MIFARE Plus

MIFARE Plus brings benchmark security to mainstream contactless smart card applications. It is the only mainstream IC compatible with MIFARE Classic offering a seamless upgrade path, with minimal effort, for existing infrastructure and services.

Key applications
- Public transportation
- Access management, e.g. employee, school or campus cards
- Electronic toll collection
- Car parking
- Loyalty programs

Key features
- Keys can be stored as MIFARE Classic CRYPTO1 keys (2 x 48 bit per sector) or as AES keys (2 x 128 bit sector)
- Supports virtual card concept
- High data rates up to 848 kbit/s
- Available in MOA4 modules or 8-inch sawn bumped wafer

NXP MIFARE Plus is based on open global standards both for air interface and cryptographic methods. It is available in two versions: MIFARE Plus S, the Slim version, for straightforward migration of MIFARE Classic systems, and MIFARE Plus X, the eXpert version, which offers more flexibility to optimize the command flow for speed, privacy and confidentiality. MIFARE Plus X offers a rich feature set, including proximity checks against relay attacks.

MIFARE Plus is fully functional backwards compatible with MIFARE Classic 1 K / 4 K. Interoperability with MIFARE Classic has been verified by the independent MIFARE Certification Institute. MIFARE Plus offers the possibility to issue cards seamlessly into existing MIFARE Classic applications, before the infrastructure is upgraded. Once the security upgrades are in place, MIFARE Plus cards can be switched to a more secure mode in the field with no customer interaction necessary.
AV2 (secure application module) is available. The Common Criteria 5+ certified IC includes all MIFARE Plus commands, secure key storage and AES calculation for a reader device. To support the design-in process for reader manufacturers and solutions developers, NXP provides MIFARE Plus documentation, application notes, and software toolkits.

Secure application module

Security levels

MIFARE Plus cards supports one pre-personalization and 3 security levels. Cards operate in one security level at any given time and can only be switched to a higher level.

An automatic anti-tear mechanism is available for secure deployment of rolling keys. If a card is removed from the field during a key update, it either concludes the update or automatically falls back to the previous key. NXP recommends 7 Byte UID, but offers 4 B UID versions of MIFARE Plus during migration. MIFARE Plus is available in the proven MOA4 module and as sawn bumped wafers, no changes for existing manufacturing processes necessary. For benchmark security on the reader side, the MIFARE SAM AV2 (secure application module) is available. The Common Criteria 5+ certified IC includes all MIFARE Plus commands, secure key storage and AES calculation for a reader device. To support the design-in process for reader manufacturers and solutions developers, NXP provides MIFARE Plus documentation, application notes, and software toolkits.

MIFARE pedigree

The NXP MIFARE portfolio is the leading technology platform for contactless ticket, card, and reader solutions. It is a proven and reliable technology and, with more than 15 million reader ICs, 1 billion card ICs, and 800 million smart ticket ICs sold, has the largest installed base worldwide. MIFARE complies with the international standard ISO/IEC 14443 A, ensuring that today's infrastructure can easily be upgraded. It makes it possible for service providers to expand their transportation networks and integrate additional services, such as payment systems for taxi fares, cinema and theatre tickets, loyalty programs, access management, and parking – while reducing the total costs of operations.

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