X-NUCLEO-IDB05A1

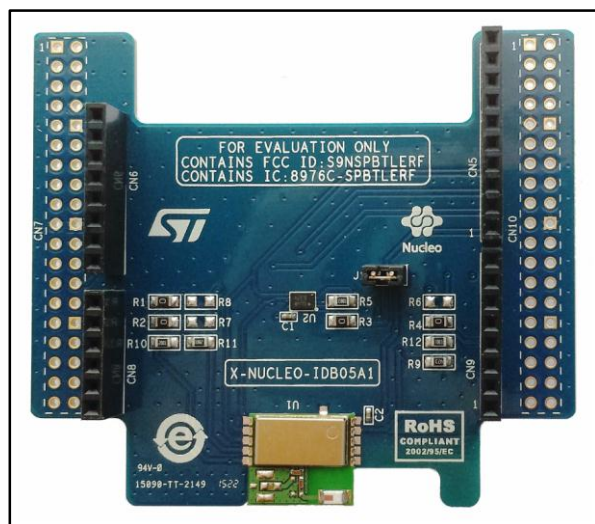## Bluetooth Low Energy expansion board based on the SPBTLE-RF module for STM32 Nucleo

Description

The X-NUCLEO-IDB05A1 is a Bluetooth Low Energy evaluation board based on the SPBTLE-RF BlueNRG-MS RF module to allow expansion of the STM32 Nucleo boards. The SPBTLE-RF module is FCC (FCC ID: S9NSPBTLERF) and IC certified (IC: 8976C-SPBTLERF).

The X-NUCLEO-IDB05A1 is compatible with the ST Morpho and Arduino UNO R3 connector layout (the user can mount the ST Morpho connectors, if required). The X-NUCLEO-IDB05A1 interfaces with the STM32 microcontroller via the SPI pin, and the user can change the default SPI clock, the SPI chip select and SPI IRQ by changing one resistor on the evaluation board.

Features

- STM32 expansion board based on the SPBTLE-RF module for STM32 Nucleo
- X-NUCLEO-IDB05A1 contains FCC and IC certified module SPBTLE-RF (FCC ID: S9NSPBTLERF and IC: 8976C-SPBTLERF)
- SPBTLE-RF:
    - Bluetooth Low Energy FCC and IC certified module based on Bluetooth® SMART 4.1 network processor BlueNRG-MS
    - Integrated Balun (BALF-NRG-01D3)
    - Chip antenna
- Compatible with STM32 Nucleo boards
- Equipped with Arduino UNO R3 connector
- Scalable solution, capable of cascading multiple boards for larger systems
- Free comprehensive development firmware library and example for BlueNRG-MS, compatible with STM32Cube firmware
- RoHS compliant

1 Formal notices required by the U.S. Federal Communications Commission ("FCC")

Any changes or modifications to this equipment not expressly approved by STMicroelectronics may cause harmful interference and void the user's authorization to operate this equipment.

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 any interference that may cause undesired operation.

This device uses, generates and radiates radio frequency energy. The radio frequency energy produced by this device is well below the maximum exposure allowed by the Federal Communications Commission (FCC).

The X-NUCLEO-IDB05A1 contains FCC certified module SPBTLE-RF (FCC ID: S9NSPBTLERF).

2 Formal notices required by the Industry Canada ("IC")

English:

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.

French:

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. 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.

The X-NUCLEO-IDB05A1 contains IC certified module SPBTLE-RF (IC: 8976C-SPBTLERF).

3   Hardware schematic diagrams
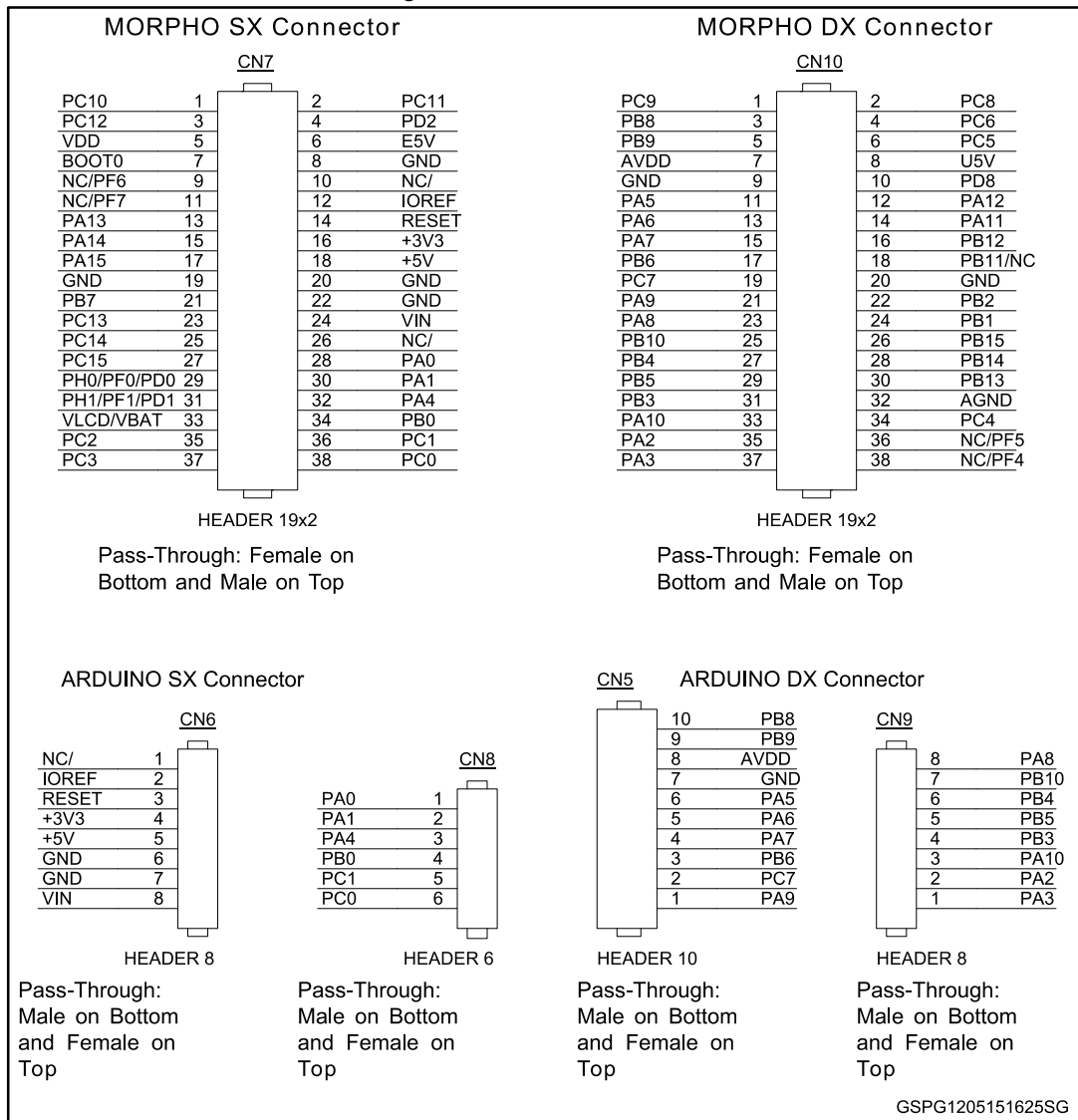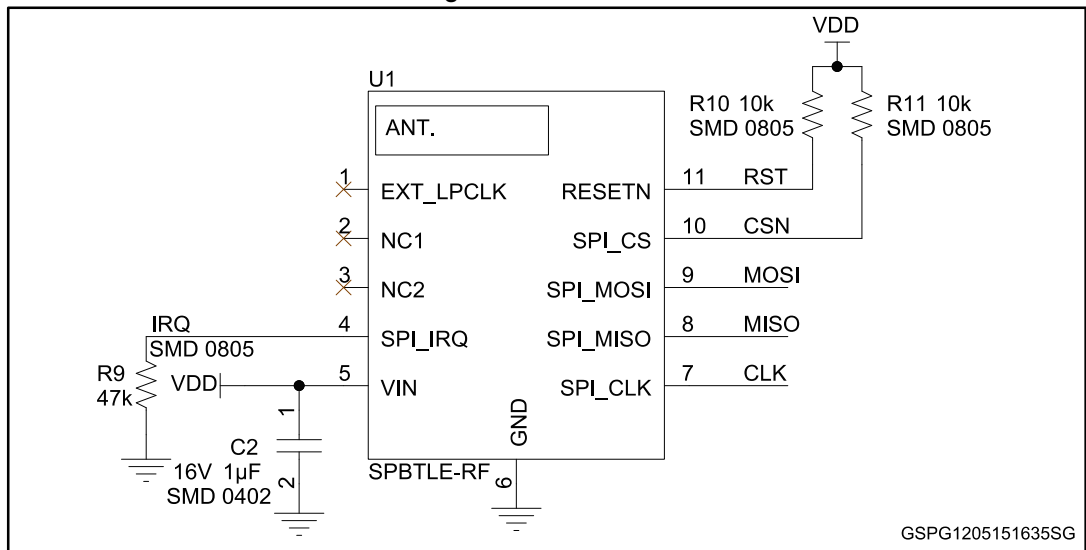
Figure 1: Nucleo connectors

MORPHO SX Connector

CN7

PC10	1	2	PC11
PC12	3	4	PD2
VDD	5	6	E5V
BOOT0	7	8	GND
NC/PF6	9	10	NC/
NC/PF7	11	12	IOREF
PA13	13	14	RESET
PA14	15	16	+3V3
PA15	17	18	+5V
GND	19	20	GND
PB7	21	22	GND
PC13	23	24	VIN
PC14	25	26	NC/
PC15	27	28	PA0
PH0/PF0/PD0	29	30	PA1
PH1/PF1/PD1	31	32	PA4
VLCD/VBAT	33	34	PB0
PC2	35	36	PC1
PC3	37	38	PC0

HEADER 19x2

Pass-Through: Female on
Bottom and Male on Top

MORPHO DX Connector

CN10

PC9	1	2	PC8
PB8	3	4	PC6
PB9	5	6	PC5
AVDD	7	8	U5V
GND	9	10	PD8
PA5	11	12	PA12
PA6	13	14	PA11
PA7	15	16	PB12
PB6	17	18	PB11/NC
PC7	19	20	GND
PA9	21	22	PB2
PA8	23	24	PB1
PB10	25	26	PB15
PB4	27	28	PB14
PB5	29	30	PB13
PB3	31	32	AGND
PA10	33	34	PC4
PA2	35	36	NC/PF5
PA3	37	38	NC/PF4

HEADER 19x2

Pass-Through: Female on
Bottom and Male on Top

ARDUINO SX Connector

CN6

NC/	1
IOREF	2
RESET	3
+3V3	4
+5V	5
GND	6
GND	7
VIN	8

HEADER 8

Pass-Through:
Male on Bottom
and Female on
Top

CN8

PA0	1
PA1	2
PA4	3
PB0	4
PC1	5
PC0	6

HEADER 6

Pass-Through:
Male on Bottom
and Female on
Top

CN5   ARDUINO DX Connector

10	PB8
9	PB9
8	AVDD
7	GND
6	PA5
5	PA6
4	PA7
3	PB6
2	PC7
1	PA9

HEADER 10

Pass-Through:
Male on Bottom
and Female on
Top

CN9

8	PA8
7	PB10
6	PB4
5	PB5
4	PB3
3	PA10
2	PA2
1	PA3

HEADER 8

Pass-Through:
Male on Bottom
and Female on
Top

GSPG1205151625SG

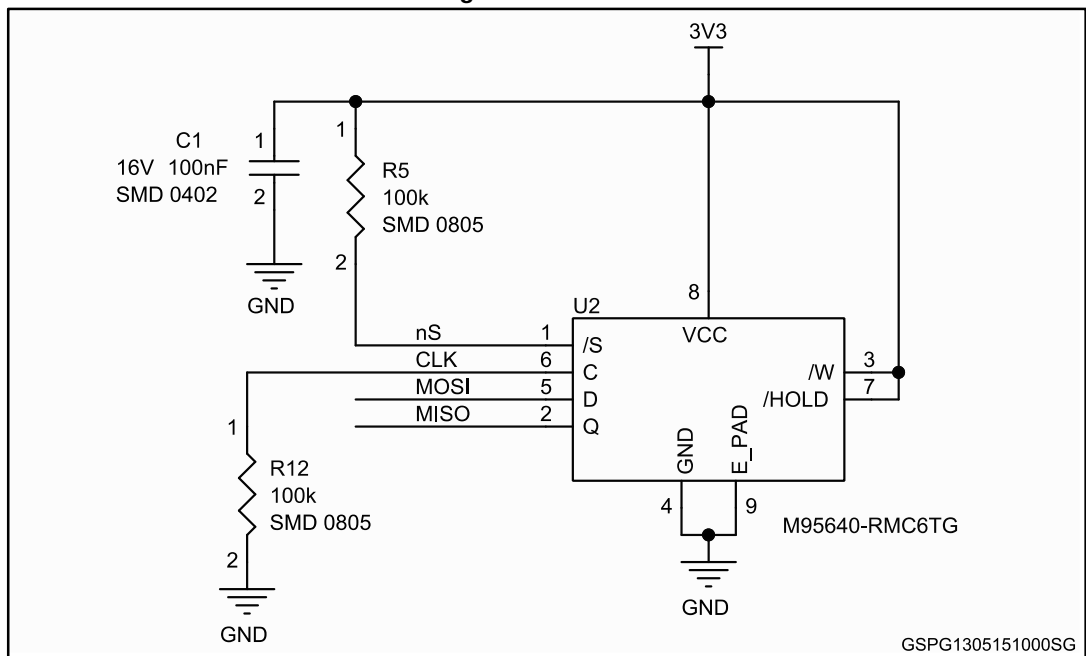**Figure 2: SPBTLE-RF**

Figure 2: SPBTLE-RF

Figure 3: Nucleo connections

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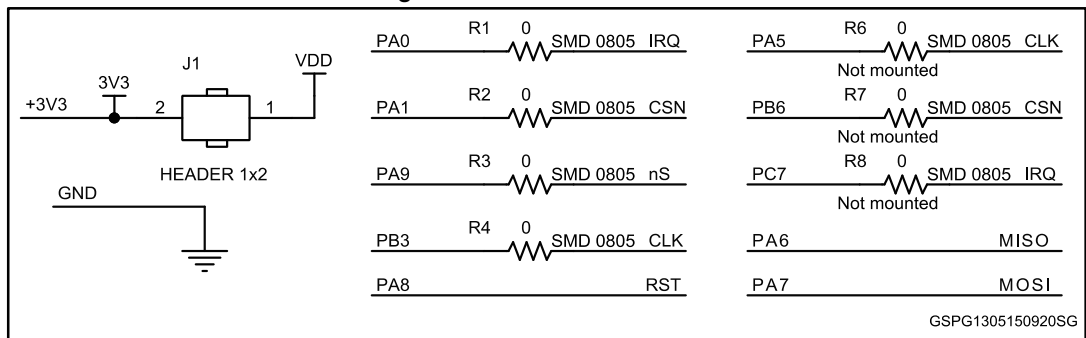
Figure 4: EEPROM

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4 Revision history

Table 1: Document revision history

Date	Version	Changes
17-Jul-2015	1	Initial release.

IMPORTANT NOTICE – PLEASE READ CAREFULLY