Enabling the future of

Healthcare & medical

Latest technologies for all healthcare and medical applications

Contents:

Electronics in healthcare

Electronics are permeating more and more into the healthcare sector, and electronics technology advances continue to enhance the functionality of healthcare equipment.

Murata is at the cutting edge of these electronics advancements and is a key provider of technologies which will help to shape the future of healthcare around the world. Apart from our standard products, which are present in almost any electronic equipment you use, Murata has developed new, innovative products specifically for healthcare applications.
In this brochure we outline just a few of these innovations.

Patient monitoring device

Learn more about patient monitoring solutions on page 6

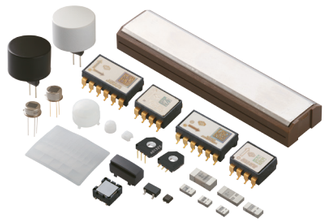
BCG (Ballistocardiography) node
Size 8.37cm x 4.07cm x 1.76cm

Sensors

Murata pursued sensing functions making full use of MEMS and processing technology, and magneto resistive elements including ceramic material technology in order to develop highly efficient and highly reliable sensing- devices, modules and systems.
A lineup of various sensors respond to the sensing needs of various applications for Healthcare and Medical.

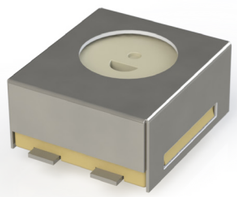
Product lineup

- **Pyroelectric infrared sensors**
- **Ultrasonic sensors**
- **Magnetic pattern recognition sensors**
- **Magnetic switches (AMR sensors)**
- **Shock sensors**
- **Angular rate sensors**
- **MEMS sensors**
- **Rotary position sensor**
- **Barometric pressure sensor**
- **Thermistor**



Learn more online
http://www.murata.com/en-eu/products/sensor

SVM4 Rotary position sensor



Rotary position sensors can measure rotational angles from output voltages. The measured rotation is linked to the motion of a slider that causes changes in resistance, the sensor circuit converts into changes in output voltage. Rotary position sensors are extremely durable.

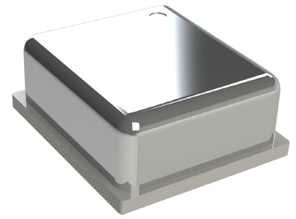
Features

- Approximately one-eighth the volume of earlier position sensors (SV03 series)
- Linearity*2 of ±2%, which is equivalent to that of earlier position sensors
- Longer service life (over 0.5 million cycles) than earlier position sensors

Learn more online
http://www.murata.com/en-eu/products/sensor/rotary

Barometric pressure sensor

There is a growing need for the high accuracy and low current consumption pressure sensor especially in the field of navigation and activity monitoring system. This product low noise and high accuracy characteristics make it ideal for healthcare applications.



Features

- **Size:** 2.3×2.6mm typ. ×0.95 mm max.
- **Interface:** SPI/I2C
- **Operation range:** 300 to 1,100 hPa
- **Relative accuracy:** ±0.12hPa typ. (T=+25degC, P=800 to 1,100hPa)
- **Absolute accuracy:** ±1.0hPa typ. (T=-10 to +65degC, P=800 to 1,100hPa)

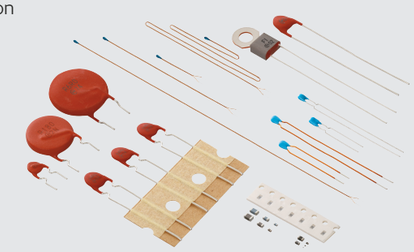
Learn more online
http://www.murata.com/en-eu/products/sensor/baropressure

Thermistors

The tightest temperature tolerance chips and lead types covering inrush current suppression, temperature compensation, overcurrent and overheat sensing.

Product lineup

- **PTC & NTC Thermistor**
  For overcurrent protection & temperature sensor / temperature compensation
- **Chip NTC Thermistor**
  For temperature sensor / temperature compensation
- **Chip PTC Thermistor Line-up**
  For overheat sensing / overcurrent protection
- **PTC Thermistor lead type**



MEMS HR sensor node

Non-contact heart rate and other cardiac measurement parameters

Electronic BCG (Ballistocardiography) module with accelerometer signal processing and algorithm in the on-board micro controller

Features

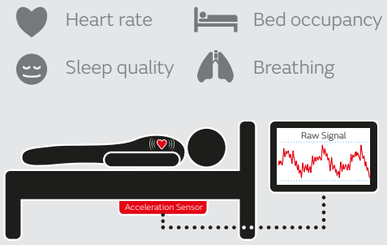
- A continuous contactless patient monitoring concept when in the bed
- Heart rate (HR), heart rate variability (HRV), respiration rate (RR) and bed occupancy detection can be utilized to analyze for example stress and relaxation index and sleep quality
- Opens new possibilities in patient monitoring and elderly care in hospitals, assisted living and at home.

Benefits

- Safety
- Efficiency
- Responsiveness

BCG module

Sensor node SCA11H



Heart rate, respiration rate & bed occupancy

Learn about MEMS sensors

http://www.murata.com/en-eu/products/sensor

Patient monitoring systems

BCG-module based, full working systems with software are also now available

Murata has partnered with technology companies who are able to offer complete working systems. If you want a fast "Go to market" product, or you simply don't have the resources or time, Murata can offer full working Plug & Play systems.

These products are ideal for independent and assisted living, sports and wellbeing, monitoring chronic diseases and post hospital recovery, etc.

Measurements include HR, RR, SV, HRV, B2B, Temperature, SpO2, posture and movement, hydration and BP.

All of the above can be used in conjunction with Murata's non-contact bed / chair BCG-sensor, wearable wrist device and bio-patch which are all connected via an easy to integrate patient- or people monitoring platform.

Full management systems are also available measuring response times and condition tracking etc.

The range of products, system solutions & mobile Apps can be used for the following applications:

- Bed Exit alarms
- Sleep quality analysis,
- Vital signs monitoring allowing for early intervention.

MEMS sensors

High accuracy, low-power consumption

Murata is a leading supplier of acceleration, inclination and angular motion sensor solutions for healthcare applications.

Medical sensors increase the intelligence of life supporting devices, and they can be used in new types of patient monitoring applications that allow patients to lead more independent lives. Detecting signals triggered by symptoms helps optimize medication and prevent serious attacks of illness.

Murata's unique MEMS design, which combines single crystal silicon and glass, ensures exceptional reliability, unprecedented accuracy and excellent stability over time. The power requirements of these medical sensors are extremely low, which gives them a significant advantage in small battery-operated devices.

As the leading supplier of activity sensors for pacemakers Murata also offers a wide range of pressure sensors, accelerometers, inclinometers and gyroscopes for various demanding medical and healthcare applications. Device developers and manufacturers of many existing and emerging healthcare applications have been able to reach their power and size requirements thanks to Murata's MEMS technology.

Learn more online

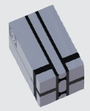
http://www.murata.com/en-eu/products/sensor

Sensor Elements (Dies)

Vertical Accelerometer Elements

SCG12S and SCG14S

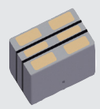
- Size 3mm x 2.12mm x 1.95 or 1.25mm
- Various measuring ranges possible (1 - 12g)
- Proven capacitive 3D-MEMS Technology



Horizontal Accelerometer Elements

SCG10X and SCG10Z

- Size SCG10X: 2.55mm x 2.95mm x 1.91mm
- Size SCG10Z: 1.50mm x 1.70mm x 1.83mm
- Various measuring ranges possible (1 - 12g)
- Proven capacitive 3D-MEMS Technology



Pressure Sensor Elements

SCB10H

- Size 1.4mm x 1.4mm x 0.85mm
- High pressure shock survival (> 200 bar)
- Various pressure ranges possible (1.2 - 25 bar)
- Proven capacitive 3D-MEMS technology
- Operates at near vacuum applications

Sensor Modules

Accelerometer

Digital 1-, 2- or 3-axis Accelerometers

- Excellent accuracy
- Excellent stability over temperature
- Ranges: ± 2g, ± 6g

Inclinometer

Analog 1- or 2-axis Inclinometers

- Excellent accuracy
- Excellent stability over temperature
- Ranges: ± 15 °, ± 30 °, ± 90 °

Gyroscope

1-axis Angular Rate Sensors

- Excellent accuracy
- Excellent stability and noise performance
- Ranges: ± 100 °/s , ± 300 °/s

Connectivity modules

Low-power reliable connectivity for healthcare devices

Healthcare devices are increasingly connected to each other and the web. Use a Murata module for proven RF excellence.

Murata RF modules make it easy for you to build connectivity into most devices, even those where space is limited and power consumption needs to stay low.

With **BLE (Bluetooth® Low Energy)** devices as small as 4.8 x 5.8 x 1.0mm, wireless communication has never been easier to design in.

Features

- Support BLE (Bluetooth® Low Energy), Bluetooth®, WiFi®, and other wireless standards
- Combo-modules available (Bluetooth®/WiFi®, etc.)
- Easy to design in
- Antenna matching supported

Applications

- E-health / home monitoring
- Connectivity of healthcare appliances like blood pressure meter, glucose meter, etc.

Small Size

Murata RF modules are small enough to suit even the most space-constrained applications with sizes from 4.8 x 5.8 x 1.0mm.

Footprint

Height

Learn more online

http://wireless.murata.com/eng/products/wireless-connectivity-platforms.html

Wi-Fi™ *with integrated MCU supporting Cypress WICED software*

Product	Murata P/N	Chipset	Processor	Op. Temp	WLAN	Size (mm)	Host Interface	Antenna	Cert.
Type YD	LBWA1ZVYDZ-679 (WICED SW)	BCM43362	STM32 ARM® Cortex®-M3"	-40°C to +85°C	802.11b/g/n	10.0 x 7.9 x 1.25	UART / SPI	External	Yes (ref.design)
Type YD	LBWA1ZVYDZ-739 (Murata SW - UART)						UART		
Type YD-D	LBWB1ZZYDZ-713 (WICED SW)					33.0 x 18.0 x 2.5	UART / SPI	On board	Yes
	LBWB1ZZYDZ-683 (Ayla SW)								
	LBWB1ZZYDZ-740 (Murata SW - UART)						UART		
	LBWB1ZZYDZ-766 (Murata SW - SPI)						SPI		
Type 1HD	LBWA1ZZ1HD-921	BCM43438	STM32 ARM® Cortex®-M4	-20°C to +70°C		21.0 x 17.5 x 2.3	UART / SPI / I2C		
Type 1GC	LBWA1UZ1GC-958	BCM43907	AMR Cortex-R4	-30°C to +85°C	802.11a/b/g/n	10.0 x 10.0 x 1.3	UART / SPI / I2S / I2C / MII / RMII / USB	External	Yes (ref.design)
Type 1GC	LBWA1UZ1GC-901 (Imp005)								

Wi-Fi™ based on Cypress chips *supporting Linux, Android or Wiced software*

Product	Murata P/N	Chipset	Op. Temp	WLAN	Size (mm)	Host Interface	Antenna	Cert.
SN8000	88-00153-00	BCM43362	-40°C to +85°C	802.11b/g/n	24.0 x 11.4 x 1.9	SDIO / SPI	On board	Yes
Type 1FX	LBWA1KL1FX-875	BCM43364	-30°C to +70°C		6.95 x 5.15 x 1.1		External	Yes (ref.design)

Wi-Fi™ supporting TI SimpleLink™ solutions

Product	Murata P/N	Chipset	Processor	Op. Temp	WLAN	Size (mm)	Host Interface	Antenna	Cert.
Type 1JP	LBWA1ZZ1JP-928	CC3100		-40°C to +85° C	802.11b/g/n	13.2 x 21.45 x 2.45	UART / SPI	O0 board	Yes
Type 1JQ	LBWA1ZZ1JQ-929	CC3200	AMR Cortex-M4						

Wi-Fi™ + Bluetooth 4.0™ *for Linux™ & Android platforms*

Product	Murata P/N	Chipset	WLAN	BT	Clock	Op. Temp	Size (mm)	Host Interface	Antenna	Cert.
Type ZP	LBEH5HMZPC	BCM4339	802.11 a/b/g/n,ac	BT®+BLE®	X'tal	-20°C to +75°C	7.8 x 7.42 x 1.0	SDIO(Wi-Fi™), UART(BT®)	External	No
Type 1BW	LBEH5DU1BW	Broadcom® BCM43340	802.11 a/b/g/n	BT®+BLE®	X'tal		8.0 x 7.5 x 1.33	SDIO(Wi-Fi™)	External	No
Type 1DX	LBEE5KL1DX-875		802.11b/g/n	EDR & BLE® v4.1		-20°C to +75°C	6.95 x 5.15 x 1.1	SDIO	External	Yes
Type XR	LBEP5CLXRC-701	TI WiLink™ 8 WL1801	802.11b/g/n	No	External	-40°C to +85°C	9.9 x 8.8 x 1.3	SDIO(Wi-Fi™)	External	No
Type WT	LBEP5CLWTC-601 (WLAN Only)	TI WiLink™ 8 WL1831	802.11b/g/n	v4.0 (BLE®+EDR)	Internal X'tal	-40°C to +85°C	9.9 x 8.8 x 1.3	SDIO(Wi-Fi™), UART(BT®)	External	No
	LBEP5CLWTC-631 (WLAN + BT + BLE)									
Type WM	LBEP5CLWMC-603 (WLAN Only)	TI WiLink™ 8 WL1833	802.11a/b/g/n	v4.0 (BLE®+EDR)	Internal X'tal	-40°C to +85°C	9.9 x 8.8 x 1.3	SDIO(Wi-Fi™), UART(BT®)	External	No
	LBEP5CLWMC-633 (WLAN + BT + BLE)									

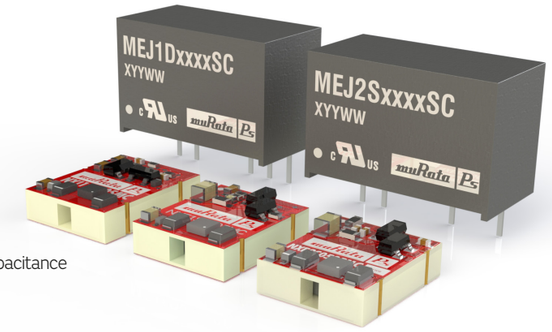
Bluetooth SMART®

Product	Freq	Murata P/N	Power Class	Version	Output Power	Op. Temp	Size (mm)	Host Interface	Antenna	Cert.
Type VZ	2.4GHz	LBCA2ZZVZZ-721 (Central Device)	Class 3	BLE®	-2dBm	-10°C to +60°C	20.0 x 13.0 x 24	UART	On Board	Yes
		LBCA2ZZVZZ-722 (Peripheral Device)								
Type WS	2.4GHz	LBCA2ZXWSE-723 (Central Device)	Class 3	BLE®	-2dBm	-10°C to +60°C	10.4 x 7.7 x 1.8	UART	External	Yes
		LBCA2ZXWSE-724 (Peripheral Device)								
Type ZF	2.4GHz	LBCA2BZZFZ	Class 3	BLE® v4.1	0dBm	-20°C to +85°C	5.4 x 4.4 x 1.0	UART	External	No
Type ZY	2.4GHz	LBCA2HNZYZ-711	Class 3	BLE® v4.1	0dBm	-20°C to +85°C	7.4 x 7.0 x 1.0	UART	Internal	Yes
Type 1BX	2.4GHz	LBMA15Q1BX	Class 1	BT®+BLE®	13dBm (Max)	-30°C to +85°C	5.0 x 4.5 x 1.0	UART	External	No

Low power DC-DC converters

Low power modules

Murata's DC/DC converters can meet the needs for miniaturization, low profile, high efficiency, power-saving, low noise designs for use in healthcare applications, and more.



Features

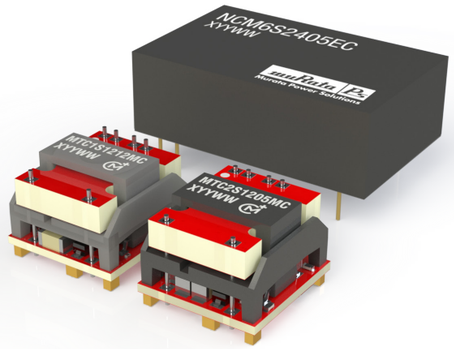
- Operating temperature range: -40º to 85ºC
- Through hole and surface mount options
- ANSI AAMI ES60601-1 recognition
- Ultra low-coupling capacitance
- UL60950

Series	Input Voltage	Output Voltage	Power	MOOP	MOPP	ES6060601-1 working voltage
NXE1	3.3/5V	3.3/5V	1	1		250Vrms
NXJ1	3.3/5/12V	3.3/5/12/15V	1	1	1	250Vrms
MEJ1	3.3/5/12/15/24V	3.3/5/9/12/15V	1	1		200Vrms
NXE2*	5/12V	5/12/15V	2	1		250Vrms
MEJ2	3.3/5/12/15V	3.3/5/9/12/15V	2	1		200Vrms

**Approval pending*

Wide input DC-DC converter 2:1 or 4:1, regulated output

Wide input DC/DC converters, ideal for applications where a regulated input source is unavailable, or when equipment is powered over long input lines,



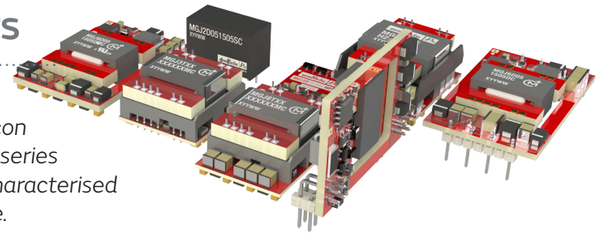
Features

- Input range 2:1, 9-18V & 18-36V
- 4:1 9-36V & 18-75V
- Operating temperature -40 to 105ºC
- UL60950 Reinforced isolation
- Short circuit protection
- Load regulation maximum 1%
- Remote on/off

Series	Input Voltage	Output Voltage	Power	MOOP	ES6060601-1 working voltage
MTC1	12/24V	3.3/5/12V	1	2	250Vrms
MTC2*	12/24V	3.3/5/12V	2	2	250Vrms
NCM6	5/12/48	3.3/5/12/15	6	2	250Vrms

**Approval pending*

Gate Drive DC/DC converters



The MGJ series of DC/DC converters for powering "high side" and "low side" gate drive circuits for IGBTs and Silicon and silicon carbide MOSFETs in bridge circuits. The MGJ series has characterised partial discharge performance and characterised dV/dt immunity 80kV/µs, with low coupling capacitance.

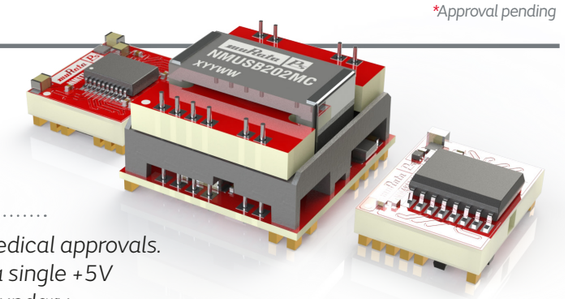
Features

- Options for driving single, dual, triple and quad circuits
- Characterised dV/dt immunity 80kV/µs
- Characterised partial discharge performance
- Suitable for DC link voltages up to 3kVDC
- Surface mount and through hole options
- Wide input and nominal input voltage range options
- Low coupling capacitance 5-15pF typical
- Operation to 105°C

Series	Input Voltage	Output Voltage	Power	MOOP	MOPP	ES6060601-1 working voltage
MGJ1*	5/12/15/24V	+15/-9V, +15V/-5V, +19V/-5V	1	2	2	250Vrms
MGJ2*	5/12/15/24V	+15/-8.7V, +15V/-5V, +20V/-5V	2	1		200Vrms
MGJ3	5/12/24V	+15/-10V, +15V/-5V, +20V/-5V	3	2	1	250Vrms
MGJ6	5/12/24V	+15/-10V, +15V/-5V, +20V/-5V	6	2	1	250Vrms
MGJ6 DIP*	5/12/24V	+15/-10V, +15V/-5V, +20V/-5V	6	2	2	250Vrms
MGJ6 SIP*	5/12/24V	+15/-10V, +15V/-5V, +20V/-5V	6	2	2	250Vrms
MGJ6 LP*	5/12/24V	+15/-10V, +15V/-5V, +20V/-5V	6	2	2	250Vrms
MGJ6 HB*	5/12/24V	24/24V	6	2	2	250Vrms
MGJ6 FB*	5/12/24V	24/24/24V	6	2	2	250Vrms
MGJ6 3P*	5/12/24V	24/24/24/24V	6	2	2	250Vrms

**Approval pending*

Isolated powered data communication interfaces



High isolation surface mount powered interfaces with medical approvals. No external components are required, for TTL and 485, a single +5V supply powers all functions either side of the isolation boundary

Features

- No external components required
- Surface mount solutions for automated manufacture
- TTL & 485 include regulated +5V and un-regulated +6/-6V for driving analogue or powering monitoring circuitry
- Pictures NMUSB, NM485

Series	Output Voltage	Data interface	MOOP	MOPP	ES6060601-1 working voltage
NM485D6S5MC*	-6V/-5V & 5V regulated	485	2	1	250Vrms
NMTTLD6S5MC*	-6V/-5V & 5V regulated	TTL	1	1	250Vrms
NMUSB202MC	5V	USB	2	1	250Vrms

**Approval pending*

AC-DC front-end power supplies

Medical approved

Custom products also available for medical applications

Selection table

Series	Convection Cooling	Forced Air 250LFM	Input Voltage (Vac)	Output Voltage (V)	Efficiency
MVAC400	250W	400W	90-264	12V/24V/50V	93%
MVAC250	170W	250W	90-264	12V/24V/50V	93%
MVAD160	110W	160W	90-264	12V/24V/48V	93%
MVAB120	75W	120W	90-264	12V/24V/28V/48V	91%
MVAD065	65W	65W	90-264	12V/24V/48V	90%
MVAD040	40W	40W	90-264	12V/24V/48V	89%

Features

- Universal input 90-264Vac
- Active power-factor correction
- Up to 250W natural convection cooling
- -20°C to +70°C full power operating temp.
- Class B conducted EMC
- Aux isolated 12V@1A fan output
- MVAC 250/400: 10W 5V standby power
- MVAD040/065: less than 0.3W at no load
- 2 x MOPP (Primary-Secondary)
- 1 x MOPP (Secondary-Chassis/Earth Enclosure

Quality/Safety

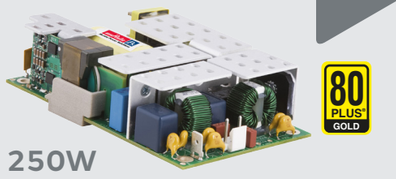
- 60601 (3rd edition) MOPP, 60950 safety approval
- 2 year warranty

Applications

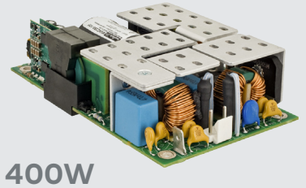
- Mains-powered medical equipment

MVAC Series

3”x5”



250W



400W

Learn more online

http://power.murata.com/en/products/ac-dc-power-supplies.html

MVAD Series

2”x4”

40W

120W

65W

MVAD160 Series

160W

Inductors

Murata chip inductors feature compact size and high-performance. The unique coil and case structures give them low DC resistance and outstanding high-frequency characteristics.

Murata offers a broad variety of products for different applications.
The diverse lineup offers the customer a choice of the types of inductors and characteristics optimal for the circuit in question.

Learn more online

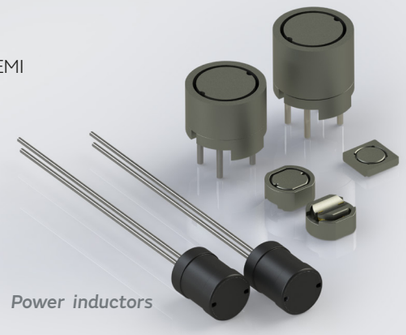
http://www.murata.com/en-eu/products/inductor

Product line-up

- **Inductors for Power Circuits (Power and Choke)**
- **RF Inductors**

Product line-up

- **Inductors/Common Mode Chokes**
  - AC and DC Powerline filtering
  - Magnetically shielded inductors for EMI sensitive applications
  - Energy storage in power converters
- **Transformers**
  - Pulse
  - Current sense



Power inductors

EMI Noise suppression

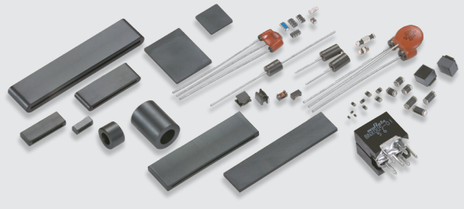
Using Murata's ceramic processing technology and unique material, we offer a variety of Noise Suppression Products and EMI Suppression Filters. Murata also offers technical support and guidance based on many years of experience operating in the field of noise suppression.

Learn more online

http://www.murata.com/en-eu/products/emc

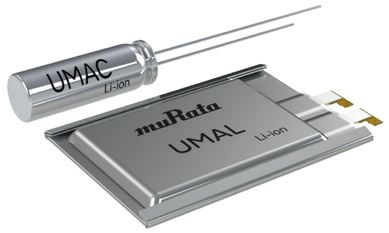
Product line-up

- **EMI Suppression Filters**
- **Microwave Absober**
- **AC Line Filter**
- **ESD Protection Devices**
- **Ferrite Core**



Small energy device

Murata's small energy devices are secondary batteries having high-rate charge-discharge characteristics and long cycle life. They are well suited as a power supply for small power portable equipments or as a backup power supply



Features

- High-rate charge/discharge up to 10C
- High safety
- Extended service cycle life
- Excellent charge (capacity) recovery rate: 80% or higher after 3,000 cycles (UMAC) and 90% or higher after 5,000 cycles (UMAL)
- Wide operating temperature range

Applications

- Emergency call or transmitter (medical equipments using IMS bands such as nurse call),
- micropower UPS,
- small power portable devices,
- patient monitor,

Learn more online

http://www.murata.com/en-eu/products/smallenergydevice

Capacitors

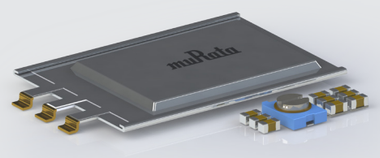
Murata offers the No. 1 most abundant lineup in the industry, responding to all possible needs, and proposing ideal solutions. Continuing to evolve as the world's No.1 manufacturer of monolithic ceramic capacitor

Learn more online

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

Product line-up

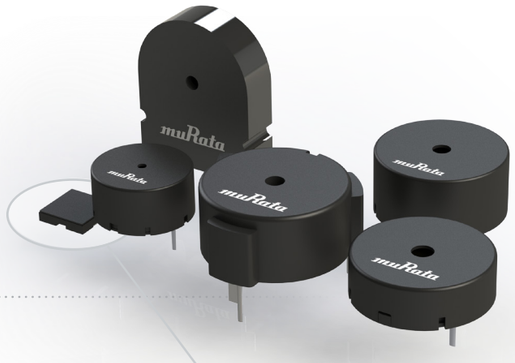
- **Monolithic ceramic capacitors**
- **High voltage capacitors**
- **PAC (Polymer aluminum electrolytic capacitors)**
- **Film capacitors**
- **EDLC (Electrical double layer capacitors)**
- **Safety capacitors**
- **Trimmer capacitors**
- **Single layer microchip capacitor**



EDLC, GRM, ZRB, TZC3

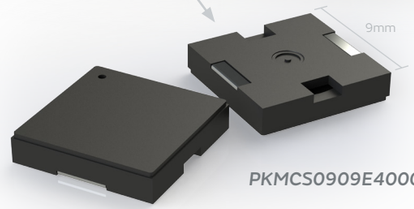
Sound components

Piezoelectric sound components utilize natural oscillation of piezoelectric ceramics. They are widely used in the applications from healthcare to consumer products.



Ultra compact light and low power SMD piezoelectric sounder suits portable healthcare devices

The smallest and lightest surface mount piezoelectric sounder available. Occupying significantly less surface area, and with a combined weight and area reduction of 44% compared to other similar products.



PKMCS0909E4000-R1

SAW components

Murata delivers high performance surface acoustic wave (SAW) radio frequency (RF) components that include filters, duplexers, diplexers, resonators and frequency control devices, giving RF engineers a broad range of SAW based RF component selections from one global manufacturer.

Murata SAW technology is industry-leading in size, performance, cost and time-to-market. We have one of the broadest SAW portfolios with frequencies from 40 MHz to 2.7 GHz, for cellular bands, ISM bands, GPS and GNSS bands, and other frequency bands.

Our state of the art production facilities allow us to offer SAW components for high-volume and high-performance markets.

Learn more online

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

Product line-up

- **RF & IF filters**
- **Diplexers**
- **Resonators**

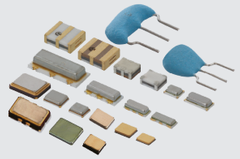
Timing Devices

Ceramic resonators (CERALOCK®) are made of high stability piezo-electric ceramics that function as a mechanical resonator.
With the advance of the IC tech-nology, various equipment may be controlled by a single LSI integrated circuit, such as the one-chip micro-processor.

Learn more online
http://www.murata.com/en-eu/products/timingdevice

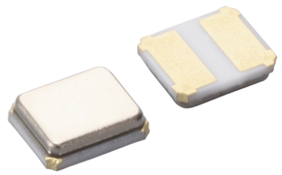
Product line-up

- **Ceramic resonators**
- **Ceramic filters**
- **Crystal units**
- **Crystal oscillators**
- **Piezoelectric sound components**



Timing devices

Crystal units



Since 2009, Murata's crystal unit has offered a compelling balance of value and accuracy, in an innovative 2016 package. Such features are ideal for size and cost conscience consumer, and communication applications.

Features

Small size
- 2016* size for 24MHz to 48MHz
- 2520* size for 16MHz to 24MHz

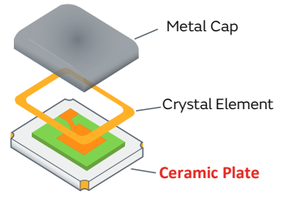
**2016 = 2.0mm x 1.6mm package size*
**2520 = 2.5mm x 2.0mm package size*

Frequency Tolerance
- Available +/-20ppm* for Consumer
- Available +/-100ppm* for Automotive

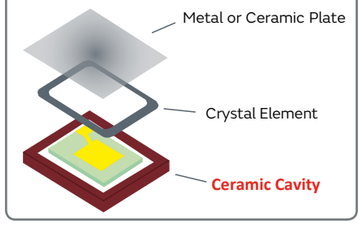
Economical & robust design
- Simple structure using Murata's proven package technology
- Particle screening process for enhanced reliability

RoHS Compliant & Pb Free

Murata Crystal Unit

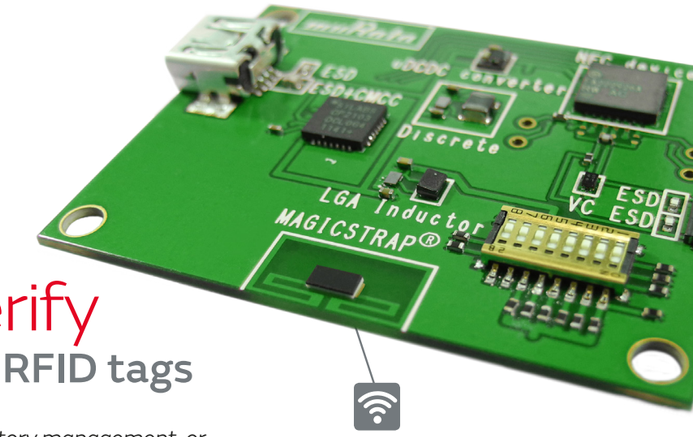


Conventional Crystal Unit



Learn more online
http://www.murata.com/en-eu/products/timingdevice/crystalu

MAGICSTRAP®



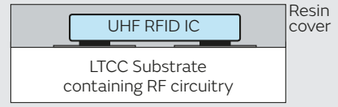
Track, trace, & verify
with ultra-miniature UHF RFID tags

Whether your focus is on anti-counterfeiting, inventory management, or process control, MAGICSTRAP® offers you an integrated solution with a tag size which can meet the challenges of almost any application.

At only 2.0 x 1.2 (LXMS21) and 3.2 x 1.6 (LXMS31), the **MAGICSTRAP®** UHF IC module is one of the smallest in the world. It can be mounted onto, or embedded into, a wide variety of materials even in non-electronic products, and can be surface-mounted directly onto your PCB for use in medical electronics.

In association with partner companies offering hardware & software solutions, we are able to provide a fully integrated system that gives you massive read/write functionality all built around an unbelievably small module.

Construction



Features

- RF circuitry incorporated in LTCC substrate
- Read range:
  - Up to 2cm using the component alone*
  - Up to 7m with external antenna
- Can be mounted on many surfaces
- Can be embedded into many materials
- Small SMD: 2.0 x 1.2 (LXMS21) and 3.2 x 1.6 (LXMS31)
- Complies with EPCglobal C1G2, ISO 18000-6C

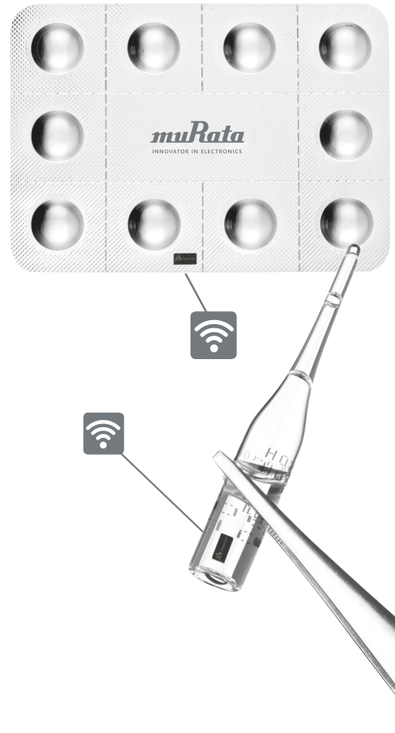
**Loop type antenna for reader/writer is required*

Applications

- Anti-counterfeit
- Process control/traceability of medical electronics
- Tracking/tracing PCBs
- Inventory management in healthcare institutions
- Probe tracking

Small Size

2.0 x 1.2 (LXMS21) or
3.2 x 1.6 (LXMS31),
surface-mounted device



Learn more online
http://www.murata.com/en-eu/products/rfid

my Murata

Find what you need, when you need it

The new 'my Murata' portal is designed to respond to your individual needs. This space acts as a conference room in which you and Murata can meet.

Focused on products and solutions, this service provides you with the information you need - quickly. Our aim is to make you will feel like you have a Murata salesman or engineer at your side.

New Murata web service registration only portal site

Get your login credentials at:
https://my.murata.com/en/

Get the latest product information

You can find out about the latest ceramic capacitor product lines, updated regularly as well as some unreleased product information, exclusively available on 'my Murata'. Plus much more...

'my Murata' knowledge exchange

To get feedback from the engineering community post your questions onto the 'Forum' which is provided to allow customers with similar experiences to exchange ideas and knowledge through discussions with Murata engineers. Find product specifications, mounting know-how, noise suppressions solutions, plus much more...

Enhanced design tool

Simulate the characteristics of Murata products using the enhanced version of our 'SimSurfing' software available on the 'my Murata' portal.

Medical Application Disclaimer Notice

Murata's products are not specifically designed or authorized for use in safety-critical applications, being applications in which a failure of Murata's product may cause severe personal injury or death, unless Murata and respective customer executed a written agreement that specifically governs such use of Murata's products. Customers shall indemnify Murata and its representatives against any damages, claims, suits and expenses arising out of the unauthorized use of Murata's products in such safety-critical applications.

Customer shall ensure that it has adequate expertise in connection with safety, regulations and regulatory requirements for its applications, and customer is solely responsible for compliance with all legal, regulatory and safety-related requirements concerning its devices or products, including any use of Murata's products in customer's applications, regardless of any information or support that may be (or has been) provided by Murata in relation thereto.

Global locations

For details please visit www.murata.com

Note

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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.

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. *Undersea equipment*
3. *Medical equipment*
4. *Traffic signal equipment*
5. *Data-processing equipment*
6. *Aerospace equipment*
7. *Power plant equipment*
8. *Transportation equipment (vehicles, trains, ships, etc.)*
9. *Disaster prevention / crime prevention equipment*
10. *Application of similar complexity and/or reliability requirements to the applications listed above*

Product specifications in this catalog are as of September 2014. 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.

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

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

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

Murata Manufacturing Co., Ltd.

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