



NXP® MIFARE® DESFire® EV1

Highspeed, contactless, multi-application solution for smart cards

MIFARE DESFire EV1 is ideal for combining and supporting multiple applications on one contactless smart card. It fully complies with the requirements for fast and secure data transmission, flexible memory organization, and interoperability with existing infrastructure.

KEY FEATURES

- ▶ Fully ISO/IEC 14443 A 1-4 compliant
- ▶ 256B, 2/4/8 kB EEPROM with fast programming
- ▶ NFC Tag Type 4 compliant
- ▶ Secure, high-speed command set
- ▶ High data rates according to ISO/IEC 14443-4: up to 848 Kbit/s
- ▶ Choice of open DES/2K3DES/3KDES/AES
- ▶ Crypto algorithm in hardware
- ▶ Anti-collision
- ▶ Privacy protection
- ▶ Unique 7-byte serial number (ISO Cascade Level 2)
- ▶ Data integrity: CRC and bit counting on physical layer
- ▶ Available in MOA4 modules or 8" sawn bumped wafer
- ▶ Common Criteria certification: EAL4+ for IC HW and SW

TARGET APPLICATIONS

- ▶ Advanced public transportation
- ▶ Access management
- ▶ E-Government, including social services
- ▶ Closed-loop micropayment
- ▶ Loyalty programs

KEY BENEFITS

- ▶ Flexible file system
- ▶ Multiple crypto support on one single card
- ▶ Full NFC compliance



CONTACTLESS CONVENIENCE

MIFARE DESFire EV1 is based on open global standards for both air interfaces and cryptographic methods. It is compliant to all four levels of ISO/IEC 14443 A and uses optional ISO/IEC 7816-4 commands. Featuring an on-chip backup management system and the mutual three-pass authentication, a MIFARE DESFire EV1 card can hold up to 28 different applications and 32 files per application. The size and access conditions of each file are defined at the moment of its creation, making MIFARE DESFire EV1 a truly flexible and convenient product. Additionally, an automatic anti-tear mechanism is available for all file types, which guarantees transaction-oriented data integrity. With MIFARE DESFire EV1, data transfer rates up to 848 Kbit/s can be achieved, making fast data processing possible. The chip's main characteristics are denoted by its name: DESFire EV1, the first evolution of MIFARE DESFire. "DES" indicates the commitment for high levels of security—MIFARE DESFire EV1 uses a DES, 2K3DES, 3K3DES and AES hardware cryptographic engine for securing transmission data.

"Fire" represents its outstanding position as a Fast, Innovative, Reliable and Enhanced IC in the contactless proximity transaction market.

MIFARE DESFire EV1 brings many benefits to end users. Cardholders experience convenient, contactless ticketing while having the ability to use the same device for applications such as closed-loop payment at vending machines, access management, loyalty or social services. In other words, the MIFARE DESFire EV1 silicon solution offers enhanced, consumer-friendly system design, in combination with security and reliability. The 70 pF option enables read range optimizations of small antenna form factors.

MIFARE DESFire EV1 delivers the perfect balance of speed, performance, and cost efficiency. Its open concept allows future seamless integration of other media such as smart paper tickets, key fobs, and mobile ticketing based on Near Field Communication (NFC) technology. It is also fully compatible with the existing MIFARE reader hardware platform.

FEATURES

| Memory | | Special Features | |
|-----------------------------|-------------------------|--------------------------------------|-------------------------------|
| EEPROM size | 2/4/8 kB | Multi-application | 28 applications, MAD3 |
| Write endurance [cycles] | 500,000 | Purse functionality | Value file |
| Data retention [yrs] | 10 | Transaction logging capability | Record file |
| Organization | Flexible file system | Secure transport transaction example | 512-byte read, 128-byte write |
| | | Related transaction time [ms] | 89 |
| Security | | Proximity check | Yes |
| Unique serial number [byte] | 7, cascaded | RF-Interface | |
| Random number generator | Yes | Acc. to ISO 14443A | Yes-up to layer 4 |
| Access keys | 14 keys per application | Frequency [MHz] | 13.56 |
| Access conditions | Per file | Baud rate [kbit/s] | 106 ... 848 |
| AES, 3DES & DES Security | MACing/Encipherment | Anti-collision | Bit-wise |
| Anti-tear supported by chip | Yes | Operating distance [mm] | Up to 100 |

ORDERING INFORMATION

| Packaging | MIFARE DESFire EV1 2 kB | MIFARE DESFire EV1 4 kB | MIFARE DESFire EV1 8 kB |
|--------------|-------------------------|-------------------------|-------------------------|
| 17 pF | Part Type | | |
| Sawn wafer | MF3ICD2101DUD/05 | MF3ICD4101DUD/05 | MF3ICD8101DUD/05 |
| MOA4 Module | MF3MOD2101DA4/05 | MF3MOD4101DA4/05 | MF3MOD8101DA4/05 |
| MOA8 Module | MF3MOD2101DA8/05 | MF3MOD4101DA8/05 | MF3MOD8101DA8/05 |
| 70 pF | Part Type | | |
| Sawn wafer | MF3ICDH2101DUD/05 | MF3ICDH4101DUD/05 | MF3ICDH8101DUD/05 |
| MOA4 Module | MF3MODH2101DA4/05 | MF3MODH4101DA4/05 | MF3MODH8101DA4/05 |
| MOA8 Module | MF3MODH2101DA8/05 | MF3MODH4101DA8/05 | MF3MODH8101DA8/05 |

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