ST25R3920B
Automotive NFC reader

For CCC digital key and center console applications

AEC-Q100 qualified high-performance NFC Forum CR13 compliant frontend for a seamless user experience and fast development cycle

The ST25R3920B offers high output power with excellent receiver sensitivity to achieve the largest communication range with the smallest antenna size. It meets demanding car and phone OEM requirements and enables a seemless user experience.

ST's unique technology can distinguish NFC cards from mobile phones in CE mode, elevating NFC card protection on Qi chargers to a new level.

The robustness of the ST25R3920B passes with ease the most challenging noise immunity tests required by car OEMs.

Fully compliant with NFC Forum CR13 requirements, supported by ST's NFC SW library RFAL, including code for CCC, NFC protection and phone OEM requirements, this NFC reader is ideal for all automotive applications.

KEY FEATURES & BENEFITS
- Enhanced noise suppression with very high receiver sensitivity simplifies electromagnetic immunity and eases certification
- Dynamic power output with active wave-shaping control on each power level for passing NFC Forum CR13 requirements
- Outstanding low-power card detection range at low power consumption for best user experience
- Advanced diagnostics and NFC card protection feature
  - Two test outputs for direct access to internal signals, digital or analog, for easy nonintrusive debugging
  - Unique technology distinguishes cards from phones

KEY APPLICATIONS
- Car access and start
- NFC card protection on center console QI chargers
- Phone pairing and data transfer

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Supported protocols

The device includes an advanced analog front end (AFE) supporting mandatory NFC-A but also optional NFC-B (ISO14443A/B) and NFC-F (FeliCa™) reader functionality as defined by CCC.

Additionally, for pairing and NFC card protection for Qi charging, ISO18092 passive and active P2P initiator&target, NFC-V (ISO15693) reader, and NFC-A / NFC-F card emulation are supported.

RFAL software library

The ST25R3920B is supported by our sophisticated software library including code for digital key application, specific phone OEM requirements and other automotive applications.

Dynamic power output

Ensures the automatic adjustment of the output power according to de-tuning conditions caused by different antenna sizes and distance. It keeps the transmitted power autonomously in NFC Forum compliant and safe condition to prevent damage of tags.

Active wave shaping

Helps to simplify compliance with the latest NFC Forum requirements, needed for CCC DK, on the mandatory monotonicity tests and requirements to limit over and undershoots of the signal. The active wave-shaping feature allows to fit the signal within the required conditions with simple register settings supported by our sophisticated GUI in our software development tools.
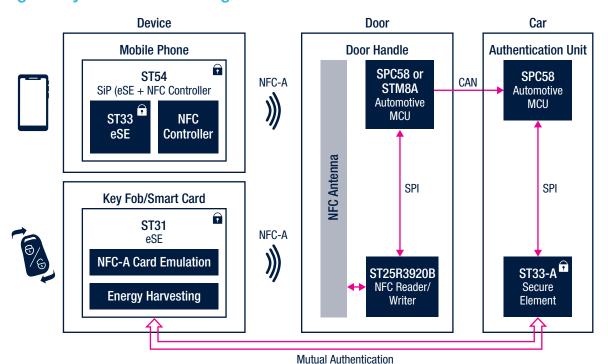
Low-power card detection

Especially designed with automotive applications in mind, this feature is based on the internal inductive wake-up circuit that helps ensure the lowest power consumption and is individually adjustable to maximize the detection range of a phone or a card.

Robustness and sensitivity

The ST25R3920B is a very robust and noise-tolerant solution. This is achieved by a highest receiver sensitivity able to suppress external noise sources and stability of performance even if noise is injected on the power supply lines. Therefore, the ST25R3920B works even under harsh conditions, while reducing electromagnetic emission enabling an easier certification.

CCC digital key solution block diagram with ST25R3920B

Device summary

Part number	Mode	RF Interface	Serial Interface	Advanced features	Output Power	Ambient Temperature Range	Package
ST25R3920B	R&W, P2P, CE	ISO14443A/B, ISO15693, FeliCa	SPI, I²C	AAT, DPO, AWS, NSR, CIWU	1.6W	-40 °C to 105 °C	QFN-32 wettable flank (5x5mm)

AAT: automatic antenna tuning; NSR: noise surpression receiver; DPO: dynamic output power; IWU: inductive wake-up; AWS: active wave shaping

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Order code: FL2204ST25R3920B

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