



复旦微电子

FM13UF011X ***EPC Gen2 UHF Tag Chip***

Datasheet

Mar. 2024



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1 Description

FM13UF011X (shorted to UF011X) is an UHF Tag Chip IC developed by Fudan Microelectronics Company in accordance with EPC Global Class1 Gen2V2 and ISO/IEC 18000-63(TypeC).

Please contact Fudan Microelectronics Company to get more documents to support the detailed design and development.

2 Product Overview

2.1 Introduction

UF011X is an UHF Tag Chip IC developed by Fudan Microelectronics Company. The chip is in accordance with EPC Global Class1 Gen2V2 and ISO/IEC 18000-63(TypeC). UF011X has dual differential RF ports. Omni-directional tag can be realized with this chip and an appropriate antenna.

With the industry-leading RF Performance, the UF011X is particularly well suited for inventory management applications, supply chain management, personnel or vehicle identification, library management, airline luggage tracking, intelligent manufacturing and other fields.

2.2 Product Features

2.2.1 Contactless Interface

- EPC Global Class1 Gen2V2 & ISO/IEC 18000-63 compliant
- Frequency Range: 840~960MHz
- Anti-Collision
- Read sensitivity -23dBm
- Write sensitivity -21dBm
- Data rates:
 - Forward link 40~160Kbits/s
 - Reverse link 5~640Kbits/s

2.2.2 NVM Memory

- EPC memory: 128 bits, extensible to 528 bits;
- User memory: 512 bits
- TID memory: 96bits
- Reserved memory: 64bits, include 32bits Access password and 32bits Kill password
- Endurance: 100,000 cycles
- Data retention: 50 years

2.2.3 Security Features

- 96-bit Unique Tag Identifier (TID), factory locked, read only
- Password verification function
- Lock command
- Kill command

2.2.4 Features

- Backscatter strength configurable
- Memory erase/write speed configurable
- Product Status Flag(PSF) function



- Parallel Encoding function
- Ultra reliable data reading function, invoid sending back wrong EPC, TID, or User data
- Fast Initialization mode

2.3 Function Block Diagram

UF011X consists of three major blocks:

- Analog Part
- Digital Part
- NVM Memory

The analog part provides stable supply voltage harvested from the field and demodulates data received from the reader which is then transfered to the digital part. The modulation transistor of the analog part also transmits data back to the reader.

The digital section includes the state machines, processes the protocol and handles communication with the NVM memory.

The NVM memory contains the Reserved memory, TID, EPC and User memory.

FM13UF011X EPC TAG CHIP

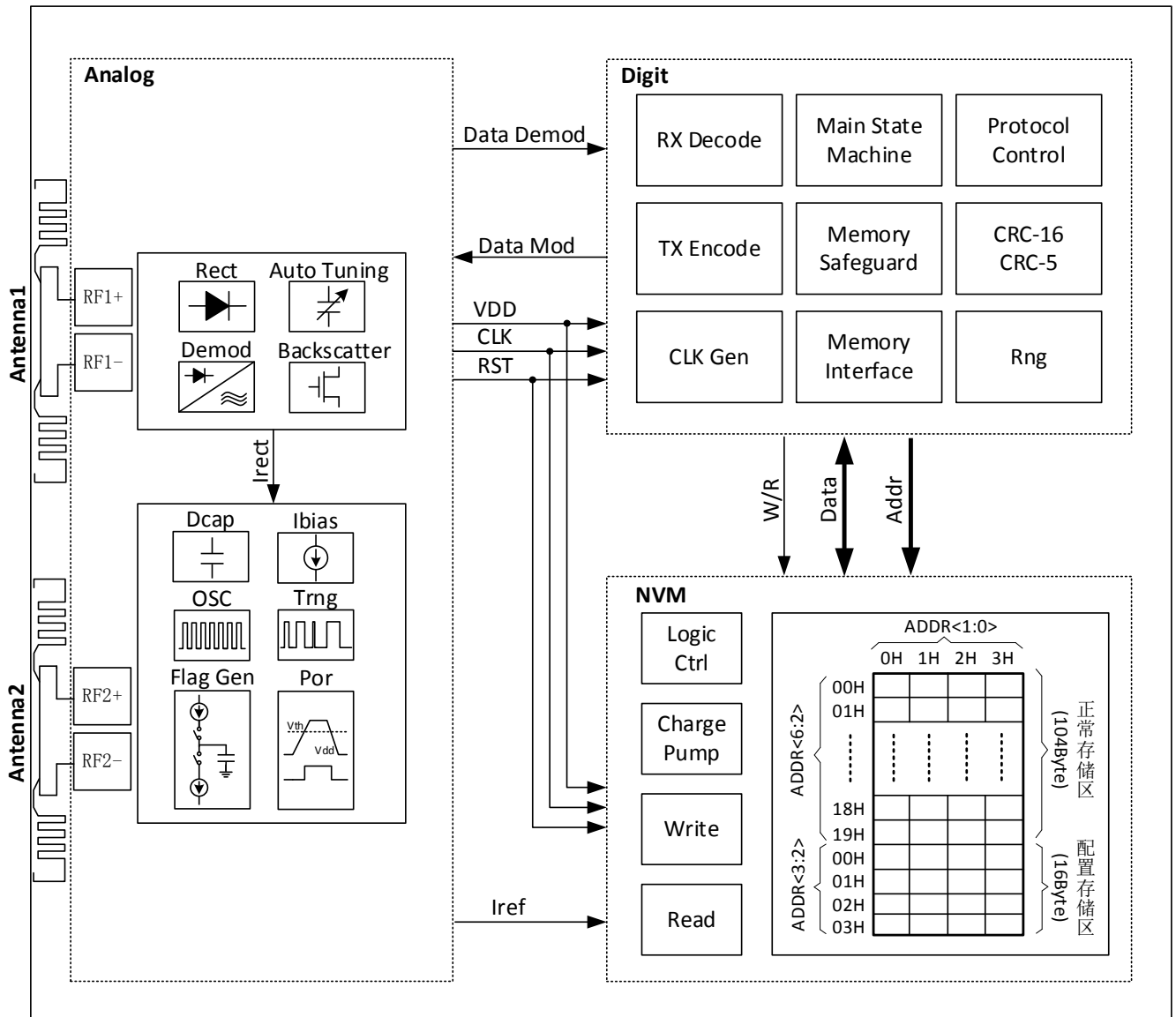


Figure 2-1 FM13UF011X Block diagram

2.3.1 Pin Information

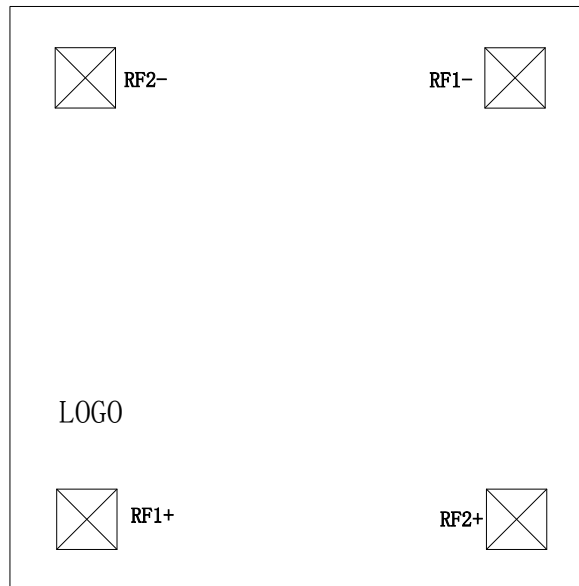


Figure 2-2 Pin assignment,Bumps

Table 2-1 Pin description, Bumps

Pin No.	Pin Name	Description
1	RF1+	The first RF antenna connection pin
2	RF1-	The first RF antenna connection pin
3	RF2+	The second RF antenna connection pin
4	RF2-	The second RF antenna connection pin

3 Ordering Information

Device number	Package	Packing
FM13UF011X-040-WTBU2-C	Bump Sawn Wafer	12 inch bump wafer (sawn, 120 um thickness, UV exposure, on film frame carrier)
FM13UF011X-041-WTBU2-C	Bump Sawn Wafer	12 inch bump wafer (sawn, 120 um thickness, UV exposure, on film frame carrier)

FM	13UF	01	1X	-	XXX	-	XXXXXX	-	X
Company name prefix									
FM: Shanghai Fudan Microelectronics									
Product family									
13UF: UHF tag chip									
Product Memory									
01: about 1Kbits									
Product version									
1: First Gen									
X: EPC Gen and ISO18000-63 (Type C) compliant, Omni-directional antenna									
Model Number									
040: data verification function is enabled.									
041: data verification function is disabled.									
Package									
WTBU2: Bump Wafer									
Packing Code									
C: sawn wafer packing									



Revision History

Rev	Release date	Pages	Modifications
1.0	Mar. 2024	11	Initial Release Version.



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