QN9090 and QN9030: the latest in Intelligent Connectivity

High Capability and Low Power Bluetooth® 5 SoC with Built-in NFC Option

The QN9090 and QN9030 are the latest devices in the QN series of Bluetooth low energy devices that achieve ultra-low-power consumption and integrate an Arm® Cortex®-M4 CPU with a comprehensive mix of analog and digital peripherals. These highly capable devices allow developers to create products that have rich features and address ease of use with optional NFC technology.

TARGET APPLICATIONS

- Wearables
- Healthcare devices
- Sports and fitness trackers
- HID controllers and remote control units
- Toys and gaming peripherals
- Building and home automation
- Retail advertising beacons

INTELLIGENT BLUETOOTH LOW ENERGY CONNECTIVITY

Supporting Bluetooth 5, the QN Series is designed to enable the next generation of intelligent connected devices. The advanced low-power modes and ultra-low 2.4GHz transmit and receive power consumption, extend battery life for QN9090 and QN9030 based systems. With -97dBm Rx sensitivity and up to +11dBm Tx output power, QN series devices can offer reliable and robust communications performance that simplifies design.

OVERVIEW

QN series devices are powered by an Arm® Cortex®-M4 running at 48MHz and include up to 640KB onboard flash and 152 KB SRAM. The memory integration provides room and flexibility for complex applications and safe Over-the-Air (OTA) updates. In addition, the quad serial flash memory controller, SPIFI, can be used to extend non-volatile memory for data or code. All QN series devices have a rich set of MCU peripherals and multiple serial communication interfaces, that enable intelligent connected designs and reduce CPU overhead. For example, the Digital Microphone subsystem PDM interface enables voice activity detection.

Within the QN series the QN9090T and QN9030T integrate NFC NTAG capability to support use cases such as out-of-band pairing. By tapping an IoT device based on the QN9090T with an NFC reader device, such as a smart phone or tablet, a Bluetooth LE connection can be established quickly simplifying the pairing process. The NFC Tag does not require the device to be powered which means it creates additional opportunities for diagnostics or device commissioning in all stages of the device life cycle.

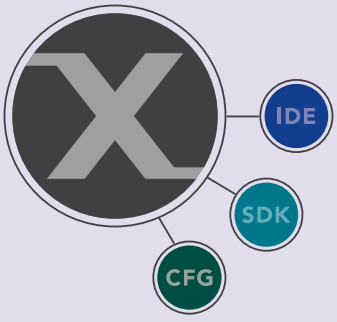
GETTING STARTED

The QN9090 development platform, the QN9090DK, comes with an integrated programmer and debugger along with suite of example applications showcasing standard GATT profiles in a complete software development kit (SDK). The MCUXpresso SDK for QN is compatible with the latest toolchains from IAR and NXP's MCUXpresso IDE. The full MCUXpresso Suite of software and tools provides a seamless software experience across all NXP devices as well as a fast path to add Bluetooth LE capability to an existing design on other NXP devices. In addition, to aid Bluetooth LE system design, NXP IoT Toolbox smart device application is available. The NXP Connectivity Tool and Test Tool are provided by NXP to help the developers' evaluate RF performance and test more efficiently.

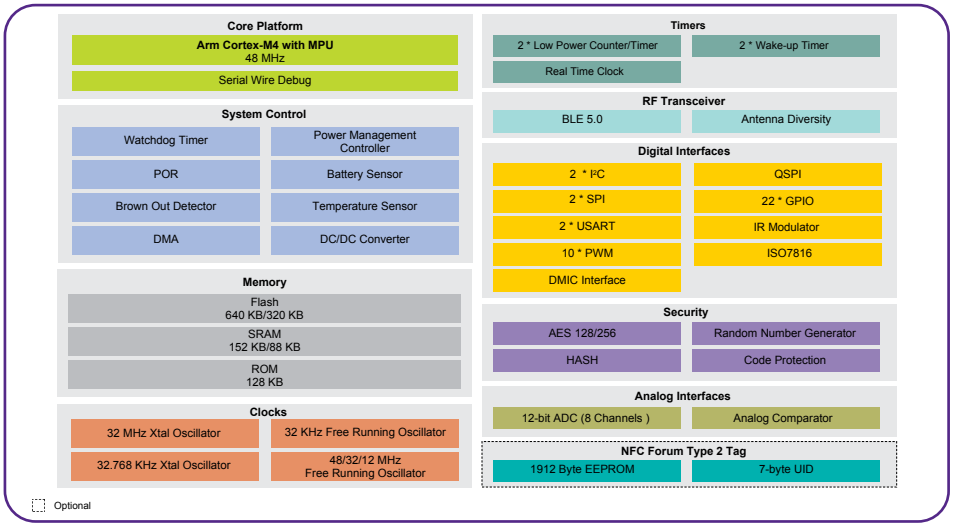
In addition to the Development Board, there are two additional hardware options available. The USB dongle and module with mezzanine as shown in the last table.

SOFTWARE AND TOOLS

NXP's **MCUXpresso software and tools** offer comprehensive development solutions designed to optimize, ease and accelerate embedded system development of applications based on Cortex-M core devices, including Kinetis, LPC, QN, JN microcontrollers and i.MX RT crossover MCUs.



QN9090/30 BLOCK DIAGRAM



QN9090 SERIES HIGHLIGHTS

Features	Benefits
System Current Consumption 7.4mA @ +0dBm TX, 4.3mA Rx peak current	Extends battery life and allows for optimized form-factors
RF Performance -97 dBm RX sensitivity Up to 11 dBm TX output power	High sensitivity allows for a more robust link budget. Integrated balun reduces system size and cost. High TX power enables long-distance transition.
Processing and Memory 48 MHz Arm® Cortex®–M4 core Up to 640kB/320kB Flash, 152kB/88kB RAM	High-performance Arm core with memory options for Bluetooth LE Stack and user applications
Connectivity throughput Bluetooth LE 2Mbps PHY with Bluetooth 5 compatibility	Doubles data throughput for more use cases, improves user experience and lowers average power consumption
Network Support Supports up to 8 simultaneous links	Allows for the creation of large, complex Bluetooth LE sensor networks
NFC Communications NFC Forum Type 2 Tag with integrated UID and Memory	Simplifies the Bluetooth LE device paring and provisioning improving the user experience
Scalability Hardware compatible with JN5189 and K32W041 family	Allows for fast moving to IEEE 802.15.4 or multiprotocol applications by only updating firmware without hardware design change
Environmental Conditions Wide temperature range: -40°C to +125°C	Applicable in various environment
Development Environment Compatible with IAR and MCUXpresso IDEs	Example projects support industry standard IAR toolchains. MCUXpresso support allows for easy code migration based on other NXP devices.

QN9090 SERIES DEVICE OPTIONS

Part Number	Flash (KB)	RAM (KB)	NFC	Package
QN9090T	640	152	Y	40 Pin HVQFN 6 mmx 6 mm 0.85 mm
QN9090	640	152	N	
QN9030T	320	88	Y	
QN9030	320	88	N	

Part Number	Description
QN9090-DK006	Development board
OM15080-QN9090	USB dongle
QN9090-001-T10	Module with mezzanine

www.nxp.com/QN9090

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Product Longevity