



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](http://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
<b>Memory</b>	
EEPROM size [bits]	1536
Write Endurance [cycles]	10 000
Data Retention [yrs]	5
Organization	Sectors, blocks
<b>RF-Interface</b>	
Acc. to ISO 14443 A	ISO 14443
Baudrate [kbit/s]	106
<b>Security</b>	
Unique Serial Number [byte]	7
Random Number Generator	no
Cryptography	3DES authentication
<b>Packaging</b>	
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](http://www.nxp.com)



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