

## NFC dynamic tag sensor and processing node evaluation board



### Features

- **NFCSENSOR.TAG.BOX**: optimized form factor and encapsulated in a plastic case for testing
- **ST25DV64KC-JF6D3** dynamic NFC/RFID tag IC with 64-Kbit EEPROM and fast transfer mode capability
- **STM32L4P5-CGU6** ultra-low-power Arm® Cortex®-M4 32-bit MCU+FPU, 150 DMIPS, up to 1-MB flash memory, 320-KB SRAM, LCD-TFT, external SMPS
- **LSM6DSO32X** iNEMO 6 DoF inertial module with 32 g accelerometer and embedded machine learning core
- **LIS2DUXS12** ultra-low-power 3-axis smart accelerometer with machine learning core and Qvar
- **H3LIS331DL** MEMS motion sensor: low-power high-g 3-axis digital accelerometer
- **LPS22DF** low-power and high-precision MEMS nano pressure sensor: 260-1260 hPa absolute digital output barometer
- **STTS22H** low-voltage, ultra-low-power, 0.5 °C accuracy I<sup>2</sup>C/SMBus 3.0 temperature sensor
- **VD6283TX** Ambient Light Sensor with Hybrid filter multispectral and with embedded light flicker engine
- **STLQ020** 200 mA ultra-low quiescent current LDO
- **STBC15** ultra-low current consumption linear battery charger (optional component, not populated)
- **STSAFE-A110** authentication, state-of-the-art security for peripherals and IoT devices
- **M41T62LC** low-power serial real-time clocks (RTCs) with alarm (optional component, not populated)
- CR2032 or LIR2032 battery powered (not included)
- STM32Cube function pack (**FP-SNS-SMARTAG2**)
- End-to-end proof of concept ecosystem mobile app and cloud dashboard:
  - **DSH-ASSETTRACKING** web cloud dashboard
  - **STAssetTracking** mobile app available on Google Play and App store
- Suitable for the following applications:
  - Internet of things
  - Supply chain and cold-chain management
  - Smart building, home, and city
  - Retail and apparel
  - Smart packaging
  - Medical and pharmaceutical
  - Batteryless sensing
  - Smart agriculture (soil control, animal tracking)
  - Asset tracking
  - Impact detection

### Product summary

| Product summary   |                                  |
|---|----------------------------------|
| NFC dynamic tag sensor and processing node evaluation board   | <a href="#">STEVAL-SMARTAG2</a>  |
| Dynamic NFC/RFID tag IC with 64-Kbit EEPROM, and fast transfer mode capability  | <a href="#">ST25DV64KC-JF6D3</a> |
| Ultra-low-power 3-axis smart accelerometer with machine learning core and Qvar  | <a href="#">LIS2DUXS12TR</a>     |
| Low-power and high-precision MEMS nano pressure sensor: 260-1260 hPa absolute digital output barometer  | <a href="#">LPS22DFTR</a>        |
| Ambient Light Sensor with Hybrid filter multispectral and with embedded light flicker engine  | <a href="#">VD6283TX45/1</a>     |
| Low power High-g 3-axis accelerometer, SPI/I <sup>2</sup> C digital output MEMS motion sensor, user-selectable full scales of ±100g/±200g/±400g | <a href="#">H3LIS331DLTR</a>     |
| iNEMO inertial module: always-on 3D accelerometer and 3D gyroscope  | <a href="#">LSM6DSO32XTR</a>     |

| Product summary   |                                   |
|---|-----------------------------------|
| Authentication, state-of-the-art security for peripherals and IoT devices | <a href="#">STSAFE-A110</a>       |
| Cloud Amazon-based web application for asset tracking                     | <a href="#">DSH-ASSETTRACKING</a> |
| ST Asset Tracking application for Android and iOS                         | <a href="#">STassetTracking</a>   |
| Applications  | IoT Applications                  |

## Description

The **STEVAL-SMARTAG2** is an NFC-enabled sensor node with inertial MEMS sensors and environmental sensors, an STM32 microcontroller, and a dynamic NFC tag for communication with NFC readers, such as tablets and smartphones.

Optionally, the **STEVAL-SMARTAG2** can be equipped with: a battery charger fed by a full-wave rectifier for NFC energy harvesting (on top of the energy harvester already embedded in the dynamic NFC tag) and a real-time clock (RTC) with an embedded crystal oscillator to enable an accurate timekeeping and time stamping.

The board has a small and thin form factor, comparable to the size of a credit card, which makes it particularly fit for deployment in the field and data collection.



Figure 2. STEVAL-SMARTAG2 circuit schematic (2 of 6)

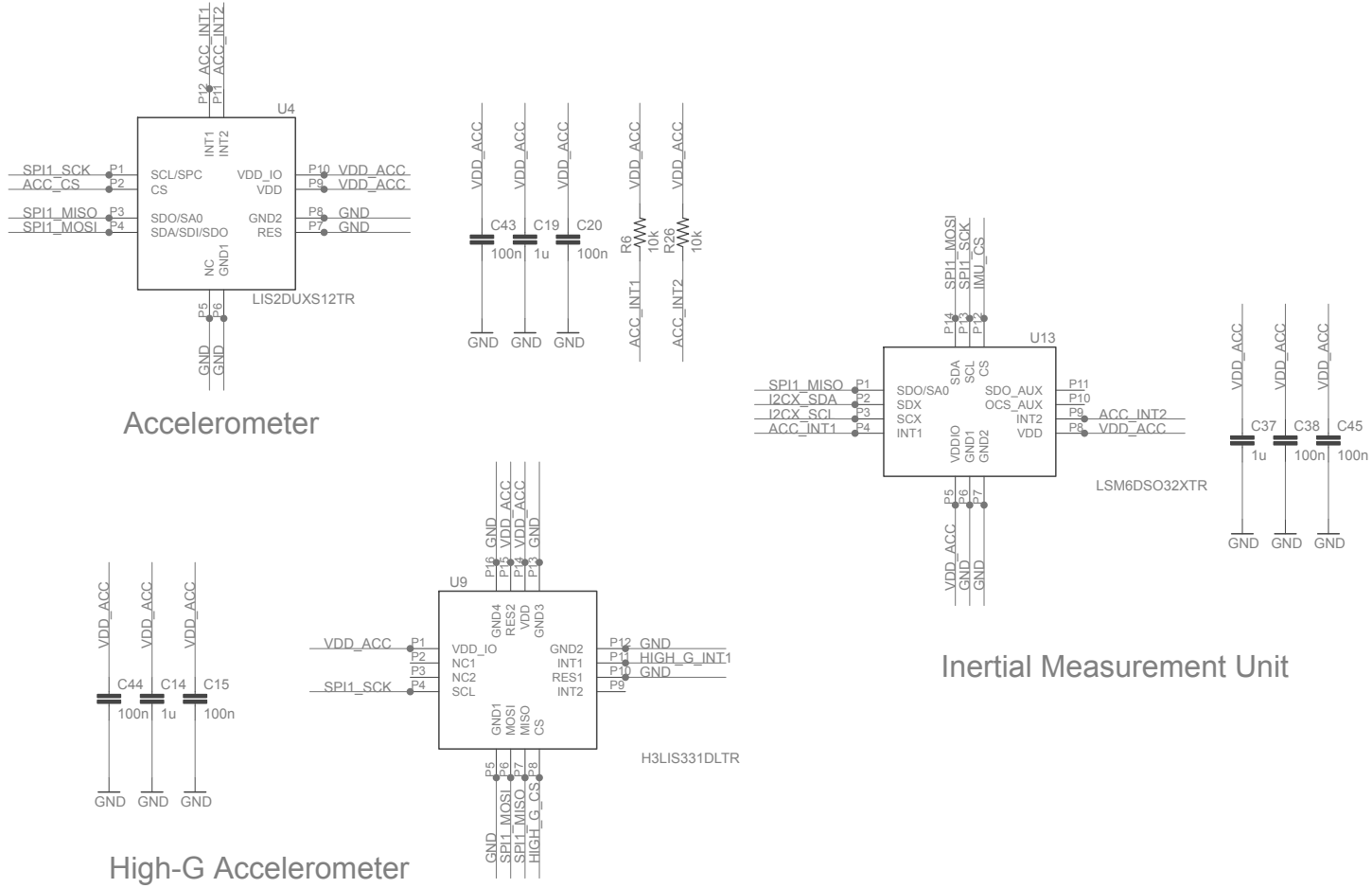


Figure 3. STEVAL-SMARTAG2 circuit schematic (3 of 6)

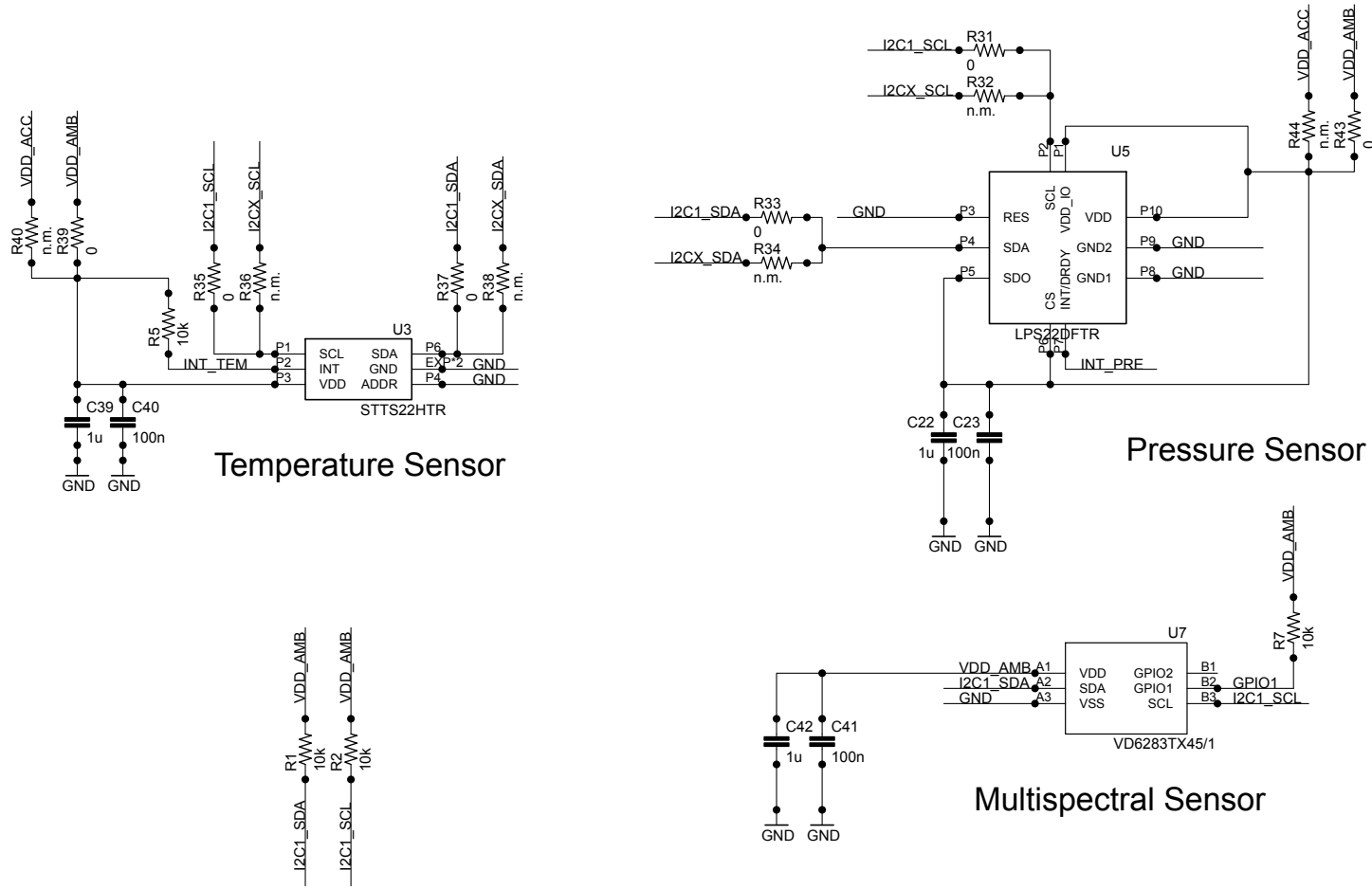
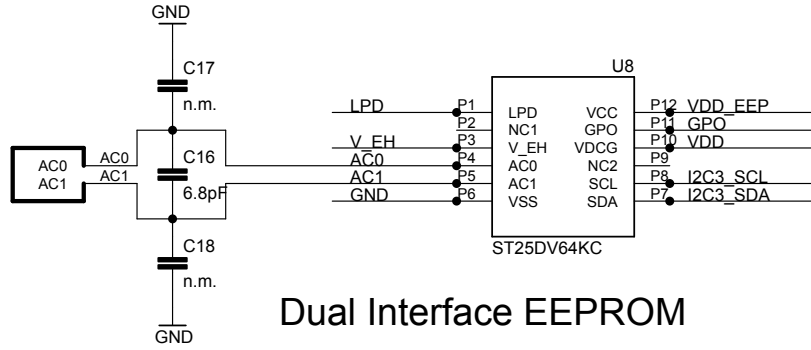
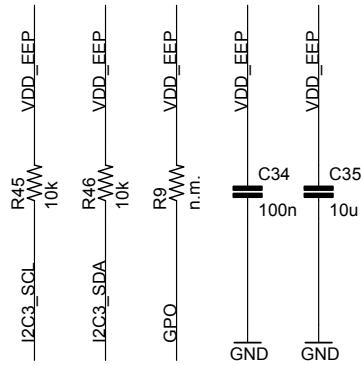


Figure 4. STEVAL-SMARTAG2 circuit schematic (4 of 6)



Dual Interface EEPROM



Push Buttons

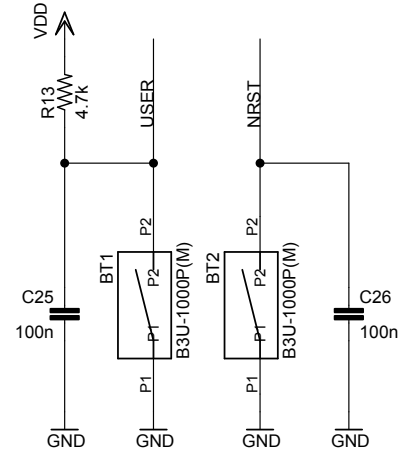
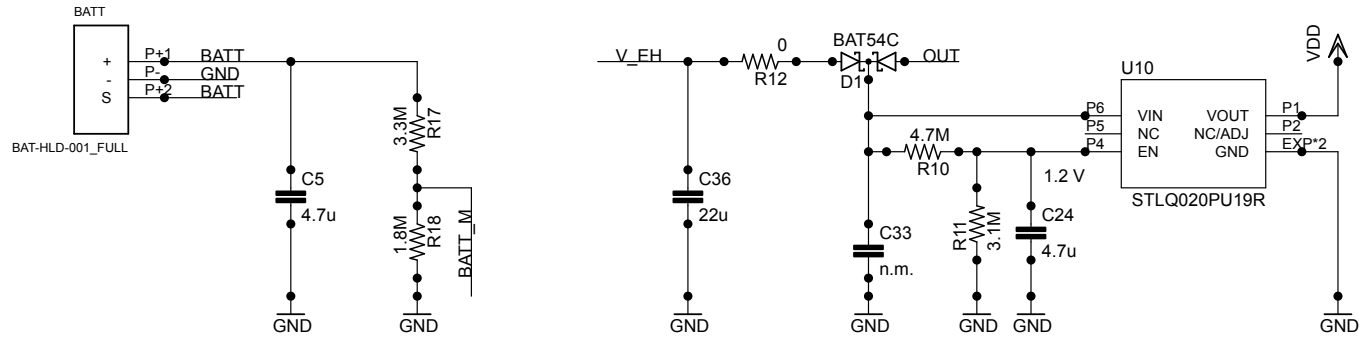


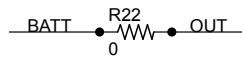
Figure 5. STEVAL-SMARTAG2 circuit schematic (5 of 6)



LIR2032 Battery

$$BATT\_M(v) = BATT * 0.353$$

Linear regulator (1.9 V)



PAD3  
X ● I2C2\_SCL

PAD4  
X ● I2C2\_SDA

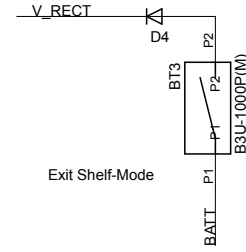
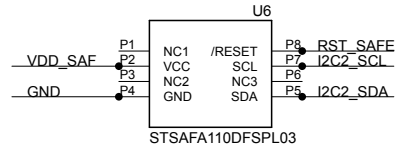
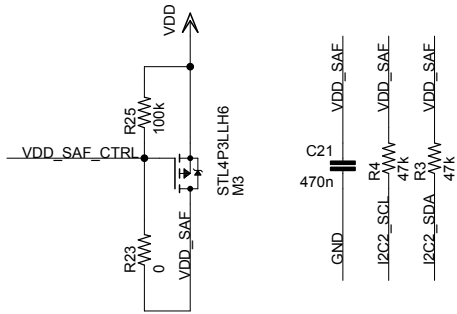
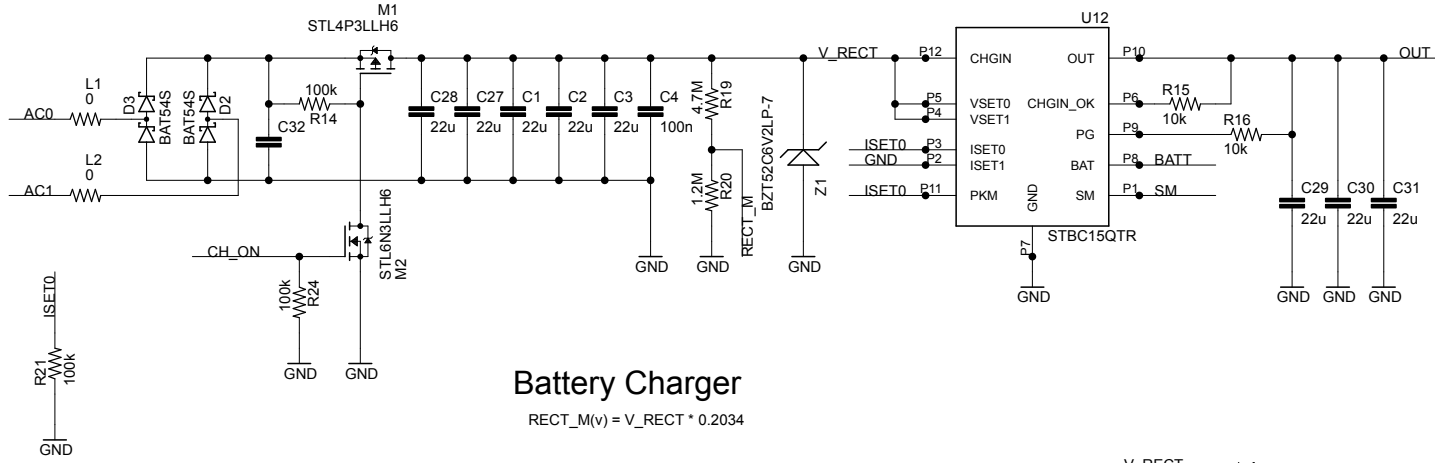
PAD5  
X ● VDD

PAD6  
X ● GND

PAD8  
X ● GND



Figure 6. STEVAL-SMARTAG2 circuit schematic (6 of 6)





## 2 Board versions

**Table 1. STEVAL-SMARTAG2 versions**

| PCB version                      | Schematic diagrams                   | Bill of materials                   |
|----------------------------------|--------------------------------------|-------------------------------------|
| STEVAL\$SMARTAG2A <sup>(1)</sup> | STEVAL\$SMARTAG2A schematic diagrams | STEVAL\$SMARTAG2A bill of materials |
| STEVAL\$SMARTAG2B <sup>(2)</sup> | STEVAL\$SMARTAG2B schematic diagrams | STEVAL\$SMARTAG2B bill of materials |

1. This code identifies the STEVAL-SMARTAG2 evaluation board first version. It is printed on the board PCB.
2. This code identifies the STEVAL-SMARTAG2 evaluation board second version. It is printed on the board PCB.

## Revision history

**Table 2. Document revision history**

| Date        | Revision | Changes  |
|-------------|----------|--|
| 11-Nov-2022 | 1        | Initial release.   |
| 06-Jun-2023 | 2        | Updated Features, Description, Version and Schematic diagrams. |

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