Bluetooth® low energy solution that will power the next 1 billion IoT devices through ease of use.

DA14531 SMARTBOND TINY™ MODULE

The DA14531 SmartBond TINY™ Module, based on the world's smallest and lowest power Bluetooth 5.1 System-on-Chip, brings the DA14531 SoC advantages to an integrated module. It just requires a power supply and a printed circuit board to build a Bluetooth application.

The module is targeting broad market use and will be certified across regions providing significant savings in development cost and time-to-market. It comes with an integrated antenna and easy to use software making Bluetooth low energy development easier than ever before.

This awesome combination takes mobile connectivity to applications previously out of reach, enabling of the next billion IoT devices, with SmartBond TINY™ at their core.

## DA14531 SmartBond TINY™ Module Block Diagram
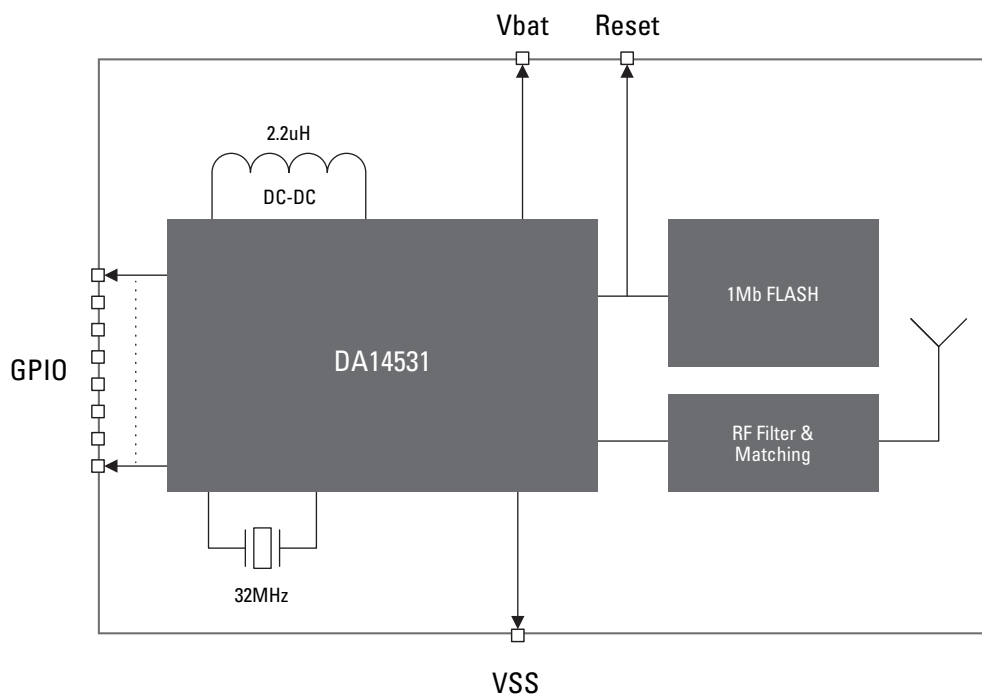
Key Features:

- Bluetooth 5.1 core qualified
- Integrated antenna
- Worldwide certification
- Cortex-M0+ @16MHz
- IoTMark™-BLE score of 18300
- 23.75uA/MHz MCU current
- Memory: 48kB RAM, 32kB OTP &1Mb FLASH
- 1.8-3.3V Supply Range
- +2.2dBM max output power
- -93dBm sensitivity
- Rx current 2mA at 3V
- Tx current 4mA at 3V at 0dBm
- Interfaces: 2xUART, SPI, I2C
- 4-channel 10-bit ADC
- 8 GPIO
- Built-in temperature sensor
- Operating temperature: -40°C to +85°C
- Dimensions: 12.5x14.5x2.8 mm

Applications

- Beacons, Remote controls, Proximity tags, Toys, Low power sensors, Bluetooth LE add-on "pipe" to existing applications
- Provisioning of any type of equipment providing ease of use with smartphone APP-based based setup and control, eliminating the need for printed user manuals

Based on the DA14531 with a powerful 32-bit Arm Cortex-M0+, integrated memories and a complete set of analog and digital peripherals, SmartBond TINY™ module is extremely power efficient. The DA14531's architecture and resources allow it to be used as a standalone wireless microcontroller or as a Bluetooth LE data pipe extension to designs with existing microcontrollers.

It is complemented by a flexible Software Development Kit (SDK) supporting major compilers such as Keil® and GCC out of the box. For simple applications, the Renesas CodeLess software will allow development without writing software code at all, using a comprehensive set of AT commands and pushing the boundaries of ease of use to the next level.
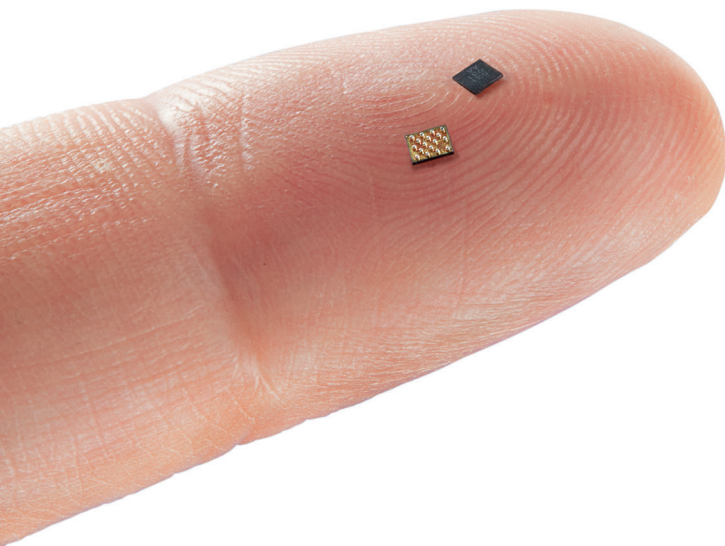
DA14531 SmartBond TINY™

Software and Hardware Tools

SmartSnippets™ SDK

The DA14531 is delivered with our complete SmartSnippets™ Software Development Kit including Renesas' mature and proven Bluetooth stack.

SDK features:

- Bluetooth 5.1 core features
- SUOTA for easy Software-Upgrade-Over-the-Air
- HCI/GTL/DSPS support to act as Bluetooth LE data pipe for an external MCU
- Security with software based TRNG
- CodeLess AT Command software
- Key profiles like device information and battery service
- Software examples

SmartSnippets™ Studio

SmartSnippets™ Studio is a royalty-free software development platform for Smartbond™ devices. It fully supports the DA14531 and DA1458x. The compiler support for DA14531 is based on the free version from Keil® or GCC.

SmartSnippets™ Toolbox

SmartSnippets™ Toolbox is provided with the Development Kit of Renesas' Bluetooth chipset. It is targeting the main activities of programming and optimizing code for best power performance.

Key features to the Toolbox are:

- Data rate monitoring
- Power profiling for real-time access of power consumption
- Programmer of FLASH and OTP
- Interfacing to hardware for device configuration:
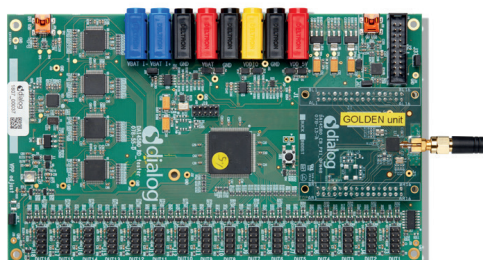 Power modes, radio setting etc.

Production Line Toolkit

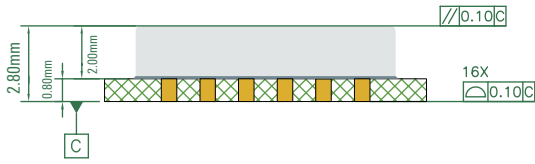The Production Line Toolkit enables customers to save cost by

- Accelerated production set up (fast track to production start)
- High throughput of less than 1 sec/device by running 16 devices under test in parallel
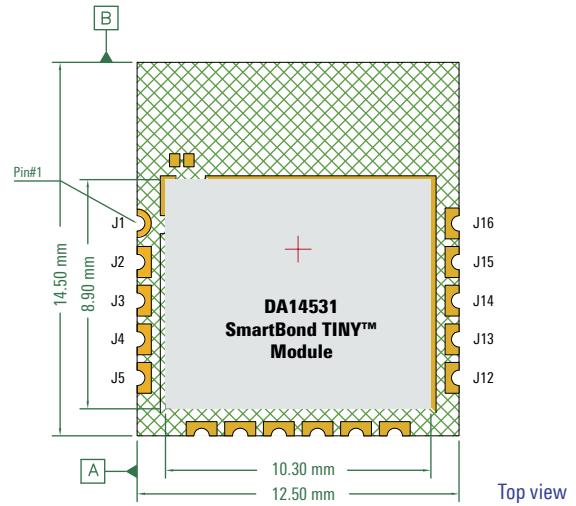
Key features:

- XTAL trimming
- RF testing
- SW programming
- Functional testing

DA14531 SmartBond TINY™ Module Package

Side view

Pin#1

Top view

## Ordering Information

DA14531 SmartBond TINY™ Module

Part number	Size (mm)	Shipment form	Pack Quantity	MOQ
DA14531MOD-00F01002	12.5 x 14.5 x 2.8	Reel	1000	1
DA14531MOD-00F0100C	12.5 x 14.5 x 2.8	Reel	100	3

DA14531 Development Kits

Part number	Description
DA14531MOD-00DEVKT-P Development Kit is based on module samples	Bluetooth Low Energy Development Kit Pro for DA14531 SmartBond TINY™ Module: Includes motherboard, daughterboard and cables; Primary usage is SW application development and power measurements
DA14531MOD-00F1DB-P	DA14531 Module Daughterboard for Pro Development Kit

For more information and purchasing please visit:

www.renesas.com/DA14531mod
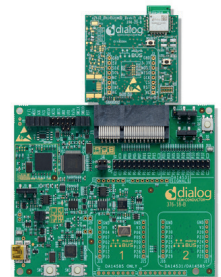
DA14531 Module Development Kit-Pro

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