Revolutionary Multiprotocol and Multiprocessor Module Range

The newest entry in our Nordic Semiconductor based Bluetooth LE portfolio is by far the most advanced, most secure, and highest performing multi core MCU architecture wireless solution available anywhere.

The BL54H20 series of robust, tiny modules feature the **Nordic nRF54H20 SoC**. It directly targets the highest-performance processing capabilities with double the application processing (vs. prior BL5340). **2x Cortex-M33** AND **2x RISC-V coprocessors** each are optimized for particular workloads. We've also scaled up memory to 2MB non-volatile and 1MB RAM.

Featuring BT 5.4, capabilities include support for Bluetooth LE, LE Audio, Bluetooth Mesh, and 802.15.4 protocols including Thread and Matter.

It's further enhanced with state-of-the-art security, designed for PSA Certified level 3, and supports Secure Boot, Secure Firmware Update, Secure Storage, and integrated tamper sensors for physical security.

The BL54H20 series brings out all nRF54H20 hardware features and capabilities including high speed **USB access, CAN** FD controller, 2 x **I3C** and **14bit ADC**, up to +10 dBm transmit power, from **1.9V to 5.5V** supply considerations, and a true industrial operating range of **-40 to 105°C.**

Complete regulatory certifications enable faster time to market and reduced development risk, simplifying your next wireless design.

- **Nordic nRF54H20** – 4.7xmm4.3 WSCLP with 64 GPIOs available.
- **Multi-protocol support**: Bluetooth 5.4 LE, 802.15.4 (Thread/Matter)
  - Bluetooth LE: Peripheral/Central, 2 Mbps (high throughput), LE Coded (long range), AoA/AoD, LE Audio/Isochronous Channels, Mesh
- **Dual Cortex M33 processor cores**: Application processor (up to 320MHz Cortex M33), Radio processor (256MHz Cortex M33)
- **Dual RISC-V co-processor cores**: 320 MHz VPR, 16 MHz VPR
- **Memory**: 2MB non-volatile memory, 768 KB RAM, and External interfaces – XIP, QSPI, xSPI, HyperBus
- **Extended Industrial Temperature Rating** (-40° to +105°C)
- **Small form factor**: 13.5 x 10 x 1.8 mm
- **Most configurable interfaces**: - NFC A-Tag, USB, CAN FD, I3C, UART, QSPI, SPI, High Speed SPI, SMIF, I²S, I²C, PDM, PWM, ADC, GPIO, QDEC, Comparator, Low Power Comparator
- **Additional SoC Hardware Features** like RNG, WDT, temperature sensor, floating point unit, inter-processor communication, debug trace, NFC
- **Antenna choice** –external antenna support via MHF4 connector OR integrated pre-certified Chip antenna (**Ignion NANO NN02-101** chip antenna for radiated efficiency and optimal location flexibility)
- Development choice: Zephyr RTOS,Nordic nRF Connect SDK, Canvas
- Firmware Over the Air (FOTA) via MCUboot and Zephyr
- Hostless operation – Multi Core MCU reduces BOM
- Fully featured development kits to jump start Bluetooth LE development

NORDIC SEMICONDUCTOR   **Zephyr**™ Project   **CANVAS** DEVICE MANAGER

Key Features

Secure, Flexible Multi Core Architecture
Multi-core dedicated application and radio processing, plus RISC-V co-processors, backed by copious non-volatile memory and RAM.

Software Flexibility and Speed to Market
Develop with either Zephyr RTOS or the Nordic's nRF Connect SDK. Use our extensive sample apps.

True Industrial Operating Range
Designed and certified to the highest industrial temperature range of -40°C to +105°C for every component utilized.

Global Approvals – Make Yourself at Home
Carries FCC, ISED, EU, UKCA, RCM, MIC for Bluetooth & 802.15.4, and Bluetooth SIG approvals.

Personal Support from Design to Manufacture
Our industry-renowned support is passionate about helping you speed your design to market.

Application Areas

Smart Building

Asset Tracking

Secure Medical Peripherals

Industrial Automation

Specifications

Category	Feature	Specification	
Wireless Specification	Bluetooth®	v5.4	
	802.15.4	Thread and Matter	
	NFC	A-Tag	
	TX Power	Up to + 10 dBm.	
	Receive Sensitivity	-100dBm (typical BLE 1Mbps) - TBD dBm (typical BLE 125kbps)	
	Link Budget	110 dB (BLE 1Mbps)	
	Antenna Options	Integrated Chip antenna or MHF4 connector for external antennas	
	Raw Data Rates (Air)	BLE: 1 Mbps, 2 Mbps, 500 kbps, 125 kbps 802.15.4-2006: 250kbps	
Host Interface and Peripherals	UART Interface	TX, RX, CTS, RTS. DTR, DSR, DCD, RI (GPIO). Default: 115200, N, 8, 1. Configurable from 1200 bps to 1 Mbps	
	USB Interface	2 pins – USB 2.0 slave, up to 12Mbps	
	Other	Up to 64 multifunction GPIO's that can provide: • 8x SPI/TWI/UART/2xHigh speed SPI • 2x I3C • 8x ADC channels (1 pin each) • 1x PDM (2 GPIO pins) • 2x TDM (I2S) • EXMIF + Fast peripherals (14pins) -QSPI, xSPI, HyperBus	• 2 GPIO pins for 32.768 kHz crystal • 1x NFC • 4x PWM output, 1x High speed PWM • 2x QDEC
Key Bluetooth LE Features	Bluetooth Low Energy	• GATT client/server – Any adopted/custom services • Central/Peripheral roles • Bluetooth mesh • 2M PHY • LE Coded PHY • LE Audio w/ Isochronous streams	• AoA / AoD • LE Advertising Extensions • LE secure connections • Data packet length extensions • LE privacy v1.2 • DTM Firmware (Test Modes)
Programming Options	Nordic nRF Connect SDK	Software/Support available from Nordic directly: https://devzone.nordicsemi.com/	
	Zephyr RTOS	Software/Support available from Nordic directly: https://www.zephyrproject.org/	
	Canvas SW Suite	Software/ Support available from https://www.ezurio.com/canvas/software-suite	
FW upgrade		Via UART, SWD, or Bluetooth LE – via nRF Connect SDK or Zephyr	
Supply Voltage		High Voltage Mode: 1.9 - 5.5V Normal Voltage Mode: 1.71 - 1.98V	
Power Consumption	Current	Max Peak Radio Current (@ +10 dBm TX) – TBC (DCDC at 3V) Max Peak Radio Current (@ 0 dBm TX) – 4.8mA (DCDC at 3V)	
		System ON – TBC	
		System OFF – 0.6 uA (with GPIO wake-up on 12pins)	
Physical	Dimensions	13.5 mm x 10 mm x 1.8 mm	
Environmental	Temp Range	-40°C to +105°C	
Miscellaneous	Lead Free	Lead-free and RoHS-compliant	
	Development Kit	Development board and free software tools	
Development Tools	Utilities	Nordic nRF Connect - Android and iOS applications XBit Tools & Utilities	
Qualifications	Bluetooth®	Complete Declaration ID	
Regulatory	Approvals	FCC, ISED, EU, UKCA, RCM, MIC, KC - All BL54H20 Series are BT & 802.15.4 certified (all pending)	

For full specifications on BL54H20 modules, please see the appropriate datasheet.

Ordering Information

Part	Description
453-00197R	Module, BL54H20 (Nordic nRF54H20), Chip antenna, Tape/Reel
453-00198R	Module, BL54H20 (Nordic nRF54H20), MHF4 Connector, Tape/Reel
453-00197C	Module, BL54H20 (Nordic nRF54H20), Chip antenna, Cut Tape
453-00198C	Module, BL54H20 (Nordic nRF54H20), MHF4 Connector, Cut Tape
453-00197-K1	Development kit, Module BL54H20 (Nordic nRF54H20), Chip antenna
453-00198-K1	Development kit, Module BL54H20 (Nordic nRF54H20) – MHF4 Connector

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