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# ST25R95 product presentation

MMY division





# ST25R95

- The ST25R95 product is an integrated reader IC for contactless applications with several key features:
  - ST25R95 manages frame coding and decoding in Reader / Writer mode and in Card Emulation mode for standard applications such as near field communication (NFC), proximity and vicinity standards (RFID).
  - Multiprotocol support @13.56MHz
    - ISO/IEC 14443 Type A and B, ISO/IEC 15693, ISO/IEC 18092, MIFARE® Classic compatible
  - Communication interfaces with a Host Controller
    - Serial Peripheral Interface (SPI) Slave Interface 2MHz
    - Up to 528-Byte RAM buffer for Reader / Writer & 256-Byte RAM buffer for Card Emulation
  - Fast data transfer speed
    - Up to 424 kb/s (ISO14443-A , ISO14443-B & ISO18092), up to 52.6 kb/s (ISO15693)



# Main markets segments

## Smart industry



- Maintenance, factory automation

## Smart home



- Home gateway, gaming

## Smart city



- Lighting, access lock



# Key uses cases

## Acces control / data reading



- Activate/deactivate access
- Data programming

## Activation for wireless industrial network



- ID activation
- Parameter settings

## Device programming in production



- In-the-box programming
- Simple & flexible

## Servicing & maintenance



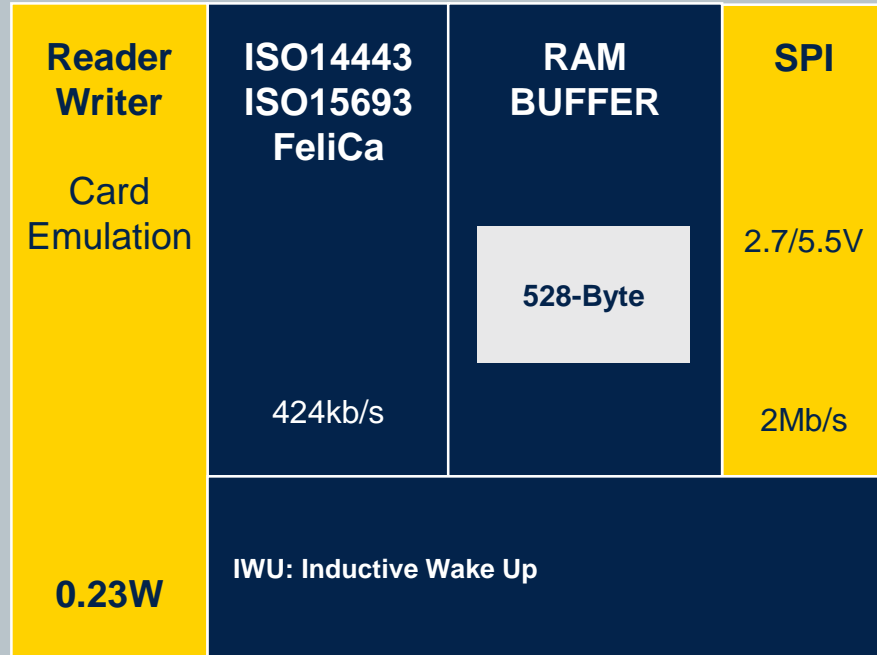
- Download record history with contactless
- Update parameters



# ST25R95

## entry level NFC reader solution

### ST25R95



QFN32

### Use cases

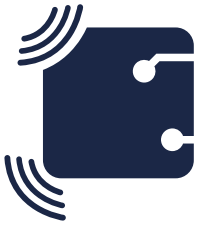
- Smart Locks, Card Readers
- Gaming and Toys
- Dynamic wireless pairing with hand-over

### Key Features

- **Reader-Writer (R/W)** and **Card Emulation (CE)**
- All NFC modes supported (ISO14443, ISO15693, FeliCa)
- Fast data transfer (up to **424kb/s**)

### Key Benefits

- Simple implementation
- Easy-to-use evaluation with development kits
- Reference designs, application notes
- Cost effective solution



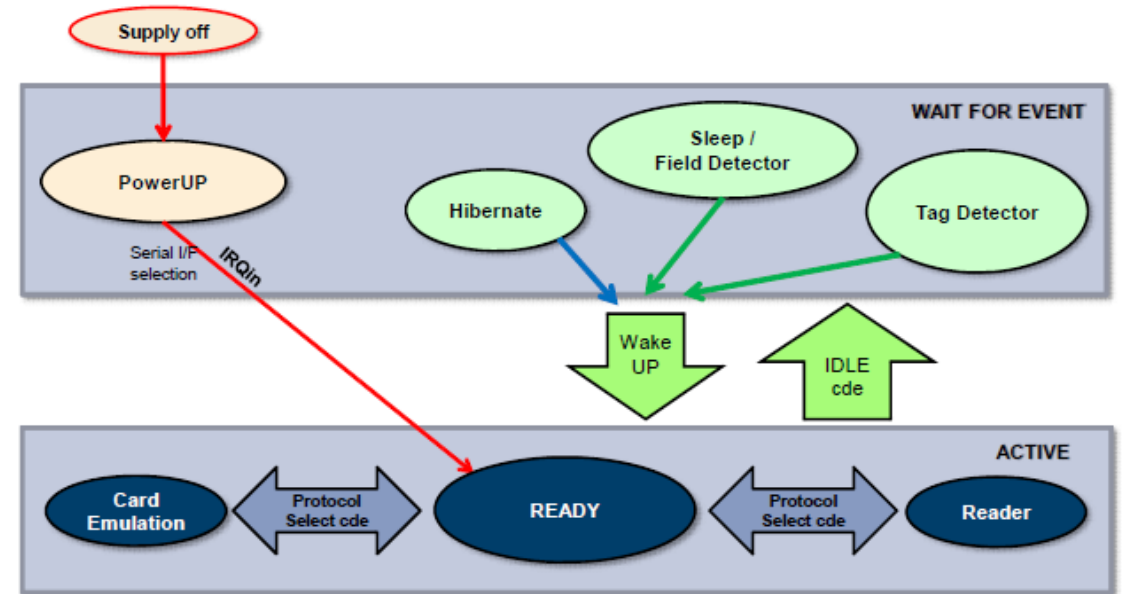
# ST25R95 HF reader

<b>ST25R95</b>	
<b>Description</b>	Entry-Level Reader
<b>Reader/Writer mode</b>	ISO14443A/B ISO15693 Felica
<b>Card emulation mode</b>	Yes
<b>P2P mode</b>	-
<b>RF speed</b>	424kbps
<b>Market certification</b>	-
<b>Advanced features</b>	Ind wake-up
<b>Interface</b>	SPI 2Mbps
<b>Power supply</b>	2.7V - 5.5V
<b>Output power</b>	0.23W
<b>Temperature range</b>	-25°C to +85°C
<b>Package</b>	32-pin QFN (5x5mm)



# ST25R95: operating modes

- ST25R95 has 2 modes operating modes:
  - Wait for Event (WFE):
    - This mode includes four low consumption states:
      - Power-up
      - Hibernate
      - Sleep / Field Detector
      - Tag detector
  - Active mode:
    - Ready: RF is OFF and the ST25R95 waits for a command (ProtocolSelec, ...) from external Host
    - Reader: ST25R95 communicates actively with a tag or an external host (an MCU, for example)
    - Card Emulation: The ST25R95 can communicate as a Card or Tag with an external reader. The Card or Tag application is located in the Host and communicates with the ST25R95 via the SPI interface.



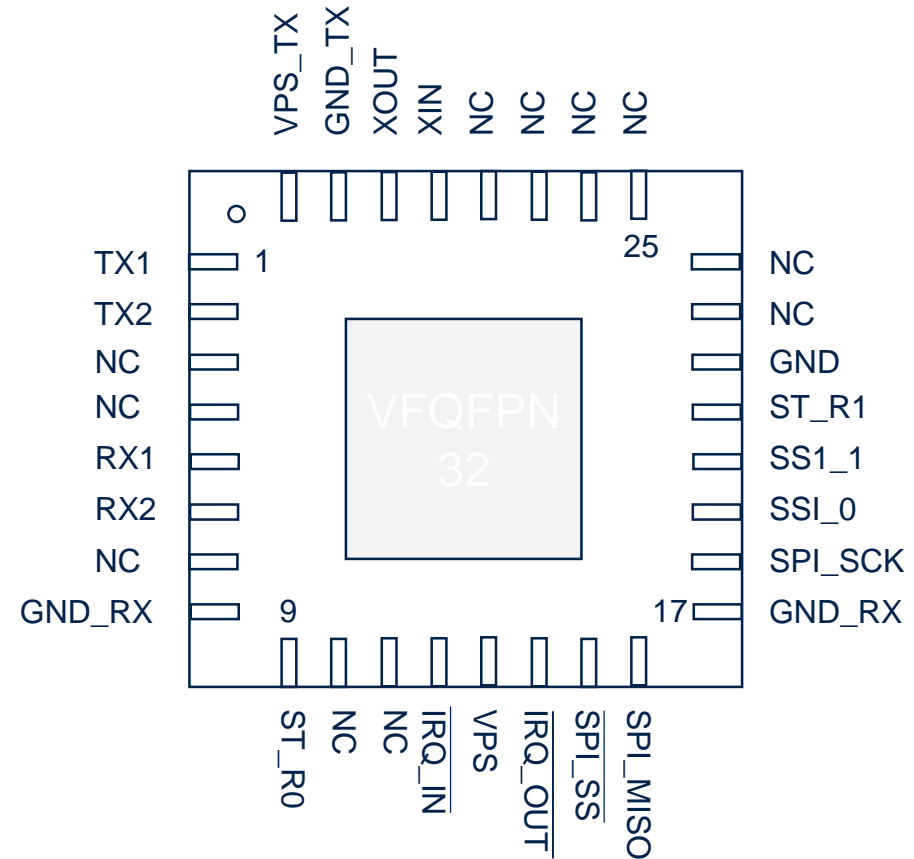
ST25R95 initialization and operating state change

- ST25R95 can switch from one mode to another



# ST25R95 package form

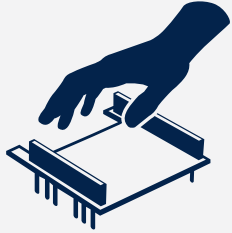
- VFQFPN32 Package – 5.0 x 5.0mm







# ST25R rich eco-system



- Discovery kits based on STM32 MCU
- STM32 Nucleo boards ecosystem
- STM32Cube software ecosystem



- Antenna e-design tool
- Schematic, BOM
- Gerber files



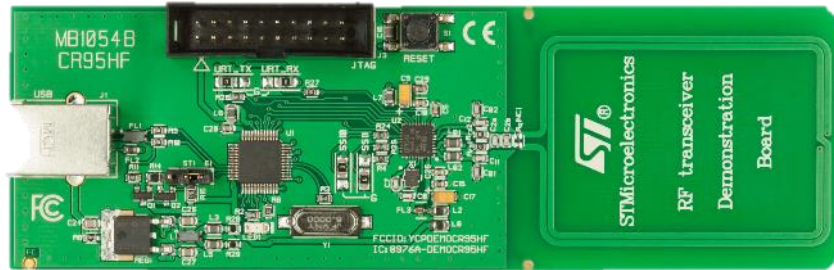
- PC software tool ST25
- MCU driver firmware



- Documentation
- e2e community
- Webinar / MOOC
- Training



# ST25R95 / CR95HF evaluation boards



M24LR-DISCOVERY

## CR95HF demo board

- **CR95HF** NFC multi-protocol reader IC
- 47x34 mm 2 turns double layer antenna on PCB and associated tuning circuit
- STM32F1 micro-controller
- USB & JTAG connectors



X-NUCLEO-NFC03A1

## CR95HF Nucleo shield

- **CR95HF** NFC multi-protocol reader IC
- 47x34mm 4 turns antenna on PCB
- SPI (Slave interface) or UART
- Up to 528-byte command/reception buffer
- Optimized power management
- Powered through Arduino™ UNO R3 connector



# ST25R95 part number



ST25R95	Package	Features	Part Number
Entry-Level HF Readers	QFN32	R/W & CE, IWU	ST25R95-VMD5T



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# Solutions for NFC / RFID Tags & Readers



**ST25 SIMPLY MORE CONNECTED**



# Thank you

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