors	GRM/GJM Series	High Frequency Filter Circuit	
Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling/For Step-up	
Resin External Electrode Monolithic Ceramic Capacitiors	GRJ Series	Coupling/Decoupling/For Step-up	
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 Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminal Capacitors	NFM/NFE Series	Noise Suppression	
Chip Common Mode Choke Coils	DLW/DLP Series	Noise Suppression	
Microwave Absorbers	EA Series	Noise Suppression	
Ferrite Cores	FS Series	Noise Suppression	
Thin Type Sandwich Cores	FSSA Series	Noise Suppression	

G-PON



1 Optical Transmitter Module/Optical Receiver Module

Monolithic Ceramic Capacitors (Top & Bottom Electrode Type for Bonding)
GMA Series

Monolithic Ceramic Capacitors (Compatible to Bonding /AuSn Soldering)
GMD Series

Single Layer Microchip Capacitors
CLB Series

Thin Film Circuit Substrate RUSUB®
RUCYT Series

2 DC-DC Converter

DC-DC Converters
MYB Series

DC-DC Converters
OKL Series

Micro DC-DC Converters
LXDC Series

Polymer Aluminum Electrolytic Capacitors
ECAS Series

Thermistors
PRF Series

3 Interface

Low ESL Monolithic Ceramic Capacitors
LLL/LLA/LLM Series

Crystal Units
XRCGB Series

Chip Common Mode Choke Coils
DLW/DLP Series

ESD Protection Devices
LXES Series

4 Routers

Low ESL Monolithic Ceramic Capacitors
LLL/LLA/LLM Series

Medium High Voltage Ceramic Capacitors
DEA/DES Series

Monolithic Ceramic Capacitors (Compatible to Bonding/AuSn Soldering)
GMD Series

Supercapacitors (EDLC)
DMT Series

Monolithic Ceramic Capacitors for Medium Voltage
GR/GA Series

Monolithic Ceramic Capacitors (Top & Bottom Electrode Type for Bonding)
GMA Series

Crystal Units
XRCGB Series

Chip Common Mode Choke Coils
DLW/DLP Series

5 Servers

Shock Sensors
PKGS Series

Supercapacitors (EDLC)
DMT Series

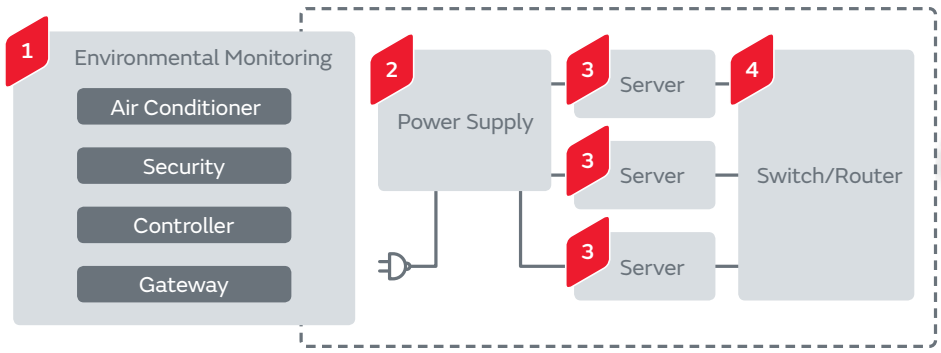
Polymer Aluminum Electrolytic Capacitors
ECAS Series

Crystal Units
XRCGB Series

General Purpose

Monolithic Ceramic Capacitors	GRM/GJM Series	High Frequency Filter Circuit
Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling/For Step-up
Resin External Electrode Monolithic Ceramic Capacitiors	GRJ Series	Coupling/Decoupling/For Step-up
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 Series	Voltage Conversion
Chip Ferrite Beads	BLM Series	Noise Suppression
3 Terminal Capacitors	NFM/NFE Series	Noise Suppression
Chip Common Mode Choke Coils	DLW/DLP Series	Noise Suppression
Microwave Absorbers	EA Series	Noise Suppression
Ferrite Cores	FS Series	Noise Suppression
Thin Type Sandwich Cores	FSSA Series	Noise Suppression
Small Energy Devices	UMAC Series	Battery Backup

Data Center



1 Environmental Monitoring

- Wi-Fi® Modules
- Sub-GHz Modules
- AMR Sensors (Magnetic Sensors) MR Series
- Pressure Sensors ZPA Series
- Shock Sensors PKGS Series
- Thermistors NCP Series

2 Power Supply

- 3-phase PFC Converters MPA Series
- DC-DC Converters for High Voltage Direct Current (HVDC) MPA Series

3 Server

- Shock Sensors PKGS Series
- Isolated DC-DC Converters MYB Series
- Non-isolated DC-DC Converters OKL/MPDR/MPDT Series
- Supercapacitors (EDLC) DMT Series
- Polymer Aluminum Electrolytic Capacitors ECAS Series
- Crystal Units XRCGB Series

4 Switch/Router

- Isolated DC-DC Converters MYB Series
- Non-isolated DC-DC Converters OKL/MPDR/MPDT Series
- Low ESL Monolithic Ceramic Capacitors LLL/LLA/LLM Series
- Monolithic Ceramic Capacitors for Medium Voltage GR/GA Series
- Medium High Voltage Ceramic Capacitors DEA/DES Series
- Monolithic Ceramic Capacitors (Top & Bottom Electrode Type for Bonding) GMA Series
- Monolithic Ceramic Capacitors (Compatible to Bonding /AuSn Soldering) GMD Series
- Crystal Units XRCGB Series
- Supercapacitors (EDLC) DMT Series
- Chip Common Mode Choke Coils DLW/DLP Series

General Purpose

Monolithic Ceramic Capacitors	GRM/GJM Series	High Frequency Filter Circuit
Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling/For Step-up
Resin External Electrode Monolithic Ceramic Capacitiors	GRJ Series	Coupling/Decoupling/For Step-up
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 Series	Voltage Conversion
Chip Ferrite Beads	BLM Series	Noise Suppression
3 Terminal Capacitors	NFM/NFE Series	Noise Suppression
Chip Common Mode Choke Coils	DLW/DLP Series	Noise Suppression
Microwave Absorbers	EA Series	Noise Suppression
Ferrite Cores	FS Series	Noise Suppression
Thin Type Sandwich Cores	FSSA Series	Noise Suppression
Small Energy Devices	UMAC Series	Battery Backup

Automotive

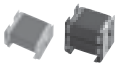
Powertrain/Safety

1. ECU
2. AT
3. Auxilliary Motors
4. TPMS
5. ABS/ESC
6. Headlamp
7. EPS
8. Fuel Injection System

1 ECU

Low Temperature Co-fired Ceramics (LTCC) Ceramic Multilayer Substrates LFC®

Metal Terminal Type Monolithic Ceramic Capacitors
KCM Series



Monolithic Ceramic Capacitors
GCM/GCJ Series

Monolithic Ceramic Capacitors for Conductive Glue Mounting
GCG Series

Radial Lead Type Monolithic Ceramic Capacitors
RH Series

Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series

Crystal Units
XRCHA-F-A Series

Accelerometers
SCA Series

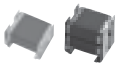
Gyro Sensors
SCC Series

Thermistors
PRF/PTG Series

2 AT

Low Temperature Co-fired Ceramics (LTCC) Ceramic Multilayer Substrates LFC®

Metal Terminal Type Monolithic Ceramic Capacitors
KCM Series



Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series

Crystal Units
XRCHA-F-A Series

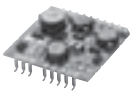
Accelerometers
SCA Series

Thermistors
PRF/PTG Series

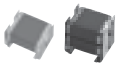
3 Auxiliary Motors

Low Temperature Co-fired Ceramics (LTCC) Ceramic Multilayer Substrates LFC®

DC-DC Converters



Metal Terminal Type Monolithic Ceramic Capacitors
KCM Series



Radial Lead Type Monolithic Ceramic Capacitors
RH Series

Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series

Large Current Common Mode Choke Coils
PLT10HH Series

Thermistors
PRF/PTG Series

4 TPMS

Shock Sensors
PKGS Series

Ceramic Filters CERAFIL®
SFECF Series

Ceramic Discriminators
CDSCB Series

Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series

Crystal Units
XRCHA-F-A Series

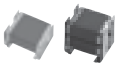
Pressure Sensor Elements

Thermistors
PRF Series

5 ABS/ESC

Low Temperature Co-fired Ceramics (LTCC) Ceramic Multilayer Substrates LFC®

Metal Terminal Type Monolithic Ceramic Capacitors
KCM Series



Monolithic Ceramic Capacitors
GCM/GCJ Series

Monolithic Ceramic Capacitors for Conductive Glue Mounting
GCG Series

Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series

Crystal Units
XRCHA-F-A Series

Accelerometers
SCA Series

Gyro Sensors
SCC Series

Thermistors for Conductive Glue Mounting
NCG18 Series

6 Headlamp

Monolithic Ceramic Capacitors
GCM/GCJ Series

Monolithic Ceramic Capacitors for Conductive Glue Mounting
GCG Series

Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series

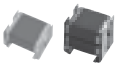
Crystal Units
XRCHA-F-A Series

Thermistors for Conductive Glue Mounting
NCG18 Series

7 EPS

Low Temperature Co-fired Ceramics (LTCC) Ceramic Multilayer Substrates LFC®

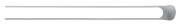
Metal Terminal Type Monolithic Ceramic Capacitors
KCM Series



Monolithic Ceramic Capacitors
GCM/GCJ Series

Monolithic Ceramic Capacitors for Conductive Glue Mounting
GCG Series

Radial Lead Type Monolithic Ceramic Capacitors
RCE Series



Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series

Crystal Units
XRCHA-F-A Series

Thermistors for Conductive Glue Mounting
NCG18 Series

Accelerometers
SCA Series

Gyro Sensors
SCC Series

Thermistors
PRF/PTG Series

8 Fuel Injection System

Radial Lead Type Monolithic Ceramic Capacitors
RPF Series

General Purpose (High Reliability)

Monolithic Ceramic Capacitors	GCM Series	Coupling/Decoupling	150°c
Radial Lead Type Monolithic Ceramic Capacitors	RCE Series	Noise Suppression/Decoupling	125°c
Radial Lead Type Monolithic Ceramic Capacitors	RH Series	Noise Suppression/Decoupling	150°c
Chip Inductors (Chip Coils)	LQH32CH Series	Voltage Conversion	105°c
Chip Inductors (Chip Coils)	LQG15HH Series	Impedance Matching/Choke	125°c
Chip Ferrite Beads	BLM_SH Series	Noise Suppression	125°c
3 Terminal Capacitors	NFM_H/NFE_H Series	Noise Suppression	125°c
Chip Common Mode Choke Coils	DLW31SH/DLW43SH Series	Common Mode Noise Suppression	125°c

105°c 105°c max. 125°c 125°c max. 150°c 150°c max.

HEV/PHEV/EV

1. Charger
2. BMS
3. Electrically-Driven Compressor
4. Electric Pump
5. Inverter
6. DC-DC Converter

1 Charger

- Metal Terminal Type Monolithic Ceramic Capacitors **KCM Series**
- Monolithic Ceramic Capacitors **GCM/GCJ Series**
- Safety Standard Certified Ceramic Capacitors **Type KJ**
- Ceramic Resonators CERALOCK® **CSTCE Series**
- Crystal Units **XRCHA-F-A Series**
- Large Current Common Mode Choke Coils **PLT10HH Series**
- Thermistors **PRF/PTG Series**

2 BMS

- DC-DC Converters
- Metal Terminal Type Monolithic Ceramic Capacitors **KCM Series**
- Monolithic Ceramic Capacitors **GCM/GCJ Series**
- Monolithic Ceramic Capacitors for Conductive Glue Mounting **GCG Series**
- Ceramic Resonators CERALOCK® **CSTCE Series**
- Crystal Units **XRCHA-F-A Series**
- Thermistors **PRF/PTG Series**

3 Electrically-driven Compressor

- Metal Terminal Type Monolithic Ceramic Capacitors **KCM Series**
- Monolithic Ceramic Capacitors **GCM/GCJ Series**
- Monolithic Ceramic Capacitors for Conductive Glue Mounting **GCG Series**
- Thermistors **PRF/PTG Series**

4 Electric Pump

- Metal Terminal Type Monolithic Ceramic Capacitors **KCM Series**
- Monolithic Ceramic Capacitors **GCM/GCJ Series**
- Monolithic Ceramic Capacitors for Conductive Glue Mounting **GCG Series**
- Large Current Common Mode Choke Coils **PLT10HH Series**
- Thermistors **PRF/PTG Series**

5 Inverter

- Metal Terminal Type Monolithic Ceramic Capacitors **KCM Series**
- Monolithic Ceramic Capacitors **GCM/GCJ Series**
- Monolithic Ceramic Capacitors for Conductive Glue Mounting **GCG Series**
- Radial Lead Type Monolithic Ceramic Capacitors **RH Series**
- Large Current Common Mode Choke Coils **PLT10HH Series**
- Thermistors **PRF/PTG Series**

6 DC-DC Converter

- Metal Terminal Type Monolithic Ceramic Capacitors **KCM Series**
- Monolithic Ceramic Capacitors **GCM/GCJ Series**
- Monolithic Ceramic Capacitors for Conductive Glue Mounting **GCG Series**
- Ceramic Resonators CERALOCK® **CSTCE/CSTCR Series**
- Crystal Units **XRCHA-F-A Series**
- Large Current Common Mode Choke Coils **PLT10HH Series**
- Thermistors **PRF/PTG Series**

General Purpose (High Reliability)

Monolithic Ceramic Capacitors	GCM Series	Coupling/Decoupling	150°c
Radial Lead Type Monolithic Ceramic Capacitors	RCE Series	Noise Suppression/Decoupling	125°c
Radial Lead Type Monolithic Ceramic Capacitors	RH Series	Noise Suppression/Decoupling	150°c
Chip Inductors (Chip Coils)	LQH32CH Series	Voltage Conversion	105°c
Chip Inductors (Chip Coils)	LQG15HH Series	Impedance Matching/Choke	125°c
Chip Ferrite Beads	BLM_SH Series	Noise Suppression	125°c
3 Terminal Capacitors	NFM_H/NFE_H Series	Noise Suppression	125°c
Chip Common Mode Choke Coils	DLW31SH/DLW43SH Series	Common Mode Noise Suppression	125°c

105°c 105°c max. 125°c 125°c max. 150°c 150°c max.

Information/Comfort/Accessory

1 Navigation/ Infotainment
2 RKE
3 Meter/HUD
4 Power Seat/ Power Mirror
5 Parking Assist

1 Navigation/Infotainment

Rotary Position Sensors
SV Series

Accelerometers
SCA Series

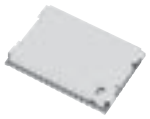
Supercapacitors (EDLC)
DMT Series

Ceramic Filters CERAFIL®
SFECF Series

Ceramic Discriminators
CDSCB Series

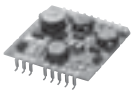
Piezoelectric Sounders
PKLCS Series

Bluetooth® Modules



Wi-Fi® Modules

DC-DC Converters



Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series

Crystal Units
XRCHA-F-A Series

Thermistors
PRF/PRG/PTG Series

2 RKE

Supercapacitors (EDLC)
DMT Series

Small Energy Devices
UMAC Series

Ceramic Filters CERAFIL®
SFECF Series

Ceramic Discriminators
CDSCB Series

Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series

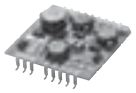
Crystal Units
XRCHA-F-A Series

Piezoelectric Diaphragms
7BB Series

3 Meter/HUD

Rotary Position Sensors
SV Series

DC-DC Converters



Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series

Crystal Units
XRCHA-F-A Series

Piezoelectric Sounders
PKM/PKLCS Series

Thermistors
PRF/PTG Series

4 Power Seat/Power Mirror

Piezoelectric Sounders
PKLCS Series

Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series

Crystal Units
XRCHA-F-A Series

Thermistors
PRF/PTG Series

5 Parking Assist

Ultrasonic Sensors
MA Series

Accelerometers
SCA Series

Supercapacitors (EDLC)
DMT Series

Piezoelectric Sounders
PKM/PKLCS Series

Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series

Crystal Units
XRCHA-F-A Series

Thermistors
PRF/PTG Series

General Purpose

Monolithic Ceramic Capacitors	GRT Series	Coupling/Decoupling
Monolithic Ceramic Capacitors for Medium Voltage	GRM Series	For Snubber
Radial Lead Type Monolithic Ceramic Capacitors	RCE Series	Noise Suppression/Decoupling
Chip Inductors (Chip Coils)	LQM/LQH Series	Voltage Conversion
Chip Ferrite Beads	BLM Series	Noise Suppression
EMI Suppression Filters EMIFIL®	NFM/NFA/NFL/NFE/NFW/NFR Series	Noise Suppression
Chip Common Mode Choke Coils	DLW Series	Common Mode Noise Suppression
Ferrite Cores	FS Series	Noise Suppression

Bike/EV Bike

Electromotive

1. Charger/Battery
2. Inverter
3. DC-DC Converter

Electric Installation

4. Accelerometer for Fuel Cut
5. Headlamp
6. Fuel Injection System

1 Charger/Battery

- Lithium Ion Storage Modules
- Metal Terminal Type Monolithic Ceramic Capacitors KCM Series
- Monolithic Ceramic Capacitors GCM/GCJ Series
- Safety Standard Certified Ceramic Capacitors Type KJ
- Ceramic Resonators CERALOCK® CSTCE Series
- Crystal Units XRCHA-F-A Series
- Large Current Common Mode Choke Coils PLT10HH Series
- Thermistors PRF/PTG Series

2 Inverter

- Monolithic Ceramic Capacitors GCM/GCJ Series
- Monolithic Ceramic Capacitors for Conductive Glue Mounting GCG Series
- Radial Lead Type Monolithic Ceramic Capacitors RH Series
- Large Current Common Mode Choke Coils PLT10HH Series
- Thermistors PRF/PTG Series

3 DC-DC Converter

- DC-DC Converters
- Metal Terminal Type Monolithic Ceramic Capacitors KCM Series
- Monolithic Ceramic Capacitors GCM/GCJ Series
- Monolithic Ceramic Capacitors for Conductive Glue Mounting GCG Series
- Ceramic Resonators CERALOCK® CSTCE/CSTCR Series
- Crystal Units XRCHA-F-A Series
- Large Current Common Mode Choke Coils PLT10HH Series
- Thermistors PRF/PTG Series

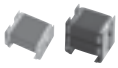
General Purpose (High Reliability)

Monolithic Ceramic Capacitors	GCM Series	Coupling/Decoupling	150°c
Radial Lead Type Monolithic Ceramic Capacitors	RCE Series	Noise Suppression/Decoupling	125°c
Radial Lead Type Monolithic Ceramic Capacitors	RH Series	Noise Suppression/Decoupling	150°c
Chip Inductors (Chip Coils)	LQH32CH Series	Voltage Conversion	105°c
Chip Inductors (Chip Coils)	LQG15HH Series	Impedance Matching/Choke	125°c
Chip Ferrite Beads	BLM_SH Series	Noise Suppression	125°c
3 Terminal Capacitors	NFM_H/NFE_H Series	Noise Suppression	125°c
Chip Common Mode Choke Coils	DLW31SH/DLW43SH Series	Common Mode Noise Suppression	125°c

105°c 105°c max. 125°c 125°c max. 150°c 150°c max.

4 Accelerometer for Fuel Cut

Metal Terminal Type Monolithic Ceramic Capacitors KCM Series



Monolithic Ceramic Capacitors GCM/GCJ Series

Monolithic Ceramic Capacitors for Conductive Glue Mounting GCG Series

Ceramic Resonators CERALOCK® CSTCE/CSTCR Series

Crystal Units XRCHA-F-A Series

Accelerometers SCA Series

Gyro Sensors SCC Series

Thermistors for Conductive Glue Mounting NCG18 Series

5 Headlamp

Monolithic Ceramic Capacitors GCM/GCJ Series

Monolithic Ceramic Capacitors for Conductive Glue Mounting GCG Series

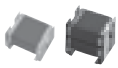
Ceramic Resonators CERALOCK® CSTCE/CSTCR Series

Crystal Units XRCHA-F-A Series

Thermistors for Conductive Glue Mounting NCG18 Series

6 Fuel Injection System

Metal Terminal Type Monolithic Ceramic Capacitors KCM Series



Monolithic Ceramic Capacitors GCM/GCJ Series

Monolithic Ceramic Capacitors for Conductive Glue Mounting GCG Series

Ceramic Resonators CERALOCK® CSTCE/CSTCR Series

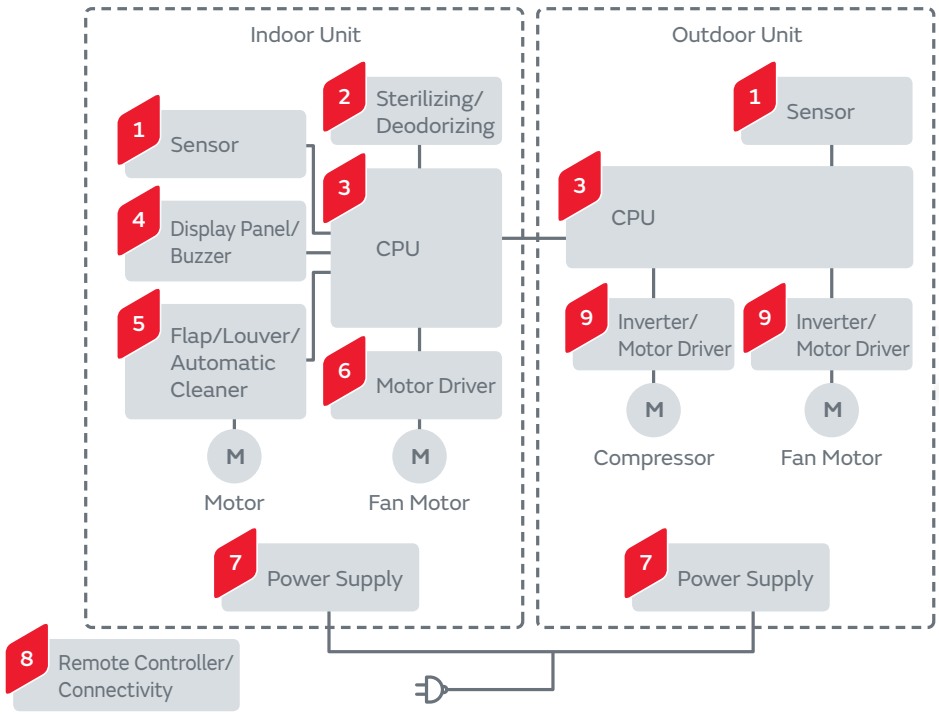
Crystal Units XRCHA-F-A Series

Thermistors PRF/PTG Series

General Purpose

Monolithic Ceramic Capacitors	GRT Series	Coupling/Decoupling	
Monolithic Ceramic Capacitors for Medium Voltage	GRM Series	For Snubber	
Radial Lead Type Monolithic Ceramic Capacitors	RCE Series	Noise Suppression/Decoupling	
Chip Inductors (Chip Coils)	LQM/LQH Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
EMI Suppression Filters EMIFIL®	NFM/NFA/NFL/NFE/NFW/NFR Series	Noise Suppression	
Chip Common Mode Choke Coils	DLW Series	Common Mode Noise Suppression	
Ferrite Cores	FS Series	Noise Suppression	

Air Conditioner



1 Sensor

Pyroelectric Infrared Sensors
IRA Series

Ultrasonic Sensors
MA Series

Thermistors
NCP/NXR/PRF Series

2 Sterilizing/Deodorizing

Ionizer Modules Ionissimo®
MHM300 Series

High Voltage Power
MPH4602 Series

Ozonizer Modules Ionissimo®
MHM500 Series

High Voltage Resistors
MHR Series

3 CPU

Ceramic Resonators CERALOCK®
CSTLS/CSTCE/CSTCR Series

4 Display Panel/Buzzer

Ceramic Resonators CERALOCK®
CSTLS/CSTCE/CSTCR Series

Piezoelectric Sounders
PKM/PKLCS Series

5 Flap/Louver/Automatic Cleaner

Rotary Position Sensors
SV Series

6 Motor Driver

Thermistors
NCP/NXR/PRF Series

7 Power Supply

Monolithic Ceramic Capacitors for Medium Voltage
GR/GA Series

Medium High Voltage Ceramic Capacitors
DEA/DES Series

Safety Standard Certified Ceramic Capacitors
Type KX/KY

Thermistors
NTP/PTG Series

8 Remote Controller/Connectivity

Bluetooth® Modules

Wi-Fi® Modules

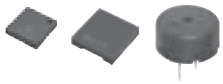
Sub-GHz Modules

Microwave Coaxial Connectors

Micro DC-DC Converters
LXDC Series

Ceramic Resonators CERALOCK®
CSTLS/CSTCE/CSTCR Series

Piezoelectric Sounders
PKMCS/PKLCS/PKM Series



Chip Inductors (Chip Coils)
LQB Series

9 Inverter/Motor Driver

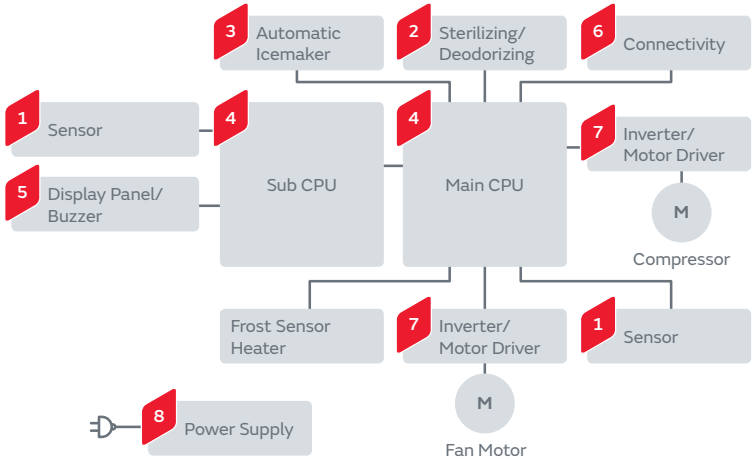
Ceramic Resonators CERALOCK®
CSTLS/CSTCE/CSTCR Series

Thermistors
NCP/NXR/PRF Series

General Purpose

Monolithic Ceramic Capacitors	GRM/GJM Series	High Frequency Filter Circuit	
Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling/For Step-up	
Resin External Electrode Monolithic Ceramic Capacitiors	GRJ Series	Coupling/Decoupling/For Step-up	
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 Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminal Capacitors	NFM/NFE Series	Noise Suppression	
Chip Common Mode Choke Coils	DLW/DLP Series	Noise Suppression	
Microwave Absorbers	EA Series	Noise Suppression	
Ferrite Cores	FS Series	Noise Suppression	
Thin Type Sandwich Cores	FSSA Series	Noise Suppression	
Small Energy Devices	UMAC Series	Battery Backup	

Refrigerator



1 Sensor

Pyroelectric Infrared Sensors
IRA Series

Thermistors
NCP/NXR/PRF Series

2 Sterilizing/Deodorizing

Ionizer Modules Ionissimo®
MHM300 Series

Ozonizer Modules Ionissimo®
MHM500 Series

High Voltage Power
MPH4602 Series

High Voltage Resistors
MHR Series

Microblowers

3 Automatic Icemaker

Microblowers

5 Display Panel/Buzzer

Ceramic Resonators CERALOCK®
CSTLS/CSTCE/CSTCR Series

Piezoelectric Sounders
PKM/PKLCS Series

4 CPU

Ceramic Resonators CERALOCK®
CSTLS/CSTCE/CSTCR Series

6 Connectivity

Bluetooth® Modules

Wi-Fi® Modules

Sub-GHz Modules

Microwave Coaxial Connectors

Micro DC-DC Converters
LXDC Series

Chip Inductors (Chip Coils)
LQB Series

7 Inverter/Motor Driver

Thermistors
NCP/NXR/PRF Series

8 Power Supply

Monolithic Ceramic Capacitors for Medium Voltage
GR/GA Series

Medium High Voltage Ceramic Capacitors
DEA/DES Series

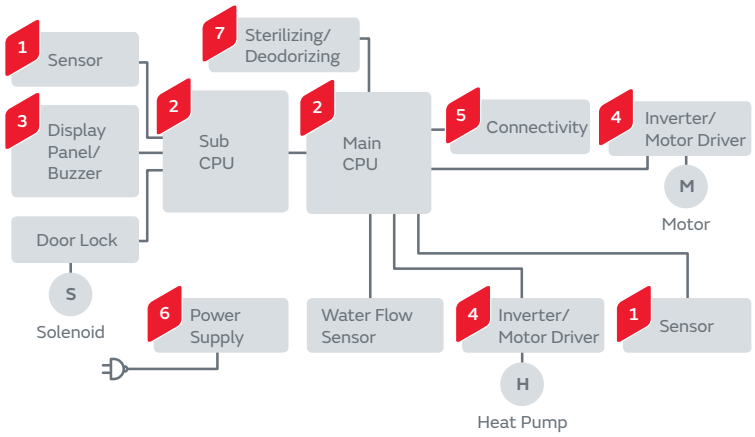
Safety Standard Certified Ceramic Capacitors
Type KX/KY

Thermistors
NTP/PTG Series

General Purpose

Monolithic Ceramic Capacitors	GRM/GJM Series	High Frequency Filter Circuit
Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling/For Step-up
Resin External Electrode Monolithic Ceramic Capacitiors	GRJ Series	Coupling/Decoupling/For Step-up
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 Series	Voltage Conversion
Chip Ferrite Beads	BLM Series	Noise Suppression
3 Terminal Capacitors	NFM/NFE Series	Noise Suppression
Chip Common Mode Choke Coils	DLW/DLP Series	Noise Suppression
Microwave Absorbers	EA Series	Noise Suppression
Ferrite Cores	FS Series	Noise Suppression
Thin Type Sandwich Cores	FSSA Series	Noise Suppression
Small Energy Devices	UMAC Series	Battery Backup

Washing Machine



1 Sensor

Thermistors
NCP/NXR/PRF Series

2 CPU

Ceramic Resonators CERALOCK®
CSTLS/CSTCE/CSTCR Series

3 Display Panel/Buzzer

Rotary Position Sensors
SV Series

Ceramic Resonators CERALOCK®
CSTLS/CSTCE/CSTCR Series

Piezoelectric Sounders
PKM Series

4 Inverter/Motor Driver

Thermistors
NCP/NXR/PRF Series

5 Connectivity

Bluetooth®
Modules

Wi-Fi®
Modules

Sub-GHz
Modules

Microwave
Coaxial Connectors

Micro
DC-DC Converters
LXDC Series

Chip Inductors
(Chip Coils)
LQB Series

6 Power Supply

Monolithic Ceramic Capacitors
for Medium Voltage
GR/GA Series

Medium High Voltage
Ceramic Capacitors
DEA/DES Series

Safety Standard Certified
Ceramic Capacitors
Type KX/KY

Thermistors
NTP/PTG Series

7 Sterilizing/Deodorizing

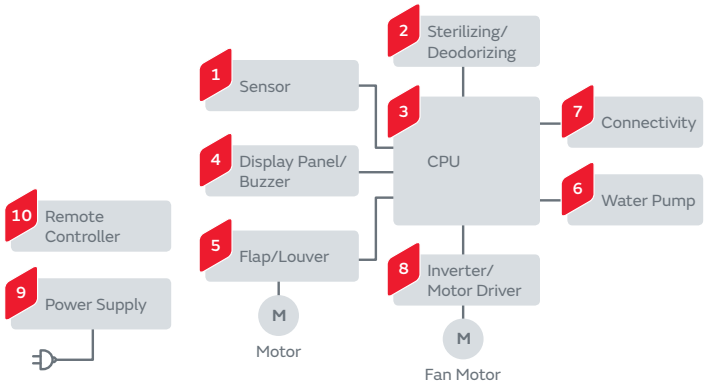
Ozonizer Modules Ionissimo®
MHM500 Series

High Voltage Power
MPH4602 Series

General Purpose

Monolithic Ceramic Capacitors	GRM/GJM Series	High Frequency Filter Circuit	
Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling/For Step-up	
Resin External Electrode Monolithic Ceramic Capacitiors	GRJ Series	Coupling/Decoupling/For Step-up	
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 Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminal Capacitors	NFM/NFE Series	Noise Suppression	
Chip Common Mode Choke Coils	DLW/DLP Series	Noise Suppression	
Microwave Absorbers	EA Series	Noise Suppression	
Ferrite Cores	FS Series	Noise Suppression	
Thin Type Sandwich Cores	FSSA Series	Noise Suppression	
Small Energy Devices	UMAC Series	Battery Backup	

Air Purifier



1 Sensor

Pyroelectric Infrared Sensors
IRA Series

Ultrasonic Sensors
MA Series

Thermistors
NCP/NXR/PRF Series

2 Sterilizing/Deodorizing

Ionizer Modules Ionissimo®
MHM300 Series

Ozonizer Modules Ionissimo®
MHM500 Series

High Voltage Power
MPH4602 Series

High Voltage Resistors
MHR Series

3 CPU

Micro DC-DC Converters
LXDC Series

Ceramic Resonators CERALOCK®
CSTLS/CSTCE/CSTCR Series

4 Display Panel/Buzzer

Ceramic Resonators CERALOCK®
CSTLS/CSTCE/CSTCR Series

Piezoelectric Sounders
PKM/PKLCS Series

5 Flap/Louver

Rotary Position Sensors
SV Series

6 Water Pump

Microblowers

8 Inverter/Motor Driver

Thermistors
NCP/NXR/PRF Series

7 Connectivity

Bluetooth® Modules

Wi-Fi® Modules

Sub-GHz Modules

Microwave Coaxial Connectors

Chip Inductors (Chip Coils)
LQB Series

Micro DC-DC Converters
LXDC Series

9 Power Supply

Monolithic Ceramic Capacitors for Medium Voltage
GR/GA Series

Medium High Voltage Ceramic Capacitors
DEA/DES Series

Safety Standard Certified Ceramic Capacitors
Type KX/KY

AC Line Filters
PLA/PLY Series

Thermistors
NTP/PTG Series

10 Remote Controller

Micro DC-DC Converters
LXDC Series

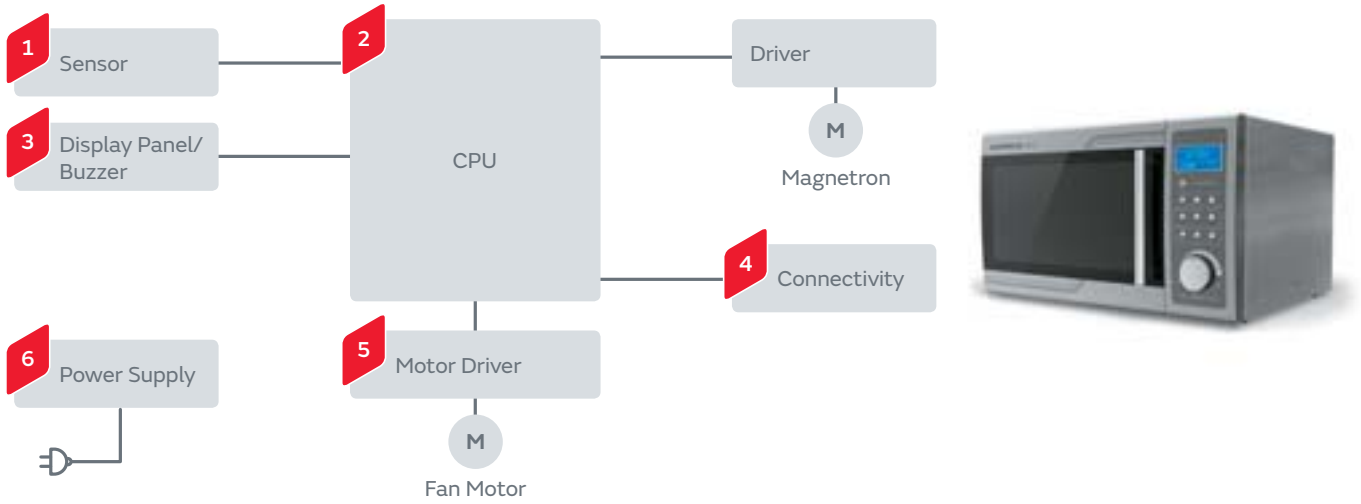
Ceramic Resonators CERALOCK®
CSTLS/CSTCE/CSTCR Series

Piezoelectric Sounders
PKMCS/PKLCS/PKM Series

General Purpose

Monolithic Ceramic Capacitors	GRM/GJM Series	High Frequency Filter Circuit
Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling/For Step-up
Resin External Electrode Monolithic Ceramic Capacitiors	GRJ Series	Coupling/Decoupling/For Step-up
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 Series	Voltage Conversion
Chip Ferrite Beads	BLM Series	Noise Suppression
3 Terminal Capacitors	NFM/NFE Series	Noise Suppression
Chip Common Mode Choke Coils	DLW/DLP Series	Noise Suppression
Microwave Absorbers	EA Series	Noise Suppression
Ferrite Cores	FS Series	Noise Suppression
Thin Type Sandwich Cores	FSSA Series	Noise Suppression
Small Energy Devices	UMAC Series	Battery Backup

Microwave Oven



1 Sensor

Thermistors
NCP/NXR/PRF Series

2 CPU

Ceramic Resonators CERALOCK®
CSTLS/CSTCE/CSTCR Series

3 Display Panel/Buzzer

Ceramic Resonators CERALOCK®
CSTLS/CSTCE/CSTCR Series

Piezoelectric Sounders
PKM/PKLCS Series

4 Connectivity

Bluetooth® Modules

Wi-Fi® Modules

Sub-GHz Modules

Microwave Coaxial Connectors

Micro DC-DC Converters
LXDC Series

Chip Inductors (Chip Coils)
LQB Series

5 Motor Driver

Thermistors
NCP/NXR/PRF Series

6 Power Supply

Monolithic Ceramic Capacitors for Medium Voltage
GR/GA Series

Medium High Voltage Ceramic Capacitors
DEA/DES Series

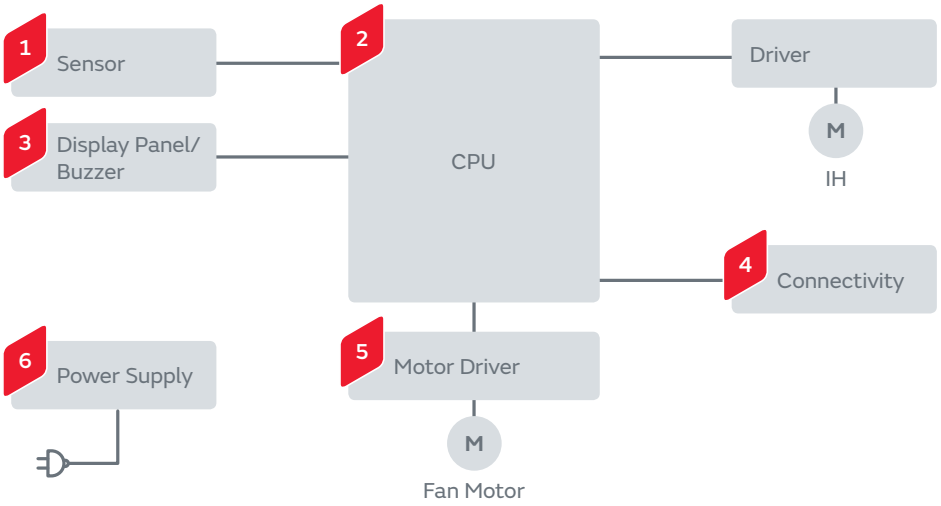
Safety Standard Certified Ceramic Capacitors
Type KX/KY

Thermistors
NTP/PTG Series

General Purpose

Monolithic Ceramic Capacitors	GRM/GJM Series	High Frequency Filter Circuit
Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling/For Step-up
Resin External Electrode Monolithic Ceramic Capacitiors	GRJ Series	Coupling/Decoupling/For Step-up
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 Series	Voltage Conversion
Chip Ferrite Beads	BLM Series	Noise Suppression
3 Terminal Capacitors	NFM/NFE Series	Noise Suppression
Chip Common Mode Choke Coils	DLW/DLP Series	Noise Suppression
Microwave Absorbers	EA Series	Noise Suppression
Ferrite Cores	FS Series	Noise Suppression
Thin Type Sandwich Cores	FSSA Series	Noise Suppression
Small Energy Devices	UMAC Series	Battery Backup

IH Rice Cooker



1 Sensor

Thermistors
NCP/NXR/PRF Series

2 CPU

Ceramic Resonators CERALOCK®
CSTLS/CSTCE/CSTCR Series

3 Display Panel/Buzzer

Ceramic Resonators CERALOCK®
CSTLS/CSTCE/CSTCR Series

Piezoelectric Sounders
PKM/PKLCS Series

4 Connectivity

Bluetooth® Modules

Wi-Fi® Modules

Sub-GHz Modules

Microwave
Coaxial Connectors

Micro DC-DC Converters
LXDC Series

Chip Inductors
(Chip Coils)
LQB Series

5 Motor Driver

Thermistors
NCP/NXR/PRF Series

6 Power Supply

Monolithic Ceramic Capacitors
for Medium Voltage
GR/GA Series

Medium High Voltage
Ceramic Capacitors
DEA/DES Series

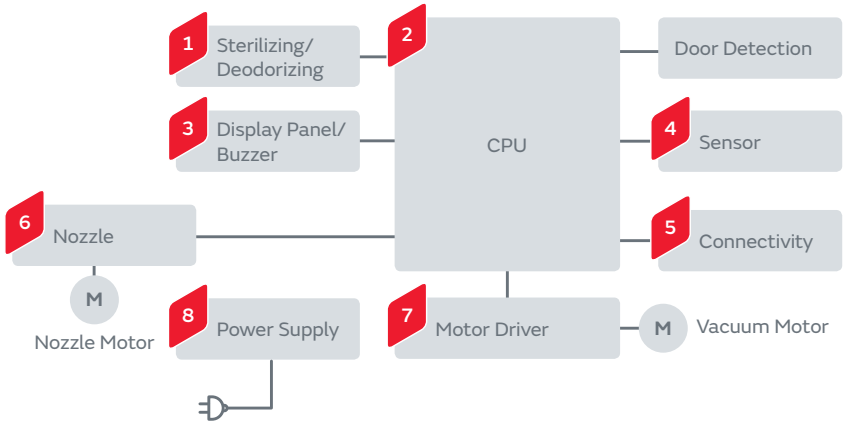
Safety Standard Certified
Ceramic Capacitors
Type KX/KY

Thermistors
NTP/PTG Series

General Purpose

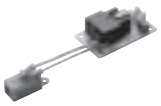
Monolithic Ceramic Capacitors	GRM/GJM Series	High Frequency Filter Circuit
Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling/For Step-up
Resin External Electrode Monolithic Ceramic Capacitiors	GRJ Series	Coupling/Decoupling/For Step-up
Polymer Aluminum Electrolytic Capacitors	ECAS Series	Smoothing/Transient Backup
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching/Resonance
Chip Inductors (Chip Coils)	LQM/LQH Series	Voltage Conversion
Chip Ferrite Beads	BLM Series	Noise Suppression
3 Terminal Capacitors	NFM/NFE Series	Noise Suppression
Chip Common Mode Choke Coils	DLW/DLP Series	Noise Suppression
Microwave Absorbers	EA Series	Noise Suppression
Ferrite Cores	FS Series	Noise Suppression
Thin Type Sandwich Cores	FSSA Series	Noise Suppression
Small Energy Devices	UMAC Series	Battery Backup

Vacuum Cleaner



1 Sterilizing/Deodorizing

Ionizer Modules Ionissimo® **MHM300 Series**



Ozonizer Modules Ionissimo® **MHM500 Series**

High Voltage Resistors **MHR Series**

2 CPU

Ceramic Resonators CERALOCK® **CSTLS/CSTCE/CSTCR Series**

3 Display Panel/Buzzer

Ceramic Resonators CERALOCK® **CSTLS/CSTCE/CSTCR Series**

Piezoelectric Sounders **PKM/PKLCS Series**

4 Sensor

Ultrasonic Sensors **MA Series**

Thermistors **NCP Series**

5 Connectivity

Bluetooth® Modules

Wi-Fi® Modules

Sub-GHz Modules

Microwave Coaxial Connectors

Micro DC-DC Converters **LXDC Series**

Chip Inductors (Chip Coils) **LQB Series**

6 Nozzle

Thermistors **PTG Series**

7 Motor Driver

Thermistors **NCP/NXR/PRF Series**

8 Power Supply

Monolithic Ceramic Capacitors for Medium Voltage **GR/GA Series**

Medium High Voltage Ceramic Capacitors **DEA/DES Series**

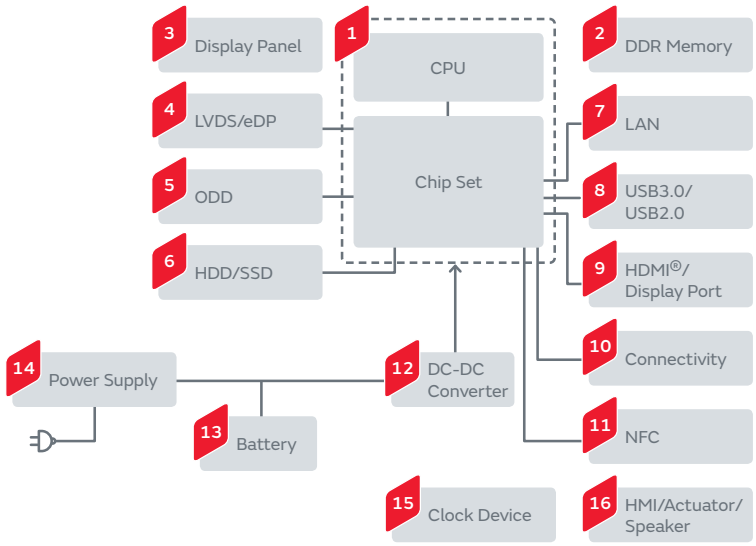
Safety Standard Certified Ceramic Capacitors **Type KX/KY**

Thermistors **NTP/PTG Series**

General Purpose

Monolithic Ceramic Capacitors	GRM/GJM Series	High Frequency Filter Circuit	
Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling/For Step-up	
Resin External Electrode Monolithic Ceramic Capacitiors	GRJ Series	Coupling/Decoupling/For Step-up	
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 Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminal Capacitors	NFM/NFE Series	Noise Suppression	
Chip Common Mode Choke Coils	DLW/DLP Series	Noise Suppression	
Microwave Absorbers	EA Series	Noise Suppression	
Ferrite Cores	FS Series	Noise Suppression	
Thin Type Sandwich Cores	FSSA Series	Noise Suppression	
Small Energy Devices	UMAC Series	Battery Backup	

Tablet Terminators



1 CPU/Chip Set

Micro DC-DC Converters
LXDC Series

Low ESL Monolithic Ceramic Capacitors
LLL/LLA/LLM Series

Polymer Aluminum Electrolytic Capacitors
ECAS Series

Crystal Units
XRCGB Series

Chip Ferrite Beads
BLM Series

3 Terminal Capacitors
NFM Series

Thermistors
NCP/PRF Series

2 DDR Memory

Micro DC-DC Converters
LXDC Series

Polymer Aluminum Electrolytic Capacitors
ECAS Series

Chip Ferrite Beads
BLM Series

3 Display Panel

Metal Terminal Type Monolithic Ceramic Capacitors
KRM Series

Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series

Power Inductors
LQH Series

Thermistors
PRF/PRG Series

4 LVDS/eDP

Chip Common Mode Choke Coils
DLW/DLP Series

ESD Protection Devices
LXES Series

Thermistors
NCP/PRF Series

5 ODD

Ceramic Resonators CERALOCK®
CSTCW Series

Crystal Units
XRCGB Series

Thermistors
NCP Series

6 HDD/SSD

Shock Sensors
PKGS Series

Micro DC-DC Converters
LXDC Series

Polymer Aluminum Electrolytic Capacitors
ECAS Series

Supercapacitors (EDLC)
DMT Series

Actuators
PALHRS Series

Crystal Units
XRCGB Series

Thermistors
NCP/PRF Series

7 LAN

Monolithic Ceramic Capacitors for Medium Voltage
GR4 Series

Chip Common Mode Choke Coils
DLW/DLP Series

8 USB3.0/USB2.0

Micro DC-DC Converters
LXDC Series

Polymer Aluminum Electrolytic Capacitors
ECAS Series

Crystal Units
XRCGB Series

Chip Common Mode Choke Coils
DLW/DLP Series

Chip Ferrite Beads
BLM Series

ESD Protection Devices
LXES Series

Thermistors
PRG Series

9 HDMI®/Display Port

Chip Common Mode Choke Coils
DLW/DLP Series

ESD Protection Devices
LXES Series

Thermistors
PRG Series

10 Connectivity

- Bluetooth® Modules
- Wi-Fi® Modules
- Bluetooth® - Wi-Fi® Combo Modules
- SAW Filters SAF Series
- Chip Multilayer LC Filters
- Chip Multilayer Hybrid Baluns LDB/LDM Series
- Microwave Coaxial Connectors
- Microwave Coaxial Connectors with Switch
- Micro DC-DC Converters LXDC Series
- ESD Protection Devices LXES Series

11 NFC

- NFC Antennas FLAN Series
- Micro DC-DC Converters LXDC Series
- Crystal Units XRCGB Series
- Chip Ferrite Beads BLM Series
- Chip Inductors (Chip Coils) LQM/LQH/LQB Series
- Trimmer Capacitors TZY2 Series
- Variable Capacitors LXRW Series
- ESD Protection Devices LXES Series

12 DC-DC Converter

- Micro DC-DC Converters LXDC Series
- Thermistors NCP/PRF Series
- Metal Terminal Type Monolithic Ceramic Capacitors KRM Series
- Polymer Aluminum Electrolytic Capacitors ECAS Series

13 Battery

- Ceramic Resonators CERALOCK® CSTCE/CSTCR Series
- Thermistors NXR/PRF/PRG Series

14 Power Supply

- Micro DC-DC Converters LXDC Series
- Wireless Power Transmission Modules
- Monolithic Ceramic Capacitors for Medium Voltage GR/GA Series
- Medium High Voltage Ceramic Capacitors DEA/DES Series
- Safety Standard Certified Ceramic Capacitors Type KX/KY
- Ceramic Resonators CERALOCK® CSTCE/CSTCR Series
- Chip Common Mode Choke Coils DLW/DLP Series
- Thermistors NCP/NTP/PRF Series

15 Clock Device

- Ceramic Resonators CERALOCK® CSTCE/CSTCR Series
- Crystal Units XRCGB Series

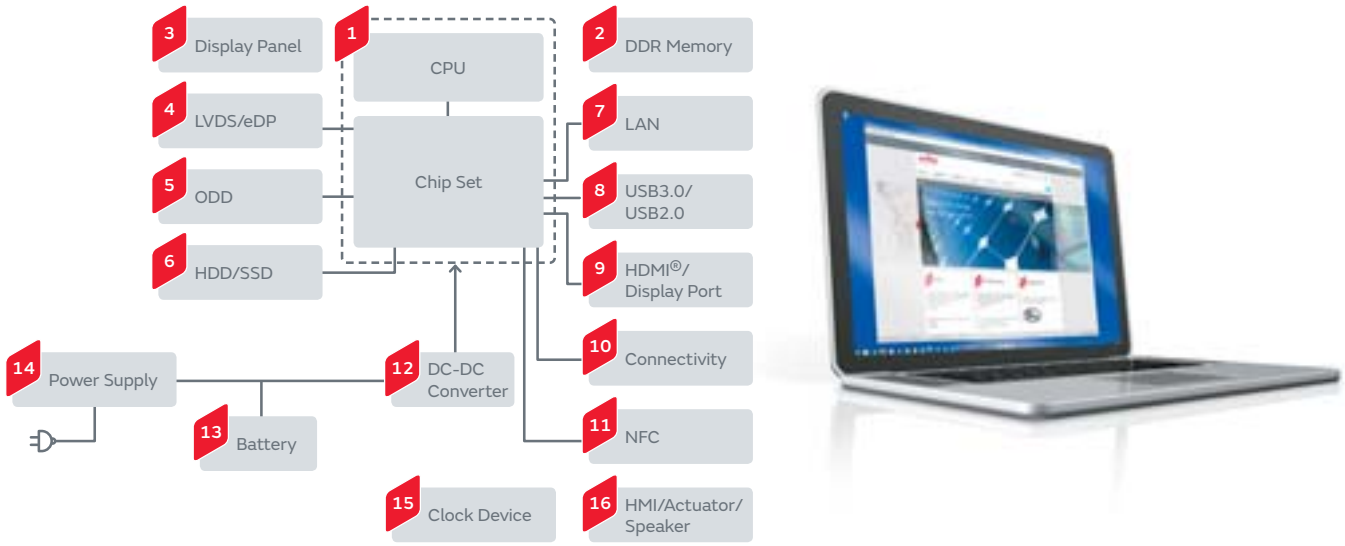
16 HMI/Actuator/Speaker

- Pyroelectric Infrared Sensors IRS Series
- Ultrasonic Sensors MA Series
- ESD Protection Devices LXES Series

General Purpose

Monolithic Ceramic Capacitors	GRM/GJM Series	High Frequency Filter Circuit
Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling/For Step-up
Resin External Electrode Monolithic Ceramic Capacitiors	GRJ Series	Coupling/Decoupling/For Step-up
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 Series	Voltage Conversion
Chip Ferrite Beads	BLM Series	Noise Suppression
3 Terminal Capacitors	NFM/NFE Series	Noise Suppression
Chip Common Mode Choke Coils	DLW/DLP Series	Noise Suppression
Microwave Absorbers	EA Series	Noise Suppression
Ferrite Cores	FS Series	Noise Suppression
Thin Type Sandwich Cores	FSSA Series	Noise Suppression
Small Energy Devices	UMAC Series	Battery Backup

Notebook Computers



1 CPU/Chip Set

Micro DC-DC Converters **LXDC Series**

Low ESL Monolithic Ceramic Capacitors **LLL/LLA/LLM Series**

Polymer Aluminum Electrolytic Capacitors **ECAS Series**

Crystal Units **XRCGB Series**

Chip Ferrite Beads **BLM Series**

3 Terminal Capacitors **NFM Series**

Thermistors **NCP/PRF Series**

2 DDR Memory

Micro DC-DC Converters **LXDC Series**

Polymer Aluminum Electrolytic Capacitors **ECAS Series**

Chip Ferrite Beads **BLM Series**

3 Display Panel

Metal Terminal Type Monolithic Ceramic Capacitors **KRM Series**

Ceramic Resonators CERALOCK® **CSTCE/CSTCR Series**

Power Inductors **LQH Series**

Thermistors **PRF/PRG Series**

4 LVDS/eDP

Chip Common Mode Choke Coils **DLW/DLP Series**

ESD Protection Devices **LXES Series**

Thermistors **NCP/PRF Series**

5 ODD

Ceramic Resonators CERALOCK® **CSTCW Series**

Crystal Units **XRCGB Series**

Thermistors **NCP Series**

6 HDD/SSD

Shock Sensors **PKGS Series**

Micro DC-DC Converters **LXDC Series**

Polymer Aluminum Electrolytic Capacitors **ECAS Series**

Supercapacitors (EDLC) **DMT Series**

Actuators **PALHRS Series**

Crystal Units **XRCGB Series**

Thermistors **NCP/PRF Series**

8 USB3.0/USB2.0

Micro DC-DC Converters **LXDC Series**

Polymer Aluminum Electrolytic Capacitors **ECAS Series**

Crystal Units **XRCGB Series**

Chip Common Mode Choke Coils **DLW/DLP Series**

Chip Ferrite Beads **BLM Series**

ESD Protection Devices **LXES Series**

Thermistors **PRG Series**

7 LAN

Monolithic Ceramic Capacitors for Medium Voltage **GR4 Series**

Chip Common Mode Choke Coils **DLW/DLP Series**

9 HDMI®/Display Port

Chip Common Mode Choke Coils **DLW/DLP Series**

ESD Protection Devices **LXES Series**

Thermistors **PRG Series**

10 Connectivity

Bluetooth® Modules

Wi-Fi® Modules

Bluetooth® - Wi-Fi® Combo Modules

SAW Filters
SAF Series

Chip Multilayer LC Filters

Chip Multilayer Hybrid Baluns
LDB/LDM Series

Microwave
Coaxial Connectors

Microwave Coaxial Connectors
with Switch

Micro DC-DC Converters
LXDC Series

ESD Protection Devices
LXES Series

11 NFC

NFC Antennas
FLAN Series

Micro
DC-DC Converters
LXDC Series

Crystal Units
XRCGB Series

Chip Ferrite Beads
BLM Series

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

Trimmer Capacitors
TZY2 Series

Variable Capacitors
LXRW Series

ESD
Protection Devices
LXES Series

12 DC-DC Converter

Micro
DC-DC Converters
LXDC Series

Thermistors
NCP/PRF Series

Metal Terminal Type
Monolithic Ceramic Capacitors
KRM Series

Polymer Aluminum
Electrolytic Capacitors
ECAS Series

13 Battery

Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series

Thermistors
NXR/PRF/PRG Series

14 Power Supply

Micro
DC-DC Converters
LXDC Series

Wireless Power
Transmission Modules

Monolithic Ceramic Capacitors
for Medium Voltage
GR/GA Series

Medium High Voltage
Ceramic Capacitors
DEA/DES Series

Safety Standard Certified
Ceramic Capacitors
Type KX/KY

Ceramic Resonators
CERALOCK®
CSTCE/CSTCR Series

Chip Common Mode
Choke Coils
DLW/DLP Series

Thermistors
NCP/NTP/PRF Series

15 Clock Device

Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series

Crystal Units
XRCGB Series

16 HMI/Actuator/Speaker

Pyroelectric
Infrared Sensors
IRS Series

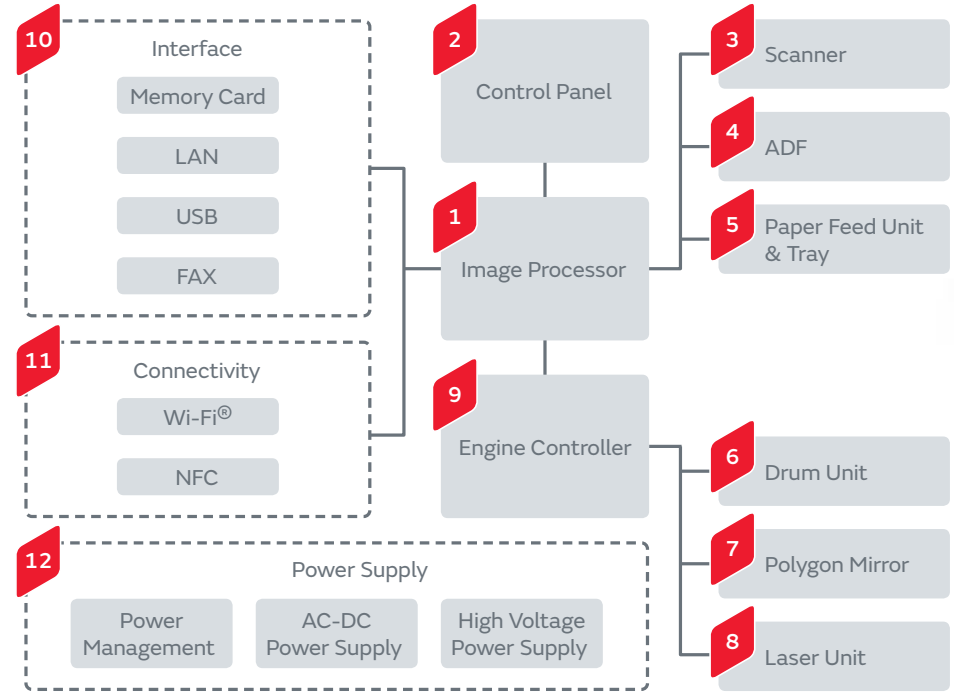
Ultrasonic Sensors
MA Series

ESD
Protection Devices
LXES Series

General Purpose

Monolithic Ceramic Capacitors	GRM/GJM Series	High Frequency Filter Circuit	
Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling/For Step-up	
Resin External Electrode Monolithic Ceramic Capacitiors	GRJ Series	Coupling/Decoupling/For Step-up	
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 Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminal Capacitors	NFM/NFE Series	Noise Suppression	
Chip Common Mode Choke Coils	DLW/DLP Series	Noise Suppression	
Microwave Absorbers	EA Series	Noise Suppression	
Ferrite Cores	FS Series	Noise Suppression	
Thin Type Sandwich Cores	FSSA Series	Noise Suppression	
Small Energy Devices	UMAC Series	Battery Backup	

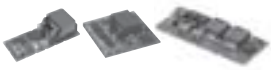
MFP (Multi Function Printer/Product/Peripheral)



1 Image Processor

Isolated DC-DC Converters
MYB Series

Non-isolated DC-DC Converters
OKL/MPDR/MPDT Series



Micro DC-DC Converters
LXDC Series

Low ESL Monolithic Ceramic Capacitors
LLL/LLA/LLM Series

Polymer Aluminum Electrolytic Capacitors
ECAS Series

AMR Sensors (Magnetic Sensors)
MR Series

Crystal Units
XRCGB Series

Thermistors
NCP/PRF Series

2 Control Panel

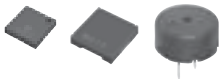
Rotary Position Sensors
SV Series

Micro DC-DC Converters
LXDC Series

Metal Terminal Type Monolithic Ceramic Capacitors
KRM Series

Polymer Aluminum Electrolytic Capacitors
ECAS Series

Piezoelectric Sounders
PKMCS/PKLCS/PKM Series



Chip Common Mode Choke Coils
DLW/DLP Series

Thermistors
NCP/PRF Series

3 Scanner

Supercapacitors (EDLC)
DMT Series

Ultrasonic Sensors
MA Series

4 ADF

Ultrasonic Sensors
MA Series

Accelerometers
SCA Series

Rotary Position Sensors
SV Series

5 Paper Feed Unit & Tray

AMR Sensors (Magnetic Sensors)
MR Series

Rotary Position Sensors
SV Series

6 Drum Unit

Thermistors
NCP/PRF Series

7 Polygon Mirror

Accelerometers
SCA Series

8 Laser Unit

Thermistors
NCP/PRF Series

9 Engine Controller

Monolithic Ceramic Capacitors for Medium Voltage
GR/GA Series

Medium High Voltage Ceramic Capacitors
DEA/DES Series

Shock Sensors
PKGS Series

Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series

Crystal Units
XRCGB Series

Large Current Common Mode Choke Coils
PLT10HH Series

Thermistors
PRF/PTG Series

10 Interface

Polymer Aluminum Electrolytic Capacitors
ECAS Series

Crystal Units
XRCGB Series

Chip Common Mode Choke Coils
DLW/DLP Series

ESD Protection Devices
LXES Series

Thermistors
PRF Series

11 Connectivity

Wi-Fi® Modules

NFC Antennas
FLAN Series

Micro DC-DC Converters
LXDC Series

Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series

Crystal Units
XRCGB Series

Chip Inductors (Chip Coils)
LQB Series

ESD Protection Devices
LXES Series

12 Power Supply

Micro DC-DC Converters
LXDC Series

Monolithic Ceramic Capacitors for Medium Voltage
GR/GA Series

Medium High Voltage Ceramic Capacitors
DEA/DES Series

Safety Standard Certified Ceramic Capacitors
Type KX/KY

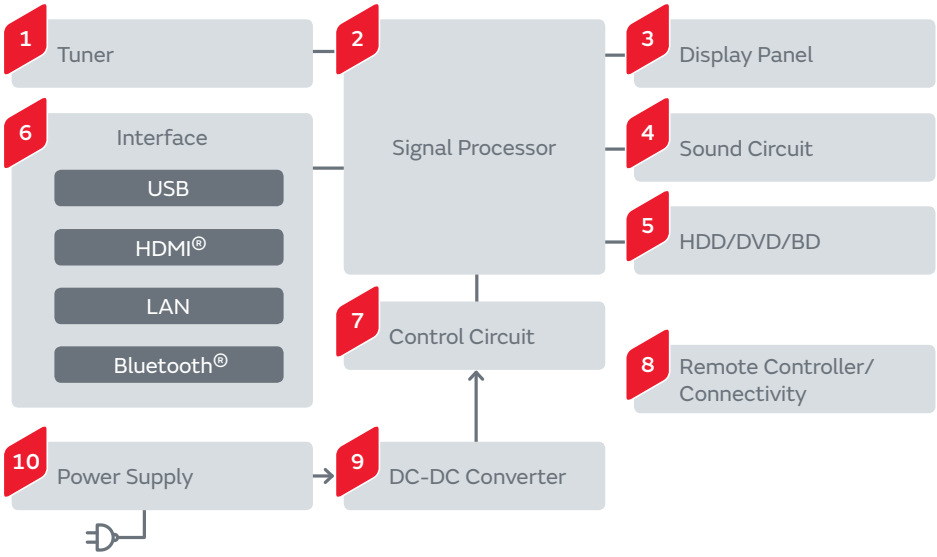
AC Line Filters
PLA/PLH/PLY Series

High Voltage Power Supplies
MPH Series

General Purpose

Monolithic Ceramic Capacitors	GRM/GJM Series	High Frequency Filter Circuit	
Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling/For Step-up	
Resin External Electrode Monolithic Ceramic Capacitiors	GRJ Series	Coupling/Decoupling/For Step-up	
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 Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminal Capacitors	NFM/NFE Series	Noise Suppression	
Chip Common Mode Choke Coils	DLW/DLP Series	Noise Suppression	
Microwave Absorbers	EA Series	Noise Suppression	
Ferrite Cores	FS Series	Noise Suppression	
Thin Type Sandwich Cores	FSSA Series	Noise Suppression	
Small Energy Devices	UMAC Series	Battery Backup	

Televisions



1 Tuner

Microchip Transformers (Baluns)
DXP18B Series

Crystal Units
XRCGB Series

Chip Inductors (Chip Coils)
LQW Series

ESD Protection Devices
LXES Series

2 Signal Processor

Polymer Aluminum Electrolytic Capacitors
ECAS Series

Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series

Crystal Units
XRCGB Series

3 Terminal Capacitors
NFM Series

Thermistors
NCP/PRF Series

3 Display Panel

DC-DC Converters
OKL Series

Metal Terminal Type Monolithic Ceramic Capacitors
KRM Series

Polymer Aluminum Electrolytic Capacitors
ECAS Series

Chip Common Mode Choke Coils
DLW/DLP Series

Power Inductors
LQH Series

Rotary Position Sensors
SV Series

Thermistors
NCP/PRF Series

4 Sound Circuit

Chip Common Mode Choke Coils
DLW/DLP Series

5 HDD/DVD/BD

Shock Sensors
PKGS Series

Polymer Aluminum Electrolytic Capacitors
ECAS Series

Ceramic Resonators CERALOCK®
CSTCE Series

Crystal Units
XRCGB Series

Thermistors
NCP/PRF Series

6 Interface

Bluetooth® Modules

Bluetooth® Smart Modules

Polymer Aluminum Electrolytic Capacitors
ECAS Series

Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series

Crystal Units
XRCGB Series

Chip Common Mode Choke Coils
DLW/DLP Series

ESD Protection Devices
LXES Series

Thermistors
PRG Series

7 Control Circuit

Bluetooth® Modules

Pyroelectric Infrared Sensors
IRS Series

Micro DC-DC Converters
LXDC Series

Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series

8 Remote Controller/Connectivity

Bluetooth® Modules

Wi-Fi® Modules

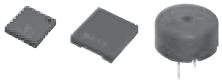
Bluetooth® Smart Modules

Shock Sensors
PKGS Series

Micro DC-DC Converters
LXDC Series

Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series

Piezoelectric Sounders
PKMCS/PKLCS/PKM Series



ESD Protection Devices
LXES Series

Chip Inductors (Chip Coils)
LQB Series

9 DC-DC Converter

Micro DC-DC Converters
LXDC Series

Metal Terminal Type Monolithic Ceramic Capacitors
KRM Series

Polymer Aluminum Electrolytic Capacitors
ECAS Series

Power Inductors
LQH Series

Thermistors
NCP/PRF Series

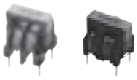
10 Power Supply

Monolithic Ceramic Capacitors for Medium Voltage
GR/GA Series

Medium High Voltage Ceramic Capacitors
DEA/DES Series

Safety Standard Certified Ceramic Capacitors
Type KX/KY

AC Line Filters
PLA/PLY Series

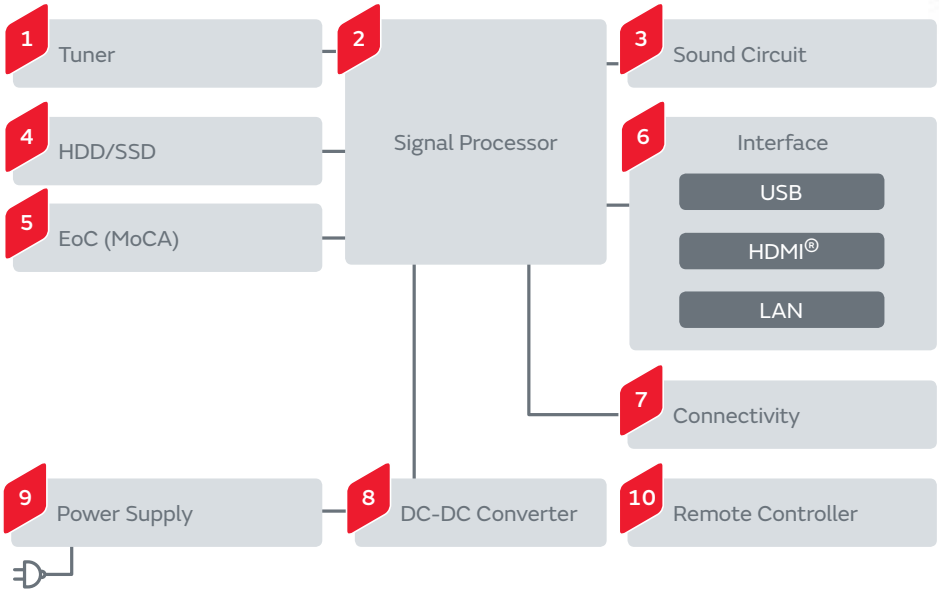


Thermistors
NCP/NTP/PRF/PTG Series

General Purpose

Monolithic Ceramic Capacitors	GRM/GJM Series	High Frequency Filter Circuit	
Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling/For Step-up	
Resin External Electrode Monolithic Ceramic Capacitiors	GRJ Series	Coupling/Decoupling/For Step-up	
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 Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminal Capacitors	NFM/NFE Series	Noise Suppression	
Chip Common Mode Choke Coils	DLW/DLP Series	Noise Suppression	
Microwave Absorbers	EA Series	Noise Suppression	
Ferrite Cores	FS Series	Noise Suppression	
Thin Type Sandwich Cores	FSSA Series	Noise Suppression	

Set-top Box



1 Tuner

- Crystal Units XRCGB Series
- Chip Inductors (Chip Coils) LQW Series
- ESD Protection Devices LXES Series

2 Signal Processor

- Polymer Aluminum Electrolytic Capacitors ECAS Series
- Ceramic Resonators CERALOCK® CSTCE/CSTCR Series
- Crystal Units XRCGB Series
- 3 Terminal Capacitors NFM Series

3 Sound Circuit

- Chip Common Mode Choke Coils DLW/DLP Series

4 HDD/SSD

- Shock Sensors PKGS Series
- Polymer Aluminum Electrolytic Capacitors ECAS Series
- Ceramic Resonators CERALOCK® CSTCE Series
- Crystal Units XRCGB Series
- Supercapacitors (EDLC) DMT Series
- Thermistors NCP/PRF Series

5 EoC (MoCA)

- Duplexers DFYH Series
- Chip Multilayer LC Filters LF Series
- Chip Multilayer Hybrid Baluns LDB/LDM Series
- Ceramic Resonators CERALOCK® CSTCE/CSTCR Series

6 Interface

- Polymer Aluminum Electrolytic Capacitors ECAS Series
- Ceramic Resonators CERALOCK® CSTCE/CSTCR Series
- Crystal Units XRCGB Series
- Chip Common Mode Choke Coils DLW/DLP Series
- ESD Protection Devices LXES Series
- Thermistors PRG Series

7 Connectivity

Wi-Fi® Modules

Microwave Coaxial Connectors

Microwave Coaxial Connectors with Switch

Micro DC-DC Converters
LXDC Series

Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series

Chip Inductors (Chip Coils)
LQB Series

ESD Protection Devices
LXES Series

8 DC-DC Converter

DC-DC Converters
OKL Series

Micro DC-DC Converters
LXDC Series

Metal Terminal Type Monolithic Ceramic Capacitors
KRM Series

Polymer Aluminum Electrolytic Capacitors
ECAS Series

Power Inductors
LQH Series

Thermistors
NCP/PRF Series

9 Power Supply

Monolithic Ceramic Capacitors for Medium Voltage
GR/GA Series

Medium High Voltage Ceramic Capacitors
DEA/DES Series

Safety Standard Certified Ceramic Capacitors
Type KX/KY

AC Line Filters
PLA/PLY Series

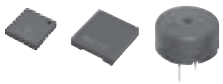
Thermistors
NCP/NTP/PRF/PTG Series

10 Remote Controller

Micro DC-DC Converters
LXDC Series

Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series

Piezoelectric Sounders
PKMCS/PKLCS/PKM Series

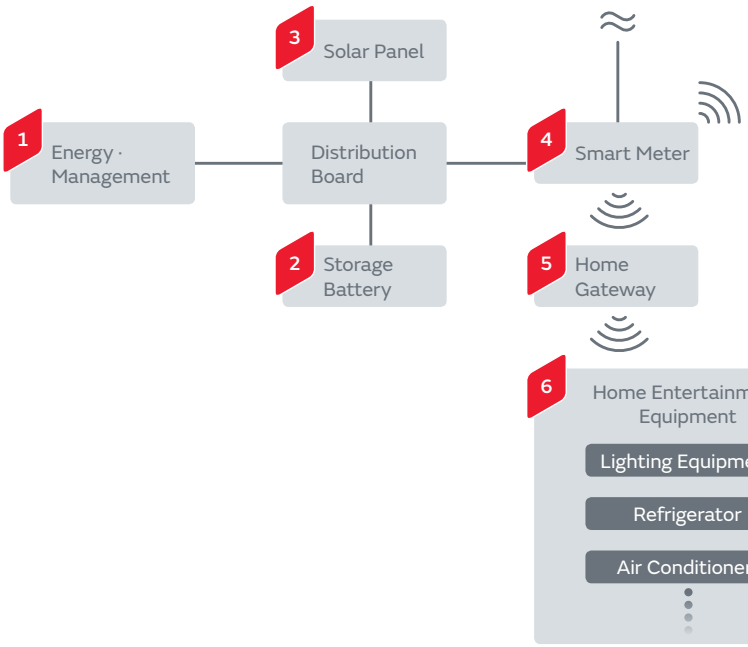


Trimmer Capacitors
TZY2 Series

General Purpose

Monolithic Ceramic Capacitors	GRM/GJM Series	High Frequency Filter Circuit	
Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling/For Step-up	
Resin External Electrode Monolithic Ceramic Capacitiors	GRJ Series	Coupling/Decoupling/For Step-up	
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 Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminal Capacitors	NFM/NFE Series	Noise Suppression	
Chip Common Mode Choke Coils	DLW/DLP Series	Noise Suppression	
Microwave Absorbers	EA Series	Noise Suppression	
Ferrite Cores	FS Series	Noise Suppression	
Thin Type Sandwich Cores	FSSA Series	Noise Suppression	
Small Energy Devices	UMAC Series	Battery Backup	

HEMS



1 Energy · Management

Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series

Crystal Units
XRCGB Series

Topics

Introduction of Examples as Energy System
http://www.murata.com/en-global/about/newsroom/news/product/power/2013/0426

2 Storage Battery

Isolated DC-DC Converters
MYB Series

Non-isolated DC-DC Converters
OKL/MPDR/MPDT Series

Monolithic Ceramic Capacitors for Medium Voltage
GR/GA Series

Medium High Voltage Ceramic Capacitors
DEA/DES Series

Safety Standard Certified Ceramic Capacitors
Type KX/KY

Thermistors
NCP/NTP/PRF/PRG/PTG Series

Micro DC-DC Converters
LXDC Series

Small Energy Devices
UMAC Series

3 Solar Panel

Isolated DC-DC Converters
MYB Series

Non-isolated DC-DC Converters
OKL/MPD Series

Monolithic Ceramic Capacitors for Medium Voltage
GR/GA Series

Micro DC-DC Converters
LXDC Series

Supercapacitors (EDLC)
DMT Series

4 Smart Meter

Chip Multilayer LC Filters
LF Series

Chip Multilayer Hybrid Baluns
LDB/LDM Series

Wi-Fi® Modules

Sub-GHz Modules

Isolated DC-DC Converters
MYB Series

Non-isolated DC-DC Converters
OKL/MPD Series

Supercapacitors (EDLC)
DMF/DMT Series

Monolithic Ceramic Capacitors for Medium Voltage
GR4 Series

Medium High Voltage Ceramic Capacitors
DEA/DES Series

Safety Standard Certified Ceramic Capacitors
Type KX/KY

Crystal Units
XRCGB Series

Piezoelectric Sounders
PKMCS/PKLCS/PKM Series

5 Home Gateway

Wi-Fi® Modules

Bluetooth® Modules

Sub-GHz Modules

6 Home Entertainment Equipment

Bluetooth® Modules

Wi-Fi® Modules

Sub-GHz Modules

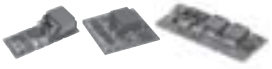
Ultrasonic Sensors
MA Series

Shock Sensors
PKGS Series

AMR Sensors (Magnetic Sensors)
MR Series

Isolated DC-DC Converters
MYB Series

Non-isolated DC-DC Converters
OKL/MPDR/MPDT Series

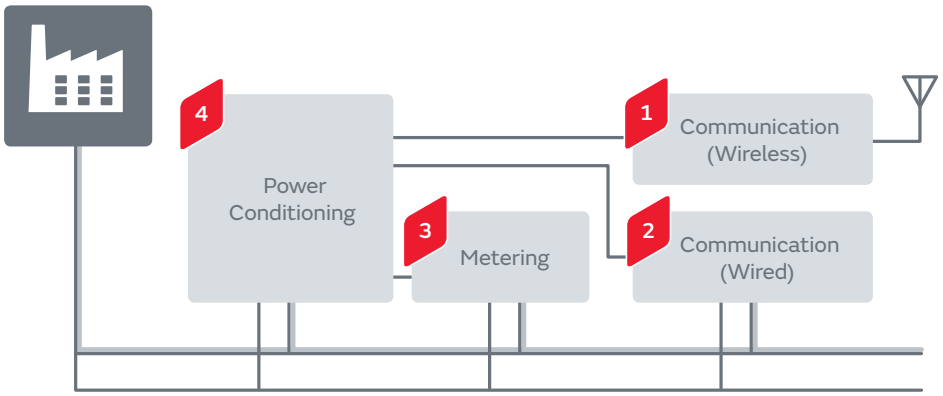


Crystal Units
XRCGB Series

General Purpose

Monolithic Ceramic Capacitors	GRM/GJM Series	High Frequency Filter Circuit	
Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling/For Step-up	
Resin External Electrode Monolithic Ceramic Capacitiors	GRJ Series	Coupling/Decoupling/For Step-up	
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 Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminal Capacitors	NFM/NFE Series	Noise Suppression	
Chip Common Mode Choke Coils	DLW/DLP Series	Noise Suppression	
Microwave Absorbers	EA Series	Noise Suppression	
Ferrite Cores	FS Series	Noise Suppression	
Thin Type Sandwich Cores	FSSA Series	Noise Suppression	

Smartmeter



1 Communication (Wireless)

Wi-Fi® Modules

Sub-GHz Modules

Chip Multilayer LC Filters
LF Series

Chip Multilayer Hybrid Baluns
LDB/LDM Series

Microwave Coaxial Connectors

Microwave Coaxial Connectors with Switch

RFID Modules with I²C Interface MAGICSTRAP®
LXMS Series

ESD Protection Devices
LXES Series

Thermistors
NCP/PRF/PRG Series

2 Communication (Wired)

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

Monolithic Ceramic Capacitors for Medium Voltage
GR3/GR4 Series

Medium High Voltage Ceramic Capacitors
DEA/DES Series

Safety Standard Certified Ceramic Capacitors
Type KX/KY

Radial Lead Type Monolithic Ceramic Capacitors
RDE Series

Thermistors
NCP/PRF/PRG Series

Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series

Crystal Units
XRCGB Series

ESD Protection Devices
LXES Series

SAW Filters
SF/RF Series

3 Metering

Chip Common Mode Choke Coils
DLW/DLP Series

Thermistors
NCP/PRF/PRG Series

Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series

Crystal Units
XRCGB Series

4 Power Conditioning

Non-isolated DC-DC Converters
OKL/MPD Series

Monolithic Ceramic Capacitors for Medium Voltage
GR3/GR4 Series

Medium High Voltage Ceramic Capacitors
DEA/DES Series

Safety Standard Certified Ceramic Capacitors
Type KX/KY

Radial Lead Type Monolithic Ceramic Capacitors
RDE Series

Chip Inductors (Chip Coils)
LQH Series

AC Line Filters
PLA Series

Thermistors
NCP/PRF/PRG Series

Polymer Aluminum Electrolytic Capacitors
ECAS Series

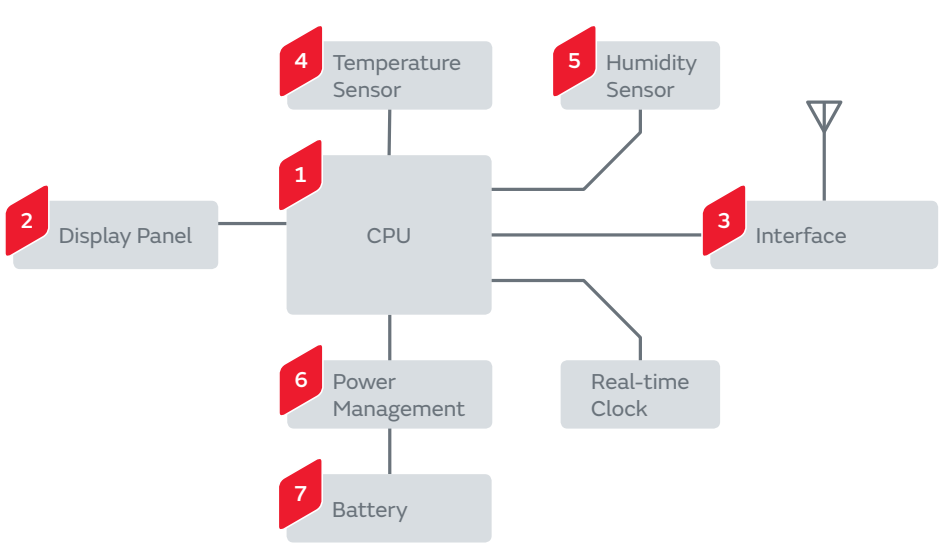
Supercapacitors (EDLC)
DMF/DMT Series

Micro DC-DC Converters
LXDC Series

General Purpose

Monolithic Ceramic Capacitors	GRM/GJM Series	High Frequency Filter Circuit	
Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling/For Step-up	
Resin External Electrode Monolithic Ceramic Capacitiors	GRJ Series	Coupling/Decoupling/For Step-up	
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 Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminal Capacitors	NFM/NFE Series	Noise Suppression	
Chip Common Mode Choke Coils	DLW/DLP Series	Noise Suppression	
Microwave Absorbers	EA Series	Noise Suppression	
Ferrite Cores	FS Series	Noise Suppression	
Thin Type Sandwich Cores	FSSA Series	Noise Suppression	
Small Energy Devices	UMAC Series	Battery Backup	

Thermostat



1 CPU

- Low ESL Monolithic Ceramic Capacitors LLL/LLA/LLM Series
- Polymer Aluminum Electrolytic Capacitors ECAS Series
- Ceramic Resonators CERALOCK® CSTCE/CSTCR Series
- Crystal Units XRCGB Series
- Thermistors NCP/PRF Series

2 Display Panel

- Metal Terminal Type Monolithic Ceramic Capacitors KRM Series
- Polymer Aluminum Electrolytic Capacitors ECAS Series
- Thermistors NCP/PRF Series

3 Interface

- Wi-Fi® Modules
- Micro DC-DC Converters LXDC Series
- Ceramic Resonators CERALOCK® CSTCE/CSTCR Series
- Crystal Units XRCGB Series
- Chip Inductors (Chip Coils) LQM/LQH/LQB Series
- ESD Protection Devices LXES Series

4 Temperature Sensor

- Thermistors NCP/NTP/PRF/PRG/PTG Series
- Ceramic Resonators CERALOCK® CSTCE/CSTCR Series
- Crystal Units XRCGB Series
- Chip Inductors (Chip Coils) LQM/LQH/LQB Series

5 Humidity Sensor

- Thermistors NCP/NTP/PRF/PRG/PTG Series
- Ceramic Resonators CERALOCK® CSTCE/CSTCR Series
- Crystal Units XRCGB Series
- Chip Inductors (Chip Coils) LQM/LQH/LQB Series

6 Power Management

Micro DC-DC Converters
LXDC Series

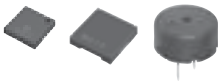
Monolithic Ceramic Capacitors for Medium Voltage
GR/GA Series

Medium High Voltage Ceramic Capacitors
DEA/DES Series

Safety Standard Certified Ceramic Capacitors
Type KX/KY

Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series

Piezoelectric Sounders
PKMCS/PKLCS/PKM Series



Thermistors
NCP/PRF/PRG Series

7 Battery

Thermistors
NCP/PRF/PRG Series

Micro DC-DC Converters
LXDC Series

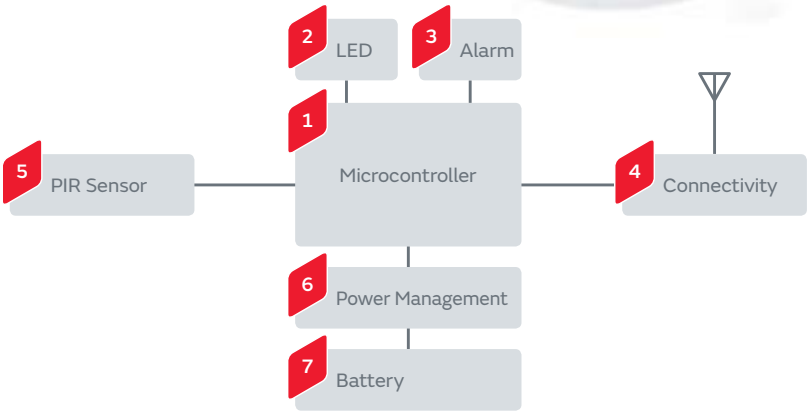
Supercapacitors (EDLC)
DMF Series

Small Energy Devices
UMAC Series

General Purpose

Monolithic Ceramic Capacitors	GRM/GJM Series	High Frequency Filter Circuit	
Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling/For Step-up	
Resin External Electrode Monolithic Ceramic Capacitiors	GRJ Series	Coupling/Decoupling/For Step-up	
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 Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminal Capacitors	NFM/NFE Series	Noise Suppression	
Chip Common Mode Choke Coils	DLW/DLP Series	Noise Suppression	
Microwave Absorbers	EA Series	Noise Suppression	
Ferrite Cores	FS Series	Noise Suppression	
Thin Type Sandwich Cores	FSSA Series	Noise Suppression	

Human Detection



1 Microcontroller

Low ESL Monolithic Ceramic Capacitors
LLL/LLA/LLM Series

Polymer Aluminum Electrolytic Capacitors
ECAS Series

Crystal Units
XRCGB Series

Thermistors
NCP/PRF Series

2 LED

Supercapacitors (EDLC)
DMF Series

Monolithic Ceramic Capacitors for Medium Voltage
GR/GA Series

Medium High Voltage Ceramic Capacitors
DEA/DES Series

Safety Standard Certified Ceramic Capacitors
Type KX/KY

Thermistors
NCP/NTP/PRF/PRG/PTG Series

AC Line Filters
PLA/PLH/PLY Series

3 Alarm

Piezoelectric Sounders
PKMCS/PKLCS/PKM Series

4 Connectivity

Wi-Fi® Modules

Micro DC-DC Converters
LXDC Series

Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series

Crystal Units
XRCGB Series

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

ESD Protection Devices
LXES Series

5 PIR Sensor

Pyroelectric Infrared Sensors
IRA Series

7 Battery

Small Energy Devices
UMAC Series

Micro DC-DC Converters
LXDC Series

Thermistors
NCP/PRF/PRG Series

6 Power Management

Micro DC-DC Converters
LXDC Series

Monolithic Ceramic Capacitors for Medium Voltage
GR/GA Series

Medium High Voltage Ceramic Capacitors
DEA/DES Series

Safety Standard Certified Ceramic Capacitors
Type KX/KY

Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series

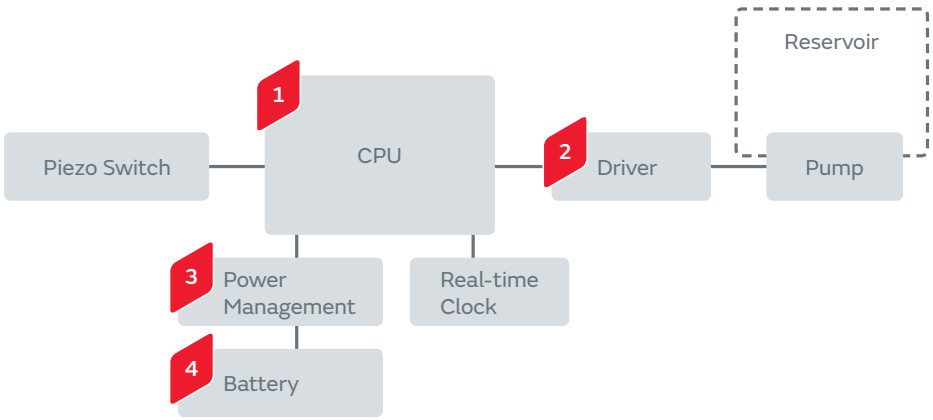
Chip Common Mode Choke Coils
DLW/DLP Series

Thermistors
NCP/PRF/PRG Series

General Purpose

Monolithic Ceramic Capacitors	GRM/GJM Series	High Frequency Filter Circuit	
Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling/For Step-up	
Resin External Electrode Monolithic Ceramic Capacitiors	GRJ Series	Coupling/Decoupling/For Step-up	
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 Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminal Capacitors	NFM/NFE Series	Noise Suppression	
Chip Common Mode Choke Coils	DLW/DLP Series	Noise Suppression	
Microwave Absorbers	EA Series	Noise Suppression	
Ferrite Cores	FS Series	Noise Suppression	
Thin Type Sandwich Cores	FSSA Series	Noise Suppression	

Air Dispenser



1 CPU

Low ESL Monolithic Ceramic Capacitors
LLL/LLA/LLM Series

Polymer Aluminum Electrolytic Capacitors
ECAS Series

Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series

Crystal Units
XRCGB Series

Thermistors
NCP/PRF Series

2 Driver

Thermistors
NCP/NXRT/NTP/PRF Series

3 Power Management

Micro DC-DC Converters
LXDC Series

Monolithic Ceramic Capacitors for Medium Voltage
GR/GA Series

Medium High Voltage Ceramic Capacitors
DEA/DES Series

Safety Standard Certified Ceramic Capacitors
Type KX/KY

Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series

Thermistors
NCP/NTP/PRF Series

4 Battery

Supercapacitors (EDLC)
DMT Series

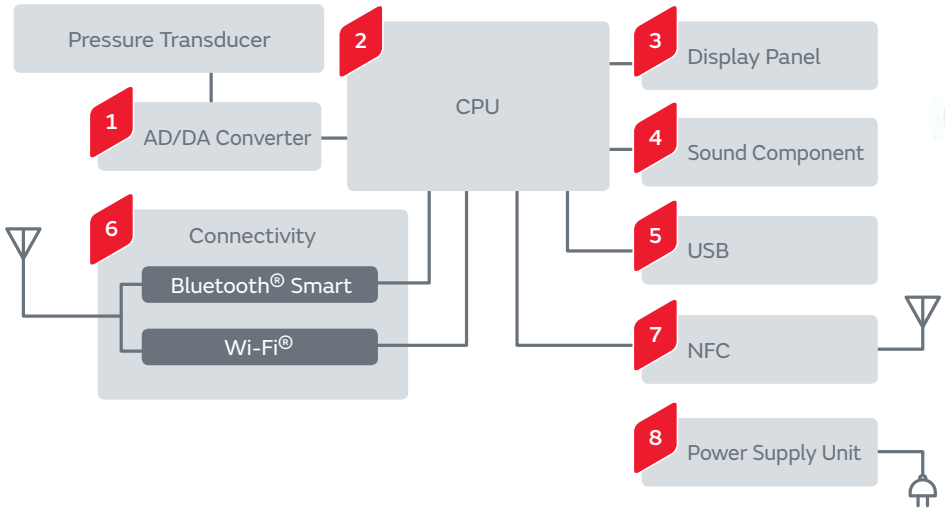
Thermistors
NXRT/PRF/PRG Series

Small Energy Devices
UMAC Series

General Purpose

Monolithic Ceramic Capacitors	GRM/GJM Series	High Frequency Filter Circuit
Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling/For Step-up
Resin External Electrode Monolithic Ceramic Capacitiors	GRJ Series	Coupling/Decoupling/For Step-up
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 Series	Voltage Conversion
Chip Ferrite Beads	BLM Series	Noise Suppression
3 Terminal Capacitors	NFM/NFE Series	Noise Suppression
Chip Common Mode Choke Coils	DLW/DLP Series	Noise Suppression
Microwave Absorbers	EA Series	Noise Suppression
Ferrite Cores	FS Series	Noise Suppression
Thin Type Sandwich Cores	FSSA Series	Noise Suppression

Blood Pressure Monitor



1 AD/DA Converter

Chip Ferrite Beads
BLM Series

Thermistors
NCP Series

2 CPU

Ceramic Resonators CERALOCK®
CSTCR-G/CSTCE-G/CSTCE-V Series

Thermistors
NCP/NXR Series

3 Display Panel

3 Terminal Capacitors
NFM/NFE Series

Chip Ferrite Beads
BLM Series

Thermistors
NCP Series

4 Sound Component

Piezoelectric Sounders
PKMCS/PKLCS/PKM Series

5 USB

Micro
DC-DC Converters
LXDC Series

Ceramic Resonators CERALOCK®
CSTCR-G-L/CSTCE-G-L/CSTCE-V-L/CSTCW-X Series

Crystal Units
XRCGB Series

ESD Protection Devices
LXES Series

Thermistors
PRG Series

6 Connectivity

ESD Protection Devices
LXES Series

Micro DC-DC Converters
LXDC Series

Bluetooth® Smart Modules

Wi-Fi® Modules

Ceramic Resonators CERALOCK®
CSTCR-G-L/CSTCE-G-L/CSTCE-V-L/CSTCW-X Series

Crystal Units
XRCGB Series

Thermistors
PRG Series

7 NFC

NFC Antennas
FLAN Series

Micro DC-DC Converters
LXDC Series

Crystal Units
XRCGB Series

Chip Ferrite Beads
BLM Series

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

Trimmer Capacitors
TZY2 Series

ESD Protection Devices
LXES Series

8 Power Supply Unit

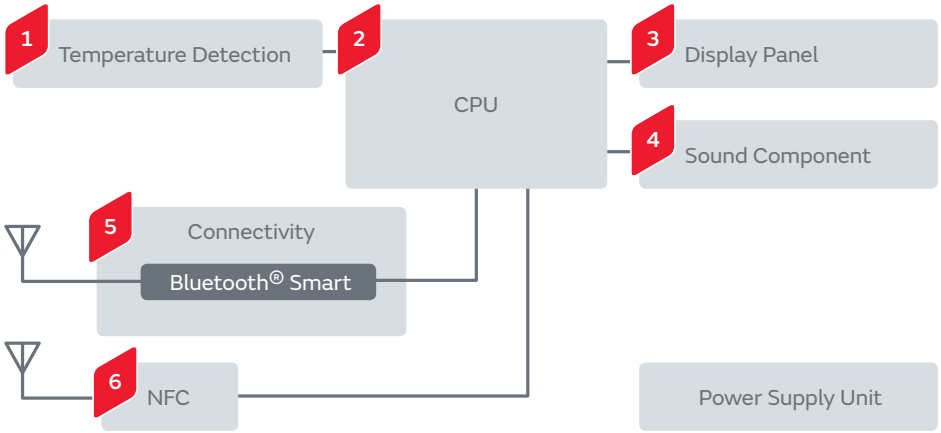
Thermistors
NCP Series

Thermistors
PRF/PRG Series

General Purpose

Monolithic Ceramic Capacitors	GRM/GJM Series	High Frequency Filter Circuit	
Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling/For Step-up	
Resin External Electrode Monolithic Ceramic Capacitiors	GRJ Series	Coupling/Decoupling/For Step-up	
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 Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminal Capacitors	NFM/NFE Series	Noise Suppression	
Chip Common Mode Choke Coils	DLW/DLP Series	Noise Suppression	
Microwave Absorbers	EA Series	Noise Suppression	
Ferrite Cores	FS Series	Noise Suppression	
Thin Type Sandwich Cores	FSSA Series	Noise Suppression	
Supercapacitors (EDLC)	DMT Series	Power Line/Battery Peak Assist	
Small Energy Devices	UMAC Series	Battery Backup	

Thermometer



1 Temperature Detection

Thermistors
NXR Series

2 CPU

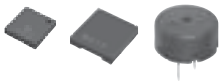
Ceramic Resonators CERALOCK®
CSTCR-G/CSTCE-G/CSTCE-V Series

3 Display Panel

Thermistors
NCP Series

4 Sound Component

Piezoelectric Sounders
PKMCS/PKLCS/PKM Series



Piezoelectric Diaphragms
7BB Series

5 Connectivity

Bluetooth® Smart Modules

6 NFC

NFC Antennas
FLAN Series

Micro DC-DC Converters
LXDC Series

Crystal Units
XRCGB Series

Chip Ferrite Beads
BLM Series

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

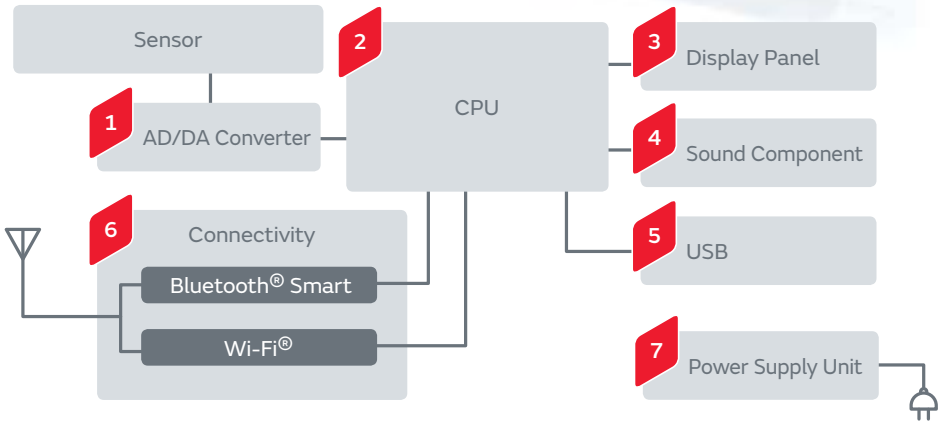
Trimmer Capacitors
TZY2 Series

ESD Protection Devices
LXES Series

General Purpose

Monolithic Ceramic Capacitors	GRM/GJM Series	High Frequency Filter Circuit
Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling/For Step-up
Resin External Electrode Monolithic Ceramic Capacitiors	GRJ Series	Coupling/Decoupling/For Step-up
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 Series	Voltage Conversion
Chip Ferrite Beads	BLM Series	Noise Suppression
3 Terminal Capacitors	NFM/NFE Series	Noise Suppression
Chip Common Mode Choke Coils	DLW/DLP Series	Noise Suppression
Microwave Absorbers	EA Series	Noise Suppression
Ferrite Cores	FS Series	Noise Suppression
Thin Type Sandwich Cores	FSSA Series	Noise Suppression
Small Energy Devices	UMAC Series	Battery Backup

Blood Glucose Meter



1 AD/DA Converter

Chip Ferrite Beads
BLM Series

Thermistors
NCP Series

2 CPU

Ceramic Resonators CERALOCK®
CSTCR-G/CSTCE-G/CSTCE-V Series

Thermistors
NCP/NXR Series

3 Display Panel

3 Terminal Capacitors
NFM Series

Chip Ferrite Beads
BLM Series

Thermistors
NCP Series

4 Sound Component

Piezoelectric Sounders
PKMCS/PKLCS/PKM Series

Piezoelectric Diaphragms
7BB Series

5 USB

Ceramic Resonators CERALOCK®
CSTCR-G-L/CSTCE-G-L/CSTCE-V-L/CSTCW-X Series

Crystal Units
XRCGB Series

Thermistors
PRG Series

6 Connectivity

Bluetooth® Smart Modules

Wi-Fi® Modules

Ceramic Resonators CERALOCK®
CSTCR-G-L/CSTCE-G-L/CSTCE-V-L/CSTCW-X Series

Crystal Units
XRCGB Series

Thermistors
PRG Series

7 Power Supply Unit

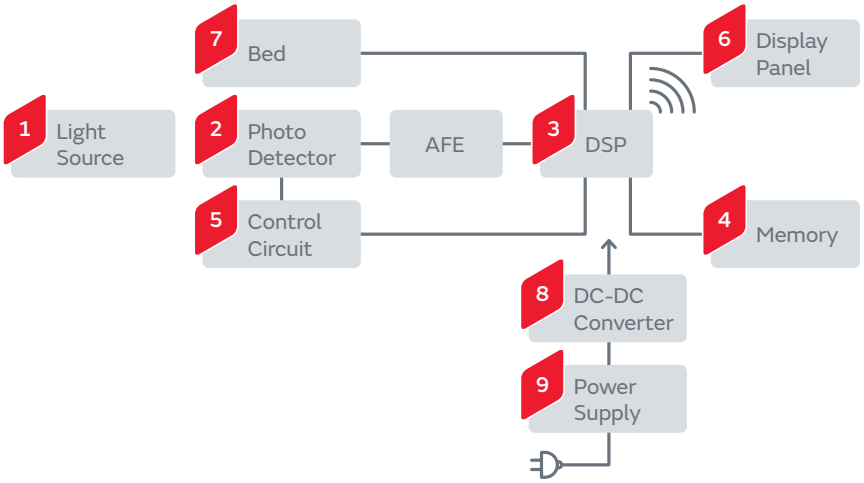
Thermistors
NCP Series

Thermistors
PRF/PRG Series

General Purpose

Monolithic Ceramic Capacitors	GRM/GJM Series	High Frequency Filter Circuit
Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling/For Step-up
Resin External Electrode Monolithic Ceramic Capacitiors	GRJ Series	Coupling/Decoupling/For Step-up
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 Series	Voltage Conversion
Chip Ferrite Beads	BLM Series	Noise Suppression
3 Terminal Capacitors	NFM/NFE Series	Noise Suppression
Chip Common Mode Choke Coils	DLW/DLP Series	Noise Suppression
Microwave Absorbers	EA Series	Noise Suppression
Ferrite Cores	FS Series	Noise Suppression
Thin Type Sandwich Cores	FSSA Series	Noise Suppression
Supercapacitors (EDLC)	DMT Series	Power Line/Battery Peak Assist
Small Energy Devices	UMAC Series	Battery Backup

Diagnostic Imaging Apparatus



1 Light Source

High Voltage Ceramic Capacitors
DHS/DHK Series

2 Photo Detector

Thermistors
NCP/PRF Series

3 DSP

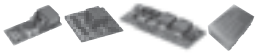
Ceramic Resonators CERALOCK®
CSTLS/CSTCE/CSTCR Series

Crystal Units
XRCGB Series

4 Memory

Isolated DC-DC Converters
MYB Series

Non-isolated DC-DC Converters
OKL/MPDR/MPDT/MYS Series



Micro DC-DC Converters
LXDC Series

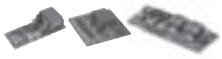
Supercapacitors (EDLC)
DMT Series

Small Energy Devices
UMAC Series

5 Control Circuit

Isolated DC-DC Converters
MYB Series

Non-isolated DC-DC Converters
OKL/MPDR/MPDT Series



Micro DC-DC Converters
LXDC Series

Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series

6 Display Panel

Metal Terminal Type
Monolithic Ceramic Capacitors
KRM Series

Ceramic Resonators
CERALOCK®
CSTCE/CSTCR Series

Thermistors
PRF/PRG Series

7 Bed

Inclinometers
SCA100T/103T Series

8 DC-DC Converter

Micro DC-DC Converters
LXDC Series

Metal Terminal Type
Monolithic Ceramic Capacitors
KRM Series

Polymer Aluminum
Electrolytic Capacitors
ECAS Series

Thermistors
NCP/PRF Series

9 Power Supply

Medical Standards-Compliant AC-DC Converters
MVAD/MVAB Series

Micro DC-DC Converters
LXDC Series

Supercapacitors (EDLC)
DMT Series

Monolithic Ceramic Capacitors for Medium Voltage
GR/GA Series

Medium High Voltage Ceramic Capacitors
DEA/DES Series

Safety Standard Certified Ceramic Capacitors
Type KX/KY

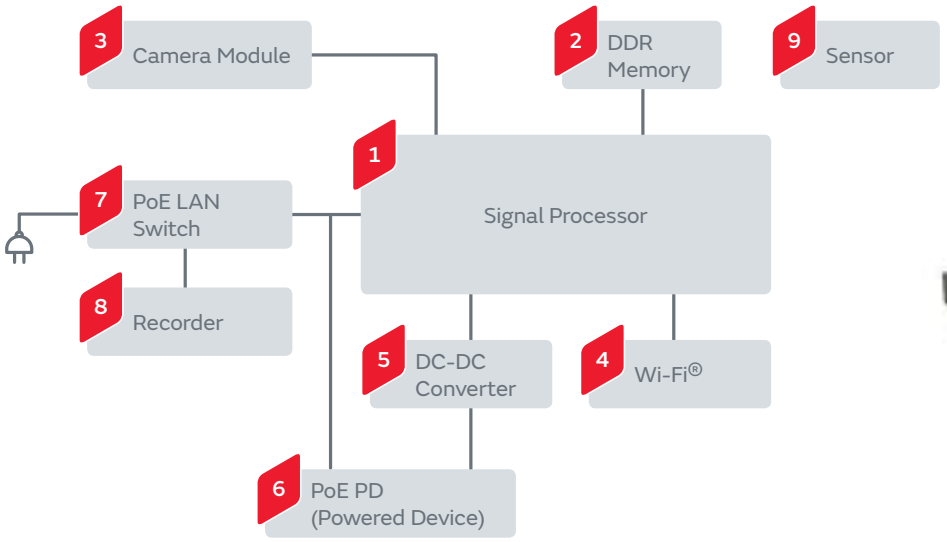
Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series

Thermistors
NCP/NTP/PRF Series

General Purpose

Monolithic Ceramic Capacitors	GRM/GJM Series	High Frequency Filter Circuit	
Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling/For Step-up	
Resin External Electrode Monolithic Ceramic Capacitiors	GRJ Series	Coupling/Decoupling/For Step-up	
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 Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminal Capacitors	NFM/NFE Series	Noise Suppression	
Chip Common Mode Choke Coils	DLW/DLP Series	Noise Suppression	
Microwave Absorbers	EA Series	Noise Suppression	
Ferrite Cores	FS Series	Noise Suppression	
Thin Type Sandwich Cores	FSSA Series	Noise Suppression	

Security Camera



1 Signal Processor

- Polymer Aluminum Electrolytic Capacitors **ECAS Series**
- Ceramic Resonators CERALOCK® **CSTCE/CSTCR Series**
- Crystal Units **XRCGB Series**
- 3 Terminal Capacitors **NFM Series**
- Thermistors **NCP/PRF Series**

2 DDR Memory

- Micro DC-DC Converters **LXDC Series**
- Polymer Aluminum Electrolytic Capacitors **ECAS Series**
- Chip Ferrite Beads **BLM Series**

3 Camera Module

- Supercapacitors (EDLC) **DMT Series**
- Crystal Units **XRCGB Series**
- Chip Ferrite Beads **BLM Series**

4 Wi-Fi®

- Wi-Fi® Modules
- Micro DC-DC Converters **LXDC Series**
- Chip Inductors (Chip Coils) **LQB Series**

5 DC-DC Converter

- Micro DC-DC Converters **LXDC Series**
- Metal Terminal Type Monolithic Ceramic Capacitors **KRM Series**
- Polymer Aluminum Electrolytic Capacitors **ECAS Series**
- Power Inductors **LQH Series**
- Thermistors **NCP/PRF Series**

6 PoE PD (Powered Device)

- Micro DC-DC Converters **LXDC Series**
- Monolithic Ceramic Capacitors for Medium Voltage **GR/GA Series**
- Medium High Voltage Ceramic Capacitors **DEA/DES Series**
- Crystal Units **XRCGB Series**
- Thermistors **NCP/NXRT/NTP/PRF Series**

7 PoE LAN Switch

Micro DC-DC Converters
LXDC Series

Monolithic Ceramic Capacitors for Medium Voltage
GR/GA Series

Medium High Voltage Ceramic Capacitors
DEA/DES Series

Safety Standard Certified Ceramic Capacitors
Type KX/KY

Metal Terminal Type Monolithic Ceramic Capacitors
KRM Series

Crystal Units
XRCGB Series

Thermistors
NCP/NXRT/NTP/PRF Series

8 Recorder

Shock Sensors
PKGS Series

Polymer Aluminum Electrolytic Capacitors
ECAS Series

Ceramic Resonators CERALOCK®
CSTCE Series

Crystal Units
XRCGB Series

Thermistors
NCP/PRF Series

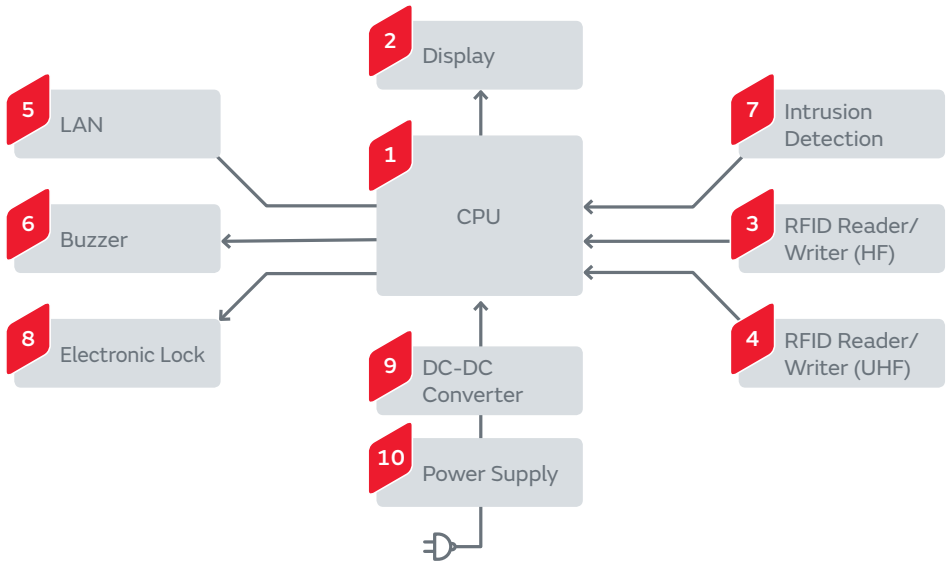
9 Sensor

Pyroelectric Infrared Sensors
IRA Series

General Purpose

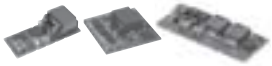
Monolithic Ceramic Capacitors	GRM/GJM Series	High Frequency Filter Circuit	
Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling/For Step-up	
Resin External Electrode Monolithic Ceramic Capacitiors	GRJ Series	Coupling/Decoupling/For Step-up	
Polymer Aluminum Electrolytic Capacitors	ECAS Series	Smoothing/Transient Backup	
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching/Resonance	
Chip Inductors (Chip Coils)	LQM/LQH Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminal Capacitors	NFM/NFE Series	Noise Suppression	
Chip Common Mode Choke Coils	DLW/DLP Series	Noise Suppression	
Microwave Absorbers	EA Series	Noise Suppression	
Ferrite Cores	FS Series	Noise Suppression	
Thin Type Sandwich Cores	FSSA Series	Noise Suppression	
Small Energy Devices	UMAC Series	Battery Backup	

Entrance and Exit Management System



1 CPU

Non-isolated DC-DC Converters
OKL/MPDR/MPDT Series



Ceramic Resonators CERALOCK®
CSTLS/CSTCE/CSTCR Series

Crystal Units
XRCGB Series

2 Display

Micro DC-DC Converters
LXDC Series

Ceramic Resonators CERALOCK®
CSTCE Series

ESD Protection Devices
LXES Series

Thermistors
NCP/PRF Series

3 RFID Reader/Writer (HF)

Supercapacitors (EDLC)
DMT Series

Crystal Units
XRCGB Series

4 RFID Reader/Writer (UHF)

Supercapacitors (EDLC)
DMT Series

Crystal Units
XRCGB Series

5 LAN

Polymer Aluminum Electrolytic Capacitors
ECAS Series

Crystal Units
XRCGB Series

ESD Protection Devices
LXES Series

Thermistors
PRG Series

6 Buzzer

Piezoelectric Sounders
PKMCS/PKLCS/PKM Series

7 Intrusion Detection

Pyroelectric Infrared Sensors
IRA Series

Ultrasonic Sensors
MA Series

AMR Sensors
(Magnetic Sensors)
MR Series

8 Electronic Lock

Supercapacitors (EDLC)
DMT Series

9 DC-DC Converter

Micro DC-DC Converters
LXDC Series

Thermistors
NCP/PRF Series

Polymer Aluminum Electrolytic Capacitors
ECAS Series

Metal Terminal Type Monolithic Ceramic Capacitors
KRM Series

10 Power Supply

Micro DC-DC Converters
LXDC Series

Monolithic Ceramic Capacitors for Medium Voltage
GR/GA Series

Medium High Voltage Ceramic Capacitors
DEA/DES Series

Safety Standard Certified Ceramic Capacitors
Type KX/KY

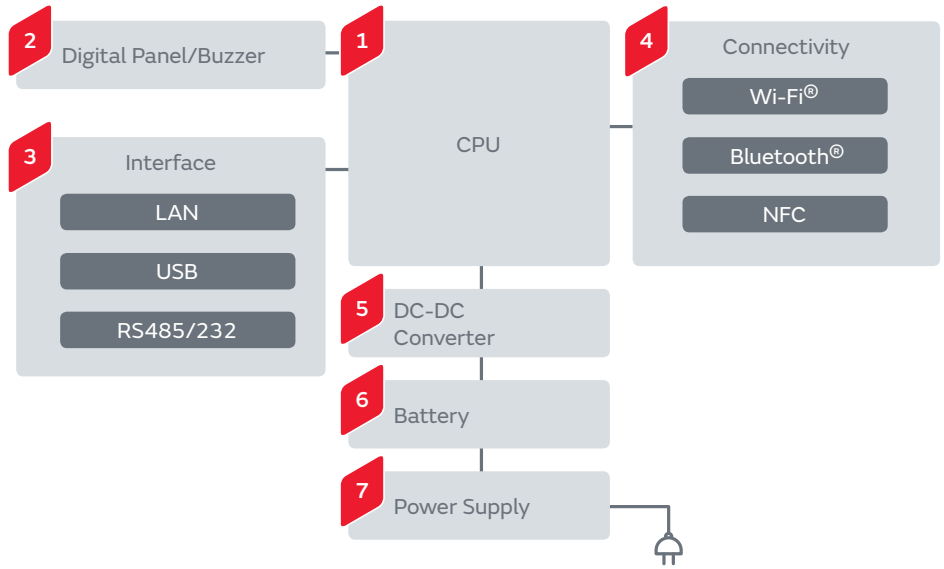
Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series

Thermistors
NCP/NTP/PRF Series

General Purpose

Monolithic Ceramic Capacitors	GRM/GJM Series	High Frequency Filter Circuit	
Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling/For Step-up	
Resin External Electrode Monolithic Ceramic Capacitiors	GRJ Series	Coupling/Decoupling/For Step-up	
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 Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminal Capacitors	NFM/NFE Series	Noise Suppression	
Chip Common Mode Choke Coils	DLW/DLP Series	Noise Suppression	
Microwave Absorbers	EA Series	Noise Suppression	
Ferrite Cores	FS Series	Noise Suppression	
Thin Type Sandwich Cores	FSSA Series	Noise Suppression	

Electronic POS



1 CPU

Supercapacitors (EDLC)
DMT Series

ESD Protection Devices
LXES Series

Micro DC-DC Converters
LXDC Series

2 Digital Panel/Buzzer

Metal Terminal Type Monolithic Ceramic Capacitors
KCM Series

Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series

Power Inductors
LQH Series

Thermistors
PRF/PRG Series

Piezoelectric Sounders
PKMCS/PKLCS/PKM Series

Piezoelectric Buzzers
PKB Series

3 Interface

Polymer Aluminum Electrolytic Capacitors
ECAS Series

Crystal Units
XRCGB Series

Chip Common Mode Choke Coils
DLW/DLP Series

ESD Protection Devices
LXES Series

Thermistors
PRG Series

4 Connectivity

Bluetooth® Modules

Bluetooth® - Wi-Fi® Combo Modules

Bluetooth® Smart Modules

Wi-Fi® Modules

NFC Antennas
FLAN Series

5 DC-DC Converter

Micro DC-DC Converters
LXDC Series

Metal Terminal Type Monolithic Ceramic Capacitors
KRM Series

Polymer Aluminum Electrolytic Capacitors
ECAS Series

Power Inductors
LQH Series

Thermistors
NCP/PRF Series

6 Battery

Thermistors
NCP/PRF/PRG Series

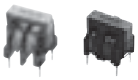
7 Power Supply

Monolithic Ceramic Capacitors for Medium Voltage
GR/GA Series

Medium High Voltage Ceramic Capacitors
DEA/DES Series

Safety Standard Certified Ceramic Capacitors
Type KX/KY

AC Line Filters
PLA/PLY Series



Thermistors
NCP/NTP/PRF/PTG Series

General Purpose

Monolithic Ceramic Capacitors	GRM/GJM Series	High Frequency Filter Circuit	
Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling/For Step-up	
Resin External Electrode Monolithic Ceramic Capacitiors	GRJ Series	Coupling/Decoupling/For Step-up	
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 Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminal Capacitors	NFM/NFE Series	Noise Suppression	
Chip Common Mode Choke Coils	DLW/DLP Series	Noise Suppression	
Microwave Absorbers	EA Series	Noise Suppression	
Ferrite Cores	FS Series	Noise Suppression	
Thin Type Sandwich Cores	FSSA Series	Noise Suppression	
Small Energy Devices	UMAC Series	Battery Backup	

Heavy Duty Vehicles

Safety

1. ECU
2. TPMS
3. ABS/ESC
4. Headlamp

Comfort/Information

5. Fine Navigation
6. Power Seat/ Power Mirror
7. Cabin Leveling

Operation

8. Motor Grader/Blade Control
9. Forklift/Container Handling

Safety

1 ECU

- Low Temperature Co-fired Ceramics (LTCC) Ceramic Multilayer Substrates LFC®
- Metal Terminal Type Monolithic Ceramic Capacitors KCM Series
- Monolithic Ceramic Capacitors for Conductive Glue Mounting GCG Series
- Radial Lead Type Monolithic Ceramic Capacitors RH/RCE Series
- Ceramic Resonators CERALOCK® CSTCE/CSTCR Series
- Accelerometers SCA Series
- Gyro Sensors SCC Series
- Thermistors PRF/PTG Series

2 TPMS

- Shock Sensors PKGS Series
- Ceramic Filters CERAFIL® SFECF Series
- Ceramic Discriminators CDSCB Series
- Ceramic Resonators CERALOCK® CSTCE/CSTCR Series
- Crystal Units XRCHA-F-A Series
- Pressure Sensor Elements
- Thermistors PRF Series

3 ABS/ESC

- Low Temperature Co-fired Ceramics (LTCC) Ceramic Multilayer Substrates LFC®
- Metal Terminal Type Monolithic Ceramic Capacitors KCM Series
- Monolithic Ceramic Capacitors GCM/GCJ Series
- Monolithic Ceramic Capacitors for Conductive Glue Mounting GCG Series
- Ceramic Resonators CERALOCK® CSTCE/CSTCR Series
- Crystal Units XRCHA-F-A Series
- Accelerometers SCA Series
- Gyro Sensors SCC Series
- Thermistors for Conductive Glue Mounting NCG18 Series

4 Headlamp

- Monolithic Ceramic Capacitors GCM/GCJ Series
- Monolithic Ceramic Capacitors for Conductive Glue Mounting GCG Series
- Ceramic Resonators CERALOCK® CSTCE/CSTCR Series
- Crystal Units XRCHA-F-A Series
- Thermistors for Conductive Glue Mounting NCG18 Series

Comfort/Information

5 Fine Navigation

Accelerometers
SCA Series

Gyro Sensors
SCC Series

MEMS Gyro Sensors
SCR Series

6 Power Seat/Power Mirror

Piezoelectric Sounders
PKLCS Series

Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series

Crystal Units
XRCHA-F-A Series

Thermistors
PRF/PTG Series

7 Cabin Leveling

Accelerometers
SCA Series

Gyro Sensors
SCC Series

Operation

8 Motor Grader/Blade Control

Accelerometers
SCA Series

Gyro Sensors
SCC Series

MEMS Gyro Sensors
SCR Series

9 Forklift/Container Handling

Accelerometers
SCA Series

General Purpose

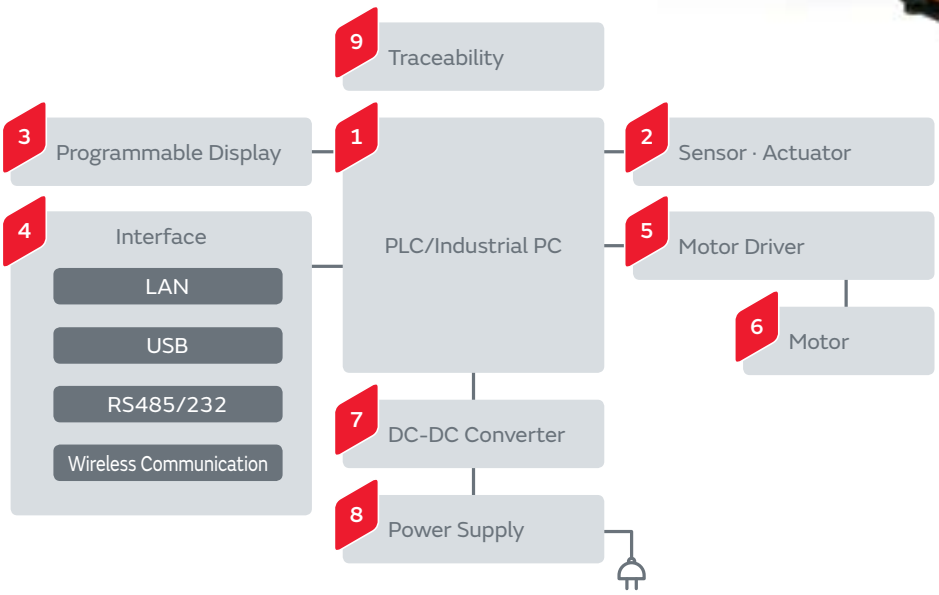
Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling	
Monolithic Ceramic Capacitors	GCM/GCJ Series	Powertrain/Safety	
Monolithic Ceramic Capacitors for Medium Voltage	GRM Series	For Snubber	
Radial Lead Type Monolithic Ceramic Capacitors	RCE Series	Noise Suppression/Decoupling	
Chip Inductors (Chip Coils)	LQM/LQH Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
EMI Suppression Filters EMIFIL®	NFM/NFA/NFL/NFE/NFW/NFR Series	Noise Suppression	
Chip Common Mode Choke Coils	DLW Series	Common Mode Noise Suppression	
Ferrite Cores	FS Series	Noise Suppression	

General Purpose (High Reliability)

Monolithic Ceramic Capacitors	GCM Series	Coupling/Decoupling	150°c
Radial Lead Type Monolithic Ceramic Capacitors	RCE Series	Noise Suppression/Decoupling	125°c
Radial Lead Type Monolithic Ceramic Capacitors	RH Series	Noise Suppression/Decoupling	150°c
Chip Inductors (Chip Coils)	LQH32CH Series	Voltage Conversion	105°c
Chip Inductors (Chip Coils)	LQG15HH Series	Impedance Matching/Choke	125°c
Chip Ferrite Beads	BLM_SH Series	Noise Suppression	125°c
3 Terminal Capacitors	NFM_H/NFE_H Series	Noise Suppression	125°c
Chip Common Mode Choke Coils	DLW31SH/DLW43SH Series	Common Mode Noise Suppression	125°c

105°c 105°c max. 125°c 125°c max. 150°c 150°c max.

Industrial Automation



1 PLC/Industrial PC

Polymer Aluminum Electrolytic Capacitors
ECAS Series

Crystal Units
XRCGB Series

Chip Ferrite Beads
BLM Series

3 Terminal Capacitors
NFM Series

Supercapacitors (EDLC)
DMT Series

Thermistors
NCP/PRF Series

2 Sensor · Actuator

Pyroelectric Infrared Sensors
IRA Series

AMR Sensors (Magnetic Sensors)
MR Series

3 Programmable Display

Micro DC-DC Converters
LXDC Series

Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series

Crystal Units
XRCGB Series

Power Inductors
LQH Series

Supercapacitors (EDLC)
DMT Series

Chip Common Mode Choke Coils
DLW/DLP Series

4 Interface

Polymer Aluminum Electrolytic Capacitors
ECAS Series

Crystal Units
XRCGB Series

Chip Common Mode Choke Coils
DLW/DLP Series

ESD Protection Devices
LXES Series

Thermistors
PRG Series

Wireless Communication Modules based on the ISA100 Wireless™ standard

5 Motor Driver

Monolithic Ceramic Capacitors for Medium Voltage
GR/GA Series

Medium High Voltage Ceramic Capacitors
DEA/DES Series

Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series

Crystal Units
XRCGB Series

Large Current Common Mode Choke Coils
PLT10HH Series

Thermistors
PRF/PTG Series

6 Motor

Crystal Units
XRCGB Series

Rotary Sensors

7 DC-DC Converter

Isolated DC-DC Converters
MYB Series

Non-isolated DC-DC Converters
OKL/MPD/MYS Series

Micro DC-DC Converters
LXDC Series

Metal Terminal Type
Monolithic Ceramic Capacitors
KRM Series

Polymer Aluminum
Electrolytic Capacitors
ECAS Series

Power Inductors
LQH Series

Thermistors
NCP/PRF Series

8 Power Supply

Micro DC-DC Converters
LXDC Series

Monolithic Ceramic Capacitors
for Medium Voltage
GR/GA Series

Medium High Voltage
Ceramic Capacitors
DEA/DES Series

Safety Standard Certified
Ceramic Capacitors
Type KX/KY

Ceramic Resonators
CERALOCK®
CSTCE/CSTCR Series

Thermistors
NCP/NTP/PRF Series

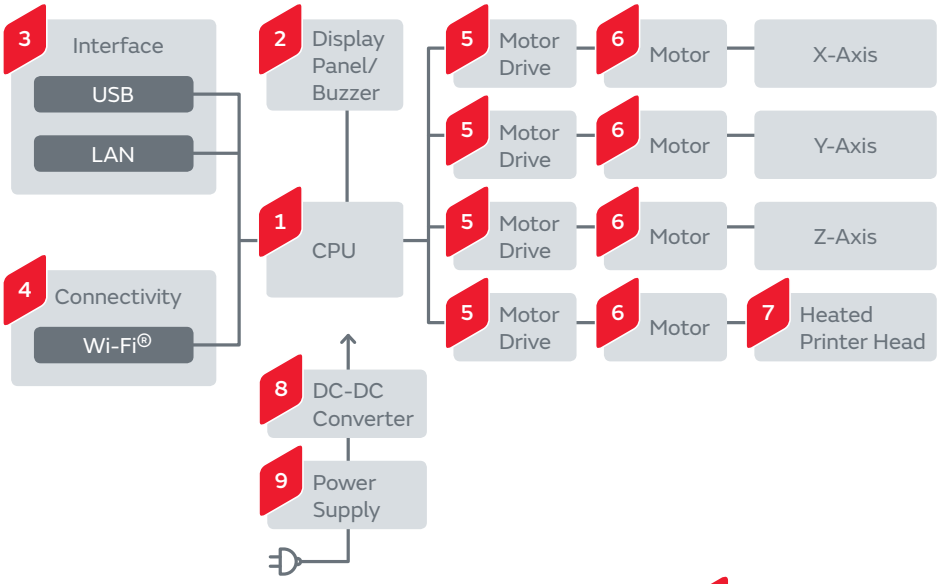
9 Traceability

Supercapacitors (EDLC)
DMT Series

General Purpose

Monolithic Ceramic Capacitors	GRM/GJM Series	High Frequency Filter Circuit	
Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling/For Step-up	
Resin External Electrode Monolithic Ceramic Capacitiors	GRJ Series	Coupling/Decoupling/For Step-up	
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 Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminal Capacitors	NFM/NFE Series	Noise Suppression	
Chip Common Mode Choke Coils	DLW/DLP Series	Noise Suppression	
Microwave Absorbers	EA Series	Noise Suppression	
Ferrite Cores	FS Series	Noise Suppression	
Thin Type Sandwich Cores	FSSA Series	Noise Suppression	
Small Energy Devices	UMAC Series	Battery Backup	

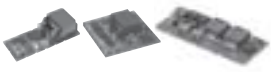
3D Printer



1 CPU

Isolated DC-DC Converters
MYB Series

Non-isolated DC-DC Converters
OKL/MPDR/MPDT Series



Ceramic Resonators CERALOCK®
CSTLS/CSTCE/CSTCR Series

Polymer Aluminum Electrolytic Capacitors
ECAS Series

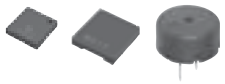
Crystal Units
XRCGB Series

Thermistors
NCP/PRF Series

2 Display Panel/Buzzer

Ceramic Resonators CERALOCK®
CSTLS/CSTCE/CSTCR Series

Piezoelectric Sounders
PKMCS/PKLCS/PKM Series



3 Interface

Polymer Aluminum Electrolytic Capacitors
ECAS Series

Crystal Units
XRCGB Series

Chip Common Mode Choke Coils
DLW/DLP Series

ESD Protection Devices
LXES Series

Thermistors
PRG Series

4 Connectivity

Wi-Fi® Modules

Micro DC-DC Converters
LXDC Series

Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series

Crystal Units
XRCGB Series

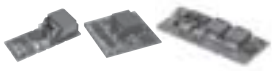
Chip Inductors (Chip Coils)
LQB Series

ESD Protection Devices
LXES Series

5 Motor Drive

Isolated DC-DC Converters
MYB Series

Non-isolated DC-DC Converters
OKL/MPDR/MPDT Series



Monolithic Ceramic Capacitors for Medium Voltage
GR/GA Series

Medium High Voltage Ceramic Capacitors
DEA/DES Series

Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series

Crystal Units
XRCGB Series

Large Current Common Mode Choke Coils
PLT10HH Series

Thermistors
PRF/PTG Series

6 Motor

Crystal Units
XRCGB Series

7 Heated Printer Head

Thermistors
NCP/PRF Series

8 DC-DC Converter

Micro DC-DC Converters
LXDC Series

Metal Terminal Type
Monolithic Ceramic Capacitors
KRM Series

Polymer Aluminum
Electrolytic Capacitors
ECAS Series

Thermistors
NCP/PRF Series

9 Power Supply

Micro DC-DC Converters
LXDC Series

Monolithic Ceramic Capacitors
for Medium Voltage
GR/GA Series

Medium High Voltage
Ceramic Capacitors
DEA/DES Series

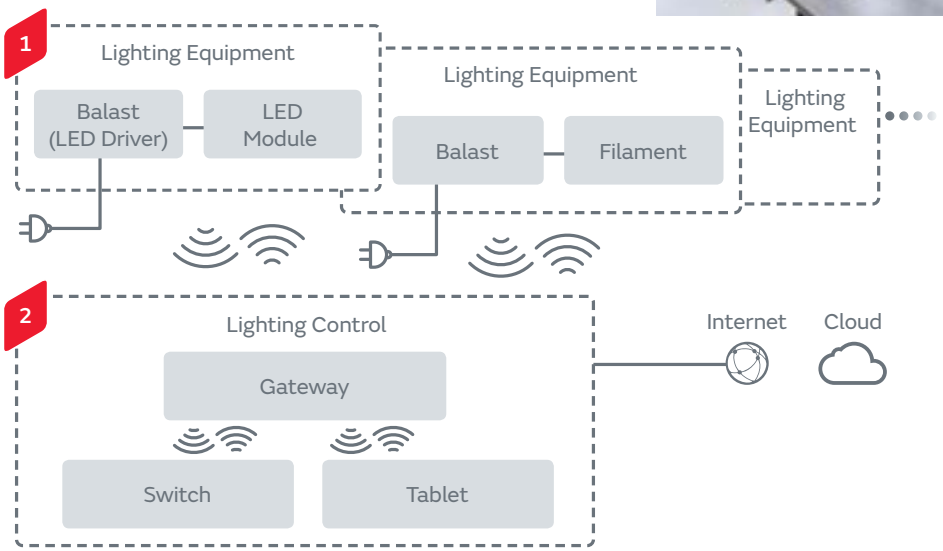
Safety Standard Certified
Ceramic Capacitors
Type KX/KY

Thermistors
NCP/NTP/PRF/PRG Series

General Purpose

Monolithic Ceramic Capacitors	GRM/GJM Series	High Frequency Filter Circuit	
Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling/For Step-up	
Resin External Electrode Monolithic Ceramic Capacitiors	GRJ Series	Coupling/Decoupling/For Step-up	
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 Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminal Capacitors	NFM/NFE Series	Noise Suppression	
Chip Common Mode Choke Coils	DLW/DLP Series	Noise Suppression	
Microwave Absorbers	EA Series	Noise Suppression	
Ferrite Cores	FS Series	Noise Suppression	
Thin Type Sandwich Cores	FSSA Series	Noise Suppression	
Small Energy Devices	UMAC Series	Battery Backup	

Lighting



1 Lighting Equipment

Ballast for LED Lighting

Monolithic Ceramic Capacitors for Medium Voltage
GR/GA Series

Medium High Voltage Ceramic Capacitors
DEA/DES Series

Safety Standard Certified Ceramic Capacitors
Type KX/KY

Wi-Fi® Modules

Sub-GHz Modules

Thermistors
NCP/NTP/PRF/PRG/PTG Series

AC Line Filters
PLA/PLH/PLY Series

2 Lighting Control

Wi-Fi® Modules

Sub-GHz Modules

Pyroelectric Infrared Sensors
IRA Series

Ceramic Resonators CERALOCK®
CSTLS/CSTCE/CSTCR Series

SAW Filters
SF/RF Series

General Purpose

Monolithic Ceramic Capacitors	GRM/GJM Series	High Frequency Filter Circuit	
Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling/For Step-up	
Resin External Electrode Monolithic Ceramic Capacitiors	GRJ Series	Coupling/Decoupling/For Step-up	
Polymer Aluminum Electrolytic Capacitors	ECAS Series	Smoothing/Transient Backup	
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching/Resonance	
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Chip Common Mode Choke Coils	DLW/DLP Series	Noise Suppression	
Microwave Absorbers	EA Series	Noise Suppression	
Ferrite Cores	FS Series	Noise Suppression	
Thin Type Sandwich Cores	FSSA Series	Noise Suppression	
Small Energy Devices	UMAC Series	Battery Backup	

Memo

Design Support Tool "SimSurfing"

http://www.murata.com/simsurfing/

This is the latest tool to get the electrical characteristics for Capacitors, Inductors, and EMI Suppression Filters, and to simulate Thermistors' behavior !

■Characteristics viewer

You can easily search and download the following data for Monolithic Ceramic Capacitors, Polymer Capacitors, EMI Suppression Filters (Three-terminal Capacitors, Ferrite Beads) and Power/RF Inductors.

■Components performance simulator

You can search by the simulation on simple circuits for Thermistors.

■Selection tool

You can select Medium voltage Capacitors and Power Inductors according to conditions of use.
* Medium voltage: Rated Voltage 250V and over

■Search tool

You can search the Murata timing device (CERALOCK® and crystal units) that is most suitable for your IC and access information about the recommended circuit constant setting.

If you register as a "my Murata" user (https://my.murata.com/en/web/mymurata/), you can use Enhanced SimSurfing.

■ Usage example of "Monolithic Ceramic Capacitors"

1 Select the products

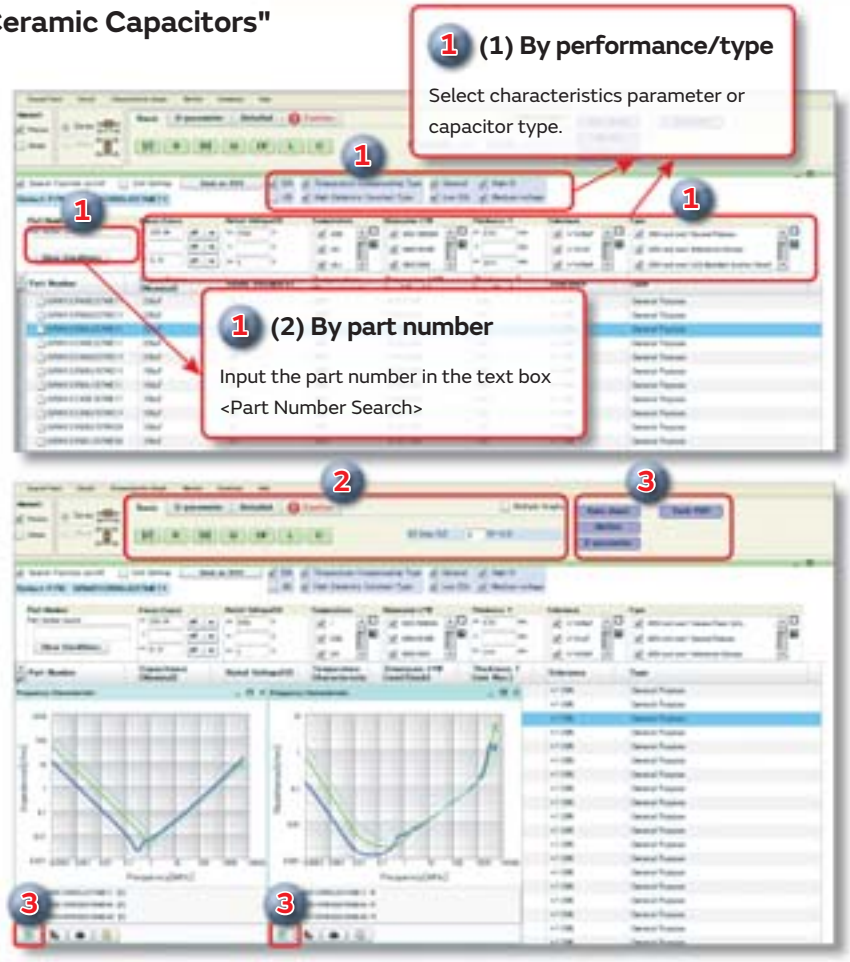
(1) By performance/type
(2) By part number

2 Show graph

Click each button on each tab of [Basic], [S-parameter] and [Detailed].

3 Data download

- Click each purple button in this area.
- Click "CSV output" button.



* Images are as of October 2015. Be assured that this software will be updated frequently.

http://www.murata.com/simsurfing/

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Cat. No. K70E-4

Global Locations

For details please visit www.murata.com

⚠Note

1 Export Control

For customers outside Japan:

No Murata products should be used or sold, through any channels, for use in the design, development, production, utilization, maintenance or operation of, or otherwise contribution to (1) any weapons (Weapons of Mass Destruction [nuclear, chemical or biological weapons or missiles] or conventional weapons) or (2) goods or systems specially designed or intended for military end-use or utilization by military end-users.

For customers in Japan:

For products which are controlled items subject to the "Foreign Exchange and Foreign Trade Law" of Japan, the export license specified by the law is required for export.

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1. *Aircraft equipment*
2. *Aerospace equipment*
3. *Undersea equipment*
4. *Power plant equipment*
5. *Medical equipment*
6. *Transportation equipment (vehicles, trains, ships, etc.)*
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 November 2015. 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.

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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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www.murata.com

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INNOVATOR IN ELECTRONICS

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Dec.25,2015