

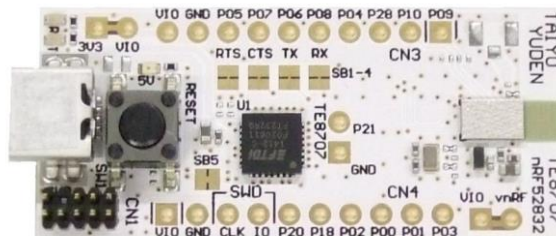
# **EVALUATION BOARD MANUAL**

## **EBSHSN Series**

# **EVALUATION KIT MANUAL**

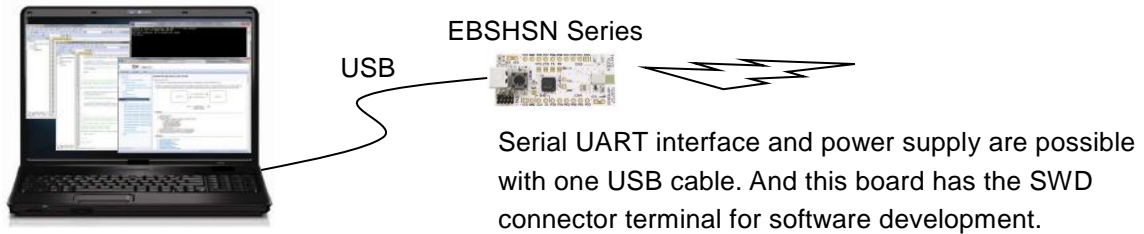
## **EKSHSN Series**

**for EYSHSN Series Bluetooth<sup>®</sup> low energy Module**



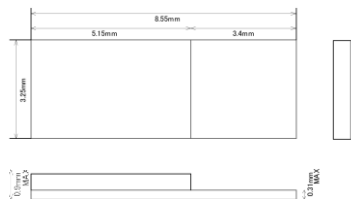
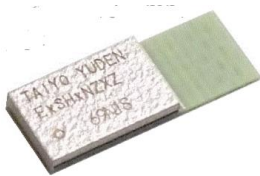
## Introduction

This evaluation board is applicable for Taiyo Yuden's **Bluetooth® low energy** module, EYSHSN Series.



## Mounted module

EYSHSN (8.55mm x 3.25mm x 0.9mm\_MAX)



Nordic nRF52832 / ARM® Cortex™-M4F 32 bit processor  
28-pin Land Grid Array / 15GPIOs / SWD

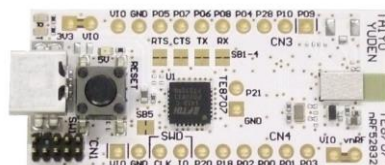
- Basic Module -

Taiyo Yuden writes firmware for S132 (EYSHSNZWZ) SoftDevice to this product.

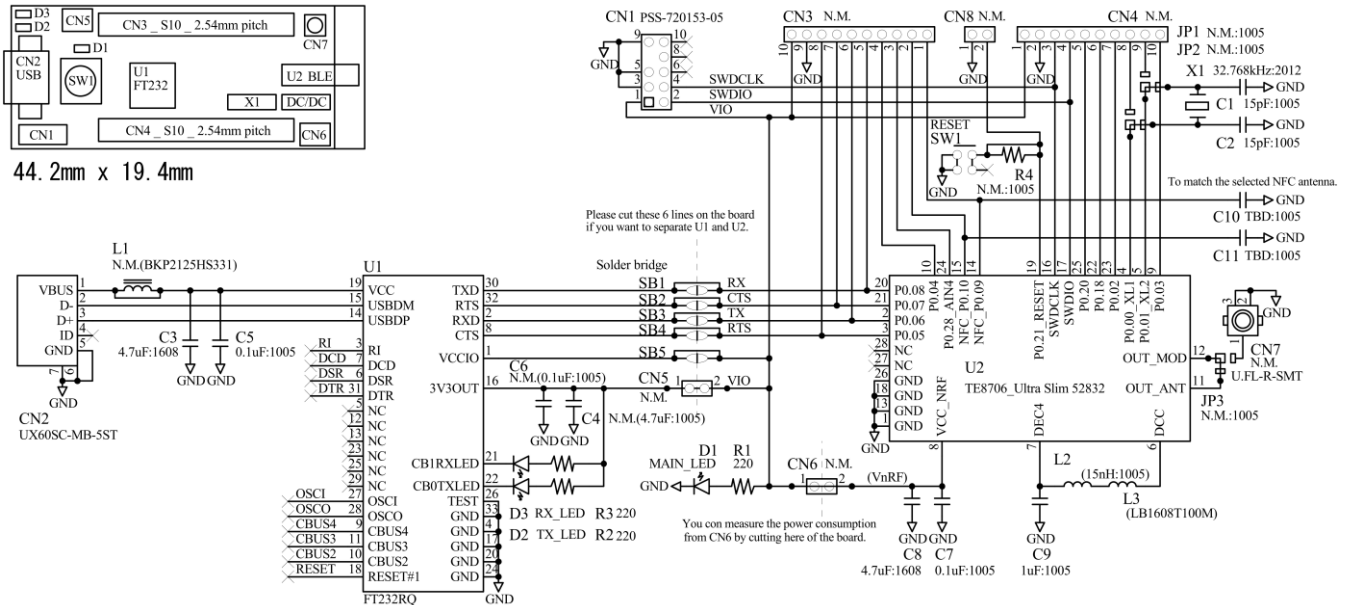
The user can develop unique application for the module.

## Content

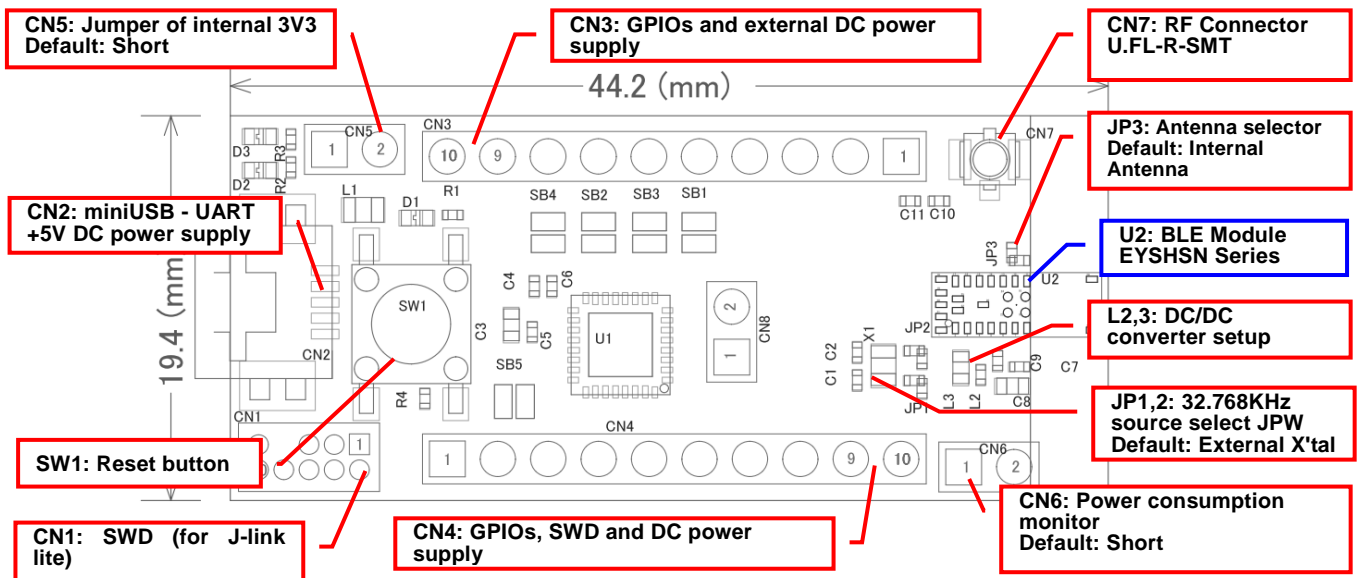
|   |                                  |       |
|---|----------------------------------|-------|
| 1 | EBSHSN Series Evaluation Board   | 1 pc  |
| 2 | J-Link Lite (EKSHSN Series Only) | 1 set |



**Evaluation board circuit schematic**

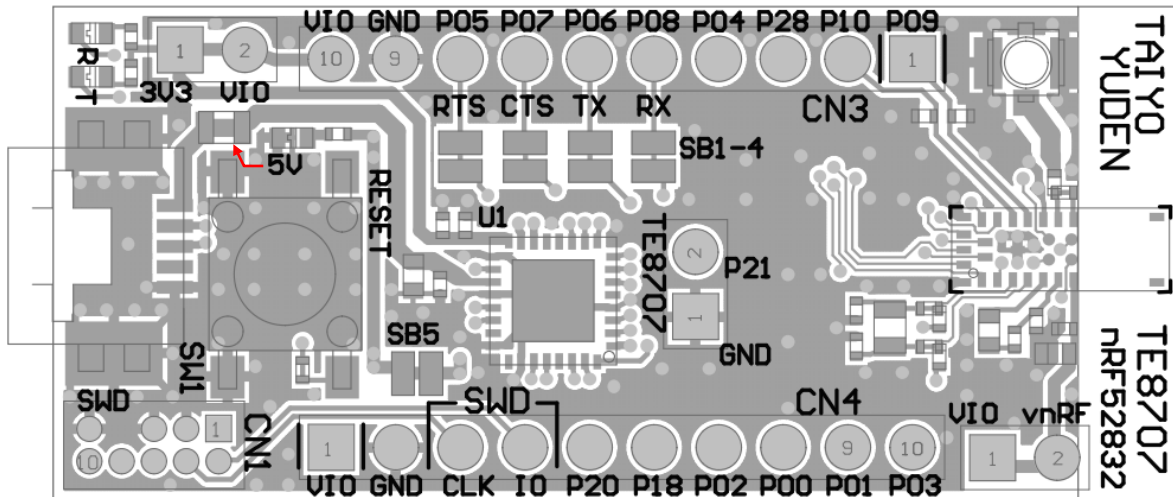


**Evaluation board layout**



- 1) All pin headers are 2.54mm pitch. And distance between **CN3** and **CN4** is **15.24mm**.
- 2) **CN3-CN8, C4, C6, C10, C11, R4, L1, JP1-JP3, SB1-5** are not mounted (N.M.).
- 3) **D1 (LED)**: 3.3V Indicator
- 4) **D2 (LED)**: UART TX Indicator
- 5) **D3 (LED)**: UART RX Indicator
- 6) **SW1 (Push button)**: Module Reset (active low)

## Silkscreen Printing



## Pin Descriptions

| Pin No. | CN3       | CN4    | CN8         |
|---------|-----------|--------|-------------|
| 1       | NFC/P0.09 | VIO    | GND         |
| 2       | NFC/P0.10 | GND    | P0.21/RESET |
| 3       | P0.28     | SWDCLK |             |
| 4       | P0.04     | SWDIO  |             |
| 5       | P0.08     | P0.20  |             |
| 6       | P0.06     | P0.18  |             |
| 7       | P0.07     | P0.02  |             |
| 8       | P0.05     | P0.00  |             |
| 9       | GND       | P0.01  |             |
| 10      | VIO       | P0.03  |             |

# EBSHSN, EKSHSN

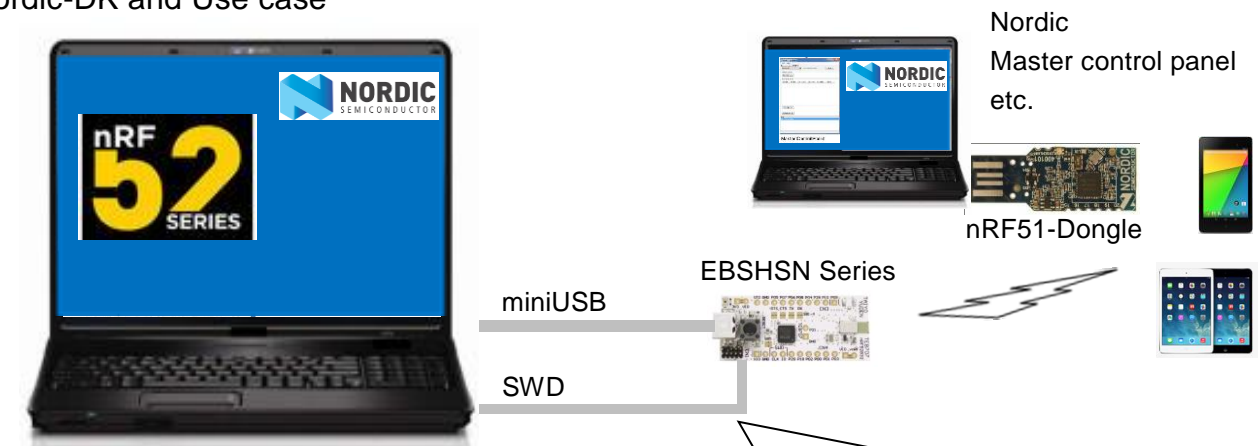
TAIYO YUDEN CO., LTD.

## How to use

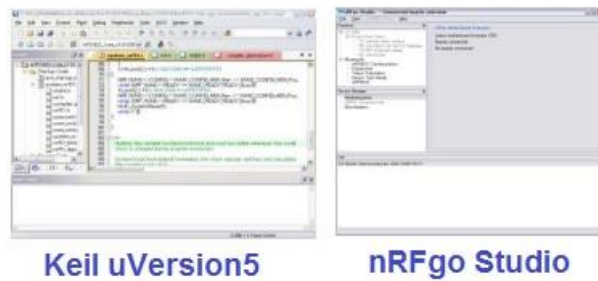
It is very easy just to tie this board to the PC with a USB cable. It is not necessary to change the setting of the board. The power supply of the module supplies by default 3.3V from 3V3OUT of FT232RQ.

## For software development

Nordic-DK and Use case



### Software Tool



Keil uVersion5

nRFgo Studio

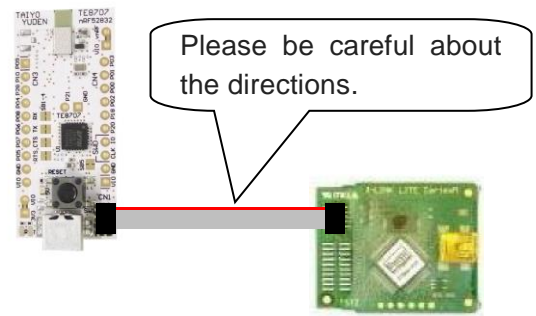
SWD : Serial Wire Debug  
 For example, please use J-Link Lite CortexM-9 JTAG/SWD Emulator.  
 EKSHSNZWZ included



CN1 supports the connection of the 10 pin 1.27 mm flat cable.

### Nordic-nRF52DK

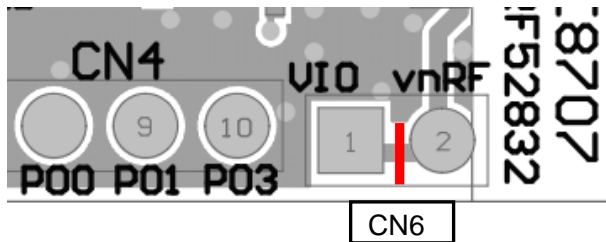
<http://www.nordicsemi.com/eng/Products/Bluetooth-Smart-Bluetooth-low-energy/nRF52-DK>



## MEMO

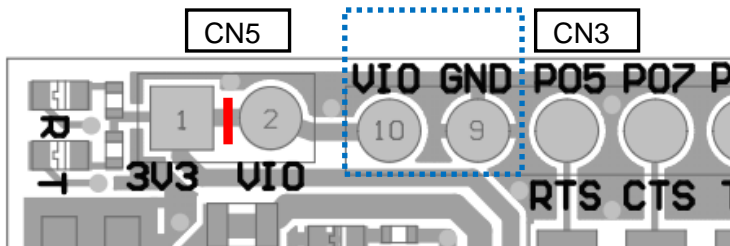
### 1) Current measurement

To measure the current, please cut the shorting 1pin and 2 pin of CN6. And connect an ampere-meter between the pins of connector CN6 to monitor the current directly.



### 2) About the power supply of the module

When you use external power supply, please supply power from 9pin and 10pin of CN3. On this configuration, you cut short circuit 1pin and 2pin of CN5 and should separate 3V3OUT of FT232RQ.



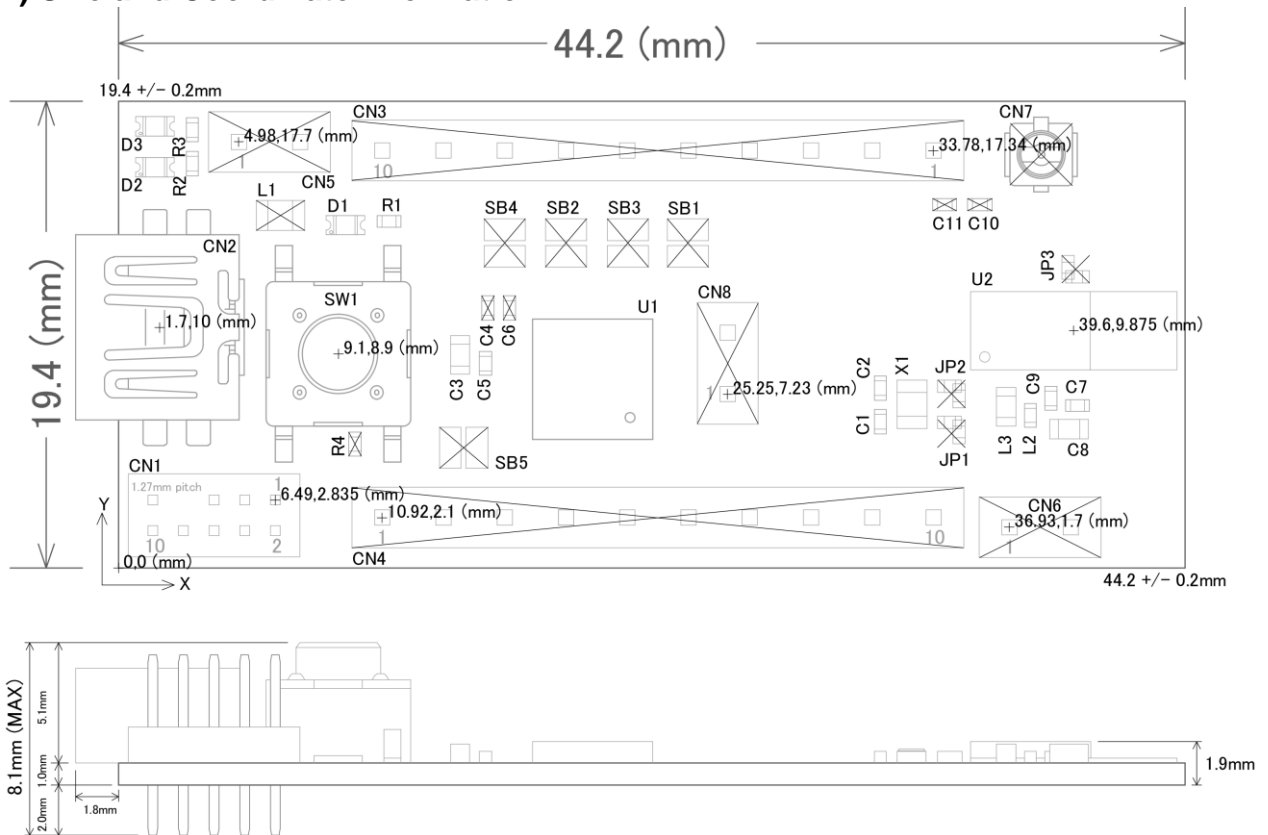
### 3) USB to serial UART interface

It needs to install driver of FT232RQ to use USB for UART interface. The drivers are available on FTDI website.

<http://www.ftdichip.com/Drivers/D2XX.htm>

In addition, by the application development, please assign GPIO as follows.

| GPIO  | UART |
|-------|------|
| P0.05 | RTS  |
| P0.06 | TX   |
| P0.07 | CTS  |
| P0.08 | RX   |

**4) Size and Coordinate information****Important notes****32kHz Clock**

This module does not installed 32.768kHz crystal. In case of operating without external crystal, please use following example code in order to enable internal 32.768kHz RC oscillator (32k RCOSC).

```
nrf_clock_lf_cfg_t clock_lf_cfg;
clock_lf_cfg.rc_ctiv = 16;
clock_lf_cfg.rc_temp_ctiv = 2;
clock_lf_cfg.source = NRF_CLOCK_LF_SRC_RC;
clock_lf_cfg.xtal_accuracy = NRF_CLOCK_LF_XTAL_ACCURACY_250_PPM;
SOFTDEVICE_HANDLER_APPSH_INIT(&clock_lf_cfg, true);
```

Note that when you choose to use the RC oscillator, it will add around 2uA average current consumption compared to a 20ppm external crystal.

ANT specification requires +/-50ppm accuracy for 32.768kHz clock. There is a possibility that the internal RC oscillator does not meet to the specification.