Wireless Sensor Node

Wireless sensor node architecture

Wireless sensor node vehicle and offer

ST BlueNRG family and topolgy

Select the right BlueNRG solution

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Wireless Sensor Node
Sensing, processing and connectivity

Motion Sensors

Low-power 6-axis IMU, embedding Machine Learning Core **LSM6DSOX**

High-performance and low power accelerometers

LIS3DHH & LIS2DW12

Magnetometer

LIS2MDL

Power management

Battery charger

STBC02

Processing

STM32 MCU

or

Bluetooth Low Energy SoC

Connectivity

Bluetooth Low Energy

Environmental Sensors

Altimeter / Pressure sensor

LPS22HH

Accurate temperature sensor

STTS751

Humidity sensor

HTS221

Analog wide-band microphone

MP23ABS1

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Wireless sensor node vehicle
IOT Ready-to-go end node

ST makes IoT sensing accessible with a certified and ready-to-connect device : SensorTile.box

Built into a compact IP54 casing

Bundled with app for Smartphone

Can be configured **for users of any skill level** to support learning, prototyping, or even as a module within a commercial end-product.

Connects out-of-the-box with several Cloud services
to further extend opportunities for learning and new-product development

Microsoft Azure

IBM Watson

aws

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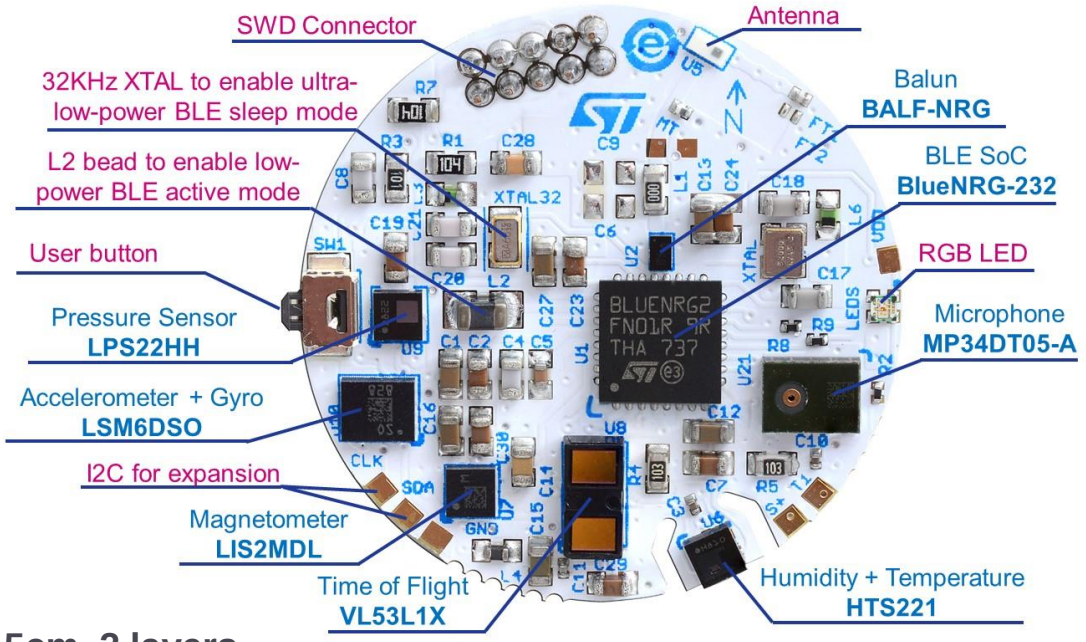
www.st.com/sensortilebox

Wireless sensor node vehicle IOT Ready-to-go PCB node

ST turnkey ready PCB within tiny form factors : BlueNRG Tile

Click here to learn more

- 2 layers PCB enabling a Wireless Node over BlueNRG-2 (Bluetooth low energy 5.0 SoC)
- All resources available, SW & HW to accelerate ctm design



2.5cm, 2 layers

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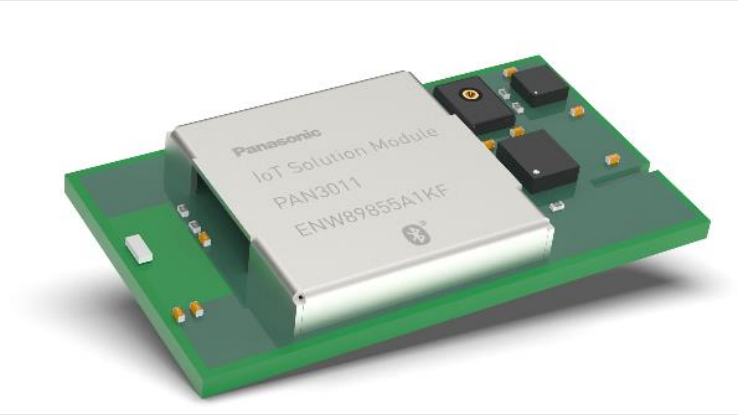
Wireless sensor node vehicle IOT Ready-to-go module

ST, Arrow & Panasonic partnership to provide time to market IOT module



Panasonic Industry through Arrow Electronics

Based on ST BlueNRG Tile offer, 3 modules and associated DK available to ease you IOT node design.

- Environmental Sensor & Voice IOT module
- Motion & TOF module
- Voice & Motion IOT module

HW integration, plug & play module.
Application **can be integrated over BlueNRG-2 host SoC**.

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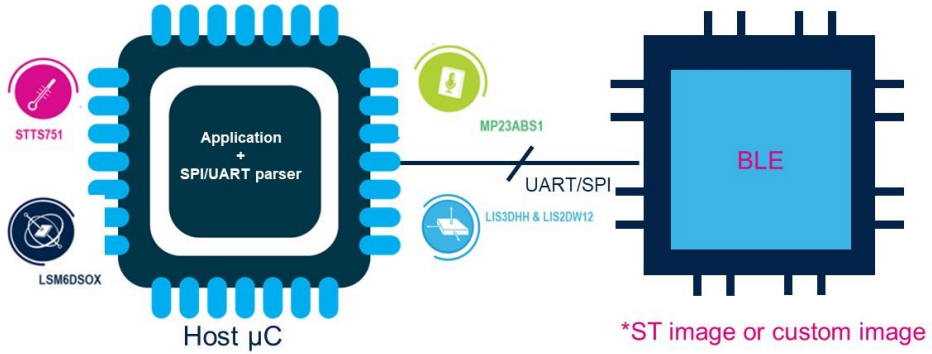
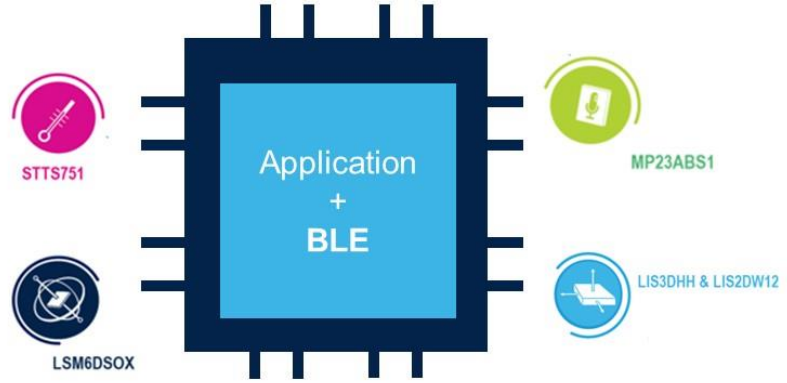
Bluetooth low energy node
BlueNRG family

BlueNRG flexibility to add BLE connectivity to your IOT node



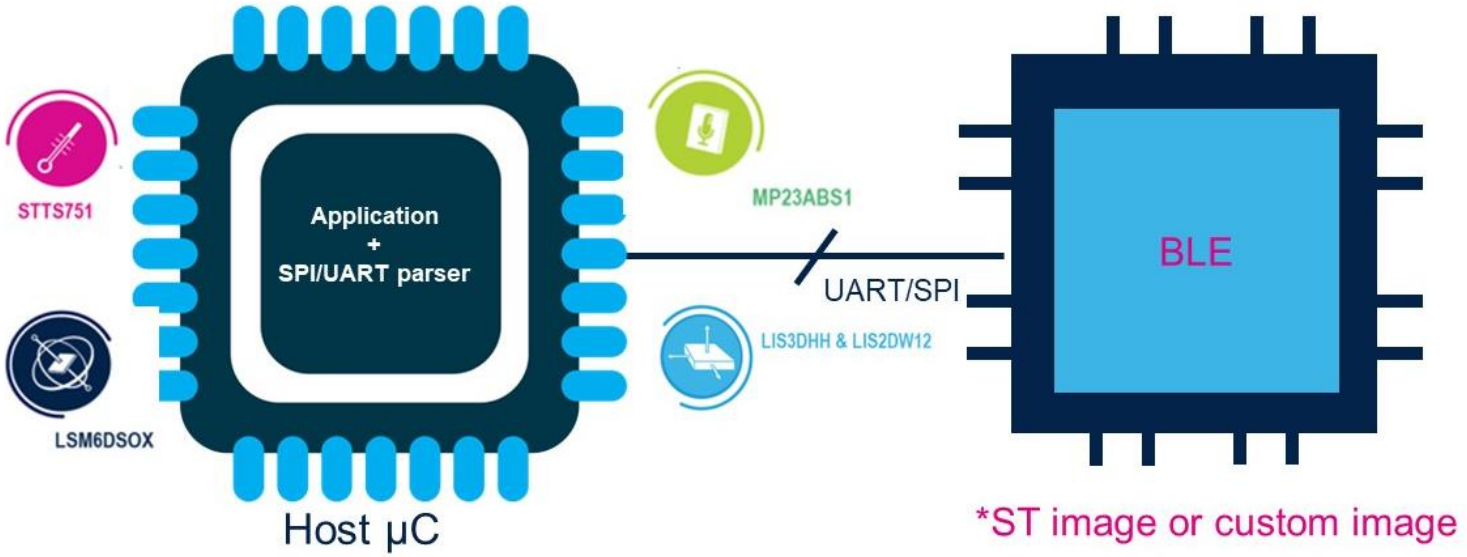
BlueNRG as a basic add-on to add ble connectivity to your IOT node



BlueNRG as a complete Application Processor , computing sensors data and adding ble connectivity

Bluetooth low energy node
BlueNRG family

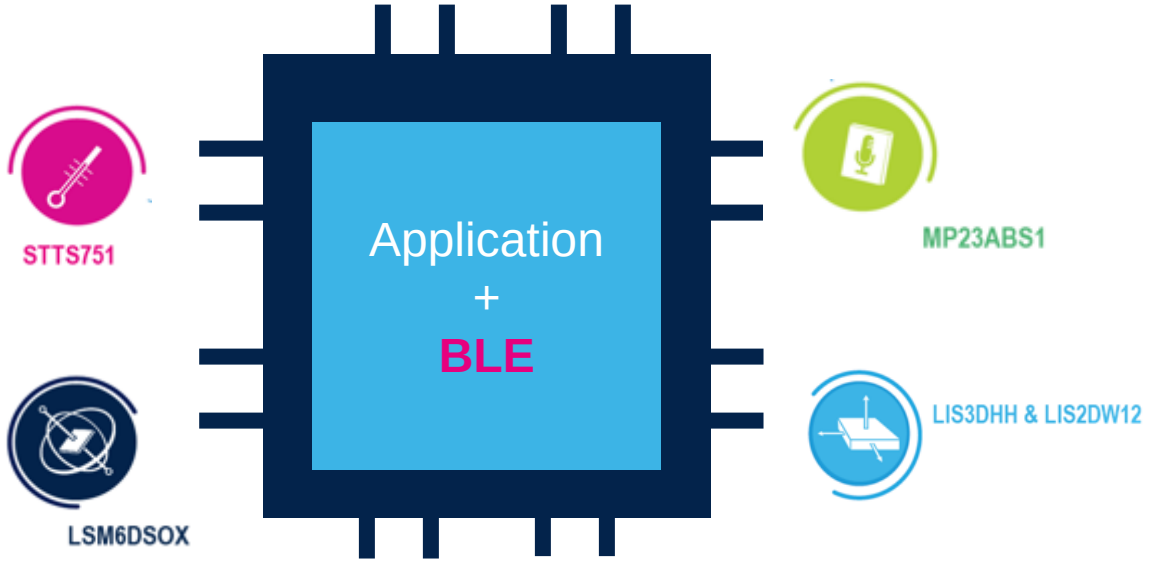
BlueNRG as a BLE add-on adding connectivity



Production facility : BlueNRG device deliver with expected image : ST or custom image
Application facility : offload main CPU processing by using resources (peripherals, flash) of the BlueNRG

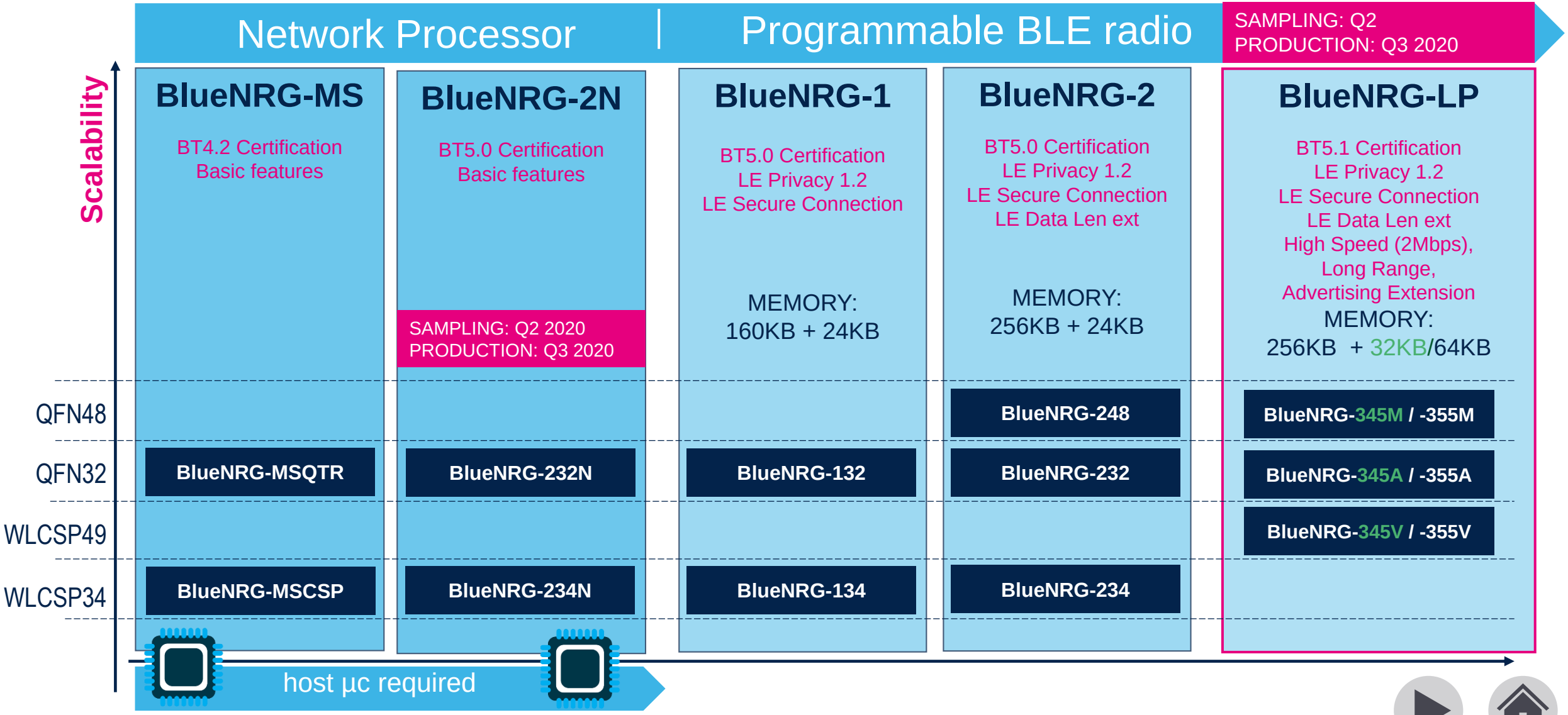
Bluetooth low energy node
BlueNRG family

BlueNRG as a complete SOC : processing & adding BLE



BOM efficiency : one chip answering to application and ble constraints
BlueNRG SW simplicity : simple architecture to ease SW design

BlueNRG chipset portfolio



BlueNRG module portfolio

Network processor modules

BLE Radio

based on

BlueNRG-MS

BlueNRG-M0L
BlueNRG-M0A

- ✓ Including high efficient chip antenna, filter and balun **BALF-NRG-01D3**
- ✓ BLE4.2 certification
- ✓ Up to **+6 dBm** output power
- ✓ 5-wires **SPI interface** to external host

Host required

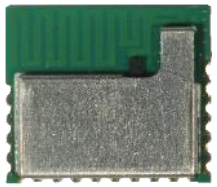
Programmable BLE radio modules

BLE SoC

based on

BlueNRG-2

BlueNRG-M2SA
BlueNRG-M2SP



- ✓ Highly efficient chip antenna [-M2SA] or PCB antenna [-M2SP], filter and balun **BALF-NRG-02D3**
- ✓ BLE5.0 certification
- ✓ Up to **+5 dBm** [-M2SA] or **+7 dBm** [-M2SP]
- ✓ Extensive **peripheral set**
- ✓ **13 GPIOs**

- **Bluetooth SIG End Product certification**
- CE/RED qualified, FCC/IC/TELEC
- **-85 dBm** Rx sensitivity

- **Small** form factor: 13.5 x 11.5 x 2 mm
- **Industrial** temperature range: -40 °C to +85 °C
- Power supply voltage from **1.7V to 3.6V**

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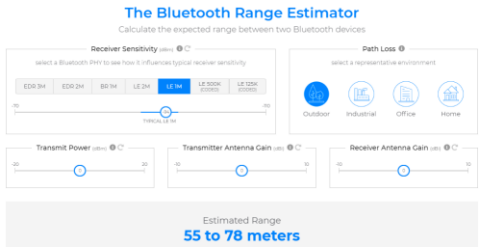
BlueNRG Key Performance Indicator

	Network processor		Programmable BLE radio		
Chipset	BlueNRG-MS	BlueNRG-2N	BlueNRG-1	BlueNRG-2	BlueNRG-LP
Modules	BlueNRG-M0			BlueNRG-M2	
RF Range	96dB	96dB	96dB	96dB	105dB LE1M 111dB LR
Data rate	200kbps	700kbps	250kbps	700kbps	1200kbps
Power consumption (*)	9.7uA	8.5uA	8.5uA	8.5uA	5.5uA
BLE Certification & BLE features	BT4.2 BT4.1	BT5.0 BT4.2	BT5.0 BT4.2 (*)	BT5.0 BT4.2	BT5.1 BT5.0

https://bluetooth.com/learn-about-bluetooth/bluetooth-technology/range#estimator



BlueNRG power consumption tool : STSW-BNRG001

(*) Beacon Average power cons.
adv conn 31 bytes, 3secs, +5dbm

(*) LE data Len excluded

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BlueNRG family SW offer

Bluetooth Low Energy stack

Bluetooth Mesh stack

Bluetooth SIG standard MESH for simple **control and monitoring applications.**

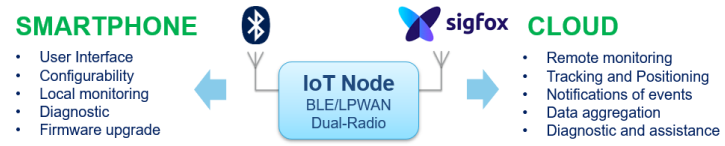
2.4GHz radio transceiver

Open protocol for **ultra-low latency applications (~ 100µs) , high data rate (1.6Mbps)** with a **small memory footprint (~5KB)** on top of a proven 2.4GHz radio.

Preamble	NetworkID	Header	Length	Data	CRC
1 Byte	4 Bytes	1 Byte	1 Byte	0-255 bytes	3 bytes

BLE stack + Sigfox

Dual-Radio turn-key solution for Wireless Sensor Nodes, Asset Trackers, Remote diagnostic, Finder/Tags, Smart Parking, Smart Objects



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