

## High performance NFC universal device and EMVCo reader



### Features

- Operating modes
  - Reader/writer
  - Card emulation
  - Active and passive peer to peer
- RF communication
  - NFC-A / ISO14443A up to 848 kbit/s
  - NFC-B / ISO14443B up to 848 kbit/s
  - NFC-F / Felica™ up to 424 kbit/s
  - NFC-V / ISO15693 up to 53 kb/s
  - NFC-A / ISO14443A and NFC-F / FeliCa™ card emulation
  - Active and passive peer to peer initiator and target modes, up to 424 kbit/s
  - Low level modes to implement MIFARE® classic compliant or other custom protocols
- Hardware features
  - Dynamic power output (DPO) controls the field strength to stay within given limits
  - Active wave shaping (AWS) reduces over-and under-shoots
  - Noise suppression receiver (NSR) allows reception in noisy environment
  - Automatic antenna tuning (AAT) via variable capacitor
  - Integrated EMVCo compliant EMD handling
  - Automatic gain control and squelch feature to maximize SNR
  - Low power capacitive and inductive card detection
  - Low power NFC active and passive target modes
  - Adjustable ASK modulation depth, from 5 to 40%
  - Integrated regulators to boost system PSRR
  - AM/PM and I/Q demodulator with baseband channel summation or automatic channel selection
  - Possibility to drive two independent single ended antennas
  - Measurement of antenna voltage amplitude and phase, driver current, RSSI, on-chip supply and regulated voltages
  - Up to 1.6 W differential output power
- External communication interfaces
  - 512 byte FIFO
  - Serial peripheral interface (SPI) up to 10 Mbit/s
  - I2C with up to 400 kbit/s in Fast-mode, 1 Mbit/s in Fast-mode Plus, and 3.4 Mbit/s in High-speed mode
- Electrical characteristics
  - Wide supply voltage range, from 2.4 to 5.5 V
  - Wide peripheral communication supply range, from 1.65 to 5.5 V
  - Wide temperature range, from -40 to +125 °C
  - Quartz oscillator capable of operating with 27.12 MHz crystal with fast start-up

Product status link

[ST25R3916](#)

## Application

The ST25R3916 is suitable for a wide range of NFC and HF RFID applications, among them

- NFC Forum compliant NFC Universal Device
- EMVCo compliant contactless payment terminal
- ISO14443 and ISO15693 compliant general purpose NFC device
- FeliCa™ reader/writer
- Supports all five NFC Forum Tag types in reader mode
- Supports all common proprietary protocols, such as Kovio, CTS, B'

## Description

The **ST25R3916** is a high performance NFC universal device supporting NFC initiator, NFC target, NFC reader, and NFC card emulation modes.

The **ST25R3916** includes an advanced analog front end (AFE) and a highly integrated data framing system for:

- ISO 18092 passive and active initiator, ISO18092 passive and active target
- NFC-A/B (ISO 14443A/B) reader including higher bit rates
- NFC-F (Felica™) reader
- NFC-V (ISO 15693) reader up to 53 kbps
- NFC-A and NFC-F card emulation

Special stream and transparent modes of the AFE and framing system can be used to implement other custom protocols such as MIFARE® classic in reader or card emulation mode.

The **ST25R3916** features a high RF output power to directly drive antennas at high efficiency.

The **ST25R3916** also includes several features, which make it incomparable for low power applications. It contains a low power capacitive sensor to detect the presence of a card without switching on the reader field. Additionally, the presence of a card can still be detected by performing a measurement of the amplitude or phase of the antenna signal. It also contains a low power RC oscillator and wake-up timer to automatically wake-up the ST25R3916 after a selected time period and check for a presence of a tag using one or more techniques of low power detection of card presence (capacitive, phase or amplitude).

The **ST25R3916** is designed to operate from a wide power supply range (from 2.4 to 5.5 V), and a wide peripheral IO voltage range (from 1.65 to 5.5 V).

Due to this combination of high RF output power, low power modes, and wide supply range the **ST25R3916** is perfectly suited for infrastructure NFC applications.

## Revision history

**Table 1. Document revision history**

Date	Version	Changes
09-Nov-2018	1	Initial release.

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