Shaping the future of Healthcare & medical

Latest technologies for all healthcare and medical applications
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.

Please note that Murata does not support the usage of Murata’s standard products for safety-critical applications that require especially high reliability.

Please don’t hesitate to contact us if you have any questions or concerns.

Contents:

- Sensors / Thermistor: 4-5
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- Power Devices (DC-DC): 9
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- My Murata: 15
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

Learn about MEMS sensors

Block diagram

- SCA61T Accelerometer
- Power management
- u-controller for signal processing
- I/F
- UART
- BCG Device

Features

- Heart rate, respiration rate & bed occupancy

Benefits

- Safety
- Efficiency
- Responsiveness
Sensors MEMS

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.

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### 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  

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### 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  

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Sensors

Sensor product lineup
- Pyroelectric Infrared Sensors
- Ultrasonic Sensors
- Magnetic Pattern Recognition Sensors
- Magnetic Switches (AMR Sensors)
- Shock Sensors
- Angular Rate Sensors
- Rotary Position Sensors
- MEMS Sensors

Learn more online

Thermistors

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

Low profile, flexible with excellent responsiveness

Easily routed in complex designs the flexible film temperature sensor is ideal for sensing housing temperatures of compact devices as wearable healthcare products, smartphone and tablets.

This range of surface-mounted NTC temperature sensors are packaged on a flexible printed circuit (FPC) film and measuring at 50.00 x 3.17 x 0.55 mm in size. The FTNT55XH103FA1A050 can measure temperatures in the range of -40 to +125 degrees C and has an accuracy, at 25 degrees C of +/- 0.4 degrees C. Resistance at 25 degrees C is 10 k ohm +/- 1%.

The film temperature sensor has been granted 4 patents including 1 basic patent and 3 peripheral patents.

Features
- FPC thickness approximately 100µm for easy wiring in complex structures and tight spaces
- Equipped with low heat capacity making thermal responsiveness excellent

FTNT55XH103FA1A050

Learn more online

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
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.

<table>
<thead>
<tr>
<th>Product</th>
<th>Murata P/N</th>
<th>Chipset</th>
<th>Processor</th>
<th>WLAN</th>
<th>Op. Temp</th>
<th>Size (mm)</th>
<th>Host Interface</th>
<th>Antenna</th>
<th>Cert.</th>
<th>Grade</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type 1FX</td>
<td>LBWA1KL1FX-875</td>
<td>BCM43364</td>
<td>N/A</td>
<td>802.11b/g/n</td>
<td>-20°C to +75°C</td>
<td>6.95 x 5.15 x 1.1</td>
<td>SDIO</td>
<td>External</td>
<td>No</td>
<td>Consumer</td>
</tr>
<tr>
<td>Type YD</td>
<td>LBWA1ZVDYDZ-679 (WICED SW)</td>
<td>Broadcom® BCM43362</td>
<td>STM32 ARM® Cortex®-M3</td>
<td>802.11b/g/n</td>
<td>-40°C to +85°C</td>
<td>10.0 x 7.9 x 1.25</td>
<td>UART/SPI</td>
<td>External</td>
<td>Yes</td>
<td>Consumer</td>
</tr>
<tr>
<td></td>
<td>LBWA1ZVDYDZ-682 (Ayla SW)</td>
<td>Broadcom® BCM43362</td>
<td>STM32 ARM® Cortex®-M4</td>
<td>802.11b/g/n</td>
<td>-40°C to +85°C</td>
<td>10.0 x 7.9 x 1.25</td>
<td>UART/SPI</td>
<td>External</td>
<td>TBD</td>
<td>Consumer</td>
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<tr>
<td></td>
<td>LBWA1ZVDYDZ-739 (Murata SW)</td>
<td>Broadcom® BCM43362</td>
<td>STM32 ARM® Cortex®-M4</td>
<td>802.11b/g/n</td>
<td>-40°C to +85°C</td>
<td>10.0 x 7.9 x 1.25</td>
<td>UART/SPI</td>
<td>External</td>
<td>Yes</td>
<td>Consumer</td>
</tr>
<tr>
<td>Type ZD</td>
<td>LBWA1ZVDZDZ-681</td>
<td>Broadcom® BCM43362</td>
<td>STM32 ARM® Cortex®-M4</td>
<td>802.11b/g/n</td>
<td>-40°C to +85°C</td>
<td>10.0 x 7.9 x 1.25</td>
<td>UART/SPI</td>
<td>External</td>
<td>Yes</td>
<td>Consumer</td>
</tr>
<tr>
<td>Type ZX</td>
<td>LBWA17DXZ6-705</td>
<td>Broadcom® BCM43362</td>
<td>STM32 ARM® Cortex®-M3</td>
<td>802.11b/g/n</td>
<td>-40°C to +85°C</td>
<td>7.0 x 6.0 x 1.2</td>
<td>SDIO</td>
<td>External</td>
<td>No</td>
<td>Consumer</td>
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</tbody>
</table>

Wi-Fi™ 802.11b/g/n Murata WICED module portfolio
Connectivity modules

**Wi-Fi™ - Broadcom® chip set** 2.4GHz IEEE 802.11b/g/n radio technology

<table>
<thead>
<tr>
<th>Product</th>
<th>Murata P/N</th>
<th>Chipset</th>
<th>Processor</th>
<th>WLAN</th>
<th>Op. Temp</th>
<th>Size (mm)</th>
<th>Host Interface</th>
<th>Antenna</th>
<th>Cert.</th>
<th>Grade</th>
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</thead>
<tbody>
<tr>
<td>SN8000</td>
<td>88-00153-00</td>
<td>Broadcom® BCM43362</td>
<td>N/A</td>
<td>802.11b/g/n</td>
<td>-40°C to +85°C</td>
<td>24.0 x 11.4 x 1.9</td>
<td>SDIO/SPI</td>
<td>On Board or U.FL Connector</td>
<td>Yes</td>
<td>Industrial</td>
</tr>
<tr>
<td>SN820X</td>
<td>88-00158-00</td>
<td>Broadcom® BCM43362</td>
<td>STM32 ARM® Cortex®-M3</td>
<td>802.11b/g/n</td>
<td>-40°C to +85°C</td>
<td>30.5 x 19.4 x 2.8</td>
<td>UART/SPI</td>
<td>On Board or U.FL Connector</td>
<td>Yes</td>
<td>Industrial</td>
</tr>
</tbody>
</table>

**Wi-Fi™ 802.11a/b/g/n with Bluetooth 4.0™ for Linux™ & Android platforms**

<table>
<thead>
<tr>
<th>Type</th>
<th>Murata P/N</th>
<th>Chipset</th>
<th>WLAN</th>
<th>BT</th>
<th>Clock</th>
<th>Op. Temp</th>
<th>Size (mm)</th>
<th>Host Interface</th>
<th>Antenna</th>
<th>Cert.</th>
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</thead>
<tbody>
<tr>
<td>Type ZP</td>
<td>LBEH5HMZPC</td>
<td>BCM4339</td>
<td>802.11 a/b/g/n, ac</td>
<td>BT+BLE®</td>
<td>X'tal</td>
<td>-20°C to +75°C</td>
<td>7.8 x 7.42 x 1.0</td>
<td>SDIO(Wi-Fi™), UART(BT®)</td>
<td>External</td>
<td>No</td>
</tr>
<tr>
<td>Type 1BW</td>
<td>LBEH5DU1BW</td>
<td>Broadcom® BCM43440</td>
<td>802.11a/b/g/n</td>
<td>BT+BLE®</td>
<td>Internal X'tal</td>
<td>-20°C to +75°C</td>
<td>8.0 x 7.5 x 1.33</td>
<td>SDIO(Wi-Fi™) + UART(BT®)</td>
<td>External</td>
<td>No</td>
</tr>
<tr>
<td>Type 1DX</td>
<td>LBEESKL1DX-875</td>
<td>BCM4343W</td>
<td>802.11b/g/n</td>
<td>EDR &amp; BLE® v4.1</td>
<td>Internal X'tal</td>
<td>-20°C to +75°C</td>
<td>6.95 x 5.15 x 1.1</td>
<td>SDIO(Wi-Fi™) + UART(BT®)</td>
<td>External</td>
<td>Yes</td>
</tr>
<tr>
<td>Type XR</td>
<td>LBEPSCLXR-701</td>
<td>WiLink™ 8 WL1801</td>
<td>802.11b/g/n</td>
<td>No</td>
<td>External</td>
<td>-40°C to +85°C</td>
<td>9.9 x 8.8 x 1.3</td>
<td>SDIO(Wi-Fi™)</td>
<td>External</td>
<td>No</td>
</tr>
<tr>
<td>Type WT</td>
<td>LBEPSCLWTC-601</td>
<td>(WLAN Only)</td>
<td>802.11b/g/n</td>
<td>v4.0 (BLE®+EDR)</td>
<td>Internal X'tal</td>
<td>-40°C to +85°C</td>
<td>9.9 x 8.8 x 1.3</td>
<td>SDIO(Wi-Fi™), UART(BT®)</td>
<td>External</td>
<td>No</td>
</tr>
<tr>
<td>Type WM</td>
<td>LBEPSCLWMC-603</td>
<td>(WLAN Only)</td>
<td>802.11a/b/g/n</td>
<td>v4.0 (BLE®+EDR)</td>
<td>Internal X'tal</td>
<td>-40°C to +85°C</td>
<td>9.9 x 8.8 x 1.3</td>
<td>SDIO(Wi-Fi™), UART(BT®)</td>
<td>External</td>
<td>No</td>
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</tbody>
</table>

**Bluetooth SMART® modules**

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
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<th></th>
<th></th>
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<th></th>
<th></th>
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</thead>
<tbody>
<tr>
<td>Type VZ</td>
<td>2.4GHz</td>
<td>LBCA2ZZVZ-721</td>
<td>Class 3</td>
<td>BLE®</td>
<td>-2dBm</td>
<td>-10°C to +60°C</td>
<td>20.0 x 13.0 x 24</td>
<td>UART</td>
<td>On Board</td>
<td>Yes</td>
</tr>
<tr>
<td>Type WS</td>
<td>2.4GHz</td>
<td>LBCA2ZWXSE-723</td>
<td>Class 3</td>
<td>BLE®</td>
<td>-2dBm</td>
<td>-10°C to +60°C</td>
<td>10.4 x 7.7 x 1.8</td>
<td>UART</td>
<td>External</td>
<td>Yes</td>
</tr>
<tr>
<td>Type ZF</td>
<td>2.4GHz</td>
<td>LBCA2BZZF2</td>
<td>Class 3</td>
<td>BLE® v4.1</td>
<td>0dBm</td>
<td>-20°C to +85°C</td>
<td>5.4 x 4.4 x 1.0</td>
<td>UART</td>
<td>External</td>
<td>No</td>
</tr>
<tr>
<td>Type ZY</td>
<td>2.4GHz</td>
<td>LBCA2HNZY-711</td>
<td>Class 3</td>
<td>BLE® v4.1</td>
<td>0dBm</td>
<td>-20°C to +85°C</td>
<td>7.4 x 7.0 x 1.0</td>
<td>UART</td>
<td>Internal</td>
<td>Yes</td>
</tr>
<tr>
<td>Type 1BX</td>
<td>2.4GHz</td>
<td>LBMA15Q1BX</td>
<td>Class 3</td>
<td>BT+BLE®</td>
<td>13dBm (Max)</td>
<td>-30°C to +85°C</td>
<td>5.0 x 4.5 x 1.0</td>
<td>UART</td>
<td>External</td>
<td>No</td>
</tr>
</tbody>
</table>
## AC-DC front-end power supplies

### Medical approved

Custom products also available for medical applications

### Selection table

<table>
<thead>
<tr>
<th>Series</th>
<th>Convection Cooling</th>
<th>Forced Air 250LFM</th>
<th>Input Voltage (Vac)</th>
<th>Output Voltage (V)</th>
<th>Efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td>MVAC400</td>
<td></td>
<td></td>
<td>90-264</td>
<td>12V/24V/50V</td>
<td>93%</td>
</tr>
<tr>
<td>MVAC250</td>
<td></td>
<td></td>
<td>90-264</td>
<td>12V/24V/50V</td>
<td>93%</td>
</tr>
<tr>
<td>MVAD160</td>
<td></td>
<td></td>
<td>90-264</td>
<td>12V/24V/48V</td>
<td>93%</td>
</tr>
<tr>
<td>MVAB120</td>
<td></td>
<td></td>
<td>90-264</td>
<td>12V/24V/28V/48V</td>
<td>91%</td>
</tr>
<tr>
<td>MVAD065</td>
<td></td>
<td></td>
<td>90-264</td>
<td>12V/24V/48V</td>
<td>90%</td>
</tr>
<tr>
<td>MVAD040</td>
<td></td>
<td></td>
<td>90-264</td>
<td>12V/24V/48V</td>
<td>89%</td>
</tr>
</tbody>
</table>

### 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

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**Learn more online**


**Custom products also available for medical applications**
DC-DC converters
Low power modules

Compact 1W & 2W DC-DC converter complies with UL60601-1

Industry standard, pin compatible 1W and 2W converters maintaining high levels of efficiency at light loads.

Selection table

<table>
<thead>
<tr>
<th>Series</th>
<th>Isolation</th>
<th>Input voltage</th>
<th>Output voltage</th>
<th>Efficiency</th>
<th>Power rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>MEJ1</td>
<td>5200Vdc</td>
<td>3.3/5/12/15/24V</td>
<td>3.3/5/9/12/15V</td>
<td>69-78%</td>
<td>1W</td>
</tr>
<tr>
<td>MEJ2</td>
<td>5200Vdc</td>
<td>3.3/5/12/15V</td>
<td>3.3/5/9/12/15V</td>
<td>70-82%</td>
<td>2W</td>
</tr>
</tbody>
</table>

Features

- High efficiency across the full load range
- Op. temp. range: -40º to 85º
- Encapsulated: superior thermal performance
- 72-79% typical efficiency
- 3.5 - 5% typical load regulation
- ANSI/AAMI ES60601-1 recognition
- UL60950

Configurable output voltage, high isolation DC-DC converters

With configurable triple output voltages of +15V, +5V and +5V, the MGJ series of DC-DC converters is ideal for powering gate drives for IGBTs and Mosfets (standard, SiC) in bridge circuits. The MGJ series is characterised for high isolation and common mode dv/dt requirements. A disable/frequency synchronisation pin simplifies EMC filter design.

Selection table

<table>
<thead>
<tr>
<th>Output 1</th>
<th>Output 2</th>
<th>Output 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>MGJ3T05150505MC</td>
<td>15</td>
<td>120</td>
</tr>
<tr>
<td>MGJ3T12150505MC</td>
<td>15</td>
<td>120</td>
</tr>
<tr>
<td>MGJ3T24150505MC</td>
<td>15</td>
<td>120</td>
</tr>
<tr>
<td>MGJ6T05150505MC</td>
<td>15</td>
<td>240</td>
</tr>
<tr>
<td>MGJ6T12150505MC</td>
<td>15</td>
<td>240</td>
</tr>
<tr>
<td>MGJ6T24150505MC</td>
<td>15</td>
<td>240</td>
</tr>
</tbody>
</table>

Features

- 3 outputs configurable for all gate drive applications:
  - +15V/-5V, +15V/-10V & +20V/-5V outputs
- ANSI/AAMI ES60601-1 pending
- Reinforced insulation to UL60950 pending
- Characterised dv/dt immunity
- Characterised partial discharge immunity
- Ultra-low coupling capacitance 15pF
- Operation to 105ºC

With configurable triple output voltages of +15V, +5V and +5V, the MGJ series of DC-DC converters is ideal for powering gate drives for IGBTs and Mosfets (standard, SiC) in bridge circuits. The MGJ series is characterised for high isolation and common mode dv/dt requirements. A disable/frequency synchronisation pin simplifies EMC filter design.
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.

Power inductors

Inductors are passive components and are required in all noise-sensitive electronic power circuits. Magnetic inductors are not restricted by application.

Whether you need to reduce noise or protect vital components, we can offer a wide range of products to suit your requirements, having developed over 1,200 highly advanced and optimized inductor and transformer solutions. With an emphasis on miniaturization, reliability and ease of handling, our inductors, current transformers and common mode chokes are available in a variety of styles including bobbin, radial, axial and surface mount.

Learn more online
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.

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.

**Product line-up**

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

**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**

Learn more online

Learn more online
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 technology, various equipment may be controlled by a single LSI integrated circuit, such as the one-chip microprocessor.

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**

Learn more online:
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.

### Specifications

<table>
<thead>
<tr>
<th>Specification</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sound pressure level</td>
<td>65dB min</td>
</tr>
<tr>
<td>Measure condition of sound pressure level</td>
<td>±1.5 Vo-p, 4.0kHz, square wave, 10cm</td>
</tr>
<tr>
<td>Maximum input voltage</td>
<td>±12.5Vo-p max</td>
</tr>
<tr>
<td>Operating temperature range</td>
<td>-40 to +85ºC</td>
</tr>
<tr>
<td>Storage temperature range</td>
<td>-40 to +85ºC</td>
</tr>
<tr>
<td>Drive type</td>
<td>External-drive</td>
</tr>
</tbody>
</table>

### Features

- Small, thin and lightweight
- 9.0mm x 9.0mm x 1.9mm - 44% reduction of its predecessor
- Low power consumption 6.0Mv
- Noiseless - piezo base enables minimum impact on surrounding circuitry by not getting any electrical noise

### Applications

- Healthcare: Blood glucose meters, thermometers, etc.
- Consumer: Remote controls, mobile printers, digital cameras, etc.


![Sound components](image-url)
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.

**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
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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 feel like you have a Murata salesman or engineer at your side.

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‘my Murata’ knowledge exchange
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Get your login credentials at: https://my.murata.com/en/
Note

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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

Product specifications in this catalog are as of March 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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