muRata
INNOVATOR IN ELECTRONICS

MURATA PRODUCTS
Lineup 2017

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2017 MURATA PRODUCTS Lineup

Capacitors

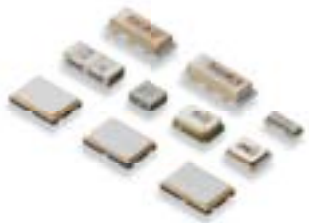
Noise Suppression Products/EMI Suppression Filters

Inductors (Coils)

Resistors

Timing Devices

Filters



RF Components

Sensors

p64

Thermistors

p69

Power Devices

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Energy Devices

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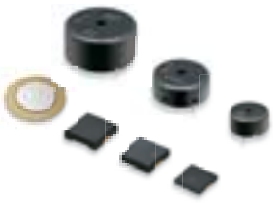
Sound Components (Buzzer)



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Others

Application Guides

Capacitors

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

Summary

Using Murata's unique 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

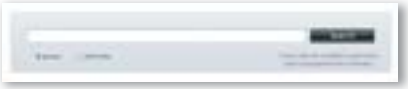
The applicable capacitors can be searched by the shape, maximum operating temperature, applications, benefits, and mounting.

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 found using a competitor's part number for chip monolithic ceramic capacitors.



Search results

It is possible to compare characteristics. <New>

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 current narrowed down conditions can be checked.

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

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

Detailed specifications sheets 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.
Info-tainment	Infotainment for Automotive Products for entertainment equipment like car navigation, car audio, and body control equipment like wipers and power windows.
Power-train	Powertrain/Safety for Automotive Products used for applications (running, turning, stopping, and safety devices) that particularly concern human life, such as in devices for automotive.
Medical Device	Medical-grade products for Implanted Medical Devices These products are intended for use in implanted medical devices such as cardiac pacemakers, cochlear implants, insulin pumps, and gastric electrostimulators. They are suitable for use in non-critical circuits.*1 *1 Non-critical circuits This term refers to circuits in implanted medical devices that are not directly linked to life support, i.e., circuits that will not directly endanger the life of the patient should the functionality of the device be reduced or halted by failure of the circuit.
AEC-Q200	AEC-Q200 compliant product
Safety standard	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.
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.
Effective Cap	No DC bias characteristics Polymer capacitor is no capacitance change with DC bias due to aluminum oxidized film for dielectric.
EMI FIL®	Low-inductance product suitable for noise suppression. This product has extremely low ESL and is suitable for suppression of noise, including high frequencies. This product can also be used as a low-ESL, high-performance bypass capacitor.
Bonding	Product for bonding Since gold is used for the external electrodes, the capacitor can be mounted by die bonding/wire bonding.
Limited to conductive glue mounting	Limited to Conductive Glue Mounting Since silver palladium is used for the external electrodes, the capacitor can be mounted by conductive adhesive.

Capacitors

Product Lineup

			AEC-Q200	Safety standard	High Q	Low ESL	Anti-noise	Fail safe	Deflecting crack	Soldering crack	Effective Cap	EMI FIL®	Other
General	GRM	P5											
	GRM	P7											For LED backlight only
	GA2	P7											
	GA3	P8		●									
	GJM	P8			●								
	GMA	P8											Wire bondable
	GMD	P9											Wire bondable
	GQM	P9			●								
	GR3	P9					●						
	GR4	P10											For communication / information devices
	GR7	P10											Limited to camera flashes
	GRJ	P10							●				
	KR3	P11					●		●	●			
	KRM	P11					●		●	●			
	LLL	P12				●							
	LLR	P12				●							
	LLA	P12				●							
	LLM	P13				●							
	NFM	P13				●						●	
	DE1	P21		●									
	DE2	P21		●									
	DEJ	P21											
	DHR	P21							●	●			
	RDE	P22					●		●	●			
	DHK	P26											
	DHS	P26											
	ECAS	P27									●		
Info-tainment	GRT	P13	●										
Power-train	GCM	P15	●										
	GC3	P16	●				●						
	GCD	P16	●					●	●				
	GCE	P16	●					●	●				
	GCG	P17	●						●	●			Limited to conductive glue mounting
	GCJ	P18	●					●	●				
	KC3	P19	●				●		●	●			
	KCA	P19	●	●			●		●	●			
	KCM	P19	●				●		●	●			
	NFM	P19	●			●						●	
	DE6	P24	●	●									
	RCE	P24	●				●		●	●			
	RH	P25	●				●		●	●			
Medical Device	GCH	P20											For Implanted Medical Devices

Chip Monolithic Ceramic Capacitors For General Purpose

For General Purpose

Temperature Compensating Type

GRM

General

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
			0.1p 1p 10p 100p 1000p 10000p 0.1μ 1μ 10μ 100μ 1000μ
GRM02	0.4X0.2 <01005>	50	0.20pF – 100pF
		25	120pF – 220pF
		16	120pF – 220pF
GRM03	0.6X0.3 <0201>	100	0.10pF – 15pF
		50	0.10pF – 220pF
		25	270pF – 1000pF
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 – 0.10μF
		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

Continued on the following page. ↗

Capacitors

High Dielectric Constant Type

GRM

General

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 – 0.47μF
		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
		50	0.47μF – 2.2μF
		35	2.2μF – 4.7μF
		25	1.0μF – 10μF
		16	1.0μF – 10μF
		10	2.2μF – 10μF
		6.3	4.7μF – 22μF
		4	10μF – 22μF
GRM21	2.0X1.25 <0805>	500	1000pF – 10000pF
		250	1000pF – 22000pF
		200	1000pF – 22000pF
		50	1.0μF – 4.7μF
		35	2.2μF – 10μF
		25	1.0μF – 22μF
		16	1.0μF – 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	1.0μF – 2.2μF
		50	1.0μF – 10μF
		35	10μF
		25	4.7μF – 22μF
		16	4.7μF – 47μF
		10	22μF – 47μF

Continued on the following page. ↗

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GRM31	3.2X1.6 <1206>	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

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

Safety Standard Certified

The Electrical Appliance and Material Safety Law of Japan

GA2

General

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

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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 (UL60950-1 Certified Product)

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 (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

High Q Type for High Frequency

GJM

General High Q

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

Top & Bottom Electrode Type for Bonding

GMA

General Bonding

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GMA0D	0.38X0.38 <015015>	10	1000pF – 10000pF
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

Product for Bonding/AuSn Soldering

GMD

General Bonding

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

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) 0.1p 1p 10p 100p 1000p 10000p 0.1μ 1μ 10μ 100μ 1000μ
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>	500	1.0pF 22pF
		250	1.0pF 100pF
		100	1.0pF 18pF
		50	20pF 100pF
GQM22	2.8X2.8 <1111>	500	1.0pF 100pF

High Effective Capacitance & High Ripple Resistance

GR3

General 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
GR321	2.0X1.25 <0805>	250	10000pF 22000pF
GR331	3.2X1.6 <1206>	630	10000pF 15000pF
		450	10000pF 47000pF
		250	33000pF 68000pF
GR332	3.2X2.5 <1210>	630	22000pF 47000pF
		450	68000pF 0.10μF
		250	0.10μF 0.15μF
GR343	4.5X3.2 <1812>	630	68000pF
		450	0.15μF
		250	0.22μF 0.33μF
GR355	5.7X5.0 <2220>	630	0.10μF 0.22μF
		450	0.22μF 0.47μF
		250	0.47μF 1.0μF

For Ethernet LAN & Primary-secondary Coupling of DC-DC Converters

GR4

General

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F) 0.1p 1p 10p 100p 1000p 10000p 0.1μ 1μ 10μ 100μ 1000μ
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) 0.1p 1p 10p 100p 1000p 10000p 0.1μ 1μ 10μ 100μ 1000μ
GR721	2.0X1.25 <0805>	350	10000pF – 27000pF
GR731	3.2X1.6 <1206>	350	10000pF – 47000pF

Resin External Electrode Type

GRJ

General Deflecting crack

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F) 0.1p 1p 10p 100p 1000p 10000p 0.1μ 1μ 10μ 100μ 1000μ
GRJ18	1.6X0.8 <0603>	100	1000pF – 0.10μF
		50	1000pF – 0.22μF
		35	1.0μF
		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 – 47μF

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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
GRJ32	3.2X2.5 <1210>	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

Metal Terminal Type

High Effective Capacitance & High Ripple Resistance

KR3

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
KR355	6.1X5.3	630	0.10μF 0.56μF
		450	0.22μF 1.2μF
		250	0.47μF 2.2μF

High Effective Capacitance

KRM

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
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

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
LLL1U	0.6X1.0 <02404>	4	4.3μF
LLL18	0.8X1.6 <0306>	50	2200pF – 4700pF
	25	10000pF – 22000pF
	16	22000pF – 47000pF
	10	0.10μF – 0.22μF
	4	0.22μF – 2.2μF
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
	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) 100	220	470	1000	Capacitance
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) 0.1p 1p 10p 100p 1000p 10000p 0.1μ 1μ 10μ 100μ 1000μ
LLA18	1.6X0.8 <0603>	4	0.10μF – 2.2μF
LLA21	2.0X1.25 <0805>	25	10000pF – 47000pF
	16	47000pF – 0.22μF
	10	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

Continued on the following page. ↗

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

3 Terminal Low ESL Type

NFM

General Low ESL EMI FIL®

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
NFM15	1.0X0.5 <0402>	16	2200pF 47000pF
		10	2200pF 0.22µF
		6.3	0.10µF 0.47µF
		4	0.47µF 1.0µF
		2.5	4.3µF 9.1µF
NFM18	1.6X0.8 <0603>	16	100pF 0.10µF
		10	2.2µF
		6.3	0.22µF 2.2µF
NFM21	2.0X1.25 <0805>	50	220pF 22000pF
		25	0.10µF
		16	0.22µF 1.0µF
		10	1.0µF 4.7µF
		6.3	2.2µF 10µF
NFM3D	3.2X1.25 <1205>	50	220pF 22000pF
NFM31	3.2X1.6 <1206>	100	10000pF 0.10µF
		50	10000pF 0.10µF
		6.3	27µF
NFM41	4.5X1.6 <1806>	100	470pF 22000pF
		50	0.20µF 1.5µF
		25	1.5µF

Chip Monolithic Ceramic Capacitors For Automotive

Meet AEC-Q200 for Infotainment

Temperature Compensating Type

GRT

Info-tainment AEC-Q200

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GRT15	1.0X0.5 <0402>	100	1.0pF 100pF
		50	1.0pF 1000pF

Continued on the following page. ↗

Capacitors

Series	LxW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GRT15	1.0X0.5 <0402>	25	10pF – 1000pF
GRT18	1.6X0.8 <0603>	100	1.0pF – 1500pF
		50	1.0pF – 10000pF
		25	560pF – 10000pF
GRT21	2.0X1.25 <0805>	50	18000pF – 22000pF
GRT31	3.2X1.6 <1206>	50	56000pF – 0.10μF
		25	0.10μF – 0.12μF
		16	0.12μF

High Dielectric Constant Type

GRT

Info-tainment AEC-Q200

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

For Automotive (General Purpose)

Temperature Compensating Type

GCM

Power-train AEC-Q200

Series	LxW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GCM15	1.0X0.5 <0402>	50	1.0pF – 1000pF
GCM18	1.6X0.8 <0603>	100	1.0pF – 10000pF
		50	1.0pF – 10000pF
GCM21	2.0X1.25 <0805>	250	10pF – 5600pF
		100	100pF – 3300pF
		80	15000pF – 22000pF
		63	15000pF – 22000pF
		50	4700pF – 22000pF
GCM31	3.2X1.6 <1206>	1k	10pF – 1000pF
		630	10pF – 4700pF
		250	10pF – 15000pF
		100	3900pF – 10000pF
		80	33000pF
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

Capacitance Range (F): 0.1p 1p 10p 100p 1000p 10000p 0.1μ 1μ 10μ 100μ 1000μ

High Dielectric Constant Type

GCM

Power-train AEC-Q200

Series	LxW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GCM03	0.6X0.3 <0201>	25	100pF – 1500pF
		16	330pF – 3300pF
		10	4700pF – 10000pF
GCM15	1.0X0.5 <0402>	100	220pF – 4700pF
		50	220pF – 0.10μF
		25	10000pF – 0.10μF
		16	33000pF – 0.22μF
		10	0.47μF – 1.0μF
GCM18	1.6X0.8 <0603>	100	1000pF – 22000pF
		50	0.22μF
		25	0.22μF – 1.0μF
		16	0.33μF – 1.0μF
		6.3	2.2μF
GCM21	2.0X1.25 <0805>	100	6800pF – 1.0μF
		50	0.22μF – 1.0μF
		35	0.68μF – 4.7μF
		25	0.15μF – 4.7μF
		16	0.68μF – 4.7μF
		10	2.2μF – 10μF
		6.3	10μF
GCM31	3.2X1.6 <1206>	100	0.22μF – 2.2μF
		50	0.33μF – 4.7μF
		25	4.7μF – 10μF

Capacitance Range (F): 0.1p 1p 10p 100p 1000p 10000p 0.1μ 1μ 10μ 100μ 1000μ

Continued on the following page. ↗

Capacitors

Series	LxW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
GCM31	3.2X1.6 <1206>	16	4.7µF 10µF
		10	10µF 22µF
		6.3	22µF
GCM32	3.2X2.5 <1210>	100	4.7µF
		50	4.7µF 10µF
		35	10µF
		25	10µF
		16	10µF 22µF
		10	22µF
		6.3	47µF

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)
GC321	2.0X1.25 <0805>	250	10000pF 22000pF
GC331	3.2X1.6 <1206>	630	10000pF 15000pF
		450	10000pF 47000pF
		250	33000pF 68000pF
GC332	3.2X2.5 <1210>	630	22000pF 47000pF
		450	68000pF 0.10µF
		250	0.10µF 0.15µF
GC343	4.5X3.2 <1812>	630	68000pF
		450	0.15µF
		250	0.22µF 0.33µF
GC355	5.7X5.0 <2220>	630	0.10µF 0.22µF
		450	0.22µF 0.47µF
		250	0.47µF 1.0µF

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	15000pF 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

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
GCE18	1.6X0.8 <0603>	25	27000pF – 47000pF
GCE21	2.0X1.25 <0805>	100	220pF – 0.10μF
		50	15000pF – 0.10μF

Limited to Conductive Glue Mounting

Temperature Compensating Type

GCG

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

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F) 0.1p 1p 10p 100p 1000p 10000p 0.1μ 1μ 10μ 100μ 1000μ
GCG15	1.0X0.5 <0402>	50	120pF – 470pF
GCG18	1.6X0.8 <0603>	50	10pF – 2200pF
GCG21	2.0X1.25 <0805>	50	1000pF – 10000pF

High Dielectric Constant Type

GCG

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

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F) 0.1p 1p 10p 100p 1000p 10000p 0.1μ 1μ 10μ 100μ 1000μ
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
		10	2.2μF
		6.3	2.2μF
GCG21	2.0X1.25 <0805>	100	10000pF
		50	18000pF – 1.0μF
		35	0.68μF – 1.0μF
		25	39000pF – 1.0μF
		16	0.33μF – 4.7μF
		10	10μF
		6.3	10μF
GCG31	3.2X1.6 <1206>	50	0.22μF – 0.33μF
		25	0.15μF – 10μF
		16	0.68μF – 4.7μF
		6.3	22μF
GCG32	3.2X2.5 <1210>	50	10μF
		35	10μF
		25	3.3μF – 10μF
		16	6.8μF – 10μF
		6.3	47μF

Capacitors

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)
			0.1p 1p 10p 100p 1000p 10000p 0.1μ 1μ 10μ 100μ 1000μ
GCJ18	1.6X0.8 <0603>	100	1000pF – 0.10μF
		50	1000pF – 0.22μF
		35	33000pF – 68000pF
		25	1000pF – 1.0μF
		16	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
		100	0.10μF – 1.0μF
		50	0.27μF – 4.7μF
		35	0.56μF – 1.0μF
		25	0.12μF – 10μF
		16	1.5μF – 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	6.8μF – 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

Metal Terminal Type

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 – 1.2μF
		450	0.22μF – 2.2μF
		250	0.47μF – 2.2μF

Safety Standard Certified Type MF (IEC60384-14 X1/Y2 Class)

KCA

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

Series	LXW (mm)	Rated Voltage (V)	Capacitance Range (F)
KCA55	6.1X5.3	AC250 (r.m.s.)	100pF – 10000pF

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

3 Terminal Low ESL Type for Automotive

NFM

Power-train | AEC-Q200 | Low ESL | EMI FIL®

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)
NFM21	2.0X1.25 <0805>	50	220pF – 22000pF
		16	1.0μF
		10	0.10μF – 0.47μF
NFM31	3.2X1.6 <1206>	100	10000pF
		50	10000pF – 0.10μF

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)
			0.1p 1p 10p 100p 1000p 10000p 0.1μ 1μ 10μ 100μ 1000μ
GCH15	1.0X0.5 <0402>	50	1.0pF – 1000pF
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)
			0.1p 1p 10p 100p 1000p 10000p 0.1μ 1μ 10μ 100μ 1000μ
GCH15	1.0X0.5 <0402>	100	220pF – 4700pF
		50	220pF – 0.10μF
		25	10000pF – 47000pF
		16	47000pF – 0.22μF
		10	0.10μF – 1.0μF
GCH18	1.6X0.8 <0603>	100	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

Disc Type (Safety Standard Certified Type)

DE1/DE2/DEJ

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

General Safety standard

Series	D (mm)	Rated Voltage (V)	Capacitance Range (F) 0.1p 1p 10p 100p 1000p 10000p 0.1μ 1μ 10μ 100μ 1000μ
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

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

General Safety standard

Series	D (mm)	Rated Voltage (V)	Capacitance Range (F) 0.1p 1p 10p 100p 1000p 10000p 0.1μ 1μ 10μ 100μ 1000μ
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

The Electrical Appliance and Material Safety Law of Japan

General

Series	D (mm)	Rated Voltage (V)	Capacitance Range (F) 0.1p 1p 10p 100p 1000p 10000p 0.1μ 1μ 10μ 100μ 1000μ
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

Series	D (mm)	Rated Voltage (Vdc)	Capacitance Range (F) 0.1p 1p 10p 100p 1000p 10000p 0.1μ 1μ 10μ 100μ 1000μ
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

Radial Lead Type

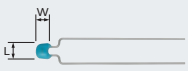
Temperature Compensating Type

RDE

General | Deflecting crack | Soldering crack | Anti-noise

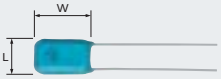
Series	LXW (mm)	Rated Voltage (Vdc)	Capacitance Range (F)
RDE5C	4.0X3.5	100	1.0pF – 1500pF
		50	1.0pF – 3900pF
	4.5X3.5	100	1800pF – 3300pF
		50	4700pF – 22000pF
	5.0X3.5	100	1.0pF – 3300pF
		50	1.0pF – 22000pF
	5.5X4.0	1k	100pF – 1000pF
		630	10pF – 3300pF
		250	10pF – 15000pF
		100	3900pF – 22000pF
		50	27000pF – 56000pF
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
		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)
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

Continued on the following page. ↗

Capacitors

Series	LxW (mm)	Rated Voltage (Vdc)	Capacitance Range (F)
			0.1p 1p 10p 100p 1000p 10000p 0.1μ 1μ 10μ 100μ 1000μ
RDED7	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
		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

Lead Type Ceramic Capacitors For Automotive

Safety Standard Certified for Automotive

Type KJ -IEC60384-14 X1/Y2 Class

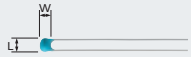
DE6

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

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	1k	100pF – 1000pF
		630	10pF – 3300pF
		250	10pF – 15000pF
		100	3900pF – 10000pF
		50	27000pF – 56000pF
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

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	4.0X3.5	50	1.0μF
	5.5X4.0	50	4.7μF
	5.5X5.0	100	1.5μF – 2.2μF
		50	10μF
	5.5X7.5	100	4.7μF

Continued on the following page. ↗

Series	LxW (mm)	Rated Voltage (Vdc)	Capacitance Range (F)
			0.1p 1p 10p 100p 1000p 10000p 0.1μ 1μ 10μ 100μ 1000μ
RCEC7	5.5X7.5	50	22μF
RCER7	3.6X3.5	100	220pF – 22000pF
		50	220pF – 0.10μF
		25	0.10μF – 0.22μF
	4.0X3.5	250	1000pF – 22000pF
		100	33000pF – 0.33μF
		50	0.15μF – 0.47μF
		25	0.33μF – 1.0μF
	5.5X4.0	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)
			0.1p 1p 10p 100p 1000p 10000p 0.1μ 1μ 10μ 100μ 1000μ
RHE5G	3.6X3.5	100	100pF – 1500pF
		50	100pF – 3900pF
	4.0X3.5	100	1800pF – 3300pF
		50	4700pF – 10000pF

High Dielectric Constant Type

RH

Power-train | AEC-Q200 | 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
RHEL8	3.6X3.5	100	220pF – 22000pF
		50	220pF – 0.10μF
		25	0.10μF – 0.22μF

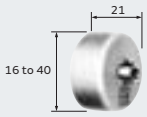
Continued on the following page. ↗

Capacitors

Series	LXW (mm)	Rated Voltage (Vdc)	Capacitance Range (F) 0.1p 1p 10p 100p 1000p 10000p 0.1μ 1μ 10μ 100μ 1000μ
RHEL8	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

High Voltage Ceramic Capacitors

High Voltage AC Rated Type



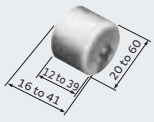
DHK

(in mm)

General

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

Ultra-high-voltage



DHS

(in mm)

General

Series	LXW (mm)	Rated Voltage (Vdc)	Capacitance Range (F) 0.1p 1p 10p 100p 1000p 10000p 0.1μ 1μ 10μ 100μ 1000μ
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

Polymer Aluminum Electrolytic Capacitors

ECAS

General Effective Cap

Series	LXW (mm)	Rated Voltage (Vdc)	Capacitance Range (F) 0.1p 1p 10p 100p 1000p 10000p 0.1μ 1μ 10μ 100μ 1000μ
ECAS	7.3X4.3	25	10μF 22μF
		16	6.8μF 47μF
		12.5	10μF 100μF
		10	10μF 150μF
		6.3	10μF 330μF
		4	68μF 330μF
		2.5	330μF 470μF
		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. 74 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 materials, we offer a variety of Noise Suppression Products and EMI Suppression Filters.

Lineup

- ●EMI (chip and lead type)
- ●Noise Suppression Products for Automotive
- ●ESD Protection Devices ●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 75 60 140 120 200 150 250 220 330 300 600 420 470 1500 1000 2200 1800 2500	
			BLM21B	0805 (2012)	-	5 75 60 200 120 250 150 330 220 420 300 470 350 750 600 1500 1000 2200 1800 2700 2250	
			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 (10 / 100 / 1000)	Effective Frequency Range (Hz) (For Reference Only) (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)	
		BLM15KD*	0402 (1005)	3800	30(3.1A) 20(3.8A) 120(1.5A)	
		BLM15PX*	0402 (1005)	3000	60(2.5A) 120(2A) 220(1.4A) 470(1A) 33(3A) 80(2.3A) 180(1.5A) 330(1.2A) 600(0.9A)	
		BLM15PD*	0402 (1005)	2200	60(1.7A) 120(1.3A) 30(2.2A) 80(1.5A)	
		BLM15PG	0402 (1005)	1000	10(1A)	
		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)	
		BLM18SD* (Low DC Resistance Type)	0603 (1608)	6000	22(6A)	
		BLM18SG* (Low DC Resistance Type)	0603 (1608)	6000	33(6A) 120(3A) 330(1.5A) 26(6A) 70(4A) 220(2.5A)	
		BLM21SN* (Low DC Resistance Type)	0805 (2012)	8500	30(8.5A)	
		BLM31SN* (Low DC Resistance Type)	1206 (3216)	12000	50(12A)	
		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 1500 330 470 1000 1800	
		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	

		Series	Size Code inch (mm)	Max. Rated Current (A)	Impedance (Ω) at 100MHz (10 / 100 / 1000)	Effective Frequency Range (Hz) (For Reference Only) (10k 100k 1M 10M 100M 1G 10G)
For General Band Noise	Large Current Type Power Lines Type	BLT5BPT*	2020 (5050)	11	68(11A)	

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

Noise Suppression Filters (Feed Through Chip EMI Filters)

	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
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 Filters)

	Series	Size Code inch (mm)	Max. Rated Current (mA)	Cut-off Frequency (MHz)	Effective Frequency Range (Hz) (For Reference Only)
				10 100 500	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	

Noise Suppression Filters (Chip EMIFIL®)

	Series	Size Code inch (mm)	Max. Rated Current (mA)	Impedance (Ω) at 1MHz	Effective Frequency Range (Hz) (For Reference Only)
				1 10 100 1000	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	

	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	120 250 500 700	
	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)	-	770 1500 2600 4600	900 1200 1450 1800	
	NFZ15SG_11	0402 (1005)	-	100 150 330	160 250 540	

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

Noise Suppression Filters (Chip Common Mode Choke Coils/ Chip Common Mode Noise Filters)

		Series	Size Code inch (mm)	Max. Rated Current (mA)	Common Mode Impedance (Ω) at 100MHz	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	
		NFP0R	018012 (0403)	-	(65)(90)	
		NFP0Q	025020 (0605)	-	(65)(90)	
		DLP0RSN	018012 (0403)	-	65 90	
		DLP0QSN	025020 (0605)	-	65 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 90 120 160 240 200 280 330	
		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 67 120 160 240 200 280	
		DLP31DN (2 circuits array)	1206 (3216)	-	90 130 200 320 440	
		DLW21S	0805 (2012)	-	90 67 120 180 210 260 490 370 500 920	
		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) (250) (400) (850) (2200) (1700)(2400)	
		DLW5AH/DLW5BS*	2014 /2020 (5036)/(5050)	5000	(190) (350) (500) (600) (800) (1500)(4000) (1000) (3000)	
		DLW5AT*/DLW5BT*	2014 /2020 (5036)/(5050)	6000	(50) (110) (100)(150) (230) (330) (500) (250) (400) (1000)(1400) (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 (A)	Common Mode Impedance (Ω) at 10MHz	Effective Frequency Range (Hz) (For Reference Only)
Large Current Type for Automotive Available	PLT5BP*	2020 (5050)	5.6	100 200 300 500	100k 1M 10M 100M 1G 10G
	PLT10H*	-	18	45 100 400 500 900 1000	

	Series	Size Code inch (mm)	Max. Rated Current (mA)	Common Mode Impedance (Ω) at 100MHz	Effective Frequency Range (Hz) (For Reference Only)
Large Current Type for Automotive Available	UCMH0907	3527 (9070)	5000	(700)	100k 1M 10M 100M 1G 10G

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.





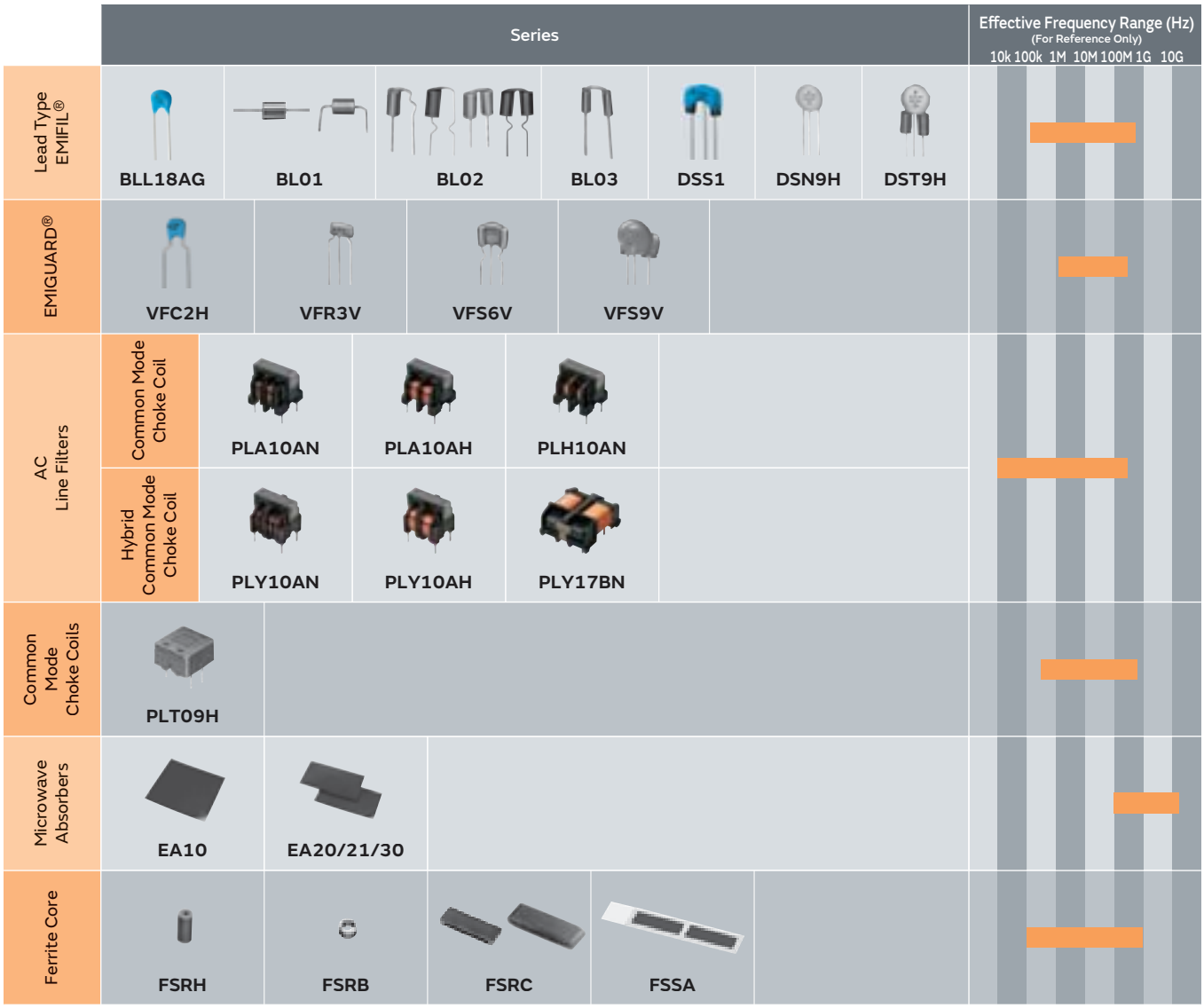
Silicon ESD Protection Devices LXES_T Series

Applying accumulated design technology for excellent ESD suppression performance.


ESD Protection Devices with Common Mode Choke Coil LXES_D Series

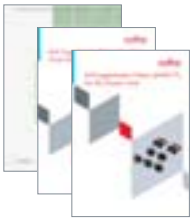
Applying Murata's original ceramic technology for excellent ESD suppression performance, small capacitance value, and common mode filter performance.


Noise Suppression Filters (Lead Type), Others



Detailed Catalogs

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



▪ EMI Suppression Filters (Lead Type EMIFIL®)	Cat. No. C30E
▪ EMI Suppression Filters (for DC)/Chip Inductors for Automotive	Cat. No. C51E
▪ 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. In addition, newly adopted metal alloy material has extended the power inductor lineup.

Lineup

●Inductors for Power Lines ●RF Inductors
●Lineup

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 found using a competitor's part number for Inductors.

Search results

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 above 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.

Inductors for Power Lines

- **Metal alloy type -DFEC series-**
- **Multilayer type -LQM series-**
- **Wire wound type -LQH series-**

Metal alloy type inductors have been added to inductor lineup!

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

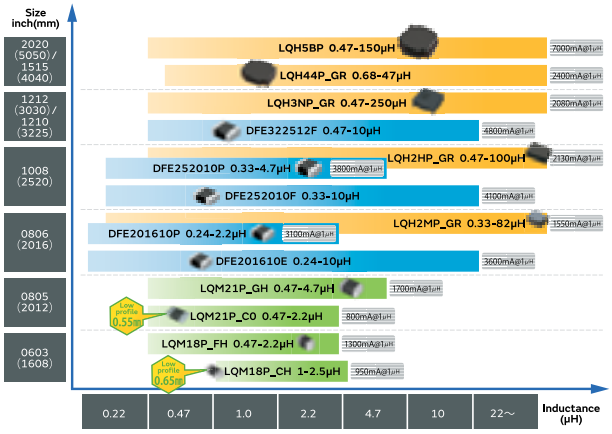
- Metal alloy type DFEC series
  Features: Made using metal materials and rectangular wire to cope with large currents.
  Applications: Power supply for smartphone digital circuits

- Multilayer type LQM series
  Features: Low profile less than 2012 size
  Applications: Power supply for wearable devices

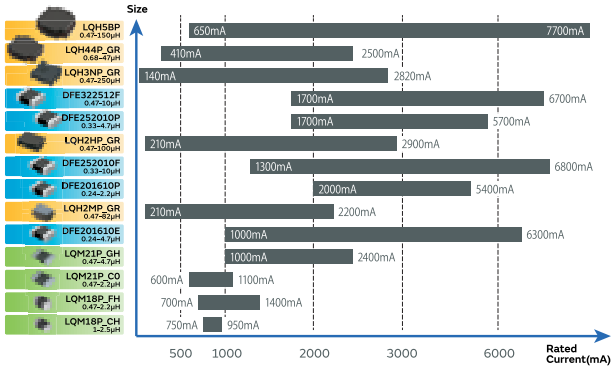
- Wound type LQH series
  Features: A wide lineup of 100µH or higher
  Applications: Backlight power supply, chokes

Recommended lineup (General)

List of inductance values

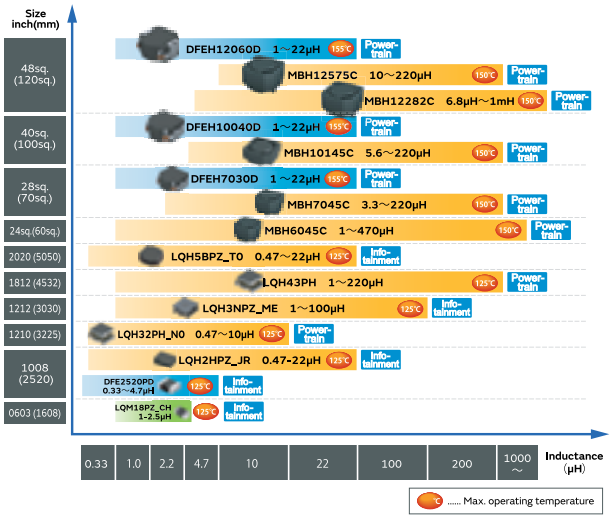


List of rated current values

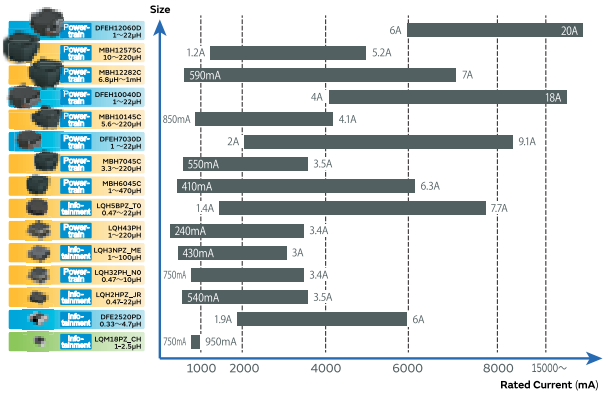


Recommended lineup (For Automotive)

List of inductance values



List of rated current values



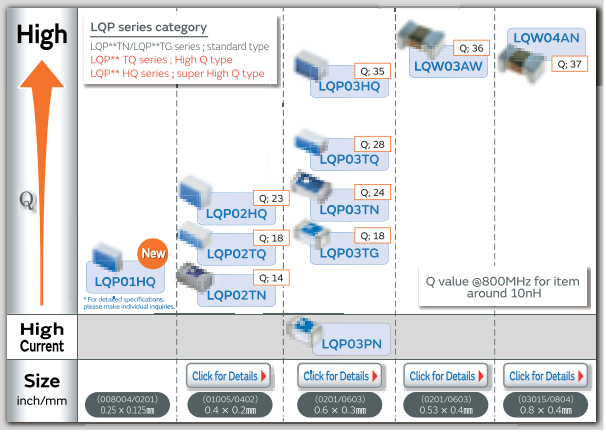
RF Inductors

- **Film type -LQP series-**
- **Wire wount type -LQW series-**
- **Multilayer type -LQG series-**

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

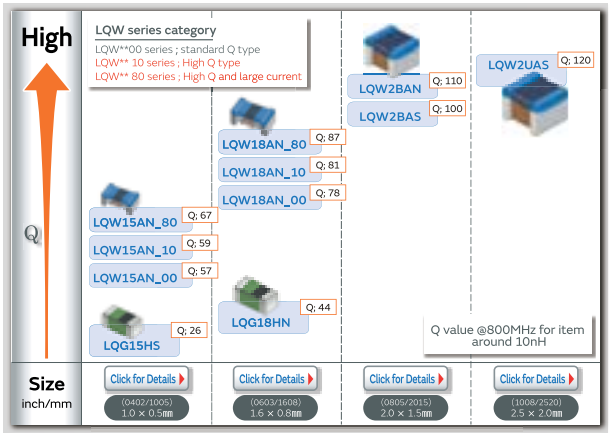
General (Small size)

Small size (0.8x0.4 mm or less) lineup



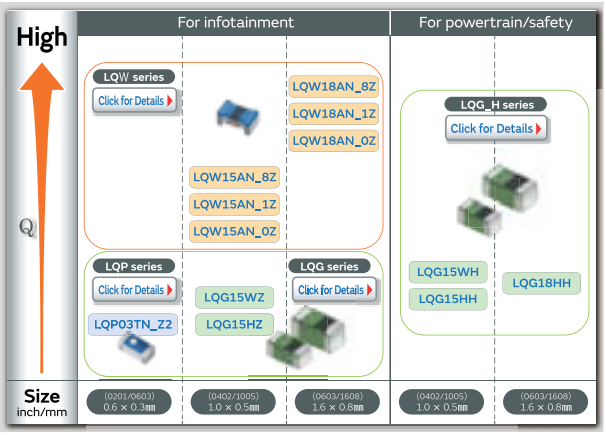
General (Large size)

Medium size (1.0x0.5 mm or more) lineup



For Automotive

Large size (1.0x0.5 mm or more) lineup



Lineup

General

Inductors for Power Lines

Series	Structure	Size Code inch (mm)	Applications	Inductance (H) 0.1n 1n 10n 100n 1µ 10µ 100µ 1m 10m	Rated Current Range
LQM18FN_00	Multilayer Type	0603 (1608)	General	1µH 10µH	50mA to 150mA
LQM18PN_B0		0603 (1608)	General	1.5µH	600mA
LQM18PN_C0		0603 (1608)	General	470nH 2.2µH	700mA to 850mA
LQM18PN_D0		0603 (1608)	General	2.5µH	700mA
LQM18PN_DH		0603 (1608)	General	2.2µH	650mA
LQM18PN_F0		0603 (1608)	General	1µH	600mA
LQM18PN_FH		0603 (1608)	General	470nH 2.2µH	700mA to 1.4A
LQM18PN_FR		0603 (1608)	General	220nH 4.7µH	620mA to 1.25A
LQM18PN_GH		0603 (1608)	General	1µH 3.3µH	1.05A
LQM18PW_CH		0603 (1608)	General	1µH 2.5µH	750mA to 950mA
LQM21DN_00		0805 (2012)	General	1µH 47µH	7mA to 60mA
LQM21FN_00		0805 (2012)	General	1µH 47µH	7mA to 220mA
LQM21FN_70		0805 (2012)	General	4.7µH 10µH	100mA to 120mA
LQM21FN_80		0805 (2012)	General	4.7µH 10µH	100mA to 120mA
LQM21PN_C0		0805 (2012)	General	470nH 2.2µH	600mA to 1.1A
LQM21PN_CA		0805 (2012)	General	2.2µH	1.05A
LQM21PN_CH		0805 (2012)	General	470nH 2.2µH	1.05A to 1.6A
LQM21PN_EH		0805 (2012)	General	240nH 2.2µH	1.1A to 2.8A
LQM21PN_G0		0805 (2012)	General	470nH 3.3µH	800mA to 1.3A
LQM21PN_GC		0805 (2012)	General	1µH 2.2µH	800mA to 900mA
LQM21PN_GH		0805 (2012)	General	470nH 4.7µH	1A to 2.4A
LQM21PN_GR		0805 (2012)	General	1µH 4.7µH	800mA to 1.3A
LQM21PN_GS		0805 (2012)	General	2.2µH 4.7µH	750mA to 950mA
LQM2MPN_DH		0806 (2016)	General	2.2µH	1.27A
LQM2MPN_EH		0806 (2016)	General	240nH 2.2µH	1.1A to 4.1A
LQM2MPN_G0		0806 (2016)	General	470nH 4.7µH	1.1A to 1.6A
LQM2MPN_GH		0806 (2016)	General	160nH 2.2µH	1.3A to 5A
LQM2HPN_CH		1008 (2520)	General	240nH 2.2µH	850mA to 2.55A
LQM2HPN_E0		1008 (2520)	General	560nH	1.5A
LQM2HPN_EH		1008 (2520)	General	240nH 2.2µH	1.3A to 4.5A
LQM2HPN_G0		1008 (2520)	General	470nH 4.7µH	1.1A to 1.8A
LQM2HPN_GC		1008 (2520)	General	1µH 4.7µH	800mA to 1.5A
LQM2HPN_GH		1008 (2520)	General	240nH 2.2µH	1.5A to 5A
LQM2HPN_GS		1008 (2520)	General	2.2µH 4.7µH	1A to 1.1A
LQM2HPN_J0		1008 (2520)	General	1µH 3.3µH	1A to 1.5A
LQM2HPN_JH		1008 (2520)	General	470nH 2.2µH	1.5A to 3.2A
LQM31PN_00		1206 (3216)	General	470nH 4.7µH	700mA to 1.4A
LQM32PN_G0		1210 (3225)	General	1µH	1.8A
LQM32PN_GC		1210 (3225)	General	1µH	2.2A
LQW15CN_00	Wire Wound Ferrite Core Type	0402 (1005)	General	18nH 200nH	390mA to 1.4A
LQW15CN_10		0402 (1005)	General	20nH 3.3µH	130mA to 2.2A
LQW18CN_00		0603 (1608)	General	4.9nH 650nH	430mA to 2.6A
LQH2MCN_02		0806 (2016)	General	1µH 82µH	90mA to 485mA
LQH2MCN_52		0806 (2016)	General	1µH 22µH	130mA to 595mA
LQH2MPN_GR		0806 (2016)	General	330nH 82µH	210mA to 2.2A
LQH2HPN_GR		1008 (2520)	General	470nH 100µH	210mA to 2.9A
LQH2HPN_JR		1008 (2520)	General	470nH 22µH	540mA to 3.5A
DEM2812C		1211 (3028)	General	470nH 12µH	760mA to 3.1A
DEM2815C		1211 (3028)	General	470nH 15µH	800mA to 3.9A
DEM2818C		1211 (3028)	General	470nH 12µH	1A to 4.7A
LQH3NPN_GR		1212 (3030)	General	470nH 250µH	140mA to 2.82A

Continued on the following page. ↗

Series	Structure	Size Code inch (mm)	Applications	Inductance (H) 0.1n 1n 10n 100n 1μ 10μ 100μ 1m 10m	Rated Current Range
LQH3NPN_JR	Wire Wound Ferrite Core Type	1212 (3030)	General	680nH 47μH	570mA to 2.86A
LQH3NPN_ME		1212 (3030)	General	1μH 100μH	430mA to 3A
LQH3NPN_MR		1212 (3030)	General	1μH 47μH	460mA to 2.15A
LQH31CN_03		1206 (3216)	General	120nH 100μH	80mA to 970mA
LQH32CN_23		1210 (3225)	General	1μH 560μH	60mA to 800mA
LQH32CN_33		1210 (3225)	General	150nH 10μH	450mA to 1.45A
LQH32CN_53		1210 (3225)	General	1μH 100μH	100mA to 1A
LQH32DN_23		1210 (3225)	General	1μH 560μH	60mA to 800mA
LQH32DN_53		1210 (3225)	General	1μH 100μH	100mA to 1A
LQH32PB_N0		1210 (3225)	General	470nH 120μH	200mA to 3.4A
LQH32PB_NC		1210 (3225)	General	470nH 22μH	650mA to 4.4A
LQH32PN_N0		1210 (3225)	General	470nH 120μH	200mA to 3.4A
LQH32PN_NC		1210 (3225)	General	470nH 22μH	650mA to 4.4A
DEM3512C		1514 (3735)	General	680nH 22μH	530mA to 2.5A
DEM3518C		1514 (3735)	General	560nH 22μH	880mA to 3.4A
LQH44PN_GR		1515 (4040)	General	680nH 47μH	410mA to 2.5A
LQH44PN_J0		1515 (4040)	General	1μH 47μH	380mA to 2A
LQH44PN_P0		1515 (4040)	General	1μH 22μH	800mA to 2.95A
LQH43CN_03		1812 (4532)	General	1μH 470μH	90mA to 1.08A
LQH43CN_33		1812 (4532)	General	560nH 3.9μH	1.6A to 2.95A
LQH43PB_26		1812 (4532)	General	1μH 220μH	240mA to 3.4A
LQH43PN_26		1812 (4532)	General	1μH 220μH	240mA to 3.4A
DEM4518C		1818 (4745)	General	1.2μH 22μH	1A to 3.5A
LQH5BPB_T0		2020 (5050)	General	470nH 22μH	1.4A to 7.7A
LQH5BPN_38		2020 (5050)	General	1μH 150μH	650mA to 7A
LQH5BPN_T0		2020 (5050)	General	470nH 22μH	1.4A to 7.7A
D52LC		2020 (5252)	General	1.2μH 100μH	260mA to 2.44A
D53LC High Current		2020 (5252)	General	1.1μH 100μH	460mA to 3.87A
D53LC Low Rdc		2020 (5252)	General	4.7μH 220μH	350mA to 2.31A
LQH55DN_03		2220 (5750)	General	120nH 10mH	50mA to 6A
DG6045C		2424 (6060)	General	1μH 100μH	900mA to 9.5A
DG6050C		2424 (6060)	General	1.2μH 100μH	1.2A to 9.8A
D63LCB		2524 (6362)	General	1μH 150μH	440mA to 4.52A
LQH66SN_03		2525 (6363)	General	270nH 10mH	50mA to 6A
DS75LC		2929 (7373)	General	1μH 470μH	430mA to 9.2A
DEM8030C		3131 (8080)	General	1.5μH 47μH	1.3A to 7.5A
DEM8040C		3131 (8080)	General	1.5μH 33μH	2.4A to 10A
DEM8045C		3131 (8080)	General	1.5μH 47μH	2.1A to 11.2A
DG8040C		3131 (8080)	General	1μH 100μH	1.3A to 10.4A
DEM10050C		3939 (100100)	General	1.5μH 33μH	3.5A to 15.3A
DS104C2		4040 (101101)	General	1.1μH 120μH	970mA to 11.7A
DS106C2		4040 (101101)	General	1.2μH 330μH	690mA to 12A
DS126C2		4949 (125125)	General	1.7μH 680μH	580mA to 11.8A
DFE201208S	Wire Wound Metal Alloy Core Type	0805 (2012)	General	470nH 2.2μH	1.8A to 4A
DFE201210S		0805 (2012)	General	470nH 2.2μH	2.1A to 4.8A
DFE201210U		0805 (2012)	General	240nH 2.2μH	2A to 6.5A
DFE201610C		0806 (2016)	General	560nH 2.2μH	1.5A to 2.8A
DFE201610E		0806 (2016)	General	240nH 10μH	1A to 6.3A
DFE201610P		0806 (2016)	General	240nH 2.2μH	2A to 5.4A
DFE201610R		0806 (2016)	General	470nH 2.2μH	1.6A to 3A
DFE201612C		0806 (2016)	General	470nH 2.2μH	1.6A to 3.4A
DFE201612E		0806 (2016)	General	330nH 4.7μH	1.8A to 6.3A
DFE201612P		0806 (2016)	General	240nH 2.2μH	2.1A to 6.5A
DFE201612R		0806 (2016)	General	470nH 2.2μH	1.7A to 3.5A
DFE252007F		1008 (2520)	General	470nH 4.7μH	1.2A to 3.3A
DFE252008C		1008 (2520)	General	470nH 4.7μH	1.1A to 3A
DFE252010C		1008 (2520)	General	470nH 10μH	1A to 3.5A

Continued on the following page. ↗

Inductors (Coils)

Series	Structure	Size Code inch (mm)	Applications	Inductance (H) 0.1n 1n 10n 100n 1µ 10µ 100µ 1m 10m	Rated Current Range
DFE252010F	Wire Wound Metal Alloy Core Type	1008 (2520)	General	330nH 10µH	1.3A to 6.8A
DFE252010P		1008 (2520)	General	330nH 4.7µH	1.7A to 5.7A
DFE252010R		1008 (2520)	General	1µH 4.7µH	1.4A to 3A
DFE252012C		1008 (2520)	General	470nH 10µH	1A to 3.8A
DFE252012F		1008 (2520)	General	330nH 10µH	1.4A to 7.6A
DFE252012P		1008 (2520)	General	330nH 4.7µH	2A to 6.6A
DFE252012R		1008 (2520)	General	1µH 4.7µH	1.7A to 3.4A
DFE322510C		1210 (3225)	General	470nH 10µH	1A to 3.8A
DFE322512C		1210 (3225)	General	470nH 10µH	1.2A to 4.7A
DFE322512F		1210 (3225)	General	470nH 10µH	1.7A to 6.7A
FDSD0412		1515 (4040)	General	330nH 4.7µH	2.5A to 7.5A
FDSD0415		1515 (4040)	General	220nH 4.7µH	2.9A to 12A
FDSD0420		1515 (4040)	General	470nH 330µH	2.5A to 11A
FDSD0512		2019 (5249)	General	1µH 6.8µH	2.3A to 6.1A
FDSD0515		2019 (5249)	General	1µH 4.7µH	3.2A to 7A
FDSD0518		2019 (5249)	General	680nH 10µH	2.7A to 9A
FDV0530		2322 (5856)	General	110nH 4.7µH	3.6A to 19.6A
FCUL0530		2322 (5857)	General	360nH 470nH	16A to 18A
FCUL0624		2726 (6866)	General	220nH 470nH	17A to 24A
FCUL0630		2726 (6866)	General	120nH 680nH	15A to 32A
FDUE0640		2726 (6967)	General	150nH 420nH	22A to 33A
FDUE0650		2726 (6967)	General	600nH 1µH	16A to 18A
FDV0618		2726 (6967)	General	240nH 3.3µH	4.1A to 14A
FDV0620		2726 (6967)	General	200nH 4.7µH	3.5A to 16.2A
FDVE0630		2726 (6967)	General	160nH 10µH	3.1A to 20.7A
FDSD0630		2726 (7066)	General	680nH 10µH	5.4A to 17A
FCUL1040		4239 (106100)	General	180nH 420nH	34A to 53A
FCUL1060		4239 (106100)	General	360nH 560nH	34A to 41A
FDUE1040D		4239 (106100)	General	220nH 1µH	18A to 32A
FDVE1040		4239 (106100)	General	1.5µH 10µH	6.1A to 14.6A
FDA1055		4242 (108108)	General	560nH 5.6µH	8A to 27.7A
FDUE1245		4848 (123121)	General	500nH 2.2µH	17A to 30A
FDA1254		5049 (126125)	General	680nH 8µH	9.1A to 29.1A
FDUE1260		5050 (127127)	General	450nH	42A

Inductors for General Circuits

Series	Structure	Size Code inch (mm)	Applications	Inductance (H) 0.1n 1n 10n 100n 1µ 10µ 100µ 1m 10m	Rated Current Range
LQB15NN_10	Multilayer Type	0402 (1005)	General	220nH 560nH	300mA to 380mA
LQB18NN_10		0603 (1608)	General	220nH 560nH	300mA to 450mA
LQM18NN_00		0603 (1608)	General	47nH 2.2µH	15mA to 50mA
LQM21NN_10		0805 (2012)	General	100nH 4.7µH	30mA to 250mA
LLB2520	Wire Wound Ferrite Core Type	1008 (2520)	General	1µH 47µH	100mA to 480mA
LLM2520		1008 (2520)	General	100nH 220µH	44mA to 570mA
LQH31HN_03		1206 (3216)	General	54nH 880nH	180mA to 920mA
LQH31MN_03		1206 (3216)	General	150nH 100µH	45mA to 250mA
LLM3225		1210 (3225)	General	100nH 1mH	19mA to 600mA
LQH32MN_23		1210 (3225)	General	1µH 560µH	40mA to 445mA
LQH44NN_03		1515 (4040)	General	510nH 470µH	145mA to 4.5A
LQH43MN_03		1812 (4532)	General	1µH 1.5mH	40mA to 500mA
LQH43NN_03		1812 (4532)	General	1µH 2.4mH	25mA to 500mA
LQW04CA_00		03019 (0805)	General	60nH 510nH	200mA to 620mA
LQW15CA_00		0402 (1005)	General	22nH 2µH	130mA to 1.3A

Continued on the following page. ↗

RF Inductors

Series	Structure	Size Code inch (mm)	Applications	Inductance (H) 0.1n 1n 10n 100n 1µ 10µ 100µ 1m 10m	Rated Current Range
LQG15HN_02	Multilayer Type	0402 (1005)	General	1nH 120nH	150mA to 1A
LQG15HS_02		0402 (1005)	General	1nH 270nH	110mA to 1A
LQG18HN_00		0603 (1608)	General	1.2nH 100nH	350mA to 1.1A
LQW21HN_00	Wire Wound Ferrite Core Type	0805 (2012)	General	470nH 2.2µH	75mA to 160mA
LQP02HQ_02	Film Type	01005 (0402)	General	0.2nH 56nH	100mA to 1A
LQP02TN_02		01005 (0402)	General	0.2nH 39nH	90mA to 320mA
LQP02TQ_02		01005 (0402)	General	0.2nH 22nH	120mA to 990mA
LQP03HQ_02		0201 (0603)	General	0.6nH 150nH	80mA to 1.1A
LQP03PN_02		0201 (0603)	General	2.2nH 4.7nH	900mA to 1.4A
LQP03TG_02		0201 (0603)	General	0.1nH 120nH	80mA to 850mA
LQP03TN_02		0201 (0603)	General	0.6nH 270nH	60mA to 850mA
LQP03TQ_02		0201 (0603)	General	0.6nH 13nH	250mA to 1A
LQP15MN_02		0402 (1005)	General	1nH 33nH	60mA to 400mA
LQP18MN_02		0603 (1608)	General	1.3nH 100nH	50mA to 300mA
LQW03AW_00	Wire Wound Non-Magnetic Core Type	0201 (0603)	General	1nH 15.5nH	230mA to 900mA
LQW04AN_00		03015 (0804)	General	0.8nH 33nH	140mA to 1.8A
LQW04AN_10		03015 (0804)	General	36nH 56nH	180mA to 200mA
LQW15AN_00		0402 (1005)	General	1.5nH 120nH	110mA to 1A
LQW15AN_10		0402 (1005)	General	1.3nH 8.4nH	640mA to 1.2A
LQW15AN_80		0402 (1005)	General	1.3nH 75nH	320mA to 3.15A
LQW18AN_00		0603 (1608)	General	2.2nH 470nH	75mA to 850mA
LQW18AN_10		0603 (1608)	General	2.2nH 33nH	550mA to 1.4A
LQW18AN_80		0603 (1608)	General	2.2nH 390nH	190mA to 3.2A
LQW18AS_00		0603 (1608)	General	1.6nH 390nH	100mA to 700mA
LQW2BAN_00		0805 (2015)	General	3.2nH 200nH	750mA to 3.8A
LQW2BAS_00		0805 (2015)	General	2.8nH 820nH	180mA to 800mA
LQW2BHN_03		0805 (2015)	General	3.3nH 470nH	160mA to 1.32A
LQW2BHN_13		0805 (2015)	General	2.7nH 27nH	900mA to 1.9A
LQW2UAS_00		1008 (2520)	General	12nH 4.7µH	260mA to 1A
LQW31HN_03		1206 (3216)	General	8.8nH 100nH	230mA to 750mA

Automotive

Inductors for Power Lines

Series	Structure	Size Code inch (mm)	Applications	Inductance (H) 0.1n 1n 10n 100n 1µ 10µ 100µ 1m 10m	Rated Current Range
LQM18PZ_CH	Multilayer Type	0603 (1608)	Infotainment	1µH 2.5µH	750mA to 950mA
LQM18PZ_DH		0603 (1608)	Infotainment	2.2µH	650mA
LQM18PZ_FH		0603 (1608)	Infotainment	2.2µH	700mA
LQM21PH_GC		0805 (2012)	Powertrain	2.2µH	800mA
LQM21PZ_C0		0805 (2012)	Infotainment	470nH 2.2µH	600mA to 1.1A
LQM21PZ_G0		0805 (2012)	Infotainment	470nH 3.3µH	800mA to 1.3A
LQM21PZ_GC		0805 (2012)	Infotainment	1µH 2.2µH	800mA to 900mA
LQM21PZ_GR		0805 (2012)	Infotainment	1µH 4.7µH	800mA to 1.3A
LQM2MPZ_G0		0806 (2016)	Infotainment	470nH 4.7µH	1.1A to 1.6A
LQM2HPZ_E0		1008 (2520)	Infotainment	560nH	1.5A
LQM2HPZ_G0		1008 (2520)	Infotainment	470nH 4.7µH	1.1A to 1.8A
LQM2HPZ_GC		1008 (2520)	Infotainment	1µH 4.7µH	800mA to 1.5A
LQM2HPZ_GS		1008 (2520)	Infotainment	2.2µH 4.7µH	1A to 1.1A
LQM2HPZ_J0		1008 (2520)	Infotainment	1µH 3.3µH	1A to 1.5A
LQW15CN_0Z	Wire Wound Ferrite Core Type	0402 (1005)	Infotainment	18nH 200nH	390mA to 1.4A
LQW15CN_1Z		0402 (1005)	Infotainment	20nH 560nH	300mA to 2.2A
LQH2MPZ_GR		0806 (2016)	Infotainment	330nH 82µH	210mA to 2.2A
LQH2HPZ_GR		1008 (2520)	Infotainment	470nH 22µH	460mA to 2.9A
LQH2HPZ_JR		1008 (2520)	Infotainment	470nH 22µH	540mA to 3.5A
LQH3NPZ_GR		1212 (3030)	Infotainment	470nH 47µH	460mA to 2.82A
LQH3NPZ_JR		1212 (3030)	Infotainment	680nH 47µH	570mA to 2.86A
LQH3NPZ_ME		1212 (3030)	Infotainment	1µH 100µH	430mA to 3A
LQH32CH_23		1210 (3225)	Powertrain	1µH 22µH	250mA to 800mA
LQH32CH_33		1210 (3225)	Powertrain	150nH 10µH	450mA to 1.45A
LQH32CH_53		1210 (3225)	Powertrain	1µH 22µH	250mA to 1A
LQH32DZ_23		1210 (3225)	Infotainment	1µH 470µH	60mA to 800mA
LQH32DZ_53		1210 (3225)	Infotainment	1µH 100µH	100mA to 1A
LQH32PH_N0		1210 (3225)	Powertrain	470nH 10µH	750mA to 3.4A
LQH32PH_NC		1210 (3225)	Powertrain	470nH 22µH	650mA to 4.4A
LQH32PZ_N0		1210 (3225)	Infotainment	470nH 120µH	200mA to 3.4A
LQH32PZ_NC		1210 (3225)	Infotainment	470nH 22µH	650mA to 4.4A
LQH44PZ_GR		1515 (4040)	Infotainment	680nH 47µH	410mA to 2.5A
LQH43PH_26		1812 (4532)	Powertrain	1µH 220µH	240mA to 3.4A
LQH43PZ_26		1812 (4532)	Infotainment	1µH 220µH	240mA to 3.4A
LQH5BPZ_T0		2020 (5050)	Infotainment	470nH 22µH	1.4A to 7.7A
MBH6045C High Current		2424 (6262)	Powertrain	1.5µH 47µH	1.1A to 6.3A
MBH6045C Low Rdc		2424 (6262)	Powertrain	1µH 470µH	410mA to 4.4A
MBH7045C High Current		2828 (7272)	Powertrain	22µH 220µH	550mA to 1.8A
MBH7045C Low Rdc		2828 (7272)	Powertrain	3.3µH 220µH	650mA to 3.5A
MBH10145C		4141 (104104)	Powertrain	5.6µH 220µH	850mA to 4.1A
MBH12282C		4949 (125125)	Powertrain	6.8µH 1mH	590mA to 7A
MBH12575C		5050 (128128)	Powertrain	10µH 220µH	1.2A to 5.2A
DFE252012P	Wire Wound Metal Alloy Core Type	1008 (2520)	Infotainment	330nH 4.7µH	1.9A to 6A
DFEG7030D		2726 (7066)	Powertrain	1µH 22µH	2A to 9.1A
DFEH7030D		2726 (7066)	Powertrain	1µH 22µH	2A to 9.1A
DFEG10040D		4339 (109100)	Powertrain	1µH 22µH	4A to 18A
DFEH10040D		4339 (109100)	Powertrain	1µH 22µH	4A to 18A
DFEG12060D		5150 (130126)	Powertrain	1µH 22µH	6A to 20A
DFEH12060D		5150 (130126)	Powertrain	1µH 22µH	6A to 20A

Continued on the following page. ↗

Inductors for General Circuits

Series	Structure	Size Code inch (mm)	Applications	Inductance (H) 0.1n 1n 10n 100n 1µ 10µ 100µ 1m 10m	Rated Current Range
LQH31HZ_03	Wire Wound Ferrite Core Type	1206 (3216)	Infotainment	54nH – 880nH	180mA to 920mA
LQH43NZ_03		1812 (4532)	Infotainment	1µH – 2.2mH	30mA to 500mA
HEAWS		4241 (107104)	Infotainment	10µH	5A
HEAW		5551 (140130)	Infotainment	10µH	7.2A

RF Inductors

Series	Structure	Size Code inch (mm)	Applications	Inductance (H) 0.1n 1n 10n 100n 1µ 10µ 100µ 1m 10m	Rated Current Range
LQG15HH_02	Multilayer Type	0402 (1005)	Powertrain	1nH – 270nH	110mA to 1A
LQG15HZ_02		0402 (1005)	Infotainment	1nH – 270nH	110mA to 1A
LQG15WH_02		0402 (1005)	Powertrain	1nH – 15nH	400mA to 1.2A
LQG15WZ_02		0402 (1005)	Infotainment	1nH – 15nH	400mA to 1.2A
LQG18HH_00		0603 (1608)	Powertrain	1.2nH – 270nH	200mA to 1.1A
LQP03TN_Z2	Film Type	0201 (0603)	Infotainment	0.6nH – 120nH	80mA to 850mA
LQW15AN_0Z	Wire Wound Non-Magnetic Core Type	0402 (1005)	Infotainment	1.5nH – 120nH	110mA to 1A
LQW15AN_1Z		0402 (1005)	Infotainment	1.3nH – 8.4nH	640mA to 1.2A
LQW15AN_8Z		0402 (1005)	Infotainment	1.3nH – 75nH	320mA to 3.15A
LQW18AN_0Z		0603 (1608)	Infotainment	2.2nH – 470nH	75mA to 850mA
LQW18AN_1Z		0603 (1608)	Infotainment	2.2nH – 33nH	550mA to 1.4A
LQW18AN_8Z		0603 (1608)	Infotainment	2.2nH – 390nH	190mA to 3.2A
LQW18AS_0Z		0603 (1608)	Infotainment	1.6nH – 390nH	100mA to 700mA

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 type of application where single or multiple power inductors are used can have an effect on the efficiency of the part(s). Core losses are suffered depending on the Temperature, Frequency, and Current needed for the application. Using the "Murata Power Inductor Selection Tool," you can input the needed Temperature, Frequency, and Current for the application and easily select a usable part.

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

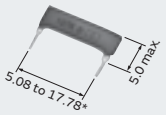
Using Murata's ceramic processing technology and unique materials, we offer a series of resistor products.

Lineup

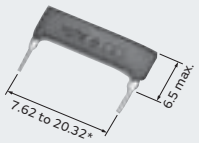
●High Voltage Resistors

High Voltage Resistors

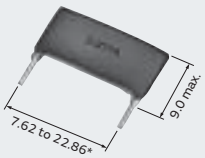
Featuring thick-film resistors, the Murata MHR series of high-voltage resistors is available in compact and thin SIP packages. Variants with small deviations are also available on request.



MHR03 Series



MHR04 Series



MHR06 Series

(in mm)

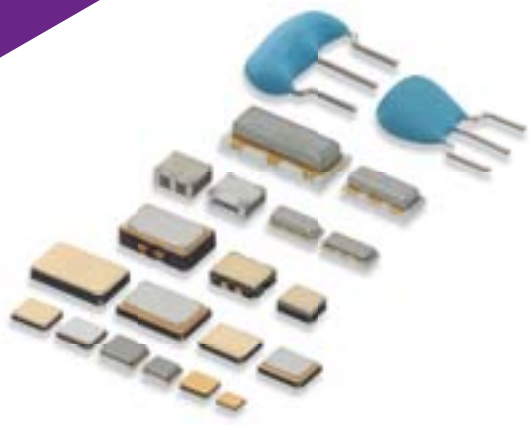
*The terminal pitch is an integral multiple of 2.54mm.

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

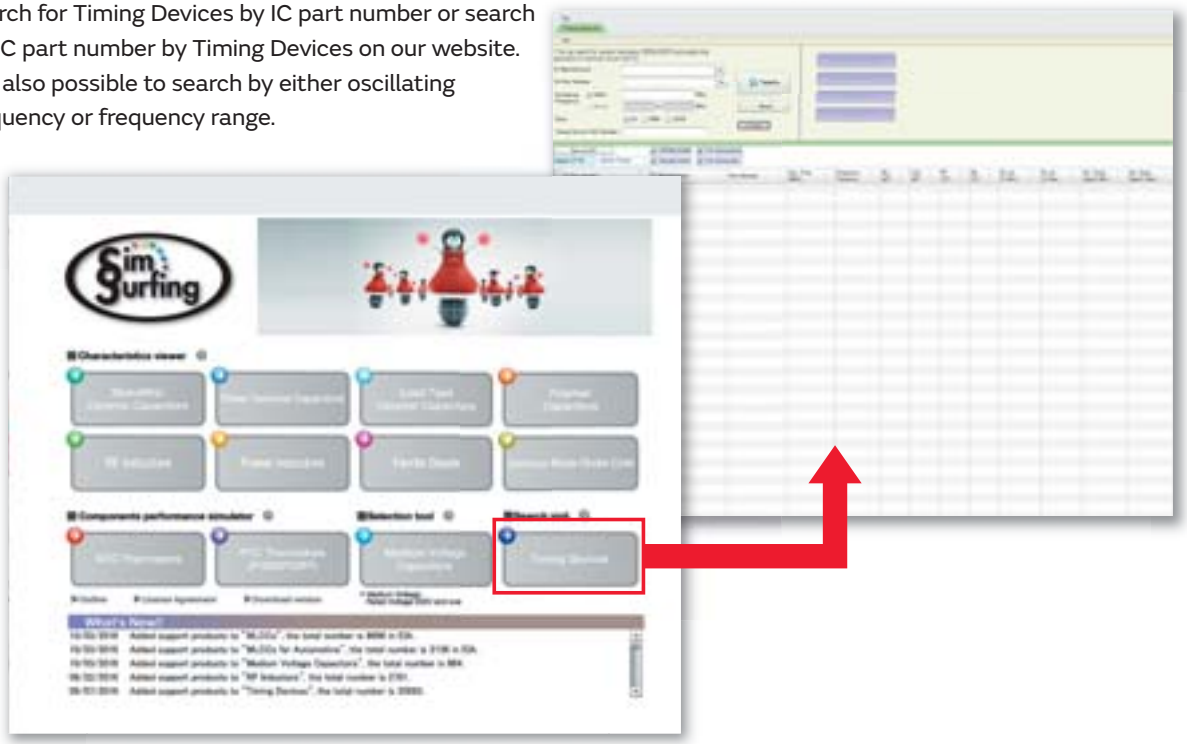
Murata's ceramic processing technology and unique piezoelectric material has led to the development of a range of small and thin ceramic timing devices that offer high oscillation frequency and remarkable oscillation tolerance.

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

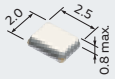
For more details, please refer to our printed catalogs and the PDF catalogs on our website.

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

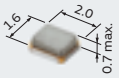
Crystal Units

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

For Automotive



XRCHA-F-A

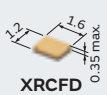


XRCGB-F-A

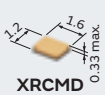
(in mm)

Series	Type	Seal	Frequency (MHz)	Frequency Shift by Temperature (ppm max.)	Operating Temperature Range (°C)
XRCHA-F-A	HCR2520	Resin	16.0000±100ppm – 24.0000±100ppm	±100	-40 to 125
XRCGB-F-A	HCR2016	Resin	24.0000±30ppm – 29.9999±30ppm	±35	-40 to 125
			30.0000±50ppm – 48.0000±50ppm	±65	-40 to 125

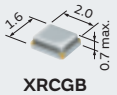
For Consumer/Industrial



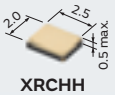
XRCFD



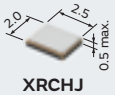
XRCMD



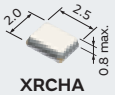
XRCGB



XRCHH



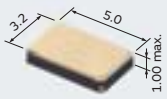
XRCHJ



XRCHA

XRCJH

XRCJK



XRCLH

XRCLK

(in mm)

Series	Type	Seal	Frequency (MHz)	Frequency Shift by Temperature (ppm max.)	Operating Temperature Range (°C)
XRCFD	MCR1612	Metal	24.0000±10ppm – 29.9999±10ppm	±10	-20 to 70
XRCMD	MCR1612	Metal	30.0000±10ppm – 48.0000±10ppm	±10	-20 to 70
XRCGB-F-H	HCR2016	Resin	24.0000±10ppm – 25.0000±10ppm	±10	-20 to 70
			26.0000±10ppm – 32.0000±10ppm	±10	-30 to 85
XRCGB-F-P	HCR2016	Resin	24.0000±20ppm – 32.0000±20ppm	±20	-30 to 85
XRCGB-F-M	HCR2016	Resin	24.0000±30ppm – 32.0000±30ppm	±40	-30 to 85
			33.8688±45ppm – 50.0000±45ppm	±40	-30 to 85
XRCGB-F-L	HCR2016	Resin	24.0000±100ppm – 50.0000±100ppm	±50	-30 to 85
XRCGB-F-Z	HCR2016	Resin	24.0000±100ppm – 50.0000±100ppm	±100	-40 to 105
XRCHH	TAS-2520F	Metal	16.0000±10ppm – 52.0000±10ppm	±15	-30 to 85
XRCHJ	TDS-2520F	Seam	16.0000±10ppm – 52.0000±10ppm	±15	-30 to 85
XRCHA-F-L	HCR2520	Resin	16.0000±100ppm – 20.0000±100ppm	±100	-30 to 85
XRCHA-F-Z	HCR2520	Resin	16.0000±100ppm – 20.0000±100ppm	±100	-40 to 105
XRCJH	TAS-3225J	Metal	13.0000±10ppm – 52.0000±10ppm	±15	-30 to 85
XRCJK	TSS-3225J	Seam	12.0000±10ppm – 52.0000±10ppm	±15	-30 to 85
XRCLH	TAS-5032F	Metal	10.0000±10ppm – 52.0000±10ppm	±15	-30 to 85
XRCLK	TSS-5032A	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 methods, and measurement furthered by our long experience and expertise.

For Consumer/Industrial

XNCHH XNCJH XTCHH XTCJH 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_J	TTS14VSH	●	10.0000±0.5ppm — 40.0000±0.5ppm	±0.28	±0.5	-40 to 85

Ceramic Resonators CERALOCK®

Wide product lineup for automotive and consumer applications with SMD and leaded packages.

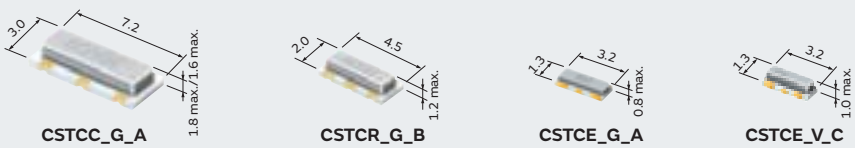
MHz Chip Type for Automotive (Tight Frequency Tolerance)

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)

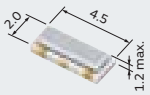


CSTCC_G_A CSTCR_G_B CSTCE_G_A CSTCE_V_C

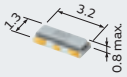
(in mm)

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

MHz Chip Type for Consumer Electronics (Tight Frequency Tolerance)

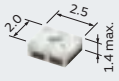


CSTCR_G15L



CSTCE_G15L

CSTCE_V13L

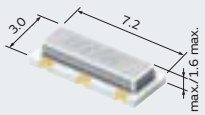


CSTCW_X11

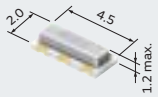
(in mm)

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_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

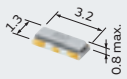
MHz Chip Type for Consumer Electronics (Standard Frequency Tolerance)



CSTCC_G



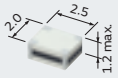
CSTCR_G



CSTCE_G

CSTCE_V

CSTCW_X



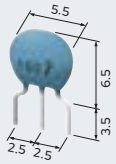
CSACW_X

(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	2.00±0.5% – 3.99±0.5%	±0.3 (15pF) ±0.4 (47pF)	-20 to 80
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
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) 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)
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

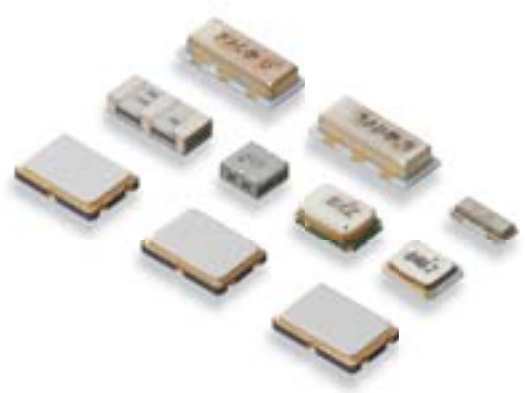
Broad lineup of Filters for video, audio, RF/Local, Duplexers, and Filters for IF

Summary

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

Lineup

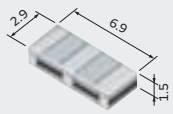
●Ceramic Filters CERAFIL® (Filters, Traps, and Discriminators)
●Crystal Filters ●SAW Filters for Mobile Communications
●Dielectric Filters GIGAFIL® ●Chip Multilayer LC Filters



Ceramic Filters CERAFIL®

CERAFIL® 10.7MHz Chip Type

Small and lightweight filters for IF in communications or AV equipment using unique piezoelectric 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☐	●	–	–

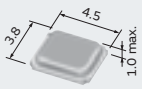
☐ is filled with the letter designating the required 3dB bandwidth.

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

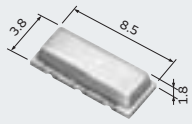
(in mm)

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

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



SFSKA Series

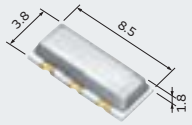
SFSKB Series

(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.



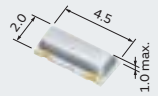
TPSKA Series

(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

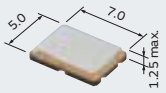
(in mm)

Series	Center Frequency
CDSCB	10.700MHz±30kHz

The 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

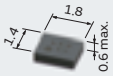
Series	Type	Frequency Range (MHz)	Number of Poles
XDCAF	TM7050F	20 to 80 [Fundamental] 70 to 150 [3rd overtone]	2
XDCAG	TM7050G		4
XDCAH	TM7050H		4

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

SAW Filters for Mobile Communications

SAW Duplexers

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



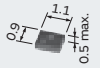
(in mm)

SAYEY Series

RF Filters

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

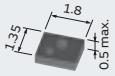
Single Filter



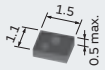
(in mm)

SAFFB Series

Dual Filter



SAWEN Series



SAWFD Series

(in mm)

SAW Filters and SAW Duplexers 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.

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

TDF Series

	Series	Frequency Range (MHz) 100 1000 2000 3000 4000 5000 6000 7000	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*
RF/IF/Local Filter	**TDF**	2000 – 6000	2 to 5	1 to 10W*

*Power depends upon specifications.

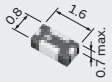
Characteristic customization is available. You can also contact us through our website.

Chip Multilayer LC Filters

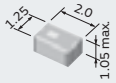
Ultra-small and low-profile filters based on ceramic multilayer technology.

Band Pass Filters

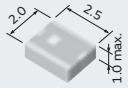
LFB15 Series



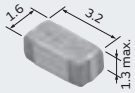
LFB18 Series



LFB21 Series



LFB2H Series

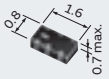


LFB31 Series

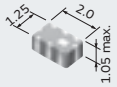
(in mm)

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®) Application Manual — Cat. No. P11E

RF Components

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

Summary

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

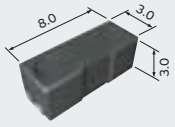
Lineup

●Antennas ●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®

Antennas

Coil Antennas

Rx 1D-ANT



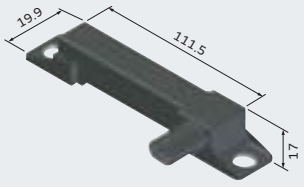
SA3M08 Series

SAZ73D Series

(in mm)

Series	Inductance (mH)	Q (Reference)
SA3M08	1.0 to 18.0	25
SAZ73D	1.0 to 9.0	30

Transmitter ANT

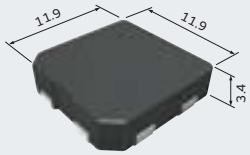


(in mm)

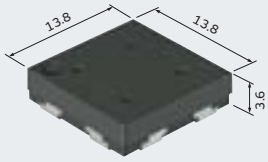
STA8121 Series

Series	Capacitance (pF)	Resonance Frequency
STA8121	2200 to 10000	125kHz, 134.2kHz

Rx 3D-ANT



SA3D12 Series



SA3D14 Series

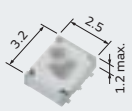
(in mm)

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

Isolators

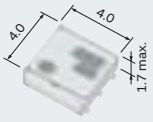
Isolators pass signals in the forward direction and blocking signals in the reverse direction.

For Base Stations



CES20 Series

CES30 Series



CES40 Series

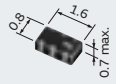
(in mm)

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.

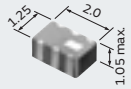
Baluns

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



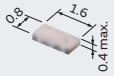
LDB18 Series



LDB21 Series

LDM0Q Series

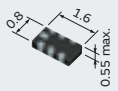
LDM15 Series



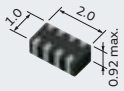
LDM18 Series

(in mm)

Film Type



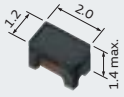
DXP18B Series



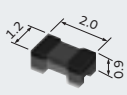
DXP2AB Series

(in mm)

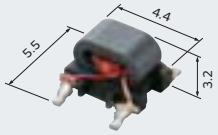
Wire Wound Type



DXW21B Series



DXW21H Series



B4F Series

B5F Series

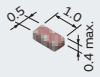
B5FL Series

(in mm)

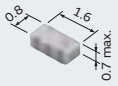
Couplers

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

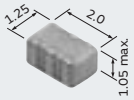
Chip Multilayer Type



LDC15 Series
LDJ15 Series



LDC18 Series
LDJ18 Series

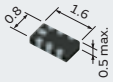


LDC21 Series
LDJ21 Series

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

(in mm)

Film Type

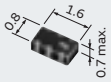


DXP18C Series

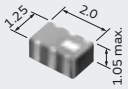
(in mm)

Chip Multilayer Hybrid Dividers

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



LDD18 Series



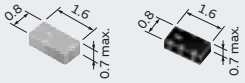
LDD21 Series

(in mm)

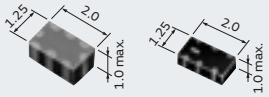
Chip Multilayer Diplexers

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

LFD15 Series



LFD18 Series



LFD21 Series

LFD2H 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_____

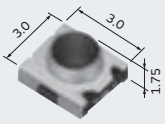
(in mm)

Type	Receptacle Part Number	Rated Voltage (Vrms)	Frequency Rating (GHz)	Temperature Range	Voltage Standing Wave Ratio	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.

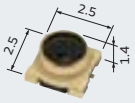
Nominal Impedance: 50Ω

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)

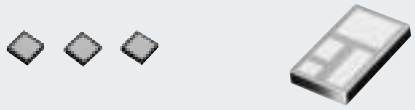
Type	Receptacle Part Number	Rated Voltage (Vrms)	Frequency Rating (GHz)	Temperature Range	Voltage Standing Wave Ratio	Standard Measurement Probe Part Number
SWD	**MM8430-2610**	30	to 6	-40 to 85°C	1.2 max. (DC to 3GHz)	**MM126320 MXHS83QE3000**
SWF	**MM8130-2600**	30	to 6	-40 to 85°C	1.2 max. (DC to 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

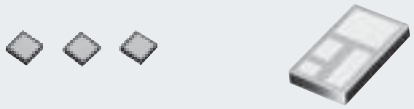
Temperature Compensation Type



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.

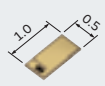
▪ High Frequency Single Layer Microchip Capacitors Cat. No. C01E

Thin Film Circuit Substrate RUSUB®

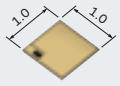
Suitable for photo diode modules.

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

Summary

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

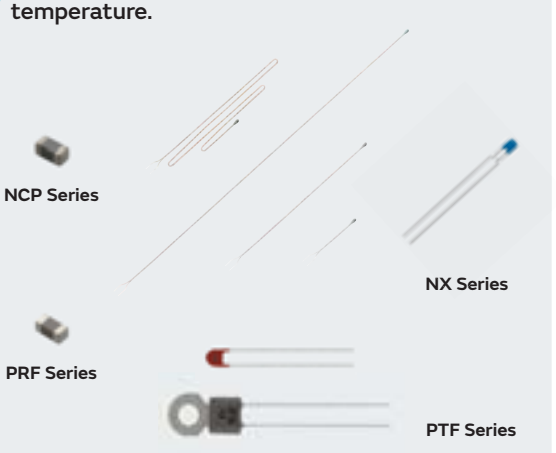
Lineup

●Infrared Sensors ●Ultrasonic Sensors ●Rotary Sensors ●Magnetic Pattern Recognition Sensors ●AMR Sensors (Magnetic Sensors) ●Shock Sensors ●Accelerometers ●Inclinometers ●Gyro Sensors ●Rotary Position Sensors ●Proximity and Ambient Light Sensors ●Barometric Pressure Sensors ●Temperature Sensors (Thermistors)

Sensor Guide (Select by Method/Principle)

Temperature

Thermistors: The resistance changes with the temperature.



Infrared/Light

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

IRA Series

Ambient light sensors: The built-in photo diode detects ambient light and infrared light.

LT Series

For more details on Thermistors, please refer to p. 64.

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
▪ NTC Thermistors	Cat. No. R44E
▪ POSISTOR® for Circuit Protection	Cat. No. R90E
▪ NTC/PTC Thermistors for Automotive	Cat. No. R03E

Distance

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

MA300D1-1
(for Dual Use)

MA40H1S

MA40S4R (for Receiver)
MA40S4S (for Transmitter)

MA58MF14-7N
(for Dual Use)

Proximity/Open and Shut

Proximity sensors: The sensor sends and receives infrared light in order to detect the proximity from the state of the reflected light.

LT Series

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

MR Series

Inertial force

Shock sensors: This sensor generates an electric charge according to the acceleration (stress) applied to the piezoelectric element.

PKGS Series

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

SCA Series

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

SCA Series

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

SCC Series
SCR Series

Magnetic

Rotary sensors: This sensor detects the motion of magnetic gears by a built-in magnet and magnetoresistive element.

FR Series

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

MR Series

Magnetic pattern recognition sensors: This sensor identifies magnetic ink by the combination of a built-in magnet and magnetoresistive element.

BS Series

Pressure

Barometric pressure sensors: This sensor detects the atmospheric pressure applied to the 3DMEMS element by the capacitance.

ZPA Series

Angle

Rotary position sensors: The resistance changes in proportion to the angle.

SV03 Series

Lineup

Detection	Murata's Sensors			Applications											
				AV Equipment					Communications Devices						
	Products	Series or Main Part Number	Dimensions (mm)	TV	Audio	DVD, CD	Digital Video Camera	Digital Camera	PC	Scanner	Multifunction Machine	Printer	FAX	Electronic Bulletin Board
Infrared	Pyroelectric Infrared Sensors	**IRA Series**	ø9.2 H4.7	●	●	●			●	●	●	●	●	●
Ultrasonic	Open Structure Type Ultrasonic Sensors	**MA40S4R** (for Receiver) **MA40S4S** (for Transmitter)	ø9.9 H7.1											●
		MA40H1S	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	**FR Series**	ø22.5 H12.5											
	Magnetic Pattern Recognition Sensors	**BS 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	**SV03 Series**	11X12X2.1	●				●			●	●		
Optical	Proximity and Ambient Light Sensors	**LT Series**	3.05X2.1X1.0								●	●		
Atmosphere Pressure	Barometric Pressure Sensors	**ZPA Series**	2.6X2.3X0.875											
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																															Wearable	Murata's Sensors
	Home Electronics											Security				Car Electronics			Toy		Others												
	Refrigerator	Electric Rice-cooker	Air Conditioner	Air Purification System	Humidifier	Cleaner	Laundry Machine	Food Fan	Water Heater	Toilet Seats with a Warm-water Shower Feature	Lighting	Security Camera	Security Light	Indoor Security Sensor	Intrusion Detection Sensor	Navigation System	Climate Control	Parking Assist	Radio Control (Attitude Control)	Game Controller	Machine Tool	ATM, CD	Vending Machine	Amusement Machine	Construction Machinery	Farm Machinery	Railroad Equipment						Products
	●	●	●	●							●	●	●	●	●							●	●	●							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
																														●		Proximity and Ambient Light Sensors
						●													●	●				●						●		Barometric Pressure 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

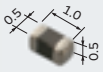
NTC Thermistors for Temperature Sensor/ Temperature Compensation

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.

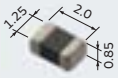
NCP02 Series

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)	220 to 470k	3500 to 4500	0.04 to 2.10	100	1	-40 to 125
NCP18	0603 (1608)	220 to 470k	3500 to 4500	0.04 to 2.10	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.

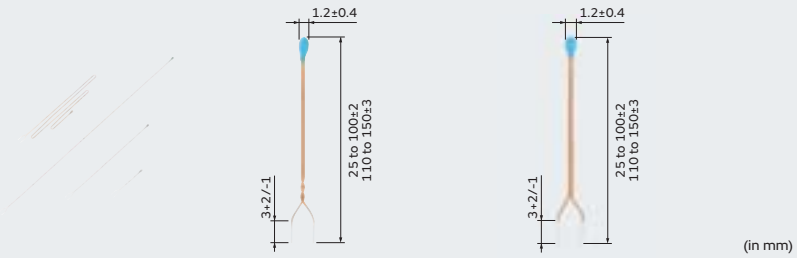
Detailed Catalogs

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
- NTC/PTC Thermistors for Automotive — Cat. No. R03E

Thermo String Type

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



Twist
NXFT15_1B Series

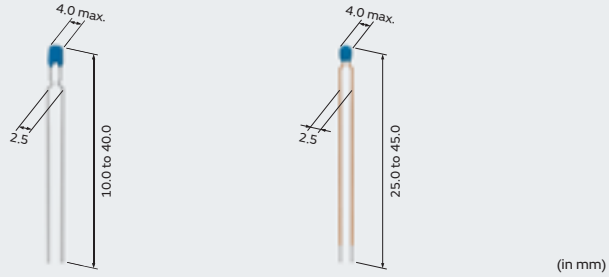
Without twist
NXFT15_2B Series

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

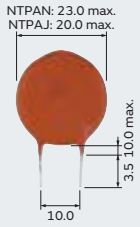
NXRT15/Insulation Series*

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 35	-40 to 125

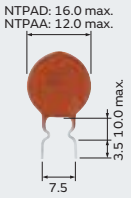
Operating Current for Sensor raises the Thermistor's temperature by 0.1°C.
There are also items for automotive applications in the NXR Series.
*Insulation: Lead wire insulation type.

NTC Thermistors for Inrush Current Suppression

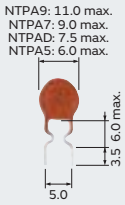
Effectively suppresses surge currents that are generated when switching power regulators are turned on.



NTPAN / J Series



NTPAD / A Series



NTPA5 / D / 7 / 9 Series

(in mm)

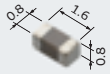
Series	Resistance (25°C) (Ω)	Permissible Max. Current (25°C) (A)	Permissible Max. Current (55°C) (A)	Thermal Time Constant (25°C) (s)	Permissible Electrolytic Capacitor (100V) (μF)	Operating Temperature Range (°C)
NTPAN / J	3 to 10	2.6 to 5.4	2.2 to 4.7	125 to 135	5000 to 8600	-20 to 160
NTPAD / A	2.2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

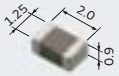
Chip Type

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

PRF15 Series



PRF18 Series



PRF21 Series

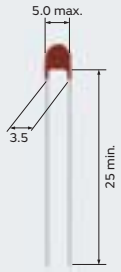
(in mm)

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)

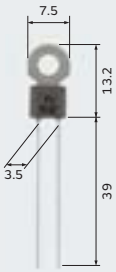
There are also items for automotive applications in the PRF Series.

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

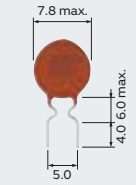
(in mm)

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

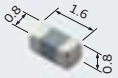
Maximum Inrush Current shows the maximum inrush current value introduced into the Posistor at operating temperature range.

PTC Thermistors POSISTOR® for Overcurrent Protection

Chip Type

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

PRG15 Series



PRG18 Series

PRG21 Series

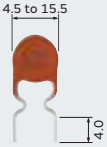
(in mm)

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

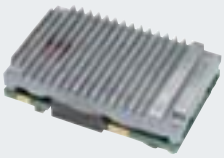
●DC-DC Converters ●Micro DC-DC Converters
●High Voltage Transformers ●High Voltage Power Supplies
●Switching Power Supplies

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 FPGAs.

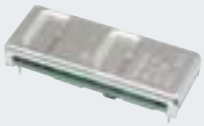
Isolated Type

MYBQC01138AZTB



MYBQC01138AZTF

MYBEA01212AZT



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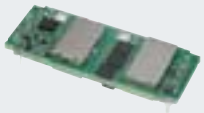

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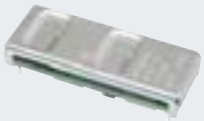
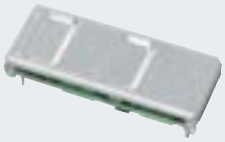


MYBEA01210CZTB



MYBEB01212AZTB

MYBTA00512ABT

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.
MYBEB01212AZTB	Insert	48V (36V to 75V)	100	12±3%	8.3	92	2250	1/8	58X22.8X12.7 max.
MYBTA00512ABT	SMD	48V (36V to 75V)	60	5±3%	12	92	2250	1/32	23.36X19.05X12.7 max.

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

Non-isolated Type


MPDRX307S
MPDRX308S


MPDRX312S


MPDTY461S
MPDTY462S


MYGTM01210BZN


MYLSM00502ERPL


MYMGK00506ERSR
MYMGK1R806FRSR


MYMGK1R820ERSR
MYMGK1R820FRSR


MYSSM01806BENL


MYUSP3R303FMP


OKL2-T/12-W12N2-C


OKL2-T/12-W5N-C


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


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


OKL-T/3-W5N-C


OKL-T/6-W12P-C

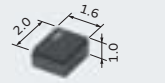
Part Number	Package	Input Voltage (V)	Nominal Output Power (W)	Output Voltage (V)	Current (A)	Efficiency (%)	Size (mm) LXWXH
MPDRX307S	SMD	6.2 to 13.2	23.6	1.8 to 3.63	6.5	91	17.6X20.2X4.2
MPDRX308S	SMD	6.2 to 13.2	10.7	0.8 to 1.65	6.5	82	17.6X20.2X4.2
MPDRX312S	SMD	3 to 5.5	28.8	0.8 to 1.8	16	86.5	27.8X15.4X4.2
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
MYLSM00502ERPL	SMD	8 to 16	12.5	1 to 5.25	2.5	85	7.9X7.9X2.3
MYMGK00506ERSR	SMD	8 to 14	30	0.7 to 5.0	6	95.4	9.0X7.5X5.0
MYMGK1R806FRSR	SMD	4.5 to 5.5	10.8	0.7 to 1.8	6	90.4	9.0X7.5X5.0
MYMGK1R820ERSR	SMD	8 to 14	36	0.7 to 1.8	20	87.8	10.5X9.0X5.6
MYMGK1R820FRSR	SMD	4.5 to 5.5	36	0.7 to 1.8	20	89.2	10.5X9.0X5.6
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
OKL2-T/12-W12N2-C	SMD	4.5 to 14	60	0.69 to 5.5	12	95	20.32X11.43X8.55
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/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
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
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

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

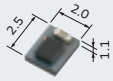
Micro DC-DC Converters

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.

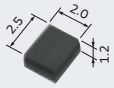
General Buck Converter



LXDC2MB Series

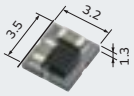


LXDC2HL Series



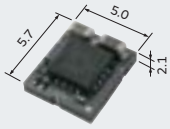
LXDC2HN Series

LXDC2UR Series

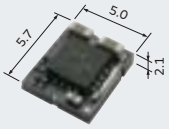


LXDC3EP Series

LXDC2XQ Series



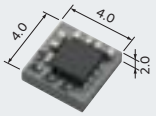
LXDC55F Series



LXDC55K Series

(in mm)

Boost Converter



LXDC44A Series

(in mm)

Buck-Boost

LXDC2SC Series

(in mm)

Series	Size (mm)		Input Voltage (V)	Output Voltage (V)	Output Current (mA)
	LXW	T (max.)			
LXDC2MB	2.0X1.6	1.0	2.0 to 5.5	1.0 to 3.3	<50
LXDC2HL**G	2.5X2.0	1.0	2.3 to 5.5	1.0 to 2.5	<300
LXDC2HL**A	2.5X2.0	1.1	2.3 to 5.5	1.0 to 3.3	<600
LXDC2HN**F	2.5X2.0	1.3	2.3 to 5.5	1.0 to 3.3	<600
LXDC2UR	2.5X2.3	1.2	2.7 to 5.5	1.2 to 3.3	<600
LXDC3EP	3.5X3.2	1.3	2.5 to 5.5	1.0 to 3.3	<1000
LXDC2XQ	2.8X2.6	1.14	2.7 to 5.5	1.0 to 3.3	<1500
LXDC55F	5.7X5.0	2.1	4.0 to 14.0	0.8 to 5.3 Set by Trim Resistor	<1500
LXDC55K	5.7X5.0	2.1	2.7 to 5.5	0.8 to 3.6 Set by Trim Resistor	<3000
LXDC44A	4.0X4.0	2.0	2.7 to 5.5	5.0, 6.0	<700
LXDC2SC	2.8X2.9	1.15	2.8 to 5.0	3.3	<1200

High Voltage Transformers


QF Type


QP Type


WP Type

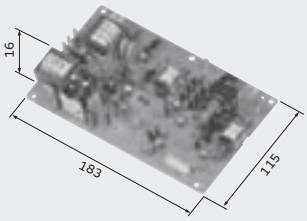

NU Type


WR Type

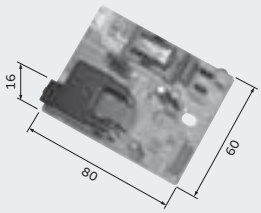

AK Type

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	49X65X27
	AK	High Voltage High Power	Max. 10kV	2mA	20 to 70kHz	55X28X26

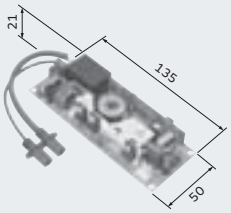
High Voltage Power Supplies



MPH7000 Series



MPH4000 Series
(for Air Purifier/Air Conditioner)



MPL3000 Series
(AC/DC Ballast)

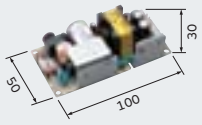
(in mm)

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	-

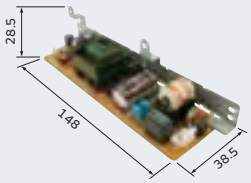
Series	Applications	Input Voltage Vin	Output Power	Other Specification
MPL3000 (AC/DC Ballast)	Projector	250 to 420V DC	to 350W	For extra-high pressure mercury lamp

For more details on our products, please contact us.

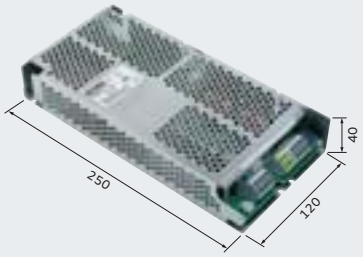
Switching Power Supplies



Medical Equipment

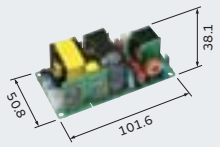


SOHO Equipment

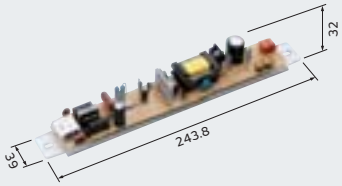


Industrial and Measurement Equipment

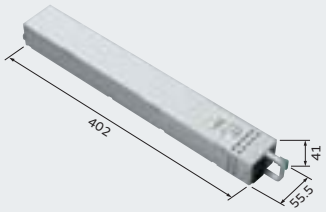
Energy Management Equipment



PBX



LED Lighting



HVDC

(in mm)

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
HVDC	200 to 400V DC	12.12V	-	VCCI	PMBus

For more details on our products, please contact us.

For Ionizer Modules, please refer to p. 81.

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 supercapacitors (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.

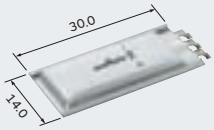
Lineup

- Supercapacitors (EDLC)
- Small Energy Devices (Lithium Ion Batteries)

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 Supercapacitor technology resulting in low ESR and high capacitance in a very small package.

DMT3N4R2U224M3DTA0
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)	DMT3N4R2U224M3DTA0	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

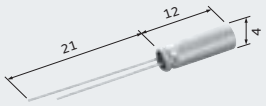
Detailed Catalogs

For more details, please refer to our 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 Devices (Lithium Ion Batteries)

Murata's small energy devices are miniature devices 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

Please contact Murata sales representative if you need higher capacity or thinner package size.

Sound Components (Buzzer)

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

Summary

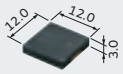
Using Murata's unique ceramic material, we offer a variety of piezoelectric sound components.

Lineup

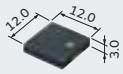
- SMD Piezoelectric Sounders
- Pin Type Piezoelectric Sounders
- Piezoelectric Buzzers
- Piezoelectric Diaphragms

SMD Piezoelectric Sounders

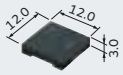
Low power consumption, lightweight.
Optimized for small devices such as blood glucose meters, clinical thermometers, photoflashes for cameras, and portable terminals.



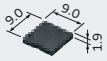
PKLCS1212E20



PKLCS1212E24



PKLCS1212E40



PKMCS0909E40

(in mm)

Applications	Mounting Type	Drive Type	Main Part Number	Sound Pressure Level (typ.)	Measurement Condition of Sound Pressure Level
For Automotive	Surface Mounting Type	External Drive	PKLCS1212E20A0-R1	76dB	±1.5Vo-p, 2.0kHz, square wave, 10cm
			PKLCS1212E24A0-R1	80dB	±1.5Vo-p, 2.4kHz, square wave, 10cm
			PKLCS1212E40A1-R1	84dB	±1.5Vo-p, 4.0kHz, square wave, 10cm
For Consumer			PKLCS1212E2000-R1	76dB	±1.5Vo-p, 2.0kHz, square wave, 10cm
			PKLCS1212E2400-R1	80dB	±1.5Vo-p, 2.4kHz, square wave, 10cm
			PKLCS1212E4001-R1	84dB	±1.5Vo-p, 4.0kHz, square wave, 10cm
			PKMCS0909E4000-R1	74dB	±1.5Vo-p, 4.0kHz, square wave, 10cm

Detailed Catalogs

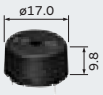
For more details, please refer to our printed catalogs and the PDF catalogs on our website.

▪ Piezoelectric Sound Components Cat. No. P37E

Pin Type Piezoelectric Sounders

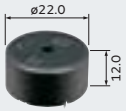
Low power consumption, lightweight.
These products are optimized for operation confirmation sounds and warning sounds in household appliances such as air conditioners, washers, and refrigerators.

PKM13EPYH

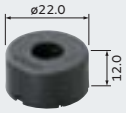


PKM17EPP

PKM22EPH



PKM22EPPH20



PKM22EPPH40

(in mm)

Packaging	Mounting Type	Drive Type	Main Part Number	Sound Pressure Level (typ.)	Measurement Condition of Sound Pressure Level
Taping	Pin Type	External Drive	**PKM13EPYH4000-A0**	78dB	±1.5Vo-p, 4.0kHz, square wave, 10cm
Bulk			**PKM13EPYH4002-B0**	78dB	±1.5Vo-p, 4.0kHz, square wave, 10cm
			PKM17EPP-2002-B0	79dB	3.0Vo-p, 2.0kHz, square wave, 10cm
			PKM22EPH2001	85dB	±1.5Vo-p, 2.0kHz, square wave, 10cm
			PKM22EPPH2001-B0	79dB	±1.5Vo-p, 2.0kHz, square wave, 10cm
			PKM22EPPH4007-B0	92dB	±1.5Vo-p, 4.0kHz, square wave, 10cm

Piezoelectric Buzzers

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

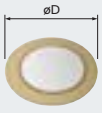
PKB24SPCH

(in mm)

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

Piezoelectric Diaphragms

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



7BB-□□-□

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

□: Indicates Metal Plate Diameter and Resonant Frequency Type.

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

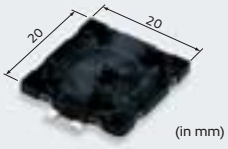
Thin film variable capacitors can carry out the variable of the capacitor by adjusting the tuning voltage.
It is designed for use as frequency matching for HF band (13.56MHz).

Micromechatronics

Utilizing the vibration and deformation properties of piezoelectric materials.

Microblowers

Tiny air pumps without a motor



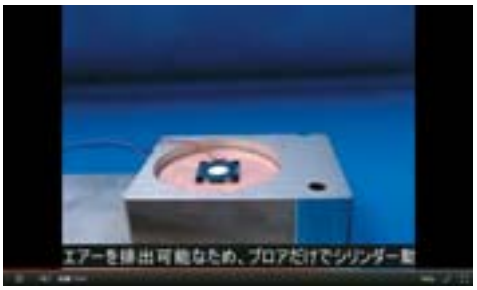
Features

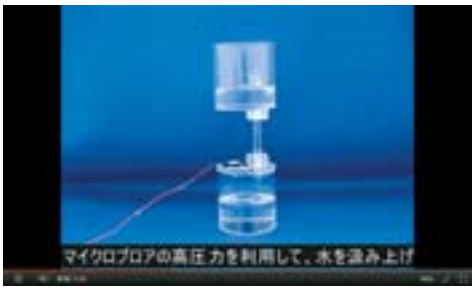
Microblowers are designed to function as an air pump,
using the ultrasonic vibrations of piezoelectric ceramics,
which can generate high pressure air from a thin and extremely compact unit.

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.

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

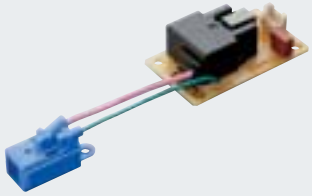
Ionizer Modules Ionissimo®

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	MHM314 Type	MHM305 Type	MHM306 Type	MHM400 Type
Input Voltage (VDC)	+10.8 to 13.2	←	←	←
Power	0.9W	0.4W	0.6W	0.6W
Ion Polarity	Negative	←	←	Positive
Ion Amount (*1)	>20000000pcs/cc (*2)	>20000000pcs/cc	←	←
Ozone Level	0.1mg/H (typ.)	<0.1mg/H	<1.0mg/H	<0.1mg/H
Operating Temp.	-10 to 50℃	←	←	←
Operating Humidity	20 to 80%RH (without dewdrop)	←	←	←

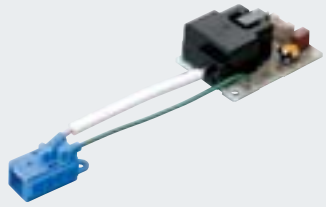
(*1) Measuring distance : 20cm
(*2) MHM314's Ion amount is around 3 times compare with MHM305.

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

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

Applications

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

Items	MHM500 Type	MHM501 Type	MHM502 Type
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)

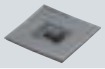
View a demonstration video of Ozonizer Modules Ionissimo® on our website.

Others

RFID Devices

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

HF (13.56 MHz) RFID Devices (MAGICSTRAP®)

	LXMS33HCNG-134	LXMSAPHA08-136	LXMS33HCNK-171	LXMSAPHA17-176	LXTB5HHCNK-002
Appearance					
Frequency	HF (13.56MHz)				
Standard	ISO15693		ISO14443 typeA, NFC forum type2		
IC	NXP ICODE® SLIX		NXP NTAG210	NXP NTAG213	NXP NTAG210
UID memory	64 bits				
User memory	896 bits		384 bits	1152 bits	384 bits
Size (mm)	3.2 x 3.2	8.3 x 8.3	3.2 x 3.2	8.3 x 8.3	5.5 x 5.5
Thickness	0.7mm max.	0.8mm max.	0.75mm max.	0.8mm max.	2.5mm max.
In-mold process	○	N/A	○	N/A	○
Read range*	20mm	42mm	15mm	32mm	25mm

* Read range depends on the performance of the reader, the power, the antenna size, etc.

Antenna, Reader/Writer unit

SPI-USB converter unit

UHF (860/920 MHz) RFID Devices (MAGICSTRAP®)

	LXMS21NCNH-147	LXMS21ACMF-183	LXMS21ACNP-184	LXMSANAA19-181	LXMSANAA18-182
Appearance					
Frequency	UHF (865 to 928MHz)			UHF (902 to 928MHz)	UHF (865 to 868MHz)
Standard	EPC global Gen2 V1.2.0 ISO/IEC18000-63	EPC global Gen2 v2 ISO/IEC18000-63	EPC global Gen2 V1.2.0 ISO/IEC18000-63	EPC global Gen2 v2 ISO/IEC18000-63	
IC	NXP G2iM	Impinj monza® R6	NXP UCODE® 7xm	Impinj monza® R6	
User memory	512 bits	N/A	1024 bits	N/A	
EPC memory	256 bits	96 bits	448 bits	96 bits	
Size (mm)	2.0 x 1.25	2.0 x 1.2	2.0 x 1.2	40 x 6	
Thickness	0.55mm max.	0.5mm max.	0.5mm max.	0.9mm max.	
Antenna	Integrated	External	External	Integrated	
In-mold process	○	○	○	N/A	
Read range* (4wEIRP)	5mm	9m	7m	4m	

* Read range depends on the performance of the reader, the power, the antenna size, etc.

Antenna, Reader/Writer unit

UART-USB converter unit

Note: MAGICSTRAP® is a registered trademark of Murata Manufacturing Co., Ltd.
Note: Windows is a registered trademark of USA-based Microsoft Corporation in the United States and/or in other countries.
Note: monza is a registered trademark of USA-based Impinj, Inc. in the United States and/or in other countries.
Note: ICODE and UCODE are a registered trademarks of USA-based NXP Semiconductors N.V. in the United States and/or in other countries.

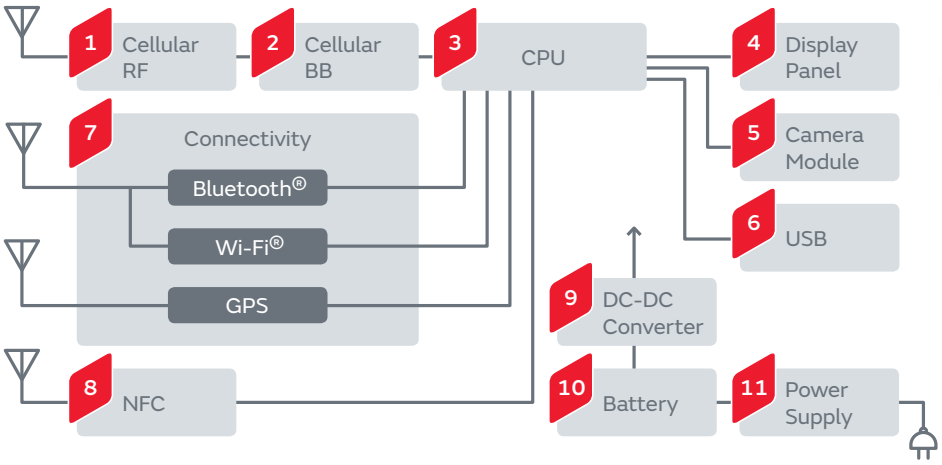
Memo

Application Guides

muRata

K70E.pdf
Jan.26,2017

Smart Phones



1 Cellular RF

- Chip Multilayer Diplexers — LFD Series
- SAW Duplexers — SAY Series
- SAW Filters — SAF Series
- Chip Multilayer LC Filters — LF Series
- Chip Multilayer Hybrid Baluns — LDB/LDM Series
- Chip Multilayer Hybrid Couplers — LDC/LDJ Series
- High-Frequency Matching Transformers — SMST Series
- Microwave Coaxial Cable Connectors
- Microwave Coaxial Connectors with Switch
- 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 — XRC 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
- ESD Protection Devices — LXES Series
- Chip Common Mode Choke Coils — DLW/DLP Series
- Thermistors — NCP/PRF Series

5 Camera Module

- Micro DC-DC Converters — LXDC Series
- Supercapacitors (EDLC) — DMF/DMT Series
- Monolithic Ceramic Capacitors for Medium Voltage — GR7 Series
- Actuators
- Chip Ferrite Beads — BLM Series
- ESD Protection Devices — LXES Series
- Low Temperature Co-fired Ceramics (LTCC) Ceramic Multilayer Substrates LFC®
- 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

Chip Multilayer Diplexers
LFD Series

Chip Multilayer Hybrid Couplers
LDC/LDJ Series

Bluetooth® Modules

Wi-Fi® Modules

Bluetooth® - Wi-Fi® Combo Modules

SAW Filters
SAF Series

Chip Multilayer LC Filters
LF Series

Chip Multilayer Hybrid Baluns
LDB/LDM Series

Microwave Coaxial Cable Connectors

Microwave Coaxial Connectors with Switch

Micro DC-DC Converters
LXDC Series

ESD Protection Devices
LXES Series

Thermistors
NCP/PRF Series

Crystal Units
XRC Series

8 NFC

NFC Antennas
FLAN Series

Crystal Units
XRC 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

Metal Terminal Type Monolithic Ceramic Capacitors
KRM Series

Monolithic Ceramic Capacitor on Interposer Board
ZRB Series

Micro DC-DC Converters
LXDC Series

Polymer Aluminum Electrolytic Capacitors
ECAS Series

Thermistors
NCP/PRF Series

10 Battery

Thermistors
NCP/PRF/PRG Series

11 Power Supply

Monolithic Ceramic Capacitors for Medium Voltage
GR/GA Series

High Temperature Guaranteed Low Loss Lead Type Ceramic Capacitor
DEA Series

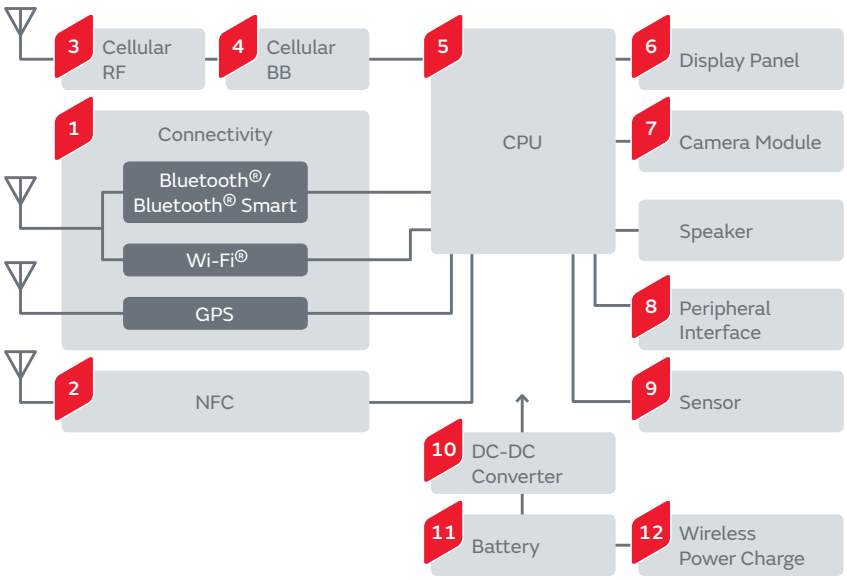
Safety Standard Certified Ceramic Capacitors
Type KX/KY

Chip Inductors (Chip Coils)
LQM/LQH Series

General Purpose

Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling/For Step-up	
Monolithic Ceramic Capacitors	GJM Series	High Frequency Filter Circuit	
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/DFEC Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminal Capacitors	NFM Series	Noise Suppression	
Feed Through Chip EMI Filters	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	

Wearable Devices



1 Connectivity

- Bluetooth® Modules
- Wi-Fi® Modules
- Bluetooth® - Wi-Fi® Combo Modules
- SAW Filters SAF Series
- Chip Multilayer LC Filters LF Series
- Chip Multilayer Hybrid Baluns LDB/LDM Series
- Chip Multilayer Diplexers LFD Series
- Chip Multilayer Hybrid Couplers LDC/LDJ Series
- Micro DC-DC Converters LXDC Series
- Crystal Units XRC Series
- Microwave Coaxial Cable Connectors
- Microwave Coaxial Connectors with Switch
- ESD Protection Devices LXES Series
- Thermistors NCP/PRF Series

2 NFC

- NFC Antennas FLAN Series
- Micro DC-DC Converters LXDC Series
- Crystal Units XRC 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 LF Series
- Chip Multilayer Hybrid Baluns LDB/LDM Series
- Chip Multilayer Hybrid Couplers LDC/LDJ Series
- High-Frequency Matching Transformers SMST Series
- Microwave Coaxial Cable Connectors
- Microwave Coaxial Connectors with Switch
- 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 XRC Series 
- Thermistors NCP/PRF Series 

6 Display Panel

- Micro DC-DC Converters LXDC Series 
- Ceramic Resonators CERALOCK® CSTCW Series 
- Crystal Units XRC 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/DMT Series 
- 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 XRC 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 
- Monolithic Ceramic Capacitor on Interposer Board ZRB Series 
- Metal Terminal Type Monolithic Ceramic Capacitors KRM Series 
- Polymer Aluminum Electrolytic Capacitors ECAS Series 
- Thermistors NCP Series 

11 Battery

- Thermistors NCP/PRF/PRG Series 

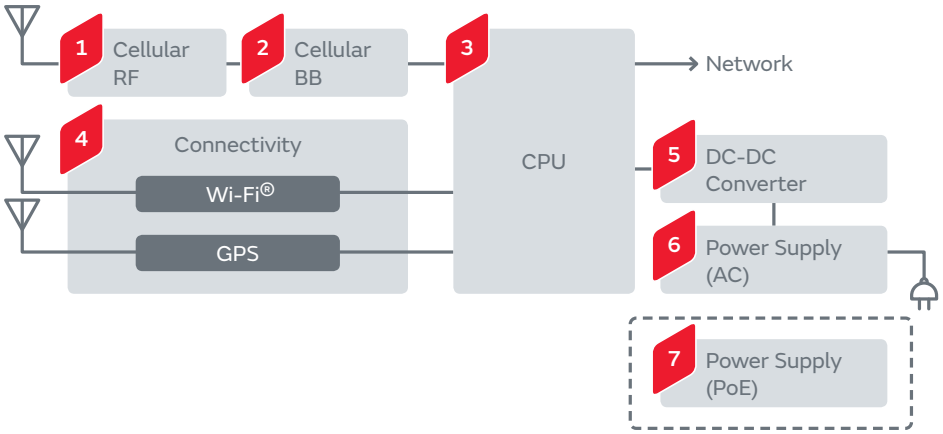
12 Wireless Power Charge

- Low ESL Monolithic Ceramic Capacitors LLL Series 
- Thermistors NCP/PRF Series 

General Purpose

Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling/For Step-up	
Monolithic Ceramic Capacitors	GJM Series	High Frequency Filter Circuit	
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/DFEC Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminal Capacitors	NFM Series	Noise Suppression	
Feed Through Chip EMI Filters	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	
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 LC Filters
LF Series

Chip Multilayer Hybrid Baluns
LDB/LDM Series

Chip Multilayer Hybrid Couplers
LDC/LDJ 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/
Crystal Oscillators

Chip Ferrite Beads
BLM Series

3 Terminal Capacitors
NFM Series

Thermistors
PRF Series

4 Connectivity

Wi-Fi® Modules

Chip Multilayer LC Filters
LF Series

Chip Multilayer Hybrid Baluns
LDB/LDM Series

Chip Multilayer Diplexers
LFD Series

Chip Multilayer Hybrid Couplers
LDC/LDJ Series

Micro DC-DC Converters
LXDC Series

ESD Protection Devices
LXES Series

Thermistors
PRF Series

Crystal Units
XRC 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

High Temperature Guaranteed Low Loss Lead Type Ceramic Capacitor
DEA 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

High Temperature Guaranteed Low Loss Lead Type Ceramic Capacitor
DEA Series

Crystal Units
XRC Series

Metal Terminal Type Monolithic Ceramic Capacitors
KRM Series

Chip Inductors (Chip Coils)
LQM/LQH Series

General Purpose

Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling/For Step-up	
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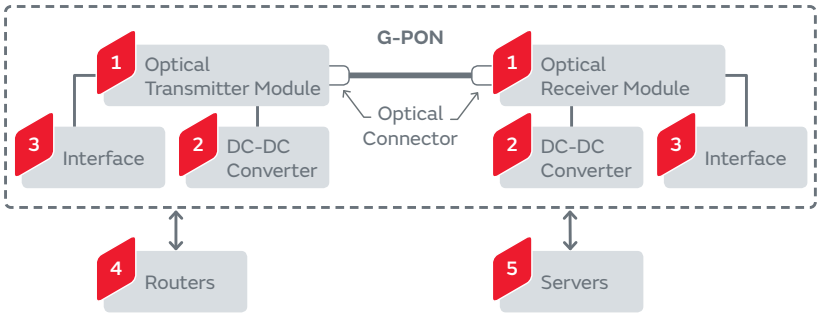
Chip Common Mode Choke Coils	DLW/DLP Series	Noise Suppression	
Microwave Absorbers	EA Series	Noise Suppression	
Ferrite Cores	FS Series	Noise Suppression	
Thin Type Sandwich Cores	FSSA Series	Noise Suppression	
Small Energy Devices	UMAC Series	Battery Backup	

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/Crystal Oscillators

Chip Common Mode Choke Coils
DLW/DLP Series

ESD Protection Devices
LXES Series

4 Routers

Low ESL Monolithic Ceramic Capacitors
LLL/LLA/LLM Series

Monolithic Ceramic Capacitors for Medium Voltage
GR/GA Series

High Temperature Guaranteed Low Loss Lead Type Ceramic Capacitor
DEA Series

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

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

Crystal Units/Crystal Oscillators

Supercapacitors (EDLC)
DMF/DMT Series

Chip Common Mode Choke Coils
DLW/DLP Series

5 Servers

Shock Sensors
PKGS Series

Supercapacitors (EDLC)
DMF/DMT Series

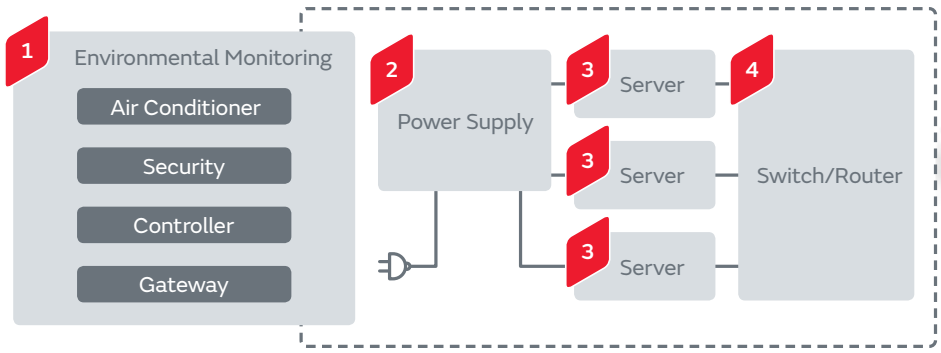
Polymer Aluminum Electrolytic Capacitors
ECAS Series

Crystal Units/Crystal Oscillators

General Purpose

Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling/For Step-up
Monolithic Ceramic Capacitors	GJM Series	High Frequency Filter Circuit
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/DFEC Series	Voltage Conversion
Chip Ferrite Beads	BLM Series	Noise Suppression
3 Terminal Capacitors	NFM Series	Noise Suppression
Feed Through Chip EMI Filters	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
- Magnetic Sensors (AMR 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/ Crystal Oscillators

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**
- High Temperature Guaranteed Low Loss Lead Type Ceramic Capacitor **DEA Series**
- Monolithic Ceramic Capacitors (Top & Bottom Electrode Type for Bonding) **GMA Series**
- Monolithic Ceramic Capacitors (Compatible to Bonding /AuSn Soldering) **GMD Series**
- Crystal Units/ Crystal Oscillators
- Supercapacitors (EDLC) **DMF Series**
- Chip Common Mode Choke Coils **DLW/DLP Series**

General Purpose

Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling/For Step-up
Monolithic Ceramic Capacitors	GJM Series	High Frequency Filter Circuit
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/DFEC Series	Voltage Conversion
Chip Ferrite Beads	BLM Series	Noise Suppression
3 Terminal Capacitors	NFM Series	Noise Suppression
Feed Through Chip EMI Filters	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

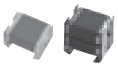
Powertrain/Safety

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 for Automotive
GCM Series

Resin External Electrode Monolithic Ceramic Capacitors
GCJ Series

Monolithic Ceramic Capacitor for Conductive Adhesives
GCG Series

Monolithic Ceramic Capacitor for Conductive Adhesives (Ni/Pd Plating Structure)
GCB Series

Radial Lead Type Monolithic Ceramic Capacitors
RH Series

Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series

Crystal Units
XRCGB/XRCHA Series

Accelerometers
SCA Series

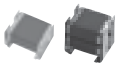
Gyro Sensors
SCC Series

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
XRCGB/XRCHA Series

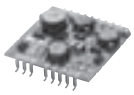
Accelerometers
SCA Series

Thermistors
PRF/PTG Series

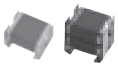
3 Auxiliary Motors

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
XRCGB/XRCHA Series

Pressure Sensor Elements
SCB10H Series

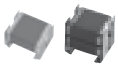
Thermistors
PRF Series

Transponder Coils
SA3M08 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 for Automotive GCM Series

Resin External Electrode Monolithic Ceramic Capacitors GCJ Series

Monolithic Ceramic Capacitor for Conductive Adhesives GCG Series

Monolithic Ceramic Capacitor for Conductive Adhesives (Ni/Pd Plating Structure) GCB Series

Ceramic Resonators CERALOCK® CSTCE/CSTCR Series

Crystal Units XRCGB/XRCHA Series

Accelerometers SCA Series

Gyro Sensors SCC Series

Thermistors for Conductive Glue Mounting NCG18 Series

6 Headlamp

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

Monolithic Ceramic Capacitors for Automotive GCM Series

Resin External Electrode Monolithic Ceramic Capacitors GCJ Series

Ceramic Resonators CERALOCK® CSTCE/CSTCR Series

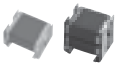
Crystal Units XRCGB/XRCHA Series

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 for Automotive GCM Series

Resin External Electrode Monolithic Ceramic Capacitors GCJ Series

Monolithic Ceramic Capacitor for Conductive Adhesives GCG Series

Monolithic Ceramic Capacitor for Conductive Adhesives (Ni/Pd Plating Structure) GCB Series

Radial Lead Type Monolithic Ceramic Capacitors RCE Series

Ceramic Resonators CERALOCK® CSTCE/CSTCR Series

Crystal Units XRCGB/XRCHA 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 For Automotive	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/MBH/DFEH 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	DLW31/DLW43 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 for Automotive GCM Series
- Resin External Electrode Monolithic Ceramic Capacitors GCJ Series
- Safety Standard Certified Ceramic Capacitors Type KJ
- Ceramic Resonators CERALOCK® CSTCE Series
- Crystal Units XRCGB/XRCHA 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 for Automotive GCM Series
- Resin External Electrode Monolithic Ceramic Capacitors GCJ Series
- Monolithic Ceramic Capacitor for Conductive Adhesives GCG Series
- Monolithic Ceramic Capacitor for Conductive Adhesives (Ni/Pd Plating Structure) GCB Series
- Ceramic Resonators CERALOCK® CSTCE Series
- Crystal Units XRCGB/XRCHA Series
- Thermistors PRF/PTG Series

3 Electrically-driven Compressor

- Metal Terminal Type Monolithic Ceramic Capacitors KCM Series
- Resin External Electrode Monolithic Ceramic Capacitors GCJ Series
- Monolithic Ceramic Capacitors for Automotive GCM Series
- Monolithic Ceramic Capacitor for Conductive Adhesives GCG Series
- Monolithic Ceramic Capacitor for Conductive Adhesives (Ni/Pd Plating Structure) GCB Series
- Thermistors PRF/PTG Series
- Ceramic Resonators CERALOCK® CSTCE/CSTCR Series
- Crystal Units XRCGB/XRCHA Series

4 Electric Pump

- Metal Terminal Type Monolithic Ceramic Capacitors KCM Series
- Monolithic Ceramic Capacitors for Automotive GCM Series
- Resin External Electrode Monolithic Ceramic Capacitors GCJ Series
- Monolithic Ceramic Capacitor for Conductive Adhesives GCG Series
- Low Temperature Co-fired Ceramics (LTCC) Ceramic Multilayer Substrates LFC®
- Large Current Common Mode Choke Coils PLT10HH Series
- Thermistors PRF/PTG Series
- Ceramic Resonators CERALOCK® CSTCE/CSTCR Series
- Crystal Units XRCGB/XRCHA Series

5 Inverter

- Metal Terminal Type Monolithic Ceramic Capacitors KCM Series
- Monolithic Ceramic Capacitors for Automotive GCM Series
- Resin External Electrode Monolithic Ceramic Capacitors GCJ Series
- Monolithic Ceramic Capacitor for Conductive Adhesives GCG Series
- Monolithic Ceramic Capacitor for Conductive Adhesives (Ni/Pd Plating Structure) GCB Series
- Radial Lead Type Monolithic Ceramic Capacitors RH Series
- Large Current Common Mode Choke Coils PLT10HH Series
- Thermistors PRF/PTG Series
- Ceramic Resonators CERALOCK® CSTCE/CSTCR Series
- Crystal Units XRCGB/XRCHA Series

6 DC-DC Converter

- Metal Terminal Type Monolithic Ceramic Capacitors KCM Series
- Monolithic Ceramic Capacitors for Automotive GCM Series
- Resin External Electrode Monolithic Ceramic Capacitors GCJ Series
- Monolithic Ceramic Capacitor for Conductive Adhesives GCG Series
- Monolithic Ceramic Capacitor for Conductive Adhesives (Ni/Pd Plating Structure) GCB Series
- Ceramic Resonators CERALOCK® CSTCE/CSTCR Series
- Crystal Units XRCGB/XRCHA Series
- Large Current Common Mode Choke Coils PLT10HH Series
- Thermistors PRF/PTG Series

Please refer to p.95 for General Purpose (High Reliability).

Information/Comfort/Accessory

1. Navigation/ Infotainment
2. Remote Keyless Entry
3. Meter/HUD
4. Power Seat/ Power Mirror
5. Parking Assist

1 Navigation/Infotainment

Rotary Position Sensors
SV Series

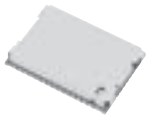
Accelerometers
SCA Series

Supercapacitors (EDLC)
DMF/DMT Series

Ceramic Filters CERAFIL®
SFECF Series

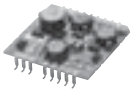
Piezoelectric Sounders
PKLCS Series

Bluetooth® Modules



Wi-Fi® Modules

DC-DC Converters



Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series

Crystal Units
XRCGB/XRCHA Series

Thermistors
PRF/PRG/PTG Series

Chip Multilayer Diplexers
LFD Series

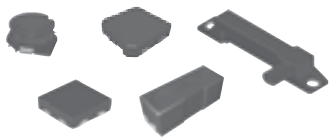
Chip Multilayer LC Filters
LF Series

Chip Multilayer Hybrid Baluns
LDB/LDM Series

Chip Multilayer Hybrid Couplers
LDC/LDJ Series

2 Remote Keyless Entry

Transponder Coils
SAZ73D/SA3D14/SA3D12/SA3M08/STA8121 Series



Supercapacitors (EDLC)
DMF/DMT Series

Small Energy Devices
UMAC Series

Ceramic Filters CERAFIL®
SFECF Series

Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series

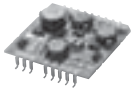
Piezoelectric Sounders
PKLCS Series

Crystal Units
XRCGB/XRCHA Series

3 Meter/HUD

Rotary Position Sensors
SV Series

DC-DC Converters



Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series

Crystal Units
XRCGB/XRCHA 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
XRCGB/XRCHA Series

Thermistors
PRF/PTG Series

5 Parking Assist

Ultrasonic Sensors
MA Series

Accelerometers
SCA Series

Supercapacitors (EDLC)
DMF/DMT Series

Piezoelectric Sounders
PKM/PKLCS Series

Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series

Crystal Units
XRCGB/XRCHA Series

Thermistors
PRF/PTG Series

Please refer to p.99 for General Purpose.

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 for Automotive GCM Series
- Resin External Electrode Monolithic Ceramic Capacitors GCJ Series
- Safety Standard Certified Ceramic Capacitors Type KJ
- Ceramic Resonators CERALOCK® CSTCE Series
- Crystal Units XRCGB/XRCHA Series
- Large Current Common Mode Choke Coils PLT10HH Series
- Thermistors PRF/PTG Series

2 Inverter

- Monolithic Ceramic Capacitors for Automotive GCM Series
- Resin External Electrode Monolithic Ceramic Capacitors GCJ Series
- Monolithic Ceramic Capacitor for Conductive Adhesives GCG Series
- Monolithic Ceramic Capacitor for Conductive Adhesives (Ni/Pd Plating Structure) GCB Series
- Radial Lead Type Monolithic Ceramic Capacitors RH Series
- Large Current Common Mode Choke Coils PLT10HH Series
- Ceramic Resonators CERALOCK® CSTCE/CSTCR Series
- Crystal Units XRCGB/XRCHA Series
- Thermistors PRF/PTG Series

3 DC-DC Converter

- DC-DC Converters
- Metal Terminal Type Monolithic Ceramic Capacitors KCM Series
- Monolithic Ceramic Capacitors for Automotive GCM Series
- Resin External Electrode Monolithic Ceramic Capacitors GCJ Series
- Monolithic Ceramic Capacitor for Conductive Adhesives GCG Series
- Monolithic Ceramic Capacitor for Conductive Adhesives (Ni/Pd Plating Structure) GCB Series
- Ceramic Resonators CERALOCK® CSTCE/CSTCR Series
- Crystal Units XRCGB/XRCHA Series
- Large Current Common Mode Choke Coils PLT10HH Series
- Thermistors PRF/PTG Series

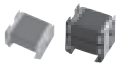
General Purpose (High Reliability)

Monolithic Ceramic Capacitors For Automotive	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/MBH/DFEH 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	DLW31/DLW43 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 for Automotive GCM Series

Resin External Electrode Monolithic Ceramic Capacitors GCJ Series

Monolithic Ceramic Capacitor for Conductive Adhesives GCG Series

Monolithic Ceramic Capacitor for Conductive Adhesives (Ni/Pd Plating Structure) GCB Series

Ceramic Resonators CERALOCK® CSTCE/CSTCR Series

Crystal Units XRCGB/XRCHA Series

Accelerometers SCA Series

Gyro Sensors SCC Series

Thermistors for Conductive Glue Mounting NCG18 Series

5 Headlamp

Monolithic Ceramic Capacitors for Automotive GCM Series

Resin External Electrode Monolithic Ceramic Capacitors GCJ Series

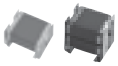
Ceramic Resonators CERALOCK® CSTCE/CSTCR Series

Crystal Units XRCGB/XRCHA Series

Thermistors for Conductive Glue Mounting NCG18 Series

6 Fuel Injection System

Metal Terminal Type Monolithic Ceramic Capacitors KCM Series



Monolithic Ceramic Capacitors for Automotive GCM Series

Resin External Electrode Monolithic Ceramic Capacitors GCJ Series

Monolithic Ceramic Capacitor for Conductive Adhesives GCG Series

Monolithic Ceramic Capacitor for Conductive Adhesives (Ni/Pd Plating Structure) GCB Series

Ceramic Resonators CERALOCK® CSTCE/CSTCR Series

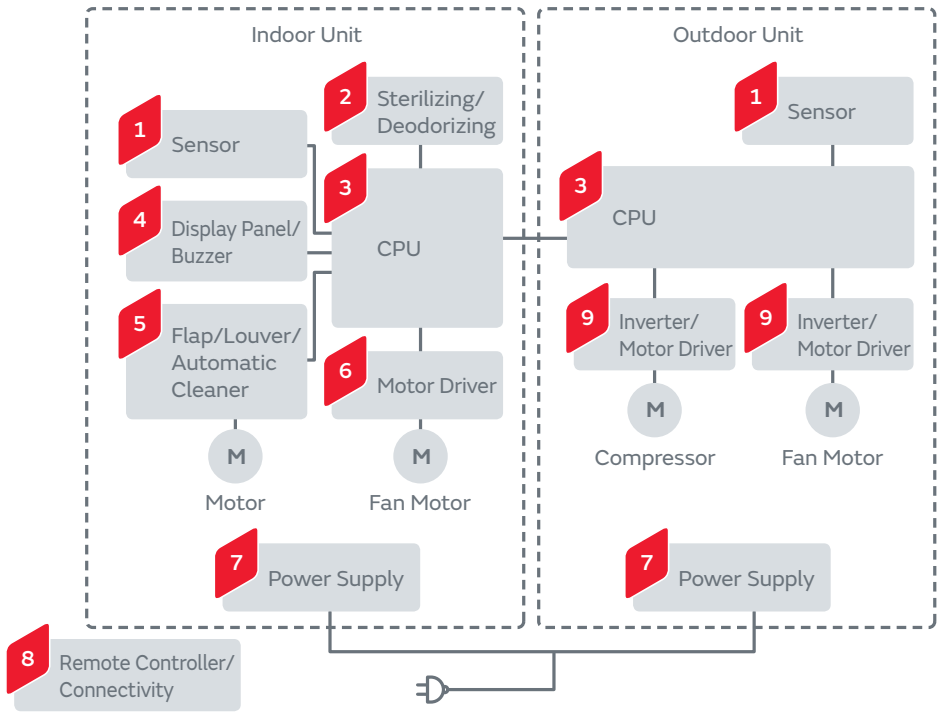
Crystal Units XRCGB/XRCHA Series

Thermistors PRF/PTG Series

General Purpose

Monolithic Ceramic Capacitors	GRT Series	Coupling/Decoupling	
Monolithic Ceramic Capacitors for Medium Voltage	GRM Series	For Snubber	
Resin External Electrode Monolithic Ceramic Capacitiors	GRJ Series	Coupling/Decoupling/For Step-up	
Radial Lead Type Monolithic Ceramic Capacitors	RCE Series	Noise Suppression/Decoupling	
Chip Inductors (Chip Coils)	LQM/LQH/DFEC Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
EMI Suppression Filters	NFL/NFE Series	Noise Suppression	
Chip Common Mode Choke Coils	DLW Series	Common Mode Noise Suppression	
Ferrite Cores	FS Series	Noise Suppression	

Air Conditioner



1 Sensor

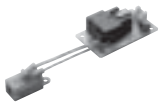
Pyroelectric Infrared Sensors
IRA Series

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

High Temperature Guaranteed
Low Loss Lead Type Ceramic Capacitor
DEA 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 Cable Connectors

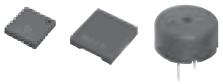
Microwave Coaxial Connectors with Switch

Micro DC-DC Converters
LXDC Series

Crystal Units
XRC Series

Ceramic Resonators CERALOCK®
CSTLS/CSTCE/CSTCR Series

Piezoelectric Sounders
PKMCS/PKLCS/PKM Series



9 Inverter/Motor Driver

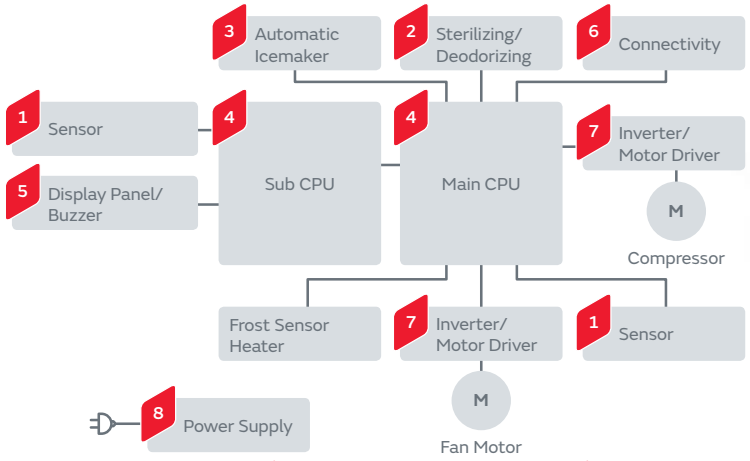
Ceramic Resonators CERALOCK®
CSTLS/CSTCE/CSTCR Series

Thermistors
NCP/NXR/PRF Series

General Purpose

Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling/For Step-up	
Monolithic Ceramic Capacitors	GJM Series	High Frequency Filter Circuit	
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/DFEC Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminal Capacitors	NFM Series	Noise Suppression	
Feed Through Chip EMI Filters	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

4 CPU

Ceramic Resonators CERALOCK®
CSTLS/CSTCE/CSTCR Series

5 Display Panel/Buzzer

Ceramic Resonators CERALOCK®
CSTLS/CSTCE/CSTCR Series

Piezoelectric Sounders
PKM/PKLCS Series

6 Connectivity

Bluetooth® Modules

Wi-Fi® Modules

Sub-GHz Modules

Microwave Coaxial Cable Connectors

Microwave Coaxial Connectors with Switch

Micro DC-DC Converters
LXDC Series

Crystal Units
XRC Series

7 Inverter/Motor Driver

Thermistors
NCP/NXR/PRF Series

Ceramic Resonators CERALOCK®
CSTLS/CSTCE/CSTCR Series

8 Power Supply

Monolithic Ceramic Capacitors for Medium Voltage
GR/GA Series

High Temperature Guaranteed Low Loss Lead Type Ceramic Capacitor
DEA Series

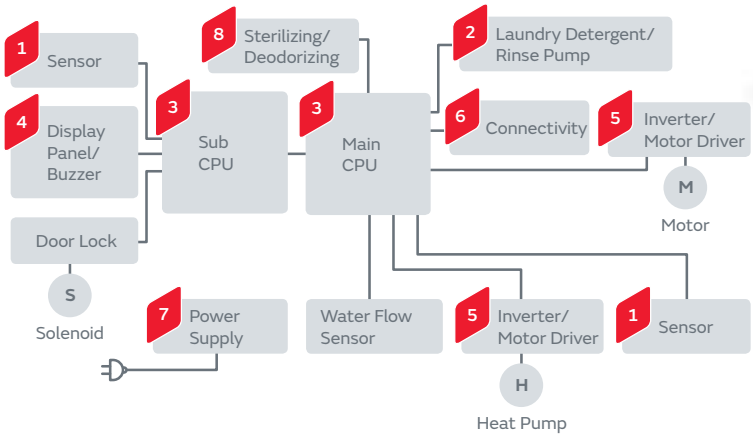
Safety Standard Certified Ceramic Capacitors
Type KX/KY

Thermistors
NTP/PTG Series

General Purpose

Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling/For Step-up
Monolithic Ceramic Capacitors	GJM Series	High Frequency Filter Circuit
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/DFEC Series	Voltage Conversion
Chip Ferrite Beads	BLM Series	Noise Suppression
3 Terminal Capacitors	NFM Series	Noise Suppression
Feed Through Chip EMI Filters	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

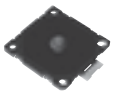


1 Sensor

Thermistors
NCP/NXR/PRF Series

2 Laundry Detergent/Rinse Pump

Microblowers



3 CPU

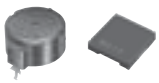
Ceramic Resonators CERALOCK®
CSTLS/CSTCE/CSTCR Series

4 Display Panel/Buzzer

Rotary Position Sensors
SV Series

Ceramic Resonators CERALOCK®
CSTLS/CSTCE/CSTCR Series

Piezoelectric Sounders
PKM/PKLCS Series



5 Inverter/Motor Driver

Thermistors
NCP/NXR/PRF Series

6 Connectivity

Bluetooth® Modules

Wi-Fi® Modules

Sub-GHz Modules

Microwave Coaxial Cable Connectors

Microwave Coaxial Connectors with Switch

Micro DC-DC Converters
LXDC Series

Crystal Units
XRC Series

7 Power Supply

Monolithic Ceramic Capacitors for Medium Voltage
GR/GA Series

High Temperature Guaranteed Low Loss Lead Type Ceramic Capacitor
DEA Series

Safety Standard Certified Ceramic Capacitors
Type KX/KY

Thermistors
NTP/PTG Series

8 Sterilizing/Deodorizing

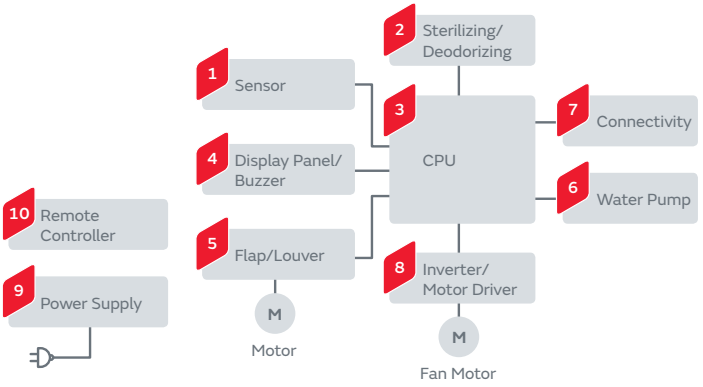
Ozonizer Modules Ionissimo®
MHM500 Series

High Voltage Power
MPH4602 Series

General Purpose

Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling/For Step-up	
Monolithic Ceramic Capacitors	GJM Series	High Frequency Filter Circuit	
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/DFEC Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminal Capacitors	NFM Series	Noise Suppression	
Feed Through Chip EMI Filters	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 Cable Connectors

Microwave Coaxial Connectors with Switch

Micro DC-DC Converters
LXDC Series

Crystal Units
XRC Series

9 Power Supply

Monolithic Ceramic Capacitors for Medium Voltage
GR/GA Series

High Temperature Guaranteed Low Loss Lead Type Ceramic Capacitor
DEA 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

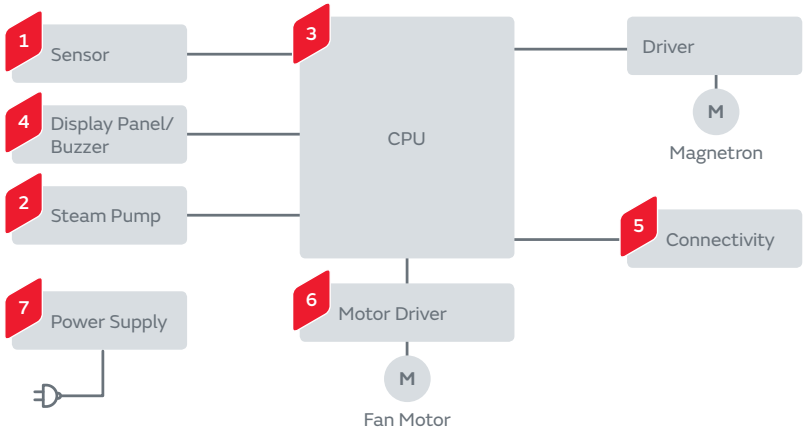
Ceramic Resonators CERALOCK®
CSTLS/CSTCE/CSTCR Series

Piezoelectric Sounders
PKMCS/PKLCS/PKM Series

General Purpose

Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling/For Step-up
Monolithic Ceramic Capacitors	GJM Series	High Frequency Filter Circuit
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/DFEC Series	Voltage Conversion
Chip Ferrite Beads	BLM Series	Noise Suppression
3 Terminal Capacitors	NFM Series	Noise Suppression
Feed Through Chip EMI Filters	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

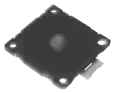


1 Sensor

Thermistors
NCP/NXR/PRF Series

2 Steam Pump

Microblowers



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 Connectivity

Bluetooth® Modules

Wi-Fi® Modules

Sub-GHz Modules

Microwave Coaxial Cable Connectors

Microwave Coaxial Connectors with Switch

Micro DC-DC Converters
LXDC Series

Crystal Units
XRC Series

6 Motor Driver

Thermistors
NCP/NXR/PRF Series

7 Power Supply

Monolithic Ceramic Capacitors for Medium Voltage
GR/GA Series

High Temperature Guaranteed Low Loss Lead Type Ceramic Capacitor
DEA Series

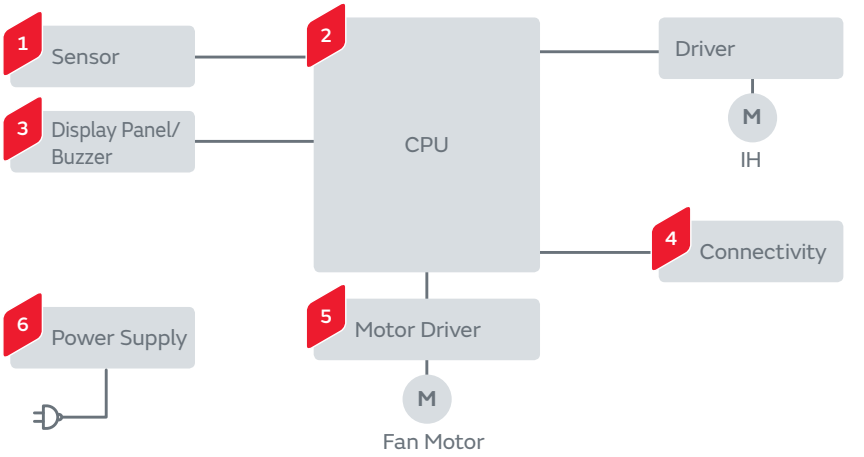
Safety Standard Certified Ceramic Capacitors
Type KX/KY

Thermistors
NTP/PTG Series

General Purpose

Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling/For Step-up
Monolithic Ceramic Capacitors	GJM Series	High Frequency Filter Circuit
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/DFEC Series	Voltage Conversion
Chip Ferrite Beads	BLM Series	Noise Suppression
3 Terminal Capacitors	NFM Series	Noise Suppression
Feed Through Chip EMI Filters	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
Cable Connectors

Microwave Coaxial Connectors
with Switch

Micro DC-DC Converters
LXDC Series

Crystal Units
XRC Series

5 Motor Driver

Thermistors
NCP/NXR/PRF Series

6 Power Supply

Monolithic Ceramic Capacitors
for Medium Voltage
GR/GA Series

High Temperature Guaranteed
Low Loss Lead Type Ceramic Capacitor
DEA Series

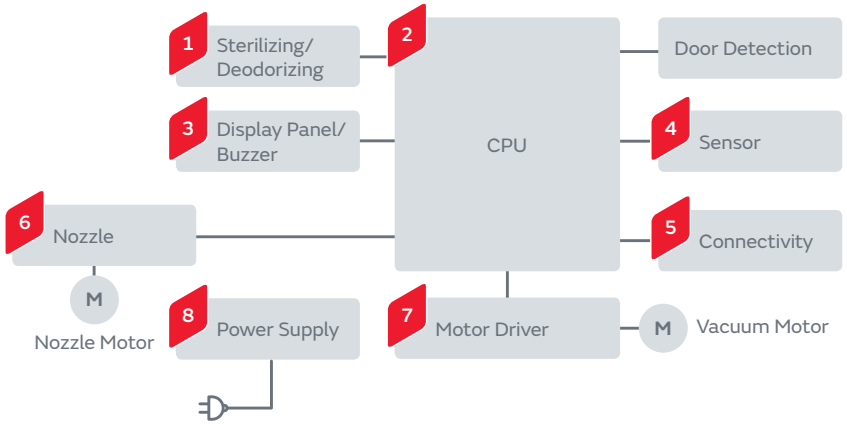
Safety Standard Certified
Ceramic Capacitors
Type KX/KY

Thermistors
NTP/PTG Series

General Purpose

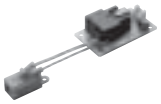
Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling/For Step-up	
Monolithic Ceramic Capacitors	GJM Series	High Frequency Filter Circuit	
Resin External Electrode Monolithic Ceramic Capacitiors	GRJ Series	Coupling/Decoupling/For Step-up	
Polymer Aluminum Electrolytic Capacitors	ECAS Series	Smoothing/Transient Backup	
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching/Resonance	
Chip Inductors (Chip Coils)	LQM/LQH/DFEC Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminal Capacitors	NFM Series	Noise Suppression	
Feed Through Chip EMI Filters	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



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

Crystal Units
XRC Series

Sub-GHz Modules

Microwave Coaxial Cable Connectors

Microwave Coaxial Connectors with Switch

Micro DC-DC Converters
LXDC 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

High Temperature Guaranteed Low Loss Lead Type Ceramic Capacitor
DEA Series

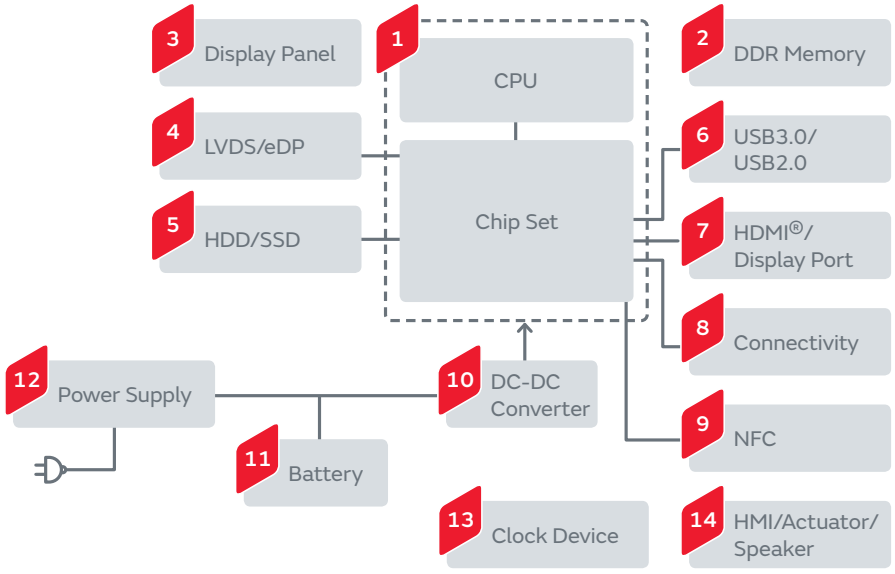
Safety Standard Certified Ceramic Capacitors
Type KX/KY

Thermistors
NTP/PTG Series

General Purpose

Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling/For Step-up	
Monolithic Ceramic Capacitors	GJM Series	High Frequency Filter Circuit	
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/DFEC Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminal Capacitors	NFM Series	Noise Suppression	
Feed Through Chip EMI Filters	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
XRC 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 HDD/SSD

Shock Sensors
PKGS Series

Micro DC-DC Converters
LXDC Series

Polymer Aluminum Electrolytic Capacitors
ECAS Series

Supercapacitors (EDLC)
DMF/DMT Series

Actuators

Crystal Units
XRC Series

Thermistors
NCP/PRF Series

6 USB3.0/USB2.0

Micro DC-DC Converters
LXDC Series

Polymer Aluminum Electrolytic Capacitors
ECAS Series

Crystal Units
XRC Series

Chip Common Mode Choke Coils
DLW/DLP Series

Chip Ferrite Beads
BLM Series

ESD Protection Devices
LXES Series

Thermistors
PRG Series

7 HDMI®/Display Port

Chip Common Mode Choke Coils
DLW/DLP Series

ESD Protection Devices
LXES Series

Thermistors
PRG Series

8 Connectivity

Bluetooth® Modules

Wi-Fi® Modules

Bluetooth® - Wi-Fi® Combo Modules

SAW Filters
SAF Series

Chip Multilayer LC Filters
LF Series

Chip Multilayer Hybrid Baluns
LDB/LDM Series

Chip Multilayer Diplexers
LFD Series

Chip Multilayer Hybrid Couplers
LDC/LDJ Series

Microwave Coaxial
Cable Connectors

Microwave Coaxial
Connectors with Switch

Crystal Units
XRC Series

Micro DC-DC Converters
LXDC Series

ESD Protection Devices
LXES Series

9 NFC

NFC Antennas
FLAN Series

Micro DC-DC Converters
LXDC Series

Crystal Units
XRC Series

Chip Ferrite Beads
BLM Series

Variable Capacitors
LXRW Series

ESD
Protection Devices
LXES Series

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

Trimmer Capacitors
TZY2 Series

10 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

Monolithic Ceramic Capacitor
on Interposer Board
ZRB Series

11 Battery

Ceramic Resonators
CERALOCK®
CSTCE/CSTCR Series

Thermistors
NXR/PRF/PRG Series

12 Power Supply

Micro
DC-DC Converters
LXDC Series

Monolithic Ceramic Capacitors
for Medium Voltage
GR/GA Series

High Temperature Guaranteed
Low Loss Lead Type Ceramic Capacitor
DEA 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

13 Clock Device

Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series

Crystal Units
XRC Series

14 HMI/Actuator/Speaker

Pyroelectric Infrared Sensors
IRS Series

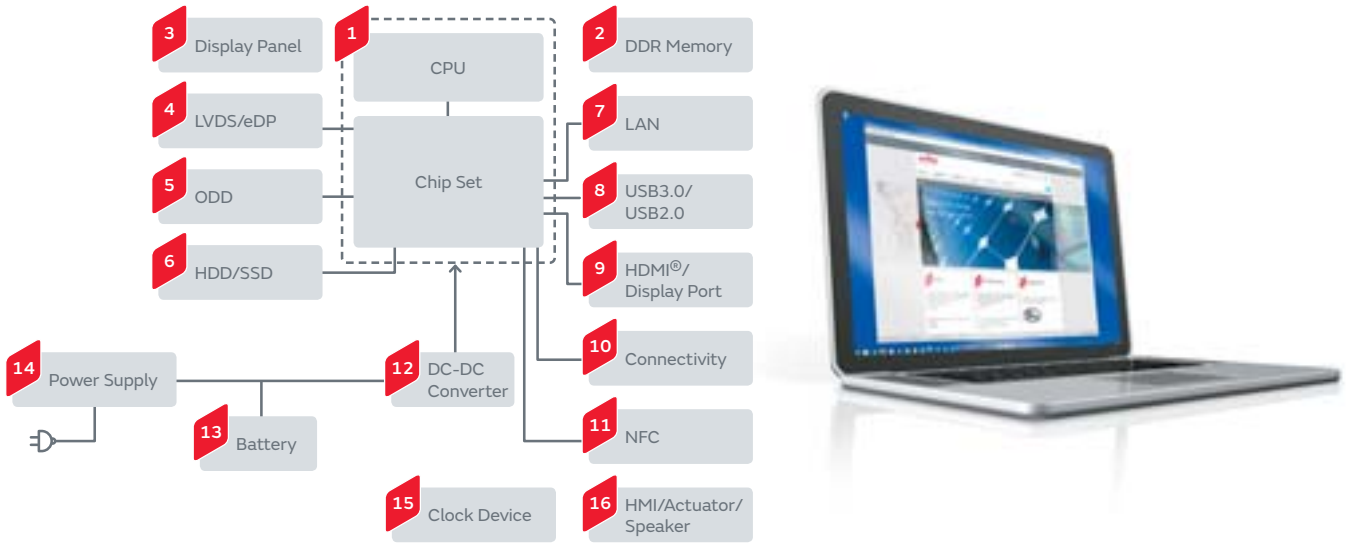
Ultrasonic Sensors
MA Series

ESD Protection Devices
LXES Series

General Purpose

Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling/For Step-up	
Monolithic Ceramic Capacitors	GJM Series	High Frequency Filter Circuit	
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/DFEC Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminal Capacitors	NFM Series	Noise Suppression	
Feed Through Chip EMI Filters	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 XRC 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 XRC 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) DMF/DMT Series
- Actuators
- Crystal Units XRC Series
- Thermistors NCP/PRF Series

7 LAN

- Monolithic Ceramic Capacitors for Medium Voltage GR4 Series
- Chip Common Mode Choke Coils DLW/DLP Series
- Crystal Units XRC Series

8 USB3.0/USB2.0

- Micro DC-DC Converters LXDC Series
- Polymer Aluminum Electrolytic Capacitors ECAS Series
- Crystal Units XRC 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

Chip Multilayer Hybrid Baluns
LDB/LDM Series

SAW Filters
SAF Series

Chip Multilayer LC Filters
LF Series

Chip Multilayer Diplexers
LFD Series

Chip Multilayer Hybrid Couplers
LDC/LDJ Series

Crystal Units
XRC Series

Microwave Coaxial Cable 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
XRC 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

Monolithic Ceramic Capacitor on Interposer Board
ZRB Series

13 Battery

Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series

Thermistors
NXR/PRF/PRG Series

14 Power Supply

Micro DC-DC Converters
LXDC Series

Monolithic Ceramic Capacitors for Medium Voltage
GR/GA Series

High Temperature Guaranteed Low Loss Lead Type Ceramic Capacitor
DEA 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
XRC Series

16 HMI/Actuator/Speaker

Pyroelectric Infrared Sensors
IRS Series

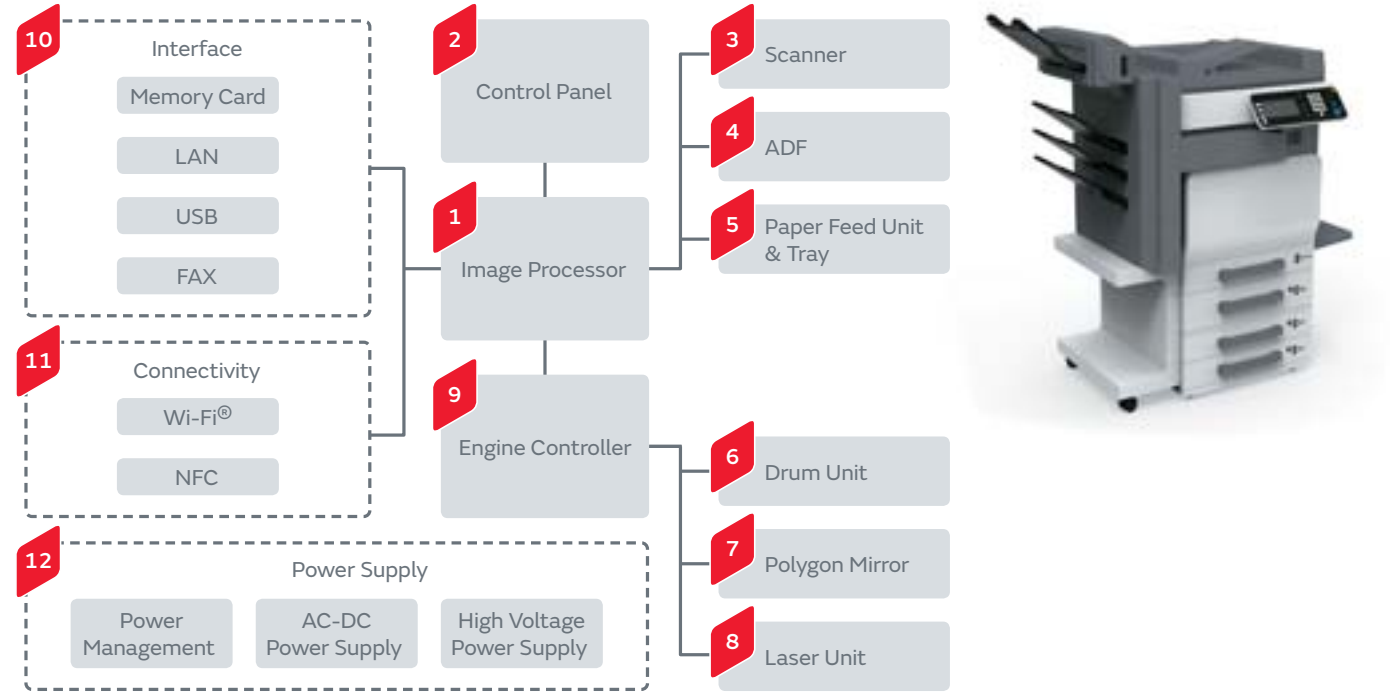
Ultrasonic Sensors
MA Series

ESD Protection Devices
LXES Series

General Purpose

Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling/For Step-up
Monolithic Ceramic Capacitors	GJM Series	High Frequency Filter Circuit
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/DFEC Series	Voltage Conversion
Chip Ferrite Beads	BLM Series	Noise Suppression
3 Terminal Capacitors	NFM Series	Noise Suppression
Feed Through Chip EMI Filters	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

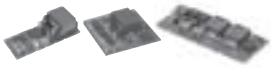
MFP (Multi Function Printer/Product/Peripheral)



1 Image Processor

Isolated DC-DC Converters
MYB Series

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



Micro DC-DC Converters
LXDC Series

Polymer Aluminum Electrolytic Capacitors
ECAS Series

Low ESL Monolithic Ceramic Capacitors
LLL/LLA/LLM Series

Magnetic Sensors (AMR Sensors)
MR Series

Crystal Units
XRC 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

Thermistors
NCP/PRF Series

Polymer Aluminum Electrolytic Capacitors
ECAS Series

Piezoelectric Sounders
PKMCS/PKLCS/PKM Series

Chip Common Mode Choke Coils
DLW/DLP Series

3 Scanner

Ultrasonic Sensors
MA Series

4 ADF

Ultrasonic Sensors
MA Series

Accelerometers
SCA Series

Rotary Position Sensors
SV Series

5 Paper Feed Unit & Tray

Magnetic Sensors (AMR 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

High Temperature Guaranteed Low Loss Lead Type Ceramic Capacitor
DEA Series

Shock Sensors
PKGS Series

Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series

Crystal Units
XRC Series

Thermistors
PRF/PTG Series

10 Interface

Polymer Aluminum Electrolytic Capacitors
ECAS Series

Crystal Units
XRC 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
XRC 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

High Temperature Guaranteed Low Loss Lead Type Ceramic Capacitor
DEA Series

Safety Standard Certified Ceramic Capacitors
Type KX/KY

AC Line Filters
PLA/PLH/PLY Series

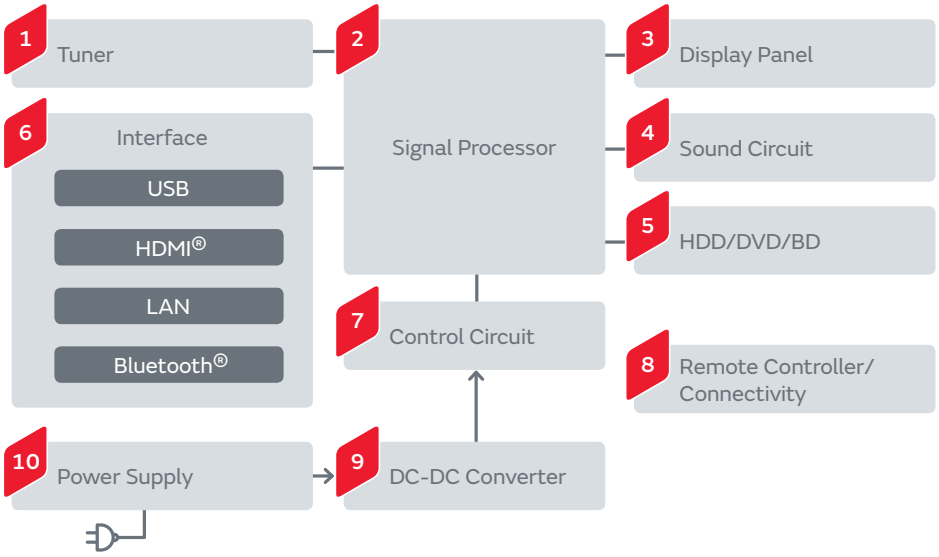
High Voltage Resistors
MHR Series

Large Current Common Mode Choke Coils
PLT10HH Series

General Purpose

Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling/For Step-up	
Monolithic Ceramic Capacitors	GJM Series	High Frequency Filter Circuit	
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/DFEC Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminal Capacitors	NFM Series	Noise Suppression	
Feed Through Chip EMI Filters	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

- Crystal Units XRC 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 XRC Series
- 3 Terminal Capacitors NFM Series
- NFC Antennas FLAN Series
- Thermistors NCP/PRF Series

3 Display Panel

- DC-DC Converters OKL Series
- Metal Terminal Type Monolithic Ceramic Capacitors KRM Series
- Monolithic Ceramic Capacitor on Interposer Board ZRB 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 XRC 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
XRC 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

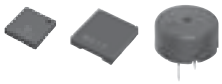
Bluetooth® Smart Modules

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

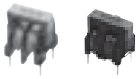
10 Power Supply

Monolithic Ceramic Capacitors for Medium Voltage
GR/GA Series

High Temperature Guaranteed Low Loss Lead Type Ceramic Capacitor
DEA Series

Safety Standard Certified Ceramic Capacitors
Type KX/KY

AC Line Filters
PLA/PLY Series

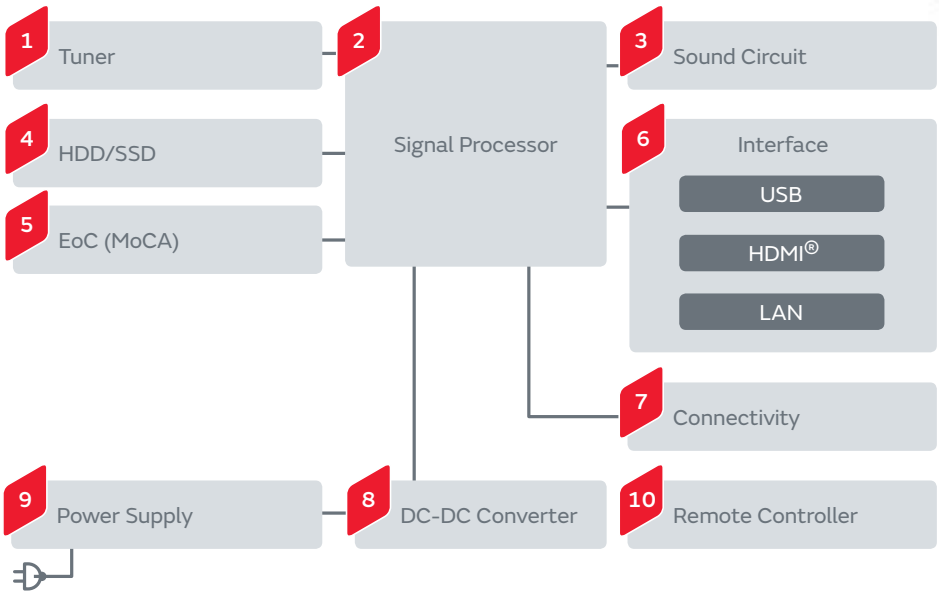


Thermistors
NCP/NTP/PRF/PTG Series

General Purpose

Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling/For Step-up	
Monolithic Ceramic Capacitors	GJM Series	High Frequency Filter Circuit	
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/DFEC Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminal Capacitors	NFM Series	Noise Suppression	
Feed Through Chip EMI Filters	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 XRC 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 XRC 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 XRC Series
- Supercapacitors (EDLC) DMF/DMT Series
- Thermistors NCP/PRF Series

5 EoC (MoCA)

- 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 XRC Series
- Chip Common Mode Choke Coils DLW/DLP Series
- ESD Protection Devices LXES Series
- Thermistors PRG Series

7 Connectivity

Wi-Fi® Modules

Microwave Coaxial Cable Connectors

Microwave Coaxial Connectors with Switch

Micro DC-DC Converters
LXDC Series

Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series

Crystal Units
XRC 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

Monolithic Ceramic Capacitor on Interposer Board
ZRB Series

Polymer Aluminum Electrolytic Capacitors
ECAS Series

Power Inductors
LQH/DFEC Series

Thermistors
NCP/PRF Series

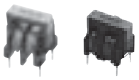
9 Power Supply

Monolithic Ceramic Capacitors for Medium Voltage
GR/GA Series

High Temperature Guaranteed Low Loss Lead Type Ceramic Capacitor
DEA Series

Safety Standard Certified Ceramic Capacitors
Type KX/KY

AC Line Filters
PLA/PLY Series



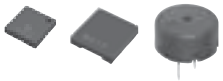
Thermistors
NCP/NTP/PRF/PTG Series

10 Remote Controller

Micro DC-DC Converters
LXDC Series

Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series

Piezoelectric Sounders
PKMCS/PKLCS/PKM Series

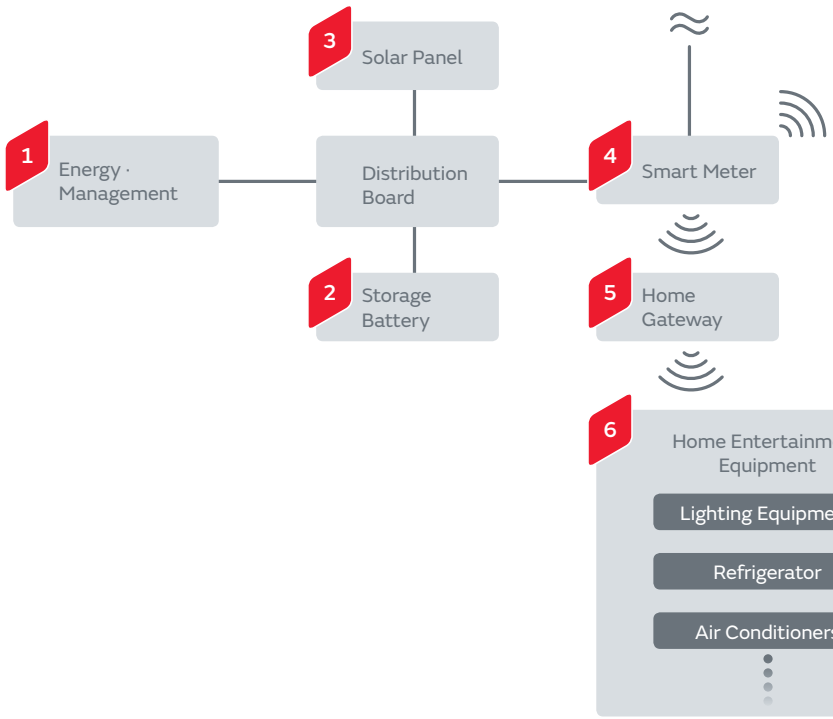


Trimmer Capacitors
TZY2 Series

General Purpose

Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling/For Step-up	
Monolithic Ceramic Capacitors	GJM Series	High Frequency Filter Circuit	
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/DFEC Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminal Capacitors	NFM Series	Noise Suppression	
Feed Through Chip EMI Filters	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
XRC Series

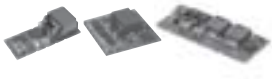
Topics

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

High Temperature Guaranteed Low Loss Lead Type Ceramic Capacitor
DEA 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)
DMF/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

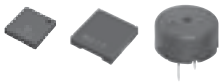
Monolithic Ceramic Capacitors for Ethernet LAN and Primary - Secondary Couplings of DC-DC Converters
GR4 Series

High Temperature Guaranteed Low Loss Lead Type Ceramic Capacitor
DEA Series

Safety Standard Certified Ceramic Capacitors
Type KX/KY

Crystal Units
XRC Series

Piezoelectric Sounders
PKMCS/PKLCS/PKM Series



5 Home Gateway

Bluetooth® Modules

Wi-Fi® Modules

Sub-GHz Modules

6 Home Entertainment Equipment

Bluetooth® Modules

Wi-Fi® Modules

Sub-GHz Modules

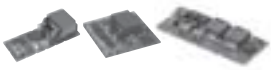
Ultrasonic Sensors
MA Series

Shock Sensors
PKGS Series

Magnetic Sensors (AMR Sensors)
MR Series

Isolated DC-DC Converters
MYB Series

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

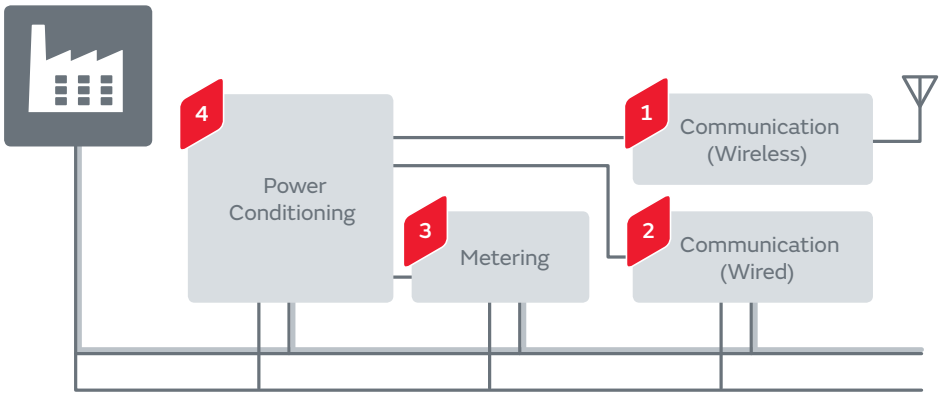


Crystal Units
XRC Series

General Purpose

Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling/For Step-up	
Monolithic Ceramic Capacitors	GJM Series	High Frequency Filter Circuit	
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/DFEC Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminal Capacitors	NFM Series	Noise Suppression	
Feed Through Chip EMI Filters	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	

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 Cable Connectors
- Microwave Coaxial Connectors with Switch
- Crystal Units
  XRC 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
  GR/GA Series
- High Temperature Guaranteed Low Loss Lead Type Ceramic Capacitor
  DEA 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/ Crystal Oscillators
- ESD Protection Devices
  LXES Series

3 Metering

- Chip Common Mode Choke Coils
  DLW/DLP Series
- Thermistors
  NCP/PRF/PRG Series
- Ceramic Resonators CERALOCK®
  CSTCE/CSTCR Series
- Crystal Units
  XRC Series
- Piezoelectric Sounders
  PKMCS/PKLCS Series

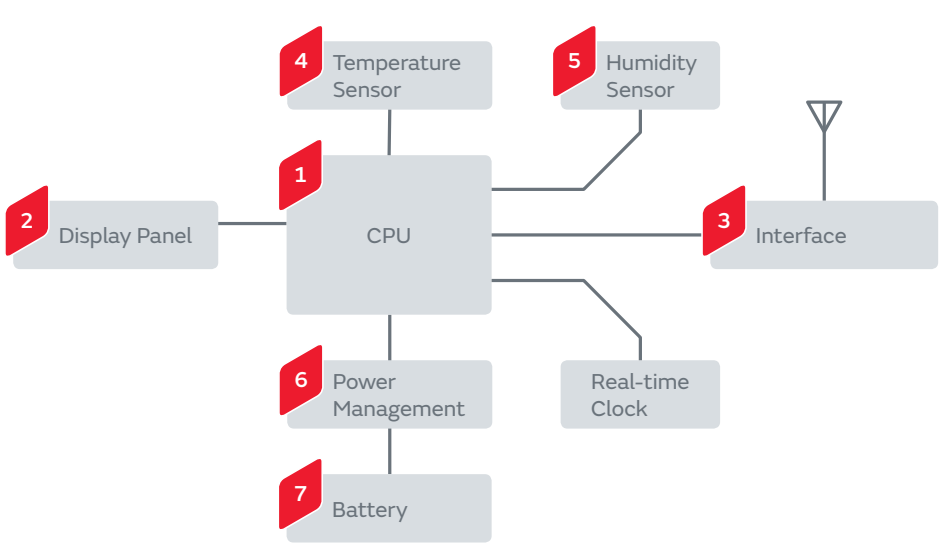
4 Power Conditioning

- Non-isolated DC-DC Converters
  OKL/MPD Series
- Monolithic Ceramic Capacitors for Medium Voltage
  GR/GA Series
- High Temperature Guaranteed Low Loss Lead Type Ceramic Capacitor
  DEA 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 Series	Coupling/Decoupling/For Step-up	
Monolithic Ceramic Capacitors	GJM Series	High Frequency Filter Circuit	
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/DFEC Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminal Capacitors	NFM Series	Noise Suppression	
Feed Through Chip EMI Filters	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	

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
XRC 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

Piezoelectric Sounders
PKMCS/PKLCS Series

3 Interface

Wi-Fi® Modules

Micro DC-DC Converters
LXDC Series

Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series

Crystal Units
XRC 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
XRC Series

5 Humidity Sensor

Thermistors
NCP/NTP/PRF/PRG/PTG Series

Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series

Crystal Units
XRC Series

6 Power Management

Micro DC-DC Converters
LXDC Series

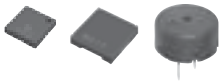
Monolithic Ceramic Capacitors for Medium Voltage
GR/GA Series

High Temperature Guaranteed Low Loss Lead Type Ceramic Capacitor
DEA 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

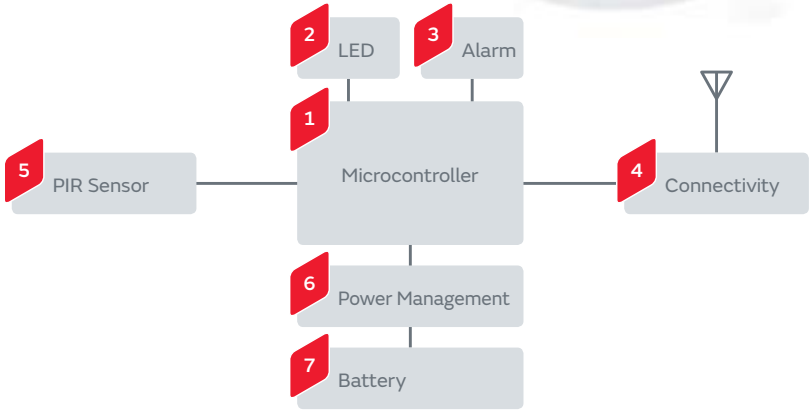
Supercapacitors (EDLC)
DMF/DMT Series

Small Energy Devices
UMAC Series

General Purpose

Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling/For Step-up	
Monolithic Ceramic Capacitors	GJM Series	High Frequency Filter Circuit	
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/DFEC Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminal Capacitors	NFM Series	Noise Suppression	
Feed Through Chip EMI Filters	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
XRC Series

Thermistors
NCP/PRF Series

2 LED

Supercapacitors (EDLC)
DMF/DMT Series

Monolithic Ceramic Capacitors for Medium Voltage
GR/GA Series

High Temperature Guaranteed Low Loss Lead Type Ceramic Capacitor
DEA 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
XRC Series

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

ESD Protection Devices
LXES Series

5 PIR Sensor

Pyroelectric Infrared Sensors
IRA Series

6 Power Management

Micro DC-DC Converters
LXDC Series

Monolithic Ceramic Capacitors for Medium Voltage
GR/GA Series

High Temperature Guaranteed Low Loss Lead Type Ceramic Capacitor
DEA 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

7 Battery

Small Energy Devices
UMAC Series

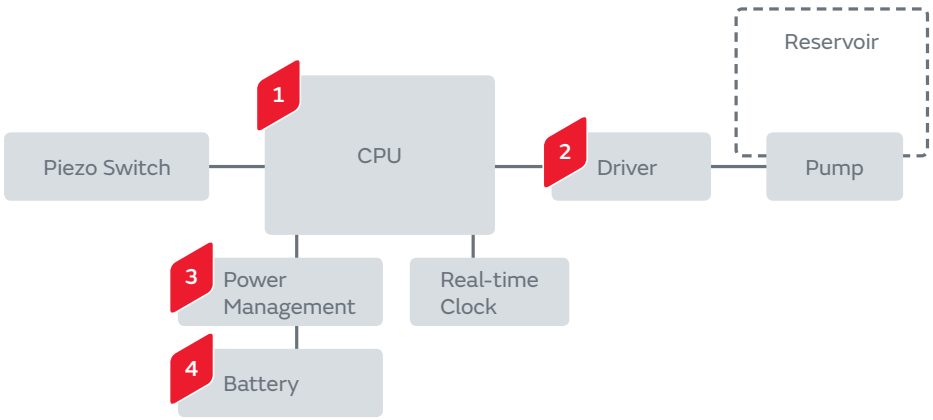
Micro DC-DC Converters
LXDC Series

Thermistors
NCP/PRF/PRG Series

General Purpose

Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling/For Step-up
Monolithic Ceramic Capacitors	GJM Series	High Frequency Filter Circuit
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/DFEC Series	Voltage Conversion
Chip Ferrite Beads	BLM Series	Noise Suppression
3 Terminal Capacitors	NFM Series	Noise Suppression
Feed Through Chip EMI Filters	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
XRC 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

High Temperature Guaranteed Low Loss Lead Type Ceramic Capacitor
DEA Series

Safety Standard Certified Ceramic Capacitors
Type KX/KY

Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series

Thermistors
NCP/NTP/PRF Series

4 Battery

Supercapacitors (EDLC)
DMF/DMT Series

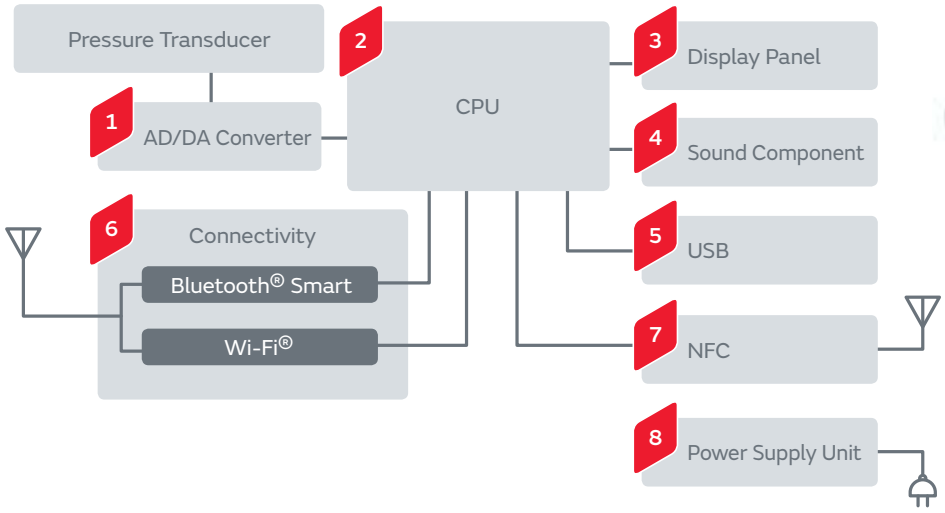
Thermistors
NXR/PRF/PRG Series

Small Energy Devices
UMAC Series

General Purpose

Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling/For Step-up
Monolithic Ceramic Capacitors	GJM Series	High Frequency Filter Circuit
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/DFEC Series	Voltage Conversion
Chip Ferrite Beads	BLM Series	Noise Suppression
3 Terminal Capacitors	NFM Series	Noise Suppression
Feed Through Chip EMI Filters	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
XRC 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
XRC 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

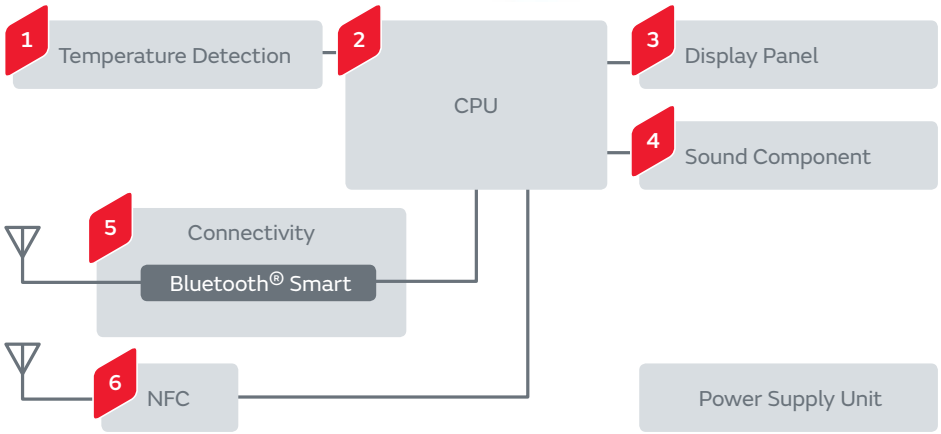
Thermistors
NCP Series

Thermistors
PRF/PRG Series

General Purpose

Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling/For Step-up	
Monolithic Ceramic Capacitors	GJM Series	High Frequency Filter Circuit	
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/DFEC Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminal Capacitors	NFM Series	Noise Suppression	
Feed Through Chip EMI Filters	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	

Thermometer



1 Temperature Detection

Thermistors
NXR Series

2 CPU

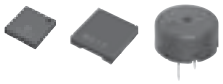
Ceramic Resonators CERALOCK®
CSTCR-G/CSTCE-G/CSTCE-V Series

3 Display Panel

Thermistors
NCP Series

4 Sound Component

Piezoelectric Sounders
PKMCS/PKLCS/PKM Series



Piezoelectric Diaphragms
7BB Series

5 Connectivity

Bluetooth® Smart Modules

Crystal Units
XRC Series

6 NFC

NFC Antennas
FLAN Series

Micro DC-DC Converters
LXDC Series

Crystal Units
XRC Series

Chip Ferrite Beads
BLM Series

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

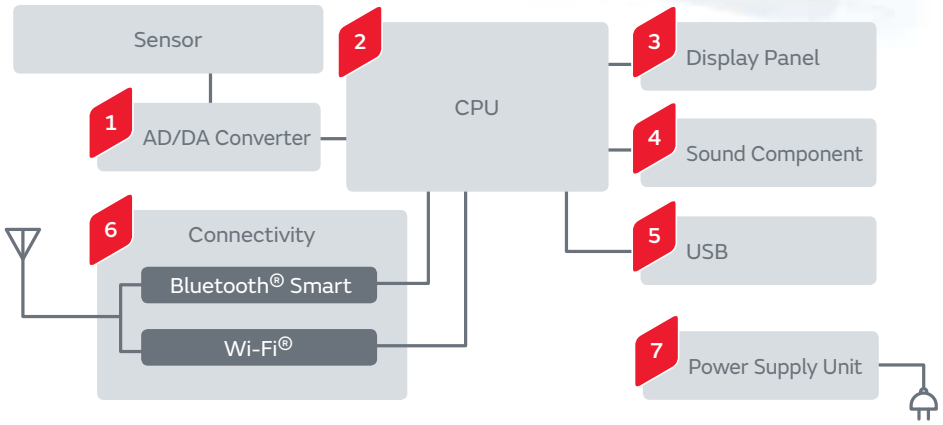
Trimmer Capacitors
TZY2 Series

ESD Protection Devices
LXES Series

General Purpose

Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling/For Step-up
Monolithic Ceramic Capacitors	GJM Series	High Frequency Filter Circuit
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/DFEC Series	Voltage Conversion
Chip Ferrite Beads	BLM Series	Noise Suppression
3 Terminal Capacitors	NFM Series	Noise Suppression
Feed Through Chip EMI Filters	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
XRC 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
XRC Series

Thermistors
PRG Series

7 Power Supply Unit

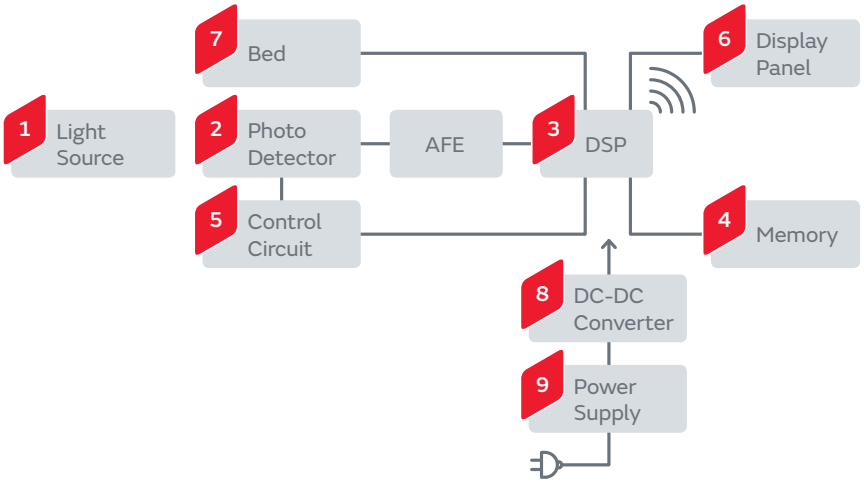
Thermistors
NCP Series

Thermistors
PRF/PRG Series

General Purpose

Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling/For Step-up
Monolithic Ceramic Capacitors	GJM Series	High Frequency Filter Circuit
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/DFEC Series	Voltage Conversion
Chip Ferrite Beads	BLM Series	Noise Suppression
3 Terminal Capacitors	NFM Series	Noise Suppression
Feed Through Chip EMI Filters	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

Diagnostic Imaging Apparatus



1 Light Source

High Voltage Ceramic Capacitors
DHS/DHK Series

2 Photo Detector

Thermistors
NCP/PRF Series

3 DSP

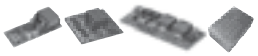
Ceramic Resonators CERALOCK®
CSTLS/CSTCE/CSTCR Series

Crystal Units
XRC 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

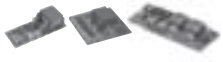
Supercapacitors (EDLC)
DMF/DMT Series

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

Piezoelectric Sounders
PKMCS/PKLCS 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)
DMF/DMT Series

Monolithic Ceramic Capacitors for Medium Voltage
GR/GA Series

High Temperature Guaranteed Low Loss Lead Type Ceramic Capacitor
DEA Series

Safety Standard Certified Ceramic Capacitors
Type KX/KY

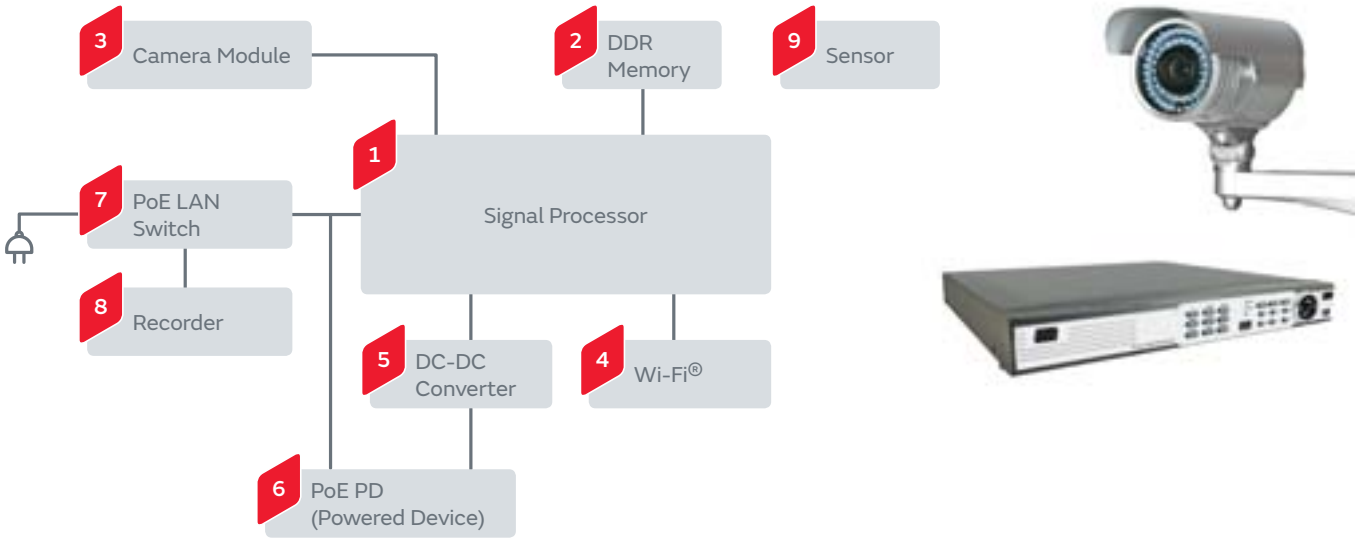
Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series

Thermistors
NCP/NTP/PRF Series

General Purpose

Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling/For Step-up	
Monolithic Ceramic Capacitors	GJM Series	High Frequency Filter Circuit	
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/DFEC Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminal Capacitors	NFM Series	Noise Suppression	
Feed Through Chip EMI Filters	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
XRC 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

Chip Ferrite Beads
BLM Series

4 Wi-Fi®

Wi-Fi® Modules

Micro DC-DC Converters
LXDC Series

Chip Inductors (Chip Coils)
LQB Series

Chip Multilayer LC Filters
LF Series

Chip Multilayer Diplexers
LFD Series

Chip Multilayer Hybrid Baluns
LDB/LDM Series

Chip Multilayer Hybrid Couplers
LDC/LDJ Series

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/DFEC 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

High Temperature Guaranteed Low Loss Lead Type Ceramic Capacitor
DEA Series

Crystal Units
XRC 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

High Temperature Guaranteed Low Loss Lead Type Ceramic Capacitor
DEA Series

Safety Standard Certified Ceramic Capacitors
Type KX/KY

Metal Terminal Type Monolithic Ceramic Capacitors
KRM Series

Crystal Units
XRC 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
XRC Series

Thermistors
NCP/PRF Series

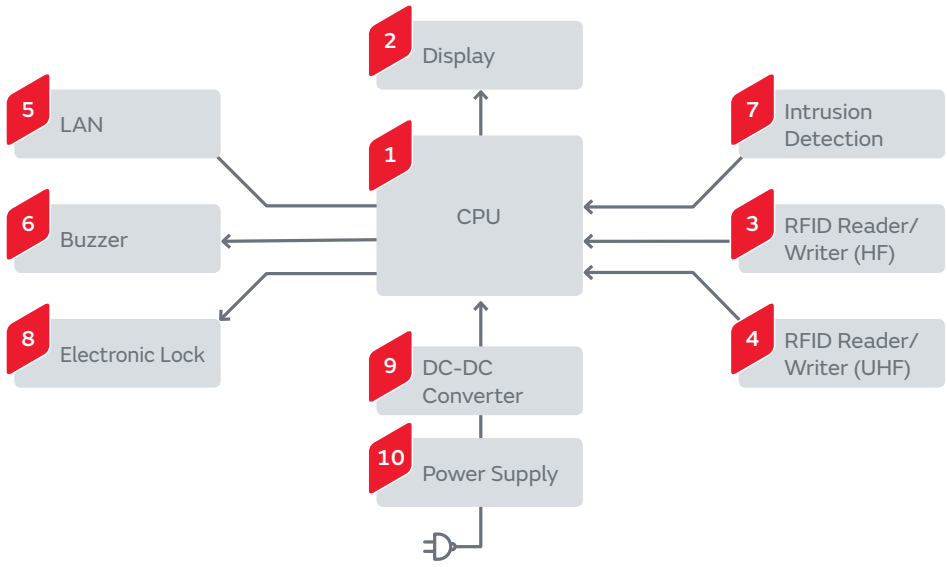
9 Sensor

Pyroelectric Infrared Sensors
IRA Series

General Purpose

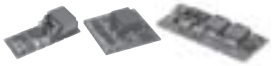
Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling/For Step-up	
Monolithic Ceramic Capacitors	GJM Series	High Frequency Filter Circuit	
Resin External Electrode Monolithic Ceramic Capacitiors	GRJ Series	Coupling/Decoupling/For Step-up	
Polymer Aluminum Electrolytic Capacitors	ECAS Series	Smoothing/Transient Backup	
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching/Resonance	
Chip Inductors (Chip Coils)	LQM/LQH/DFEC Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminal Capacitors	NFM Series	Noise Suppression	
Feed Through Chip EMI Filters	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	

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
XRC 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)

Crystal Units
XRC Series

4 RFID Reader/Writer (UHF)

Crystal Units
XRC Series

5 LAN

Polymer Aluminum Electrolytic Capacitors
ECAS Series

Crystal Units
XRC 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

Magnetic Sensors
(AMR Sensors)
MR Series

8 Electronic Lock

Supercapacitors (EDLC)
DMF/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

High Temperature Guaranteed Low Loss Lead Type Ceramic Capacitor
DEA Series

Safety Standard Certified Ceramic Capacitors
Type KX/KY

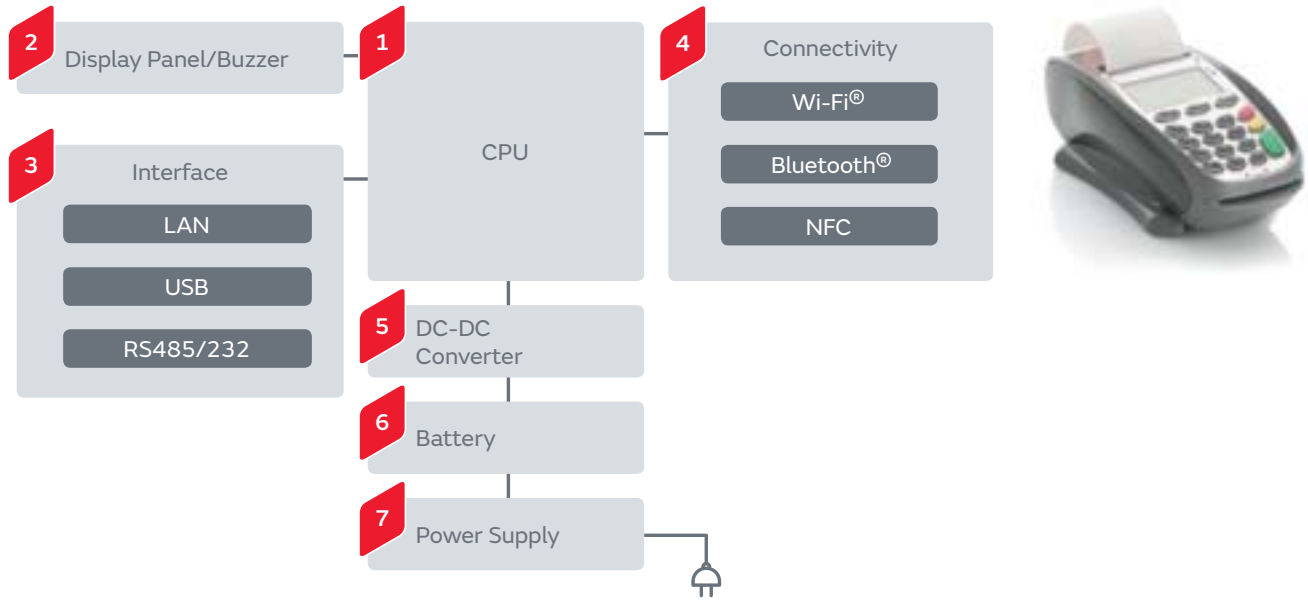
Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series

Thermistors
NCP/NTP/PRF Series

General Purpose

Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling/For Step-up	
Monolithic Ceramic Capacitors	GJM Series	High Frequency Filter Circuit	
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/DFEC Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminal Capacitors	NFM Series	Noise Suppression	
Feed Through Chip EMI Filters	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)
DMF/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 Series

Piezoelectric Buzzers
PKB Series

3 Interface

Polymer Aluminum Electrolytic Capacitors
ECAS Series

Crystal Units
XRC 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

Crystal Units
XRC 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/DEM/DFEC Series

Thermistors
NCP/PRF Series

6 Battery

Thermistors
NCP/PRF/PRG Series

7 Power Supply

Monolithic Ceramic Capacitors for Medium Voltage
GR/GA Series

High Temperature Guaranteed Low Loss Lead Type Ceramic Capacitor
DEA 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 Series	Coupling/Decoupling/For Step-up	
Monolithic Ceramic Capacitors	GJM Series	High Frequency Filter Circuit	
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/DFEC Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminal Capacitors	NFM Series	Noise Suppression	
Feed Through Chip EMI Filters	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 Automotive GCM Series
- Resin External Electrode Monolithic Ceramic Capacitors GCJ Series
- Monolithic Ceramic Capacitor for Conductive Adhesives GCG Series
- Monolithic Ceramic Capacitor for Conductive Adhesives (Ni/Pd Plating Structure) GCB Series
- Radial Lead Type Monolithic Ceramic Capacitors RH/RCE Series
- Ceramic Resonators CERALOCK® CSTCE/CSTCR Series
- Crystal Units XRCGB/XRCHA Series
- Accelerometers SCA Series
- Gyro Sensors SCC Series
- Thermistors PRF/PTG Series

2 TPMS

- Shock Sensors PKGS Series
- Ceramic Filters CERAFIL® SFECF Series
- Ceramic Resonators CERALOCK® CSTCE/CSTCR Series
- Crystal Units XRCGB/XRCHA Series
- Pressure Sensor Elements SCB10H Series
- 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 for Automotive GCM Series
- Resin External Electrode Monolithic Ceramic Capacitors GCJ Series
- Monolithic Ceramic Capacitor for Conductive Adhesives GCG Series
- Monolithic Ceramic Capacitor for Conductive Adhesives (Ni/Pd Plating Structure) GCB Series
- Ceramic Resonators CERALOCK® CSTCE/CSTCR Series
- Crystal Units XRCGB/XRCHA Series
- Accelerometers SCA Series
- Gyro Sensors SCC Series
- Thermistors for Conductive Glue Mounting NCG18 Series

4 Headlamp

- Monolithic Ceramic Capacitors for Automotive GCM Series
- Resin External Electrode Monolithic Ceramic Capacitors GCJ Series
- Ceramic Resonators CERALOCK® CSTCE/CSTCR Series
- Crystal Units XRCGB/XRCHA Series
- Thermistors for Conductive Glue Mounting NCG18 Series
- Low Temperature Co-fired Ceramics (LTCC) Ceramic Multilayer Substrates LFC®

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
XRCGB/XRCHA Series

Thermistors
PRF/PTG Series

7 Cabin Leveling

Accelerometers
SCA Series

Ceramic Resonators
CERALOCK®
CSTCE/CSTCR Series

Gyro Sensors
SCC Series

Crystal Units
XRCGB/XRCHA Series

Operation

8 Motor Grader/Blade Control

Accelerometers
SCA Series

Gyro Sensors
SCC Series

MEMS Gyro Sensors
SCR Series

Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series

Crystal Units
XRCGB/XRCHA Series

9 Forklift/Container Handling

Accelerometers
SCA Series

Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series

Crystal Units
XRCGB/XRCHA Series

General Purpose

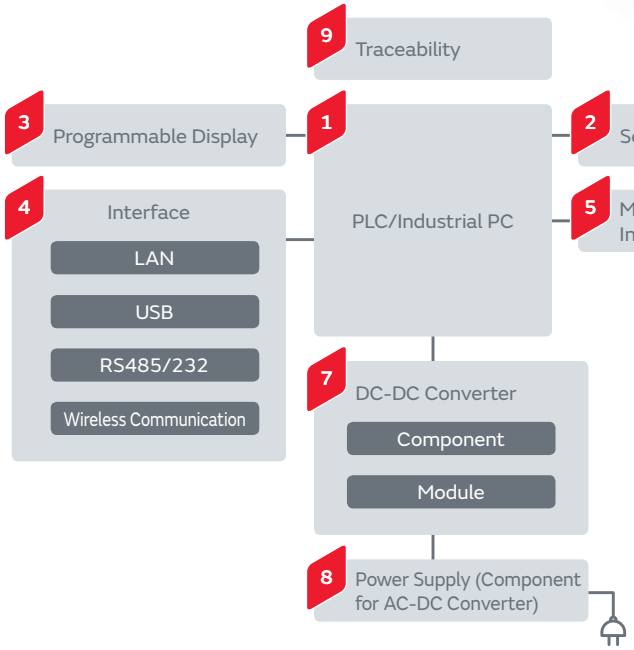
Monolithic Ceramic Capacitors	GRT Series	Coupling/Decoupling	
Monolithic Ceramic Capacitors for Medium Voltage	GRM Series	For Snubber	
Resin External Electrode Monolithic Ceramic Capacitiors	GRJ Series	Coupling/Decoupling/For Step-up	
Radial Lead Type Monolithic Ceramic Capacitors	RCE Series	Noise Suppression/Decoupling	
Chip Inductors (Chip Coils)	LQM/LQH/DFEC Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
EMI Suppression Filters	NFL/NFE 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 For Automotive	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/MBH/DFEH 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	DLW31/DLW43 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
XRC Series

Chip Ferrite Beads
BLM Series

3 Terminal Capacitors
NFM Series

Supercapacitors (EDLC)
DMF/DMT Series

Thermistors
NCP/PRF Series

2 Sensor · Actuator

Pyroelectric Infrared Sensors
IRA Series

Magnetic Sensors (AMR Sensors)
MR Series

3 Programmable Display

Micro DC-DC Converters
LXDC Series

Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series

Crystal Units
XRC Series

Power Inductors
LQH Series

Supercapacitors (EDLC)
DMF/DMT Series

Chip Common Mode Choke Coils
DLW/DLP Series

4 Interface (LAN · USB · RS485/232 · Wireless Communication)

Polymer Aluminum Electrolytic Capacitors
ECAS Series

Crystal Units
XRC 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/AC Servo/Inverter

Monolithic Ceramic Capacitors for Medium Voltage
GR/GA Series

High Temperature Guaranteed Low Loss Lead Type Ceramic Capacitor
DEA Series

Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series

Crystal Units
XRC Series

Large Current Common Mode Choke Coils
PLT10HH Series

Thermistors
PRF/PTG Series

6 Motor

Rotary Sensors

7 DC-DC Converter (Module · Component)

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 (Component for AC-DC Converter)

Micro DC-DC Converters
LXDC Series

Monolithic Ceramic Capacitors
for Medium Voltage
GR/GA Series

High Temperature Guaranteed
Low Loss Lead Type Ceramic Capacitor
DEA Series

Safety Standard Certified
Ceramic Capacitors
Type KX/KY

Ceramic Resonators
CERALOCK®
CSTCE/CSTCR Series

Thermistors
NCP/NTP/PRF Series

9 Traceability

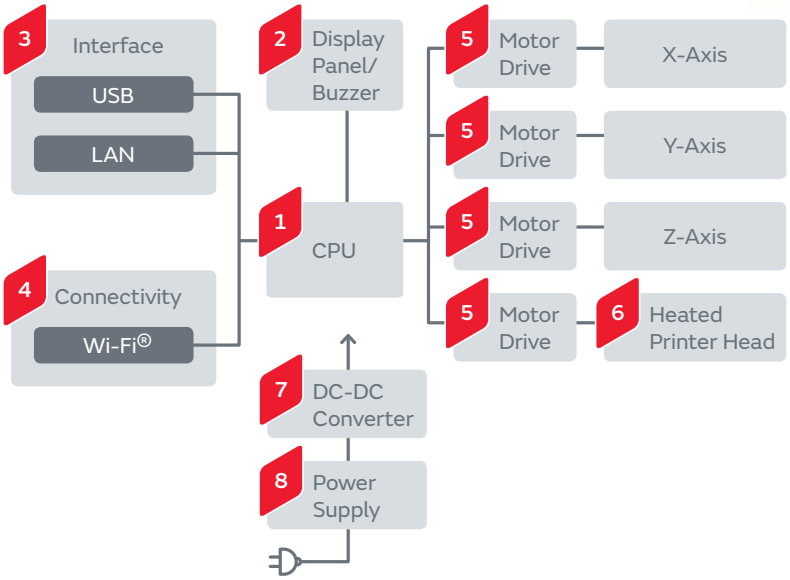
RFID Device MAGICSTRAP®
LXMS Series

Supercapacitors (EDLC)
DMF/DMT Series

General Purpose

Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling/For Step-up	
Monolithic Ceramic Capacitors	GJM Series	High Frequency Filter Circuit	
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/DFEC Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminal Capacitors	NFM Series	Noise Suppression	
Feed Through Chip EMI Filters	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	

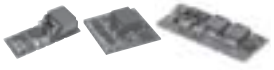
3D Printer



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

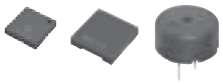
Crystal Units
XRC Series

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
XRC 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
XRC Series

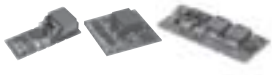
Chip Inductors (Chip Coils)
LQB Series

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

High Temperature Guaranteed
Low Loss Lead Type
Ceramic Capacitor
DEA Series

Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series

Crystal Units
XRC Series

Large Current Common Mode Choke Coils
PLT10HH Series

Thermistors
PRF/PTG Series

6 Heated Printer Head

Thermistors
NCP/PRF Series

7 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

8 Power Supply

Micro DC-DC Converters
LXDC Series

Monolithic Ceramic Capacitors
for Medium Voltage
GR/GA Series

High Temperature Guaranteed
Low Loss Lead Type Ceramic Capacitor
DEA Series

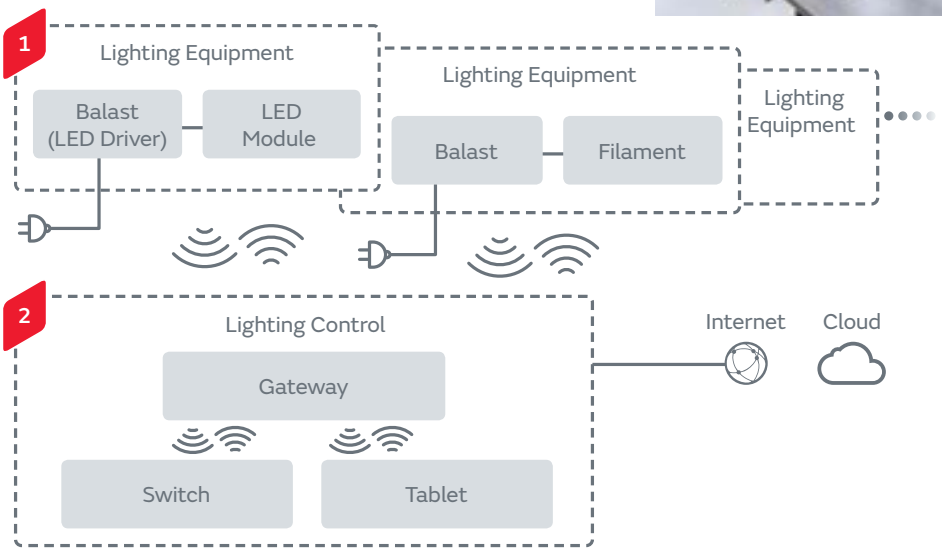
Safety Standard Certified
Ceramic Capacitors
Type KX/KY

Thermistors
NCP/NTP/PRF/PRG Series

General Purpose

Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling/For Step-up	
Monolithic Ceramic Capacitors	GJM Series	High Frequency Filter Circuit	
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/DFEC Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminal Capacitors	NFM Series	Noise Suppression	
Feed Through Chip EMI Filters	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

High Temperature Guaranteed Low Loss Lead Type Ceramic Capacitor
DEA Series

Safety Standard Certified Ceramic Capacitors
Type KX/KY

Piezoelectric Sounders
PKMCS/PKLCS Series

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

Crystal Units
XRC Series

Ceramic Resonators CERALOCK®
CSTLS/CSTCE/CSTCR Series

General Purpose

Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling/For Step-up	
Monolithic Ceramic Capacitors	GJM Series	High Frequency Filter Circuit	
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/DFEC Series	Voltage Conversion	
Chip Ferrite Beads	BLM Series	Noise Suppression	
3 Terminal Capacitors	NFM Series	Noise Suppression	
Feed Through Chip EMI Filters	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	

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, etc., and to simulate thermistors' behavior !

■Characteristics viewer

You can easily search and download the following data for [Monolithic Ceramic Capacitors], [Three-terminal Capacitors], [RF Inductors], [Ferrite Beads] and [Common Mode Choke Coils], etc.

■Component performance simulator

You can search by the simulation on simple circuits for [NTC Thermistors] and [PTC Thermistors(POSISTOR®)].

■Selection tool

According to conditions of use, you can select our medium voltage capacitors and power inductors on [Medium Voltage Capacitors] and [Power Inductors].

■Search tool

You can search CERALOCK® and crystal units that are most suitable for your IC and access information about the recommended circuit constant setting on [Timing Devices].

■ Usage example of "Monolithic Ceramic Capacitors"

1 Select the products

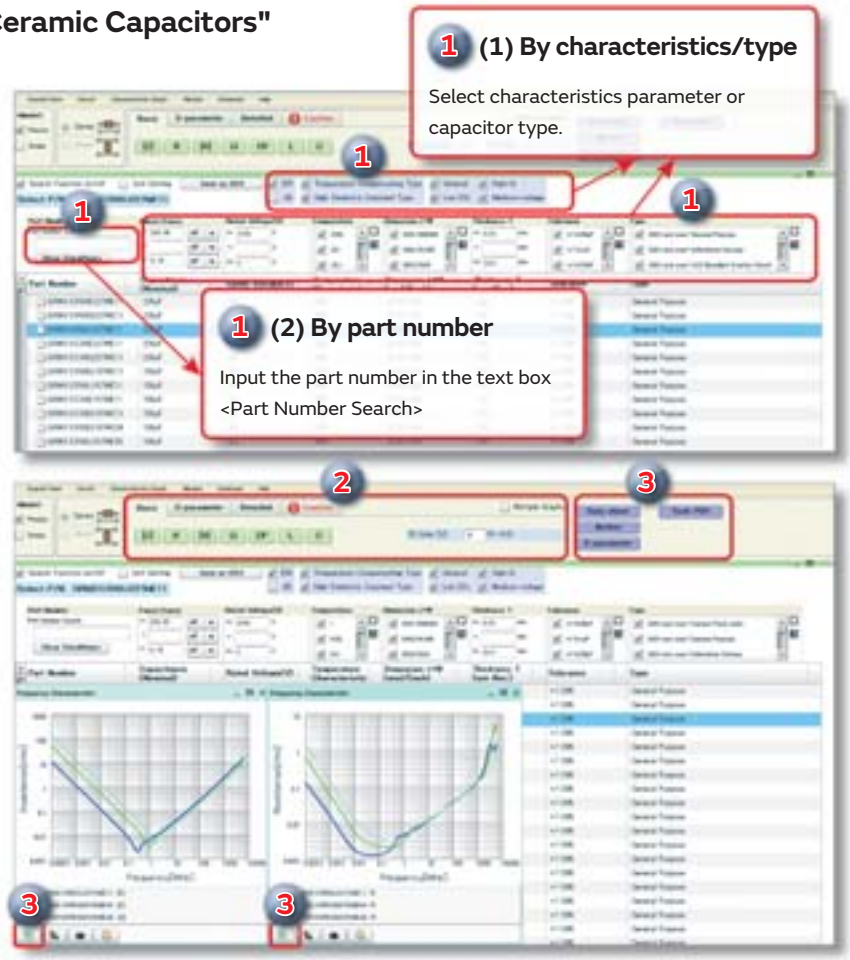
(1) By characteristics/type
(2) By part number

2 Show graph

Click a 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/

Index

Cat. No. K70E-5

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.

2 Please contact our sales representatives or product engineers before using the products in this catalog for the applications listed below, which require especially high reliability for the prevention of defects which might directly damage a third party's life, body or property, or when one of our products is intended for use in applications other than those specified in this catalog.

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 2016. They are subject to change or our products in it may be discontinued without advance notice. Please check with our sales representatives or product engineers before ordering. If there are any questions, please contact our sales representatives or product engineers.

4 Please read rating and ⚠CAUTION (for storage, operating, rating, soldering, mounting and handling) in this catalog to prevent smoking and/or burning, etc.

5 This catalog has only typical specifications. Therefore, please approve our product specifications or transact the approval sheet for product specifications before ordering.

6 Please note that unless otherwise specified, we shall assume no responsibility whatsoever for any conflict or dispute that may occur in connection with the effect of our and/or a third party's intellectual property rights and other related rights in consideration of your use of our products and/or information described or contained in our catalogs. In this connection, no representation shall be made to the effect that any third parties are authorized to use the rights mentioned above under licenses without our consent.

7 No ozone depleting substances (ODS) under the Montreal Protocol are used in our manufacturing process.

Murata Manufacturing Co., Ltd.

www.murata.com

muRata
INNOVATOR IN ELECTRONICS

K70E.pdf
Jan.26,2017