BLED112

DATA SHEET

11 Sept 2019

Version 1.2

SILICON LABS

VERSION HISTORY

Version	Comment
1.0	First version
1.1	Current consumption added
1.2	Certification updates

TABLE OF CONTENTS

BLED112 *Bluetooth®* Smart USB Dongle

DESCRIPTION

BLED112 *Bluetooth* Smart Dongle integrates all *Bluetooth* Smart features. The USB dongle can a virtual COM port that enables simple host application development using a simple application programming interface. The BLED112 can be used for *Bluetooth* Smart development. With two BLED112 dongles you can quickly prototype new *Bluetooth* Smart application profiles by utilizing Bluegiga Profile Toolkit™ and also automate in module software functions with Bluegiga BGScript™ .

Figure 1: BLED112 Bluetooth Smart USB dongle

KEY FEATURES:

- *Bluetooth* v.4.0, single mode compliant
    - o Supports master and slave modes
    - o Supports up to eight connections
- Integrated *Bluetooth* Smart stack
    - o GAP, GATT, L2CAP and SMP
    - o *Bluetooth* Smart profiles
- Radio performance
    - o Transmit power : +0 dBm to -27 dBm
    - o Receiver sensitivity: -91 dBm
- Host interfaces
    - o USB (virtual COM port emualation)
- Programmable 8051 processor for stand-alone operation
- Simple Bluegiga BGScript™ scripting language for quick application development
- Bluegiga Profile Toolkit™ allowing the quick development of GATT based profiles
- Free Software Development Kit
- *Bluetooth*, CE, FCC, IC and South-Korea and Japan qualified

1 BLED112 Product Numbering

Available products and product codes

Product code	Description
BLED112-V1	BLED112 USB dongle

2 Electrical Characteristics

2.1 Absolute Maximum Ratings

Note: These are absolute maximum ratings beyond which the module can be permanently damaged. These are not maximum operating conditions. The maximum recommended operating conditions are in the table 6.

Rating	Min	Max	Unit
Storage Temperature	-40	+85	°C
VBUS	-0.3	6.5	V

Table 1: Absolute Maximum Ratings

2.2 Recommended Operating Conditions

Rating	Min	Max	Unit
Operating Temperature Range	-40	+85	°C
VBUS	3.6	5.5	V

Table 2: Recommended Operating Conditions

2.3 Current Consumption

Rating		AVG	Peak	Unit
Idle		12.1		mA
Scan			44	mA
Advertising	TX		44	mA
	RX		33	mA

Table 3: Current Consumption

Silicon Labs

3 Block Diagram

BLED112 is based on TI's CC2540 chip. Embedded 32 MHz and 32.678 kHz crystals are used for clock generation.
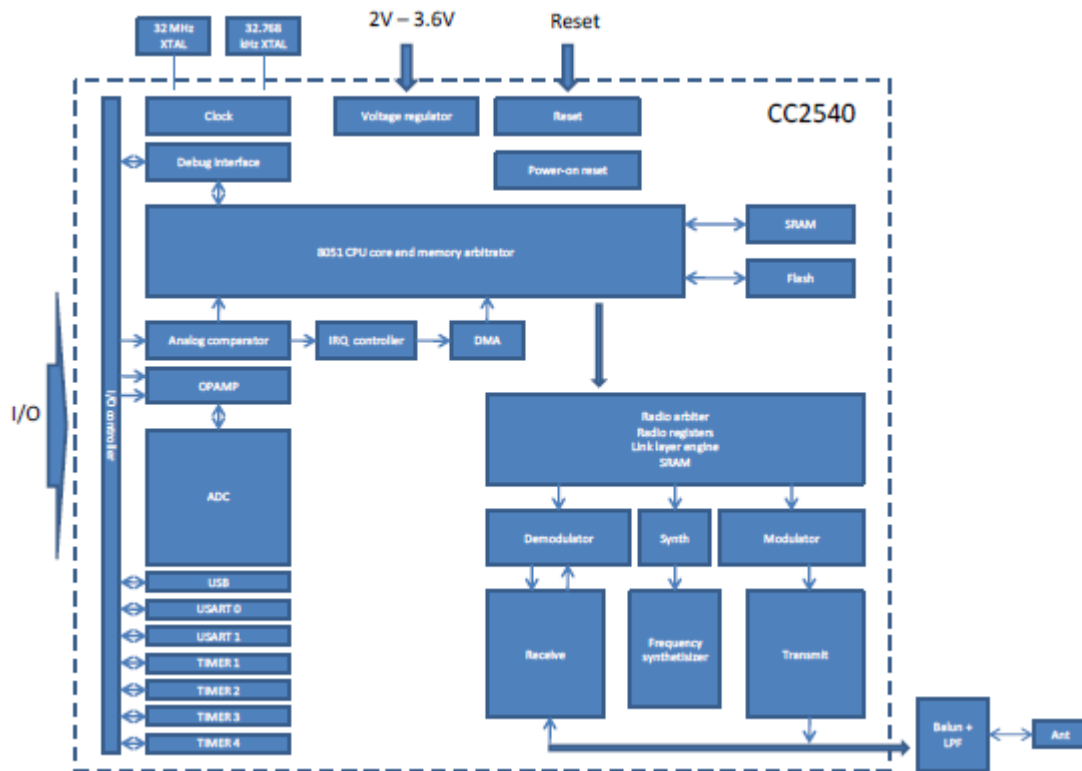

Figure 2: Simplified block diagram of BLE112

CPU and Memory

The 8051 CPU core is a single-cycle 8051-compatible core. It has three different memory access buses (SFR, DATA, and CODE/XDATA), a debug interface, and an 18-input extended interrupt unit.

The memory arbiter is at the heart of the system, as it connects the CPU and DMA controller with the physical memories and all peripherals through the SFR bus. The memory arbiter has four memory-access points, access of which can map to one of three physical memories: an SRAM, flash memory, and XREG/SFR registers. It is responsible for performing arbitration and sequencing between simultaneous memory accesses to the same physical memory.

The SFR bus is a common bus that connects all hardware peripherals to the memory arbiter. The SFR bus also provides access to the radio registers in the radio register bank, even though these are indeed mapped into XDATA memory space.

The 8-KB SRAM maps to the DATA memory space and to parts of the XDATA memory spaces. The SRAM is an ultralow-power SRAM that retains its contents even when the digital part is powered off (power modes 2 and 3).

The 128KB flash block provides in-circuit programmable non-volatile program memory for the device, and maps into the CODE and XDATA memory spaces.

4 Certifications

4.1 *Bluetooth*

BLED112 Bluetooth low energy module is *Bluetooth* qualified and listed as an End Product.

4.2 FCC and IC

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation.

This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one of the following measures:

- Reorient or relocate the receiving antenna
- Increase the separation between the equipment and receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected
- Consult the dealer or an experienced radio/TV technician for help

FCC Caution : To assure continued compliance, any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment. (Example - use only shielded interface cables when connecting to computer or peripheral devices).

FCC Radiation Exposure Statement

This equipment complies with FCC RF radiation exposure limits set forth for an uncontrolled environment. This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) This device may not cause harmful interference, and

(2) This device must accept any interference received, including interference that may cause undesired operation.

4.3 Industry Canada

IC Statements:

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Under Industry Canada regulations, this radio transmitter may only operate using an antenna of a type and maximum (or lesser) gain approved for the transmitter by Industry Canada. To reduce potential radio interference to other users, the antenna type and its gain should be so chosen that the equivalent isotropically radiated power (e.i.r.p.) is not more than that necessary for successful communication.

Déclaration d'IC :

Ce dispositif est conforme aux normes RSS exemptes de licence d'Industrie Canada. Son fonctionnement est assujetti aux deux conditions suivantes : (1) ce dispositif ne doit pas provoquer de perturbation et (2) ce dispositif doit accepter toute perturbation, y compris les perturbations qui peuvent entraîner un fonctionnement non désiré du dispositif.

Selon les réglementations d'Industrie Canada, cet émetteur radio ne doit fonctionner qu'avec une antenne d'une typologie spécifique et d'un gain maximum (ou inférieur) approuvé pour l'émetteur par Industrie Canada. Pour réduire les éventuelles perturbations radioélectriques nuisibles à d'autres utilisateurs, le type d'antenne et son gain doivent être choisis de manière à ce que la puissance isotrope rayonnée équivalente (P.I.R.E.) n'excède pas les valeurs nécessaires pour obtenir une communication convenable.

4.4 CE

BLED112 is in conformity with the essential requirements and other relevant requirements of the R&TTE Directive (1999/5/EC). The product is conformity with the following standards and/or normative documents.

- EMC EN 301 489-17 V.1.3.3 in accordance with EN 301 489-1 V1.8.1

- Radiated emissions EN 300 328 V1.7.1

- Safety EN 60950-1

4.5 South-Korea

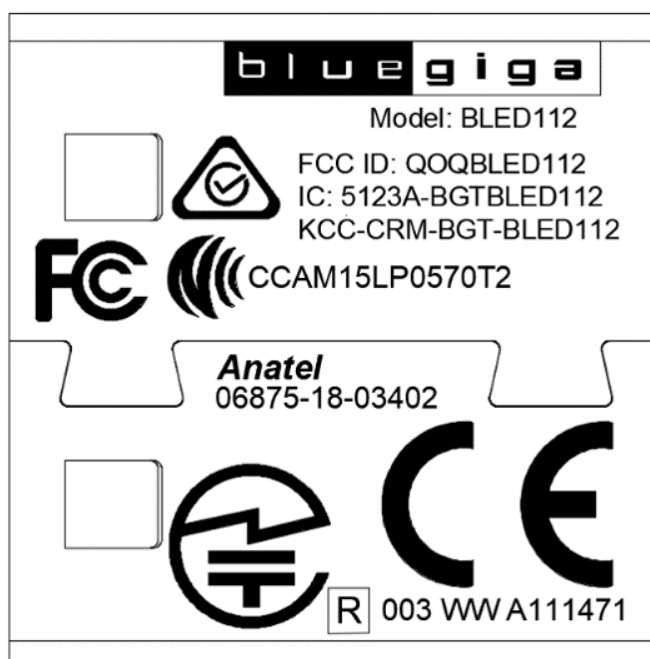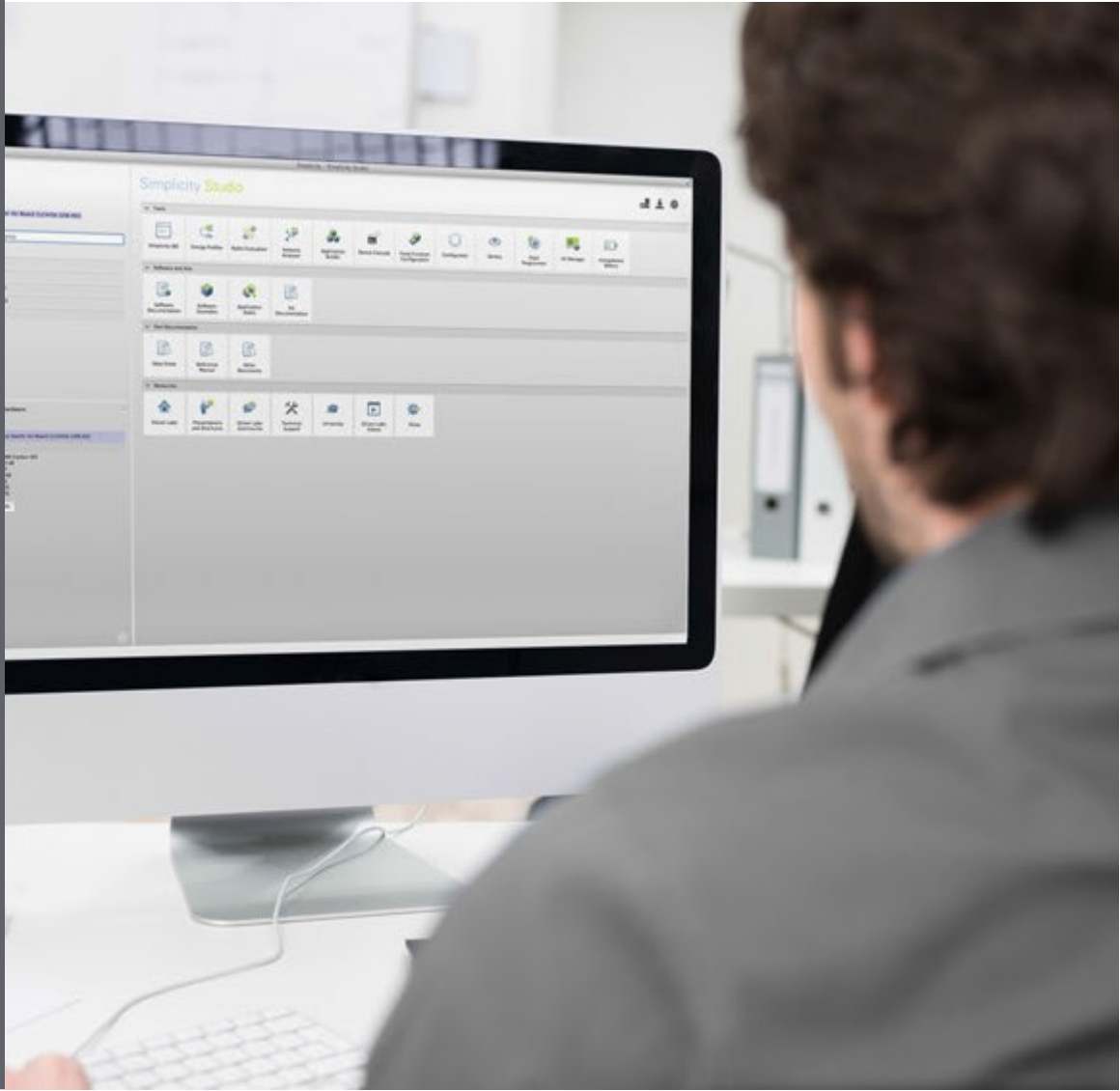BLED112 is certified in South-Korea with certification number: KCC-CRM-BGT-BLED112

4.6 Japan

BLED112 has MIC Japan type certification with certification number: 003WWA111471

4.7 Brazil

BLED112 is certified in Brazil with Anatel certification number: 06875-18-03402

4.8   BLED112 BLED Certifications Label

Simplicity Studio

One-click access to MCU and wireless tools, documentation, software, source code libraries & more. Available for Windows, Mac and Linux!

IoT Portfolio
www.silabs.com/IoT

SW/HW
www.silabs.com/simplicity

Quality
www.silabs.com/quality

Support and Community
community.silabs.com

Silicon Laboratories Inc.
400 West Cesar Chavez
Austin, TX 78701
USA

http://www.silabs.com

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[Silicon Laboratories](#):
  [BLED112](#)