

MIFARE & ISO14443A & ISO14443B & ISO7816 & ISO15693 IC CARD MODULE

JMY600 Series IC Card Module

MIFARE 1K Card Operation Guide

(Revision 1.02)

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March 31, 2015



Please read this manual carefully before using. If any problem, please feel free to contact us, we will offer a satisfied answer ASAP.



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1 Overview

This file describes how to operate MIFARE 1K card and the sequence via using JMY600 Series RFID module. It is suitable for the programmers who are using it to do the development.

Any questions during the programming, please feel free to contact our technical support via jinmuyu@vip.sina.com.

2 Features

2.1 MIFARE RF Interface (ISO/IEC 14443 A)

- Contactless transmission of data and supply energy
- Operating distance: Up to 100mm (depending on antenna geometry)
- Operating frequency: 13.56 MHz
- Fast data transfer: 106kbit/s
- High data integrity: 16 Bit CRC, parity, bit coding, bit counting
- Anticollision
- Typical ticketing transaction time of < 100 ms (including backup management)
- 7 Byte UID or 4 Byte NUID
- Random ID support (7 Byte UID version)
- NXP Originality Check support

2.2 EEPROM

- 1 kB, organized in 16 sectors of 4 blocks(one block consists of 16 byte)
- User definable access conditions for each memory block
- Data retention time of 10 years
- Write endurance 200000 cycles

2.3 Applications

- Public transportation
- Electronic toll collection
- School and campus cards
- Internet cafes
- Access management
- Car parking
- Employee cards
- Loyalty



3 General Description

NXP Semiconductors has developed the MIFARE Classic MF1S50yyX/V1 to be used in a contactless smart card according to ISO/IEC 14443 Type A. The MIFARE Classic EV1 1K MF1S50yyX/V1 IC is used in applications like public transport ticketing and can also be used for various other applications.

4 Memory Organization

4.1 EEPROM memory

The 1024*8 bit EEPROM memory is organized in 16 sectors of 4 blocks. One block contains 16 bytes.

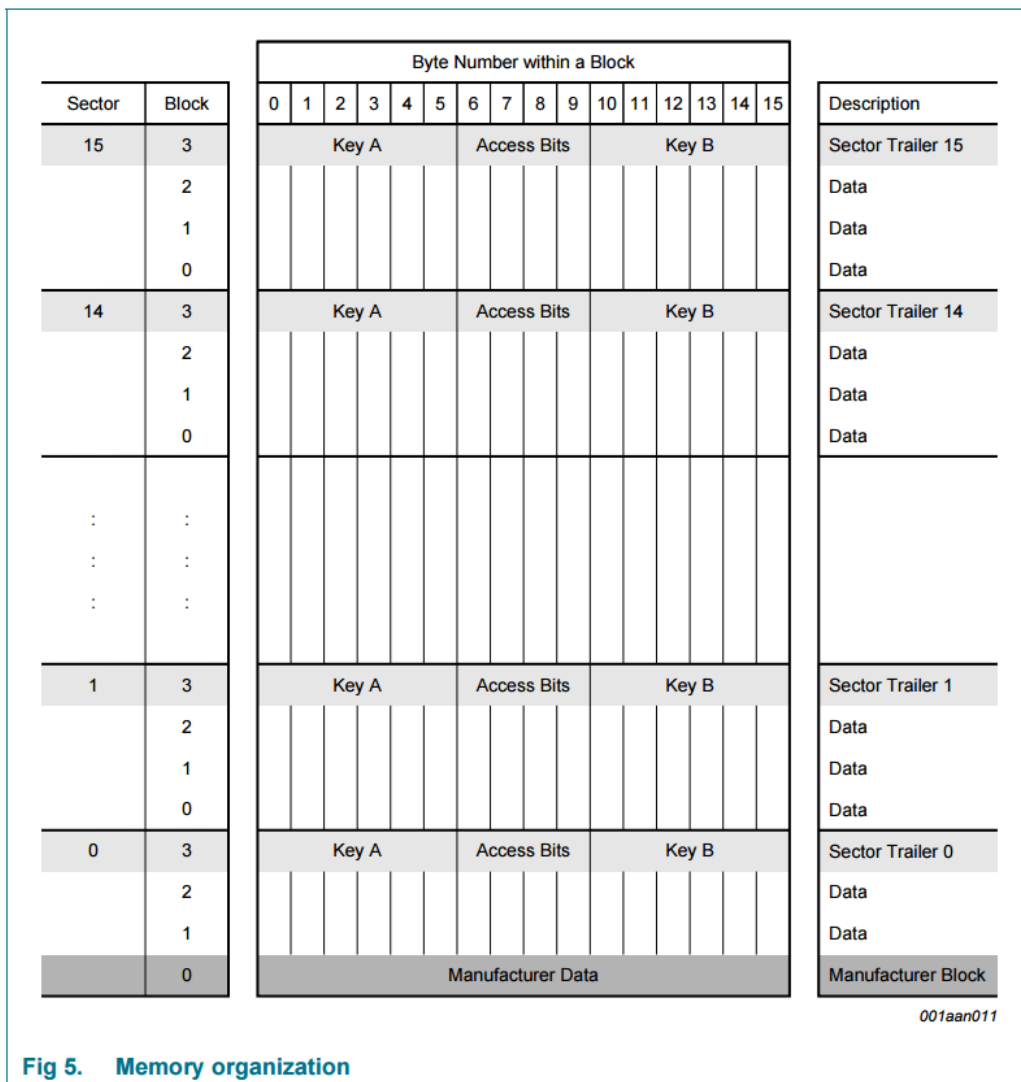
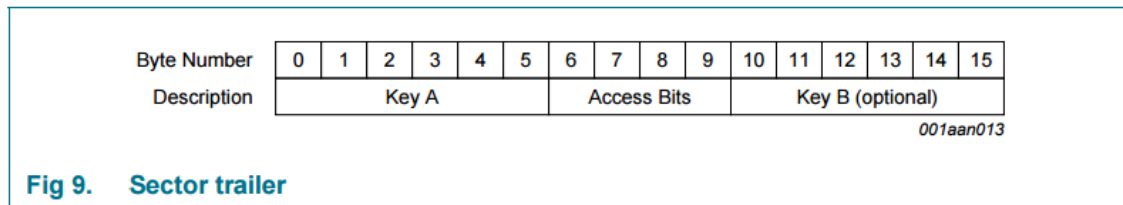


Fig 5. Memory organization



4.2 Sector trailer

All keys are set to FFFF FFFF FFFFh at chip delivery and the bytes 6, 7 and 8 are set to FF0780h.



5 Card Operation

5.1 Active Mode

"Automatic detection card" only can be used via UART or RS232C interface. Under this function, the reader module output card Serial Number.

Under this working mode, the following information, you can refer to:

Continuous or discontinuous output card SNR

HEX or ASCII format output:

As an example: "Continuous output card Serial Number" + "HEX format output". We need choose "JCP04 communication protocol" to send the configuration commands via TransPort.

- TransPort input: 1E 03
- Host sends: 03 1E 03 1E
- Success: 02 1E 1C

SNR output:

- TransPort Close
- SSCOM Open, Choose the suitable Port, Baudrate 19200bps, and HEX display

Then put the MIFARE 1K Card within the Antenna field, if the Module with Buzzer, the Buzzer will beep. And the SNR will output continuously on the SSCOM display. The output data:

"09 20 8D CE F8 01 04 00 00 97" This is JCP04 protocol data packet. We choose JCP04 as an example, because of the data packet is less. (09 is Length; 20 is Command; "8D CE F8 01" is card Serial Number; "04 00" is ATQA; 00 is SAK; 97 is Checksum).

Each MIFARE 1K Card Serial Number is unique, that can be used as identification.

Module reset to factory default:

- TransPort input: 0F 52 45 53 45 54
- Host sends: 07 0F 52 45 53 45 54 5D
- Success: 02 0F 0D

After the power on, the Tested Module will be in factory default.



5.2 Passive Mode

During the MIFARE 1K Card operations, the Module ICC Pin need be connected with User System. When the Auto-detecting Mode is ON, at this time the "MIFARE 1K Request" function is prohibited. Once the Card is within the Antenna field, the IIC Pin will be in low level, you can directly send Read/Write commands to the Reader Module.

If the ICC Pin cannot be connected with User System, please use command 0x20 to request the Card. And then operate the requested the Card.

Put a new MIFARE 1K Card (Key: FF FF FF FF FF FF) into the antenna field, then to do the test via TransPort test tool. Please send the commands like the following sequence.

- MIFARE 1K Request:
TransPort input: 20 00
Host sends: 00 05 00 20 00 25
Success: 00 0B 01 20 BD 32 30 63 04 00 08 FA
 - MIFARE 1K Data Block Read:
TransPort input: 21 00 00 FF FF FF FF FF FF
Host sends: 00 0C 00 21 00 00 FF FF FF FF FF FF 2D
Success: 00 14 01 21 BD 32 30 63 DC 08 04 00 62 63 64 65 66 67 68 69 38
 - MIFARE 1K Multi-Blocks Read:
TransPort input: 2A 00 01 02 FF FF FF FF FF FF
Host sends: 00 0D 00 2A 00 01 02 FF FF FF FF FF FF 24
Success: 00 24 01 2A 05 03 02 01 FA FC FD FE 05 03 02 01 02 FD 02 FD 05 03 02 01 FA FC FD FE 05 03 02 01 02 FD 02 FD 0F
 - MIFARE 1K Data Block Write:
TransPort input: 22 00 01 FF FF FF FF FF FF 00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F
Host sends: 00 1C 00 22 00 01 FF FF FF FF FF FF 00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F 3F
Success: 00 04 01 22 27
 - MIFARE 1K Multi-Blocks Write:
TransPort input: 2B 00 01 02 FF FF FF FF FF FF 00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F 10 11 12 13 14 15 16 17 18 19 1A 1B 1C 1D 1E 1F
Host sends: 00 2D 00 2B 00 01 02 FF FF FF FF FF FF 00 01 02 03 04 05 06 07 08 09 0A 0B 0C 0D 0E 0F 10 11 12 13 14 15 16 17 18 19 1A 1B 1C 1D 1E 1F 05
Success: 00 04 01 2B 2E
- Note: If you need use MIFARE 1K Card Purse functions, you need initialize the Data Block to be Purse State first.
- MIFARE 1K Purse Block Initialization:
TransPort input: 23 00 02 FF FF FF FF FF FF 04 03 02 01
Host sends: 00 10 00 23 00 02 FF FF FF FF FF FF 04 03 02 01 35
Success: 00 04 01 23 26
 - MIFARE 1K Purse Read:
TransPort input: 24 00 02 FF FF FF FF FF FF
Host sends: 00 0C 00 24 00 02 FF FF FF FF FF FF 2A



Success: 00 08 01 24 04 03 02 01 29

- MIFARE 1K Purse Increment:

TransPort input: 25 00 02 FF FF FF FF FF FF 01 00 00 00

Host sends: 00 10 00 25 00 02 FF FF FF FF FF FF 01 00 00 00 36

Success: 00 04 01 25 20

- MIFARE 1K Purse Decrement:

TransPort input: 26 00 02 FF FF FF FF FF FF 01 00 00 00

Host sends: 00 10 00 26 00 02 FF FF FF FF FF FF 01 00 00 00 35

Success: 00 04 01 26 23

- MIFARE 1K Purse Backup:

TransPort input: 27 00 02 01 FF FF FF FF FF FF 29

Host sends: 00 0E 00 27 00 02 01 FF FF FF FF FF FF 29 03

Success: 00 04 01 27 22

- MIFARE 1K Card Halt:

TransPort input: 28

Host sends: 00 04 00 28 2C

Success: 00 04 01 28 2D