NFC / RFID
ST25 product overview

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iOS 기기를 통한 도어락 컨트롤

ST25 SIMPLY MORE **CONNECTED**

Certification & Interoperability Status

	Tags		Dynamic Tags			Readers	
	ST25TV	ST25TA	ST25DV-I2C	ST25DV-PWM		ST25R3911B	ST25R3916
NFC Forum	✓	✓	✓	✓	NFC Forum	✓	✓
iOS app	✓	✓	✓	✓	RFAL SW	✓	✓
Android app	✓	✓	✓	✓	Linux SW	✓	✓

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ST25R Reader – Key Messages

What it does

- ST25R is the Master device and provides power: phone readout with empty battery
- Communication with NFC enabled mobile phone (>70% adoption rate) for iOS or Android

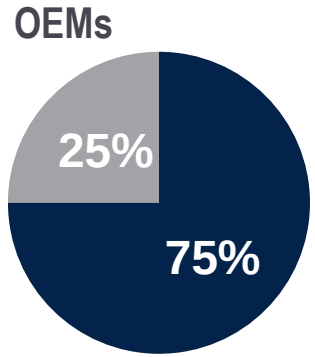
2.5W **power** for excellent interaction range and

smallest **antenna** sizes, combined with

advanced **features** allow for **flexible design**

faster **time to market**

and **best** **customer experience**
by **tapping** a phone without any setup required.



Payment, access (Car, building…), gaming, consumables, authentication, interaction, data transfer…

www.st.com/st25r





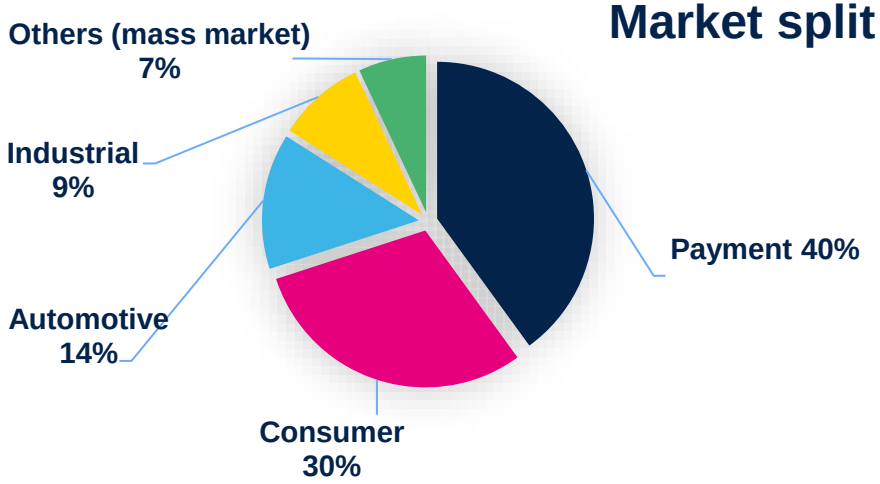
ST25R Reader - Overview

Right fit for consumer & automotive applications

Use cases

- ✓ EMVCo 3.0 Payment Terminals
- ✓ CCC Digital Key Car Access
- ✓ Qi Charging Card Protection
- ✓ Access Control
- ✓ Gaming
- ✓ Consumables & Authentication
- ✓ Data transfer & Programming

Market split



Key features

- ✓ 1.6W Highest Output Power
- ✓ Dynamic Power Control
- ✓ Noise Suppression Receivers
- ✓ Automatic Antenna Tuning
- ✓ AEC Q-100 Qualified
- ✓ NFC Forum Reader & Universal Device

Interoperability

Performances

- ✓ Up to 20cm (TA) / 1m (TV) read range
- ✓ NFC Forum certified
- ✓ Low Power modes

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ST25 NFC / RFID Portfolio
One-Stop-Shop for Tags and Readers

Tags			Dynamic Tags				NFC / HF Readers					UHF Readers
ST25TA	ST25TB	ST25TV	M24SR	M24LR	ST25DV-I2C	ST25DV-PWM	ST25R95 *	ST25R3911B ST25R3912	ST25R3914 ST25R3915	ST25R3916 ST25R3917	ST25R3920	ST25RU3993
ISO14443-A 106kbps NFC Type 4	ISO14443-B 106Kbps	ISO15693 up to 53Kbps NFC Type 5	ISO14443-A 106kbps NFC Type 4	ISO15693 up to 53kbps	ISO15693 up to 53kbps NFC Type 5	ISO15693 up to 53kbps NFC Type 5	ISO14443-A/B ISO15693	ISO14443-A/B Felica ISO15693 ISO18092	ISO14443-A/B Felica ISO15693 ISO18092	ISO14443-A/B Felica ISO15693 ISO18092	ISO14443-A/B Felica ISO15693 ISO18092	ISO18000 6c & b Gen2 Protocol
EEPROM 512b-64Kb 200 year retention 1M cycles	EEPROM 512b-04Kb 40 year retention 1M cycles	EEPROM 512b-64Kb 200 year retention 1M cycles	EEPROM 2Kb-64Kb 200 year retention 1M cycles	EEPROM 4Kb-64Kb 40 year retention 1M cycles	256B Buffer EEPROM 4Kb-64Kb 40 year retention 1M cycles	EEPROM 2Kb 40 year retention 100K cycles	Reader/Writer Card Emulation	Reader/Writer P2P EMVco & PBOC	Reader/Writer P2P AEC-Q100	Reader/Writer P2P Card Emulation EMVco & PBOC	Reader/Writer P2P Card Emulation AEC-Q100	Reader / Writer -90dBm sensitivity Internal VCO
TruST25 128b password 20b counter UID RF Detect	32b counter Lock OTP bits UID	TruST25 64b password 16b counter UID Tamper Detect	128b password RF disable RF Detect UID	32b password E-Harvesting RF Detect UID	Fast X-fer Mode 64b password E-Harvesting RF Detect UID	TruST25 64b password UID		VHBR Auto Ant. Tuning Dyn. Power Out Multi-antenna	Auto Ant. Tuning Dyn. Power Out Multi-antenna	Active waveshaping Auto Ant. Tuning Dyn Power Out Multi-antenna	Active waveshaping Auto Ant. Tuning Dyn. Power Out Multi-antenna	Dense Reader Mode Linear RSSI Automatic PSRR Auto ACK
			I2C 1MHz 2.4V-5.5V	I2C 400kHz 1.8V-5.5V	I2C 1MHz 1.8V-5.5V	2x PWM 488-31.25 kHz 1.8V-5.5V	SPI & UART 2Mbps 2.7V-5.5V 230mW	SPI 6Mbps 2.4V-5.5V 1W – 1.4W	SPI 6Mbps 2.4V-5.5V 1W	SPI 10Mbps I2C 3.4Mbps 2.4V-5.5V 1.6W	SPI 5Mbps I2C 3.4Mbps 2.4V-5.5V 1.6W	SPI 10Mbps 1.65V-5.5V 0-20dBm
SBN12 / SBN075 / FPN5	SBN12	SBN12 / SBN075 / FPN5	SO8 / TSSOP8 / FPN8 / SBN12	SO8 / TSSOP8 / FPN8	SO8 / TSSOP8 / FPN8 / FPN12 / WLCSP10 / SBN12	SO8 / TSSOP8	32-pin QFN	WF 32-pin QFN / 32-pin QFN / WLCSP-30 / Wafer	WF 32-pin QFN / 32-pin QFN	WF 32-pin QFN / WLCSP-36	WF 32-pin QFN	48-pin QFN

*: same as former CR95HF / ST95HF

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ST25R Product ID Cards

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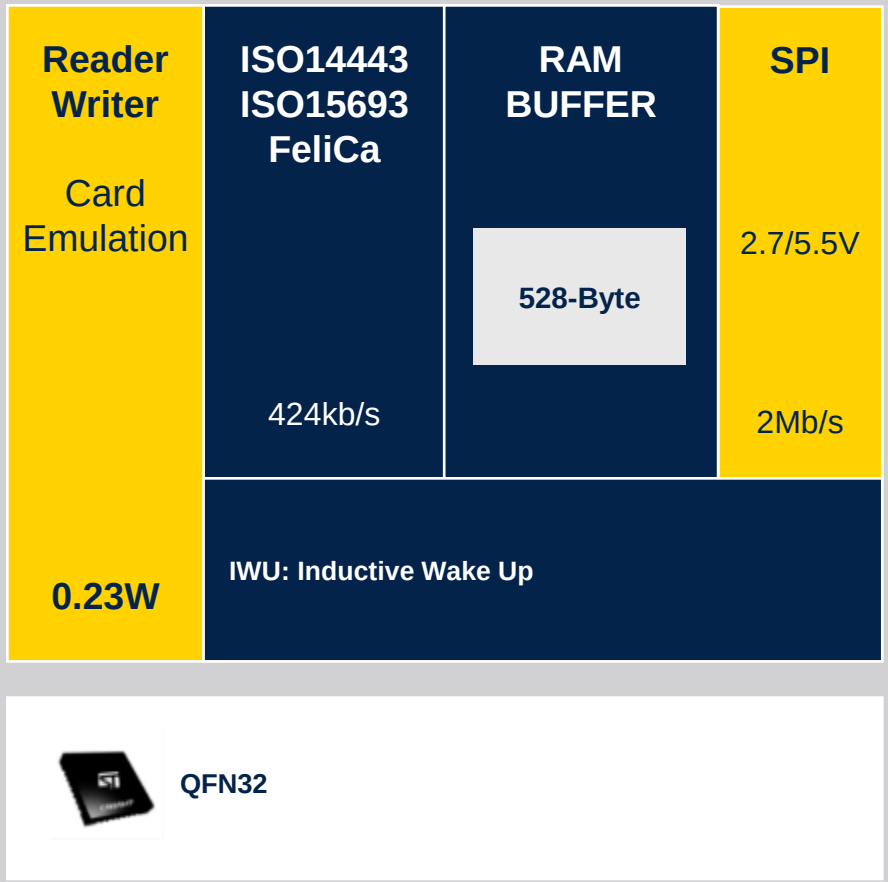
ST25R95
Entry Level NFC Reader Solution



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

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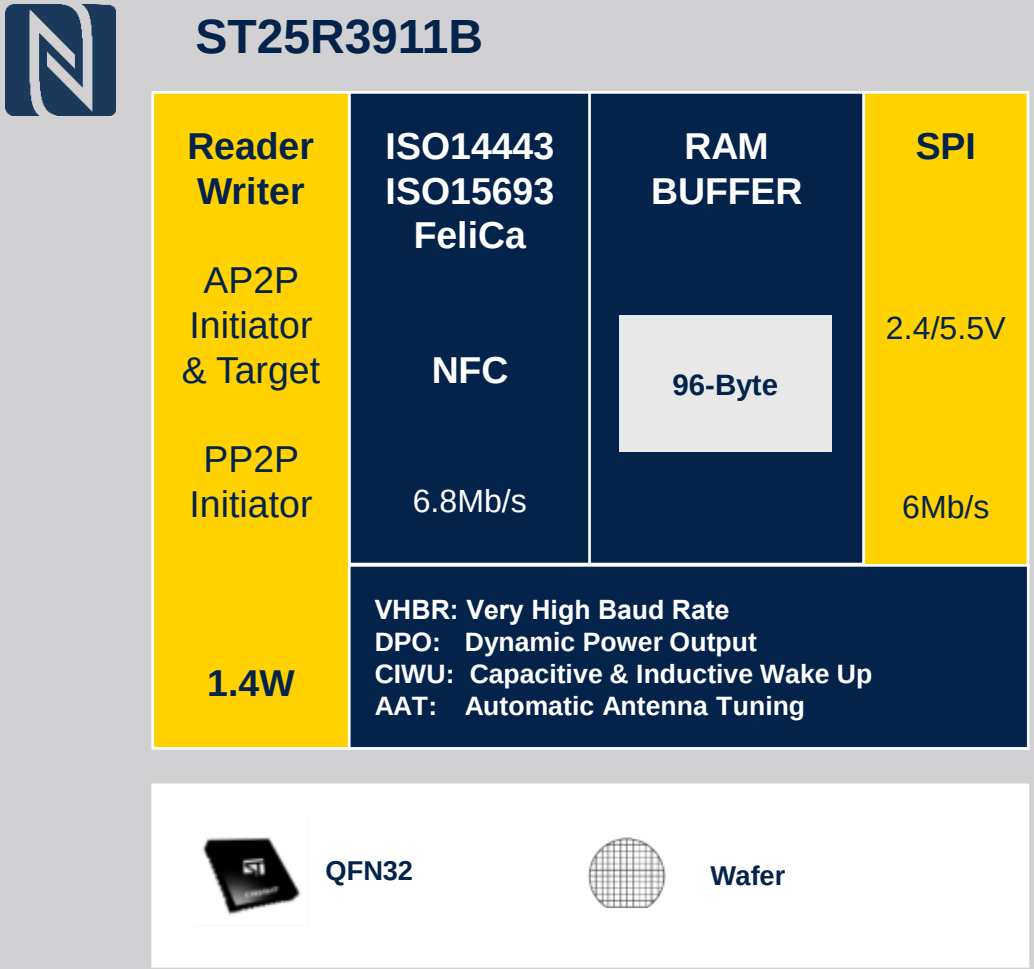
ST25R3911B
1.4W High Power Payment Reader Solution



Use cases

- Ideal for **Payment** applications
- Access Control, Gaming, eGovernment passport

Key Features

- All NFC modes supported (ISO14443, ISO15693, FeliCa) with P2P
- **1.4W** output power at 5V with 2.5W peak current
- **EMVCo 2.6** & **PBOC** certification without external power amplifier
- Automatic Antenna Tuning
- **VHBR** support up to **6.8Mb/s**
- -40°C to **125°C** junction temperature range

Key Benefits

- Low power operation & Stand-by mode (capacitive wake-up)
- 2 antennas operation at the same time
- Enhanced fast transfer rate for Passport application

ST25R3912
Smallest Footprint, High Power Reader Solution

Use cases

- Ideal for EMVCo 2.6 legacy **Payment** and **small handheld mPOS**
- Access Control
- Gaming

Key Features

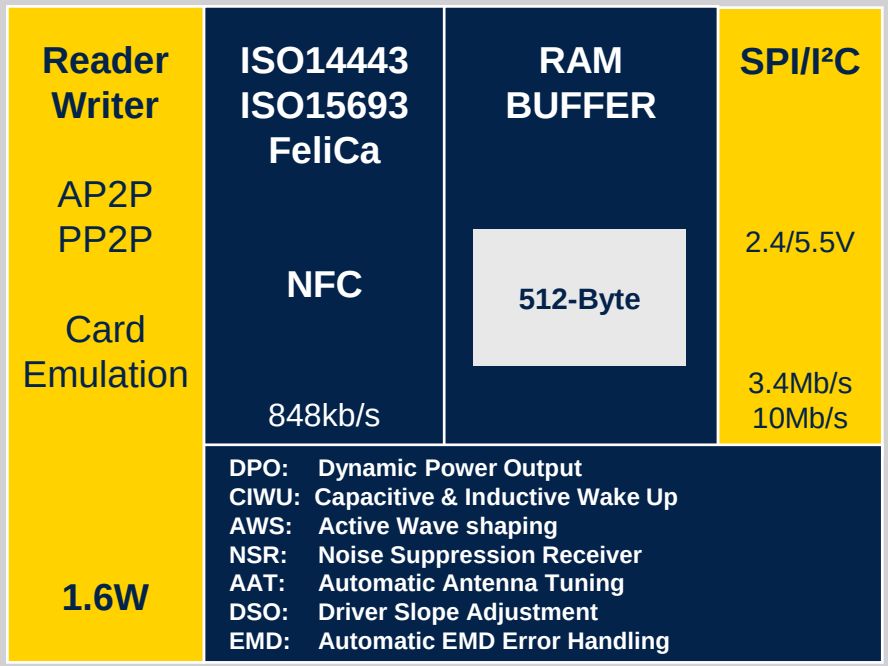
- All NFC modes supported (ISO14443, ISO15693, FeliCa) with P2P
- 1W output power at 5V
- **EMVCo** & **PBOC** certification without external power amplifier
- Small 3x2.8 **WLCSP** package
- -40°C to **125°C** junction temperature range

Key Benefits

- Small Footprint on PCB, Low power operation & Stand-by mode
- 2 antennas operation at the same time

ST25R3916
High-Perf. NFC Universal Device & EMVCo Reader

ST25R3916



QFN32
Wettable flank

WLCSP

Use cases

- Ideal for **Payment** applications
- Access Control, Gaming, IOT and pairing

Key Features

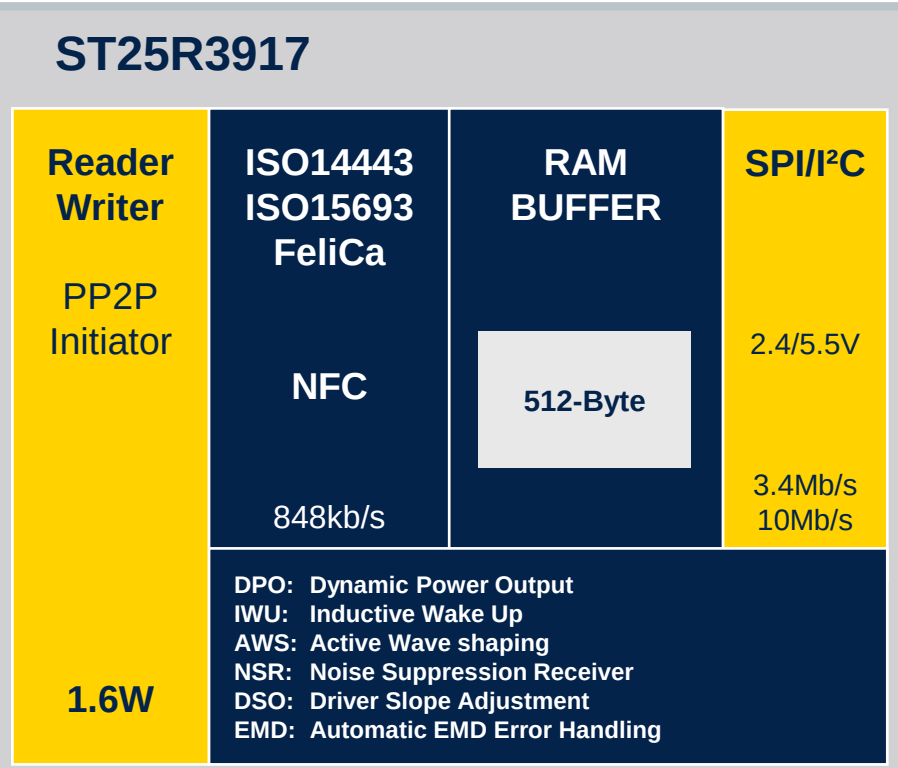
- NFC Forum Universal Device (with CE mode)
- **1.6W** output power at 5V with **2.5W** peak current
- **EMVCo 3.0** certification without external power amplifier
- **Active Waveshaping, Noise Suppression Receiver**
- **Automatic Antenna Tuning**
- -40°C to **105°C** ambient temperature range (QFN)

Key Benefits

- Low power operation & Standby mode (capacitive wake-up)
- Works in challenging environment like noisy LCD displays
- Ideal for passing newest EMVCo standards

ST25R3917
High-Performance NFC & EMVCo Reader

ST25R3917



QFN32
Wettable flank

Use cases

- Ideal for **Payment** applications
- Access Control, Gaming, Consumer

Key Features

- NFC Forum Reader device
- **1.6W** output power at 5V with **2.5W** peak current
- **EMVCo 3.0** certification without external power amplifier
- **Active Waveshaping, Noise Suppression Receiver**
- -40°C to **105°C** ambient temperature range

Key Benefits

- Low power operation & Standby mode (capacitive wake-up)
- Works in challenging environment like noisy LCD displays
- Ideal for passing newest EMVCo standards

ST25R NFC / HF Readers Product Family

	ST25R95	ST25R3911B	ST25R3912	ST25R3914/15	ST25R3916	ST25R3917	ST25R3920
Description	Entry-Level NFC Reader	High-Performance NFC Forum Reader	Mid-Range NFC Forum Reader	Automotive Grade NFC Forum Reader	High-performance NFC Universal Device & EMVCo Reader	High-performance NFC & EMVCo Reader	Automotive Grade NFC Forum Reader
Reader/Writer mode	ISO14443A/B ISO15693 Felica	ISO14443A/B ISO15693 FeliCa	ISO14443A/B ISO15693 FeliCa	ISO14443A/B ISO15693 FeliCa	ISO14443A/B ISO15693 FeliCa	ISO14443A/B ISO15693 FeliCa	ISO14443A/B ISO15693 FeliCa
Card emulation mode	Yes	-	-	-	Yes	-	Yes
AP2P mode	-	Initiator & Target	Initiator & Target	Initiator & Target	Initiator & Target	Initiator & Target	Initiator & Target
PP2P mode	-	Initiator	Initiator	Initiator	Initiator & Target	Initiator	Initiator & Target
RF speed	424kbps	6.8Mbps (VHBR)	848kbps	848kbps	848kbps	848kbps	848kbps
Market	Consumer	Payment EMVCo 2.6, Industrial	Access control, Metering, Consumer	Automotive AEC-Q100 grade 1	Payment EMVCo 3.0, Industrial, Consumer	Payment EMVCo 3.0, Industrial, Consumer	Automotive AEC-Q100 grade 1
Advanced features	IWU	AAT, DPO, CIWU	DPO, IWU	AAT (3914), DPO, CIWU	AAT, DPO, NSR, DSA, AWS, CIWU, EMD	DPO, NSR, DSA, AWS, IWU, EMD	AAT, DPO, NSR, DSA, AWS, CIWU, EMD
HW interface	SPI 2Mbps	SPI 6Mbps	SPI 6Mbps	SPI 6Mbps	SPI 10Mbps	SPI 10Mbps	SPI 5Mbps
SW interface	RFAL Unified Software Library for Frontends						
Power supply	2.7V - 5.5V	2.4V – 5.5V	2.4V – 5.5V	2.4V – 5.5V	2.4V – 5.5V	2.4V – 5.5V	2.4V – 5.5V
Output power	0.23W	1.4W	1.0W	1.0W	1.6W	1.6W	1.6W
Temperature range	-25°C to +85°C	-40°C to +125°C	-40°C to +125°C	-40°C to +125°C	-40°C to +125°C	-40°C to +125°C	-40°C to +125°C
Package	32-pin QFN	32-pin QFN / Wafer	32-pin QFN / WF 32-pin QFN / WLCSP-30	32-pin QFN / WF 32-pin QFN	WF 32-pin QFN / WLCSP-36	WF 32-pin QFN	WF 32-pin QFN

VHBR: Very High Baud Rate
P2P: Peer to Peer mode
AAT: Automatic Antenna Tuning
AWS: Active Wave Shaping

EMD: Automatic EMD suppression
VHBR: Very High Baud Rate
DPO: Dynamic Power Output
CIWU: Capacitive & Inductive Wakeup

DSA: Drive Slope Adjustment
* Peak output power
NSR: Noise Suppression Receiver
IWU: Inductive Wakeup

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ST25R UHF Reader

	ST25RU3993
Description	UHF RFID Reader for Mobile and Fast Moving Consumer Goods applications
Contactless interface	ISO18000-6c/b
Market certification	EPC Gen 2
Sensitivity	-90dBm
Advanced features	Internal VCO Dense Reader Mode Linear RSSI & Phase Bit Automatic PSRR regulation Auto ACK
Interface	SPI 5Mbps
Power supply	1.65V – 5.5V
Output power	0dBm / 20dBm
Temperature range	-40 to +85°C
Package	48-pin QFN (7x7mm)

VCO: Voltage Controlled Oscillator
RSSI: Received Signal Strength Indicator

PSRR: Power Supply Rejection Ratio
ACK: ACKnowledge

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Solutions for NFC / RFID Tags & Readers

ST25 SIMPLY MORE **CONNECTED**