

## General Description

LE6621DB is a power-optimized true system-on-chip (SoC) module for both *Bluetooth*<sup>®</sup> low energy and proprietary 2.4-GHz applications.

The module targets 2.4-GHz *Bluetooth*<sup>®</sup> low energy system, proprietary 2.4-GHz system, Human-Interface Devices (keyboard, mouse, and remote control), sports and fitness equipment, mobile phone accessories and consumer electronics.



The on-chip *Bluetooth*<sup>®</sup> system is compliant with *Bluetooth*<sup>®</sup> version 5.0.

The module integrates a high-performance Arm Cortex-M4 MCU which is up to 64-MHz, a 32-MHz crystal oscillator, a 32.768-KHz on-chip RC oscillator, 24-KB ROM, 24-KB RAM, a PCB antenna, 12 GPIOs and UART/SPI peripherals which can be allocated to any GPIOs.

The module supports BDE-SPP, with which user can simplify use the module as a UART port to transfer data through BLE.

The module has a very small form factor with the dimensions of 11.5 mm x 11 mm x 2.0 mm.

## Key Features

- Link controller
  - BT5.0 LE PHY, link controller
  - Proprietary 2.4-GHz link controller
- Processing and memories
  - Arm<sup>®</sup> Cortex<sup>®</sup> M4, up to 64-MHz
  - 24-KB SRAM
  - 24-KB ROM
  - 256-KB Flash
  - 16-KB OTP
  - Serial Wire Debug (SWD) supports
- Current Consumption
  - 14.1 mA RX at VBAT = 3.3V
  - 12.8 mA TX at VBAT = 3.3V and 0 dBm
  - 2.5 uA at deep sleep mode with all RAM retained
- Radio
  - Programmable RF transmit power from -20 to +10 dBm
  - -95 dBm receiver sensitivity
- Antenna
  - Integrated PCB antenna
- Peripherals
  - Direct Memory Access (DMA) x 4
  - UART x 1
- SPI x 1, master and slave mode
- PWM x 6
- Watch dog x 1
- 32-bit timer x 3
- Single-ended 10-bit GPADC x 4
- Power Management
  - Operating range (1.8V - 3.6V)
  - Integrated charger (100mA/200mA)
- Others
  - Real Time Clock
  - AES HE encryption
- Packaging
  - 11.5 mm x 11 mm x 2 mm package
- Module Software Development Kit
  - Configurable BDE-SPP
  - Full stack SDK supported
- Standards Conformance
  - *Bluetooth*<sup>®</sup> SIG
  - CE-RED (Europe)
  - FCC (US)
  - ISED (Canada)

## Applications

- Beacons
- Remote Controls
- Proximity tags
- Low Power Sensors
- Keyboards and mice
- Toys
- Serial port transmission
- Smart home
- Smart meters
- Smart medical devices

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# 1. Block Diagram

LE6621DB is a power-optimized true system-on-chip (SoC) module. With a 32-MHz XTAL and an on-board PCB antenna and all the passives components, it allows faster time to market at reduced development cost. Figure 1-1 shows the block diagram of the module.

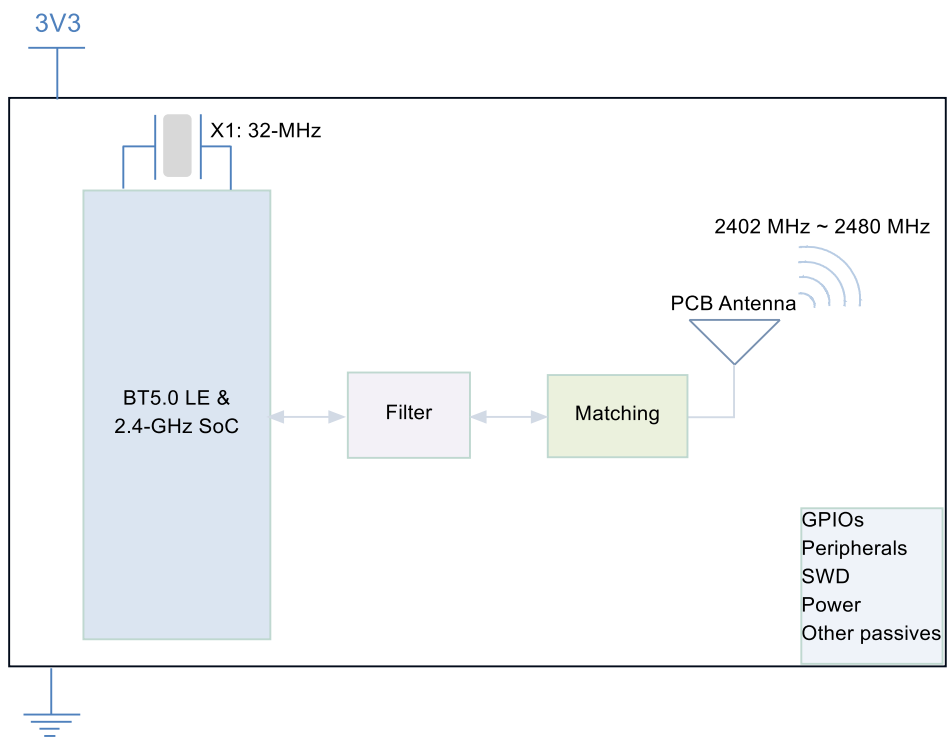


Figure 1-1. The block diagram of LE6621DB

## 2. Pinout

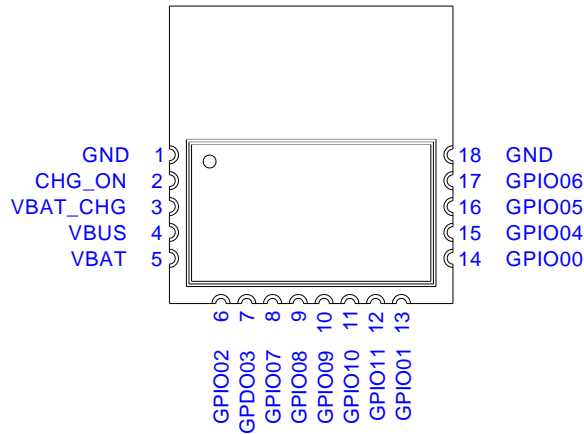


Figure 2-1. Pinout Diagram Top View

Table 2-1 describes the definitions of the pins.

Table 2-1. Pin Description

Pin #	Pin Name	Type	Description
1	GND	GND	Ground
2	GHG_ON	AO <sup>(Note 1)</sup>	Charger indicator
3	VBAT_CHG	Power	Charger battery input
4	VBUS	Power	Charger power
5	VBAT	Power	Power supply 1.8V ~ 3.6V
6	GPIO02	DIO/AI <sup>(Note 1)</sup>	Digital GPIO/ADC input
7	GPIO03	DIO/AI	Digital GPIO/ADC input
8	GPIO07	DIO/AI	Digital GPIO/ADC input
9	GPIO08	DIO/AI	Digital GPIO/ADC input
10	GPIO09	DIO	Digital GPIO
11	GPIO10	DIO	Digital GPIO
12	GPIO11	DIO	Digital GPIO
13	GPIO01	DIO	Digital GPIO
14	GPIO00	DIO	Digital GPIO
15	GPIO04	DIO	Digital GPIO
16	GPIO05	DIO	Digital GPIO
17	GPIO06	DIO	Digital GPIO
18	GND	GND	Ground

Note 1: DIO stands for Digital Input-Output; AO stands for Analog Output; AI stands for Analog Input.

### 3. Characteristics

All MIN/MAX specification limits are guaranteed by design, production testing and/or statistical characterization. Typical values are based on characterization results at default measurement conditions and are informative only.

Default measurement conditions (unless otherwise specified):  $V_{BAT} = 3.3\text{ V}$ ,  $T_A = 25\text{ }^\circ\text{C}$ . All radio measurements are performed with standard RF measurement equipment.

#### 3.1. Absolute Maximum Ratings

Stresses beyond those listed under Absolute Maximum Ratings may cause permanent damage to the device. These are stress ratings only, so functional operation of the device at these or any other conditions beyond those indicated in the operational sections of the specification are not implied. Exposure to Absolute Maximum Rating conditions for extended periods may affect device reliability.

**Table 3-1. Absolute Maximum Ratings**

Parameter	Description	Conditions	Min	Max	Unit
$V_{BAT}$	Supply voltage	-	-0.3	3.9	V
$V_{BUS}$	Charger input voltage	-	-0.3	6.0	V
$T_{STG}$	Storage temperature	-	-40	125	$^\circ\text{C}$

#### 3.2. Recommended Operating Conditions

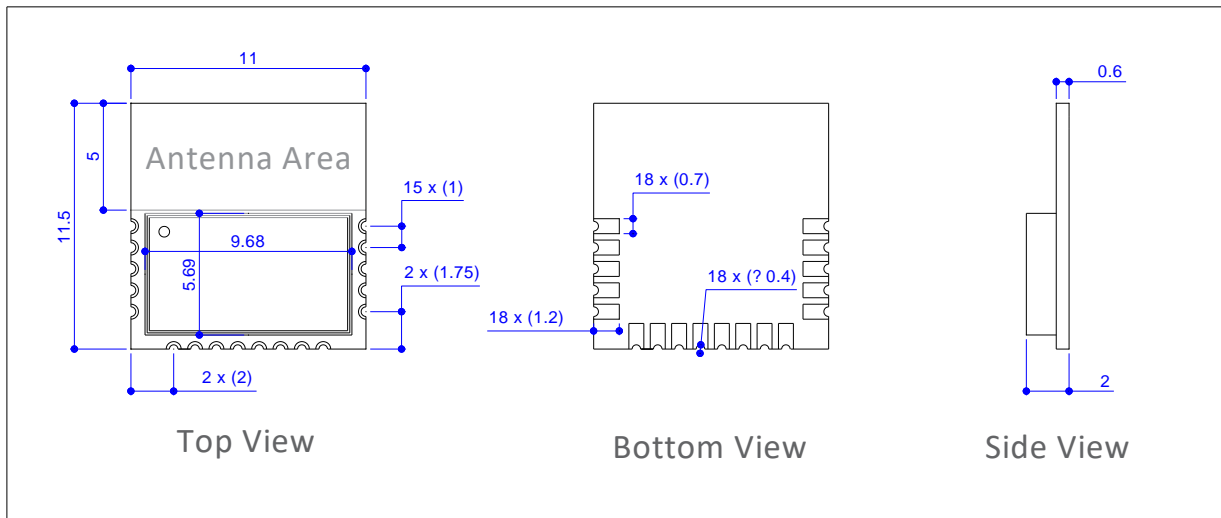
**Table 3-2. Recommended Operating Conditions**

Parameter	Description	Conditions	Min	Typ	Max	Unit
$V_{BAT}$	Battery supply voltage	-	1.8	3.3	3.6	V
$V_{BUS}$	Charger input voltage	-	4.5	5	5.5	V
$T_A$	Operating temperature		-40	25	85	$^\circ\text{C}$

## 4. Mechanical Specifications

### 4.1. Dimensions

The module dimensions are presented in the following figure:

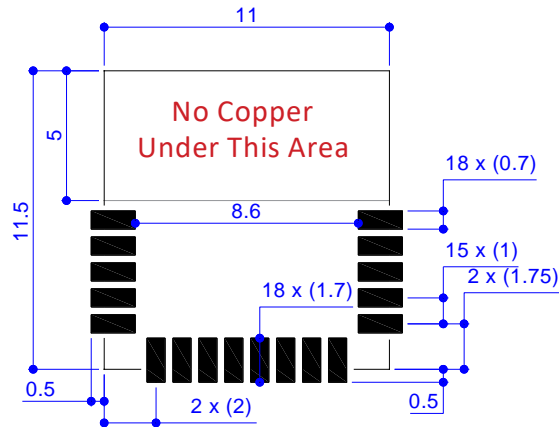


Note: All dimensions are in millimeter

Figure 4-1. Mechanical Drawing

### 4.2. PCB Footprint

The footprint for the PCB is presented in the following figure:



Note: All dimensions are in millimeter

Figure 4-2. Module Footprint Top View

### 4.3. Marking



Figure 4-3. Indicative Module Shield Marking



## 5. Ordering Information

Part Number	Description	Size (mm)	Package	MOQ
LE6621DB	Bluetooth 5.0 LE& 2.4-GHz Module	11.5 × 11 × 2	Tape & Reel	1000

## 6. Revision History

Revision	Date	Description
V1.0	7-July-2021	Initial Release

## Contacts

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