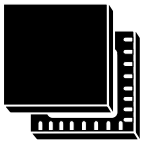
ST25R300

Data brief

NFC reader for payment, consumer, and industrial applications



UQFPN32

(5 x 5 mm)

Product status
Prerelease

Features

Operating modes

- Reader/writer
- Card emulation

RF communication - Reader/writer

- EMVCo® 3.1 analog- and digital-compliant
- NFC-A/ISO14443A up to 848 kbit/s
- NFC-B/ISO14443B up to 848 kbit/s
- NFC-V/ISO15693 up to 212 kbit/s
- NFC-F/FeliCa™ up to 424 kbit/s
- Low-level modes to implement MIFARE Classic®-compliant or other custom protocols

RF communication - card emulation

- NFC-A/ISO14443A 106 kbit/s
- NFC-F/FeliCa™ 212-424 kbit/s
- Key characteristics:
  - Passive P2P mode
  - Acts as an NFC Forum universal reader
  - CCC digital key reader
  - USI WLC reader device
- Low-power inductive card detection
- I/Q demodulator with baseband channel summation
- Dynamic power output (DPO): Field strength is controlled to stay within given limits (software feature)
- Active wave shaping (AWS): Over and undershoots are reduced
- Noise suppression receiver (NSR): Reception is allowed in a noisy environment
- External communication interfaces
- Serial peripheral interface (SPI) up to 10 Mbit/s
- Possibility to drive one differential or two independent single-ended antennas

Electrical characteristics

- Wide supply voltage range: 2.7 to 6.0 V
- Wide peripheral communication supply range: 1.65 to 5.5 V
- Wide ambient temperature range: -40 to +105 °C
- Quartz oscillator capable of operating with 27.12 MHz crystal with fast startup

1 Description

The ST25R300 is a high-performance NFC universal device supporting NFC initiator, NFC target, NFC reader, and NFC card emulation modes. Designed to be compliant with EMVCo® 3.1a analog and digital standards, this device is optimized for the most demanding POS terminal applications. It enables fast EMVCo® certification cycles, even under harsh conditions, with the antenna behind noisy LCD displays.

The device includes an advanced analog front end (AFE) and a highly integrated data framing system for reader NFC-A/B (ISO14443A/B), including higher bit rates, NFC-F (FeliCa™), NFC-V (ISO15693) up to 212 kbps, and NFC-A/NFC-F card emulation. Special transparent modes of the AFE and framing system can be used to implement other custom protocols in reader or card emulation modes.

The device features high RF power with dynamic power output to directly drive antennas at high efficiency. It achieves large interaction distances even with small antenna sizes common in access control and EMVCo® readers. The device offers long-range and low-power card detection by performing a measurement of the I and Q channels, which represent the amplitude and phase of the antenna signal. This approach minimizes power consumption. It is designed to operate from a wide power supply range (from 2.7 to 6.0 V), an ambient temperature range from -40 to +105 °C, and a wide peripheral I/O 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 device is perfectly suited for all NFC applications.

Revision history

Table 1. **Document revision history**

Date	Revision	Changes
21-Nov-2024	1	Initial release.

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