

**2004**  
**MURATA PRODUCT**  
**Selection Guides**



*Innovator in Electronics*



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No one makes more multilayer ceramic capacitors than Murata, and no one makes them smaller! We span the field from chips you can hardly see to high power capacitors you can hardly lift.

Our chip types are progressively replacing other dielectrics, especially plastic film and tantalum. Why? Because they are smaller, more reliable, more versatile and more available.

As a materials house, Murata has the advantage of making the dielectrics for these capacitors right from the mined materials up. This gives us an unusually high level of control and expertise.

Catalog No.

## Chip Monolithic Ceramic Capacitors

C02E

- For Flow/Reflow Soldering GRM15/18/21/31 Series
- For Reflow Soldering GRM32/43/55 Series
- Ultra Small GRM03 Series
- Thin Capacitors (Flow/Reflow)
- Thin Layer Large Capacitance Type
- Low Dissipation
- Microchips
- Capacitor Arrays
- For Ultrasonic Sensors
- Low ESL
- High Frequency for Flow/Reflow Soldering
- High-Q & High Power
- High Frequency
- Medium Voltage Low Dissipation Factor
- Medium Voltage High Capacitance for General-use
- Medium Voltage Only for Telecommunication Devices
- AC250V (r. m. s.) Type
- Safety Standard Recognized GC (UL, IEC60384-14 Class X1/Y2)
- Safety Standard Recognized GD (IEC60384-14 Class Y3)
- Safety Standard Recognized GF (IEC60384-14 Class Y2, X1/Y2)
- Safety Standard Recognized GB (IEC60384-14 Class X2)



## Monolithic Ceramic Capacitor Leaded Type

C49E

## Safety Recognized Ceramic Capacitor

C80E

## High Voltage Ceramic Capacitor DC250V-6.3kV

C84E

## High Voltage Ceramic Capacitor DC10-40kV

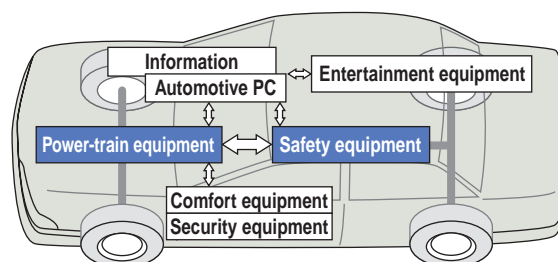
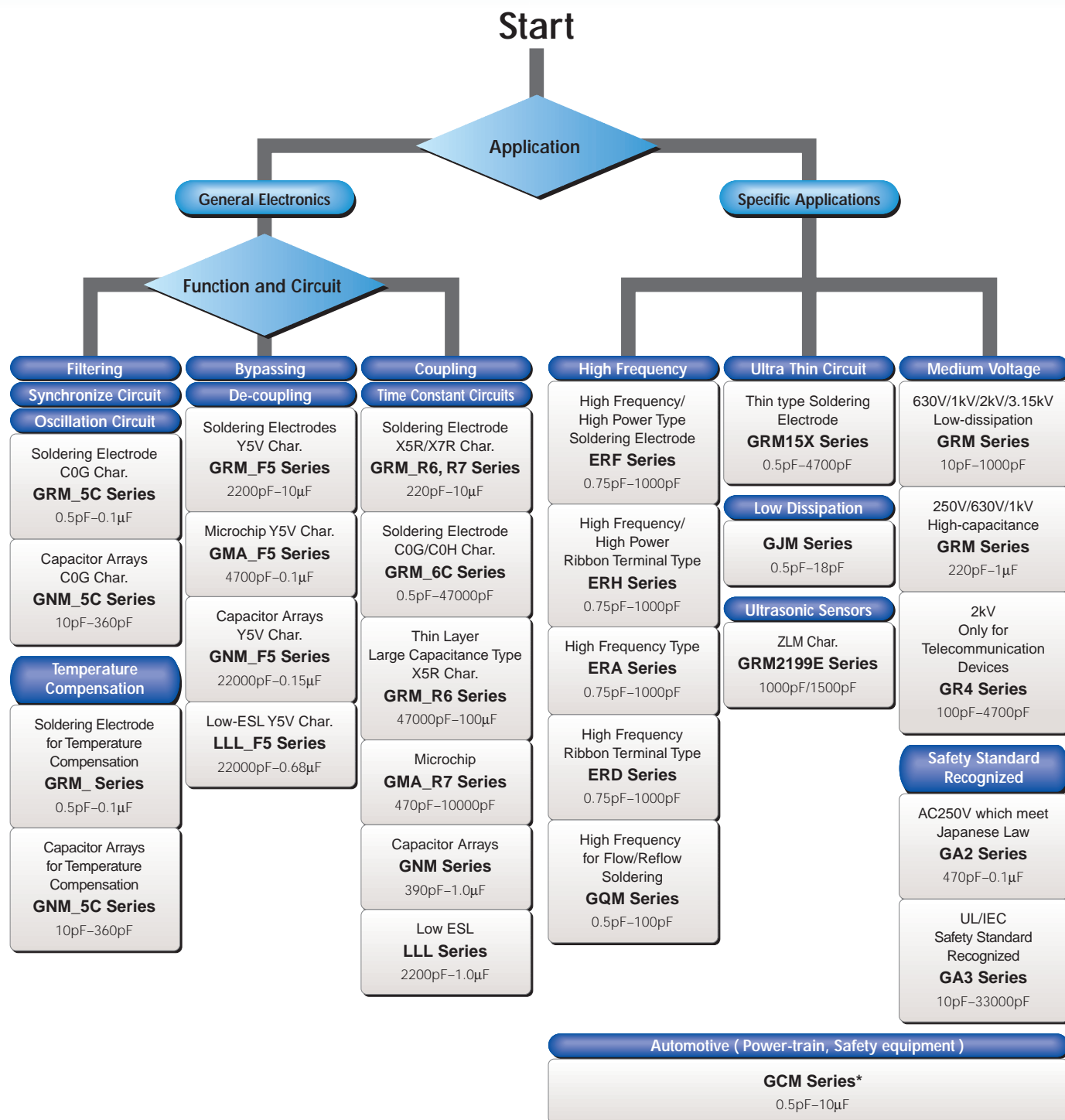
C41E

## Trimmer Capacitors

T13E

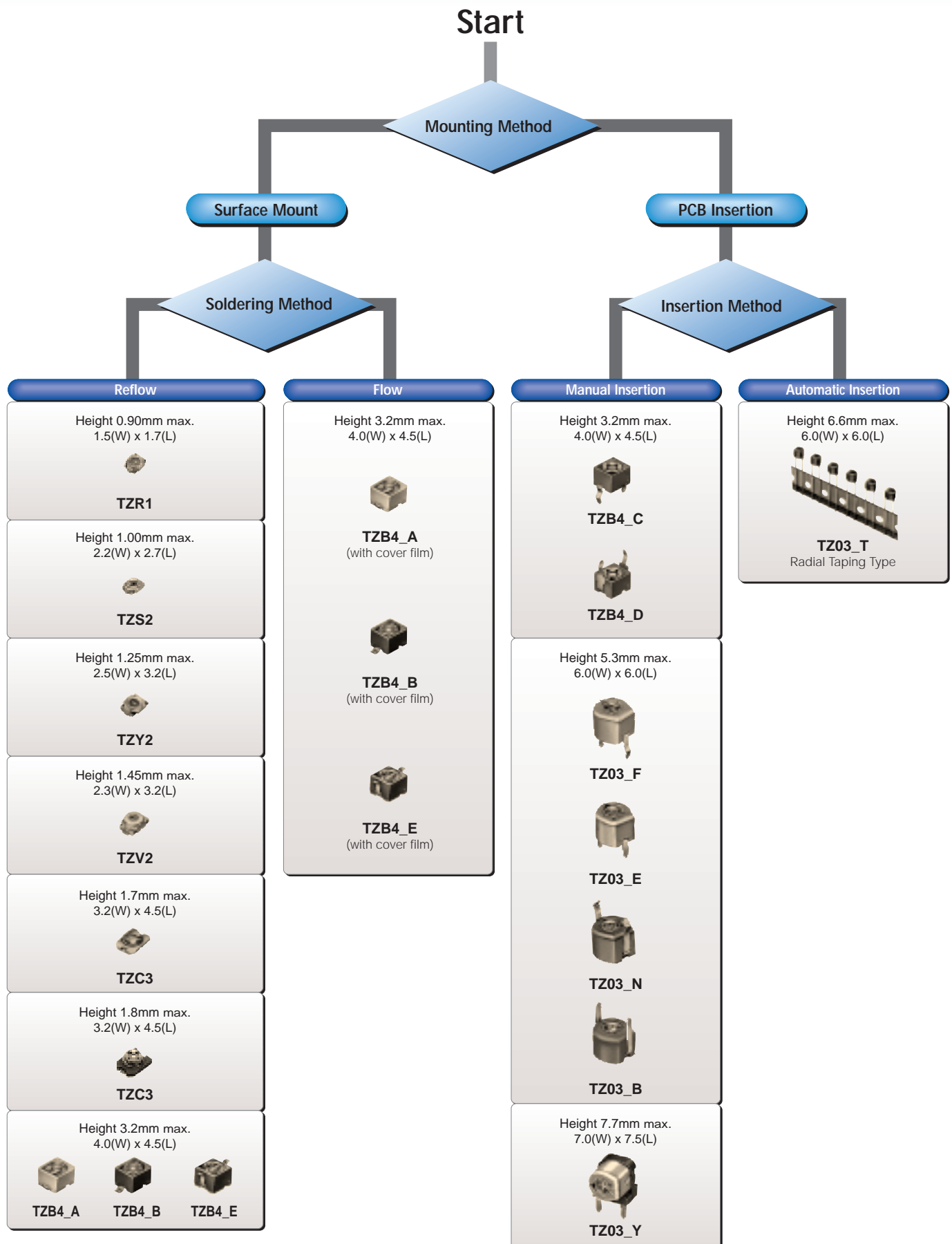
## C Networks

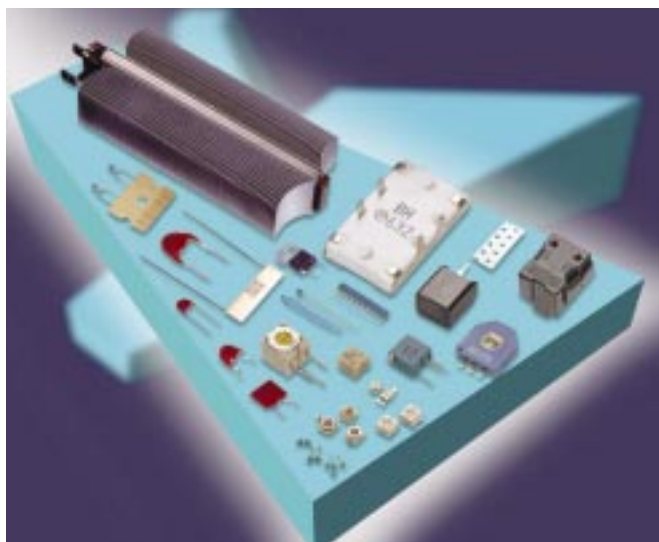




★For other automotive equipment such as comfort, security, information, entertainment, GRM series (for general electronics) are available.

	Series	Dimensions (mm)	Capacitance Range (F)									
			0.1p	1p	10p	100p	1000p	0.01μ	0.1μ	1μ	10μ	100μ
Ultra-miniature For General Electronics Equipment	GRM03	0.6X0.3		1pF				0.01μF				
	GRM15	1.0X0.5	0.5pF					0.1μF				
	GRM18	1.6X0.8	0.5pF						1μF			
	GRM21	2.0X1.25			12pF					4.7μF		
	GRM31	3.2X1.6	1pF							10μF		
	GRM32	3.2X2.5				560pF				10μF		
	GRM43	4.5X3.2				1200pF				4.7μF		
	GRM55	5.7X5.0				3300pF				4.7μF		
Thin Layer Large-capacitance	GRM03	0.6X0.3						0.015μF	0.1μF			
	GRM15	1.0X0.5						0.15μF	1μF			
	GRM18	1.6X0.8						0.47μF	4.7μF			
	GRM21	2.0X1.25						1μF	22μF			
	GRM31	3.2X1.6						2.2μF	47μF			
	GRM32	3.2X2.5								22μF	100μF	
	GRM43	4.5X3.2								22μF	100μF	
Low-dissipation	GJM03	0.6X0.3	0.5pF	6pF								
	GJM15	1.0X0.5	0.5pF	18pF								
Medium Voltage	GRM (Low Dissipation)	3.2X1.6–4.5X3.2	Rated Voltage DC630V			100pF	1000pF					
			DC1kV			47pF	470pF					
			DC2kV		10pF		220pF					
			DC3.15kV		10pF		100pF					
AC250V	GRM (High-Capacitance)	1.6X0.8–5.7X5.0	DC250V			220pF			1μF			
			DC630V				1000pF		0.22μF			
			DC1kV				1000pF		0.1μF			
	GR4	4.5X2.0–4.5X3.2	DC2kV			100pF	4700pF					
	GA2	4.5X2.0–5.7X5.0	AC250V				470pF		0.1μF			
Safety Standard Recognition	GA3 (Type GC)	5.7X5.0	Class / Rated Voltage X1,Y2/AC250V			100pF	330pF					
	GA3 (Type GD)	4.5X2.0–4.5X3.2	Y3/AC250V		10pF		4700pF					
	GA3 (Type GF)	4.5X2.0–5.7X5.0	Y2/AC250V		10pF		330pF					
	GA3 (Type GB)	5.7X5.0	X1,Y2/AC250V				470pF		4700pF			
High Frequency Series	GQM18	1.6X0.8	X2/AC250V					0.01μF	0.033μF			
	GQM21	2.0X1.25		0.5pF		100pF						
	GQM32	3.2X2.5		0.5pF		100pF						
	ERA11	1.25X1.0		0.5pF		51pF						
	ERA21	2.0X1.25		0.5pF		160pF						
	ERA32	3.2X2.5		0.5pF		1000pF						
	ERF1D	1.4X1.4		0.5pF		100pF						
	ERF22	2.8X2.8		0.5pF		1000pF						
	ERD32	4.0X3.0		0.5pF		1000pF						
	ERH1X	1.6X1.4		0.5pF		100pF						
	ERH3X	3.2X2.8		0.5pF		1000pF						
For Ultrasonic Sensors	GRM21	2.0X1.25				1000pF	1500pF					
Micro Chip	GMA05	0.5X0.5				470pF		0.01μF				
	GMA08	0.8X0.8						0.01μF	0.1μF			
Array	GNM1M	1.37X1.0			10pF			0.1μF				
	GNM21	2.0X1.25				1000pF		0.1μF				
	GNM31	3.2X1.6			10pF			0.15μF				
Wide, Low ESL	LLL18	0.8X1.6					2200pF		0.12μF			
	LLL21	1.25X2.0					4700pF		0.56μF			
	LLL31	1.6X3.2					0.01μF		2.2μF			
Smoothing	GJ221	2.0X1.25								10μF		
	GJ231	3.2X1.6								22μF		
	GJ232	3.2X2.5							1μF	47μF		
	GJ243	4.5X3.2								10μF	100μF	





Resistive products may not seem compatible with those of a ceramic technology house like Murata, but PTCs and NTCs are in the semiconductor range of ceramic products. High voltage resistors, resistor networks and trimmer potentiometers utilise materials and processes that Murata uses extensively on other products.

Murata helped to establish PTCs with fast switching times and self resetting capabilities making them ideal for circuit protection. Murata was among the first to develop the NTC and use the more progressive switching for temperature compensation, monitoring and control.

Catalog No.

PTC Thermistors (POSISTOR®) for Heaters

R19E

PTC Thermistors (POSISTOR®) for Circuit Protection

R90E

PTC Thermistors (POSISTOR®) for Motor Starter

R06E

PTC Thermistors (POSISTOR®) for Degaussing Circuits

NTC Thermistors

R44E

Temperature Compensation

Temperature Sensing

Inrush Current Suppression

SIP Resistor Networks

N16E

Trimmer Potentiometers

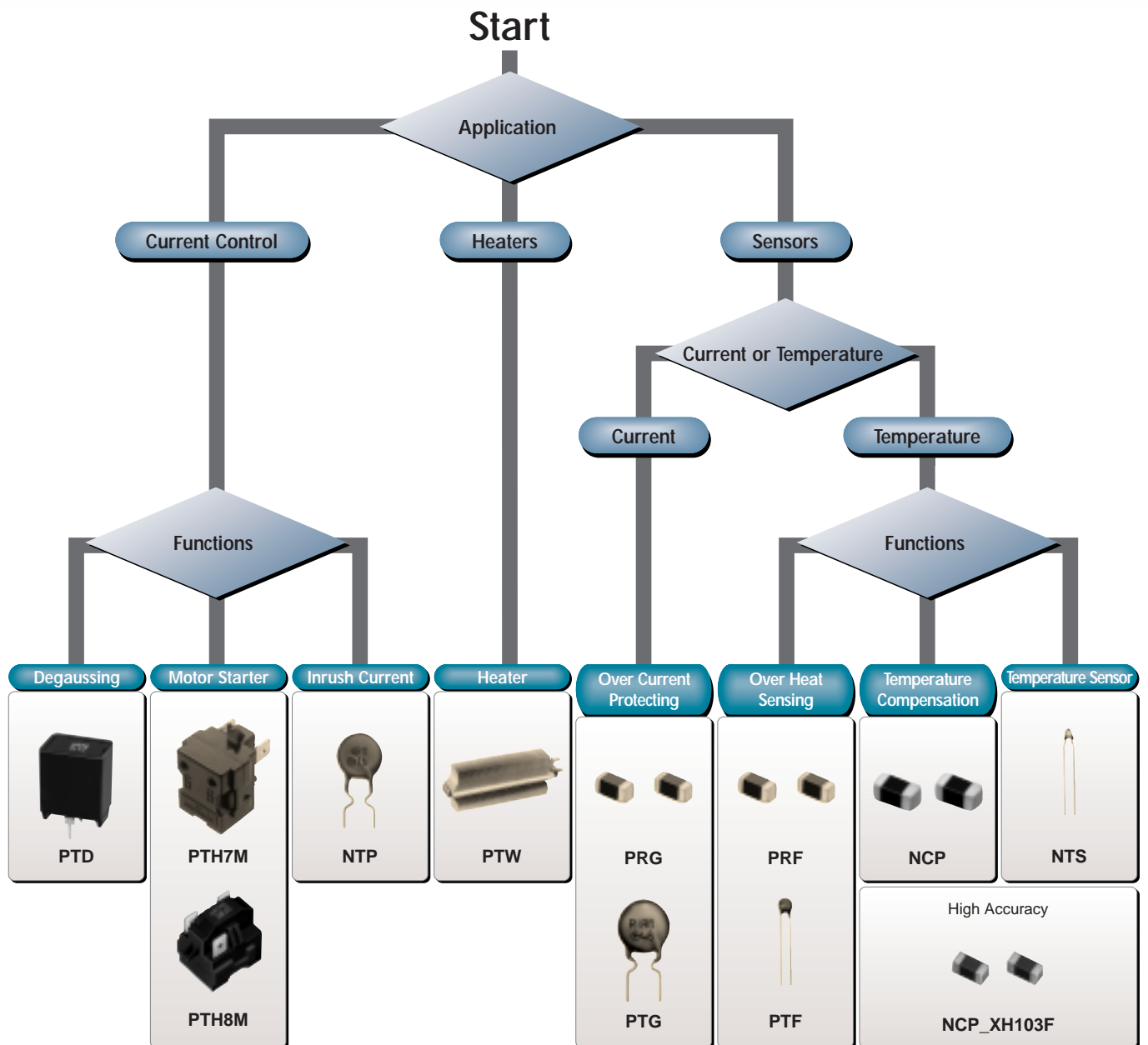
R50E

High Voltage Resistors

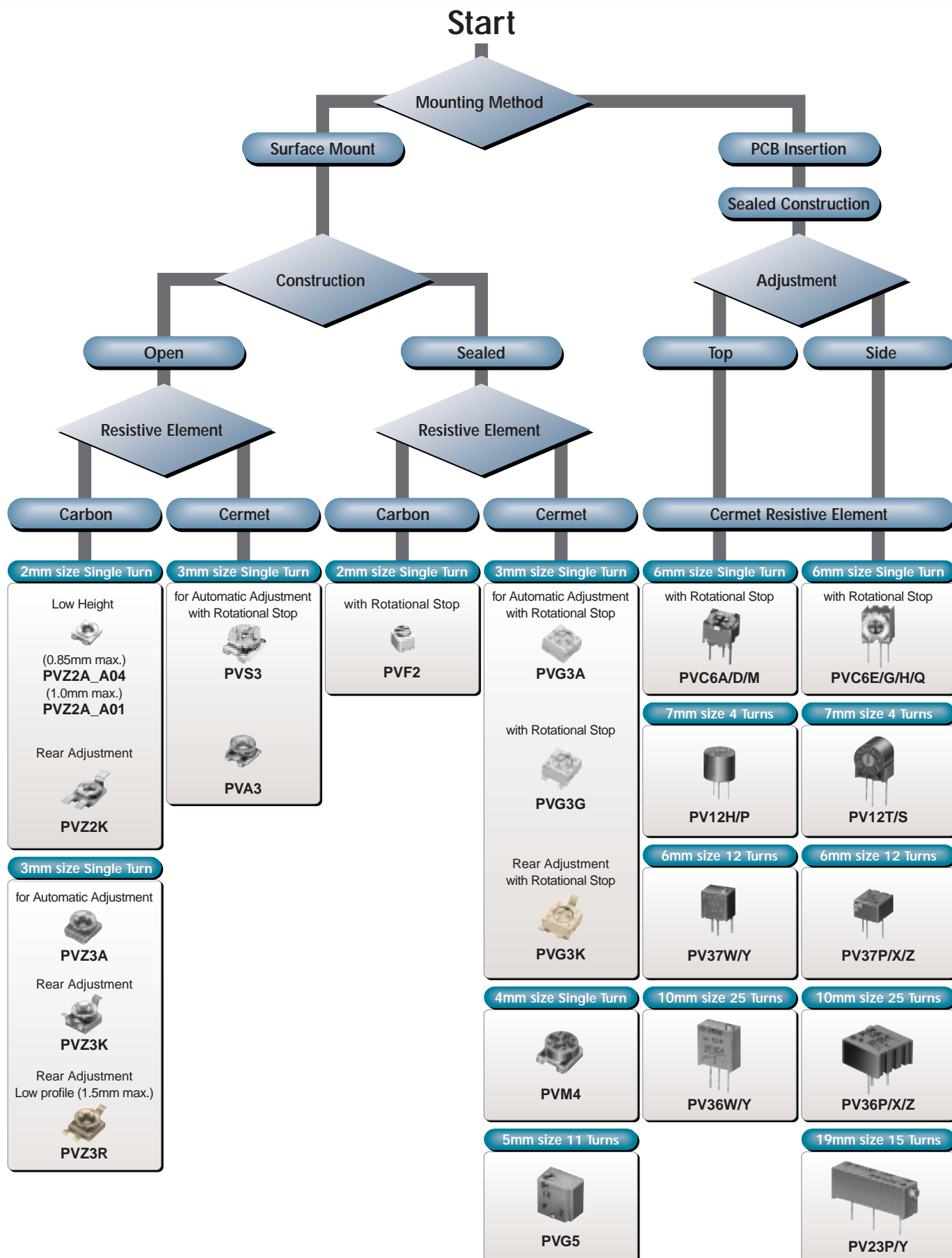
H01E











# Coils / Delay Lines



Today's miniature and complex equipment demands smaller components that perform well at the lower frequencies already in use, but also at GHz levels.

Since Joseph Henry established the Henry as the unit of inductance, the coil has come a long way, mostly in the last 20 years and much of it in Murata laboratories.

The delay line is a relative newcomer. However, Murata chip coils and delay lines do work well at high frequencies. This results from the monolithic and thin-film technologies, materials and processes Murata has developed for these components.

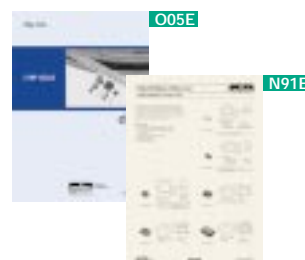
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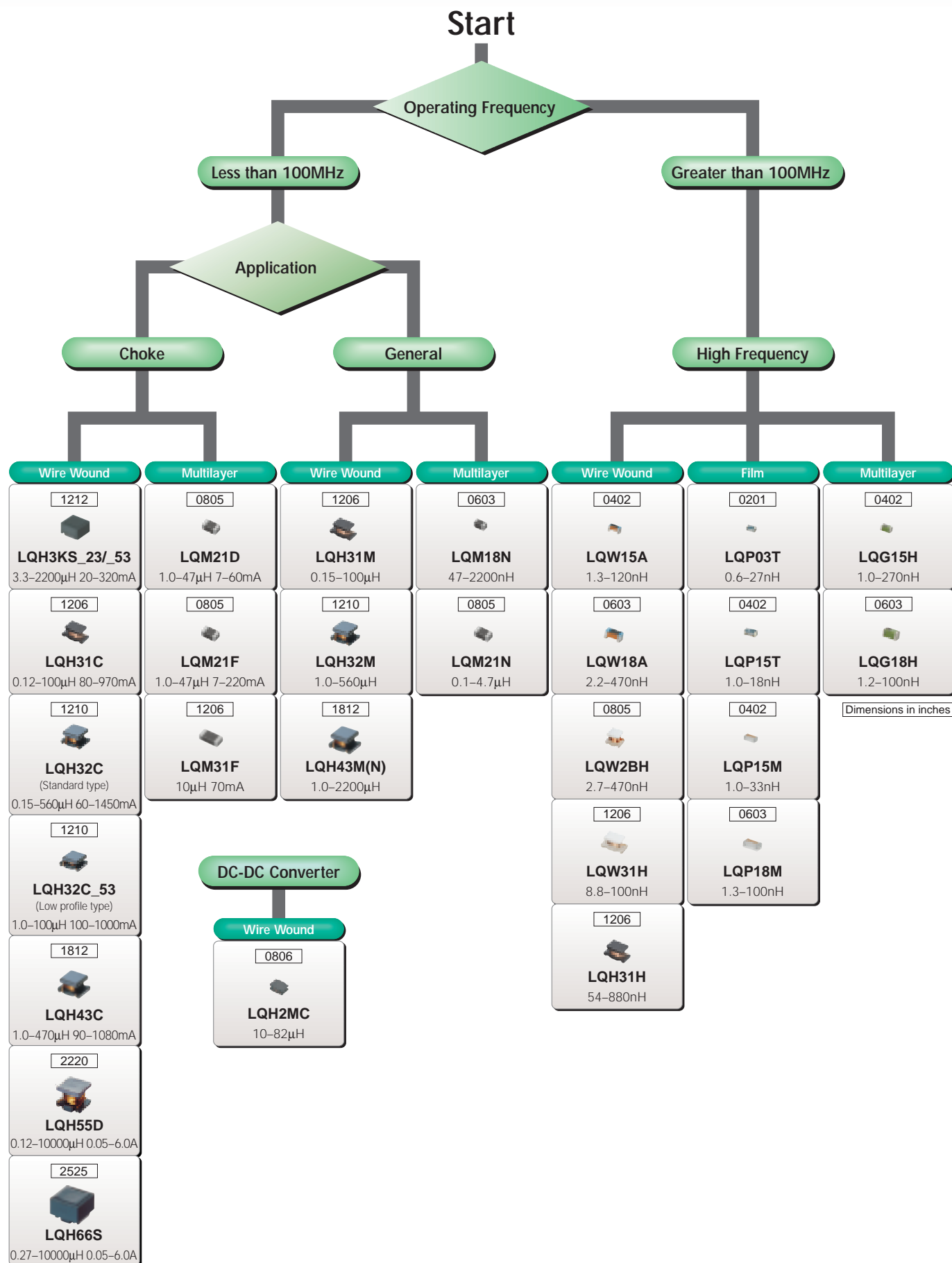
Chip Coils

**O05E**

Chip Multilayer Delay Lines

**N91E**

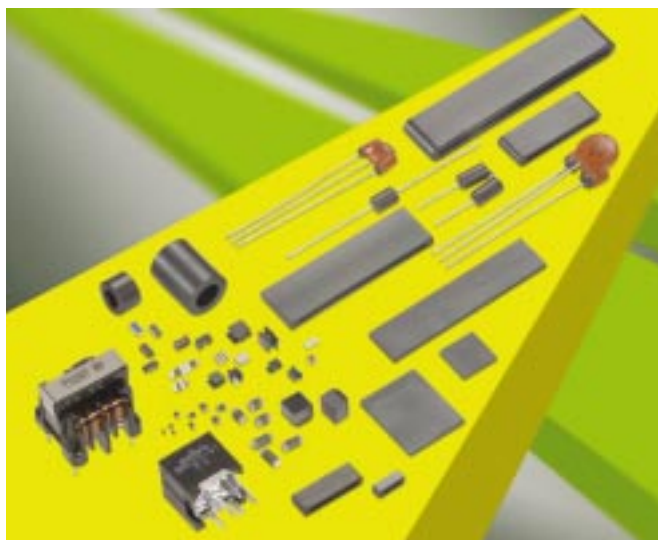




Murata's LQ□ series of chip coils consists of compact, high-performance inductors. Their innovative coil and case structures mean low DC resistance and outstanding high-frequency characteristics. The series is designed for a variety of applications, facilitating component selection for individual circuit requirements.

Application	Part Number	Structure	Dimensions		Inductance Range (H)							
			(mm)	EIA Code	1n	10n	100n	1μ	10μ	100μ	1m	10m
High Frequency Range	LQG15H	Multilayer	1.0 ■ ±0.5	0402	1.0nH			270nH				
	LQG18H		1.6 ■ ±0.8	0603	1.2nH			100nH				
	LQP03T	Film	0.6 ■ ±0.3	0201	0.6nH			27nH				
	LQP15T		1.0 ■ ±0.5	0402	1.0nH			18nH				
	LQP15M		1.0 ■ ±0.5	0402	1.0nH			33nH				
	LQP18M		1.6 ■ ±0.8	0603	1.3nH			100nH				
	LQW15A	Winding (air core)	1.0 ■ ±0.5	0402	1.3nH			120nH				
	LQW18A		1.6 ■ ±0.8	0603	2.2nH			470nH				
	LQW2BH		2.0 ■ ±1.5	0805	2.7nH			470nH				
	LQW31H	Winding (ferrite core)	3.2 ■ ±1.6	1206	8.8nH			100nH				
	LQH31H		3.2 ■ ±1.6	1206		54nH		880nH				
General Frequency Range	LQM18N	Magnetically shielded multilayer	1.6 ■ ±0.8	0603		47nH		2200nH				
	LQM21N		2.0 ■ ±1.25	0805		0.1μH		4.7μH				
	LQH31M	Winding (ferrite core)	3.2 ■ ±1.6	1206		0.15μH		100μH				
	LQH32M		3.2 ■ ±2.5	1210		1.0μH		560μH				
	LQH43M(N)		4.5 ■ ±3.2	1812		1.0μH		2200μH				
DC-DC Converter Type	LQH2MC	Winding	2.0 ■ ±1.6	0806				10μH		82μH		
Chokes	LQM21D	Magnetically shielded multilayer	2.0 ■ ±1.25	0805		1.0μH		47μH				
	LQM21F		2.0 ■ ±1.25	0805		1.0μH		47μH				
	LQM31F		3.2 ■ ±1.6	1206				10μH				
	LQH31C	Winding	3.2 ■ ±1.6	1206		0.12μH		100μH				
	LQH32C		3.2 ■ ±2.5	1210		0.15μH		560μH				
	LQH43C		4.5 ■ ±3.2	1812		1.0μH		470μH				
	LQH55D	Winding	5.7 ■ ±5.0	2220		0.12μH					10000μH	
	LQH3KS	Magnetically shielded	3.3 ■ ±3.3	1212				3.3μH		2200μH		
	LQH66S	Magnetically shielded	6.3 ■ ±6.3	2525				0.27μH			10000μH	

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

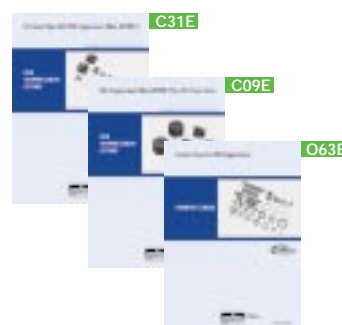


With wide anechoic test capabilities, Murata knows about EMI, and our vast range of EMI filters almost guarantees that, with Murata, you will solve your problems.

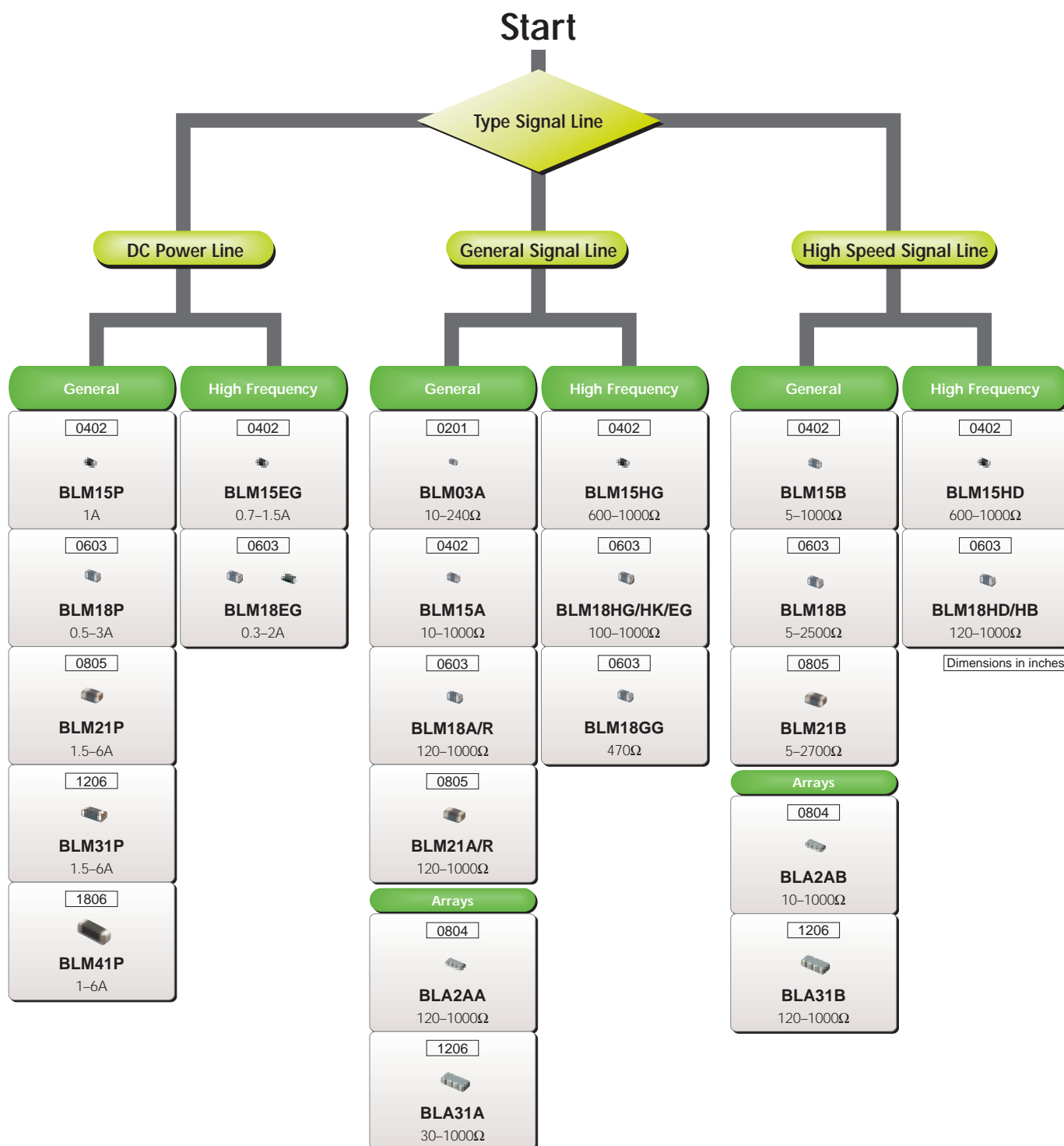
As well as comprehensive catalogs, full of application information and component data, we offer publications on subjects like measuring methods, legislation compliance and noise suppression.

Our free EMI filter simulation software is available on our web-site ([www.murata.com/](http://www.murata.com/)) or on our free CD-ROM catalog. It enables you to select the best filters by circuit type and a range of other conditions.

	Catalog No.
On-board Type (DC) EMI Suppression Filters (EMIFIL®)	C31E
EMI Suppression Filters (EMIFIL®) for AC Power Line	C09E
Ferrite Cores for Noise Suppression	O63E
Microwave Absorber	C31E

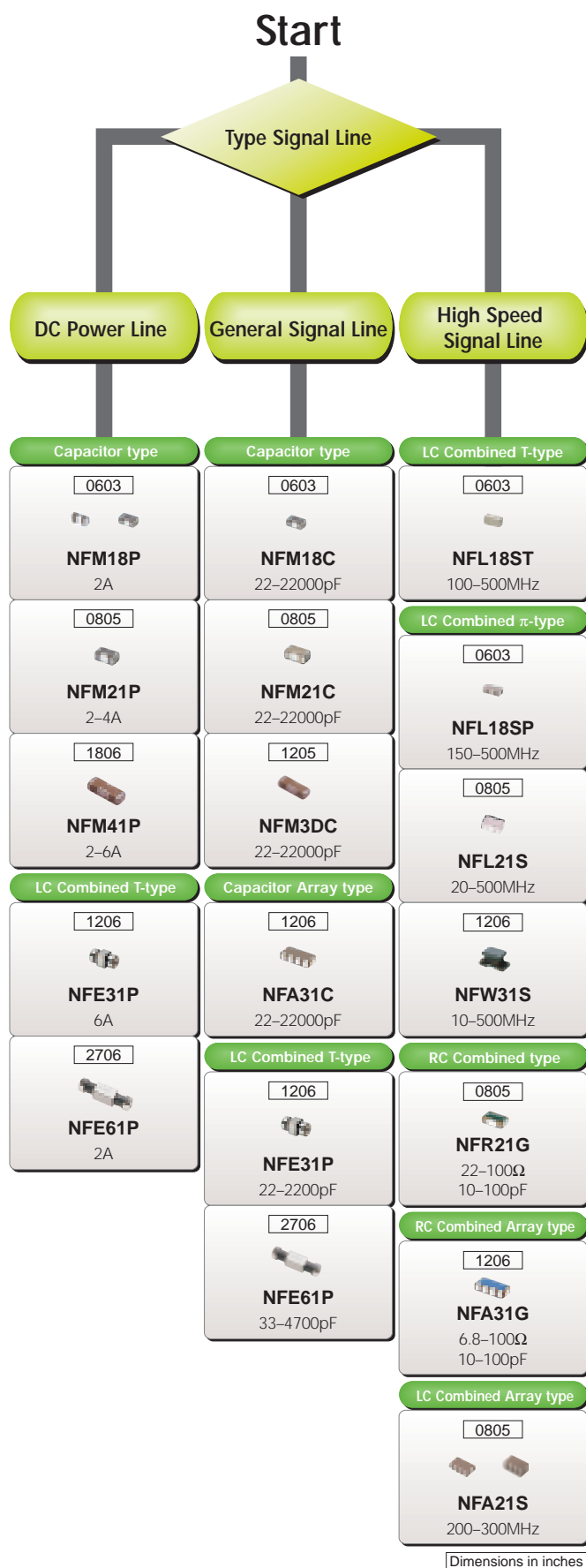


## Chip Ferrite Beads

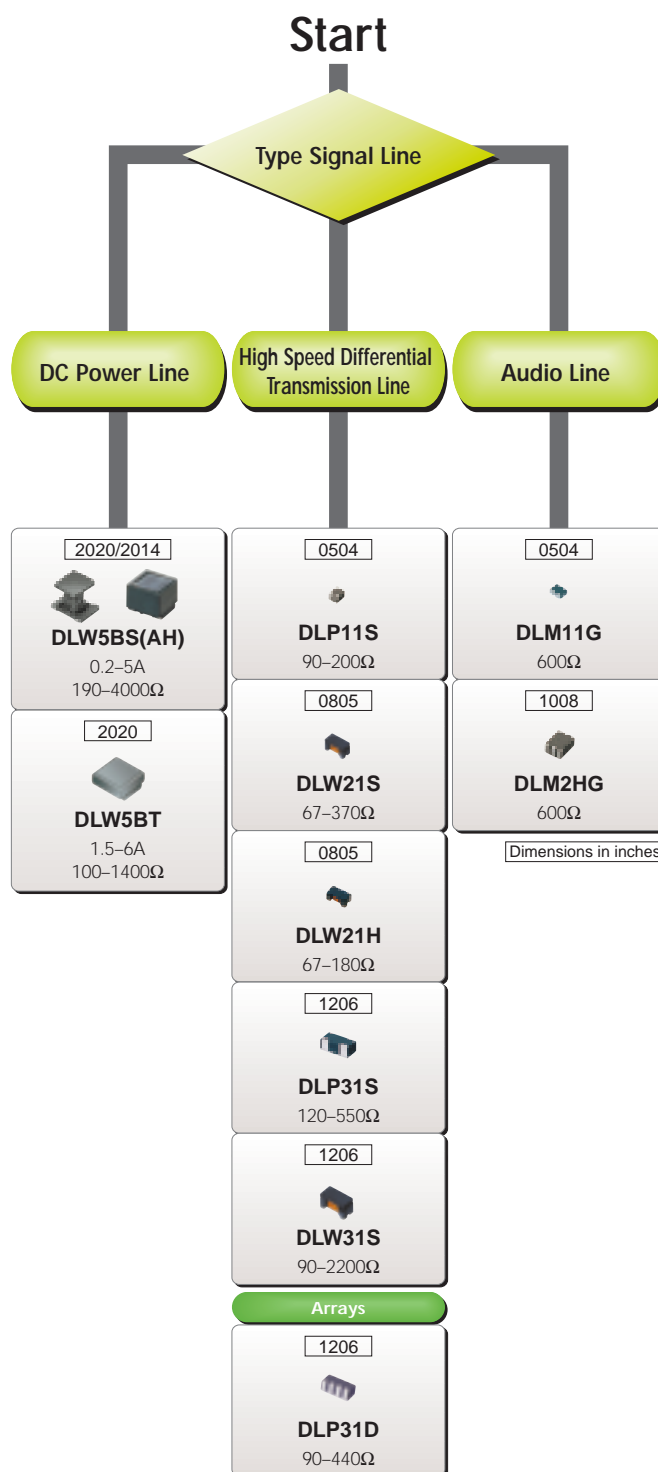


Impedance is typical value at 100MHz.

## Chip EMIFIL®




## Chip Common Mode Choke Coils









Impedance is typical value at 100MHz.





## Product Guide

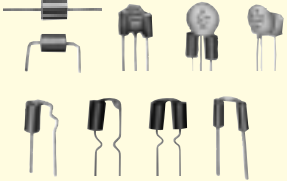



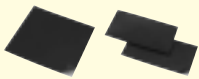
Inductor Type	Type	Series	Dimensions		Effective Frequency Range						
			(mm)	EIA Code	10kHz	100kHz	1MHz	10MHz	100MHz	1GHz	10GHz
	For Digital Interfaces	BLM18R	1.6 ±0.8	0603							
		BLM21R	2.0 ±1.25	0805							
	Standard	BLM03A	0.6 ±0.3	0201							
		BLM15A	1.0 ±0.5	0402							
		BLM18A	1.6 ±0.8	0603							
		BLM21A	2.0 ±1.25	0805							
		BLM31A	3.2 ±1.6	1206							
		BLM41A	4.5 ±1.6	1806							
		BLA2AA (4 circuits array)	2.0 ±1.0	0804							
		BLA31A (4 circuits array)	3.2 ±1.6	1206							
	For High Speed Signals	BLM15B	1.0 ±0.5	0402							
		BLM18B	1.6 ±0.8	0603							
		BLM21B	2.0 ±1.25	0805							
		BLM31B	3.2 ±1.6	1206							
		BLA2AB (4 circuits array)	2.0 ±1.0	0804							
		BLA31B (4 circuits array)	3.2 ±1.6	1206							
	For High Current	BLM15P	1.0 ±0.5	0402							
		BLM18P	1.6 ±0.8	0603							
		BLM21P	2.0 ±1.25	0805							
		BLM31P	3.2 ±1.6	1206							
		BLM41P	4.5 ±1.6	1806							
	For GHz Range Noise Suppression	BLM15HG	1.0 ±0.5	0402							
		BLM15HD	1.0 ±0.5	0402							
		BLM15EG	1.0 ±0.5	0402							
		BLM18HG	1.6 ±0.8	0603							
		BLM18HB	1.6 ±0.8	0603							
		BLM18HD	1.6 ±0.8	0603							
		BLM18HK	1.6 ±0.8	0603							
		BLM18EG	1.6 ±0.8	0603							
		BLM18GG	1.6 ±0.8	0603							

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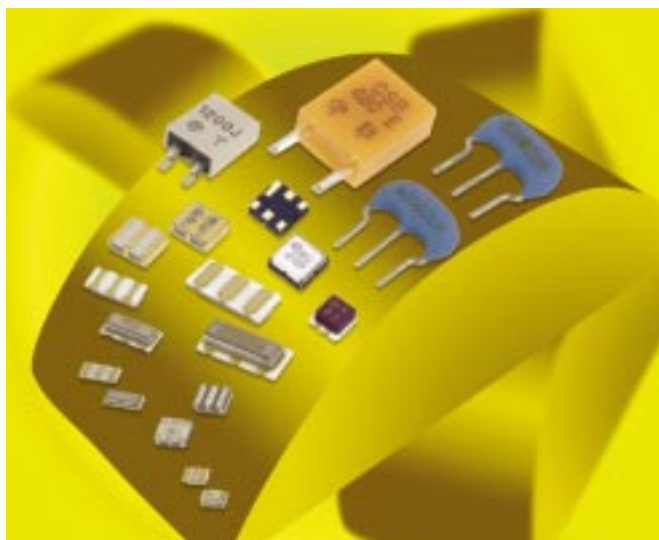
Type		Series	Dimensions		Effective Frequency Range						
			(mm)	EIA Code	10kHz	100kHz	1MHz	10MHz	100MHz	1GHz	10GHz
Capacitor Type	Standard Type	 <b>NFM18C</b>	1.6 ■ ±0.8	0603							
		 <b>NFM21C</b>	2.0 ■ ±1.25	0805							
		 <b>NFM3DC</b>	3.2 ■ ±1.25	1205							
		 <b>NFM41C</b>	4.5 ■ ±1.6	1806							
		 <b>NFA31C</b> (4 circuits array)	3.2 ■ ±1.6	1206							
	For Signal Lines	 <b>NFL18ST</b>	1.6 ■ ±0.8	0603							
		 <b>NFL18SP</b>	1.6 ■ ±0.8	0603							
		 <b>NFL21S</b>	2.0 ■ ±1.25	0805							
		 <b>NFR21G</b>	2.0 ■ ±1.25	0805							
		 <b>NFA21S</b>	2.0 ■ ±1.25	0805							
		 <b>NFA31G</b> (4 circuits array)	3.2 ■ ±1.6	1206							
		 <b>NFW31S</b>	3.2 ■ ±1.6	1206							
	For High Current	 <b>NFM18P</b>	1.6 ■ ±0.8	0603							
		 <b>NFM21P</b>	2.0 ■ ±1.25	0805							
		 <b>NFM3DP</b>	3.2 ■ ±1.25	1205							
		 <b>NFM41P</b>	4.5 ■ ±1.6	1806							
	T Filter for High Current	 <b>NFE31P</b>	3.2 ■ ±1.6	1206							
		 <b>NFE61P(H)</b>	6.8 ■ ±1.6	2706							
Common Mode Choke Coils		 <b>DLP11S</b>	1.25 ■ ±1.0	0504							
		 <b>DLP31S</b>	3.2 ■ ±1.6	1206							
		 <b>DLP31D</b>	3.2 ■ ±1.6	1206							
		 <b>DLM11G</b>	1.25 ■ ±1.0	0504							
		 <b>DLM2HG</b>	2.5 ■ ±2.0	1008							
		 <b>DLW21S</b>	2.0 ■ ±1.2	0805							
		 <b>DLW21H</b>	2.0 ■ ±1.2	0805							
		 <b>DLW31S</b>	3.2 ■ ±1.6	1206							
		 <b>DLW5BS</b> (DLW5AH)	5.0 ■ 5.0 (3.6)	2020 (2014)							
		 <b>DLW5BT</b>	5.0 ■ 5.0 (3.6)	2020 (2014)							

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Type	Series	Dimensions		Effective Frequency Range							
		(mm)	EIA Code	10kHz	100kHz	1MHz	10MHz	100MHz	1GHz	10GHz	
<b>Disc EMIFIL®</b> 	<b>BL01/02/03</b> <b>DSN6/9(H)</b> <b>DSS6/9(H)</b> <b>DST9(H)</b>										
<b>EMIGUARD®</b> (EMI Filters with varistor functions) 	<b>VFR3V</b> <b>VFS6V/9V</b>										
<b>Block EMIFIL®</b> 	<b>BNX002/003/005</b> <b>BNX012</b> (Low profile)										
<b>Common Mode Choke Coils</b> 	<b>PLT09H</b>										
<b>EMC Absorber</b> 	<b>EA10/20/21</b>										

# Resonators

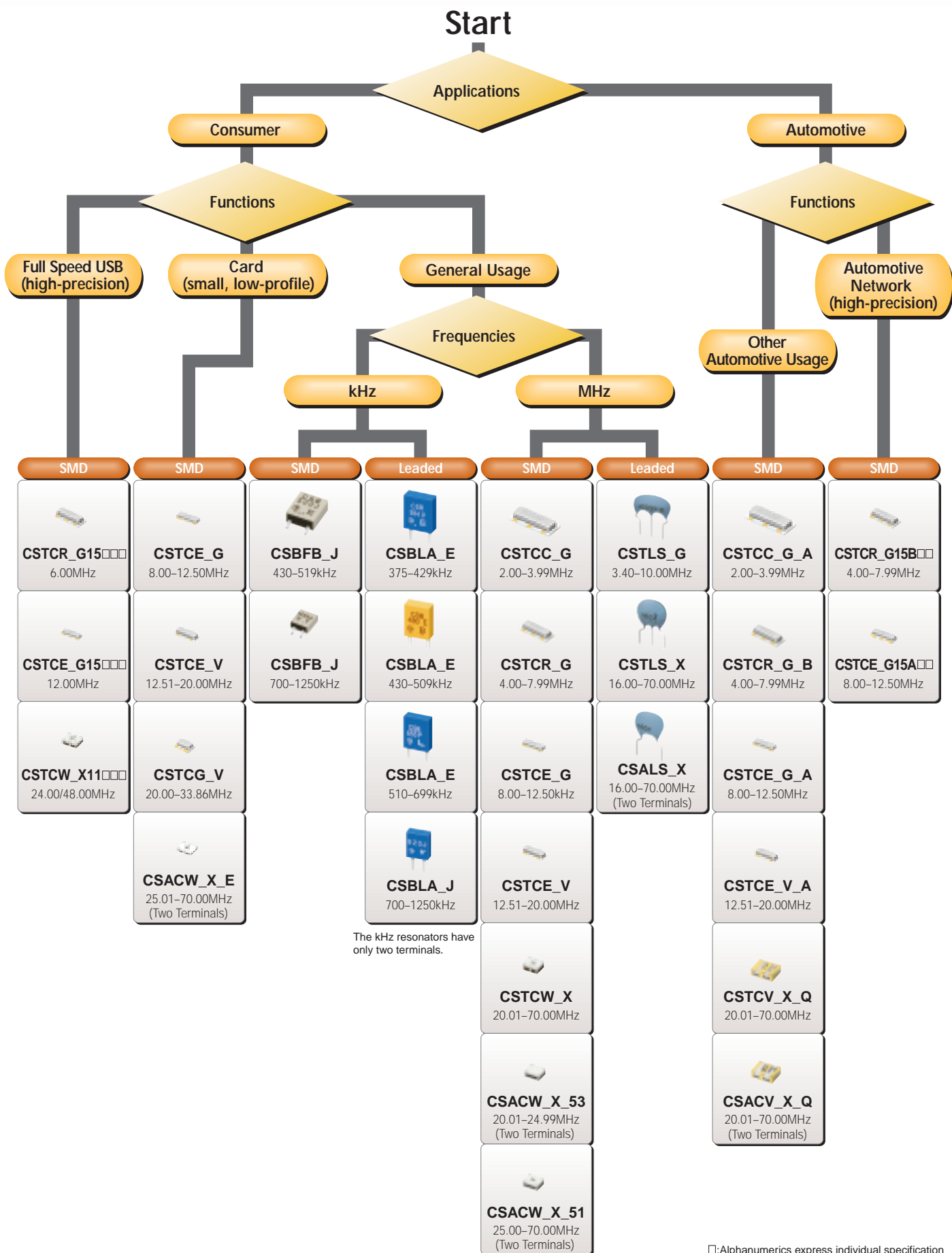


Murata leads the world in Ceramic and SAW Resonator technologies. These derive from the ceramic family of materials that is the basis of most Murata components. Murata's strength, in what appears to be a range of different technologies, stems from the same fundamental material. Murata has worked with ceramic technology material since the early 1940's.

The materials for this product range are developed in Murata laboratories, made in our own plants and supplied to our own component makers.

	Catalog No.
Ceramic Resonators (CERALOCK®)	P16E
SAW Resonators	P36E
BGS Resonators	





## Piezoelectric Sound Components



Murata makes a diverse and comprehensive range of piezoelectric sound components, offering high output levels from extremely small spaces by way of original materials, designs and processes. Advanced acoustic structures and enclosures optimize the effect of the piezo output.

Like most other Murata products, the essential elements are based on our core material of ceramic, enhanced by studies of the technologies involved in applying elements to applications. In this case, optimizing the sound levels and quality achieved when putting elements into enclosures.

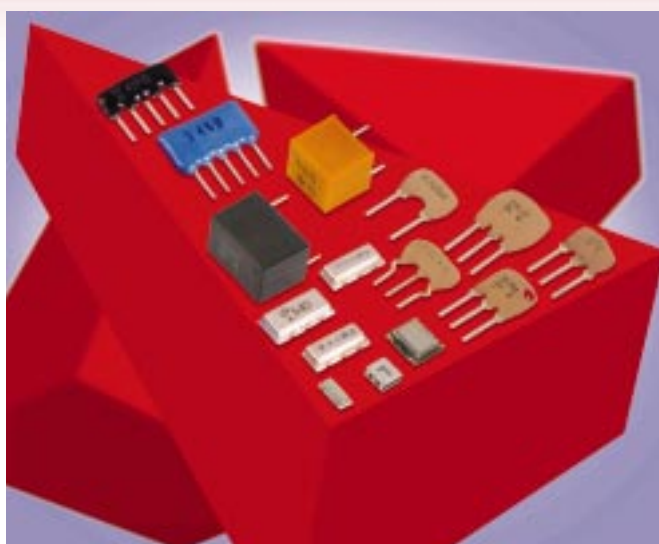
Catalog No.

Piezoelectric Sound Components

P37E



## Filters for Audio Visual Equipment



CERAFIL<sup>®</sup> are Murata ceramic filters, state-of-the-art materials, designs and performance in convenient formats for AM, FM and TV/VCR reception. You can use these products with confidence because we supply a significant amount of the world's TV and video tuners. We know what is needed for these applications.

Furthermore, we are in volume automated production, and understand the need for assembly to be automated. Not all parts are right for auto-handling, and some of the AM filters are only available in bulk, however the majority can be processed by machine.

Catalog No.

CERAFIL<sup>®</sup> (Filters/Traps/Discriminators) for Audio/Visual Equipment P50E

SAW Filters for TV/VCR

BGS Filters





Catalog No.

### Filters for Mobile Communications

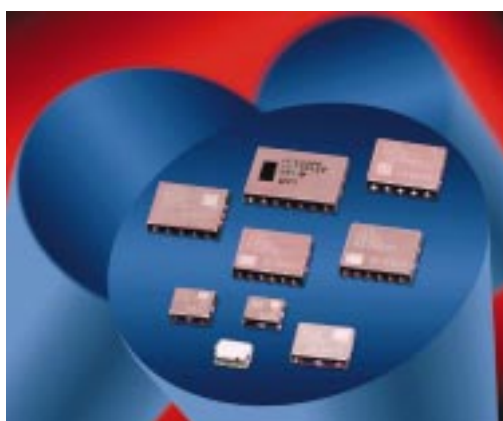
Microwave Filters (GIGAFIL®)  
 Chip Multilayer LC Filters  
 Chip Multilayer Diplexers  
 SAW Filters  
 Ceramic Filters (CERAFIL®)  
 /Ceramic Discriminators for Mobile Communication

**P05E**

Catalog No.

### Microwave Components

Isolators  
 Chip Multilayer Hybrid Couplers/Baluns  
 Chip Multilayer Antennas  
 Chip Dielectric Antennas  
 Dielectric Resonators (RESOMICS®)  
 High-frequency Coaxial Connectors

**O95E****O30E**

### Microwave Modules

RF Diode Switches  
 Microwave Oscillators (VCO)  
 Microwave PLL Modules  
 RF Submodule  
 TCXO

Catalog No.

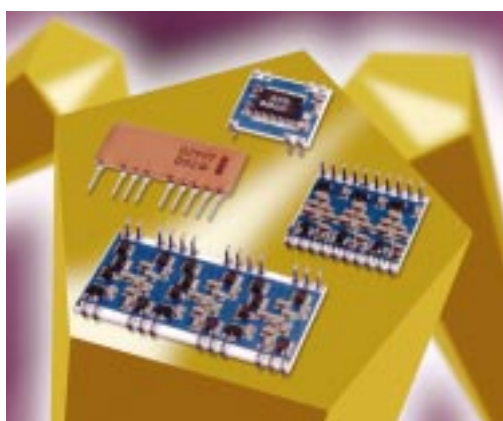
### DRY PHANTOM

**M05E**

DRY PHANTOM is a full-scale model of the human body designed to have the same electrical response characteristics as the human body.







## Products for Video Equipment

TV/CATV Tuners  
CRT Peripheral Components  
Flyback Transformers  
Focus Adjusting Resistors  
High-voltage CR Blocks  
High-voltage Multipliers  
High-voltage Resistors

## Functional Modules/Hybrid IC

Modules for Communication Equipment  
Modules for OA Equipment  
Modules for Video Equipment


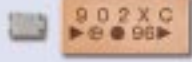




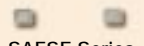
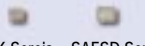
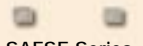
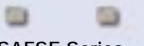
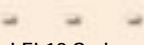
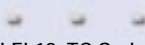
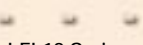
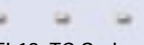
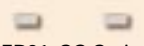
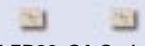
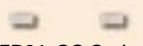
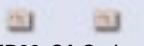





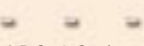
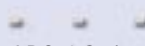
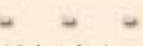
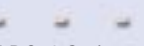







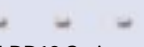






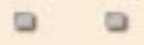


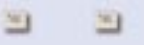

## Power Supplies

Switching Power Supplies  
High-voltage Power Supplies  
DC-DC Converters

Catalog No.









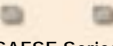

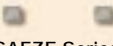
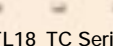
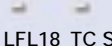
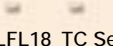
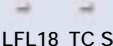
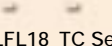
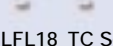
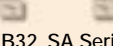














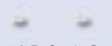



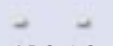


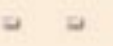

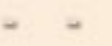




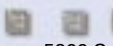
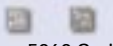
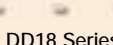


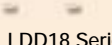











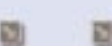

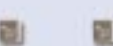







## Sensors

PTC Thermistors for Overheat Sensing	<b>R90E</b>
NTC Thermistors for Temperature Sensing	<b>R44E</b>
Pyroelectric Infrared Sensors/Pyroelectric Infrared Sensor Modules	<b>S21E</b>
Piezoelectric Ceramic Sensors (PIEZOTITE®)	<b>P19E</b>
(Piezoelectric Actuator/Molded Underwater Transducer/Ultrasonic Sensor/Shock Sensor/)	
(Knocking Sensor Elements/Ultrasonic Bubble Sensor/Electric Potential Sensor)	
Piezoelectric Vibrating Gyroscopes (GYROSTAR®)	<b>S42E</b>
Non-contact Potentiometers	<b>S30E</b>
Rotary Position Sensors	<b>R50E</b>
Rotary Sensors	<b>S35E</b>
Magnetic Pattern Recognition Sensors	<b>S31E</b>

System		UMTS	GSM/DCS Dual Band	W-CDMA	CDMA-800	
Channel Multiplexing Method		CDMA/TDMA	TDMA	CDMA	CDMA	
Frequency (MHz)	Tx	GSM:880-915 DCS1800:1710-1785 W-CDMA:1920-1980	GSM:880-915 DCS1800:1710-1785	1920-1980	Japan 887-925	Korea 824-849
	Rx	GSM:925-960 DCS1800:1805-1880 W-CDMA:2110-2170	GSM:925-960 DCS1800:1805-1880	2110-2170	832-870	869-894
RF	SWITCHPLEXER® GIGAFIL® (Duplexers) Chip Multilayer Duplexers	 KB Type	 LMSP43 Series GB Type	 KB Type		
	GIGAFIL® (BPF)	 MB Type	 MB Type	 MB Type		
	SAW Filters (Duplexers)					
	SAW Filters (BPF)	 SAFSE Series	 SAFEK Series SAFSD Series	 SAFSE Series	 SAFSE Series	
	Chip Multilayer LC Filters (LPF)	 LFL18 Series	 LFL18_TC Series	 LFL18 Series	 LFL18_TC Series	
	Chip Multilayer LC Filters (BPF)	 LFB31_SG Series	 LFB32_SA Series	 LFB31_SG Series	 LFB32_SA Series	
	Isolators	 CE040 Series CES30 Series	 CE040 Series CE053 Series  CES30 Series CES40 Series	 CE040 Series CES30 Series	 CES40 Series CE053 Series	
	Chip Multilayer Hybrid Couplers (Directional Couplers)	 LDC18 Series	 LDC18 Series	 LDC18 Series	 LDC18 Series	
	Chip Multilayer Hybrid Baluns	 LDB21 Series	 LDB21 Series	 LDB21 Series	 LDB21 Series	
	GaAs MMIC					
Local	Chip Multilayer Hybrid Couplers (3dB Hybrid • Hybrid Divider)	 LDD18 Series	 LDC32 Series	 LDD18 Series	 LDD18 Series	
	Microwave Oscillators (VCOs)	 MQL Series	 MQK Series MQW2 Series	 MQL Series	 MQR Series	
	PLL Modules (HFQ □□□ Series)	 HFQD80 Series			 HFQS57 Series	
1st IF	SAW Filters Chip Multilayer LC Filters	 SAFSD Series	 SAFCC Series	 SAFSD Series	 LFB32_SQ Series	
2nd IF	CERAFIL®					
Modules	RF Modules RF Sub Modules			 HFQM Series		

Actual Size

\*1 Please refer to products in "GSM/DCS Dual Band" for products out of W-CDMA Band.

Triple Mode Cellular	PDC	PHS	5.8GHz Cordless	2.4GHz W-LAN	5GHz W-LAN
CDMA/TDMA	TDMA	TDMA	(DS/FH)	SS	CSMA (OFDM)
AMPS:824-849 PCS:1850-1910 AMPS:869-894 PCS:1930-1990	940-960/1429-1453 810-830/1477-1501	1895-1916	5725-5850	2400-2483.5*2	5150-5350
 LFD21_DP Series KB Type VB Type					
 MB Type		 MB Type	 MB Type	 MB Type	 MB Type
 SAYHS Series	 SAYHR Series				
 SAFSE Series	 SAT Series	 SAFZE Series			
 LFL18_TC Series	 LFL18_TC Series	 LFL18_TC Series	 LFL18_TC Series	 LFL18_TC Series	 LFL18_TC Series
 LFB32_SA Series	 LFB31_SL Series	 LFB32_SA Series	 LFB31_SL Series	 LFB32H_SG Series	 LFB21_SG Series
 CE040 Series	 CE053 Series	 CE040 Series	 CE053 Series		
 CES30 Series	 CES40 Series	 CES30 Series	 CES40 Series		
 LDC18 Series	 LDC18 Series	 LDC18 Series	 LDC18 Series	 LDC18 Series	 LDC18 Series
 LDB21 Series	 LDB21 Series	 LDB21 Series	 LDB21 Series	 LDB18 Series	 LDB21 Series
			 5060 Series	 2400 Series	 2458 Series
 5800 Series				 5060 Series	
 LDD18 Series	 LDD18 Series	 LDC32 Series		 LDD18 Series	
 MQK Series	 MQR Series	 MQR Series	 MQR Series		
 HFQW80 Series	 HFQS57 Series	 HFQS57 Series	 HFQS57 Series	 HFQW80 Series	 HFQW80 Series
 SAFCT Series	 SAFCC Series	 SAFCC Series	 SAFCD Series	 SAFCD Series	 SAFCD Series
 CFXCE Series	 CFXCD Series	 CFXCR Series	 SFECS Series	 SFSCE Series	

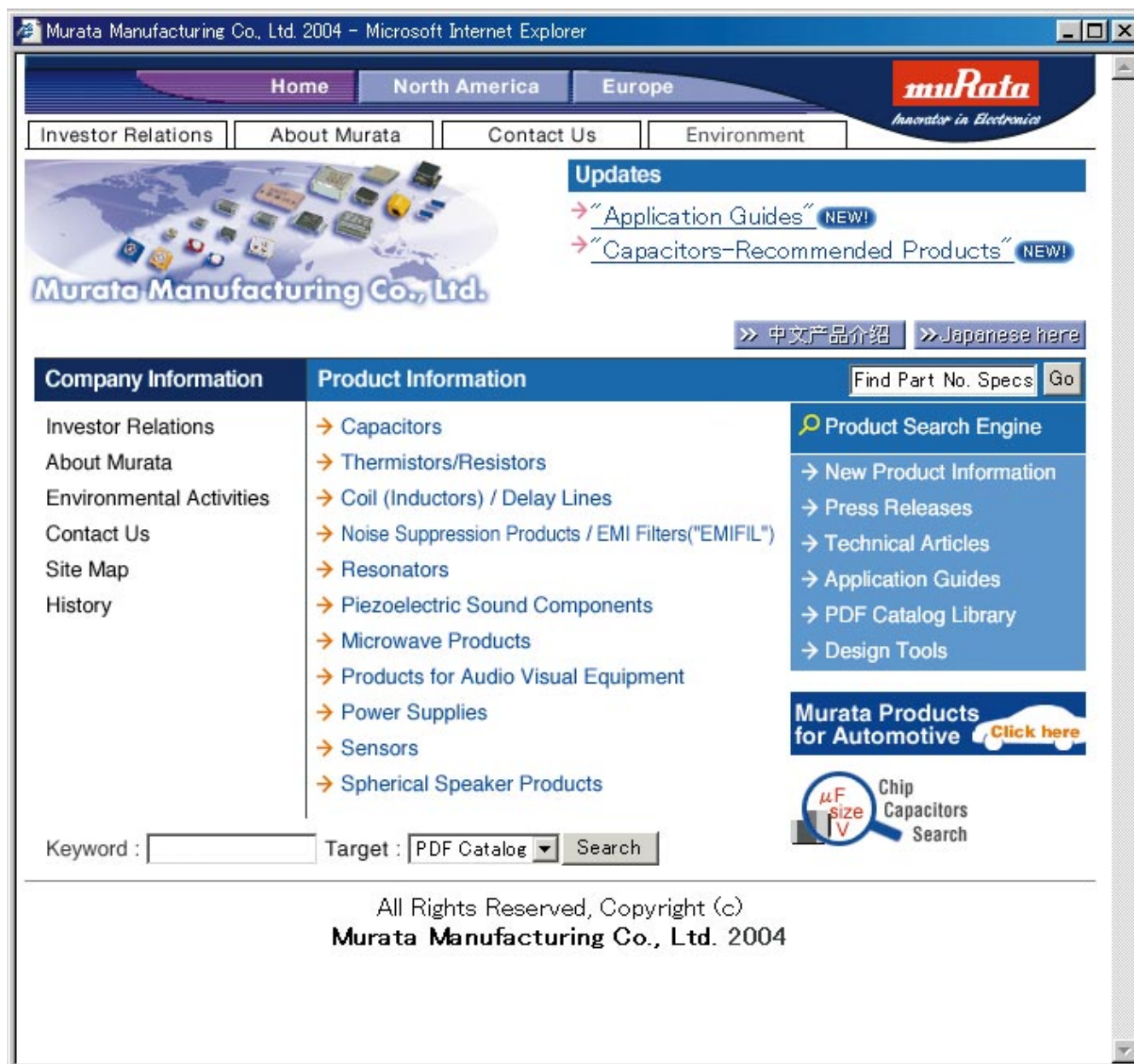
The sample units and data in this catalog are only reference, which contains some provisional specifications.  
 For more information, please ask for catalog shown above or visit our website.  
<http://www.murata.com/>  
<http://search.murata.co.jp/>



\*2 Except France, Spain

Murata's website plays a vital role in solving your problems.

<http://www.murata.com/>



Murata's website puts a rich source of information and resources for design issues at your fingertips. From recommending parts for circuits and providing application information about parts, to introducing solutions to the problem of EMI, we provide a broad spectrum of support concerning design work. Electronic parts are a core part of what we do - so, as a parts user, when you need a "partner", this is the place to come!



**⚠ Note:****1. Export Control**

〈For customers outside Japan〉

Murata products should not be used or sold for use in the development, production, stockpiling or utilization of any conventional weapons or mass-destructive weapons (nuclear weapons, chemical or biological weapons, or missiles), or any other weapons.

〈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 to 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 in the above |

**3. Product specifications in this catalog are as of February 2004. They are subject to change or our products in it may be discontinued without advance notice. Please check with our sales representatives or product engineers before ordering. If there are any questions, please contact our sales representatives or product engineers.**

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

**5. This catalog has only typical specifications because there is no space for detailed specifications. Therefore, please approve our product specifications or transact the approval sheet for product specifications before ordering.**

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

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



<http://www.murata.com/>

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