BlueNRG-LP

Bluetooth LE 5.2 Wireless Processor

BlueNRG-LP family overview

Bluetooth LE 5.2 Wireless Processor

KEY BENEFITS AND FEATURES

ULTRA LOW CURRENT CONSUMPTION

- Sleep current consumption down to 600 nA
- TX current consumption 4.3 mA (@ 0 dBm)
- RX current consumption 3.4 mA (@ sensitivity level)

OPTIMIZED BLE PROTOCOL STACK

- Bluetooth LE 5.2 certified
  - Long-range 125kbps or 500kbps
  - 2Mbps Data Rate
  - Advertisement Extension
  - GATT caching
  - Channel Selection Algorithm (CSA) #2
- FOTA upgrade in less than 5 seconds

FLEXIBILITY

- Embedded RF balun and HSE oscillator capacitors
- Available in 12x different flavors
  - QFN48 / QFN32 / WLCSP49 packages
  - Up to +85C / Up to +105C operating temperature ranges
  - 32KB RAM / 64KB RAM memory configurations

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BlueNRG-LP block diagram

Bluetooth LE 5.2-Certified wireless processor

Key features → benefits

Multiple concurrent connections → World's first Bluetooth SoC supporting up to 128 concurrent connections

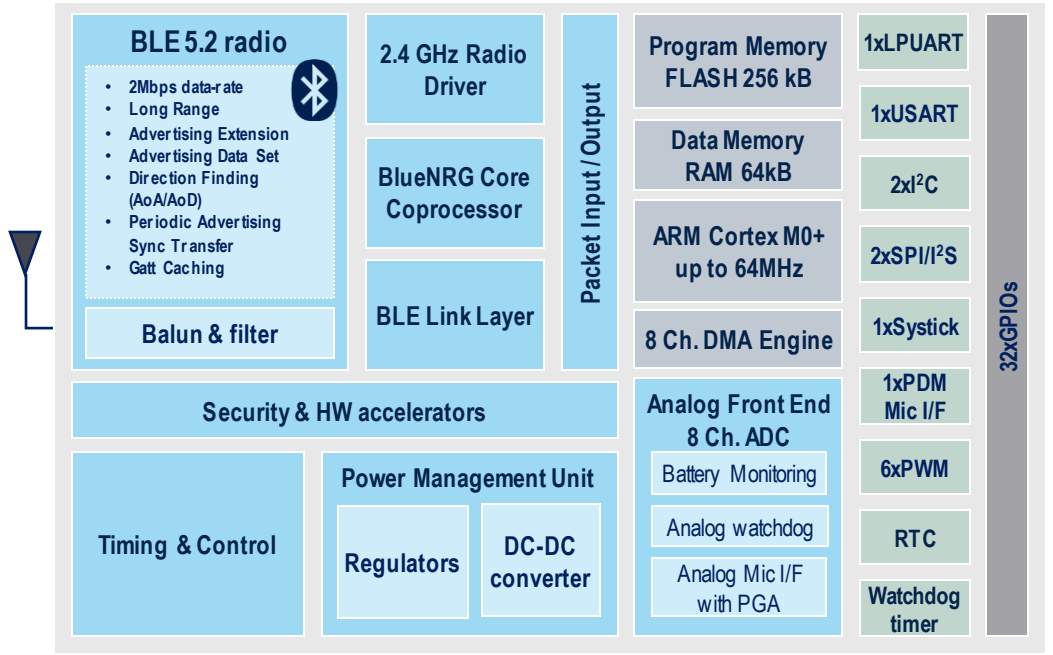
Long range communication → ensuring coverage of greater distance and communication effectiveness.

Faster data transfer rate → 2Mbps boosts Over-The-Air firmware update in less than 5 seconds.

Cryptographic security → Built-in image authentication technology enhances cyber-security.

10-years longevity → Granting long-term availability for industrial applications.

Internal architecture



BlueNRG-LP typical application

Suitable for applications where both processing capabilities and BLE connectivity are needed in a single device

Easy integration

BlueNRG wireless processor

- Application
- BLE Protocol stack
- Link Layer
- 2.4GHz Radio

SPI
I2S
I2C
LP-UART
PDM
ADC
PGA
TIMER
PWM

Sensors

MOTION SW libraries

Mic

VOICE SW libraries

BlueNRG – 3 5 5 M C

Product Family
Bluetooth Low Energy Processor

Temperature Range
C – -40C up to +85C
T – -40C up to +105C

Package Type
A – QFN32
M – QFN48
V – WLCSP

Memory Configuration
4 – 256KB Flash / 32KB RAM
5 – 256KB Flash / 64KB RAM

Device Generation
3 – BlueNRG-LP based

Typical Applications

- Asset tracking and beacons
- Smart tools and appliances
- Industrial connectivity
- Lighting and building automation
- Personal electronics
- Connected toys and robots
- Healthcare and wearable
- People and animal tracking

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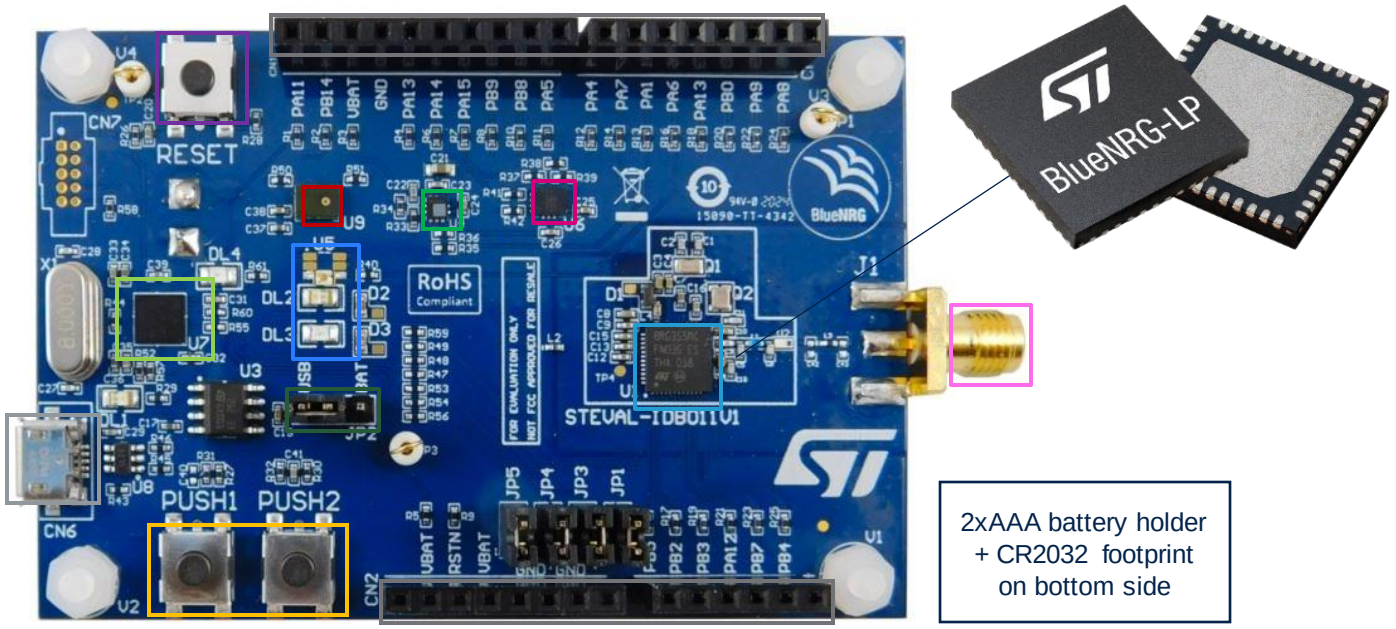
STEVAL-IDB011V1 and STSW-BNRGLP-DK

BlueNRG-LP evaluation HW and SW development kit



2xAAA battery holder + CR2032 footprint on bottom side

- BlueNRG-355MC
- MP34DT05-A
- LPS22HB
- LSM6DSOX
- User LED (2 + 1 RGB)
- User button (2)
- Reset button
- USB/Battery power selection
- USB connector
- Arduino UNO R3 connector
- SMA connector
- CMSIS-DAP debugger/programmer

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- BLE_ANCS
- BLE_Beacon
- BLE_Beacon_FlashManagement
- BLE_Beacon_FreeRTOS
- BLE_HID_Peripheral
- BLE_MultipleConnections
- BLE_OTA_ResetManager
- BLE_OTA_ServiceManager
- BLE_Power_Consumption
- BLE_Privacy
- BLE_RC_LongRange
- BLE_RemoteControl
- BLE_Security
- BLE_SensorDemo
- BLE_SensorDemo_BlueMSapp
- BLE_SensorDemo_Central
- BLE_SensorDemo_StaticStack
- BLE_SerialPort
- BLE_SerialPort_Master_Slave
- BLE_StaticStack
- BLE_Throughput
- DTM
- DTM_basic
- DTM_Updater

BLE_Beacon

Enabling Advertsing Extension, and getting 8x Broadcast (BLE5.0 feature)

BLE_MultipleConnections

Allow a MasterSlave device to connect to a configurable number of peers (up to 128)

BLE_RC_LongRange

Enabling Long Range, and getting 1.5x Range (BLE5.0 feature)

BLE_SensorDemo_BlueMSapp

Connect and share data sensor with ST BLE Sensor App

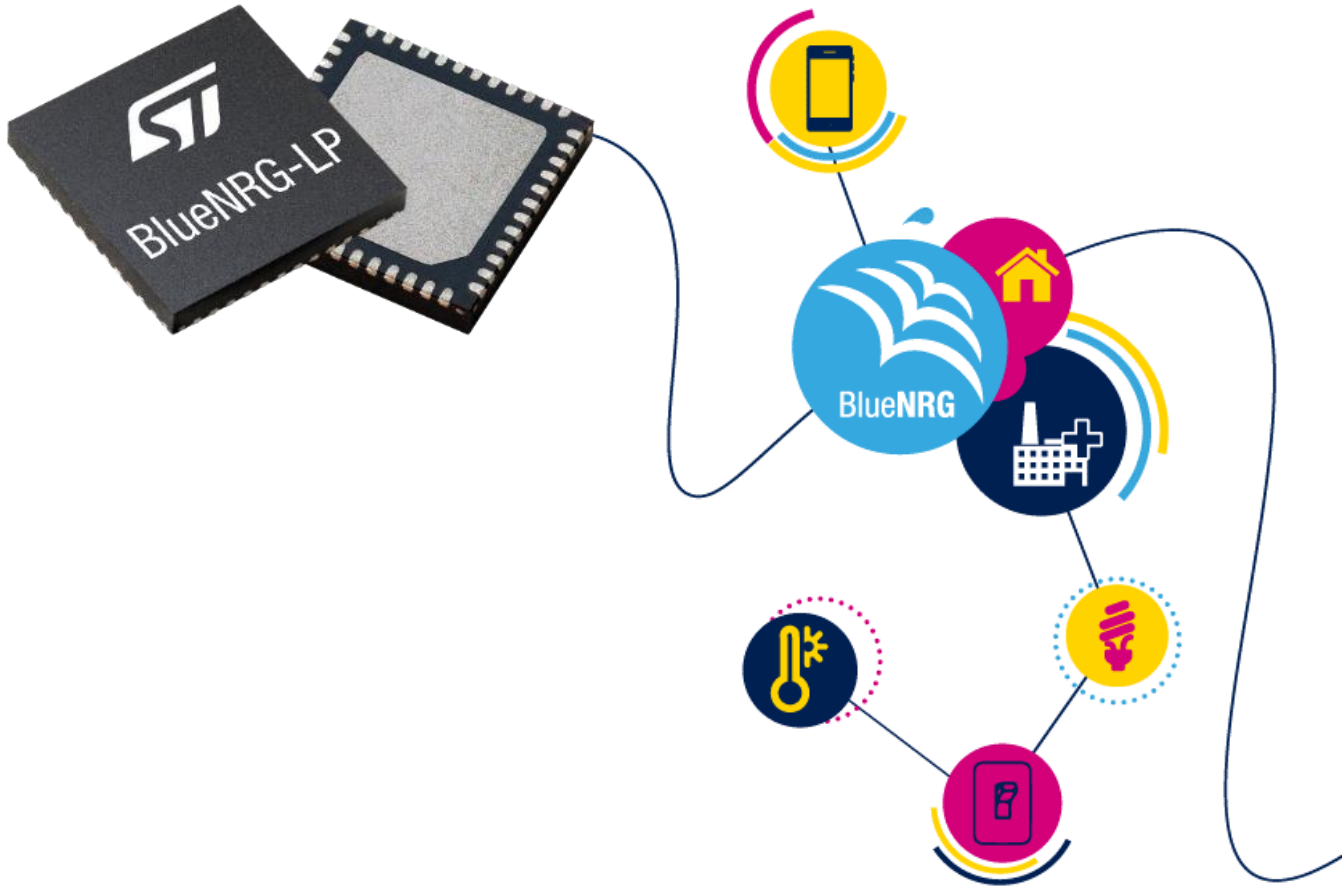
BLE_Thoughput

Enabling 2Mbps, and getting 2x Speed (BLE5.0 feature)

BlueNRG-LP collaterals

Tools for mass market effectiveness

- STEVAL-IDB011V1
- STSW-BNRGLP-DK (a.k.a. BlueNRG Navigator), STSW-LP-PROFILES and STSW-BNRGLP-MESH Development Kits
- STSW-BNRG001 (a.k.a. Power Consumption Tool), STSW-BNRGUI and STSW-BNRGFLASHER Graphical User Interfaces
- Datasheet, Reference Manual, Programming Manual, User Manual, and several Application Notes
- Product Labeled Sustainable Technology
- BlueNRG-LP Flyer
- BlueNRG-LP Press Release
- BlueNRG-LP Blog Post
- 10 years longevity program



BlueNRG-LP key benefits

Maximum performance for wide variety of applications

- Multiple concurrent connections
  - World's first Bluetooth LE 5.2-certified SoC designed to support up to 128 concurrent connections
- Faster data transfer
  - The 2Mbps feature has now doubled the bandwidth, allowing lower latency and OTA upgrade in less than 5 sec
- Long range communication
  - The higher maximum output power (+8dBm), together with Long Range feature, will enable to cover greater distance
- Robust Bluetooth-certified protocol stack
  - Highly optimized, upgradable and robust-proven BLE stack developed and maintained by ST expertise team
- 10-years longevity
  - Part of ST longevity program: long-term availability for industrial applications.

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Thank you

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