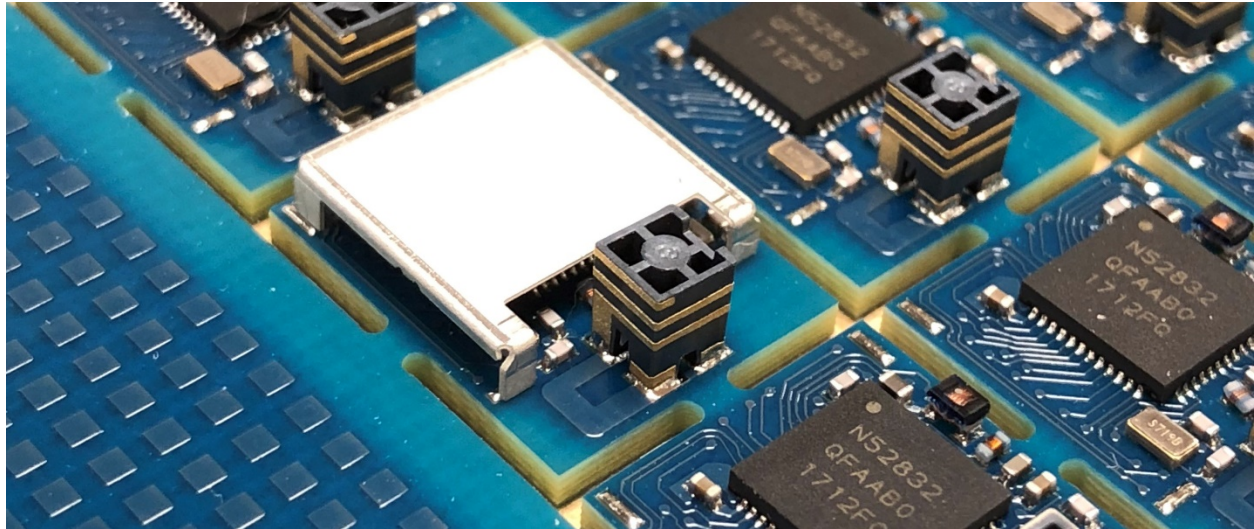# Honeywell

BLUETOOTH 5.0 LITE MODULE

Bluetooth®

Honeywell's Bluetooth 5.0 lite module and reusable block is an inexpensive and compact Bluetooth 5.0 solution. It is based on Nordic's nRF52832 chip.

KEY FEATURES

- nRF52832 Chip Cortex-M4f 32-bit, 64 MHz, 512kB flash, 64kB RAM
- Compact: 12mm by 12mm (0.472" by 0.472"). 12mm by 15mm with on board antenna
- $ Two layer PCB. Non HDI. 4.5mil minimum trace/gap
- $ 0402 or bigger caps & inductors
- $ Standard 8 and 12 mil vias. No microvias, no buried and no blind vias
- High and Low frequency crystals installed
- Type 2 NFC-A tag supported
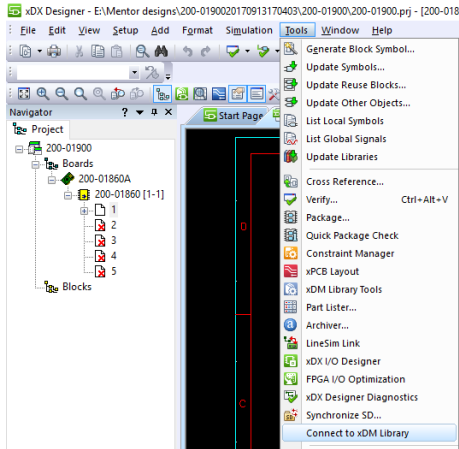- Connects to external antenna

BLOCK DIAGRAM
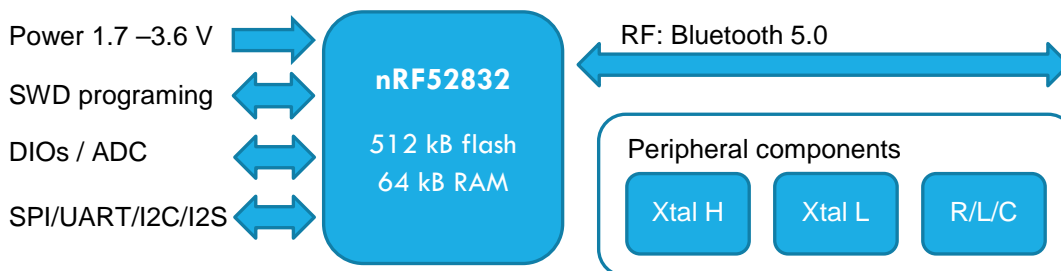
- All four Bluetooth 5 modes (central, peripheral, observer, broadcaster)
- ANT protocol
- Proprietary GFSK
- NFC-A

The stack is software defined and called Nordic SoftDevice.

More info: http://infocenter.nordicsemi.com
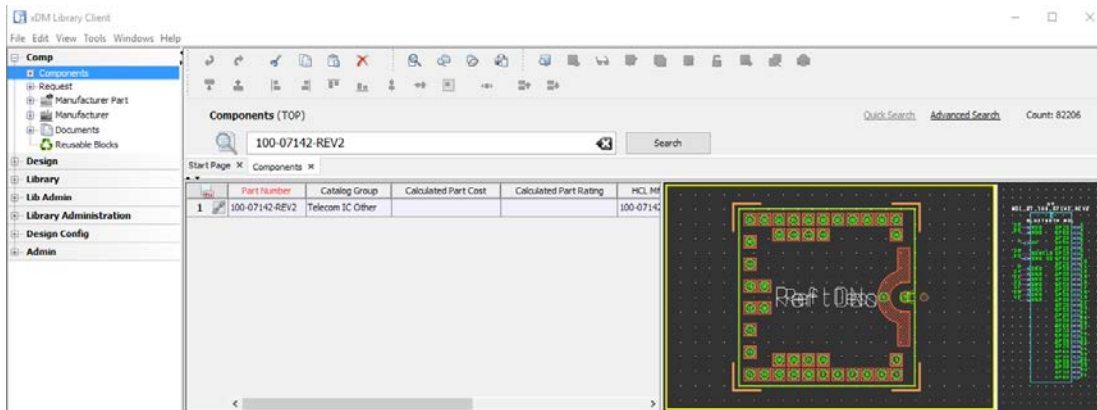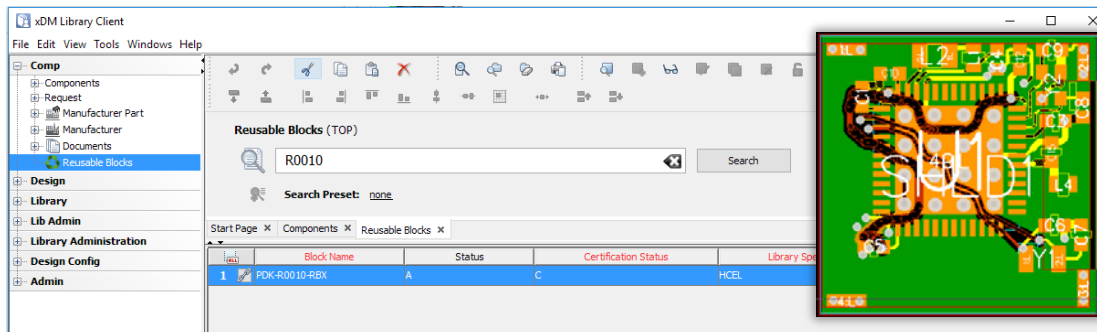
Step 1: From DX designer, connect to xDM library

Step 2: Search, select and instantiate

Part 100-07142-REV2 is the footprint for all drop-in modules and includes pads and traces to 20 GPIOs:

Part PDK-R0010-RBX is a reusable block with the basic components

Nordic continuously expands their coexistance capabilities. Please check the latest softdevice documentation for the latest coexistance functions

The below Coexistance functions are implemented as of Nov 2017

COEXISTANCE: MUTING

The TX power can be reduced to -40dBm when required. (complete muting is not supported as of Nov 17)

THROUGH SOFTDEVICE:
Call
`sd_ble_gap_tx_power_set(-40)` to set the power to -40dBm
`sd_ble_gap_tx_power_set(4)` to set the power to +4dBm
The above functions can be triggered by any event handler like a GPIO state

THROUGH REGISTER ACCESS
If you would like to bypass the stack, you can write directly to the register that configures the TX power
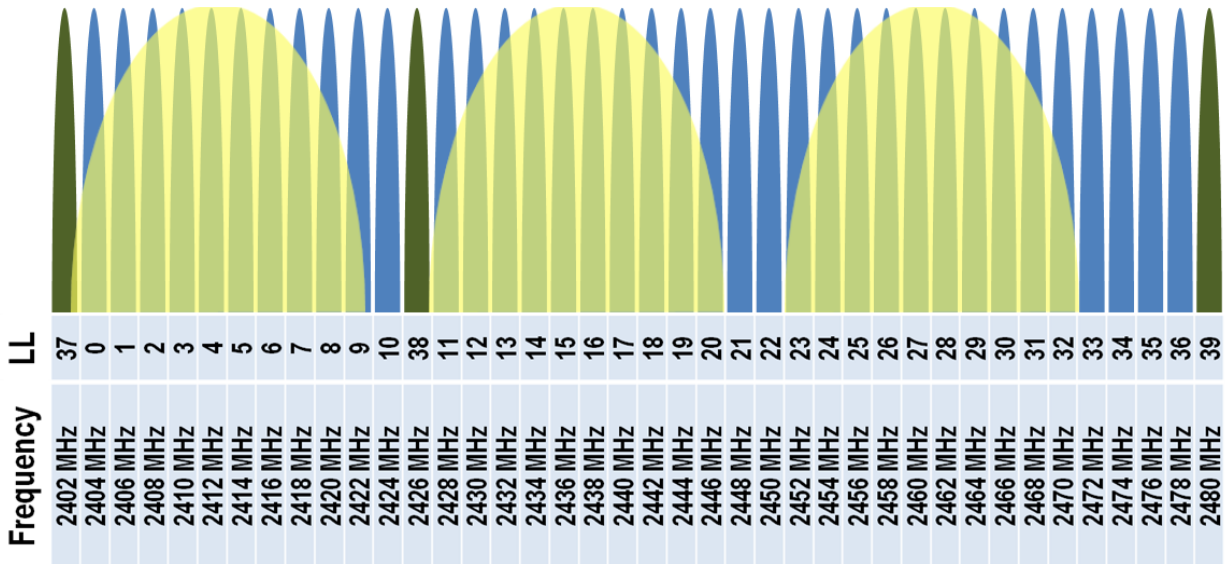
23.14.10 TXPOWER

Address offset: 0x50C

Output power

Bit number	31 30 29 28 27 26 25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 0
Id	A A A A A A A A
Reset 0x00000000	0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0

Id	RW	Field	Value Id	Value	Description	
A	RW	TXPOWER			RADIO output power.	
					Output power in number of dBm, i.e. if the value -20 is specified the output power will be set to -20dBm.	
			Pos4dBm	0x04	+4 dBm	
			Pos3dBm	0x03	+3 dBm	
			0dBm	0x00	0 dBm	
			Neg4dBm	0xFC	-4 dBm	
			Neg8dBm	0xF8	-8 dBm	
			Neg12dBm	0xF4	-12 dBm	
			Neg16dBm	0xF0	-16 dBm	
			Neg20dBm	0xEC	-20 dBm	
			Neg30dBm	0xD8	-40 dBm	Deprecated
			Neg40dBm	0xD8	-40 dBm	

Nordic's stack S132 SoftDevice provides the structure ble_gap_opt_ch_map_t

Channel Map option. Used with sd_ble_opt_get to get the current channel map or sd_ble_opt_set to set a new channel map. When setting the channel map, it applies to all current and future connections. When getting the current channel map, it applies to a single connection and the connection handle must be supplied.

If you can get the WiFi channels in use from your WiFi interface,

You can use the sd_ble_opt_set function of the S130/S132 to set the channel map so that the WiFi is avoided. The opt_id you would use is the BLE_GAP_OPT_CH_MAP .

The channels used by WiFi should be set as a "bad" channels.

Bad = 0, Good = 1

More details here: Link

The module is programed using Nordic's development board nRF52 DK or nRF52840 DK. The module can also be programed using SWD programmer by SEGGER.
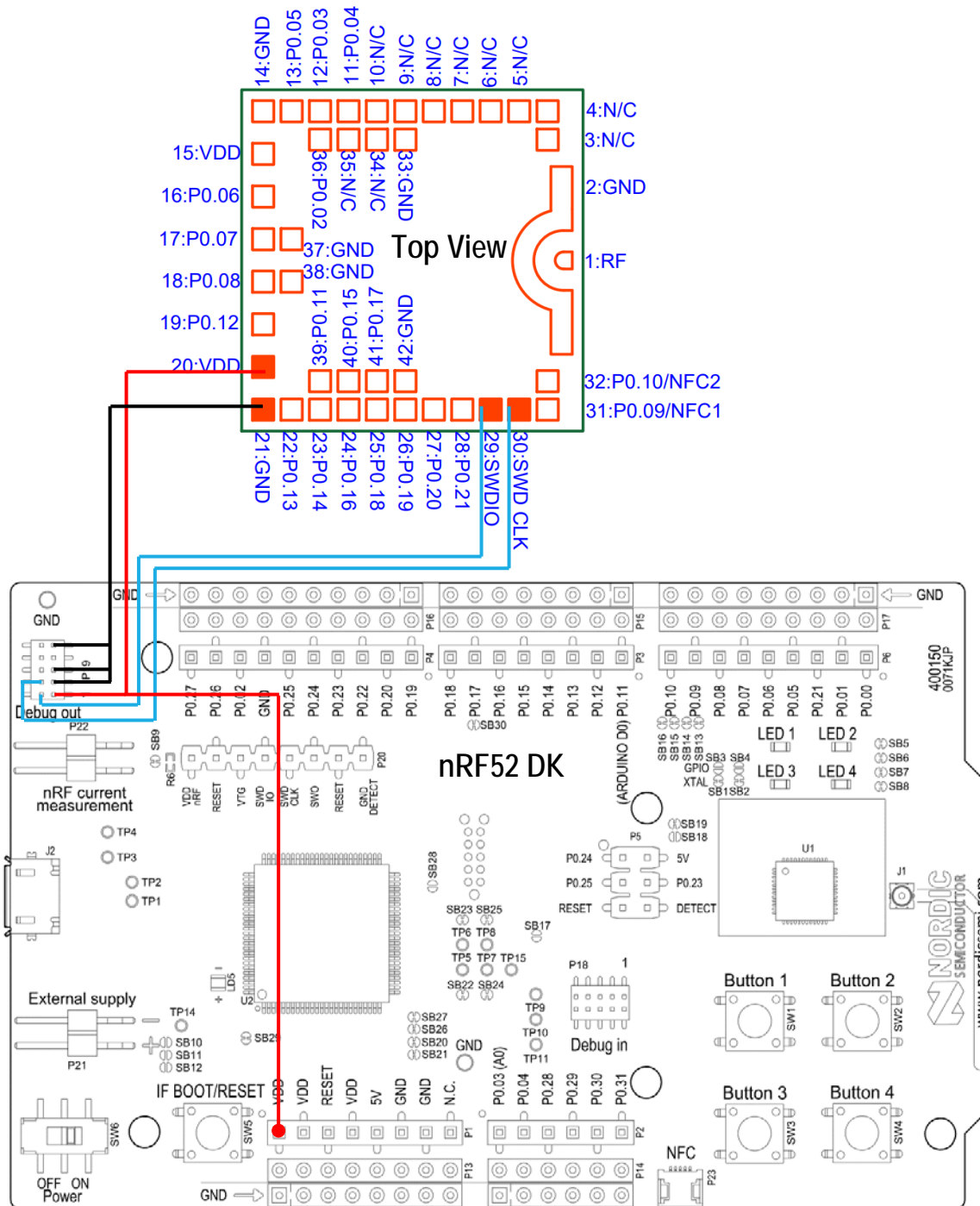
1. Connect the module to nRF52 DK as shown below:

Figure: Connection diagram for programming

Located at Honeywell GHCL part **100-07142-REV2**

Top View

PIN NUMBER	PIN ASSIGNMENT	PIN DESCRIPTION
1	RF	RF
2	GND	GND
3	N/C	
4	N/C	
5	N/C	
6	N/C	
7	N/C	
8	N/C	
9	N/C	
10	N/C	
11	P0.04	GPIO
12	P0.03	GPIO
13	P0.05	GPIO
14	GND	GND
15	VDD	1.7V – 3.6V
16	P0.06	GPIO
17	P0.07	GPIO
18	P0.08	GPIO
19	P0.12	GPIO
20	VDD	1.7V – 3.6V
21	GND	GND
22	P0.13	GPIO
23	P0.14	GPIO
24	P0.16	GPIO
25	P0.18	GPIO
26	P0.19	GPIO
27	P0.20	GPIO
28	P0.21	GPIO
29	SDWIO	SWD PROGRAMING
30	SWDCLK	SWD PROGRAMING
31	P0.09/NFC1	GPIO/NFC
32	P0.10/NFC2	GPIO/NFC
33	GND	GND
34	N/C	
35	N/C	
36	P0.02	GPIO
37	GND	GND
38	GND	GND
39	P0.11	GPIO
40	P0.15	GPIO
41	P0.17	GPIO
42	GND	GND
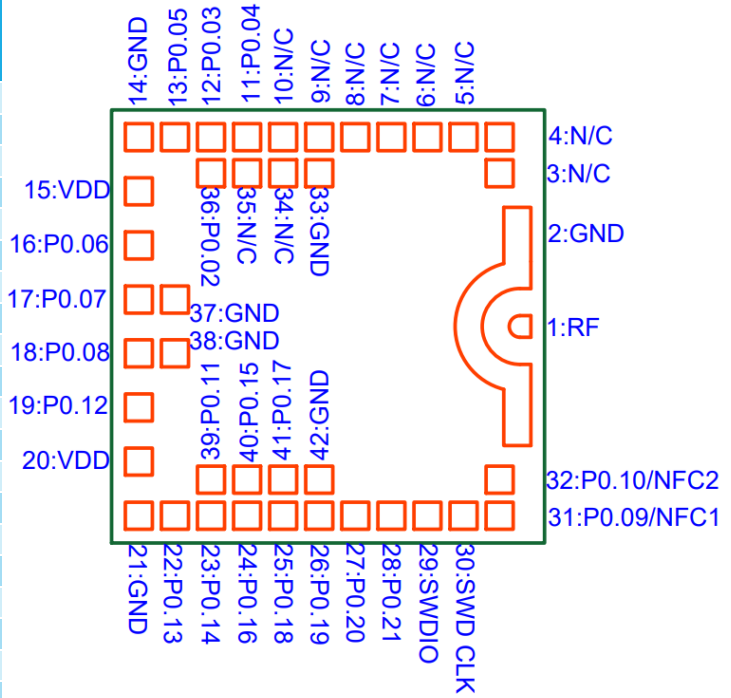
Sensitivity BLE 1Mbps	-96 dBm
TX power	+4 dBm
MCU	Cortex M4f 32-bit, 64 MHz, 512kB flash, 64kB RAM
Supply voltage	1.7V – 3.6V
Current cunsumption	Link
SDK	SDK link

Nordic Semiconductor links:

www.nordicsemi.com

infocenter.nordicsemi.com

devzone.nordicsemi.com

Submit your questions to:

https://www.nordicsemi.com/eng/supportcase/create

LINUX CONNECTIVITY

Procedure:

Use the hci-uart project in the zephyr project to provide the HCI implementation and then use BlueZ on linux to use the HCI implementation.

Others:

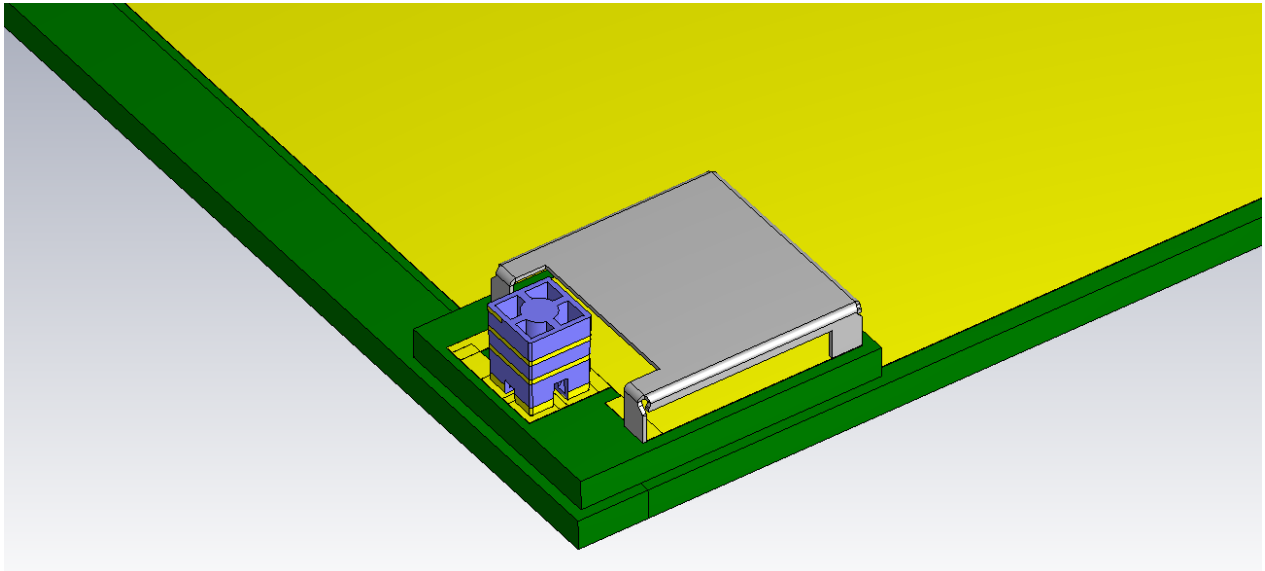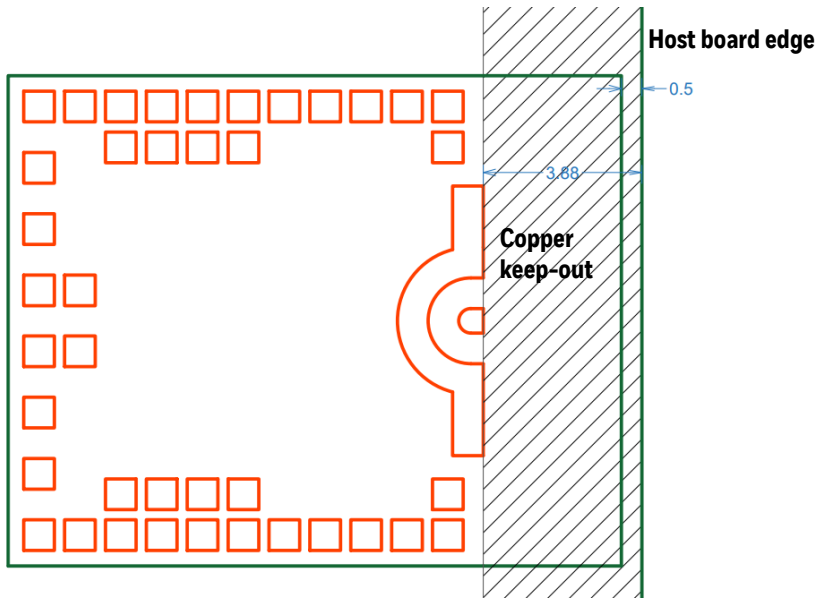pc-ble-driver is a static and shared library that provides serial port communication

https://github.com/NordicSemiconductor/pc-ble-driver

IOT SDK offers Constrained Application Protocol (CoAP)

Host board edge

0.5

3.88

Copper
keep-out

REGULATORY INFORMATION

a.   FCC

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

> 1) The device may not cause harmful interference, and

> 2) The device Module must accept any interference received, including interference that may cause undesired operation.

This device complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. The antenna used for this transmitter must be installed to provide a separation distance of at least 20 cm for mobile applications from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.

Important Note: 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.

This transmitter must not be co-located or operating in conjunction with any other antennas or transmitters.

It is the responsibility of the host device manufacturer to ensure continued compliance with FCC rule part 15B once the module has been installed in the host device. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

The concerned end-product must be labelled to say: "Contains FCC ID: CFS8DLBLE50"

b.   ISED

i. English

This device complies with Innovation, Science and Economic Development Canada (ISED) license-exempt RSS standard(s). Operation is subject to the following two conditions:

1) The device may not cause interference, and

2) The device must accept any interference, including interference that may cause undesired operation of the device.

Important note: To comply with Industry Canada RF exposure limits, the antenna used for this device must be installed to provide a separation distance of at least 20cm from all persons.

RF exposure is in accordance with RSS-102, section 2.5.2.

The concerned end-product must be labelled to say: "Contains IC: 573F-BLE50"

ii. French

Cet equipement est conforme aux normes d'exemption de licence RSS Innovation, Sciences et Développement économique Canada. Son utilisation est soumise aux deux conditions suivantes:

1) Le dispositif ne doit pas provoquer d'interference, et

2) Le dispositif doit accepter toute interference, y compris des interferences susceptibles de provoquer un fonctionnement indesirable de l'equipement.

Remarque importante: Pour respecter les limites d'exposition aux radiofrequences Innovation, Sciences et Développement économique Canada, l'antenne utilisee pour cet appareil doit etre installe pour fournir une distance de separation d'au moins 20 cm de toutes les personnes.

L'exposition aux RF est conforme a la norme RSS-102, section 2.5.2.

Le produit final concerne doit porter une etiquette avec la mention: "Contient IC: 573F-BLE50"