

BluNor BT40N/NE is a series of powerful, highly flexible, ultra long range Bluetooth Low Energy (BLE) modules using Nordic nRF21540 power amplifier. With up to 128 MHz dual core ARM Cortex™ M33 MCU, embedded 2.4GHz multi-protocol transceiver, and various antenna solution. It allows faster time to market with reduced development cost.

**No external component needed to minimize host PCB area:** Both 32 MHz and 32.768 KHz, -40°C to +105°C, 20 PPM crystals are integrated.

The **N** (BT40**N**) series module is footprint compatible with the Fanstel **X** series module (BT40**X**) using a Skyworks PA. The nRF21540 PA can be controlled using commands through SPI interface. BT40NE have both a PCB antenna and an u.FL connector.

### BT40N, BT40NE

- nRF5340 QKAA, dual core ARM® Cortex M33
- Application Core: 128 MHz Cortex M33 with FPU and DSP instructions. 1MB flash, 512KB RAM, 8KB 2-way set associate cache. ARM® TrustZone® Cryptocell-312 co-processor
- Network core: 64 MHz Cortex M33 with 2KB instruction cache. 256KB flash, 64KB RAM
- nRF21540 power amplifier.
- NT40N: a high performance PCB antenna.

- NT40NE: a high performance PCB antenna + an u.FL connector.
- 39 GPIOs

### Common Specifications

- QDID: 119517, 182626

### Application Examples

- BLE-LTE M.2 module
- BLE to LTE gateways

### Model Summaries

module	BT40N	BT40NE
SoC	nRF5340	nRF5340
Size. mm	15x29.9x2.0	15x29.9x2.0
32M, 32.768kHz crystals	Inteartated	Inteartated
DCDC inductors, VDD, VDDH	Inteartated	Inteartated
BT Antenna	PA+PCB	PA+PCB+u.FL
Max TX. conducted		
Max TX. radiated		
Operating temp.	-40°C to +105°C	-40°C to +105°C
FCC ID		
ISED ID		
CE. RCM		
TELEC		
Evaluation board	EV-BT40NE	EV-BT40NE
Availability		

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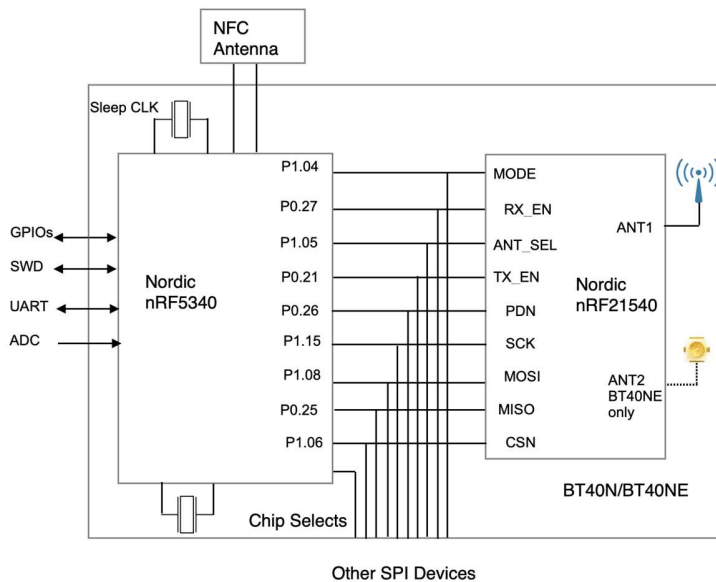
## 1. Introduction

A Nordic nRF21540 provide amplification for the transmitter and the receiver of nRF52833, nRF52840, and nRF5340.

### BT40N, BT40NE Block Diagram

A Nordic nRF21540 power amplifier is integrated with nRF5340 SoC in BT40N and BT40NE modules. Both modules are referred as BT40N in this product specifications.

- BT40N has an integrated high performance PCB trace antenna.
- BT40NE has an integrated high performance PCB trace antenna and an u.FL connector for an external antenna.



### Common Specifications:

- nRF5340 QKAA, dual core ARM® Cortex M33
- Application Core
  - 128/64 MHz Cortex M33 with FPU and DSP instructions
  - 1MB flash, 512KB RAM
  - 8KB 2-way set associate cache
  - ARM® TrustZone® Cryptocell-312 co-processor
- Network core:
  - 64 MHz Cortex M33 with 2KB instruction cache
  - 256KB flash, 64KB RAM
  - 2.6 mA in RX and 3.2 mA in 0dBm TX
  - Receiver Sensitivity: -98 dBm at 1Mbps.
  - TX power: programmable up to +19dBm.
  - BLE 5.3 data rate: 2Mbps, 1Mbps, 500kbps, 125kbps.
  - IEEE 802.15.4 data rate: 250 Kbps
  - 2.4 GHz proprietary data rate: 2 Mbps, 1 Mbps

- nRF2140 power amplifier
- DCDC inductors for VDD, VDDH on board.
- Serial Wire Debug (SWD)
- Over-the-Air (OTA) firmware update
- 39 General purpose I/O pins
- USB 2.0 full speed (12 Mbps) controller
- QSPI interface
- Type 2 NFC-A tag with wake-on field, Touch-to-pair support
- Programmable peripheral interconnect (PPI)
- 12 bit/200 Ksps ADC, 8 configurable channels with programmable gain
- Temperature sensor
- Up to 3x pulse width modulator (PWM)
- Audio peripherals: I<sup>2</sup>S, digital microphone interface (PDM)
- 5 x 32 bit timers with counter mode
- Up to 3x SPI masters/3x SPI slaves
- Up to 2x I<sup>2</sup>C compatible 2-wire masters/slaves
- 2x UART (CTS/RTS)
- Quadrature Demodulator (QDEC)
- 2x real time counters (RTC)
- Hybrid pins: 16 castellated and 45 LGA.
- Both 32 MHz and 32.768KHz crystals on board
- Operation voltage: 3.3V, regulated.
- Current consumption: **to be measured**.
- Size: 15x29.9x2.0mm

## 2. Codes Development Using Nordic Tools

Development tools from Nordic and other third party development tools recommended by Nordic should be used.

### Over-The-Air DFU

All modules are supported by an Over-The-Air Device Firmware Upgrade (OTA DFU) feature. This allows for in the field updates of application software and SoftDevice.

### nRF Connect SDK

nRF Connect SDK is a scalable and unified software development kit for building products based on all our nRF52, nRF53 and nRF91 Series wireless devices. It offers developers an extensible framework for building size-optimized software for memory-constrained devices as well as powerful and complex software for more advanced devices and applications. It integrates the Zephyr RTOS and a wide range of samples, application protocols, protocol stacks, libraries and hardware drivers.

For developing Bluetooth Low Energy, Thread and Zigbee products, the nRF Connect SDK contains all needed software, including protocol stacks. For developing cellular IoT products it contains everything except the LTE modem firmware that must be downloaded separately from the [nRF9160 SiP product page](#). See the [cellular IoT software](#) for more details.

nRF Connect SDK also offers an unique integration of HomeKit Accessory Development Kit for developing products using both HomeKit over Thread and HomeKit over Bluetooth Low Energy. It is a highly optimized solution that enables battery-powered products with both the HomeKit Accessory Protocol (HAP) and application firmware running on a single chip. MFi licensees can get access to the HomeKit repository by contacting us via [Nordic DevZone private ticket](#).

nRF Connect SDK offers a single code base for all our devices and software components. It simplifies porting modules, libraries and drivers from one application to another, thus reducing development time. By enabling developers to pick and choose the essential software components for their application, high memory efficiency is guaranteed.

nRF Connect SDK is publicly hosted on GitHub, offers source code management with Git and has free SEGGER Embedded Studio IDE support. Nordic runs continuous integration tests on the nRF Connect SDK code to ensure robust and secure production quality code.

### Development Tools

Nordic Semiconductor provides a complete range of hardware and software development tools for the nRF53 Series devices. nRF53 DK board is recommended for firmware development.

[Nordic software development tools](#) can be downloaded.

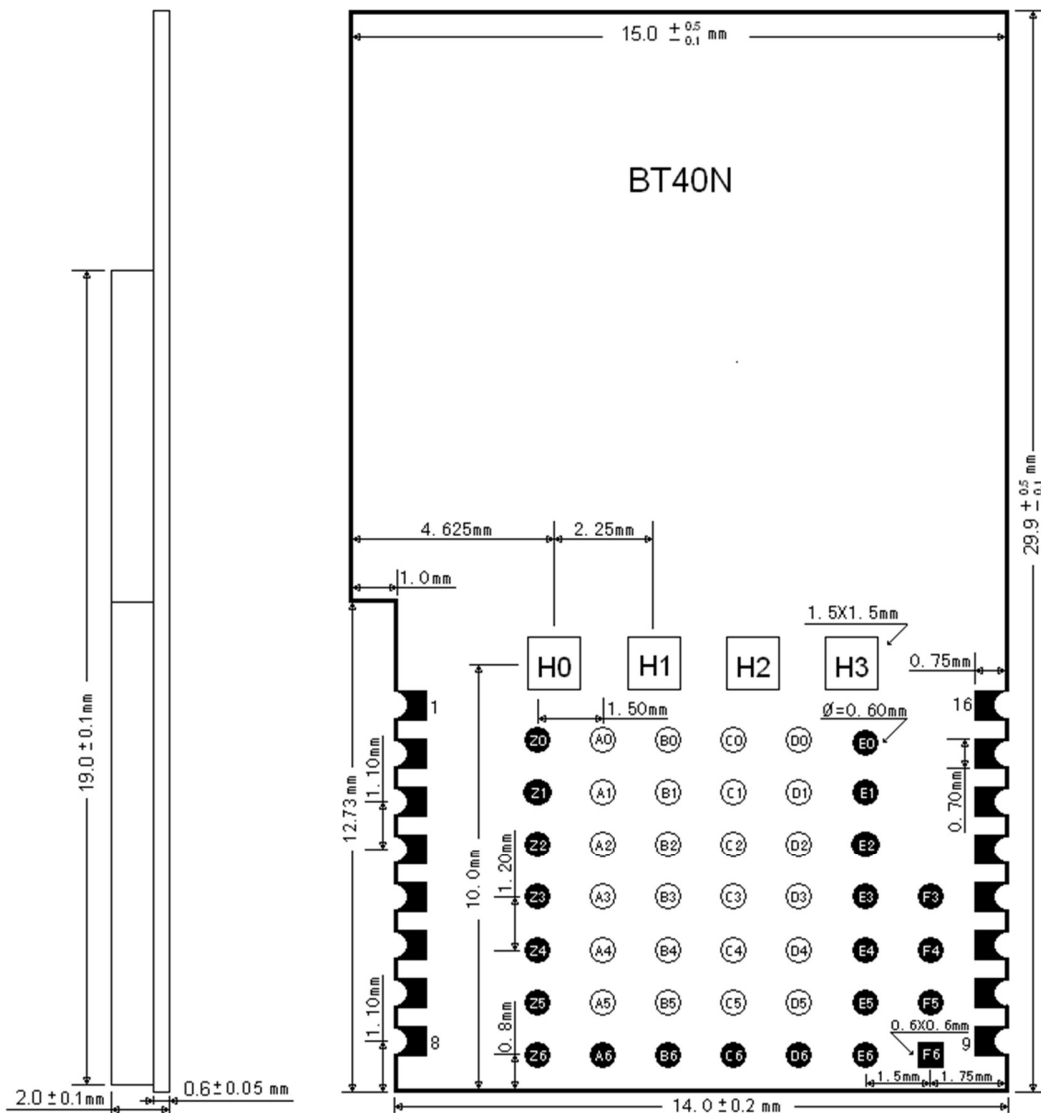
### 3. Product Descriptions

#### Mechanical Drawings

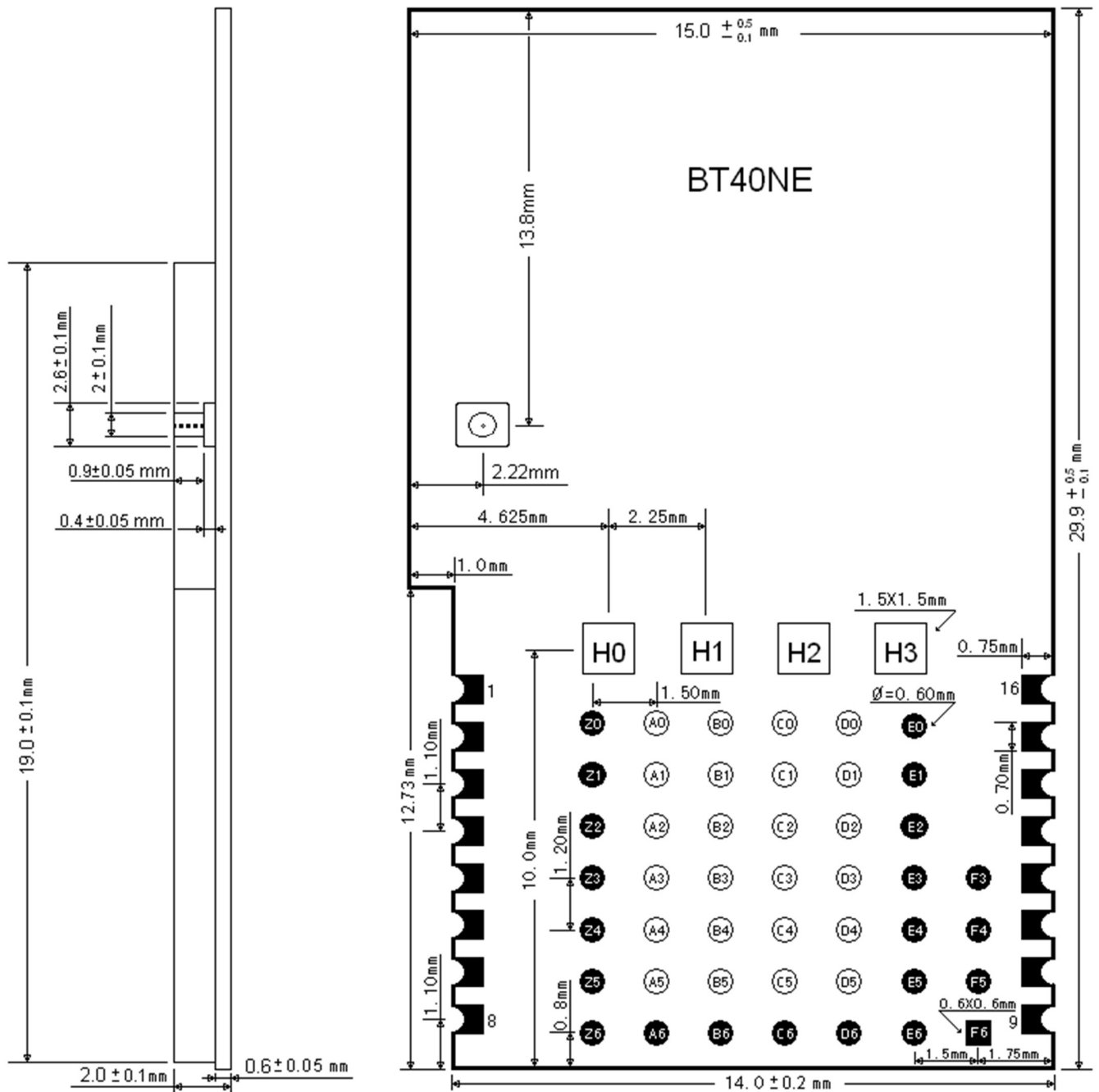
Mechanical drawings of BT40B, BT840N, and BT833N are the same.

Two types of pins are available to meet different application requirements.

- 16 castellated pins for application needing limited number of IOs. SMT equipment is not required for soldering castellated pins.
- 45 LGA (Land Grid Array) pins to access all 48 GPIOs of nRF52840 when needed.



The following is BT40N, BT840N, and BT833N mechanical drawings, top view.



The following is BT40NE, BT840NE, BT833NE mechanical drawing.

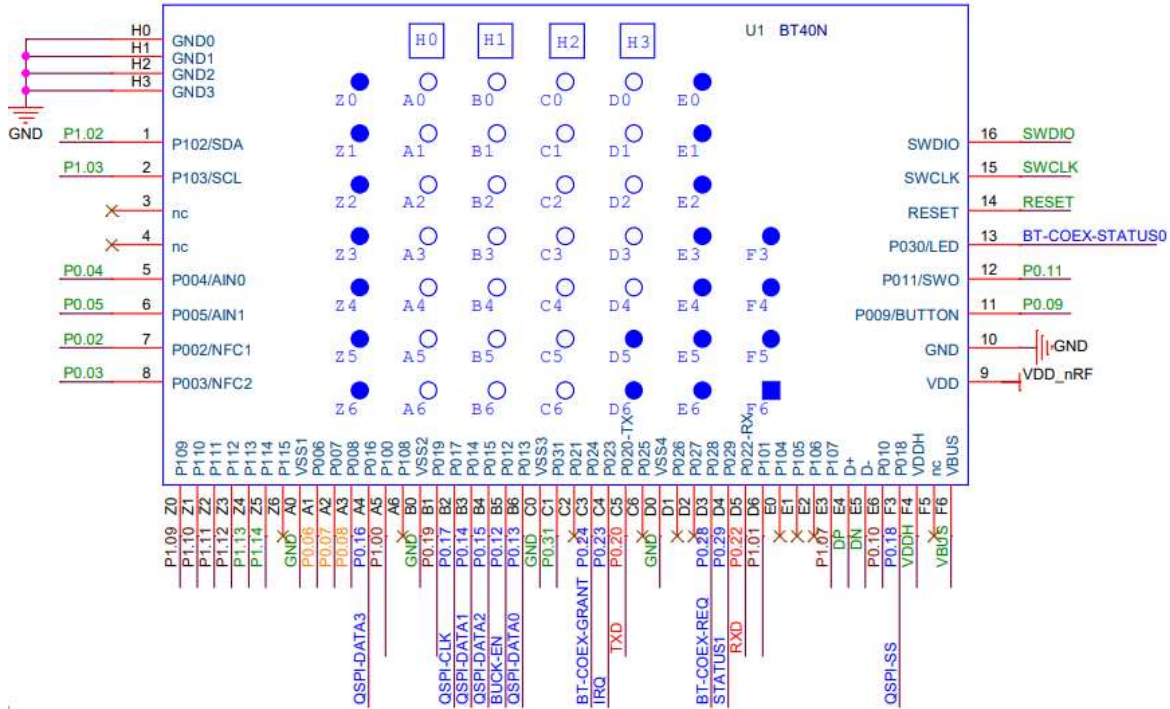




**Pin Assignments of BT40**

The followings are pin assignment of BT40N, BT840N, and BT833N. Pin functions are in a table in next section. Please refer to Nordic [nRF5340 Product Specifications](#) for detailed descriptions and features supported.

BT840N, BT833N and BT40N have compatible footprints. Pin assignments are below. Firmware configuration is required to upgrade module on the PCB.



## Pin Functions

BT40N/NE has the same soldering pads as BT40F. It uses 9 GPIO pins to control the power amplifier, nRF21540. **These 9 pins in red color are also available for external connection. Please avoid possible signal conflict if you use them for other IO functions.**

BT833N/NE and BT840N/NE/NEE are footprint compatible with BT40N/NE. BT833N/NE have fewer GPIO pins.

BT840N /833N	52833	52840		BT40N	nRF5340		
pin#		pin#	pin name	pin#	pin#	pin name	Descriptions
1	G1	G1	P0.26/SDA	1	AE1	P1.02	GPIO, configured as I2C SDA on EV board
2	H2	H2	P0.27/SCL	2	AF2	P1.03	GPIO, configured as I2C SCL on EV board
3	D2	D2	NC	3	N1	NC	NC, 32.768 KHz crystal embedded.
4	F2	F2	NC	4	R1	NC	NC, 32.768 KHz crystal embedded.
5	A12	A12	P0.02/AIN0	5	V2	P0.04/AIN0	GPIO, Analog input
6	B13	B13	P0.03/AIN1	6	Y2	P0.05/AIN1	GPIO, Analog input
7	L24	L24	P0.09/NFC1	7	W1	P0.02/NFC1	GPIO, NFC antenna connection
8	J24	J24	P0.10/NFC2	8	AA1	P0.03/NFC2	GPIO, NFC antenna connection
9	B1	B1	VDD	9	A19	VDD	DC supply 1.7V to 3.6V
10	B7	B7	GND	10	A25	VSS	Ground
11	T2	T2	P0.11	11	AJ1	P0.09	GPIO
12	AD22	AD22	P1.00	12	AK4	P0.11	GPIO
13	AD8	AD8	P0.13	13	B24	P0.30	GPIO; BT40N, BT-COEX-SATUS0
14	AC13	AC13	P0.18/RESET	14	AC31	/RESET	GPIO, reset with internal pull up, active low.
15	AA24	AA24	SWDCLK	15	W31	SWDCLK	Serial Wire Debug clock input
16	AC24	AC24	SWDIO	16	AA31	SWDIO	Serial Wire Debug I/O
Z0		B19	P1.11	Z0	AK26	P1.09	GPIO, NC for BT833N; LTE-RXD for BT40N, BT840N in Fanstel app.
Z1		B17	P1.12	Z1	R31	P1.10	GPIO, NC for BT833N; LTE-TXD for BT40N, BT840N in Fanstel app.
Z2		A16	P1.13	Z2	B20	P1.11	GPIO, NC for BT833N; LTE-CTS for BT40N, BT840N in Fanstel app.
Z3		B15	P1.14	Z3	B18	P1.12	GPIO, NC for BT833N; LTE-RTS for BT40N, BT840N in Fanstel app.
Z4		A14	P1.15	Z4	A17	P1.13	GPIO, NC for BT833N.
Z5		A20	P1.10	Z5	B16	P1.14	GPIO; NC for BT833N
Z6	R24	R24	P1.06	Z6	B14	P1.15	Connected to nRF21540 SCK pin internally.
A0			GND	A0	A25	VSS	Ground
A1	B11	B11	P0.28/AIN4	A1	AB2	P0.06/AIN2	GPIO, Analog input; Flash-WP in Fanstel app.
A2	A0	A10	P0.29/AIN5	A2	AD2	P0.07/AIN3	GPIO, Analog input; Flash-CS in Fanstel app.
A3	J1	J1	P0.04/AIN2	A3	AH2	P0.08	GPIO, BT840N/BT833N, analog input; Flash-/HOLD in Fanstel app.
A4	K2	K2	P0.05/AIN3	A4	AL9	P0.16/IO3	GPIO, BT840N/BT833N, analog input; QSPI Data3 in Fanstel app.
A5	M2	M2	P0.07	A5	M2	P1.00	GPIO, DIO1 in Fanstel LoRa app.

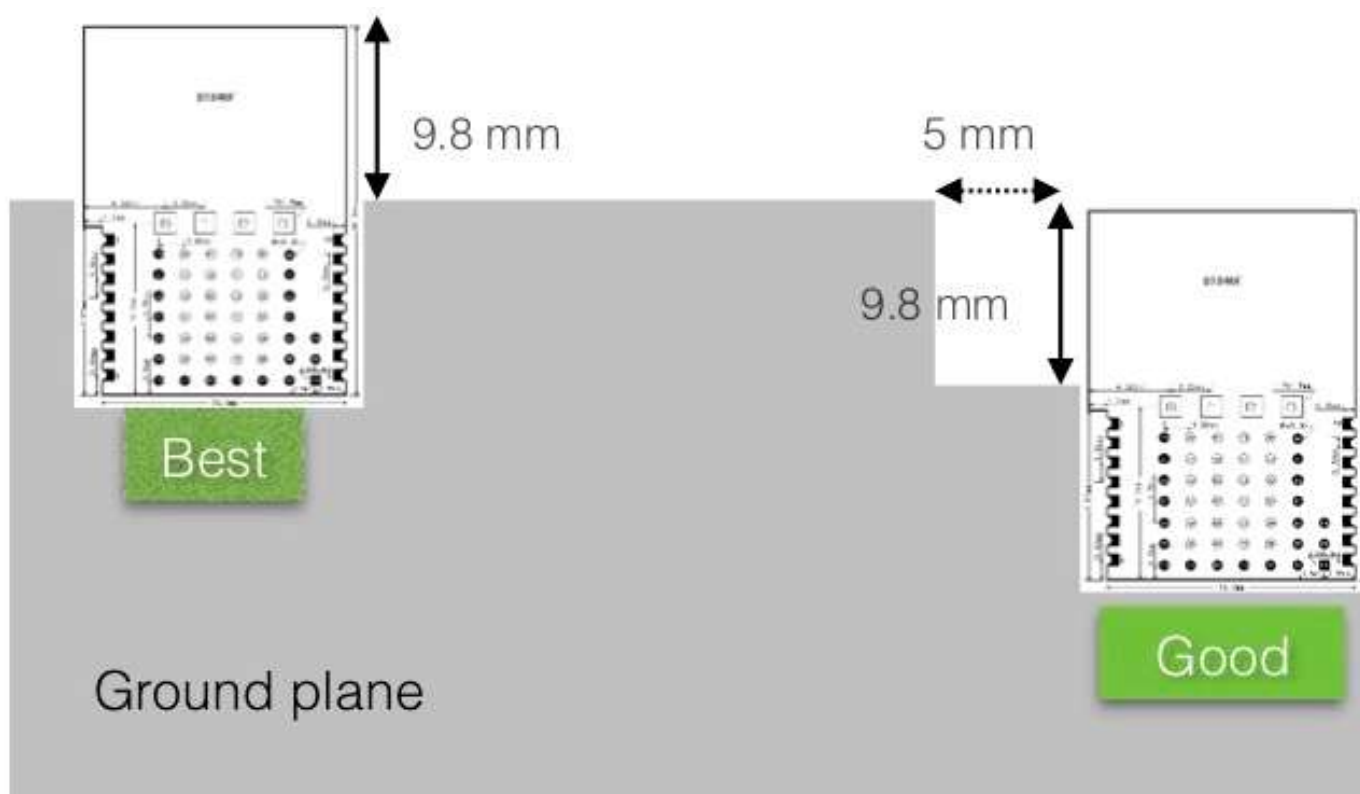
A6	P2	P2	P1.08	A6	AL23	P1.08	Connected to nRF21540 MOSI pin internally.
B0			GND	B0		VSS	Ground
B1	A20	AC21	P0.25	B1	AL13	P0.19	GPIO; BUSY in Fanstel LoRa app.
B2	B9	B9	P0.30/AIN6	B2	AK12	P0.17/SCK	GPIO, BT840N/BT833N, analog input; QSPI clock in Fanstel app.
B3	A8	A8	P0.31/AIN7	B3	AK8	P0.14/IO1	GPIO, BT840N/BT833N, analog input; QSPI Data1 in Fanstel app.
B4	L1	L1	P0.06	B4	AK10	P0.15/IO2	GPIO, QSPI Data2 in Fanstel app.
B5	N1	N1	P0.08	B5	AK6	P0.12/DCX	GPIO; BT40N, QSPI DCX in Fanstel app.
B6	B15	V23	P1.03	B6	AL5	P0.13/IO0	GPIO
C0			GND	C0		VSS	Ground
C1	AD20	AD20	P0.24	C1	B22	P0.31	GPIO
C2	AD18	AD18	P0.22	C2	AL15	P0.21	Connected to nRF21540 TX_EN pin internally.
C3	AD12	AD12	P0.17	C3	AL27	P0.24	GPIO
C4	AD10	AD10	P0.15	C4	AK20	P0.23	GPIO
C5	W24	W24	P1.02	C5	AK16	P0.20	GPIO
C6	U24	U24	P1.04	C6	AK28	P0.25/AIN4	Connected to nRF21540 MISO pin internally
D0			GND	D0		VSS	Ground
D1	B17	AC19	P0.23	D1	AL29	P0.26/AIN5	Connected to nRF21540 PDN pin internally.
D2	A14	AC15	P0.19	D2	AK30	P0.27/AIN6	Connected to nRF21540 RX_EN pin internally.
D3	AC11	AC11	P0.16	D3	AE31	P0.28/AIN7	GPIO, BT40F, analog input.
D4	AC9	AC9	P0.14	D4	U31	P0.29	GPIO
D5	Y23	Y23	P1.01	D5	AK18	P0.22	GPIO
D6	A16	T23	P1.05	D6	P2	P1.01	GPIO
E0	P23	P23	P1.07	E0	AL19	P1.04	Connected to nRF21540 MODE internally.
E1	AD16	AD16	P0.20	E1	AK22	P1.05	Connected to nRF21540 ANT-SEL internally.
E2	AC17	AC17	P0.21	E2	AL21	P1.06	Connected to nRF21540 CSN pin internally.
E3	R1	R1	P1.09	E3	AK24	P1.07	GPIO
E4	AD6	AD6	D+	E4	B2	D+	USB D+
E5	AD4	AD4	D-	E5	B4	D-	USB D-
E6	U1	U1	P0.12	E6	AK2	P0.10/MISO	GPIO, BT40F, high speed SPI MISO
F0				H0			Ground pad
F1				H1			Ground pad
F2				H2			Ground pad
F3				H3			Ground pad
				F3	AK14	P0.18/CSN	GPIO, BT40F, QSPI chip select
F4	Y2	Y2	VDDH	F4	E1	VDDH	High Voltage Power Supply, 2.5V to 5.5V
F5		AB2	DCCH	F5	J1	NC	BT840F, DCDC converter output; BT40F, No connect, L,C circuit embedded.
F6	AD2	AD2	VBUS	F6	A5	VBUS	5V DC power for USB 3.3V regulator



### Mounting BT40N on the Host PCB

The following figure shows recommended mounting of BT40N module on the host PCB.

- For the best Bluetooth range performance, the antenna area of module shall extend 9.8 mm outside the edge of host PCB board, or 9.8 mm outside the edge of a ground plane.
- The next choice is to place a module on a corner of host PCB, the antenna area shall extend 9.8 mm from the edge of ground plane. Ground plane shall be at least 5 mm from the edge of the antenna area of module.



- We don't recommend mounting BT40N module in the middle of a host PCB.

For the best Bluetooth range performance, keep all external metal at least 30mm from the antenna area.

### **Host Board Design for Low Cost or Long Range**

A host board can be designed to accommodate these modules with nRF21540 PA. They are referred as BT40N. Our suggestions for host PCB design:

- Use a 4 or more layers PCB.
- Use library component from EV-BT40NE Gerber files. They can be downloaded from <http://www.fanstel.com/download-document/>. It has 16 castellated pins plus 45 LGA pins.
- As much ground plane under BT40N, on top side of host PCB as possible. Use EV-BT40F Gerber files as an example.

## Control Nordic nRF21540 Power Amplifier

BT40N and BT40NE uses nRF21540 power amplifier.

Nordic online document

[https://developer.nordicsemi.com/nRF\\_Connect\\_SDK/doc/latest/nrf/ug\\_radio\\_fem.html?highlight=sky66112#ug-radio-fem-skyworks](https://developer.nordicsemi.com/nRF_Connect_SDK/doc/latest/nrf/ug_radio_fem.html?highlight=sky66112#ug-radio-fem-skyworks)

[https://infocenter.nordicsemi.com/pdf/nRF21540\\_PS\\_v1.2.pdf](https://infocenter.nordicsemi.com/pdf/nRF21540_PS_v1.2.pdf)

The nRF21540 device is a range extender that you can use with nRF52 and nRF53 Series devices. For more information about nRF21540, see the nRF21540 documentation.

## Setting for BT833N and BT840N

Set up the FCC IC TX power for BT833N, BT840N  
SDK V.2.0.0  
prj.conf

```
#TX POWER For BT833N(nrf52833+nrf21540) FCC IC  
CONFIG_BT_CTLR_TX_PWR_DYNAMIC_CONTROL=y  
CONFIG_BT_CTLR_TX_PWR_PLUS_3=y
```

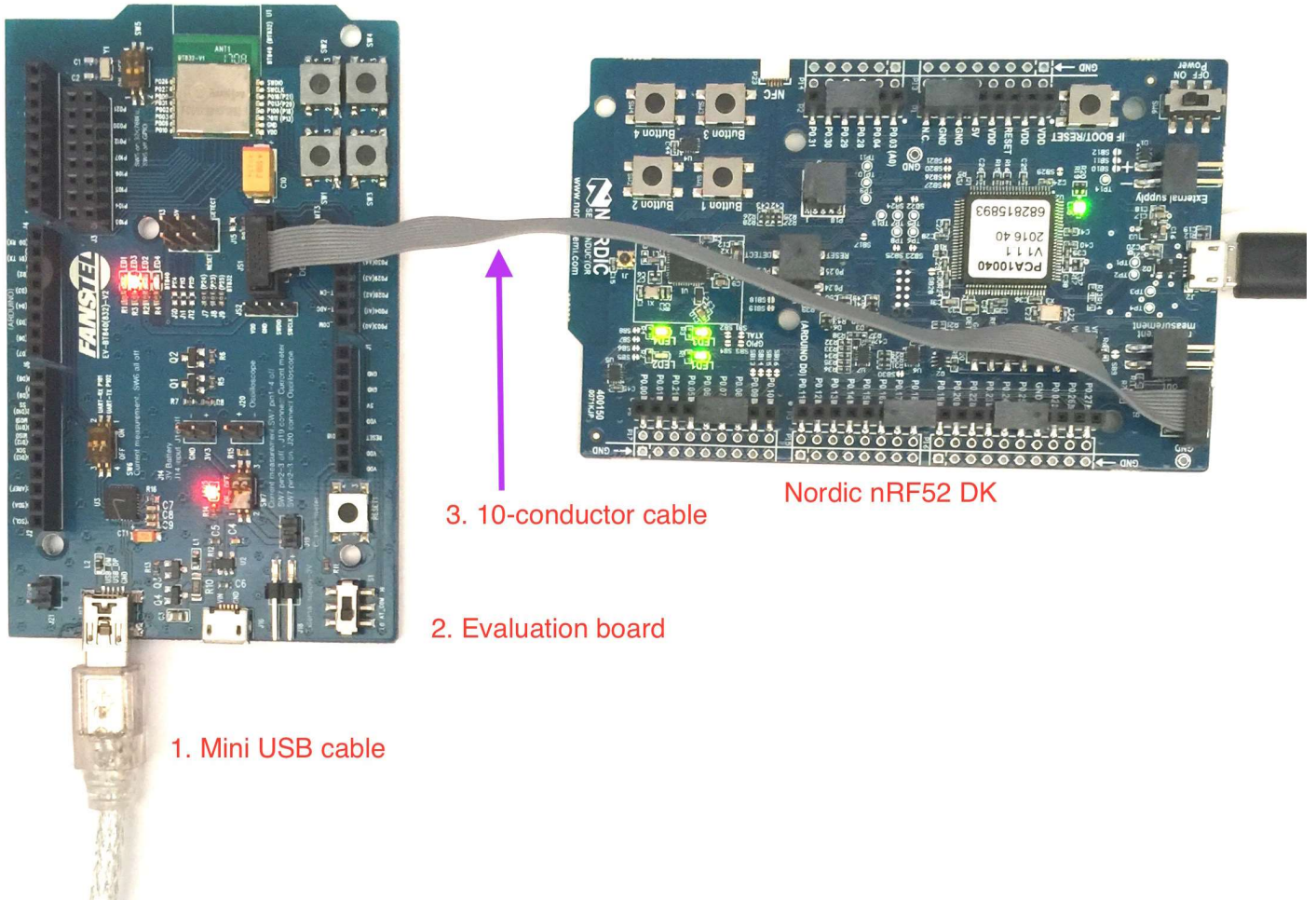
```
#TX POWER For BT840N(nrf52840+nrf21540) FCC IC  
CONFIG_BT_CTLR_TX_PWR_DYNAMIC_CONTROL=y  
CONFIG_BT_CTLR_TX_PWR_PLUS_4=y
```

## 4. BT40F Evaluation Board

An evaluation board consists of the followings:

- Mini USB cable
- Evaluation board
- 10-conductor cable for connection to Nordic nRF53 DK (DK is not included)

The EV board can be programmed by using a Nordic nRF53 DK board, connected as below. (Photo to be updated)



1. Mini USB cable

2. Evaluation board

3. 10-conductor cable

Nordic nRF53 DK



## Nordic Development Tools

A Nordic nRF5340 DK is recommended for programming this evaluation board. Visit Nordic website for [nRR5340 DK description and product brief](#).

Many application examples can be downloaded from Nordic website.

Some firmware, Android OS, and iOS app codes can be downloaded from **Bluetooth 5 Codes section** of this Fanstel webpage.

<http://www.fanstel.com/download-document/>

**BT40** firmware can be used in all nRF5340 modules without power amplifier, e.g., BT40F and BT40E.

## Android OS Apps

The following Android OS apps are available for download from Google Play Store:

**BlueNor nrf5x**: to use with Bluetooth 5 stacks, AT commands, or Slave firmware. Master firmware does not connect to a smartphone. Source codes can be downloaded from <http://www.fanstel.com/download-document/>

**BlueNor Mesh**: to use with BlueNor mesh firmware to send command to any node in a mesh. Node number is displayed when acknowledgement is received. Source codes will be uploaded to Fanstel website when supporting Bluetooth 5.

## iOS Apps

The following iOS apps can be downloaded from Apple APP Store.

**BlueNor Mesh**: to use with BlueNor mesh firmware to send command to any node in a mesh. Node number is displayed when acknowledgement is received.

**BlueNor nrf5x** firmware, apps, and source codes will be uploaded when ready.

**EV-BT40NE EvaluationBoard Schematics**

Evaluation board [EV-BT40F schematics and Gerber files](#) is available at Fanstel website.

Evaluation board can be used as a reference design for using modules. EV-BT40F is designed for the BT40F soldering pads with 61 pins. This EV board can also be used for BT40, BT40E, and BT40X modules.

**Suggestion for Battery Power Application**

Standby current consumption is important for battery-powered product. To reduce host board area, the followings are embedded in modules:

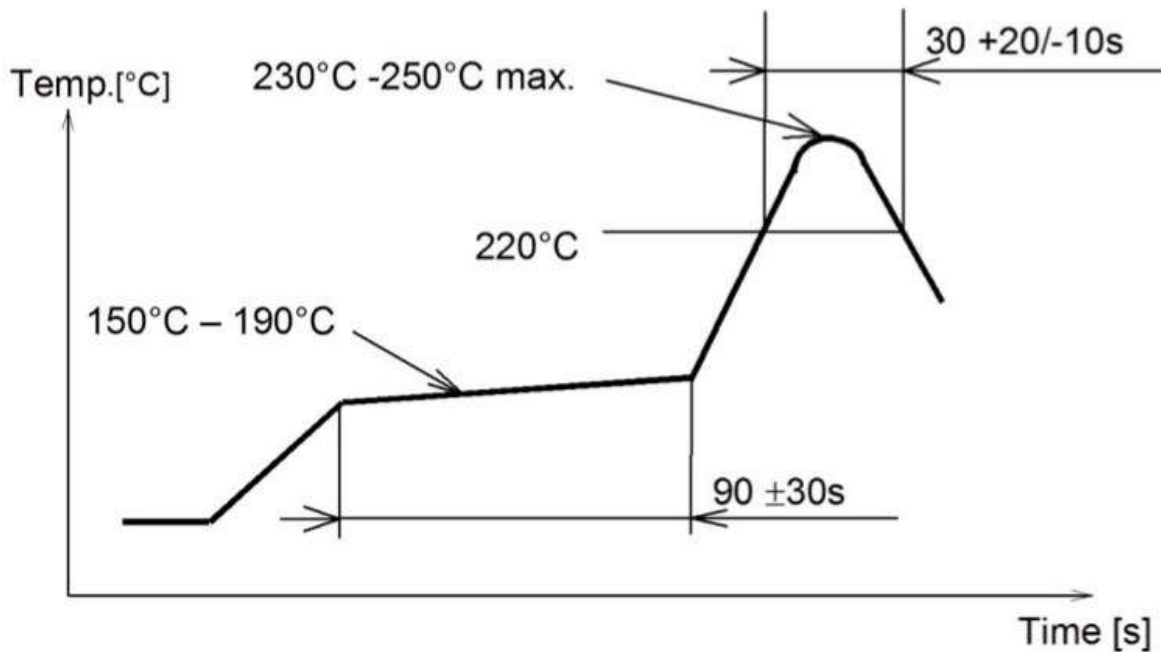
- 32 MHz, 20PPM main crystal and load capacitors.
- 32.768 KHz, 20PPM sleep crystal and load capacitors.
- Inductors and capacitors required for VDD power supply DC to DC converter.
- Inductors and capacitors required for VDDH power supply DC to DC converter.

The external sleep crystal shall be used for a precise sleep clock frequency. DCDC converter shall be enabled to reduce power consumption.

## 5. Miscellaneous

### Soldering Temperature-Time Profile for Re-Flow Soldering

Maximum number of cycles for re-flow is 2. No opposite side re-flow is allowed due to module weight.



### Cautions, Design Notes, and Installation Notes

Failure to follow the guidelines set forth in this document may result in degrading of the product's functions and damage to the product.

#### Design Notes

- (1) Follow the conditions written in this specification, especially the control signals of this module.
- (2) The supply voltage has to be free of AC ripple voltage (for example from a battery or a low noise regulator output). For noisy supply voltages, provide a decoupling circuit (for example a ferrite in series connection and a bypass capacitor to ground of at least 47uF directly at the module).
- (3) This product should not be mechanically stressed when installed.
- (4) Keep this product away from heat. Heat is the major cause of decreasing the life of these products.
- (5) Avoid assembly and use of the target equipment in conditions where the products' temperature may exceed the maximum tolerance.
- (6) The supply voltage should not be exceedingly high or reversed. It should not carry noise and/or spikes.

(7) this product away from other high frequency circuits.

#### *Notes on Antenna and PCB Layout*

(1) Don't use a module with internal antenna inside a metal case.

(2) For PCB layout:

- Avoid running any signal line below module whenever possible,
- No ground plane below antenna,
- If possible, cut-off the portion of main board PCB below antenna.

#### *Installation Notes*

(1) Reflow soldering is possible twice based on the time-temperature profile in this data sheets. Set up the temperature at the soldering portion of this product according to this reflow profile.

(2) Carefully position the products so that their heat will not burn into printed circuit boards or affect the other components that are susceptible to heat.

(3) Carefully locate these products so that their temperatures will not increase due to the effects of heat generated by neighboring components.

(4) If a vinyl-covered wire comes into contact with the products, then the cover will melt and generate toxic gas, damaging the insulation. Never allow contact between the cover and these products to occur.

(5) This product should not be mechanically stressed or vibrated when reflowed.

(6) If you want to repair your board by hand soldering, please keep the conditions of this chapter.

(7) Do not wash this product.

(8) Refer to the recommended pattern when designing a board.

(9) Pressing on parts of the metal cover or fastening objects to the metal will cause damage to the unit.

#### *Usage Condition Notes*

(1) Take measures to protect the unit against static electricity. If pulses or other transient loads (a large load applied in a short time) are applied to the products, check and evaluate their operation before assembly on the final products.

(2) Do not use dropped products.

(3) Do not touch, damage or soil the pins.

(4) Follow the recommended condition ratings about the power supply applied to this product.

(5) Electrode peeling strength: Do not add pressure of more than 4.9N when soldered on PCB

(6) Pressing on parts of the metal cover or fastening objects to the metal cover will cause damage.

(7) These products are intended for general purpose and standard use in general electronic equipment, such as home appliances, office equipment, information and communication equipment.

#### **Storage Notes**

(1) The module should not be stressed mechanically during storage.

(2) Do not store these products in the following conditions or the performance characteristics of the product, such as RF performance will be adversely affected:

- Storage in salty air or in an environment with a high concentration of corrosive gas.
- Storage in direct sunlight
- Storage in an environment where the temperature may be outside the range specified.
- Storage of the products for more than one year after the date of delivery storage period.

(3) Keep this product away from water, poisonous gas and corrosive gas.

(4) This product should not be stressed or shocked when transported.

(5) Follow the specification when stacking packed crates (max. 10).

#### **Safety Conditions**

These specifications are intended to preserve the quality assurance of products and individual components. Before use, check and evaluate the operation when mounted on your products. Abide by these specifications, without deviation when using the products. These products may short-circuit. If electrical shocks, smoke, fire, and/or accidents involving human life are anticipated when a short circuit occurs, then provide the following failsafe functions, as a minimum.

(1) Ensure the safety of the whole system by installing a protection circuit and a protection device.

(2) Ensure the safety of the whole system by installing a redundant circuit or another system to prevent a dual fault causing an unsafe status.

#### **Other Cautions**

(1) This specification sheet is copyrighted. Reproduction of this data sheet is permissible only if reproduction is without alteration and is accompanied by all associated warranties, conditions, limitations, and notices.

(2) Do not use the products for other purposes than those listed.

(3) Be sure to provide an appropriate failsafe function on your product to prevent an additional damage that may be caused by the abnormal function or the failure of the product.

(4) This product has been manufactured without any ozone chemical controlled under the Montreal Protocol.

(5) These products are not intended for other uses, other than under the special conditions shown below. Before using these products under such special conditions, check their performance and

reliability under the said special conditions carefully to determine whether or not they can be used in such a manner.

- In liquid, such as water, salt water, oil, alkali, or organic solvent, or in places where liquid may splash.
  - In direct sunlight, outdoors, or in a dusty environment
  - In an environment where condensation occurs.
  - In an environment with a high concentration of harmful gas.
- (6) If an abnormal voltage is applied due to a problem occurring in other components or circuits, replace these products with new products because they may not be able to provide normal performance even if their electronic characteristics and appearances appear satisfactory.
- (7) When you have any question or uncertainty, contact Fanstel.

**Packaging and Lot Number**

Production modules are delivered in reel, 1000 modules in each reel. Lot number for modules made after May 2019, can be used to track silicon version of SoC, module PCB version, and production test

(K) Cust. PO:2630427

(4K) Cust. PO line:00003

(P) Cust. P/N : 1914-1019-2-ND

(1T) Lot :D0V218B-0000000

(Q) QTY :1000

(1P) MFG P/N : BT840F

(6D) Ship Date :20190522

(9D) Date : 1920

(4L) COO: CN

MSL	3/260°C
(E)	e4
<b>RoHS</b>	

**Lot: D0 V2 18B - 00 00 000**

D0: 2 digits, version number of SoC.

V2: 2 digits, version number of module PCB.

18B: the first 2 digits for production test codes released year and the last digit for month in hex format. A=October, B=November, C=December. 18B was released in November 2018.

00 00 000, 7 digits, reserved for 2nd SoC for modules with 2 SoCs.

code version.

**FCC LABEL**

The Original Equipment Manufacturer (OEM) must ensure that the OEM modular transmitter must be labeled with its own FCC ID number. This includes a clearly visible label on the outside of the final product enclosure that displays the contents shown below. If the FCC ID is not visible when the equipment is installed inside another device, then the outside of the device into which the equipment is installed must also display a label referring to the enclosed equipment

The end product with this module may subject to perform FCC part 15 unintentional emission test requirement and be properly authorized.

This device is intended for OEM integrator only.





## **Revision History**

- Feb. 2023, Ver. 0.90: Initial draft release.

## Contact Us

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**Federal Communications Commission (FCC) Statement**

You are cautioned that changes or modifications not expressly approved by the part responsible for compliance could void the user's authority to operate the equipment.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

- 1) this device may not cause harmful interference, and
- 2) this device must accept any interference received, including interference that may cause undesired operation of the device.

**FCC RF Radiation Exposure Statement:**

This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment. End users must follow the specific operating instructions for satisfying RF exposure compliance. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

**RF exposure warning**

This equipment must be installed and operated in accordance with provided instructions and the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. End-users and installers must be provided with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance.

**Industry Canada (IC) Statement**

This device complies with Industry Canada license-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

**RF exposure warning**

This equipment must be installed and operated in accordance with provided instructions and the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter. End-users and installers must be provided with antenna installation instructions and transmitter operating conditions for satisfying RF exposure compliance.

**Canada, avis d'Industry Canada (IC)**

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

- (1) l'appareil ne doit pas produire de brouillage, et
- (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

**Informations concernant l'exposition aux fréquences radio (RF)**

Cet équipement est conforme avec l'exposition aux radiations IC définies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé à une distance minimum de 20 cm entre le radiateur et votre corps. Cet émetteur ne doit pas être co-localisées ou opérant en conjonction avec une autre antenne ou transmetteur. Les utilisateurs finaux et les installateurs doivent être informés des instructions d'installation de l'antenne et des conditions de fonctionnement de l'émetteur afin de satisfaire à la conformité d'exposition RF.

**Note: The end product shall have the words “Contains Transmitter Module FCC ID: X8WBT40N , contient IC: 4100A-BT40N**

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Information for the OEM and Integrators

The following statement must be included with all versions of this document supplied to an OEM or integrator, but should not be distributed to the end user.

- (1) This device is intended for OEM integrators only.
- (2) Please see the full Grant of Equipment document for other restrictions.

**BT40N: PCB Antenna, 0.88 dBi ; BT40NE: Dipole Antenna, 6dBi**

Must use the device only in host devices that meet the FCC/ISED RF exposure category of mobile, which means the device is installed and used at distances of at least 20cm from persons.

The end user manual shall include FCC Part 15 /ISED RSS GEN compliance statements related to the transmitter as show in this manual.

Host manufacturer is responsible for compliance of the host system with module installed with all other applicable requirements for the system such as Part 15 B, ICES 003.

Host manufacturer is strongly recommended to confirm compliance with FCC/ISED requirements for the transmitter when the module is installed in the host.

Must have on the host device a label showing Contains **FCC ID: X8WBT40N** , **contient IC: 4100A-BT40N**

The use condition limitations extend to professional users, then instructions must state that this information also extends to the host manufacturer's instruction manual.

This module is stand-alone modular. If the end product will involve the Multiple simultaneously transmitting condition or different operational conditions for a stand-alone modular transmitter in a host, host manufacturer have to consult with module manufacturer for the installation method in end system.

l'hôte doit utiliser l'instrument uniquement dans des dispositifs qui répondent à la fcc / (catégorie d'exposition rf mobile, ce qui signifie le dispositif est installé et utilisé à une distance d'au moins 20 cm de personnes. le manuel de l'utilisateur final doit inclure la partie 15 / (fac rss gen déclarations de conformité relatives à l'émetteur que de montrer dans ce manuel.

le fabricant est responsable de la conformité de l'hôte, le système d'accueil avec le module installé avec toutes les autres exigences applicables du système comme la partie 15 b, ices - 003.

accueillir le fabricant est fortement recommandé de confirmer la conformité avec les exigences de la fcc / (émetteur lorsque le module est installé dans l'hôte. le dispositif d'accueil doivent avoir une étiquette indiquant contient **FCC ID: X8WBT40N** , **contient IC: 4100A-BT40N**