



NXP IC solution for
contactless limited-use
applications with enhanced
security

MIFARE Ultralight C

MIFARE Ultralight C is the first smart card IC for limited-use applications that offers solution developers and providers the benefits of an open cryptography.

With 3DES, MIFARE Ultralight C uses a widely adopted standard, enabling easy integration in existing infrastructures. The integrated authentication command set provides an effective cloning protection that helps to prevent counterfeit of tickets.

Key applications

- ▶ Public transportation
- ▶ Event ticketing
- ▶ Loyalty
- ▶ NFC Forum tag type 2

Key features

- ▶ Fully ISO / IEC 14443 A 1-3 compliant
- ▶ 106 kbit/s communication speed
- ▶ Anti-collision support
- ▶ 1536 bits (192 bytes) EEPROM memory
- ▶ Protected data access via 3DES authentication
- ▶ Cloning protection
- ▶ Command set compatible to MIFARE Ultralight
- ▶ Memory structure as in MIFARE Ultralight (pages)
- ▶ 16 bit counter
- ▶ Unique 7 bytes serial number
- ▶ Number of single write operations: 10.000

Benefits for ticket manufacturers

- ▶ Easy integration in existing production processes
- ▶ Choice of three delivery formats: wafer, module and polymer strap (FCS2)

Benefits for solution developers

- ▶ Compliance to ISO / IEC 14443 A 1-3
- ▶ Backwards compatibility to MIFARE Ultralight
- ▶ Limited integration effort in MIFARE DESFire based solutions
- ▶ Enhanced security for limited-use applications
- ▶ Ease of use and proven toolkits
- ▶ Fast time-to-market

Benefits for solution providers

- ▶ Ability to detect cloned tickets
- ▶ Availability of statistical data to optimize the system
- ▶ Efficient fleet management
- ▶ Higher customer throughput
- ▶ Reduction of maintenance costs
- ▶ Reduction of cash handling
- ▶ Fraud prevention
- ▶ Easy system enhancement in limited-use applications

Contactless smart paper ticketing

NXP MIFARE Ultralight C represents a new security concept to the contactless limited-use market.

With its 3DES authentication, MIFARE Ultralight C reflects the trend for enhanced security in contactless applications.

Nowadays many solution providers eliminate double infrastructure where MIFARE Ultralight C provides the perfect solution for a complete contactless system. It can easily be integrated in existing MIFARE DESFire installations, re-using similar authentication commands.

MIFARE in figures

- ▶ In 1994, first MIFARE card & reader solution invented and launched by NXP engineers
- ▶ More than 650 cities and 50 countries adopted MIFARE solutions
- ▶ More than 40 different applications use MIFARE technology
- ▶ More than 10 million reader core components, 1 billion cards and 800 million smart ticket ICs distributed in the market
- ▶ More than 750 card manufacturers, reader manufacturers and solution developers registered and available at www.MIFARE.net

MIFARE Pedigree

NXP MIFARE is the leading technology platform for contactless ticket, card and reader solutions. With more than 10 million reader core components, 1 billion cards and 800 million smart ticket ICs sold, MIFARE is a proven and reliable technology, which represents the largest installed base worldwide.

Compliant with the ISO / IEC 14443 A international standard, MIFARE ensures that today's infrastructure can easily be upgraded. It enables solution providers to expand their transportation networks and to integrate additional services such as payment systems for taxi fares, cinema and theatre tickets, loyalty programs, access management and parking. And all while reducing the total costs of operations.

| Product Features | MIFARE Ultralight |
|------------------------------------|---------------------|
| Memory | |
| EEPROM size [byte] | 1536 |
| Write Endurance [cycles] | 10 000 |
| Data Retention [yrs] | 5 |
| Organization | Sectors, blocks |
| RF-Interface | |
| Acc. to ISO 14443 A | ISO 14443 |
| Baudrate [kbit/s] | 106 |
| Security | |
| Unique Serial Number [byte] | 7 |
| Random Number Generator | no |
| Cryptography | 3DES authentication |
| Packaging | |
| Sawn Wafer FFC Bump 17 pF type | MF01CU2001DUD |
| 12NC Sawn Wafer | 9352 875 76005 |
| Sawn Wafer FFC Bump 50 pF type | MF01CU2101DUD |
| 12NC Sawn Wafer | 9352 875 77005 |
| MOA4 Module 17 pF Type Description | MF0MOU2001DA4 |
| 12NC MOA4 Module 17 pF | 9352 875 78118 |
| MOA4 Module 50 pF Type Description | MF0MOU2101DA4 |
| 12NC MOA4 Module 50 pF | 9352 875 79118 |
| FCS2, 17 pF | Coming in 2009 |
| FCS2, 50 pF | Coming in 2009 |

MIFARE.net

www.nxp.com



©2008 NXP B.V.

All rights reserved. Reproduction in whole or in part is prohibited without the prior written consent of the copyright owner. The information presented in this document does not form part of any quotation or contract, is believed to be accurate and reliable and may be changed without notice. No liability will be accepted by the publisher for any consequence of its use. Publication thereof does not convey nor imply any license under patent- or other industrial or intellectual property rights.

Date of release: August 2008

Document order number: 9397 750 16620

Printed in the Netherlands