

Micro modules

World's smallest Bluetooth V4.1 Smart module

- Miniaturized dimensions of 3.5 mm x 3.5 mm x 1.0 mm are ideal for wearable devices
- Enables communication with Bluetooth Smart Ready compatible devices
- Offers Bluetooth connectivity with low power consumption

September 29, 2015

TDK Corporation presents the world's smallest module* for the latest Bluetooth 4.1 low energy (LE) specification. The ultra-compact dimensions of the new TDK SESUB-PAN-D14580 module are just 3.5 mm x 3.5 mm x 1.0 mm, thus reducing the footprint by over 60 percent compared to modules with discrete components. The module features an integrated DC-DC converter. With a voltage supply of 3.0 V, its current consumption is only 5.0 mA when transmitting, 5.4 mA when receiving and 0.8 μ A in standby mode. Thanks to its miniature size and low current consumption, the new Bluetooth module is ideal for use in battery-powered wearable devices, where small size, light weight, and low power consumption are essential requirements. Mass production started in July 2015.

The SESUB-PAN-D14580 module, which is based on TDK's SESUB (semiconductor embedded in substrate) integration technology, features an embedded DA14580 Bluetooth 4.1 chip from Dialog Semiconductor. All terminals of the discrete chip are available, allowing full use of chip functions. The quartz oscillator, capacitors, and various other peripheral components are mounted on the same substrate, enabling the record miniaturization. In addition, the modular approach simplifies the hardware design process.

Bluetooth has established itself as the wireless communication standard of choice to connect wearable devices to smartphones, tablets or PCs, for example. The new SESUB-PAN-D14580 implements Bluetooth 4.1 LE, the latest version of this standard that is also known as Bluetooth Smart, which made it possible to reduce power consumption to about one fourth of conventional Bluetooth devices.

* As of July 2015, according to TDK data

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 beacon systems, thin card devices, remote controls, sensor tags, toys, lighting systems and more
- Computer peripheral devices such as mice, keyboards, stylus pens and presentation pointers

Main features and benefits

- Ultra compact module dimensions of 3.5 mm x 3.5 mm x 1.0 mm (typical) drastically reduces the mounting footprint to only about 12 mm²
- Easy implementation of Bluetooth connectivity
- Integrated DC-DC converter
- All terminals of the discrete chip are available, allowing full use of chip functions
- Modular approach simplifies the hardware design process

Key data (3.0 V power supply)

Type	SESUB-PAN-D14580
Dimensions [mm]	3.5 x 3.5 x 1.0 (typ.)
Communication standard	2.4-GHz Bluetooth 4.1 Low Energy (Bluetooth Smart)
Radio output power [dBm]	0 (typ.)
Radio reception sensitivity [dBm]	-93.5 (typ.)
Communication range [m]	10 (line of sight, depending on antenna characteristics)
Current consumption	Transmit: 5.0 mA Receive: 5.4 mA Standby: 0.8 µA
Interfaces	UART, SPI+TM, 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 2015, TDK posted total sales of USD 9.0 billion and employed about 88,000 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
http://www.global.tdk.com/news_center/press/201509291937.htm.

Further information on the products can be found under
http://product.tdk.com/en/catalog/datasheets/sesub-pan-d14580_en.pdf

Contacts for regional media

Region	Contact		Phone	Mail
Japan	Mr. Akira TESHIMA	TDK Corporation Tokyo, Japan	+813 6852-7102	pr@jp.tdk.com
ASEAN	Ms. Jiang MAN Ms. Pei Lu LEE	TDK Singapore (Pte) Ltd. Singapore	+65 6273 5022	asean.inquiry@sg.tdk.com
Greater China	Ms. Clover XU	TDK China Co., Ltd. Shanghai, China	+86 21 61962307	pr@cn.tdk.com
Europe	Mr. Frank TRAMPNAU	TDK Europe GmbH Duesseldorf, Germany	+49 211 9077 127	frank.trampnau@eu.tdk.com
America	Ms. Sara M. LAMBETH	TDK Corporation of America Irving, TX, USA	+1 972-409-4519	sara.lambeth@us.tdk.com