ST54H

NFC controller and Secure Element system-in-package

Data brief

Features
- SIP (system-in-package) with ST21NFCD controller and ST33J2M0 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
- \(^{2}\)C 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
- 2048 Kbyte of Flash memory
- 50 Kbyte of RAM
- ISO/IEC 7816-3 interface
- Single wire protocol (SWP) Interface
- SPI master/slave interface

Secure Operating System
- Supports state of the art Secure Element operating systems:
  - JavaCard™ 3.0.5
  - GlobalPlatform™ 2.3 with Amdts
  - EMVCo™ certification

Electrical characteristics
- Battery voltage support from 2.4 V to 5 V

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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.
• 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 ST54H is an all-in-one solution including ST21NFCD NFC controller and ST33J2M0 Secure Element with the highest security level (EAL6+ and EMVCo certified hardware).

Fully manufactured in a secure environment, the ST33J2M0 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 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

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<thead>
<tr>
<th>Date</th>
<th>Revision</th>
<th>Changes</th>
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<tbody>
<tr>
<td>07-Feb-2017</td>
<td>1</td>
<td>Initial release.</td>
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