NCJ39 Automotive-Qualified Secure Element

The NCJ39 Secure Element (SE) is a dedicated hardware and software security architecture implemented with high resistance against physical attacks. It is typically used to protect valuable assets making it ideal to securely store the Digital Keys needed to unlock and start a car with a smart device.

Overview

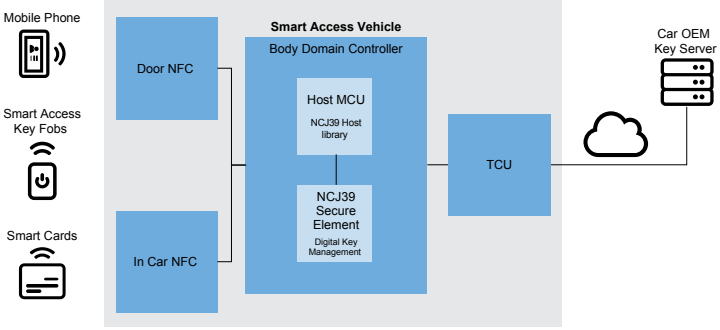
The NCJ39 family is an automotive Secure Element platform with advanced cryptographic accelerators and physical and electrical attack resistance. It supports a broad spectrum of cryptography and security features and is well-suited for high secure applications, such as smart car access (CCC Digital Key), connectivity or infotainment. For each of these use cases dedicated JavaCard™ applets are available to securely run them on the provided JavaCard Operating Platform (JCOP) OS by NXP. NCJ39 also comes with a dedicated JavaCard applet development toolchain to support customer proprietary applet developments.

NCJ39 complies with AEC-Q100 qualification requirements and is Common Criteria EAL5+ certified. Together with NXP's smart car access portfolio for Ultra-Wideband (UWB), Bluetooth Low Energy (BLE) and Near-Field Communication (NFC) ICs, it is tailored to build a secure car access system.

Target applications

- CCC Digital Key management for smart car access
- Qi 1.3 authentication
- Securing external and internal connections of a connected car
- NCJ39 Secure Element application block diagram

NCJ39 Secure Element application block diagram



Key features

General features:

- NXP processor with Arm® Cortex M33 32-bit technology
- Large user memory for applets

Interfaces:

- SPI follower interface
- I^2C bus target interface

Cryptographic coprocessors

- High-speed Public-Key Coprocessor (PKC) supporting major public key cryptography systems such as RSA, ECC and corresponding schemes
- High-speed triple-DES and AES coprocessors
- Random number generator in hardware AIS-31 compliant
- Two high-speed cyclical redundancy check engines

Certified EdgeLock® assurance:

- The NCJ39, part of the certified EdgeLock assurance program, is designed to meet industry standards and follows NXP's security-by-design approach. It has been certified by an independent lab.

Certifications and package:

- AEC-Q100 grade 2 qualified
- Hardware certification: Common Criteria EAL 5+
- HVQFN32 package

NCJ39 Secure Element

Digital Key solution

NXP offers a Digital Key solution following the Car Connectivity Consortium's standardization release 2. This solution uses the NCJ39 SE and NXP's NCF3320 and NCF3340 NFC chipsets and enables the unlocking and starting of a car with an NFC-enabled smartphone, key fob or an NFC smart card holding a Digital Key. This NFC-based solution makes it possible to trigger car access and driver authorization even if a phone's battery is drained, thus eliminating the need for a traditional physical key. In the solution, NXP's Secure Elements are used inside the phones, key fobs and smart cards as well as on the car side using the NCJ39 automotive qualified Secure Element.

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