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Products and solutions for Secure Wearables

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Introduction

Smart solutions for secure wearables

Leveraging its long experience in a wide range of technologies, ST offers a selection of products specifically designed for wearable devices targeting applications such as:

- Payment
- Transport
- Access control
- Healthcare
- Authentication
- eSIM

In these applications high precision, low power consumption, compact form factor and outstanding performance are a must and ST's products take into account the needs of the most recent and innovative wearable devices.

From the optimized passive solution ST31G480 to the multi-application ST54 system-in-package, ST provides everything developers need to start building their applications on a host, choosing from ST's proven secure element devices and adding optional boostedNFC™ technology.

With the development of the ST53G system-in-package, ST widen its secure wearables ecosystem to optimized active solutions. Co-evolving with product designers, ST helps them integrate support for payment, ticketing, digital access, and loyalty-card system within a diversity of form factors.

Security

SECURE ELEMENT AND INTEGRATED NFC BOOSTED SOLUTIONS FOR WEARABLE DEVICES

Wearable makers are facing multiple challenges to integrate secure contactless applications. They have to carefully address two main domains such as “Security” and “Contactless communication” to build a best–in-class wearable device.

ST platform security approach enables customers with a large choice of products and solutions for wearable applications such as payment, transport, and multiple contactless transactions answering the challenges such as Security certification, interoperability, power consumption, integration, and NFC highest performances.

BENEFITS

- Off line payment thanks to tamper proof Secure Element
- Enhanced user experience (reading distances)
- Allows ultra-small antenna
- Minimize footprint & ease integration

SECURE ELEMENT

The ST31 secure microcontroller family is the platform for highly-secure applications including banking, identification, pay TV, and transport.

With the ARM® SecurCore® SC000 processor and an architecture optimized for contactless performances, the ST31 offers a broad portfolio including MIFARE Plus® and MIFARE® DESFire® libraries, multiple interfaces, and certified cryptographic libraries.

ST31 dual interface secure microcontrollers are designed to enable secure and fast contactless transactions. They support various multiprotocol RF interfaces enhancing multi-application versability. ISO/IEC 14443 Type A and B, NFC, ISO/IEC 18092 and Very High Bit Rate (VHBR) protocols are all available and Auto-detect mode allows automatic detection and dynamic adaptation of the device to the correct reader protocol. Combined with STS3922 booster, it meets all the requirements to support wearable payment/ transport applications with very small antennas.

ST33 secure microcontroller is designed to meet advanced security and performance requirements for secure application including NFC embedded secure element with a large user Flash memory capability. Combined with the ST's NFC controller ST21NFC, it meets all the requirements for the integration of the wearable payment, transport or multi-application in wearable device.

KEY FEATURES

- 32-bit ARM® SC000 CPU/ SC300 CPU
- Multi-protocol (ISO7816, ISO14443 A/B/F, VHBR)
- EMVCo and Common Criteria certified

Part number	Secure device	NFC Mode	RF Protocol	Interface	Key features	Package
ST31G480	eSE 480 kB	Card Emulation	ISO 14443 A, B, B' – ISO 18092, VHBR	ISO 7816 ISO 14443	32-bit ARM® SecurCore® SC000 CPU eSE for payment, transport, access control MIFARE® Classic & DESFire® Available with or without STPay Payment application Ideal for contactless payment integration in battery-less wearables	DFN Bare die
ST33G1M2	eSE 1.2 MB	Card emulation / reader / P2P combined with NFC controller	Managed by NFC controller	ISO7816, SPI, SWP	32-bit ARM® SecurCore® SC300 CPU eSE for payment, transport, access control MIFARE® Classic & DESFire®	Wafer DFN8 4.2 * 4 WLCSP
ST33J2M0	eSE 2 MB	Card emulation / reader / P2P combined with NFC controller	Managed by NFC controller	ISO7816, SPI, I²C, SWP	32-bit ARM® SecurCore® SC300 CPU MIFARE® Classic & DESFire®, FeliCa® combining eSE and eSIM	Wafer QFN20 WLCSP

NFC BOOSTER AND NFC CONTROLLER SOLUTIONS

ST NFC booster (STS3921/22) and NFC controller (ST21NFCD) solutions, implementing Active Load Modulation technology guarantee NFC transactions on wearables in challenging metallic environment or with a very small antenna. The key benefits of these product families are to:

- Simplify the software integration: Compatible with most operating systems on the market (Linux, Android, RTOS, …). ST lowers the cost for developers by providing multi-application support with optimized solutions including intuitive SDK (software Development Kit) platforms for integrating contactless services around any microcontroller wearable device architecture
- Simplify the hardware integration: Reference designs, expansion boards, design guidelines
- Simplify the deployment: Integration into the most popular TSMs, pre-certification services to help reduce the time to market as well as development costs

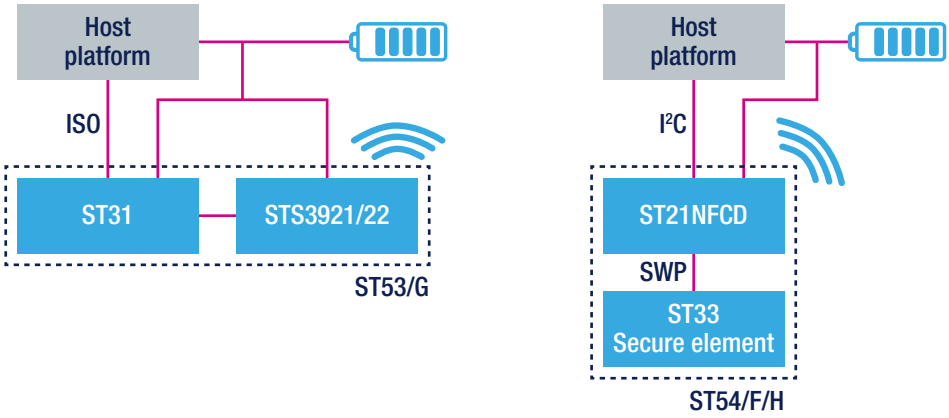
KEY FEATURES

- Enhanced user experience (reading distance)
- Allows ultra-small antenna
- Minimize footprint & ease integration
- Increase interoperability
- Reach low power consumption

Part number	Type	NFC Modes	RF Protocol	Interface	Key features	Package
STS3921	Boosted NFC	Card Emulation	ISO14443A	Contactless bridge to Secure microcontroller chip SPI to Host	Active Load Modulation Q factor adjustment Automatic Power Control, Automatic Gain Control Low power field detection	WLCSP
STS3922	Boosted NFC	Card Emulation	ISO14443A	Contactless bridge to Secure microcontroller chip SPI to Host	Active Load Modulation Automatic Antenna Tuning Q factor adjustment Automatic Power Control, Automatic Gain Control Low power field detection	Bare die
ST21NFCD	NFC Controller	Card Emulation/ reader/P2P	ISO14443A/B ISO18092 ISO15693	SWP SPI, I²C, UART	Active Load modulation Optimized power consumption modes NCI 2.0 compliant Secure Firmware update mechanism	BGA64 4*4

INTEGRATED SOLUTION

From ST31 Secure Microcontroller, STPay and ST33 to full blown NFC solutions based on ST53 and ST54 families, ST offers a complete range of turnkey solutions pre-certified for most payment and transit schemes (EMVCo, PBOC, VISA, MC, AMEX, Discover, MIFARE®, …).



Part number	SE integrated	Contactless frontend	Targeted devices	Package
ST53G	ST31G480	STS3922	Ideal for single/dual contactless applications Ideal for low and middle-end wearables Available with or without STPay Payment application	BGA 4x4
ST54F	ST33G1M2	ST21NFCD	Support multiple secure applications Ideal for middle and high end wearables	BGA 4x4
ST54H	ST33J2M0	ST21NFCD	Support multiple secure applications and eSIM Ideal and to enable convergence of application such as eSIM & FeliCa®	BGA 4x4

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