Sub-1 GHz 868 MHz RF expansion board based on S2-LP radio for STM32 Nucleo

Features

- Based on S2-LP radio
- S2-LP narrow band ultra-low power sub-1 GHz transceiver tuned for 860 - 940 MHz frequency band
- Programmable RF output power up to +16 dBm
- Modulation schemes: 2-FSK, 2-GFSK, 4-FSK, 4-GFSK, OOK and ASK
- Air data rate from 0.1 to 500 kbps
- Ultra-low power consumption: 7 mA RX and 10 mA TX at +10 dBm
- IEEE 802.15.4g hardware packet support with whitening, FEC, CRC and dual SYNC word detection
- RX and TX 128 byte FIFO buffers
- Support to wireless M-Bus
- Excellent performance of receiver sensitivity (up to -130 dBm)
- Automatic acknowledgement, retransmission and timeout protocol engine
- Compatible with STM32 Nucleo boards
- Compatible with Arduino UNO R3 connectors
- BALF-SPI2-01D3 IPD balun for matching network and harmonics filter
- Sigfox compatible
- Sample firmware for P2P communication
- 6LoWPAN compatible thanks to STM32Cube
- RoHS and WEEE compliant

Product summary

<table>
<thead>
<tr>
<th>Sub-1 GHz RF expansion board based on S2-LP radio for STM32 Nucleo</th>
<th>X-NUCLEO-S2868A2</th>
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<tbody>
<tr>
<td>Ultra-low power, high performance, sub-1 GHz transceiver</td>
<td>S2-LP</td>
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<td>50 Ω nominal input/ conjugate match balun to S2-LP, 868-930 MHz with integrated harmonic filter</td>
<td>BALF- SPI2-01D3</td>
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<tr>
<td>Applications</td>
<td>ISM Radio</td>
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<td></td>
<td>SubGHz</td>
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<td>Sigfox</td>
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Description

The X-NUCLEO-S2868A2 expansion board is based on the S2-LP ultra-low power RF transceiver and operates in the 868 MHz ISM frequency band. The X-NUCLEO-S2868A2 interfaces with the STM32 Nucleo microcontroller via SPI connections and GPIO pins. You can change some of the GPIOs by mounting or removing the resistors.

The expansion board is compatible with ST morpho and Arduino UNO R3 connectors.
Figure 1. X-NUCLEO-S2868A2 circuit schematic

Figure 2. X-NUCLEO-S2868A2 circuit schematic - Arduino connectors

8 Pass-Through:
Male on Bottom
and Female on Top

6 Pass-Through:
Male on Bottom
and Female on Top
Figure 3. X-NUCLEO-S2868A2 circuit schematic - ST morpho connectors

ST morpho DX connector

Pass-Through: Female on Bottom and Male on Top

ST morpho SX connector

Pass-Through: Female on Bottom and Male on Top
## Revision history

<table>
<thead>
<tr>
<th>Date</th>
<th>Version</th>
<th>Changes</th>
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<tbody>
<tr>
<td>12-Dec-2019</td>
<td>1</td>
<td>Initial release.</td>
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**Table 1. Document revision history**