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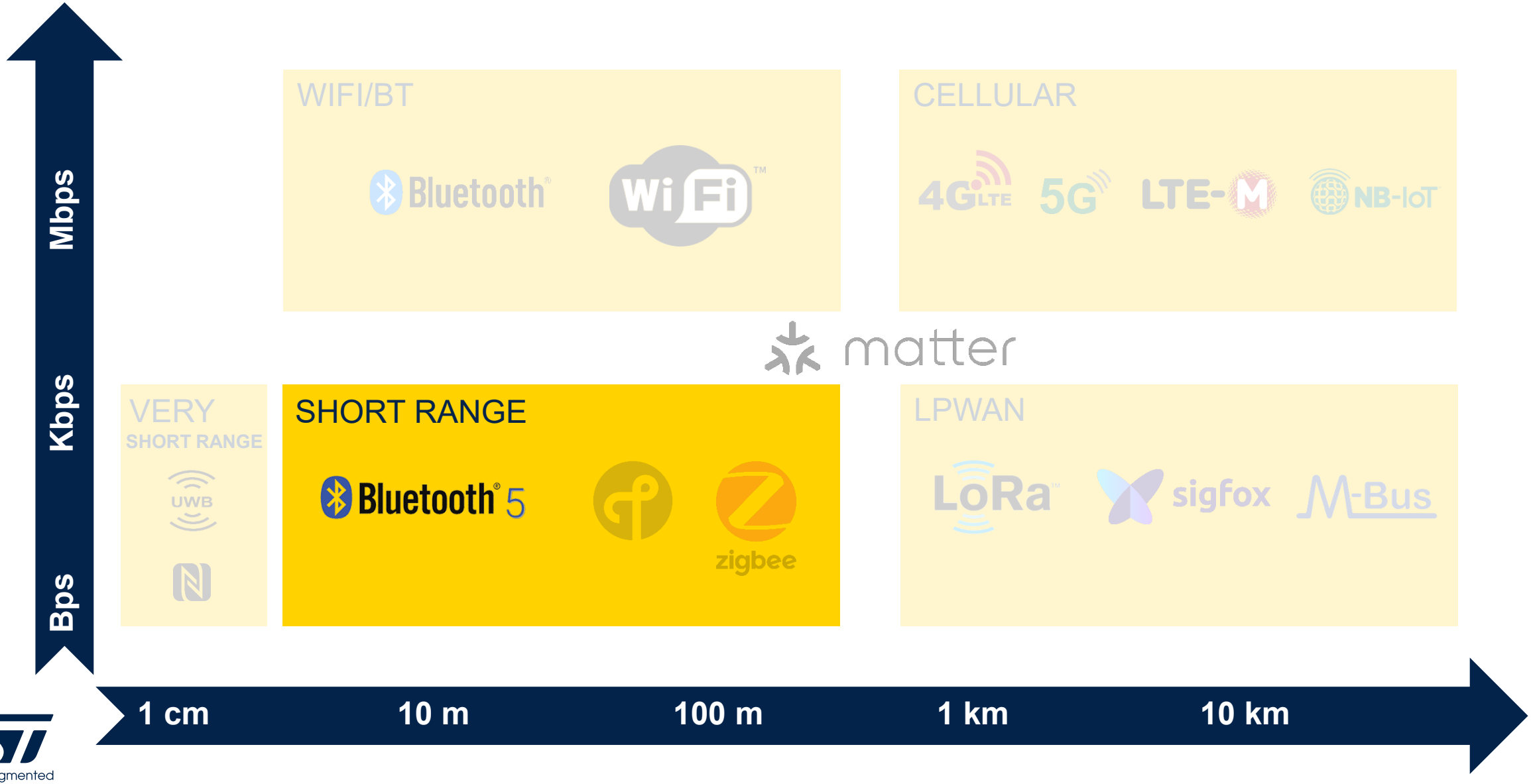
BlueNRG-LP & BlueNRGLPS System-on-Chips

Low-power Bluetooth® Low Energy 5.3 communications

BlueNRG

Communication technologies



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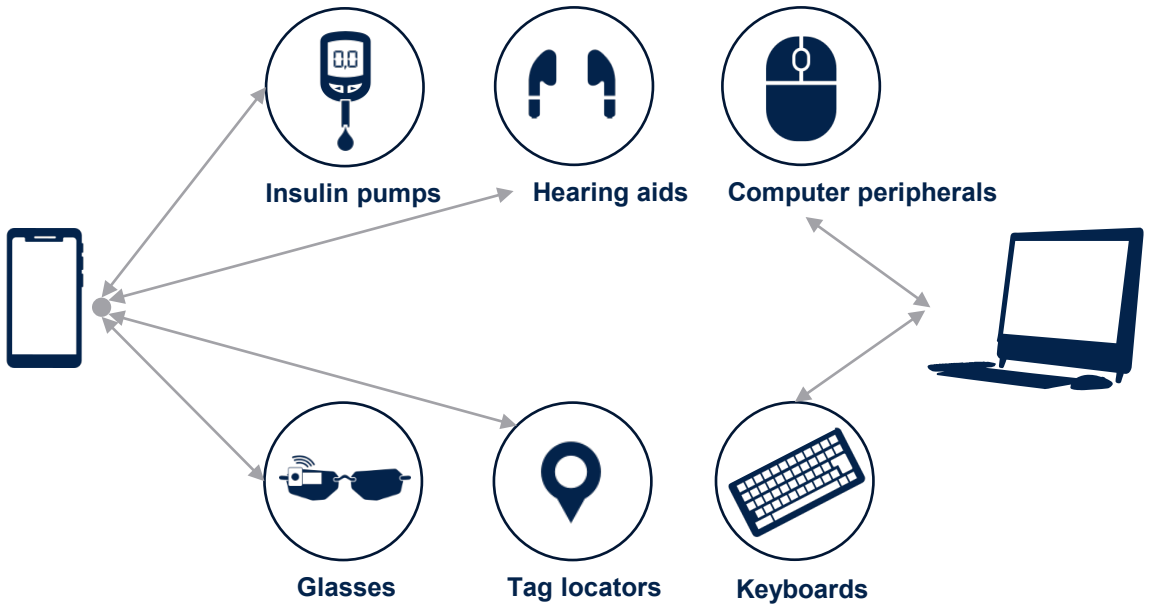
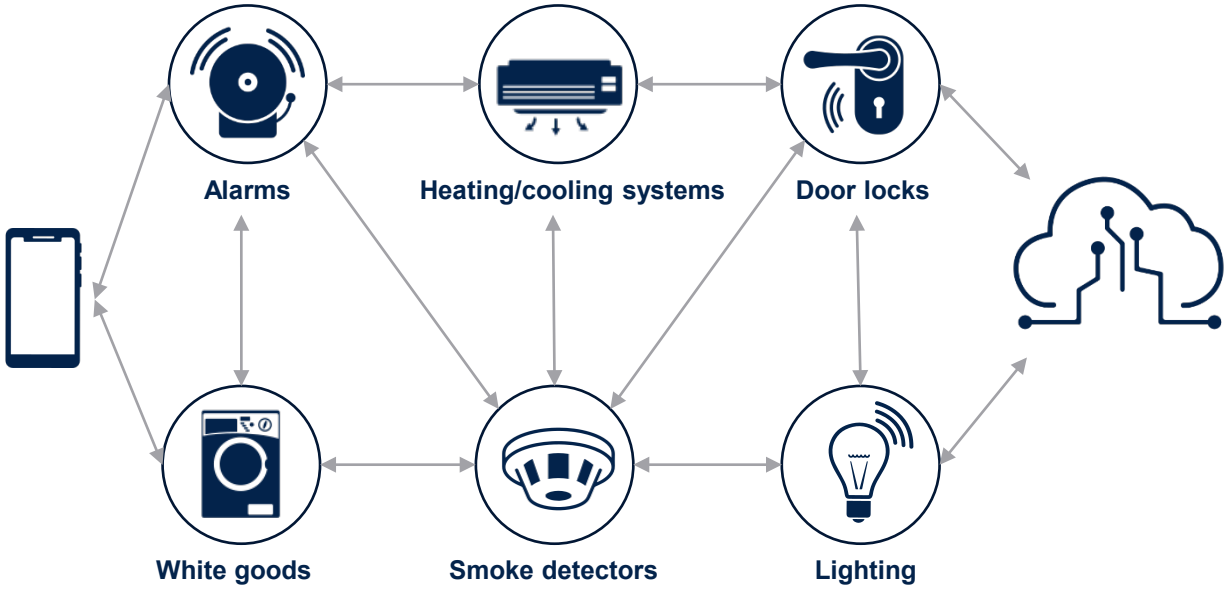
Bluetooth® Low Energy technology is all around us





P2Point or P2Multi-Comm. devices
Connected to smartphones, laptops…
Mostly battery powered

Bluetooth®

Proprietary protocols

Mesh communication devices
Home automation, Industry 4.0, consumer
power supply and/or battery powered

Bluetooth®

Mesh

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Bluetooth® Low Energy: new applications

Smart homes
Lights, thermostats, sensors

Fitness tracking
Smartwatches

Electronic shelf Labeling
Pricing and product information

Digital keys
Smartphones as secure keys

Item finding
Personal property tags

Audio
Broadcast, hearing aids

PoI information
Proximity marketing

Indoor positioning
Wayfinding

RTLS
Asset tracking

Networked lighting control

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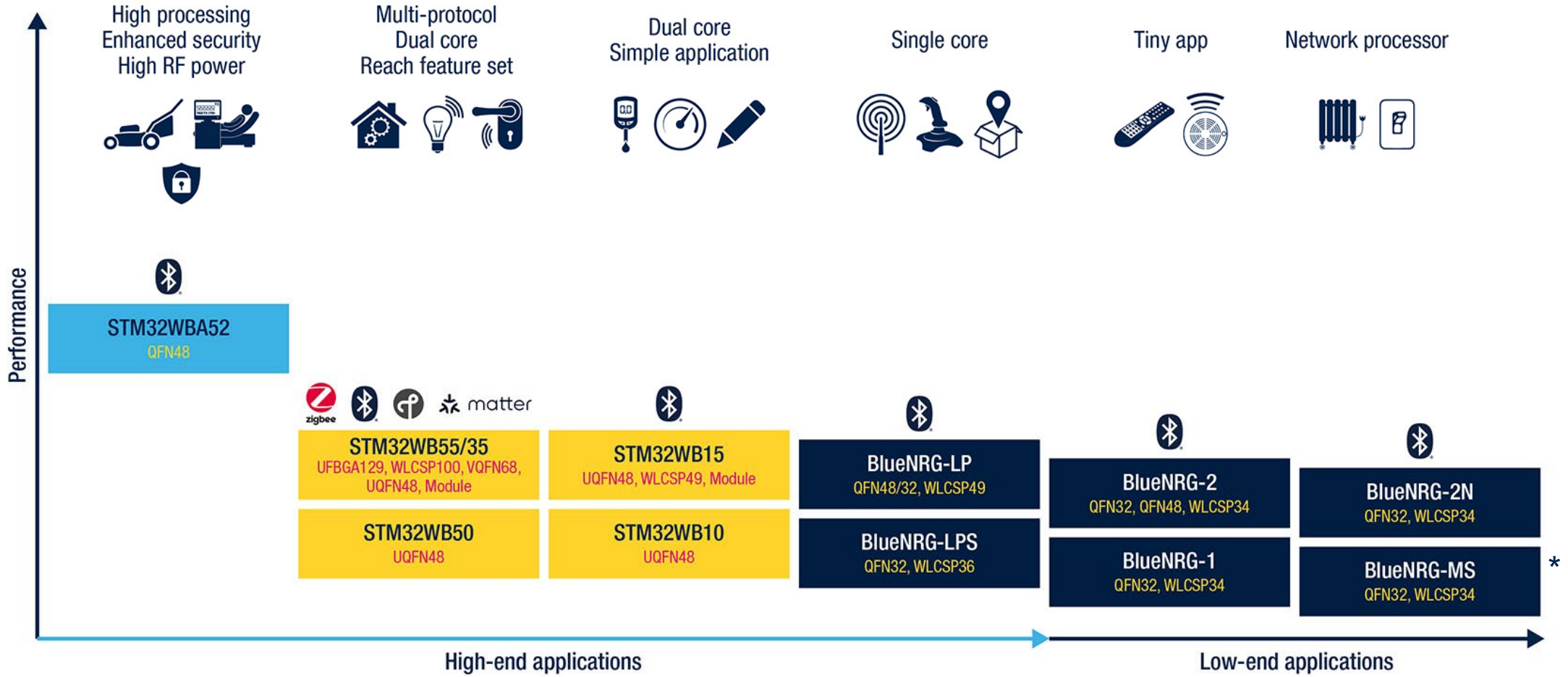
BlueNRG-LPx product positioning



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**The BlueNRG-MS is not recommended for new designs*

BlueNRG-LPx family overview

Bluetooth® Low Energy 5.3 certified SoC
Secure, faster, long-range connectivity

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 Bluetooth® Low Energy protocol stack

For BlueNRG-LPx

- Bluetooth® Low Energy 5.3 certified
  - Long-range 125 kbps or 500 kbps
  - 2 Mbps data rate
  - Advertisement extension
  - GATT caching
  - Channel selection algorithm (CSA) #2
  - AoA/AoD support (**BlueNRG-LPS**)
  - FOTA upgrade in less than 5 seconds

Flexibility

- Embedded RF balun and HSE oscillator capacitors
- Available in 12x different flavors
  - QFN48 / QFN32 / WLCSP49 packages for BlueNRG-LP
  - QFN32 / WLCSP36 packages for BlueNRG-LPS
  - Up to +85C / up to +105C operating temperature ranges
  - 24 KB RAM / 32 KB RAM / 64 KB RAM memory configurations

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BlueNRG-LP
High performance for wide variety of applications

Up to 128 concurrent connections

World's first Bluetooth® Low Energy 5.3-certified SoC designed to support up to 128 concurrent connections.

Faster data transfer

The 2 Mbps feature doubles the bandwidth compared to older versions of Bluetooth® Low Energy, enabling lower latency and OTA upgrade in less than 5 sec.

Long range communication

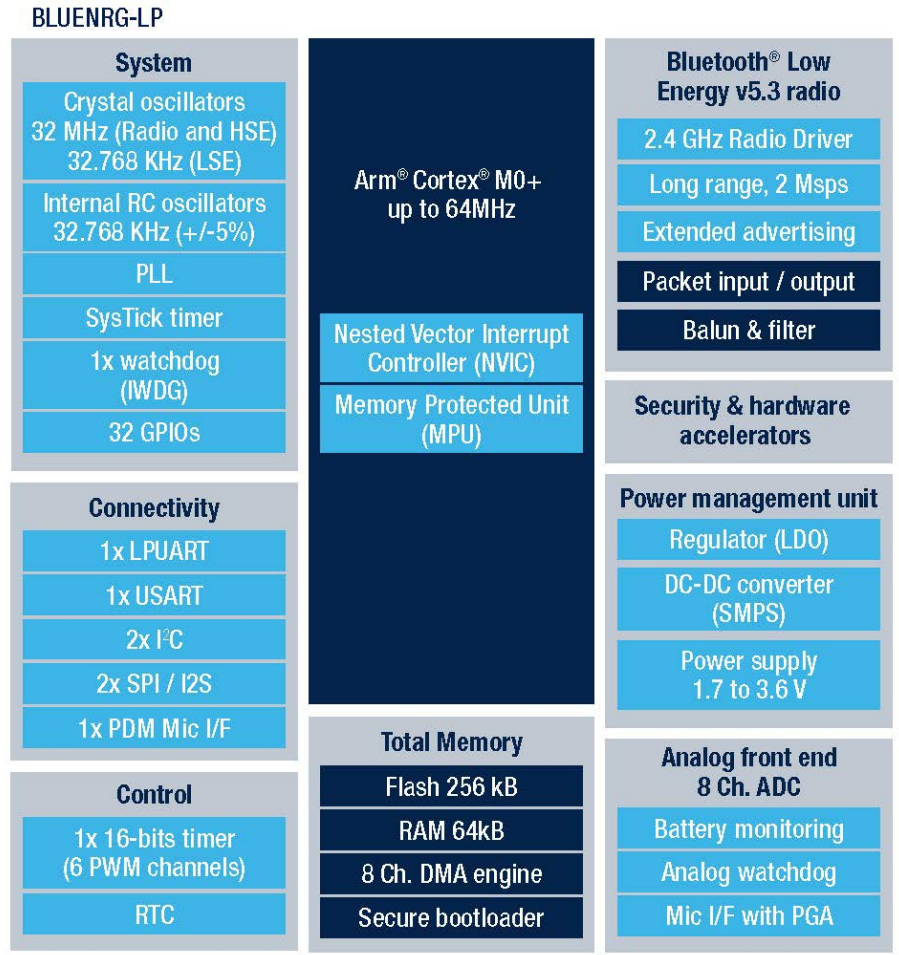
The +8 dBm maximum output power, together with the long-range feature, covers greater distances.

Robust Bluetooth-certified protocol stack

Highly optimized, upgradable, and robust Bluetooth® Low Energy stack developed and maintained by STMicroelectronics experts.

10-year longevity commitment

Long-term availability for industrial applications.



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BlueNRG-LPS
For simpler, energy-efficient & cost-sensitive applications

AoA/AoD support	Simply enables any Bluetooth® Low Energy direction finding and RTLS applications for both tag and locator roles.
Faster data transfer	The 2 Mbps feature doubles the bandwidth compared to older versions of Bluetooth® Low Energy, enabling lower latency and OTA upgrade in less than 5 sec.
Long range communication	The +8 dBm maximum output power, together with the long-range feature, can cover greater distances.
Robust Bluetooth-certified protocol stack	Highly optimized, upgradable, and robust Bluetooth® Low Energy stack developed and maintained by STMicroelectronics experts.
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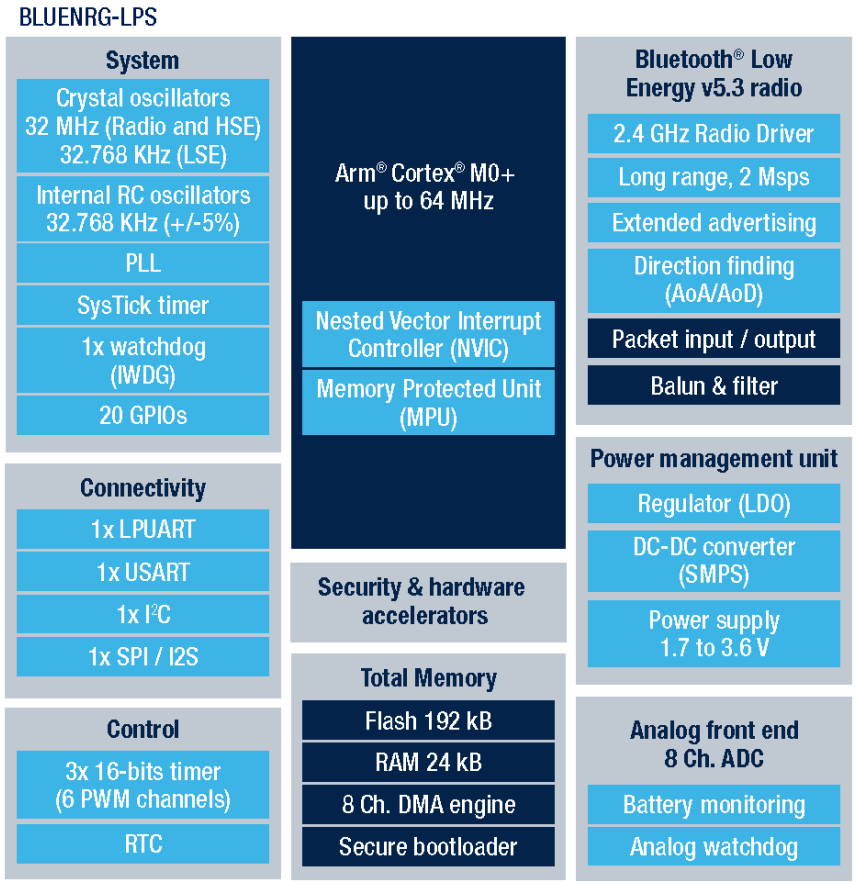

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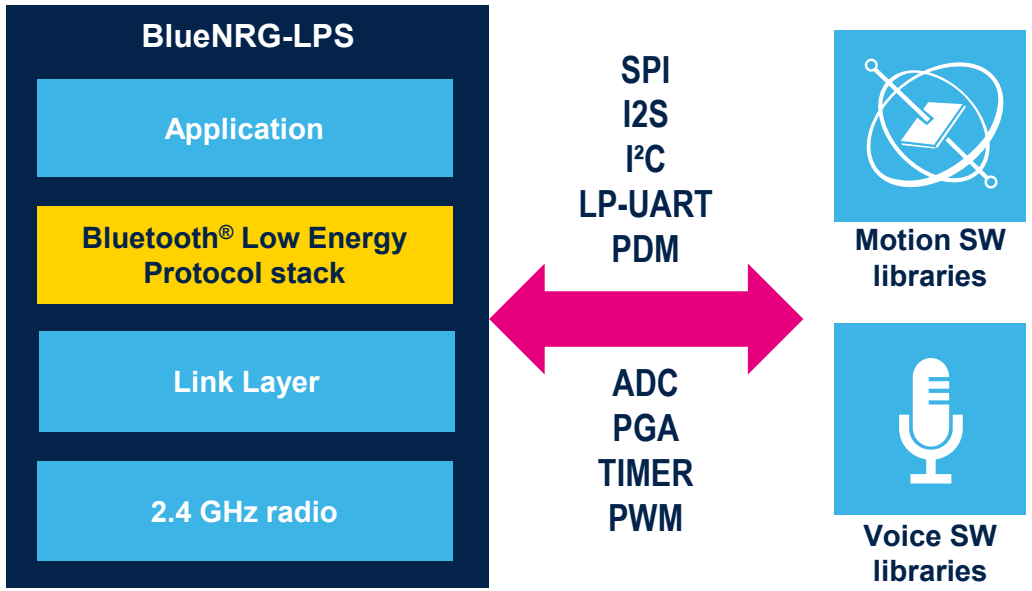
BlueNRG-LP application and ordering information

Enabling processing capabilities & Bluetooth® Low Energy connectivity in a single IoT device

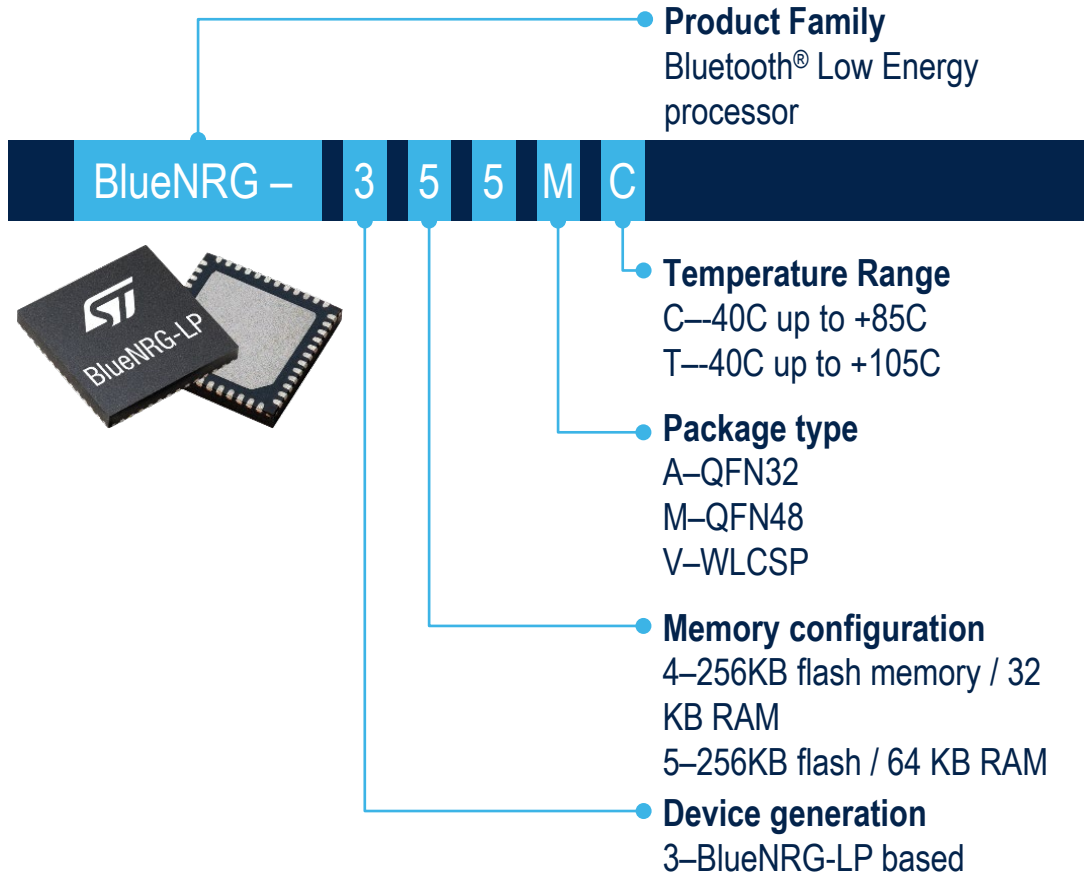
Easy integration



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

Ordering information



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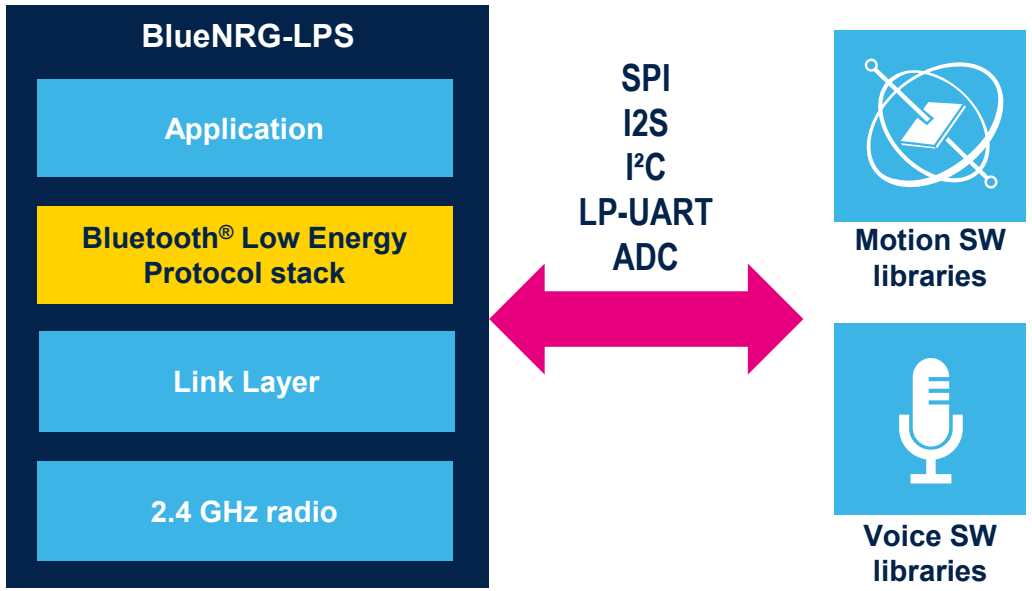

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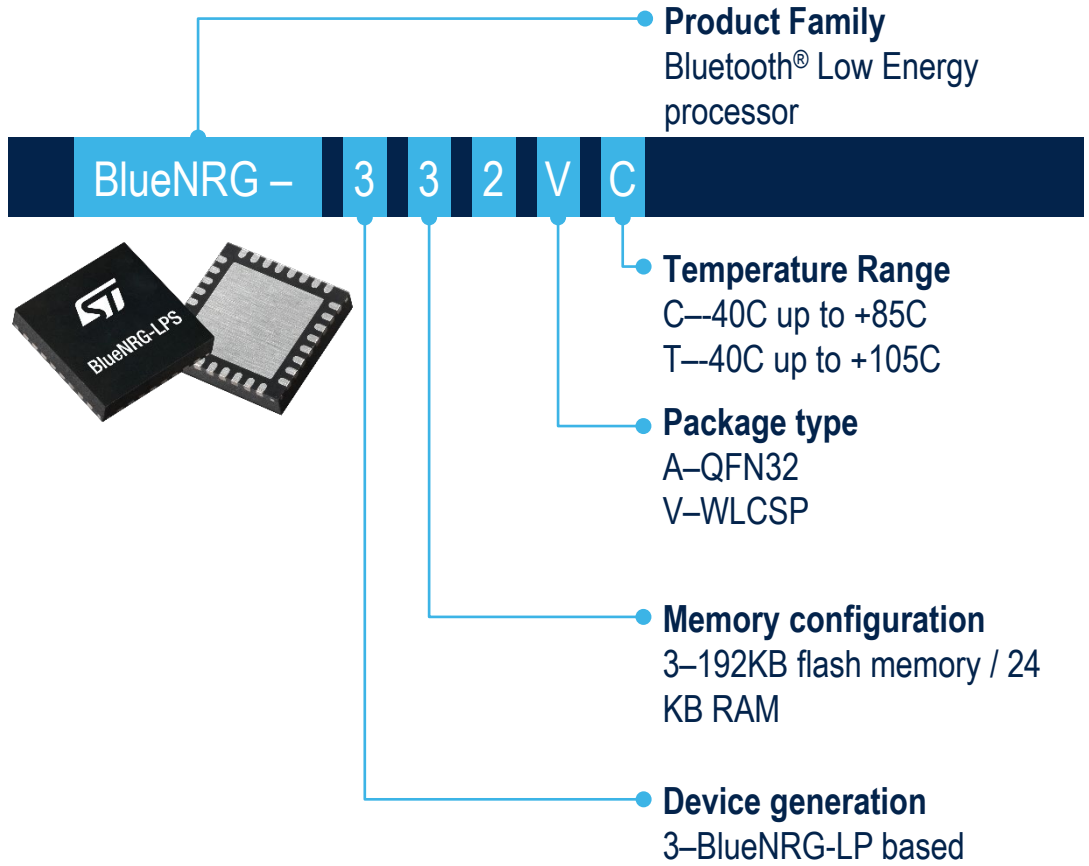
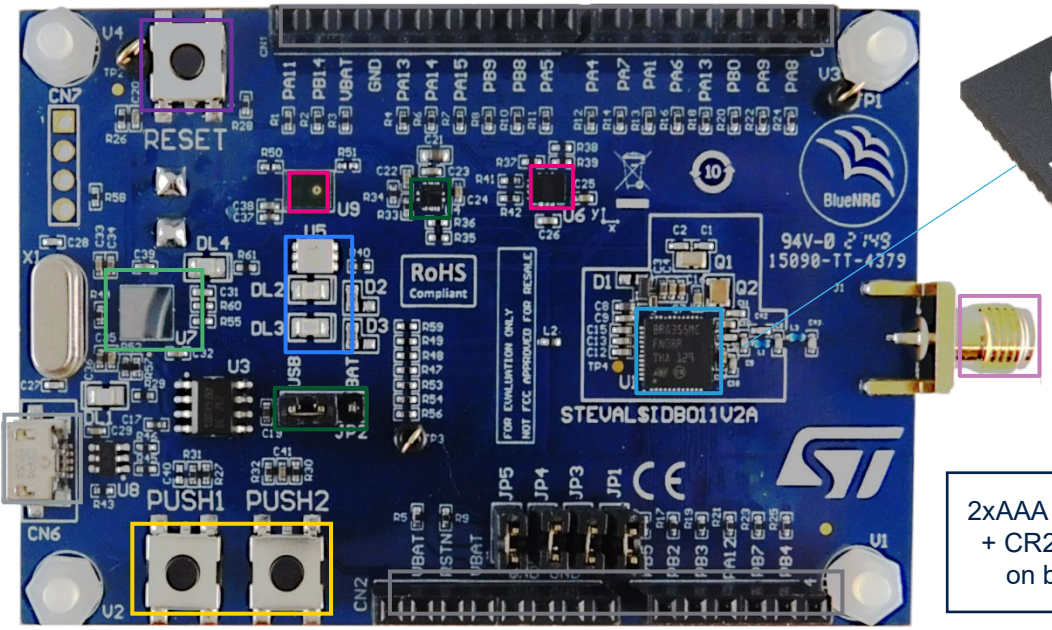
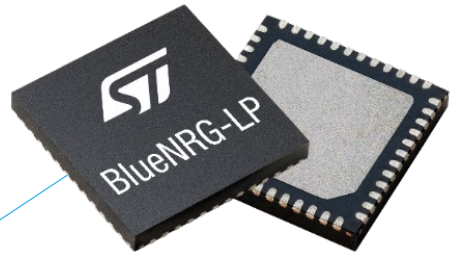


STEVAL-IDB011V2 and STSW-BNRGLP-DK

BlueNRG-LP evaluation hardware and software 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_DirectionFinding
- BLE_HID_Peripheral
- BLE_MultipleConnections
- BLE_OTA_ResetManager
- BLE_OTA_ServiceManager
- BLE_Power_Consumption
- BLE_PowerControl
- 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_Sync
- BLE_Throughput
- DTM
- DTM_basic
- DTM_Updater

BLE_Beacon

Enabling Advertising Extension and getting 8x Broadcast

BLE_MultipleConnections

Allow a controller/target device to connect to a configurable number of peers (up to 128)

BLE_RC_LongRange

Enabling Long Range and getting 1.5x Range

BLE_SensorDemo_BlueMSapp

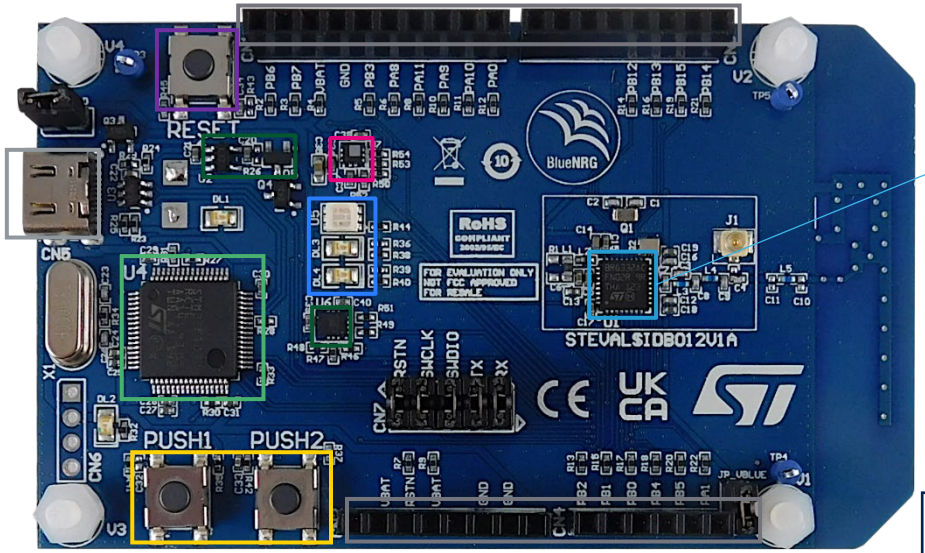
Connect and share data sensor with ST BLE Sensor App

BLE_Thoughput

Enabling 2Mbps and getting 2x Speed

STEVAL-IDB012V1 and STSW-BNRGLP-DK

BlueNRG-LPS evaluation hardware and software development kit



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BLE_Beacon

Enabling Advertising Extension and getting 8x Broadcast

BLE_DirectionFinding

How to implement Bluetooth LE Direction-Finding tag and locator roles using connection CTE mode

BLE_RC_LongRange

Enabling Long Range and getting 1.5x Range

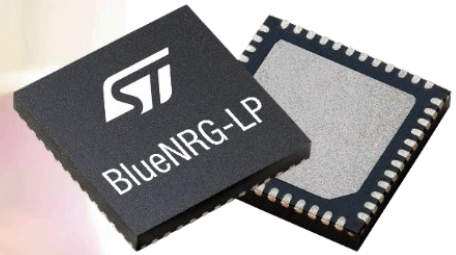
BLE_SensorDemo_BlueMSapp

Connect and share data sensor with ST BLE Sensor App

BLE_Thoughput

Enabling 2Mbps and getting 2x Speed

Useful resources
BlueNRG-LP collaterals



- STEVAL-IDB011V2 (QFN32, QFN48, WLCSP49)
- 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
- BlueNRG-LP flyer and brochure
- BlueNRG-LP press release
- BlueNRG-LP blog post

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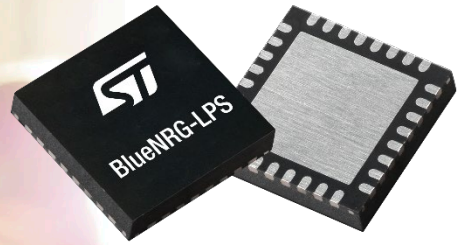
Useful resources
BlueNRG-LPS collaterals



- STEVAL-IDB012V1 (QFN32, WLCSP36),
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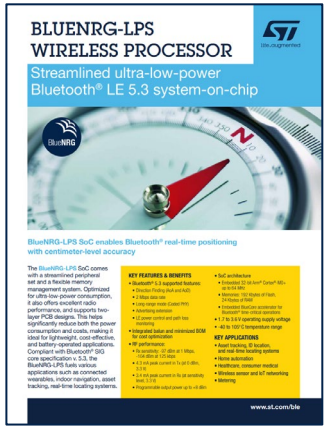

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Our technology starts with You

Find out more at www.st.com/bluenrg

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