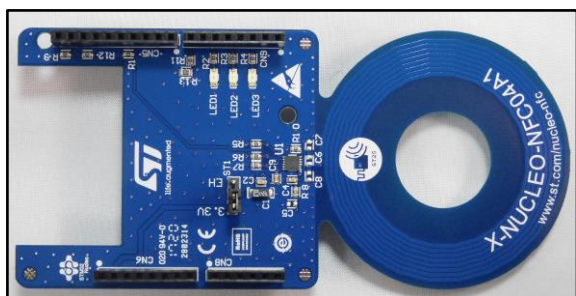# X-NUCLEO-NFC04A1

Dynamic NFC/RFID tag IC expansion board based on ST25DV04K for STM32 Nucleo

Data brief

Features

- Expansion board based on the ST25DV04K dynamic NFC/RFID tag for STM32 Nucleo
- Up to 4-Kbit memory with NDEF support
- 54 mm diameter, single layer circular antenna
- Compatible with STM32 Nucleo boards
- Equipped with Arduino™ UNO R3 connector
- Self-powered or powered through the Arduino™ UNO R3 connectors
- Three general purpose LEDs
- Scalable solution, capable of cascading multiple boards for larger systems
- Free comprehensive development firmware library and example for ST25DV04K, compatible with STM32Cube firmware
- FCC and IC verified
- RoHS compliant

Description

The X-NUCLEO-NFC04A1 dynamic NFC/RFID tag IC expansion board is based on the ST25DV04K NFC Type V/RFID tag IC with a dual interface 4 Kbits EEPROM that also features an I²C interface. It can be powered by the pin of Arduino connector or directly by the received carrier electromagnetic field.

The X-NUCLEO-NFC04A1 expansion board is compatible with the Arduino™ UNO R3 connector pin assignment and can easily be plugged onto any STM32 Nucleo board. Various expansion boards can also be stacked to evaluate different devices operating together with the dynamic NFC tag. The board also features an antenna with a 54 mm ISO 24.2 diameter, single layer, copper etched on PCB.

Detailed description

The X-NUCLEO-NFC04A1 is based on the ST25DV04K 4-Kbit Dynamic NFC/RFID tag NFC Forum type V with I²C interface, fast transfer mode and energy harvesting.

Figure 1: Functional block diagram
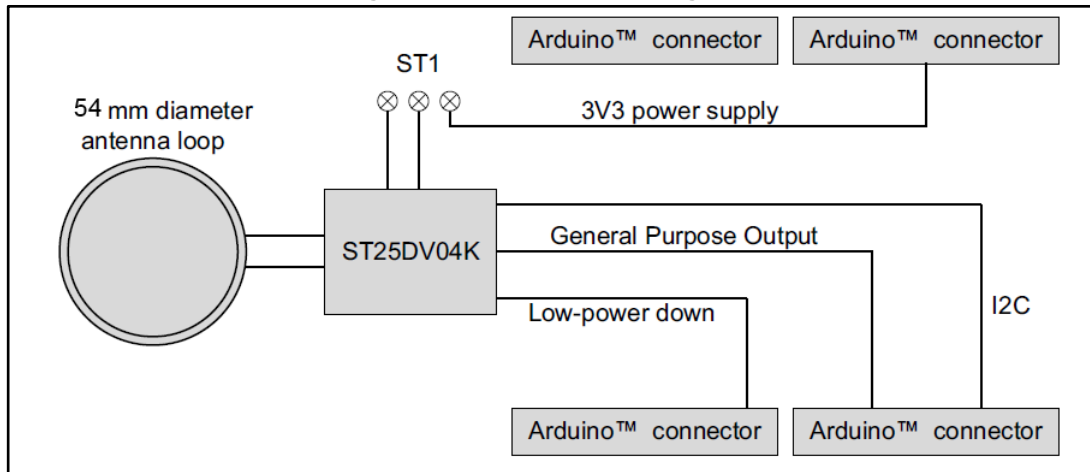
The ST25DV04K is an NFC Type V / RFID tag IC with a dual-interface 4-kBit electrically erasable programmable read-only memory (EEPROM) that also features an I²C interface. The EEPROM is organized in blocks of 512 bytes arranged in 4-byte pages in I²C mode and in 128 blocks of 4 bytes in RF mode. It can be powered either from an external power supply or directly by the received carrier electromagnetic field. The tag features an event-configurable interruption output and supports multi-interruption:

- Field Change
- RF Busy
- Mail Box filled
- E² Update
- RF user Interrupt
- RF User Set/Reset

The ST25DV04K also features an Energy Harvesting mode. When activated, the ST25DV04K delivers a voltage on the Vout analog pin. In case the RF field strength is insufficient or when Energy Harvesting mode is disabled, the Vout pin goes into high-Z state and Energy Harvesting mode is automatically stopped. The X-NUCLEO-NFC04A1 is compatible with the Arduino™ UNO R3 connector pin assignment, and interfaces with the STM32 microcontroller via the I²C pins.

1 Schematic diagrams

Figure 2: X-NUCLEO-NFC04A1 circuit schematic
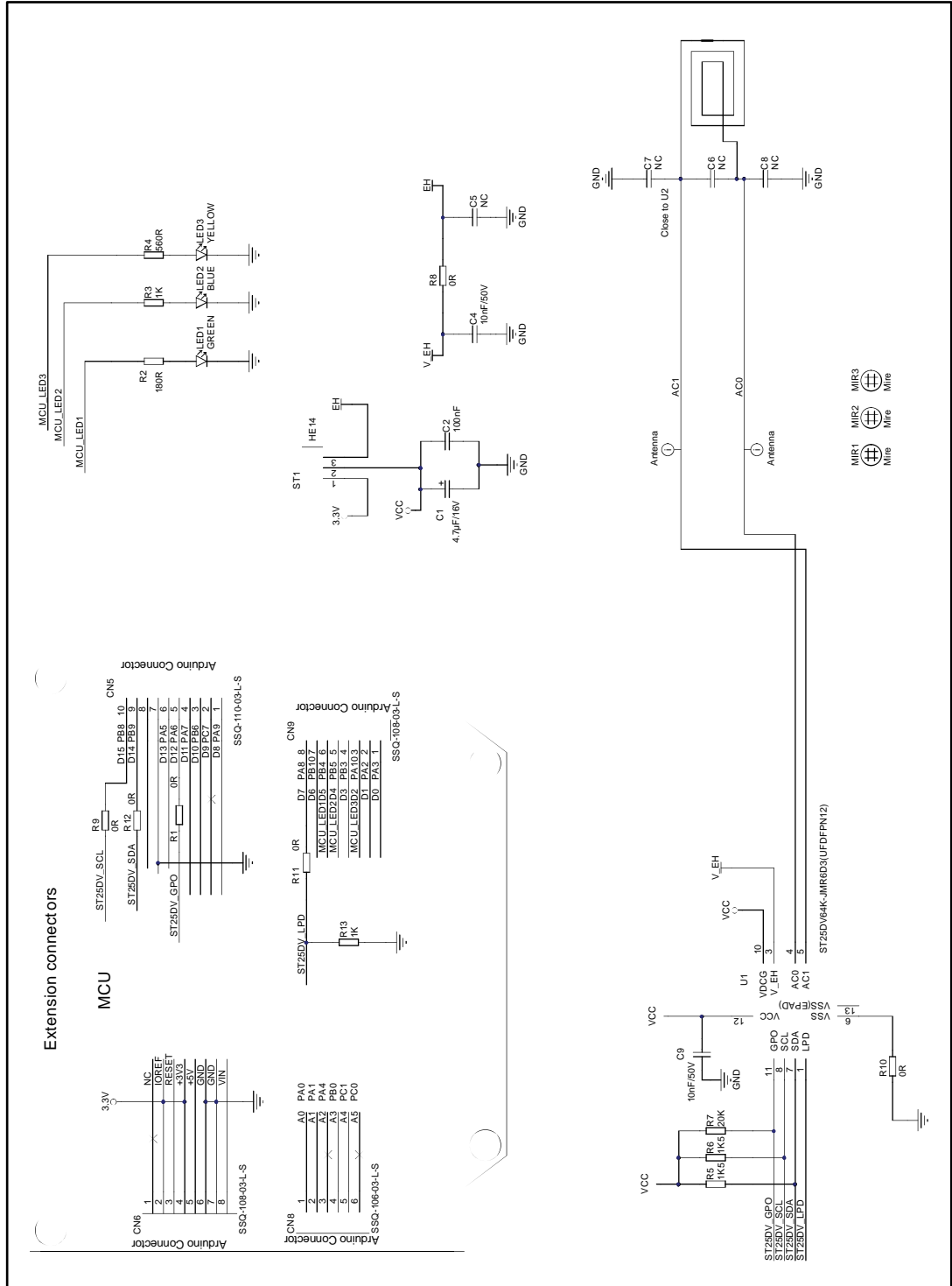
2 Federal Communications Commission (FCC) and Industry Canada (IC) compliance statements

2.1 FCC Compliance Statement

2.1.1 Part 15.19

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 interference that may cause undesired operation..

2.2 Part 15.105

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference's by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

2.2.1 Part 15.105

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

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

2.3.1 Compliance statement

This device complies with Industry Canada licence-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.

2.3.2 Declaration de conformité

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

3   Revision history

Table 1: Document revision history

Date	Version	Changes
22-Jun-2017	1	Initial release.

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