# LBCA1KU1WA User Manual

Model Name: LBCA1KU1WA
FCC ID: Z7ALBCA1KU1WA
IC: 4919E-LBCA1KU1WA

## Table of Contents



**Note: This device cannot be sold to the public.**

# 1. Specification

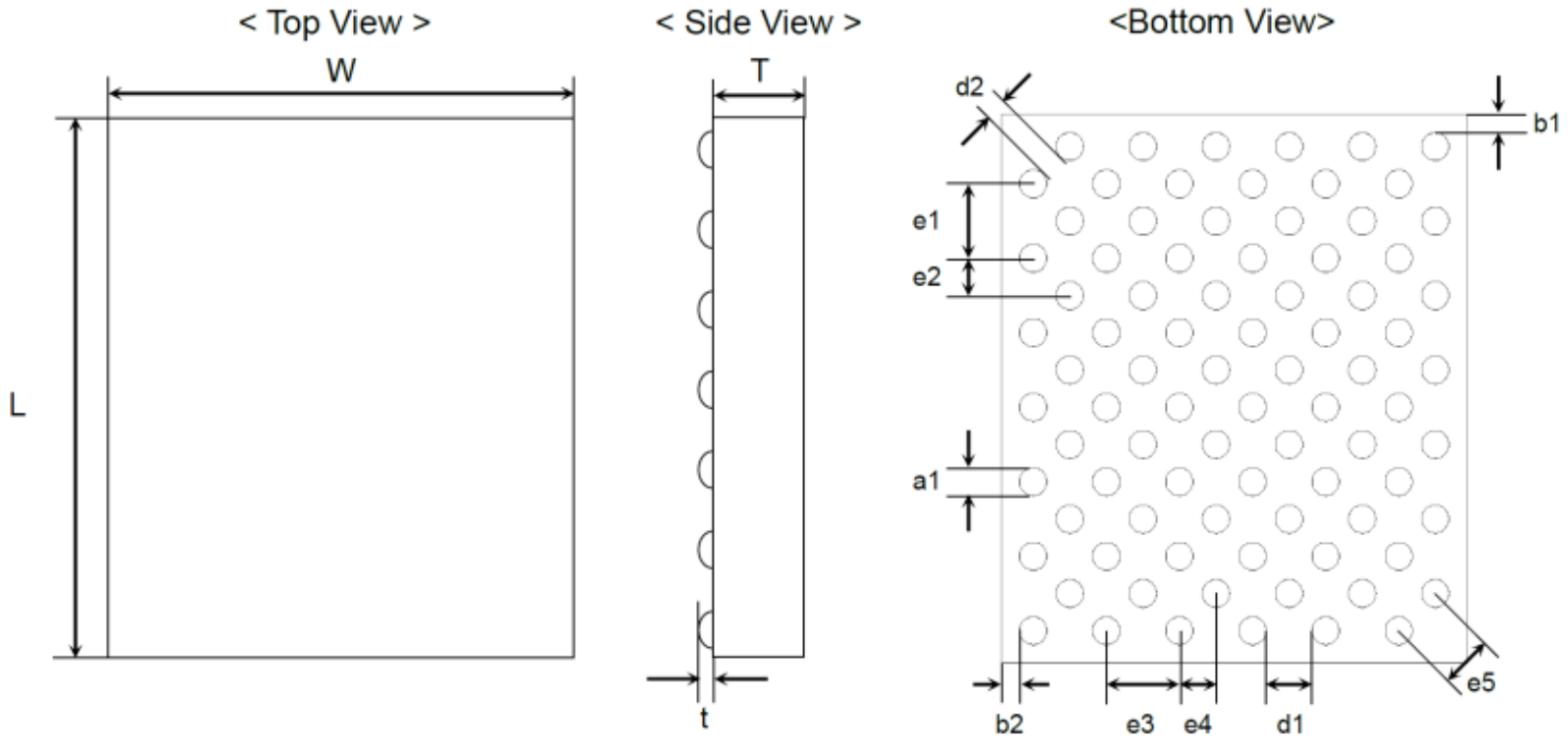
This specification is applied to the Bluetooth 5.0 module.

- Interface UART
- IC CYW20721
- Sleep Clock External 32.768 kHz oscillator required.
- Dimensions 5.9 x 5.1 x 1.1 mm
- Weight 75.6mg
- Frequency Range 2402 - 2480 MHz
- Voltage Range N/A
- Temperature Range N/A

| | | Min. | Typ. | Max. | Unit |
|---|---|---|---|---|---|
| **Operating Temperature** | | -40 | +25 | +85 | Degree C |
| **Supply Voltage** | VDD | 1.75 | 3.0 | 3.63 | V |
| | VDDIO* | --- | 3.0 | --- | V |

* Maximum Tune-Up Tolerance is “Average Power” during Duty ON time.

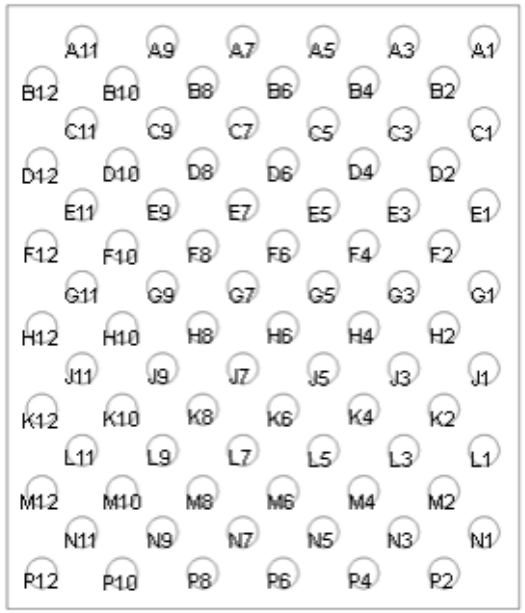
## 2. Dimensions




(units = mm)

| Mark | Dimensions | Mark | Dimensions | Mark | Dimensions | Mark | Dimensions | Mark | Dimensions |
|---|---|---|---|---|---|---|---|---|---|
| L | 5.9 ± 0.2 | t | 0.07 max. | e5 | 0.566 ± 0.1 | e3 | 0.8 ± 0.1 | e2 | 0.4 ± 0.1 |
| W | 5.1 ± 0.2 | d2 | 0.266 ± 0.2 | d1 | 0.5 ± 0.2 | b2 | 0.2 ± 0.2 | e1 | 0.8 ± 0.1 |
| T | 1.10 max. | b1 | 0.2 ± 0.2 | e4 | 0.4 ± 0.1 | a1 | 0.3 ± 0.2 | | |

## 3. PIN Layout




| No. | Terminal Name | No. | Terminal Name | No. | Terminal Name |
|---|---|---|---|---|---|
| A1 | GND | E9 | P3 | K6 | P17 |
| A3 | BT_CBUCK_OUT | E11 | GND | K8 | GND |
| A5 | P31 | F2 | GND | K10 | BT_UART_TXD |
| A7 | BT_XTAL_32K_I | F4 | P25 | K12 | P15 |
| A9 | BT_XTAL_32K_O | F6 | P23 | L1 | RF |
| A11 | GND | F8 | P19 | L3 | GND |
| B2 | VDD3P3 | F10 | P2 | L5 | P7 |
| B4 | P32 | F12 | GND | L7 | GND |
| B6 | P24 | G1 | GND | L9 | BT_GPIO2 |
| B8 | P36 | G3 | P29 | L11 | BT_UART_RTS_N |
| B10 | P21 | G5 | P18 | M2 | GND |
| B12 | P22 | G7 | P11 | M4 | P4 |
| C1 | GND | G9 | P9 | M6 | P5 |
| C3 | GND | G11 | GND | M8 | BT_HOST_WAKE |
| C5 | NC | H2 | P37 | M10 | BT_UART_RXD |
| C7 | P26 | H4 | P13 | M12 | VDDIO |
| C9 | P10 | H6 | P16 | N1 | GND |
| C11 | P14 | H8 | GND | N3 | GND |
| D2 | BT_CBUCK_IN | H10 | GND | N5 | P6 |
| D4 | P30 | H12 | GND | N7 | BT_GPIO5 |
| D6 | P35 | J1 | GND | N9 | BT_GPIO3 |
| D8 | P1 | J3 | P33 | N11 | GND |
| D10 | P28 | J5 | P34 | P2 | GND |
| D12 | P20 | J7 | P8 | P4 | GND |
| E1 | GND | J9 | GND | P6 | BT_GPIO4 |
| E3 | P27 | J11 | BT_UART_CTS_N | P8 | BT_DEV_WAKE |
| E5 | P0 | K2 | GND | P10 | RST_N |
| E7 | P12 | K4 | P38 | P12 | GND |

## 4. RF Performance

| Mode | Maximum Tune Up Tolerance (dBm) |
|---|---|
| **BT** | 4.5 |
| **BLE** | 4.5 |

* Maximum Tune-Up Tolerance is “Average Power” during Duty ON time.

## 5. Antenna

- Please perform the antenna design that followed the specifications of the antenna.
- About the signal line between an antenna and a module

It is a 50-ohm line design.

Fine tuning of return loss etc. can be performed using a matching network. However, it is required to check "Class1 change" and "Class2 change" which the authorities define then.

The concrete contents of a check are the following three points.

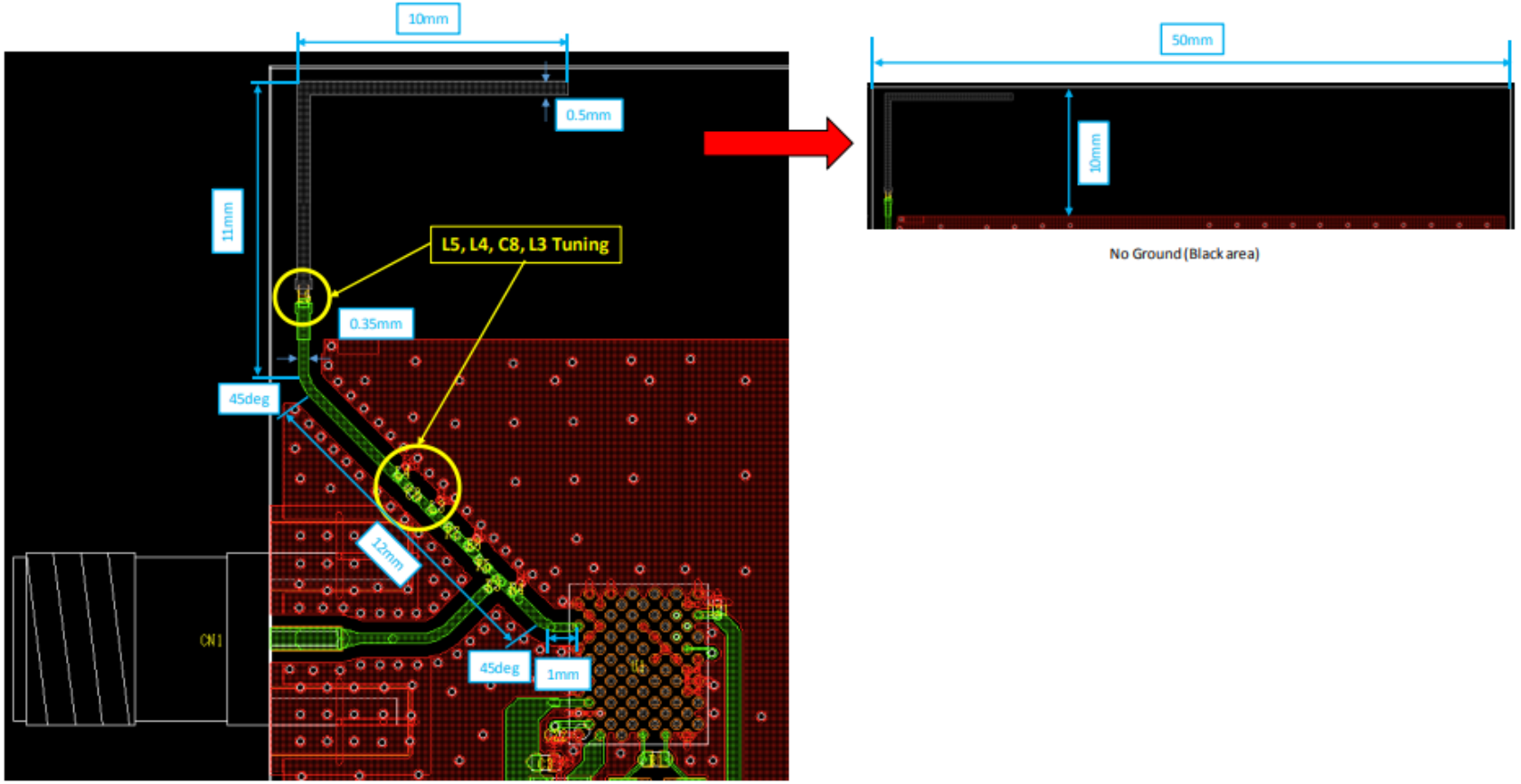
a) It is the same type as the antenna type of antenna specifications.

b) An antenna gain is lower than a gain given in antenna specifications.

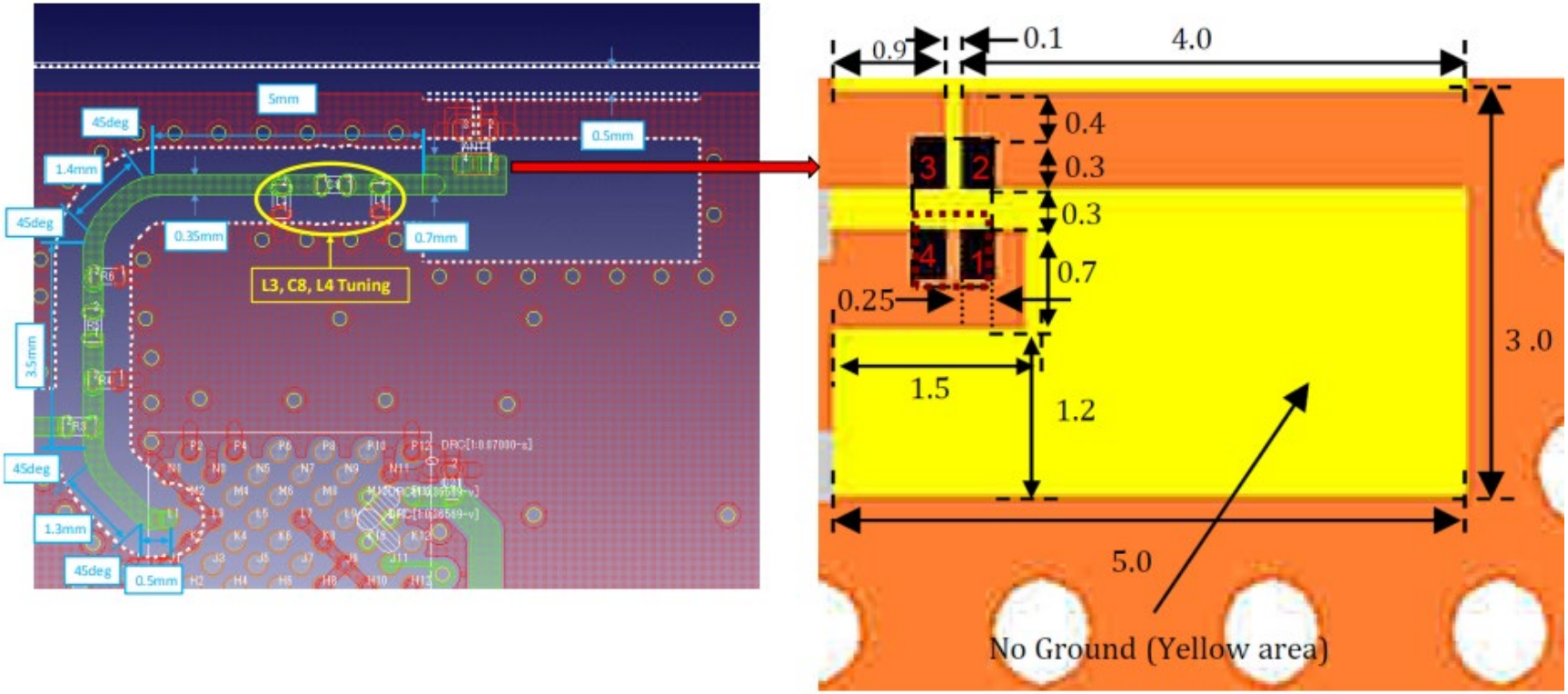
c) The emission level is not getting worse.

The following is the design of the EVB used for the test.

## 5.1 Pattern Antenna



## 5.2 Chip Antenna



## 6. FCC Compliance Information

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.

Please note that changes or modifications not expressly approved by Stryker Medical could void the user's authority to operate the equipment.

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. If it is not installed and used in accordance with these instructions, it 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 or more 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.

This device is only FCC authorized for the specific rule parts (i.e., FCC transmitter rules) listed on Stryker's grant. Stryker is responsible for compliance to any other FCC rules that may apply to the device not covered by the modular transmitter grant of certification. For products using this device, they are required to be Part 15 Subpart B compliant (when it also contains unintentional-radiator digital circuity) and shall provide a notice stating that the final host product still requires Part 15 Subpart B compliance testing with the modular transmitter installed.

## 7. ISED Compliance Information

This device complies with Industry Canada's applicable license-exempt RSSs. 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.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes : 1) l'appareil ne doit pas produire de brouillage; 2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

## 8. OEM/Integrators Installation Manual

This module has been granted modular approval for mobile applications. OEM integrators for host products may use the module in their final products without additional FCC / IC (Industry Canada) certification if they meet the following conditions. Otherwise, additional FCC / IC approvals must be obtained.

- The host product with the module installed must be evaluated for simultaneous transmission requirements.
- The user's manual for the host product must clearly indicate the operating requirements and conditions that must be observed to ensure compliance with current FCC / IC RF exposure guidelines.
- To comply with FCC / IC regulations limiting both maximum RF output power and human exposure to RF radiation, the maximum antenna gain including cable loss in a mobile-only exposure condition must not exceed, it includes one chip antenna with Max antenna gain 2 dBi and Pattern antenna with Max antenna gain 4 dBi;
- A label must be affixed to the outside of the host product with the following statements:
    - This device contains FCC ID: Z7ALBCA1KU1WA
    - This equipment contains equipment certified under IC: 4919E-LBCA1KU1WA

The final host / module combination may also need to be evaluated against the FCC Part 15B criteria for unintentional radiators in order to be properly authorized for operation as a Part 15 digital device.

If the final host / module combination is intended for use as a portable device (see classifications below) the host manufacturer is responsible for separate approvals for the SAR requirements from FCC Part 2.1093 and RSS-102.

## 9. FCC Definitions

**Portable:** (§2.1093) — A portable device is defined as a transmitting device designed to be used so that the radiating structure(s) of the device is / are within 20 centimeters of the body of the user.

**Mobile:** (§2.1091) (b) — A mobile device is defined as a transmitting device designed to be used in other than fixed locations and to generally be used in such a way that a separation distance of at least 20 centimeters is normally maintained between the transmitter's radiating structure(s) and the body of the user or nearby persons. Per §2.1091d(d)(4) In some cases (for example, modular or desktop transmitters), the potential conditions of use of a device may not allow easy classification of that device as either Mobile or Portable. In these cases, applicants are responsible for determining minimum distances for compliance for the intended use and installation of the device based on evaluation of either specific absorption rate (SAR), field strength, or power density, whichever is most appropriate.

## 10. Simultaneous Transmission Evaluation

This module has not been evaluated or approved for simultaneous transmission as it is impossible to determine the exact multi-transmission scenario that a host manufacturer may choose. Any simultaneous transmission condition established through module integration into a host product must be evaluated per the requirements in KDB447498D01(8) and KDB616217D01,D03 (for laptop, notebook, netbook, and tablet applications).

These requirements include, but are not limited to:

- Transmitters and modules certified for mobile or portable exposure conditions can be incorporated in mobile host devices without further testing or certification when:

- The closest separation among all simultaneous transmitting antennas is >20 cm,

OR

- Antenna separation distance and MPE compliance requirements for ALL simultaneous transmitting antennas have been specified in the application filing of at least one of the certified transmitters within the host device. In addition, when transmitters certified for portable use are incorporated in a mobile host device, the antenna(s) must be >5 cm from all other simultaneous transmitting antennas.

- All antennas in the final product must be at least 20 cm from users and nearby persons.