Bluetooth® Smart Module

FEATURES

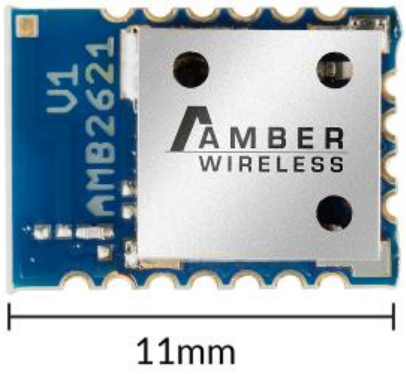
- Bluetooth Smart 4.2 stack
- Various low power modes
- Suitable for IoT applications
- Supporting all BLE services, roles and profiles
- Integrated networking and security
- Connection-based SPP-like data transmission (pairing, bonding) or fast broadcast via Beacons
- Plug & Play power efficient peripheral only mode with transparent UART interface and static passkey pairing
- Custom application firmware

Integrated MCU

32-bit ARM Cortex-M4F Processor with 512kb flash + 64kb RAM

RANGE OF APPLICATION

- Internet of Things (IoT)
  - Home automation
  - Sensor networks
  - Building automation
- Personal Area Networks
  - Health/fitness sensor and monitor devices
  - Medical devices
  - Key-fobs + wrist watches
- Interactive entertainment devices
  - Remote controls
  - Gaming controllers
- Beacons
- A4WP wireless chargers
- Computer peripherals
  - Mouse
  - Keyboard
  - Multi-touch trackpad



- Embedded 2.4 GHz Bluetooth 4.2 module
- 1.7 to 3.6 V operation
- Up to +2 dBm output power
- -96 dBm sensitivity
- UART
- Event driven API
- Automated power management system with automatic power management of each peripheral
- AES HW encryption
- Compact dimensions: 11 x 8 x 1.8 mm
- Antenna options: integrated or RF pad

The AMB2621 is an ultra-low power 2.4 GHz wireless module integrating the nRF52832 System on Chip including a 2.4 GHz transceiver and an ARM Cortex™-M4F CPU with flash memory. The module is optimized for applications where costs and low-power optimization really matter. Several pins with alternate functions are available to e.g. connect LEDs, or realize an SPI, I2C, ADC or handshake for the UART as well as NFC.

By default the AMB2621 contains the AMBER firmware according to option 1. Upon request the customer's own firmware (option 2) may be flashed during production.

The module enables distance estimation (localization) using RSSI and output power in just one advertise packet for optimized power consumption.

As a second option the module can be switched into peripheral only mode with transparent UART and static passkey pairing.

As interface to the host system a 2-wire UART interface is provided with a default data rate of 115200 Baud. OTA firmware update via PC or Android / iOS App is supported. An Android App supporting the SPP-like operation is also available on request.

Option 1: AMBER firmware

By default, the module provides the industry proven, fully qualified Bluetooth® Smart (previously called Bluetooth low energy) stack from Nordic, plus the AMBER firmware. The latter contains an SPP-like profile, which offers a fast secured data transmission of packets with up to 128 bytes payload. Furthermore the AMB2621 includes an easy-to-use command interface allowing a convenient configuration and operation. The module can perform both, an advertising mode in order to be found, or a scan for finding other devices, which are advertising. Data transmission can be executed as soon as a (secured) connection has been set up. In addition data can be broadcasted quickly using so called Beacons.

Option 2: Custom development

Based on the free Nordic Semiconductor SDK and demo examples various BLE-profiles and custom applications can be realized and flashed on the AMB2621 module. The versatile and well documented Nordic stack ensures quick and easy realization of various standard BLE-profiles, such as:

- HID services
- Medical services (BLS, HRS, HTP…)
- Alert services (ANS, IAS, PASS …)
- Information services (CTS, DIS, TPS …)
- and others

For full feature list see the nRF52832 documentation .

AMBER WIRELESS

www.amber-wireless.com

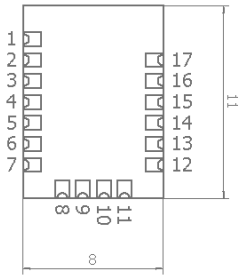
Specifications

TA = 25°C, VCC = 3 V if nothing else stated.

Performance	RF data rate	1 Mbit/s
	Interface data rate	Typ. 115200 Baud
	Output power	Up to +2 dBm @ 50 Ohm
	RF sensitivity	Typ. -96 dBm @ 50 Ohm
	Range	AMB2621: 50m, AMB2621-1: 125m
General	Power supply	1.7 - 3.6 V
	Power consumption	TX: typ. 5.3 mA @ 0dB, 7.5 mA@ 4dBm / RX: 5.4 mA *
		Low Power: typ. 0.4 µA (System OFF mode)
	Dimensions	8 x 11 x 1.8 mm
	Operating temperature	-40 to +85 °C
	Weight	Approx. 3 g
	Antenna	Integrated antenna or RF pad
RF	Technology	Bluetooth® Smart 4.2
	Frequency range	2.402 GHz to 2.48 GHz
	Modulation	DSSS
Compliance	Europe	EN 60950, EN 301 489, EN 62311, EN 300 328
	US	FCC
	Bluetooth SIG	SIG listing is mandatory

* DC/DC converter in use, transceiver only. Complete currents with CPU active: TX 8mA @ 0 dBm, TX 11mA @ 4 dBm, RX 8mA

Dimensions and Pin Assignment



No.	Pad Name	No.	Pad Name
1	RF [1]	9	P0.09/NFC1 [2]
2, 17	GND	10	P0.00/XL1 [2]
3	SWDCLK	11	P0.01/XL2 [2]
4	SWDIO	12	P0.02/AIN0 [2]
5	P0.21/Reset	13	P0.03/AIN1 [2]
6	P0.05/AIN3 [2]	14	P0.04/AIN2 [2]
7	VDD	15	P0.28/AIN4 [2]
8	P0.10/NFC2 [2]	*16*	P0.29/AIN5 [2]

[1] only on AMB2621-1
[2] can be used with customer specific firmware. Refer to AMB2621 manual for function in standard (SPP-like) firmware

Ordering Information

Item No.	Description
AMB2621	Bluetooth Smart Module w/ integrated antenna
AMB2621-1	Bluetooth Smart Module w/ RF pad
AMB2621-EV	Bluetooth Smart Evaluation Board (Module AMB2621)

ABOUT AMBER WIRELESS

AMBER wireless GmbH, established in 1997, is a German electronics company. AMBER specializes in the design and manufacturing of wireless connectivity solutions including compact short range RF modules for rapid implementation of cable-free data links. We have become one of the leading suppliers for low power ISM/SRD products in Europe. AMBER provides high-quality and cost-effective wireless modules and devices as well as custom design services.

SERVICES AVAILABLE

- Technical Support
- Custom Design Services
- Software / App Development
- Hardware Support

For more information on any of our products or services please visit our website:
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