MURATA PRODUCTS Lineup 2012

muRata
Innovator in Electronics

2012 MURATA PRODUCTS Lineup

Capacitors

Chip Monolithic Ceramic Capacitors for General Electronic Devices — 3
Chip Monolithic Ceramic Capacitors for Automotive — 12
Lead Type Ceramic Capacitors for General Electronic Devices — 14
Lead Type Ceramic Capacitors for Automotive — 18
High Voltage Ceramic Capacitors — 19
Polymer Aluminum Electrolytic Capacitors — 19
Trimmer Capacitors — 20

Noise Suppression Products/EMI Suppression Filters

Noise Suppression Filters (Chip Ferrite Bead) — 22
Noise Suppression Filters (Chip 3 Terminal Capacitor) — 23
Noise Suppression Filters (Chip LC/RC Filter) — 23
Noise Suppression Filters (Chip Common Mode Choke Coil) — 24
Noise Suppression Filters (Block Type) — 24
Noise Suppression Filters (Lead Type), Others — 25

Inductors (Coils)

General Purpose Inductors for Power Circuits — 27
RF Inductors — 28

Resistors

Trimmer Potentiometers — 30
High Voltage Resistors — 31

Resonators

Crystal Resonators — 33
Ceramic Resonators CERALOCK® — 33

Filters for Audio Visual Equipment

Ceramic Filters CERAFIL® — 36
Ceramic Traps — 38
Ceramic Discriminators — 38
SAW Traps — 38

Filters for Communication Equipment

SAW Filters for Mobile Communications — 40
Dielectric Filters GIGAFIL® — 41
Chip Multilayer LC Filters — 41
Ceramic Filters CERAFIL® — 42
Ceramic Discriminators — 43

RF Components

Antennas — 46
Isolators — 47
Baluns — 48
Couplers — 48
Chip Multilayer Hybrid Dividers — 49
Chip Multilayer Diplexers — 49
High Frequency Coaxial Connectors — 50
Single Layer Microchip Capacitors — 51
Thin Film Circuit Substrate RUSUB® — 53

Bluetooth is a registered trademark of Bluetooth SIG, Inc. of the United States.
Wi-Fi is a registered trademark or trademark of Wi-Fi Alliance.

Contents

Sensors

Pyroelectric Infrared Sensors — 56
Ultrasonic Sensors — 56
Rotary Sensors — 56
Magnetic Pattern Recognition Sensors — 55
Magnetic Switches (AMR Sensors) — 55
Shock Sensors — 56
Angular Rate Sensors — 56
Rotary Position Sensors — 55
Temperature Sensors (Thermistors) — 55

Thermistors

NTC Thermistors (for Temperature Sensor/Temperature Compensation) — 59
NTC Thermistors (for Inrush Current Suppression) — 60
PTC Thermistors POSISTOR® (for Overheat Sensing) — 60
PTC Thermistors POSISTOR® (for Overcurrent Protection) — 61
PTC Thermistors POSISTOR® (for Motor Starters) — 62
PTC Thermistors POSISTOR® (for Heater) — 63

Power Supplies

DC-DC Converters — 65
Switching Power Supplies — 66
High Voltage Power Supplies — 67

Sound Components

Piezoelectric Sounders — 69
Piezoelectric Buzzers — 70
Piezoelectric Diaphragms — 70

Others

Micromechatronics — 71
Wireless Communication Modules — 72
Ceramic Applied Products — 72
Ionizer Modules Ionissimo® — 73
Wireless Power Transmission Modules — 73
RFID Devices — 74
ESD Protection Devices — 74

Application Guides

Mobile Phones p76
Refrigerator p85
Microwave Oven p90
Personal Computers p78
Air Conditioner p86
IH Rice Cooker p91
Televisions p80
Washing Machine p88
Vacuum Cleaner p92
Automotive p82
Air Purifier p89

Wireless HD is a registered trademark or trademark of SiBEAM Inc. in the United States and other countries.
ZigBee is a registered trademark or trademark of SiBEAM Inc. in the United States and other countries.

p2
p21
p26
p29
p32
p35
p39
p45
p54
p58
p64
p68
p71
p75

Capacitors

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

Summary

Using Murata's unique material technology, we offer a variety of capacitors covering a wide range of voltages. Murata also offers technical support that includes design kits and a comprehensive set of software tools to simulate virtually any circuit condition, satisfying the demands of many applications.

Lineup

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

Web Content

We have completely updated the ceramic capacitor website and search system. In this update, we improved and enhanced the search function to enable customers to find the right capacitor even more quickly and easily.

http://www.murata.com/products/capacitor/

Detailed Catalogs

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

• Chip Monolithic Ceramic Capacitors	Cat. No. C02E
• Chip Monolithic Ceramic Capacitors for Automotive	Cat. No. C03E
• Safety Standard Certified Ceramic Capacitors/ High Voltage Ceramic Capacitors	Cat. No. C85E
• Ceramic Trimmer Capacitors	Cat. No. T13E
• Polymer Aluminum Electrolytic Capacitors	Cat. No. C90E
• Radial Lead Type Monolithic Ceramic Capacitors	Cat. No. C49E

http://www.murata.com/products/capacitor/catalog/

Chip Monolithic Ceramic Capacitors For General Electronic Devices

General-purpose (Temperature Compensating Type)

GRM

TC Code	Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)	Operating Temperature Range (°C)
C0G	GRM02	0.4X0.2 <01005>	16	0.2pF – 47pF	-55 to 125
			10	56pF – 100pF	-55 to 125
			6.3	56pF – 100pF	-55 to 125
	GRM03	0.6X0.3 <0201>	50	0.1pF – 100pF	-55 to 125
	GRM15	1.0X0.5 <0402>	50	0.1pF – 1000pF	-55 to 125
	GRM18	1.6X0.8 <0603>	100	10pF – 1500pF	-55 to 125
			50	10pF – 3900pF	-55 to 125
	GRM21	2.0X1.25 <0805>	250	10pF – 330pF	-55 to 125
			100	100pF – 3300pF	-55 to 125
			50	1200pF – 0.022μF	-55 to 125
	GRM31	3.2X1.6 <1206>	1k	10pF – 220pF	-55 to 125
			630	10pF – 1000pF	-55 to 125
			100	1800pF – 0.022μF	-55 to 125
			50	4700pF – 0.10μF	-55 to 125
U2J	GRM03	0.6X0.3 <0201>	50	1pF – 15pF	-55 to 125
			25	18pF – 100pF	-55 to 125
	GRM15	1.0X0.5 <0402>	50	1pF – 180pF	-55 to 125
			10	1200pF – 4700pF	-55 to 125
	GRM18	1.6X0.8 <0603>	50	1000pF – 0.01μF	-55 to 125
			10	5600pF – 0.022μF	-55 to 125
	GRM21	2.0X1.25 <0805>	250	100pF – 5600pF	-55 to 125
			50	0.01μF – 0.047μF	-55 to 125
			10	0.056μF – 0.10μF	-55 to 125
	GRM31	3.2X1.6 <1206>	2k	10pF – 68pF	-55 to 125
			1k	10pF – 1000pF	-55 to 125
			630	10pF – 4700pF	-55 to 125
			250	2700pF – 0.022μF	-55 to 125
			50	0.056μF – 0.10μF	-55 to 125
	GRM32	3.2X2.5 <1210>	2k	82pF – 220pF	-55 to 125
			1k	1200pF – 2200pF	-55 to 125
			630	1200pF – 0.01μF	-55 to 125
	GRM42	4.5X2.0 <1808>	3.15k	27pF – 100pF	-55 to 125
	GRM43	4.5X3.2 <1812>	1k	2700pF – 4700pF	-55 to 125
			630	0.012μF – 0.022μF	-55 to 125
	GRM55	5.7X5.0 <2220>	1k	5100pF – 0.01μF	-55 to 125
			630	0.027μF – 0.047μF	-55 to 125
P2H	GRM15	1.0X0.5 <0402>	50	1pF – 27pF	-55 to 125
R2H	GRM03	0.6X0.3 <0201>	25	1pF – 100pF	-55 to 125
	GRM15	1.0X0.5 <0402>	50	1pF – 33pF	-55 to 125
S2H	GRM03	0.6X0.3 <0201>	25	1pF – 100pF	-55 to 125
	GRM15	1.0X0.5 <0402>	50	1pF – 39pF	-55 to 125
T2H	GRM03	0.6X0.3 <0201>	25	1pF – 100pF	-55 to 125
	GRM15	1.0X0.5 <0402>	50	1pF – 100pF	-55 to 125

For more details on each series, please refer to our website.
Product Search ⇒ http://www.murata.com/products/capacitor/

General-purpose (High Dielectric Constant Type)

GRM

TC Code	Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F) (0.1p 1p 10p 100p 1000p 0.01μ 0.1μ 1μ 10μ 100μ 1000μ)	Operating Temperature Range (°C)
X7R/X7S/ X7T/X7U	GRM02	0.4X0.2 <01005>	10	68pF – 470pF	-55 to 125
	GRM03	0.6X0.3 <0201>	25	100pF – 1500pF	-55 to 125
			16	100pF – 3300pF	-55 to 125
			10	2200pF – 0.01μF	-55 to 125
			6.3	4700pF – 0.01μF	-55 to 125
	GRM15	1.0X0.5 <0402>	100	220pF – 4700pF	-55 to 125
			50	220pF – 0.022μF	-55 to 125
			25	2200pF – 0.047μF	-55 to 125
			16	3300pF – 0.22μF	-55 to 125
			10	0.068μF – 0.10μF	-55 to 125
	GRM18	1.6X0.8 <0603>	250	220pF – 2200pF	-55 to 125
			100	220pF – 0.10μF	-55 to 125
			50	220pF – 0.10μF	-55 to 125
			25	2200pF – 1.0μF	-55 to 125
			16	0.15μF – 1.0μF	-55 to 125
			10	0.33μF – 2.2μF	-55 to 125
			6.3	2.2μF	-55 to 125
			4	2.2μF	-55 to 125
	GRM21	2.0X1.25 <0805>	250	1000pF – 0.01μF	-55 to 125
			100	6800pF – 0.47μF	-55 to 125
			50	0.033μF – 1.0μF	-55 to 125
			25	0.068μF – 2.2μF	-55 to 125
			16	0.68μF – 4.7μF	-55 to 125
			10	2.2μF – 10μF	-55 to 125
			6.3	10μF	-55 to 125
			4	22μF	-55 to 125
	GRM31	3.2X1.6 <1206>	1k	470pF – 4700pF	-55 to 125
			630	1000pF – 0.015μF	-55 to 125
			250	0.015μF – 0.10μF	-55 to 125
			100	0.015μF – 1.0μF	-55 to 125
			50	0.15μF – 4.7μF	-55 to 125
			25	0.33μF – 10μF	-55 to 125
			16	2.2μF – 10μF	-55 to 125
			10	10μF – 22μF	-55 to 125
			6.3	22μF	-55 to 125
			4	47μF	-55 to 125
	GRM32	3.2X2.5 <1210>	1k	6800pF – 0.022μF	-55 to 125
			630	0.022μF – 0.047μF	-55 to 125
			250	0.068μF – 0.22μF	-55 to 125
			100	0.68μF – 2.2μF	-55 to 125
			50	4.7μF	-55 to 125
			35	10μF	-55 to 125
			25	10μF – 22μF	-55 to 125
			16	22μF	-55 to 125
			10	22μF – 47μF	-55 to 125
			6.3	47μF	-55 to 125
			4	100μF	-55 to 125

Continued on the following page.

For more details on each series, please refer to our website.
Product Search ⇒ http://www.murata.com/products/capacitor/

TC Code	Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)	Operating Temperature Range (°C)
X7R/X7S/ X7T/X7U	GRM43	4.5X3.2 <1812>	1k	0.033μF 0.047μF	-55 to 125
			630	0.068μF 0.10μF	-55 to 125
			250	0.15μF 0.47μF	-55 to 125
	GRM55	5.7X5.0 <2220>	1k	0.068μF 0.10μF	-55 to 125
			630	0.15μF 0.22μF	-55 to 125
			250	0.33μF 1.0μF	-55 to 125
X6S/X6T	GRM03	0.6X0.3 <0201>	6.3	0.015μF 0.047μF	-55 to 105
			4	0.015μF 0.047μF	-55 to 105
	GRM15	1.0X0.5 <0402>	25	0.068μF 0.10μF	-55 to 105
			6.3	0.15μF 0.68μF	-55 to 105
			4	0.15μF 0.68μF	-55 to 105
	GRM18	1.6X0.8 <0603>	25	1.0μF	-55 to 105
			10	1.0μF 2.2μF	-55 to 105
			6.3	1.0μF 2.2μF	-55 to 105
			4	4.7μF 10μF	-55 to 105
			2.5	10μF	-55 to 105
	GRM21	2.0X1.25 <0805>	25	4.7μF	-55 to 105
			16	1.0μF 4.7μF	-55 to 105
			10	4.7μF 10μF	-55 to 105
			6.3	4.7μF 22μF	-55 to 105
			4	22μF	-55 to 105
	GRM31	3.2X1.6 <1206>	25	10μF	-55 to 105
			16	2.2μF 10μF	-55 to 105
			10	10μF 22μF	-55 to 105
			6.3	10μF 47μF	-55 to 105
			4	47μF 100μF	-55 to 105
	GRM32	3.2X2.5 <1210>	25	10μF 22μF	-55 to 105
			10	22μF 47μF	-55 to 105
			6.3	47μF 100μF	-55 to 105
			4	100μF	-55 to 105
X5R	GRM02	0.4X0.2 <01005>	10	68pF 0.01μF	-55 to 85
			6.3	680pF 0.01μF	-55 to 85
	GRM03	0.6X0.3 <0201>	10	1500pF 0.01μF	-55 to 85
			6.3	0.01μF 0.047μF	-55 to 85
	GRM15	1.0X0.5 <0402>	50	1000pF 4700pF	-55 to 85
			25	0.068μF 0.10μF	-55 to 85
			16	0.022μF 0.10μF	-55 to 85
			10	0.033μF 1.0μF	-55 to 85
			6.3	0.15μF 0.68μF	-55 to 85
	GRM18	1.6X0.8 <0603>	50	1000pF 0.022μF	-55 to 85
			25	0.10μF 1.0μF	-55 to 85
			16	0.22μF 2.2μF	-55 to 85
			10	0.68μF 2.2μF	-55 to 85
			6.3	4.7μF 10μF	-55 to 85
			4	10μF 22μF	-55 to 85
	GRM21	2.0X1.25 <0805>	25	1.0μF 4.7μF	-55 to 85
			16	1.0μF 10μF	-55 to 85
			10	2.2μF 10μF	-55 to 85
			6.3	4.7μF 22μF	-55 to 85
			4	22μF	-55 to 85
	GRM31	3.2X1.6 <1206>	50	2.2μF	-55 to 85
			25	2.2μF 10μF	-55 to 85
			16	4.7μF 22μF	-55 to 85

Continued on the following page.

For more details on each series, please refer to our website.
Product Search ⇒ http://www.murata.com/products/capacitor/

TC Code	Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F) (0.1p, 1p, 10p, 100p, 1000p, 0.01μ, 0.1μ, 1μ, 10μ, 100μ, 1000μ)	Operating Temperature Range (°C)
X5R	**GRM31**	3.2X1.6 <1206>	10	10μF – 47μF	-55 to 85
			6.3	22μF – 100μF	-55 to 85
			4	100μF	-55 to 85
	GRM32	3.2X2.5 <1210>	35	10μF	-55 to 85
			25	10μF – 22μF	-55 to 85
			16	47μF	-55 to 85
			10	47μF	-55 to 85
			6.3	100μF	-55 to 85

Array (High Dielectric Constant Type)

GNM

TC Code	Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F) (0.1p, 1p, 10p, 100p, 1000p, 0.01μ, 0.1μ, 1μ, 10μ, 100μ, 1000μ)	Operating Temperature Range (°C)
X7R/X7S	**GNM1M**	1.37X1.0 <0504>	50	1000pF	-55 to 125
			25	2200pF – 0.01μF	-55 to 125
			16	0.022μF – 0.1μF	-55 to 125
			10	0.022μF – 0.1μF	-55 to 125
	GNM21	2.0X1.25 <0805>	50	470pF – 1000pF	-55 to 125
			25	2200pF – 0.01μF	-55 to 125
			16	0.022μF – 0.1μF	-55 to 125
X5R	**GNM0M**	0.9X0.6 <0302>	16	0.01μF – 0.1μF	-55 to 85
			10	0.01μF – 0.1μF	-55 to 85
			6.3	0.01μF – 0.1μF	-55 to 85
			4	1.0μF	-55 to 85
	GNM1M	1.37X1.0 <0504>	50	1000pF	-55 to 85
			25	2200pF – 0.01μF	-55 to 85
			16	0.022μF – 1.0μF	-55 to 85
			10	0.022μF – 2.2μF	-55 to 85
			6.3	1.0μF – 2.2μF	-55 to 85

Low ESL Type

LW Reversed Type

LLL

TC Code	Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F) (0.1p, 1p, 10p, 100p, 1000p, 0.01μ, 0.1μ, 1μ, 10μ, 100μ, 1000μ)	Operating Temperature Range (°C)
X6S	**LLL15**	0.5X1.0 <0204>	6.3	0.1μF – 0.22μF	-55 to 105
X7R/X7S	**LLL15**	0.5X1.0 <0204>	4	0.47μF	-55 to 125
	LLL18	0.8X1.6 <0306>	50	2200pF – 4700pF	-55 to 125
			25	0.01μF – 0.022μF	-55 to 125
			16	0.047μF	-55 to 125
			10	0.1μF – 0.22μF	-55 to 125
			4	0.47μF – 2.2μF	-55 to 125
	LLL21	1.25X2.0 <0508>	50	0.01μF – 0.022μF	-55 to 125
			25	0.047μF – 0.1μF	-55 to 125

Continued on the following page.

For more details on each series, please refer to our website.
Product Search ⇒ http://www.murata.com/products/capacitor/

TC Code	Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F) 0.1p 1p 10p 100p 1000p 0.01μ 0.1μ 1μ 10μ 100μ 1000μ	Operating Temperature Range (°C)
X7R/X7S	**LLL21**	1.25X2.0 <0508>	16	0.22μF	-55 to 125
			10	0.22μF 1.0μF	-55 to 125
			4	2.2μF	-55 to 125
	LLL31	1.6X3.2 <0612>	50	0.01μF 0.1μF	-55 to 125
			25	0.1μF 0.47μF	-55 to 125
			16	0.22μF 1.0μF	-55 to 125
			10	1.0μF 2.2μF	-55 to 125
			6.3	2.2μF 4.7μF	-55 to 125
X5R	**LLL31**	1.6X3.2 <0612>	6.3	10μF	-55 to 85

LW Reversed Low-profile Type

TC Code	Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F) 0.1p 1p 10p 100p 1000p 0.01μ 0.1μ 1μ 10μ 100μ 1000μ	Operating Temperature Range (°C)
X7R/X7S	**LLL18**	0.8X1.6 <0306>	25	0.01μF	-55 to 125
			16	0.022μF 0.047μF	-55 to 125
			10	0.1μF	-55 to 125
			4	0.22μF	-55 to 125
	LLL21	1.25X2.0 <0508>	50	0.01μF	-55 to 125
			25	0.022μF	-55 to 125
			16	0.047μF 0.1μF	-55 to 125
			10	0.22μF	-55 to 125
			6.3	0.47μF	-55 to 125
			4	1.0μF	-55 to 125
	LLL31	1.6X3.2 <0612>	50	0.01μF 0.022μF	-55 to 125
			25	0.047μF 0.1μF	-55 to 125
			16	0.22μF	-55 to 125
			10	0.47μF	-55 to 125

Controlled ESR Type

LLR

TC Code	Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F) 0.1p 1p 10p 100p 1000p 0.01μ 0.1μ 1μ 10μ 100μ 1000μ	Operating Temperature Range (°C)
X7S	**LLR18**	0.8X1.6 <0306>	4	1.0μF	-55 to 125

8 Terminal Type

LLA

TC Code	Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F) 0.1p 1p 10p 100p 1000p 0.01μ 0.1μ 1μ 10μ 100μ 1000μ	Operating Temperature Range (°C)
X7R/X7S	**LLA18**	1.6X0.8 <0603>	4	0.1μF 2.2μF	-55 to 125
	LLA21	2.0X1.25 <0805>	25	0.01μF 0.047μF	-55 to 125
			16	0.1μF 0.22μF	-55 to 125
			10	0.47μF	-55 to 125
			6.3	1.0μF	-55 to 125
			4	2.2μF 4.7μF	-55 to 125
	LLA31	3.2X1.6 <1206>	16	0.1μF 1.0μF	-55 to 125
			10	1.0μF 2.2μF	-55 to 125
			4	2.2μF	-55 to 125

Continued on the following page.

For more details on each series, please refer to our website.
Product Search ⇒ http://www.murata.com/products/capacitor/

8 Terminal Low-profile Type

TC Code	Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)	Operating Temperature Range (°C)
X7R/X7S	LLA21	2.0X1.25 <0805>	25	0.01μF – 0.022μF	-55 to 125
			16	0.047μF – 0.1μF	-55 to 125
			10	0.22μF	-55 to 125
			6.3	0.47μF	-55 to 125
			4	1.0μF – 4.7μF	-55 to 125
	LLA31	3.2X1.6 <1206>	16	0.22μF	-55 to 125
			10	0.47μF	-55 to 125
			6.3	1.0μF – 2.2μF	-55 to 125

10 Terminal Low-profile Type

LLM

TC Code	Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)	Operating Temperature Range (°C)
X7R/X7S	LLM21	2.0X1.25 <0805>	25	0.01μF – 0.022μF	-55 to 125
			16	0.047μF – 0.1μF	-55 to 125
			6.3	0.22μF – 0.47μF	-55 to 125
			4	1.0μF – 2.2μF	-55 to 125
	LLM31	3.2X1.6 <1206>	16	0.1μF – 0.22μF	-55 to 125
			10	0.47μF	-55 to 125
			6.3	2.2μF	-55 to 125

High-Q Type

GJM

TC Code	Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)	Operating Temperature Range (°C)
C0G/C0H	GJM03	0.6X0.3 <0201>	25	0.2pF – 20pF	-55 to 125
			6.3	22pF – 33pF	-55 to 125
	GJM15	1.0X0.5 <0402>	50	0.1pF – 20pF	-55 to 125

High Frequency High-Q Type

GQM

TC Code	Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)	Operating Temperature Range (°C)
C0G	GQM18	1.6X0.8 <0603>	250	0.1pF – 47pF	-55 to 125
			100	0.5pF – 6.8pF	-55 to 125
			50	7.0pF – 100pF	-55 to 125
	GQM21	2.0X1.25 <0805>	250	0.5pF – 100pF	-55 to 125
			100	0.5pF – 18pF	-55 to 125
			50	20pF – 100pF	-55 to 125
	GQM22	2.8X2.8 <1111>	500	0.5pF – 100pF	-55 to 125

For more details on each series, please refer to our website.
Product Search ⇒ http://www.murata.com/products/capacitor/

For Bonding (High Dielectric Constant Type)

GMD

TC Code	Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F) (0.1p 1p 10p 100p 1000p 0.01μ 0.1μ 1μ 10μ 100μ 1000μ)	Operating Temperature Range (°C)
X7R/X5R	**GMD03**	0.6X0.3 <0201>	25	100pF – 1500pF	-55 to 125
			16	1800pF – 3300pF	-55 to 125
			10	3900pF – 0.01μF	-55 to 125
	GMD15	1.0X0.5 <0402>	50	220pF – 4700pF	-55 to 125
			25	5600pF – 0.047μF	-55 to 125
			16	0.056μF – 0.1μF	-55 to 125
	GMD03	0.6X0.3 <0201>	6.3	0.056μF – 0.1μF	-55 to 85
	GMD15	1.0X0.5 <0402>	10	0.12μF – 0.47μF	-55 to 85

Monolithic Microchip (High Dielectric Constant Type)

GMA

TC Code	Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F) (0.1p 1p 10p 100p 1000p 0.01μ 0.1μ 1μ 10μ 100μ 1000μ)	Operating Temperature Range (°C)
X7R/X5R	**GMA0D**	0.38X0.38 <015015>	10	0.01μF	-55 to 125
	GMA05	0.5X0.5 <0202>	100	100pF – 1000pF	-55 to 125
			25	1500pF – 4700pF	-55 to 125
			10	6800pF – 0.022μF	-55 to 125
			6.3	0.1μF	-55 to 85
	GMA08	0.8X0.8 <0303>	100	1500pF – 6800pF	-55 to 125
			25	0.01μF – 0.022μF	-55 to 125
			10	0.033μF – 1.0μF	-55 to 125
			6.3	0.47μF	-55 to 85

Soft Termination Type

GRJ

TC Code	Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F) (0.1p 1p 10p 100p 1000p 0.01μ 0.1μ 1μ 10μ 100μ 1000μ)	Operating Temperature Range (°C)
X7R	**GRJ21**	2.0X1.25 <0805>	250	1000pF – 0.022μF	-55 to 125
	GRJ31	3.2X1.6 <1206>	1k	470pF – 4700pF	-55 to 125
			630	1000pF – 0.022μF	-55 to 125
			250	0.015μF – 0.10μF	-55 to 125
	GRJ32	3.2X2.5 <1210>	1k	6800pF – 0.022μF	-55 to 125
			630	0.022μF – 0.047μF	-55 to 125
			250	0.068μF – 0.22μF	-55 to 125
	GRJ43	4.5X3.2 <1812>	1k	0.033μF – 0.047μF	-55 to 125
			630	0.068μF – 0.10μF	-55 to 125
			250	0.15μF – 0.47μF	-55 to 125
	GRJ55	5.7X5.0 <2220>	1k	0.068μF – 0.10μF	-55 to 125
			630	0.15μF – 0.22μF	-55 to 125
			250	0.33μF – 1.0μF	-55 to 125

For more details on each series, please refer to our website.
Product Search ⇒ http://www.murata.com/products/capacitor/

Only for LCD Backlight Inverter Circuit

GRM

TC Code	Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F) (0.1p, 1p, 10p, 100p, 1000p, 0.01μ, 0.1μ, 1μ, 10μ, 100μ, 1000μ)	Operating Temperature Range (°C)
C0G	**GRM42**	4.5X2.0 <1808>	3.15k	5pF – 47pF	-55 to 125

Only for Comunication / Information Devices

GR4

TC Code	Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F) (0.1p, 1p, 10p, 100p, 1000p, 0.01μ, 0.1μ, 1μ, 10μ, 100μ, 1000μ)	Operating Temperature Range (°C)
X7R	**GR431**	3.2X1.6 <1206>	2k	470pF – 1000pF	-55 to 125
	GR442	4.5X2.0 <1808>	2k	100pF – 1500pF	-55 to 125
	GR443	4.5X3.2 <1812>	2k	1800pF – 4700pF	-55 to 125
	GR455	5.7X5.0 <2220>	2k	0.01μF	-55 to 125

Only for Camera Flash Units

GR7

TC Code	Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F) (0.1p, 1p, 10p, 100p, 1000p, 0.01μ, 0.1μ, 1μ, 10μ, 100μ, 1000μ)	Operating Temperature Range (°C)
X7T	**GR721**	2.0X1.25 <0805>	350	0.01μF – 0.027μF	-55 to 125
	GR731	3.2X1.6 <1206>	350	0.01μF – 0.047μF	-55 to 125

Safety Standard Certified

The Electrical Appliance and Material Safety Law of Japan

GA2

TC Code	Series	LXW (mm) <Size Code (inch)>	Rated Voltage (V)	Capacitance Range (F) (0.1p, 1p, 10p, 100p, 1000p, 0.01μ, 0.1μ, 1μ, 10μ, 100μ, 1000μ)	Operating Temperature Range (°C)
X7R	**GA242**	4.5X2.0 <1808>	AC250 (r.m.s.)	470pF – 1000pF	-55 to 125
	GA243	4.5X3.2 <1812>	AC250 (r.m.s.)	2200pF – 0.047μF	-55 to 125
	GA255	5.7X5.0 <2220>	AC250 (r.m.s.)	0.1μF	-55 to 125

Type GC (UL, IEC60384-14 X1/Y2 Class)

GA3

TC Code	Series	LXW (mm) <Size Code (inch)>	Rated Voltage (V)	Capacitance Range (F) (0.1p, 1p, 10p, 100p, 1000p, 0.01μ, 0.1μ, 1μ, 10μ, 100μ, 1000μ)	Operating Temperature Range (°C)
X7R	**GA355**	5.7X5.0 <2220>	AC250 (r.m.s.)	100pF – 330pF	-55 to 125

Continued on the following page.

For more details on each series, please refer to our website.
Product Search ⇒ http://www.murata.com/products/capacitor/

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

GA3

TC Code	Series	LXW (mm) <Size Code (inch)>	Rated Voltage (V)	Capacitance Range (F)	Operating Temperature Range (°C)
SL/X7R	**GA342**	4.5X2.0 <1808>	AC250 (r.m.s.)	10pF – 1000pF	-55 to 125
X7R	**GA352**	5.7X2.8 <2211>	AC250 (r.m.s.)	100pF – 1500pF	-55 to 125
	GA355	5.7X5.0 <2220>	AC250 (r.m.s.)	1800pF – 4700pF	-55 to 125

Type GD (IEC60384-14 Y3 Class)

GA3

TC Code	Series	LXW (mm) <Size Code (inch)>	Rated Voltage (V)	Capacitance Range (F)	Operating Temperature Range (°C)
SL/X7R	**GA342**	4.5X2.0 <1808>	AC250 (r.m.s.)	10pF – 1500pF	-55 to 125
X7R	**GA343**	4.5X3.2 <1812>	AC250 (r.m.s.)	1800pF – 4700pF	-55 to 125

Type GB (UL, IEC60384-14 X2 Class)

GA3

TC Code	Series	LXW (mm) <Size Code (inch)>	Rated Voltage (V)	Capacitance Range (F)	Operating Temperature Range (°C)
X7R	**GA355**	5.7X5.0 <2220>	AC250 (r.m.s.)	0.01μF – 0.056μF	-55 to 125

Metal Terminal Type

KRM

TC Code	Series	LXW (mm)	Rated Voltage (Vdc)	Capacitance Range (F)	Operating Temperature Range (°C)
X7R	**KRM55**	6.1X5.3	100	4.7μF – 15μF	-55 to 125
			63	10μF – 22μF	-55 to 125
			50	10μF – 22μF	-55 to 125
			25	22μF – 47μF	-55 to 125

For more details on each series, please refer to our website.
Product Search ⇒ http://www.murata.com/products/capacitor/

Chip Monolithic Ceramic Capacitors For Automotive

Powertrain / Safety (Temperature Compensating Type)

GCM

TC Code	Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F) (0.1p 1p 10p 100p 1000p 0.01μ 0.1μ 1μ 10μ 100μ 1000μ)	Operating Temperature Range (°C)
C0G	GCM03	0.6X0.3 <0201>	25	1.0pF – 100pF	-55 to 125
	GCM15	1.0X0.5 <0402>	50	1.0pF – 470pF	-55 to 125
	GCM18	1.6X0.8 <0603>	100	1.0pF – 1500pF	-55 to 125
			50	1.0pF – 3900pF	-55 to 125
	GCM21	2.0X1.25 <0805>	100	100pF – 3300pF	-55 to 125
			50	560pF – 0.022μF	-55 to 125
	GCM31	3.2X1.6 <1206>	100	1800pF – 0.01μF	-55 to 125
			50	4700pF – 0.056μF	-55 to 125
U2J	GCM21	2.0X1.25 <0805>	250	100pF – 5600pF	-55 to 125
	GCM31	3.2X1.6 <1206>	1k	10pF – 1000pF	-55 to 125
			630	10pF – 4700pF	-55 to 125
			250	2700pF – 0.01μF	-55 to 125
	GCM32	3.2X2.5 <1210>	1k	1200pF – 2200pF	-55 to 125
			630	1200pF – 0.01μF	-55 to 125
	GCM43	4.5X3.2 <1812>	1k	2700pF – 4700pF	-55 to 125
			630	0.012μF – 0.022μF	-55 to 125
	GCM55	5.7X5.0 <2220>	1k	5600pF – 0.01μF	-55 to 125
			630	0.027μF – 0.047μF	-55 to 125

Powertrain / Safety (High Dielectric Constant Type)

GCM

TC Code	Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F) (0.1p 1p 10p 100p 1000p 0.01μ 0.1μ 1μ 10μ 100μ 1000μ)	Operating Temperature Range (°C)
X7R/X7S	GCM03	0.6X0.3 <0201>	25	100pF – 1500pF	-55 to 125
			16	2200pF – 3300pF	-55 to 125
			10	4700pF – 0.01μF	-55 to 125
	GCM15	1.0X0.5 <0402>	100	220pF – 4700pF	-55 to 125
			50	220pF – 0.022μF	-55 to 125
			25	0.01μF – 0.047μF	-55 to 125
			16	0.033μF – 0.10μF	-55 to 125
	GCM18	1.6X0.8 <0603>	100	1000pF – 0.10μF	-55 to 125
			50	1000pF – 0.22μF	-55 to 125
			25	0.033μF – 1.0μF	-55 to 125
			16	0.10μF – 1.0μF	-55 to 125
			6.3	2.2μF	-55 to 125
	GCM21	2.0X1.25 <0805>	250	1000pF – 0.01μF	-55 to 125
			100	6800pF – 0.10μF	-55 to 125
			50	0.033μF – 0.47μF	-55 to 125
			35	0.68μF – 1.0μF	-55 to 125
			25	0.15μF – 2.2μF	-55 to 125

Continued on the following page.

For more details on each series, please refer to our website.
Product Search ⇒ http://www.murata.com/products/capacitor/

TC Code	Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)	Operating Temperature Range (°C)
X7R/X7S	**GCM21**	2.0X1.25 <0805>	16	0.68μF – 4.7μF	-55 to 125
			10	2.2μF – 4.7μF	-55 to 125
			6.3	10μF	-55 to 125
	GCM31	3.2X1.6 <1206>	630	1000pF – 4700pF	-55 to 125
			250	0.015μF – 0.047μF	-55 to 125
			100	0.10μF – 0.22μF	-55 to 125
			50	0.33μF – 2.2μF	-55 to 125
			25	2.2μF – 4.7μF	-55 to 125
			16	4.7μF – 10μF	-55 to 125
			10	10μF	-55 to 125
			6.3	22μF	-55 to 125
	GCM32	3.2X2.5 <1210>	630	6800pF – 0.022μF	-55 to 125
			250	0.068μF – 0.1μF	-55 to 125
			100	2.2μF	-55 to 125
			50	1.0μF – 4.7μF	-55 to 125
			25	4.7μF – 10μF	-55 to 125
			16	10μF – 22μF	-55 to 125
			10	22μF	-55 to 125
			6.3	47μF	-55 to 125
	GCM43	4.5X3.2 <1812>	630	0.033μF – 0.047μF	-55 to 125
			250	0.15μF – 0.22μF	-55 to 125
	GCM55	5.7X5.0 <2220>	630	0.068μF – 0.1μF	-55 to 125
			250	0.33μF – 0.47μF	-55 to 125

GCJ

TC Code	Series	LXW (mm) <Size Code (inch)>	Rated Voltage (Vdc)	Capacitance Range (F)	Operating Temperature Range (°C)
R/X7R	**GCJ21**	2.0X1.25 <0805>	250	1000pF – 0.022μF	-55 to 125
	GCJ31	3.2X1.6 <1206>	1k	1000pF – 4700pF	-55 to 125
			630	1000pF – 0.022μF	-55 to 125
			250	0.015μF – 0.1μF	-55 to 125
	GCJ32	3.2X2.5 <1210>	1k	6800pF – 0.022μF	-55 to 125
			630	6800pF – 0.047μF	-55 to 125
			250	0.068μF – 0.22μF	-55 to 125
	GCJ43	4.5X3.2 <1812>	1k	0.033μF – 0.47μF	-55 to 125
			630	0.033μF – 0.1μF	-55 to 125
			250	0.15μF – 0.47μF	-55 to 125
	GCJ55	5.7X5.0 <2220>	1k	0.068μF – 0.1μF	-55 to 125
			630	0.068μF – 0.22μF	-55 to 125
			250	0.33μF – 1.0μF	-55 to 125

For more details on each series, please refer to our website.
Product Search ⇒ http://www.murata.com/products/capacitor/

Metal Terminals Type

KCM

TC Code	Series	LXW (mm)	Rated Voltage (Vdc)	Capacitance Range (F) (0.1p, 1p, 10p, 100p, 1000p, 0.01μ, 0.1μ, 1μ, 10μ, 100μ, 1000μ)	Operating Temperature Range (°C)
X7R	**KCM55**	6.1X5.3	100	4.7μF – 15μF	-55 to 125
			63	10μF – 22μF	-55 to 125
			50	10μF – 22μF	-55 to 125
			35	17μF – 33μF	-55 to 125
			25	22μF – 47μF	-55 to 125

Lead Type Ceramic Capacitors For General Electronic Devices

Radial Lead Type (High Dielectric Constant Type)

RPE RDE RDE RDE

TC Code	Series	LXW (mm)	Rated Voltage (Vdc)	Capacitance Range (F) (0.1p, 1p, 10p, 100p, 1000p, 0.01μ, 0.1μ, 1μ, 10μ, 100μ, 1000μ)	Operating Temperature Range (°C)
F	**RPEF1**	5.0X3.5*1	50	1000pF – 0.47μF	-25 to 85
Y5V	**RPEF5**	5.0X3.5*1	50	1000pF – 0.47μF	-30 to 85
X7R	**RDER7**	4.0X3.5*1	100	1000pF – 0.022μF	-55 to 125
			50	220pF – 0.10μF	-55 to 125
			25	0.10μF	-55 to 125
		4.5X3.5*1	100	0.033μF – 0.47μF	-55 to 125
			50	0.15μF – 0.47μF	-55 to 125
		5.0X3.5	1k	470pF – 4700pF	-55 to 125
			630	1000pF – 0.015μF	-55 to 125
			250	1000pF – 0.047μF	-55 to 125
		5.0X4.5	1k	6800pF – 0.022μF	-55 to 125
			630	0.022μF – 0.047μF	-55 to 125
			250	0.068μF – 0.1μF	-55 to 125
		5.5X4.0	100	0.68μF – 1.0μF	-55 to 125
			50	0.68μF – 2.2μF	-55 to 125
		5.5X5.0	50	3.3μF	-55 to 125
		7.5X5.5	1k	0.033μF – 0.047μF	-55 to 125
			630	0.068μF – 0.1μF	-55 to 125
			250	0.15μF – 0.22μF	-55 to 125
		7.5X7.5	250	0.33μF – 0.47μF	-55 to 125
		7.5X8.0	1k	0.068μF – 0.1μF	-55 to 125
			630	0.15μF – 0.22μF	-55 to 125
		7.7X12.5	250	0.68μF – 1.0μF	-55 to 125
		7.7X13.0	1k	0.22μF	-55 to 125
			630	0.47μF	-55 to 125

*1 Some parts will be different depending on capacitance and lead form.

Continued on the following page.

For more details on each series, please refer to our website.
Product Search ⇒ http://www.murata.com/products/capacitor/

TC Code	Series	LXW (mm)	Rated Voltage (Vdc)	Capacitance Range (F) (0.1p, 1p, 10p, 100p, 1000p, 0.01μ, 0.1μ, 1μ, 10μ, 100μ, 1000μ)	Operating Temperature Range (°C)
X7S	**RDEC7**	4.0X3.5*1	25	0.22μF – 1.0μF	-55 to 125
		4.5X3.5*1	25	2.2μF	-55 to 125
		5.5X4.0	50	4.7μF	-55 to 125
			25	4.7μF – 10μF	-55 to 125
		5.5X5.0	100	1.5μF – 2.2μF	-55 to 125
			25	22μF	-55 to 125
		5.5X7.5	100	4.7μF	-55 to 125
			25	47μF	-55 to 125
X7T	**RDED7**	5.0X4.0	630	0.01μF – 0.015μF	-55 to 125
			450	0.01μF – 0.047μF	-55 to 125
			250	0.033μF – 0.068μF	-55 to 125
		5.0X5.0	630	0.022μF – 0.047μF	-55 to 125
			450	0.068μF – 0.1μF	-55 to 125
			250	0.1μF – 0.15μF	-55 to 125
		7.5X5.5	630	0.068μF	-55 to 125
			450	0.15μF	-55 to 125
			250	0.22μF – 0.33μF	-55 to 125
		7.5X7.5	450	0.22μF – 0.56μF	-55 to 125
			250	0.47μF – 1.0μF	-55 to 125
		7.5X8.0	630	0.1μF – 0.27μF	-55 to 125
		7.7X12.5	250	2.2μF	-55 to 125
		7.7X13.0	630	0.47μF – 0.56μF	-55 to 125
			450	1.0μF – 1.2μF	-55 to 125
F	**RDEF1**	4.0X3.5*1	50	0.01μF – 0.1μF	-25 to 85
Y5V	**RDEF5**	4.0X3.5*1	50	0.01μF – 0.1μF	-30 to 85

*1 Some parts will be different depending on capacitance and lead form.

Radial Lead Type (Temperature Compensating Type)

RDE

TC Code	Series	LXW (mm)	Rated Voltage (Vdc)	Capacitance Range (F) (0.1p, 1p, 10p, 100p, 1000p, 0.01μ, 0.1μ, 1μ, 10μ, 100μ, 1000μ)	Operating Temperature Range (°C)
C0G	**RDE5C**	4.0X3.5*1	100	10pF – 1000pF	-55 to 125
			50	10pF – 1000pF	-55 to 125

*1 Some parts will be different depending on capacitance and lead form.

Disc Type (Medium High Voltage)

DES

TC Code	Series	D (mm)	Rated Voltage (Vdc)	Capacitance Range (F) (0.1p, 1p, 10p, 100p, 1000p, 0.01μ, 0.1μ, 1μ, 10μ, 100μ, 1000μ)	Operating Temperature Range (°C)
D	**DESD3**	6 to 17	1k	100pF – 4700pF	-25 to 125
		6 to 14	500	100pF – 4700pF	-25 to 125

Continued on the following page.

For more details on each series, please refer to our website.
Product Search ⇒ http://www.murata.com/products/capacitor/

DEH

TC Code	Series	D (mm)	Rated Voltage (Vdc)	Capacitance Range (F) (0.1p 1p 10p 100p 1000p 0.01μ 0.1μ 1μ 10μ 100μ 1000μ)	Operating Temperature Range (°C)
R	DEHR3	7 to 19	3.15k	150pF – 2700pF	-25 to 125
		7 to 21	2k	220pF – 4700pF	-25 to 125
		7 to 17	1k	220pF – 4700pF	-25 to 125
C	DEHC3	6 to 14	500	330pF – 4700pF	-25 to 125

DEA

TC Code	Series	D (mm)	Rated Voltage (Vdc)	Capacitance Range (F) (0.1p 1p 10p 100p 1000p 0.01μ 0.1μ 1μ 10μ 100μ 1000μ)	Operating Temperature Range (°C)
SL	DEA1X	5 to 16	3.15k	10pF – 390pF	-25 to 125
		4.5 to 15	2k	10pF – 560pF	-25 to 125
		4.5 to 12	1k	10pF – 560pF	-25 to 125

DEB

TC Code	Series	D (mm)	Rated Voltage (Vdc)	Capacitance Range (F) (0.1p 1p 10p 100p 1000p 0.01μ 0.1μ 1μ 10μ 100μ 1000μ)	Operating Temperature Range (°C)
B	DEBB3	5 to 15	3.15k	100pF – 3300pF	-25 to 85
		4.5 to 15	2k	100pF – 4700pF	-25 to 85
		4.5 to 15	1k	100pF – 6800pF	-25 to 85
E	DEBE3	7 to 13	3.15k	1000pF – 4700pF	-25 to 85
		6 to 16	2k	1000pF – 0.01μF	-25 to 85
		5 to 13	1k	1000pF – 0.01μF	-25 to 85
F	DEBF3	5 to 12	2k	1000pF – 0.01μF	-25 to 85
		6 to 10	1k	2200pF – 0.01μF	-25 to 85

DEC

TC Code	Series	D (mm)	Rated Voltage (Vdc)	Capacitance Range (F) (0.1p 1p 10p 100p 1000p 0.01μ 0.1μ 1μ 10μ 100μ 1000μ)	Operating Temperature Range (°C)
SL	DEC1X	7 to 15	6.3k	10pF – 150pF	-25 to 85
B	DECB3	9 to 13	6.3k	100pF – 1000pF	-25 to 85
E	DECE3	11 to 15	6.3k	1000pF – 2200pF	-25 to 85

Disc Type (High Voltage) Only for LCD Backlight Inverter Circuit

DEF

TC Code	Series	D (mm)	Rated Voltage (Vdc)	Capacitance Range (F) (0.1p 1p 10p 100p 1000p 0.01μ 0.1μ 1μ 10μ 100μ 1000μ)	Operating Temperature Range (°C)
CH	DEF2C	7 to 8	6.3k(p-p)	2pF – 10pF	-25 to 105
SL	DEF1X	7 to 9	6.3k(p-p)	10pF – 47pF	-25 to 105

For more details on each series, please refer to our website.
Product Search ⇒ http://www.murata.com/products/capacitor/

Disc Type (Safety Standard Certified Type)

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

DE2

TC Code	Series	D (mm)	Rated Voltage (V)	Capacitance Range (F) (0.1p 1p 10p 100p 1000p 0.01μ 0.1μ 1μ 10μ 100μ 1000μ)	Operating Temperature Range (°C)
SL	**DE21X**	8	AC250(r.m.s.)	10pF–68pF	-25 to 125
B	**DE2B3**	7 to 8	AC250(r.m.s.)	100pF–680pF	-25 to 125
E	**DE2E3**	7 to 10	AC250(r.m.s.)	1000pF–4700pF	-25 to 125
F	**DE2F3**	14	AC250(r.m.s.)	0.01μF	-25 to 125

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

DE2

TC Code	Series	D (mm)	Rated Voltage (V)	Capacitance Range (F) (0.1p 1p 10p 100p 1000p 0.01μ 0.1μ 1μ 10μ 100μ 1000μ)	Operating Temperature Range (°C)
B	**DE2B3**	8 to 9	AC250(r.m.s.)	100pF–680pF	-25 to 125
E	**DE2E3**	8 to 13	AC250(r.m.s.)	1000pF–4700pF	-25 to 125
F	**DE2F3**	16	AC250(r.m.s.)	0.01μF	-25 to 125

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

DE1

TC Code	Series	D (mm)	Rated Voltage (V)	Capacitance Range (F) (0.1p 1p 10p 100p 1000p 0.01μ 0.1μ 1μ 10μ 100μ 1000μ)	Operating Temperature Range (°C)
SL	**DE11X**	9	AC250(r.m.s.)	10pF–68pF	-25 to 125
B	**DE1B3**	9 to 10	AC250(r.m.s.)	100pF–680pF	-25 to 125
E	**DE1E3**	8 to 15	AC250(r.m.s.)	1000pF–4700pF	-25 to 125

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

DE1

TC Code	Series	D (mm)	Rated Voltage (V)	Capacitance Range (F) (0.1p 1p 10p 100p 1000p 0.01μ 0.1μ 1μ 10μ 100μ 1000μ)	Operating Temperature Range (°C)
B	**DE1B3**	8 to 9	AC250(r.m.s.)	100pF–680pF	-25 to 125
E	**DE1E3**	7 to 12	AC250(r.m.s.)	1000pF–4700pF	-25 to 125

The Electrical Appliance and Material Safety Law of Japan

DEJ

TC Code	Series	D (mm)	Rated Voltage (V)	Capacitance Range (F) (0.1p 1p 10p 100p 1000p 0.01μ 0.1μ 1μ 10μ 100μ 1000μ)	Operating Temperature Range (°C)
E	**DEJE3**	7 to 11	AC250(r.m.s.)	1000pF–4700pF	-25 to 85
F	**DEJF3**	8 to 11	AC250(r.m.s.)	4700pF–0.01μF	-25 to 85

For more details on each series, please refer to our website.
Product Search ⇒ http://www.murata.com/products/capacitor/

Lead Type Ceramic Capacitors For Automotive

Radial Lead Type (Temperature Compensating Type)

RPE RH

TC Code	Series	LXW (mm)	Rated Voltage (Vdc)	Capacitance Range (F) (0.1p 1p 10p 100p 1000p 0.01μ 0.1μ 1μ 10μ 100μ 1000μ)	Operating Temperature Range (°C)
CΔ/C0G	**RPE□C**	5.0X3.5*1	100	1pF – 1500pF	-55 to 125
			50	1pF – 0.01μF	-55 to 125
X8G	**RHE5G**	4.0X3.5	100	100pF – 1000pF	-55 to 150
			50	100pF – 1500pF	-55 to 150

*1 Some parts will be different depending on capacitance and lead form.

Radial Lead Type (High Dielectric Constant Type)

RPE RH RH

TC Code	Series	LXW (mm)	Rated Voltage (Vdc)	Capacitance Range (F) (0.1p 1p 10p 100p 1000p 0.01μ 0.1μ 1μ 10μ 100μ 1000μ)	Operating Temperature Range (°C)
R/X7R	**RPER3/R7**	5.0X3.5*1	100	220pF – 0.047μF	-55 to 125
			50	220pF – 2.2μF	-55 to 125
			25	0.47μF – 1.0μF	-55 to 125
X8L	**RHEL8**	4.0X3.5	100	1000pF – 0.022μF	-55 to 150
			50	1000pF – 0.10μF	-55 to 150
		5.7X4.5	100	0.033μF – 0.10μF	-55 to 150
			50	0.15μF – 1.5μF	-55 to 150
		6.0X5.5	50	2.2μF – 4.7μF	-55 to 150
		6.0X8.0	50	10μF	-55 to 150

*1 Some parts will be different depending on capacitance and lead form.

Safety Standard Certified for Automotive

Type KJ -IEC60384-14 X1/Y2 Class

DE6

TC Code	Series	D (mm)	Rated Voltage (V)	Capacitance Range (F) (0.1p 1p 10p 100p 1000p 0.01μ 0.1μ 1μ 10μ 100μ 1000μ)	Operating Temperature Range (°C)
B	**DE6B3**	8 to 9	AC250(r.m.s.)	100pF – 680pF	-40 to 125
E	**DE6E3**	7 to 12	AC250(r.m.s.)	1000pF – 4700pF	-40 to 125

For more details on each series, please refer to our website.
Product Search ⇒ http://www.murata.com/products/capacitor/

High Voltage Ceramic Capacitors

DHS

(in mm)

TC Code	Series	LXW (mm)	Rated Voltage (Vdc)	Capacitance Range (F) (0.1p 1p 10p 100p 1000p 0.01μ 0.1μ 1μ 10μ 100μ 1000μ)	Operating Temperature Range (°C)
N4700	**DHS4E**	–	40k	140pF – 2000pF	-20 to 85
			30k	190pF – 2700pF	-20 to 85
			20k	280pF – 4000pF	-20 to 85
			15k	370pF – 5300pF	-20 to 85
			10k	560pF – 8000pF	-20 to 85
Z5V	**DHSF4**	–	40k	340pF – 2700pF	-20 to 85
			30k	460pF – 3600pF	-20 to 85
			20k	600pF – 4800pF	-20 to 85

Polymer Aluminum Electrolytic Capacitors

ECAS

TC Code	Series	LXW (mm)	Rated Voltage (Vdc)	Capacitance Range (F) (0.1p 1p 10p 100p 1000p 0.01μ 0.1μ 1μ 10μ 100μ 1000μ)	Operating Temperature Range (°C)
–	**ECAS**	7.3X4.3	16	6.8μF – 22μF	-40 to 105
			12.5	10μF – 100μF	-40 to 105
			10	10μF – 150μF	-40 to 105
			6.3	10μF – 220μF	-40 to 105
			4	68μF – 330μF	-40 to 105
			2	100μF – 470μF	-40 to 105

For more details on each series, please refer to our website.
Product Search ⇒ http://www.murata.com/products/capacitor/

Trimmer Capacitors

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

Mounting Method	Soldering Method	Series	Max. Height	Size (WXL)	Rated Voltage	Operating Temperature Range	Remarks
Surface Mounting	Reflow Soldering Methods	TZR1	0.9mm max.	1.5X1.7mm	25V	-25 to 85°C	
		TZS2	1.0mm max.	2.2X2.7mm	25V	-25 to 85°C	
		TZY2	1.25mm max.	2.5X3.2mm	25V	-25 to 85°C	
		TZV2	1.45mm max.	2.3X3.2mm	25V	-25 to 85°C	
		TZC3	1.7mm max.	3.2X4.5mm	100V	-25 to 85°C	
		TZW4	2.6mm max.	4.2X5.2mm	250V	-55 to 125°C	for High Frequency Power
		TZB4_A	3.2mm max.	4.0X4.5mm	100V/50V	-25 to 85°C	
		TZB4_B	3.2mm max.	4.0X4.5mm	100V/50V	-25 to 85°C	
		TZB4_E	3.2mm max.	4.0X4.5mm	100V/50V	-25 to 85°C	
	Flow Soldering Methods	TZB4_A	3.2mm max.	4.0X4.5mm	100V/50V	-25 to 85°C	with Cover Film
		TZB4_B	3.2mm max.	4.0X4.5mm	100V/50V	-25 to 85°C	with Cover Film
		TZB4_E	3.2mm max.	4.0X4.5mm	100V/50V	-25 to 85°C	with Cover Film
PCB Insertion	Manual Insertion	TZ03_F	5.3mm max.	6.0X6.0mm	100V/50V	-25 to 85°C	
		TZ03_N	5.3mm max.	6.0X6.0mm	100V/50V	-25 to 85°C	

For more details on each series, please refer to our website.
Product Search ⇒ http://www.murata.com/products/capacitor/
Selection Guide of Trimmer Capacitors ⇒ http://www.murata.com/products/capacitor/kt_search/selection.html

Noise Suppression Products/ EMI Suppression Filters

Broad lineup of Noise Suppression Products and EMI Suppression Filters

Summary

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

Lineup

- ●EMI (chip and lead type) ●AC Line Filters
- ●Noise Suppression Products for Automotive
- ●Ferrite Cores ●ESD Protection Devices

Selection Guide

The Selection Guide on our website is useful for searching the applications and the product lineup.

http://www.murata.com/products/emc/selection_guide/

Detailed Catalogs

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

• SMD/BLOCK Type EMI Suppression Filters EMIFIL®	Cat. No. C31E
• On-Board Type (DC) EMI Suppression Filters (EMIFIL®) for Automotive	Cat. No. C50E
• EMI Suppression Filters (Lead Type EMIFIL®)	Cat. No. C30E
• EMI Suppression Filters (EMIFIL®) for AC Power Lines	Cat. No. C09E
• Noise Suppression by EMIFIL® Digital Equipment Application Manual	Cat. No. C33E
• Noise Suppression by EMIFIL® Application Guide Application Manual	Cat. No. C35E
• Application Manual for Power Supply Noise Suppression and Decoupling for Digital ICs	Cat. No. C39E
• Ferrite Core for EMI Suppression Microwave Absorber	Cat. No. O63E

http://www.murata.com/products/emc/catalog/

Noise Suppression Filters (Chip Ferrite Bead)

			Series	Size Code Inch (mm)	Max. Rated Current (mA)	Impedance (Ω) at 100MHz (10 / 100 / 1000)	Effective Frequency Range (10kHz / 100kHz / 1MHz / 10MHz / 100MHz / 1GHz / 10GHz)
For General Band Noise	Universal Type [Power Lines / Signal Lines]		BLM03AX	0201 (0603)	1000	10 80 120 240 600 1000	
			BLM15AX	0402 (1005)	1740	10 30 70 120 220 600 1000	
	Signal Lines Type	For General Signal Lines	BLM03AG	0201 (0603)	-	10 80 70 120 240 600 1000	
			BLM15AG	0402 (1005)	-	10 70 120 220 600 1000	
			BLM18A	0603 (1608)	-	120 150 220 330 470 600 1000	
			BLM21A	0805 (2012)	-	120 150 220 330 470 600 1000	
			BLM18T	0603 (1608)	-	120 220 600 1000	
			BLA2AA (4 circuits array)	0804 (2010)	-	120 220 600 1000	
			BLA31A (4 circuits array)	1206 (3216)	-	30 60 120 220 600 1000	
		For High Speed Signal Lines	BLM03B	0201 (0603)	-	10 22 33 47 56 75 80 120 240 470 600	
			BLM15B	0402 (1005)	-	5 10 22 33 47 75 120 240 220 470 600 1000 1800	
			BLM18B	0603 (1608)	-	5 10 22 47 60 75 120 140 150 220 330 420 470 600 1000 1500 1800 2200 2500	
			BLM21B	0805 (2012)	-	5 60 75 120 150 200 220 330 420 470 600 750 1000 1500 1800 2200 2250 2700	
			BLA2AB (4 circuits array)	0804 (2010)	-	10 22 47 75 120 220 470 600 1000	
			BLA31B (4 circuits array)	1206 (3216)	-	120 220 470 600 1000	
		For Digital Interface Lines	BLM18R	0603 (1608)	-	120 220 470 600 1000	
			BLM21R	0805 (2012)	-	120 220 470 600 1000	
	Power Lines Type		BLM03P*	0201 (0603)	1800	22 (0.9A/1.8A) 33 (0.75A/1.5A) 80 (1.0A)	
			BLM15P*	0402 (1005)	2200	10 (1A) 30 (2.2A) 60 (1.7A) 80 (1.5A) 120 (1.3A/1.8A)	
			BLM18P*	0603 (1608)	3000	30 (1A) 33 (3A) 60 (0.5A) 120 (2A) 180 (1.5A) 220 (1.4A) 330 (1.2A) 470 (1A)	
			BLM21P*	0805 (2012)	6000	22 (6A) 30 (4A) 60 (3.5A) 120 (3A) 220 (2A) 330 (1.5A)	
			BLM31P*	1206 (3216)	6000	33 (6A) 50 (3.5A) 120 (3.5A) 390 (2A) 600 (1.5A)	
			BLM41P*	1806 (4516)	6000	60 (6A) 75 (3.5A) 180 (3.5A) 470 (2A) 1000 (1.5A)	
			BLM18K* (Low DC Resistance Type)	0603 (1608)	6000	26 (6A) 30 (5A) 100 (3A) 70 (3.5A) 120 (3A) 220 (2.2A) 330 (1.7A) 470 (1.5A) 600 (1.3A)	
			BLM18S* (Low DC Resistance Type)	0603 (1608)	6000	26 (6A) 70 (4A) 120 (3A) 220 (2.5A) 330 (1.5A)	
For GHz Band Noise	Universal Type [Power Lines / Signal Lines]		BLM15EG*	0402 (1005)	1500	120 (1.5A) 220 (0.7A)	
			BLM18EG*	0603 (1608)	2000	100 (2A) 120 (2A) 220 (2A/1A) 330 (0.5A) 390 (0.5A) 470 (0.5A) 600 (0.5A)	
	Signal Lines Type		BLM03HG	0201 (0603)	-	600 1000	
			BLM03HD	0201 (0603)	-	330 470 600 1000	
			BLM15HG	0402 (1005)	-	600 1000	
			BLM15HD	0402 (1005)	-	600 1000 1800	
			BLM15HB	0402 (1005)	-	120 220	
			BLM18HG	0603 (1608)	-	470 600 1000	
			BLM18HE*	0603 (1608)	-	600 (0.8A) 1000 (0.6A) 1500 (0.5A)	
			BLM18HD	0603 (1608)	-	470 600 1000	
			BLM18HB	0603 (1608)	-	120 220 330	
			BLM18HK	0603 (1608)	-	330 470 600 1000	

Continued on the following page.

For more details on each series, please refer to our website.
Product Search ⇒ http://search.murata.co.jp/

Noise Suppression Products/EMI Suppression Filters

		Series	Size Code Inch (mm)	Max. Rated Current (mA)	Impedance (Ω) at 100MHz (10 / 100 / 1000)	Effective Frequency Range (10kHz 100kHz 1MHz 10MHz 100MHz 1GHz 10GHz)
For High-GHz Band Noise	Signal Lines Type	BLM15GG	0402 (1005)	-	220 470	
		BLM15GA	0402 (1005)	-	75	
		BLM18GG	0603 (1608)	-	470	

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

Noise Suppression Filters (Chip 3 Terminal Capacitor)

	Series	Size Code Inch (mm)	Max. Rated Current (mA)	Capacitance (F) (10p 100p 1000p 10000p 0.1μ 1μ 10μ)	Effective Frequency Range (10kHz 100kHz 1MHz 10MHz 100MHz 1GHz 10GHz)
Signal Lines Type	NFM18C	0603 (1608)	-	22 47 100 220 470 1000 2200 22000	
	NFM21C	0805 (2012)	-	22 47 100 220 470 1000 2200 22000	
	NFM3DC	1205 (3212)	-	22 47 100 220 470 1000 2200 22000	
	NFM41C	1806 (4516)	-	22 47 100 220 470 1000 2200 22000	
	NFA31C (4 circuits array)	1206 (3216)	-	22 47 100 220 470 1000 2200 22000	
Power Lines Type	NFM18P	0603 (1608)	4000	0.1 0.22 0.47 1.0 2.2	
	NFM21P	0805 (2012)	6000	0.1 0.22 0.47 1.0 2.2 4.7 10	
	NFM3DP*	1205 (3212)	2000	22000	
	NFM31P	1206 (3216)	6000	27	
	NFM31K*	1206 (3216)	10000	10000 (10A) 15000 (10A) 22000 (10A) 0.1 (6A)	
	NFM41P	1806 (4516)	6000	0.2 1.5	
	NFM55P	2220 (5750)	6000	1.5	
Universal Type [Power Lines / Signal Lines]	NFE31P	1206 (3216)	6000	22 47 100 220 470 1500 2200	
	NFE61P	2706 (6816)	2000	33 68 100 180 360 680 1000 4700	

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

Noise Suppression Filters (Chip LC/RC Filter)

	Series	Size Code Inch (mm)	Max. Rated Current (mA)	Cut-off Frequency (MHz) (10 / 100 / 500)	Effective Frequency Range (10kHz 100kHz 1MHz 10MHz 100MHz 1GHz 10GHz)
Signal Lines Type	NFL15ST	0402 (1005)	-	150 200 300 500	
	NFL18ST	0603 (1608)	-	50 70 100 200 300 500	
	NFL18SP	0603 (1608)	-	150 200 300 500	
	NFL21S	0805 (2012)	-	10 20 50 70 100 150 200 300 400 500	
	NFA18S (4 circuits array)	0603 (1608)	-	50 130 180 200 220 300 350 400 480	
	NFA21S (4 circuits array)	0805 (2012)	-	50 80 200 280 300 310 330	
	NFW31S	1206 (3216)	-	10 20 50 100 150 200 300 400 500	
	NFR21G	0805 (2012)	-		
	NFA31G (4 circuits array)	1206 (3216)	-		

For more details on each series, please refer to our website.
Product Search ⇒ http://search.murata.co.jp/

Noise Suppression Filters (Chip Common Mode Choke Coil)

		Series	Size Code Inch (mm)	Max. Rated Current (mA)	Common Mode Impedance (Ω) at 100MHz (100 / 500 / 1000)	Effective Frequency Range (10kHz, 100kHz, 1MHz, 10MHz, 100MHz, 1GHz, 10GHz)
Signal Lines Type	For Audio Lines	DLM11G	0504 (1210)	-	600	
		DLM2HG	1008 (2520)	-	600	
	For Ultra High Speed Signal Lines	DLP0NS	03025 (0806)	-	28 90 15 67 120	
		DLP11S	0504 (1210)	-	67 240 35 90 120 160 200 280 330	
		DLP11R	0504 (1210)	-	15 40 45	
		DLP11TB	0504 (1210)	-	80	
		DLP31S	1206 (3216)	-	120 220 550	
		DLP1ND (2 circuits array)	05025 (1506)	-	35 90 67	
		DLP2AD (2 circuits array)	0804 (2010)	-	35 90 240 67 120 160 200 280	
		DLP31D (2 circuits array)	1206 (3216)	-	90 130 200 320 440	
		DLW21S	0805 (2012)	-	90 67 120 180 260 370 500	
		DLW21H	0805 (2012)	-	90 67 120 180	
		DLW31S	1206 (3216)	-	90 160 260 600 1000 2200	
Universal Type [Power Lines / Signal Lines]		DLW5BS*/DLW5AH	2020 (5050)/2014 (5036)	5000	1500 4000 190 350 1000 3000	
		DLW5AT*	2014 (5036)	5000	110 (5A) 400 (2A) 850 (1.5A) 2700 (1A)	
		DLW5BT*	2020 (5050)	6000	1400 100 250 500 1000	
Large Current Type for Auto-motive Available		PLT10HH*	-	-	400 900 500 1000 (at 10MHz)	

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

Noise Suppression Filters (Block Type)

		Series	Height (mm)	Max. Rated Current (mA)	Rated Voltage (Vdc)	Rated Current (A)	Effective Frequency Range (10kHz, 100kHz, 1MHz, 10MHz, 100MHz, 1GHz, 10GHz)
Power Lines Type	SMD Type	BNX022*	3.1	-	50	10	
		BNX023*	3.1	-	100	15	
		BNX024*	3.5	-	50	15	
		BNX025*	3.5	-	25	15	
	Lead Type	BNX002	13 max.	-	50	10	
		BNX003	13 max.	-	150	10	
		BNX005	13.5 max.	-	50	15	
		BNX012*	8.0 max.	-	50	15	
		BNX016*	8.0 max.	-	25	15	

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

For more details on each series, please refer to our website.
Product Search ⇒ http://search.murata.co.jp/

Noise Suppression Products/EMI Suppression Filters

Noise Suppression Filters (Lead Type), Others

	Series								Effective Frequency Range (10kHz, 100kHz, 1MHz, 10MHz, 100MHz, 1GHz, 10GHz)
Lead Type EMIFIL®	BL01	BL02	BL03	DSN6	DSN9(H)	DSS6	DSS9(H)	DST9(H)	
EMIGUARD®	VFR3V	VFS6V	VFS9V						
AC Line Filters	PLA	PLH	PLY						
Common Mode Choke Coils	PLT09H								
Microwave Absorbers	EA10	EA20/21/30							
Ferrite Core	FSRH	FSRB	FSRC	FSMA	FSSA				

Please refer to p.74 for ESD Protection Devices.

For more details on each series, please refer to our website.
Product Search ⇒ http://search.murata.co.jp/

Inductors (Coils)

Broad lineup of Chip Inductors and Power Inductors

Summary

Using Murata's ceramic processing technology and unique material we offer a variety of inductor products that are suitable for the demands of many applications.

Lineup

●Inductors for Power Circuits (power inductors and choke inductors) ●Chip Inductors (for general purpose, RF circuits and automotive)

Selection Guide

The Selection Guide on our website is useful for searching the applications and the product lineup.

http://www.murata.com/products/inductor/selection_guide/

Detailed Catalogs

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

• Chip Inductors (Chip Coils) Cat. No. O05E

http://www.murata.com/products/inductor/catalog/

General Purpose Inductors for Power Circuits

	Series	Structure	Size Code Inch (mm)	Inductance Range (1n 10n 100n 1μ 10μ 100μ 1m 10m)	Rated Current (mA) (10 100 1000 10000)
Inductor for Power Lines (Power Inductor)	LQM18P_B0	Magnetically Shielded Multilayer	0603 (1608)	1.5μH	600
	LQM18P_C0		0603 (1608)	1.8μH	700
	LQM18P_F0		0603 (1608)	1.0μH	600
	LQM18P_FR		0603 (1608)	220nH – 4.7μH	620 – 1250
	LQM21P_C0		0805 (2012)	470nH – 2.2μH	600 – 1100
	LQM21P_G0		0805 (2012)	540nH – 3.3μH	800 – 1300
	LQM21P_GC		0805 (2012)	1.0μH – 2.2μH	800 – 900
	LQM21P_GR		0805 (2012)	1.0μH – 4.7μH	800 – 1300
	LQM2MP_G0		0806 (2016)	470nH – 4.7μH	1100 – 1600
	LQM2HP_J0		1008 (2520)	1.0μH – 3.3μH	1000 – 1500
	LQM2HP_JC		1008 (2520)	1.0μH – 2.2μH	1000 – 1500
	LQM2HP_G0		1008 (2520)	470nH – 4.7μH	1100 – 1800
	LQM2HP_GC		1008 (2520)	1.0μH – 4.7μH	800 – 1500
	LQM2HP_E0		1008 (2520)	560nH	1500
	LQM31P_00		1206 (3216)	470nH – 4.7μH	700 – 1400
	LQM31P_C0		1206 (3216)	470nH – 2.2μH	900 – 1300
	LQM32P_G0		1210 (3225)	1.0μH	1800
	LQH2MC_02	Wire Wound	0806 (2016)	1.0μH – 82μH	90 – 485
	LQH2MC_52		0806 (2016)	1.0μH – 22μH	130 – 595
	LQH2HP_G0		1008 (2520)	2.2μH – 100μH	130 – 1000
	LQH2HP_M0		1008 (2520)	2.2μH – 4.7μH	800 – 1250
	LQH3NP_M0		1212 (3030)	1.0μH – 100μH	200 – 1400
	LQH3NP_MR		1212 (3030)	1.0μH – 47μH	320 – 1600
	LQH3NP_J0		1212 (3030)	1.0μH – 47μH	200 – 1620
	LQH3NP_G0		1212 (3030)	1.0μH – 250μH	80 – 1525
	LQH32P_N0		1210 (3225)	470nH – 120μH	170 – 2550
	LQH32P_NC		1210 (3225)	470nH – 22μH	550 – 2900
	LQH43P_26		1812 (4532)	1.0μH – 220μH	220 – 3300
	LQH44P_P0		1515 (4040)	1.0μH – 22μH	790 – 2450
	LQH44P_J0		1515 (4040)	1.0μH – 47μH	300 – 1530
	LQH5BP_T0		2020 (5050)	470nH – 22μH	1050 – 4000
	LQH55P_R0		2220 (5852)	1.2μH – 22μH	670 – 2600
Chokes	LQM18F	Magnetically Shielded Multilayer	0603 (1608)	1.0μH – 10μH	50 – 150
	LQM21D		0805 (2012)	1.0μH – 47μH	7 – 60
	LQM21F		0805 (2012)	1.0μH – 47μH	7 – 220
	LQM31F		1206 (3216)	10μH	70
	LQW15C	Wire Wound	0402 (1005)	18nH – 200nH	390 – 1400
	LQW18C		0603 (1608)	4.9nH – 650nH	430 – 2600

Continued on the following page.

For more details on each series, please refer to our website.
Product Search ⇒ http://search.murata.co.jp/

Inductors (Coils)

Inductance Lineup
: E-24 or Higher
: E-12
: Other
*There are some items that do not match to E step.

		Series	Structure	Size Code Inch (mm)	Inductance Range (1n 10n 100n 1μ 10μ 100μ 1m 10m)	Rated Current (mA) (10 100 1000 10000)
Inductor for Power Lines (Power Inductor)	Chokes	LQH31C	Wire Wound	1206 (3216)	120nH–100μH	80–970
		LQH32C_23/_33		1210 (3225)	150nH–560μH	60–1450
		LQH32C_53		1210 (3225)	1.0μH–100μH	100–1000
		LQH43C_03		1812 (4532)	1.0μH–470μH	90–1080
		LQH43C_33		1812 (4532)	560nH–3.9μH	1600–2950
		LQH55D		2220 (5750)	120nH–10mH	50–6000
		LQH66S	Magnetically Shielded	2525 (6363)	270nH–10mH	50–6000
General Purpose Inductor		LQM18N	Magnetically Shielded Multilayer	0603 (1608)	47nH–2.2μH	15–50
		LQM21N		0805 (2012)	100nH–4.7μH	30–250
		LQH31M	Wire Wound (ferrite core)	1206 (3216)	150nH–100μH	45–250
		LQH32M		1210 (3225)	1.0μH–560μH	40–445
		LQH43M(N)		1812 (4532)	1.0μH–2.2mH	30–500

CAUTION: Use rosin-based flux, but not strong acidic flux (with chlorine content exceeding 0.2wt%) when soldering chip inductor (chip coil).
Do not use water-soluble flux.

RF Inductors

	Series	Structure	Size Code Inch (mm)	Inductance Range (1n 10n 100n 1μ 10μ 100μ 1m 10m)	Rated Current (mA) (10 100 1000 10000)
RF Inductor	LQG15H	Multilayer	0402 (1005)	1.0nH–270nH	110–300
	LQG18H		0603 (1608)	1.2nH–100nH	300–500
	LQP02T	Film	01005 (0402)	0.4nH to 18nH	140–320
	LQP03T_02		0201 (0603)	0.6nH to 120nH	40–850
	LQP15T		0402 (1005)	1.0nH–18nH	80–300
	LQP15M		0402 (1005)	1.0nH–33nH	60–400
	LQP18M		0603 (1608)	1.3nH–100nH	50–300
	LQW04A	Wire Wound (air core)	03015 (0804)	1.1nH–33nH	140–990
	LQW15A		0402 (1005)	1.3nH–120nH	110–1200
	LQW18A		0603 (1608)	2.2nH–470nH	75–1400
	LQW2BH		0805 (2015)	2.7nH–470nH	160–1900
	LQW2BA		0805 (2015)	2.8nH–820nH	180–800
	LQW2UA		1008 (2520)	12nH–4.7μH	260–1000
	LQW31H		1206 (3216)	8.8nH–100nH	230–750
	LQW21H	Wire Wound (ferrite core)	0805 (2012)	470nH–2.2μH	75–160
	LQH31H		1206 (3216)	54nH–880nH	180–920

CAUTION: Use rosin-based flux, but not strong acidic flux (with chlorine content exceeding 0.2wt%) when soldering chip inductor (chip coil).
Do not use water-soluble flux.

For more details on each series, please refer to our website.
Product Search ⇒ http://search.murata.co.jp/

Resistors

Full lineup for various applications

Summary

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

Lineup

- Trimmer Potentiometers
- High Voltage Resistors

Web Content

Introducing Trimmer Potentiometer content on our website.

http://www.murata.com/products/resistor/

Detailed Catalogs

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

• Trimmer Potentiometers Cat. No. R50E

http://www.murata.com/products/resistor/catalog/

Trimmer Potentiometers

Trimmer Potentiometers are used for trimming the resistance value of electronic equipment.
Murata offers a broad range of Trimmer Potentiometers using both carbon and cermet materials.

Mounting	Structure	Resistive Element Type	Adjustment Angle	Adjustment Turns	Size	Series	Remarks
Surface Mounting	Open Type	Carbon	Top Adjustment	1	2mm	PVZ2A	Low Profile (0.85mm max.)
					3mm	PVZ3A	Automatic Adjustment
						PVZ3G	Low Profile (1.25mm max.)
						PVZ3H	
			Rear Adjustment	1	2mm	PVZ2R	Low Profile with Smaller Footprint (0.9mm max.)
					3mm	PVZ3K	
		Cermet	Top Adjustment	1	2mm	PVA2A	Automatic Adjustment
	Sealed Type	Cermet	Top Adjustment	1	3mm	PVG3A	Automatic Adjustment with Rotational Stop
						PVG3G	with Rotational Stop
					4mm	PVM4	
				11	5mm	PVG5A	
			Side Adjustment	11	5mm	PVG5H	
PCB Insertion	Sealed Type	Cermet	Top Adjustment	1	6mm	PV32H	with Rotational Stop
				4	7mm	PV12P	
				12	6mm	PV37W	
				25	10mm	PV36W	
			Side Adjustment	1	6mm	PV32N	with Rotational Stop
				4	7mm	PV12T	
				12	6mm	PV37X	
				25	10mm	PV36X	

For more details on each series, please refer to our website.
Product Search ⇒ http://search.murata.co.jp/

High Voltage Resistors

High Voltage Resistors are used for home and office equipment such as printers, copies and air-conditioners. Murata offers the High Voltage Resistors "MHR Series".

MHR03 Series

MHR04 Series

MHR06 Series

(in mm)

Series	Resistance (min.) (MΩ)	Resistance (max.) (MΩ)	Maximum Operating Voltage (Single Use) (kV)	Maximum Operating Voltage (Molded Use) (kV)	Rated Power (W)
MHR03	1	500 to 1000	2 to 8	3 to 14	0.3 to 1.0
MHR04	1	1000	3.5 to 9	10 to 16	0.6 to 1.3
MHR06	1	1000	3.5 to 9	10 to 18	0.8 to 1.5

We have many products with various specifications.
For resistance value and ratio of B circuit, please contact us.

For more details on each series, please refer to our website.
Product Search ⇒ http://search.murata.co.jp/

Resonators

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 resonators that offer high oscillation frequency and remarkable oscillation tolerance.

Lineup

- Crystal Resonators
- Ceramic Resonators CERALOCK®

IC Part Number - Resonator Search

Search for Resonators by IC part number or search for IC part number by Resonator on our website.

http://search.murata.co.jp/Ceramy/ICsearchAction.do?sLang=en

Detailed Catalogs

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

• Ceramic Resonators (CERALOCK®)	Cat. No. P16E
• Ceramic Resonator (CERALOCK®) Application Manual	Cat. No. P17E
• Crystal Resonator	Cat. No. P79E

http://www.murata.com/products/resonator/catalog/

Crystal Resonators

Available in the applications to be necessary for high accuracy resonator.
Especially, the communication clocks such as S-ATA and USB2.0/3.0.

XRCGB

(in mm)

Series	Nominal Frequency (MHz)	Frequency Tolerance (25±3°C)	Equivalent Series Resistance (Ω)	Temperature Stability	Drive Level (μW)	Load Capacitance (pF)
XRCGB	24.0000 to 29.9999	±100ppm max.	150 max.	±50ppm max. (-30 to 85°C)	300 max.	6
	30.0000 to 48.0000	±100ppm max.	100 max.	±50ppm max. (-30 to 85°C)	300 max.	6

Ceramic Resonators CERALOCK®

Wide variety of product lineup for automotive and consumer use by SMD and lead package.

MHz Chip Type for Automotive (Tight Frequency Tolerance)

CSTCR_G15C

CSTCE_G15C

CSTCE_V13C

(in mm)

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

MHz Chip Type for Automotive (Standard Frequency Tolerance)

CSTCC_G_A

CSTCR_G_B

CSTCE_G_A

CSTCE_V_C

CSTCV_X_Q

CSACV_X_Q

(in mm)

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

For more details on each series, please refer to our website.
Product Search ⇒ http://search.murata.co.jp/

MHz Chip Type for Consumer Electronics (Tight Frequency Tolerance)

CSTCR_G15L

CSTCE_G15L

CSTCE_V13L

CSTCW_X11

(in mm)

Series	Frequency Range (MHz) (1 2 3 4 5 6 7 8 9 10 20 30 40 50 70 100)	Temperature Stability (%)	Temperature Range (°C)
CSTCR_G15L	4.00±0.1% – 7.99±0.1%	±0.08	0 to 70
CSTCE_G15L	8.00±0.1% – 13.99±0.1%	±0.08	0 to 70
CSTCE_V13L	14.00±0.1% – 20.00±0.1%	±0.08	0 to 70
CSTCW_X11	20.01±0.1% – 48.00±0.1%	±0.1	0 to 70

MHz Chip Type for Consumer Electronics (Standard Frequency Tolerance)

CSTCC_G

CSTCR_G

CSTCE_G

CSTCE_V

CSTCW_X

CSACW_X

CSTCG_V

(in mm)

Series	Frequency Range (MHz) (1 2 3 4 5 6 7 8 9 10 20 30 40 50 70 100)	Temperature Stability (%)	Temperature Range (°C)
CSTCC_G	2.00±0.5% – 3.99±0.5%	±0.3 (15pF) ±0.4 (47pF)	-20 to 80
CSTCR_G	4.00±0.5% – 7.99±0.5%	±0.2	-20 to 80
CSTCE_G	8.00±0.5% – 13.99±0.5%	±0.2	-20 to 80
CSTCE_V	14.00±0.5% – 20.00±0.5%	±0.3	-20 to 80
CSTCW_X	20.01±0.5% – 70.00±0.5%	±0.2	-20 to 80
CSACW_X (No built-in load capacitance)	20.01±0.5% – 70.00±0.5%	±0.2	-20 to 80
CSTCG_V	20.00±0.5% – 33.86±0.5%	±0.3	-20 to 80

MHz Lead Type for Consumer Electronics (Standard Frequency Tolerance)

CSTLS_G

CSTLS_X

(in mm)

Series	Frequency Range (MHz) (1 2 3 4 5 6 7 8 9 10 20 30 40 50 70 100)	Temperature Stability (%)	Temperature Range (°C)
CSTLS_G	3.40±0.5% – 10.00±0.5%	±0.2 (15pF) -0.4/+0.2 (47pF)	-20 to 80
CSTLS_X	16.00±0.5% – 70.00±0.5%	±0.2	-20 to 80

For more details on each series, please refer to our website.
Product Search ⇒ http://search.murata.co.jp/

Filters for Audio Visual Equipment

Signal extraction for visual and audio in electronic devices

Summary

Using Murata's ceramic processing technology and unique material, we offer components such as Ceramic Filters CERAFIL® and SAW Filters to enable the development of high-performance digital audio/visual systems and home PCs.

Lineup

●Ceramic Filters CERAFIL® (Filters, Traps and Discriminators) ●SAW Traps

Web Content

View the CERAFIL® Selection Guide on our website.

http://www.murata.com/products/av_filter/

Application Lineup of CERAFIL®

		Applications				
		Hi-Fi Audio	Portable Audio	Car Audio	TV / VCR	RKE / TPMS
Ceramic Filters	450kHz	●	●	●		●
	10.7MHz	●	●	●	●	●
	2.3 to 6.5MHz	●			●	
Ceramic Discriminators	450kHz					●
	10.7MHz	●	●	●		
Ceramic Traps	4.5 to 6.5MHz				●	

CERAFIL® Selection Guide

Detailed Catalogs

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

- CERAFIL® (Filters/Traps/Discriminators) for Audio/Visual Equipment Cat. No. P50E
- CERAMIC FILTER (CERAFIL®) Application Manual Cat. No. P11E

http://www.murata.com/products/av_filter/catalog/

Filters for Audio Visual Equipment

Ceramic Filters CERAFIL®

CERAFIL® 10.7MHz Chip Type

This series is suitable for FM radio and VICS/RKE/TPMS receiver use.
This series enables customers to design thinner and smaller circuits.

SFECF Series

SFECK / SFECV Series

(in mm)

Type	Series	3dB Bandwidth (kHz)						
		D	E	F	G	H	J	K
		350	330	280	230	180	150	110
Standard Type	SFECF10M7□	●	●	●	●	●	–	–
High-reliability Type	SFECK10M7□	–	–	–	–	–	●	●
Standard Type	SFECV10M7□	–	–	–	–	–	●	●
Standard Type	SFECV15M0□	–	●	–	–	–	–	–

□ is filled in with a letter denoting 3dB bandwidth.

CERAFIL® 10.7MHz Lead Type

This series is suitable for FM radio, car-audio or AM up-conversion use.

SFELF Series (Standard Type)

SFELF Series (Low Loss Type)

SFELF Series (Low Spurious Response Type)

SFVLF Series

SFKLF Series

SFELG Series

(in mm)

Type	Series	3dB Bandwidth (kHz)							
		F	G	H	J	K	L	M	N
		280	230	180	150	110	80	50	35
Standard Type	SFELF10M7□	●	●	●	–	●	–	–	–
Low Loss Type		●	●	●	●	–	–	–	–
Low Spurious Response Type		●	●	●	●	●	–	–	–
Narrow Bandwidth Type	SFVLF10M7□	–	–	–	–	–	●	●	–
Narrow Bandwidth Type	SFKLF10M7□	–	–	–	–	–	–	–	●
Low Profile Type	SFELG10M7□	●	●	●	●	●	–	–	–

□ is filled in with a letter denoting 3dB bandwidth.

For more details on each series, please refer to our website.
Product Search ⇒ http://search.murata.co.jp/

Filters for Audio Visual Equipment

CERAFIL® 2.3 to 6.5MHz Chip Type

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

SFSKA Series

SFSKB Series

(in mm)

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

CERAFIL® 450kHz

This series features high selectivity, high stability and adjustment-free operation, suitable for intermediate filters for AM radios.

SFPKA Series

SFPLA / CFULA Series

CFWLA Series

(in mm)

Type	Series	6dB Bandwidth (kHz) min.					
		D	E	F	G	H	J
		±10	±7.5	±6	±4.5	±3	±2
Chip Standard Type	**SFPKA450K□**	–	–	–	●	●	–
Lead Standard Type	**SFPLA450K□ / CFULA450K□**	●	●	●	●	●	●
Lead High-selectivity Type	**CFWLA450K□**	●	●	●	●	●	●

□ is filled in with a letter denoting 6dB bandwidth.

For more details on each series, please refer to our website.
Product Search ⇒ http://search.murata.co.jp/

Filters for Audio Visual Equipment

Ceramic Traps

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

TPSKA Series

(in mm)

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

Ceramic Discriminators

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

CDSCB Series

CDALF Series

(in mm)

Series	Center Frequency
CDSCB	10.700MHz±30kHz
CDALF	10.700MHz±30kHz

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

SAW Traps

Features: Wide pass band width, Highly selective attenuation band, High performance, Small size, Chip Size Package

SAEEA / SAEEL Series

SAEEB Series

(in mm)

SAW Filters and SAW Duplexers must be used only for the below 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.

For more details on each series, please refer to our website.
Product Search ⇒ http://search.murata.co.jp/

Filters for Communication Equipment

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

Summary

Using Murata's ceramic processing technology and unique material, we offer miniaturized filters with excellent properties for advanced communication equipment.

Lineup

- SAW Filters for Mobile Communications
- Dielectric Filters GIGAFIL®
- Chip Multilayer LC Filters
- Ceramic Filters CERAFIL®
- Ceramic Discriminators

Web Content

For more details on communication equipment, please refer to our website.

http://www.murata.com/products/comm_filter/

Detailed Catalogs

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

• Ceramic Filters (CERAFIL®)/Ceramic Discriminators for Communications Equipment
Cat. No. P05E

http://www.murata.com/products/comm_filter/catalog/

Filters for Communication Equipment

SAW Filters for Mobile Communications

SAW Duplexers

Features: Low Loss, High attenuation performance, Small size, Highly selective pass band, Chip Size Package

SAYFH Series

SAYRF Series

SAYFP Series

SAYRJ Series

(in mm)

RF Filters

Features: Low Loss, High attenuation performance, Small size, Highly selective pass band, Chip Size Package

Single Filter

SAFEA Series

SAFEB Series

SAFFB Series

(in mm)

Dual Filter

SAWEN Series

SAWFD Series

(in mm)

SAW Bank

This module, which has matching components, can simplify the connection to RFIC.

Filter Bank

Please contact us if you have any questions regarding our SAW Bank products.

DPX Bank

Please contact us if you have any questions regarding our DPX Bank products.

SAW Filters and SAW Duplexers must be used only for the below 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.

For more details on each series, please refer to our website.
Product Search ⇒ http://search.murata.co.jp/
RF Application Guides ⇒ http://www.murata.com/products/apps/rf/

Filters for Communication Equipment

Dielectric Filters GIGAFIL®

Suitable for the cellular base stations and other telecom infrastructure systems.
Customized proposal responded to the request characteristics is also available in our applicable range mentioned below.

DFYH Series

DFCH Series

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

*Power depends upon specifications.

Characteristic customization is available. You can contact us also from our website.
Contact Form ⇒ https://www.murata.co.jp/en/contact/product_gigafil/

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)

For more details on each series, please refer to our website.
Product Search ⇒ http://search.murata.co.jp/
RF Application Guides ⇒ http://www.murata.com/products/apps/rf/

Filters for Communication Equipment

Ceramic Filters CERAFIL®

Small and light Filters for IF in communications equipment using unique piezo-electric material.

CERAFIL® 10.7MHz Chip Type

(in mm)

SFECF Series

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

□ is filled in with a letter denoting 3dB bandwidth.

(in mm)

SFSCE Series

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

□ is filled in with a number denoting 3dB bandwidth.

CERAFIL® 450/455kHz Chip Type

SFPKA Series

CFUKG / CFUKF Series

CFWKA Series

(in mm)

Type	Series	6dB Bandwidth (kHz) min.							
		A	B	C	D	E	F	G	H
		±17.5	±15	±12.5	±10	±7.5	±6	±4.5	±3
High-selectivity	**SFPKA455K□** (4 Elements)	–	–	–	●	●	●	●	●
High-selectivity Miniature	**CFUKG455K□** (4 Elements)	–	–	–	●	●	●	●	–
GDT Flat Type Miniature	**CFUKF455K□** (4 Elements)	●	●	●	●	●	–	–	–
High-selectivity	**CFWKA450K□** (6 Elements)	–	–	–	●	●	●	●	–

□ is filled in with a letter denoting 6dB bandwidth.

For more details on each series, please refer to our website.
Product Search ⇒ http://search.murata.co.jp/

Filters for Communication Equipment

CERAFIL® 450/455kHz Lead Type

CFULA Series

CFWLA Series

CFULB Series

CFWLB Series

(in mm)

Type	Series	6dB Bandwidth (kHz) min.							
		B	C	D	E	F	G	H	J
		±15	±12.5	±10	±7.5	±6	±4.5	±3	±2
High-selectivity Low-profile	**CFULA455K☐ (4 Elements)**	●	●	●	●	●	●	●	–
High-selectivity Low-profile	**CFWLA455K☐ (6 Elements)**	●	●	●	●	●	●	●	●
High-selectivity Miniature	**CFULB455K☐ (4 Elements)**	●	●	●	●	●	●	●	●
High-selectivity Miniature	**CFWLB455K☐ (6 Elements)**	●	●	●	●	●	●	●	●

☐ is filled in with a letter denoting 6dB bandwidth.

Ceramic Discriminators

In combination with ICs, Ceramic Discriminators obtain stable demodulation characteristics.

Ceramic Discriminators 10.7MHz Type

CDSCB Series

(in mm)

Series	Center Frequency
CDSCB	10.700MHz±30kHz

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

For more details on each series, please refer to our website.
Product Search ⇒ http://search.murata.co.jp/

Filters for Communication Equipment

Ceramic Discriminators 450/455kHz Type

CDBLB Series

CDBKB Series

(in mm)

Series	Center Frequency (kHz)
CDBLB	450/455
CDBKB	450/455

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

For more details on each series, please refer to our website.
Product Search ⇒ http://search.murata.co.jp/

RF Components

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

Summary

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

Lineup

●Antennas ●Isolators ●GaAs Switch ICs ●RF Diode Switches ●Baluns (Chip Multilayer and Wire Wound/Film type) ●Couplers (Chip Multilayer and Film type) ●Chip Multilayer Components (Hybrid Dividers and Diplexers) ●High Frequency Coaxial Connectors ●Single Layer Microchip Capacitors ●Thin Film Circuit Substrate RUSUB®

RF Application Guides

The RF Application Guide on our website is useful for searching applications.

http://www.murata.com/products/apps/rf/

Detailed Catalogs

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

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

http://www.murata.com/products/microwave/catalog/

Antennas

Chip Antennas LDA Series

Ultra small size antennas for W-LAN, Bluetooth®, ZigBee®, etc.

LDA31 Series

LDA21 Series

LDA2H Series

(in mm)

Series	Center Frequency (MHz)	Applications	Use Form
LDA31	2442/3500/5800	WLAN / BT / ZigBee®, etc.	GND Clearance
LDA21	2442	WLAN / BT / ZigBee®, etc.	GND Clearance
LDA2H	2442	WLAN / BT / ZigBee®, etc.	On GND

Operating Temperature Range: -40°C to 85°C

Chip Antennas ANC Series

Small size antennas for GPS, ISM2.4, etc.

ANCG11G57SAA160RD2

ANCG12G44SAA145RD1

ANCL11G57SAA166RB5

(in mm)

Main Part Number	Center Frequency (MHz)	Applications	Use Form
ANCG11G57SAA160RD2	1575	GPS	On GND
ANCG12G44SAA145RD1	2442	WLAN / BT / ZigBee®, etc.	On GND
ANCL11G57SAA166RB5	1575	GPS	GND Clearance

Operating Temperature Range: -40°C to 85°C

*We have other products for various applications and sizes, please contact us about your requirements.
Some items of the ANC Series are the multiband type.

For more details on each series, please refer to our website.
Product Search ⇒ http://search.murata.co.jp/

Isolators

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

For Mobile Phones

CEG23 Series

(in mm)

Series	Adaptive Frequency Range (MHz) (100 / 1000 / 2000 / 3000)	Size (mm)	Rating Power (W)
CEG23	700 – 2000	2.0×2.0×1.0 max.	1.2 max.

For Base Stations

CES20 Series

CES30 Series

CES40 Series

(in mm)

Series	Adaptive Frequency Range (MHz) (100 / 1000 / 2000 / 3000)	Size (mm)	Rating Power (W)
CES20	1900 – 2600	3.2×2.5×1.2 max.	2.5 max.
CES30	1400 – 2200	3.2×3.2×1.6 max.	2.5 max.
CES40	830 – 950	4.0×4.0×1.7 max.	2.5 max.

For more details on each series, please refer to our website.
Product Search ⇒ http://search.murata.co.jp/

RF Components

Baluns

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

Chip Multilayer Type

LDB18 Series

LDB21 Series

LDM15 Series

LDM18 Series

(in mm)

Film Type

DXP18B Series

DXP2AB Series

(in mm)

Wire Wound Type

DXW21B Series

(in mm)

Couplers

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

Chip Multilayer Type

LDC15 Series

LDC18 Series

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

LDC32 Series
(3dB Hybrid)

(in mm)

For more details on each series, please refer to our website.
Product Search ⇒ http://search.murata.co.jp/
RF Application Guides ⇒ http://www.murata.com/products/apps/rf/

Film Type

DXP18C Series

(in mm)

Chip Multilayer Hybrid Dividers

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

LDD18 Series

LDD21 Series

(in mm)

Chip Multilayer Diplexers

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

LFD18 Series

LFD21 Series

(in mm)

For more details on each series, please refer to our website.
Product Search ⇒ http://search.murata.co.jp/
RF Application Guides ⇒ http://www.murata.com/products/apps/rf/

High Frequency Coaxial Connectors

High Frequency Coaxial Cable Connectors

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

MM5829-2700

MXJA01_____

MM4829-2702

MXHP32_____

MM9329-2700

MXTK92_____

(in mm)

Type	Receptacle Part Number	Rated Voltage (Vrms)	Frequency Rating (GHz)	Temperature Range	VSWR	Cable Number	Mating Height (mm)
JSC	**MM5829-2700**	30	to 12	-40 to 85°C	1.3 max. (DC to 3GHz)	**MXJA01_____**	1.0 max.
HSC	**MM4829-2702**	250	to 6	-40 to 85°C	1.3 max. (DC to 3GHz)	**MXHP32_____**	1.2 max.
GSC	**MM9329-2700**	250	to 6	-40 to 90°C	1.2 max. (DC to 3GHz)	**MXTK92_____**	2.0 max.

Nominal impedance: 50Ω

High Frequency Coaxial Connectors with Switch

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

MM8030-2610

MM8130-2600

MM8430-2610

(in mm)

Type	Receptacle Part Number	Rated Voltage (Vrms)	Frequency Rating (GHz)	Temperature Range	VSWR	Standard Measurement Probe Part Number
SWG	**MM8030-2610**	250	to 11	-40 to 85°C	1.2 max. (DC to 3GHz)	**MM126310 MXHQ87WA3000**
SWF	**MM8130-2600**	250	to 6	-40 to 85°C	1.2 max. (DC to 3GHz)	**MM126036 MXHS83QE3000 MXHS83QH3000**
SWD	**MM8430-2610**	250	to 6	-40 to 85°C	1.2 max. (DC to 3GHz)	

Nominal impedance: 50Ω

For more details on each series, please refer to our website.
Product Search ⇒ http://search.murata.co.jp/

Single Layer Microchip Capacitors

Very reliable performance and excellent frequency characteristics

Temperature Compensation Type

Capacitance Change	Series	Size (mm)	Rated Voltage (Vdc)	Capacitance Range at 25°C (pF) (0.1 – 1 – 10 – 100 – 1000)	Operating Temperature Range (°C)
0±30ppm/°C	CLB0A	0.25×0.25	100	0.1	-25 to 85
	CLB0C	0.35×0.25	100	0.2	-25 to 85
	CLB0D	0.38×0.38	100	0.2 – 0.4	-25 to 85
	CLB05	0.5×0.5	100	0.3 – 0.6	-25 to 85
	CLB0E	0.55×0.38	100	0.5 – 0.6	-25 to 85
	CLB0F	0.64×0.64	100	0.3 – 1	-25 to 85
	CLB0G	0.7×0.5	100	0.7 – 1	-25 to 85
	CLB0H	0.71×0.38	100	0.7 – 0.8	-25 to 85
	CLB0J	0.76×0.76	100	0.4 – 1.3	-25 to 85
	CLB09	0.9×0.9	100	0.5 – 1.8	-25 to 85
	CLB1A	1.00×0.64	100	1.1 – 1.6	-25 to 85
	CLB1B	1.09×0.76	100	1.5 – 2	-25 to 85
	CLB1C	1.27×1.27	100	1 – 3.6	-25 to 85
	CLB1E	1.49×0.9	100	2 – 2.7	-25 to 85
	CLB1G	1.73×1.27	100	3.9 – 4.7	-25 to 85
	CLB1H	1.78×1.78	100	1.8 – 6.8	-25 to 85
	CLB2C	2.19×1.27	100	5.1	-25 to 85
	CLB2E	2.29×2.29	100	3 – 10	-25 to 85
	CLB2L	2.95×1.78	100	7.5 – 10	-25 to 85
	CLB3G	3.71×2.29	100	11 – 16	-25 to 85
-750±60ppm/°C	CLB0A	0.25×0.25	100	0.3 – 0.7	-25 to 85
	CLB0B	0.30×0.25	100	0.8	-25 to 85
	CLB0C	0.35×0.25	100	0.9	-25 to 85
	CLB0D	0.38×0.38	100	0.9 – 1.6	-25 to 85
	CLB05	0.5×0.5	100	1 – 2.4	-25 to 85
	CLB0E	0.55×0.38	100	1.8 – 2.4	-25 to 85
	CLB0F	0.64×0.64	100	2 – 4.3	-25 to 85
	CLB0G	0.7×0.5	100	2.7 – 3	-25 to 85
	CLB0H	0.71×0.38	100	2.7	-25 to 85
	CLB0J	0.76×0.76	100	3 – 6.2	-25 to 85
	CLB09	0.9×0.9	100	3.3 – 6.8	-25 to 85
	CLB1A	1.00×0.64	100	4.7 – 6.2	-25 to 85
	CLB1B	1.09×0.76	100	6.8 – 7.5	-25 to 85
	CLB1C	1.27×1.27	100	7.5 – 15	-25 to 85
	CLB1E	1.49×0.9	100	7.5 – 9.1	-25 to 85
	CLB1H	1.78×1.78	100	13 – 15	-25 to 85
	CLB2E	2.29×2.29	100	20	-25 to 85

Some capacitances are not available in the CLB05 Series.
All Single Layer Microchip Capacitors are produced after receiving an order.

Continued on the following page.

For more details on each series, please refer to our website.
Product Search ⇒ http://search.murata.co.jp/

Capacitance Change	Series	Size (mm)	Rated Voltage (Vdc)	Capacitance Range at 25°C (pF)	Operating Temperature Range (°C)
-2200±500ppm/°C	CLB0A	0.25×0.25	100	0.8 1.3	-25 to 85
	CLB0B	0.30×0.25	100	1.5 1.6	-25 to 85
	CLB0C	0.35×0.25	100	1.8	-25 to 85
	CLB0D	0.38×0.38	100	1.8 3	-25 to 85
	CLB05	0.5×0.5	100	2.2 4.7	-25 to 85
	CLB0E	0.55×0.38	100	3.3 4.3	-25 to 85
	CLB0F	0.64×0.64	100	3.6 7.5	-25 to 85
	CLB0G	0.7×0.5	100	5.1 5.6	-25 to 85
	CLB0H	0.71×0.38	100	4.7 5.1	-25 to 85
	CLB0J	0.76×0.76	100	5.6 11	-25 to 85
	CLB09	0.9×0.9	100	6.2 13	-25 to 85
	CLB1A	1.00×0.64	100	8.2 11	-25 to 85
	CLB1B	1.09×0.76	100	12	-25 to 85
	CLB1C	1.27×1.27	100	15 22	-25 to 85
	CLB1E	1.49×0.9	100	15 16	-25 to 85
	CLB1G	1.73×1.27	100	33	-25 to 85
	CLB1H	1.78×1.78	100	27	-25 to 85
	CLB2E	2.29×2.29	100	39 47	-25 to 85

Some capacitances are not available in the CLB05 Series.
All Single Layer Microchip Capacitors are produced after receiving an order.

High Dielectric Constant Type

Capacitance Change	Series	Size (mm)	Rated Voltage (Vdc)	Capacitance Range at 25°C (pF)	Operating Temperature Range (°C)
±10%	CLB0A	0.25×0.25	100	2 to 3 4.7 to 12	-25 to 85
	CLB0B	0.30×0.25	100	3.3 3.6 13 15	-25 to 85
	CLB0C	0.35×0.25	100	3.9 4.3 16 18	-25 to 85
	CLB0D	0.38×0.38	100	5.1 to 7.5 11 to 30	-25 to 85
	CLB05	0.5×0.5	100	5.6 43	-25 to 85
	CLB0E	0.55×0.38	100	8.2 10 33 43	-25 to 85
	CLB0F	0.64×0.64	100	10 75	-25 to 85
	CLB0G	0.7×0.5	100	47 68	-25 to 85
	CLB0H	0.71×0.38	100	47 56	-25 to 85
	CLB0J	0.76×0.76	100	15 110	-25 to 85
	CLB09	0.9×0.9	100	16 130	-25 to 85
	CLB1A	1.00×0.64	100	82 120	-25 to 85
	CLB1C	1.27×1.27	100	33 to 62 75 to 200	-25 to 85
	CLB1E	1.49×0.9	100	150 160	-25 to 85
	CLB1G	1.73×1.27	100	300	-25 to 85
	CLB1H	1.78×1.78	100	130 430	-25 to 85
	CLB2E	2.29×2.29	100	200 620	-25 to 85
+30, -80%	CLB0A	0.25×0.25	100	27 33	-25 to 85
	CLB0B	0.30×0.25	100	36 39	-25 to 85
	CLB0C	0.35×0.25	100	43 51	-25 to 85
	CLB0D	0.38×0.38	100	62 82	-25 to 85
	CLB05	0.5×0.5	100	75 130	-25 to 85
	CLB0E	0.55×0.38	100	91 120	-25 to 85
	CLB0F	0.64×0.64	100	130 220	-25 to 85

Some capacitances are not available in the CLB0A/B/C/D/E, CLB1C Series.
All Single Layer Microchip Capacitors are produced after receiving an order.

Continued on the following page.

For more details on each series, please refer to our website.
Product Search ⇒ http://search.murata.co.jp/

Capacitance Change	Series	Size (mm)	Rated Voltage (Vdc)	Capacitance Range at 25°C (pF) (0.1 / 1 / 10 / 100 / 1000)	Operating Temperature Range (°C)
+30, -80%	CLB0G	0.7×0.5	100	150 – 200	-25 to 85
	CLB0H	0.71×0.38	100	130 – 150	-25 to 85
	CLB0J	0.76×0.76	100	200 – 300	-25 to 85
	CLB09	0.9×0.9	100	200 – 390	-25 to 85
	CLB1A	1.00×0.64	100	240 – 360	-25 to 85
+30, -90%	CLB0A	0.25×0.25	100	36 – 56	-25 to 85
	CLB0D	0.38×0.38	100	91 – 150	-25 to 85
	CLB05	0.5×0.5	100	130 – 220	-25 to 85
	CLB0F	0.64×0.64	100	220 – 390	-25 to 85
	CLB0J	0.76×0.76	100	330 – 560	-25 to 85
	CLB09	0.9×0.9	100	390 – 680	-25 to 85

Some capacitances are not available in the CLB0A/B/C/D/E, CLB1C Series.
All Single Layer Microchip Capacitors are produced after receiving an order.

Thin Film Circuit Substrate RUSUB®

Suitable for Photo diode module.

Features

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

RUCYT101 Series

RUCYT201 Series

(in mm)

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

Part Number	Size (mm) (L×W×T)	Capacitance (pF)	Resistance (Ω)	Temperature Characteristics of Capacitance at -25 to 85°C	Capacitor Rated Voltage (V)	Temperature Coefficient of Resistance (ppm/°C)	Resistor Rated Power (mW/mm²)
RUCYT101K00009GNTC	1.0×0.5×0.11	100±10%	50±20%	±10%	100	-70±50	100
RUCYT101K00011GNTC	1.0×0.5×0.11	100±10%	100±20%				
RUCYT101K00012GNTC	1.0×0.5×0.11	100±10%	200±20%				
RUCYT201K00010GNTC	1.0×1.0×0.12	200±10%	50±20%				
RUCYT201K00013GNTC	1.0×1.0×0.12	200±10%	100±20%				
RUCYT201K00014GNTC	1.0×1.0×0.12	200±10%	200±20%				

For more details on each series, please refer to our website.
Product Search ⇒ http://search.murata.co.jp/

Sensors

Offering sensing elements for various applications

Summary

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

Lineup

●Infrared Sensors ●Ultrasonic Sensors ●Rotary Sensors ●Magnetic Pattern Recognition Sensors ●Magnetic Switches
●Shock Sensors ●Angular Velocity Sensors ●Rotary Position Sensors ●Temperature Sensors (Thermistors)

Web Content

Introducing Sensor details on our website.

http://www.murata.com/products/sensor/

Detailed Catalogs

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

• MR Sensors	Cat. No. S45E
• Rotary Position Sensors	Cat. No. R51E
• Pyroelectric Infrared Sensors	Cat. No. S21E
• Angular Rate Sensors (ENC Series)	Cat. No. S42E
• Ultrasonic Sensor Application Manual	Cat. No. S15E
• NTC Thermistors	Cat. No. R44E
• POSISTOR® for Circuit Protection	Cat. No. R90E

http://www.murata.com/products/sensor/catalog/

Product Pickup

Rotary Position Sensors

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

SV Series

For more details, please refer to our website.
http://www.murata.com/products/sensor/

Magnetic Pattern Recognition Sensors

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

BS05 Series

For more details, please refer to our website.
http://www.murata.com/products/sensor/

Magnetic Switches (AMR Sensors)

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

AS Series

For more details, please refer to our website.
http://www.murata.com/products/sensor/

Temperature Sensors NTC/PTC Thermistors

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

NCP Series

NXF Series

PRF Series

PTF Series

For more details on Thermistors, please refer to p.58.

For more details, please refer to our website.
http://www.murata.com/products/thermistor/

Lineup

Detection	Murata's Sensors: Products	Series or Main Part Number	Dimensions (mm)	TV	Audio	DVD, CD	Digital Video Camera	Digital Camera	PC	Scanner	Multifunction Machine	Printer	FAX	Electronic Bulletin Board
				Applications: AV Equipment					Communications Devices					
Infrared	Pyroelectric Infrared Sensors	**IRS Series**	4.9×4.7×2.4	●	●	●			●	●	●	●	●	●
Ultrasonic	Ultrasonic Sensors Open Structure Type	**MA40S4R (for Receiver) MA40S4S (for Transmitter)**	ø9.9 H7.1											●
Ultrasonic	Ultrasonic Sensors Enclosed Type	**MA58MF14-0N (for Dual Use)**	ø14.0 H9.0											
Ultrasonic	Ultrasonic Sensors High Frequency Type	**MA300D1-1 (for Dual Use)**	ø9.9 H7.3							●	●	●		
Magnetic	Rotary Sensors	**FR05CM21AR**	ø12.7 H20											
Magnetic	Magnetic Pattern Recognition Sensors	**BS05 Series**	11.15×8.8×12.5 193.0×16.0×7.5											
Magnetic	Magnetic Switches (AMR Sensors)	**AS Series**	1.2×1.2×0.37				●	●	●					
Accel-eration	Shock Sensors	**PKGS Series**	3.2×2.0×1.05						●					
Angle Velocity	Angular Rate Sensors	**ENC Series**	8.0×4.0×2.0				●	●						
Angle Velocity	Angular Rate Sensors	**MEV Series**	10.0×6.2×5.25											
Angle	Rotary Position Sensors	**SV Series**	11×12×2.1	●				●			●	●		
Temperature	NTC Thermistors	**Chip Type NCP Series**	NCP03: 0.6×0.3×0.3 NCP15: 1.0×0.5×0.5 NCP18: 1.6×0.8×0.8 NCP21: 2.0×1.25×0.85	●	●	●	●	●	●	●	●	●	●	●
Temperature	NTC Thermistors	**Lead Type NXF Series**	ø1.2 L25 to 150	●	●				●	●	●	●	●	●
Temperature	PTC Thermistors POSISTOR®	**Chip Type PRF Series**	PRF15: 1.0×0.5×0.5 PRF18: 1.6×0.8×0.8 PRF21: 2.0×1.25×0.9	●	●	●	●	●	●	●	●	●	●	●
Temperature	PTC Thermistors POSISTOR®	**Lead Type PTF Series**	ø5.0 max. T4.0 max. ø7.5 T3.0	●	●				●	●	●	●	●	●

For more details on each series, please refer to our website.
Product Search ⇒ http://search.murata.co.jp/

Applications																							
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	Murata's Sensors Products
●		●	●	●				●	●	●	●	●	●	●							●	●	●	Pyroelectric Infrared Sensors
		●												●										Ultrasonic Sensors Open Structure Type
																	●							Ultrasonic Sensors Enclosed Type
																					●			Ultrasonic Sensors High Frequency Type
																				●				Rotary Sensors
																					●	●		Magnetic Pattern Recognition Sensors
●	●		●	●	●	●			●														●	Magnetic Switches (AMR Sensors)
																								Shock Sensors
																		●	●					Angular Rate Sensors (ENC Series)
															●									Angular Rate Sensors (MEV Series)
●		●				●		●	●	●	●				●	●		●	●				●	Rotary Position Sensors
●	●	●	●	●	●	●	●	●	●	●					●				●			●	●	NTC Thermistors
●	●	●	●	●	●	●	●	●	●	●												●	●	
●	●	●	●	●	●	●	●	●	●	●					●				●				●	PTC Thermistors POSISTOR®
				●	●	●	●	●	●	●													●	

Thermistors

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

Summary

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

Lineup

●NTC Thermistors (for temperature sensor/compensation, inrush current suppression and automotive)
●PTC Thermistors POSISTOR® (for overheat sensing, overcurrent protection, motor starters, heater and automotive)

Features

●Chip Type NTC Thermistor for Temperature Sensor/ Compensation
We have many series of thermistor products with a wide variety of resistance and B-Constant.
The line-up is still expanding, for example,
1. Small size 0201(inch) size
2. Tighter tolerance series like as +/-0.5% on resistance value.

●Lead Type NTC Thermistor for Sensing Temperature
Thermostring products which consist of SMD type NTC with lead wire.
This product has the following advantages:
1. Small head size due to 0402 sized chip NTC (NCP15 Series) inside.
2. Soft lead wire
3. Excellent thermal response

●Chip Type PTC Thermistor for Overheat Sensing
PTC thermistor detects abnormal temperatures.
The sensing temperature range is 65°C to 150°C.
We have devised the PRF15 (0402 inch size) Series, which are the smallest PTC thermistors in the world with a tight sensing temperature tolerance of ±3°C.

●Chip Type PTC Thermistor for Overcurrent Protection
Our PRG Series of PTC thermistor can be used as a resettable fuse.
Murata provides a variety of PRG Series in different sizes: 0603 and 0805 inch (PRG18 or PRG21).
The hold current is up to 500mA.

●Lead Type PTC Thermistor for Overcurrent Protection
Murata has many series of lead type PTC products; some of our series have a hold current up to 1200mA and maximum voltage is up to 265V.
Some series have a resistance tolerance of ±10%.

Web Content

Introducing Thermistor content on our website.

Product Lineup ⇒ http://www.murata.com/products/thermistor/

Product Search ⇒ http://search.murata.co.jp/

We offer simulation software tools.

Design Tool ⇒ http://www.murata.com/products/thermistor/design_support/

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.

NCP03 Series　NCP15 Series　NCP18 Series　NCP21 Series

(in mm)

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

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

Thermo String Type

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

Twist
NXFT15_1B Series

Without twist
NXFT15_2B Series

(in mm)

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

Operating Current for Sensor rises Thermistor's temperature by 0.1°C.

For more details on each series, please refer to our website.
Product Search ⇒ http://search.murata.co.jp/

NTC Thermistors (for Inrush Current Suppression)

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

NTPAN / NTPAJ Series

NTPAD / NTPAA Series

NTPA7 / NTPA9 Series

(in mm)

Series	Resistance (25°C) (Ω)	Permissible Max. Current (25°C) (A)	Permissible Max. Current (55°C) (A)	Thermal Time Constant (25°C) (s)	Permissible Electrolytic Capacitor (100V) (μF)	Operating Temperature Range (°C)
NTPAN / NTPAJ	3 to 10	2.6 to 5.4	2.2 to 4.7	125 to 135	5000 to 8600	-20 to 160
NTPAD / NTPAA	2.2 to 16.0	1.7 to 3.7	1.5 to 3.2	65 to 70	1400 to 2700	-20 to 160
NTPA7 / NTPA9	4.0 to 22.0	1.0 to 2.3	0.88 to 2.0	40 to 65	400 to 800	-20 to 160

PTC Thermistors POSISTOR® (for Overheat Sensing)

Chip Type

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

PRF15 Series

PRF18 Series

PRF21 Series

(in mm)

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

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

For more details on each series, please refer to our website.
Product Search ⇒ http://search.murata.co.jp/

Lead Type

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

PTFL Series

PTFM Series

(in mm)

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

A 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 Overcurrent Protection)

Chip Type

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

PRG18 Series

PRG21 Series

(in mm)

Series	Maximum Voltage (V)	Hold Current (60°C) (mA)	Trip Current (-10°C) (mA)	Maximum Current (A)	Resistance (25°C) (Ω)	Size Code Inch (mm)
PRG18	6 to 24	7 to 220	25 to 850	0.06 to 7.5	1.0 to 470	0603 (1608)
PRG21	6 to 24	30 to 500	110 to 2000	1.1 to 10	0.2 to 22	0805 (2012)

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

For more details on each series, please refer to our website.
Product Search ⇒ http://search.murata.co.jp/

Lead Type

Best suited to meet the requirements for power supplies and motor protection.
Error-free operations are assured by rush current.

(in mm)

PTGL Series
*The Lead shape is an example.

Series	Maximum Voltage (V)	Hold Current (60°C) (mA)	Trip Current (-10°C) (mA)	Maximum Current (A)	Resistance (25°C) (Ω)
PTGL	16	370 to 1200	1040 to 3360	2.0 to 10.0	0.15 to 1.0
	24	80 to 180	320 to 710	2.0	2.2 to 10
	30	122 to 685	240 to 1900	0.7 to 7.0	0.8 to 13
	32	30 to 60	140 to 240	1.5	15 to 47
	51	213 to 749	332 to 1168	1.0 to 5.0	1.2 to 10
	56	90 to 380	240 to 980	1.0 to 2.5	3.3 to 22
	60	88 to 439	175 to 867	1.0 to 5.0	2.2 to 22
	80	50 to 310	135 to 860	0.7 to 5.5	3.7 to 55
	125	30 to 420	75 to 1050	0.3 to 2.0	3.3 to 180
	140	74 to 340	147 to 780	0.5 to 3.5	4.7 to 56
	250	90 to 100	280 to 300	0.5 to 0.6	12 to 39
	265	28 to 300	78 to 830	0.2 to 4.1	6.0 to 180

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

PTC Thermistors POSISTOR® (for Motor Starters)

This series is specifically designed for appliance application in refrigerators and freezers.

PTH7M Series

PTH8M Series

(in mm)

PTHTM Series
*It is effective solution for the power saving.

Series	Resistance (25°C) (Ω)	Maximum Voltage (V)	Maximum Current (A)	Operating Time (25°C) (s)	Starting System
PTH7M	4.7 to 33	180 to 355	6 to 12	0.2 to 2.2	CSR/RSIR/RSCR
PTH8M	4.7 to 33	180 to 355	6 to 12	0.2 to 3.5	CSR/RSIR/RSCR
PTHTM	4.7 to 47	180 to 400	5 to 12	0.2 to 2.2	RSCR

For more details on each series, please refer to our website.
Product Search ⇒ http://search.murata.co.jp/

PTC Thermistors POSISTOR® (for Heater)

Standard Type

These POSISTOR® are designed for various applications for constant temperature heating purpose.

PTWS Series

PTWT Series

(in mm)

Series	Curie Point (°C)	Rated Voltage (V)	Maximum Voltage (V)	Inrush Current (A)	Steady State Current (at 120Vrms) (mA)	Steady State Current (at 220Vrms) (mA)
PTWS / PTWT	92 to 280	120/220	260	5.0/10.0	28 to 65	17 to 75

Inrush Current Based on 220Vrms.
Operating Temperature Range PTWSB1: -20 to 60°C, PTWSB2: -20 to 85°C, PTWTA: 0 to 60°C

Detailed Catalogs

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

- NTC Thermistors — Cat. No. R44E
- POSISTOR® for Circuit Protection — Cat. No. R90E
- POSISTOR® for Heater — Cat. No. R19E
- PTC Thermistor (POSISTOR®) Application Manual — Cat. No. R16E
- NTC/PTC Thermistors for Automotive — Cat. No. R03E
- PTC - NTC for Surface Mounting Application — Cat. No. R01E

http://www.murata.com/products/thermistor/catalog/

For more details on each series, please refer to our website.
Product Search ⇒ http://search.murata.co.jp/

Power Supplies

Eco-friendly and high quality power supplies

Summary

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

Lineup

●DC-DC Converters ●Switching Power Supplies
●High Voltage Power Supplies ●Ionizer Modules

Web Content

Introducing DC-DC Converter content on our website.

DC-DC Converter Selection Guide

http://www.murata.com/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, low noise power supplies. Murata provides standard products and customized products, ultra-low-profile products and products for FPGA.

Non-isolated Type

MPDRX002S

MPDRX103S

MYGTM01210BZN

MYGTR01205BZN

MYSSM0123EBENL

MYUSP3R303FMP

OKL Series

MPDRX312S

Part Number	Package	Input Voltage (V)	Nominal Output Power (W)	Output Voltage (V)	Current (A)	Efficiency (%)	Size (mm) L×W×H
MPDRX002S	SMD	3.0 to 5.5	28.8	0.8 to 1.8	16	90	33.0×13.5×8.5
MPDRX103S	SIL	10.8 to 13.2	28.8	0.8 to 1.8	16	86	50.8×5.8×14.0
MYGTM01210BZN	SIL	17 to 40	120	5 to 12	10	97.3	40×40.3×29.2
MYGTR01205BZN	SIL	17 to 40	36	5 to 12	3 to 5.2	93	25.1×12×27
MYSSM0123EBENL	SMD	14 to 40	42	5 to 12	3.5	96	30.2×20.9×12
MYUSP3R303FMP	SMD	3.0 to 5.5	9.9	0.7 to 3.3	3	94	11.0×8.5×5.6
OKL-T/3-W5N-C	SMD	2.7 to 5.5	10.9	0.6 to 3.63	3	95.3	12.2×12.2×6.2
MPDRX312S	SMD	3.0 to 5.5	28.8	0.8 to 1.8	16	86.5	27.8×15.4×4.2

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

For more details on our product lineup, please refer to our website.
Product Search ⇒ http://search.murata.co.jp/
Power Supplies Contents ⇒ http://www.murata.com/products/power/

Isolated Type

MPD5D01*S Series

MPD6D10*S/20*S Series
MPD7D06*S Series

MPD6D12*S Series
MPD7D05*S/13*S/12*S Series

Part Number	Package	Input Voltage (V)	Nominal Output Power (W)	Output Voltage (V)	Current (A)	Efficiency (%)	Size (mm) L×W×H
MPD5D013S	SMD	36.0 to 75.0	5	1.5	0.8	70	27.0×14.6×4.7
MPD6D101S	SMD	36.0 to 75.0	10	12	0.8	88	39.9×22.4×4.2
MPD6D207S	SMD	18.0 to 36.0	30	3.3	9	91	39.3×30.1×8.0
MPD7D067S	SMD	36.0 to 75.0	35	3.3	10.6	90	39.3×30.1×8.0
MPD6D122S	SMD	36.0 to 75.0	30	1.2	12	84	45.0×45.0×4.4
MPD7D052S	SMD	36.0 to 75.0	50	1.2	16	86	45.0×36.2×4.2
MPD7D137S	SMD	36.0 to 75.0	80	3.3	24	92	45.0×45.0×8.5
MPD7D128S	SMD	36.0 to 75.0	100	5	20	92.5	45.0×45.0×8.5

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

For more details on our product lineup, please refer to our website.
Product Search ⇒ http://search.murata.co.jp/
Power Supplies Contents ⇒ http://www.murata.com/products/power/

Switching Power Supplies

For SOHO Equipment For Wide-screen LCD Panel For PBX LED Lighting

Applications	Input Voltage	Output Voltage	Safety Standard	EMI Standard	Remarks
SOHO Equipment	115V AC	50V 0.3A/24V 4.5A (PEAK)	Facsimile voluntary standard, UL, CSA	VCCI, FCC	Models that provide a power-saving standby mode are also available.
	230V AC	24V 1.0A (RATE)	IEC	VDE, CISPR	
For Wide-screen LCD Panel	100/115V /230V AC	24V 20A/15V 4A/5V 0.3A	Electrical safety, UL, CSA, IEC	VCCI, FCC, VDE, CISPR	W/W input type is available. Models that provide a power-saving standby mode are also available.
PBX	115V/30V AC	5V 5.0A/12V 1.0A/-48V 2.5V	UL, IEC	FCC, CISPR	Provided with Pb battery charging function.
LED Lighting	100V/200V AC	10W (Constant current output) Output 10 to 24V	Electrical Appliance and Materials Safety Law of Japan	VCCI	PWM Dimming, Accepted for triac dimming
		80W (Constant current output) Output 30V			

For more details on our products, please contact us.

High Voltage Power Supplies

MPH1000/2000 Series

MPH7000 Series

MPH4000 Series
(for Air Cleaner)

(in mm)

MPL3000/8000 Series
(AC/DC Ballast)

Series	Input Voltage Vin	Power Supply Type		Output Voltage Vout	Output Current Iout	Adjustable Range
MPH1000	24V DC	DC Constant Voltage		6kV	(350μA)	Vout: 4 to 6.5kV
MPH2000		DC Constant Current		(6kV)	350μA	Iout: 150 to 400μA
MPH7000		DC Constant Current		(6kV)	250μA	Iout: 200 to 300μA
		DC Constant Voltage		0.6kV	(1μA)	Vout: 550 to 650μV
		Switching	DC Constant Current	(-1.5kV)	-3μA	Iout: -2 to -4μA
			DC Constant Voltage	1.5kV	(0.5μA)	Vout: 1.4 to 1.6kV
		AC Constant Voltage		1.5kV rms	(250μA rms)	Vout: 1.3 to 1.7kV rms
MPH4000 (for Air Cleaner)		DC Constant Voltage		±6kV	±400μA	—
		DC Constant Current		(±6kV)	±400μA	—

Series	Applications	Input Voltage Vin	Output Power	Other Specification
MPL3000	Projector/Rear projection TV	250 to 420V DC	to 350W	For extra-high pressure mercury lamp

For more details on our products, please contact us.

For Ionizer Modules, please refer to p.73.

Sound Components

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

Summary

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

Lineup

●Piezoelectric Sounders ●Piezoelectric Buzzers
●Piezoelectric Diaphragms

Web Content

Introducing Sound Component content on our website.

http://www.murata.com/products/sound/

Detailed Catalogs

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

- Piezoelectric Sound Components Cat. No. P37E
- Piezoelectric Sound Components Application Manual Cat. No. P15E

http://www.murata.com/products/sound/catalog/

Piezoelectric Sounders

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

Drive Type	Mounting Type	Main Part Number	Sound Pressure Level (dB)	Measurement Condition of Sound Pressure Level
External Drive	Surface Mounting Type	**PKLCS1212E2400-R1**	75 min.	[3Vp-p, 2.4kHz, square wave, 10cm]
		PKLCS1212E4001-R1	75 min.	[3Vp-p, 4kHz, square wave, 10cm]
	Pin Type	**PKM13EPYH4000-A0**	70 min.	[3Vp-p, 4kHz, square wave, 10cm]
		PKM17EPP-2002-B0	70 min.	[3Vp-p, 2kHz, square wave, 10cm]
		PKM22EPH2001	75 min.	[3Vp-p, 2kHz, square wave, 10cm]
		PKM22EPPH2001-B0	70 min.	[3Vp-p, 2kHz, square wave, 10cm]
	Lead Type	**PKM17EWH4000**	75 min.	[3Vp-p, 4kHz, square wave, 10cm]
Self Drive	Pin Type	**PKM24SPH3805**	90 min.	[12Vdc, 10cm]

For more details on each series, please refer to our website.
Product Search ⇒ http://search.murata.co.jp/

Piezoelectric Buzzers

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

PKB24SPCH

(in mm)

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

Piezoelectric Diaphragms

Low power consumption, lightweight
Suitable for Clocks/Calculators/Digital cameras/Various alarms (Burglar alarms, etc.)

7BB-□□-□

7BB-□□-□C

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

For more details on each series, please refer to our website.
Product Search ⇒ http://search.murata.co.jp/

Others

Micromechatronics

Utilizing the vibration and deformation of piezoelectric materials.

Microblowers

Tiny air pumps without a motor

Features

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

Applications

Air freshener, Gas & Alcohol Sensor, Air ionizer, Amusement, Spot Cooling for tiny devices

Part Number	Size	Air Flow	Static Pressure	Voltage of Operation
MZB1001T02	20(W)×20(L)×1.85(H)mm without the nozzle 20(W)×20(L)×3.45(H)mm with the nozzle	≧0.7L/min@15Vp-p	≧1.42kPa@15Vp-p	10 to 20Vp-p

Microblower demonstration videos
http://www.murata.com/products/micromechatronics/demonstration/microblower/

Piezoelectric Actuators

Quick response and high-accuracy position control.

PALPRM Series

Features

Piezoelectric actuators, utilizing the deformation properties of the Piezoelectric ceramics itself, are used for position control within the autofocus system of cellular camera modules and within the image stabilization system of digital still cameras. The features of Murata's piezoelectric actuators contribute to miniaturization of various modules, due to its very usable displacement in spite of its small size and a low profile.

*Please contact us for custom-made specifications.

For more details on Micromechatronics products, please refer to our website.
http://www.murata.com/products/micromechatronics/

Others

Wireless Communication Modules

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

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

Features

Compact, highly efficient and flexible custom-made correspondence

Applications

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

Bluetooth® Modules / Bluetooth® Low Energy Modules

Features

Compact, highly efficient and flexible custom-made correspondence

Applications

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

Please contact us about Wireless Communication Modules.

Others

Ceramic Applied Products

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

LTCC (Low Temperature Co-fired Ceramics) Multilayer Substrates

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

LFC® Series

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

AWG Series

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

For more details on Ceramic Applied Products, please refer to our website and the PDF catalogs on our website.
http://www.murata.com/products/ceramic/

Cat.No. N20E

Others

Ionizer Modules Ionissimo®

High-concentration ion, compact design, ozone control

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

*Surveyed by Murata (As of March 2011)

MHM Series

Features

- Ion is generated at low voltage (-2.0kV) with high efficiency, resulting in high ion concentration.
- 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.

For more details on the Ionizer Modules, please refer to our website.
http://www.murata.com/products/ionizer/

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

Others

Wireless Power Transmission Modules

Realization of wireless charging systems

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

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

LXWS Series

Features

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

For more details on Wireless Power Transmission Modules, please refer to our website.
http://www.murata.com/products/wireless_power/

View demonstration videos of Wireless Power Transmission Modules on our website

Others

RFID Devices

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

MAGICSTRAP®

LXMS31 Series

(in mm)

MAGICSTRAP® can be easily assembled by means of reflow soldering and adhesive (electrically conductive or non-conductive). Even if non-conductive adhesive is used, communication will take place when MAGICSTRAP® is bonded onto the antenna, and the RFID tag will function correctly.
MAGICSTRAP® complies with international standard EPC/gC1G2. It is an ultra-miniature (3.2x1.6x0.55mm typ.) robust package with impedance transformation function. MAGICSTRAP® can be bonded onto the antenna over a wide range (±500µm). In addition, MAGICSTRAP® supports wide UHF band (860-960MHz) for worldwide use in a single design.

An example using the grand pattern of the PCB board as an antenna.

For more details on RFID Devices, please refer to our website.
http://www.murata.com/products/rfid/

View demonstration videos of MAGICSTRAP® on our website

Others

ESD Protection Devices

Support ESD protection for various kinds of electronic devices

Ceramic ESD Protection Devices

Applying Murata original ceramic technology to have excellent ESD suppression performance and ultra-small capacitance value

LXES_A Series

LXES-100

LXES-098

(in mm)

Silicon ESD Protection Devices

Applying accumulated design technology to have excellent ESD suppression performance

LXES_B Series

LXES-008

LXES-013

LXES-026

LXES-028

LXES-046

LXES-027

(in mm)

For more details on each series, please refer to our website.
Product Lineup ⇒ http://www.murata.com/products/emc/selection_guide/emc3/
Product Search ⇒ http://search.murata.co.jp/
<Category Search> Primary: "Noise Suppression Products/EMI Suppression Filters" Secondary: "ESD Protection Device"
<Part Number Search> Part Number: "LXES"

Application Guides

muRata

Application Guides

Mobile Phones

1 Cellular RF

- Chip Antennas LDA/ANC Series — p46
- SWITCHPLEXER® LMSP Series
- Chip Multilayer Diplexers LFD Series — p49
- SAW Duplexers SAY Series — p40
- SAW Filters SAF Series — p40
- Chip Multilayer LC Filters — p41
- Chip Multilayer Hybrid Baluns LDB/LDM Series — p48
- Chip Multilayer Hybrid Dividers LDD Series — p49
- Coaxial Connectors — p50
- GaAs Switch IC
- Isolators CEG23 Series — p47
- Micro DC-DC Converters LXDC Series
- Trimmer Capacitors TZS2 Series — p20
- ESD Protection Devices LXES Series — p74
- Thermistors NCP Series — p59

2 Cellular BB

- Micro DC-DC Converters LXDC Series
- 3 Terminal Capacitors NFM Series — p23
- Chip Common Mode Choke Coils DLW/DLP Series — p24
- Thermistors PRF/NCP Series — p59
- Microblowers — p71

3 CPU

- Crystal Resonators XRCGB Series — p33
- Chip Ferrite Beads BLM Series — p22
- 3 Terminal Capacitors NFM Series — p23

4 Display Panel

- Micro DC-DC Converters LXDC Series
- Ceramic Resonators CERALOCK® CSTCE Series — p33
- EMI Suppression Filters EMIFIL® NFA Series — p23
- Chip Common Mode Choke Coils DLW/DLP Series — p24
- Chip Inductors (Chip Coils) LQW/LQP Series — p27
- Trimmer Potentiometers PVZ2 Series — p30
- ESD Protection Devices LXES Series — p74
- Thermistors PRF/NCP Series — p59

5 Camera Module

- Micro DC-DC Converters LXDC Series
- Monolithic Ceramic Capacitors for Medium Voltage GR7 Series — p10
- Actuators PALPRM Series — p71
- Chip Ferrite Beads BLM Series — p22
- Trimmer Potentiometers PVZ2 Series — p30
- ESD Protection Devices LXES Series — p74
- Thermistors NCP Series — p59

6 Speaker

Micro DC-DC Converters
LXDC Series

Chip Common Mode Choke Coils
DLM Series
p24

ESD Protection Devices
LXES Series
p74

7 USB

Micro DC-DC Converters
LXDC Series

Chip Common Mode Choke Coils
DLW/DLP Series
p24

Chip Ferrite Beads
BLM Series
p22

ESD Protection Devices
LXES Series
p74

10 DC-DC Converter

Micro DC-DC Converters
LXDC Series

Metal Terminal Type
Monolithic Ceramic Capacitors
KRM Series
p11

Polymer Aluminum Electrolytic Capacitors
ECAS Series
p19

Thermistors
NCP Series
p59

11 Battery

Thermistors
NCP/PRF/PRG Series
p59

8 Connectivity

Bluetooth® Modules
p72

Wi-Fi™ Modules
p72

GPS Modules

Chip Antennas
LDA/ANC Series
p46

Dielectric Antennas
ANH Series

SAW Filters
SAF Series
p40

Chip Multilayer LC Filters
p41

Chip Multilayer Hybrid Baluns
LDB/LDM Series
p48

Coaxial Connectors
p50

Micro DC-DC Converters
LXDC Series

ESD Protection Devices
LXES Series
p74

9 NFC

NFC Modules

Micro DC-DC Converters
LXDC Series

Crystal Resonators
XRCGB Series
p33

Chip Ferrite Beads
BLM Series
p22

Chip Inductors (Chip Coils)
LQM/LQH Series
p27

Trimmer Capacitors
TZS2 Series
p20

ESD Protection Devices
LXES Series
p74

12 Power Supply

Wireless Power
Transmission Modules
p73

Monolithic Ceramic Capacitors
for Medium Voltage
GR/GA Series
p3

Medium High Voltage
Ceramic Capacitors
DEA/DES Series
p15

Safety Standard Certified
Ceramic Capacitors
Type KX/KY
p17

Chip Inductors (Chip Coils)
LQM/LQH Series
p27

General Purpose

Monolithic Ceramic Capacitors	GRM/GJM Series	High Frequency Filter Circuit	p3
Monolithic Ceramic Capacitors	GRM/GNM Series	Coupling/Decoupling/For Step-up	p3
Polymer Aluminum Electrolytic Capacitors	ECAS Series	Smoothing/Transient Backup	p19
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching/Resonance	p27
Chip Inductors (Chip Coils)	LQM/LQH Series	Voltage Conversion	p27
Chip Ferrite Beads	BLM Series	Noise Suppression	p22
3 Terminal Capacitors	NFM/NFE Series	Noise Suppression	p23
Chip Common Mode Choke Coils	DLW/DLP Series	Noise Suppression	p24
Microwave Absorbers	EA Series	Noise Suppression	p25
Ferrite Cores	FS Series	Noise Suppression	p25
Thin Type Sandwich Cores	FSSA Series	Noise Suppression	p25

Application Guides

Personal Computers

1 CPU/Chip Set

- Micro DC-DC Converters LXDC Series
- Low ESL Monolithic Ceramic Capacitors LLL/LLA/LLM Series — p6
- Monolithic Ceramic Decoupling Capacitors GWM Series
- Polymer Aluminum Electrolytic Capacitors ECAS Series — p19
- Chip Ferrite Beads BLM Series — p22
- 3 Terminal Capacitors NFM Series — p23
- Thermistors PRF/NCP Series — p59
- Microblowers — p71

2 DDR Memory

- Micro DC-DC Converters LXDC Series
- Polymer Aluminum Electrolytic Capacitors ECAS Series — p19
- Chip Ferrite Beads BLM Series — p22
- Trimmer Capacitors TZY2 Series — p20

3 Display Panel

- Metal Terminal Type Monolithic Ceramic Capacitors KRM Series — p11
- Power Inductors LQH Series — p27
- Trimmer Potentiometers PVZ2 Series — p30
- Thermistors PRF/PRG Series — p59

5 ODD

- Ceramic Resonators CERALOCK® CSTCW Series — p34
- Crystal Resonators XRCGB Series — p33
- Trimmer Potentiometers PVZ2 Series — p30
- Thermistors NCP Series — p59

4 LVDS/eDP

- Chip Common Mode Choke Coils DLW/DLP Series — p24
- ESD Protection Devices LXES Series — p74
- Thermistors PRF/NCP Series — p59

6 HDD/SSD

- Shock Sensors PKGS Series — p56
- Micro DC-DC Converters LXDC Series
- Polymer Aluminum Electrolytic Capacitors ECAS Series — p19
- Actuators PALHRS Series
- Ceramic Resonators CERALOCK® CSTCE Series — p33
- Crystal Resonators XRCGB Series — p33
- Thermistors PRF/NCP Series — p59

7 LAN

Monolithic Ceramic Capacitors for Medium Voltage GR4 Series p10

Chip Common Mode Choke Coils DLW/DLP Series p24

8 USB3.0/USB2.0

Micro DC-DC Converters LXDC Series

Polymer Aluminum Electrolytic Capacitors ECAS Series p19

Crystal Resonators XRCGB Series p33

Chip Ferrite Beads BLM Series p22

Chip Common Mode Choke Coils DLW/DLP Series p24

ESD Protection Devices LXES Series p74

Thermistors PRG Series p61

9 HDMI/Display Port

Chip Common Mode Choke Coils DLW/DLP Series p24

ESD Protection Devices LXES Series p74

Thermistors PRG Series p61

10 DC-DC Converter

Micro DC-DC Converters LXDC Series

Metal Terminal Type Monolithic Ceramic Capacitors KRM Series p11

Polymer Aluminum Electrolytic Capacitors ECAS Series p19

Thermistors PRF/NCP Series p59

11 Battery

Ceramic Resonators CERALOCK® CSTCE/CSTCR Series p33

Thermistors PRF/PRG/NXF Series p59

12 Power Supply

Micro DC-DC Converters LXDC Series

Monolithic Ceramic Capacitors for Medium Voltage GR/GA Series p3

Medium High Voltage Ceramic Capacitors DEA/DES Series p15

Safety Standard Certified Ceramic Capacitors Type KX/KY p17

Ceramic Resonators CERALOCK® CSTCE/CSTCR Series p33

Trimmer Potentiometers PVG3 Series p30

Chip Common Mode Choke Coils DLW/DLP Series p24

Thermistors NTP Series p60

13 Clock Device

Ceramic Resonators CERALOCK® CSTCE/CSTCR Series p33

Crystal Resonators XRCGB Series p33

14 HMI/Actuator/Speaker

Pyroelectric Infrared Sensors IRS Series p56

Ultrasonic Sensors MA Series p56

VectorPad

ESD Protection Devices LXES Series p74

General Purpose

Monolithic Ceramic Capacitors	GRM/GNM Series	Coupling/Decoupling	p3
Polymer Aluminum Electrolytic Capacitors	ECAS Series	Smoothing/Transient Backup	p19
Radial Lead Type Monolithic Ceramic Capacitors	RDE Series	Coupling/Decoupling	p14
Chip Inductors (Chip Coils)	LQM/LQH Series	Voltage Conversion	p27
Chip Ferrite Beads	BLM Series	Noise Suppression	p22
3 Terminal Capacitors	NFM/NFE Series	Noise Suppression	p23
Microwave Absorbers	EA Series	Noise Suppression	p25
Ferrite Cores	FS Series	Noise Suppression	p25

Application Guides

Televisions

1 Tuner

Microchip Transformers (Baluns) DXP18B Series p48

Crystal Resonators XRCGB Series p33

Chip Inductors (Chip Coils) LQW Series p27

Trimmer Potentiometers PVZ2 Series p30

ESD Protection Devices LXES Series p74

2 Signal Processor

Polymer Aluminum Electrolytic Capacitors ECAS Series p19

Ceramic Resonators CERALOCK® CSTCE/CSTCR Series p33

Crystal Resonators XRCGB Series p33

3 Terminal Capacitors NFM Series p23

Thermistors PRF/NCP Series p59

Microblowers p71

3 Display Panel

Switching Power Supplies MPF/MPH Series p66

DC-DC Converters OKL Series p65

Metal Terminal Type Monolithic Ceramic Capacitors KRM Series p11

Polymer Aluminum Electrolytic Capacitors ECAS Series p19

Chip Common Mode Choke Coils DLW/DLP Series p24

Power Inductors LQH Series p27

Rotary Position Sensors SV Series p56

Trimmer Potentiometers PVZ2 Series p30

Thermistors PRF/NCP Series p59

4 Sound Circuit

Chip Common Mode Choke Coils DLW/DLP Series p24

5 HDD/DVD/BD

Shock Sensors PKGS Series p56

Polymer Aluminum Electrolytic Capacitors ECAS Series p19

Ceramic Resonators CERALOCK® CSTCE Series p33

Crystal Resonators XRCGB Series p33

Trimmer Potentiometers PVZ2 Series p30

Thermistors PRF/NCP Series p59

6 Interface

WirelessHD® Modules

11n Modules

Polymer Aluminum Electrolytic Capacitors
ECAS Series
p19

Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series
p33

Crystal Resonators
XRCGB Series
p33

Chip Common Mode Choke Coils
DLW/DLP Series
p24

ESD Protection Devices
LXES Series
p74

Thermistors
PRG Series
p61

7 Control Circuit

Bluetooth® Modules
p72

Pyroelectric Infrared Sensors
IRS Series
p56

Micro DC-DC Converters
LXDC Series

Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series
p33

8 Remote Controller/Connectivity

Bluetooth® Modules
p72

Wi-Fi™ Modules
p72

ZigBee® Modules

Bluetooth® Low Energy Modules
p72

Shock Sensors
PKGS Series
p56

Angular Rate Sensors
ENC Series
p56

VectorPad

Micro DC-DC Converters
LXDC Series

Wireless Power Transmission Modules
p73

Ceramic Resonators CERALOCK®
CSTCE/CSTCR Series
p33

Piezoelectric Sounders
PKM/PKLCS Series
p69

ESD Protection Devices
LXES Series
p74

9 DC-DC Converter

Micro DC-DC Converters
LXDC Series

Metal Terminal Type Monolithic Ceramic Capacitors
KRM Series
p11

Polymer Aluminum Electrolytic Capacitors
ECAS Series
p19

Power Inductors
LQH Series
p27

Thermistors
PRF/NCP Series
p59

10 Power Supply

Wireless Power Transmission Modules
p73

Monolithic Ceramic Capacitors for Medium Voltage
GR/GA Series
p3

Medium High Voltage Ceramic Capacitors
DEA/DES Series
p15

Safety Standard Certified Ceramic Capacitors
Type KX/KY
p17

Trimmer Potentiometers
PVG3 Series
p30

AC Line Filters
PLA/PLY Series
p25

Thermistors
PRF/PTG/NCP/NTP Series
p59

General Purpose

Monolithic Ceramic Capacitors	GRM Series	High Frequency Filter Circuit/Frequency Control	p3
Monolithic Ceramic Capacitors	GRM/GNM Series	Coupling/Decoupling	p3
Polymer Aluminum Electrolytic Capacitors	ECAS Series	Smoothing/Transient Backup	p19
Radial Lead Type Monolithic Ceramic Capacitors	RDE Series	Coupling/Decoupling	p14
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	High Frequency Circuit-Impedance Matching/Resonance	p27
Chip Inductors (Chip Coils)	LQM/LQH Series	Voltage Conversion	p27
Chip Ferrite Beads	BLM Series	Noise Suppression	p22
3 Terminal Capacitors	NFM/NFE Series	Noise Suppression	p23
Ferrite Cores	FS Series	Noise Suppression	p25
Thin Type Sandwich Cores	FSSA Series	Noise Suppression	p25

Application Guides

Automotive

Powertrain/Safety

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

1 ECU

LTCC (Low Temperature Co-fired Ceramics) Multilayer Substrates LFC® p72

Metal Terminal Type Monolithic Ceramic Capacitors KCM Series p14

Monolithic Ceramic Capacitors GCM/GCJ Series p12

Monolithic Ceramic Capacitors for Conductive Glue Mounting GCG Series

Radial Lead Type Monolithic Ceramic Capacitors RH Series p18

Ceramic Resonators CERALOCK® CSTCE/CSTCR Series p33

Thermistors PTG/PRF Series p59

2 AT

LTCC (Low Temperature Co-fired Ceramics) Multilayer Substrates LFC® p72

Metal Terminal Type Monolithic Ceramic Capacitors KCM Series p14

Ceramic Resonators CERALOCK® CSTCE/CSTCR Series p33

Thermistors PTG/PRF Series p59

3 Auxiliary Motors

LTCC (Low Temperature Co-fired Ceramics) Multilayer Substrates LFC® p72

Metal Terminal Type Monolithic Ceramic Capacitors KCM Series p14

Radial Lead Type Monolithic Ceramic Capacitors RH Series p18

Ceramic Resonators CERALOCK® CSTCE/CSTCR Series p33

Large Current Common Mode Choke Coils PLT10HH Series p24

Thermistors PTG/PRF Series p59

4 TPMS

SAW Filters SAFB Series

Ceramic Filters CERAFIL® SFECF Series p36

Ceramic Discriminators CDSCB Series p38

Ceramic Resonators CERALOCK® CSTCE/CSTCR Series p33

Piezoelectric Sounders PKLCS Series p69

Thermistors PRF Series p59

5 ABS/ESC

LTCC (Low Temperature Co-fired Ceramics) Multilayer Substrates LFC® p72

Metal Terminal Type Monolithic Ceramic Capacitors KCM Series p14

Monolithic Ceramic Capacitors GCM/GCJ Series p12

Monolithic Ceramic Capacitors for Conductive Glue Mounting GCG Series

Ceramic Resonators CERALOCK® CSTCE/CSTCR Series p33

Thermistors for Conductive Glue Mounting NCG18 Series

6 AFS

Monolithic Ceramic Capacitors GCM/GCJ Series p12

Monolithic Ceramic Capacitors for Conductive Glue Mounting GCG Series

Ceramic Resonators CERALOCK® CSTCE/CSTCR Series p33

Thermistors for Conductive Glue Mounting NCG18 Series

7 EPS

LTCC (Low Temperature Co-fired Ceramics) Multilayer Substrates LFC® p72

Metal Terminal Type Monolithic Ceramic Capacitors KCM Series p14

Monolithic Ceramic Capacitors GCM/GCJ Series p12

Monolithic Ceramic Capacitors for Conductive Glue Mounting GCG Series

Radial Lead Type Monolithic Ceramic Capacitors RPE Series p18

Ceramic Resonators CERALOCK® CSTCE/CSTCR Series p33

Thermistors for Conductive Glue Mounting NCG18 Series

Thermistors PTG/PRF Series p59

8 Fuel Injection System

Actuator for Fuel Injector

Radial Lead Type Monolithic Ceramic Capacitors RPF Series

HEV/PHEV/EV

1. Charger
2. BMS
3. Electrically-driven Compressor
4. Electric Pump
5. IPM/MG
6. DC-DC Converter

1 Charger

- Metal Terminal Type Monolithic Ceramic Capacitors KCM Series — p14
- Monolithic Ceramic Capacitors GCM/GCJ Series — p12
- Safety Standard Certified Ceramic Capacitors Type KJ — p18
- Ceramic Resonators CERALOCK® CSTCE Series — p33
- Large Current Common Mode Choke Coils PLT10HH Series — p24
- Thermistors PTG/PRF Series — p59

2 BMS

- Metal Terminal Type Monolithic Ceramic Capacitors KCM Series — p14
- Monolithic Ceramic Capacitors GCM/GCJ Series — p12
- Monolithic Ceramic Capacitors for Conductive Glue Mounting GCG Series
- Ceramic Resonators CERALOCK® CSTCE Series — p33
- Thermistors PTG/PRF Series — p59

3 Electrically-driven Compressor

- Metal Terminal Type Monolithic Ceramic Capacitors KCM Series — p14
- Monolithic Ceramic Capacitors GCM/GCJ Series — p12
- Monolithic Ceramic Capacitors for Conductive Glue Mounting GCG Series
- Thermistors PTG/PRF Series — p59

4 Electric Pump

- Metal Terminal Type Monolithic Ceramic Capacitors KCM Series — p14
- Monolithic Ceramic Capacitors GCM/GCJ Series — p12
- Monolithic Ceramic Capacitors for Conductive Glue Mounting GCG Series
- Large Current Common Mode Choke Coils PLT10HH Series — p24
- Thermistors PTG/PRF Series — p59

5 IPM/MG

- Monolithic Ceramic Capacitors for High Power Applications EVC Series
- Metal Terminal Type Monolithic Ceramic Capacitors KCM Series — p14
- Monolithic Ceramic Capacitors GCM/GCJ Series — p12
- Monolithic Ceramic Capacitors for Conductive Glue Mounting GCG Series
- Radial Lead Type Monolithic Ceramic Capacitors RH Series — p18
- Large Current Common Mode Choke Coils PLT10HH Series — p24
- Thermistors PTG/PRF Series — p59

6 DC-DC Converter

- Monolithic Ceramic Capacitors for High Power Applications EVC Series
- Metal Terminal Type Monolithic Ceramic Capacitors KCM Series — p14
- Monolithic Ceramic Capacitors GCM/GCJ Series — p12
- Monolithic Ceramic Capacitors for Conductive Glue Mounting GCG Series
- Large Current Common Mode Choke Coils PLT10HH Series — p24
- Thermistors PTG/PRF Series — p59

High Reliability

Monolithic Ceramic Capacitors	GCM Series	Coupling/Decoupling	150°c	p12
Radial Lead Type Monolithic Ceramic Capacitors	RPE Series	Noise Suppression/Decoupling	125°c	p18
Radial Lead Type Monolithic Ceramic Capacitors	RH Series	Noise Suppression/Decoupling	150°c	p18
Chip Inductors (Chip Coils)	LQH32CH Series	Voltage Conversion	105°c	p28
Chip Inductors (Chip Coils)	LQG15HH Series	Impedance Matching/Choke	125°c	p28
Chip Ferrite Beads	BLM_SH Series	Noise Suppression	125°c	p22
3 Terminal Capacitors	NFM_H/NFE_H Series	Noise Suppression	125°c	p23
Chip Common Mode Choke Coils	DLW31SH/DLW43SH Series	Common Mode Noise Suppression	125°c	p24

http://www.murata.com/products/apps/auto/hev.html

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

Information/Comfort/Accessory

1. Navigation/PND
2. RKE
3. ETC/DSRC
4. Power Seat/ Power Mirror
5. Parking Assist

1 Navigation/PND

- Angular Rate Sensors MEV Series — p56
- Rotary Position Sensors SV Series — p56
- Ceramic Filters CERAFIL® SFECF Series — p36
- Ceramic Discriminators CDSCB Series — p38
- Piezoelectric Sounders PKLCS Series — p69
- Bluetooth® Modules — p72
- Wi-Fi™ Modules — p72
- DC-DC Converters — p65
- Ceramic Resonators CERALOCK® CSTCE/CSTCR Series — p33
- Trimmer Potentiometers PV Series — p30
- Thermistors PRG/PTG/PRF Series — p59

2 RKE

- SAW Filters SAFB Series
- Ceramic Filters CERAFIL® SFECF Series — p36
- Ceramic Discriminators CDSCB Series — p38
- SAW Resonators SARB Series
- Trimmer Capacitors TZY2 Series — p20
- Ceramic Resonators CERALOCK® CSTCE/CSTCR Series — p33
- Trimmer Potentiometers PVM4 Series — p30

3 ETC/DSRC

- Piezoelectric Sounders PKLCS Series — p69
- Ceramic Resonators CERALOCK® CSTCE/CSTCR Series — p33
- Trimmer Potentiometers PV Series — p30
- Thermistors PTG/PRF Series — p59

4 Power Seat/Power Mirror

- Piezoelectric Sounders PKLCS Series — p69
- Ceramic Resonators CERALOCK® CSTCE/CSTCR Series — p33
- Thermistors PTG/PRF Series — p59

5 Parking Assist

- Ultrasonic Sensors MA Series — p56
- Piezoelectric Sounders PKLCS Series — p69
- Ceramic Resonators CERALOCK® CSTCE/CSTCR Series — p33
- Trimmer Potentiometers PV Series — p30
- Thermistors PTG/PRF Series — p59

General Purpose

Monolithic Ceramic Capacitors	GRM Series	Coupling/Decoupling	p3
Monolithic Ceramic Capacitors for Medium Voltage	GRM Series	For Snubber	p3
Radial Lead Type Monolithic Ceramic Capacitors	RPE Series	Noise Suppression/Decoupling	p14
Chip Inductors (Chip Coils)	LQW/LQP/LQG Series	Voltage Conversion	p27
Chip Ferrite Beads	BLM Series	Noise Suppression	p22
EMI Suppression Filters EMIFIL®	NFM/NFA/NFL/NFE/NFW/NFR Series	Noise Suppression	p23
Chip Common Mode Choke Coils	DLW Series	Common Mode Noise Suppression	p24
Ferrite Cores	FS Series	Noise Suppression	p25

Application Guides

Refrigerator

1 Sensor

Pyroelectric Infrared Sensors IRS Series p56

Thermistors PRF/NCP/NXFT Series p59

2 Ionizer

Ionizer Modules Ionissimo® MHM Series p73

High Voltage Resistors MHR Series p31

3 CPU

Ceramic Resonators CERALOCK® CSTLS/CSTCE/CSTCR Series p33

4 Display Panel/Buzzer

Ceramic Resonators CERALOCK® CSTLS/CSTCE/CSTCR Series p33

Piezoelectric Sounders PKM/PKLCS Series p69

5 Door Detection

Magnetic Switches AS Series p56

6 Inverter/Motor Driver

Thermistors PRF/NCP/NXFT Series p59

7 Power Supply

Monolithic Ceramic Capacitors for Medium Voltage GR/GA Series p3

Medium High Voltage Ceramic Capacitors DEA/DES Series p15

Safety Standard Certified Ceramic Capacitors Type KX/KY p17

Trimmer Potentiometers PVG3 Series p30

Thermistors PTG/NTP Series p60

General Purpose

Monolithic Ceramic Capacitors	GRM/GJM Series	Coupling/Decoupling/For Snubber	p3
Monolithic Ceramic Capacitors for Medium Voltage	GR/GA Series	Coupling/Decoupling	p3
Polymer Aluminum Electrolytic Capacitors	ECAS Series	Smoothing/Transient Backup	p19
Radial Lead Type Monolithic Ceramic Capacitors	RDE Series	Coupling/Decoupling	p14
Chip Inductors (Chip Coils)	LQM/LQH Series	Voltage Conversion	p27
Chip Ferrite Beads	BLM Series	Noise Suppression	p22
3 Terminal Capacitors	NFM/NFE Series	Noise Suppression	p23
Chip Common Mode Choke Coils	DLW/DLP Series	Noise Suppression	p24
Ferrite Cores	FS Series	Noise Suppression	p25

Application Guides
Air Conditioner

1 Sensor

Pyroelectric Infrared Sensors
IRS Series

p56

Ultrasonic Sensors
MA Series

p56

Thermistors
PRF/NCP/NXFT Series

p59

2 Ionizer

Ionizer Modules Ionissimo®
MHM Series

p73

High Voltage Resistors
MHR Series

p31

3 CPU

Ceramic Resonators CERALOCK®
CSTLS/CSTCE/CSTCR Series

p33

4 Display Panel/Buzzer

Ceramic Resonators CERALOCK®
CSTLS/CSTCE/CSTCR Series

p33

Piezoelectric Sounders
PKM/PKLCS Series

p69

5 Flap/Louver/Automatic Cleaner

Rotary Position Sensors
SV Series

p56

6 Motor Driver

Thermistors
PRF/NCP/NXFT Series

p59

7 Power Supply

Monolithic Ceramic Capacitors
for Medium Voltage
GR/GA Series

p3

Medium High Voltage Ceramic Capacitors
DEA/DES Series

p15

Safety Standard Certified Ceramic Capacitors
Type KX/KY

p17

Trimmer Potentiometers
PVG3 Series

p30

Thermistors
PTG/NTP Series

p60

8 Remote Controller/Connectivity

Bluetooth® Modules p72

Wi-Fi™ Modules p72

ZigBee® Modules

Chip Multilayer Antennas
LDA Series p46

Chip Dielectric Antennas
ANC Series p46

Coaxial Connectors p50

Micro DC-DC Converters
LXDC Series

Ceramic Resonators CERALOCK®
CSTLS/CSTCE/CSTCR Series p33

9 Inverter/Motor Driver

Trimmer Potentiometers
PVG3 Series p30

Thermistors
PRF/NCP/NXFT Series p59

General Purpose

Monolithic Ceramic Capacitors	GRM/GJM Series	Coupling/Decoupling/For Snubber		p3
Monolithic Ceramic Capacitors for Medium Voltage	GR/GA Series	Coupling/Decoupling		p3
Polymer Aluminum Electrolytic Capacitors	ECAS Series	Smoothing/Transient Backup		p19
Radial Lead Type Monolithic Ceramic Capacitors	RDE Series	Coupling/Decoupling		p14
Chip Inductors (Chip Coils)	LQM/LQH Series	Voltage Conversion		p27
Chip Ferrite Beads	BLM Series	Noise Suppression		p22
3 Terminal Capacitors	NFM/NFE Series	Noise Suppression		p23
Chip Common Mode Choke Coils	DLW/DLP Series	Noise Suppression		p24
Ferrite Cores	FS Series	Noise Suppression		p25

Application Guides

Washing Machine

1 Sensor

Thermistors PRF/NCP/NXFT Series p59

2 Laundry Detergent/Rinse Pump

Microblowers p71

3 CPU

Ceramic Resonators CERALOCK® CSTLS/CSTCE/CSTCR Series p33

5 Door Lock

Rotary Position Sensors SV Series p56

Magnetic Switches AS Series p56

4 Display Panel/Buzzer

Rotary Position Sensors SV Series p56

Ceramic Resonators CERALOCK® CSTLS/CSTCE/CSTCR Series p33

Piezoelectric Sounders PKM Series p69

6 Inverter/Motor Driver

Trimmer Potentiometers PVG3 Series p30

Thermistors PRF/NCP/NXFT Series p59

7 Power Supply

Monolithic Ceramic Capacitors for Medium Voltage GR/GA Series p3

Medium High Voltage Ceramic Capacitors DEA/DES Series p15

Safety Standard Certified Ceramic Capacitors Type KX/KY p17

Trimmer Potentiometers PVG3 Series p30

Thermistors PTG/NTP Series p60

General Purpose

Monolithic Ceramic Capacitors	GRM/GJM Series	Coupling/Decoupling/For Snubber	p3
Monolithic Ceramic Capacitors for Medium Voltage	GR/GA Series	Coupling/Decoupling	p3
Polymer Aluminum Electrolytic Capacitors	ECAS Series	Smoothing/Transient Backup	p19
Radial Lead Type Monolithic Ceramic Capacitors	RDE Series	Coupling/Decoupling	p14
Chip Inductors (Chip Coils)	LQM/LQH Series	Voltage Conversion	p27
Chip Ferrite Beads	BLM Series	Noise Suppression	p22
3 Terminal Capacitors	NFM/NFE Series	Noise Suppression	p23
Chip Common Mode Choke Coils	DLW/DLP Series	Noise Suppression	p24
Ferrite Cores	FS Series	Noise Suppression	p25

Application Guides

Air Purifier

1 Sensor

Pyroelectric Infrared Sensors
IRS Series

p56

Ultrasonic Sensors
MA Series

p56

Thermistors
PRF/NCP/NXFT Series

p59

2 Ionizer

Ionizer Modules Ionissimo®
MHM Series

p73

High Voltage Resistors
MHR Series

p31

3 CPU

Micro DC-DC Converters
LXDC Series

Ceramic Resonators CERALOCK®
CSTLS/CSTCE/CSTCR Series

p33

4 Display Panel/Buzzer

Ceramic Resonators CERALOCK®
CSTLS/CSTCE/CSTCR Series

p33

Piezoelectric Sounders
PKM/PKLCS Series

p69

5 Flap/Louver

Rotary Position Sensors
SV Series

p56

6 Inverter/Motor Driver

Trimmer Potentiometers
PVG3 Series

p30

Thermistors
PRF/NCP/NXFT Series

p59

7 Power Supply

Monolithic Ceramic Capacitors
for Medium Voltage
GR/GA Series

p3

Medium High Voltage
Ceramic Capacitors
DEA/DES Series

p15

Safety Standard Certified
Ceramic Capacitors
Type KX/KY

p17

Trimmer Potentiometers
PVG3 Series

p30

AC Line Filters
PLA/PLY Series

p25

Thermistors
PTG/NTP Series

p60

8 Remote Controller

Micro DC-DC Converters
LXDC Series

Ceramic Resonators CERALOCK®
CSTLS/CSTCE/CSTCR Series

p33

General Purpose

Monolithic Ceramic Capacitors	GRM/GJM Series	Coupling/Decoupling/For Snubber		p3
Monolithic Ceramic Capacitors for Medium Voltage	GR/GA Series	Coupling/Decoupling		p3
Polymer Aluminum Electrolytic Capacitors	ECAS Series	Smoothing/Transient Backup		p19
Radial Lead Type Monolithic Ceramic Capacitors	RDE Series	Coupling/Decoupling		p14
Chip Inductors (Chip Coils)	LQM/LQH Series	Voltage Conversion		p27
Chip Ferrite Beads	BLM Series	Noise Suppression		p22
3 Terminal Capacitors	NFM/NFE Series	Noise Suppression		p23
Chip Common Mode Choke Coils	DLW/DLP Series	Noise Suppression		p24
Ferrite Cores	FS Series	Noise Suppression		p25

http://www.murata.com/products/apps/whitegoods/purifier.html

Application Guides

Microwave Oven

1 Sensor

Thermistors
PRF/NCP/NXFT Series

p59

2 Steam Pump

Microblowers

p71

3 CPU

Ceramic Resonators CERALOCK®
CSTLS/CSTCE/CSTCR Series

p33

5 Motor Driver

Thermistors
PRF/NCP/NXFT Series

p59

4 Display Panel/Buzzer

Ceramic Resonators CERALOCK®
CSTLS/CSTCE/CSTCR Series

p33

Piezoelectric Sounders
PKM/PKLCS Series

p69

6 Power Supply

Monolithic Ceramic Capacitors
for Medium Voltage
GR/GA Series

p3

Medium High Voltage
Ceramic Capacitors
DEA/DES Series

p15

Safety Standard Certified
Ceramic Capacitors
Type KX/KY

p17

Trimmer Potentiometers
PVG3 Series

p30

Thermistors
PTG/NTP Series

p60

General Purpose

Monolithic Ceramic Capacitors	GRM/GJM Series	Coupling/Decoupling/For Snubber		p3
Monolithic Ceramic Capacitors for Medium Voltage	GR/GA Series	Coupling/Decoupling		p3
Polymer Aluminum Electrolytic Capacitors	ECAS Series	Smoothing/Transient Backup		p19
Radial Lead Type Monolithic Ceramic Capacitors	RDE Series	Coupling/Decoupling		p14
Chip Inductors (Chip Coils)	LQM/LQH Series	Voltage Conversion		p27
Chip Ferrite Beads	BLM Series	Noise Suppression		p22
3 Terminal Capacitors	NFM/NFE Series	Noise Suppression		p23
Chip Common Mode Choke Coils	DLW/DLP Series	Noise Suppression		p24
Ferrite Cores	FS Series	Noise Suppression		p25

Application Guides

IH Rice Cooker

1 Sensor

Thermistors
PRF/NCP/NXFT Series

p59

2 CPU

Ceramic Resonators CERALOCK®
CSTLS/CSTCE/CSTCR Series

p33

3 Display Panel/Buzzer

Ceramic Resonators CERALOCK®
CSTLS/CSTCE/CSTCR Series

p33

Piezoelectric Sounders
PKM/PKLCS Series

p69

4 Motor Driver

Thermistors
PRF/NCP/NXFT Series

p59

5 Power Supply

Monolithic Ceramic Capacitors
for Medium Voltage
GR/GA Series

p3

Medium High Voltage Ceramic Capacitors
DEA/DES Series

p15

Safety Standard Certified
Ceramic Capacitors
Type KX/KY

p17

Trimmer Potentiometers
PVG3 Series

p30

Thermistors
PTG/NTP Series

p60

General Purpose

Monolithic Ceramic Capacitors	GRM/GJM Series	Coupling/Decoupling/For Snubber		p3
Monolithic Ceramic Capacitors for Medium Voltage	GR/GA Series	Coupling/Decoupling		p3
Polymer Aluminum Electrolytic Capacitors	ECAS Series	Smoothing/Transient Backup		p19
Radial Lead Type Monolithic Ceramic Capacitors	RDE Series	Coupling/Decoupling		p14
Chip Inductors (Chip Coils)	LQM/LQH Series	Voltage Conversion		p27
Chip Ferrite Beads	BLM Series	Noise Suppression		p22
3 Terminal Capacitors	NFM/NFE Series	Noise Suppression		p23
Chip Common Mode Choke Coils	DLW/DLP Series	Noise Suppression		p24
Ferrite Cores	FS Series	Noise Suppression		p25

Application Guides

Vacuum Cleaner

1 Ionizer

Ionizer Modules Ionissimo® MHM Series

p73

High Voltage Resistors MHR Series

p31

2 CPU

Ceramic Resonators CERALOCK® CSTLS/CSTCE/CSTCR Series

p33

3 Display Panel/Buzzer

Ceramic Resonators CERALOCK® CSTLS/CSTCE/CSTCR Series

p33

Piezoelectric Sounders PKM/PKLCS Series

p69

4 Door Detection

Magnetic Switches AS Series

p56

5 Motor Driver

Thermistors PRF/NCP/NXFT Series

p59

6 Power Supply

Monolithic Ceramic Capacitors for Medium Voltage GR/GA Series

p3

Medium High Voltage Ceramic Capacitors DEA/DES Series

p15

Safety Standard Certified Ceramic Capacitors Type KX/KY

p17

Trimmer Potentiometers PVG3 Series

p30

Thermistors PTG/NTP Series

p60

General Purpose

Monolithic Ceramic Capacitors	GRM/GJM Series	Coupling/Decoupling/For Snubber		p3
Monolithic Ceramic Capacitors for Medium Voltage	GR/GA Series	Coupling/Decoupling		p3
Polymer Aluminum Electrolytic Capacitors	ECAS Series	Smoothing/Transient Backup		p19
Radial Lead Type Monolithic Ceramic Capacitors	RDE Series	Coupling/Decoupling		p14
Chip Inductors (Chip Coils)	LQM/LQH Series	Voltage Conversion		p27
Chip Ferrite Beads	BLM Series	Noise Suppression		p22
3 Terminal Capacitors	NFM/NFE Series	Noise Suppression		p23
Chip Common Mode Choke Coils	DLW/DLP Series	Noise Suppression		p24
Ferrite Cores	FS Series	Noise Suppression		p25

Memo

Index

A

AN	Antennas	46
AS	Magnetic Switches (AMR Sensors)	56
AWG	LTCC (Low Temperature Co-fired Ceramics) Multilayer Substrates	72

B

BL	Noise Suppression Filters (Chip Ferrite Bead)	22
BL	Noise Suppression Filters (Lead Type)	25
BNX	Noise Suppression Filters (Block Type)	24
BS	Magnetic Pattern Recognition Sensors	56

C

CD	Ceramic Discriminators	38, 43
CE	Isolators	47
CF	Ceramic Filters CERAFIL®	37, 42
CL	Single Layer Microchip Capacitors	51
CS	Ceramic Resonators CERALOCK®	33

D

DE	Lead Type Ceramic Capacitors	15, 18
DF	Dielectric Filters GIGAFIL®	41
DH	High Voltage Ceramic Capacitors	19
DL	Noise Suppression Filters (Chip Common Mode Choke Coil)	24
DS	Noise Suppression Filters (Lead Type)	25
DXP	Baluns	48
DXP	Couplers	49
DXW	Baluns	48

E

EA	Microwave Absorbers	25
ECAS	Polymer Aluminum Electrolytic Capacitors	19
EN	Angular Rate Sensors (ENC Series)	56

F

FR	Rotary Sensors	56
FS	Ferrite Core	25

G

GA	Chip Monolithic Ceramic Capacitors	10
GC	Chip Monolithic Ceramic Capacitors	12
GJ	Chip Monolithic Ceramic Capacitors	8
GM	Chip Monolithic Ceramic Capacitors	9
GN	Chip Monolithic Ceramic Capacitors	6
GQ	Chip Monolithic Ceramic Capacitors	8
GR	Chip Monolithic Ceramic Capacitors	3, 9

I

IR	Pyroelectric Infrared Sensors	56

K

KC	Chip Monolithic Ceramic Capacitors	14
KR	Chip Monolithic Ceramic Capacitors	11

L

LDA	Antennas	46
LDB	Baluns	48
LDC	Couplers	48
LDD	Chip Multilayer Hybrid Dividers	49
LDM	Baluns	48
LF	Chip Multilayer LC Filters	41
LFC	LTCC (Low Temperature Co-fired Ceramics) Multilayer Substrates	72
LFD	Chip Multilayer Diplexers	49
LL	Chip Monolithic Ceramic Capacitors	6
LQ	Inductors (Coils)	27
LXES	ESD Protection Devices	74
LXMS	MAGICSTRAP®	74

Index

LXWS Wireless Power Transmission Modules — 73

M

MA Ultrasonic Sensors — 56
ME Angular Rate Sensors (MEV Series) — 56
MHM Ionizer Modules Ionissimo® — 73
MHR High Voltage Resistors — 31
MM High Frequency Coaxial Connectors (Receptacle) — 50
MPH High Voltage Power Supplies — 67
MPL High Voltage Power Supplies — 67
MPD DC-DC Converters — 65
MX High Frequency Coaxial Connectors (Cable) — 50
MY DC-DC Converters — 65
MZB Microblowers — 71

N

NC NTC Thermistors — 56, 59
NF Noise Suppression Filters (Chip 3 Terminal Capacitor), (Chip LC/RC Filter) — 23
NT NTC Thermistors — 60
NX NTC Thermistors — 56, 59

O

OK DC-DC Converters — 65

P

PAL Piezoelectric Actuators — 71
PKG Shock Sensors — 56
PKB Piezoelectric Buzzers — 70
PKL Piezoelectric Sounders — 69
PKM Piezoelectric Sounders — 69
PLA AC Line Filters — 25
PLH AC Line Filters — 25
PLT Noise Suppression Filters (Chip Common Mode Choke Coil) — 24, 25
PLY AC Line Filters — 25
PR PTC Thermistors POSISTOR® — 56, 60
PT PTC Thermistors POSISTOR® — 56, 61
PV Trimmer Potentiometers — 30

R

RD Lead Type Ceramic Capacitors — 14
RH Lead Type Ceramic Capacitors — 18
RP Lead Type Ceramic Capacitors — 14, 18
RU Thin Film Circuit Substrate RUSUB® — 53

S

SAE SAW Traps — 38
SAF SAW Filters for Mobile Communications — 40
SAW SAW Filters for Mobile Communications — 40
SAY SAW Filters for Mobile Communications — 40
SF Ceramic Filters CERAFIL® — 36, 42
SV Rotary Position Sensors — 56

T

TP Ceramic Traps — 38
TZ Trimmer Capacitors — 20

V

VF EMIGUARD® — 25

X

XR Crystal Resonators — 33

7BB Piezoelectric Diaphragms — 70

Website http://www.murata.com/products/

For detailed information regarding products, please visit the "Products" page on the Murata website. The "Products" page is full of valuable information.

Using the keyword search function, you can search every page of the Murata website.

Murata's RoHS compliance is clarified.

Please make any inquiries using the "Contact Us" form.

It contains information updates regarding both new product news and new product content.

You can search for product information using various search functions. In particular, the capacitor search function is covered extensively.

The product information listed on the website is organized into different product categories. The wealth of information ranges in complexity from basic product knowledge through technical information.

You can find Murata's products and technologies by choosing the application (mobile phones, PCs, televisions, automotive, white goods, RF).

The website offers a wide variety of information, covering different technologies, such as PDF catalogs, design tools, product information etc.

muRata
Innovator in Electronics

Design Support Software
SimSurfing

SimSurfing is the latest tool to get the electrical characteristics for Power Inductor or RF Inductor on the internet !

You can easily search and download the following data for Inductor with no special software.

- Product search
- View frequency characteristics S_{11}, S_{21}, S_{12}, S_{22} (X-Y / Smith chart) Z/R/X/Y/G/B/L/Q/C/DF

Capacitor
- · DC bias characteristics (Absolute cap / change ratio)
- · Temperature characteristics (Absolute cap / change ratio)
- · Ripple exothermic characteristic (Absolute cap / change ratio)
- · AC voltage characteristics (Absolute cap / change ratio)

Inductor
- · DC bias characteristics (L-DC current @ each temp.)
- · Temperature characteristics of Inductance (L-Temperature @ each bias current)
- · Temperature characteristics of DC resistance (DCR-Temp.)
- · Magnetic loss

- Download SPICE Netlist / S-parameter

1 Select the Products

(1) By part number
(2) By performance

2 Show graph

Click each button in <Graph Output> area.

3 Data download

Click each button in <Data Download> area.

These images are captured at November/2011. Be sure that this software will be updated frequently.

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

⚠ 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 January 2012. 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. This catalog has only typical specifications because there is no space for detailed specifications. Therefore, please approve our product specifications or transact the approval sheet for product specifications before ordering. Especially, please read rating and ⚠CAUTION (for storage, operating, rating, soldering, mounting and handling) in them to prevent smoking and/or burning, etc.
5. You are able to read a detailed specification in the website of Search Engine (http://search.murata.co.jp/) or catalog library (http://www.murata.com/products/catalog/) before to require our product specification or to transact the approval sheet for product specification.
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.

http://www.murata.com/

Head Office
1-10-1, Higashi Kotari, Nagaokakyo-shi, Kyoto 617-8555, Japan
Phone: 81-75-951-9111

International Division
3-29-12, Shibuya, Shibuya-ku, Tokyo 150-0002, Japan
Phone: 81-3-5469-6123 Fax: 81-3-5469-6155 E-mail: intl@murata.co.jp

Cat. No. K70E