nRF52 Series SoC

High performance solutions for Bluetooth 5/ANT/2.4GHz

nRF52840

Advanced featureset
Bluetooth 5/802.15.4/ANT/2.4GHz

nRF52832

General purpose
Bluetooth 5/ANT/2.4GHz

nRF52810

Entry-level
Bluetooth 5/ANT/2.4GHz

Broad range solutions for Bluetooth 5/ANT/2.4GHz

The nRF52 Series SoC family offer you a broad selection of high performance Bluetooth 5 SoCs that cover high functionality through to entry-level in a range of package options.

All of the nRF52 Series have support for Bluetooth 5 features in addition to multi-protocol capabilities, which include ANT, 802.15.4 and 2.4GHz proprietary.

5 Long range

5 High throughput

5 Advertising extensions

Bluetooth 5 for every situation

The nRF52 Series cover a broad spectrum of features and functionality from the top of the range richly featured nRF52840 through to the entry-level nRF52810.

A common aspect of all the nRF52 Series is an ARM Cortex-M4 or M4F CPU. This brings exceptional processing horsepower to any application's needs. This also makes migration across ICs in the series very straightforward with code compatibility. Differentiation beyond this point lies in range and number of peripherals and memory availability.

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.

nRF52 Series SoC Feature selector

	nRF52840	nRF52832	nRF52810
Bluetooth 5 – 2Mbps	X	X	X
Bluetooth 5 – Advertising Extensions	X	X	X
Bluetooth 5 – Long Range	X		
ANT/2.4GHz	X	X	X
IEEE 802.15.4	X		
ARM Cortex M4F/M4	X	X	X
ARM CryptoCell	X		
Flash	X	X	X
USB	X		
Adaptive power management system	X	X	X
ADC	X	X	
50Ω antenna output	X	X	X
Quadrature demodulator	X	X	X
64MHz clock	X	X	X
32kHz clock	X	X	X
Easy DMA	X	X	X
SPI/2-wire/UART	X	X	X
I²S	X	X	
PDM	X	X	
QFN package	X	X	X
CSP package		X	

nRF52 Series flash-based flexibility and upgradability

The nRF52 Series are flash-based Bluetooth SoCs. Flash memory brings complete flexibility and upgradability to your designs and products. Devices can be re-programmed in the factory or in the field with over the air device firmware upgrades (OTA DFU). This enables product bug fixing and feature addition any time, anywhere.

nRF52840 - Bluetooth 5 long range, full home connectivity

The nRF52840 supports all of Bluetooth 5's key new features:

- High Throughput (2Mbps)
- Long range
- Advertising extensions

The nRF52840 now offers four times the range of previous Bluetooth. This means ultra-low power Bluetooth low energy is a viable candidate for simple operation home networks with a typical indoor range of around 50m. This is generally enough to cover the vast majority of home dwellings. A real benefit of Bluetooth 5 long range is its simplicity of operation, unlike mesh networks it can reach around the home in a single hop making creation and operation of networks simple, robust and latency-free.

Bluetooth 5 long range introduces no increases in peak power levels and is achieved by a reduction in the on-air data-rate to a choice of 500kbps or 125kbps. Whilst these data-rates are somewhat below the higher rates offered they are perfectly adequate for typical home sensor/actuator operations such as control of lights and home appliances.

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.

Code compatibility and broad device offering means easy migration
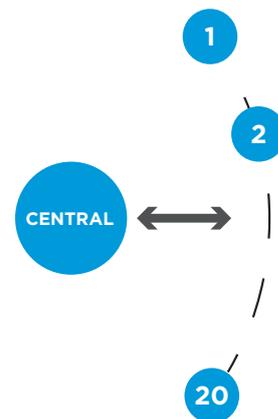
The nRF52 Series comprises the nRF52840, nRF52832 and nRF52810 multi-protocol SoCs. The devices all have some different to offer, but each device comes in a range of memory and package options allowing you to choose exactly the device that fits your application needs. The architecture of the nRF52 Series means you can develop on the nRF52 Series and migrate across to another member of the Series with absolute ease in the knowledge full code compatibility exists within the series.

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 nRF52840 is supported by the S140 SoftDevice with nRF52832 and nRF52810 supported by the S132 SoftDevice. S140 and s132 are Bluetooth 5 capable protocol stacks allowing you to take advantage of the appropriate Bluetooth 5's features in whichever nRF52 Series device you choose. These stacks have a rich feature-set and can support 20 concurrent multi-role connections.

nRF52 Series compatible SoftDevices

S132	Bluetooth 5 - 20-link concurrent multi-role protocol stack
S140	Bluetooth 5 - 20-link concurrent multi-role protocol stack

RELATED PRODUCTS

nRF52840	Multi-protocol Bluetooth 5/ANT/802.15.4/2.4GHz SoC
nRF52832	Multi-protocol Bluetooth 5/ANT/2.4GHz SoC
nRF52810	Multi-protocol Bluetooth 5/ANT/2.4GHz SoC
nRF 52 DK	Development Kit for Bluetooth 5/ANT/2.4GHz applications
nRF 52840 PDK	Development Kit for Bluetooth 5/ANT/802.15.4/2.4GHz applications
nRF5 SDK	Software Development Kit for nRF51 and nRF52 Series
Power Profiler Kit	Current measurement tool for embedded development

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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.