

## 868 MHz RF USB dongle based on the SPSGRF-868 transceiver module



### Features

- Based on [SPSGRF-868](#) module which features:
  - low data rate, low-power, sub-1GHz [SPIRIT1](#) transceiver
  - integrated balun ([BALF-SPI-01D3](#))
  - chip antenna
- On-board [STM32L151CBU6A](#) ultra low power ARM® Cortex®-M3 microcontroller
- Modulation schemes: 2-FSK, GFSK, MSK, GMSK, OOK and ASK
- Air data rate: from 1 to 500 kbps
- Fully compliant with the [SPIRIT1](#) development kit firmware and GUI
- Debug connector
- USB interface

### Description

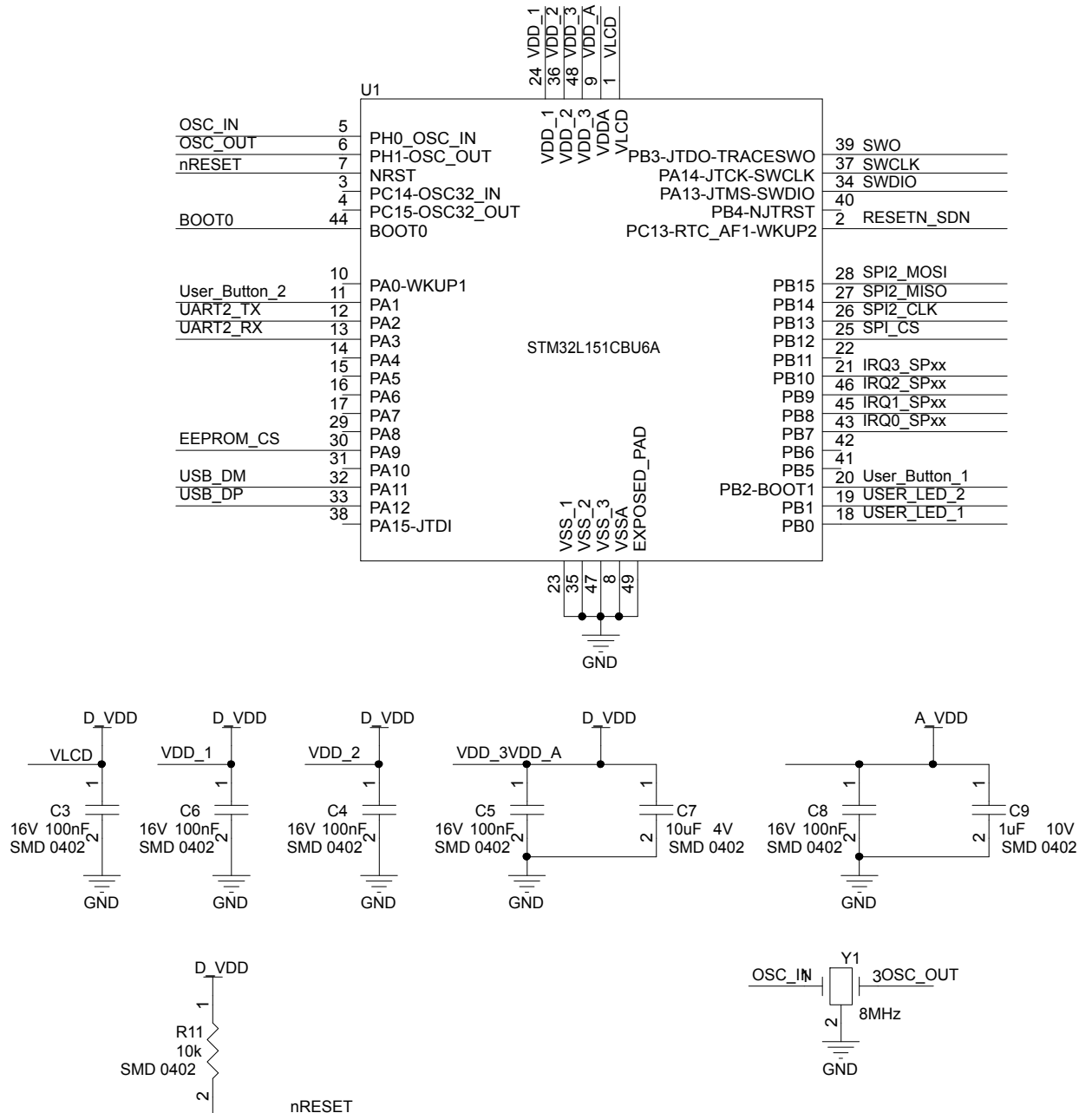
The [STEVAL-IDS001V4M](#) evaluation board is based on the [SPSGRF-868](#) CE certified RF module with the [SPIRIT1](#) low-power Sub 1GHz transceiver and embeds the [STM32L151CBU6A](#) ultra low-power ARM Cortex-M3 MCU.

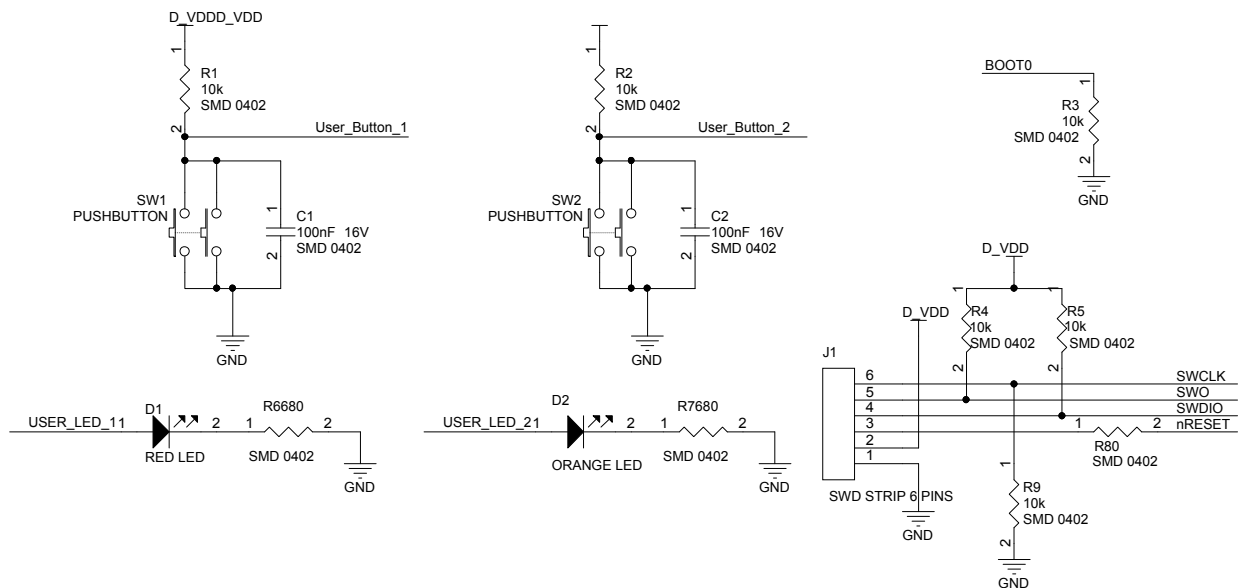
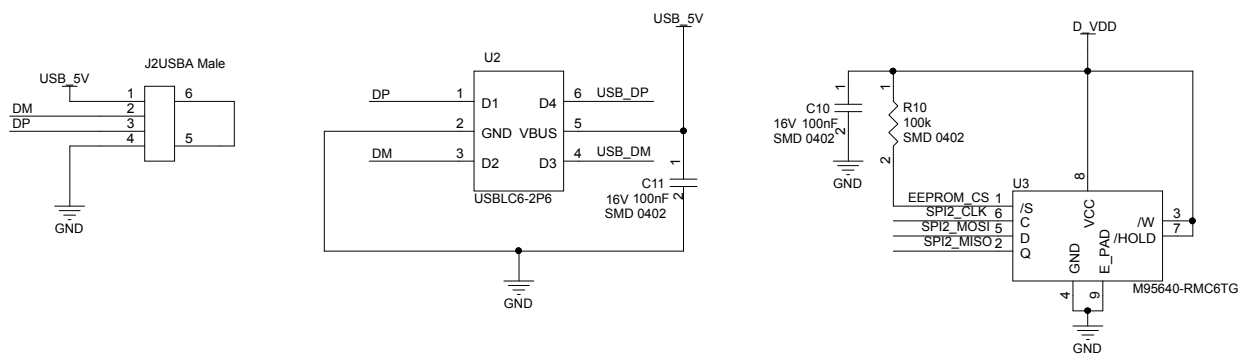
The [SPSGRF-868](#) module integrates the [BALF-SPI-01D3](#) match balun and a chip antenna, and operates in the 868 MHz ISM band.

The [STEVAL-IDS001V4M](#) evaluation board features a USB connector for PC-GUI interaction and firmware updates, and an SWD connector for specific firmware development.

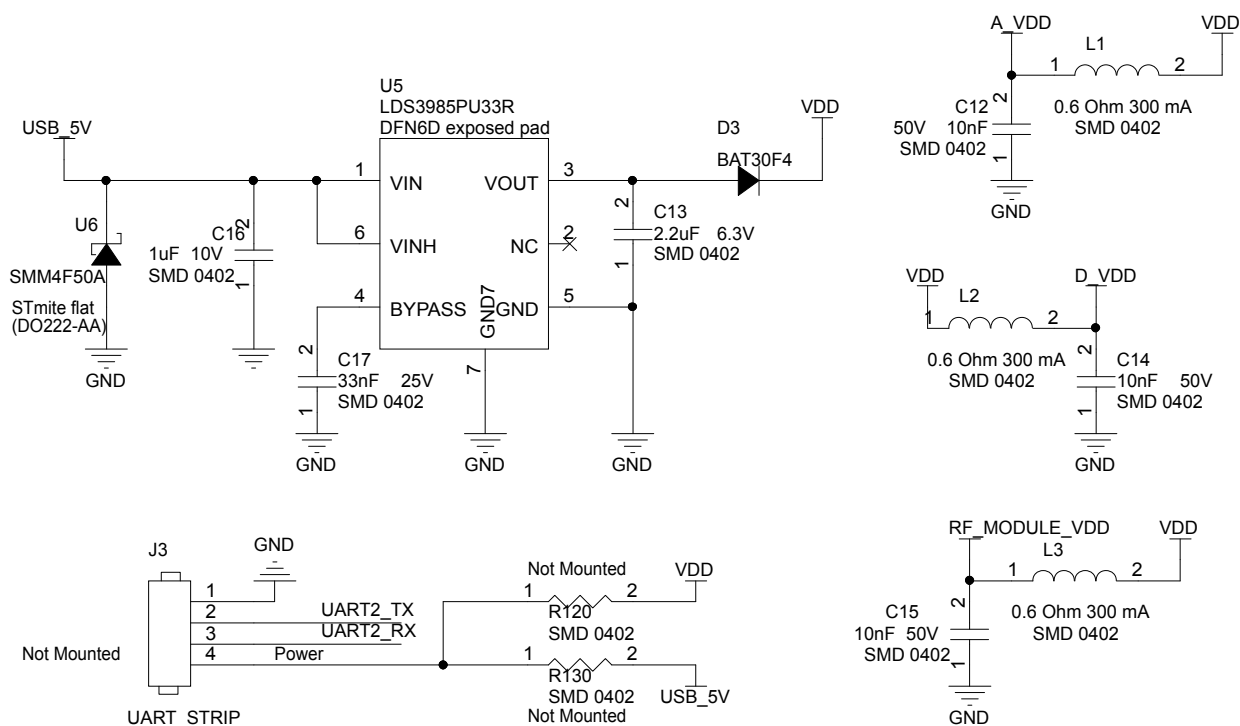
| Product summary                                                  |                                                                                                                                       |
|------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------|
| 868 MHz RF USB dongle based on the SPSGRF-868 transceiver module | <a href="#">STEVAL-IDS001V4M</a>                                                                                                      |
| Sub-GHz low power programmable RF transceiver module             | <a href="#">SPSGRF-868</a>                                                                                                            |
| Match balun with integrated harmonic filter                      | <a href="#">BALF-SPI-01D3</a>                                                                                                         |
| Low data rate, low power Sub 1GHz transceiver                    | <a href="#">SPIRIT1</a>                                                                                                               |
| Ultra-low-power ARM Cortex-M3 MCU                                | <a href="#">STM32L151CBU6A</a>                                                                                                        |
| Applications                                                     | <a href="#">Smart City</a><br><a href="#">Smart Home</a><br><a href="#">Industrial Tools</a><br><a href="#">Wireless connectivity</a> |

# 1 Schematic diagrams

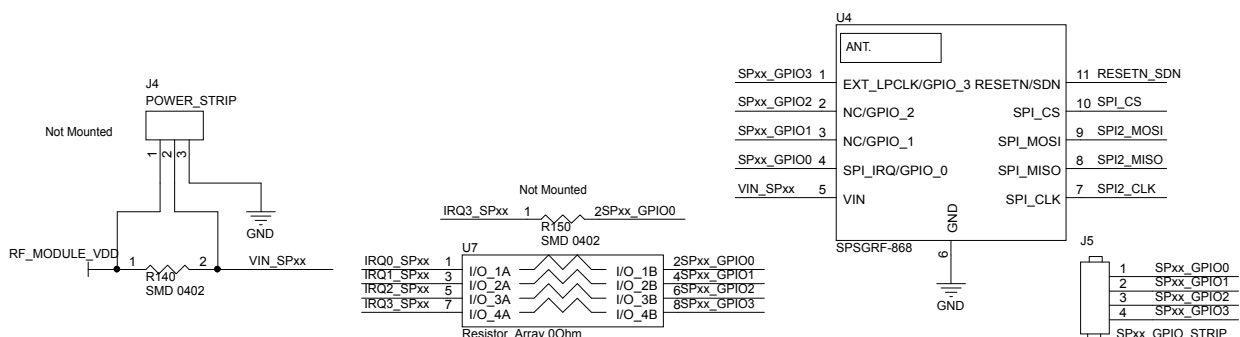
**Figure 1. STEVAL-IDS001V4M circuit schematic - MCU oscillator and voltage**


**Figure 2. STEVAL-IDS001V4M circuit schematic - SWD, boot, user LEDs and user buttons**

**Figure 3. STEVAL-IDS001V4M circuit schematic - USB and EEPROM**


**Figure 4. STEVAL-IDS001V4M circuit schematic - power management stage**



**Figure 5. STEVAL-IDS001V4M circuit schematic - RF module**



## Revision history

**Table 1. Document revision history**

| Date        | Version | Changes                                                                                           |
|-------------|---------|---------------------------------------------------------------------------------------------------|
| 02-Jul-2015 | 1       | Initial release.                                                                                  |
| 20-Apr-2020 | 2       | Updated all document to reflect new MCU (STM32L151CBU6A) and new signal Schottky diode (BAT30F4). |

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