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DATASHEET v1.0

nRF54L15, nRF54L10, and nRF54L05 Wireless SoCs

nRF54L15, nRF54L10, and nRF54L05 are a part of the nRF54L Series. All wireless System-on-Chip (SoC) options in the series integrate an ultra-low power, multiprotocol 2.4 GHz radio with MCU (Microcontroller Unit) functionality featuring a 128 MHz Arm® Cortex®-M33 processor. nRF54L15, nRF54L10, and nRF54L05 make up a flexible set of SoCs enabling multiple product categories with an extended peripheral set and scalable memory configurations.

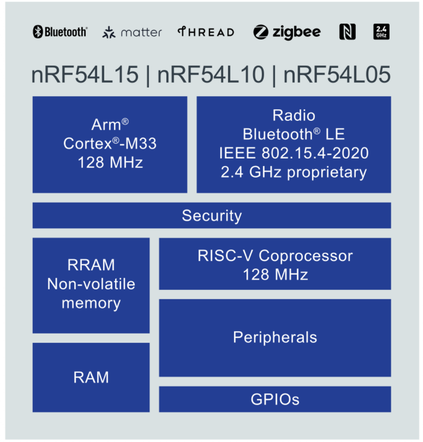
Nordic Semiconductor's proprietary technologies, such as low-leakage RAM and advanced multiprotocol radio design, enable ultra-low power consumption, reducing battery size or increasing lifetime.

Designed with versatility in mind, the nRF54L Series SoCs are suited to enable a broad range of applications. The multiprotocol 2.4 GHz radio supports *Bluetooth*® LE with optional features including Channel Sounding, introduced in *Bluetooth*® Core 6.0, as well as 802.15.4-2020 for standards such as Thread®, Matter, and Zigbee®, and a proprietary 2.4 GHz mode supporting up to 4 Mbps for higher throughput. The devices integrate peripherals expected in a wireless microcontroller, enabling many products to be implemented with a single chip. An integrated RISC-V coprocessor further reduces the need for external ICs.

nRF54L15, nRF54L10, and nRF54L05 are available in a range of memory and package configurations, including pin-to-pin compatible QFN packages, enabling cost-optimized and flexible design across different application requirements.

Key features

- 128 MHz Arm® Cortex®-M33 processor
- Scalable memory configurations from 500 KB up to 1524 KB NVM and 96 KB up to 256 KB RAM
- Multiprotocol 2.4 GHz radio supporting *Bluetooth*® LE, 802.15.4-2020, and 2.4 GHz proprietary modes (up to 4 Mbps)
- Five serial interfaces (SPI/TWI/UART) including high-speed support
- Extended set of interfaces, peripherals, and timers including Global RTC available in System OFF, 14-bit ADC, I^2S, PDM, NFC, PWM, and QDEC
- 128 MHz RISC-V coprocessor
- Advanced security including TrustZone® isolation, tamper detection, and cryptographic engine with side-channel leakage protection
- Ultra-compact CSP and QFN packages



Power consumption highlights

Power mode	Current @ 3.0 V
Active with radio	
Bluetooth® LE TX 1 Mbps at 0 dBm	4.8 mA
Bluetooth® LE TX 1 Mbps at +4 dBm	6.6 mA
Bluetooth® LE TX 1 Mbps at +8 dBm	9.8 mA
Bluetooth® LE RX 1 Mbps	3.4 mA
Active with processing	
CPU CoreMark® from RRAM with cache	2.6 mA
Sleep	
System ON IDLE with GRTC (XOSC) and 256 KB RAM	2.9 µA
System ON IDLE with GRTC (XOSC) and 192 KB RAM	2.6 µA
System ON IDLE with GRTC (XOSC) and 96 KB RAM	1.7 µA
System OFF with GRTC wakeup	0.9 µA
System OFF	0.7 µA

Product variants

Part number	NVM	RAM
nRF54L15	1524 KB	256 KB
nRF54L10	1012 KB	192 KB
nRF54L05	500 KB	96 KB