ST25 NFC / RFID solutions for automotive applications

Automotive: car, 4 wheelers, truck…

MMY division
NFC, RFID HF & UHF technologies

Complementary solutions to Wireless Technologies

Communication from 1cm (NFC) to up to 10m (RFID UHF)
## NFC technology

### Near Field Communication

- Short range contactless communication
- Technology operating at 13.56MHz frequency
- Based on RFID HF ISO14443 & ISO15693 standards

### Interactive and zero power

- NFC tags powered by phone or RFID reader
- Enabling convenient connection to the Cloud for IoT
- NFC-enabled mobile phone can engage with items by a simple tap

### NFC is developed by NFC Forum

- Interoperability between devices with NFC Forum certified products
- Standardized use cases (URL web link, Bluetooth handover…)

### Fast growing employment in Mobile phone

- More than 70% of new phones come with NFC
- NFC is used for Mobile Payment with Android and iOS (ApplePay)
- Apple added in 2019 support of NFC reader / writer mode from iOS13 onward

**Automotive applications**
NFC main use cases & benefits

Access & Start
- Convenient access to the car (door handle)
- NFC being the RF back-up interface for keyfob in case of battery off
- Secured start
- Cloud-based distribution of keys to an NFC enabled phone

Pairing, Setup & Safety
- Convenient BT pairing to connect NFC phone to car
- Automatic driver identification & personal settings configuration (seat, temperature…)
- NFC credit cards or badges detection to prevent damaging them during Qi charging
- In car secured payment

Consumable & Diagnostics
- NFC also enables consumable authentication (e.g. air filter, oil filter)
- No physical connection (ODB) is required anymore for car diagnostics.

Interactive and zero power technology (Tag powered by Reader)
Trusted communication thanks to short reading distance
Simple and flexible

Automotive applications
NFC reader for door handle

Typical NFC Reader Block Diagram & Usage for Car door handle

Car door handle

- ST25R
  - Touch
  - LF / HF
  - BT / UWB
- STM8A / SPC58
  - MCU
- eSE (ST33)
- RAM

ST25R3914 / 15 - ST25R3920

- High output power
- Low power consumption
- Automatic antenna tuning
- Phone compatibility

Keyless car access
(CCC specification)

Automotive applications
NFC reader for center console

Typical NFC Reader Block Diagram & Usage for Car center console

- Car center console
- ST25R
- SPC58 MCU
- eSE (ST33)
- Wireless charging (STWBC)
- RAM
- SPI
- CAN / LIN
- Automotive chips

- High output power
- Low power consumption
- Automatic antenna tuning
- Phone compatibility

- Car easy start
- BT pairing
- Driver settings
- NFC for Wireless charging

Automotive applications
Typical NFC Tag (+ Reader) Block Diagram & Usage in Automotive

- **ST25T**
  - EEPROM
  - Consumable (e.g. filter…)

**ST25TV02K / ST25TA02KB**

- **TruST25 digital signature**
  - Passwords
  - Easy & fast data transfer

- **Product recognition**
- **End user experience**

**Automotive applications**
ST25 rich eco-system

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

- Antenna e-design tool
- Schematic, BOM, Gerber
- IBIS models

- PC software tool ST25 SDK
- Mobile Apps ST25 SDK (Android & iOS)

- Documentation
- Training
- Webinar
- MOOC

Automotive applications
ST25 hardware solutions

Speed-up Evaluation, Prototyping and Design

NFC TAG KIT
- ST25-TAG-BAG-U

DYNAMIC NFC TAG KITS
- ST25DV-DISCOVERY
- ANT-1-6-ST25DV
- X-NUCLEO-NFC04A1
- ANT7-T-ST25DV04K

HF / NFC READER KITS
- ST25R3911B-DISCO
- X-NUCLEO-NFC05A1
- ST25R3916-DISCO
- X-NUCLEO-NFC06A1

Automotive applications
Solutions for NFC / RFID Tags & Readers

ST25 SIMPLY MORE CONNECTED