Ultra Low Power Wireless Solutions from NORDIC SEMICONDUCTOR

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PRODUCTS

**BLUETOOTH 5
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**BLUETOOTH LOW ENERGY
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ENERGY)**

ANT™ (/ENG/PRODUCTS/ANT)

**2.4GHZ RF (/ENG/PRODUCTS/2.4GHZ-
RF)**

**SUB 1-GHZ RF (/ENG/PRODUCTS/SUB-
1-GHZ-RF)**

**IEEE 802.15.4 / THREAD
(/ENG/PRODUCTS/IEEE-802.15.4-
THREAD)**

**NORDIC MOBILE APPS
(/ENG/PRODUCTS/NORDIC-MOBILE-
APPS)**

**3RD PARTY BLUETOOTH LOW ENERGY
MODULES (/ENG/PRODUCTS/3RD-
PARTY-BLUETOOTH-LOW-ENERGY-
MODULES)**

**3RD PARTY DEVELOPMENT BOARDS,
DK-PLUGIN CARDS AND ARDUINO
BOARDS (/ENG/PRODUCTS/3RD-
PARTY-DEVELOPMENT-BOARDS-DK-
PLUGIN-CARDS-AND-ARDUINO-
BOARDS)**

**3RD PARTY BEACONS
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BEACONS)**

nRF51822
Bluetooth low energy and
2.4GHz proprietary SoC
Active

Replacement products ⇅

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OVERVIEW   SPECIFICATION   REFERENCE DESIGNS   DEVELOPMENT TOOLS AND SOFTWARE   DOWNLOADS

DESCRIPTION

Product Specifica
(http://infocenter.nordicsemi.com/topic/com.nordic.infocenter.nrf51/dita/nrf51/pdflinks/51822_ps.h
cp=2_

The **nRF51822** is a powerful, highly flexible multiprotocol SoC ideally suited for *Bluetooth*® low
energy and 2.4GHz ultra low-power wireless applications. The **nRF51822** is built around a 32-bit
ARM® Cortex™ M0 CPU with 256kB/128kB flash + 32kB/16kB RAM for improved application
performance. The embedded 2.4GHz transceiver supports both Bluetooth low energy and the
Nordic Gazell 2.4 GHz protocol stack which is on air compatible with the nRF24L series products
from Nordic Semiconductor.

nRF51822 incorporates a rich selection of analog and digital peripherals that can interact without
CPU intervention through the Programmable Peripheral Interconnect (PPI) system. A flexible 31-
pin GPIO mapping scheme allows I/O like serial interfaces, PWM and quadrature demodulator to
be mapped to any device pin as dictated by PCB requirements. This enables complete design
flexibility associated with pin-out location and function.

nRF51822 supports Bluetooth low energy protocol stacks as well as 2.4GHz protocol stacks,
including Gazell, both available as downloads. **nRF51822** requires a single power supply and gives
the user the option of using on chip linear regulators giving a supply range of 1.8-3.6V, a direct
1.8V mode and a on chip DC-DC buck converter giving a supply range of 2.1-3.6V. The use of the
DC-DC converter can be dynamically controlled during run time and enables **nRF51822** to operate
at radio peak currents below 10 mA @ 3V supply (TX @ 0 dBm & RX).

nRF51 SDK provides extensive software support for both Bluetooth low energy and 2.4GHz
proprietary applications.

nRF51822 is available in 6x6mm 48-pin QFN packages and 3 ultra-compact wafer-level chip-scale
packages (WL-CSP).

**New: nRF51822 is now available as a thin WL-CSP variant measuring 3.83mm x 3.83mm with a
height profile of just 0.35mm, and is drop in compatible with regular WL-CSP devices.**

nRF51822 is available in either 256kB or 128kB Flash + 32kB or 16kB RAM variants.

Nordic Semiconductor protocol stacks are known as SoftDevices. SoftDevices are pre-compiled,
pre-linked binary files. SoftDevices can be programmed in nRF51 series SoCs and are
downloadable from the Nordic website.

The **nRF51822** supports the SoftDevices below (click on the icons for details).

PRODUCT UPDATE NOTIFICATIONS

(http://response.nordicsemi.com/subscribe-to-our-newsletters)

DOCUMENTATION
Visit the infocenter to access all technical documentation

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ask questions, share info, and be inspired!

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S110   S120   S130

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Nordic/ARM Lab-in-a-Box University Program

(/eng/Products/Bluetooth-low-energy/Nordic-ARM-Lab-in-a-Box-University-Program)

FEATURES

- Single chip, highly flexible, 2.4 GHz multi-protocol device
- 32-bit ARM Cortex M0 CPU core
- 256kB/128kB flash + 32kB/16kB RAM
- Supports Bluetooth low energy protocol stacks
- Thread safe and run-time protected
- Event driven API
- On air compatible with nRF24L series
- 3 data rates (2Mbps/1Mbps/250kbps)
- +4dBm output power
- -93dBm sensitivity, Bluetooth low energy
- PPI system for maximum power-efficient applications and code simplification
- Flexible power management system with automatic power management of each peripheral
- Configurable I/O mapping for analog and digital I/O
- Operating temperature range: -40°C to +105°C

APPLICATIONS

- Mobile phone accessories
- Wearables
- Beacons
- Rezence wireless charging monitoring
- PC peripherals
- Consumer Electronics (CE) remote controls
- Proximity/Alert sensors
- Smart Home
- Sports, fitness and healthcare sensors
- Smart RF tags
- Toys and electronic games
- Intelligent domestic appliances
- Industrial and commercial sensors
- Lighting

RELATED PRODUCTS

Product	Brief Description
nRF5 SDK for Mesh (/eng/Products/Bluetooth-low-energy/nRF5-SDK-for-Mesh)	Software Development Kit for Bluetooth mesh solutions using nRF51 Series and nRF52 Series
nRF51 DK (/eng/Products/nRF51-DK)	Development kit for Bluetooth low energy, ANT and 2.4GHz applications
nRF51 Dongle (/eng/Products/nRF51-Dongle)	Bluetooth low energy/ANT/2.4GHz Development dongle
nRF5 SDK (/eng/Products/Bluetooth-low-energy/nRF5-SDK)	Software Development Kit for the nRF51 and nRF52 Series
nRF51 IoT SDK (/eng/Products/Bluetooth-low-energy/nRF51-IoT-SDK)	IoT Software Development Kit (SDK) for applications using IPv6 over Bluetooth low energy
nRF51 HomeKit SDK (/eng/Products/Bluetooth-low-energy/nRF5-SDK-for-HomeKit)	Software Development Kit for HomeKit solutions
nRF51824 (/eng/Products/Bluetooth-low-energy/nRF51824)	Automotive grade Bluetooth low energy SoC
nRF51422 (/eng/Products/ANT/nRF51422)	Multiprotocol ANT/Bluetooth low energy SoC
nRFready Smart Remote 3 for nRF51 Series (/eng/Products/Bluetooth-low-energy/nRFready-Smart-Remote-3-for-nRF51-Series)	Advanced Bluetooth low energy enabled remote control reference design with voice input
nRF Sniffer (/eng/Products/Bluetooth-low-energy/nRF-Sniffer)	Low cost Bluetooth low energy packet sniffer

ORDERING CODES

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RF specialist in ultra-low power
wireless communications

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