HY0021

Bluetooth$^®$ low energy module
with Slot Antenna Built into Shielded Package
Evaluation board manual

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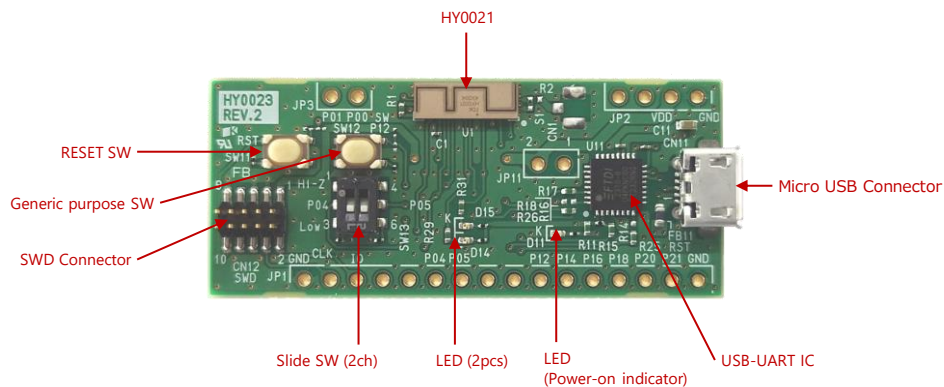| Version	Date	Description
1.0	Dec.11, 2024	First edition issued

1 Purpose of this document

This document describes the basic usage of HY0021 Evaluation Board. The design of the board circuit is dedicated to the evaluation of the board, and it does not guarantee the performance and the safety.
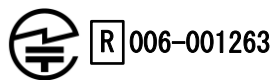
Model Name: HY0023 Rev.2

2 Board overview

2.1 Structure of the board

2.2 Certification

2.2.1 Japan

The HY0021, which has been approved as a radio station in a low power data communication system based on the Radio Law, is built in.

R 006-001263

2.2.2 USA (FCC)

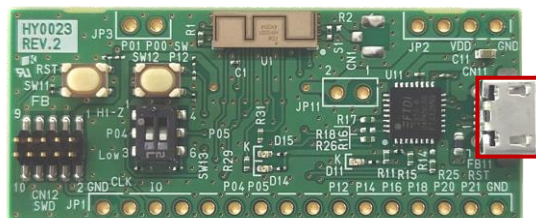Contains Transmitter Module FCC ID: 2AQ85HY0021

2.2.3 Canada (ISED)

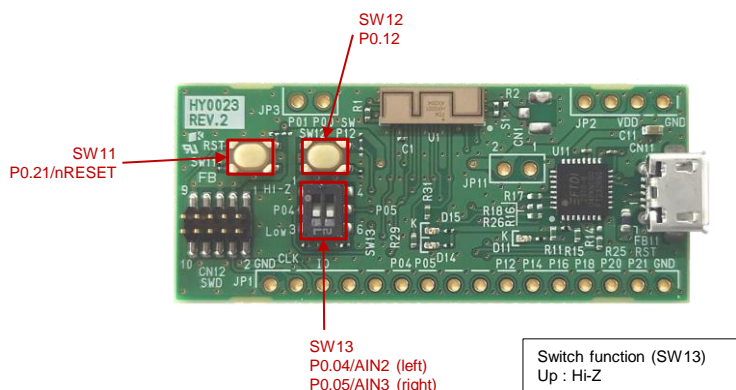Contains transmitter module IC: 31945-HY0021

3 Port description

3.1 USB port

HY0021 Evaluation Board has a USB port. The UART communication is available between the USB port (CN11) and PC via USB-UART interface IC (U11:FT232RNQ). 5V power may be supplied via the USB port.
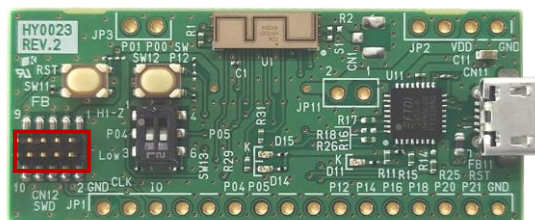
3.2 Switch ports

SW12
P0.12

SW11
P0.21/nRESET

SW13
P0.04/AIN2 (left)
P0.05/AIN3 (right)

Switch function (SW13)
Up : Hi-Z

3.3 SWD Header pin (10pin)

The board has an SWD debugging connector. (1.27mm apart, 10pin header pins)
Please note that the cable can be connected in the wrong orientation. Please refer to the photo below to check the correct orientation.

4   Basic usage

4.1   Turn on the board

Plugging in a USB cable supplies VBUS:5V and subsequently turns on the board.
There is no power switch. LED (orange) is illuminated while power is supplied.
3.3V is supplied to the BLE module via the regulator in the USB-UART IC.
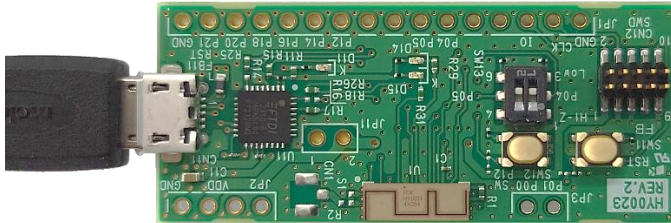
4.2   Turn off the board

Unplugging the USB cable stops the VBUS:5V power supply and then turns off the board.

4.3   Control interface

This board has FTDI USB-UART IC (FT232RNQ). Connecting the board and the PC using a USB cable enables the command control. It is necessary to flash the firmware which has UART functions. It is necessary to install a driver for USB-UART IC (FT232RNQ) prior to connect a PC.
   (Reference) FTDI Home page: https://ftdichip.com/products/ft232rnq/

4.4   Prepare for flashing the firmware

(1)   Prepare for the firmware to flash (softdevice and application (HEX files)).
(2)   Connect HY0021 EV board and a debugger (e.g. J-Link Base), seeing the photo below.
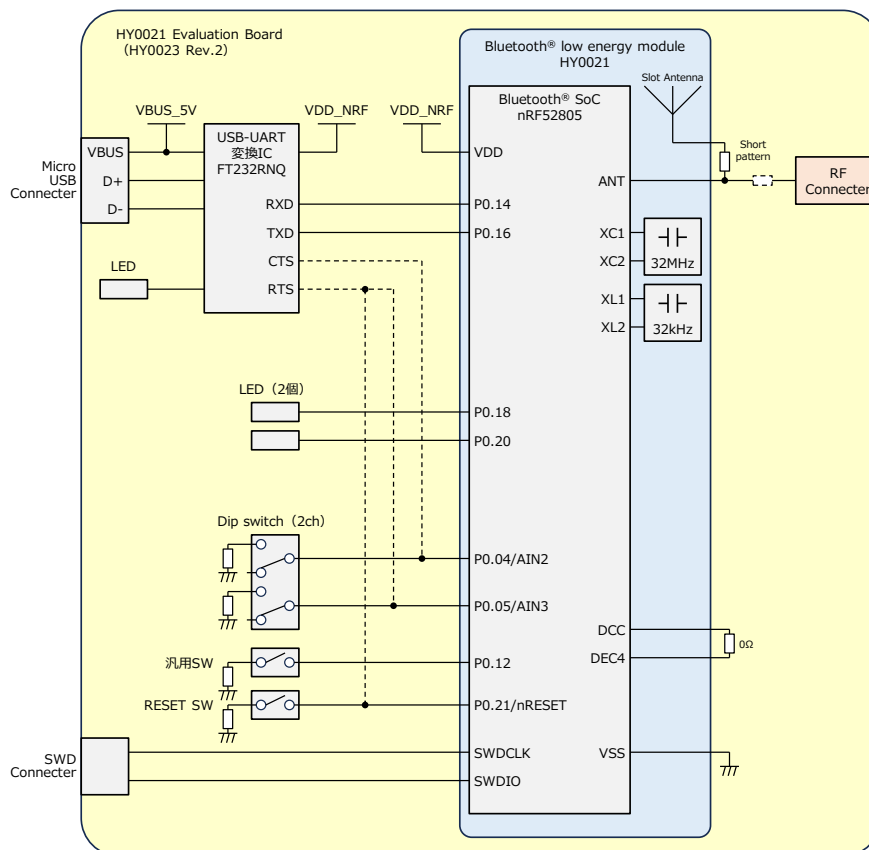(3)   Supply VBUS:5V to this board via USB and then supply VBUS:5V to the debugger via USB.

4.5   Flash the firmware

Please use the software "nRF Connect for Desktop" provided by Nordic Semiconductor ASA for flashing the firmware.
   (Reference) https://www.nordicsemi.com/Products/Development-tools/nrf-connect-for-desktop

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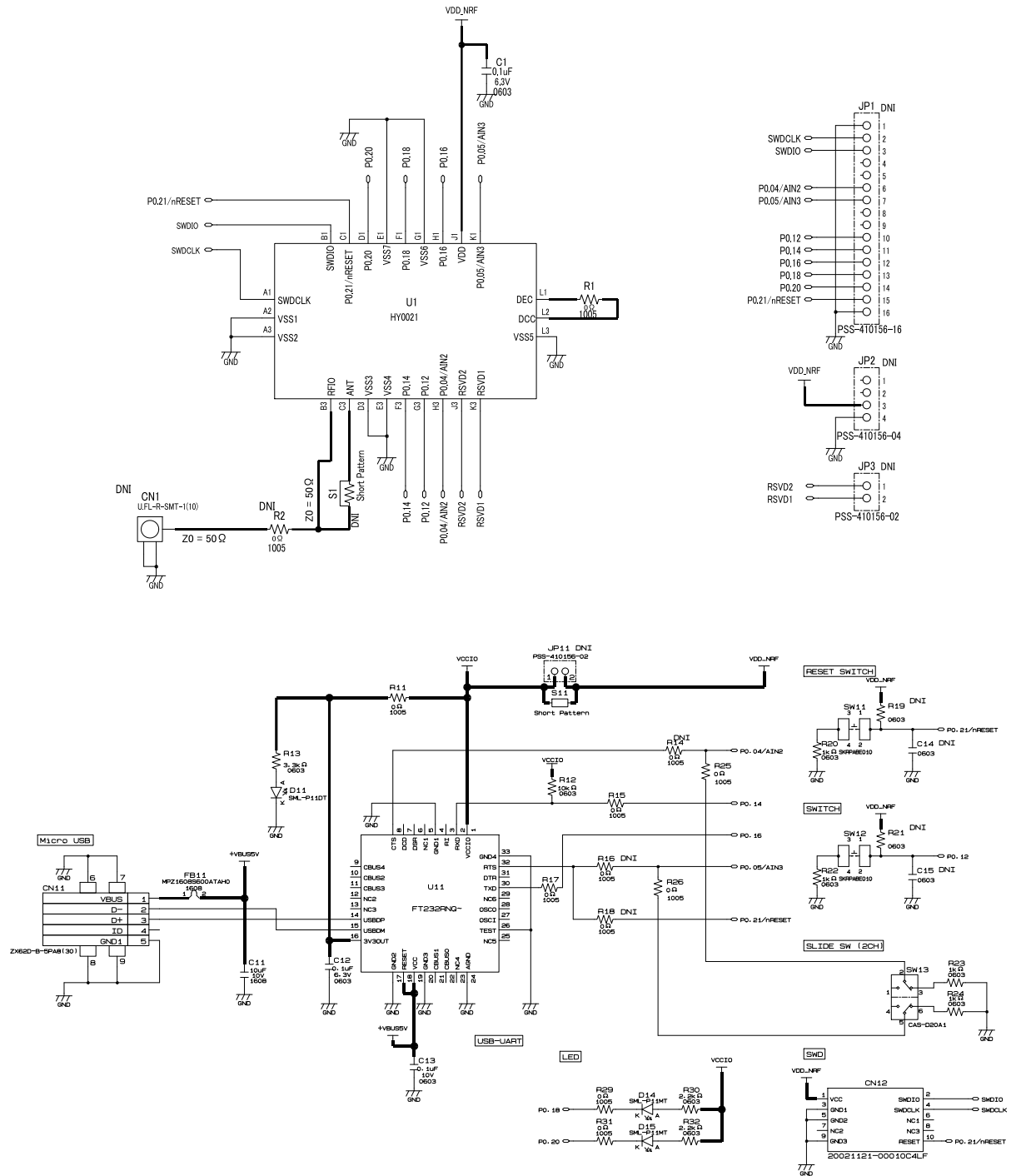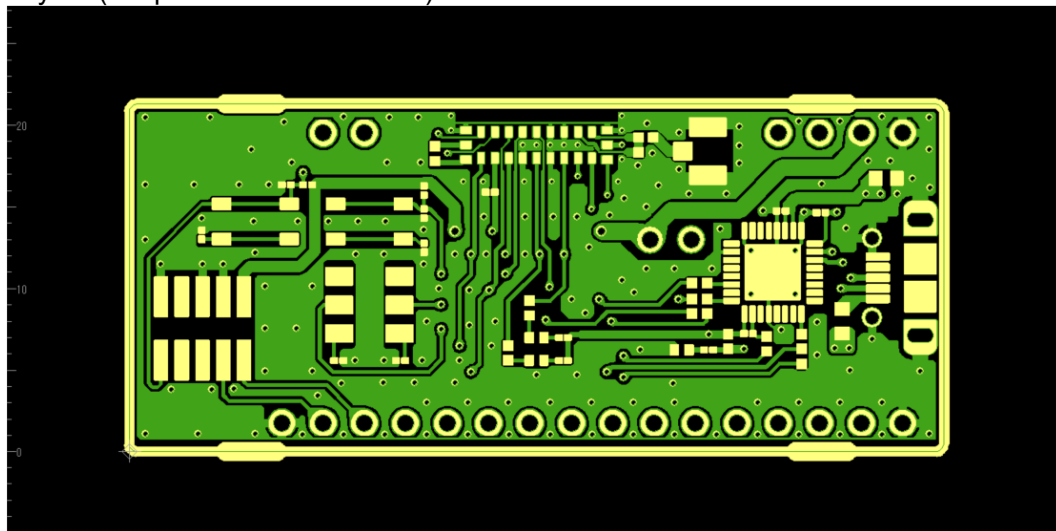
5 Board design

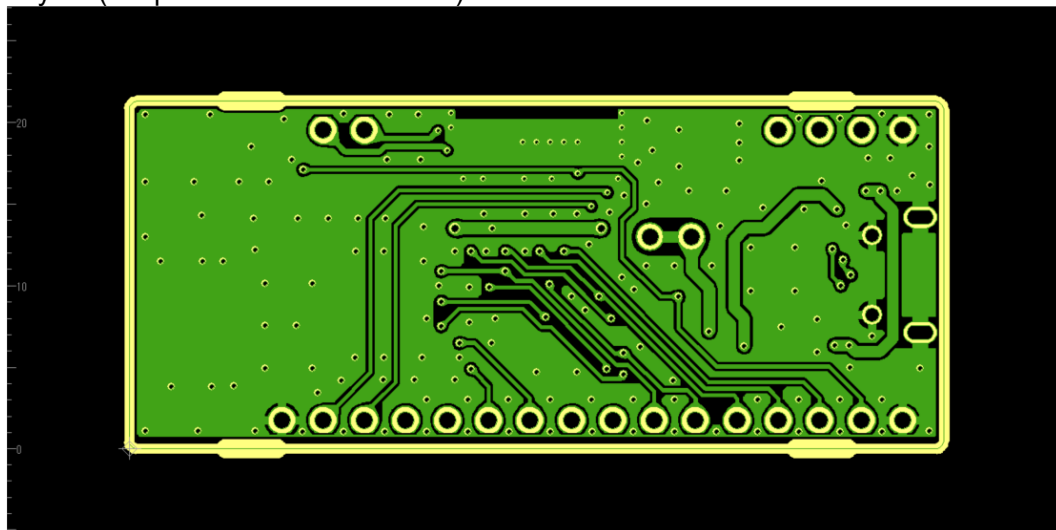## 5.1 System structure

5.2 Schematic
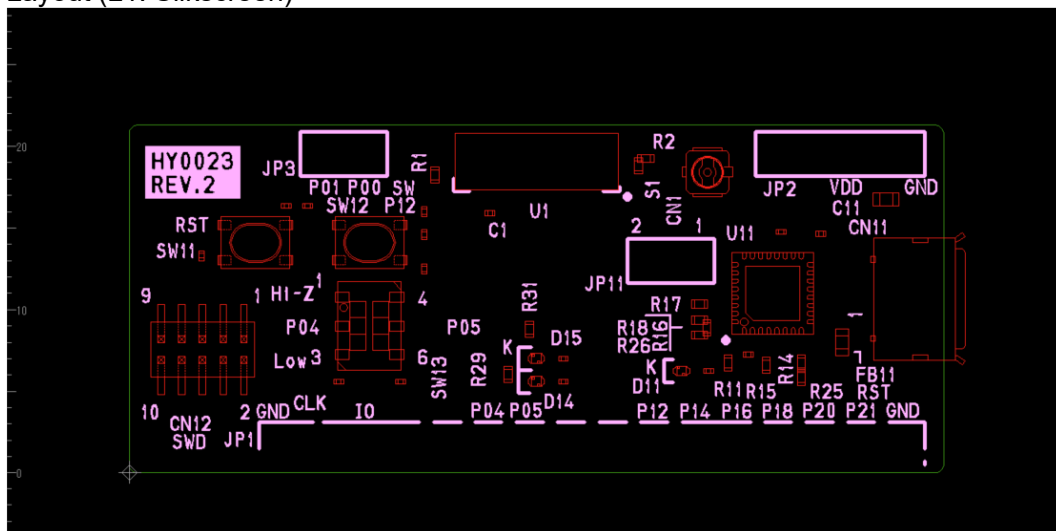
5.3 PCB layout

Layout (L1: pattern + solder resist)

Layout (L2: pattern and solder resist)

Layout (L1: Silkscreen)

5.4   Bill of materials

Part type	Part number	Manufacturer	Q'ty	Designation
CONNECTOR	ZX62D-B-5PA8(30)	HIROSE ELECTRIC	1	CN11
CONNECTOR	20021121-00010C4LF	AMPHENOL JAPAN	1	CN12
DIGITAL_IC	FT232RNQ	FUTURE TECHNOLOGY DEVICES INTERNATIONAL	1	U11
LED	SML-P11DTT86R	ROHM	1	D11
LED	SML-P11MTT86R	ROHM	2	D14,D15
FILTER	MPZ1608S600ATAH0	TDK	1	FB11
SWITCH	SKRPABE010	ALPS ELECTRIC	2	SW11,SW12
SWITCH	CAS-D20TA1	NIDEC COMPONENTS	1	SW13
RESISTOR	RK73Z1ETTP	KOA	8	R1,R11,R15,R17,R29,R31,R25,R26
RESISTOR	RK73B1HTTCM103J	KOA	1	R12
RESISTOR	RK73B1HTTB332J	KOA	1	R13
RESISTOR	RK73B1HTTB102J	KOA	4	R20,R22,R23,R24
RESISTOR	RK73B1HTTCM222J	KOA	2	R30,R32
CAPACITOR	GRM033R61A104K_D	MURATA	3	C1,C12,C13
CAPACITOR	GRM188R61A106ME69D	MURATA	1	C11
MODULE	HY0021	FDK	1	U1
	DNI		2	C14,C15
	DNI		1	CN1
	DNI		4	JP1,JP2,JP3,JP11
	DNI		2	R19,R21
	DNI		4	R2,R14,R16,R18
	DNI (Short Pattern)		2	S1,S11

6   Precautions

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