Attn: Reviewing Engineer

PHOENIX TESTLAB GmbH
Product Certification
Königswinkel 10
D-32825 Blomberg

RE: Certification Application
Model: NINA-B301, NINA-B302
IC :   8595A-NINAB30
FCC ID: XPYNINAB30

Operational description of OEM-Bluetooth low energy module series NINA-B30

The u-blox NINA-B30 series are small sized radio modules intended for OEM integration utilizing Bluetooth 5, IEEE 802.15.4, 2.4 GHz proprietary mode and/or NFC. All 2.4 GHz RF-signals share the same RF-path thus it is not possible to transmit e.g. BLE and 802.15.4 signals simultaneously. The NFC receiver uses its own interface. It is intended to function as a short-range radio link transmitting and receiving information between portable and/or fixed electronic devices.

The NFC interface is passive, supporting tag functionality only, and requires an external 13.56 MHz antenna to operate. An external NFC field is required to activate the NFC block of the module.

The following two different antenna options (hardware options) are available for the NINA-B30 modules:

- NINA-B301 with the RF-port presented at a solder land to be connected to an external antenna connector using the external antenna reference design (see separate document for more info). Different types of approved external antennas are available and can be used. See Table 2 for a list of approved antennas.
- NINA-B302 equipped with an integral antenna.

2.4 GHz radio		Nordic Semiconductor nRF52840
Bluetooth low energy	RF output power	Typical 8 dBm at antenna port
	Data rate	1 Mbps, 2 Mbps, 500 kbps, 125 kbps
	Frequencies	2402 – 2480 MHz
	Channels	40 channels, numbered 0 – 39 2 MHz separation
IEEE 802.15.4	RF output power	Typical 8 dBm at antenna port
	Data rate	250 kbps
	Frequencies	2405 – 2475 MHz
	Channels	24 channels, numbered 11-25 5 MHz separation
2.4 GHz proprietary modes	RF output power	Typical 8 dBm at antenna port
	Data rate	1 Mbps, 2 Mbps
	Frequencies	2402 – 2480 MHz
	Channels*	79 channels, 1 MHz separation
NFC receiver		Nordic Semiconductor nRF52840
NFC	RF output power	Receive only, load modulation is used to 'transmit' data.
	Data rate	106 kbps
	Frequencies	13.65 MHz
	Channels	1 channel

*Depends on selected protocol

Table 1: Radio data

Configuration and software security

The NINA-B30 modules have open CPU architecture tailored for OEMs who wish to embed their own application on top of the available 2.4 GHz radio platform.

The FCC/IC modular transmitter approvals for NINA-B30 only allow u-blox AG to integrate the module into an end product. The integration of the module into an end product can only be made by the grantee itself. To allow someone else to integrate NINA-B30 into an end product, u-blox AG will help the integrator to obtain the status as grantee, by performing a "change in ID"/"Multiple listing".

The term "Change in ID" relates to § 2.933 of Title 47 of the Code of Federal Regulations (CFR) and the term "Multiple listing" relates to section 8.4 of Radio Standards Procedure RSP-100.

Any changes or modifications NOT explicitly APPROVED by the grantee may cause the module to cease to comply with the FCC rules 15, and thus void the user's authority to operate the equipment.
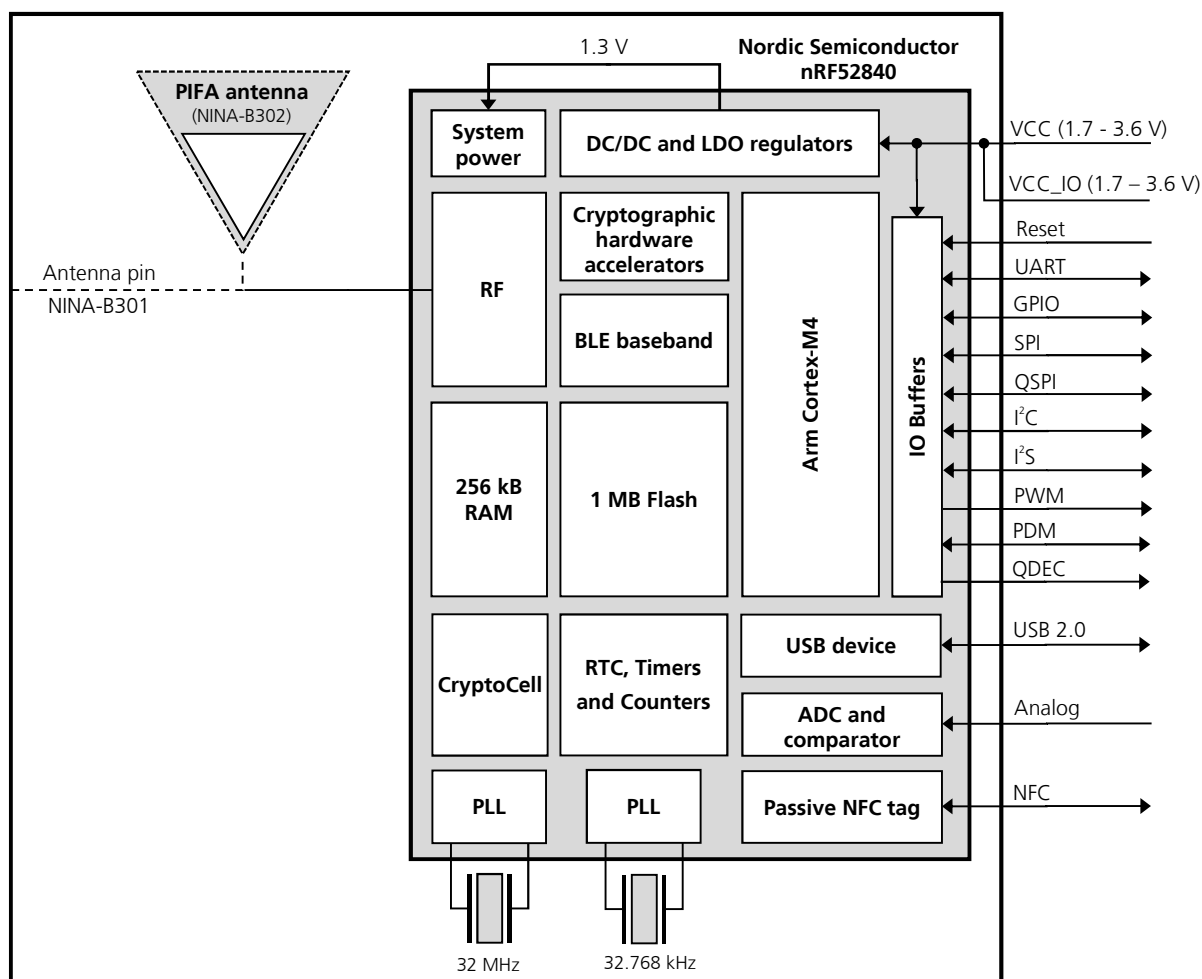
Block diagram

Figure 1: NINA-B30 series block diagram

List of antennas

#	Antenna name	Manufacturer	Comment	Gain [dBi]
1	u-blox LILY Antenna	ProAnt	SMD PIFA antenna on NINA-B302	+3
2	InSide-2400	ProAnt	Patch, 10cm cable/U.FL	+3
3	Ex-IT 2400 -RP-SMA 28-001 -MHF 28-001	ProAnt	Monopole, RP-SMA 10 cm cable/U.FL	+3
4	Ex-IT 2400 -RP-SMA 70-002	ProAnt	Monopole, RP-SMA	+3
5	FlatWhip-2400	ProAnt	Monopole, RP-SMA	+3

Table 2: Antennas to be used with the NINA-B30 series