

Micro modules

World's smallest Bluetooth Smart module in production

- Miniaturized dimensions of 4.6 mm x 5.6 mm x 1.0 mm
- Reduces power consumption to about one quarter of that of classic Bluetooth devices
- Enables easy implementation of Bluetooth connectivity simply by connecting it to a power supply and antenna

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TDK Corporation presents an ultra compact Bluetooth low energy module designed for the Bluetooth 4.0 low energy (LE) specification, which is being marketed as Bluetooth Smart. With its miniature footprint of just 4.6 mm x 5.6 mm and slim insertion height of 1.0 mm, the new SESUB-PAN-T2541 Bluetooth 4.0 LE module is the world's smallest module* for Bluetooth Smart devices. Thanks to its compact size, the new module is very well suited for use in emerging wearable devices, a market that market researchers expect will grow rapidly in the near future. Mass production of the SESUB-PAN-T2541 began in February 2014.

The new module is based on TDK's proprietary SESUB technology (semiconductor embedded in substrate). The Bluetooth IC die is embedded into the thin substrate, and all the peripheral circuitry, including a quartz resonator, bandpass filter and capacitors, is integrated on top. As a result, the new Bluetooth low energy module is nearly 65 percent smaller than modules that employ discrete components. Its substrate layers optimally route all of the I/Os to a BGA on the module's bottom surface, enabling designers to take full advantage of the chip's functionality. The new module thus facilitates the hardware design process and allows easy implementation of Bluetooth connectivity simply by connecting it to a power supply and antenna.

The Bluetooth 4.0 LE specification aims at significantly reducing the power consumption of battery powered wireless devices. The new SESUB-PAN-T2541 Bluetooth 4.0 LE module cuts power consumption to about one quarter of that of classic Bluetooth devices. This makes the new TDK module ideally suited for a wide range of wireless healthcare, sport, fitness, home entertainment and wearable devices, where minimal size, weight, and power consumption are essential.

* As of February 2014, according to TDK investigations

Glossary

- Bluetooth 4.0 LE: Connectivity specification developed by the Bluetooth Special Interest Group is aimed at reducing power consumption in wireless healthcare, sport, fitness, security and home entertainment applications. Bluetooth 4.0 LE is marketed by the Bluetooth Special Interest Group as Bluetooth Smart.
- Bluetooth Smart Ready device: Dual-mode device, such as a smartphone, tablet or notebook, whose hardware is compatible with both classic Bluetooth and LE peripherals.
- Bluetooth Smart device: LE only device, typically a battery-operated sensor, which requires either a Smart Ready or another Bluetooth Smart device in order to function.
- Bluetooth, Bluetooth Smart and the related logo marks are registered by the Bluetooth SIG.

Main applications

- Healthcare, sport and fitness devices such as physical activity monitors, thermometers, blood pressure monitors, blood oxygen monitors, blood sugar monitors, heart rate monitors, and more
- Wearable devices such as smart bracelets, watches, rings, glasses, and clothing
- Home and entertainment devices such as remote controls, sensor tags, toys, lighting equipment, and more
- Computer peripheral devices such as mice, keyboards, stylus pens, or presentation pointers

Main features and benefits

- Miniaturized dimensions of 4.6 mm x 5.6 mm x 1.0 mm
- Substrate layers optimally route all of the I/Os to a BGA on the module's bottom surface, enabling designers to take full advantage of the chip's functionality
- Easy implementation of Bluetooth connectivity simply by connecting it to a power supply and antenna
- Reduces power consumption to about one quarter of that of classic Bluetooth devices

Key data

Type	Communication standard	Wireless output power	Communication range	Interfaces
SESUB-PAN-T2541	Bluetooth 4.0 low energy (2.4 GHz)	0 dBm (typ.)	10 m (line of sight, dependent on antenna characteristics)	UART / SPI / I2C / GPIO / ADC

About TDK Corporation

TDK Corporation is a leading electronics company based in Tokyo, Japan. It was established in 1935 to commercialize ferrite, a key material in electronic and magnetic products. TDK's portfolio includes electronic components, modules and systems* marketed under the product brands TDK and EPCOS, power supplies, magnetic application products as well as energy devices, flash memory application devices, and others. TDK focuses on demanding markets in the areas of information and communication technology and consumer, automotive and industrial electronics. The company has a network of design and manufacturing locations and sales offices in Asia, Europe, and in North and South America. In fiscal 2013, TDK posted total sales of USD 9.1 billion and employed about 80,000 people worldwide.

* The product portfolio includes ceramic, aluminum electrolytic and film capacitors, ferrites, inductors, high-frequency components such as surface acoustic wave (SAW) filter products and modules, piezo and protection components, and sensors.

You can download this text and associated images from www.global.tdk.com/news_center/press/20140212771.htm.

Further information on the product can be found under www.tdk.co.jp/tefe02/sesub-pan-t2541_en.pdf.

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