



NXP
MIFARE Plus® SE

Seamless AES security upgrade for MIFARE Classic® installations

Bring benchmark security to mainstream contactless smartcard applications with minimum effort, using this seamless upgrade for existing MIFARE Classic infrastructure and services.

KEY FEATURES

- ↳ Entry-level version of proven MIFARE Plus family
- ↳ 1 kB EEPROM
- ↳ Simple fixed memory structure compatible with MIFARE Classic
- ↳ Full support for MIFARE Classic value-block operations
- ↳ AES for authenticity and integrity
- ↳ NXP originality check
- ↳ Freely configurable access conditions
- ↳ Supports ISO/IEC 14443-3A UIDs (4-byte NUID, 7-byte UID)
- ↳ Optional support of random IDs
- ↳ Multi-sector authentication, multi-block read and write
- ↳ Anti-tearing mechanism for writing AES keys
- ↳ Keys can be stored as MIFARE Crypto1 keys (2 x 48 bits per sector) and AES keys (2 x 128 bits per sector)
- ↳ Virtual card concept
- ↳ Communications speed up to 848 kbit/s
- ↳ Number of single write operations: 200,000 typical

KEY BENEFITS

- ↳ Minimum effort: compatibility with MIFARE Classic generations in SL1
- ↳ Added security: issue AES-ready cards in existing MIFARE Classic installations
- ↳ Sound investment: cost-effective preparation for AES secure credentials

APPLICATIONS

- ↳ Access management
- ↳ Public transport
- ↳ School and campus cards
- ↳ Employee cards
- ↳ Electronic toll collection
- ↳ Car parking



MIFARE Plus SE is the entry-level version of NXP's proven and reliable MIFARE Plus product family. Designed for full functional compatibility with MIFARE Classic 1K, MIFARE Plus SE provides complete support for the MIFARE Classic value blocks.

MIFARE Plus is the only mainstream smartcard product family compatible with MIFARE Classic 1K and MIFARE Classic 4K that offers pre-issuance of cards prior to making security upgrades in the infrastructure. After a security upgrade to Security Level 3, MIFARE Plus uses Advanced Encryption Standard (AES) for authentication, data integrity, and encryption.

MIFARE Plus SE is the choice for end customers who want to switch to higher security while preparing for the future by

introducing cards, ready for AES security, into the existing system environment.

MIFARE Plus SE cards are easy to distribute into running MIFARE Classic systems, since MIFARE Plus SE uses the same linear memory structure as MIFARE Classic, and because MIFARE Plus SE supports all MIFARE Classic value-block operations in the Security Levels SL1 and SL3. MIFARE Plus SE stores its 128-bit AES keys on top of the data blocks. The optional AES authentication in SL1 enables efficient detection of cards not belonging to the system.

Feature comparison: MIFARE Plus S and MIFARE Plus SE

| Feature | MIFARE Plus S | MIFARE Plus SE |
|--|--|--|
| Available memory size (kB) | 2, 4 | 1 |
| Input capacitance (pF) | 17 | 17 |
| Security levels | SL0, SL1, SL3 | SL0, SL1, SL3 |
| Maximum transfer data buffer size in ISO/IEC 14443-4 (B) | 64 | 64 |
| ID | 7 B UID or 4 B ONUID | 7 B UID or 4 B ONUID |
| Clone protection in SL1 (with optional AES authentication) | Yes | Yes |
| Encryption in SL1 | Crypto1 with optional AES authentication | Crypto1 with optional AES authentication |
| Value block operations | No | Yes |
| Common Criteria certifications (HW & SW) | EAL 4+ | Based on EAL4+ certified platform |
| AES key personalization | SL0, SL3 | SL0, SL3 |
| Virtual Card architecture for privacy protection | Yes | Yes |
| Proximity check against relay attacks (with L3 command) | Yes | Yes |
| Delivery formats | Wafer (120 µm), MOA4, MOA8 | Wafer (120 µm), MOA4, MOA8 |

Ordering information

| Type number | Description | Package | 12NC |
|------------------|---------------------------------|--------------------------------|----------------|
| MF1SEP1001DUD/03 | MIFARE Plus SE, 1 kB, 7 B UID | FFC bump (120 µm, 8"), UV tape | 9353 061 61005 |
| MF1SEP1001DA4/03 | MIFARE Plus SE, 1 kB, 7 B UID | MOA4 | 9353 061 62118 |
| MF1SEP1001DA8/03 | MIFARE Plus SE, 1 kB, 7 B UID | MOA8 | 9353 061 63118 |
| MF1SEP1031DUD/03 | MIFARE Plus SE, 1 kB, 4 B ONUID | FFC bump (120 µm, 8"), UV tape | 9353 061 71005 |
| MF1SEP1031DA4/03 | MIFARE Plus SE, 1 kB, 4 B ONUID | MOA4 | 9353 061 72118 |
| MF1SEP1031DA8/03 | MIFARE Plus SE, 1 kB, 4 B ONUID | MOA8 | 9353 061 73118 |



www.MIFARE.net

www.nxp.com

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