



Press Release

Joint ams and STMicroelectronics solution enables secure NFC transactions in new ARM mbed Wearable Reference Design

Benefiting from ams' boostedNFC technology and ST's proven Secure NFC, ARM® mbed™ Wearable Reference Design supports IoT applications including contactless ticketing, access control, payments and more

Premstaetten, Austria; Geneva, Switzerland, 23 February, 2016 -- ams AG (SIX: AMS), a leading provider of high-performance sensors and analog ICs, and STMicroelectronics, (NYSE: STM), a global semiconductor leader serving customers across the spectrum of electronics applications, today revealed that ARM is using the companies' NFC solution to provide the secure, high-performance NFC and microcontroller functionality in its new wearable reference design.

The NFC solution developed jointly by ST and ams is comprised of the ST54E from ST, a system-in-package featuring an NFC controller (NFCC) and a secure element compliant with the GlobalPlatform standard v2.2, and ams' AS39230 NFC analog front end with boostedNFC technology. This NFC solution is particularly well suited to very small, battery-powered products such as wearable devices and smartphones:

- the ams boostedNFC technology overcomes the difficulties that conventional NFC devices face when attempting to operate via a tiny antenna in an environment hostile to RF transmissions. The ams/ST solution exceeds the EMVCo requirements for RF performance in contactless payments, even when operating through an antenna smaller than 100mm².
- the ST SiP provides comprehensive support for all important NFC security standards worldwide, ensuring that the ARM mbed Wearable Reference Design can support secure transaction types required in Internet of Things (IoT) applications including, but not limited to, contactless payments, automatic fare collection and access control.
- the joint ams/ST solution achieves very low average power consumption, helping to extend battery run-time between charges, thanks to fully configurable power cycling of both the boostedNFC front end and the NFCC.

The mbed Wearable Reference Design provides a model that wearable device OEMs can quickly replicate to achieve high-performance NFC card emulation. The joint ams/ST solution is particularly easy for system designers to work with, since it is supplied with a complete NFC software stack developed by ST. This stack is compatible with ARM's mbed IoT Device Platform.



In addition, the high RF performance of the ams/ST solution ensures robust NFC functioning even in the most demanding operating environments. The NFC system draws on unique capabilities in the ams AS39230, which implements active load modulation. This boosts the NFC front end's transmission signal to achieve an 'operating volume' – the space in which the wearable reference design can couple with an NFC reader – comparable to or exceeding that of a contactless card, which will typically have an antenna that is some 40 times bigger. The solution provided by ST and ams is also optimized for the mbed Wearable Reference Design's antenna, giving high immunity to interference from the Wearable Reference Design's Bluetooth® and GPS radios.

The close compatibility between the discrete ST and ams components provides for sophisticated power-saving capabilities: the ST54E may be held in a deep power-down mode when not in the presence of an NFC RF field. At the same time, the AS39230 cycles rapidly through its far less power-hungry active power modes, drawing an average current of just 18µA. The ams/ST solution's software is optimized for low-power microcontrollers based on ARM technology. Its modular design means that users can choose to compile only the modules for the use cases their device supports, helping to reduce the system's memory requirement and to optimize the resource footprint. The software stack optionally also supports peer-to-peer and reader/writer functionality, and can be updated over-the-air when the device is in the field.

The ST54E is supplied to developers fully approved for use as an NFC device in card emulation, peer-to-peer and tag reader modes in compliance with the NFC Forum standards. It is also suitable for use in applications which require worldwide certification, including for Common Criteria, EMVCo, GlobalPlatform, and Visa, Mastercard, Amex, Discover, and the People's Bank of China (PBoC). In addition, the security capabilities of the mbed Wearable Reference Design are enhanced by a separate fingerprint reader, which uses an STM32F411 Dynamic Efficient microcontroller from ST, based on the ARM Cortex®-M4 core, to perform fingerprint image processing and matching.

"Our joint NFC reference design has been proven to provide the best combination of RF performance, interoperability and low-power operation available in the market today. Thanks to minimum system requirements in terms of footprint and processing power, the ams/ST solution is ideally suited for space constrained designs, such as ARM's mbed Wearable Reference Design", said Mark Dickson, Director Business Line Wireless at ams.

"The ams/ST comprehensive NFC solution provides an easy path to developing secure and energy-efficient wearable/IoT applications for contactless payment, ticketing, and access control", said Laurent Degauque, Marketing Director, Secure Microcontroller Division, STMicroelectronics. "Compatibility with the mbed IoT Device Platform will enable OEMs to go from prototype to product quickly and focus on adding their own value-add features."



“The ARM mbed Wearable Reference Design provides a tested design foundation for companies to quickly build low-power IoT devices and focus on adding value with their own innovative features”, said Zach Shelby, Vice President of Marketing, IoT Business, ARM. “The NFC solution from ams and STMicroelectronics demonstrates the energy efficiency obtained by utilizing ARM Cortex®-M processors and the mbed OS for small form factor devices and applications.”

Details of the mbed Wearable Reference Design can be found on www.mbed.com/wearables.

Separately, ST will be demonstrating its products and solutions for mobile and wearable devices at Mobile World Congress (22 - 25 February, Barcelona), stand 7A61.

ams will be demonstrating AS39230 and other NFC solutions at Mobile World Congress, stand 6E20.

For more technical information about the AS39230, please, go to www.ams.com/NFC-HF-Booster/AS39230.

About ams

ams is a global leader in the design and manufacture of advanced sensor solutions and analog ICs. Our mission is to shape the world with sensor solutions by providing a seamless interface between humans and technology. ams' high-performance analog products drive applications requiring extreme precision, dynamic range, sensitivity, and ultra-low power consumption. Products include sensors, sensor interfaces, power management and wireless ICs for consumer, communications, industrial, medical, and automotive markets.

With headquarters in Austria, ams employs over 2,100 people globally and serves more than 8,000 customers worldwide. ams is listed on the SIX Swiss stock exchange (ticker symbol: AMS). More information about ams can be found at www.ams.com.

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About STMicroelectronics

ST is a global leader in the semiconductor market serving customers across the spectrum of sense and power and automotive products and embedded processing solutions. From energy management and savings to trust and data security, from healthcare and wellness to smart consumer devices, in the home, car and office, at work and at play, ST is found everywhere microelectronics make a positive and innovative contribution to people's life. By getting more from technology to get more from life, ST stands for life.augmented.

In 2015, the Company's net revenues were \$6.90 billion. Further information on ST can be found at www.st.com.



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