



MIFARE® Classic Family



MIFARE® Classic Family—Card, Quictag, Keyfob and CombiWatch

1.0 Introduction

MIFARE® classic family is the pioneer and front runner in contactless smart card ICs operating in the 13.56MHz frequency range with read/write capability. It is available in a wide variety of transponder shapes, such as card, wristband, keyfob, and wristwatch.

1.1 MIFARE® card



MIFARE® card is a multi-application card supporting up to 40 different applications on the chip, each with its own dedicated keys and memory area.

It is in use around the globe and usually regarded as an alternative to barcode or other optical identification technology. Without doubt, MIFARE® card has already gained maturity in terms of its level of sophistication and coverage in the market and is ideal for applications of closed system and physical access control like fixed value tickets, parking cards, toll payment cards, student identification cards, employee cards and so forth.

Both MIFARE® 1K and 4K bytes cards are available.

1.2 MIFARE® Quictag



MIFARE® Quictag is a RFID (Radio Frequency Identification) silicone wristband with two different sizes for adults and kids. The ergonomic design of Quictag makes it a comfortable, virtually imperceptible device to wear regardless of conditions. In addition, thanks to its waterproof and luminous specialties, it is ideal for applications like membership identification for gym club, payment for water activities, and so forth.

MIFARE® 1K bytes Quictag is available.

1.3 MIFARE® Keyfob



MIFARE® Keyfob is a RFID (Radio Frequency Identification) ABS tag. The compact design makes it highly portable and easy to be attached to lanyard, key ring, etc. It is ideal for applications like health spas, student identification, public transportation and so forth.

MIFARE® 1K bytes Keyfob is available.

1.4 **MIFARE® CombiWatch**



MIFARE® CombiWatch is a trendy wristwatch designed to meet the fast growing contactless applications. It merges seamlessly a built-in contactless Mifare® module with a fashionable wristwatch for optimal user convenience. By integrating the Mifare® technology into the timepiece, it turns our classical watch into a portable, secure payment device.

CombiWatch can be used for multi-applications, ranging from transit payment to physical access control. It is handy yet easy to use with no training required. The high data transmission rate of the embedded Mifare® module allows quick and convenient transactions. CombiWatch can also be used as identification, employee, company or building access applications. With merely just a wave, you can experience the limitless possibilities of contactless applications.

MIFARE® 1K bytes CombiWatch is available.

2.0 Features

For MIFARE® 1K card, Quictag, Keyfob and Combiwatch:

- 1 kbyte EEPROM (768 Byte free available)
- Unique serial number (4 Byte)
- 16 securely separated sectors supporting multi-application
- Each sector consists 4 blocks with a length of 16 Byte
- 2 x 48 bit keys per sector for key hierarchy
- Access conditions free configurable based on 2 level key hierarchy
- Number of single write operations: 100.000
- Data retention: 10 years

For MIFARE® 4K card:

- 4 Kbyte EEPROM (3480 Byte free available)
- Unique serial number (4 Byte)
- 40 securely separated sectors supporting multi-application:
- 32 sectors consist of 4 blocks with a length of 16 Byte
- 8 sectors consist of 16 blocks with a length of 16 Byte
- 2 x 48 bit keys per sector for key hierarchy
- Access conditions free configurable based on 2 level key hierarchy
- Number of single write operations: 100.000
- Data retention: 10 years

3.0 Typical Applications

- Loyalty program: gym club, golf club, health club
- Entrance ticket applications: skiing, swimming pool, stadium, concert, football match, night pubs
- Time tracking: sports competitions like Marathon
- Electronic payment: pay fares in mass transit systems, retail stores, fast food chains and gas stations, water activities
- Logical Access Control (e.g.: Windows Logon)



4.0 Benefits

- Fast, secure and convenient transactions
- Reliable and proven technology in volume production
- Suitable for harsh environments - sealed reader units for reading contactless transponders are unaffected by humidity, sand, dust and vandalism

5.0 Technical Specification

Embedded MIFARE® Module

For MIFARE® 1K card, Quictag, Keyfob and CombiWatch:

IC Type MF1 S50
 Interface ISO14443A
 Protocol & Crypto MIFARE® Classic
 Memory 1 Kbytes EEPROM
 Operating Frequency 13.56 MHz, with read/write capability

For MIFARE® 4K card:

IC Type MF1 S70
 Interface ISO14443A
 Protocol & Crypto MIFARE® Classic
 Memory 4 Kbytes EEPROM
 Operating Frequency 13.56 MHz, with read/write capability

Operating Distance

Cards: up to 60mm
 Quictag: up to 60mm
 Keyfob: up to 35mm
 CombiWatch: up to 40mm

Operating Temperature

Cards: -25°C to 50°C
 Quictag: -40°C to 100°C
 Keyfob: -10°C to 50°C
 CombiWatch: -20°C to 60°C

Storage Temperature

Cards: -25°C to 50°C
 Quictag: -40°C to 120°C
 Keyfob: -10°C to 50°C
 CombiWatch: -20°C to 60°C

Material

Cards: PVC
 Quictag: Silicone
 Keyfob: ABS
 CombiWatch: Case-ABS; Strap-Polyurethane; Lens- Acrylic; Brezel, case back, buckle & tongue- Stainless Steel

Dimension

Cards: 85mm x 54mm x 1mm
 Quictag: 202mm x 17.5mm (180mm x 17.5mm upon request)
 Keyfob: 28mm x35mm x7mm (blue model)/ 32mm x40mm x4mm (purple model)
 CombiWatch: 255 mm x 36 mm x 10mm

Power Source

Cards, Quictag, Keyfob: N/A
 CombiWatch: 1 x SR626 1.55V Silver Oxide Watch Battery (battery life of approx. 2 years)

Color Options

Cards: White (printing upon request)
 Quictag: White (luminous)/ red/ black/ yellow/ green/ blue/ red/ purple
 Keyfob: Blue/ purple
 CombiWatch: Black/ purple

Weight

Cards: 5g
 Quictag: 15g
 Keyfob: 5g
 CombiWatch: 20g