



NEW PRODUCT PREVIEW: CELLULAR IoT

Nordic nRF91 low power cellular IoT 'sneak peek' – cellular made easy, cellular for everything else

Nordic's nRF91 Series is an ultra-compact, low power, global, multimode LTE-M / NB-IoT System-in-Package with integrated Arm Cortex-M33 host processor, Arm TrustZone security technology, and Assisted GPS

Oslo, Norway – January 22, 2018 – Nordic Semiconductor today provided a 'sneak peek' of its upcoming nRF91® Series low power cellular IoT solution. During an event in Oslo, Nordic also demonstrated the nRF91 operating on the Verizon Wireless Network in the U.S. and on the Telia network in Norway.

The Nordic nRF91 Series is all about taking the unique value proposal of cellular and bringing simplicity and appeal to a broader market. Today cellular is associated with the high data rates of smartphones and tablets. This solution aims to take cellular beyond just mobile devices and foster innovation that brings cellular connectivity to just about anything you can imagine. In much the same way as Nordic Semiconductor's nRF5 Series enabled innovation and drove adoption of Bluetooth wireless technology in new markets, the nRF91 Series is designed to be an easily accessible solution for cellular connectivity. By setting new benchmarks in terms of integration, size, and power consumption, coupled with its ease-of-use, the nRF91 Series is designed to unleash the huge potential of cellular in IoT – cellular made easy, cellular for everything else.

All the benefits of a traditional cellular module in a tiny System-in-Package with global coverage

Front and center of Nordic Semiconductor's upcoming nRF91 Series is a highly-integrated, low power, global multimode LTE-M / NB-IoT System-in-Package (SiP). The SiP integrates a complete low power cellular IoT system into a tiny 10x16x1.2mm package that integrates modem, transceiver, RF front end, dedicated application processor, Flash memory, power management, and crystal and passive components. With this level of integration the nRF91 SiP combines all the benefits of traditional cellular modules, including teleregulatory and cellular certifications, with ease-of-use, unprecedented integration, and the smallest form factor ever seen in the cellular industry to date.

Nordic is proud and excited to have Qorvo as a strategic partner for both the RF front end and the SiP development and manufacturing. The nRF91 SiP leverages Qorvo's state-of-the-art, proven RF front-end, advanced packaging, and MicroShield™ technology to deliver a unique, ultra-compact solution that combines high performance with low power consumption. The nRF91 Series supports global operation with a single SiP variant thanks to the combination of Nordic's multimode LTE-M / NB-IoT modem, SAW-less transceiver, and a custom RF front-end solution from Qorvo.

Built-in Arm® Cortex®-M33 host processor, Arm® TrustZone® security, and Assisted GPS

The nRF91 takes security for low power IoT devices to new heights by combining the inherent security of cellular connectivity with a cutting-edge security solution for the application hardware and software. The integration of an [Arm Cortex-M33 processor](#) and Arm [CryptoCell-310](#) security IP enables an entire low power cellular IoT application to be implemented on an nRF91 SiP.

The built-in host processor features TrustZone for Armv8-M, helping secure application data, firmware, and peripherals using an isolated, trusted execution environment across the CPU and system. This solution provides an efficient security foundation, and reduces size, Bill-of-Materials (BOM), and power consumption versus using an external host processor.

The nRF91 SiP also features built-in support for positioning via an integrated Assisted GPS (A-GPS) solution that combines cellular and GPS technology to deliver fast and accurate positioning.

Nordic nRF91 Series System-on-Chip inside

The nRF91 SiP is based on Nordic's own nRF91 Series low power cellular IoT System-on-Chip (SoC). Jointly developed by Nordic's highly experienced cellular design team in Finland, and low power experts in Norway, the chip was developed from scratch to optimize the power, cost, and size savings enabled by the new LTE-M and NB-IoT cellular standards. The chip features an unprecedented and unique level of integration by

combining a multimode cellular modem and transceiver, as well as application processor, Flash memory, RAM memory, and power management on a single chip.

Software, development tools, support, and developer community

The Nordic Semiconductor nRF91 Series includes a complete suite of software and easy-to-use development tools to accelerate innovation and product development. Assistance is available from a world-class, first-line technical support team, and a thriving Nordic development community. This all combines to allow developers to concentrate on what they want to do: develop exceptional products and services using cellular technology. “Back in early 2015, when we started the development of nRF91 Series, we set out on a mission to create a truly different solution for cellular IoT,” comments Thomas Embla Bonnerud, the Director of Strategy and Investor Relations at Nordic Semiconductor. “A highly integrated, low power, ultra-compact, and simple-to-use solution that would foster innovation and accelerate adoption of cellular connectivity across new markets. We are confident that the upcoming nRF91 Series represents such different solution, and we are excited to provide a sneak peek and demonstration of it today.”

“We are pleased with our strategic partnership with Nordic to bring this new category of cellular IoT solution to the market,” said Eric Creviston, President Mobile Products at Qorvo. “Qorvo is excited to see our leading RF and advanced packaging technology playing a key and enabling part of new products targeting the emerging low power cellular IoT market.”

“Delivering the combination of power efficient, TrustZone secure, and cellular connectivity capabilities to the extensive Cortex-M developer base opens up the benefits of IoT to a diverse range of new and innovative applications,” said Thomas Ensergueix, Senior Director of Embedded, Embedded and Automotive Line of Business, Arm. “We are pleased to see the nRF91 SiP from Nordic with Cortex-M33 and CryptoCell-310 enabling the deployment of secure IoT solutions at scale.”

Telia is experiencing an unprecedented demand for dedicated IoT connectivity represented by LTE-M and NB-IoT. These novel technologies enable products and services that wouldn't otherwise be possible. Access to components has so far been scarce and has hindered large scale commercial launches. That is why Telia has been a supportive partner to Nordic Semiconductor in their development of the new product; sharing our insight of the market, our plans and ambitions for the IoT market, and made our network available for testing. We are happy to see that Nordic Semiconductor now announces their new product, and that our collaborating partners are eager to launch novel products and services benefitting on the unique capabilities of LTE-M and NB-IoT. " Andreas Carlsson – Head of Telia Next

Availability

Nordic is sampling nRF91 to selected lead customers now. Start of general sampling is planned for mid-2018, with first production quantities available by end of 2018. The nRF91 SiP will be available in variants with and without integrated GPS.

About Qorvo

Qorvo (Nasdaq:QRVO) makes a better world possible by providing innovative RF solutions at the center of connectivity. We combine product and technology leadership, systems-level expertise and global manufacturing scale to quickly solve our customers' most complex technical challenges. Qorvo serves diverse high-growth segments of large global markets, including advanced wireless devices, wired and wireless networks, and defense radar and communications. We also leverage our unique competitive strengths to advance 5G networks, cloud computing, the Internet of Things, and other emerging applications that expand the global framework interconnecting people, places and things. Visit www.qorvo.com to learn how Qorvo connects the world.

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About Nordic Semiconductor

Nordic Semiconductor (OSX:NOD) is the world's leading Bluetooth® Low Energy chip supplier and will expand into the low power cellular IoT market later this year. Nordic's extended, multiple-award-winning Bluetooth chip ranges give product developers the price-performance flexibility to add ultra-low power (typically battery-powered) wireless connectivity to a uniquely wide range of applications. Examples include: wearables, sports watches, sports and health sensors, advanced RF remote controls, beacons, toys, wireless mice and keyboards, wireless IoT home and industrial automation sensors, and even smart jewelry and clothing. Visit www.nordicsemi.com to learn more.