NXP provides the technologies and system knowledge to enable secure, robust and scalable car access solutions.

NXP offers a Digital Key solution using our Secure Elements (SE) in combination with communication technologies including ultra-wideband (UWB), Bluetooth® Low Energy (Bluetooth LE) and near field communication (NFC). They help enable the unlocking and starting of a car with a smartphone, key fob or an NFC Smart Card holding a digital key, as well as the secure sharing of vehicle access with other mobile devices, an advanced capability for the secure car access ecosystem.

The solution leverages global standards from the Car Connectivity Consortium, IEEE, the Bluetooth SIG and the NFC Forum.

Car Block Diagram
### Recommended Products for Car

**UWB**

- **Ultra-Wideband (UWB):** Ultra wideband (UWB)
  - **NCJ29D5:** Trimension™ NCJ29D5: UWB IC for Automotive Applications

- **NCJ29D6:** Trimension™ NCJ29D6: Secure UWB IC for Automotive Ranging and Radar Applications

**Bluetooth Low Energy**

- **KW45:** 32-Bit Bluetooth® 5.3 Long-Range MCUs with CAN FD and LIN Bus Options, Arm® Cortex®-M33 Core

**Door NFC**

- **NCx3320:** Automotive-Grade NFC Frontend IC
- **NCx3321:** NFC Forum-Compliant Frontend IC with Superior RF Performance for Automotive

**In Car NFC**

- **NCF3340AHN:** Automotive Qualified NFC Controller with NCI Interface
- **NCx3321:** NFC Forum-Compliant Frontend IC with Superior RF Performance for Automotive

**MCU**

- **Arm Processors:** Arm®-Based Processors

**Secure Element (CCC) for Smart Access Vehicle**

- **NCJ36A:** Automotive-Qualified Embedded Secure Element (SE)
- **NCJ37x:** Automotive Secure Element with Passive NFC, I²C and SPI Interfaces

**SBC**

- **FS24:** Safety Mini CAN FD SBC for Automotive Applications Fit for ASIL-B

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### KeyFob Block Diagram

![KeyFob Block Diagram](image-url)
### Recommended Products for KeyFob

| Secure NFC (CCC) for Key Fobs | • Secure Car Access: Secure Car Access  
|                             | • NCJ37x: Automotive Secure Element with Passive NFC, \( \text{i}^2 \text{C} \) and SPI Interfaces |
| Bluetooth Low Energy        | • KW45: 32-Bit Bluetooth\(^\text{®}\) 5.3 Long-Range MCUs with CAN FD and LIN Bus Options, Arm\(^\text{®}\) Cortex\(^\text{®}\)-M33 Core |
| UWB KeyFob                  | • Ultra-Wideband (UWB): Ultra wideband (UWB)  
|                             | • EdgeLock\(^\text{®}\) SE050: Plug and Trust Secure Element Family – Enhanced IoT security with high flexibility |

### Phone Block Diagram

- **Digital Key Backends**
  - Phone OEM Backend
  - Car OEM Backend

- **Phones for Smart Access**
  - App
  - UWB
  - BLE
  - eSE (CCC)

- **Smart Access Key Fobs**
  - Secure NFC (CCC)  
  - BLE  
  - UWB

- **Smart Access Vehicle**
  - UWB Outside
  - BLE
  - Door NFC
  - In Car NFC and Qi
  - SBC
  - Smart Access MCU  
  - Secure Element (CCC)

- **Smart Cards**
  - Secure NFC (CCC/DESFire)

**Technology**
- NXP Technology
- Non NXP Technology
- Optional Technology

### Recommended Products for Phone

| UWB KeyFob | • Ultra-Wideband (UWB): Ultra wideband (UWB)  
|            | • EdgeLock\(^\text{®}\) SE050: Plug and Trust Secure Element Family – Enhanced IoT security with high flexibility |

| eSE (CCC) and NFC for Phones | • Mobile: Mobile |

| Bluetooth Low Energy | • KW45: 32-Bit Bluetooth\(^\text{®}\) 5.3 Long-Range MCUs with CAN FD and LIN Bus Options, Arm\(^\text{®}\) Cortex\(^\text{®}\)-M33 Core |

### SmartCard Block Diagram
Recommended Products for SmartCard

- Secure NFC (CCC/DESFire) for Smart Cards
- MiFARE® DESFire® EV3: High-Security IC for Contactless Smart City Services
- SmartMX3 P71D321: Secure and Flexible Microcontroller

View our complete solution for Smart Car Access.

Note: The information on this document is subject to change without notice.

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