# Feature overview

**Radio**

- *Bluetooth*® LE
  - LE 2M, LE 1M, LE Coded
  - Channel Sounding
- IEEE 802.15.4-2020 – 250 kbps
  - Enables Matter, Thread®, Zigbee®
- 2.4 GHz proprietary GFSK
  - 4 Mbps, 2 Mbps, 1 Mbps
- Single-ended antenna output

  (on-chip balun)
- 128-bit AES/ECB/CCM/AAR coprocessor
- Configurable TX power with 1 dBm step size from -10 dBm to maximum

**Processor**

- 128MHz Arm® Cortex®-M33 CPU
  - FPU, DSP, MPU, TrustZone®
  - Debug – SWD, ETM, ITM, DWT, CTI, TPIU

**Memory**

- 500 KB to 1524 KB NVM (RRAM)
- 96 KB to 256 KB RAM

**Coprocessor/SoftPeripherals**

- 128 MHz RISC-V coprocessor (VPR)
- sQSPI available as SoftPeripheral for VPR; see the software documentation for details

**Peripherals**

- Five fully featured serial interfaces with EasyDMA, supporting $I^2C$, SPI controller/ peripheral, and UART
  - One HS-SPI up to 32 MHz, four SPI up to 8 MHz (SPIM, SPIS)
  - Four TWI up to 400 kHz and $I^2C$ compatible (TWIM, TWIS)
  - One HS-UART up to 4 Mbps, four UART up to 1 Mbps (UARTE)
- SAADC with eight programmable gain channels
  - 14-bit at 31.25 ksps
  - 12-bit at 250 ksps
  - 10-bit at up to 2 Msps
- Global RTC can run in System OFF mode and implement a shared system timer (GRTC)
- NFC-A listening device (NFCT)
- Pulse density modulation interface (PDM)
- $I^2S$ two-channel Inter-IC sound interface
- Three pulse width modulator (PWM) four-channel units with autonomous waveform generation (PWM)
- Two quadrature decoders (QDEC)
- Two individual watchdog timers for secure and non-secure context (WDT)
- Seven 32-bit timers with counter mode (TIMER)
- Temperature sensor (TEMP)
- Comparator and low-power comparator with wake-up from System OFF mode (COMP, LPCOMP)

**GPIO**

- Up to 35 GPIO pins
- 64 MHz and 8 MHz ports

**Power supply and clock**

- Single-inductor DC/DC converter
- Single 32 MHz crystal operation
- Optional 32.768 kHz crystal

**Security**

- Arm TrustZone, Root of Trust, secure boot, secure storage
- Security components – Cryptographic engine (CRACEN), Key management (KMU)
- Physical protection – Tamper detectors (TAMPC, GLITCHDET), Side-channel protection

**Key specifications**

- Maximum TX power (CSP/QFN) – 8 dBm/7 dBm
- RX sensitivity for 1 Mbps Bluetooth LE – -96 dBm
- RX sensitivity for IEEE 802.15.4 – -102 dBm
- EEMBC CoreMark® executing from non-volatile memory – 503 CoreMark, 3.93 CoreMark/MHz
- Supply and GPIO voltage – 1.7 V to 3.6 V
- Operating temperature – -40°C to +105°C

**Packages for all variants**

- QFN40 (QDAA) with 24 GPIO pins
  - 5.0x5.0 mm with 0.4 mm pitch
- QFN48 (QFAA) with 31 GPIO pins
  - 6.0x6.0 mm with 0.4 mm pitch
- QFN52 (QGAA) with 35 GPIO pins
  - 6.0x6.0 mm with 0.4 mm pitch

**Package for nRF54L15**

- CSP47 (CAAA) with 32 GPIO pins
  - 2.4x2.2 mm with 0.3 mm pitch