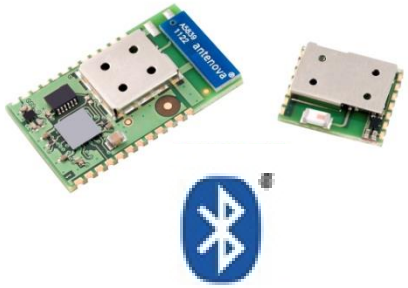
Classic Bluetooth® 3.0 modules

Modules and turnkey solutions with embedded Bluetooth 3.0 firmware and AT command



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Blue Modules series

- The SPBT2632 micro-sized Blue Modules offer the most advanced Bluetooth® technology on a highly-reliable and affordable platform

- The series includes modules for short (class 2) and long range (class 1), with antenna on-board, embedding a simple to use Firmware subsets to meet the requirements of a wide range of applications, supporting communication with smartphones and Apple iOS Bluetooth enabled devices.

Blue Modules series

SPBT2632 Modules with antenna embedded

SPBT2632C2A.AT 2 (Class 2 profile, enhanced Firmware)
SPBT2632C1A.AT 2 (Class 1 profile, enhanced Firmware)

Why use Blue Modules 1/2

Key factors - certification

- Compliant with latest **Bluetooth version 3.0**
- Pre-qualified and tested
- Embedded **Firmware for smart communication** with smartphone and Apple devices
- SPBT2632 series is **BQB End product qualified**
- SPBT2632 module **QDIDs** are listed on **SIG** website
- Your product has **declaration ID listed**
- **Antenna onboard**
- SPBT2632 series is **modular approved FCC** qualified and **IC qualified**
- SPBT2632 series is **CE 1051 approved**
- SPBT2632C2A is **Telec** certified

Key benefits

- Future-ready module, enhanced security, easier paring, smartphone and Apple compatible
- High-reliable solution not requiring specific RF and Bluetooth knowledge on customer side
- Fully embedded Firmware, you only need connecting the MFI co-processor to talk with Apple world
- Adopting SPBT2632 modules your final product is ready for BT logo **no further BQB cetification**
- Simply recalling ST QDID you can apply for **declaration ID** listing on SIG website
- You can use the Bluetooth logo and advertise your product on the Bluetooth.com website
- Fully RF certified , reducing your effort and cost
- You can simply use SPBT2632 FCC and IC ID, no need for further test on your final product
- Your final product CE marking can simply recall the SPBT2632 ID without further test
- The SPBT2632 is ready for Japanese market

Why use Blue Modules 2/2

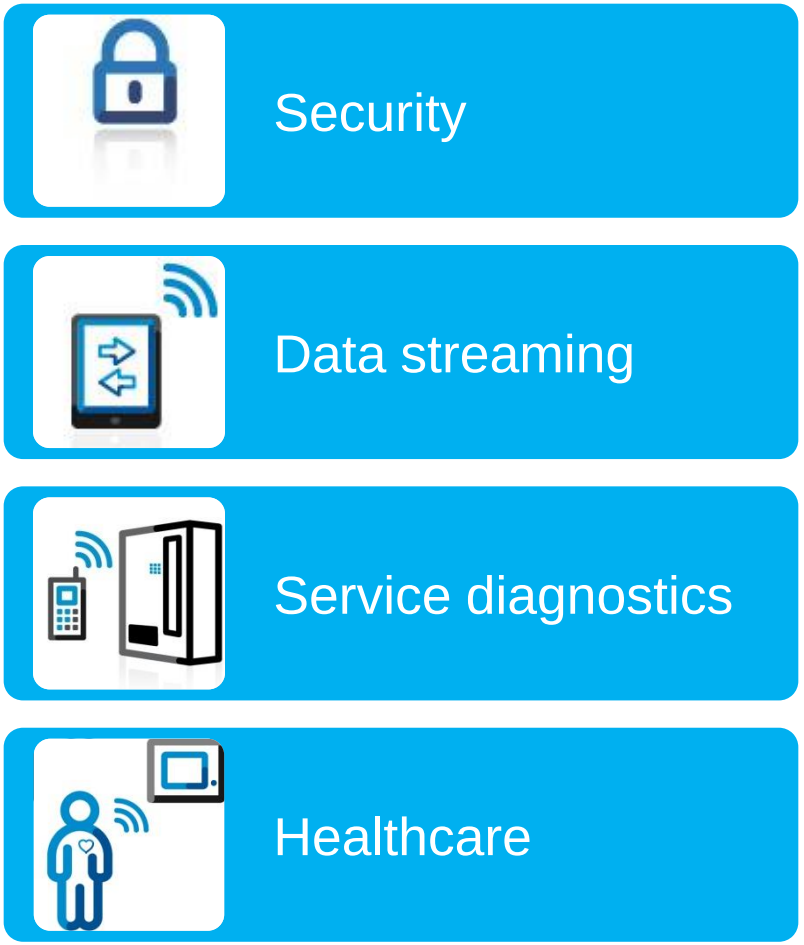
Key factors - features	Key benefits
• Bluetooth radio, microprocessor, memories and RF design fully **embedded** in a unique device	• **Embedded modules** save development resources and time, shortens time-to-market
• Equipped with high speed UART	• For real high speed transmission rate
• Low power mode supported	• Reduces power consumption, increasing final application's battery life
• Smart cable featured	• Realizes automatic connection between predefined devices
• Remote mode supported	• Enables GPIOs and UART setting via Bluetooth link from a remote device
• No need of a driver or Software stack in the host	• Easier integration in final application not requiring further Bluetooth qualification
• Micro-sized form factor	• SMD–like component to fit miniaturized applications
• Fully compliant with ST quality system	• The silicon quality applied to SMD module
• Produced according to ST standard	• SMD module assembled in respect of highest production standard
• RoHS compliant, ST classified Ecopack 2	• Go green, module environmental friendly

Key applications

ST's series of Bluetooth modules offers a high performance, robust and flexible answer to a variety of applications.

Wireless cable replacement for:

- Point-to-point and multipoint between portable equipment and monitoring stations
- Service diagnostics
- Security
- Cable free robotics
- Data acquisition equipment
- Machine control
- Sensor monitoring
- Mobile health
  - Patient monitoring
  - Body gateway
  - Wearable equipment



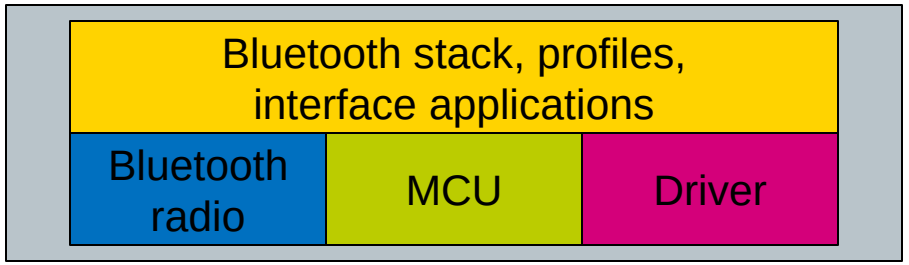
Bluetooth software system partitioning

Blue Modules

Embedded modules

The integrated solution

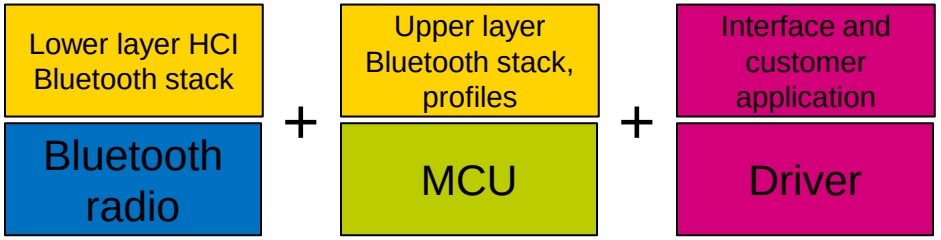
SBT2632 series



Other solutions on the market

HCI modules

The hosted solution



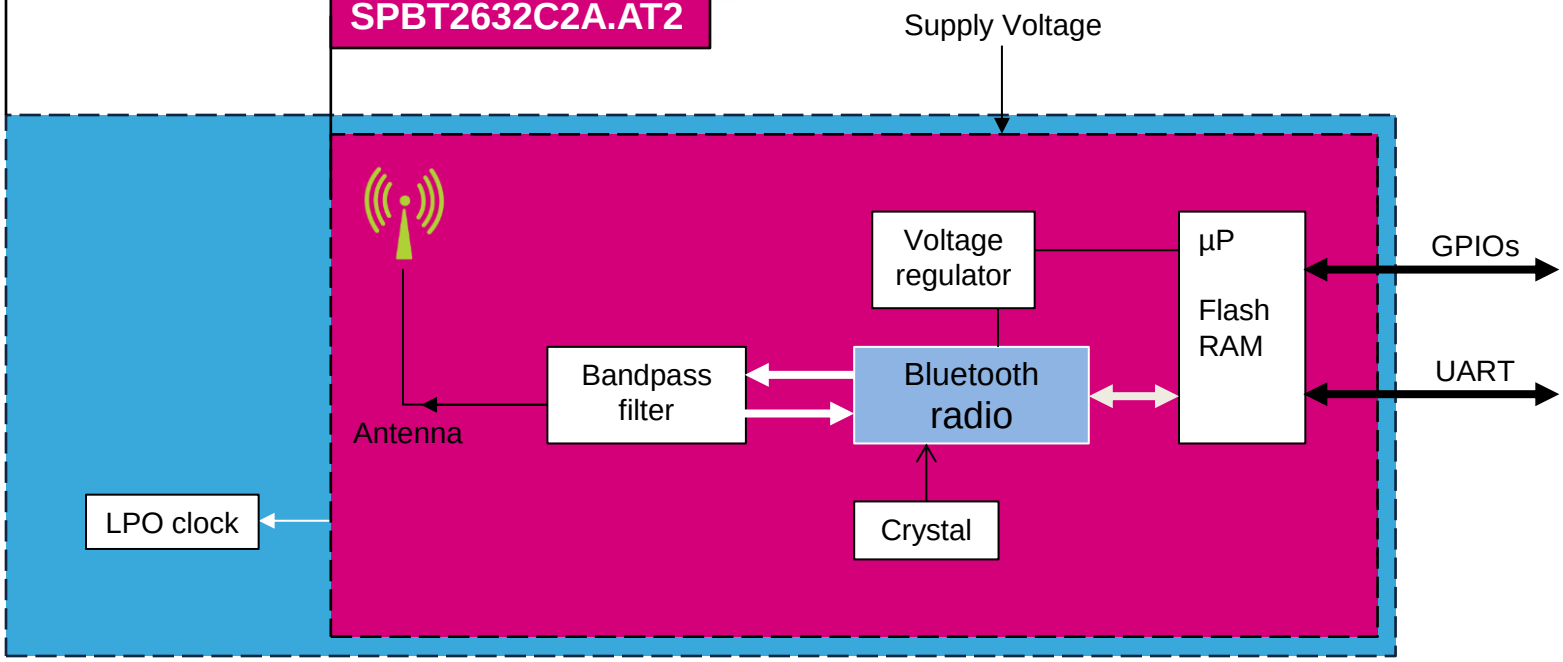
Blue Modules hardware architecture

TX Power: +10 dBm.
RX Sensitivity: -90 dBm
Size: 15 x 27 mm

SPBT2632C1A.AT2

TX Power: +0 dBm.
RX Sensitivity: - 86 dBm
Size: 11.6 x 13.5 mm

SPBT2632C2A.AT2



Blue Modules characteristics 1/3

Key features	SPBT2632C2A.AT2 	SPBT2632C1A.AT2 
Core devices	STM32 ARM-Cortex-M3 MCU + STLC2690 *Bluetooth* IC	
Class	Class 2, typ output 0dBm	Class 1, typ output 10dBm
BT standard	*Bluetooth* 3.0	*Bluetooth* 3.0
SPP and ATz command	✓	✓
Antenna and shield	✓	✓
Low power mode	with external LPO	✓
Pin count	16	24
Form factor	Micro-sized: 11.6 x 13.5 mm	Small: 15 x 27 mm
Supply voltage	2.5 V	2.5 V
Voltage regulator	✓	✓
Clock integrated	✓	✓
WLAN coexistence	✓	✓
Operating temperature	- 40 ÷ 85 ºC	- 40 ÷ 85 ºC

Blue Modules characteristics 2/3

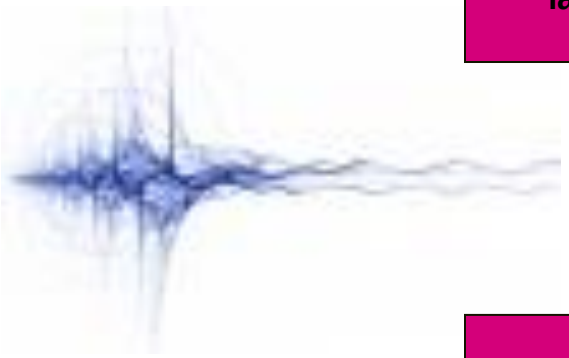
Key features	SPBT2632C2A.AT2 	SPBT2632C1A.AT2 
High Speed CPU Mode 32 MHz	Average Values	
ACL data 115KBaud UART at max throughput (Master)	23 mA	23 mA
ACL data 115KBaud UART at max throughput (Slave)	27.5 mA	27.5 mA
Connection, no data traffic, Master	9.1 mA	9.1 mA
Connection, no data traffic, Slave	11.2 mA	11.2 mA
Connection 375 ms sniff with LPO	490 µA *	490 µA
Page/inquiry scan, without deep sleep	9.5 mA	9.5 mA
Page/inquiry scan, with deep sleep, no LPO	2.7 mA	------
Page/inquiry scan, with deep sleep and LPO	520 µA *	520 µA
Standby, without deep sleep	8.6 mA	8.6 mA
Standby with deep sleep, no LPO	1.7 mA	------
Standby with deep sleep and LPO	70 µA *	60 µA

* with external clock

Blue Modules characteristics 3/3

Key features	SPBT2632C2A.AT2 	SPBT2632C1A.AT2 
Memory		
Flash memory	256 KB	256 KB
Flash memory free	60 KB	60 KB
RAM	48 KB	48 KB
RAM free	5 KB	5 KB
RF characteristics		
Antenna Load	50 Ω	50 Ω
Sensitivity Level (BER<.001 with DH5)	-86 dBm	-90 dBm
Maximum Output Power (50 Ω load)	0 dBm	+10 dBm
Interfaces		
High speed UART	✓	✓
GPIOs	7 and LPO input	16
I²C (not available with AT Firmware version)	Only for Apple code processor interface	Only for Apple code processor interface

Blue Modules firmware architecture



Application layer API

HCI over UART

AT2 command set and/ or custom application

Upper layer stack + BT profiles

Lower layer BT radio

AT2 Command Set

Application

SPP

iAP

GAP

RFCOMM

SDP

L2CAP

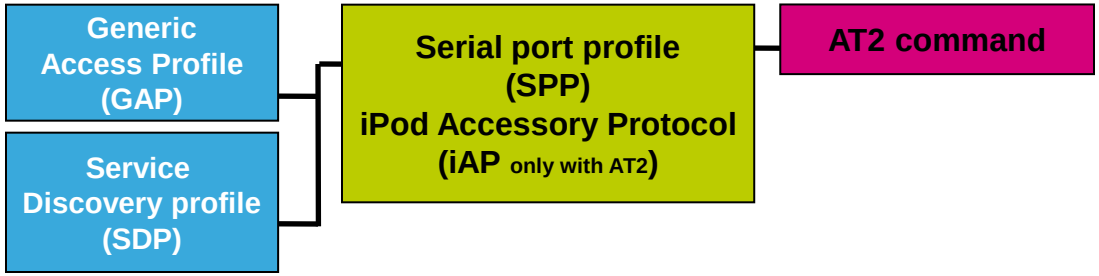
HCI

HCI

LMP

BT PHY

Blue Modules Firmware profile and application



Key features	AT2 command
Bluetooth version (**)	3.0
Point-to-point communication	✓
Multipoint communication	✓
Profiles	
SPP	✓
iAP	✓
Phone support	
Android	✓
iPhone	✓

Generic Access Profile (GAP)

- Discovers and connects to other devices
- Security (authentication)
- idle mode procedure: inquiry
- linking, paging, connection

Service Discovery Profile (SDP)

- Locates/describes services from/to other devices

Serial Port Profile (SPP)

- Emulates legacy serial communication
- Cable replacement

iPod Accessory Protocol (iAP)

- Supports communication with Apple iOS Bluetooth enabled device*

* The external Apple Authentication coprocessor and MFI certification are required

Blue Modules - Certifications

- **Blue Modules are CE and Bluetooth® certified.**
- **Radio type compliant for US, Canada and Japan**

	BQB qualified design	CE Statement of opinion*	FCC and IC	Japan Type Certification
SPBT2632C1A.AT2	QD ID: **B019224** Product type: End Product TGP Version: Core 3.0 Core Spec Version: 3.0 Product Description: Bluetooth Module, spec V3.0	**0447-ARAM00002** Measurements in accordance with: EN 300 328 V 1.7.1 (2006-10) EN 301 489-17 V 2.1.1 (2009) EN 60950-1:2006 +A11:2009+A1:2010 CE 0051 ⓘ	FCC ID: **X3ZBTMOD3** IC: **8828A-MOD3** In accordance with FCC part 15, the SPBT2632C1A.AT2 is listed above as a modular transmitter device	in progress
SPBT2632C2A.AT2	QD ID: **B019224** Product type: End Product TGP Version: Core 3.0 Core Spec Version: 3.0 Product Description: Bluetooth Module, spec V3.0	**0448-ARAM00003** Measurements n accordance with : EN 300 328 V 1.7.1 (2006-10) EN 301 489-17 V 2.1.1 (2009) EN 60950-1:2006 +A11:2009+A1:2010 CE 0051 ⓘ	FCC ID: **X3ZBTMOD5** IC: **8828A-MOD4** In accordance with FCC part 15, the SPBT2632C2A.AT2 is listed above as a modular transmitter device	Radio type ID: **006-000095** SPBT2632C2A.AT2 **is** certified as Type Approval in conformity with Chapter 38-24-1 of Japan Radio Law

new

* Reports available on request

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ST modules are Bluetooth SIG qualified

EPL Bluetooth® End Product Listing

The Bluetooth SIG Hereby Recognizes

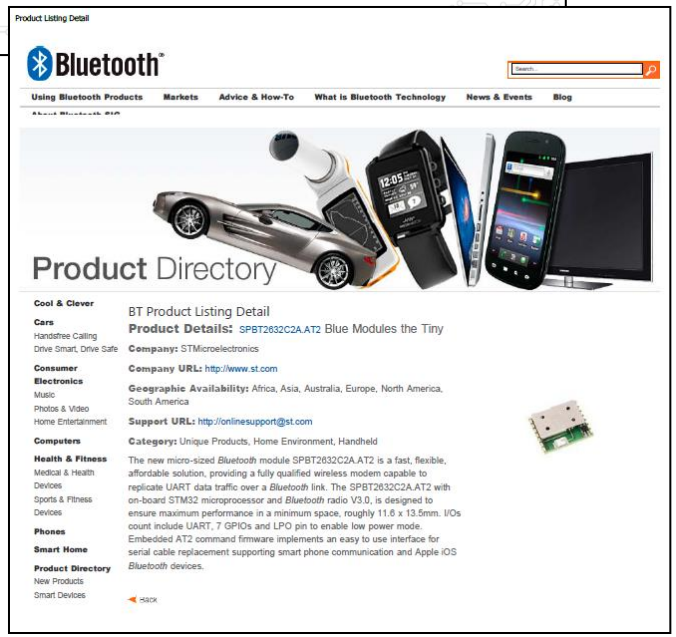
STMicroelectronics
Member Company

SPBT2632C2A.AT2
Qualified Design Name

Qualified Design ID(s): B019224
Contact Person: Paola Orsi
Series: Blue Modules the Tiny
Publish Date: 21 March 2012
EPL Type: Industrial

This certificate acknowledges the *Bluetooth*® Specifications declared by the member were achieved in accordance with the *Bluetooth* Qualification Process as specified within the *Bluetooth* Specifications and as required within the current PRD

Bluetooth SPECIAL INTEREST GROUP



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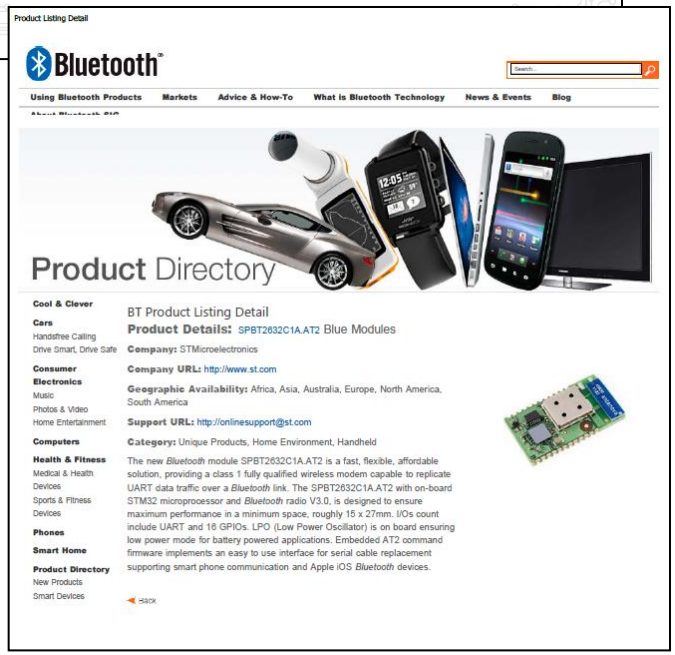
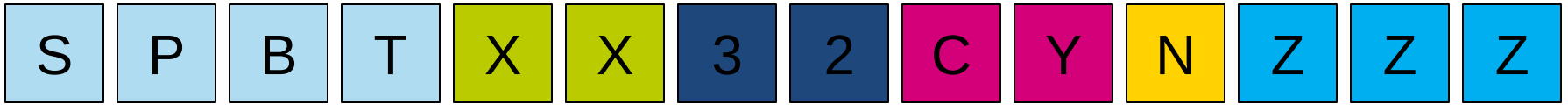


Part numbering schema



SPBT = Bluetooth subsystem module

BT chip
XX = 26 Bluetooth radio STLC2690

MCU
32 = STM32F

Bluetooth class
Y = 1 class 1
Y = 2 class 2

Antenna
N = A with antenna
N = Blank no antenna

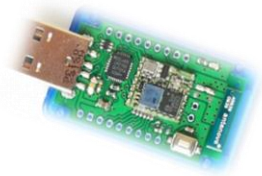
Firmware version
ZZZ = Firmware version

Support tools

Order codes

Order code	Description
SPBT2632C2A.AT2	Bluetooth V3.0, Class2, antenna, AT2 command Firmware
SPBT2632C1A.AT2	Bluetooth V3.0, Class1, antenna, AT2 command Firmware

Evaluation boards



Order code	Description
STEVAL-SPBT3ATV3	USB dongle, evaluation board for SPBT2632C2A.AT2
STEVAL-SPBT4ATV3	USB dongle, evaluation board for SPBT2632C1A.AT2

Other tools

Technical Documentation
Datasheets
Application note
AT command user manual
User guide
Eval board

Promotional Documentation
Marketing presentation on st.com
Product briefcase on MyST
Brochure

Technical support
Contact us @ onlinesupport@st.com

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Do you want more about ST Blue Modules?

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www.st.com/bluemodules

Thanks