NCI reader

WLCSP49
(2.559 × 2.581 mm)

Product status
ST25RN300

Features

NCI reader

- Enhanced active load modulation technology
- Enhanced Tx drive up to 2.2 W
- Support for external DC-DC up to 5.5 V
- Output power with optimized power transfer
- Optimized low-power consumption modes
- Selectable ultra-low-power hibernate state
- Battery voltage monitoring
- Proprietary in-frame synchronization (IFS) in card emulation (CE) to ensure stability in battery low and switched-off modes
- Improved XOR mode on all technologies
- OOFS with external reference clock in CE
- System clock
    - Fractional-N PLL input range from 19.2 MHz to 76.8 MHz
    - Support for multiple external crystal oscillators (27.12 and 54.24 MHz)
- 32.768 kHz, 16 MHz, and 32 MHz support for EMC tests
- Automatic wake-up via communication interfaces, GPIO, RF field or tag detection, and power supply detection
- 100% re-flashing capability for firmware update
  (The availability of the firmware update feature depends on licensing and commercial conditions. Contact your local ST representative for further information.)

RF communication

- Passive peer-to-peer
    - ISO/IEC 18092 - NFCIP-1 initiator and target
- Reader/writer mode
    - NFC Forum Type 1, 2, 3, 4, and 5 tags
    - FeliCa™
    - ISO/IEC 15693
    - MIFARE $^®$
      (MIFARE Classic$^®$ read/write mode feature is available only on specific parts and subject to license conditions. Contact your local ST representative for further information.)
- Card emulation mode
    - ISO/IEC 14443 Type A and B
    - FeliCa™
    - Intelligent card switching

Communication interfaces

- Compatible with the following I²C bus modes:
    - 1 MHz (Fast-mode Plus)
    - 400 kHz (Fast-mode)
    - 100 kHz (Standard-mode)

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For further information, contact your local STMicroelectronics sales office.

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- GPIOs
- Dedicated chip-enable pin

Electrical characteristics

- Battery voltage support from 2.4 V to 5.1 V
- I/O dedicated voltage level (VPS_IO): 1.2 V and 1.8 V compatibility
- Ambient operating temperature range: -40°C to +85°C

Package

- WLCSP49 (ECOPACK-compliant)

Applications

- NFC Forum-compliant NFC universal device
- Contactless Payment - EMVCo v3.2a-compliant
- Access control
- Transportation

1 General information

The ST25RN300 devices are based on Arm® cores.

Note: *Arm is a registered trademark of Arm Limited (or its subsidiaries) in the US and/or elsewhere.*

arm

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2 Description

The ST25RN300 is an NCI reader / NFC controller designed for integration into NFC-compliant products.

The device performs NFC functions in the three operating modes: card emulation, reader/writer, and peer-to-peer communication. It is based on an advanced Arm® Cortex®-M3 32-bit microcontroller. It is designed to increase RF communication distances, ease NFC technology integration, and operate in efficient low-power modes. It is best-in-class in terms of RF output power, working up to 2.2 W. Maximum power can be safely used to communicate thanks to dynamic power control: when a card is close, power is automatically reduced to ensure interoperability and standard compliance. To complement this outstanding output power, demodulation sensitivity is improved to maximize the communication distance with all types of cards.

The card emulation mode does not require any external oscillator or reference clock source. Thanks to active load modulation and automatic adjustments based on field strength, communication distance is maximized, and interoperability is ensured. The device can operate in very low-power modes due to improved field detection sensitivity and a stable, efficient low-power card detection mechanism. It can detect the presence of a reader, card, or tag beyond its rated communication distance

The ST25RN300 exchanges data with the application processor through the NCI 2.1 (2.2 compliant) logical interface on top of the I²C connection.

Revision history

Table 1. Document revision history

Date	Revision	Changes
08-Aug-2025	1	Initial release.
05-Sep-2025	2	Updated the following: • Features • Applications • Description
22-Sep-2025	3	Updated: • Features

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