

FUDAN MICROELECTRONICS



复旦微电子

FM1208 Contactless CPU Card

Datasheet

May. 2008



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1. Product Overview

1.1. Description

FM1208 is an Contactless CPU card designed by Fudan Microelectronics Co.,Ltd. It is designed to support both Electronics Wallet and existing Pulic Traffic RF Card based on ISO14443-A contactless interface platform. Furth more, it support CPU card based on PBOC2.0 Standard.

1.2. Feature

- Contactless RF interface according to ISO/IEC14443 TypeA
- MCU command set compatible with Turbo 8051
- Support 106Kbps data transmission
- Triple-DES/Single-DES processor
- Program memory: 32K x 8bit ROM
- Data memory: 8K x 8bit EEPROM
- iRAM: 256 x 8bit
- xRAM: 384 x 8bit
- SPA、DPA resistant controller
- Reset controller of low voltage detection
- Reset controller of High/Low frequency detection
- Memory data encryption (ROM、EEPROM、RAM)
- ROM code reverse resistant
- EEPROM endurance: minimum 100,000
- EEPROM data retention: 10 years minimum

Typical Dealing Time:

- ◆ Identifying Card 3ms (include REQA/ANTI-COLLISION/SELECTION)
- ◆ EEPROM Erase and Write time 2.4ms
- ◆ Typical ticketing transaction <350ms

Security Features:

1. DPA resistant
2. Frequency sensors
3. ROM code not visible due to implantation, encryption of memory data

1.3. Block Diagram

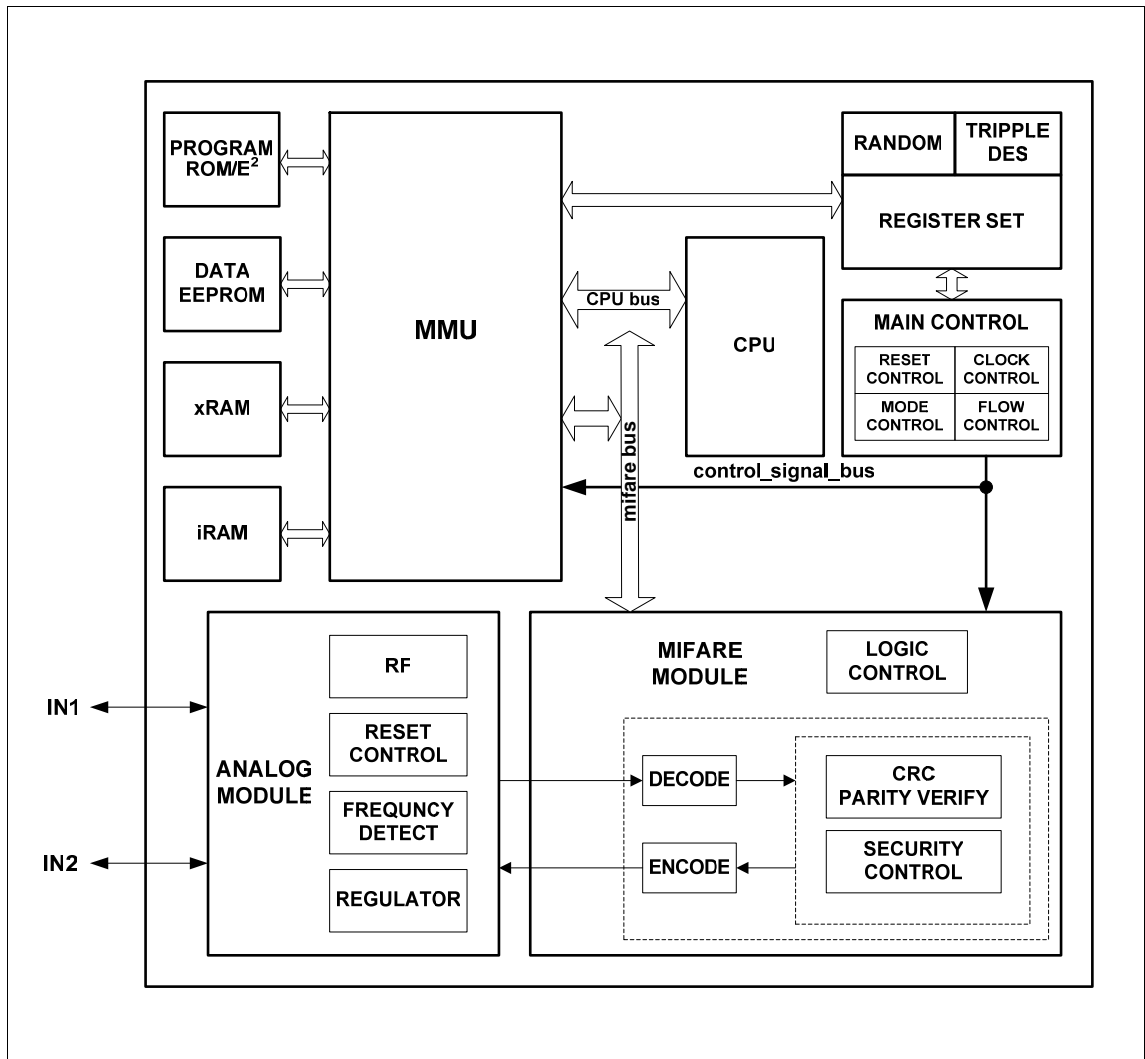


Figure 1-1 FM1208 Block diagram

1.4. Absolute Maximum Ratings

1.4.1. Module Maximum Ratings

Parameter	Symbol	Range	Unit
Operating Temperature	Topr	-25 - +70	°C
Storage Temperature	Tstr	-25 - +85	°C
ESD*	Vesd	4000 (minimum)	V

Table 1-1 FM1208 Module Maximum Ratings

1.4.2. Card Maximum Ratings

Parameter	Symbol	Range	Unit
Operating Temperature	Topr	0 - +70	°C
Storage Temperature	Tstr	-20 - +70	°C
ESD*	Vesd	6000 (最小)	V

Table 1-2 FM1208 Card Maximum Ratings

1.5. Package

FM1208 module: XOA2

FM1208 card: according to ISO7810 5.1.1

1.6. Pin Description

Number	Symbol	Type	Function
1	IN1	inout	Coil connection pin 1
2	IN2	Inout	Coil connection pin 2

Table 1-3 FM1208 Pin Description

1.7. ATQA and SAK Description

Type	ATQA	SAK
FM1208	0x0008	0x20

Table 1-4 FM1208 ATQA and SAK Description

2. Operating Flow

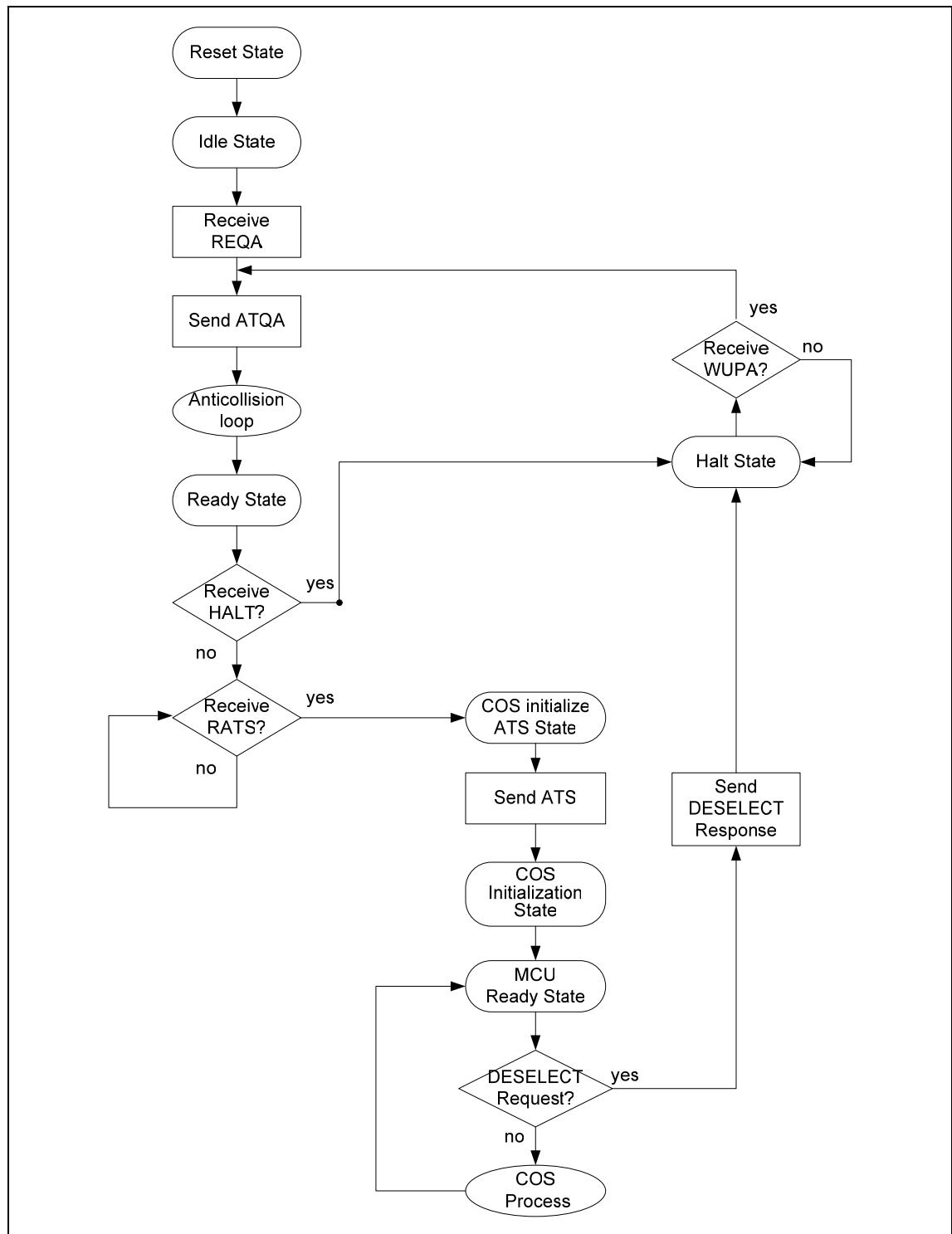


Figure 2-1 FM1208 Operating Flow

3. Memory Organisation

FM1208 include internal memory and external memory (according to MCU). External memory includes program memory and data memory. The size of data memory is 8K byte.

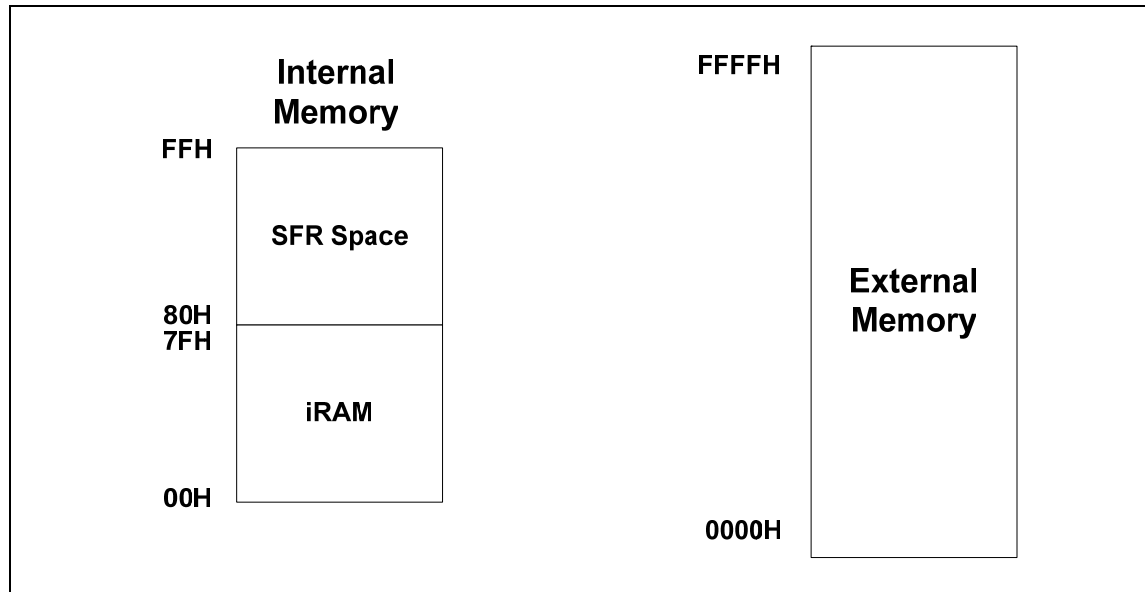
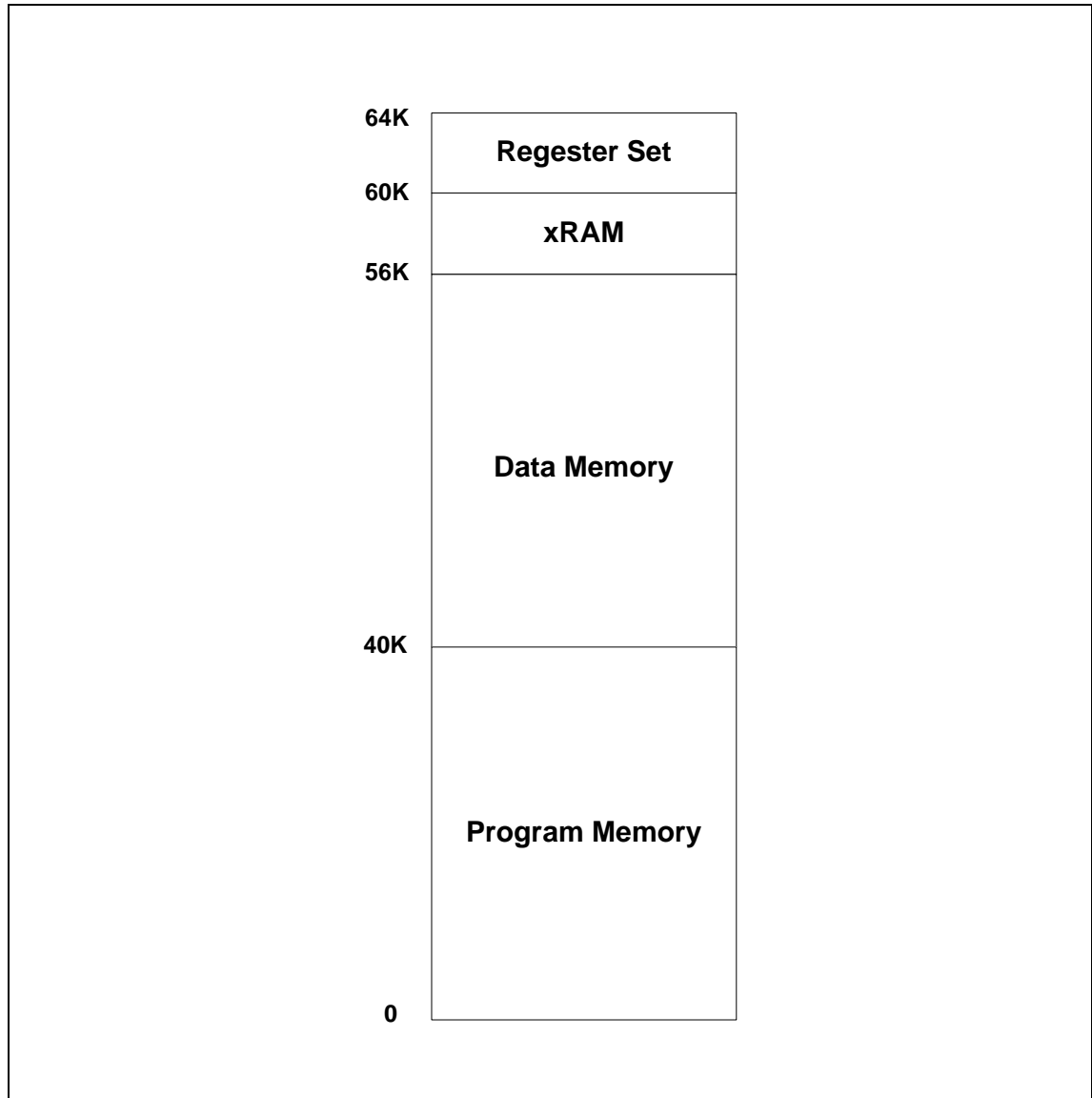


Figure 3-1 FM1208 Memory Organisation

External Memory Organisation:

Number	Address	Size	Description
1	0000H ~ 9FFFH	40K	Program Memory
2	A000H ~ DFFFH	16K	Data Memory
3	E000H ~ EFFFH	4K	xRAM
4	F000H ~ FFFFH	4K	Register set

Table 3-1 FM1208 External Memory Organisation

External Memory Organisation:**Figure 3-2 FM1208 External Memory Organisation**

4. Command Set

CPU command compatible to Turbo51 command set.

Common command set:

Command	Code (HEX)	Description
request std	26	Answer to Request Look for card in operating area. 'Request Std' means looking for card which is not set to halt
request all	52	Answer to Request Look for card in operating area. 'Request All' means looking for all cards which are in operating area
Anti-collision	93	Anti-collision It means selecting only one card if there is one card or several cards in operating area.
Select Card	93	Select Card It means setting up the communication with the selected card after the anti-collision command.
Halt	50	Halt Card is set to halt.

Table 4-1 FM1208 Command Set



5. Ordering Information

Ordering Code	Package	Operation Temperature
FM1208-X0A2	XOA2 module	-25°C ~ +70°C



6. Revision History

Version	Publication date	Pages	Paragraph or Illustration	Revise Description
0.1	Oct. 2007	13		Prelimily Release.
0.2	May. 2008	13	Sales and service	Updated the address of HK office.



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