Shanghai Fudan Microelectronics Group Company Limited

复旦微电子

FM13UF0051E
EPC Gen2 UHF Tag Chip

Datasheet

Mar. 2024

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1 Description

FM13UF0051E (shorted to UF0051E) 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

UF0051E 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).

With the industry-leading RF Performance, the UF0051E 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
- Frequence Range: 840~960MHz
- Anti-Collision
- Read sensitivity -24dBm
- Write sensitivity -23dBm
- Data rates:
  - Forward link 40~160Kbits/s
  - Reverse link 5~640Kbits/s

2.2.2 NVM Memory

- EPC memory: 160 bits
- User memory: 32 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

UF0051E 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.

FM13UF0051E EPC TAG CHIP

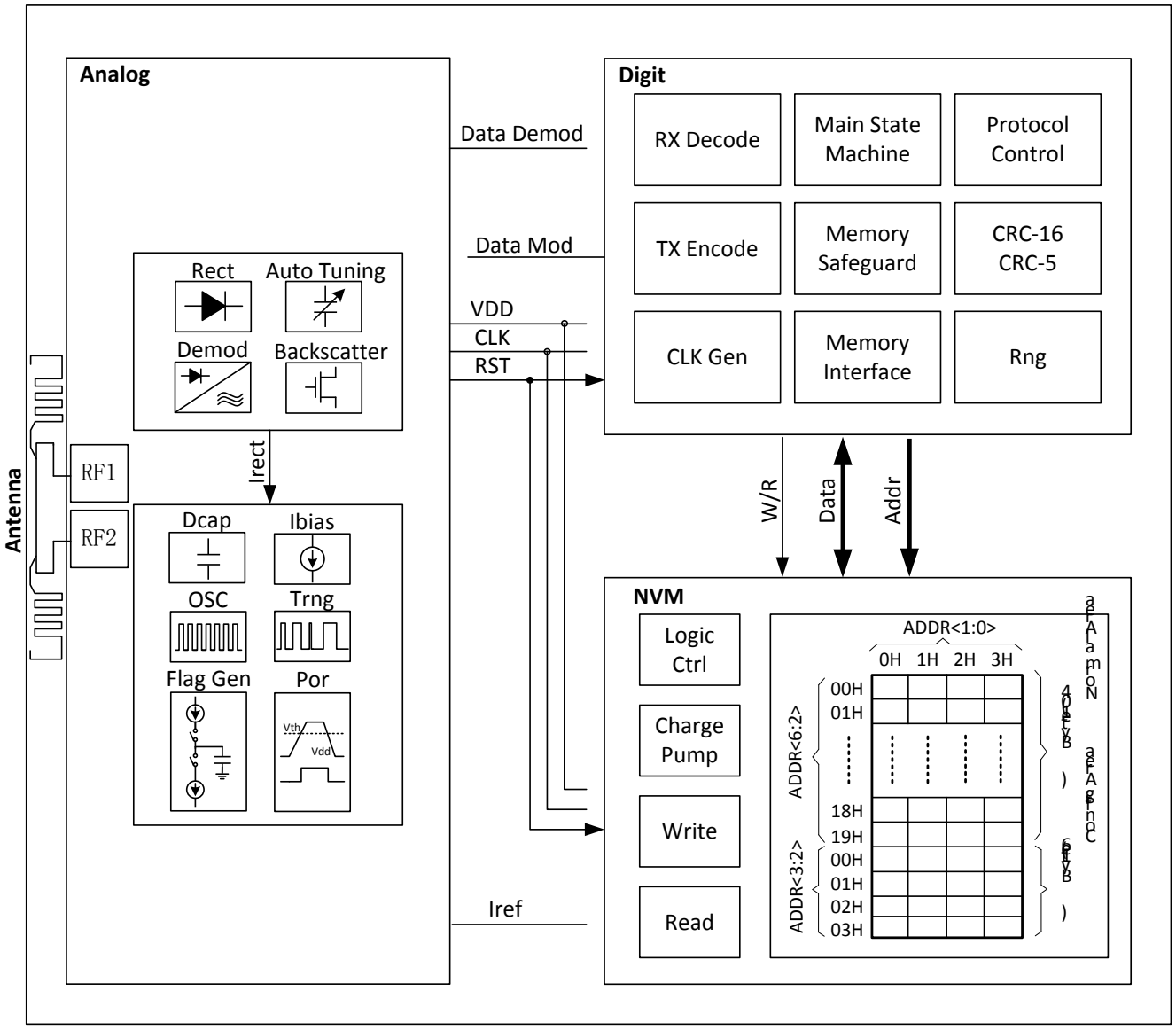

Figure 2-1 FM13UF0051E Block diagram

2.3.1 Pin Information

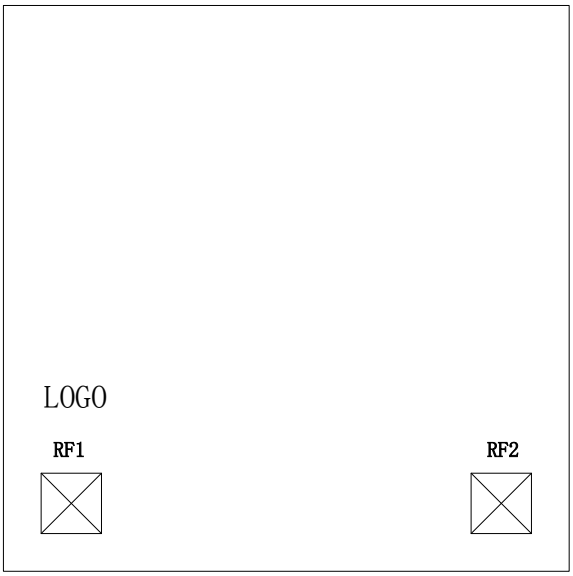

Figure 2-2 Pin assignment,Bumps

Table 2-1 Pin description, Bumps

Pin No.	Pin Name	Description
1	RF1	RF antenna connection pin
2	RF2	RF antenna connection pin

3 Ordering Information

Device number	Package	Packing
FM13UF0051E-020-WTBU2-C	Bump Sawn Wafer	12 inch bump wafer (sawn, 120 um thickness, UV exposure, on film frame carrier)
FM13UF0051E-021-WTBU2-C	Bump Sawn Wafer	12 inch bump wafer (sawn, 120 um thickness, UV exposure, on film frame carrier)

FM 13UF 005 1E - XXX - XXXXX - X

Company name prefix

FM: Shanghai Fudan Microelectronics

Product family

13UF: UHF tag chip

Product Memory

005: about 0.5Kbits

Product version

1: First Gen

E: EPC Gen and ISO18000-63 (Type C) compliant

Model Number

020：data verification function is enabled.

021：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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