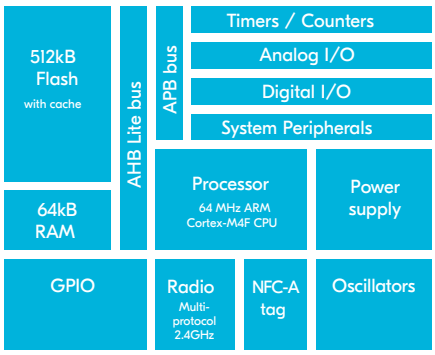
nRF52832

Multiprotocol Bluetooth 5, ANT/ANT+ and 2.4 GHz proprietary System-on-Chip

A new breed of Bluetooth 5-ready energy SoC
The nRF52832 takes Bluetooth Low Energy SoCs to the next level with its support for Bluetooth 5. It has an ARM Cortex M4 CPU at its heart, running at 64 MHz, it is capable of handling demanding application and communication tasks in a short timeframe. This frees up the CPU handle even more tasks, or to return to sleep mode, thus conserving precious battery energy.

The nRF52832, and all SoCs in the nRF52 Series family are flash-based SoCs and are ideal for Device Firmware Updates (DFU). DFU brings total flexibility and control to the firmware running in your product. Enabling new security updates, bug-fixing and feature additions in the field.



Rich peripheral flexibility
The nRF52832 has a plentiful array of peripherals and interfaces to enable complex single chip applications to be realized. All commonly found serial interfaces are supported. Additionally, there are dual PDM digital microphone inputs, QDEC and PWMs included on-chip. All peripherals and interfaces support EasyDMA memory mapping to improve performance, efficiency and simplicity when in use.

Power ON, Power OFF as required
There is an intelligent automated power distribution system internal to the device. This system ensures only system blocks that are required to carry out operations are energized. The power control system energizes ON or OFF blocks in real time as the application runs.

Bluetooth 5	nRF52810	nRF52811	nRF52832	nRF52840
2 Mbps	X	X	X	X
CSA #2	X	X	X	X
Advertising Extensions		(X)	X	X
Long Range		(X)		X

(X) Software support planned

KEY FEATURES

- Bluetooth 5
  - 2 Mbps
  - CSA #2
  - Advertising Extensions
- 64 MHz ARM® Cortex-M4F
- 512/256 KB Flash + 64/32 KB RAM
- Software stacks available as downloads
- Supports 1 Mbps and 2 Mbps Bluetooth LE modes
- 100 dB link budget
- Sensitivity of -96 dbm for Bluetooth LE
- Programmable output power +4 dBm to -20 dBm
- RSSI with 1 dB resolution
- RAM mapped FIFOs using EasyDMA
- Flexible and configurable 32 pin GPIO
- Programmable Peripheral Interface — PPI
- Automatic smart power management
- Full set of digital interfaces including: SPI/2-wire/I²S/UART/PDM/QDEC with EasyDMA
- 12-bit/200 ksps ADC
- 128-bit AES ECB/CCM/AAR co-processor
- Integrated balun with 50 Ω single-ended output
- Ultra low-power 32 kHz crystal and RC oscillators
- Wide supply voltage range (1.7 V to 3.6 V)
- On-chip DC/DC buck converter
- Individual power management for all peripherals
- QFN and WL-CSP package options

APPLICATIONS

- IoT
  - Smart Home
  - Sensor networks
  - Building automation
- Personal Area Networks
  - Health/fitness sensor and monitor devices
  - Medical devices
  - Key-fobs + wrist watches
- Interactive entertainment devices
  - Remote control
  - VR/AR
  - Gaming controller
- Beacons
- A4WP wireless chargers and devices
- Remote control toys
- Computer peripherals and I/O devices
  - Mouse + Keyboard
  - Multi-touch trackpad

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Simpler, safer code development

The nRF52 Series all support SoftDevices for communication operations. SoftDevices are pre-compiled, event-driven protocol stacks supplied as downloadable binaries. SoftDevices have APIs allowing your application to interact with the protocol in a clearly defined, and predictable manner. SoftDevices are developed, tested and maintained by Nordic in-house. As you develop and build your applications the SoftDevice remains in exactly the same memory location and as a binary is unaffected by the successive recompilation of your application during development.

OTA DFU

The nRF52832 is supported by an Over-The-Air Device Firmware Update (OTA DFU) feature. This allows for in the field updates of application software and SoftDevice.

S132 SoftDevice

The S132 SoftDevice is an advanced Bluetooth 5 protocol stack for the nRF52832. High application throughput is available through the 2 Mbps bitrate of Bluetooth 5, and improved co-existence through CSA #2. It supports up to 20 connections in any combination of peripheral and central role.

Development tools

Nordic Semiconductor offer the nRF52 DK for development with the nRF52832 SoC. Segger Embedded Studio is available free of charge for developers using the nRF52 Series SoC family.

A broad range of development tools, utilities and apps are freely available to enhance your development experience and allow detailed evaluation and testing.

nRF52832 compatible SoftDevices

S112	Memory-optimized Bluetooth 5 protocol stack for the nRF52810, nRF52811 and nRF52832 SoCs
S132	High performance Bluetooth 5 protocol stack for the nRF52810 and nRF52832 SoCs
S212	ANT stack for the nRF52810 and nRF52832 SoCs
S332	Combined Bluetooth 5 and ANT protocol stack for the nRF52832 SoC

RELATED PRODUCTS

nRF52 DK	Development kit for nRF52810 and nRF52832 SoCs
Power Profiler Kit	Current measurement tool for embedded development

SPECIFICATIONS

Radio	
Band	2.4 GHz ISM
On-air datarate	2 Mbps and 1 Mbps Bluetooth LE 1 Mbps ANT 2 Mbps and 1 Mbps 2.4 GHz proprietary
Output power	Programmable: +4 to -20 dBm in 4 dB steps
Sensitivity	-96 dBm Bluetooth LE 1 Mbps -89 dBm Bluetooth LE 2 Mbps -93 dBm 1 Mbps ANT -30 dBm whisper mode
RSSI	1 dB resolution
Radio current consumption with DC/DC at 3V	7.5 mA — TX at +4 dBm output power 5.3 mA — TX at 0 dBm output power 5.4 mA — RX at 1 Mbps
Microcontroller	
CPU	ARM Cortex M4
Floating Point Unit	Yes
Memory	Flash 512 KB (+ cache) + 64 KB RAM Flash 256 KB (+ cache) + 32 KB RAM
GPIO	32 configurable
Peripherals	
NFC	NFC-A Tag
ADC	12-bit 200 ksps
Comparators	General purpose, low-power
Interfaces	SPI/2-wire/I²S/UART/PDM/QDEC
Security	AES-128/ECB/CCM/AAR
Timers/Counters	32-bit
System	
System peripheral bus	20-channel PPI
Power supply	Automatic system power DC/DC (1.7 V to 3.6 V), LDO (1.7 V to 3.6 V)
System current consumption DC/DC at 3V	0.3 µA — No RAM retention 1.2 uA — All peripherals in IDLE mode 1.6 uA — All peripherals IDLE mode (32 kHz + RTC) 20 nA per 4 KB - RAM retention
Performance	
Coremark	215 EEMBC CoreMark® (3.36 CoreMark/MHz) 58 CoreMark®/mA (Flash)
Package options	
QFN48	6 × 6 with 32 GPIOs
WLCSP50	3.0 × 3.2 with 32 GPIOs

WORLD WIDE OFFICE LOCATIONS

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For more information
Visit **nordicsemi.com** for the complete product specification about this and any other wireless ULP products.

About Nordic Semiconductor
Nordic Semiconductor is a fabless semiconductor company specializing in ULP short-range wireless communication. Nordic is a public company listed on the Norwegian stock exchange.

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