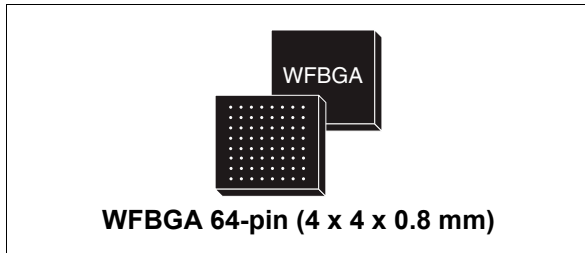


NFC controller and Secure Element system-in-package

Data brief



Features

- SIP (system-in-package) with ST21NFCD controller and ST33G1M2 or ST33I1M2 32-bit secure microcontroller for eUICC / eSE applications

NFC controller

- ARM® Cortex®-M3 microcontroller
- eFlash for full firmware update
- Enhanced Active load modulation technology
- Enhanced TX drive up to 1.3 W
- Compatible with extremely small or metal frame antennas
- Optimized power consumption modes
- Battery voltage monitoring
- System clock
 - FracN PLL input range from 13 to 76.8 MHz
 - 27.12 MHz external crystal oscillator
- Automatic Wake-Up via communication interfaces, internal timers, GPIO, RF field or tag detection
- Support of an external DC/DC converter for TX supply

RF communications

- Active and passive Peer-to-Peer
 - ISO/IEC 18092 - NFCIP-1 Initiator & Target
- Passive mode – Reader/Writer

- NFC Forum Type 1/2/3/4/5 tags
- ISO/IEC 15693
- MIFARE® Classic^{(a)(b)}
- Thinfilm (ex Kovio) Barcode
- Active mode – Card Emulation
 - ISO/IEC 14443 Type A & B
 - JIS X 6319 – 4
 - MIFARE® Classic^{(a)(b)} through SWP-CLT

External communication interfaces

- Two SWP master interfaces up to 1.695 Mbit/s
- I²C slave interface up to 3.4 MHz
- Slave and master SPI interface up to 13 MHz
- HSUART interface up to 6 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

- MIFARE R/W mode feature availability is pending to license conditions. Please contact your local ST representative for further information.
- MIFARE is a register trademark of NXP B.V. in the U.S and other jurisdictions, and is used under license.

- EMVCo™ certification

Electrical characteristics

- Battery voltage support from 2.4 V to 5 V
- I/O dedicated voltage level (V_{PS_IO}) from 1.62 V to 3.3 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

1 Description

The ST54F is an all-in-one solution including ST21NFCD NFC controller and ST33G1M2 or ST33I1M2 Secure Element with the highest security level (EAL6+ and EMVCo certified hardware).

Fully manufactured in a secure environment, the ST33 provides the highest performance levels thanks to its ARM® SC300® core.

- ST33G1M2: 25 MHz
- ST33I1M2: 33 MHz

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 up to 2048 Kbyte (depending on profile) of non-volatile Flash memory 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
12-Jan-2017	1	Internal release.
06-Feb-2017	2	Initial public release.

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