

Out-of-the-box NFC commissioning and Matter security for smart home devices

With the increasing adoption of connected home ecosystems and specifications such as Matter, developers are required to implement various industry-standard security mechanisms, including cryptographic key pairs, digital certificates, as well as a range of hardware- and firmware-based security features. The [EdgeLock SE051H](#) secure element is a turnkey solution designed to support the security requirements of smart home devices. It enables the necessary cryptographic algorithms and functions while simplifying device onboarding and commissioning via NFC. This allows developers to create products that combine strong security with ease of deployment, helping to deliver an improved user experience.

Key features

- NFC commissioning for both unpowered and powered devices (feature available in EdgeLock SE051H v2)
- Common Criteria EAL 6+ certified
- EdgeLock SE051 security: dynamic file system, TPM functions, applet updatability via SEMS Lite, extended cryptographic options (high-key-length AES and ECC)
- Enhanced user experience for device commissioning and easy Wi-Fi® pairing
- Contactless late-stage device provisioning and configuration by OEM (no need to power and connect device with cables)
- Run device commissioning over an encrypted NFC channel to securely provision customer credentials onto the EdgeLock SE051H v2, even when the device is powered off



- Full support for Matter-specified cryptography, including SPAKE2+, PASE and CASE
- Optimized device attestation, performed on chip
- Matter credential generation leveraging NXP Matter Product Attestation Authority and credential pre-injection at NXP or in factory using [NXP EdgeLock 2GO](#) services

Key benefits

- Turnkey solution for seamlessly deploying smart home devices
- Faster design-in, with Plug & Trust middleware and dedicated development boards
- Security-certified protection, future-proof solution with secure key storage in tamper resistant IC and updateable applet
- All-in-one, end-to-end Matter device attestation

Deep expertise in Matter

NXP is an active board member of the Connectivity Standards Alliance (CSA). The NXP EdgeLock 2GO service is approved by CSA for issuing the Matter Device Attestation Certificates and offers flexible options for device provisioning. The EdgeLock SE051H

Fact sheet EdgeLock SE051H

secure element, supported by the EdgeLock 2GO service, is an innovative approach that enables peace of mind while simplifying security.

Enable smart home and Matter security

The EdgeLock SE051H provides Matter device attestation and certificate-based authentication, based on ECC cryptography and NIST P-256 curve (with key functions such as ECDSA, ECDH and true random number generation). This ready-to-use solution is available with pre-injected and customized Matter attestation credentials and has enough memory to store other credentials, such as those used to securely connect the device to a SW update server.

The EdgeLock SE051H supports the SPAKE2+ algorithm for password-authenticated key exchange, enabling the creation of the encrypted PASE channel used by Matter during device commissioning. With EdgeLock SE051H, it becomes possible to store the onboarding payload securely in the secure element and perform the initial key exchange within the secure element for optimal security and performances.

Simplify the management of certificates and keys

NXP is one of the first semiconductor manufacturers to have been granted trusted Product Attestation Authority (PAA) status by the CSA. NXP's EdgeLock 2GO is a flexible turnkey solution for securely provisioning IoT devices. As a PAA, NXP can inject Matter credentials directly into silicon, via pre-injection on secure elements and authenticators, or deliver them securely over-the-air (OTA).

NFC for smart homes

With the EdgeLock SE051H, device commissioning can be streamlined using NFC technology. A simple tap with an NFC-enabled smartphone enables secure interaction with the device, eliminating the need for manual setup steps.

The EdgeLock SE051H acts as a secure element within the device, enabling the protected exchange of configuration and setup information over NFC. Communication between the device and the smartphone is handled using NDEF (NFC Data Exchange Format), a standardized format defined by the NFC Forum.

Ordering information

SE051 variant	Orderable part number	Temperature range	12NC
SE051H v2 (powered and unpowered NFC commissioning)	Samples available on demand	-40 to +105 °C	TBD
SE051H (first version, compatible with Matter 1.5)	SE051H2HQ1/Z0112Z	-40 to +105 °C	9354 451 54472

This interaction allows the smartphone to securely initiate the device onboarding process, while the EdgeLock SE051H provides hardware-based security such as authentication, secure storage and cryptographic operations, supporting a trusted and efficient commissioning experience.

EdgeLock SE051H secure element enables new user experiences with NFC for smart home and offers new use cases too. With a quick tap of their smartphone, device owners can instantly access a static URL, a connected object setup guide or other helpful information.

With EdgeLock SE051H, developers can leverage NFC technology to commission devices, whether powered or unpowered, enabling a seamless setup process and commissioning even before the device is installed.

In Matter applications, the EdgeLock SE051H can be used to enable NFC-based onboarding as an alternative to QR code scanning. By simply tapping an NFC-enabled smartphone on the device, the required onboarding information is securely retrieved, allowing the Matter controller to initiate onboarding in a convenient and user-friendly way.

Easy integration

The EdgeLock SE051H is designed to help developers save time while delivering highly secure smart home and Matter systems that support NFC commissioning and applet updatability to keep up with Matter standard evolution. In addition to the EdgeLock Plug & Trust middleware, the EdgeLock SE051H is supported by a full range of evaluation kits and development kits for Matter devices. These tools are designed to work together and give developers a quick way to leverage NXP's trusted security expertise for a complete portfolio of IoT devices.

Broad coverage of IoT use cases

As part of the EdgeLock SE05x family, the EdgeLock SE051H serves as a root of trust for a wide range of IoT use cases, extending beyond Matter-specific scenarios. It supports secure onboarding to various cloud services, secure software attestation, secure device authentication, updatability for future maintenance without requiring hardware changes, certificate-based Wi-Fi authentication and NFC-based device configuration.

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