BLUENRG-LPS WIRELESS PROCESSOR

Streamlined ultra-low-power Bluetooth® LE 5.3 system-on-chip

BlueNRG-LPS SoC enables Bluetooth® real-time positioning with centimeter-level accuracy

The **BlueNRG-LPS** SoC comes with a streamlined peripheral set and a flexible memory management system. Optimized for ultra-low-power consumption, it also offers excellent radio performance, and supports two-layer PCB designs. This helps significantly reduce both the power consumption and costs, making it ideal for lightweight, cost-effective, and battery-operated applications. Compliant with Bluetooth® SIG core specification v. 5.3, the BlueNRG-LPS fuels various applications such as connected wearables, indoor navigation, asset tracking, real-time locating systems.

KEY FEATURES & BENEFITS

- Bluetooth® 5.3 supported features:
  - Direction Finding (AoA and AoD)
  - 2 Mbps data rate
  - Long-range mode (Coded PHY)
  - Advertising extension
  - LE power control and path loss monitoring
- Integrated balun and minimized BOM for cost optimization
- RF performance:
  - Rx sensitivity: -97 dBm at 1 Mbps, -104 dBm at 125 kbps
  - 4.3 mA peak current in Tx (at 0 dBm, 3.3 V)
  - 3.4 mA peak current in Rx (at sensitivity level, 3.3 V)
  - Programmable output power up to +8 dBm

- SoC architecture
  - Embedded 32-bit Arm® Cortex®-M0+ up to 64 MHz
  - Memories: 192 Kbytes of Flash, 24 Kbytes of RAM
  - Embedded BlueCore accelerator for Bluetooth® time-critical operations
- 1.7 to 3.6 V operating supply voltage
- -40 to 105°C temperature range

KEY APPLICATIONS

- Asset tracking, ID location, and real-time locating systems
- Home automation
- Healthcare, consumer medical
- Wireless sensor and IoT networking
- Metering

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Bluetooth® LE 5.3 SoC

The BlueNRG-LPS is a programmable Bluetooth® Low Energy wireless SoC. Built with ST's state-of-the-art 2.4 GHz RF technology, its unique architecture, operation mode and radio block drastically extend battery life. The BlueNRG-LPS supports simultaneous multirole connections and is suitable for 2.4 GHz proprietary wireless communications to address ultralow latency applications. It also offers enhanced security with dedicated hardware.

Streamlined peripheral set

The BlueNRG-LPS is optimized for lightweight applications, with a streamlined memory footprint and peripheral set. Its single-core architecture further simplifies the design process to fast-track design cycles. The BlueNRG-LPS comes with a 12-bit ADC, a low-power RTC, and three general-purpose 16-bit timers. Moreover, it features standard and advanced communication interfaces: 1x SPI/I2S, 1x LPUART, 1x USART supporting ISO 7816 (smartcard mode), IrDA, and Modbus mode, 1x I²C supporting SMBus/PMBus.

Location System

The BlueNRG-LPS supports the standard Bluetooth® Direction Finding feature with both Angle of Arrival (AoA) and Angle of Departure (AoD) methods for powerful, low-cost, real-time locating systems. The BlueNRG-LPS can transmit a special direction-finding tone and capture the signal via a suitable antenna array. It can also feed IQ samples into an external host, to enable efficient 3D location computation.
These features make the BlueNRG-LPS ideal for building simple and cost-effective tracking tags as well as more complex location gateways and anchor point designs.

Packages

The BlueNRG-LPS is available in QFN32 (5 x 5 mm, 20 I/Os) and WLCSP36 (2.65 x 2.59 mm, 20 I/Os).

QFN32   WLCSP36
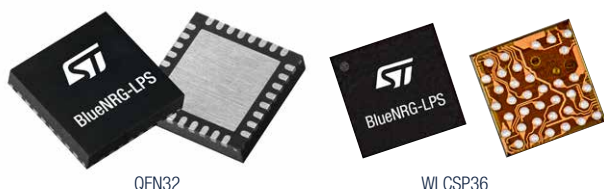
Learn more about BlueNRG-LPS product

Everything you need to reduce development time

Evaluation Kit	STEVAL-IDB013V1	Evaluation platform based on the BlueNRG-LPS system-on-chip (WLCSP36 package)
	STEVAL-IDB012V1	Evaluation platform based on the BlueNRG-LPS system-on-chip (VFQFN32 package)
	STSW-QUUPPA-ETAG	ST Quuppa tag emulation
SDK	STSW-BNRGLP-DK	BlueNRG-LP, BlueNRG-LPS Software Development Kit package
PC GUI and Tools	STSW-BNRGFLASHER	The RF-Flasher utility
	STSW-BNRGUI	BLUENRG family GUI
	STSW-WISE-STUDIO	WiSE-Studio free IDE for Windows®, Linux®, MAC OS®
Documentation	DS13819	BlueNRG-LPS data-sheet
	RM0491	The BlueNRG-LPS Arm® Cortex® M0+ based Reference Manual
	UM2058	The BlueNRG GUI SW software package
	UM2726	The BlueNRG-LP, BlueNRG-LPS 2.4 GHz radio proprietary driver
	AN5466	BlueNRG-LP, BlueNRG-LPS power-save modes
	AN5503	Bringing up the BlueNRG-LP, BlueNRG-LPS devices
	AN5574	Driving an external RF front-end with the BlueNRG-LP, BlueNRG-LPS
	AN5463	The BlueNRG-LP, BlueNRG-LPS OTA (over-the-air) firmware upgrade
	AN5471	The BlueNRG-LP, BlueNRG-LPS UART bootloader protocol

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