

ANNA-B112 module

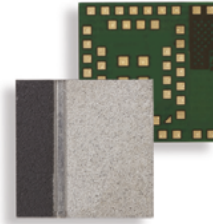


Stand-alone Bluetooth 5 low energy module



The smallest industrial Bluetooth 5 module

- Ultra compact SiP (6.5 x 6.5 x 1.2 mm)
- Bluetooth 5 and Bluetooth mesh
- Feature-rich, out-of-the-box connectivity software
- Open CPU for customer applications
- Internal antenna / antenna pin
- Global certification



6.5 x 6.5 x 1.2 mm

Product description

The ANNA-B112 is an ultra-small, high-performing, standalone Bluetooth low energy module. The System in Package (SiP) module features Bluetooth 5, a powerful Arm® Cortex®-M4 microprocessor with FPU, and state-of-the-art power performance. The ANNA-B112 is delivered with u-blox connectivity software that provides support for u-blox Bluetooth low energy Serial Port Service, GATT client and server, beacons, NFC, and simultaneous peripheral and central roles – all configurable from a host by means of AT commands.

ANNA-B112 offers full flexibility for customers who prefer their application to run on the built-in Arm Cortex-M4 with FPU. With 512 kB flash and 64 kB RAM, it offers the best-in-class capacity for customer applications running on top of the Bluetooth low energy stack using the SDK from Nordic

Semiconductor or Arm Mbed. Additionally, SPI, I²C, and I²S interfaces are available, and features such as NFC, Bluetooth mesh, AirFuel, and Apple HomeKit are also supported. In combination with Wirepas Mesh stack, ANNA-B112 can form large-scale industrial mesh networks for several applications, such as lighting, asset tracking, and metering.

The ANNA-B112 module includes an integrated antenna providing a range of 160 m, and an antenna pin for design-in of an external antenna.

ANNA-B112 is globally certified for use with the internal or external antenna. This reduces time, cost and effort for customers integrating ANNA-B112 in their designs.

Product selector

| Model | Radio | Interfaces | Power | Features | Grade | |
|-----------|--|--|---|--|--|---|
| | Software application Bluetooth® qualification Bluetooth profiles NFC for "Touch to Pair" Antenna type Maximum radiated output power (EIRP) [dBm] Maximum range [m] | UART SPI and I ² C GPIO pins AD converters (ADC) | Power supply: 1.7- 3.6 VDC Current consumption, sleep [µA] Current consumption, Tx @ 0 dBm [mA] | u-blox Low Energy Serial Port Service GATT server and GATT client Throughput [Mbit/s] AT command support IPv6 Mesh networking Max simultaneous connections Over-the-air firmware update | Standard Professional Automotive | |
| ANNA-B112 | uCS ¹ | v5.0 G ● I 5 160 P 8 190 | ● 11 | ● 0.3 5 | ● ● 0.8 ● 7 | ● |
| | Open CPU ² | v5.0 G ● I 5 160 P 8 190 | ● ● 25 8 | ● 0.3 5 | ● 1.4 ● ● 20 ● | ● |

1 = u-blox connectivity software / P = antenna pin / I = internal antenna / G = GATT
 2 = open CPU for embedded customer developed applications using Nordic SDK, Arm® Mbed™ or Wirepas Mesh SDK



Features

| | |
|----------------------|---|
| Bluetooth | v5.0 (Bluetooth low energy) |
| NFC | NFC-A tag support |
| Range | 160 m with internal antenna 190 m with external antenna |
| Max. output power | 4 dBm conducted 5 dBm with internal antenna 8 dBm with external antenna |
| Receiver sensitivity | -91 dBm conducted -92 dBm with internal antenna -95 dBm with external antenna |

u-blox connectivity software

This section describes features of ANNA-B112 when used with the embedded u-blox connectivity software. ANNA-B112 is delivered with this software and the module is configured using AT commands.

| | |
|--------------------------|---|
| Software features | u-blox Low Energy Serial Port Service (SPS); GATT server and client via AT commands; Configuration over air; Extended Data Mode (EDM) protocol for simultaneous AT commands and data, and multiple simultaneous data streams; beacons; NFC tag for pairing and data |
| HW interfaces | UART, 11 x GPIO pins, NFC tag for pairing |
| Configuration | AT Commands |
| Support tools | s-center |
| Simultaneous connections | 7 |
| Security | Secure Simple Pairing 128-bit AES encryption |
| Throughput | 780 kbps |

Open CPU for customer application

Customers can develop and embed their own application on top of the Bluetooth stack and software inside the ANNA-B112 module (open CPU concept). This section describes features specific to using ANNA-B112 with open CPU. Many software features are already available via Arm Mbed or Nordic SDK environment, and more are added continuously.

| | | |
|-------------------------|--|----------------------|
| Development environment | Nordic SDK (including Bluetooth Mesh, HomeKit, AirFuel, IoT); Arm Mbed 5; Wirepas Mesh (for large scale mesh networking) | |
| Memory | 512 kB flash, 64 kB RAM | |
| HW interfaces* | NFC tag for pairing | UART |
| | 3 x SPI | 2 x I ² C |
| | 25 x GPIO pins | I ² S |
| | 8 x ADC channels | PDM |
| | 12 x PWM | QDEC |
| Security | Secure Simple Pairing 128-bit AES encryption LE secure connections | |

* Not all simultaneously

Further information

For contact information, see www.u-blox.com/contact-us.

For more product details and ordering information, see the [product data sheet](#).

Package

| | |
|------------|----------------------------------|
| Dimensions | 6.5 x 6.5 x 1.2 mm |
| Weight | 0.1 g |
| Mounting | Machine mountable Solder pins |

Environmental data, quality & reliability

| | |
|-----------------------|-------------------------|
| Operating temperature | -40 °C to +85 °C |
| Storage temperature | -40 °C to +85 °C |
| Humidity | RH 5-90% non-condensing |

Electrical data

| | |
|-------------------|--|
| Power supply | 1.7 V to 3.6 VDC |
| Power consumption | Active TX @ 0 dBm: 5.3 mA Standby: 2.2 µA with external LPO Sleep: 300 nA (with wake-up on external event) |

Certifications and approvals

| | |
|-------------------------|---|
| Type approvals | Europe (ETSI RED); US (FCC/CFR 47 part 15 unlicensed modular transmitter approval); Canada (ISED RSS); Japan (MIC); Taiwan (NCC)*; South Korea (KCC)*; Australia / New Zealand (ACMA)*; Brazil (Anatel)*; South Africa (ICASA)* |
| Health and safety | EN 62479, EN 60950-1, IEC 60950-1 |
| Bluetooth qualification | v5.0 (Bluetooth low energy) |

* Pending approvals

Support products

The evaluation kits include an ANNA-B112 module on an evaluation board, with access to all module pins at connectors, and built-in debugging capabilities. It can be used either with the ready-to-use u-blox connectivity software or with open CPU, where the customer application is developed using a software development kit such as Nordic nRF52 SDK, Arm Mbed, or Wirepas Mesh software.

EVK-ANNA-B112C Evaluation kit for ANNA-B112 module using the internal antenna, with module placed in the corner of the PCB

EVK-ANNA-B112U Evaluation kit for ANNA-B112 module using the antenna pin, with an external antenna connected via a U.FL connector

Product variants

| | |
|-----------|---------------------------------------|
| ANNA-B112 | With internal antenna and antenna pin |
|-----------|---------------------------------------|

The modules are shipped with the u-blox connectivity software and can be re-flashed with customer application (open CPU).

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