nRF52810

High performance, entry-level Bluetooth 5/ANT/2.4GHz SoC

A Bluetooth 5 SoC for everybody

The nRF52810 is the third member of the nRF52 Series SoCs. It features a powerful CPU (ARM Cortex-M4), and together with the nRF52840 and nRF52832 it completes a lineup of Nordic's Bluetooth 5 ready devices that together offer the full spectrum of possibilities when designing *Bluetooth*® 5 into your products.

The nRF52810 supports key Bluetooth 5 features of high throughput (2Mbps) and increased broadcast capacity with advertising extensions (x 8), as an optimized solution that makes it attractive in a very wide range of applications from a performance and minimal Bill of Material (BOM) perspective.

The nRF52810 and all nRF52 Series are flash-based SoCs and as such, fully support over the air firmware upgrades.

Stand-alone performance or network processor

The nRF52810 uses the same hardware and software architecture as other nRF52 Series SoCs. This means migration between the nRF52 Series is straightforward and simple. It uses the ARM Cortex-M4 CPU and is capable of supporting demanding performance requirements.

The nRF52810 has a reduced feature set compared to nRF52840 and nRF52832 and is an ideal compromise between advanced performance and functionality and cost. The nRF52810 is ideal for middle to lower tier applications and is the perfect companion network processor when adding Bluetooth 5 connectivity to designs that employ a significantly bigger main application processor to perform their function.

Bluetooth 5 – More speed, less energy

The nRF52810 supports two of the three flagship features of Bluetooth 5, high Throughput Mode and Advertising Extensions. High throughput doubles the on-air data rate to 2Mbs offering new use cases and up to a 50% saving in energy usage. Advertising Extensions offers significant increases in broadcasting capacity (x8) for broadcast applications, including beacons.

Maximum re-use and easy migration

The nRF52810 has binary compatible peripherals with other devices in the nRF52 and nRF51 Series for most functions. The common hardware and software architectures mean use and porting of existing code is straightforward, allowing developers to re-use firmware libraries they have developed previously with ease.

KEY FEATURES

- Bluetooth 5 ready multi-protocol radio
- Bluetooth 5 datarate support 2Mbps, 1Mbps
- Supports Bluetooth 5 Advertising Extensions
- ARM® Cortex-M4 @ 64MHz
- 192kB flash and 24kB RAM
- Software stacks available as download
- Programmable output power +4dBm to -20dBm
- -96dBm sensitivity for Bluetooth Low Energy (1Mbps)
- -93dBm sensitivity for Bluetooth 5 (2Mbps)
- On-air compatible with nRF52, nRF51 and nRF24 SoCs
- Wide supply voltage range 1.7 V to 3.6 V
- Programmable Peripheral Interconnect - PPI
- Full range of interfaces SPI/2-wire/UARTE
- High speed SPI 8MHz
- Easy DMA for all digital interfaces
- 12 bit/200ksps ADC
- On-chip DC-DC buck converter
- Quadrature demodulator
- On-chip balun with 50Ω single-ended output

APPLICATIONS

- Network connectivity processor
- Smart RF remote controls
- PC peripherals
- Medical sensors
- Fitness sensors
- Toys
- Smart home sensors and actuators
- Logistics and tagging
- Airfuel wireless charging

Bluetooth 5	nRF52840	nRF52832	nRF52810
2Mbps	X	X	X
Advertising Extensions	X	X	X
Long Range	X		

OTA DFU

The nRF52810 is supported by and Over-The-Air Firmware upgrades (OTA DFU) feature. This allows for in the field updates of application software and SoftDevices.
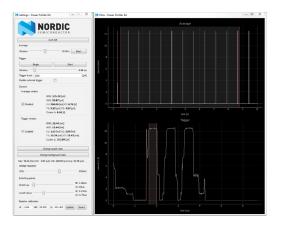
Nordic SoftDevices

Nordic protocol stacks are called SoftDevices, and complement the nRF52 Series SoCs. SoftDevices are qualified, pre-compiled and link-free libraries and can be downloaded from Nordic Semiconductor. SoftDevices reside in separate memory space to the application and are interfaced by their API making application development simpler and more predictable.

The S112 SoftDevice is compatible with the nRF52810. It supports Bluetooth 5 high throughput feature (2Mbps) and all Bluetooth roles. S112 can support up to 2 concurrent links and has configurable bandwidth settings to optimize connection throughput and energy efficiency.

Power Profiler Kit

The Power Profiler Kit is an affordable and valuable tool for accurate measurement of energy usage whilst developing you application. It connects directly to the nRF52 DK and has software that allows detailed monitor and measurement on a PC.

nRF52810 compatible SoftDevices

S112	Bluetooth 5 protocol stack optimized for nRF52810 SoC

SPECIFICATIONS

Frequency band	2.4GHz ISM (2.36000 – 2.4835GHz)
Protocol support	Bluetooth 5/ANT/2.4GHz proprietary
On-air data rate	2Mbps/1Mbps
Output power	Programmable: +4 to -20dBm in 4dB steps
Sensitivity	Bluetooth 5: -93dBm at 2Mbps, -96dBm at 1Mbps ANT: -92.5dBm at 1Mbps 2.4GHz: -93dBm at 2Mbps, -96dBm at 1Mbs
Radio current consumption DC-DC at 3V	4.6mA – TX at 0dBm output power, 4.6mA – RX at 1Mbs 7.0mA TX at +4dBm output power,
Microcontroller	32-bit ARM Cortex-M4
Program memory	192kB Flash
RAM	24kB
Oscillators	32MHz crystal oscillator, 64MHz RC oscillator, 32kHz crystal oscillator, 32kHz RC oscillator
System current consumption	0.3µA no RAM retention, 1.3µA All peripherals in ON mode, 1.8µA All peripherals in IDLE mode with 32kHz XO and RTC running, 40nA per 4kB RAM retention
Hardware security	128-bit AES ECB/CCM/AAR co-processor
GPIO	32 configurable
Digital I/O	1 x hardware SPI master/slave, 1 x 2 wire master/slave, UARTE, Quadrature demodulator
Peripherals	12-bit/200ksps ADC, RNG, Temperature sensor, GP comparator
PPI	20-channel
Voltage regulator	LDO(1.7 to 3.6V), Buck DC-DC (1.7 to 3.6V)
Timers/counters	3 x 32-bit, 2 x 24-bit RTC
Package options	QFN

RELATED PRODUCTS

nRF 52 DK	Development Kit for Bluetooth 5/ANT/2.4GHz applications
nRF52832	Multi-protocol Bluetooth 5/Bluetooth Low Energy/ANT/2.4GHz SoC
nRF52840	Multi-protocol Bluetooth 5/Bluetooth Low Energy/ANT/802.15.4/2.4GHz RF SoC
nRF5 SDK	Software Development Kit for nRF51 and nRF52 Series
Power Profiler Kit	Current measurement tool for embedded development

WORLD WIDE OFFICE LOCATIONS

Headquarters:
Trondheim, Norway
Tel: +47 72 89 89 00

For more information
Visit **www.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.

TRONDHEIM, NORWAY HEAD OFFICE
OULU, FINLAND
OSLO, NORWAY
TURKU, FINLAND
SAN JOSE, USA
KRAKOW, POLAND
BEIJING, CHINA
SEOUL, KOREA
TOKYO, JAPAN
SHANGHAI, CHINA
SHENZHEN, CHINA
HONG KONG, CHINA
TAIPEI, TAIWAN
LAGUNA, PHILIPPINES