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RE: **Certification Application**
HVIN: ANNA-B112
FCC ID: XPYANNAB1
IC: 8595A-ANNAB1

Operational description of OEM-Bluetooth low energy module with passive NFC tag functionality ANNA-B112

The ANNA-B112 series modules are small sized radio SiP module intended for OEM integration enabling a mobile or fixed end-product to utilise Bluetooth low energy technology in the 2.4 GHz ISM band. It is intended to function as a short-range radio link transmitting and receiving information between other portable, mobile or fixed electronic devices and the end product.

It is possible to connect an external NFC antenna to the ANNA-B112 module, to enable a passive NFC Type-2 tag functionality operating at 13.56 MHz. The modules are not able to operate at the NFC frequency by themselves (passive), they require an active NFC device to apply a strong enough electromagnetic field in order to activate the NFC block inside the ANNA-B112 modules.

The following two different antenna options are available for the ANNA-B112 module:

- ANNA-B112 with an antenna pin to be used with an external antenna connector. See Table 2 for a list of approved antennas. OEM integrators are only allowed to use these antennas and must follow
- ANNA-B112 with an internal PIFA antenna. Two different reference designs for the internal antenna is included:
    - A reference design when the module is mounted in a corner of the host board.
    - A reference design when the module is mounted on an edge of the host board (not in a corner).

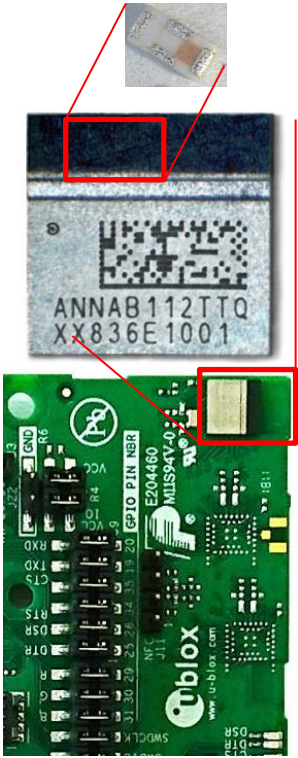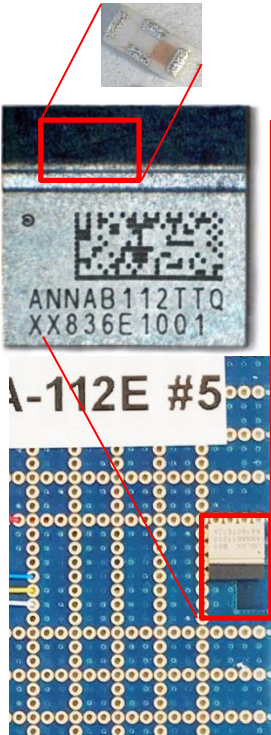Both module versions have two NFC antenna pins available to connect to an external NFC antenna.

The module operates in the 2.4 GHz ISM Band, at 2402 – 2480 MHz with 40 channels using 2 MHz separation and a channel bit rate of 1 Mbit/s and 2 Mbit/s. ANNA-B112 fully conforms to the Bluetooth 5.0 standard.

NFC operates at 13.56 MHz at a bit rate of 106 kbit/s.

Bluetooth low energy radio with NFC tag functionality		Nordic Semiconductor nRF52832
BLE RF output power (conducted)	1 Mbit/s and 2 Mbit/s	max 4 dBm / 2.5 mW
Bluetooth frequencies		2402 – 2480 MHz, ISM band
NFC frequency		13.56 MHz, ISM band

Table 1 - Parameter data

locate, communicate, accelerate

List of antennas

Antenna PN		Manufacturer	Comment	Peak Gain [dBi]
AT1608-A2R4NAA + EVB-ANNA-B112C		ACX	Internal ANNA-B112 antenna AT1608-A2R4NAA + Reference design EVB-ANNA-B112C (ANNA-B112 mounted in a corner)	0.5
AT1608-A2R4NAA + EVB-ANNA-B112E		ACX	Internal ANNA-B112 antenna AT1608-A2R4NAA + Reference design EVB-ANNA-B112E (ANNA-B112 mounted on the edge)	0.5