ST54D

NFC controller and Secure Element system-in-package

WFBGA

WFBGA 64-pin
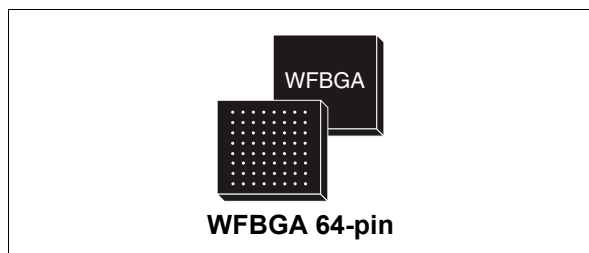
Features

- SIP (system-in-package) with ST21NFCB controller and ST33G1M2 32-bit secure microcontroller for UICC / SE applications

NFC controller

- Enhanced 8/16-bit CPU core with 16 Mbytes linear addressable memory
- 180 Kbytes of EEPROM
- 6.4 Kbytes of RAM
- 36 Kbytes of EEPROM
- High integrated analog front end (AFE) for RF transmission and reception including automatic card and field detection modes
- Battery Off and Switched Off modes supported in Card Emulation mode
- Optimized power consumption modes
- Battery voltage monitoring
- Support for up to 3 external Secure Elements
- System clock
  - FracN PLL input range from 12 to 52 MHz
  - 27.12 MHz external crystal oscillator
- Enhanced testability

Package

- WFBGA 64-pin 4x4x0.8, MSL 1, ECOPACK®2

RF communications

- Active mode – Peer-to-Peer
  - ISO/IEC 18092 - NFCIP-1 Initiator & Target
- Passive mode – Reader/Writer
  - NFC Forum Type 1/2/3/4 tags
  - ISO/IEC 15693
  - MIFARE® Classic[a][b]

  - KOVIO Barcode
- Passive mode – Peer-to-Peer
  - ISO/IEC 18092 - NFCIP-1 Initiator & Target
- Passive mode – Card Emulation
  - ISO/IEC 14443 Type A & B
  - JIS X 6319 – 4

Communication interfaces

- Three SWP interfaces up to 1.695 Mbit/s
- I^2C Slave interface up to 1 Mbit/s
- SPI Slave interface up to 4 Mbit/s

Secure microcontroller

- ARM® SecurCore® SC300™ 32-bit RISC core
- 1280 Kbytes of Flash memory available
- 30 Kbytes of RAM
- ISO/IEC 7816-3 interface for T=0 and T=1 protocols (master/slave mode)
- Single wire protocol (SWP) Interface for communications with NFC router
- SPI master/slave interface

Secure operating system

- Supports state of the art Secure Element operating systems:
  - JavaCard™ 3.0.4 Classical Edition
  - GlobalPlatform™ 2.2.1 with Amendments A,C,D and E
  - EMVCo™ certification

Electrical characteristics

- Single power supply pin (V_{BAT})
- I/O dedicated voltage level (V_{PS_IO}) from 1.8 V to 3 V
- Battery voltage support from 0 V to 5 V
- Supports Class B and C operating conditions for UICC
- Ambient operating temperature -25 to + 85 °C

Applications

- Mobile devices
- Wearable devices
- SmartWatch
- Secure Connected Devices

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a. MIFARE R/W mode feature availability is pending to license conditions. Please contact your local ST representative for further information.

b. MIFARE is a register trademark of NXP B.V. in the U.S and other jurisdictions, and is used under license.

For further information contact your local STMicroelectronics sales office.   *www.st.com*

1 Description

The ST54D is an all-in-one solution including NFC controller and Secure Element with the highest security level (EAL5+ and EMVCo certified hardware).

Fully manufactured in a secure environment, it provides the highest performance levels thanks to its ARM® SC300® core.

The 64-ball WFBGA (4 x 4 x 0.8 mm) ECOPACK® package provides a reduced footprint and pin-to-pin compatibility with the STMicroelectronics NFC standalone solution. There is no internal direct connection between the two devices inside the package.

A complete range of memory sizes from 128 to more than 600 Kbytes (depending on profile) is available on the Secure Element.

In order to meet environmental requirements, ST offers these devices in different grades of ECOPACK® packages, depending on their level of environmental compliance. ECOPACK® specifications, grade definitions and product status are available at: *www.st.com*. ECOPACK® is an ST trademark.

2 Revision history

Table 1. Document revision history

Date	Revision	Changes
05-Nov-2015	1	Initial release.

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