The BL54LM20A Series Pushes the Nordic nRF54L Even Further

The BL54LM20A series builds on the proven foundation of Ezurio's BL54L family, delivering greater memory capacity, USB interface, expanded I/O, and enhanced interface flexibility, while maintaining ultra-low-power performance, industrial robustness, and advanced security. Powered by the **Nordic's nRF54LM20A** SoC, our compact BL54LM20A modules deliver secure and robust Bluetooth LE and 802.15.4 with flexible programming via the Nordic nRFConnect SDK, Zephyr RTOS and Canvas.

BL54LM20A modules feature a 128 MHz Arm Cortex-M33 processor and a 128 MHz RISC-V coprocessor. With 2 MB non-volatile memory and 512 KB RAM, the BL54LM20A supports ample headroom for larger applications, richer protocol combinations, and long-term product scalability.

The BL54LM20A exposes a significantly larger GPIO set compared to earlier BL54L variants, enabling:

- More sensors and peripherals
- Advanced human-interface devices
- Gateway-class and controller-style designs

High-speed peripherals are supported via the RISC-V coprocessor, alongside a rich set of low-leakage peripherals including timers, ADC, PWM, QDEC, I2S, and NFC. It supports Bluetooth features like Channel Sounding, LE Secure Connections, Extended Advertising, and more.

It's further enhanced with state-of-the-art security and is designed for PSA Certified level 3 and supports services such as Secure Boot, Secure Firmware Update, Secure Storage plus protection from physical attacks.

Application Areas: Smart building and building automation, Industrial sensors and controllers, Medical peripherals, Asset tracking and location services, Matter-enabled smart home devices

- **Nordic nRF54LM20A SoC** – CSP61 package with 40 GPIOs utilized.
- **Multi-protocol support:** Qualified against Bluetooth Core 6.0, 802.15.4 (Thread & Matter)
- **Cortex M33** processor core: 128 MHz ARM Cortex M33
- **RISC-V** co-processor core: 128 MHz VPR
- **Memory:** 2MB non-volatile memory, 512 KB RAM
- **High Speed Peripherals**: - HS-SPI/UART, software defined peripherals on 128 MHz VPR, GPIOs, USB
- **Low Leakage Peripherals:** 2x QDEC, 7x Timer, Global RTC, 2x WDT, NFC A-Tag, TEMP, I2S, COMP, 3x PWM, LPCOMP, 14-bit 8CH ADC, 5x TWI/SPI/UART, GPIO
- **Antenna choice** – **Integrated Chip Antenna** or external antenna support via **MHF4 connector**
- **Ultra-small footprint** (8 mm x 12 mm x 2 mm)
- **Extended Industrial Temperature Rating** (-40° to +85 °C)
- **Development choice:** Zephyr RTOS, Nordic nRF Connect SDK & Canvas
- **Bluetooth LE**: Channel Sounding, LE 2M, LE Coded, LE Secure Connections & more
- Firmware Over the Air **(FOTA)** via MCUboot and Zephyr
- **Fully featured development kits** to jump start Bluetooth LE development

Key Features

Best in Class Multiprotocol Radio
Best-in-class multiprotocol radio with up to 8 dBm TX power and -95.5 dBm RX sensitivity for 1 Mbps Bluetooth LE. Supports Bluetooth Core 6.0 including Channel Sounding

Advanced Security
Designed for PSA Certified Level 3 with Secure Boot, Secure Firmware Update, and Secure Storage. Integrated tamper sensors detect attacks and take action, and cryptographic accelerators are hardened against side-channel attacks.

True Industrial Operating Range
Designed and certified to the highest industrial temperature range of -40 ºC to +85 ºC for every component utilized.

Global Approvals – Make Yourself at Home
Carries several modular FCC, ISED, CE, UKCA, RCM, MIC, KC for Bluetooth LE & 802.15.4
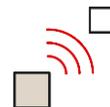
Personal Support from Design to Manufacture
Our industry-renowned support is passionate about helping you speed your design to market.

Where We Help

Wireless Connectivity
Enhanced processing power, expanded memory and innovative peripherals ideal for applications that require optimized, low power connectivity.

Security Resilience
Security is top of mind with advanced security services that deliver greater protection, including PSA Certified level 3.

Lifecycle Management
Designed for long product lifecycles, with options for scalability and futureproofing.

Regulatory Compliance
Accredited EMC test facility, certification experience in 140 countries and continuous compliance monitoring.

Interested in our BL54LM20A Series?
Visit www.ezurio.com/bl54lm20a-series

Specifications

Category	Feature	Specification
Wireless Specification	Bluetooth®	Qualified against Bluetooth Core 6.0
	802.15.4	Thread and Matter
	NFC	A-Tag
	Frequency	2.402 - 2.480 GHz
	Transmit Power	+ 8 dBm (maximum). Configurable down to -40 dBm
	Receive Sensitivity	-95.5 dBm (typical BLE 1 Mpbs) TBC dBm (typical BLE 125 kbps)
	Antenna Options	Integrated chip antenna or MHF4 connector for external antennas
	Raw Data Rates (Air)	Bluetooth LE: 1 Mbps, 2 Mbps, 125 kbps, 500kps 802.15.4-2006: 250kbps
Host Interface and Peripherals	UART Interface	TX, RX, CTS, RTS. DTR, DSR, DCD, RI (GPIO) Default: 19200, N, 8, 1. Configurable from 1200 bps to 1 Mbps
	Other	40 multifunction GPIO's that can provide: • USB • 5x UART/SPI/TWI • 8x ADC channels (1 pin each) • 2x I2S (5 GPIO pins) • 3x PWM output (1 GPIO pin per PWM) • 7x TIMER (no GPIO needed unless required) • 2 GPIO pins for 32.768 kHz crystal • 1x NFC (2 GPIO pins) • 2x QDEC • 20x Wakeup pins
Features	Bluetooth LE	• GATT client & GATT server – Any adopted/custom services • Central/Peripheral roles • Mesh networking • LE CODED • LE 2M • Channel Sounding • LE Secure Connections • Extended Advertising • LE Power Control • DTM Firmware (Test Modes)
Programmability Options	Nordic SDK	Software/Support available from Nordic directly https://devzone.nordicsemi.com/
	Zephyr RTOS	Software/Support available from https://www.zephyrproject.org/
	Canvas SW Suite	Software/ Support available from https://www.ezurio.com/canvas/software-suite
FW upgrade		Via UART or JTAG
Supply Voltage		Normal Voltage Mode: 1.7V – 3.6V
Power Consumption	Current	Max Peak Radio Current (@ +8dBm TX) – TBC mA (supply voltage.8V) Max Peak Radio Current (@ -40 dBm TX) – TBC mA (supply voltage 1.8V)
Physical	Dimensions	14 mm x 10 mm x 1.6 mm
Environmental	Temp Range	-40°C to +85°C
Miscellaneous	Lead Free	Lead-free and RoHS-compliant
	Development Kit	Development board and free software tools
Development Tools	Utilities	Nordic nRFConnect - Android and iOS applications UART firmware upgrade Xbit Tools and utilities
Qualifications	Bluetooth®	Complete Declaration ID
Regulatory	Approvals	FCC, ISED, EU, UKCA, RCM, MIC, KC – All BL54LM20A Series are Bluetooth & 802.15.4 certified

Ordering Information

Part	Description
453-00586R	Module, BL54LM20A, (Nordic nRF54LM20A), Chip Antenna, Tape/Reel
453-00585R	Module, BL54LM20A, (Nordic nRF54LM20A), MHF4 Connector, Tape/Reel
453-00586C	Module, BL54LM20A, (Nordic nRF54LM20A), Chip Antenna, Cut Tape
453-00585C	Module, BL54LM20A, (Nordic nRF54LM20A), MHF4 Connector, Cut Tape
453-00586-K1	Development kit, Module, BL54LM20A, (Nordic nRF54LM20A), Chip Antenna
453-00585-K1	Development kit, Module, BL54LM20A, (Nordic nRF54LM20A), MHF4 Connector

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