

nRF91 SiP Series

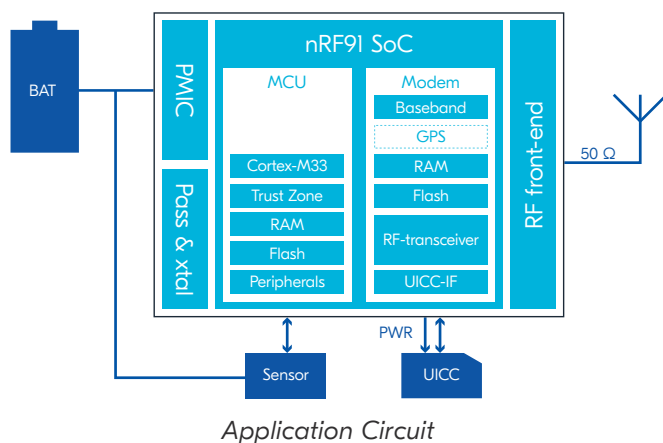
Low power MCU with Integrated LTE-M and NB-IoT wireless modem

Overview

The nRF9160 is making the latest LTE technology accessible for a wide range of applications and developers. Through the high integration and pre-certification for global operation, it solves the complex wireless design challenges as well as comprehensive set of qualifications needed to utilize cellular technology.

By integrating an application MCU, full LTE modem, RF front end and power management in a 10×16×1.2 mm package, it also offers the most compact solution for cellular IoT (cIoT) on the market.

Targeting asset tracking applications, the nRF91 SiP Series includes a variant with built-in GPS support. It combines location data from the cellular network with GPS satellite trilateration to allow remote monitoring of the device position.



Application MCU

The nRF9160 offers a modern and powerful ARM Cortex M33 processor with on-chip flash and RAM exclusively for application use.

A range of analog and digital peripherals supports the powerful CPU and enables advanced single chip cellular IoT products. nRF9160 uses standard Nordic development tools, making porting and development easy.

KEY FEATURES

LTE-M and NB-IoT modem

- LTE-M and NB-IoT support in bands from 700 MHz to 2.2GHz
- Worldwide operation
- Up to 23 dBm output power
- -108 dBm LTE-M RX sensitivity
- Single pin 50 Ω antenna interface
- eDRX, PSM
- SMS, IPv4/IPv6
- TCP/UDP, TLS/DTLS

Application Processor

- ARM Cortex M33
- TrustZone for trusted execution
- Crypto cell co-processor
- Low power peripherals
- HW Automated power and clock management
- 32 GPIO with flexible mapping

Software Development kit

- LWM2M client
- CoAP, MQTT, HTTP
- Secure FOTA for application and modem
- Peripheral driver libraries
- Application examples

APPLICATIONS

- Logistics and asset tracking
- Smart City
- Smart Agriculture
- Industrial & Predictive maintenance
- Wearables
- Medical

LTE-M and NB-IOT modem

The nRF9160 LTE modem integrates RF Front End (RFFE), radio and baseband. It supports operation worldwide, enabling IoT products without regional specific variants

The LTE modem radio offers a single pin antenna interface, support half-duplex FDD operation and the power saving and range extension features added in 3GPP standard, release 13.

The LTE modem integrates IPv4/IPv6 stack layers up to transport and security (ex. TCP/TLS).

IP application layer protocols are located in the application MCU, making it easy for a developer to select application protocols and device profiles supported by the chosen cloud service.

Low power

nRF9160 is made exclusively for the low power and low data rate LTE standards, introduced in 3GPP release 13. Due to this and the integration of application MCU, modem and all memories, it can offer unparalleled low power performance.

It can maintain a connection with the cellular network with less than 10 uA average current and upload data every 20 seconds with 0.5 mA average current.

Security

The integrated crypto and security features enables the nRF9160 to meet the latest requirements on internet security and authentication. By including trusted execution capability on the application processor, it takes security a step further by securing the most critical processes and peripherals in the application.

The on-chip modem is its own security island.

UICC support

The nRF9160 LTE modem automatically powers and handles all communication with needed external UICC. It supports both use of traditional class C (1.8V) SIM cards as well as eUICC (eSIM) solutions.

Development Kits and Tools

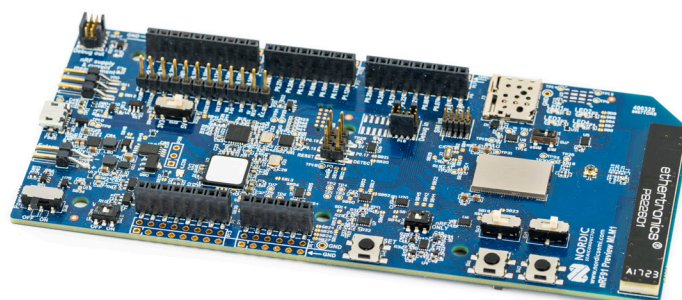
Easy to use SDKs, development tools and support.

KEY DATA

Application MCU	
CPU	ARM Cortex M33
Crypto	ARM Cryptocell 310
Program memory	Flash
Data Memory	RAM
Supply range	3.1 – 5.5V (single supply)

LTE modem	
Frequency range	700 MHz – 2.2 GHz
On air data rates	Cat. M: 360 kbps NB-IoT: 60 kbps
Output power	Up to 23 dBm
RX sensitivity	-108 dBm LTE-M
Mode	HD-FDD

Power consumption (3.7V supply)	
LTE-M eDRX idle 10 minute interval	15 uA
LTE-M DRX 20 s uplink	0.5 mA
LTE-M full speed download	150 mA



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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.

