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IMAGE: 8001_dime_PRESS/WEB.jpg

SUGGESTED CAPTION: The first Nordic nRF8001 μ Blue single mode chip comes in a miniaturized 5x5mm QFN package suitable for use in ultra slim, light weight, coin cell (watch) battery wireless products

BLUETOOTH LOW ENERGY: FIRST SAMPLES EXHIBITED

Nordic exhibits its μ Blue™ *Bluetooth* low energy single mode solution at Continua Health Alliance press event, Tokyo

The nRF8001 single mode chip and μ Blue Prototype Kit are enabling Nordic's key customers to start developing their first *Bluetooth* low energy products. By providing current consumption in the microampere range, the nRF8001 sets new ultra low power consumption benchmarks for *Bluetooth* wireless connectivity

Tokyo, Japan – February 17, 2010 – Ultra low power (ULP) RF specialist Nordic Semiconductor ASA (OSE: NOD) announces it is exhibiting silicon samples and development kits of the first member of its μ Blue™ *Bluetooth* low energy single mode solution, the nRF8001 at the press event in Tokyo hosted by Continua Health Alliance and organized by healthcare, medical and IT industry member companies.

The exhibition follows the December 17, 2009 announcement by the Bluetooth Special Interest Group (SIG) of *Bluetooth* Core Specification Version 4.0, which includes the official adoption of *Bluetooth* low energy wireless technology¹ (see “About *Bluetooth* low energy” below).

Nordic is exhibiting a complete beta implementation, including host and profiles subsystem, which enables its lead customers to begin both hardware and software development of their first single mode *Bluetooth* low energy applications. Nordic expects to have a feature complete and qualified product by the first half of 2010.

Key features of the μ Blue nRF8001 include:

- Highly integrated single mode slave solution;
- 32-pin 5x5mm QFN package;
- Fully embedded radio, link controller, and host subsystem;
- Profiles and application examples included within the μ Blue SDK™;
- Sub 15mA peak current consumption;
- Microampere range average current consumption;
- Years of battery operating life for coin cell battery-powered applications (depending on duty cycle).

(See “About μ Blue” below.)

“We are making the nRF8001 silicon samples and Prototype Kits available to seed the market,” says Thomas Embla Bonnerud, Product Manager for Ultra Low Power Wireless at Nordic Semiconductor ASA.

“We can provide our lead customers with something that enables them to get started developing end-products,” continues Bonnerud. “We believe that *Bluetooth* low energy is a great technology that will accelerate the market for ultra low power wireless. Nordic Semiconductor will deliver market leading solution to fuel that growth; the nRF8001 is just the beginning.”

In June 2009, Continua Health Alliance, organized by healthcare, medical and IT industry member companies, specified *Bluetooth* low energy and ZigBee® Health Care in the next version of its interoperability Design Guidelines for Continua Certified™ wireless devices².

References:

1. <http://tinyurl.com/ybtdkmz>
2. <http://tinyurl.com/yezglnz>

About *Bluetooth* low energy*

Bluetooth low energy wireless technology will encourage rapid deployment of ultra-low power (ULP) wireless by providing a technology that is interoperable. Moreover, *Bluetooth* low energy wireless technology-equipped products will be able to communicate with mobile phones and PCs featuring modified *Bluetooth* wireless technology transceivers opening up a whole new range of possibilities. In summary, *Bluetooth* low energy wireless technology is an ultra low power (ULP) wireless solution delivering:

- Ultra low peak, average and idle mode power consumption;
- Ultra low cost plus small size for accessories and human interface devices (HIDs);
- Minimal (if any) cost and size addition to cell phone handsets and PCs;
- Global, intuitive and secure multi-vendor interoperability.

The technology will operate in the globally accepted 2.4GHz Industrial, Scientific & Medical (ISM) band. It features a physical layer bit rate of 1Mbps over a range up to 15 meters.

The *Bluetooth* low energy wireless technology specification will feature two implementations, namely 'dual mode' and 'single mode'. In the dual mode implementation *Bluetooth* low energy functionality is integrated into classic *Bluetooth* circuitry. The resulting architecture shares much of *Bluetooth* technology's existing functionality and physical radio and results in a minimal, if any, cost increase compared to contemporary *Bluetooth* chips.

Single mode chips will be highly integrated and compact devices. The simplified *Bluetooth* low energy wireless technology protocol stack features a lightweight Link Layer (LL) providing ultra-low power idle mode operation, simple device discovery and reliable point-to-multipoint data transfer with advanced power-save and encryption functionalities. The LL provides a means to schedule *Bluetooth* low energy wireless technology traffic between classic *Bluetooth* transmissions. Profiles will include support for a variety of low power devices such as HIDs, sensors and sports watches etc.

ULP consumption is critical to *Bluetooth* low energy wireless technology's success. Single mode devices will be expected to run for many months or even years on standard coin-cell batteries (for example, CR2032, 3V lithium devices). Single mode chips will typically operate with low duty cycles, entering ultra-low power idle and sleep modes, to wake up periodically for a communication 'burst'.

Dual mode chips are targeted at handsets, multimedia computers and PCs. The dual mode specification is also advanced and it is envisaged chips will feature power consumptions of around 75 to 80 percent of conventional *Bluetooth* chips when operating in *Bluetooth* low energy wireless technology mode and typically cost less than tens of cents more. These next generation dual mode *Bluetooth* chips will share much of *Bluetooth* technology's existing functionality and radio in a single die. However, because dual mode devices will use parts of *Bluetooth* technology's hardware, power consumption is ultimately dependant upon the *Bluetooth* implementation. Consequently, dual mode devices will not enjoy all of the benefits and possibilities outlined in the *Bluetooth* low energy wireless technology specification.

*Note: Technical information is provisional and subject to change prior to the publication of the industry open standard.

About μ Blue

μ Blue will be a range of single mode *Bluetooth* low energy solutions based on a single chip architecture integrating radio, baseband, and microcontroller with fully embedded *Bluetooth* low energy software stacks. By providing a complete solution, μ Blue will significantly ease the effort and cost for manufacturers to make *Bluetooth* low energy wireless-enabled products. This high level of integration, tiny chip size and low external component count makes μ Blue ideal for size-constrained applications like watches and wearable sensors. μ Blue will also be made available in a number of targeted application variants to suit the specific requirements of products in various market segments.

μ Blue will provide a true ultra low power (ULP) wireless solution with peak currents low enough to support standard coin cell battery operation and microampere average current. This means that μ Blue will drastically expand the range of applicable application areas where manufacturers can take advantage of *Bluetooth* wireless connectivity as well as deliver an improved user experience in existing applications. While classic *Bluetooth* solutions typically require rechargeable batteries and weekly charging cycles,

µBlue will support applications that use non-rechargeable batteries, such as coin cells, and that therefore need to deliver months to years of battery lifetime to avoid end user frustration. Applications that use classic *Bluetooth* today - like *Bluetooth* enabled watches and remote controls - can benefit on both battery lifetime and cost by migrating to µBlue *Bluetooth* low energy wireless technology.

The ULP consumption of µBlue does not come with a compromise on radio performance. µBlue is built on Nordic Semiconductor's latest class-leading ULP 2.4GHz radio technology and is therefore expected to deliver best-in-class sensitivity and blocking performance from launch. Combined with the robust adaptive frequency hopping of *Bluetooth* low energy, µBlue will provide excellent co-existence performance in the presence of other 2.4GHz radios such as Wi-Fi and classic *Bluetooth*.

The first offering in the µBlue range will include the nRF8001, a single mode *Bluetooth* low energy slave solution ideal for applications like watches, mobile phone peripherals, remote controls, and sensors. More detailed specifications and pricing indications will be supplied at the official product launch.

About Nordic Semiconductor ASA

Nordic Semiconductor is a fabless semiconductor company specializing in ultra-low power (ULP) short-range wireless communication. Nordic is a public company listed on the Norwegian stock exchange.

Nordic provides RF silicon solutions including:

- Highly integrated RF silicon
- Sophisticated and flexible development tools
- Application specific communication software
- Complete reference designs

The company's innovative range of wireless solutions includes:

- The nRF24LE1™ single-chip, ultra-low cost and power, fully integrated 2.4GHz transceiver with radio, microprocessor, flash memory and MultiCeiver™ technology supporting up to six simultaneous wireless devices (also available in a lower cost, one time programmable (OTP) variant, the nRF24LE1 OTP);
- The nRF24L01+™ ultra-low cost and power 2.4GHz transceiver with MultiCeiver technology supporting up to six simultaneous wireless devices;
- The nRF24LU1+™ single chip 2.4GHz transceiver with full-speed USB, microcontroller and flash memory enabling ultra-compact USB dongles for wireless peripherals (also available in a lower cost, one time programmable (OTP) variant, the nRF24LU1+ OTP);
- The nRF24AP2™ ultra-low power 2.4GHz transceiver for wireless communication with Dynastream Innovation's production-proven low-power network protocol, ANT™;
- The nRF24E1™ and nRF24E2™ low cost transceivers paired with an industry standard 8051 MCU core, and leading peripherals to create the world's first complete low cost SoCs for global 2.4GHz operation;
- The nRF24Z1™ single-chip system for CD quality audio streaming of up to 16-bit, 48-kHz audio;
- The nRF905™ single-chip multiband radio transceiver for the 433, 868 or 915MHz ISM band;
- The nRF9E5™ low-cost, single-chip system with fully integrated RF transceiver for the 433, 868 or 915MHz ISM band.

Nordic Semiconductor's nRF24xx range of 2.4GHz transceiver and transmitter devices are aimed at applications such as PC peripherals such as wireless keyboards/mice, game controllers, intelligent sports equipment and wireless audio (for example, mp3 and portable CD player headphones and PC speakers). The latest nRF24L01+ family, for instance, is targeted at ultra-low cost and power applications such as wireless desktops and intelligent (for example, wristwatch-based) sports equipment.

Nordic is an associate member of the Bluetooth SIG, and has contributed core expertise in ultra-low power RF design to the forthcoming specification for *Bluetooth* low energy wireless technology (formerly ultra low power *Bluetooth*). *Bluetooth* low energy wireless technology is a short range RF communication technology featuring ultra-low power consumption, a lightweight protocol stack and simple integration with *Bluetooth*® wireless technology chips. *Bluetooth* low energy wireless technology ushers in the next generation of RF communications by opening up many new opportunities for wireless data links between suitably equipped mobile phones or personal computers (PCs) and coin cell battery-powered devices such as sports and health sensors.

Nordic's products are all manufactured in ultra modern semiconductor process technologies through strong relationships with world-best manufacturing facilities. Sales are primarily made through a carefully selected worldwide distribution network. The company has offices in Trondheim and Oslo, Norway, the US (west coast), Hong Kong, Korea, Japan, Taiwan, and the Philippines. Nordic is listed on the Oslo Stock Exchange (OSX: NOD). All operations are managed according to the ISO 9001:2000-approved quality assurance system.

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