




WIRELESS CONNECTIVITY PORTFOLIO

	ST's Bluetooth low-energy ICs are compliant with the Bluetooth® 4.0 standard and are also Bluetooth® SIG (Bluetooth Special Interest Group) qualified products. Featuring ultra-low power consumption, ST's solutions are ideal for all Bluetooth® Smart accessories
	ST's Blue Modules support the latest Bluetooth Classic stack V3.0 (Seattle) protocols and feature a standalone embedded BT solution implementing Bluetooth radio, microcontroller, driver and FW in a BT complete module
	Integrating radio, RF circuitry, microcontroller and a full featured TCP/IP stack, ST's SPWF01S series of Wi-Fi modules are a Plug&Play and cost effective 802.11 bgn complete solution for integration in IoT devices and in multiple applications
Sub-1 GHz	Sub-GHz RF proprietary transceivers with excellent receiver sensitivity and extremely low current consumption. Error-free transmission in harsh-environmental or challenging-logistical conditions is guaranteed.

SPIRIT1 RF TRANSCEIVER

ST's SPIRIT1 transceiver is intended for RF wireless-sensor node applications in the sub-1 GHz band, such as Automatic Meter Infrastructure, alarm and security systems, home and building automation, and industrial monitoring and control. It combines excellent receiver sensitivity with a very low current consumption. Additional embedded features include a "Listen-before-talk with" (CSMA/CA) engine, an AES-128-bit data encryption, error correction and detection, FIFO memory blocks, as well as a highly flexible and programmable data packet which contributes to further reducing the computational load of the host microcontroller and the overall system power consumption. SPIRIT1 is designed to operate within the ISM and SRD sub-1 GHz frequency bands namely at 169, 315, 433, 868, and 915 MHz. Several software stacks are available, such as the 6LoWPAN protocol stack enabling low-power devices to participate in the IoT, and the wireless M-Bus protocol stack (based on European standard 13757-4:2011.10) mainly addressing energy meter applications.



M-Bus

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KEY FEATURES

- Frequency bands: 150-174 MHz, 300-348 MHz, 387-470 MHz, 779-956 MHz
- Ultra low current consumption (9 mA RX and 21 mA TX @ +11 dBm)
- Excellent sensitivity -122 dBm @ 1.2 Kbps (1% BER)
- ETSI, FCC and ARIB compliant
- Wireless MBUS, 6LowPan
- QFN 20 4 x 4mm Package

STS1TX RF TRANSMITTER

ST's STS1TX sub-1GHz transmitter embeds a 128-bit data encryption, FIFO memory blocks, as well as a highly flexible and programmable data packet. It's housed in a small 4x4 QFN package and it is also pin-to-pin compatible with SPIRIT1.



EVALUATION KITS

Part number	Description
STEVAL-IDS001V2/3/4/5	SPIRIT1 - Low Data Rate Transceiver - 315, 433, 868, 915 MHz - USB dongle
STEVAL-IKR002V1/2/3/4/5	SPIRIT1 - Low Data Rate Transceiver - 169, 315, 433, 868, 915 MHz - FULL KIT

BALF-SPI-0xD3 is an ultraminiaturized balun (1.2 mm x 1.4 mm) series integrating matching network and harmonics filters with a customized matching impedance for the ST SPIRIT1 transceiver. It uses ST's IPD technology on a non-conductive glass substrate to optimize RF performance.

- BALF-SPI-01D3 optimized for 868 MHz operating frequency



SPBT2632 SERIES, SMART COMMUNICATION EMBEDDED IN A QUALIFIED BLUETOOTH V 3.0 SOLUTION

ST's Blue Module range of wireless modules is based on the latest Bluetooth Classic 3.0 and implements leading-edge Bluetooth technology. The modules are designed for maximum performance in a minimal space. They include high-speed UART, general-purpose I/O lines and high data throughput. An optimized design allows the integration of a complete Bluetooth modem, enabling low-power mode capability in the minimum possible size.

All Blue Modules are BQE qualified and listed on the SIG website. The SPBT2632 series with antenna onboard is fully certified FCC, IC, CE and the SPBT2632C2A. AT2 is also TELEC certified.

Blue Modules support the AT command interface based on SPP (serial port profile) featuring fast and secure, transparent serial data transmission and simple automatic connection between predefined devices through smart cable links. In addition the AT2 FW version supports iAP (iPOD accessory protocol) for communication with smartphones and Apple iOS Bluetooth-enabled devices.



SPBT2632C1A.AT2
15 x 27 mm



SPBT2632C2A.AT2
11.6 x 13.5 mm

TARGETED APPLICATIONS

- Wireless cable replacement
- M2M
- Smartphones
- Service diagnostics
- Data acquisition equipment
- Mobile health

Key features	Key benefits
Compliant with latest Bluetooth version 3.0	Future-ready module, enhanced security, easier pairing, compatible with Apple product
SPBT2632 series is BQE End product qualified and the relevant QDIDs are listed on SIG website	Recalling ST QDID you can apply for declaration ID listing on SIG website, no further BQE certification is required for your product
Pre-qualified, pre-tested, RF design fully integrated in a unique device	Highly reliable solution, easier design saves development resources and time, shortens time-to-market
Low-power mode supported	Reduces power consumption, increasing final application's battery life
Smart cable and remote mode supported	Ensures easy automatic connection and remote mode control over Bluetooth link
Micro-sized form factor	SMD-like component to fit miniaturized applications

Part number	Description	Bluetooth version	FW release	Certification	Dimension
SPBT2632C2A.AT2	Class2, onboard antenna	Bluetooth V3.0	AT2 command supporting, M2M, smartphones and Apple iOS	BQE, TELEC, CE, FCC, IC	11.6 x 13.5 x 2.9 mm
SPBT2632C1A.AT2	Class1, onboard antenna	Bluetooth V3.0	AT2 command supporting, M2M, smartphones and Apple iOS	BQE, CE, FCC, IC	15.2 x 26.9 x 2.9 mm

DESIGN SUPPORT

STEVAL-SPBT dongles are an easy way to test and operate the Blue Module and get familiar with the embedded firmware, which enables the setup of a Bluetooth link with simple AT commands. The AT command list is detailed in the UM1547 user manual.

A "getting started" section is included in each Application Note to explain the module settings and features.

EVALUATION KITS

Part number	Description
STEVAL-SPBT3ATV3	USB dongle, evaluation board for SPBT2632C2A.AT2
STEVAL-SPBT4ATV3	USB dongle, evaluation board for SPBT2632C1A.AT2

Datasheets, application notes, AT command user manual and a Blue module presentation are available at www.st.com/bluemodules



SPWF01S SERIES OF WI-FI MODULES

The SPWF01S series of Wi-Fi modules offers a fast, flexible and affordable Plug&Play solution for integration of 802.11 b/g/n and TCP/IP technologies in IoT devices. The modules integrate a complete TCP/IP stack and a user-friendly application layer that ensures a simple and effective way to use the modules via AT commands. The modules are configured around a single-chip 802.11 transceiver with integrated PA and an STM32 32-bit microcontroller with extensive GPIO support. The modules also incorporate timing clocks and voltage regulators. Multiple antenna options are available.



Part number	Description	Antenna	Flash
SPWF01SA.11	802.11 bgn Wi-Fi module with integrated TCP/IP protocol stack and AT command layer	Ceramic Antenna	1.5 MB
SPWF01SC.11		U.FI. Connector	
SPWF01SA.21		Ceramic Antenna	512 kB
SPWF01SC.21		U.FI Connector	

EVALUATION TOOLS

Part number	Description
STEVAL-IDW01V1	Based on the SPWF01SA.11, the board can be used as a dongle when integrated with the Daughter Board usable with STEVAL-PCC018V1 or as a Wi-Fi network coprocessor when integrated with the STM32F0-Discovery.

BlueNRG

The BlueNRG is an ultra-low power Bluetooth® SMART (also known as Bluetooth low energy) Network Processor IC compliant with the Bluetooth specification 4.0. The BlueNRG is certified as both Master and Slave. The entire Bluetooth Low Energy stack runs on the embedded ARM Cortex-M0 core. The ultra-low power consumption in active and sleep modes together with the excellent RF performances makes the BlueNRG the ideal solution for applications such as wearable, sport and fitness and consumer medical.

Part number	Description
STEVAL-IDB002V1	Bluetooth SMART board based on the BlueNRG low energy network processor
STEVAL-IDB003V1	Bluetooth SMART USB dongle based on the BlueNRG low energy network processor

KEY FEATURES

- Programmable TX output power up to +8 dBm
- Excellent RX sensitivity performance (-88 dBm)
- Very low current consumption: 1.7 µA in sleep mode
- QFN32 (5 x 5 mm) and WLCSP34 (2.66 x 2.56 mm) packages

BAL-NRF01D3 is an ultraminiaturized balun. Integrating matching network and harmonics filter. Matching impedance has been customized for BlueNRG.

