

# MURATA PRODUCTS

## Lineup 2020

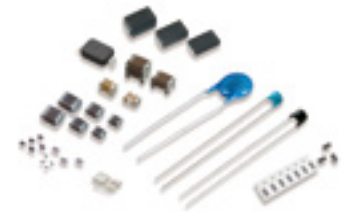


# 2020 MURATA PRODUCTS Lineup

p2

## Capacitors

Ceramic Capacitors, Polymer Aluminum Electrolytic Capacitors	4
Single-Layer Microchip Capacitors, Thin Film Circuit Substrates (RUSUB)	30
Variable Capacitors	34
Silicon Capacitors	34
Film Capacitors	40



p41

## Noise Suppression Products/EMI Suppression Filters

Noise Suppression Filters (Chip Ferrite Bead)/(Frequency Specified Noise Filters)	41
Noise Suppression Filters (Feed Through Chip EMI Filters)	43
Noise Suppression Filters (Chip LC Filters)	43
Noise Suppression Filters (Chip EMIFIL)	44
Noise Suppression Filters (Chip Common Mode Choke Coils/Chip Common Mode Noise Filters)	45
Noise Suppression Filters (Block Type)	46
ESD Protection Devices	47
Noise Suppression Filters (Lead Type), Others	47



p48

## Inductors (Coils)

Inductors for Power Lines	49
RF Inductors	56
General Circuit Inductors	59
Variable Inductors	60



p62

## Resistors

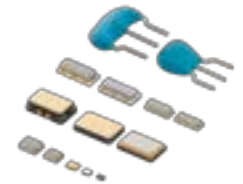
High Voltage Resistors	62
------------------------	----



p63

## Timing Devices

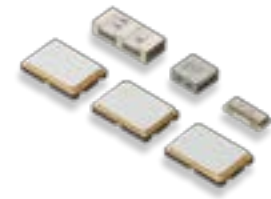
MEMS Resonator	64
Crystal Units	64
Crystal Oscillators	65
Ceramic Resonators CERALOCK	65



p67

## Filters

Ceramic Filters CERAFIL	67	SAW Filters for Mobile Communications	68
Ceramic Discriminators	67	Dielectric Filters GIGAFIL	69
Crystal Filters	68	Chip Multilayer LC Filters	69



p70

## RF Components

Antennas	70	Chip Multilayer Hybrid Dividers	72
Baluns	71	Chip Multilayer Diplexers	72
Couplers	72	Microwave Coaxial Connectors	73



p76

## Sensors

Pyroelectric Infrared Sensors	78	Accelerometers	78
Ultrasonic Sensors	78	Inclinometers	78
AMR Sensors (Magnetic Sensors)	78	Gyro Sensors	78
Shock Sensors	78	Temperature Sensors (Thermistors)	78





## Thermistors

NTC Thermistors for Temperature Sensor/Temperature Compensation	80
PTC Thermistors POSISTOR for Overheat Sensing	82
PTC Thermistors POSISTOR for Inrush Current Suppression	83
PTC Thermistors POSISTOR for Overcurrent Protection	83



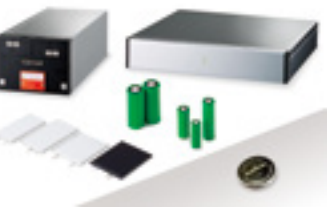
## Power Devices

DC-DC Converters	85
High Voltage Power Supplies	87
Switching Power Supplies	87



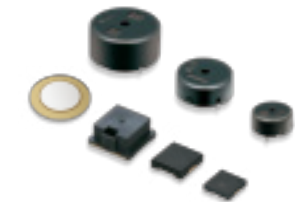
## Batteries

Laminated Type Lithium Ion Batteries	88
Cylindrical Type Lithium Ion Batteries	88
Li-ion Energy Storage System	88
Coin Manganese Dioxide Lithium Batteries	91
Silver Oxide Batteries	94
Alkaline Manganese Batteries	95



## Sound Components (Buzzer)

SMD Piezoelectric Sounders	96
Pin Type Piezoelectric Sounders	97
Piezoelectric Buzzers	97
Piezoelectric Diaphragms	97



## Others

Wireless Communication Modules	98	Ozonizer Modules: Ionissimo	101
Micromechatronics	99	RFID Devices	102
Ionizer Modules: Ionissimo	100	Femtet, CAE Software	103



## Application Guides

AI speaker (Voice recognition)	105
Hearable	106
HEMS	108
Smartmeter	110
Thermostat	112
Human Detection	114
Air Dispenser	115
Blood Pressure Monitor	116
Thermometer	118
Blood Glucose Meter	119
Diagnostic Imaging Apparatus	120
Automotive	
Powertrain/Safety	122
HEV/PHEV/EV	124
Information/Comfort/Accessory	126
Bike/EV Bike	128
Smart Phones	130
Wearable Devices	132
Base Stations	134
G-PON	136
Lighting	137

Data Center	138
Industrial Automation	140
3D Printer	142
Electronic POS	144
Heavy Duty Vehicles	146
Security Camera	148
Entrance and Exit Management System	150
Air Conditioner	152
Refrigerator	154
Washing Machine	155
Air Purifier	156
Microwave Oven	157
IH Rice Cooker	158
Vacuum Cleaner	159
Tablet Terminators	160
Notebook Computers	162
MFP (Multi Function Printer/Product/Peripheral)	164
Televisions	166
Set-top Box	168

Design Support Tool SimSurfing	170
Index	171

p2  
 p41  
 p48  
 p62  
 p63  
 p67  
 p70  
 p76  
 p80  
 p85  
 p88  
 p96  
 p98  
 p104

# Capacitors

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

## Summary

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

## Lineup

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



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



## Ceramic Capacitors

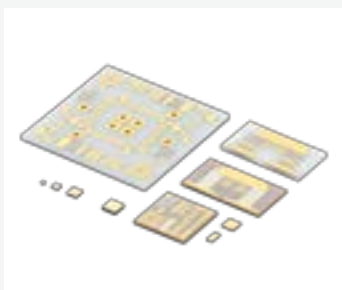
p4

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

## Polymer Aluminum Electrolytic Capacitors

These are high-capacity capacitors that are characterized by a low profile and low ESR.

They handle the stabilization of voltage in circuits where serious voltage control is demanded, and contribute to the advanced features in customer products.



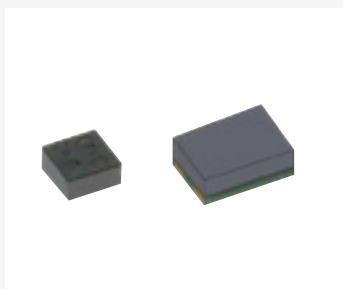
## Single-Layer Microchip Capacitors

p30

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

## Thin Film Circuit Substrates (RUSUB)

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

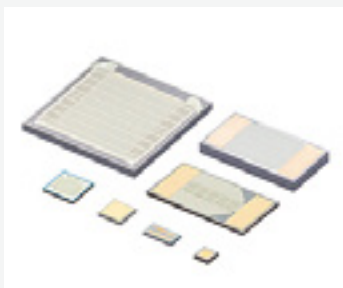


## Variable Capacitors

p34

Variable capacitors can carry out the variable of the capacitor by adjusting the tuning voltage.

They are designed for frequency matching use for HF band (13.56MHz).



## Silicon Capacitors

p34

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



## Film Capacitors

p40












The FH series uses materials with high heat resistance. Therefore, it has a higher allowable ripple current under a higher temperature environment than conventional PP film capacitors.

This feature is more prominent in the high-frequency range. For example, when the ambient temperature is at 105°C, the PP film capacitors would be already at its limit for allowable ripple current, but because of the higher heat resistance of the FH series, the allowable ripple current can be increased drastically.

## Ceramic Capacitors, Polymer Aluminum Electrolytic Capacitors

## Ceramic Capacitors, Polymer Aluminum Electrolytic Capacitors

## Icons

	For applications that do not require a particular reliability, such as general equipment.
	Infotainment for Automotive Products for entertainment equipment like car navigation, car audio, and body control equipment like wipers and power windows.
	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-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 compliant product
	Products that acquired safety standard certification IEC60384-14.
	Products that are based on the Electrical Appliance and Material Safety Law of Japan.
	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 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 product This capacitor is designed to prevent failures as much as possible by short mode.
	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.
	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.
	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.
	No DC bias characteristics Polymer capacitor is no capacitance change with DC bias due to aluminum oxidized film for dielectric.
	Low-inductance product suitable for noise suppression This product has extremely low ESL and is suitable for suppression of noise, including high frequencies.
	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 Since silver palladium is used for the external electrodes, the capacitor can be mounted by conductive adhesive.



# Ceramic Capacitors, Polymer Aluminum Electrolytic Capacitors

## Product Lineup

For general			
General SMD			
Solder mounting			
Chip type			
	GRM		p6
	GRM	For LCD backlight inverter circuit only	p8
	GR3	Anti-noise High effective capacitance & high ripple current	p8
	GRJ	Deflecting crack Soft termination	p8
	GR4	For information devices only	p9
	GR7	For camera flash circuit only	WEB
	GJM	High Q	p9
	GQM	High Q High power	p9
	GA2	Japanese Low Voltage Based on the Electrical Appliance and Material Safety Law of Japan	p10
	GA3	Safety standard	p10
	LLL	Low ESL LW reversed	p11
	LLA	Low ESL 8 terminals	p11
	LLM	Low ESL 10 terminals	p12
	LLR	Low ESL LW reversed controlled ESR	p12
	NFM	Low ESL EMI Filter 3 terminals	p12
	GJ4	Anti-noise Low distortion	WEB
On interposer board			
	ZRA	Anti-noise	WEB
	ZRB	Anti-noise	WEB
Metal terminal type			
	KRM	Anti-noise Deflecting crack Soldering crack	p13
	KR3	Anti-noise Deflecting crack Soldering crack High effective capacitance & high ripple current	p13
Resin molding SMD type			
	DK1	Safety standard	p28
Polymer Aluminum Electrolytic Capacitors			
	ECAS	Anti-noise Deflecting crack Effective Cap	p29
	ECNS	Anti-noise Deflecting crack Effective Cap	p29
Wire bonding mounting			
Chip type			
	GMA	Microchip	p13
	GMD		p14
Lead type			
Solder mounting			
	RDE	Anti-noise Deflecting crack Soldering crack	p22
	DE1	Safety standard X1/Y1 Class certified product	p24
	DE2	Safety standard X1/Y2 Class certified product	p25

Infotainment for automotive		
SMD		
Solder mounting		
Chip type		
	GRT	p14

Powertrain/Safety for automotive			
SMD			
Solder mounting			
Chip type			
	GCM		p15
	GC3	Anti-noise High effective capacitance & high ripple current	p17
	GCJ	Fall safe Deflecting crack Soft termination	p17
	GCQ	High Q	p18
	GCD	Fall safe Deflecting crack MLSC design	p18
	GCE	Fall safe Deflecting crack Soft termination MLSC design	p18
	NFM	Low ESL EMI Filter 3 terminals	p19
Metal terminal type			
	KCM	Anti-noise Deflecting crack Soldering crack	p19
	KC3	Anti-noise Deflecting crack Soldering crack High effective capacitance & high ripple current	p19
	KCA	Safety standard Anti-noise Deflecting crack Soldering crack	p20
Limited to Conductive Glue Mounting			
Chip type			
	GCB	Deflecting crack Soldering crack Ni plating + Pd plating termination conductive glue mounting	WEB
	GCG	Deflecting crack Soldering crack AgPd termination conductive glue mounting	p20
Lead type			
Solder mounting			
	RCE	Anti-noise Deflecting crack Soldering crack	p26
	RHE	Anti-noise Deflecting crack Soldering crack 150°C operation leaded	p27
	RHS	Anti-noise Deflecting crack Soldering crack 200°C operation leaded	p28
	DE6	Safety standard	p28

Medical-grade products for implanted medical devices		
SMD		
Solder mounting		
Chip type		
	GCH	p21

# Ceramic capacitors SMD type For General Purpose

## Chip Multilayer Ceramic Capacitors for General Purpose



GRM

### Temperature Compensating Type

General

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)																	
			0.1p	1p	10p	100p	1000p	10000p	0.1μ	1μ	10μ	100μ	1000μ							
GRM01	0.25X0.125 <008004>	25	0.20pF				100pF													
		16	0.20pF				100pF													
GRM02	0.4X0.2 <01005>	50	0.20pF				100pF													
		25				120pF	220pF													
		16				120pF	220pF													
GRM03	0.6X0.3 <0201>	100	0.10pF				100pF													
		50	0.10pF				220pF													
		25				270pF	1000pF													
GRM15	1.0X0.5 <0402>	100				150pF	1000pF													
		50				270pF	6800pF													
		35																		
		25																		
		10																		
GRM18	1.6X0.8 <0603>	250			10pF	47pF														
		100					1000pF	3900pF												
		50					1000pF	10000pF												
		10																		
GRM21	2.0X1.25 <0805>	630			10pF		2200pF													
		250			10pF		10000pF													
		200			10pF		4700pF													
		100					1000pF	22000pF												
		50					2700pF	47000pF												
		10																		
GRM31	3.2X1.6 <1206>	2000			10pF	68pF														
		1000			10pF		1000pF													
		630			10pF		4700pF													
		500			10pF		4700pF													
		250																		
		200																		
		100																		
		50																		
GRM32	3.2X2.5 <1210>	2000			100pF	220pF														
		1000					1500pF	2200pF												
		630					1500pF	15000pF												
		500					1500pF	10000pF												
GRM42	4.5X2.0 <1808>	3150			10pF	100pF														
GRM43	4.5X3.2 <1812>	1000																		
		630																		
		500																		
GRM55	5.7X5.0 <2220>	1000																		
		630																		
		500																		

Continued on the following page. ↗



## Ceramic Capacitor, Polymer Aluminum Electrolytic Capacitors

### High Dielectric Constant Type

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)											
			0.1p	1p	10p	100p	1000p	10000p	0.1μ	1μ	10μ	100μ	1000μ	
GRM01	0.25X0.125 <008004>	10				100pF	470pF							
		6.3					1000pF	10000pF						
GRM02	0.4X0.2 <01005>	16				100pF	10000pF							
		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	0.22μF							
		16					2200pF	0.22μF						
		10					4700pF	1.0μF						
		6.3					4700pF	1.0μF						
		4							0.22μF	1.0μF				
		2.5								1.0μF				
GRM15	1.0X0.5 <0402>	100				220pF	4700pF							
		50					2200pF	0.47μF						
		35							0.22μF	1.0μF				
		25						22000pF	2.2μF					
		16							0.22μF	2.2μF				
		10							0.22μF	4.7μF				
		6.3								1.0μF	10μF			
		4								1.0μF	10μF			
GRM18	1.6X0.8 <0603>	2.5								4.7μF	10μF			
		50									2.2μF			
		35									2.2μF	4.7μF		
		25									2.2μF	10μF		
		16									2.2μF	10μF		
		10									2.2μF	10μF		
		6.3									4.7μF	22μF		
GRM21	2.0X1.25 <0805>	4									10μF	22μF		
		100									1.0μF			
		50										4.7μF		
		35									4.7μF	10μF		
		25									2.2μF	22μF		
		16									4.7μF	22μF		
		10										22μF	47μF	
		6.3										22μF	100μF	
GRM31	3.2X1.6 <1206>	4									22μF	100μF		
		2.5										47μF	100μF	
		50										4.7μF		
		25									10μF	22μF		
		16										22μF	47μF	
		10										22μF	100μF	
		6.3										22μF	220μF	
GRM32	3.2X2.5 <1210>	4										47μF	220μF	
		2.5											220μF	
		100										10μF		
		25										22μF		
		16										22μF	47μF	
GRM43	4.5X3.2 <1812>	10										47μF	100μF	
		6.3										47μF	220μF	
		4										100μF	220μF	
		1000											33000pF	47000pF
630												68000pF	0.10μF	


Continued on the following page. ↗



## Ceramic Capacitor, Polymer Aluminum Electrolytic Capacitors

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	
GRJ43	4.5X3.2 <1812>	250								0.15μF	0.47μF			
GRJ55	5.7X5.0 <2220>	1000								68000pF	0.10μF			
		630								0.15μF	0.22μF			
		250								0.33μF	1.0μF			


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



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>	2000				220pF	1500pF							
GR443	4.5X3.2 <1812>	2000					1800pF	4700pF						
GR455	5.7X5.0 <2220>	2000							10000pF					


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



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	
GR431	3.2X1.6 <1206>	630					1000pF	4700pF						
GR432	3.2X2.5 <1210>	630						6800pF	15000pF					


### High Q Chip Multilayer Ceramic Capacitors for General Purpose



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	
GJM02	0.4X0.2 <01005>	25		0.20pF		22pF								
GJM03	0.6X0.3 <0201>	100		0.30pF		15pF								
		50		0.20pF		0.90pF								
		25			1.0pF		33pF							
GJM15	1.0X0.5 <0402>	50	0.10pF			47pF								

### High Q and High Power Chip Multilayer Ceramic Capacitors for General Purpose





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								
GQM21	2.0X1.25 <0805>	500		1.0pF		22pF								
		250		1.0pF		100pF								
GQM22	2.8X2.8 <1111>	500		1.0pF		100pF								

Continued on the following page. ↗



## Ceramic Capacitor, Polymer Aluminum Electrolytic Capacitors

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

 **GA2** General 



Series	LXW (mm) <Size Code (inch)>	Rated Voltage (V)	Capacitance Range (F)											
			0.1p	1p	10p	100p	1000p	10000p	0.1μ	1μ	10μ	100μ	1000μ	
<b>GA242</b>	4.5X2.0 <1808>	AC250 (r.m.s.)					470pF	1000pF						
<b>GA243</b>	4.5X3.2 <1812>	AC250 (r.m.s.)					2200pF	47000pF						
<b>GA255</b>	5.7X5.0 <2220>	AC250 (r.m.s.)								0.10μF				

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

 **GA3 Type GB** General 

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (V)	Capacitance Range (F)											
			0.1p	1p	10p	100p	1000p	10000p	0.1μ	1μ	10μ	100μ	1000μ	
<b>GA355</b>	5.7X5.0 <2220>	AC250 (r.m.s.)					10000pF	56000pF						

## Safety Standard Certified Chip Multilayer Ceramic Capacitors for General Purpose Type GD Acquired certifications of UL60950-1

 **GA3 Type GD** General 



**Temperature Compensating Type**

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (V)	Capacitance Range (F)											
			0.1p	1p	10p	100p	1000p	10000p	0.1μ	1μ	10μ	100μ	1000μ	
<b>GA342</b>	4.5X2.0 <1808>	AC250 (r.m.s.)			10pF	82pF								

**High Dielectric Constant Type**

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (V)	Capacitance Range (F)											
			0.1p	1p	10p	100p	1000p	10000p	0.1μ	1μ	10μ	100μ	1000μ	
<b>GA342</b>	4.5X2.0 <1808>	AC250 (r.m.s.)				100pF	1500pF							
<b>GA343</b>	4.5X3.2 <1812>	AC250 (r.m.s.)					1800pF	4700pF						

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

 **GA3 Type GF** General 

**Temperature Compensating Type**

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (V)	Capacitance Range (F)											
			0.1p	1p	10p	100p	1000p	10000p	0.1μ	1μ	10μ	100μ	1000μ	
<b>GA342</b>	4.5X2.0 <1808>	AC250 (r.m.s.)			10pF	82pF								

Continued on the following page. ↗

## Ceramic Capacitor, Polymer Aluminum Electrolytic Capacitors

### High Dielectric Constant Type

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (V)	Capacitance Range (F)											
			0.1p	1p	10p	100p	1000p	10000p	0.1μ	1μ	10μ	100μ	1000μ	
GA342	4.5X2.0 <1808>	AC250 (r.m.s.)				100pF	1000pF							
GA352	5.7X2.8 <2211>	AC250 (r.m.s.)				100pF	1500pF							
GA355	5.7X5.0 <2220>	AC250 (r.m.s.)					1800pF	4700pF						

### LW Reversed Low ESL Chip Multilayer Ceramic Capacitors for General Purpose



LLL

General Low ESL

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

### 8 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose



LLA


General Low ESL

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

Continued on the following page. ↗


Ceramic Capacitor, Polymer Aluminum Electrolytic Capacitors

10 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose

 **LLM** General Low ESL


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

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

 **LLR** General Low ESL

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

3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose

 **NFM** General Low ESL EMI Filter

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)											
			0.1p	1p	10p	100p	1000p	10000p	0.1μ	1μ	10μ	100μ	1000μ	
NFM15	1.0X0.5 <0402>	16						2200pF	47000pF					
		10						2200pF	0.22μF					
		6.3							0.10μF	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									1.5μF			
		25									1.5μF			

Continued on the following page. ↗



### Metal Terminal Type Multilayer Ceramic Capacitors for General Purpose



KRM

- General
- Deflecting crack
- Soldering crack
- Anti-noise

#### Temperature Compensating Type

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)													
			0.1p	1p	10p	100p	1000p	10000p	0.1μ	1μ	10μ	100μ	1000μ			
KRM55	6.1X5.1	630						15000pF	54000pF							

#### High Dielectric Constant Type

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)														
			0.1p	1p	10p	100p	1000p	10000p	0.1μ	1μ	10μ	100μ	1000μ				
KRM21	2.2X1.25	25										10μF	22μF				
		16											10μF				
KRM31	3.5X1.7	100										1.0μF					
		50										4.7μF					
		35											10μF				
		25											10μF				
		50											2.2μF				
	3.6X1.7	50										2.2μF					
	3.7X1.85	100										2.2μF					
KRM55	6.1X5.3	1000							68000pF	0.22μF							
		630							0.15μF	0.47μF							
		450								0.33μF	1.0μF						
		250								0.68μF	2.2μF						
		100									4.7μF	22μF					
		63									4.7μF	22μF					
		50									4.7μF	33μF					
		35									10μF	47μF					
		25								15μF	100μF						

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



KR3

- General
- Deflecting crack
- Soldering crack
- 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					

### Wire Bonding Mount Multilayer Microchip Capacitors for General Purpose



GMA

- 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		
GMA0D	0.38X0.38 <015015>	10					1000pF	10000pF							
GMA05	0.5X0.5 <0202>	100				100pF	1000pF								
		25					1500pF	4700pF							
		10					6800pF	22000pF							

Continued on the following page. ↗



## Ceramic Capacitor, Polymer Aluminum Electrolytic Capacitors

### High Dielectric Constant Type

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)																				
			0.1p	1p	10p	100p	1000p	10000p	0.1μ	1μ	10μ	100μ	1000μ										
GRT03	0.6X0.3 <0201>	35												0.10μF									
		25				100pF									0.10μF								
		16								10000pF					0.10μF								
		10							1500pF						1.0μF								
		6.3													2200pF								
		4														68000pF							
		2.5																				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					4.7μF		
		6.3																			22000pF	4.7μF	
		4																			1.0μF	4.7μF	
GRT18	1.6X0.8 <0603>	100								3300pF											10000pF		
		50																			1.0μF	2.2μF	
		35																			1.0μF	4.7μF	
		25																			0.15μF	10μF	
		16																			0.33μF	10μF	
		10																			10μF	22μF	
		6.3																			10μF	22μF	
GRT21	2.0X1.25 <0805>	100																			47000pF		
		50																			0.47μF	4.7μF	
		35																				4.7μF	
		25																			2.2μF	22μF	
		16																			2.2μF	22μF	
		10																			3.3μF	22μF	
		6.3																			3.3μF	47μF	
GRT31	3.2X1.6 <1206>	50																			1.0μF	10μF	
		35																				10μF	
		25																			1.5μF	10μF	
		16																			1.5μF	22μF	
		10																				47μF	
		6.3																				15μF	47μF
		4																					47μF
GRT32	3.2X2.5 <1210>	50																			3.3μF	4.7μF	
		25																				6.8μF	
		16																				47μF	
		10																				47μF	
		6.3																				33μF	100μF

### Chip Multilayer Ceramic Capacitors for Automotive



GCM

#### Temperature Compensating Type



Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)																			
			0.1p	1p	10p	100p	1000p	10000p	0.1μ	1μ	10μ	100μ	1000μ									
GCM03	0.6X0.3 <0201>	50				1.0pF			100pF													
		25				1.0pF			100pF													
GCM15	1.0X0.5 <0402>	50				1.0pF			1000pF													
GCM18	1.6X0.8 <0603>	100				1.0pF			10000pF													

Continued on the following page. ↗

## Ceramic Capacitor, Polymer Aluminum Electrolytic Capacitors

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	
GCM18	1.6X0.8 <0603>	80					1800pF	3900pF						
		50					1000pF	10000pF						
GCM21	2.0X1.25 <0805>	630			10pF				2200pF					
		250			10pF				10000pF					
		100					1000pF	3300pF						
		80					4700pF	22000pF						
		50					12000pF	22000pF						
GCM31	3.2X1.6 <1206>	1000			10pF			1000pF						
		630			10pF			4700pF						
		250					6800pF	22000pF						
		100					3900pF	0.10μF						
		80					27000pF	33000pF						
GCM32	3.2X2.5 <1210>	1000					1500pF	2200pF						
		630					1500pF	10000pF						
GCM43	4.5X3.2 <1812>	1000					3300pF	4700pF						
		630					15000pF	22000pF						
GCM55	5.7X5.0 <2220>	1000					6800pF	10000pF						
		630					33000pF	47000pF						

### High Dielectric Constant Type

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)											
			0.1p	1p	10p	100p	1000p	10000p	0.1μ	1μ	10μ	100μ	1000μ	
GCM03	0.6X0.3 <0201>	25				100pF	3300pF							
		16				330pF	3300pF							
		10					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					6800pF	22000pF						
		50							0.22μF					
		25							0.22μF	1.0μF				
		16							0.33μF	1.0μF				
		6.3								2.2μF	10μF			
		4									10μF			
GCM21	2.0X1.25 <0805>	100						33000pF	1.0μF					
		50							0.22μF	1.0μF				
		35							0.68μF	4.7μF				
		25							0.33μF	4.7μF				
		16							1.0μF	10μF				
		10							2.2μF	10μF				
		6.3									10μF			
GCM31	3.2X1.6 <1206>	100							0.22μF	2.2μF				
		50							1.0μF	4.7μF				
		25							1.0μF	10μF				
		16								4.7μF	10μF			
		10									22μF			
		6.3									22μF			
GCM32	3.2X2.5 <1210>	100								4.7μF				
		50								4.7μF	10μF			
		35									10μF			
		25									10μF	22μF		
		16									22μF			
		10										22μF	47μF	
		6.3										47μF		

Continued on the following page. ↗







Ceramic Capacitor, Polymer Aluminum Electrolytic Capacitors

3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for Automotive



NFM



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				
NFM18	1.6X0.8 <0603>	16											1.0μF				
		6.3												1.0μF			
NFM21	2.0X1.25 <0805>	50				220pF											
		16												1.0μF			
		10									0.10μF			0.47μF			
NFM31	3.2X1.6 <1206>	100															
		50															10000pF

Metal Terminal Type Multilayer Ceramic Capacitors for Automotive



KCM

Temperature Compensating Type



Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)													
			0.1p	1p	10p	100p	1000p	10000p	0.1μ	1μ	10μ	100μ	1000μ			
KCM55	6.1X5.1	630														

High Dielectric Constant Type

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)															
			0.1p	1p	10p	100p	1000p	10000p	0.1μ	1μ	10μ	100μ	1000μ					
KCM55	6.1X5.3	100												4.7μF		22μF		
		63													4.7μF		22μF	
		50													4.7μF		33μF	
		35													10μF		47μF	
		25													15μF		100μF	

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



KC3



Series	LXW (mm)	Rated Voltage (Vdc)	Capacitance Range (F)														
			0.1p	1p	10p	100p	1000p	10000p	0.1μ	1μ	10μ	100μ	1000μ				
KC355	6.1X5.3	630															
		450															
		250															

Continued on the following page. ↗

Ceramic Capacitor, Polymer Aluminum Electrolytic Capacitors

**Safety Standard Certified Metal Terminal Type Multilayer Ceramic Capacitors for Automotive**



KCA

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

Series	LXW (mm)	Rated Voltage (V)	Capacitance Range (F)																		
			0.1p	1p	10p	100p	1000p	10000p	0.1μ	1μ	10μ	100μ	1000μ								
KCA55	6.1X5.1	AC250 (r.m.s.)				100pF															

**AgPd Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive**



GCG

**Temperature Compensating Type**

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															
GCG18	1.6X0.8 <0603>	100				10pF															
		50				10pF															
GCG21	2.0X1.25 <0805>	50																			

**High Dielectric Constant Type**

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)																		
			0.1p	1p	10p	100p	1000p	10000p	0.1μ	1μ	10μ	100μ	1000μ								
GCG15	1.0X0.5 <0402>	50				220pF															
		25																			
		16																			
GCG18	1.6X0.8 <0603>	100																			
		50																			
		25																			
		16																			
		10																			
GCG21	2.0X1.25 <0805>	50																			
		35																			
		25																			
		16																			
		10																			
GCG31	3.2X1.6 <1206>	50																			
		25																			
		16																			
		6.3																			
GCG32	3.2X2.5 <1210>	50																			
		35																			
		25																			
		16																			
		6.3																			

Continued on the following page. ↗

# Ceramic capacitors SMD type For Medical Devices

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



GCH

Medical Device

## Temperature Compensating Type

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)											
			0.1p	1p	10p	100p	1000p	10000p	0.1μ	1μ	10μ	100μ	1000μ	
GCH15	1.0X0.5 <0402>	50		10pF				1000pF						
GCH18	1.6X0.8 <0603>	100		10pF				1500pF						
		50					1500pF	3300pF						
GCH21	2.0X1.25 <0805>	100					2200pF	3300pF						
		50					4700pF	22000pF						
GCH31	3.2X1.6 <1206>	100					4700pF	10000pF						
		50					33000pF	0.10μF						

## High Dielectric Constant Type

Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)											
			0.1p	1p	10p	100p	1000p	10000p	0.1μ	1μ	10μ	100μ	1000μ	
GCH03	0.6X0.3 <0201>	25					1000pF							
GCH15	1.0X0.5 <0402>	100				220pF	4700pF							
		50				220pF				0.10μF				
		25					10000pF	47000pF						
		16						47000pF	0.22μF					
		10							0.10μF	1.0μF				
GCH18	1.6X0.8 <0603>	100					10000pF	22000pF						
		50								0.22μF				
		25							0.10μF	1.0μF				
		16								0.47μF	1.0μF			
		10										2.2μF		
GCH21	2.0X1.25 <0805>	100						47000pF	1.0μF					
		50							0.47μF	1.0μF				
		35								1.0μF	4.7μF			
		25								2.2μF	4.7μF			
		16								2.2μF	4.7μF			
GCH31	3.2X1.6 <1206>	100												
		50												
		16												
		10												
		6.3												
GCH32	3.2X2.5 <1210>	50												
		10												
		6.3												

Continued on the following page. ↗



## Ceramic Capacitor, Polymer Aluminum Electrolytic Capacitors

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

Continued on the following page. ↗

## Ceramic Capacitor, Polymer Aluminum Electrolytic Capacitors

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



DE1 Type RA

#### Temperature Compensating Type

General Safety standard

Series	Rated Voltage (V)	D (mm)	Capacitance Range (F)															
			0.1p	1p	10p	100p	1000p	10000p	0.1μ	1μ	10μ	100μ	1000μ					
DE11X	X1: AC500V (r.m.s.), Y1: AC500V(r.m.s.)	6.0 to 9.0			10pF	68pF												

#### High Dielectric Constant Type

Series	Rated Voltage (V)	D (mm)	Capacitance Range (F)															
			0.1p	1p	10p	100p	1000p	10000p	0.1μ	1μ	10μ	100μ	1000μ					
DE1B3	X1: AC500V (r.m.s.), Y1: AC500V(r.m.s.)	6.0 to 9.0				100pF	680pF											
DE1E3	X1: AC500V (r.m.s.), Y1: AC500V(r.m.s.)	8.0 to 14.0					1000pF	4700pF										

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



DE1 Type RA

#### Temperature Compensating Type

General Safety standard

Series	Rated Voltage (V)	D (mm)	Capacitance Range (F)															
			0.1p	1p	10p	100p	1000p	10000p	0.1μ	1μ	10μ	100μ	1000μ					
DE11X	X1: AC440V (r.m.s.), Y1: AC300V(r.m.s.)	6.0 to 8.0			10pF	68pF												
	X1: AC440V (r.m.s.), Y1: AC250V(r.m.s.)	6.0 to 8.0			10pF	68pF												

#### High Dielectric Constant Type

Series	Rated Voltage (V)	D (mm)	Capacitance Range (F)															
			0.1p	1p	10p	100p	1000p	10000p	0.1μ	1μ	10μ	100μ	1000μ					
DE1B3	X1: AC440V (r.m.s.), Y1: AC300V(r.m.s.)	6.0 to 8.0				100pF	680pF											
	X1: AC440V (r.m.s.), Y1: AC250V(r.m.s.)	6.0 to 8.0				100pF	680pF											
DE1E3	X1: AC440V (r.m.s.), Y1: AC300V(r.m.s.)	7.0 to 12.0					1000pF	4700pF										
	X1: AC440V (r.m.s.), Y1: AC250V(r.m.s.)	7.0 to 12.0					1000pF	4700pF										

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



DE1 Type RB

#### Temperature Compensating Type

General Safety standard

Series	Rated Voltage (V)	D (mm)	Capacitance Range (F)															
			0.1p	1p	10p	100p	1000p	10000p	0.1μ	1μ	10μ	100μ	1000μ					
DE11X	X1: AC760V (r.m.s.), Y1: AC500V(r.m.s.)	6.0 to 9.0			10pF	68pF												

Continued on the following page. ↗



## Ceramic Capacitor, Polymer Aluminum Electrolytic Capacitors

### High Dielectric Constant Type

Series	Rated Voltage (V)	D (mm)	Capacitance Range (F)													
			0.1p	1p	10p	100p	1000p	10000p	0.1μ	1μ	10μ	100μ	1000μ			
DE1B3	X1: AC760V (r.m.s.), Y1: AC500V(r.m.s.)	6.0 to 9.0				100pF	680pF									
DE1E3	X1: AC760V (r.m.s.), Y1: AC500V(r.m.s.)	8.0 to 14.0				1000pF	4700pF									

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



DE2 Type SA



### Temperature Compensating Type

Series	Rated Voltage (V)	D (mm)	Capacitance Range (F)													
			0.1p	1p	10p	100p	1000p	10000p	0.1μ	1μ	10μ	100μ	1000μ			
DE21X	X1: AC440V (r.m.s.), Y2: AC400V(r.m.s.)	6.0 to 9.0			10pF	68pF										

### High Dielectric Constant Type

Series	Rated Voltage (V)	D (mm)	Capacitance Range (F)													
			0.1p	1p	10p	100p	1000p	10000p	0.1μ	1μ	10μ	100μ	1000μ			
DE2B3	X1: AC440V (r.m.s.), Y2: AC400V(r.m.s.)	6.0 to 8.0				100pF	680pF									
DE2E3	X1: AC440V (r.m.s.), Y2: AC400V(r.m.s.)	7.0 to 17.0				1000pF	10000pF									

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



DE2 Type SA



### Temperature Compensating Type

Series	Rated Voltage (V)	D (mm)	Capacitance Range (F)													
			0.1p	1p	10p	100p	1000p	10000p	0.1μ	1μ	10μ	100μ	1000μ			
DE21X	X1: AC300V (r.m.s.), Y2: AC300V(r.m.s.)	6.0 to 8.0			10pF	68pF										
	X1: AC300V (r.m.s.), Y2: AC250V(r.m.s.)	6.0 to 8.0			10pF	68pF										

### High Dielectric Constant Type

Series	Rated Voltage (V)	D (mm)	Capacitance Range (F)													
			0.1p	1p	10p	100p	1000p	10000p	0.1μ	1μ	10μ	100μ	1000μ			
DE2B3	X1: AC300V (r.m.s.), Y2: AC300V(r.m.s.)	6.0 to 7.0				100pF	680pF									
	X1: AC300V (r.m.s.), Y2: AC250V(r.m.s.)	6.0 to 7.0				100pF	680pF									
DE2E3	X1: AC300V (r.m.s.), Y2: AC300V(r.m.s.)	6.0 to 15.0				1000pF	10000pF									
	X1: AC300V (r.m.s.), Y2: AC250V(r.m.s.)	6.0 to 15.0				1000pF	10000pF									

Continued on the following page. ↗



## Ceramic Capacitor, Polymer Aluminum Electrolytic Capacitors

Series	LXW (mm)	Rated Voltage (Vdc)	Capacitance Range (F)												
			0.1p	1p	10p	100p	1000p	10000p	0.1μ	1μ	10μ	100μ	1000μ		
RCER7	5.5X5.0	1000							15000pF	22000pF					
		630							33000pF	47000pF					
		250								0.15μF	0.22μF				
		50									3.3μF	4.7μF			
		25										10μF			
	5.5X7.5	50										10μF			
		25											22μF		
	7.5X5.5	1000							33000pF	47000pF					
		630							68000pF	0.10μF					
		250								0.33μF	0.47μF				
	7.5X7.5	250								0.68μF	1.0μF				
	7.5X8.0	1000							68000pF	0.10μF					
		630								0.15μF	0.22μF				
	7.7X12.5	250										2.2μF			
7.7X13.0	1000									0.22μF					
	630										0.47μF				

### 150°C Operation Leaded MLCC for Automotive



RHE

#### Temperature Compensating Type



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

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					
	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			

Continued on the following page. ↗

Ceramic Capacitor, Polymer Aluminum Electrolytic Capacitors

175°C/200°C Operation Leaded MLCC for Automotive




RHS

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	
RHS7G	3.9X3.5	100				100pF	1500pF							
	4.2X3.5	100					1800pF	3300pF						
RHS7J	4.2X3.5	200				100pF	4700pF							
	5.5X4.0	500				100pF	4700pF							
		200						6800pF	10000pF					

Safety Standard Certified Lead Type Disc Ceramic Capacitors for Automotive




DE6

Power-train
AEC-Q200
Safety standard

Series	Rated Voltage (V)	D (mm)	Capacitance Range (F)											
			0.1p	1p	10p	100p	1000p	10000p	0.1μ	1μ	10μ	100μ	1000μ	
DE6E3	X1: AC440V (r.m.s.), Y2: AC300V(r.m.s.)	7.0 to 12.0					1000pF	4700pF						

Resin Molding SMD Type Ceramic Capacitors

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



DK1

General
Safety standard
Deflecting crack
Soldering crack

**Temperature Compensating Type**

Series	Rated Voltage (V)	LXW (mm)	Capacitance Range (F)											
			0.1p	1p	10p	100p	1000p	10000p	0.1μ	1μ	10μ	100μ	1000μ	
DK11X	X1: AC440V (r.m.s.), Y1: AC300V(r.m.s.)	11.4X6.0				10pF	47pF							
	X1: AC440V (r.m.s.), Y1: AC250V(r.m.s.)	11.4X6.0				10pF	47pF							

**High Dielectric Constant Type**

Series	Rated Voltage (V)	LXW (mm)	Capacitance Range (F)											
			0.1p	1p	10p	100p	1000p	10000p	0.1μ	1μ	10μ	100μ	1000μ	
DK1B3	X1: AC440V (r.m.s.), Y1: AC300V(r.m.s.)	11.4X6.0				100pF	680pF							
	X1: AC440V (r.m.s.), Y1: AC250V(r.m.s.)	11.4X6.0				100pF	680pF							
DK1E3	X1: AC440V (r.m.s.), Y1: AC300V(r.m.s.)	11.4X6.0					1000pF	1500pF						
	X1: AC440V (r.m.s.), Y1: AC250V(r.m.s.)	11.4X6.0					1000pF	1500pF						

Continued on the following page. ↗

# Polymer Aluminum Electrolytic Capacitors

Series	LXW (mm)	Rated Voltage (Vdc)	Capacitance Range (F)											
			0.1p	1p	10p	100p	1000p	10000p	0.1μ	1μ	10μ	100μ	1000μ	
ECAS	7.3X4.3	25									10μF	33μF		
		20										33μF	47μF	
		16									6.8μF	68μF		
		12.5									10μF	100μF		
		10									10μF	150μF		
		6.3									10μF	330μF		
		4										68μF	330μF	
		2.5											330μF	470μF
		2										100μF	560μF	
ECNS	3.5X2.8	25									10μF	15μF		
		16									15μF	33μF		
		6.3									22μF	100μF		

General

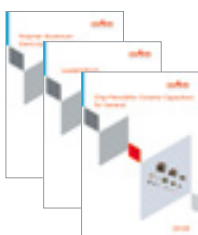
Deflecting crack

Anti-noise

Effective Cap

## Detailed Catalogs

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



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

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

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

## Single-Layer Microchip Capacitors

Very reliable performance and excellent frequency characteristics

## Temperature Compensating Type



Capacitance Change (Temperature Range)	Series	Size (mm)	Rated Voltage (Vdc)	Capacitance Range at 25°C (pF)					Operating Temperature Range (°C)
				0.1	1	10	100	1000	
0±30ppm/°C (-25 to 85°C)	CLB0A	0.25X0.25	100	0.1					-55 to 125
	CLB0C	0.35X0.25	100	0.2					-55 to 125
	CLB0D	0.38X0.38	100	0.2	0.4				-55 to 125
	CLB05	0.50X0.50	100	0.3	0.6				-55 to 125
	CLB0E	0.55X0.38	100	0.5	0.6				-55 to 125
	CLB0F	0.64X0.64	100	0.3	1.0				-55 to 125
	CLB0G	0.70X0.50	100	0.7	1.0				-55 to 125
	CLB0H	0.71X0.38	100	0.7	0.8				-55 to 125
	CLB0J	0.76X0.76	100	0.4	1.3				-55 to 125
	CLB09	0.90X0.90	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	1.49X0.90	100	2.0	2.7				-55 to 125
	CLB1G	1.73X1.27	100	3.9	4.7				-55 to 125
	CLB1H	1.78X1.78	100	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	0.50X0.50	100	1.0	2.4				-55 to 125
	CLB0E	0.55X0.38	100	1.8	2.4				-55 to 125
	CLB0F	0.64X0.64	100	2.0	4.3				-55 to 125
	CLB0G	0.70X0.50	100	2.7	3.0				-55 to 125
	CLB0H	0.71X0.38	100	2.7					-55 to 125
	CLB0J	0.76X0.76	100	3.0	6.2				-55 to 125
	CLB09	0.90X0.90	100	3.3	6.8				-55 to 125
	CLB1A	1.00X0.64	100	4.7	6.2				-55 to 125
	CLB1B	1.09X0.76	100	6.8	7.5				-55 to 125
	CLB1C	1.27X1.27	100	7.5	15				-55 to 125
	CLB1E	1.49X0.90	100	7.5	9.1				-55 to 125
	CLB1H	1.78X1.78	100	13	15				-55 to 125
	CLB2E	2.29X2.29	100	20					-55 to 125

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



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

### High Dielectric Constant Type



Capacitance Change (Temperature Range)	Series	Size (mm)	Rated Voltage (Vdc)	Capacitance Range at 25°C (pF)					Operating Temperature Range (°C)	
				0.1	1	10	100	1000		
±10% (-25 to 85°C)	CLBOA	0.25X0.25	100			5.6	12			-55 to 125
	CLBOB	0.30X0.25	100			13	15			-55 to 125
	CLBOC	0.35X0.25	100			16	18			-55 to 125
	CLBOD	0.38X0.38	100			18	30			-55 to 125
	CLBO5	0.50X0.50	100			22	43			-55 to 125
	CLBOE	0.55X0.38	100			33	43			-55 to 125
	CLBOF	0.64X0.64	100			43	75			-55 to 125
	CLBOG	0.70X0.50	100			47	68			-55 to 125
	CLBOH	0.71X0.38	100			47	56			-55 to 125
	CLBOJ	0.76X0.76	100			68	110			-55 to 125
	CLBO9	0.90X0.90	100			68	130			-55 to 125
	CLB1A	1.00X0.64	100			82	120			-55 to 125
	CLB1C	1.27X1.27	100				160	200		-55 to 125
	CLB1E	1.49X0.90	100				150	160		-55 to 125
	CLB1G	1.73X1.27	100					300		-55 to 125
	CLB1H	1.78X1.78	100					300	430	-55 to 125
CLB2E	2.29X2.29	100					470	620	-55 to 125	
+30, -80% (-25 to 85°C)	CLBOA	0.25X0.25	100			27	33			-55 to 125
	CLBOB	0.30X0.25	100			36	39			-55 to 125
	CLBOC	0.35X0.25	100			43	51			-55 to 125
	CLBOD	0.38X0.38	100			62	82			-55 to 125
	CLBO5	0.50X0.50	100			75	130			-55 to 125
	CLBOE	0.55X0.38	100			91	120			-55 to 125
	CLBOF	0.64X0.64	100			130	220			-55 to 125
	CLBOG	0.70X0.50	100			150	200			-55 to 125
	CLBOH	0.71X0.38	100			130	150			-55 to 125
	CLBOJ	0.76X0.76	100			200	300			-55 to 125
	CLBO9	0.90X0.90	100			200	390			-55 to 125
+30, -90% (-25 to 85°C)	CLB1A	1.00X0.64	100			240	360			-55 to 125
	CLBOA	0.25X0.25	100			36	56			-55 to 125
	CLBOD	0.38X0.38	100			91	150			-55 to 125
	CLBO5	0.50X0.50	100			130	220			-55 to 125
	CLBOF	0.64X0.64	100			220	390			-55 to 125
CLBOJ	0.76X0.76	100				330	560		-55 to 125	
CLBO9	0.90X0.90	100				390	680		-55 to 125	

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

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

## Thin Film Circuit Substrates (RUSUB)

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

### ■ Features

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

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

\*1 : Typical value

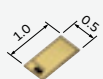
\*2 : L = length, W = width, T = thickness

\*3 : Temperature Range: -25 to 85°C, Reference Temperature: 25°C

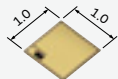
\*4 : L = line, S = space

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

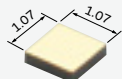
Thirteen types of standard products suitable for decoupling are also available.



RUCYT101 Series



RUCYT201 Series



RUCQD Series

(in mm)

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

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

### Detailed Catalogs

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



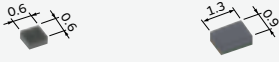
• Single-Layer Microchip Capacitors/Thin Film Circuit Substrates

Cat. No. C01E

# Variable Capacitors

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

## LXRW\_V Series



Series	LXW (mm)	Rated Voltage (Vdc)	Capacitance Range (F)										
			0.1p	1p	10p	100p	1000p	10000p	0.1μ	1μ	10μ	100μ	1000μ
LXRW0Y	0.6X0.6	CSP			33pF	90pF							
LXRW19	1.3X0.9	DFN			33pF	200pF							

# Silicon Capacitors

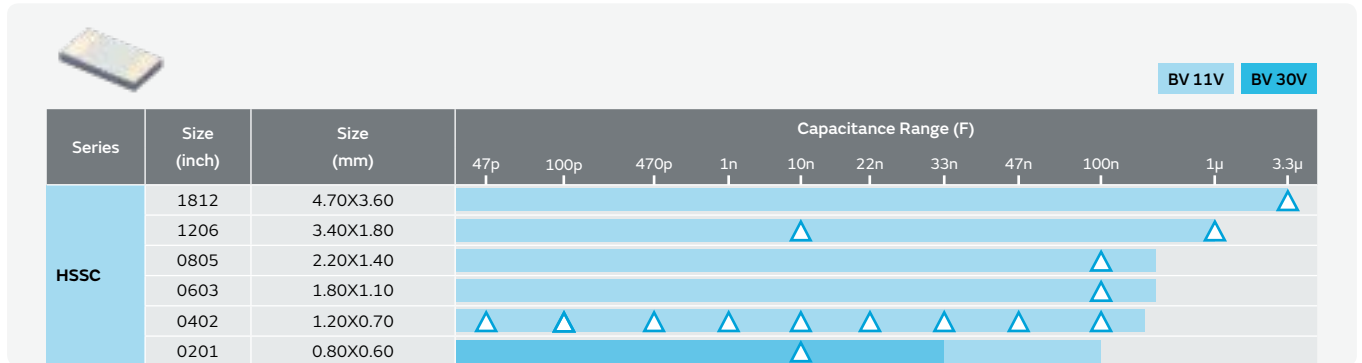
Murata High-Density Silicon Capacitors are based on a MOS Semiconductor technology and utilize a 3D structure that substantially increases their performance and enables compact design. Silicon Capacitors offer small size and low thickness, superior reliability, and stability over high temperatures and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

## Product Lineup

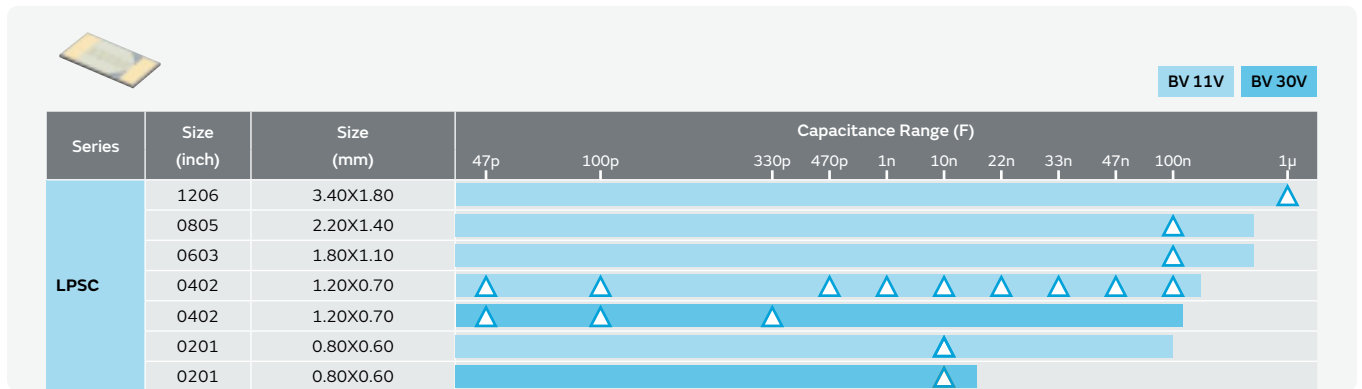
	Thickness	Standard (150°C)	High temp.	Operating Frequency	Low ESL
Solder Mounting	85μm				UESL (Typically 15pH) <b>S</b> (p39)
	100μm	LPSC <b>R All</b> (p35)		XBSC (100GHz+) UBSC (60GHz+) BBSC (40GHz) ULSC (20GHz) UBDC (60GHz+)	
	400μm	HSSC <b>All</b> (p35)	HTSC (200°C) XTSC (250°C) <b>H</b> (p35)		
Wire-bonding vertical	100μm	WLSC <b>P A B</b> (p38)			
	250μm	WBSC <b>P A B</b> (p38)	WTSC (200°C) WXSC (250°C) <b>A P H</b> (p38)		UWSC (26GHz+) (down to 10pH) <b>B P</b> (p38)
Wire-bonding /Embedded horizontal	100μm	EMSC <b>All M</b> (p35, 39) MGSC <b>M</b>			UBEC (60GHz+) BBEC (40GHz) ULEC (20GHz) <b>B</b> (p37)
	250μm		ETSC (200°C) EXSC (250°C) <b>H</b> ATSC (200°C) <b>A</b> (p36, 39)		

Target application | **A** Automotive | **H** High Reliability | **S** Signal Integrity | **B** BroadBand | **M** Medical | **All** All applications | **P** Power Amp for RF | **R** RFID

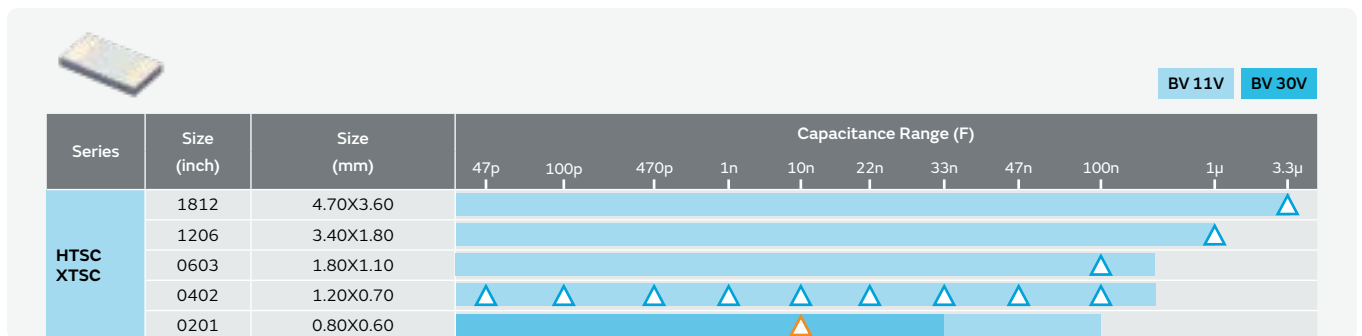
### High stability and reliability Si capacitors (HSSC)



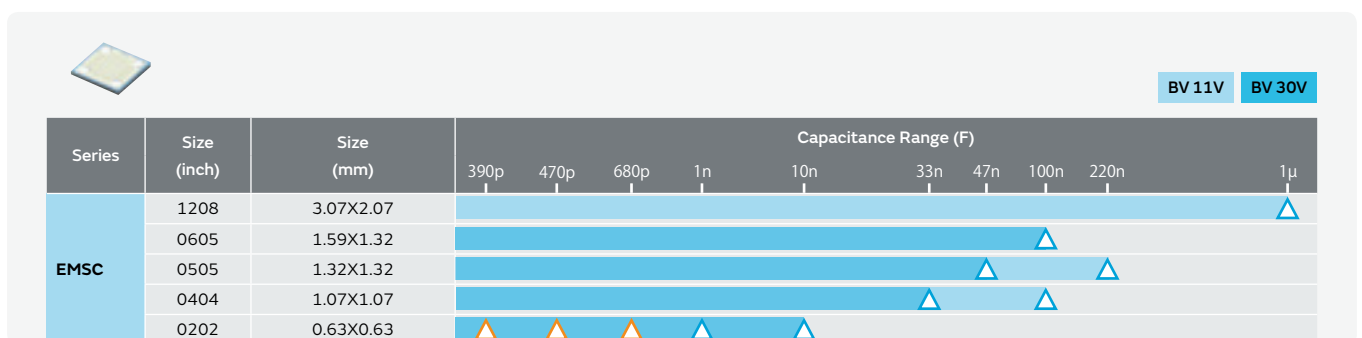
### Low-profile Si capacitors down to 100μm (LPSC)



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



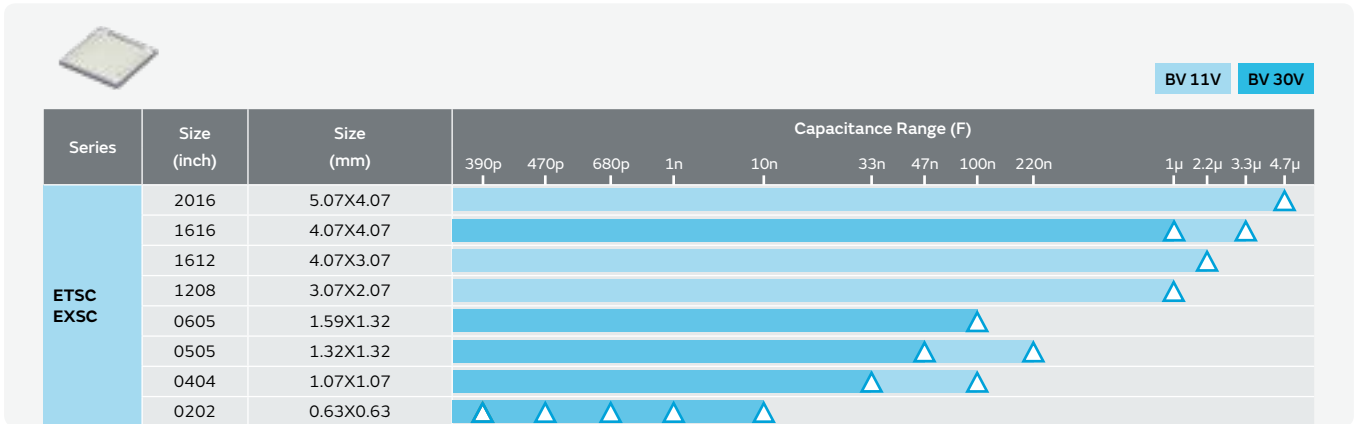
### Wire-bondable or embedded low-profile Si capacitors down to 100μm (EMSC)



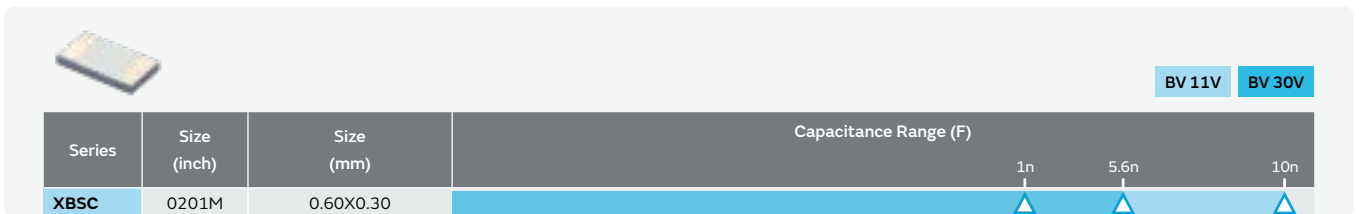
△ Available parts. For other values, contact your Murata sales representative. ▴ Under development.

## Silicon Capacitors

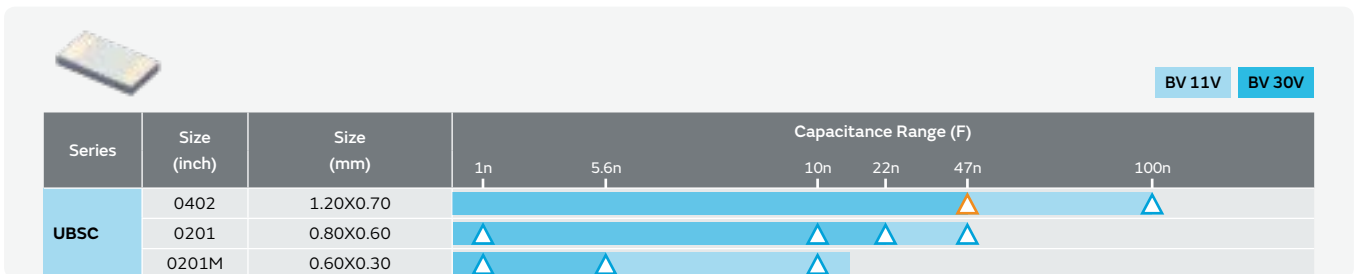
### Extreme temperature wire-bondable Si capacitors up to 250°C (ETSC/EXSC)



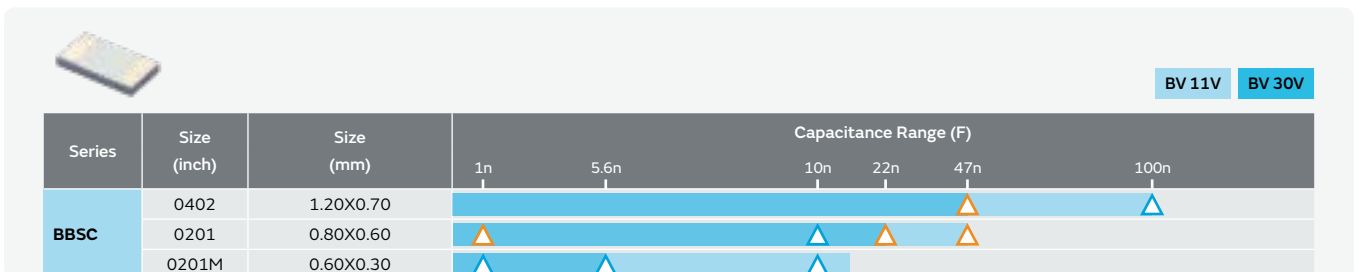
### Ultra broadband surface mounted Si capacitor up to 100GHz+ (XBSC)



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

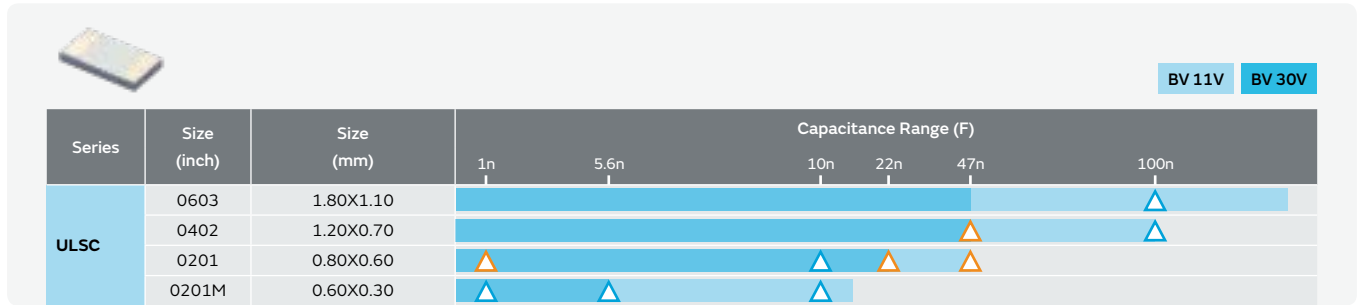


### Ultra broadband surface mounted Si capacitors up to 40GHz (BBSC)

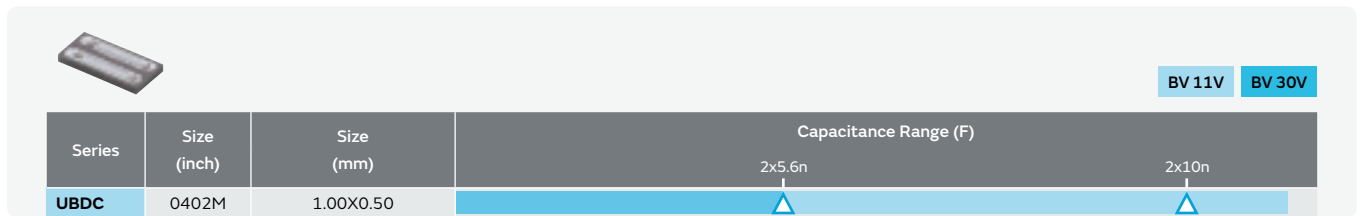


△ Available parts. For other values, contact your Murata sales representative. ▴ Under development.

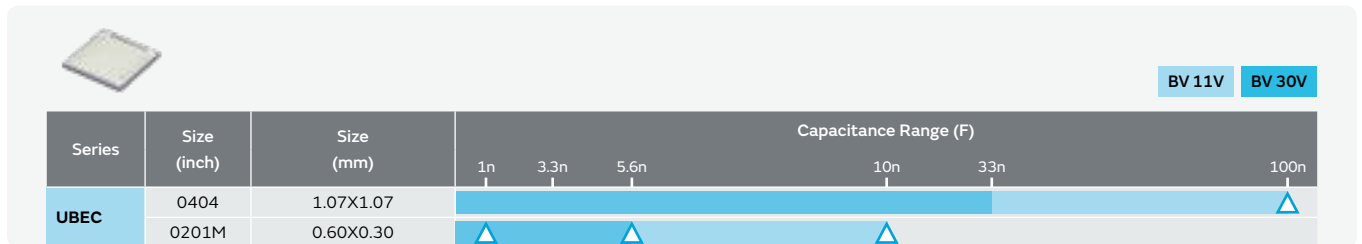
### Ultra broadband surface mounted Si capacitors up to 20GHz (ULSC)



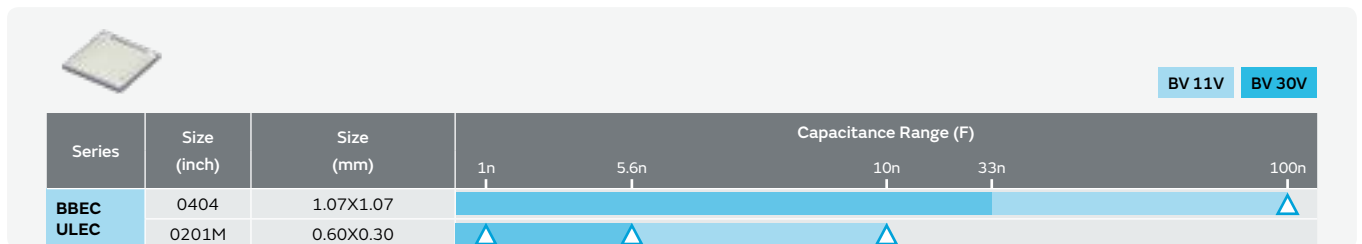
### Ultra Broadband surface mounted differential Si capacitors pairs up to 60GHz+ (UBDC)



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



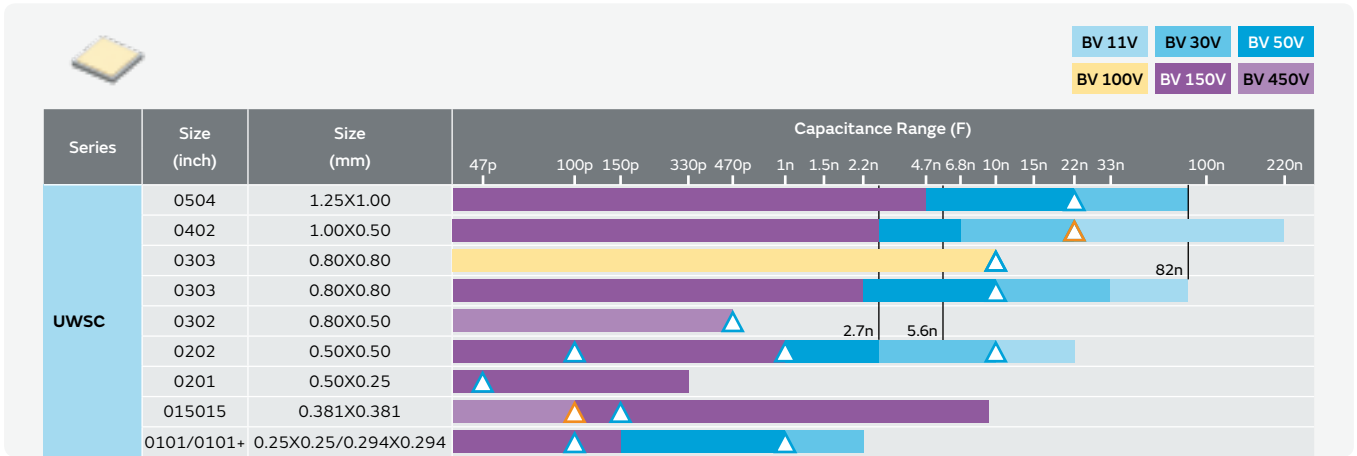
### Ultra broadband wire-bondable embedded Si capacitors up to 40/20GHz (BBEC/ULEC)



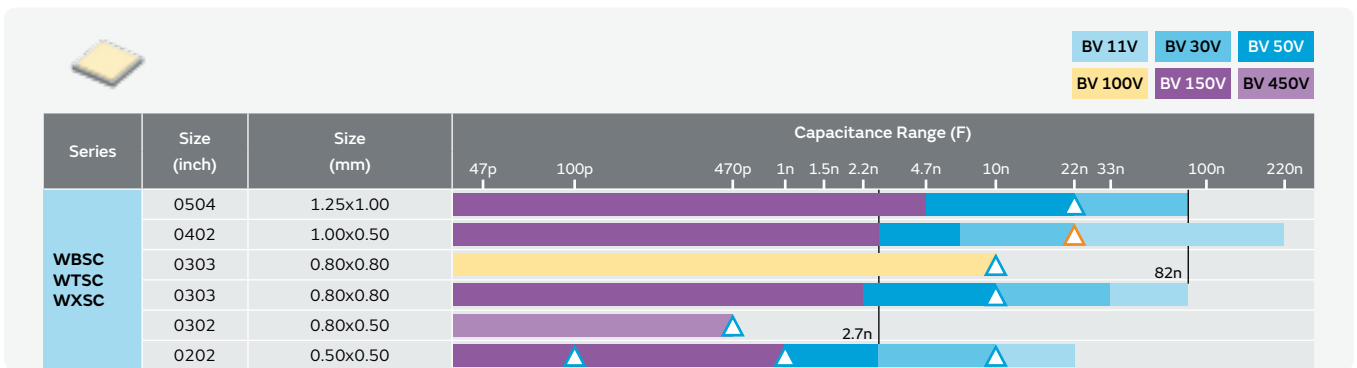
△ Available parts. For other values, contact your Murata sales representative. ▴ Under development.

## Silicon Capacitors

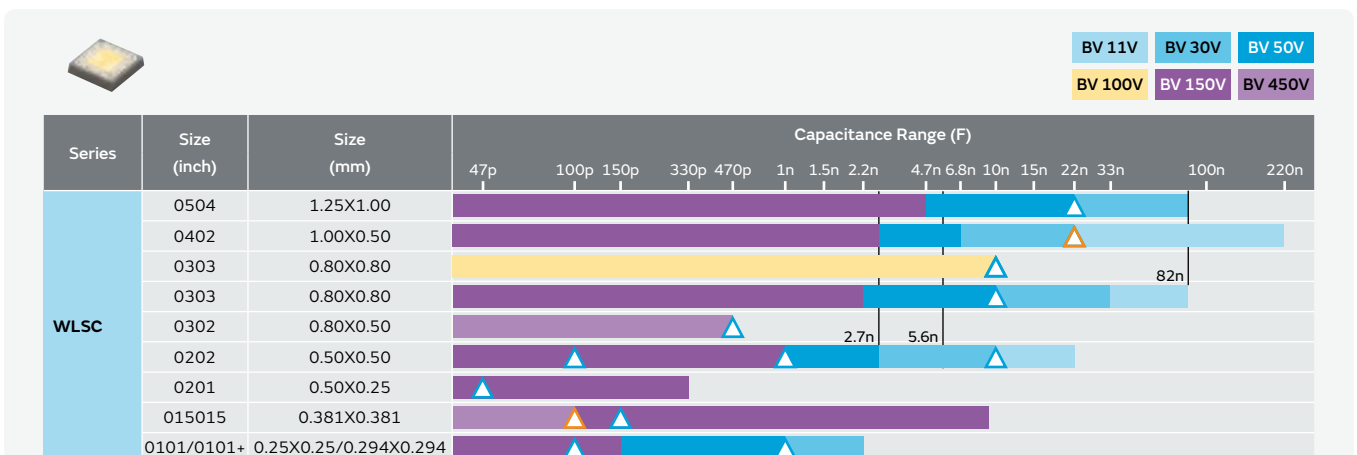
### Ultra large-band wire-bondable vertical Si capacitors up to 26GHz+ (UWSC)



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



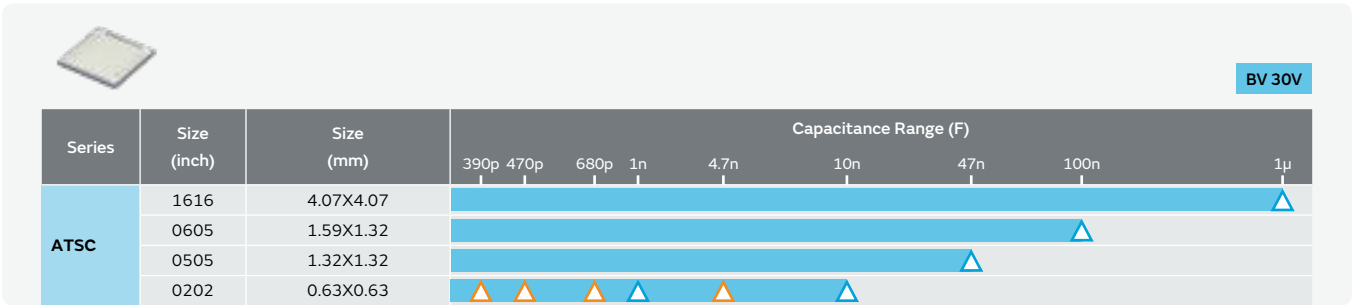
### Wire-bondable vertical low-profile Si capacitors down to 100µm (WLSC)



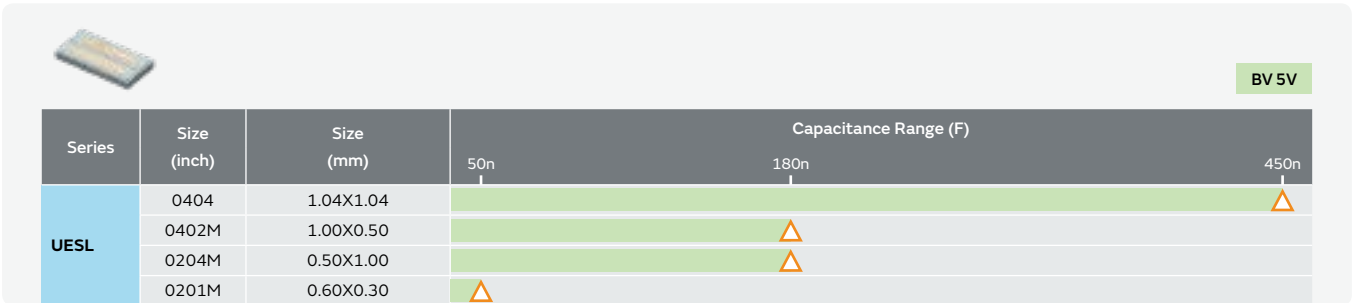
△ Available parts. For other values, contact your Murata sales representative. ▽ Under development.



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



### Ultra low ESL and ultra-low-profile Si capacitors down to 85μm (UESL)



### Medical grade Si capacitors (MGSC)

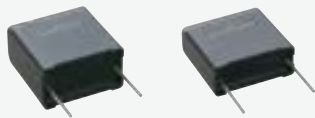


△ Available parts. For other values, contact your Murata sales representative. ▴ Under development.

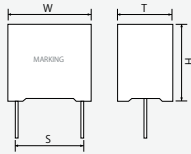
# Film Capacitors

The FH series uses materials with high heat resistance. Therefore, it has a higher allowable ripple current under a higher temperature environment than conventional PP film capacitors.

This feature is more prominent in the high-frequency range. For example, when the ambient temperature is at 105°C, the PP film capacitors would be already at its limit for allowable ripple current, but because of the higher heat resistance of the FH series, the allowable ripple current can be increased drastically.



FHA50Y206KS

FHA50Y156KS  
FHA50Y106KS

## Specifications

Items	Basic Specifications
Rated Capacitance	10,15,20 $\mu$ F
Rated Voltage	500V
Operational Life	125°C/500V 2000h
Biased Humidity	85°C/85%RH/500V 1000h

## Dimensions

Part Number	Capacitance	Dimensions (mm)			
		W	H	T	S
FHA50Y206KS	20 $\mu$ F	35.0	37.0	20.0	29.0
FHA50Y156KS	15 $\mu$ F	35.0	35.5	14.5	29.0
FHA50Y106KS	10 $\mu$ F				

# Noise Suppression Products/ EMI Suppression Filters

Broad lineup of Noise Suppression Products and EMI Suppression Filters

## Summary

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

## Lineup

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



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

## Noise Suppression Filters (Chip Ferrite Bead)/ (Frequency Specified Noise Filters)

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

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

For automotive grade products, please refer to the catalog C51E, "EMI Suppression Filters (for DC)/Chip Inductors for Automotive."

Continued on the following page. ↗







## Noise Suppression Filters (Chip Ferrite Bead)/(Frequency Specified Noise Filters)

		Series	Size Code inch (mm)	Max. Rated Current (mA)	Impedance at 100MHz (Rated Current)
For General Band Noise	Power Lines Type	<b>BLM02KX*</b>	01005 (0402)	1500	10Ω to 18Ω (1.2A to 1.5A)
		<b>BLM02PX*</b>	01005 (0402)	1100	10Ω to 60Ω (0.5A to 1.1A)
		<b>BLM03PX*</b>	0201 (0603)	1800	22Ω to 120Ω (0.9A to 1.8A)
		<b>BLM03PG</b>	0201 (0603)	900	22Ω to 33Ω (0.75A to 0.9A)
		<b>BLM15KD*</b>	0402 (1005)	3800	20Ω to 120Ω (1.5A to 3.8A)
		<b>BLM15PX*</b>	0402 (1005)	3000	33Ω to 600Ω (0.9A to 3A)
		<b>BLM15PD*</b>	0402 (1005)	2200	30Ω to 120Ω (1.3A to 2.2A)
		<b>BLM15PG</b>	0402 (1005)	1000	10Ω (1A)
		<b>BLM18PG*</b>	0603 (1608)	3000	30Ω to 470Ω (1A to 3A)
		<b>BLM21PG*</b>	0805 (2012)	6000	22Ω to 330Ω (1.5A to 6A)
		<b>BLM31PG*</b>	1206 (3216)	6000	33Ω to 600Ω (1.5A to 6A)
		<b>BLM41PG*</b>	1806 (4516)	6000	60Ω to 1000Ω (1.5A to 6A)
		<b>BLM18SN*</b> (Low DC Resistance Type)	0603 (1608)	8000	22Ω (8A)
		<b>BLM18KG*</b> (Low DC Resistance Type)	0603 (1608)	6000	26Ω to 1000Ω (1A to 6A)
		<b>BLM18SD*</b> (Low DC Resistance Type)	0603 (1608)	6000	22Ω (6A)
		<b>BLM18SG*</b> (Low DC Resistance Type)	0603 (1608)	6000	26Ω to 330Ω (1.5A to 6A)
		<b>BLM21SN*/SP*</b> (Low DC Resistance Type)	0805 (2012)	8500	30Ω to 1000Ω (1.6A to 8.5A)
		<b>BLM31SN*</b> (Low DC Resistance Type)	1206 (3216)	12000	50Ω (12A)
		<b>BLM31KN*</b>	1206 (3216)	6000	120Ω to 1000Ω (2A to 6A)
		<b>BLE18PS*</b>	0603 (1608)	8000	8.5Ω (8A)
<b>BLE32PN</b>	1210 (3225)	10000	26Ω to 30Ω (10A)		
For GHz Band Noise	Universal Type [ Power Lines/Signal Lines ]	<b>BLM03EB*</b>	0201 (0603)	600	25Ω to 50Ω (0.4A to 0.6A)
		<b>BLM15EG*</b>	0402 (1005)	1500	120Ω to 220Ω (0.7A to 1.5A)
		<b>BLM15EX*</b>	0402 (1005)	1800	120Ω to 470Ω (0.95A to 1.8A)
		<b>BLM18EG*</b>	0603 (1608)	2000	100Ω to 600Ω (0.5A to 2A)
		<b>BLM18HE*</b>	0603 (1608)	800	600Ω to 1500Ω (0.5A to 0.8A)
	Signal Lines Type	<b>BLM03HG</b>	0201 (0603)	-	600Ω to 1200Ω
		<b>BLM03HD</b>	0201 (0603)	-	330Ω to 1800Ω
		<b>BLM03HB</b>	0201 (0603)	-	190Ω to 400Ω
		<b>BLM15HG</b>	0402 (1005)	-	600Ω to 1000Ω
		<b>BLM15HD</b>	0402 (1005)	-	600Ω to 1800Ω
		<b>BLM15HB</b>	0402 (1005)	-	120Ω to 220Ω
		<b>BLM18HG</b>	0603 (1608)	-	470Ω to 1000Ω
		<b>BLM18HD</b>	0603 (1608)	-	470Ω to 1000Ω
		<b>BLM18HB</b>	0603 (1608)	-	120Ω to 330Ω
		<b>BLM18HK</b>	0603 (1608)	-	330Ω to 1000Ω
For High-GHz Band Noise	Signal Lines Type	<b>BLM15GG</b>	0402 (1005)	-	220Ω to 470Ω
		<b>BLM15GA</b>	0402 (1005)	-	75Ω
		<b>BLM18GG</b>	0603 (1608)	-	470Ω
	Power Lines Type	<b>BLM18DN*</b>	0603 (1608)	1400	150Ω to 600Ω



\* 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 (A)	Impedance at 700MHz
Frequency Specified Noise Filters	For 700MHz Band	 <b>BLF02JD*</b>	01005 (0402)	-	360Ω to 470Ω
		 <b>BLF02GD</b>	01005 (0402)	-	1600Ω
		 <b>BLF03JD*</b>	0201 (0603)	-	420Ω
		Series	Size Code inch (mm)	Max. Rated Current (A)	Impedance at 2.4GHz
Frequency Specified Noise Filters	For 2.4GHz Band	 <b>BLF02RD*</b>	01005 (0402)	-	330Ω to 470Ω
		Series	Size Code inch (mm)	Max. Rated Current (A)	Impedance at 5GHz
Frequency Specified Noise Filters	For 5GHz Band	 <b>BLF03VK*</b>	0201 (0603)	1.2	60Ω to 220Ω
		Series	Size Code inch (mm)	Max. Rated Current (A)	Impedance at 100MHz (Rated Current)
For General Band Noise	Large Current Type Power Lines Type	 <b>BLT5BPT*</b>	2020 (5050)	11	68Ω (11A)

## Noise Suppression Filters (Feed Through Chip EMI Filters)




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






## Noise Suppression Filters (Chip LC Filters)


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




## Noise Suppression Filters (Chip EMIFIL)

## Noise Suppression Filters (Chip EMIFIL)

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

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































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

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

\* 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 at 100MHz	
Signal Lines Type	For Audio Lines	 <b>DLM11GN</b>	0504 (1210)	-	600Ω	
	For Ultra-High-Speed Signal Lines	 <b>NFGONCN</b> (3 Lines)	03025 (0806)	-	25Ω	
		 <b>DLMOQSN</b>	025020 (0605)	-	50Ω to 90Ω	
		 <b>DLMOQSB</b>	025020 (0605)	-	12Ω to 35Ω	
		 <b>DLMONSN</b>	03025 (0806)	-	50Ω to 90Ω	
		 <b>DLMONSM</b>	03025 (0806)	-	90Ω	
		 <b>DLMONSB</b>	03025 (0806)	-	12Ω to 28Ω	
		 <b>DLM11SN</b>	0504 (1210)	-	45Ω to 90Ω	
		 <b>NFPOQHB</b>	025020 (0605)	-	-	
		 <b>NFPOQSB</b>	025020 (0605)	-	(90Ω)	
		 <b>DLPOQSA</b>	025020 (0605)	-	7Ω to 35Ω	
		 <b>DLPONSC</b>	03025 (0806)	-	28Ω to 90Ω	
		 <b>DLPONSN</b>	03025 (0806)	-	35Ω to 120Ω	
		 <b>DLPONSA</b>	03025 (0806)	-	7Ω to 15Ω	
		 <b>DLP11SN</b>	0504 (1210)	-	67Ω to 330Ω	
		 <b>DLP11SA</b>	0504 (1210)	-	35Ω to 90Ω	
		 <b>DLP11RN</b>	0504 (1210)	-	45Ω	
		 <b>DLP11RB</b>	0504 (1210)	-	15Ω to 40Ω	
		 <b>DLP11TB</b>	0504 (1210)	-	80Ω	
		 <b>DLP31SN</b>	1206 (3216)	-	120Ω to 550Ω	
		 <b>DLP1NDN</b> (2 circuits array)	05025 (1506)	-	35Ω to 90Ω	
		 <b>DLP2ADA</b> (2 circuits array)	0804 (2010)	-	35Ω to 90Ω	
		 <b>DLP2ADN</b> (2 circuits array)	0804 (2010)	-	67Ω to 280Ω	
		 <b>DLP31DN</b> (2 circuits array)	1206 (3216)	-	90Ω to 440Ω	
		 <b>DLW21S</b>	0805 (2012)	-	67Ω to 920Ω	
		 <b>DLW21H</b>	0805 (2012)	-	67Ω to 180Ω	
		 <b>DLW31S</b>	1206 (3216)	-	90Ω to 2200Ω	
		Universal Type [ Power Lines/Signal Lines ]	 <b>DLW44S*</b>	1515 (4040)	3100	(100Ω) to (2400Ω)
			 <b>DLW5AH/DLW5BS*</b>	2014 (5036) / 2020 (5050)	5000	(190Ω) to (4000Ω)
			 <b>DLW5AT*/DLW5BT*</b>	2014 (5036) / 2020 (5050)	6000	(50Ω) to (2700Ω)

\* 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 Filters (Chip Common Mode Choke Coils/Chip Common Mode Noise Filters), Noise Suppression Filters (Block Type)

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

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

## Noise Suppression Filters (Block Type)

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

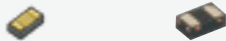


# ESD Protection Devices


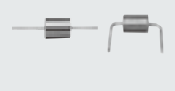




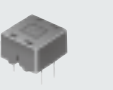

Support ESD protection for various kinds of electronic devices.

## Silicon ESD Protection Devices LXES\_T Series

Applying accumulated design technology for excellent ESD suppression performance.



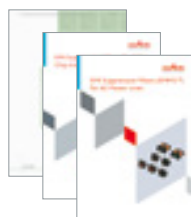
# Noise Suppression Filters (Lead Type), Others

	Series				
Lead Type EMIFIL	 <b>BLL18AG</b>	 <b>BL01</b>	 <b>BL02</b>	 <b>BL03</b>	 <b>DSS1</b>
EMIGUARD	 <b>VFC2H</b>				
Common Mode Choke Coils	 <b>PLT09H</b>	 <b>PLT10HN*</b>			

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

### 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
- Noise Suppression by EMIFIL Digital Equipment Application Manual Cat. No. C33E
- Noise Suppression by EMIFIL Application Guide Application Manual Cat. No. C35E
- Application Manual for Power Supply Noise Suppression and Decoupling for Digital ICs Cat. No. C39E

# Inductors (Coils)

Broad Lineup of Chip Inductors and Power Inductors

## Summary

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

In addition, newly adopted metal alloy material has extended the power inductor lineup.

## Lineup

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



## Online design support tool: SimSurfing

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

The screenshot displays the SimSurfing web application. At the top, it says 'Design Support Software "SimSurfing"'. Below this, there are several navigation buttons: 'Multilayer Ceramic Capacitors', 'Three-Terminal Capacitors', 'Lead Type Ceramic Capacitors', 'Resonating SMD Type Ceramic Capacitors', 'Polymer Capacitors', 'RF Inductors', and 'Power Inductors'. A red box highlights 'RF Inductors' and 'Power Inductors'. A red arrow points from 'Power Inductors' to the 'DC-DC Converter Design Support Tool' in the 'Selection Tool' section. Below the Selection Tool, there is a detailed view of the tool's output, which includes a table of inductor specifications and several graphs showing inductor characteristics.

Part Number	Value	Inductance (nH)	DC Resistance (mΩ)	Q Factor	Q Factor (100kHz)	Q Factor (1MHz)	Q Factor (10MHz)	Application
LC040-0001	0.1	100000	0.1	100	100	100	100	General
LC040-0002	0.2	200000	0.1	100	100	100	100	General
LC040-0003	0.5	500000	0.1	100	100	100	100	General
LC040-0004	1.0	1000000	0.1	100	100	100	100	General
LC040-0005	2.0	2000000	0.1	100	100	100	100	General
LC040-0006	5.0	5000000	0.1	100	100	100	100	General
LC040-0007	10.0	10000000	0.1	100	100	100	100	General
LC040-0008	20.0	20000000	0.1	100	100	100	100	General
LC040-0009	50.0	50000000	0.1	100	100	100	100	General
LC040-0010	100.0	100000000	0.1	100	100	100	100	General

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



# Inductors for Power Lines

## Main Type:

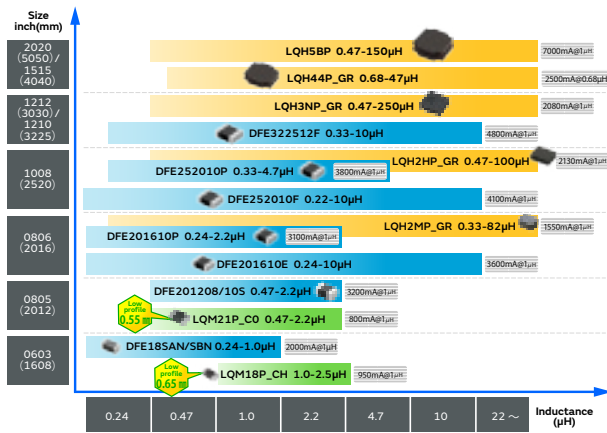
- Wound Metal Alloy
- Multilayer Type
- Wound Ferrite Core

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

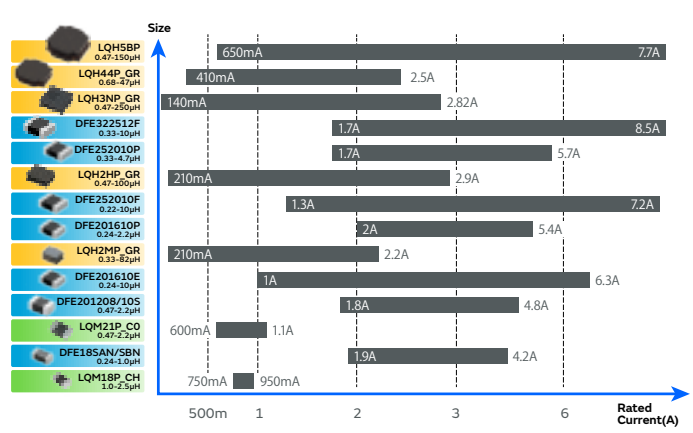
Structure	Description	Series
Wound Metal Alloy	Supports high current by using metal materials in which magnetic saturation does not occur so easily. This product can be used for a wide range of high current power circuits from smart phones to industrial electronics and automotive device applications.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

### Recommended Lineup (General)

List of inductance values

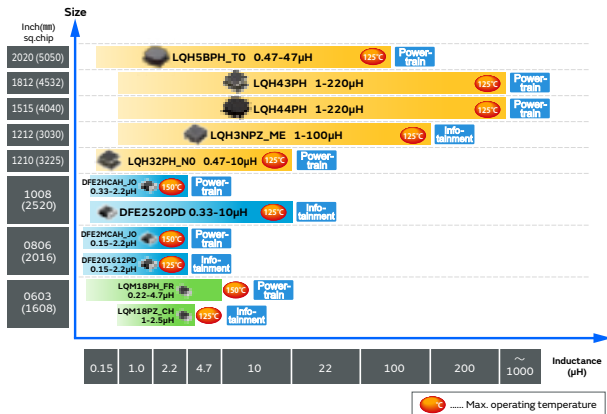


List of rated current values

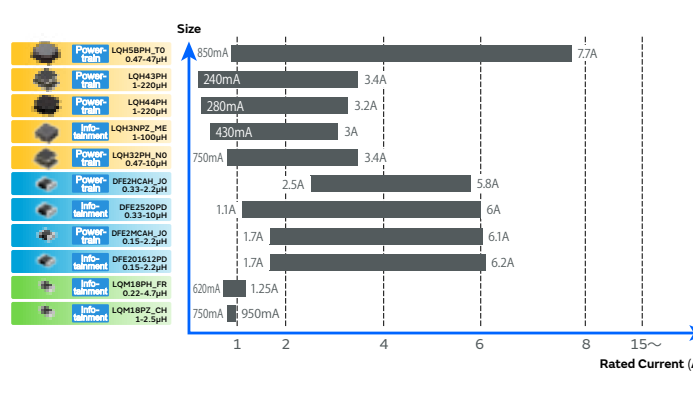


### Recommended Lineup (For Automotive)

List of inductance values











List of rated current values



**For Power Circuits (For General)**









































Structure	Size Code inch (mm)	Short Series Name/View	Series	Thickness (mm/max.)	Inductance Range	Rated Current Range	
Wound Metal Alloy	0603 (1608)	DFE18SAN	DFE18SAN_EO	0.8	240nH to 1µH	2A to 4.2A	
			DFE18SAN_GO	1.0	240nH to 1µH	2.1A to 4.9A	
		DFE18SBN	DFE18SBN_EO	0.8	470nH to 1µH	1.9A to 3.1A	
LQM18PN			LQM18PN_B0	0.4	1.5µH	600mA	
		LQM18PN_CO	0.55	470nH to 2.2µH	700mA to 850mA		
		LQM18PN_DO	0.75	2.5µH	700mA		
	LQM18PN_DH	0.75	2.2µH	650mA			
	LQM18PN_F0	0.95	1µH	600mA			
	LQM18PN_FH	0.95	470nH to 2.2µH	700mA to 1.4A			
	LQM18PN_FR	0.95	220nH to 4.7µH	620mA to 1.25A			
	LQM18PN_GH	1.0	1µH to 3.3µH	1.05A			
Wound Metal Alloy	0805 (2012)	DFE2012	DFE201208S	0.8	470nH to 2.2µH	1.8A to 4A	
			DFE201210S	1.0	470nH to 2.2µH	2.1A to 4.8A	
			DFE201210U	1.0	240nH to 2.2µH	2A to 6.5A	
Multilayer Type		LQM21PN	LQM21PN_CO	0.55	470nH to 2.2µH	600mA to 1.1A	
			LQM21PN_CA	0.65	2.2µH	1.05A	
			LQM21PN_CH	0.55	470nH to 2.2µH	1.05A to 1.6A	
			LQM21PN_EH	0.8	240nH to 2.2µH	1.1A to 2.8A	
			LQM21PN_GO	1.0	470nH to 3.3µH	800mA to 1.3A	
			LQM21PN_GC	1.0	1µH to 2.2µH	800mA to 900mA	
			LQM21PN_GH	1.0	470nH to 4.7µH	1A to 2.4A	
			LQM21PN_GR	1.0	1µH to 4.7µH	800mA to 1.3A	
Wound Metal Alloy		0806 (2016)	DFE2016	DFE201610C	1.0	560nH to 2.2µH	1.5A to 2.8A
				DFE201610E	1.0	240nH to 10µH	1A to 6.3A
				DFE201610P	1.0	240nH to 2.2µH	2A to 5.4A
				DFE201610R	1.0	470nH to 2.2µH	1.6A to 3A
	DFE201612C			1.2	470nH to 2.2µH	1.6A to 3.4A	
	DFE201612E			1.2	240nH to 4.7µH	1.8A to 6.6A	
	DFE201612P			1.2	240nH to 2.2µH	2.1A to 6.5A	
	DFE201612R			1.2	470nH to 2.2µH	1.7A to 3.5A	
Wound Ferrite Core	LQH2MCN		LQH2MCN_O2	0.95	1µH to 82µH	90mA to 485mA	
			LQH2MCN_52	0.7	1µH to 22µH	130mA to 595mA	
Multilayer Type	LQH2MPN		LQH2MPN_GR	0.95	330nH to 82µH	210mA to 2.2A	
			LQM2MPN	LQM2MPN_DH	0.7	2.2µH	1.27A
	LQM2MPN_EH			0.8	240nH to 2.2µH	1.1A to 4.1A	
	LQM2MPN_GO			1.0	470nH to 4.7µH	1.1A to 1.6A	
			LQM2MPN_GH	1.0	160nH to 2.2µH	1.3A to 5A	

Continued on the following page. ↗








Structure	Size Code inch (mm)	Short Series Name/View	Series	Thickness (mm/max.)	Inductance Range	Rated Current Range						
Wound Metal Alloy	1008 (2520)	DFE2520		DFE252007F	0.7	470nH to 4.7µH	1.2A to 3.3A					
				DFE252008C	0.8	470nH to 4.7µH	1.1A to 3A					
				DFE252008U	0.8	470nH to 10µH	1A to 4.5A					
				DFE252010C	1.0	470nH to 10µH	1A to 3.5A					
				DFE252010F	1.0	220nH to 10µH	1.7A to 7.2A					
				DFE252010P	1.0	330nH to 4.7µH	1.7A to 5.7A					
				DFE252010R	1.0	1µH to 4.7µH	1.4A to 3A					
				DFE252012C	1.2	470nH to 10µH	1A to 3.8A					
				DFE252012F	1.2	330nH to 10µH	1.4A to 7.6A					
				DFE252012P	1.2	330nH to 4.7µH	2A to 6.6A					
				DFE252012R	1.2	1µH to 4.7µH	1.7A to 3.4A					
Wound Ferrite Core	1008 (2520)	LQH2HPN		LQH2HPN_DR	0.6	470nH to 22µH	270mA to 1.67A					
				LQH2HPN_GR	1.0	470nH to 100µH	210mA to 2.9A					
				LQH2HPN_JR	1.2	470nH to 22µH	540mA to 3.5A					
Multilayer Type	1008 (2520)	LQM2HPN		LQM2HPN_CH	0.55	240nH to 2.2µH	850mA to 2.55A					
				LQM2HPN_E0	0.8	560nH	1.5A					
				LQM2HPN_EH	0.8	240nH to 2.2µH	1.3A to 4.5A					
				LQM2HPN_GO	1.0	470nH to 4.7µH	1.1A to 1.8A					
				LQM2HPN_GC	1.0	1µH to 4.7µH	800mA to 1.5A					
				LQM2HPN_GH	1.0	240nH to 2.2µH	1.5A to 5A					
				LQM2HPN_GS	1.0	2.2µH to 4.7µH	1A to 1.1A					
				LQM2HPN_J0	1.2	1µH to 3.3µH	1A to 1.5A					
LQM2HPN_JH	1.2	470nH to 2.2µH	1.5A to 3.2A									
Wound Ferrite Core	3mm square	DEM28/DEM35		DEM2812C	1.2	470nH to 12µH	760mA to 3.1A					
				DEM2815C	1.5	470nH to 15µH	800mA to 3.9A					
				DEM2818C	1.8	470nH to 12µH	1A to 4.7A					
				DEM3512C	1.2	680nH to 22µH	530mA to 2.5A					
				DEM3518C	1.8	560nH to 22µH	880mA to 3.4A					
		LQH3NPN		LQH3NPN_GR	1.0	470nH to 250µH	140mA to 2.82A					
					LQH3NPN_JR	1.2	680nH to 47µH	570mA to 2.86A				
					LQH3NPN_ME	1.5	1µH to 100µH	430mA to 3A				
					Multilayer Type	1206 (3216)	LQM31PN		LQM31PN_00	0.95	470nH to 4.7µH	700mA to 1.4A
									Wound Metal Alloy	DFE3225		DFE322510C
DFE322512C	1.2	470nH to 10µH	1.2A to 4.7A									
DFE322512F	1.2	330nH to 10µH	1.7A to 8.5A									
Wound Ferrite Core	1210 (3225)	LQH32P		LQH32PB_N0	1.7	470nH to 120µH	200mA to 3.4A					
				LQH32PB_NC	1.7	470nH to 22µH	650mA to 4.4A					
				LQH32PN_N0	1.7	470nH to 120µH	200mA to 3.4A					
				LQH32PN_NC	1.7	470nH to 22µH	650mA to 4.4A					
Multilayer Type	1210 (3225)	LQM32PN		LQM32PN_GO	1.0	1µH	1.8A					
				LQM32PN_GC	1.0	1µH	2.2A					

Continued on the following page. ↗













## Inductors for Power Lines

Structure	Size Code inch (mm)	Short Series Name/View	Series	Thickness (mm/max.)	Inductance Range	Rated Current Range	
Wound Metal Alloy	4mm square	FDSD04	 FDSD0412	1.2	330nH to 4.7µH	2.5A to 7.5A	
			 FDSD0415	1.5	220nH to 4.7µH	2.9A to 12A	
			 FDSD0420	2.0	330nH to 10µH	2.5A to 11A	
			 FDSD0420W	2.0	15µH to 22µH	1.5A to 1.9A	
Wound Ferrite Core		LQH44PN	 LQH44PN_GR	1.0	680nH to 47µH	410mA to 2.5A	
			 LQH44PN_J0	1.2	1µH to 47µH	380mA to 2A	
			 LQH44PN_P0	1.8	1µH to 22µH	800mA to 2.95A	
		LQH43P	 LQH43PB_26	2.8	1µH to 220µH	240mA to 3.4A	
			 LQH43PN_26	2.8	1µH to 220µH	240mA to 3.4A	
		DEM4518	 DEM4518C	1.8	1.2µH to 22µH	1A to 3.5A	
Wound Ferrite Core		5mm square	LQH5BP	 LQH5BPB_T0	2.2	470nH to 22µH	1.4A to 7.7A
				 LQH5BPN_38	4.0	1µH to 150µH	650mA to 7A
	 LQH5BPN_T0			2.2	470nH to 22µH	1.4A to 7.7A	
	D52LC/D53LC		 D52LC	2.0	1.2µH to 100µH	260mA to 2.44A	
			 D53LC	3.0	1.1µH to 220µH	350mA to 3.87A	
	FDV05		 FDV0530S	3.0	0.12µH to 2.2µH	4.5A to 18A	
Wound Metal Alloy	FDSD05		 FDSD0512	1.2	1µH to 6.8µH	2.3A to 6.1A	
			 FDSD0515	1.5	1µH to 4.7µH	3.2A to 7A	
			 FDSD0518	1.8	680nH to 10µH	2.7A to 9A	
Wound Ferrite Core	6 to 9mm square		DG60	 DG6028C	2.8	1µH to 22µH	1.7A to 5.8A
				 DG6045C	4.5	1µH to 100µH	900mA to 9.5A
				 DG6050C	5.0	1.2µH to 100µH	1.2A to 9.8A
		D63	 D63LCB	3.0	1µH to 150µH	440mA to 4.52A	
		DS75LC	 DS75LC	5.0	1µH to 470µH	430mA to 9.2A	
		DEM80	 DEM8030C	3.0	2.2µH to 47µH	1.3A to 6.2A	
			 DEM8040C	4.0	1.5µH to 33µH	2.4A to 10A	
			 DEM8045C	4.5	1.5µH to 47µH	2.1A to 11.2A	
		DG80	 DG8040C	4.0	1µH to 100µH	1.3A to 10.4A	
		Wound Metal Alloy	FCUL05	 FCUL0530	3.0	360nH to 470nH	16A to 18A
				 FDSD06	3.0	680nH to 10µH	5.4A to 17A
				FCUL06	 FCUL0624	2.4	220nH to 470nH
 FCUL0630	3.0				120nH to 680nH	15A to 32A	
Wound Metal Alloy	FDV05/FDV06	 FDV0530	3.0	110nH to 4.7µH	3.6A to 19.6A		
		 FDV0618	1.8	240nH to 3.3µH	4.1A to 14A		
		 FDV0620	2.0	200nH to 4.7µH	3.5A to 16.2A		
		 FDVE0630	3.0	160nH to 10µH	3.1A to 20.7A		
	FDUE06	 FDVE0640	4.0	1.5µH to 4.7µH	5A to 8.2A		
		 FDUE0630	3.0	120nH to 240nH	27A to 36A		
		 FDUE0640	4.0	150nH to 420nH	22A to 33A		
		 FDUE0650	5.0	600nH to 1µH	16A to 18A		

Continued on the following page. ↗

Structure	Size Code inch (mm)	Short Series Name/View	Series	Thickness (mm/max.)	Inductance Range	Rated Current Range
Wound Ferrite Core	10mm square and over	DEM10050	 DEM10050C	5.0	1.5µH to 33µH	3.5A to 15.3A
			DEM10050C_DD	5.0	1.5µH to 33µH	3.5A to 15.3A
		DS10/DS12	 DS104C2	4.8	1.1µH to 120µH	970mA to 11.7A
			DS106C2	6.8	1.2µH to 330µH	690mA to 12A
			DS126C2	6.8	1.7µH to 680µH	580mA to 11.8A
Wound Metal Alloy		FDA10/FDA12	 FDA1055	5.5	560nH to 5.6µH	8A to 27.7A
			FDA1254	5.4	680nH to 8µH	9.1A to 29.1A
		FDUE10	 FDUE1040D	4.0	220nH to 1µH	18A to 32A
		FDVE10	 FDVE1040	4.0	1.5µH to 10µH	6.1A to 14.6A
		FCUL10	 FCUL1040	4.0	180nH to 420nH	34A to 53A
	FCUL1060		6.0	360nH to 560nH	34A to 41A	
	FDUE12	 FDUE1245	4.5	500nH to 2.2µH	17A to 30A	
		FDUE1260	6.0	450nH	34A	

**For Choke Circuits (For General)**

Structure	Size Code inch (mm)	Short Series Name/View	Series	Thickness (mm/max.)	Inductance Range	Rated Current Range
Wound Ferrite Core	0402 (1005)	LQW15DN	 LQW15DN_00	0.7	10µH to 15µH	100mA to 120mA
Multilayer Type	0603 (1608)	LQM18FN	 LQM18FN_00	0.9	1µH to 10µH	50mA to 150mA
	0805 (2012)	LQM21DN	 LQM21DN_00	1.05	1µH to 47µH	7mA to 60mA
			LQM21FN_00	1.45	1µH to 47µH	7mA to 220mA
		LQM21FN	 LQM21FN_70	1.45	4.7µH to 10µH	100mA to 120mA
	LQM21FN_80	 LQM21FN_80	1.45	4.7µH to 10µH	100mA to 120mA	
Wound Ferrite Core	1206 (3216)	LQH31CN	 LQH31CN_03	2.0	120nH to 100µH	80mA to 970mA
	1210 (3225)	LQH32CN	 LQH32CN_23	2.2	1µH to 560µH	60mA to 800mA
			LQH32CN_33	2.2	150nH to 10µH	450mA to 1.45A
		LQH32DN	 LQH32DN_53	1.7	1µH to 100µH	100mA to 1A
			LQH32DN_23	2.2	1µH to 560µH	60mA to 800mA
	LQH32DN_53	 LQH32DN_53	1.7	1µH to 100µH	100mA to 1A	
	4mm square	LQH43CN	 LQH43CN_03	2.8	1µH to 470µH	90mA to 1.08A
	LQH43CN_33		2.8	560nH to 3.9µH	1.6A to 2.95A	
	5mm square	LQH55DN	 LQH55DN_03	5.0	120nH to 10mH	50mA to 6A
6 to 9mm square	LQH66SN	 LQH66SN_03	5.0	270nH to 10mH	50mA to 6A	













**For Power Circuits (Infotainment)**



Structure	Size Code inch (mm)	Short Series Name/View	Series	Thickness (mm/max.)	Inductance Range	Rated Current Range
Multilayer Type	0603 (1608)	LQM18PZ	LQM18PZ_CH	0.6	1µH to 2.5µH	750mA to 950mA
			LQM18PZ_DH	0.75	2.2µH	650mA
			LQM18PZ_FH	0.95	2.2µH	700mA
	0805 (2012)	LQM21PZ	LQM21PZ_C0	0.55	470nH to 2.2µH	600mA to 1.1A
			LQM21PZ_G0	1.0	470nH to 3.3µH	800mA to 1.3A
			LQM21PZ_GC	1.0	1µH to 2.2µH	800mA to 900mA
			LQM21PZ_GR	1.0	1µH to 4.7µH	800mA to 1.3A
Multilayer Type	0806 (2016)	DFE2016	DFE201612P_D	1.2	150nH to 2.2µH	1.7A to 6.2A
		LQH2MPZ	LQH2MPZ_GR	0.95	330nH to 82µH	210mA to 2.2A
		LQM2MPZ	LQM2MPZ_G0	1.0	470nH to 4.7µH	1.1A to 1.6A
			LQM2MPZ_JH	1.2	100nH	4A
Wound Ferrite Core	1008 (2520)	LQH2HPZ	LQH2HPZ_DR	0.6	470nH to 22µH	270mA to 1.67A
			LQH2HPZ_GR	1.0	470nH to 22µH	460mA to 2.9A
			LQH2HPZ_JR	1.2	470nH to 22µH	540mA to 3.5A
Multilayer Type	1008 (2520)	LQM2HPZ	LQM2HPZ_E0	0.8	560nH	1.5A
			LQM2HPZ_G0	1.0	470nH to 4.7µH	1.1A to 1.8A
			LQM2HPZ_GC	1.0	1µH to 4.7µH	800mA to 1.5A
			LQM2HPZ_GS	1.0	2.2µH to 4.7µH	1A to 1.1A
			LQM2HPZ_J0	1.2	1µH to 3.3µH	1A to 1.5A
Wound Metal Alloy		DFE2520	DFE252012P_D	1.2	330nH to 10µH	1.1A to 6A
Wound Ferrite Core	3mm square	LQH3NPZ	LQH3NPZ_GR	1.0	470nH to 47µH	460mA to 2.82A
			LQH3NPZ_JR	1.2	680nH to 47µH	570mA to 2.86A
			LQH3NPZ_ME	1.5	1µH to 100µH	430mA to 3A
Wound Metal Alloy		DFE3225	DFE322520F_D	2.0	1µH to 4.7µH	3.4A to 7.5A
Wound Ferrite Core	1210 (3225)	LQH32PZ	LQH32PZ_N0	1.7	470nH to 120µH	200mA to 3.4A
			LQH32PZ_NC	1.7	470nH to 22µH	650mA to 4.4A
	4mm square	LQH44PZ	LQH44PZ_GR	1.0	680nH to 47µH	410mA to 2.5A
			LQH43PZ	2.8	1µH to 220µH	240mA to 3.4A
	5mm square	LQH5BPZ	LQH5BPZ_T0	2.2	470nH to 22µH	1.4A to 7.7A
	6 to 9mm square	DEM80	DEM8045C_Z	4.5	1.5µH to 47µH	2.1A to 11.2A



## For Power Circuits (Powertrain)

Structure	Size Code inch (mm)	Short Series Name/View	Series	Thickness (mm/max.)	Inductance Range	Rated Current Range
Multilayer Type	0603 (1608)	LQM18PH	 LQM18PH_FR	0.95	220nH to 4.7µH	620mA to 1.25A
	0805 (2012)	LQM21PH	 LQM21PH_GO	1.0	0.47µH to 0.54µH	1.3A
			 LQM21PH_GC	1.0	1.0µH to 2.2µH	800mA to 1A
Wound Metal Alloy	0806 (2016)	DFE2MCAH	 DFE2MCAH_JO	1.2	0.15µH to 2.2µH	1.7A to 6.1A
	1008 (2520)	DFE2HCAH	 DFE2HCAH_JO	1.2	330nH to 2.2µH	2.5A to 5.8A
Wound Ferrite Core	1210 (3225)	LQH32PH	 LQH32PH_N0	1.7	470nH to 10µH	750mA to 3.4A
			 LQH32PH_NC	1.7	470nH to 22µH	650mA to 4.4A
	4mm square	LQH44PH	 LQH44PH_PR	1.8	1µH to 220µH	330mA to 4.3A
		LQH43PH	 LQH43PH_T6	2.8	1µH to 220µH	240mA to 3.4A
	5mm square	LQH5BPH	 LQH5BPH_T0	2.2	0.47µH to 47µH	850mA to 7.7A

## For Choke Circuits (Infotainment)

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

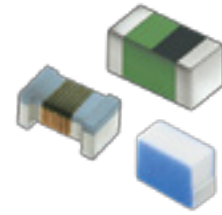
## For Choke Circuits (Powertrain)

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

# RF Inductors

## Main Type:

- Film Type
- Wire Wound Type
- Multilayer Type



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

### General (0.8×0.4 mm or less)

Lineup list

High ↑ Q	<b>LQP series category</b> LQP**TN/LQP**TG series; standard type LQP** TQ series; High Q type LQP** HQ series; super High Q type				
High Current	Q value @800MHz for item around 10nH				
Size inch/mm	(080804/0201) 0.25 × 0.125mm	(01005/0402) 0.4 × 0.2mm	(0201/0503) 0.6 × 0.3mm	(0201/0503) 0.53 × 0.4mm	(0301/0504) 0.8 × 0.4mm

### General (1.0×0.5 mm or more)

Lineup list














High ↑ Q	<b>LQW series category</b> LQW**00 series; standard Q type LQW** 10 series; High Q type LQW** 80 series; High Q and large current			
High Current	Q value @800MHz for item around 10nH			
Size inch/mm	(0402/2005) 1.0 × 0.5mm	(0503/1608) 1.6 × 0.8mm	(0808/2015) 2.0 × 1.5mm	(1008/2520) 2.5 × 2.0mm

### For Automotive

Lineup list

High ↑ Q	<b>For infotainment</b>		<b>For powertrain/safety</b>	
High Current	Q value @800MHz for item around 10nH		Q value @800MHz for item around 10nH	
Size inch/mm	(0201/0503) 0.6 × 0.3mm	(0402/1005) 1.0 × 0.5mm	(0503/1608) 1.6 × 0.8mm	(0402/1005) 1.0 × 0.5mm

## RF Circuits (0.8 x 0.4 mm or less)

Structure	Size Code inch (mm)	Short Series Name/View	Series	Thickness (mm/max.)	Inductance Range	Rated Current Range
Wound non-magnetic type	0201 (0603)	LQW03A	 LQW03AW_00	0.45	1nH to 15.5nH	230mA to 900mA
	03019 (0805)	LQW04A	 LQW04AN_00	0.45	0.8nH to 33nH	140mA to 1.8A
			 LQW04AN_10	0.45	36nH to 56nH	180mA to 200mA
			 LQW04AN_20	0.45	36nH to 56nH	120mA to 155mA
Film type	008004 (0201)	LQP01	 LQP01HQ	0.213	0.3nH to 2.7nH	200mA to 500mA
	01005 (0402)	LQP02	 LQP02HQ_02	0.32	0.2nH to 56nH	100mA to 1A
			 LQP02TQ_02	0.22	0.2nH to 22nH	120mA to 990mA
			 LQP02TN_02	0.22	0.2nH to 39nH	90mA to 320mA
	0201 (0603)	LQP03	 LQP03HQ_02	0.42	0.5nH to 470nH	50mA to 1.1A
			 LQP03TQ_02	0.32	0.6nH to 110nH	70mA to 1A
			 LQP03TN_02	0.33	0.6nH to 270nH	60mA to 850mA
			 LQP03TG_02	0.33	0.1nH to 120nH	80mA to 850mA
			 LQP03PN_02	0.33	2.2nH to 4.7nH	900mA to 1.4A

## RF Circuits (1.0 x 0.5 mm or more)

Structure	Size Code inch (mm)	Short Series Name/View	Series	Thickness (mm/max.)	Inductance Range	Rated Current Range
Wound non-magnetic type	0402 (1005)	LQW15A	 LQW15AN_00	0.6	1.5nH to 120nH	110mA to 1A
			 LQW15AN_10	0.6	1.3nH to 8.4nH	640mA to 1.2A
			 LQW15AN_80	0.6	1.3nH to 75nH	320mA to 3.15A
			 LQW15AW_80	0.66	51nH to 220nH	220mA to 480mA
	0603 (1608)	LQW18A	 LQW18AN_00	1.0	2.2nH to 470nH	75mA to 850mA
			 LQW18AN_10	1.0	2.2nH to 33nH	550mA to 1.4A
			 LQW18AN_80	1.0	2.2nH to 390nH	190mA to 3.2A
			 LQW18AS_00	1.0	1.2nH to 390nH	100mA to 700mA
			 LQW18AS_0C	1.0	1.6nH to 390nH	100mA to 700mA
	0806 (2016)	LQW2B	 LQW2BAN_00	1.52	3.2nH to 200nH	750mA to 3.8A
			 LQW2BAS_00	1.52	2.7nH to 1μH	170mA to 910mA
			 LQW2BHN_03	1.78	3.3nH to 470nH	160mA to 1.32A
			 LQW2BHN_13	1.78	2.7nH to 27nH	900mA to 1.9A
	1008 (2520)	LQW2U	 LQW2UAS_00	2.03	12nH to 4.7μH	260mA to 1A
			 LQW2UAS_0C	2.03	12nH to 8.2μH	170mA to 1A
	1206 (3216)	LQW31H	 LQW31HN_03	2.0	8.8nH to 100nH	230mA to 750mA
Film type	0402 (1005)	LQP15M	 LQP15MN_02	0.45	1nH to 33nH	60mA to 400mA
	0603 (1608)	LQP18M	 LQP18MN_02	0.6	1.3nH to 100nH	50mA to 300mA
Multilayer Type	0402 (1005)	LQG15H	 LQG15HN_02	0.55	1nH to 120nH	150mA to 1A
			 LQG15HS_02	0.55	1nH to 270nH	110mA to 1A
	0603 (1608)	LQG18H	 LQG18HN_00	0.95	1.2nH to 100nH	350mA to 1.1A

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

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

### LC trap filter

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

### For RF Circuits (Infotainment)

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

### For RF Circuits (Powertrain)

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

### For Choke/Tuner Circuits (Infotainment)

Structure	Size Code inch (mm)	Short Series Name/View	Series	Thickness (mm/max.)	Inductance Range	Rated Current Range
Wound Ferrite Core type	0402 (1005)	LQW15C	LQW15CN_OZ	0.6	18nH to 200nH	390mA to 1.4A
			LQW15CN_1Z	0.6	20nH to 560nH	300mA to 2.2A
	0603 (1608)	LQW18C	LQW18CN_OZ	0.95	4.9nH to 650nH	430mA to 2.6A
	1206 (3216)	LQH31H	LQH31HZ_03	2.0	54nH to 880nH	180mA to 920mA

## General Circuit Inductors

Main Type:

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



We have an extensive lineup of general purpose inductors for a variety of circuits.

You can select an inductor to match your particular application. Wire-wound type LQH\_M, LQH\_N series are suitable for large inductance, multilayer type LQM\_M, LQM\_N series are suitable for small size.

In addition, we have the 2-in-1 type HEAWS series inductors for digital audio amplifiers.



### General Purpose (For General)

Structure	Size Code inch (mm)	Short Series Name/View	Series	Thickness (mm/max.)	Inductance Range	Rated Current Range
Wound Ferrite Core type	03019 (0805)	LQW04CA	LQW04CA_00	0.55	60nH to 510nH	200mA to 620mA
	0402 (1005)	LQW15CA	LQW15CA_00	0.66	22nH to 2µH	130mA to 1.3A
	0603 (1608)	LQW18CA	LQW18CA_00	0.95	32nH to 580nH	450mA to 2.2A
	1206 (3216)	LQH31MN	LQH31MN_03	2.0	150nH to 100µH	45mA to 250mA
	1210 (3225)	LQH32MN	LQH32MN_23	2.2	1µH to 560µH	40mA to 445mA
	4mm square	LQH44NN	LQH44NN_03	4.5	510nH to 470µH	145mA to 4.5A
			LQH43M/N	LQH43MN_03	2.8	1µH to 1.5mH
Multilayer Type	0402 (1005)	LQB15NN	LQB15NN_10	0.55	220nH to 560nH	300mA to 380mA
		LQB18NN	LQB18NN_10	0.95	220nH to 560nH	300mA to 450mA
	0603 (1608)	LQM18JN	LQM18JN_00	0.65	100nH to 160nH	550mA to 650mA
		LQM18NN	LQM18NN_00	0.95	47nH to 2.2µH	15mA to 50mA
	0805 (2012)	LQM21NN	LQM21NN_10	1.05	100nH to 4.7µH	30mA to 250mA

### General Purpose (For Automotive Infotainment)

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

## General Purpose (For Automotive Powertrain)

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

## Variable Inductors

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



### 5CCEG

6.5×5.9×6.0(H) mm MAX.

Supported inductance range: 0.05 to 2.7µH

#### Features

- High reliability that conforms to automotive standards
- Operating temperature range: -40°C to +85°C

#### Applications

- Ideal for use as RF matching transformers for car tuners



### FSDVA

5.8×5.8×5.5(H) mm MAX.




Supported inductance range:

0.1 to 52mH(1 to 7 mH for corner sensor applications)



#### Features

- Resistant to mechanical stress
- Operating temperature range:  
Up to 20 mH (-40°C to +105°C)  
20 mH or more (-40°C to +85°C)
- Various reliability conditions guaranteed for 1,000 hours (evaluation performed up to 3,000 hours)
- Lead coplanarity guaranteed within 0.1 mm

### 5CCEG Series

Winding Connection (Bottom View)	Part Number	Test Frequency (MHz)	Resonance Capacitor Range (pF)	Unloaded Q
	#A1313AN-0001GGH=P3	100	11.4+3/-3%	72+/-20%
	#A1313AN-0002GRG=P3	100	11.4+5/-2%	61+/-20%
	#A1313AN-0003GRG=P3	100	11.4+2/-4%	54+/-20%
	#A1313AN-0004GGH=P3	100	11.7+3/-3%	72+/-20%

**FSDVA Series**

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

 **DC-DC converters design assistant tool**

No download necessary; available on web browsers.

We have released a design assistant tool to select inductors or capacitors for DC-DC converters efficiently.

Input converter work condition and click the calculation button; the ranking of efficiency with each inductor will be listed.

To use this tool, go to

<https://ds.murata.co.jp/mpst>

 **Detailed Catalogs**

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



- Chip Inductors (Chip Coils)
- EMI Suppression Filters (for DC)/Chip Inductors for Automotive

Cat. No. O05E

Cat. No. C51E

# Resistors

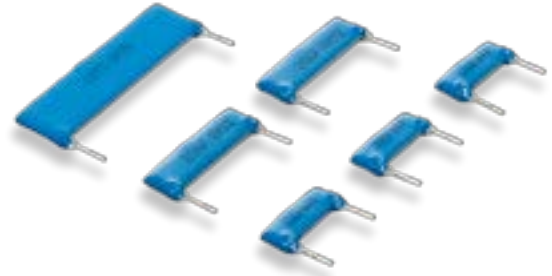
Full lineup for various applications

## Summary

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

## Lineup

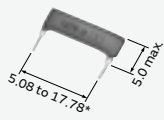
- High Voltage Resistors



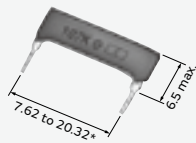
<https://www.murata.com/en-global/products/resistor>

## High Voltage Resistors

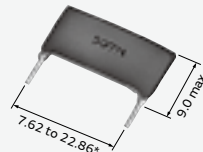
Featuring thick-film resistors, the Murata MHR series of high-voltage resistors is available in compact and thin SIP packages. Variants with small deviations are also available on request.



**MHR03 Series**



**MHR04 Series**



**MHR06 Series**

(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)
<b>MHR03</b>	1	500 to 1000	2 to 8	3 to 14	0.3 to 1.0
<b>MHR04</b>	1	1000	3.5 to 10	10 to 18	0.6 to 1.4
<b>MHR06</b>	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

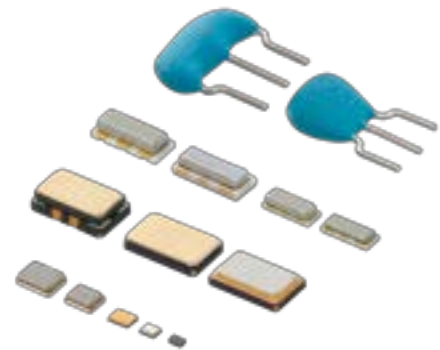
A stable timing source for microprocessors in various electronic devices

## 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

- MEMS Resonator ●Crystal Units ●Crystal Oscillators
- Ceramic Resonators CERALOCK



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

## IC Part Number - Timing Devices Search

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

Part Number	OSC FREQ (MHz)	FREQUENCY TOLERANCE	Q11 (dB)	Q12 (dB)
1) CERALOCK-08	10	±0.01%	20	20
2) CERALOCK-08	10	±0.01%	20	20
3) CERALOCK-08	10	±0.01%	20	20
4) CERALOCK-08	10	±0.01%	20	20
5) CERALOCK-08	10	±0.01%	20	20
6) CERALOCK-08	10	±0.01%	20	20
7) CERALOCK-08	10	±0.01%	20	20
8) CERALOCK-08	10	±0.01%	20	20
9) CERALOCK-08	10	±0.01%	20	20
10) CERALOCK-08	10	±0.01%	20	20
11) CERALOCK-08	10	±0.01%	20	20
12) CERALOCK-08	10	±0.01%	20	20
13) CERALOCK-08	10	±0.01%	20	20
14) CERALOCK-08	10	±0.01%	20	20
15) CERALOCK-08	10	±0.01%	20	20
16) CERALOCK-08	10	±0.01%	20	20
17) CERALOCK-08	10	±0.01%	20	20
18) CERALOCK-08	10	±0.01%	20	20
19) CERALOCK-08	10	±0.01%	20	20
20) CERALOCK-08	10	±0.01%	20	20

<https://www.murata.com/sim surfing/>

## Detailed Catalogs

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



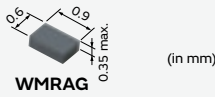
- Ceramic Resonators (CERALOCK)
- Ceramic Resonator (CERALOCK) Application Manual
- Crystal Units/Crystal Oscillators

- Cat. No. P16E
- Cat. No. P17E
- Cat. No. P79E

# MEMS Resonator

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

## For Consumer/Industrial



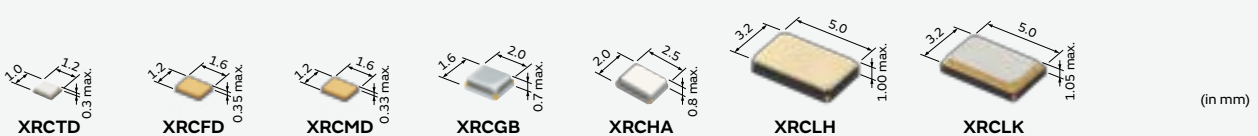
Series	Frequency (kHz)	Frequency Tolerance (ppm)	Operating Temperature Range (°C)
WMRAG	32.768	±20	-40 to 125

Timing Devices

# Crystal Units

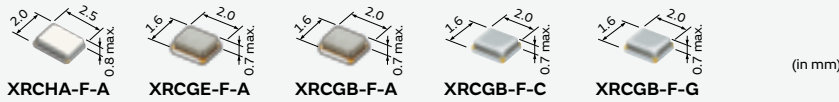
Crystal Units utilize highly accurate frequency-based high-grade quartz crystal elements. We offer a wide lineup of Crystal Units using Murata's proven package technology for small digital devices, automotive, etc.

## For Consumer/Industrial



Series	Type	Seal	Frequency (MHz)	Frequency Tolerance (ppm)	Frequency Shift by Temperature (ppm max.)	Operating Temperature Range (°C)
XRCTD	MCR1210	Metal	32.0000 - 52.0000	±10	±10	-30 to 85
XRCFD	MCR1612	Metal	24.0000 - 29.9999	±10	±10	-20 to 70
XRCMD	MCR1612	Metal	30.0000 - 48.0000	±10	±10	-20 to 70
XRCGB-F-H	HCR2016	Resin	24.0000 - 25.0000	±10	±10	-20 to 70
XRCGB-F-P	HCR2016	Resin	26.0000 - 32.0000	±10	±10	-30 to 85
XRCGB-F-M	HCR2016	Resin	16.0000 - 38.4000	±20	±20	-30 to 85
XRCGB-F-L	HCR2016	Resin	16.0000 - 32.0000	±30	±40	-30 to 85
XRCGB-F-L	HCR2016	Resin	33.8688 - 50.0000	±45	±40	-30 to 85
XRCGB-F-L	HCR2016	Resin	16.0000 - 50.0000	±100	±50	-30 to 85
XRCHA-F-L	HCR2520	Resin	16.0000 - 20.0000	±100	±100	-30 to 85
XRCLH	TAS-5032F	Metal	10.0000 - 52.0000	±10	±15	-30 to 85
XRCLK	TSS-5032A	Seam	10.0000 - 52.0000	±10	±15	-30 to 85

### For Automotive Applications

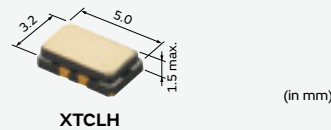


Series	Type	Seal	Frequency (MHz)							Frequency Tolerance (ppm)				Frequency Shift by Temperature (ppm max.)	Operating Temperature Range (°C)		
			0	10	20	30	40	50	60	0	20	40	60			80	100
XRCHA-F-A	HCR2520	Resin	16.0000												±100	±100	-40 to 125
XRCGE-F-A	HCR2016	Resin	20.0000												±30	±45	-40 to 125
			24.5454												±15	±35	-40 to 125
XRCGB-F-A	HCR2016	Resin	24.0000												±30	±35	-40 to 125
			30.0000												±50	±65	-40 to 125
XRCGB-F-C	HCR2016	Resin	27.6000											±20	±20	-30 to 85	
XRCGB-F-G	HCR2016	Resin	24.0000											±30 ±45	±100	±50	-40 to 85

## Crystal Oscillators

We offer a lineup of Crystal Oscillators using highly reliable crystal units, and superior temperature compensation methods.

### For Industrial Applications

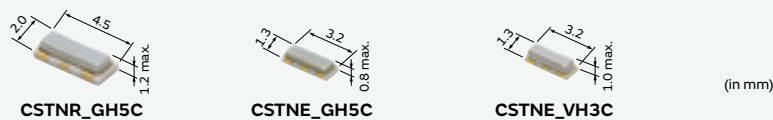


Series	Type	VC Function	Frequency (MHz)							Initial Frequency Tolerance (ppm)	Frequency Shift by Temperature (ppm max.)	Frequency Aging (ppm max./year)	Operating Temperature Range (°C)	
			0	10	20	30	40	50	60					
XTCLH_T	TTS14VSH	●	10.0000								±0.5	±0.20	±0.5	-40 to 85
XTCLH_C	TTS14VCH	●	10.0000								±0.5	±0.28	±0.5	-40 to 85

## Ceramic Resonators CERALOCK

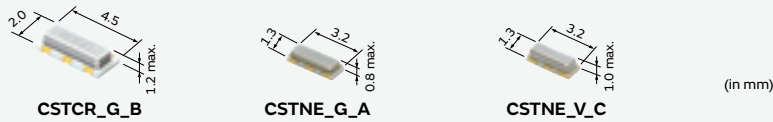
Wide product lineup of SMD and lead type versions for automotive and consumer applications.

### MHz Chip Type for Automotive (Tight Frequency Tolerance)



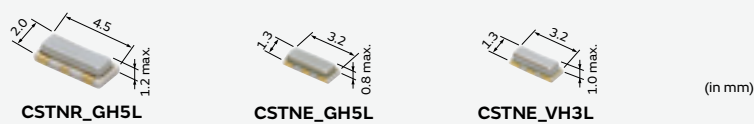
Series	Frequency (MHz)							Frequency Tolerance (%)	Frequency Shift by Temperature (% max.)	Operating Temperature Range (°C)
	0	10	20	30	40	50	60			
CSTNR_GH5C	4.00							±0.07	±0.13	-40 to 125
CSTNE_GH5C	8.00							±0.07	±0.13	-40 to 125
CSTNE_VH3C	14.00							±0.07	±0.13	-40 to 125

### MHz Chip Type for Automotive (Standard Frequency Tolerance)



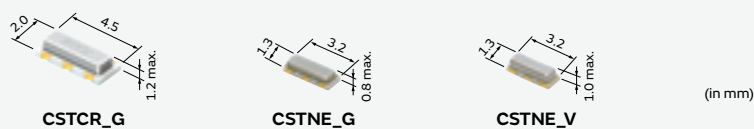
Series	Frequency (MHz)							Frequency Tolerance (%)		Frequency Shift by Temperature (% max.)	Operating Temperature Range (°C)
	0	10	20	30	40	50	60	70	0		
CSTCR_G_B	4.00	7.99						±0.5		±0.15	-40 to 125
CSTNE_G_A	8.00		13.99					±0.5		±0.20	-40 to 125
CSTNE_V_C	14.00		20.00					±0.5		±0.15	-40 to 125

### MHz Chip Type for Consumer Electronics (Tight Frequency Tolerance)



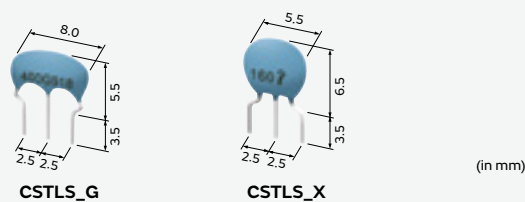
Series	Frequency (MHz)							Frequency Tolerance (%)		Frequency Shift by Temperature (% max.)	Operating Temperature Range (°C)
	0	10	20	30	40	50	60	70	0		
CSTNR_GH5L	4.00	7.99						±0.07		±0.11	-20 to 85
CSTNE_GH5L	8.00		13.99					±0.07		±0.11	-40 to 85
CSTNE_VH3L	14.00		20.00					±0.07		±0.11	-40 to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

### MHz Chip Type for Consumer Electronics (Standard Frequency Tolerance)



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

### MHz Lead Type for Consumer Electronics (Standard Frequency Tolerance)



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

# Filters

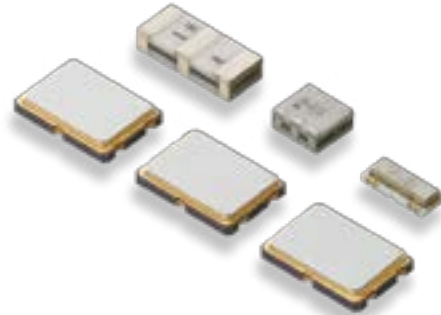
Broad lineup of Filters for video, audio, RF/Local, Duplexers, and Filters for IF

## Summary

Using Murata's ceramic processing 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 and Discriminators)
- Crystal Filters ●SAW Filters for Mobile Communications
- Dielectric Filters GIGAFIL ●Chip Multilayer LC Filters

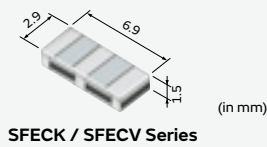


<https://www.murata.com/en-global/products/filter>

## 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

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.



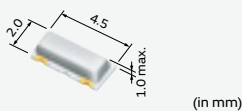
SFECF Series

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.

## Ceramic Discriminators

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



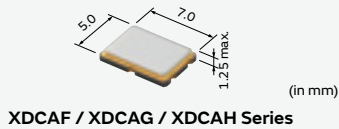
CDSCB Series

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.



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

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

Filters

# SAW Filters for Mobile Communications

## SAW Duplexers

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



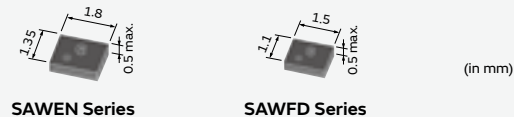
## RF Filters

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

### Single Filter



### Dual Filter



SAW Filters and SAW Duplexers may be used only in the following equipment:

Mobile phones, cordless telephones (except automobile telephone), smartphones, tablet PC, PC (including laptop/netPC), game machines, cameras (except for business use and for security), STB, electronic dictionaries, and digital audio instruments. Please contact us for other usages.

# Dielectric Filters GIGAFIL

This is a high frequency dielectric filter for Wi-Fi routers, accespoints, communication infrastructures of mobile phone base stations, for example.

It employs a unique plate construction which enables the filter to be compact and have a low profile.



TDF Series

RF/IF/Local Filter	Series	Frequency Range (MHz)								Number of Resonators	Input Power Range
		100	1000	2000	3000	4000	5000	6000	7000		
	<b>TDF</b>			2000					6000	2 to 5	1 to 10W*

\*Power depends upon specifications.

Filters

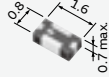
# Chip Multilayer LC Filters

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

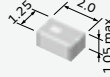
## Band Pass Filters



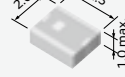
LFB15 Series



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
- Ceramic Filters (CERAFIL) Application Manual

Cat. No. P51E  
Cat. No. P11E

# RF Components

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

## Summary

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

## Lineup

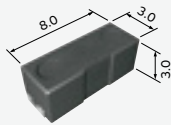
- Antennas
- Baluns (Chip Multilayer and Wire Wound/Film type)
- Couplers (Chip Multilayer) ●Chip Multilayer Hybrid Dividers
- Chip Multilayer Diplexers
- Microwave Coaxial Connectors



## Antennas

### Antenna Coils

Rx 1D-ANT

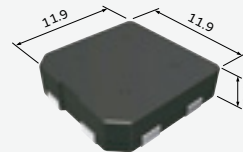


(in mm)

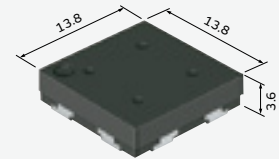
SA3M08 Series

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

Rx 3D-ANT



SA3D12 Series



(in mm)

SA3D14 Series

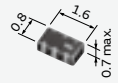
Series		Inductance (mH)	Q (Reference)
SA3D12	X	1.0 to 6.3	20
	Y	1.0 to 6.3	20
	Z	1.0 to 9.0	20
SA3D14	X	1.0 to 6.3	20
	Y	1.0 to 6.3	20
	Z	1.0 to 9.0	20



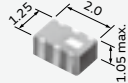
# Baluns

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

## Chip Multilayer Type



LDB18 Series



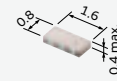
LDB21 Series



LDM0Q Series



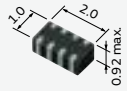
LDM15 Series



LDM18 Series

(in mm)

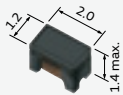
## Film Type



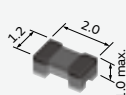
DXP2AB Series

(in mm)

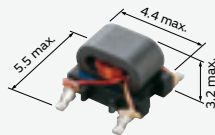
## Wire Wound Type



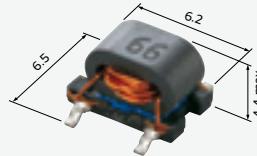
DXW21B Series



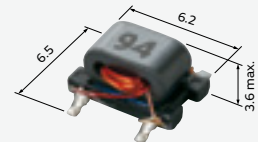
DXW21H Series



B4F Series



B5F Series



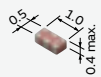
B5FL Series

(in mm)

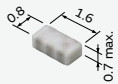
## Couplers

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

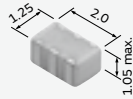
### Chip Multilayer Type



LDC15 Series  
LDJ15 Series



LDC18 Series  
LDJ18 Series



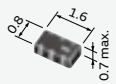
LDC21 Series  
LDJ21 Series

(in mm)

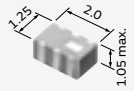
\*It is available with Integrated LPF for LDC21 Series.

## Chip Multilayer Hybrid Dividers

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



LDD18 Series

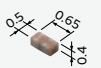


LDD21 Series

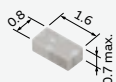
(in mm)

## Chip Multilayer Diplexers

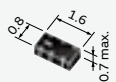
A diplexer branching low and high band. Suitable for band-switching for dual-band system.



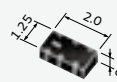
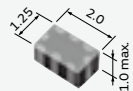
LFD15 Series



LFD18 Series



LFD21 Series



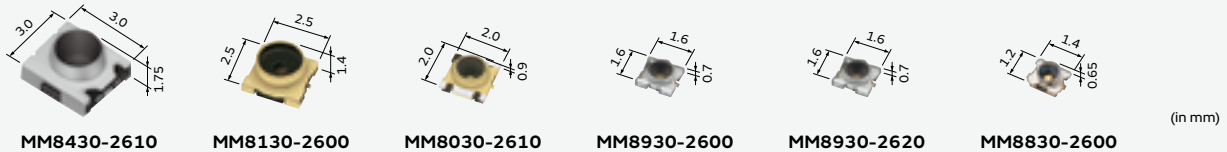
LFD2H Series

(in mm)

# Microwave Coaxial Connectors

## Microwave Coaxial Connectors with Switch

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

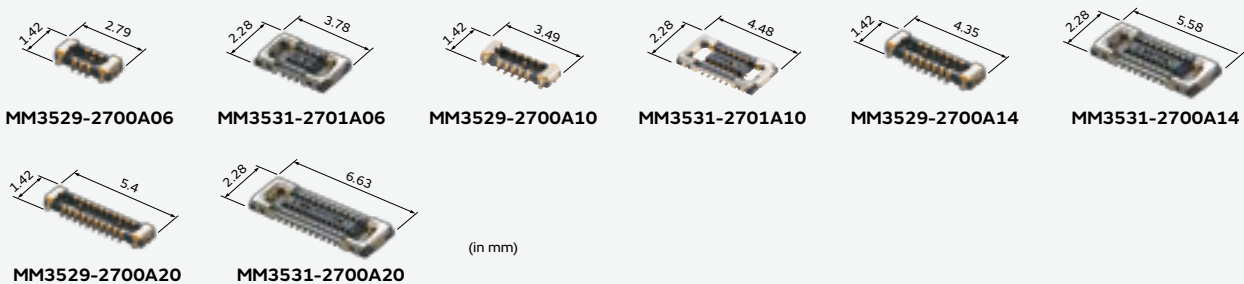


Type	Receptacle Part Number	Frequency Rating (GHz)	Voltage Standing Wave Ratio	Standard Measurement Probe Part Number
SWD	<b>MM8430-2610</b>	to 6	1.2 max. (DC to 3GHz) 1.3 max. (3GHz to 6GHz)	<b>MM126320</b> <b>MXHS83QE3000</b>
SWF	<b>MM8130-2600</b>	to 6	1.2 max. (DC to 3GHz) 1.3 max. (3GHz to 6GHz)	
SWG	<b>MM8030-2610</b>	to 11	1.2 max. (DC to 3GHz) 1.3 max. (3GHz to 6GHz) 1.5 max. (6GHz to 11GHz)	<b>MM126320</b> <b>MXHQ87WJ3000</b>
SWH	<b>MM8930-2600</b>	to 6	1.2 max. (DC to 3GHz) 1.3 max. (3GHz to 6GHz)	<b>MM126515</b> <b>MXHQ87PA3000</b>
SWH-2Way	<b>MM8930-2620</b>	to 6	1.2 max. (DC to 3GHz) 1.3 max. (3GHz to 6GHz)	<b>RF: MM126526</b> <b>ANT: MM126517</b> <b>RF: MXHQ87PN3000</b> <b>ANT: MXHQ87PP3000</b>
SWJ	<b>MM8830-2600</b>	to 9	1.2 max. (DC to 8GHz) 1.3 max. (8GHz to 9GHz)	<b>MM126715</b> <b>MXHQ87PK3000</b>

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

## Multi Line Connectors

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



Type	Receptacle Part Number	Plug Receptacle Part Number (Mating Height (mm))	Pitch (mm)	Frequency Rating (GHz)	Voltage Standing Wave Ratio
MLF06	<b>MM3529-2700A06</b>	<b>MM3531-2701A06 (0.69max.)</b>	0.35	to 20	1.2 max. (DC to 3GHz) 1.2 max. (3GHz to 6GHz) 1.3 max. (6GHz to 9GHz) 1.3 max. (9GHz to 12GHz) 1.35 max. (12GHz to 15GHz) 1.5 max. (15GHz to 18GHz) 1.65 max. (18GHz to 20GHz)
MLF10	<b>MM3529-2700A10</b>	<b>MM3531-2701A10 (0.69max.)</b>			
MLF14	<b>MM3529-2700A14</b>	<b>MM3531-2700A14 (0.69 max.)</b>			
MLF20	<b>MM3529-2700A20</b>	<b>MM3531-2700A20 (0.69 max.)</b>			

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

RF Components

## Microwave Coaxial Cable Connectors/Board to Board Connectors

Murata microwave coaxial connectors are small, thin, and suitable for low-profile design. The connectors have high RF performance.



Type	Receptacle Part Number	Pulg Receptacle Part Number (Mating Height (mm))	Cable Number (Mating Height (mm))	Cable Dia. (mm)	Frequency Rating (GHz)	Voltage Standing Wave Ratio
JSC	MM5829-2700	MM5831-2700 (0.8 max.)	MXJA01_ (1.0 max.)	0.81	to 12	1.3 max. (DC to 3GHz) 1.4 max. (3GHz to 6GHz) 1.5 max. (6GHz to 9GHz) 1.6 max. (9GHz to 12GHz)
			MXJGB3_ (1.0 max.)	0.49		
			MXJF56_ (1.0 max.)	0.53		
KSC	MM6829-2700	MM6831-2700 (0.6 max.)	MXKGB3_ (0.8 max.)	0.49	to 12	1.3 max. (DC to 3GHz) 1.4 max. (3GHz to 6GHz) 1.6 max. (6GHz to 9GHz) 1.7 max. (9GHz to 12GHz)
			MXKF56_ (0.8 max.)	0.53		
LSC	MM7829-2700	MM7831-2700 (0.6 max.)	MXLAB3_ (0.8 max.)	0.49	to 6	1.3 max. (DC to 3GHz) 1.4 max. (3GHz to 6GHz)
			MXLF56_ (0.8 max.)	0.53		

Nominal Impedance: 50Ω Rated Voltage: 30Vrms Temperature Range: -40 to 85°C  
Mating Height is mated with receptacle.

### Detailed Catalogs

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



• Microwave Coaxial Connectors

Cat. No. O30E

# Memo

# Sensors

## Summary

Murata pursued sensing functions making full use of MEMS and processing technology, and magnetoresistive elements including ceramic material technology in order to develop highly efficient and highly reliable devices, modules, and systems.

A lineup of various sensors respond to the sensing needs of various applications for automobile, wearable, medical care, and health care.

## Lineup

- Infrared Sensors
- Ultrasonic Sensors
- AMR Sensors (Magnetic Sensors)
- Shock Sensors
- Accelerometers
- Inclinometers
- Gyro Sensors
- Temperature Sensors (Thermistors)



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

## Sensor Guide (Select by Method/Principle)

### Temperature

Thermistors: The resistance changes with the temperature.

NC\_Series

NX Series

PR\_Series

PTF Series

### Infrared

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

IRA Series

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

**Detailed Catalogs**

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

- MEMS Sensors & Sensing Elements
- NTC Thermistors
- POSISTOR for Circuit Protection
- NTC/PTC Thermistors for Automotive

Cat. No. S47E

Cat. No. R44E

Cat. No. R90E

Cat. No. R03E



## Distance

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



MA300D1-1  
(for Dual Use)



MA40S4R (for Receiver)  
MA40S4S (for Transmitter)



MA58MF14-7N  
(for Dual Use)



MA40H1S-R  
(for Dual Use)



## Magnetic/ Open and Shut

Magnetic switches: This switch switches built-in ICs when the magneto-resistive 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.



PKG 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.






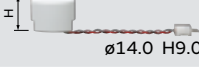










SCA Series

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



SCC Series  
SCR Series

# Lineup

Detection	Murata's Sensors			Applications													
	Products	Series or Main Part Number	Dimensions (mm)	AV Equipment				Communications Devices									
				TV	Audio	DVD, CD	Digital Video Camera	Digital Camera	PC	Scanner	Multifunction Machine	Printer		FAX	Electronic Bulletin Board		
Infrared	Pyroelectric Infrared Sensors	IRA Series	 ø9.2 H4.7	●	●	●				●	●	●	●	●	●		
Ultrasonic	Open Structure Type Ultrasonic Sensors	MA40S4R (for Receiver) MA40S4S (for Transmitter)	 ø9.9 H7.1													●	
		MA40H1S-R (SMD/for Dual Use)	 5.2X5.2X1.15	●					●		●					●	
	Drip-proof Type Ultrasonic Sensors	MA58MF14-7N (for Dual Use)	 ø14.0 H9.0														
	High Frequency Type Ultrasonic Sensors	MA300D1-1 (for Dual Use)	 ø9.9 H7.3								●	●	●				
Magnetic	AMR Sensors (Magnetic Sensors)	MR Series	 MRMS201A-001: 2.8X2.9X1.1 MRMS501A-001: 1.45X1.45X0.55			●	●	●	●								
Acceleration	Shock Sensors	PKGS Series	 3.2X2.0X1.05							●							
	Accelerometers	SCA Series	 7.6X8.6X3.3														
	Inclinometers	SCA Series	 7.6X8.6X3.3												●		
Angle Velocity	Gyro Sensors	SCC Series SCR Series	 12.1X15.0X4.35														
Temperature	NTC Thermistors	Chip Type NC_ Series	 NCP02: 0.4X0.2X0.2 NCP03: 0.6X0.3X0.3 NC_15: 1.0X0.5X0.5 NC_18: 1.6X0.8X0.8	●	●	●	●	●	●	●	●	●	●	●	●	●	●
		Lead Type NX Series	 NXF: ø1.2 L25 to 150 NXR: ø4.0 L10 to 40	●	●	●	●	●	●	●	●	●	●	●	●	●	●
	PTC Thermistors POSISTOR	Chip Type PR_ Series	 PRF15: 1.0X0.5X0.5 PRF18: 1.6X0.8X0.8 PRF21: 2.0X1.25X0.9	●	●	●	●	●	●	●	●	●	●	●	●	●	●
		Lead Type PTF Series	 ø5.0 max. T4.0 max. ø7.5 T3.0	●	●					●	●	●	●	●	●	●	●



		Applications																				Wearable								
		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	Murata's Sensors	Products
		●	●	●	●						●	●	●	●	●								●	●	●				Pyroelectric Infrared Sensors	
		●		●		●					●	●	●	●	●								●	●	●				Open Structure Type Ultrasonic Sensors	
		●		●		●					●	●	●	●	●								●	●	●				High Frequency Type Ultrasonic Sensors	
																			●										Drip-proof Type Ultrasonic Sensors	
																							●						High Frequency Type Ultrasonic Sensors	
		●	●	●	●	●	●	●	●	●	●				●							●	●	●	●				AMR Sensors (Magnetic Sensors)	
																													Shock Sensors	
							●															●		●	●	●			Accelerometers	
																						●			●	●			Inclinometers	
							●										●					●		●	●	●			Gyro Sensors	
			●	●	●	●	●	●	●	●	●						●	●	●	●	●	●	●		●				NTC Thermistors	
		●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●			PTC Thermistors	
		●	●	●	●	●	●	●	●	●	●						●	●	●		●			●				POSISTOR		
						●	●	●	●	●	●													●						

Sensors

# Thermistors

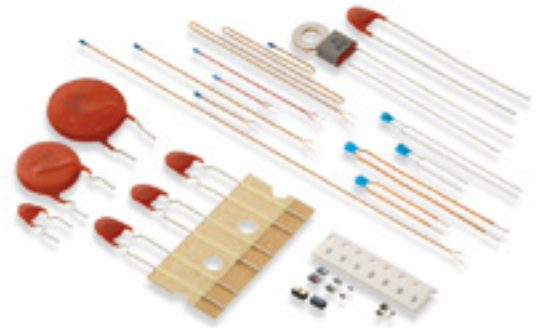
Facilitate your designs and products utilizing our thermal design and thermistor products.

## Summary

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

## Lineup

- NTC Thermistors for temperature sensor/compensation, and automotive
- PTC Thermistors POSISTOR for overheat sensing, overcurrent protection, inrush current suppression, and automotive



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

## NTC Thermistors for Temperature Sensor/ Temperature Compensation

### Chip Type

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

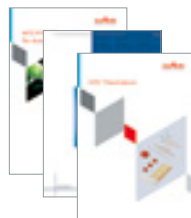


Series	Size Code inch (mm)	Resistance (25°C) (Ω)	B-Constant (25-50°C) (K)	Maximum Operating Current for Sensor (25°C) (mA)	Maximum Voltage (V)	Typical Dissipation Constant (25°C) (mW/°C)	Operating Temperature Range (°C)
<b>NCP02</b>	01005 (0402)	10k to 470k	3380 to 4250	0.015 to 0.100	5	1	-40 to 125
<b>NCP03</b>	0201 (0603)	1.0k to 220k	3500 to 4485	0.021 to 0.316	5	1	-40 to 125
<b>NCP15</b>	0402 (1005)	220 to 470k	3500 to 4500	0.015 to 0.674	5	1	-40 to 125
<b>NCU15</b>	0402 (1005)	10k to 100k	3380 to 4250	0.032 to 0.100	5	1	-40 to 125
<b>NCP18</b>	0603 (1608)	220 to 470k	3500 to 4500	0.015 to 0.674	5	1	-40 to 125
<b>NCU18</b>	0605 (1608)	10k to 470k	3380 to 4500	0.032 to 0.100	5	1	-40 to 125

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

### Detailed Catalogs

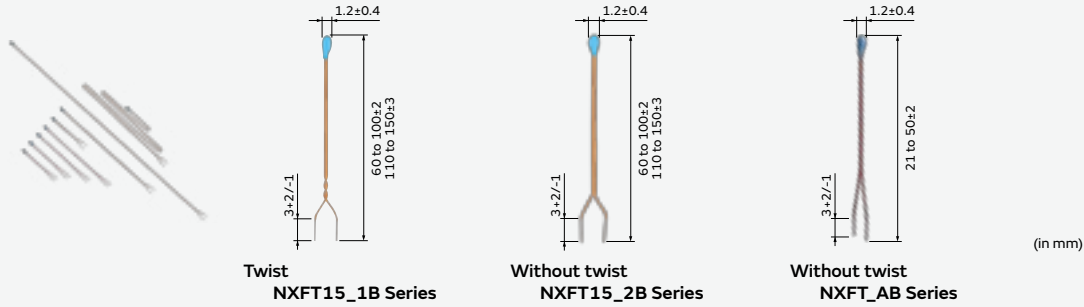
For more details, please refer to our printed catalogs and the PDF catalogs on our website.



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

## Thermo String Type

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

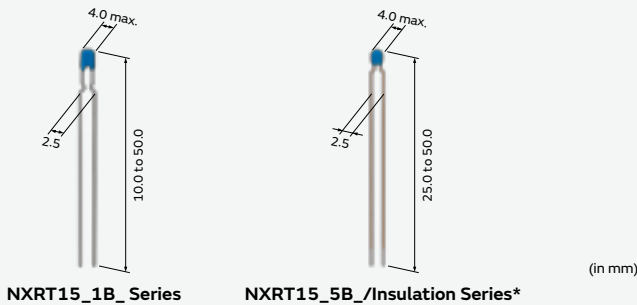


Series	Resistance (25°C) (Ω)	B-Constant (25-50°C) (K)	Maximum Operating Current for Sensor (25°C) (mA)	Thermal Time Constant (25°C) (s)	Full Length (mm)	Operating Temperature Range (°C)
<b>NXFT15_1/2B_</b> (Cooper wire Type)	3k to 100k	3380 to 4250	0.04 to 0.22	4	60 to 150	-40 to 125
<b>NXFT15_AB_</b> (Nickel Cooper wire type)	3k to 100k	3380 to 4250	0.024 to 0.14	3	21 to 50	-40 to 125

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

## Lead Type

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



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

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

# PTC Thermistors POSISTOR for Overheat Sensing

## Chip Type

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

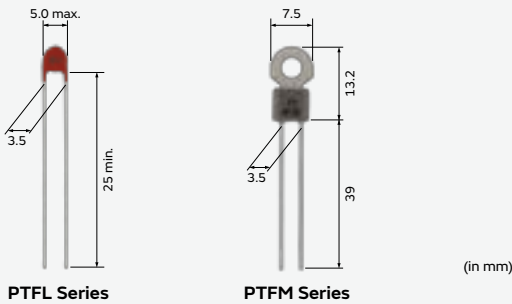


Series	Sensing Temperature Range (°C)										Sensing Temperature Tolerance (°C)	Maximum Voltage (V)	Size Code inch (mm)
	60	70	80	90	100	110	120	130	140	150			
PRF15	●	●	●	●	●	●	●	●	●	●	±3/±5	32	0402 (1005)
PRF18	●	●	●	●	●	●	●	●	●	●	±3/±5	32	0603 (1608)
PRF21			●	●	●	●	●	●	●	●	±5	32	0805 (2012)

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.

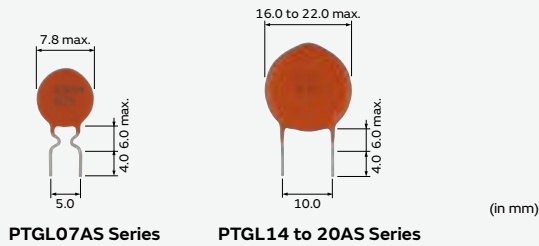


Series	Sensing Temperature Range (TS) (°C)										Maximum Voltage (V)	Resistance (25°C) (max.) (Ω)	Resistance (TS-10°C) (max.) (Ω)	Resistance (TS°C) (min.) (Ω)
	60	70	80	90	100	110	120	130	140	150				
PTF□_471Q	●	●	●	●	●	●	●	●	●	●	16	100	330	470
PTF□_222Q	●	●	●	●	●	●	●	●	●	●	16	330	1.5k	2.2k

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.



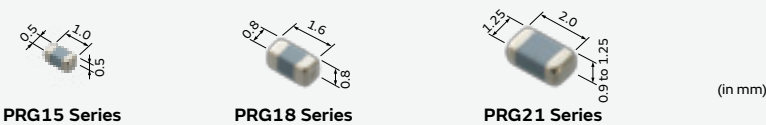
Series	Resistance (25°C) (Ω)	Maximum Voltage (V)	Maximum Inrush Current (A <sub>o-p</sub> )	Maximum Charge Energy (J)	Operating Temperature Range (°C)
<b>PTGL07AS</b>	120 to 200	280	5.66 to 8.46	7.8 (105°C)	-40 to 105
<b>PTGL14 to 20AS</b>	33 to 100	280	13 to 39	56.9 to 181.7 (60 to 85°C)	-20 to 85

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.



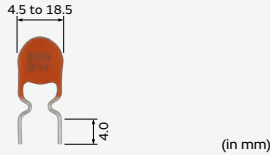
Series	Maximum Voltage (V)	Hold Current (60°C) (mA)	Trip Current (-10°C) (mA)	Maximum Current (A)	Resistance (25°C) (Ω)	Size Code inch (mm)
<b>PRG15</b>	6 to 30	17 to 88	65 to 318	0.6 to 3.5	2.2 to 68	0402 (1005)
<b>PRG18</b>	6 to 30	7 to 220	25 to 850	0.06 to 7.5	1.0 to 470	0603 (1608)
<b>PRG21</b>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

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

Thermistors

## Lead Type

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



**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	120 to 140	500 to 580	2.0	3.3 to 4.7
	30	122 to 685	240 to 1900	1.5 to 7.0	0.8 to 10
	32	40 to 60	170 to 240	1.5	15 to 33
	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 190	135 to 530	0.7 to 3.0	9.4 to 55
	125	30 to 220	75 to 550	0.3 to 1.2	10 to 180
	140	74 to 310	147 to 670	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	70 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

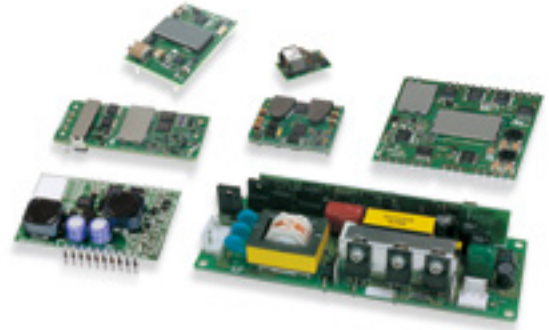
Eco-friendly and high-quality power devices

## 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 makes components utilizing advanced design and high-density packaging technology.

## Lineup

- DC-DC Converters
- High Voltage Power Supplies
- Switching Power Supplies



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

## DC-DC Converters

DC-DC converters are vital to the demands of electronic equipment.

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

### Non-isolated Type

**MYMGK00504ERSR**  
**MYMGK1R804ERSR**

**MYMGK00506ERSR**  
**MYMGK1R806FRSR**

**MYMGK1R820ERSR**  
**MYMGK1R820FRSR**

**MYSGK1R830FRSR**

**MYLSM00502ERPL**

**MYSGK02506BRSR**

**MYMGA5R04RELA5RA**

**MYMGC series**

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

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

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

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

**MYSSM02406BEPL**

**MYUSP3R303FMP**

Part number	Output Current (A)	Input Voltage (V)	Output Voltage (V)	Efficiency (%)	I2C or PMBus	Package	Size (mm)		
							W	L	T
<b>MYLSM00502ERPL</b>	2.5	4.5 to 17	1 to 5.25	89.4	Not available	SMD	7.9	7.9	2.3
<b>MYMGK1R804FRSR</b>	4	4.5 to 8	0.7 to 1.8	93.1	Not available	SMD	7.5	9.0	5.0
<b>MYMGK00504ERSR</b>	4	8 to 15	0.7 to 5	96.1	Not available	SMD	7.5	9.0	5.0
<b>MYMGK1R806FRSR</b>	6	4.5 to 8	0.7 to 1.8	90.4	Not available	SMD	7.5	9.0	5.0
<b>MYMGK00506ERSR</b>	6	8 to 15	0.7 to 5	95.4	Not available	SMD	7.5	9.0	5.0
<b>MYMGK1R812FRSR</b>	12	4.5 to 8	0.7 to 1.8	92	Not available	SMD	9.0	10.5	5.6
<b>MYMGK1R812ERSR</b>	12	8 to 15	0.7 to 1.8	90.4	Not available	SMD	9.0	10.5	5.6
<b>MYMGK1R820FRSR</b>	20	4.5 to 8	0.7 to 1.8	89.2	Not available	SMD	9.0	10.5	5.6

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

Continued on the following page. ↗

## DC-DC Converters

Part number	Output Current (A)	Input Voltage (V)	Output Voltage (V)	Efficiency (%)	I2C or PMBus	Package	Size (mm)		
							W	L	T
MYMGK1R820ERSR	20	8 to 15	0.7 to 1.8	87.8	Not available	SMD	9.0	10.5	5.6
MYSKG1R830FRSR	30	4.5 to 15	0.7 to 1.8	89.7	Not available	SMD	14.0	11.0	8.3
MYSKG02506BRSR	6	13.5 to 42	5 to 25	98	Not available	SMD	14.7	16.3	7.5
MYMGA5R04RELA5RA	4	8.0 to 16.0	3.3 to 5	94	Not available	SMD	9.0	10.5	5.6
MYMGC0R88RFLF2RV	8	3.3 to 5.5	0.85	81	I2C	SMD	11.9	15.0	2.4
MYMGC1R83BFPF2RV (Quad output)	3.2 0.5 0.5 1.5 2.5	3.3 to 5.5	0.85 0.85 1.2 1.8	81	I2C	SMD	11.9	15.0	2.4
MYMGC3R32EFPF2RV (Quad output)	1 2 1.5	4.3 to 5.5	1.2 1.8 3.3 2.5	91	I2C	SMD	11.9	15.0	2.4
OKL-T/3-W5P-C	3	2.4 to 5.5	0.6 to 3.63	95.3	Not available	SMD	12.2	12.2	6.2
OKL-T/6-W12P-C	6	4.5 to 14	0.591 to 5.5	93	Not available	SMD	12.2	12.2	7.2
OKL2-T/12-W12P2-C	12	4.5 to 14	0.69 to 5.5	95	Not available	SMD	20.32	11.43	8.55
OKL2-T/20-W12P2-C	20	4.5 to 14	0.69 to 5.5	94	Not available	SMD	33.02	13.46	8.7
MYSSM02406BEPL	6	30.5 to 40	12 to 24	97.6	Not available	SMD	30.2	20.9	8.3
MYUSP3R303FMP	3	3 to 5.5	0.7 to 3.3	94	Not available	SMD	11.0	8.5	5.6

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

## Isolated DC-DC Converter for PoE



MYBSP0055AABFT  
MYBSP0122BABFT



MYBSP0055AABF  
MYBSP0122BABF



MYBSP00502ABF  
MYBSP01201ABF



MYBTA00512ABT



MYBSC00520ABT  
MYBSC0128CABT  
MYBSC0128CAZT

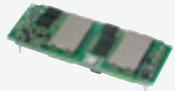


MYBSS054R6EBF

Part number	Output Power (W)	Input Voltage (V)	Output Voltage (V)	Efficiency (%)	PoE controller	Package	Size (mm)		
							W	L	T
MYBSP00502ABF	10	37 to 57	5	80	Available	SMD	26.0	14.8	6.2
MYBSP01201ABF	12	37 to 57	12	84	Available	SMD	26.0	14.8	6.2
MYBSP0055AABF	25.5	37 to 57	5	90.5	Available	SMD	35.5	22.4	10.55
MYBSP0122BABF	25.5	37 to 57	12	92.5	Available	SMD	35.5	22.4	10.55
MYBSP0055AABFT	25.5	37 to 57	5	90.5	Available	SMD	35.5	22.4	10.55
MYBSP0122BABFT	25.5	37 to 57	12	92.5	Available	SMD	35.5	22.4	10.55
MYBTA00512ABT	60	36 to 75	5	92	Not available	SMD	23.36	19.05	12.7
MYBSC00520ABT	100	36 to 75	5	92	Not available	SMD	33.0	23.2	10.35
MYBSC0128CABT	100	36 to 75	12	92.5	Not available	SMD	33.0	23.2	10.35
MYBSC0128CAZT	100	36 to 75	12	92.5	Not available	Insert	33.0	23.2	9.32
MYBSS054R6EBF	30	10.8 to 27	54	90	Not available	SMD	35.5	22.4	8.9



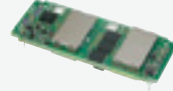
**Isolated Type**



MYBEA01212AZT



MYBEA01212AZTB  
MYBEA01210CZTB



MYBEA01210CZT



MYBSA00804KZT  
MYBSA0122ECZT



MYBEB01212AZTB



MYBSC00520ABT  
MYBSC0128CABT  
MYBSC0128CAZT



MYBTA00512ABT

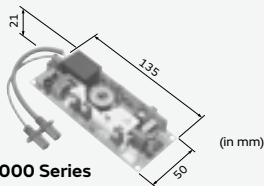


MPD5D017S  
MPD5D018S

Part number	Output Power (W)	Input Voltage (V)	Output Voltage (V)	Efficiency (%)	Footprint (Brick)	Package	Size (mm)		
							W	L	T
MYBEA01212AZT	144	36 to 75	12	92.5	1/8	Insert	58.4	22.8	8.46
MYBEA01212AZTB	144	36 to 75	12	92.5	1/8	Insert	58.4	22.8	11.3
MYBEA01210CZT	120	18 to 36	12	93	1/8	Insert	58.4	22.8	8.46
MYBEA01210CZTB	120	18 to 36	12	93	1/8	Insert	58.4	22.8	11.3
MYBEB01212AZTB	100	36 to 75	12	91.5	1/8	Insert	58.4	22.8	12.2
MYBTA00512ABT	60	36 to 75	5	92	1/32	SMD	23.36	19.05	12.7
MYBSC00520ABT	100	36 to 75	5	92	1/16	SMD	33.0	23.2	10.35
MYBSC0128CABT	100	36 to 75	12	92.5	1/16	SMD	33.0	23.2	10.35
MYBSC0128CAZT	100	36 to 75	12	92.5	1/16	Insert	33.0	23.2	9.32
MPD5D017S	4.95	36 to 75	3.3	84	NA	SMD	26.8	14.6	4.7
MPD5D018S	5	36 to 75	5	84	NA	SMD	26.8	14.6	4.7
MYBSA00804KZT	33.6	18 to 60	8	88	1/16	Insert	33.0	22.7	8.95
MYBSA0122ECZT	30	19.2 to 30	12	91	1/16	Insert	33.0	22.7	8.95

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

## High Voltage Power Supplies



MPL3000 Series  
(AC/DC Ballast)

Series	Applications	Input Voltage Vin	Output Power	Other Specification
<b>MPL3000</b> (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



LED Lighting

Applications	Input Voltage	Output Voltage	Safety Standard	EMI Standard	Remarks
LED Lighting	90 to 264V AC	8 to 25V 30 to 50V	PSE	VCCI, CISPR	PWM Dimming, Accepted for DALI, UART

For more details on our products, please contact us.

For Ionizer Modules, please refer to p. 100.

# Batteries

Battery solutions for energy storage systems and various small devices

## Summary

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

## Lineup

- Laminated Type Lithium Ion Batteries
- Cylindrical Type Lithium Ion Batteries
- Li-ion Energy Storage System ● Micro Batteries



## Laminated Type Lithium Ion Batteries

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

## Cylindrical Type Lithium Ion Batteries

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

## Li-ion Energy Storage System

Possible to customize capacity in order to meet wide usage

### 2.1kWh Energy Storage Module



(in mm)

(Excluding terminal)  
**IJ1101M**  
27kg

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

Storage Temperature: -20 to 45°C (Recommended room temperature)

Operating Ambient Temperature: Discharge: -20 to 40°C (Discharge current  $\leq$  50.0A)  
40 to 50°C (Discharge current  $\leq$  40.0A)

Charge: 10 to 45°C (Charge current  $\leq$  40.0A)  
0 to 10°C (Charge current  $\leq$  12.0A)

## High Rate Module



(Excluding terminal)  
**IJ1201M**  
18kg

(in mm)

\*use for Japan market

Model Name	Nominal Capacity	Rated Capacity	Nominal Voltage	Maximum Discharge Current	Charge Voltage	Maximum Charge Current	Safety Standard
<b>IJ1201M</b>	1.2kWh (24Ah)	1.15kWh (22.5Ah)	51.2V	90A	56.0V	22.5A	-

Storage Temperature: -20 to 45°C (Recommended room temperature)

Operating Ambient Temperature: Continuous Discharge: 0 to 30°C (Discharge current  $\leq$  90.0A)

30 to 35°C (Discharge current  $\leq$  75.0A)

35 to 40°C (Discharge current  $\leq$  67.5A)

Non-Continuous Discharge: 30 to 40°C (Discharge current  $\leq$  90.0A, Time  $\leq$  60 sec)

Charge: 10 to 40°C (Charge current  $\leq$  22.5A)

0 to 10°C (Charge current  $\leq$  6.75A Recommended)

## Battery Management Unit (BMU)



(Excluding terminal)  
**IJ5101C**  
12kg

\*use for Japan market



(Excluding terminal)  
**IJ8101C**  
14kg

(in mm)

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

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

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

## BMU-HUB



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

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

## Cable

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

# Coin Manganese Dioxide Lithium Batteries

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



## Standard

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

Model	Electrical Characteristics			Dimensions			Operating Temperature Range (°C)
	Nominal Voltage (V)	Nominal Capacity (mAh)	Standard Discharge Current (mA)	Diameter (mm)	Height (mm)	Weight (g)	
CR1216	3	30	0.1	12.5	1.6	0.67	-30 to 70
CR1220	3	40	0.1	12.5	2.0	0.77	-30 to 70
CR1616	3	60	0.1	16.0	1.6	1.1	-30 to 70
CR1620	3	80	0.1	16.0	2.0	1.3	-30 to 70
CR1632	3	140	0.2	16.0	3.2	1.9	-30 to 70
CR2016	3	90	0.1	20.0	1.6	1.8	-30 to 70
CR2025	3	160	0.2	20.0	2.5	2.6	-30 to 70
CR2032	3	220	0.2	20.0	3.2	3.1	-30 to 70
CR2430	3	300	0.2	24.5	3.0	4.4	-30 to 70
CR2450	3	610	0.2	24.5	5.0	6.5	-30 to 70
CR2477	3	1000	0.4	24.5	7.7	11	-30 to 70

Nominal capacity indicates duration until discharge voltage drops down to 2.0V when discharged at nominal discharge current at 23°C.

## Heat-resistant

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

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

Continued on the following page. ↗

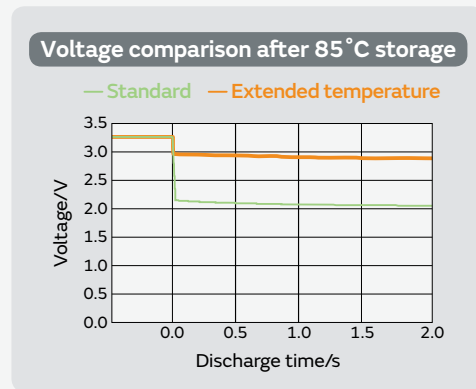
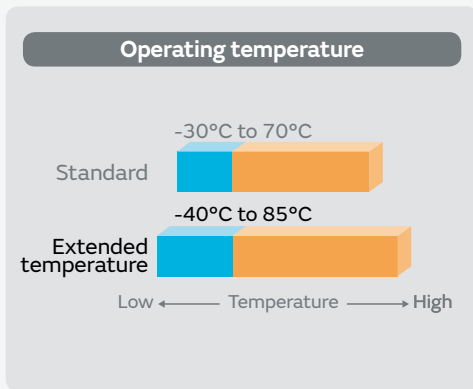
## Extended Temperature

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

Model	Electrical Characteristics				Dimensions			Operating Temperature Range (°C)
	Nominal Voltage (V)	Nominal Capacity (mAh)	Recommended Continuous Discharge Current (mA)	Maximum pulse discharge current*1 (mA)	Diameter (mm)	Height (mm)	Weight (g)	
<b>CR2032X</b>	3.0	220	≤1	30	20.0	3.2	3.0	-40 to 85
<b>CR2450X</b>	3.0	600	≤1	30	24.5	5.0	6.2	-40 to 85
<b>CR2477X</b>	3.0	1000	≤1	30	24.5	7.7	9.5	-40 to 85
<b>CR3677X*2</b>	3.0	2000	≤1	80	36.5	7.7	20	-40 to 85

\*1 Current for maintaining minimum 2V voltage with pulsed discharge of 3 seconds and 50% nominal capacity discharged (ambient temperature 23°C)

\*2 Shipment of mass-produced CR3677X is scheduled to start at the end of 2019.

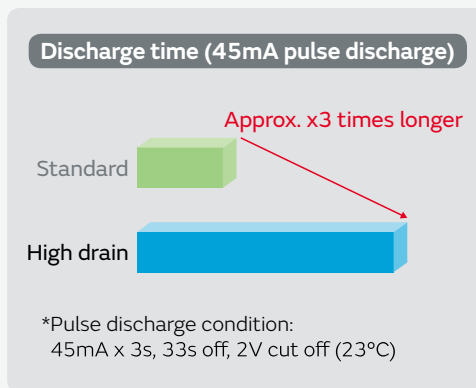
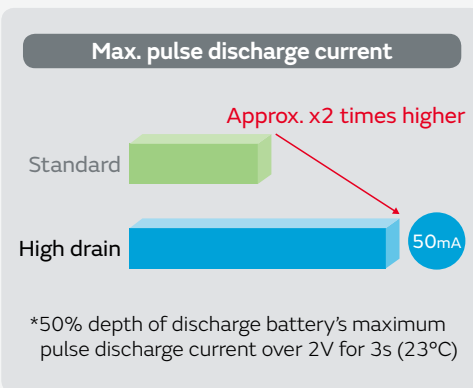


## High Drain

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


































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

\*1 Current for maintaining minimum 2V voltage with pulsed discharge of 3 seconds and 50% nominal capacity discharged (ambient temperature 23°C)



Continued on the following page. ↗

**Tab-welder**

Mounting Direction		H		V	M	
Tab Specification	Shape	E		O	E	P
	Width of Negative Tab Tip (mm)	0.75	0.75	1.8	0.75	2.0
	Width of Positive Tab Tip (mm)	0.75X2	0.75X2	2.8	0.75X2	2.0
	Pitch (mm)	17.8	20.5	20.5	N/A	N/A
Standard	CR2032	CR2032-HE8 	CR2032-HE1 	CR2032-HO6 	CR2032-VE3 	
	CR2430	CR2430-HE1 	CR2430-HE2 	CR2430-HO1 	CR2430-VE1 	
	CR2450	CR2450-HE5 	CR2450-HE6 	CR2450-HO5 	CR2450-VE6 	
	CR2477		CR2477-HE2 	CR2477-HO4 	CR2477-VE1 	
Extended Temperature	CR2032X		CR2032X-HE1 	CR2032X-HO6 		
	CR2450X		CR2450X-HE6 	CR2450X-HO5 		
	CR2477X		CR2477X-HE2 	CR2477X-HO4 		
Heat-resistant	CR2032W		CR2032W-HE1 	CR2032W-HO6 		
	CR2050W					CR2050W-MP1 
	CR2450W		CR2450W-HE6 	CR2450W-HO5 		CR2450W-MP1 
	CR2477W		CR2477W-HE2 	CR2477W-HO4 		
High Drain	CR2032R		CR2032R-HE1 	CR2032R-HO6 		
	CR2450R		CR2450R-HE6 	CR2450R-HO5 		

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

# Silver Oxide Batteries

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



Model	Electrical Characteristics		Dimensions			Operating Temperature Range (°C)
	Nominal Voltage (V)	Nominal Capacity (mAh)	Diameter (mm)	Height (mm)	Weight (g)	
SR621	1.55	20	6.8	2.15	0.32	-10 to 60
SR626	1.55	28	6.8	2.60	0.40	-10 to 60
SR721	1.55	29	7.9	2.10	0.42	-10 to 60
SR726	1.55	35	7.9	2.60	0.50	-10 to 60
SR41	1.55	45	7.9	3.60	0.65	-10 to 60
SR48	1.55	75	7.9	5.40	1.2	-10 to 60
SR920	1.55	40	9.5	2.05	0.59	-10 to 60
SR927	1.55	60	9.5	2.70	0.79	-10 to 60
SR936	1.55	75	9.5	3.60	1.1	-10 to 60
SR1120	1.55	60	11.6	2.05	0.92	-10 to 60
SR1130	1.55	85	11.6	3.05	1.4	-10 to 60
SR43	1.55	110	11.6	4.20	1.8	-10 to 60
SR44	1.55	160	11.6	5.40	2.2	-10 to 60

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



# Alkaline Manganese Batteries

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



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

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

# Sound Components (Buzzer)

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

## Summary

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

## Lineup

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



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

## SMD Piezoelectric Sounders

Low power consumption, lightweight.

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

Applicable for automotive usage based on our design and manufacturing technology.



(in mm)

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

## 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.

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

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

## Piezoelectric Diaphragms

Low power consumption, lightweight.

Suitable for clocks/calculators/digital cameras/burglar alarms, and various alarms.

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

□: Indicates Metal Plate Diameter and Resonant Frequency Type.

# Wireless Communication Modules

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

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



### ■ Features

Compact, highly efficient, and flexible custom-made correspondence

### ■ Applications

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

## Bluetooth Modules/ Bluetooth Low Energy Modules



### ■ Features

Compact, highly efficient, and flexible custom-made correspondence

### ■ Applications

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

## Low Power Wide Area Network (LPWAN) Wireless Module



### ■ Features

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

### ■ Applications

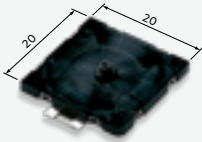
Positioning Tracking, Smart Houses, Agriculture, Healthcare/Medical, Industrial, Logistics, Utilities (Water, Gas Metering), etc.

## Microblowers

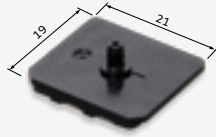
Tiny air blowers/pumps without a motor

### Features

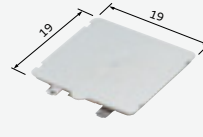
The structure is designed to operate as a blower and pump by applying the ultrasonic vibrations of the ceramic as the drive source. This is achieved in an extremely compact, thin, and silent device with a high flow rate.



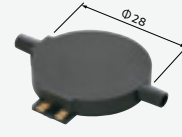
MZB1001T02



MZB3004T04



MZB3005T06



MZB4001T05

(in mm)

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

\*The above value shows typical characteristics.

(\*1) A drive circuit is required for the operation. Driving circuits are not common. The voltage is the voltage applied to them.

(\*2) Only when the back pressure condition is 10kPa or more; it can be driven with a voltage of 18Vdc or more.

(\*3) When operated continuously, sufficient performance may not be demonstrated due to the generation of heat.

(\*4) Please use in environments where the temperature of the metal surface (marking surface) is 60°C or less.

(\*5) Please use in environments where the temperature of the resin surface is 60°C or less.

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

### Application Examples

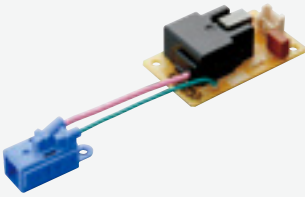
Aroma diffuser, gas/breath suction equipment, blood pressure measuring, breast pump, liquid transfer equipment by air pressure

# Ionizer Modules: Ionissimo

High-concentration ion, compact design, ozone control

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

## MHM Series



### Features

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

### Applications

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

Items	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°C	←	←	←
Operating Humidity	20 to 80%RH (without dewdrop)	←	←	←

(\*1) Measuring distance: 20cm

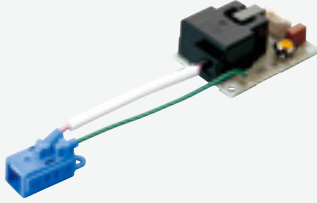
(\*2) MHM314's ion amount is around 3 times more than MHM305.

View a demonstration video of Ionissimo Ionizer Modules 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.





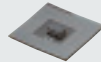
Items	MHM500 Type	MHM501 Type	MHM502 Type
Input Voltage (VDC)	+11 to 13	←	←
Power	1.0W	1.0W (with heater)	6.0W
Ozone Level	<2.5mg/H	<2.5mg/H	<60mg/H
Operating Temp.	-10 to 50°C	←	←
Operating Humidity	20 to 80%RH (without dewdrop)	20 to 95%RH	20 to 85%RH (without dewdrop)

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

# RFID Devices







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

## HF band RFID tag

Part number	LXMS33HCNG-134	LXMS33HCNK-171	LXMS33HCNL-167	LXMSAPHA08-136	LXMSAPHA17-176
Application	Small product management				
Appearance					
RFID standard	ISO15693 NFC Forum Type5	ISO14443 TypeA NFC Forum Type2		ISO15693 NFC Forum Type5	ISO14443 TypeA NFC Forum Type2
Frequency	13.56MHz				
IC	NXP ICODE SLIX	NXP NTAG210	NXP NTAG212	NXP ICODE SLIX	NXP NTAG213
UID memory	64bit				
NDEF memory	896bit	384bit	1024bit	896bit	1152bit
Size(L x W x H)	3.2 x 3.2 x 0.7 mm	3.2 x 3.2 x 0.75 mm		8.3 x 8.3 x 0.8 mm	
Read range*	20mm	15mm	15mm	42mm	32mm

\*Reference

## UHF band RFID tag

Part number	LXMS21NCNH-147	LXMSJZNCMF-198	LXMS21ACMF-183	LXMS21ACNP-184	LXMSANAA19-181	LXTBKZMCMG-010
Application	Small product management		Electronic equipment management		Garment management	Metal product management
Appearance						
RFID standard	ISO18000-63 and EPC Global Gen2(v1.2.0)	ISO18000-63 and EPC Global Gen2v2	ISO18000-63 and EPC Global Gen2v2	ISO18000-63 and EPC Global Gen2(v1.2.0)	ISO18000-63 and EPC Global Gen2v2	ISO18000-63 and EPC global Gen2v2
Frequency	865-928MHz				902-928MHz	865-928MHz
IC	NXP UCODE G2iM	Impinj Monza R6	Impinj Monza R6	NXP UCODE 7xm	Impinj Monza R6	Impinj Monza R6P
UID memory	256bit	96bit	96bit	448bit	96bit	128bit
NDEF memory	512bit	NA	NA	2048bit	NA	32bit
Size(L x W x H)	2.0 x 1.25 x 0.55 mm	1.2 x 1.2 x 0.55 mm	2.0 x 1.2 x 0.5 mm		40 x 6 x 0.9 mm	6 x 2.0 x 2.3mm
Read range*	10mm (500mW reader)	10mm (500mW reader)	9m (4W EIRP)	7m (4W EIRP)	2m (4W EIRP)	1.5m (4W EIRP)

\*Reference

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 registered trademarks of USA-based NXP Semiconductors N.V. in the United States and/or in other countries.



# Femtet, CAE Software

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

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

## Features

### Femtet

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

### Seven Solvers and Multiphysics

Solves seven major physical phenomena and multiphysics.

### Efficient Designing

Capable of batch processing and parametric analysis that are essential for tuning and optimization of design.

VBA macro function is available to realize optimum design.

### Comprehensive Functionalities

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

### Database Management

Manages databases of materials, boundary conditions, body attributes, and models.

The database can be shared and used among a group of users.

### CAD Translator

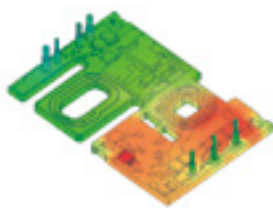
Lets you use the CAD data on hand right away by supporting various kinds of CAD formats to import and export.

## Examples

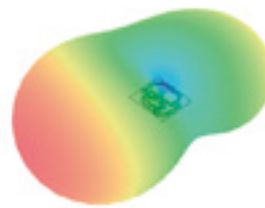
Mechanical Stress



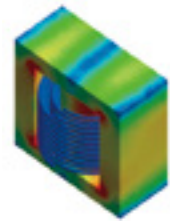
Thermal Conductivity



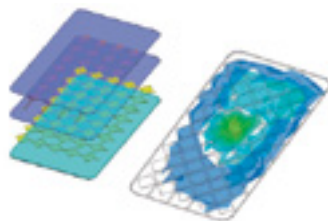
Electromagnetic Waves



Magnetic Fields



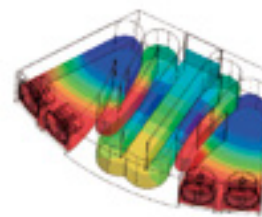
Electric Fields



Piezoelectricity



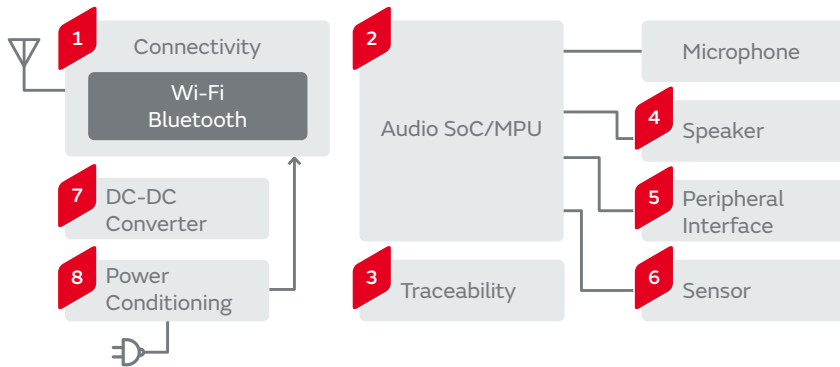
Acoustic Waves



# Application Guides



# AI speaker (Voice recognition)



## 1 Connectivity

- Microwave Coaxial Connectors with Switch
- Chip Multilayer LC Filters LFD Series
- Chip Multilayer Hybrid Baluns LDB/LDM Series
- Chip Multilayer Diplexers LFD Series
- Chip Multilayer Hybrid Couplers LDC/LDJ Series
- Chip Inductors (Chip Coils) LQP03HQ/LQW18AN Series
- Crystal Units XRC Series

## 2 Audio SoC/MPU

- Crystal Units XRC Series
- MEMS Resonators WMRAG Series

## 3 Traceability

- RFID Tag LXMS/LXTB Series

## 4 Speaker

- Frequency Specified Noise Filters BLF02 Series
- Chip LC Trap Filters LQZ02HQ Series

## 5 Peripheral Interface

- Chip Common Mode Choke Coils DLMON/NFPOQ Series

## 8 Power Conditioning

- Thermistors NCP03/NXR Series
- Chip Ferrite Beads BLM18/21 Series
- Chip Common Mode Choke Coils DLW5AT/5BT Series

## 6 Sensor

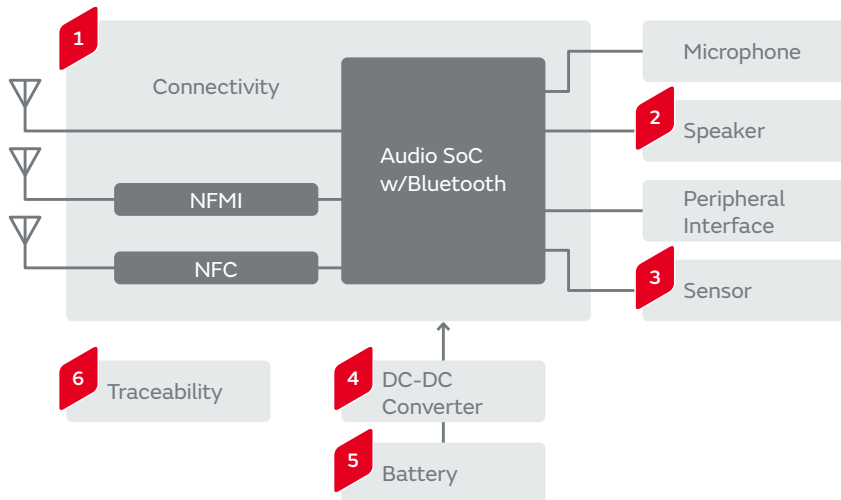
- Pyroelectric Infrared Sensors IRA-S Series
- Ultrasonic Sensors MA40 Series

## 7 DC-DC Converter

- Power Inductors DFEC Series
- Power Inductors DFES/LQH3NP Series

**General Purpose** Chip Multilayer Ceramic Capacitors for General Purpose GRM Series High Frequency Filter Circuit/Coupling/Decoupling/For Step-up

# Hearable



## 1 Connectivity

<p>RF Inductors LQP02HQ/LQW15AN Series</p>	<p>Microwave Coaxial Cable Connectors Microwave Coaxial Connectors with Switch</p>	<p>Chip Multilayer LC Filters LF Series</p>
<p>Chip Multilayer Hybrid Baluns LDB/LDM Series</p>	<p>Chip Multilayer Diplexers LFD Series</p>	<p>Chip Multilayer Hybrid Couplers LDC/LDJ Series</p>
<p>Chip LC Trap Filters LQZ02HQ Series</p>	<p>Frequency Specified Noise Filters BLF02RD Series</p>	<p>NFC Antennas FLAN Series</p>
<p>Crystal Units XRC Series</p>		<p>MEMS Resonators WMRAG Series</p>

## 2 Speaker

<p>Chip LC Trap Filters LQZ02HQ Series</p>	<p>Frequency Specified Noise Filters BLF02 Series</p>
--	---

3 Sensor

Thermistors  
NCP03/FTN Series



4 DC-DC Converter

Power Inductors  
DFE18SAN Series



5 Battery

Thermistors  
NCP03/FTN Series



6 Traceability

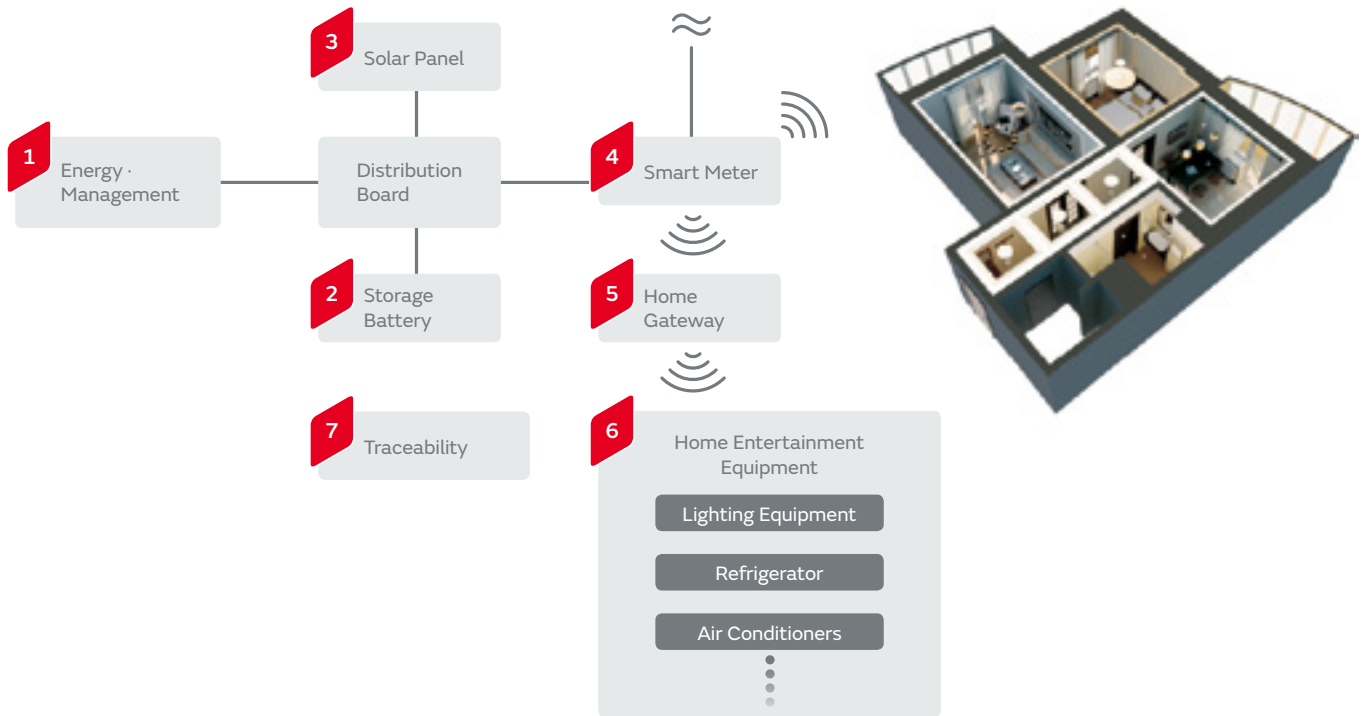
RFID Tag  
LXMS/LXTB Series




General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose GRM Series High Frequency Filter Circuit/Coupling/Decoupling/For Step-up










# HEMS






## 1 Energy · Management

<p>Ceramic Resonators CERALOCK CST Series</p> 	<p>Crystal Units XRC Series</p> 
---	---













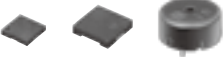



## 2 Storage Battery

<p>Thermistors PRF/PRG/PTG/NCU Series</p> 	<p>Isolated DC-DC Converters MYB Series</p> 	
<p>Non-Isolated DC-DC Converters MYMGK/MYSGK/OKL/MYLSM Series</p> 	<p>Chip Multilayer Ceramic Capacitors for General Purpose GR/GA Series</p> 	
<p>Safety Standard Certified Resin Molding SMD Type Ceramic Capacitors for General Purpose DK1 Series</p> 	<p>Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose DE1/DE2 Series</p> 	
<p>Energy Storage Module Model IJ1101M Series</p> 	<p>BMU (Battery Management Unit) IJ8101C Series</p> 	<p>BMU-HUB IJ1101K Series</p> 








## 3 Solar Panel

<p>Isolated DC-DC Converters MYB Series</p> 
<p>Non-Isolated DC-DC Converters MYMGK/MYSGK/OKL/MYLSM Series</p> 
<p>Chip Multilayer Ceramic Capacitors for General Purpose GR/GA Series</p> 










**4 Smart Meter**

<p>Chip Multilayer LC Filters LF Series</p> 	<p>Chip Multilayer Hybrid Baluns LDB/LDM Series</p> 	<p>Wi-Fi Modules</p> 	<p>LPWA Modules</p> 	<p>Isolated DC-DC Converters MYB Series</p> 
<p>Non-Isolated DC-DC Converters MYMGK/MYSGK/OKL/MYLSM Series</p> 	<p>Isolated DC-DC Converters for PoE + PD MYBSP Series</p> 	<p>Chip Multilayer Ceramic Capacitors for Ethernet LAN and Primary - Secondary Coupling of DC-DC Converters GR4 Series</p> 		
<p>Safety Standard Certified Resin Molding SMD Type Ceramic Capacitors for General Purpose DK1 Series</p> 	<p>Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose DE1/DE2 Series</p> 	<p>Ceramic Resonators CERALOCK CST Series</p> 	<p>Crystal Units XRC Series</p> 	
<p>Piezoelectric Sounders PKMCS/PKLCs/PKM Series</p> 	<p>Coin Manganese Dioxide Lithium Batteries Standard Type/Heat-resistant Type</p> 	<p>Microwave Coaxial Connectors with Switch</p> 	<p>MEMS Resonators WMRAG Series</p> 	

**5 Home Gateway**

<p>Wi-Fi Modules</p> 	<p>Bluetooth Modules</p> 	<p>LPWA Modules</p> 	<p>Microwave Coaxial Connectors with Switch</p> 
<p>Isolated DC-DC Converters for PoE + PD MYBSP Series</p> 	<p>Crystal Units XRC Series</p> 	<p>MEMS Resonators WMRAG Series</p> 	

**6 Home Entertainment Equipment**

<p>Bluetooth Modules</p> 	<p>Wi-Fi Modules</p> 	<p>LPWA Modules</p> 
<p>Ultrasonic Sensors MA40 Series</p> 	<p>Magnetic Sensors (AMR Sensors) MR Series</p> 	
<p>Isolated DC-DC Converters MYB Series</p> 	<p>Non-Isolated DC-DC Converters MYMGK/MYSGK/OKL/MYLSM Series</p> 	
<p>Crystal Units XRC Series</p> 	<p>MEMS Resonators WMRAG Series</p> 	

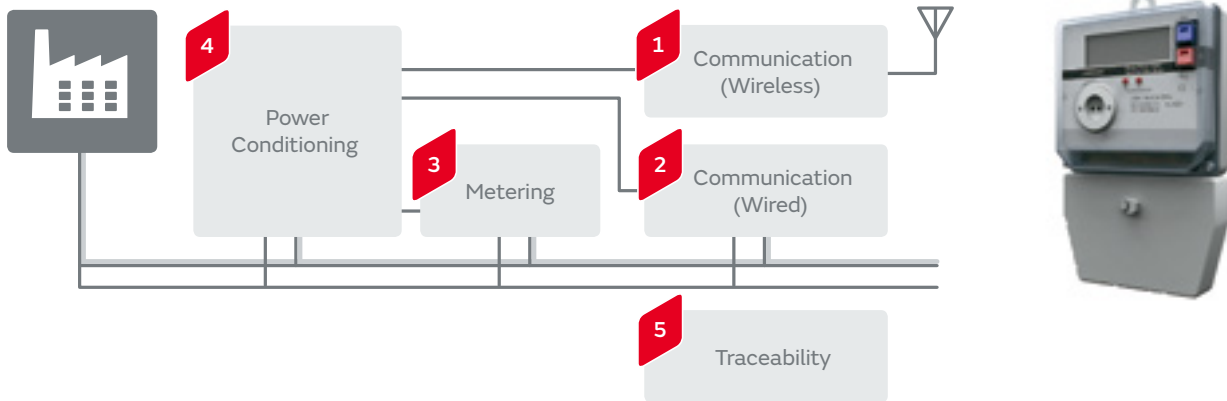
**7 Traceability**

RFID Tag  
LXMS/LXTB Series



General Purpose	Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
	High Q Chip Multilayer Ceramic Capacitors for General Purpose	GJM Series	High Frequency Filter Circuit
	Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
	3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression
	Polymer Aluminum Electrolytic Capacitors	ECAS/ECNS Series	Smoothing/Transient Backup
	Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching/Resonance
	Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
	Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
	Feed Through Chip EMI Filters	NFE Series	Noise Suppression
	Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLP/NFP Series	Noise Suppression

# Smartmeter



## 1 Communication (Wireless)

<p>Wi-Fi Modules</p>	<p>LPWA Modules</p>	<p>Chip Multilayer LC Filters LF Series</p>	<p>Chip Multilayer Hybrid Baluns LDB/LDM Series</p>	<p>Microwave Coaxial Connectors with Switch</p>
<p>ESD Protection Devices LXES Series</p>	<p>Thermistors NCP/PRF/PRG/NCU Series</p>	<p>Crystal Units XRC Series</p>	<p>Chip Inductors (Chip Coils) LQW/LQP/LQG Series</p>	<p>MEMS Resonators WMRAG Series</p>

## 2 Communication (Wired)

<p>Chip Multilayer Ceramic Capacitors for General Purpose GR/GA Series</p>	<p>Safety Standard Certified Resin Molding SMD Type Ceramic Capacitors for General Purpose DK1 Series</p>
<p>Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose DE1/DE2 Series</p>	<p>Leaded MLCC for General Purpose RDE Series</p>
<p>Thermistors NCP/PRF/PRG/NCU Series</p>	<p>Ceramic Resonators CERALOCK CST Series</p>
<p>Crystal Units XRC Series</p>	<p>ESD Protection Devices LXES Series</p>

## 3 Metering

<p>Chip Common Mode Choke Coils/ Common Mode Noise Filters DLW/DLP/NFP Series</p>	<p>Thermistors NCP/PRF/PRG/NCU Series</p>
<p>Ceramic Resonators CERALOCK CST Series</p>	<p>Crystal Units XRC Series</p>
<p>Piezoelectric Sounders PKMCS/PKLCs/PKM Series</p>	<p>Magnetic Sensors (AMR Sensors) MR Series</p>
<p>MEMS Resonators WMRAG Series</p>	



**4 Power Conditioning**

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



Isolated DC-DC Converters  
for PoE + PD  
MYBSP Series



Chip Multilayer  
Ceramic Capacitors  
for General Purpose  
GR/GA Series



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



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



Leaded MLCC  
for General Purpose  
RDE Series



Chip Inductors (Chip Coils)  
LQH Series



Thermistors  
NCP/PRF/PRG/NCU Series



Polymer Aluminum  
Electrolytic Capacitors  
ECAS/ECNS Series



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



**5 Traceability**

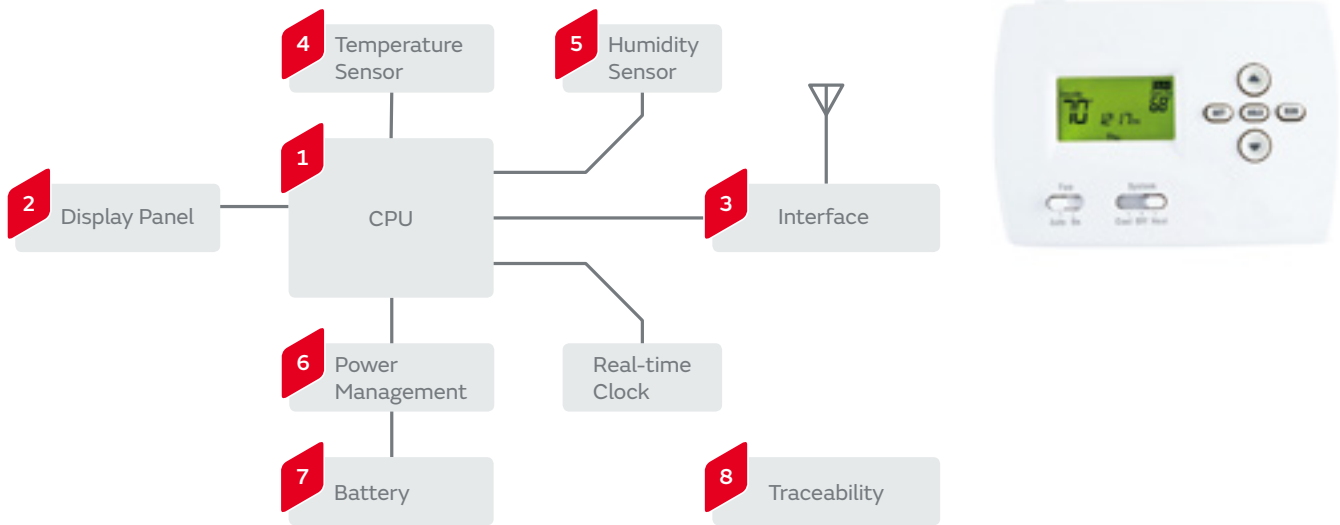
RFID Tag  
LXMS/LXTB Series



General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GJM Series	High Frequency Filter Circuit
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression
Polymer Aluminum Electrolytic Capacitors	ECAS/ECNS Series	Smoothing/Transient Backup
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching/Resonance
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
Feed Through Chip EMI Filters	NFE Series	Noise Suppression
Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLP/NFP Series	Noise Suppression

# Thermostat



## 1 CPU

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



Polymer Aluminum Electrolytic Capacitors ECAS/ECNS Series



Ceramic Resonators CERALOCK CST Series



Crystal Units XRC Series



Thermistors NCP/PRF Series



MEMS Resonators WMRAG Series



## 2 Display Panel

Metal Terminal Type Multilayer Ceramic Capacitors for General Purpose KRM Series



Polymer Aluminum Electrolytic Capacitors ECAS/ECNS Series



Ceramic Resonators CERALOCK CST Series



Piezoelectric Sounders PKMCS/PKLCS/PKM Series



Thermistors NCP/PRF Series



## 3 Interface

Bluetooth Modules



LPWA Modules



Wi-Fi Modules



Crystal Units XRC Series



Ceramic Resonators CERALOCK CST Series



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



ESD Protection Devices LXES Series



Microwave Coaxial Connectors with Switch



MEMS Resonators WMRAG Series



## 5 Humidity Sensor

Ceramic Resonators CERALOCK CST Series



Thermistors NCP/PRF/PRG/PTG Series



## 4 Temperature Sensor

Ceramic Resonators CERALOCK CST Series



Thermistors NCP/PRF/PRG/PTG Series



## 6 Power Management

Chip Multilayer Ceramic Capacitors for General Purpose GR/GA Series



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



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



Thermistors NCP/PRF/PRG Series



Ceramic Resonators CERALOCK CST Series



**7 Battery**

Thermistors  
NCP/PRF/PRG Series



**8 Traceability**

RFID Tag  
LXMS/LXTB Series



General Purpose	Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
	High Q Chip Multilayer Ceramic Capacitors for General Purpose	GJM Series	High Frequency Filter Circuit
	Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
	3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression
	Polymer Aluminum Electrolytic Capacitors	ECAS/ECNS Series	Smoothing/Transient Backup
	Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching/Resonance
	Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
	Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
	Feed Through Chip EMI Filters	NFE Series	Noise Suppression
	Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLP/NFP Series	Noise Suppression

# Human Detection



## 1 Microcontroller

- Low ESL Chip Multilayer Ceramic Capacitors for General Purpose LLL/LLA/LLM Series
- Polymer Aluminum Electrolytic Capacitors ECAS/ECNS Series
- Crystal Units XRC Series
- Thermistors NCP/PRF Series
- Isolated DC-DC Converters for PoE + PD MYBSP Series
- MEMS Resonators WMRAG Series

## 2 LED

- Chip Multilayer Ceramic Capacitors for General Purpose GR/GA Series
- Safety Standard Certified Resin Molding SMD Type Ceramic Capacitors for General Purpose DK1 Series
- Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose DE1/DE2 Series
- Thermistors NCP/PRF/PRG/PTG Series

## 6 Power Management

- Chip Multilayer Ceramic Capacitors for General Purpose GR/GA Series
- Safety Standard Certified Resin Molding SMD Type Ceramic Capacitors for General Purpose DK1 Series
- Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose DE1/DE2 Series
- Ceramic Resonators CERALOCK CST Series
- Chip Common Mode Choke Coils/Common Mode Noise Filters DLW/DLP/NFP Series
- Thermistors NCP/PRF/PRG Series

## 7 Battery

- Coin Manganese Dioxide Lithium Batteries Standard Type
- Thermistors NCP/PRF/PRG Series

## 3 Alarm

- Piezoelectric Sounders PKMCS/PKLCS /PKM Series

## 4 Connectivity

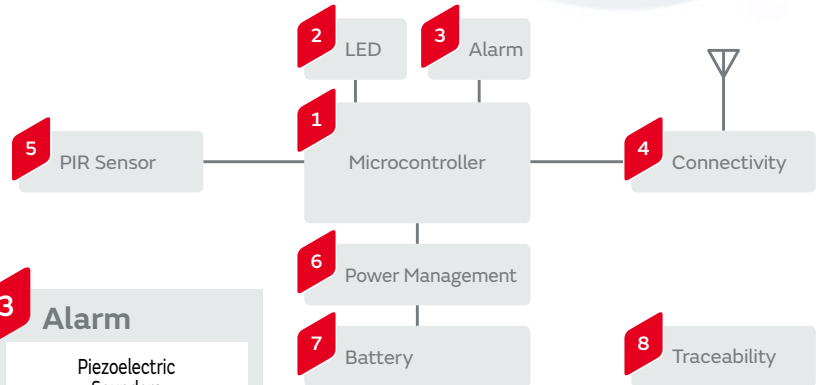
- Wi-Fi Modules
- Crystal Units XRC Series
- Chip Inductors (Chip Coils) LQW/LQP/LQG Series
- ESD Protection Devices LXES Series
- MEMS Resonators WMRAG Series

## 5 PIR Sensor

- Isolated DC-DC Converters for PoE + PD MYBSP Series
- Silicon Capacitors
- Pyroelectric Infrared Sensors IRA-S Series
- Ultrasonic Sensors MA40 Series

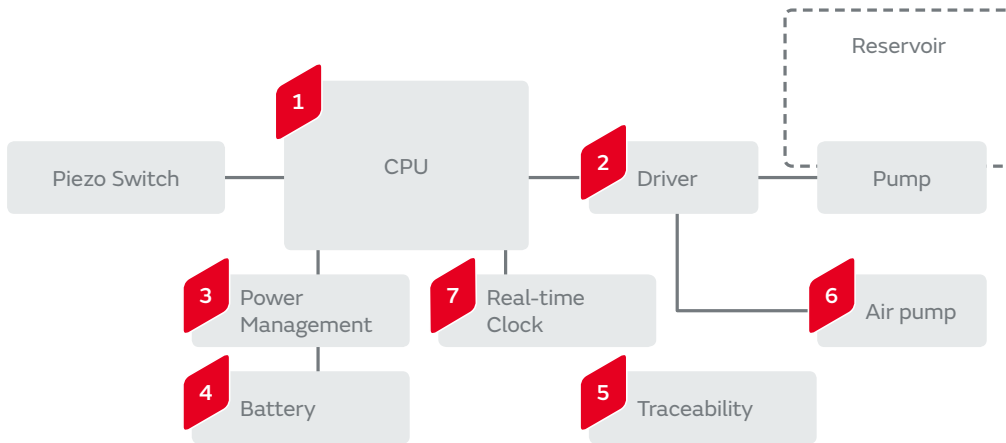
## 8 Traceability

- RFID Tag LXMS/LXTB Series



Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GJM Series	High Frequency Filter Circuit
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression
Polymer Aluminum Electrolytic Capacitors	ECAS/ECNS Series	Smoothing/Transient Backup
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching/Resonance
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
Feed Through Chip EMI Filters	NFE Series	Noise Suppression
Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLP/NFP Series	Noise Suppression

# Air Dispenser



## 1 CPU

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



Polymer Aluminum Electrolytic Capacitors  
ECAS/ECNS Series



Ceramic Resonators  
CERALOCK  
CST Series



Crystal Units  
XRC Series



Thermistors  
NCP/PRF Series



## 2 Driver

Thermistors  
NCP/NXRT/PRF Series



## 3 Power Management

Chip Multilayer Ceramic Capacitors for General Purpose  
GR/GA Series



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



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



Ceramic Resonators CERALOCK  
CST Series



Thermistors  
NCP/PRF Series



## 4 Battery

Thermistors  
NXR/PRF/PRG Series



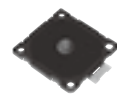
## 5 Traceability

RFID Tag  
LXMS/LXTB Series



## 6 Air pump

Microblowers



## 7 Real-time Clock

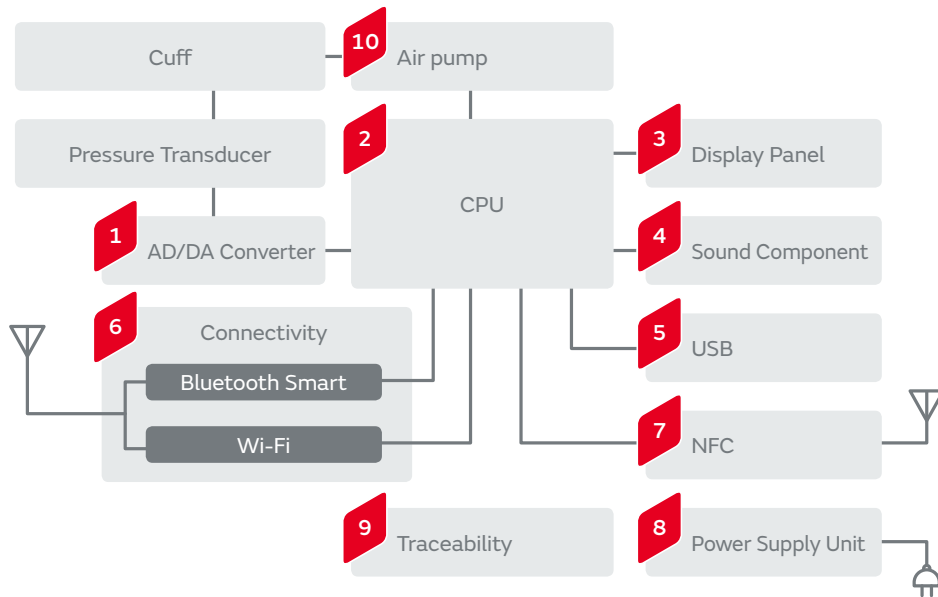
MEMS Resonators  
WMRAG Series



### General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GJM Series	High Frequency Filter Circuit
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression
Polymer Aluminum Electrolytic Capacitors	ECAS/ECNS Series	Smoothing/Transient Backup
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching/Resonance
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
Feed Through Chip EMI Filters	NFE Series	Noise Suppression
Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLP/NFP Series	Noise Suppression

# Blood Pressure Monitor



### 1 AD/DA Converter

- Chip Ferrite Beads BLM Series
- Thermistors NCP Series

### 2 CPU

- Ceramic Resonators CERALOCK CST Series
- Thermistors NCP/NXR Series

### 4 Sound Component

- Piezoelectric Sounders PKMCS/PKLCs/PKM Series

### 3 Display Panel

- 3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose NFM Series
- Chip Ferrite Beads BLM Series
- Ceramic Resonators CERALOCK CST Series
- Crystal Units XRC Series
- Thermistors NCP Series

### 5 USB

- Ceramic Resonators CERALOCK CST Series
- Crystal Units XRC Series
- ESD Protection Devices LXES Series
- Thermistors PRG Series

### 6 Connectivity

- ESD Protection Devices LXES Series
- Bluetooth Smart Modules LBCA/LBMA Series
- Wi-Fi Modules
- Crystal Units XRC Series
- Thermistors PRG Series
- MEMS Resonators WMRAG Series

### 7 NFC

- NFC Antennas FLAN Series
- Crystal Units XRC Series
- Chip Ferrite Beads BLM Series
- Chip Inductors (Chip Coils) LQW18C/LQM18J Series
- ESD Protection Devices LXES Series

### 8 Power Supply Unit

- Thermistors NCP Series
- Thermistors PRF/PRG Series
- Coin Manganese Dioxide Lithium Batteries Standard Type
- Isolated DC-DC Converters for PoE + PD MYBSP Series
- Non-Isolated DC-DC Converters MYMGK/MYSGK/OKL/MYLSM Series

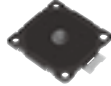
**9 Traceability**

RFID Tag  
LXMS/LXTB Series



**10 Air pump**

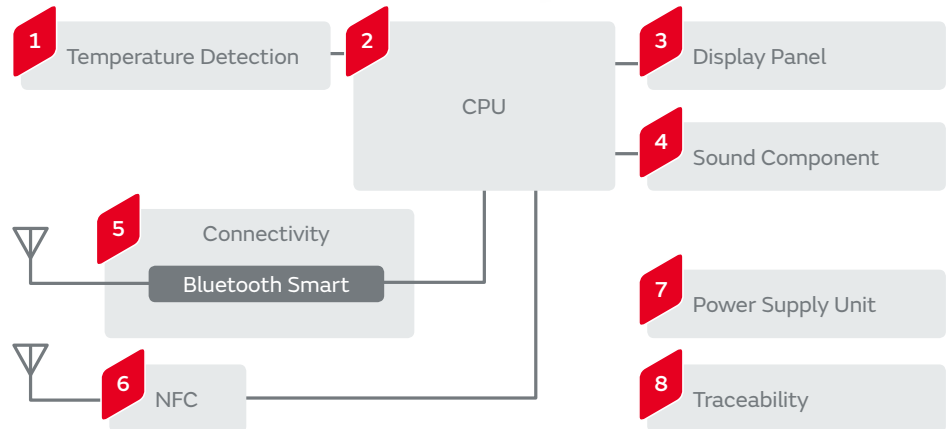
Microblowers



General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GJM Series	High Frequency Filter Circuit
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression
Polymer Aluminum Electrolytic Capacitors	ECAS/ECNS Series	Smoothing/Transient Backup
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching/Resonance
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
Feed Through Chip EMI Filters	NFE Series	Noise Suppression
Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLP/NFP Series	Noise Suppression

# Thermometer



**1 Temperature Detection**

Thermistors  
NXR Series

**2 CPU**

Ceramic Resonators CERALOCK  
CST Series

**3 Display Panel**

Thermistors  
NCP Series

**4 Sound Component**

Piezoelectric Sounders  
PKLCS/PKMCS Series

**5 Connectivity**

Bluetooth Modules  
LBCA/LBMA Series

Crystal Units  
XRC Series

MEMS Resonators  
WMRAG Series

**6 NFC**

NFC Antennas  
FLAN Series

Crystal Units  
XRC Series

Chip Ferrite Beads  
BLM Series

Chip Inductors (Chip Coils)  
LQW18C/LQM18J Series

ESD Protection Devices  
LXES Series

**7 Power Supply Unit**

Coin Manganese Dioxide  
Lithium Batteries  
Standard Type

Alkaline Manganese  
Batteries

**8 Traceability**

RFID Tag  
LXMS/LXTB Series

General Purpose	Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
	High Q Chip Multilayer Ceramic Capacitors for General Purpose	GJM Series	High Frequency Filter Circuit
	Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
	3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression
	Polymer Aluminum Electrolytic Capacitors	ECAS/ECNS Series	Smoothing/Transient Backup
	Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching/Resonance
	Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
	Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
	Feed Through Chip EMI Filters	NFE Series	Noise Suppression
	Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLP/NFP Series	Noise Suppression



# Blood Glucose Meter



## 1 AD/DA Converter

- Chip Ferrite Beads  
BLM Series
- Thermistors  
NCP Series

## 2 CPU

- Ceramic Resonators CERALOCK  
CST Series
- Thermistors  
NCP/NXR Series

## 3 Display Panel

- 3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose  
NFM Series
- Chip Ferrite Beads  
BLM Series
- Ceramic Resonators CERALOCK  
CST Series
- Crystal Units  
XRC Series
- Thermistors  
NCP Series

## 4 Sound Component

- Piezoelectric Sounders  
PKLCS/PKMCS Series

## 5 USB

- Ceramic Resonators CERALOCK  
CST Series
- Crystal Units  
XRC Series
- Thermistors  
PRG Series

## 7 Power Supply Unit

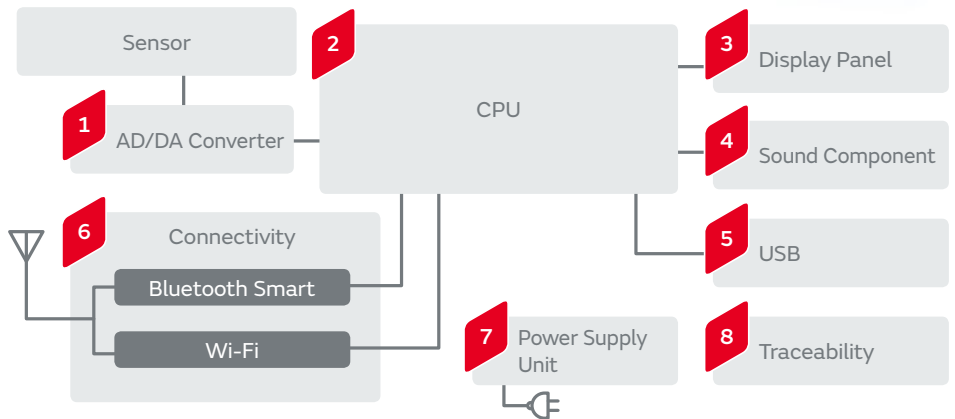
- Coin Manganese Dioxide Lithium Batteries  
Standard Type
- Isolated DC-DC Converters for PoE + PD  
MYBSP Series
- Non-Isolated DC-DC Converters  
MYMGK/MYSGK/OKL/MYLSM Series
- Thermistors  
NCP Series
- Thermistors  
PRF/PRG Series

## 6 Connectivity

- Bluetooth Smart Modules  
LBCA/LBMA Series
- Wi-Fi Modules
- Crystal Units  
XRC Series
- Thermistors  
PRG Series
- MEMS Resonators  
WMRAG Series

## 8 Traceability

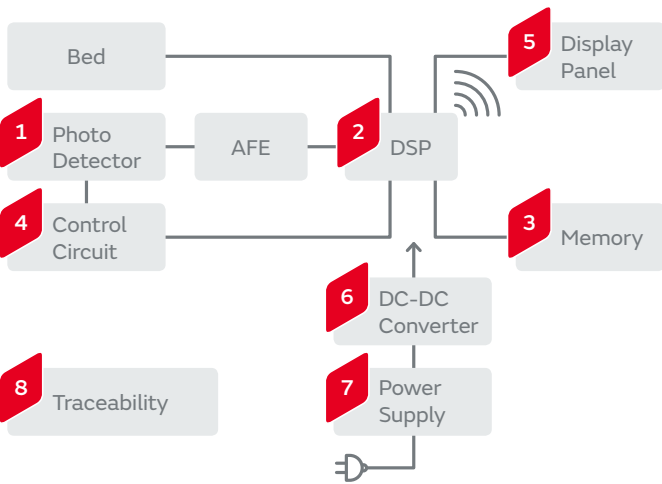
- RFID Tag  
LXMS/LXTB Series



General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GJM Series	High Frequency Filter Circuit
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression
Polymer Aluminum Electrolytic Capacitors	ECAS/ECNS Series	Smoothing/Transient Backup
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching/Resonance
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
Feed Through Chip EMI Filters	NFE Series	Noise Suppression
Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLP/NFP Series	Noise Suppression

# Diagnostic Imaging Apparatus



**1 Photo Detector**

Thermistors  
NCP/PRF Series

**2 DSP**

Ceramic Resonators CERALOCK  
CST Series

Crystal Units  
XRC Series

**3 Memory**

Isolated DC-DC Converters  
MYB Series

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

**4 Control Circuit**

Isolated DC-DC Converters  
MYB Series

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

Ceramic Resonators CERALOCK  
CST Series

**5 Display Panel**

Metal Terminal Type Multilayer Ceramic Capacitors  
for General Purpose  
KRM Series

Ceramic Resonators  
CERALOCK  
CST Series

Piezoelectric Sounders  
PKMCS/PKLCS/PKM Series

Isolated DC-DC Converters  
for PoE + PD  
MYBSP Series

Thermistors  
PRF/PRG Series

**6 DC-DC Converter**

Metal Terminal Type Multilayer Ceramic Capacitors  
for General Purpose  
KRM Series

Polymer Aluminum  
Electrolytic Capacitors  
ECAS/ECNS Series

Thermistors  
NCP/PRF Series

Application Guides Diagnostic Imaging Apparatus

**7 Power Supply**

Chip Multilayer Ceramic Capacitors for General Purpose  
GR/GA Series



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



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



Ceramic Resonators CERALOCK  
CST Series



Thermistors  
NCP/PRF Series



**8 Traceability**

RFID Tag  
LXMS/LXTB Series



General Purpose	Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
	High Q Chip Multilayer Ceramic Capacitors for General Purpose	GJM Series	High Frequency Filter Circuit
	Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
	3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression
	Polymer Aluminum Electrolytic Capacitors	ECAS/ECNS Series	Smoothing/Transient Backup
	Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching/Resonance
	Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
	Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
	Feed Through Chip EMI Filters	NFE Series	Noise Suppression
Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLP/NFP Series	Noise Suppression	

# Automotive



## Powertrain/Safety

1

ECU

2

AT

3

Auxilliary Motors

4

TPMS

5

ABS/ESC

6

Headlamp

7

EPS

8

IMU

9

Fuel Injection System

## 1 ECU

Gyro Sensors  
SCC Series



Metal Terminal Type  
Multilayer Ceramic Capacitors  
for Automotive  
KCM Series



Chip Multilayer Ceramic  
Capacitors for Automotive  
GCM Series



Soft Termination Chip  
Multilayer Ceramic Capacitors  
for Automotive  
GCJ Series



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



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



150°C/175°C/200°C Operation  
Leaded MLCC for Automotive  
RH Series



Ceramic Resonators  
CERALOCK  
CST Series



Crystal Units  
XRC Series



Thermistors  
PRF/PTG/NCU Series



High Reliability Chip Ferrite Beads  
BLM\_SH1/BH1/TH1/JH1 Series



High Reliability Common Mode Choke Coils  
DLW31SH/DLW32SH/  
DLW43SH/DLW43MH Series



Silicon Capacitors



## 2 AT

Accelerometers  
SCA Series



Metal Terminal Type  
Multilayer Ceramic Capacitors  
for Automotive  
KCM Series



Ceramic Resonators  
CERALOCK  
CST Series



Crystal Units  
XRC Series



Thermistors  
PRF/PTG/NCU Series



High Reliability Chip Ferrite Beads  
BLM\_SH1/BH1/TH1/JH1 Series



## 3 Auxiliary Motors

Metal Terminal Type  
Multilayer Ceramic Capacitors  
for Automotive  
KCM Series



150°C/175°C/200°C Operation  
Leaded MLCC for Automotive  
RH Series



Ceramic Resonators  
CERALOCK  
CST Series



Large-current  
Common Mode Choke Coils  
PLT10HH/PLT5BP Series



Thermistors  
PRF/PTG/NCU Series



Crystal Units  
XRC Series



High Reliability Chip Ferrite Beads  
BLM\_SH1/BH1/TH1/JH1 Series



## 4 TPMS

Shock Sensors  
For Tire Pressure Monitoring  
System, PKGS Series



Ceramic Filters CERAFIL  
SFEFC Series



Ceramic Resonators CERALOCK  
CST Series



Crystal Units  
XRC Series



Pressure Sensor Elements  
SCB10H Series



Thermistors  
PRF/NCU Series



Antenna Coil  
SA3M08 Series



Coin Manganese Dioxide Lithium Batteries  
Heat-resistant Type














High Reliability Chip Ferrite Beads  
BLM\_SH1/BH1/TH1/JH1 Series



High Reliability Chip Inductors  
LQG15HH Series














**5 ABS/ESC**

Accelerometers SCA Series 	Gyro Sensors SCC Series 	Metal Terminal Type Multilayer Ceramic Capacitors for Automotive KCM Series 	Chip Multilayer Ceramic Capacitors for Automotive GCM Series 
Soft Termination Chip Multilayer Ceramic Capacitors for Automotive GCJ Series 	AgPd Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive GCG Series 	Ni Plating + Pd Plating Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive GCB Series 	
Ceramic Resonators CERALOCK CST Series 	Crystal Units XRC Series 	Thermistors NCG18/NCU Series 	High Reliability Chip Ferrite Beads BLM_SH1/BH1/TH1/JH1 Series 



**6 Headlamp**

Accelerometers SCA Series 	Chip Multilayer Ceramic Capacitors for Automotive GCM Series 
Soft Termination Chip Multilayer Ceramic Capacitors for Automotive GCJ Series 	Ceramic Resonators CERALOCK CST Series 
Crystal Units XRC Series 	Thermistors NCG18/NCU Series 
High Reliability Chip Ferrite Beads BLM_SH1/BH1/TH1/JH1 Series 	



**7 EPS**

Metal Terminal Type Multilayer Ceramic Capacitors for Automotive KCM Series 	Chip Multilayer Ceramic Capacitors for Automotive GCM Series 	Soft Termination Chip Multilayer Ceramic Capacitors for Automotive GCJ Series 
AgPd Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive GCG Series 	Ni Plating + Pd Plating Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive GCB Series 	
Leaded MLCC for Automotive RCE Series 	Ceramic Resonators CERALOCK CST Series 	Crystal Units XRC Series 
Thermistors NCG18/NCU Series 	Thermistors PRF/PTG/NCU Series 	High Reliability Chip Ferrite Beads BLM_SH1/BH1/TH1/JH1 Series 

**8 IMU**

Gyro Sensors SCC Series 	Ceramic Resonators CERALOCK CST Series 	Crystal Units XRC Series 
---	--	--

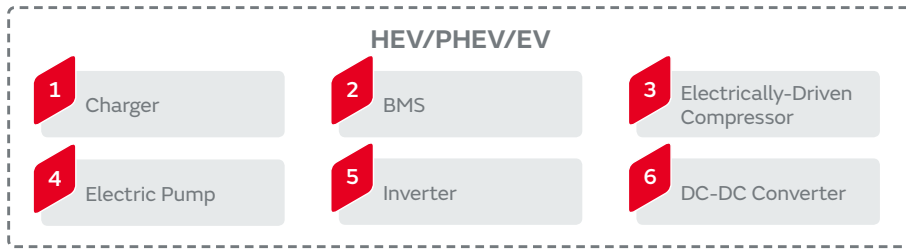
**9 Fuel Injection System**

Leaded MLCC for Automotive RCF Series 	High Reliability Chip Ferrite Beads BLM_SH1/BH1/TH1/JH1 Series 
--	--

General Purpose (High Reliability)	Chip Multilayer Ceramic Capacitors for Automotive	GCM Series	Coupling/Decoupling	150°C
	Ni Plating + Pd Plating Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive	GCB Series	Coupling/Decoupling	
	Leaded MLCC for Automotive	RCE Series	Noise Suppression/Decoupling	125°C
	150°C/175°C/200°C Operation Leaded MLCC for Automotive	RH Series	Noise Suppression/Decoupling	150°C 175°C 200°C
	3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for Automotive/Feed Through Noise Filters	NFM_H/NFE_H Series	Noise Suppression	125°C
	Chip Inductors (Chip Coils)	LQH32PH/LQH44PH/LQH43PH/LQH5BPH Series	Voltage Conversion	125°C
	Chip Inductors (Chip Coils)	LQG15HH Series	Impedance Matching/Choke	125°C
	Chip Ferrite Beads	BLM_SH/BLM_BH/BLE_SH Series	Noise Suppression	125°C
	Chip Common Mode Choke Coils	DLW31SH/DLW32SH/DLW43SH/DLW43MH/DLW5ATH/DLW5BTH Series	Common Mode Noise Suppression	125°C

125°C 125°C max. 150°C 150°C max. 175°C 175°C max. 200°C 200°C max.

# Application Guides Automotive



## 1 Charger

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

## 2 BMS

<p>Metal Terminal Type Multilayer Ceramic Capacitors for Automotive KCM Series</p>	<p>Chip Multilayer Ceramic Capacitors for Automotive GCM Series</p>
<p>Soft Termination Chip Multilayer Ceramic Capacitors for Automotive GCJ Series</p>	<p>AgPd Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive GCG Series</p>
<p>Ni Plating + Pd Plating Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive GCB Series</p>	<p>Ceramic Resonators CERALOCK CST Series</p>
<p>Crystal Units XRC Series</p>	<p>Thermistors PRF/PTG/NCU Series</p>
<p>High Reliability Chip Ferrite Beads BLM_SH1/BH1/TH1/JH1 Series</p>	







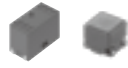





## 3 Electrically-Driven Compressor

<p>Metal Terminal Type Multilayer Ceramic Capacitors for Automotive KCM Series</p>	<p>Chip Multilayer Ceramic Capacitors for Automotive GCM Series</p>
<p>Soft Termination Chip Multilayer Ceramic Capacitors for Automotive GCJ Series</p>	<p>AgPd Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive GCG Series</p>
<p>Ni Plating + Pd Plating Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive GCB Series</p>	<p>Thermistors PRF/PTG/NCU Series</p>
<p>High Temperature Film Capacitors for Automotive FH Series</p>	<p>Ceramic Resonators CERALOCK CST Series</p>
<p>Crystal Units XRC Series</p>	<p>High Reliability Chip Ferrite Beads BLM_SH1/BH1/TH1/JH1 Series</p>












## 4 Electric Pump

<p>Metal Terminal Type Multilayer Ceramic Capacitors for Automotive KCM Series</p>	<p>Chip Multilayer Ceramic Capacitors for Automotive GCM Series</p>	<p>Soft Termination Chip Multilayer Ceramic Capacitors for Automotive GCJ Series</p>	<p>AgPd Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive GCG Series</p>
<p>Large-current Common Mode Choke Coils PLT10HH/PLT5BP Series</p>	<p>Thermistors PRF/PTG/NCU Series</p>	<p>High Temperature Film Capacitors for Automotive FH Series</p>	<p>Ceramic Resonators CERALOCK CST Series</p>
<p>Crystal Units XRC Series</p>		<p>High Reliability Chip Ferrite Beads BLM_SH1/BH1/TH1/JH1 Series</p>	

**5 Inverter**

<p>Metal Terminal Type Multilayer Ceramic Capacitors for Automotive <b>KCM Series</b></p> 	<p>Chip Multilayer Ceramic Capacitors for Automotive <b>GCM Series</b></p> 	<p>Soft Termination Chip Multilayer Ceramic Capacitors for Automotive <b>GCJ Series</b></p> 	<p>AgPd Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive <b>GCG Series</b></p> 
<p>Ni Plating + Pd Plating Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive <b>GCB Series</b></p> 	<p>150°C/175°C/200°C Operation Leaded MLCC for Automotive <b>RH Series</b></p> 	<p>Large-current Common Mode Choke Coils <b>PLT10HH/PLT5BP Series</b></p> 	<p>Thermistors <b>PRF/PTG/NCU Series</b></p> 
<p>High Temperature Film Capacitors for Automotive <b>FH Series</b></p> 	<p>Ceramic Resonators CERALOCK <b>CST Series</b></p> 	<p>Crystal Units <b>XRC Series</b></p> 	<p>High Reliability Chip Ferrite Beads <b>BLM_SH1/BH1/TH1/JH1 Series</b></p> 

**6 DC-DC Converter**

<p>Metal Terminal Type Multilayer Ceramic Capacitors for Automotive <b>KCM Series</b></p> 	<p>Chip Multilayer Ceramic Capacitors for Automotive <b>GCM Series</b></p> 	<p>Soft Termination Chip Multilayer Ceramic Capacitors for Automotive <b>GCJ Series</b></p> 	<p>AgPd Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive <b>GCG Series</b></p> 
<p>Ni Plating + Pd Plating Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive <b>GCB Series</b></p> 	<p>High Temperature Film Capacitors for Automotive <b>FH Series</b></p> 	<p>Ceramic Resonators CERALOCK <b>CST Series</b></p> 	<p>Crystal Units <b>XRC Series</b></p> 
<p>Large-current Common Mode Choke Coils <b>PLT10HH/PLT5BP Series</b></p> 	<p>Thermistors <b>PRF/PTG/NCU Series</b></p> 	<p>High Reliability Chip Ferrite Beads <b>BLM_SH1/BH1/TH1/JH1 Series</b></p> 	

<b>General Purpose</b>	AEC-Q 200 Compliant Chip Multilayer Ceramic Capacitors for Infotainment	GRT Series	Coupling/Decoupling
	Chip Inductors (Chip Coils)	LQW Series	Matching/High Frequency Choke
	Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
	Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
	EMI Suppression Filters EMIFIL	NFL/NFE Series	Noise Suppression
	Chip Common Mode Choke Coils	DLW Series	Common Mode Noise Suppression

<b>General Purpose (High Reliability)</b>	Chip Multilayer Ceramic Capacitors for Automotive	GCM Series	Coupling/Decoupling	150°C
	Ni Plating + Pd Plating Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive	GCB Series	Coupling/Decoupling	
	Leaded MLCC for Automotive	RCE Series	Noise Suppression/Decoupling	125°C
	150°C/175°C/200°C Operation Leaded MLCC for Automotive	RH Series	Noise Suppression/Decoupling	150°C 175°C 200°C
	3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for Automotive/Feed Through Noise Filters	NFM_H/NFE_H Series	Noise Suppression	125°C
	Chip Inductors (Chip Coils)	LQH32PH/LQH44PH/LQH43PH/LQH5BPH Series	Voltage Conversion	125°C
	Chip Inductors (Chip Coils)	LQG15HH Series	Impedance Matching/Choke	125°C
	Chip Ferrite Beads	BLM_SH/BLM_BH/BLE_SH Series	Noise Suppression	125°C
Chip Common Mode Choke Coils	DLW31SH/DLW32SH/DLW43SH/DLW43MH/DLW5ATH/DLW5BTH Series	Common Mode Noise Suppression	125°C	

125°C 125°C max. 150°C 150°C max. 175°C 175°C max. 200°C 200°C max.



Information/Comfort/Accessory

1 Navigation/  
Infotainment

2 Remote Keyless Entry

3 Meter/HUD

4 Power Seat/  
Power Mirror

5 Parking Assist



1 Navigation/Infotainment

Accelerometers  
SCA Series



Gyro Sensors  
SCC Series



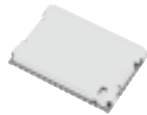
Ceramic Filters CERAFIL  
SFECF Series



Piezoelectric Sounders  
PKLCS/PKMCS Series



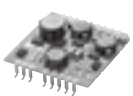
Bluetooth Modules



Wi-Fi Modules



DC-DC Converters



Ceramic Resonators CERALOCK  
CST Series



Crystal Units  
XRC Series



Thermistors  
PRF/PRG/PTG/NCU 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



Chip Ferrite Beads  
BLM Series



2 Remote Keyless Entry

Ceramic Filters CERAFIL  
SFECF Series



Ceramic Resonators CERALOCK  
CST Series



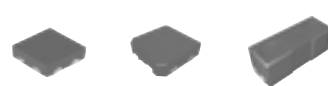
Crystal Units  
XRC Series



Piezoelectric Sounders  
PKLCS/PKMCS Series



Antenna Coils  
SA3D14/SA3D12/SA3M08 Series



Coin Manganese Dioxide Lithium Batteries  
Standard Type



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

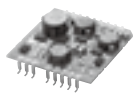


Chip Ferrite Beads  
BLM Series



3 Meter/HUD

DC-DC Converters



Ceramic Resonators CERALOCK  
CST Series



Crystal Units  
XRC Series



Thermistors  
PRF/PTG/NCU Series



Chip Ferrite Beads  
BLM Series

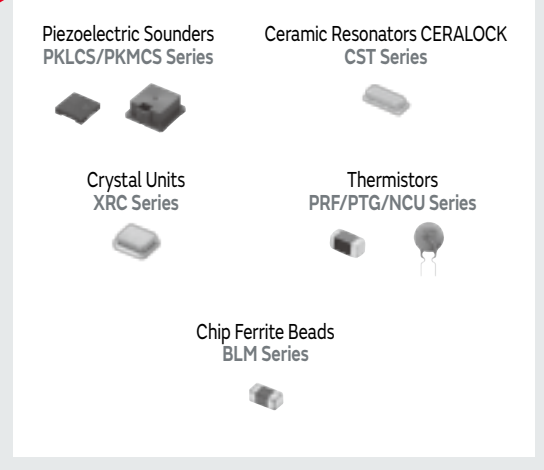


Piezoelectric Sounders  
PKLCS/PKMCS Series

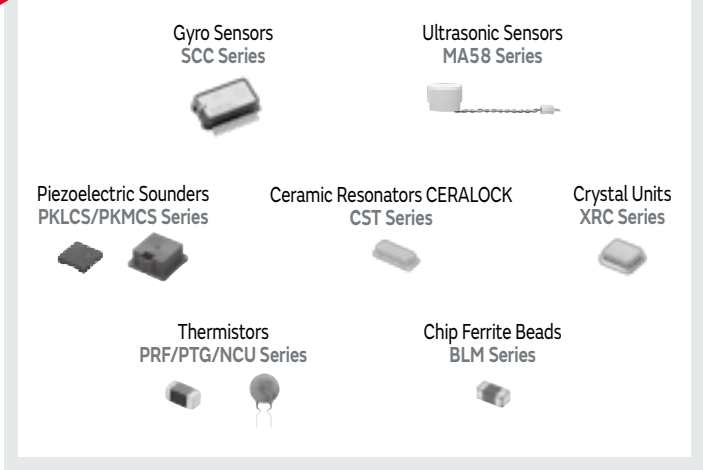




**4 Power Seat/Power Mirror**



**5 Parking Assist**



General Purpose	AEC-Q 200 Compliant Chip Multilayer Ceramic Capacitors for Infotainment	GRT Series	Coupling/Decoupling
	Chip Inductors (Chip Coils)	LQW Series	Matching/High Frequency Choke
	Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
	Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
	EMI Suppression Filters EMIFIL	NFL/NFE Series	Noise Suppression
	Chip Common Mode Choke Coils	DLW Series	Common Mode Noise Suppression

General Purpose (High Reliability)	Chip Multilayer Ceramic Capacitors for Automotive	GCM Series	Coupling/Decoupling	150°C
	Ni Plating + Pd Plating Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive	GCB Series	Coupling/Decoupling	
	Leaded MLCC for Automotive	RCE Series	Noise Suppression/Decoupling	125°C
	150°C/175°C/200°C Operation Leaded MLCC for Automotive	RH Series	Noise Suppression/Decoupling	150°C 175°C 200°C
	3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for Automotive/Feed Through Noise Filters	NFM_H/NFE_H Series	Noise Suppression	125°C
	Chip Inductors (Chip Coils)	LQH32PH/LQH44PH/LQH43PH/LQH5BPH Series	Voltage Conversion	125°C
	Chip Inductors (Chip Coils)	LQG15HH Series	Impedance Matching/Choke	125°C
	Chip Ferrite Beads	BLM_SH/BLM_BH/BLE_SH Series	Noise Suppression	125°C
Chip Common Mode Choke Coils	DLW31SH/DLW32SH/DLW43SH/DLW43MH/DLW5ATH/DLW5BTH Series	Common Mode Noise Suppression	125°C	

125°C 125°C max. 150°C 150°C max. 175°C 175°C max. 200°C 200°C max.

# 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 Multilayer  
Ceramic Capacitors for Automotive  
KCM Series



Chip Multilayer Ceramic  
Capacitors for Automotive  
GCM Series



Soft Termination Chip Multilayer  
Ceramic Capacitors for Automotive  
GCJ Series



Safety Standard Certified  
Lead Type Disc Ceramic  
Capacitors for Automotive  
DE6 Series



Ceramic Resonators  
CERALOCK  
CST Series



Crystal Units  
XRC Series



Large-current Common Mode Choke Coils  
PLT10HH/PLT5BP Series



Thermistors  
PRF/PTG/NCU Series



High Reliability Chip Ferrite Beads  
BLM\_SH1/BH1/TH1/JH1 Series



## 2 Inverter

Chip Multilayer Ceramic  
Capacitors for Automotive  
GCM Series



Soft Termination Chip Multilayer  
Ceramic Capacitors for Automotive  
GCJ Series



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



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



150°C/175°C/200°C Operation  
Leaded MLCC for Automotive  
RH Series



Large-current  
Common Mode Choke Coils  
PLT10HH/PLT5BP Series



Ceramic Resonators CERALOCK  
CST Series



Crystal Units  
XRC Series



High Reliability Chip Ferrite Beads  
BLM\_SH1/BH1/TH1/JH1 Series



Thermistors  
PRF/PTG/NCU Series



## 3 DC-DC Converter

DC-DC Converters  
MYPMA Series



Metal Terminal Type Multilayer  
Ceramic Capacitors for Automotive  
KCM Series



Chip Multilayer Ceramic  
Capacitors for Automotive  
GCM Series



Soft Termination Chip Multilayer  
Ceramic Capacitors for Automotive  
GCJ Series



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



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



Ceramic Resonators CERALOCK  
CST Series



Crystal Units  
XRC Series



Large-current Common Mode Choke Coils  
PLT10HH/PLT5BP Series














Thermistors  
PRF/PTG/NCU Series











High Reliability Chip Ferrite Beads  
BLM\_SH1/BH1/TH1/JH1 Series












**4 Accelerometer for Fuel Cut**

<p>Accelerometers SCA Series</p> 	<p>Gyro Sensors SCC Series</p> 	<p>Metal Terminal Type Multilayer Ceramic Capacitors for Automotive KCM Series</p> 	<p>Chip Multilayer Ceramic Capacitors for Automotive GCM Series</p> 
<p>Soft Termination Chip Multilayer Ceramic Capacitors for Automotive GCJ Series</p> 	<p>AgPd Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive GCG Series</p> 	<p>Ni Plating + Pd Plating Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive GCB Series</p> 	
<p>Ceramic Resonators CERALOCK CST Series</p> 	<p>Crystal Units XRC Series</p> 	<p>Thermistors NCG18/NCU Series</p> 	<p>High Reliability Chip Ferrite Beads BLM_SH1/BH1/TH1/JH1 Series</p> 

**5 Headlamp**

<p>Accelerometers SCA Series</p> 	<p>Gyro Sensors SCC Series</p> 
<p>Chip Multilayer Ceramic Capacitors for Automotive GCM Series</p> 	<p>Soft Termination Chip Multilayer Ceramic Capacitors for Automotive GCJ Series</p> 
<p>Ceramic Resonators CERALOCK CST Series</p> 	<p>Crystal Units XRC Series</p> 
<p>Thermistors NCG18/NCU Series</p> 	<p>High Reliability Chip Ferrite Beads BLM_SH1/BH1/TH1/JH1 Series</p> 

**6 Fuel Injection System**

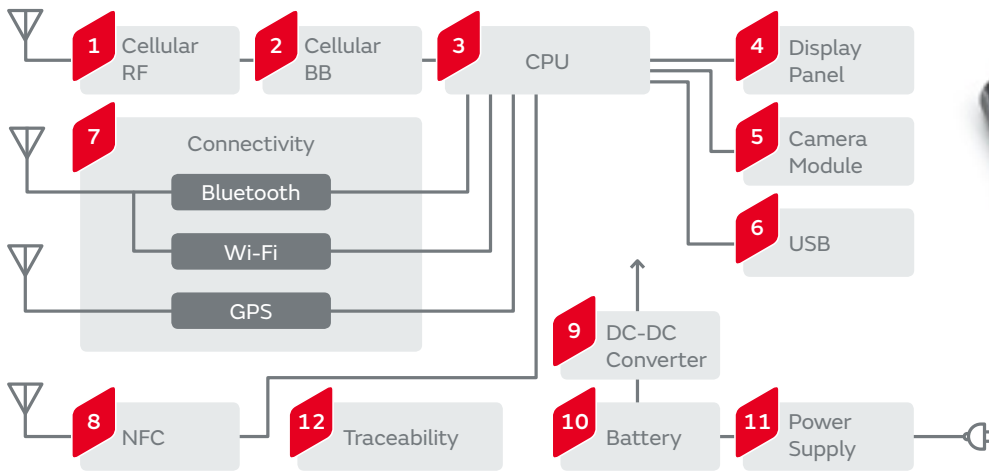
<p>Metal Terminal Type Multilayer Ceramic Capacitors for Automotive KCM Series</p> 	<p>Chip Multilayer Ceramic Capacitors for Automotive GCM Series</p> 
<p>Soft Termination Chip Multilayer Ceramic Capacitors for Automotive GCJ Series</p> 	<p>AgPd Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive GCG Series</p> 
<p>Ni Plating + Pd Plating Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive GCB Series</p> 	<p>Ceramic Resonators CERALOCK CST Series</p> 
<p>Crystal Units XRC Series</p> 	<p>Thermistors PRF/PTG/NCU Series</p> 
<p>High Reliability Chip Ferrite Beads BLM_SH1/BH1/TH1/JH1 Series</p> 	

General Purpose	AEC-Q 200 Compliant Chip Multilayer Ceramic Capacitors for Infotainment	GRT Series	Coupling/Decoupling
	Chip Inductors (Chip Coils)	LQW Series	Matching/High Frequency Choke
	Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
	Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
	EMI Suppression Filters EMIFIL	NFL/NFE Series	Noise Suppression
	Chip Common Mode Choke Coils	DLW Series	Common Mode Noise Suppression

General Purpose (High Reliability)	Chip Multilayer Ceramic Capacitors for Automotive	GCM Series	Coupling/Decoupling	150°C
	Ni Plating + Pd Plating Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive	GCB Series	Coupling/Decoupling	150°C
	Leaded MLCC for Automotive	RCE Series	Noise Suppression/Decoupling	125°C
	150°C/175°C/200°C Operation Leaded MLCC for Automotive	RH Series	Noise Suppression/Decoupling	150°C 175°C 200°C
	3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for Automotive/Feed Through Noise Filters	NFM_H/NFE_H Series	Noise Suppression	125°C
	Chip Inductors (Chip Coils)	LQH32PH/LQH44PH/LQH43PH/LQH5BPH Series	Voltage Conversion	125°C
	Chip Inductors (Chip Coils)	LQG15HH Series	Impedance Matching/Choke	125°C
	Chip Ferrite Beads	BLM_SH/BLM_BH/BLE_SH Series	Noise Suppression	125°C
Chip Common Mode Choke Coils	DLW31SH/DLW32SH/DLW43SH/DLW43MH/DLW5ATH/DLW5BTH Series	Common Mode Noise Suppression	125°C	

125°C 125°C max. 150°C 150°C max. 175°C 175°C max. 200°C 200°C max.

# Smart Phones



## 1 Cellular RF

- SAW Duplexers SAY Series
- SAW Filters SAF Series
- Chip Multilayer LC Filters LF Series
- Chip Multilayer Diplexers LFD Series
- Chip Multilayer Hybrid Baluns LDB/LDM Series
- Chip Multilayer Hybrid Dividers LDD Series
- Chip Multilayer Hybrid Couplers LDC/LDJ Series
- High-Frequency Matching Transformers SMST Series
- Microwave Coaxial Cable Connectors
- Microwave Coaxial Connectors with Switch
- Chip Inductors (Chip Coils) LQW/LQP Series
- ESD Protection Devices LXES Series
- Band-Selectable Phase Adjustment Device (B-SPADE)
- Thermistors NCP/PRF Series

## 2 Cellular BB

- 3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose NFM Series
- Chip Common Mode Choke Coils/ Common Mode Noise Filters DLW/DLP/NFP Series
- Frequency Specified Noise Filters BLF Series
- Chip LC Trap Filters LQZ02HQ Series
- Thermistors NCP/PRF Series

## 3 CPU

- Crystal Units XRC Series
- Chip Ferrite Beads BLM Series
- 3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose NFM Series
- Silicon Capacitors
- Thermistors NCP/PRF Series

## 4 Display Panel

- Ceramic Resonators CERALOCK CST Series
- EMI Suppression Filters EMIFIL NFA Series
- ESD Protection Devices LXES Series
- Chip Common Mode Choke Coils/ Common Mode Noise Filters DLW/DLP/NFP Series
- Thermistors NCP/PRF Series

## 5 Camera Module

- Chip Multilayer Ceramic Capacitors for Camera Flash Circuit Only GR7 Series
- Chip Ferrite Beads BLM Series
- ESD Protection Devices LXES Series
- Thermistors NCP/PRF Series

**6** USB

Chip Common Mode Choke Coils/  
Common Mode Noise Filters  
DLW/DLP/NFP/DLM 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



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)  
LQW18C/LQM18J Series



Variable Capacitors  
LXRW Series



ESD Protection Devices  
LXES Series



**9** DC-DC Converter

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



Metal Terminal Type Multilayer Ceramic Capacitors  
for General Purpose  
KRM Series



Polymer Aluminum  
Electrolytic Capacitors  
ECAS/ECNS Series



Thermistors  
NCP/PRF Series



**10** Battery

Thermistors  
NCP/PRF/PRG Series



**12** Traceability

RFID Tag  
LXMS/LXTB Series



**11** Power Supply

Chip Multilayer  
Ceramic Capacitors  
for General Purpose  
GR/GA Series



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



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



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



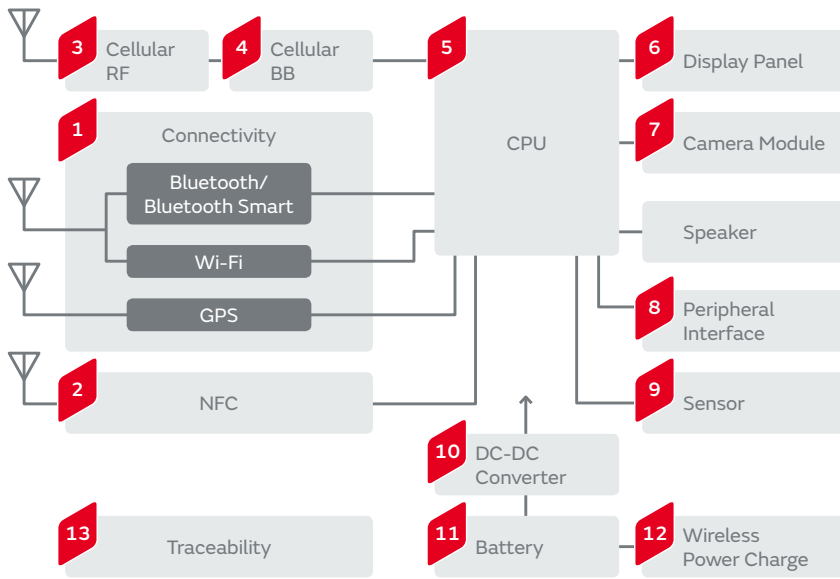
MEMS Resonators  
WMRAG Series



General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GJM Series	High Frequency Filter Circuit
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression
Polymer Aluminum Electrolytic Capacitors	ECAS/ECNS Series	Smoothing/Transient Backup
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching/Resonance
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
Feed Through Chip EMI Filters	NFE Series	Noise Suppression
Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLP/NFP Series	Noise Suppression

# Wearable Devices



## 1 Connectivity

Bluetooth Modules	Wi-Fi Modules	Bluetooth - Wi-Fi Combo Modules	SAW Filters SAF Series	Chip Multilayer LC Filters 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	ESD Protection Devices LXES Series	Thermistors NCP/PRF Series	MEMS Resonators WMRAG Series	

## 2 NFC

NFC Antennas FLAN Series	Crystal Units XRC Series	Chip Inductors (Chip Coils) LQW18C/LQM18J 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 Dividers LDD Series	Chip Multilayer Hybrid Couplers LDC/LDJ Series	
High-Frequency Matching Transformers SMST Series	Microwave Coaxial Cable Connectors Microwave Coaxial Connectors with Switch	ESD Protection Devices LXES Series	
Band-Selectable Phase Adjustment Device (B-SPADE)	Thermistors NCP/PRF Series		

## 4 Cellular BB

Thermistors NCP/PRF Series
-------------------------------

## 5 CPU

Crystal Units XRC Series	Silicon Capacitors
Thermistors NCP/PRF Series	

**6 Display Panel**

Ceramic Resonators CERALOCK CST Series



Crystal Units XRC Series



ESD Protection Devices LXES Series



Thermistors NCP/PRF Series



**7 Camera Module**

Chip Multilayer Ceramic Capacitors for Camera Flash Circuit Only GR7 Series



ESD Protection Devices LXES Series



Thermistors NCP/PRF Series



**8 Peripheral Interface**

Ceramic Resonators CERALOCK CST Series



Crystal Units XRC Series



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



ESD Protection Devices LXES Series



Thermistors NCP/PRF Series



**9 Sensor**

Thermistors NCP/PRF Series



**10 DC-DC Converter**

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



Metal Terminal Type Multilayer Ceramic Capacitors for General Purpose KRM Series



Polymer Aluminum Electrolytic Capacitors ECAS/ECNS Series



Thermistors NCP Series



**11 Battery**

Coin Manganese Dioxide Lithium Batteries Standard Type



Thermistors NCP/PRF/PRG Series



**12 Wireless Power Charge**

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



Thermistors NCP/PRF Series



**13 Traceability**

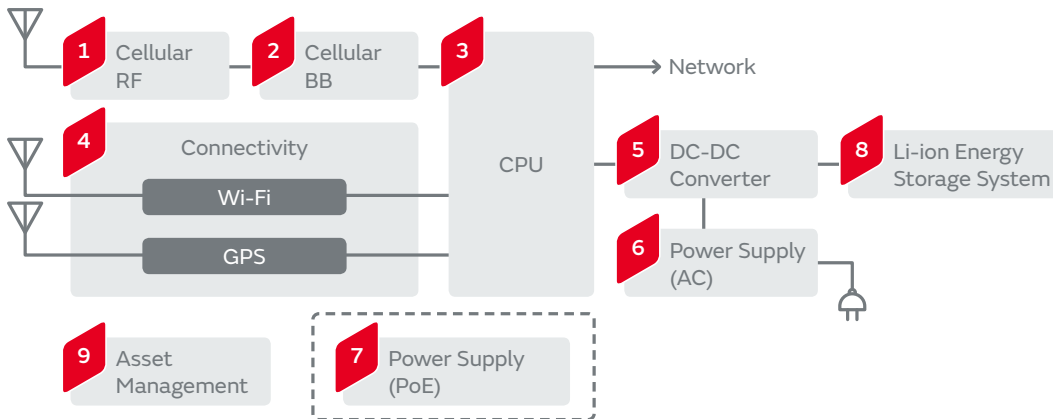
RFID Tag LXMS/LXTB Series



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



# Base Stations



## 1 Cellular RF

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



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



ESD Protection Devices  
LXES Series



Thermistors  
PRF Series



Precision TCXO  
XTCLH/XNCLH Series



Silicon Capacitors



Single-Layer Microchip Capacitors  
CLB Series



Thin Film Circuit Substrates (RUSUB)  
RU Series



MEMS Resonators  
WMRAG Series



## 2 Cellular BB

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



Chip Common Mode Choke Coils/  
Common Mode Noise Filters  
DLW/DLP/NFP Series



Precision TCXO  
XTCLH/XNCLH Series



Thermistors  
PRF Series



## 3 CPU

Crystal Units  
XRC Series



Chip Ferrite Beads  
BLM Series



3 Terminals Low ESL Chip  
Multilayer Ceramic Capacitors  
for General Purpose  
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



ESD Protection Devices  
LXES Series



Thermistors  
PRF Series



Crystal Units  
XRC Series



## 5 DC-DC Converter

Isolated DC-DC Converters  
MYB Series



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



Metal Terminal Type Multilayer Ceramic Capacitors  
for General Purpose  
KRM Series



Polymer Aluminum Electrolytic Capacitors  
ECAS/ECNS Series




Thermistors  
PRF Series






**6 Power Supply (AC)**


Chip Multilayer Ceramic Capacitors for General Purpose GR/GA Series




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



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




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




**7 Power Supply (PoE)**


Chip Multilayer Ceramic Capacitors for General Purpose GR/GA Series




Metal Terminal Type Multilayer Ceramic Capacitors for General Purpose KRM Series




Crystal Units XRC Series



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



Isolated DC-DC Converters for PoE + PD MYBSP Series



**8 Li-ion Energy Storage System**

Energy Storage Module Model IJ1101M Series



BMU (Battery Management Unit) IJ8101C Series




BMU-HUB IJ1101K Series



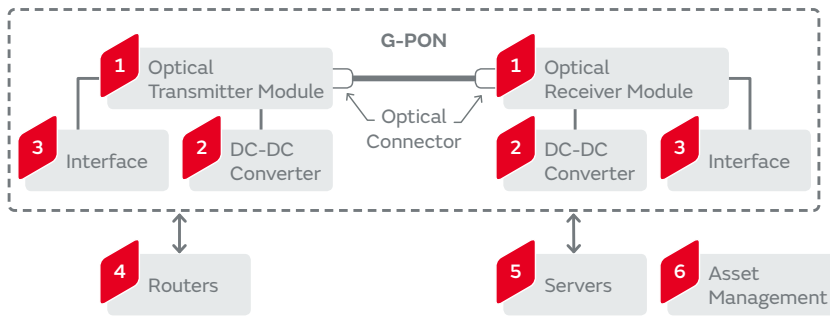
**9 Asset Management**

RFID Tag LXTB Series



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

# G-PON



## 1 Optical Transmitter Module/Optical Receiver Module

Wire Bonding Mount Multilayer Microchip Capacitors for General Purpose  
GMA Series



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



Single-Layer Microchip Capacitors  
CLB Series



Thin Film Circuit Substrates (RUSUB)  
RU Series



Silicon Capacitors



## 2 DC-DC Converter

Isolated DC-DC Converters  
MYB Series



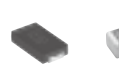
Non-Isolated DC-DC Converters  
MYMGK/MYSGK/OKL/MYLSM Series



Isolated DC-DC Converters for PoE + PD  
MYBSP Series



Polymer Aluminum Electrolytic Capacitors  
ECAS/ECNS Series



Thermistors  
PRF Series

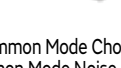


## 3 Interface

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



Crystal Units  
XRC Series



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



ESD Protection Devices  
LXES Series



## 4 Routers

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



Wire Bonding Mount Multilayer Microchip Capacitors for General Purpose  
GMA Series



Crystal Units  
XRC Series



Chip Common Mode Choke Coils/ Common Mode Noise Filters  
DLW/DLP/NFP Series



Thin Film Circuit Substrates (RUSUB)  
RU Series



Chip Multilayer Ceramic Capacitors for General Purpose  
GR/GA Series



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



Single-Layer Microchip Capacitors  
CLB Series



Precision TCXO  
XTCLH/XNCLH Series



## 5 Servers

Polymer Aluminum Electrolytic Capacitors  
ECAS/ECNS Series



Crystal Units  
XRC Series



## 6 Asset Management

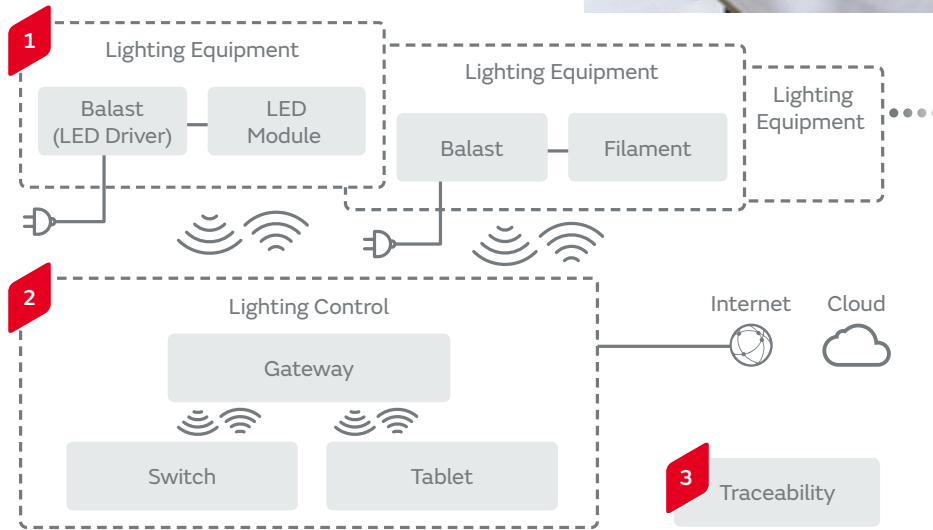
RFID Tag  
LXTB Series



General Purpose

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

# Lighting



## 1 Lighting Equipment

<p><b>Ballast for LED Lighting</b></p>	<p><b>Chip Multilayer Ceramic Capacitors for General Purpose GR/GA Series</b></p>
<p><b>Safety Standard Certified Resin Molding SMD Type Ceramic Capacitors for General Purpose DK1 Series</b></p>	<p><b>Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose DE1/DE2 Series</b></p>
<p><b>Wi-Fi Modules</b></p>	<p><b>LPWA Modules</b></p>
<p><b>Thermistors NCP/PRF/PRG/PTG Series</b></p>	<p><b>Microwave Coaxial Connectors with Switch</b></p>
<p><b>Piezoelectric Sounders PKLCS/PKMCS Series</b></p>	<p><b>Crystal Units XRC Series</b></p>

## 2 Lighting Control

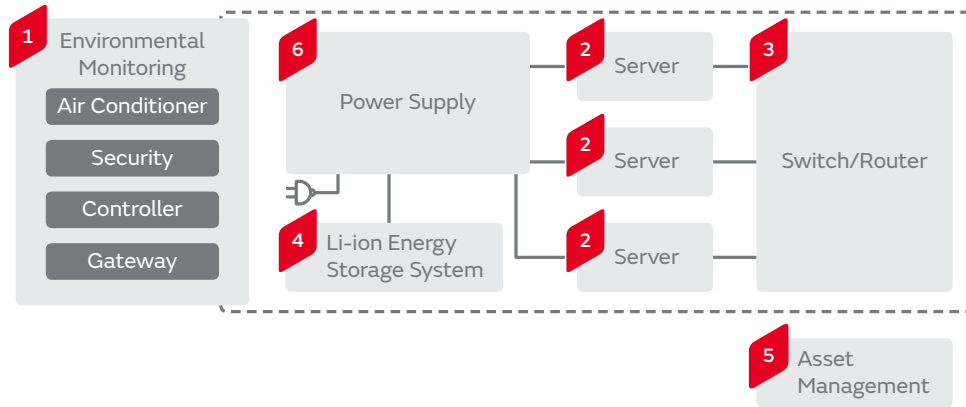
<p><b>Wi-Fi Modules</b></p>	<p><b>LPWA Modules</b></p>	<p><b>Crystal Units XRC Series</b></p>
<p><b>Ceramic Resonators CERALOCK CST Series</b></p>	<p><b>Isolated DC-DC Converters for PoE + PD MYBSP Series</b></p>	<p><b>Microwave Coaxial Connectors with Switch</b></p>
<p><b>Pyroelectric Infrared Sensors IRA-S Series</b></p>	<p><b>Ultrasonic Sensors MA40 Series</b></p>	<p><b>MEMS Resonators WMRAG Series</b></p>

## 3 Traceability

**RFID Tag LXMS/LXTB Series**

General Purpose	Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
	High Q Chip Multilayer Ceramic Capacitors for General Purpose	GJM Series	High Frequency Filter Circuit
	Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
	3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression
	Polymer Aluminum Electrolytic Capacitors	ECAS/ECNS Series	Smoothing/Transient Backup
	Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching/Resonance
	Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
	Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
	Feed Through Chip EMI Filters	NFE Series	Noise Suppression
	Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLP/NFP Series	Noise Suppression

# Data Center



## 1 Environmental Monitoring

<p>Wi-Fi Modules</p>	<p>LPWA Modules</p>	<p>Magnetic Sensors (AMR Sensors) MR Series</p>
<p>Thermistors NCU Series</p>	<p>MEMS Resonators WMRAG Series</p>	

## 2 Server

<p>Isolated DC-DC Converters MYB Series</p>	<p>Non-Isolated DC-DC Converters MYMGK/MYSGK/OKL/MYLSM Series</p>
<p>Polymer Aluminum Electrolytic Capacitors ECAS/ECNS Series</p>	<p>Crystal Units XRC Series</p>

## 3 Switch/Router

<p>Isolated DC-DC Converters MYB Series</p>	<p>Non-Isolated DC-DC Converters MYMGK/MYSGK/OKL/MYLSM Series</p>	<p>Low ESL Chip Multilayer Ceramic Capacitors for General Purpose LLL/LLA/LLM Series</p>	<p>Chip Multilayer Ceramic Capacitors for General Purpose GR/GA Series</p>
<p>Wire Bonding Mount Multilayer Microchip Capacitors for General Purpose GMA Series</p>	<p>Wire Bonding/AuSn Soldering Mount Chip Multilayer Ceramic Capacitors for General Purpose GMD Series</p>	<p>Chip Common Mode Choke Coils/ Common Mode Noise Filters DLW/DLP/NFP Series</p>	<p>Crystal Units XRC Series</p>
<p>Silicon Capacitors</p>	<p>Precision TCXO XTCLH/XNCLH Series</p>	<p>Single-Layer Microchip Capacitors CLB Series</p>	<p>Thin Film Circuit Substrates (RUSUB) RU Series</p>

**4** Li-ion Energy Storage System

Energy Storage Module Model  
IJ1101M Series



BMU  
(Battery Management Unit)  
IJ8101C Series



BMU-HUB  
IJ1101K Series



**5** Asset Management

RFID Tag  
LXTB Series



**6** Power Supply

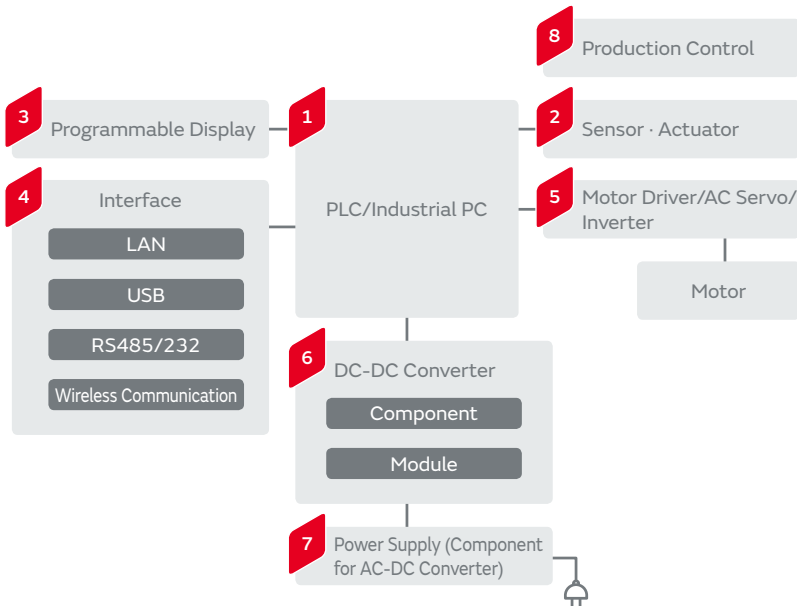
AC-DC Power Supplies 1U Front End



General Purpose

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

# Industrial Automation



## 1 PLC/Industrial PC

<p>Polymer Aluminum Electrolytic Capacitors ECAS/ECNS Series</p>	<p>Crystal Units XRC Series</p>	<p>Chip Ferrite Beads BLM Series</p>	<p>3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose NFM Series</p>	<p>Thermistors PRF/NCU Series</p>
<p>Non-Isolated DC-DC Converters MYMGK/MYSGK/OKL/MYLSM Series</p>	<p>Isolated DC-DC Converters for PoE + PD MYBSP Series</p>	<p>Piezoelectric Sounders PKMCS/PKLCs/PKM Series</p>	<p>MEMS Resonators WMRAG Series</p>	

## 2 Sensor · Actuator

<p>Accelerometers SCA Series</p>	<p>Gyro sensors SCC Series</p>
<p>Magnetic Sensors (AMR Sensors) MR Series</p>	







## 3 Programmable Display

<p>Ceramic Resonators CERALOCK CST Series</p>	<p>Crystal Units XRC Series</p>	<p>Power Inductors LQH Series</p>	<p>Chip Common Mode Choke Coils/ Common Mode Noise Filters DLW/DLP/NFP Series</p>
<p>Coin Manganese Dioxide Lithium Batteries Standard Type/Heat-resistant Type</p>	<p>Non-Isolated DC-DC Converters MYMGK/MYSGK/ OKL/MYLSM Series</p>	<p>Isolated DC-DC Converters for PoE + PD MYBSP Series</p>	




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

<p>Wireless Communication Modules Based on the ISA100 Wireless™ Standard Type 1EU</p>	<p>MEMS Resonators WMRAG Series</p>	<p>Polymer Aluminum Electrolytic Capacitors ECAS/ECNS Series</p>	<p>Crystal Units XRC Series</p>
<p>Chip Common Mode Choke Coils/Common Mode Noise Filters DLW/DLP/NFP/DLM Series</p>	<p>ESD Protection Devices LXES Series</p>	<p>Thermistors PRG Series</p>	

**5 Motor Driver/AC Servo/Inverter**

<p>Chip Multilayer Ceramic Capacitors for General Purpose GR/GA Series</p> 	<p>Ceramic Resonators CERALOCK CST Series</p> 	<p>Crystal Units XRC Series</p> 
<p>Large-current Common Mode Choke Coils PLT10/PLT5B/DLW5A/DLW5B/UCMH Series</p> 	<p>Thermistors PRF/PTG Series</p> 	<p>MEMS Resonators WMRAG Series</p> 

**6 DC-DC Converter (Module · Component)**


<p>Isolated DC-DC Converters MYB Series</p> 	<p>Non-Isolated DC-DC Converters MYMGK/MYSGK/OKL/MYLSM Series</p> 	<p>Metal Terminal Type Multilayer Ceramic Capacitors for General Purpose KRM Series</p> 
<p>Polymer Aluminum Electrolytic Capacitors ECAS/ECNS Series</p> 	<p>Power Inductors LQH Series</p> 	<p>Thermistors PRF/NCU Series</p> 

**7 Power Supply (Component for AC-DC Converter)**

<p>Chip Multilayer Ceramic Capacitors for General Purpose GR/GA Series</p> 	<p>Safety Standard Certified Resin Molding SMD Type Ceramic Capacitors for General Purpose DK1 Series</p> 	<p>Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose DE1/DE2 Series</p> 
<p>Ceramic Resonators CERALOCK CST Series</p> 	<p>Thermistors PRF/NCU Series</p> 	

**8 Production Control**

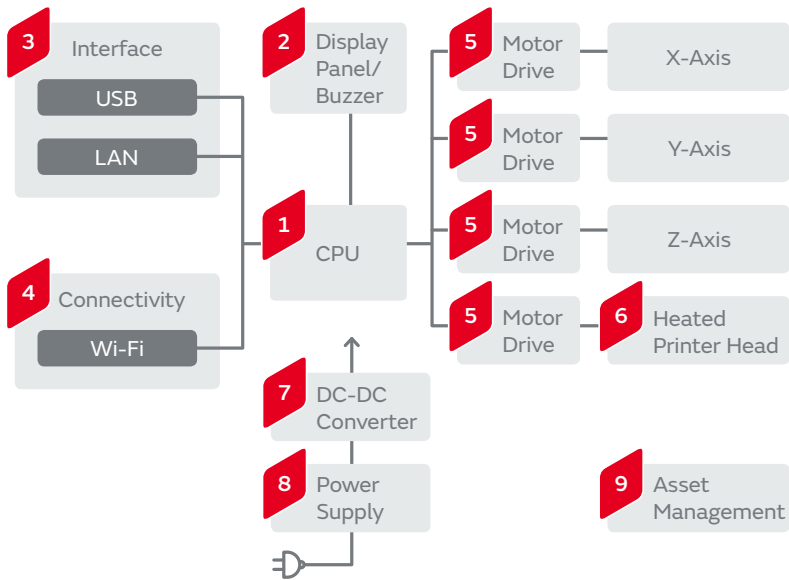
RFID Tag  
LXMS/LXTB Series



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



# 3D Printer



## 1 CPU

<p><b>Isolated DC-DC Converters</b> MYB Series</p> <p><b>Polymer Aluminum Electrolytic Capacitors</b> ECAS/ECNS Series</p>	<p><b>Non-Isolated DC-DC Converters</b> MYMGK/MYSGK/OKL/MYLSM Series</p> <p><b>Crystal Units</b> XRC Series</p>	<p><b>Ceramic Resonators CERALOCK</b> CST Series</p> <p><b>Thermistors</b> NCP/PRF Series</p>
--	---	---

## 2 Display Panel/Buzzer

<p><b>Ceramic Resonators CERALOCK</b> CST Series</p> <p><b>Piezoelectric Sounders</b> PKMCS/PKLCS/PKM Series</p>	<p><b>MEMS Resonators</b> WMRAG Series</p>
--	--

## 3 Interface

<p><b>Polymer Aluminum Electrolytic Capacitors</b> ECAS/ECNS Series</p>	<p><b>Crystal Units</b> XRC Series</p>	<p><b>Chip Common Mode Choke Coils/ Common Mode Noise Filters</b> DLW/DLP/NFP/DLM Series</p>	<p><b>ESD Protection Devices</b> LXES Series</p>	<p><b>Thermistors</b> PRG Series</p>
---	--	--	--	--

## 4 Connectivity

<p><b>Wi-Fi Modules</b></p>	<p><b>Crystal Units</b> XRC Series</p>
<p><b>Chip Inductors (Chip Coils)</b> LQW/LQP/LQG Series</p>	<p><b>ESD Protection Devices</b> LXES Series</p>

## 5 Motor Drive

<p><b>Isolated DC-DC Converters</b> MYB Series</p>	<p><b>Non-Isolated DC-DC Converters</b> MYMGK/MYSGK/OKL/MYLSM Series</p>	
<p><b>Chip Multilayer Ceramic Capacitors for General Purpose</b> GR/GA Series</p>	<p><b>Ceramic Resonators CERALOCK</b> CST Series</p>	<p><b>Crystal Units</b> XRC Series</p>
<p><b>Large-current Common Mode Choke Coils</b> PLT10HH/PLT5BPH/DLW5ATN/UCMH Series</p>	<p><b>Thermistors</b> PRF/PTG Series</p>	



**6** Heated Printer Head

Thermistors  
NCP/PRF Series



**7** DC-DC Converter

Metal Terminal Type Multilayer  
Ceramic Capacitors for General Purpose  
KRM Series



Polymer Aluminum  
Electrolytic Capacitors  
ECAS/ECNS Series



Isolated DC-DC Converters  
for PoE + PD  
MYBSP Series



Thermistors  
NCP/PRF Series



**8** Power Supply

Chip Multilayer Ceramic Capacitors  
for General Purpose  
GR/GA Series



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



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



Thermistors  
NCP/PRF/PRG Series



**9** Asset Management

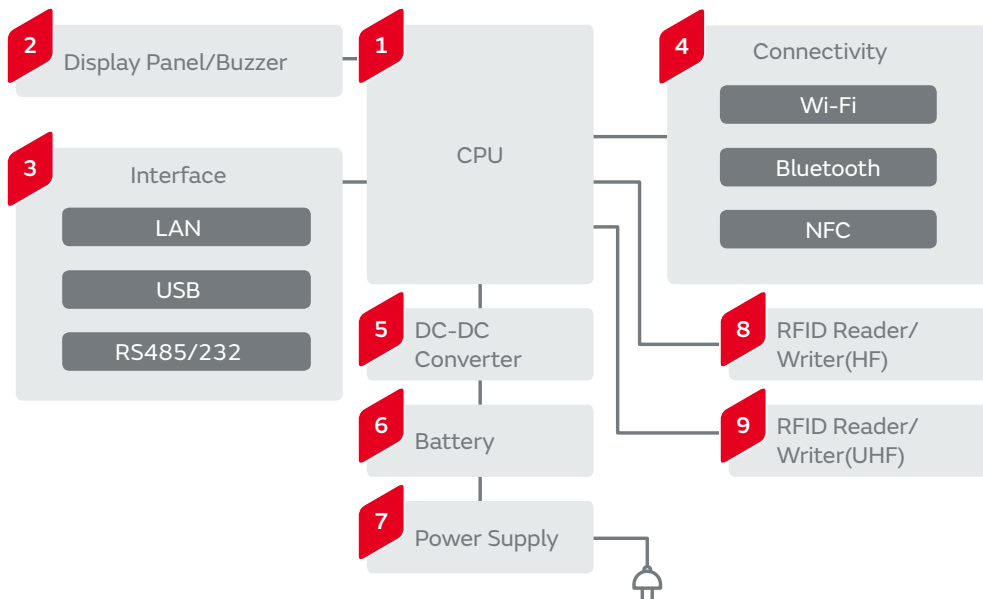
RFID Tag  
LXTB Series



General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GJM Series	High Frequency Filter Circuit
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression
Polymer Aluminum Electrolytic Capacitors	ECAS/ECNS Series	Smoothing/Transient Backup
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching/Resonance
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
Feed Through Chip EMI Filters	NFE Series	Noise Suppression
Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLP/NFP Series	Noise Suppression

# Electronic POS



### 1 CPU

- ESD Protection Devices LXES Series
- Ceramic Resonators CERALOCK CST Series
- Non-Isolated DC-DC Converters MYMGK/MYSGK/OKL/MYLSM Series
- Crystal Units XRC Series
- MEMS Resonators WMRAG Series

### 2 Digital Panel/Buzzer

- Metal Terminal Type Multilayer Ceramic Capacitors for General Purpose KRM Series
- Ceramic Resonators CERALOCK CST Series
- Power Inductors LQH Series
- Thermistors PRF/PRG Series
- Piezoelectric Sounders PKMCS/PKLCS/PKM Series

### 3 Interface

- Polymer Aluminum Electrolytic Capacitors ECAS/ECNS Series
- Crystal Units XRC Series
- Chip Common Mode Choke Coils/ Common Mode Noise Filters DLW/DLP/NFP/DLM Series
- ESD Protection Devices LXES Series
- Thermistors PRG Series
- Ceramic Resonators CERALOCK CST Series

### 4 Connectivity

- Bluetooth Modules
- Bluetooth - Wi-Fi Combo Modules
- Bluetooth Smart Modules
- Wi-Fi Modules
- NFC Antennas FLAN Series
- Crystal Units XRC Series
- Microwave Coaxial Connectors with Switch

**5 DC-DC Converter**

Metal Terminal Type  
Multilayer Ceramic Capacitors  
for General Purpose  
KRM Series



Polymer Aluminum  
Electrolytic Capacitors  
ECAS/ECNS Series



Power Inductors  
LQH/DEM/DFE Series



Thermistors  
NCP/PRF Series



Isolated DC-DC Converters  
for PoE + PD  
MYBSP Series



**6 Battery**

Thermistors  
NCP/PRF/PRG Series



**7 Power Supply**

Chip Multilayer  
Ceramic Capacitors  
for General Purpose  
GR/GA Series



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



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



Thermistors  
NCP/PRF/PRG Series



**8 RFID Reader/Writer(HF)**

Crystal Units  
XRC Series



**9 RFID Reader/Writer(UHF)**

Crystal Units  
XRC Series

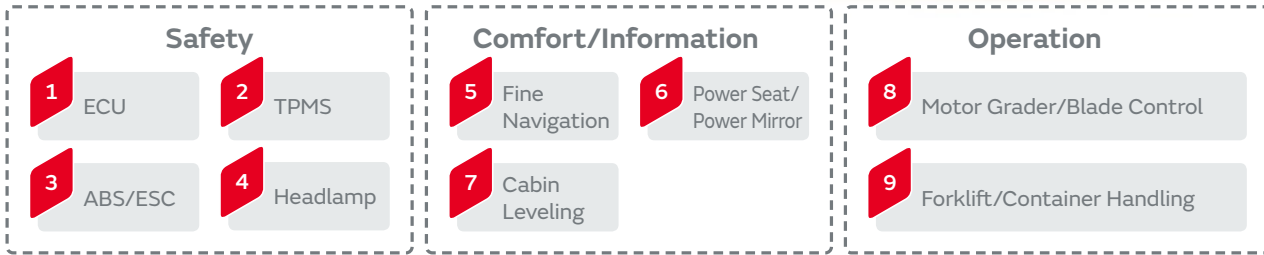


Isolated DC-DC Converters  
for PoE + PD  
MYBSP Series



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

# Heavy Duty Vehicles



## Safety

### 1 ECU

<p>Accelerometers SCA Series</p>	<p>Gyro Sensors SCC Series</p>	<p>Metal Terminal Type Multilayer Ceramic Capacitors for Automotive KCM Series</p>	<p>Chip Multilayer Ceramic Capacitors for Automotive GCM Series</p>	<p>Soft Termination Chip Multilayer Ceramic Capacitors for Automotive GCJ Series</p>
<p>AgPd Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive GCG Series</p>	<p>Ceramic Resonators CERALOCK CST Series</p>	<p>Crystal Units XRC Series</p>	<p>Ni Plating + Pd Plating Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive GCB Series</p>	
<p>Leaded MLCC for Automotive RH/RCE Series</p>	<p>Thermistors PRF/PTG/NCU Series</p>		<p>High Reliability Chip Ferrite Beads BLM_SH1/BH1/TH1/JH1 Series</p>	

### 2 TPMS

<p>Shock Sensors For Tire Pressure Monitoring System, PKGS Series</p>	<p>Pressure Sensor Elements SCB10H Series</p>	<p>Thermistors PRF/NCU Series</p>
<p>Ceramic Filters CERAFIL SFECE Series</p>	<p>Ceramic Resonators CERALOCK CST Series</p>	<p>Crystal Units XRC Series</p>
<p>Coin Manganese Dioxide Lithium Batteries Heat-resistant Type</p>	<p>High Reliability Chip Inductors LQG15HH Series</p>	
<p>High Reliability Chip Ferrite Beads BLM_SH1/BH1/TH1/JH1 Series</p>		

### 3 ABS/ESC

<p>Accelerometers SCA Series</p>	<p>Gyro Sensors SCC Series</p>	<p>Metal Terminal Type Multilayer Ceramic Capacitors for Automotive KCM Series</p>
<p>Chip Multilayer Ceramic Capacitors for Automotive GCM Series</p>	<p>Soft Termination Chip Multilayer Ceramic Capacitors for Automotive GCJ Series</p>	
<p>AgPd Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive GCG Series</p>	<p>Ni Plating + Pd Plating Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive GCB Series</p>	
<p>Ceramic Resonators CERALOCK CST Series</p>	<p>Crystal Units XRC Series</p>	<p>Thermistors NCG18/NCU Series</p>
		<p>High Reliability Chip Ferrite Beads BLM_SH1/BH1/TH1/JH1 Series</p>

### 4 Headlamp

<p>Chip Multilayer Ceramic Capacitors for Automotive GCM Series</p>	<p>Soft Termination Chip Multilayer Ceramic Capacitors for Automotive GCJ Series</p>	<p>Ceramic Resonators CERALOCK CST Series</p>
<p>Crystal Units XRC Series</p>	<p>Thermistors NCG18/NCU Series</p>	<p>High Reliability Chip Ferrite Beads BLM_SH1/BH1/TH1/JH1 Series</p>

Comfort/Information

**5** Fine Navigation

Accelerometers SCA Series  
Gyro Sensors SCC Series

High Reliability Chip Ferrite Beads BLM\_SH1/BH1/TH1/JH1 Series

Ceramic Resonators CERALOCK CST Series  
Crystal Units XRC Series

**6** Power Seat/Power Mirror

Piezoelectric Sounders PKLCS/PKMCS Series  
Ceramic Resonators CERALOCK CST Series

Crystal Units XRC Series  
Thermistors PRF/PTG/NCU Series

High Reliability Chip Ferrite Beads BLM\_SH1/BH1/TH1/JH1 Series

**7** Cabin Leveling

Accelerometers SCA Series  
Gyro Sensors SCC Series

Ceramic Resonators CERALOCK CST Series  
Crystal Units XRC Series

High Reliability Chip Ferrite Beads BLM\_SH1/BH1/TH1/JH1 Series

Operation

**8** Motor Grader/Blade Control

Accelerometers SCA Series  
Gyro Sensors SCC Series  
Crystal Units XRC Series

Ceramic Resonators CERALOCK CST Series  
High Reliability Chip Ferrite Beads BLM\_SH1/BH1/TH1/JH1 Series

**9** Forklift/Container Handling

Accelerometers SCA Series  
Ceramic Resonators CERALOCK CST Series

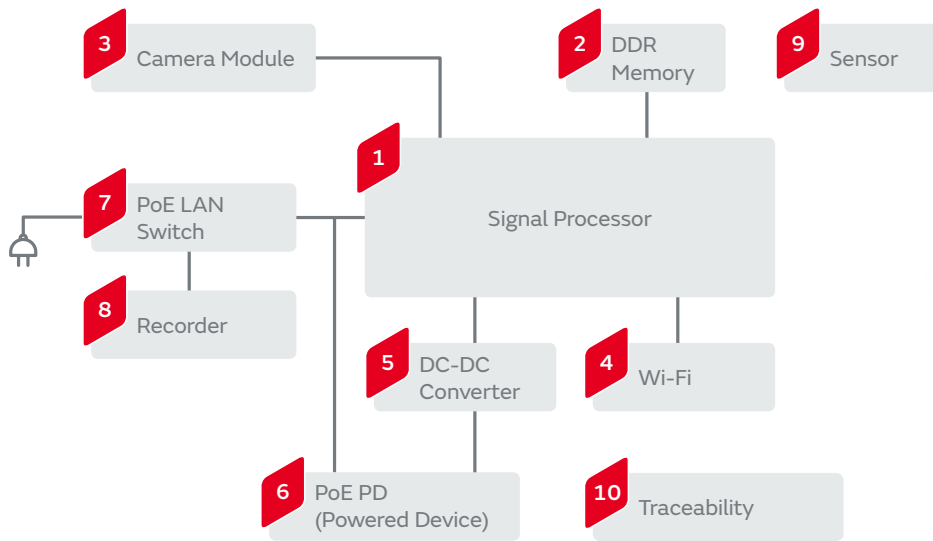
Crystal Units XRC Series  
High Reliability Chip Ferrite Beads BLM\_SH1/BH1/TH1/JH1 Series

General Purpose	AEC-Q 200 Compliant Chip Multilayer Ceramic Capacitors for Infotainment	GRT Series	Coupling/Decoupling
	Chip Inductors (Chip Coils)	LQW Series	Matching/High Frequency Choke
	Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
	Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
	EMI Suppression Filters EMIFIL	NFL/NFE Series	Noise Suppression
	Chip Common Mode Choke Coils	DLW Series	Common Mode Noise Suppression

General Purpose (High Reliability)	Chip Multilayer Ceramic Capacitors for Automotive	GCM Series	Coupling/Decoupling	150°C
	Ni Plating + Pd Plating Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive	GCB Series	Coupling/Decoupling	
	Leaded MLCC for Automotive	RCE Series	Noise Suppression/Decoupling	125°C
	150°C/175°C/200°C Operation Leaded MLCC for Automotive	RH Series	Noise Suppression/Decoupling	150°C 175°C 200°C
	3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for Automotive/Feed Through Noise Filters	NFM_H/NFE_H Series	Noise Suppression	125°C
	Chip Inductors (Chip Coils)	LQH32PH/LQH44PH/LQH43PH/LQH5BPH Series	Voltage Conversion	125°C
	Chip Inductors (Chip Coils)	LQG15HH Series	Impedance Matching/Choke	125°C
	Chip Ferrite Beads	BLM_SH/BLM_BH/BLE_SH Series	Noise Suppression	125°C
Chip Common Mode Choke Coils	DLW31SH/DLW32SH/DLW43SH/DLW43MH/DLW5ATH/DLW5BTH Series	Common Mode Noise Suppression	125°C	

125°C 125°C max. 150°C 150°C max. 175°C 175°C max. 200°C 200°C max.

# Security Camera



## 1 Signal Processor

<p>Polymer Aluminum Electrolytic Capacitors ECAS/ECNS Series</p>	<p>Ceramic Resonators CERALOCK CST Series</p>	<p>Crystal Units XRC Series</p>
<p>3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose NFM Series</p>	<p>Thermistors PRF/NCU Series</p>	<p>MEMS Resonators WMRAG Series</p>

## 2 DDR Memory

<p>Polymer Aluminum Electrolytic Capacitors ECAS/ECNS Series</p>	<p>Chip Ferrite Beads BLM Series</p>	<p>Non-Isolated DC-DC Converters MYMGK/MYSGK/OKL/MYLSM Series</p>
--	--------------------------------------	---

## 3 Camera Module

<p>Chip Ferrite Beads BLM Series</p>	<p>Isolated DC-DC Converters for PoE + PD MYBSP Series</p>
--------------------------------------	--

## 4 Wi-Fi

<p>Wi-Fi Modules</p>	<p>Chip Inductors (Chip Coils) LQW/LQP/LQG Series</p>	<p>Chip Multilayer LC Filters LF Series</p>	<p>Chip Multilayer Diplexers LFD Series</p>
<p>Chip Multilayer Hybrid Baluns LDB/LDM Series</p>	<p>Chip Multilayer Hybrid Couplers LDC/LDJ Series</p>	<p>Crystal Units XRC Series</p>	

## 5 DC-DC Converter

<p>Metal Terminal Type Multilayer Ceramic Capacitors for General Purpose KRM Series</p>	<p>Polymer Aluminum Electrolytic Capacitors ECAS/ECNS Series</p>
<p>Power Inductors LQH/DFE Series</p>	<p>Thermistors PRF/NCU Series</p>

## 6 PoE PD (Powered Device)

<p>Chip Multilayer Ceramic Capacitors for General Purpose GR/GA Series</p>	<p>Crystal Units XRC Series</p>
<p>Thermistors NXRT/PRF/NCU Series</p>	<p>Isolated DC-DC Converters for PoE + PD MYBSP Series</p>

**7 PoE LAN Switch**

Chip Multilayer Ceramic Capacitors for General Purpose GR/GA Series



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



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



Metal Terminal Type Multilayer Ceramic Capacitors for General Purpose KRM Series



Crystal Units XRC Series



Thermistors NXRT/PRF/NCU Series



Isolated DC-DC Converters for PoE + PD MYBSP Series



**8 Recorder**

Polymer Aluminum Electrolytic Capacitors ECAS/ECNS Series



Ceramic Resonators CERALOCK CST Series



Crystal Units XRC Series



Thermistors PRF/NCU Series



**9 Sensor**

Pyroelectric Infrared Sensors IRA-S Series



Ultrasonic Sensors MA40 Series



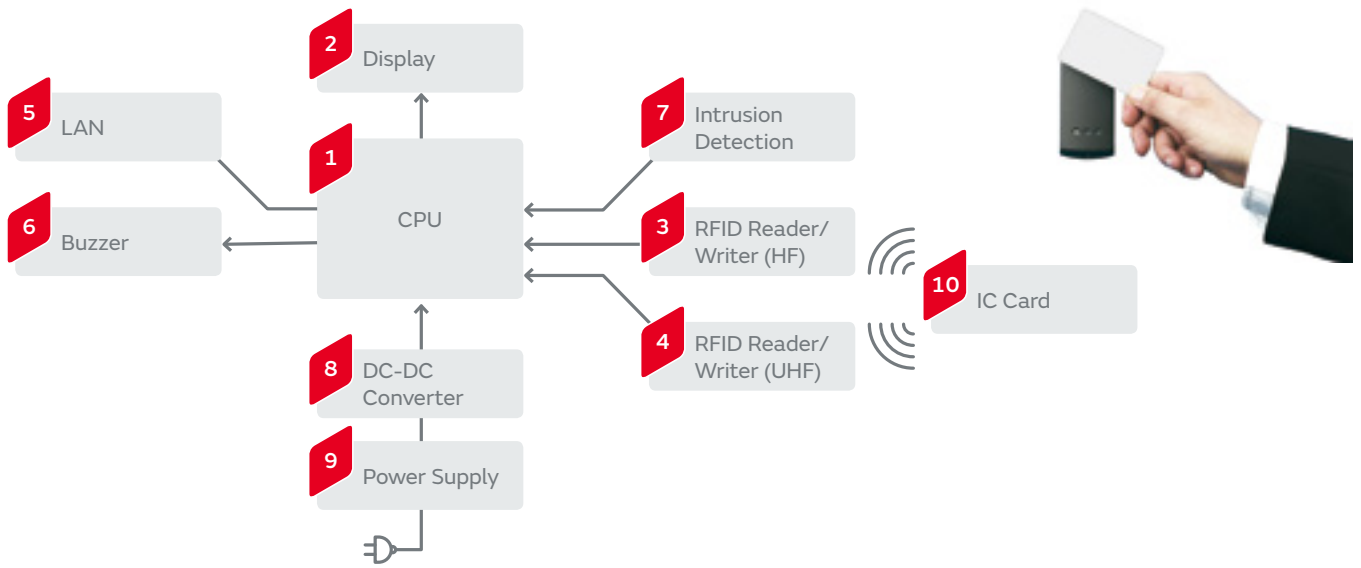
**10 Traceability**

RFID Tag LXMS/LXTB Series



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

# Entrance and Exit Management System



**1 CPU**

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

Ceramic Resonators CERALOCK  
CST Series

Crystal Units  
XRC Series

**2 Display**

Ceramic Resonators CERALOCK  
CST 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/ECNS Series

Crystal Units  
XRC Series

ESD Protection Devices  
LXES Series

Thermistors  
PRG Series

**6 Buzzer**

Piezoelectric Sounders  
PKMCS/PKLCs/PKM Series

**7 Intrusion Detection**

Ultrasonic Sensors  
MA40 Series

Magnetic Sensors (AMR Sensors)  
MR Series

Pyroelectric Infrared Sensors  
IRA-S Series



**8 DC-DC Converter**

Polymer Aluminum Electrolytic Capacitors ECAS/ECNS Series



Metal Terminal Type Multilayer Ceramic Capacitors for General Purpose KRM Series



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



Isolated DC-DC Converters for PoE + PD MYBSP Series



Thermistors NCP/PRF Series



**9 Power Supply**

Chip Multilayer Ceramic Capacitors for General Purpose GR/GA Series



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



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



Ceramic Resonators CERALOCK CST Series

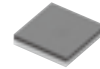


Thermistors NCP/PRF Series



**10 IC Card**

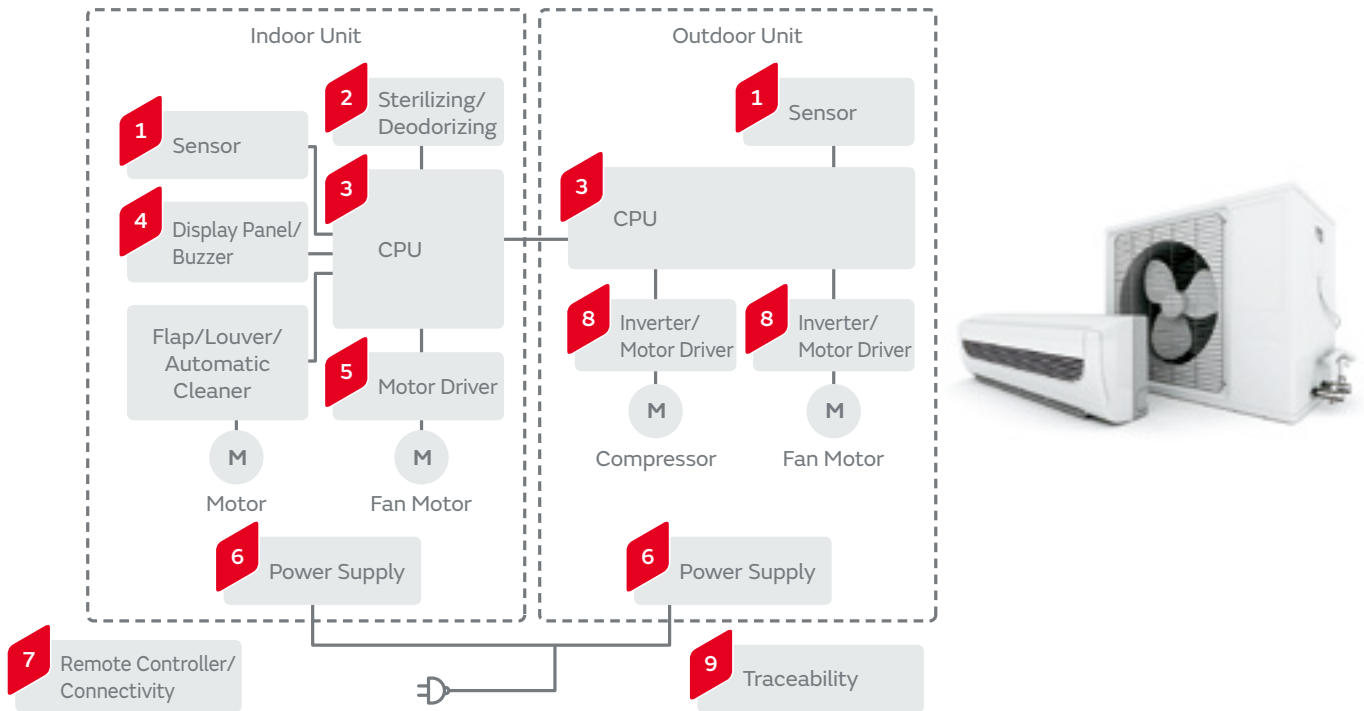
RFID Tag LXMS/LXTB Series



General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GJM Series	High Frequency Filter Circuit
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression
Polymer Aluminum Electrolytic Capacitors	ECAS/ECNS Series	Smoothing/Transient Backup
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching/Resonance
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
Feed Through Chip EMI Filters	NFE Series	Noise Suppression
Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLP/NFP Series	Noise Suppression

# Air Conditioner



### 1 Sensor

- Ultrasonic Sensors MA40 Series
- Thermistors NCP/NXR/PRF Series
- Magnetic Sensors (AMR Sensors) MR Series
- Pyroelectric Infrared Sensors IRA-S Series

### 2 Sterilizing/Deodorizing

- Ionizer Modules Ionissimo MHM300 Series
- Ozonizer Modules Ionissimo MHM500 Series
- High Voltage Resistors MHR Series

### 3 CPU

- Ceramic Resonators CERALOCK CST Series
- MEMS Resonators WMRAG Series
- Non-Isolated DC-DC Converters MYMGK/MYSGK/OKL/MYLSM Series

### 4 Display Panel/Buzzer

- Ceramic Resonators CERALOCK CST Series
- Piezoelectric Sounders PKMCS/PKLCS/PKM Series

### 5 Motor Driver

- Thermistors NCP/NXR/PRF Series

### 6 Power Supply

- Chip Multilayer Ceramic Capacitors for General Purpose GR/GA Series
- Safety Standard Certified Resin Molding SMD Type Ceramic Capacitors for General Purpose DK1 Series
- Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose DE1/DE2 Series
- Thermistors PTG Series

**7 Remote Controller/Connectivity**

Bluetooth Modules



Wi-Fi Modules



LPWA Modules



Microwave Coaxial Connectors with Switch



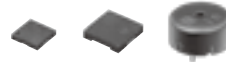
Crystal Units  
XRC Series



Ceramic Resonators CERALOCK  
CST Series



Piezoelectric Sounders  
PKMCS/PKLCS/PKM Series



MEMS Resonators  
WMRAG Series



**8 Inverter/Motor Driver**

Ceramic Resonators CERALOCK  
CST Series



Thermistors  
NCP/NXR/PRF Series



**9 Traceability**

RFID Tag  
LXMS/LXTB Series



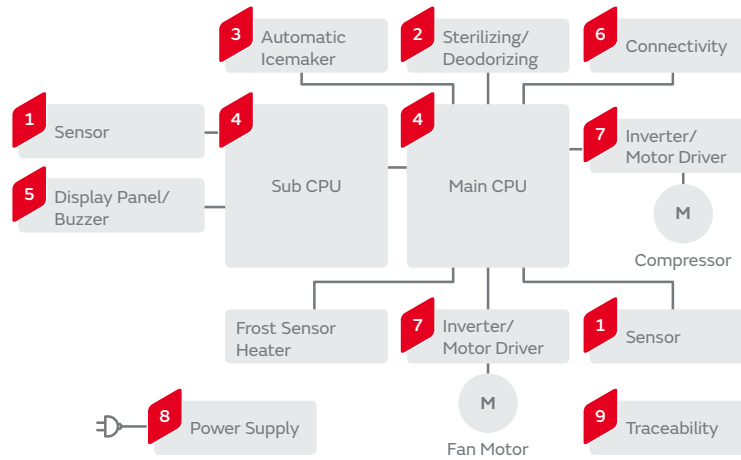
General Purpose	Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
	High Q Chip Multilayer Ceramic Capacitors for General Purpose	GJM Series	High Frequency Filter Circuit
	Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
	3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression
	Polymer Aluminum Electrolytic Capacitors	ECAS/ECNS Series	Smoothing/Transient Backup
	Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching/Resonance
	Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
	Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
	Feed Through Chip EMI Filters	NFE Series	Noise Suppression
	Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLP/NFP Series	Noise Suppression

# Refrigerator



## 1 Sensor

- Thermistors  
NCP/NXR/PRF Series
- Magnetic Sensors (AMR Sensors)  
MR Series
- Pyroelectric Infrared Sensors  
IRA-S Series
- Ultrasonic Sensors  
MA40 Series



## 2 Sterilizing/Deodorizing

- Ionizer Modules Ionissimo  
MHM300 Series
- Ozonizer Modules Ionissimo  
MHM500 Series
- High Voltage Resistors  
MHR Series
- Microblowers

## 3 Automatic Icemaker

- Microblowers

## 4 CPU

- Ceramic Resonators  
CERALOCK CST Series
- Non-Isolated DC-DC Converters  
MYMGK/MYSGK/OKL/MYLSM Series
- MEMS Resonators  
WMRAG Series

## 5 Display Panel/Buzzer

- Ceramic Resonators CERALOCK  
CST Series
- Piezoelectric Sounders  
PKMCS/PKLCs/PKM Series

## 7 Inverter/Motor Driver

- Ceramic Resonators  
CERALOCK CST Series
- Thermistors  
NCP/NXR/PRF Series

## 6 Connectivity

- Bluetooth Modules
- Wi-Fi Modules
- LPWA Modules
- Microwave Coaxial Connectors with Switch
- Crystal Units  
XRC Series
- MEMS Resonators  
WMRAG Series

## 8 Power Supply

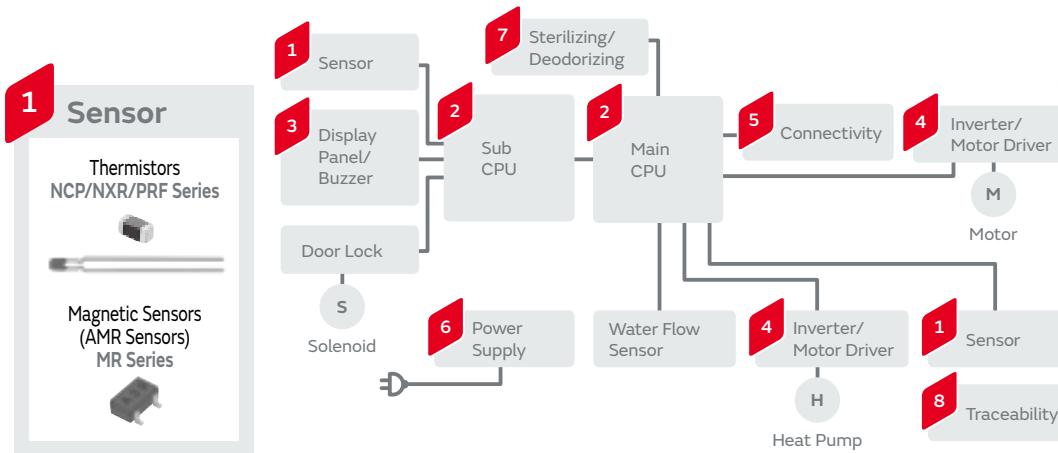
- Chip Multilayer Ceramic Capacitors for General Purpose  
GR/GA Series
- Safety Standard Certified Resin Molding SMD Type Ceramic Capacitors for General Purpose  
DK1 Series
- Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose  
DE1/DE2 Series
- Thermistors  
PTG Series

## 9 Traceability

- RFID Tag  
LXMS/LXTB Series

General Purpose	Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
	High Q Chip Multilayer Ceramic Capacitors for General Purpose	GJM Series	High Frequency Filter Circuit
	Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
	3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression
	Polymer Aluminum Electrolytic Capacitors	ECAS/ECNS Series	Smoothing/Transient Backup
	Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching/Resonance
	Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
	Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
	Feed Through Chip EMI Filters	NFE Series	Noise Suppression
	Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLP/NFP Series	Noise Suppression

# Washing Machine



### 2 CPU

- Ceramic Resonators CERALOCK CST Series
- Non-Isolated DC-DC Converters MYMGK/MYSGK/OKL/MYLSM Series
- MEMS Resonators WMRAG Series

### 3 Display Panel/Buzzer

- Ceramic Resonators CERALOCK CST Series
- Piezoelectric Sounders PKMCS/PKLCS/PKM Series

### 4 Inverter/Motor Driver

- Thermistors NCP/NXR/PRF Series
- Ceramic Resonators CERALOCK CST Series

### 5 Connectivity

- Bluetooth Modules
- Wi-Fi Modules
- LPWA Modules
- Microwave Coaxial Connectors with Switch
- Crystal Units XRC Series
- MEMS Resonators WMRAG Series

### 6 Power Supply

- Chip Multilayer Ceramic Capacitors for General Purpose GR/GA Series
- Safety Standard Certified Resin Molding SMD Type Ceramic Capacitors for General Purpose DK1 Series
- Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose DE1/DE2 Series
- Thermistors PTG Series

### 7 Sterilizing/Deodorizing

- Ozonizer Modules Ionissimo MHM500 Series

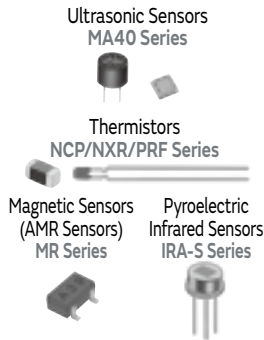
### 8 Traceability

- RFID Tag LXMS/LXTB Series

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

# Air Purifier

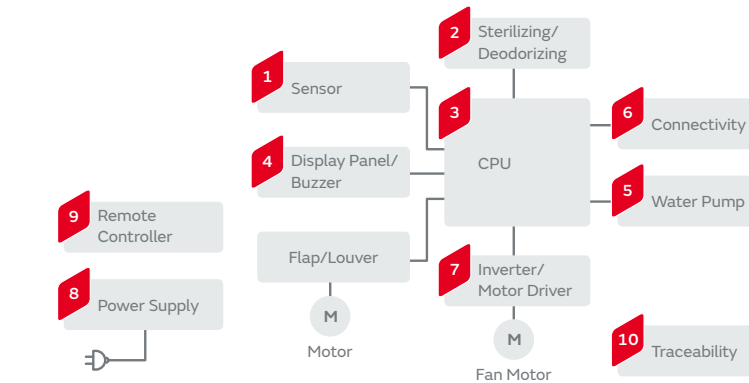
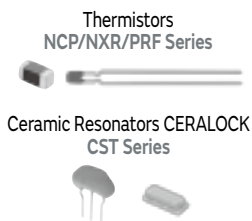
## 1 Sensor



## 2 Sterilizing/Deodorizing



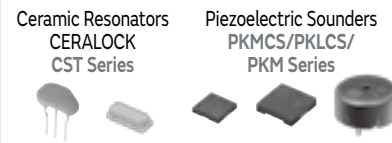
## 7 Inverter/Motor Driver



## 3 CPU



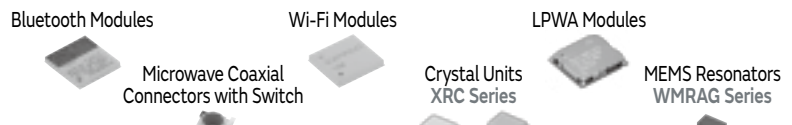
## 4 Display Panel/Buzzer



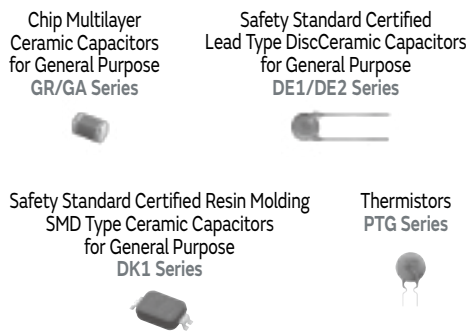
## 5 Water Pump



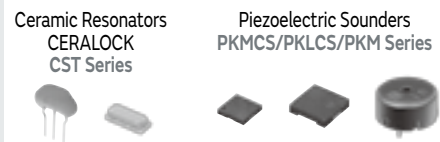
## 6 Connectivity



## 8 Power Supply



## 9 Remote Controller

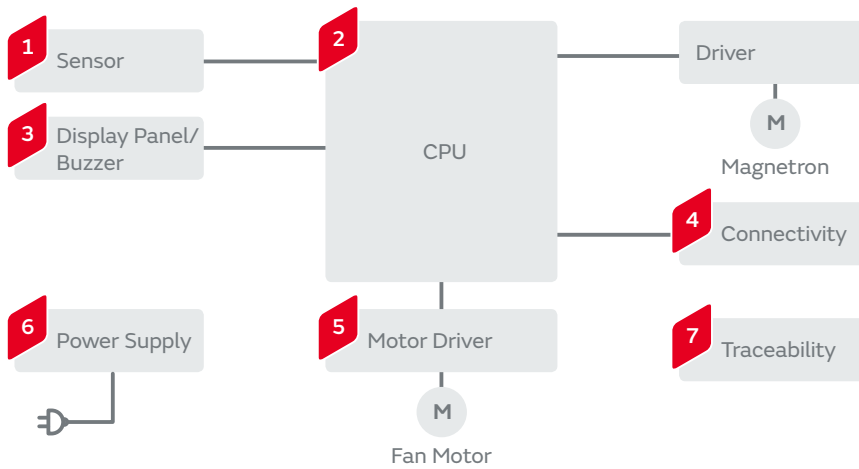


## 10 Traceability



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

# Microwave Oven



### 1 Sensor

Thermistors  
NCP/NXR/PRF Series

Magnetic Sensors (AMR Sensors)  
MR Series

### 2 CPU

Ceramic Resonators CERALOCK  
CST Series

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

MEMS Resonators  
WMRAG Series

### 3 Display Panel/Buzzer

Ceramic Resonators CERALOCK  
CST Series

Piezoelectric Sounders  
PKMCS/PKLCs/PKM Series

### 4 Connectivity

Bluetooth Modules    Wi-Fi Modules    LPWA Modules    Microwave Coaxial Connectors with Switch    Crystal Units XRC Series    MEMS Resonators WMRAG Series

### 5 Motor Driver

Thermistors  
NCP/NXR/PRF Series

### 6 Power Supply

Chip Multilayer Ceramic Capacitors for General Purpose  
GR/GA Series

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

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

Thermistors  
PTG Series

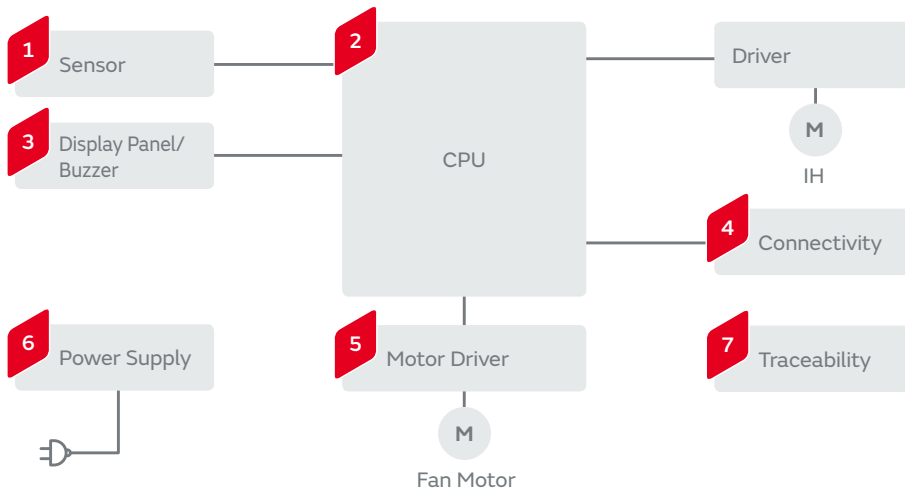
### 7 Traceability

RFID Tag  
LXMS/LXTB Series

General Purpose	Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
	High Q Chip Multilayer Ceramic Capacitors for General Purpose	GJM Series	High Frequency Filter Circuit
	Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
	3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression
	Polymer Aluminum Electrolytic Capacitors	ECAS/ECNS Series	Smoothing/Transient Backup
	Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching/Resonance
	Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
	Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
	Feed Through Chip EMI Filters	NFE Series	Noise Suppression
	Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLP/NFP Series	Noise Suppression



# IH Rice Cooker



### 1 Sensor

- Thermistors NCP/NXR/PRF Series
- Magnetic Sensors (AMR Sensors) MR Series

### 3 Display Panel/Buzzer

- Ceramic Resonators CERALOCK CST Series
- Piezoelectric Sounders PKMCS/PKLCs/PKM Series

### 4 Connectivity

- Bluetooth Modules
- Wi-Fi Modules
- LPWA Modules
- Microwave Coaxial Connectors with Switch
- Crystal Units XRC Series
- MEMS Resonators WMRAG Series

### 2 CPU

- Ceramic Resonators CERALOCK CST Series
- Non-Isolated DC-DC Converters MYMGK/MYSGK/OKL/MYLSM Series
- MEMS Resonators WMRAG Series

### 6 Power Supply

- Chip Multilayer Ceramic Capacitors for General Purpose GR/GA Series
- Safety Standard Certified Resin Molding SMD Type Ceramic Capacitors for General Purpose DK1 Series
- Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose DE1/DE2 Series
- Thermistors PTG Series

### 5 Motor Driver

- Thermistors NCP/NXR/PRF Series

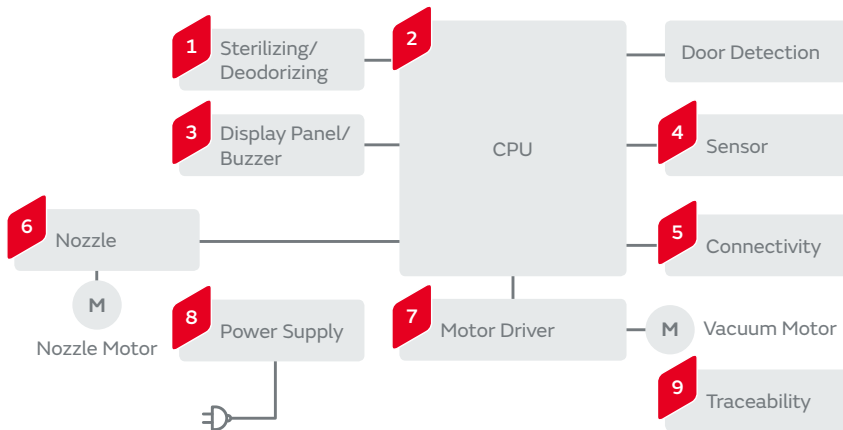
### 7 Traceability

- RFID Tag LXMS/LXTB Series

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



# Vacuum Cleaner



### 1 Sterilizing/Deodorizing

Ionizer Modules Ionissimo  
MHM300 Series

High Voltage Resistors  
MHR Series

### 2 CPU

Ceramic Resonators  
CERALOCK  
CST Series

MEMS Resonators  
WMRAG Series

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

### 3 Display Panel/Buzzer

Ceramic Resonators CERALOCK  
CST Series

Piezoelectric Sounders  
PKMCS/PKLC5/PKM Series

### 4 Sensor

Ultrasonic Sensors  
MA40 Series

Thermistors  
NCP Series

Magnetic Sensors (AMR Sensors)  
MR Series

### 5 Connectivity

Bluetooth Modules

Wi-Fi Modules

LPWA Modules

MEMS Resonators  
WMRAG Series

Microwave Coaxial  
Connectors with Switch

Crystal Units  
XRC Series

### 6 Nozzle

Thermistors  
PTG Series

### 7 Motor Driver

Thermistors  
NCP/NXP/PRF Series

### 8 Power Supply

Chip Multilayer  
Ceramic Capacitors  
for General Purpose  
GR/GA Series

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

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

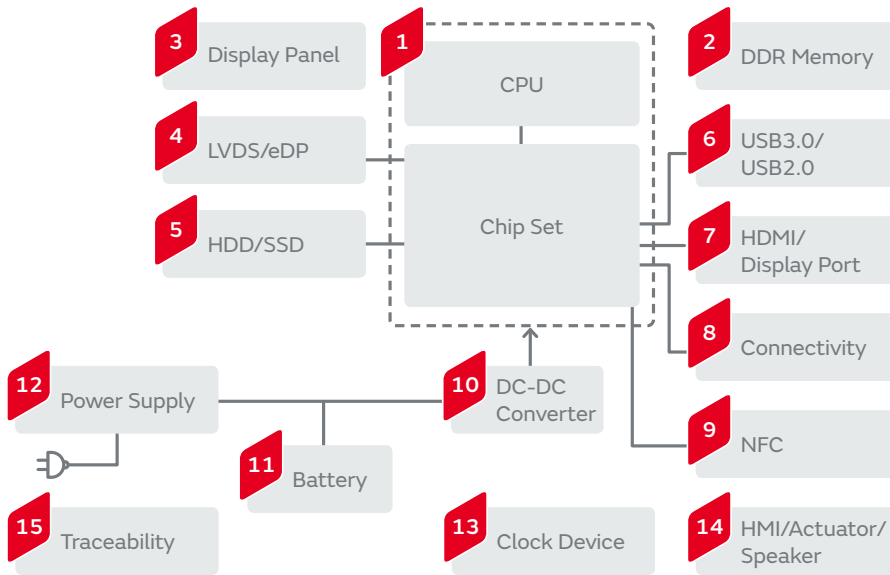
Thermistors  
PTG Series

### 9 Traceability

RFID Tag  
LXMS/LXTB Series

General Purpose	Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
	High Q Chip Multilayer Ceramic Capacitors for General Purpose	GJM Series	High Frequency Filter Circuit
	Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
	3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression
	Polymer Aluminum Electrolytic Capacitors	ECAS/ECNS Series	Smoothing/Transient Backup
	Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching/Resonance
	Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
	Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
	Feed Through Chip EMI Filters	NFE Series	Noise Suppression
	Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLP/NFP Series	Noise Suppression

# Tablet Terminators



## 1 CPU/Chip Set

- Low ESL Chip Multilayer Ceramic Capacitors for General Purpose LLL/LLA/LLM Series
- Polymer Aluminum Electrolytic Capacitors ECAS/ECNS Series
- Crystal Units XRC Series
- Chip Ferrite Beads BLM Series
- 3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose NFM Series
- Thermistors NCP/PRF Series
- Silicon Capacitors
- MEMS Resonators WMRAG Series

## 2 DDR Memory

- Polymer Aluminum Electrolytic Capacitors ECAS/ECNS Series
- Chip Ferrite Beads BLM Series

## 3 Display Panel

- Metal Terminal Type Multilayer Ceramic Capacitors for General Purpose KRM Series
- Ceramic Resonators CERALOCK CST Series
- Power Inductors LQH Series
- Thermistors PRF/PRG Series

## 4 LVDS/eDP

- Chip Common Mode Choke Coils/ Common Mode Noise Filters DLW/DLP/NFP/DLM Series
- ESD Protection Devices LXES Series
- Thermistors NCP/PRF Series

## 5 HDD/SSD

- Shock Sensors PKGS Series
- Polymer Aluminum Electrolytic Capacitors ECAS/ECNS Series
- Actuators
- Crystal Units XRC Series
- Thermistors NCP/PRF Series













## 6 USB3.0/USB2.0

- Polymer Aluminum Electrolytic Capacitors ECAS/ECNS Series
- Crystal Units XRC Series
- Chip Common Mode Choke Coils/ Common Mode Noise Filters DLW/DLP/NFP/DLM Series
- Chip Ferrite Beads BLM Series
- ESD Protection Devices LXES Series
- Thermistors PRG Series







## 7 HDMI/Display Port

- ESD Protection Devices LXES Series
- Crystal Units XRC Series
- Thermistors PRG Series





## 8 Connectivity

<p>Bluetooth Modules</p> 	<p>Wi-Fi Modules</p> 	<p>Bluetooth - Wi-Fi Combo Modules</p> 
<p>SAW Filters SAF Series</p> 	<p>Chip Multilayer LC Filters LF Series</p> 	<p>Chip Multilayer Hybrid Baluns LDB/LDM Series</p> 
<p>Chip Multilayer Diplexers LFD Series</p> 	<p>Chip Multilayer Hybrid Couplers LDC/LDJ Series</p> 	<p>Microwave Coaxial Cable Connectors/Microwave Coaxial Connectors with Switch</p> 
<p>Crystal Units XRC Series</p> 	<p>ESD Protection Devices LXES Series</p> 	<p>MEMS Resonators WMRAG Series</p> 



## 9 NFC

<p>NFC Antennas FLAN Series</p> 	<p>Crystal Units XRC Series</p> 	<p>Chip Ferrite Beads BLM Series</p> 
<p>Chip Inductors (Chip Coils) LQW18C/LQM18J Series</p> 	<p>Variable Capacitors LXRW Series</p> 	<p>ESD Protection Devices LXES Series</p> 






## 10 DC-DC Converter

<p>Metal Terminal Type Multilayer Ceramic Capacitors for General Purpose KRM Series</p> 	<p>Polymer Aluminum Electrolytic Capacitors ECAS/ECNS Series</p> 	<p>Chip Multilayer Ceramic Capacitors on Interposer Board for General Purpose ZRB Series</p> 	<p>Thermistors NCP/PRF Series</p> 
---	--	--	---



## 11 Battery

<p>Ceramic Resonators CERALOCK CST Series</p> 	<p>Thermistors NXP/PRF/PRG Series</p> 
---	---

## 12 Power Supply

<p>Chip Multilayer Ceramic Capacitors for General Purpose GR/GA Series</p> 	<p>Safety Standard Certified Resin Molding SMD Type Ceramic Capacitors for General Purpose DK1 Series</p> 	<p>Ceramic Resonators CERALOCK CST Series</p> 	<p>Thermistors NCP/PRF Series</p> 
<p>Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose DE1/DE2 Series</p> 			


## 13 Clock Device

<p>Ceramic Resonators CERALOCK CST Series</p> 	<p>Crystal Units XRC Series</p> 
---	---

## 14 HMI/Actuator/Speaker

<p>ESD Protection Devices LXES Series</p> 
---

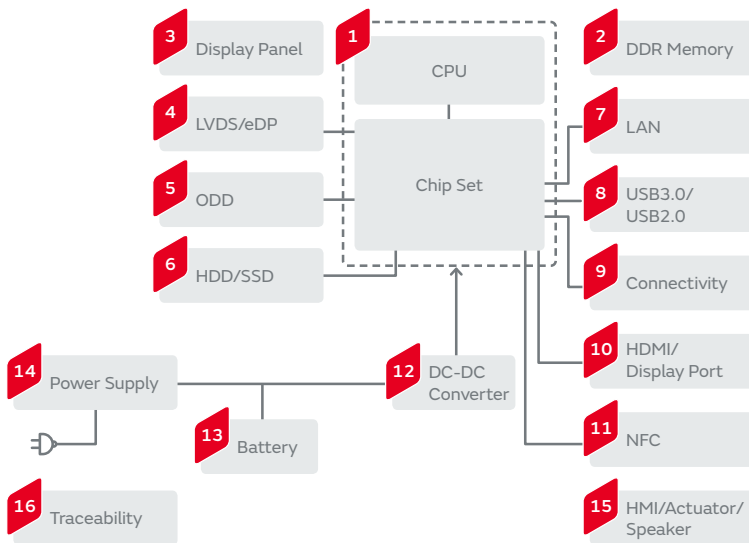
## 15 Traceability

<p>RFID Tag LXMS/LXTB Series</p> 
--

General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GJM Series	High Frequency Filter Circuit
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression
Polymer Aluminum Electrolytic Capacitors	ECAS/ECNS Series	Smoothing/Transient Backup
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching/Resonance
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
Feed Through Chip EMI Filters	NFE Series	Noise Suppression
Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLP/NFP Series	Noise Suppression

# Notebook Computers



### 1 CPU/Chip Set

- Low ESL Chip Multilayer Ceramic Capacitors for General Purpose LLL/LLA/LLM Series
- Polymer Aluminum Electrolytic Capacitors ECAS/ECNS Series
- Crystal Units XRC Series
- Chip Ferrite Beads BLM Series
- 3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose NFM Series
- Thermistors NCP/PRF Series
- Silicon Capacitors
- MEMS Resonators WMRAG Series

### 2 DDR Memory

- Polymer Aluminum Electrolytic Capacitors ECAS/ECNS Series
- Chip Ferrite Beads BLM Series
- Non-Isolated DC-DC Converters MYMGK/MYSGK/OKL/MYLSM Series

### 3 Display Panel

- Metal Terminal Type Multilayer Ceramic Capacitors for General Purpose KRM Series
- Ceramic Resonators CERALOCK CST Series
- Power Inductors LQH Series
- Thermistors PRF/PRG Series
- Non-Isolated DC-DC Converters MYMGK/MYSGK/OKL/MYLSM Series

### 4 LVDS/eDP

- ESD Protection Devices LXES Series
- Thermistors NCP/PRF Series

### 6 HDD/SSD

- Shock Sensors PKGS Series
- Polymer Aluminum Electrolytic Capacitors ECAS/ECNS Series
- Actuators
- Crystal Units XRC Series
- Thermistors NCP/PRF Series
- Non-Isolated DC-DC Converters MYMGK/MYSGK/OKL/MYLSM Series

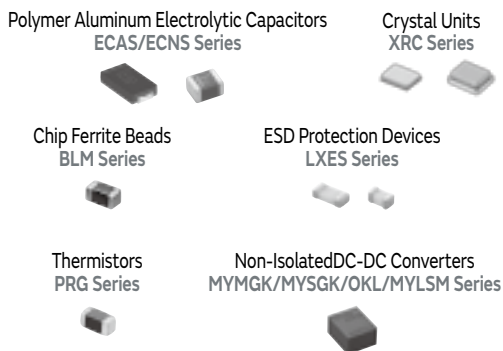
### 5 ODD

- Ceramic Resonators CERALOCK CST Series
- Crystal Units XRC Series
- Thermistors NCP Series

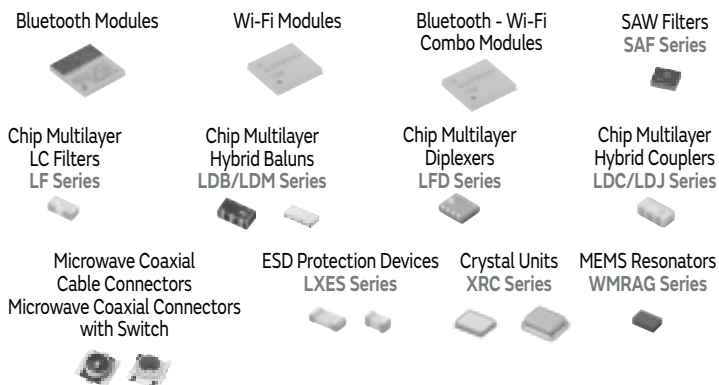
### 7 LAN

- Chip Multilayer Ceramic Capacitors for Ethernet LAN and Primary-secondary Coupling of DC-DC converters GR4 Series
- Chip Common Mode Choke Coils/Common Mode Noise Filters DLW/DLP/NFP/DLM Series
- Crystal Units XRC Series

## 8 USB3.0/USB2.0



## 9 Connectivity



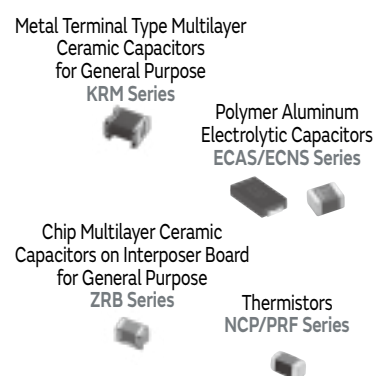
## 10 HDMI/Display Port



## 11 NFC



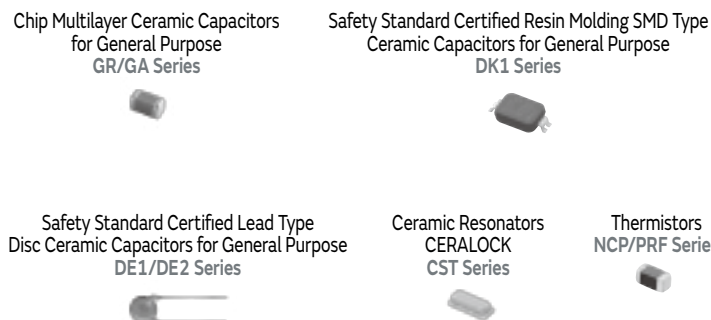
## 12 DC-DC Converter



## 13 Battery



## 14 Power Supply



## 15 HMI/Actuator/Speaker



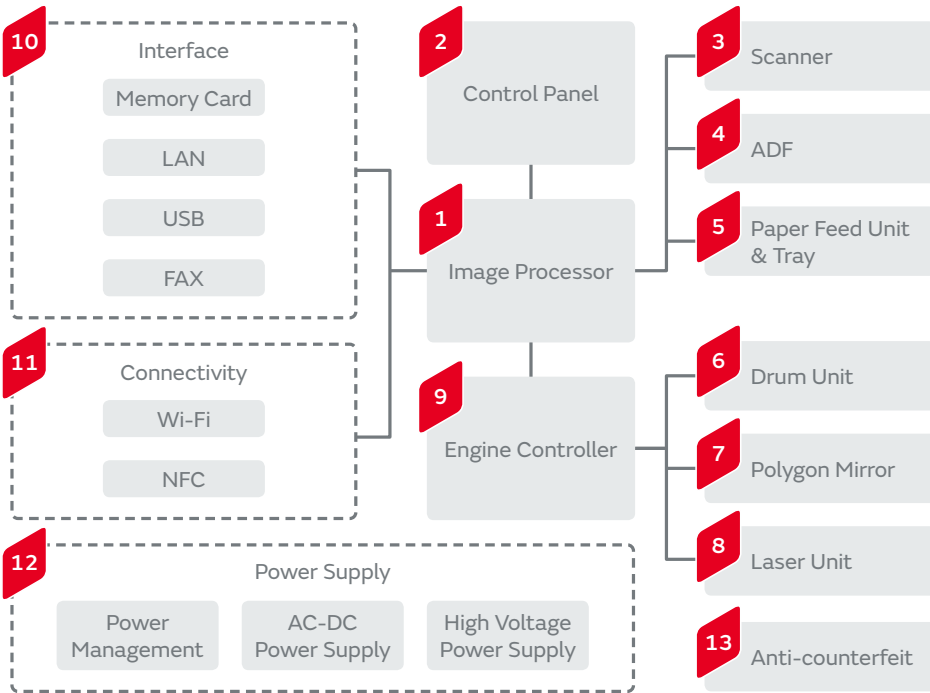
## 16 Traceability



General Purpose

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

# MFP (Multi Function Printer/Product/Peripheral)



## 1 Image Processor

Isolated DC-DC Converters  
MYB Series



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



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



Polymer Aluminum Electrolytic Capacitors  
ECAS/ECNS Series



Crystal Units  
XRC Series



Thermistors  
NCP/PRF Series



## 2 Control Panel

Metal Terminal Type  
Multilayer Ceramic Capacitors  
for General Purpose  
KRM Series



Ceramic Resonators  
CERALOCK  
CST Series



Crystal Units  
XRC Series



Polymer Aluminum  
Electrolytic Capacitors  
ECAS/ECNS Series



Piezoelectric Sounders  
PKMCS/PKLCS/PKM Series



Chip Common Mode Choke Coils/  
Common Mode Noise Filters  
DLW/DLP/NFP Series



Thermistors  
NCP/PRF Series



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



Isolated DC-DC Converters  
for PoE + PD  
MYBSP Series



MEMS Resonators  
WMRAG Series



## 3 Scanner

Ultrasonic  
Sensors  
MA300 Series



## 4 ADF

Accelerometers  
SCA Series



Ultrasonic  
Sensors  
MA300 Series



## 5 Paper Feed Unit & Tray

Magnetic Sensors (AMR Sensors)  
MR Series



## 6 Drum Unit

Thermistors  
NCP/PRF Series



**7 Polygon Mirror**

Accelerometers  
SCA Series



**8 Laser Unit**

Thermistors  
NCP/PRF Series



**9 Engine Controller**

Chip Multilayer Ceramic  
Capacitors for General Purpose  
GR/GA Series



Ceramic Resonators CERALOCK  
CST Series



Crystal Units  
XRC Series



Thermistors  
PRF/PTG Series



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



**10 Interface**

Polymer Aluminum Electrolytic Capacitors  
ECAS/ECNS Series



Crystal Units  
XRC Series



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



ESD Protection Devices  
LXES Series



Thermistors  
PRF Series



**11 Connectivity**

Wi-Fi Modules



NFC Antennas  
FLAN Series



Crystal Units  
XRC Series



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



ESD Protection Devices  
LXES Series



MEMS Resonators  
WMRAG Series



**12 Power Supply**

Chip Multilayer Ceramic  
Capacitors for General Purpose  
GR/GA Series



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



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



High Voltage Resistors  
MHR Series



Large-current Common Mode Choke Coils  
PLT10HH/PLT5BPH/DLW5A/DLW5B/UCMH Series



**13 Anti-counterfeit**

RFID Tag  
LXMS/LXTB Series

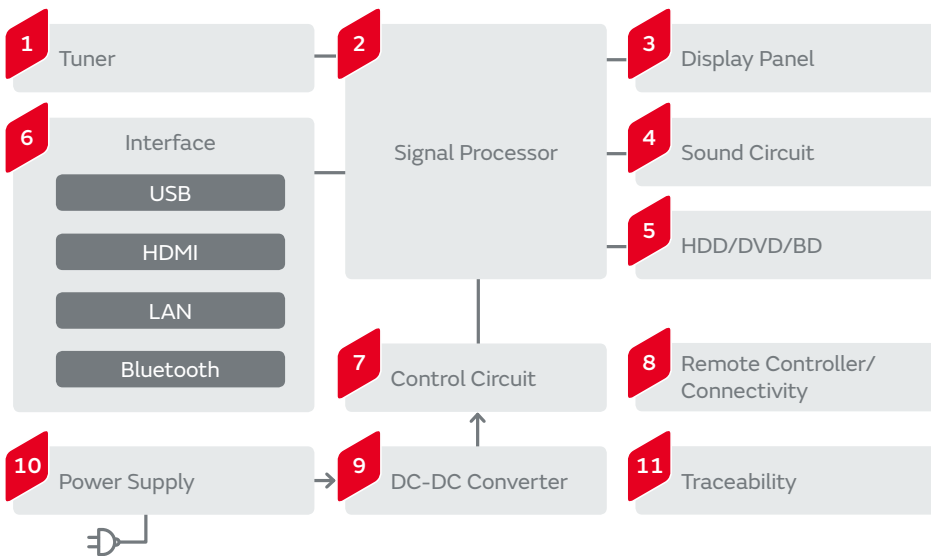


General Purpose

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



# Televisions



## 1 Tuner

Microchip Transformers (Baluns) DXP18B Series

Crystal Units XRC Series

Chip Inductors (Chip Coils) LQW Series

ESD Protection Devices LXES Series

## 2 Signal Processor

Polymer Aluminum Electrolytic Capacitors ECAS/ECNS Series

Ceramic Resonators CERALOCK CST Series

Crystal Units XRC Series

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

NFC Antennas FLAN Series

Thermistors NCP/PRF Series

MEMS Resonators WMRAG Series

## 3 Display Panel

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

Metal Terminal Type Multilayer Ceramic Capacitors for General Purpose KRM Series

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

Polymer Aluminum Electrolytic Capacitors ECAS/ECNS Series

Chip Common Mode Choke Coils/ Common Mode Noise Filters DLW/DLP/NFP Series

Power Inductors LQH Series

Thermistors NCP/PRF Series

## 4 Sound Circuit

Chip Common Mode Choke Coils DLW/DLP Series

## 5 HDD/DVD/BD

Polymer Aluminum Electrolytic Capacitors ECAS/ECNS Series

Ceramic Resonators CERALOCK CST Series

Crystal Units XRC Series

Thermistors NCP/PRF Series

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



## 6 Interface

Bluetooth Modules



Bluetooth Smart Modules



Polymer Aluminum Electrolytic Capacitors  
ECAS/ECNS Series



Ceramic Resonators CERALOCK  
CST Series



Crystal Units  
XRC Series



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



ESD Protection Devices  
LXES Series



Thermistors  
PRG Series



## 7 Control Circuit

Bluetooth Modules



Ceramic Resonators CERALOCK  
CST Series



## 8 Remote Controller/Connectivity

Bluetooth Modules



Wi-Fi Modules



Bluetooth Smart Modules



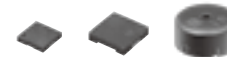
MEMS Resonators  
WMRAG Series



Ceramic Resonators CERALOCK  
CST Series



Piezoelectric Sounders  
PKMCS/PKLCs/PKM Series



ESD Protection Devices  
LXES Series



Crystal Units  
XRC Series



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



## 9 DC-DC Converter

Metal Terminal Type Multilayer Ceramic Capacitors  
for General Purpose  
KRM Series



Polymer Aluminum Electrolytic Capacitors  
ECAS/ECNS Series



Power Inductors  
LQH Series



Thermistors  
NCP/PRF Series



## 10 Power Supply

Chip Multilayer Ceramic  
Capacitors for General Purpose  
GR/GA Series



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



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



Thermistors  
NCP/PRF/PTG Series



## 11 Traceability

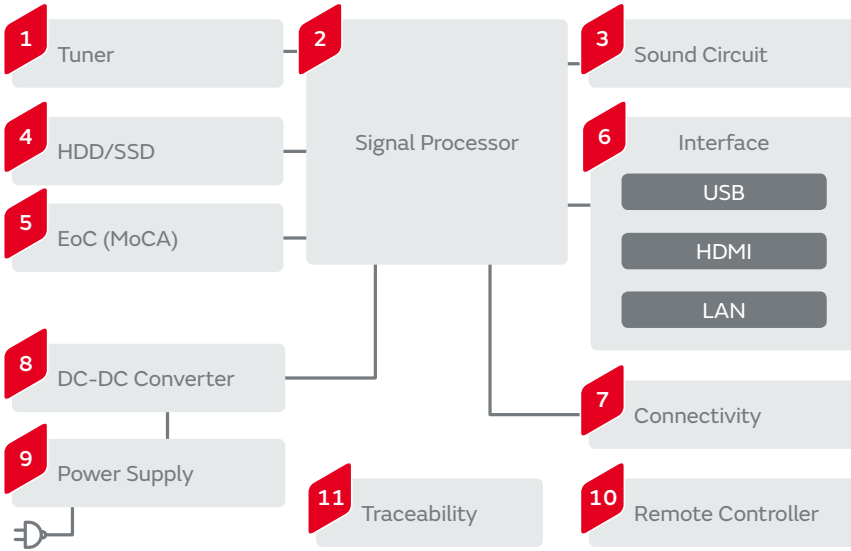
RFID Tag  
LXMS/LXTB Series



General Purpose

Chip Multilayer Ceramic Capacitors for General Purpose	GRM Series	High Frequency Filter Circuit/Coupling/Decoupling/For Step-up
High Q Chip Multilayer Ceramic Capacitors for General Purpose	GJM Series	High Frequency Filter Circuit
Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose	GRJ Series	Coupling/Decoupling/For Step-up
3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose	NFM Series	Noise Suppression
Polymer Aluminum Electrolytic Capacitors	ECAS/ECNS Series	Smoothing/Transient Backup
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching/Resonance
Chip Inductors (Chip Coils)	LQM/LQH/DFE Series	Voltage Conversion
Chip Ferrite Beads	BLM/NFZ Series	Noise Suppression
Feed Through Chip EMI Filters	NFE Series	Noise Suppression
Chip Common Mode Choke Coils/Common Mode Noise Filters	DLW/DLP/NFP Series	Noise Suppression

# Set-top Box



### 1 Tuner

- Crystal Units XRC Series
- Chip Inductors (Chip Coils) LQW Series
- ESD Protection Devices LXES Series
- Microchip Transformers (Baluns) DXP18B Series

### 2 Signal Processor

- Polymer Aluminum Electrolytic Capacitors ECAS/ECNS Series
- Crystal Units XRC Series
- 3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose NFM Series
- MEMS Resonators WMRAG Series

### 3 Sound Circuit

- Chip Common Mode Choke Coils DLW/DLP Series

### 4 HDD/SSD

- Polymer Aluminum Electrolytic Capacitors ECAS/ECNS Series
- Crystal Units XRC Series
- Thermistors NCP/PRF Series
- Non-Isolated DC-DC Converters MYMGK/MYSGK/OKL/MYLSM Series

### 5 EoC (MoCA)

- Chip Multilayer Hybrid Baluns LDB/LDM Series
- Chip Multilayer LC Filters LF Series
- Crystal Units XRC Series

### 6 Interface

- Polymer Aluminum Electrolytic Capacitors ECAS/ECNS Series
- Crystal Units XRC Series
- Chip Common Mode Choke Coils/Common Mode Noise Filters DLW/DLP/NFP/DLM Series
- ESD Protection Devices LXES Series
- Thermistors PRG Series

### 7 Connectivity

- Wi-Fi Modules
- Microwave Coaxial Connectors with Switch
- Crystal Units XRC Series
- ESD Protection Devices LXES Series

**8 DC-DC Converter**

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



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



Power Inductors  
LQH/DFE Series



Metal Terminal Type Multilayer  
Ceramic Capacitors for General Purpose  
KRM Series



Polymer Aluminum Electrolytic Capacitors  
ECAS/ECNS Series



Thermistors  
NCP/PRF Series



**9 Power Supply**

Chip Multilayer  
Ceramic Capacitors  
for General Purpose  
GR/GA Series



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



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



Thermistors  
NCP/PRF/PTG Series



**10 Remote Controller**

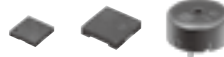
Crystal Units  
XRC Series



Ceramic Resonators CERALOCK  
CST Series



Piezoelectric Sounders  
PKMCS/PKLCs/PKM Series



**11 Traceability**

RFID Tag  
LXMS/LXTB Series



General Purpose

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

# SimSurfing

The best partner  
for your circuit  
design



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

- View and download data**  
You can see various characteristics graphs for our products with easy operation, or download data files including s-parameter, spice models, etc.
- Simulate circuit conditions**  
SimSurfing includes advanced equivalent circuit models which show the characteristics data close to actual measurement (for some components including MLCC & RF inductors).
- Compare characteristics**  
Easily compare characteristics data on the same graph.

For more information about SimSurfing visit  
[www.murata.com/tool/simsurfing](http://www.murata.com/tool/simsurfing)  
or visit the SimSurfing site directly at  
[ds.murata.co.jp/simsurfing/?lcid=en-us](http://ds.murata.co.jp/simsurfing/?lcid=en-us)

**muRata**

INNOVATOR IN ELECTRONICS

K70E.pdf

Dec.12,2019



# Index

<b>B</b>	<b>B4F</b> Baluns.....	71	<b>G</b>	<b>GCJ</b> Soft Termination Chip Multilayer Ceramic Capacitors for Automotive.....	17	<b>M</b>	<b>MA</b> Ultrasonic Sensors.....	78	
	<b>B5F</b> Baluns.....	71		<b>GCM</b> Chip Multilayer Ceramic Capacitors for Automotive.....	15		<b>MHM</b> Ionizer Modules Ionissimo.....	100	
	<b>BLO</b> Noise Suppression Filters (Lead Type).....	47		<b>GCQ</b> High Q Chip Multilayer Ceramic Capacitors for Automotive.....	18		<b>MHM</b> Ozonizer Modules Ionissimo.....	101	
	<b>BLA</b> Noise Suppression Filters (Chip Ferrite Bead).....	41		<b>GJM</b> High Q Chip Multilayer Ceramic Capacitors for General Purpose.....	9		<b>MHR</b> High Voltage Resistors.....	62	
	<b>BLE</b> Noise Suppression Filters (Chip Ferrite Bead).....	42		<b>GMA</b> Wire Bonding Mount Multilayer Microchip Capacitors for General Purpose.....	13		<b>MM</b> Microwave Coaxial Connectors (Receptacle).....	73	
	<b>BLF</b> Noise Suppression Filters (Chip Ferrite Bead).....	43		<b>GMD</b> Wire Bonding/AuSn Soldering Mount Chip Multilayer Ceramic Capacitors for General Purpose.....	14		<b>MPD</b> DC-DC Converters.....	87	
	<b>BLL</b> Noise Suppression Filters (Lead Type).....	47		<b>GQM</b> High Q and High Power Chip Multilayer Ceramic Capacitors for General Purpose.....	9		<b>MPL</b> High Voltage Power Supplies.....	87	
	<b>BLM</b> Noise Suppression Filters (Chip Ferrite Bead).....	41		<b>GR3</b> High Effective Capacitance & High Ripple Current Chip Multilayer Ceramic Capacitors for General Purpose.....	8		<b>MR</b> AMR Sensors (Magnetic Sensors).....	78	
	<b>BLT</b> Noise Suppression Filters (Chip Ferrite Bead).....	43		<b>GR4</b> Chip Multilayer Ceramic Capacitors for Ethernet LAN and primary-secondary coupling of DC-DC converters.....	9		<b>MX</b> Microwave Coaxial Connectors (Cable).....	74	
	<b>BN</b> Noise Suppression Filters (Block Type).....	46		<b>GR4</b> Chip Multilayer Ceramic Capacitors for Splitter Circuit of G-Fast, xDSL.....	9		<b>MY</b> DC-DC Converters.....	85	
<b>C</b>	<b>CD</b> Ceramic Discriminators.....	67		<b>GRJ</b> Soft Termination Chip Multilayer Ceramic Capacitors for General Purpose.....	8	<b>N</b>	<b>NC</b> NTC Thermistors.....	78, 80	
	<b>CL</b> Single-Layer Microchip Capacitors.....	30		<b>GRM</b> Chip Multilayer Ceramic Capacitors for General Purpose.....	6		<b>NF</b> Noise Suppression Filters (Feed Through Chip EMI Filters), (Chip LC Filters), (Chip EMIFIL), (Chip Common Mode Noise Filters)...	43, 44, 45	
	<b>CR</b> Coin Manganese Dioxide Lithium Batteries.....	91		<b>GRM</b> Chip Multilayer Ceramic Capacitors for LCD Backlight Inverter Circuit only.....	8		<b>NFM</b> 3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose.....	12	
	<b>CS</b> Ceramic Resonators CERALOCK.....	65		<b>GRT</b> AEC-Q200 Compliant Chip Multilayer Ceramic Capacitors for Infotainment.....	14		<b>NFM</b> 3 Terminals Low ESL Chip Multilayer Ceramic Capacitors for Automotive.....	19	
<b>D</b>	<b>D5</b> Inductors (Coils).....	52	<b>I</b>	<b>IJ</b> Li-ion Energy Storage System.....	88		<b>NX</b> NTC Thermistors.....	78, 81	
	<b>D6</b> Inductors (Coils).....	52		<b>IR</b> Pyroelectric Infrared Sensors.....	78	<b>O</b>	<b>OK</b> DC-DC Converters.....	85	
	<b>DE1</b> Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose / IEC60384-14 Class X1/Y1...	24	<b>K</b>	<b>KC3</b> High Effective Capacitance & High Allowable Ripple Current Metal Terminal Type Multilayer Ceramic Capacitors for Automotive.....	19	<b>P</b>	<b>PKB</b> Piezoelectric Buzzers.....	97	
	<b>DE2</b> Safety Standard Certified Lead Type Disc Ceramic Capacitors for General Purpose / IEC60384-14 Class X1/Y2...	25		<b>KCA</b> Safety Standard Certified Metal Terminal Type Multilayer Ceramic Capacitors for Automotive.....	20		<b>PKG</b> Shock Sensors.....	78	
	<b>DE6</b> Safety Standard Certified Lead Type Disc Ceramic Capacitors for Automotive.....	28		<b>KCM</b> Metal Terminal Type Multilayer Ceramic Capacitors for Automotive.....	19		<b>PKL</b> Piezoelectric Sounders.....	96	
	<b>DEM</b> Inductors (Coils).....	51		<b>KR3</b> High Effective Capacitance & High Allowable Ripple Current Metal Terminal Type Multilayer Ceramic Capacitors for General Purpose.....	13		<b>PKM</b> Piezoelectric Sounders.....	96, 97	
	<b>DFE</b> Inductors (Coils).....	50		<b>KRM</b> Metal Terminal Type Multilayer Ceramic Capacitors for General Purpose.....	13		<b>PLT</b> Noise Suppression Filters (Common Mode Choke Coil).....	46, 47	
	<b>DG</b> Inductors (Coils).....	52		<b>L</b>	<b>LDB</b> Baluns.....	71		<b>PR</b> PTC Thermistors POSISTOR.....	78, 82, 83
	<b>DK1</b> Safety Standard Certified Resin Molding SMD Type Ceramic Capacitors for General Purpose.....	28		<b>LDC</b> Couplers.....	72		<b>PT</b> PTC Thermistors POSISTOR.....	78, 82, 83, 84	
	<b>DL</b> Noise Suppression Filters (Chip Common Mode Choke Coil).....	45		<b>LDD</b> Chip Multilayer Hybrid Dividers.....	72	<b>R</b>	<b>RCE</b> Leaded MLCC for Automotive.....	26	
	<b>DS</b> Noise Suppression Filters (Lead Type) ..	47		<b>LDJ</b> Couplers.....	72		<b>RDE</b> Leaded MLCC for General Purpose.....	22	
	<b>DS1</b> Inductors (Coils).....	53		<b>LDM</b> Baluns.....	71		<b>RHE</b> 150°C Operation Leaded MLCC for Automotive.....	27	
	<b>DS7</b> Inductors (Coils).....	52		<b>LFB</b> Chip Multilayer LC Filters.....	69		<b>RHS</b> 175°C/200°C Operation Leaded MLCC for Automotive.....	28	
	<b>DXP</b> Baluns.....	71		<b>LFD</b> Chip Multilayer Diplexers.....	72		<b>RU</b> Thin Film Circuit Substrates (RUSUB) ..	32	
	<b>DXW</b> Baluns.....	71		<b>LFL</b> Chip Multilayer LC Filters.....	69	<b>S</b>	<b>SA3</b> Antenna Coils.....	70	
<b>E</b>	<b>ECAS</b> Polymer Aluminum Electrolytic Capacitors.....	29		<b>LLA</b> 8 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose.....	11		<b>SAF</b> SAW Filters for Mobile Communications.....	68	
	<b>ECNS</b> Polymer Aluminum Electrolytic Capacitors.....	29		<b>LLL</b> LW Reversed Low ESL Chip Multilayer Ceramic Capacitors for General Purpose.....	11		<b>SAW</b> SAW Filters for Mobile Communications.....	68	
<b>F</b>	<b>FC</b> Inductors (Coils).....	52		<b>LLM</b> 10 Terminals Low ESL Chip Multilayer Ceramic Capacitors for General Purpose.....	12		<b>SAY</b> SAW Filters for Mobile Communications.....	68	
	<b>FD</b> Inductors (Coils).....	52		<b>LLR</b> LW Reversed Controlled ESR Low ESL Chip Multilayer Ceramic Capacitors for General Purpose.....	12		<b>SCA</b> Accelerometers.....	78	
	<b>FHA</b> Film Capacitors.....	40		<b>LQ</b> Inductors (Coils).....	50, 57, 59		<b>SCA</b> Inclinometers.....	78	
	<b>FSDVA</b> Inductors (Coils).....	60		<b>LR</b> Alkaline Manganese Batteries.....	95		<b>SCC</b> Gyro Sensors.....	78	
<b>G</b>	<b>GA2</b> Based on the Electrical Appliance and Material Safety Law of Japan Chip Multilayer Ceramic Capacitors for General Purpose.....	10		<b>LXMS</b> RFID tag.....	102		<b>SCR</b> Gyro Sensors.....	78	
	<b>GA3</b> Safety Standard Certified Chip Multilayer Ceramic Capacitors for General Purpose.....	10		<b>LXRW</b> Variable Capacitors.....	34		<b>SF</b> Ceramic Filters CERAFIL.....	67	
	<b>GC3</b> High Effective Capacitance & High Ripple Current Chip Multilayer Ceramic Capacitors for Automotive.....	17		<b>LXTB</b> RFID tag.....	102		<b>SR</b> Silver Oxide Batteries.....	94	
	<b>GCD</b> MLSC Design Chip Multilayer Ceramic Capacitors for Automotive.....	18				<b>T</b>	<b>TD</b> Dielectric Filters GIGAFIL.....	69	
	<b>GCE</b> Soft Termination MLSC Design Chip Multilayer Ceramic Capacitors for Automotive.....	18				<b>U</b>	<b>UCMH</b> Noise Suppression Filters (Chip Common Mode Choke Coil).....	46	
	<b>GCG</b> AgPd Termination Conductive Glue Mounting Chip Multilayer Ceramic Capacitors for Automotive.....	20				<b>V</b>	<b>VF</b> EMIGUARD.....	47	
	<b>GCH</b> Chip Multilayer Ceramic Capacitors for Implantable Medical devices (Non Life support circuit).....	21				<b>W</b>	<b>WM</b> MEMS Resonator.....	64	
						<b>X</b>	<b>XD</b> Crystal Filters.....	68	
							<b>XR</b> Crystal Units.....	64	
							<b>XT</b> Crystal Oscillators.....	65	
							<b>5CCEG</b> Inductors (Coils).....	60	
							<b>7B</b> Piezoelectric Diaphragms.....	97	
							<b>935*</b> Silicon Capacitors.....	34	
							<b>939*</b> Silicon Capacitors.....	34	

# Global Locations

For details please visit [www.murata.com](http://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 September 2019. 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](http://www.murata.com)

**muRata**  
INNOVATOR IN ELECTRONICS

## X-ON Electronics

Largest Supplier of Electrical and Electronic Components

*Click to view similar products for [Signal Conditioning](#) category:*

*Click to view products by [Murata](#) manufacturer:*

Other Similar products are found below :

[MAPDCC0004](#) [PD0409J5050S2HF](#) [880157](#) [HHS-109-PIN](#) [DC1417J5005AHF](#) [DC4859J5005AHF](#) [AFS14A30-2185.00-T3](#) [AFS14A35-1591.50-T3](#) [DS-323-PIN](#) [DSS-313-PIN](#) [B39321R801H210](#) [B39321R821H210](#) [B39921B4317P810](#) [1A0220-3](#) [2089-6207-00](#) [JP510S](#) [LFB212G45SG8C341](#) [LFB322G45SN1A504](#) [LFL182G45TC3B746](#) [SF2159E](#) [30057](#) [1P510S](#) [CER0813B](#) [3A325](#) [40287](#) [41180](#) [ATB3225-75032NCT](#) [B69842N5807A150](#) [BD0810N50100AHF](#) [BD2326L50200AHF](#) [BD2425J50200AHF](#) [HMC189AMS8TR](#) [C5060J5003AHF](#) [JHS-114-PIN](#) [JP503AS](#) [DC0710J5005AHF](#) [DC2327J5005AHF](#) [DC3338J5005AHF](#) [43020](#) [LFB2H2G60BB1C106](#) [LFL15869MTC1B787](#) [X3C19F1-20S](#) [XC3500P-20S](#) [10013-20](#) [SF2081E](#) [SF2194E](#) [SF2238E](#) [CDBLB455KCAX39-B0](#) [RF1353C](#) [PD0922J5050D2HF](#)