



# NXP EdgeLock™ SE050

## Use Case: *Secure Access*



Adding a secure element to any application that uses a physical or logical access solution creates a higher level of protection for users, facilities, and machinery, while enabling advanced features for multi-user/multi-session management and even safe online access.

### APPLICATIONS



Smart door locks



Smart factories



Machine access

### CHALLENGE

The features and functions offered by today's solutions for secure access have evolved rapidly. What started, not so long ago, as simple opening and closing capabilities has become a sophisticated range of advanced options, such as key management for multiple users and safe logins to cloud-based services. What's more, secure access is expanding beyond smart door locks in homes and buildings to include sensitive equipment like machines in smart factories, e-bikes/car sharing, enterprise IT devices and networks, medical devices, etc.

To ensure a higher level of security, with the highest degree of design flexibility, developers are moving away from PIN codes and QR codes as the access technology (since PIN codes can be forgotten or stolen and QR codes can be copied or forged) and choosing contactless technology instead.

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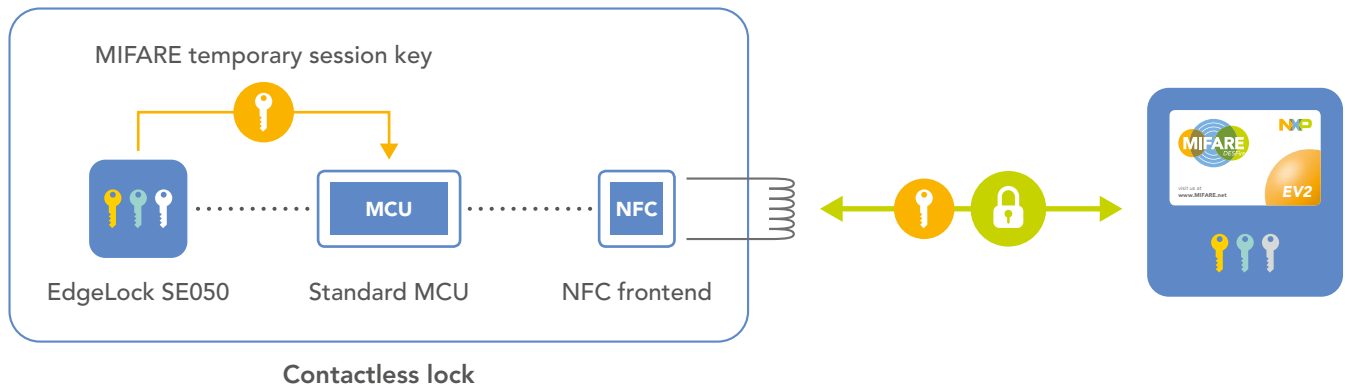
MIFARE® products leveraging Near Field Communication (NFC) offer built-in security features, such as authentication and encryption, and also support augmented functionality, such as multi-application smartcard operation and native support on mobile devices.

A design that uses the latest generation of MIFARE DESFire® products offers efficient management and strong protection of user credentials. Those credentials can be stored on a smartcard, inside a mobile device and as a secure counterpart in the EdgeLock SE050, for example, inside a smart lock.

## SOLUTION

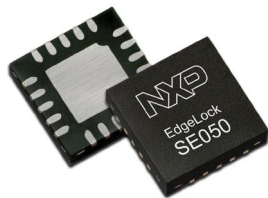
The EdgeLock SE050 secure element is targeted at online secure access solutions. It works seamlessly with MIFARE DESFire to extend functionality, adding MIFARE key derivation, authentication as well as generation of session keys.

## BLOCK DIAGRAM



## LEARN MORE

The NXP Design Community site offers helpful hints and easy-to-follow how-to's, along with a dedicated description of using LPC55S69 with EdgeLock SE050 and CLRC663 *plus* for secure access to Industrial IoT. The EdgeLock SE050 product page links to detailed specs, designs tools & software, training & support, including a full application note on using EdgeLock SE050 for secure access control in Industrial IoT.



In a design that combines an MCU with an NFC frontend, the EdgeLock SE050 provides a secure location for storing the master key needed for the authentication of the MIFARE DESFire credential. The EdgeLock SE050 performs this authentication on chip with the master key never leaving the EdgeLock SE050. The EdgeLock SE050 also calculates and exports the MIFARE DESFire session key to the MCU. The MCU then implements the standard MIFARE DESFire command set and secure messaging.

This approach offers a lot of flexibility and is applicable beyond smart door locks, for example to industrial environments, where electronic systems typically use a microcontroller-based architecture. If the design is used to support access to specialized machinery, for example, the EdgeLock SE050 can also be used to configure secure cloud onboarding, so machine operators can safely access cloud-based information and applications.

### ▶ NXP Design Community

- <https://community.nxp.com/community/identification-security/secure-authentication/people>
- <https://community.nxp.com/docs/DOC-344270>

### ▶ EdgeLock SE050 Product Page

[www.nxp.com/SE050](http://www.nxp.com/SE050)

### ▶ CLRC663 *plus*

[www.nxp.com/products/:CLRC66303HN](http://www.nxp.com/products/:CLRC66303HN)

### ▶ MIFARE DESFire

[www.nxp.com/products/:MIFARE\\_DESFIRE\\_LIGHT](http://www.nxp.com/products/:MIFARE_DESFIRE_LIGHT)

### ▶ LPC55S

[www.nxp.com/products/:LPC55S6x](http://www.nxp.com/products/:LPC55S6x)

Find more information on [www.nxp.com/SE050](http://www.nxp.com/SE050)

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