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# FIBOCOM B830-GL Hardware User Manual

**HP Customization Version**

Version: V1.0.1

Date: 2019-11-12

## Applicability type

| No. | Product model | Description |
|---|---|---|
| 1 | B830-GL-02 | NA |

## Copyright



## Attention

The document is subject to update from time to time owing to the product version upgrade or other reasons. Unless otherwise specified, the document only serves as the user guide. All the statements, information and suggestions contained in the document do not constitute any explicit or implicit guarantee.

## Trademark

The trademark is registered and owned by Fibocom Wireless Inc.

## Versions

| Version | Author | Assessor | Approver | Update Date | Description |
|---|---|---|---|---|---|
| V1.0.0 | Howson | Beren | Ricky | 2019-08-15 | 2019-08-15 |
| V1.0.1 | Howson | Beren | Ricky | 2019-11-12 | 1. Delete Extended Operating temperature<br>2. Update pin6/8/26 pin name<br>3. Update TBD data including power consumption, TX Power, RX sensitivity<br>4. Update Module picture |

# Contents

# 1 Preface

## 1.1 Introduction

The document describes the electrical characteristics, RF performance, dimensions and application environment, etc. of B830-GL (hereinafter referred to as B830). With the assistance of the document and other instructions, the developers can quickly understand the hardware functions of B830 modules and develop products.

## 1.2 Reference Standard

The design of the product complies with the following standards:

- Bluetooth Core Specification v5.0
- Bluetooth® 5, IEEE 802.15.4-2006, 2.4 GHz transceiver
- PCI_Express_M.2_Specification_Rev1.1

## 1.3 Related Documents

- RF Antenna Application Design Specification

# 2 Overview

## 2.1 Introduction

B830-GL is a BT 5.0 module which uses M.2 form factor interface.

## 2.2 Specification

| **Specification** | |
|---|---|
| BT Version | 5.0 |
| Power Supply | DC 3.135V～3.6V, Typical 3.3V |
| Temperature | Normal Operating temperature：-10°C ～+55°C |
| | Storage temperature：-40°C ～+85°C |
| Physical characteristics | Interface: M.2 Key B-M |
| | Dimension：30 x 42 x 2.3mm |
| | Weight: about 4.0 g |
| **Interface** | |
| Antenna Connector | BT Antenna x 1 |
| Function Interface | BUTTON |
| | I2C |
| | Piezo(on board) |
| | GPIO |

## 2.3 Warnings

### 2.3.1 FCC Statement

**Federal Communication Commission Interference Statement**

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.

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**

(1) Any changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate this equipment.

(2) This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

**Federal Communication Commission Radiation Exposure Statement**

This EUT is compliance with SAR for general population/uncontrolled exposure limits in ANSI/IEEE C95.1-1999 and had been tested in accordance with the measurement methods and procedures specified in OET Bulletin 65 Supplement C.

This device is intended only for OEM integrators under the following conditions:
1) The Max allowed antenna gain is 2 dBi for external monopole antenna and PIFA antenna
2) The transmitter module may not be co-located with any other transmitter or antenna.

As long as 2 conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed。

**End Product Labeling**

The final end product must be labeled in a visible area with the following: “Contains FCC ID:ZMOB830GL”.The grantee's FCC ID can be used only when all FCC compliance

**IMPORTANT NOTE:** In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the FCC authorization is no longer considered valid and the FCC ID can not be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate FCC authorization.

### 2.3.2 IC Statement

**Industry Canada Statement**

This device complies with Industry Canada's licence-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, et
(2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement."

The final end product must be labeled in a visible area with the following: "Contains IC:21374-B830GL"

**RF exposure**

**Radiation Exposure Statement:**

The product comply with the Canada portable RF exposure limit set forth for an uncontrolled environment and are safe for intended operation as described in this manual. The further RF exposure reduction can be achieved if the product can be kept as far as possible from the user body or set the device to lower output power if such function is available.

**Déclaration d'exposition aux radiations:**Le produit est conforme aux limites d'exposition pour les appareils portables RF pour les Etats-Unis et le Canada établies pour un environnement non contrôlé. Le produit est sûr pour un fonctionnement tel que décrit dans ce manuel. La réduction aux expositions RF peut être augmentée si l'appareil peut être conservé aussi loin que possible du corps de l'utilisateur ou que le dispositif est réglé sur la puissance de sortie la plus faible si une telle fonction est disponible.

### 2.3.3 CE Statement

**EU Regulatory Conformance**

Hereby, We, Manufacturer name declares that the radio equipment type B830-GL is in compliance with the Directive 2014/53/EU.

In all cases assessment of the final product must be mass against the Essential requirements of the Directive 2014/53/EU Articles 3.1(a) and (b), safety and EMC respectively, as well as any relevant Article

3.2 requirements.

The maximum antenna gain for is 2 dBi and the antenna separation distance is 20cm.

**Declaration of Conformity(should include manufacturer contact info.)**

Please added certification standard in your user manual which depended on the test standards your device performed., If the DoC should be a simplified version, please take below as reference, The full text of the EU declaration of conformity isavailableat the following internet address: http//www.fibocom.com.

B830-GL is in conformity with the relevant Union harmonization legislation: Radio Equipment directive 2014 / 53 / EU with reference to the following standards applied: Health (Article 3.1(a) of Directive 2014/53/EU)

Applied Standard(s): EN 62311 : 2008

Safety (Article 3.1(a) of Directive 2014/53/EU) Applied Standard(s): EN 62368-1: 2018

Electromagnetic compatibility (Article 3.1 (b) of Directive 2014/53/EU) Applied Standard(s): Final Draft EN 301 489-1 V2.2.2 and Draft EN 301 489-17 V3.2.0

Radio frequency spectrum usage (Article 3.2 of Directive 2014/53/EU) Applied Standard(s): EN 300328 V2.1.1

## 2.4 Application Block

The peripheral applications for B830 module are shown in Figure 2-1:

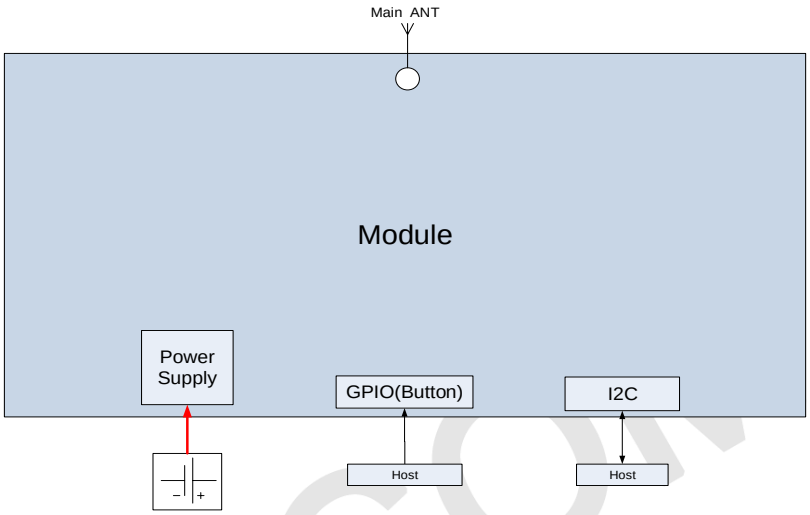


Figure2-1 Application Block

## 2.5 Hardware Block Diagram

The hardware block diagram in Figure 2-2 shows the main hardware functions of B830 module, including baseband and RF functions.

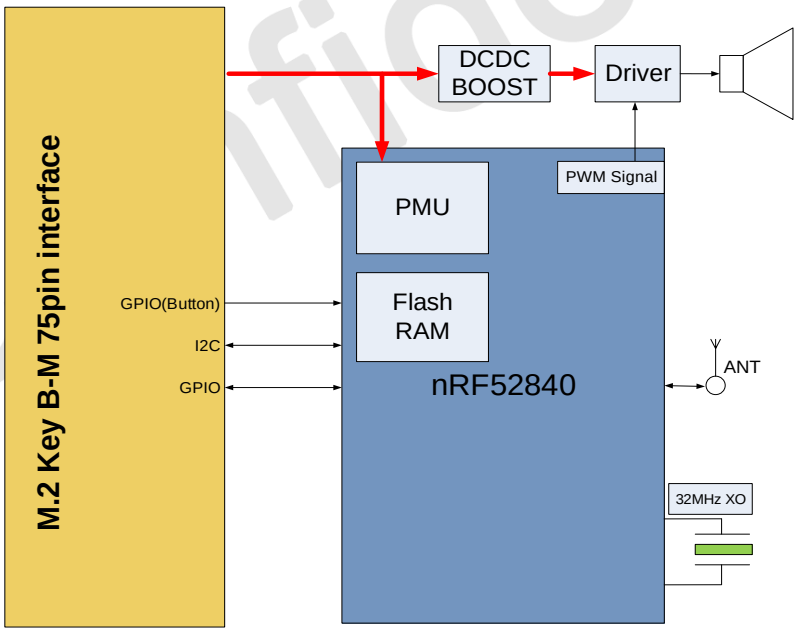


Figure 2-2 Hardware Block Diagram

# 3 Application Interface

## 3.1 M.2 Interface

The B830 module uses standard M.2 Key-B-M interface, with a total of 75 pins.

### 3.1.1 Pin Map

| | | | |
|---|---|---|---|
| 74 | 3.3 V | CONFIG_2 | 75 |
| 72 | 3.3 V | GND | 73 |
| 70 | 3.3 V | GND | 71 |
| 68 | NC | CONFIG_1 | 69 |
| | Notch(Key-M) | NC | 67 |
| | Notch(Key-M) | Notch(Key-M) | |
| | Notch(Key-M) | Notch(Key-M) | |
| | Notch(Key-M) | Notch(Key-M) | |
| 58 | NC | Notch(Key-M) | |
| 56 | NC | GND | 57 |
| 54 | NC | NC | 55 |
| 52 | NC | NC | 53 |
| 50 | NC | GND | 51 |
| 48 | NC | NC | 49 |
| 46 | NC | NC | 47 |
| 44 | NC | GND | 45 |
| 42 | NC | NC | 43 |
| 40 | NC | NC | 41 |
| 38 | NC | GND | 39 |
| 36 | NC | NC | 37 |
| 34 | NC | NC | 35 |
| 32 | NC | GND | 33 |
| 30 | NC | NC | 31 |
| 28 | I2C_INT# | NC | 29 |
| 26 | NC | GND | 27 |
| 24 | I2C_DATA | NC | 25 |
| 22 | NC | NC | 23 |
| 20 | I2C_CLK | CONFIG_0 | 21 |
| | Notch(Key-B) | Notch(Key-B) | |
| | Notch(Key-B) | Notch(Key-B) | |
| | Notch(Key-B) | Notch(Key-B) | |
| | Notch(Key-B) | Notch(Key-B) | |
| 10 | NC | GND | 11 |
| 8 | NC | USB_D- | 9 |
| 6 | GPIO(BUTTON) | USB_D+ | 7 |
| 4 | 3.3 V | GND | 5 |
| 2 | 3.3 V | GND | 3 |
| | | CONFIG_3 | 1 |

Figure 3-1 Pin Map

**Note:**

Pin “Notch” represents the gap of the gold fingers.

### 3.1.2 Pin Definition

The pin definition is as follows:

| Pin | Pin Name | I/O | Pin Description | Type |
|---|---|---|---|---|
| 1 | CONFIG_3 | O | Connected to internal GND | |
| 2 | +3.3V | PI | Module main power input. | Power Supply |
| 3 | GND | | GND | Power Supply |
| 4 | +3.3V | PI | Module main power input. | Power Supply |
| 5 | GND | | GND | Power Supply |
| 6 | GPIO(Button) | I | Wake up module, Low active | 3.3V |
| 7 | USB D+ | I/O | USB 1.1 D+ signal(Reserved) | 0.3---3V |
| 8 | NC | | NC | |
| 9 | USB D- | I/O | USB 1.1 D- signal(Reserved) | 0.3---3V |
| 10 | NC | | NC | |
| 11 | GND | | GND | Power Supply |
| 12 | Notch | | Notch | |
| 13 | Notch | | Notch | |
| 14 | Notch | | Notch | |
| 15 | Notch | | Notch | |
| 16 | Notch | | Notch | |
| 17 | Notch | | Notch | |
| 18 | Notch | | Notch | |
| 19 | Notch | | Notch | |
| 20 | I2C_CLK | O | I2C serial data signal, internal 10KΩ pull-up. | 3.3V |
| 21 | CONFIG_0 | O | Connected to internal GND | |
| 22 | NC | | NC | |
| 23 | NC | | NC | |
| 24 | I2C_DATA | I/O | I2C serial data signal, internal 10KΩ pull-up. | 3.3V |

| Pin | Pin Name | I/O | Pin Description | Type |
|---|---|---|---|---|
| 25 | NC | | NC | |
| 26 | NC | | NC | |
| 27 | GND | | GND | Power Supply |
| 28 | I2C_INT# | I/O | I2C serial data signal, internal 10KΩ pull-up. | 3.3V |
| 29 | NC | | NC | |
| 30 | NC | | NC | |
| 31 | NC | | NC | |
| 32 | NC | | NC | |
| 33 | GND | | GND | Power Supply |
| 34 | NC | | NC | |
| 35 | NC | | NC | |
| 36 | NC | | NC | |
| 37 | NC | | NC | |
| 38 | NC | | NC | |
| 39 | GND | | GND | Power Supply |
| 40 | NC | | NC | |
| 41 | NC | | NC | |
| 42 | NC | | NC | |
| 43 | NC | | NC | |
| 44 | NC | | NC | |
| 45 | GND | | GND | Power Supply |
| 46 | NC | | NC | |
| 47 | NC | | NC | |
| 48 | NC | | NC | |
| 49 | NC | | NC | |
| 50 | NC | | NC | |
| 51 | GND | | GND | Power Supply |
| 52 | NC | | NC | |
| 53 | NC | | NC | |

| Pin | Pin Name | I/O | Pin Description | Type |
|---|---|---|---|---|
| 54 | NC | | NC | |
| 55 | NC | | NC | |
| 56 | NC | | NC | |
| 57 | GND | | GND | Power Supply |
| 58 | NC | | NC | |
| 59 | Notch | | Notch | |
| 60 | Notch | | Notch | |
| 61 | Notch | | Notch | |
| 62 | Notch | | Notch | |
| 63 | Notch | | Notch | |
| 64 | Notch | | Notch | |
| 65 | Notch | | Notch | |
| 66 | Notch | | Notch | |
| 67 | NC | | NC | |
| 68 | NC | | NC | |
| 69 | CONFIG_1 | O | Connected to internal GND | |
| 70 | +3.3V | PI | Module main power input. | Power Supply |
| 71 | GND | | GND | Power Supply |
| 72 | +3.3V | PI | Module main power input. | Power Supply |
| 73 | GND | | GND | Power Supply |
| 74 | +3.3V | PI | Module main power input. | Power Supply |
| 75 | CONFIG_2 | O | Connected to internal GND | |

**Note:**

The unused pins can be left floating.

## 3.2 Power Supply

The power interface of B830 module is as shown in the following table:

| Pin | Pin Name | I/O | Pin Description | DC Parameter（V） | | |
|---|---|---|---|---|---|---|
| | | | | Minimum Value | Typical Value | Maximum Value |
| 2,4,70,72,74 | +3.3V | PI | Power supply input | 3.135 | 3.3 | 3.6 |

### 3.2.1 Power Supply

The B830 module should be powered through the +3.3V pins, and the power supply design is shown in Figure 3-2:

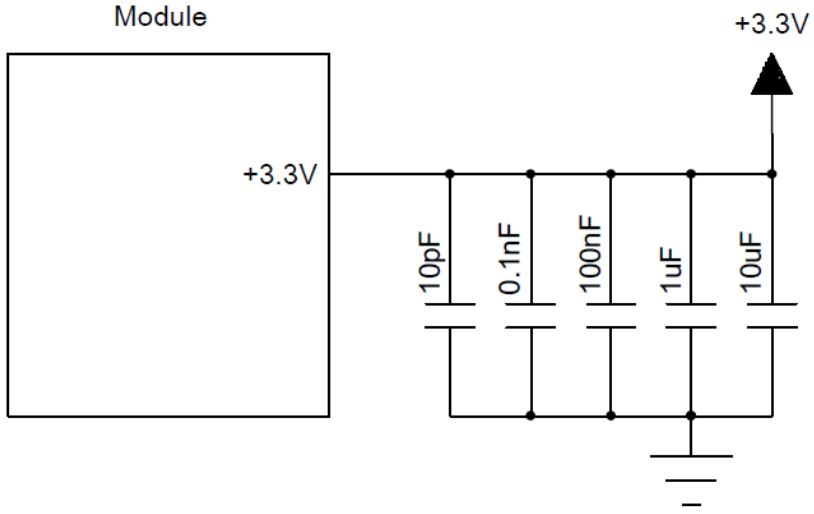


Figure 3-2 Power Supply Design

The filter capacitor design for power supply as shown in the following table:

| Recommended capacitance | Application | Description |
|---|---|---|
| 10uF | Voltage-stabilizing capacitors | Reduce power fluctuations of the module in operation, requiring capacitors with low ESR. |
| 1uF,100nF | Digital signal noise | Filter out the interference generated from the clock and digital signals |
| 0.1nF | 500MHz~2GHz signal noise | Filter out medium/high frequency band RF interference |
| 10pF | 2.4GHz frequency band | Filter out high frequency band RF interference |

The stable power supply can ensure the normal operation of B830 module; and the ripple of the power supply should be less than 300mV in design. So the power source should be not lower than 3.135V, or the module may shut down or reboot. The power supply limits are shown in Figure 3-3:

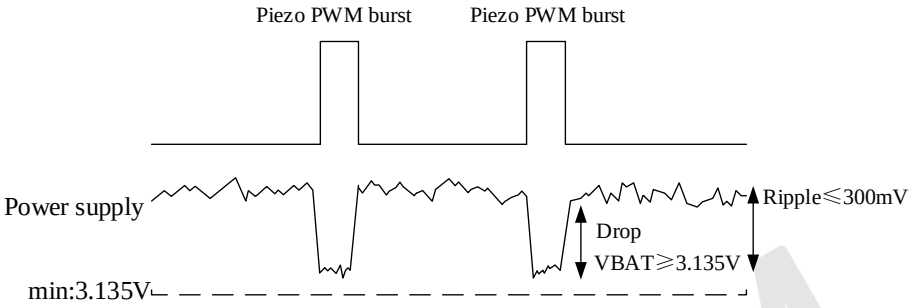


Figure 3-3 Power Supply Limit

## 3.2.2 GPIO Logic level

The B830 module GPIO logic level definition as shown in the following table:

| Parameters | Minimum | Maximum |
|---|---|---|
| $V_{IH}$ | 0.7 x VDD | VDD |
| $V_{IL}$ | 0V | 0.3 x VDD |

**Note:**

VDD is module power supply.

## 3.2.3 Power Consumption

In the condition of 3.3V power supply, the B830 power consumption as shown in the following table:

| Parameter | Mode | Condition | Max Current(mA) | Typical Current(mA) |
|---|---|---|---|---|
| $I_{Deep\ sleep}$ | Deep sleep | Deep sleep | 1 | 0.03 |
| $I_{Idle}$ | Idle | Idle | 2 | 1.0 |
| $I_{1LE}$ | RMS | 1LE @+6dBm | 100 | 20 |
| | Peak | 1LE @+6dBm | 150 | 75 |
| $I_{2LE}$ | RMS | 2LE @+6dBm | 100 | 15 |
| | Peak | 2LE @+6dBm | 150 | 70 |
| $I_{s2}$ | RMS | S2 @+6dBm | 100 | 18 |

| Parameter | Mode | Condition | Max Current(mA) | Typical Current(mA) |
|---|---|---|---|---|
| | Peak | S2@+6dBm | 150 | 66 |
| $I_{s8}$ | RMS | S8 @+6dBm | 100 | 25 |
| | Peak | S8 @+6dBm | 150 | 66 |
| $I_{sound}$ | RMS | 1st Level Sound (Mute) | 5 | 0.3 |
| | Peak | | 30 | 20 |
| | RMS | 2nd Level Sound (Normal) | 100 | 75 |
| | Peak | | 300 | 220 |
| | RMS | 3rd Level Sound (Medium) | 250 | 200 |
| | Peak | | 600 | 550 |
| | RMS | 4th Level Sound (Loud) | 500 | 450 |
| | Peak | | 1200 | 1100 |

**Note:**

The data above is an average value obtained by testing some samples.

+6dBm means the TX power default step setting in FW.

## 3.3 GPIO(Button)

B830 provides an interrupt signal use to wake up module, the definition of Button# signal is as follows:

| Pin | Pin Name | I/O | Pin Description | Type |
|---|---|---|---|---|
| 6 | GPIO(Button) | I | Wake up module, Low active | 3.3V |

## 3.4 I2C Interface Description

The B830 module supports I2C interface, which is configured as I2C slave.

| Pin | Pin Name | I/O | Pin Description | Type |
|---|---|---|---|---|
| 20 | I2C_CLK | I | I2C serial data signal, internal 10KΩ pull-up. | 3.3V |
| 24 | I2C_DATA | I/O | I2C serial data signal, internal 10KΩ pull-up. | 3.3V |

| Pin | Pin Name | I/O | Pin Description | Type |
|---|---|---|---|---|
| 28 | I2C_INT# | I | I2C serial data signal, internal 10KΩ pull-up. | 3.3V |

External host can control module with I2C interface, the connection schematic design is as Figure 3-4:

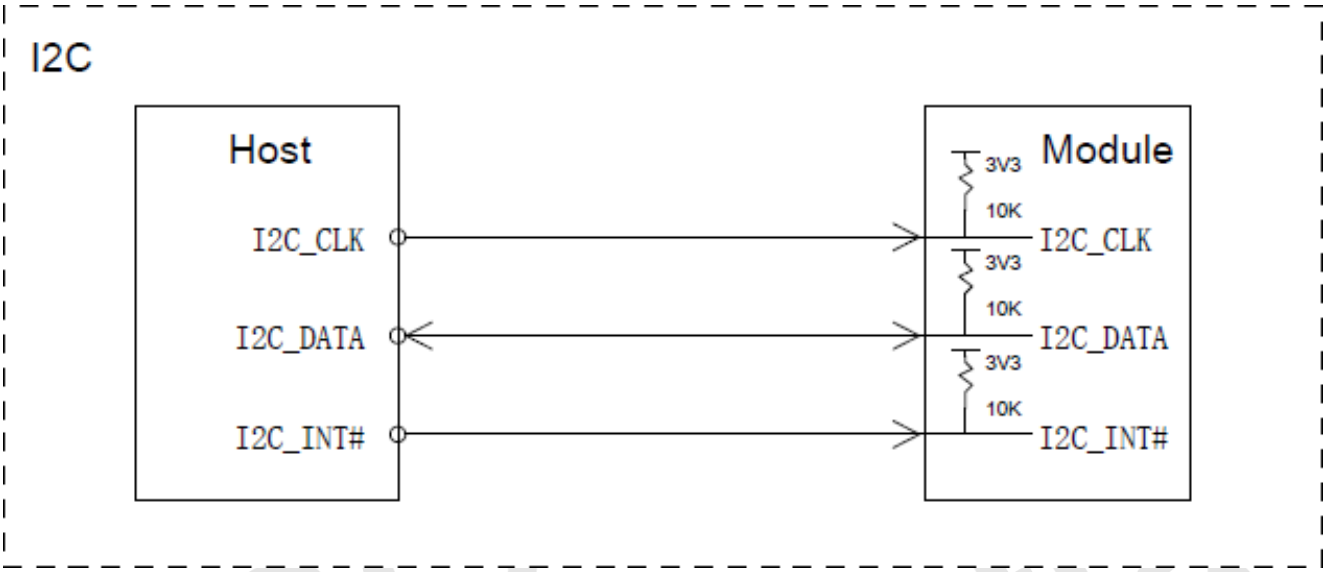


Figure 3-4 I2C Signal Connection

**Note:**

I2C interface can be left floating if not used.

## 3.5 Piezo

The B830 has a piezoelectric element that can be used to output simply sounds.

| nRF52840 pin | Pin Name | I/O | Pin Description | Type |
|---|---|---|---|---|
| P0.08 | PIEZO_PWM_NEG | O | Bridge output signal(Phase difference of 180°), output PWM signal to drive piezo buzzer | 3.3V |
| P1.08 | PIEZO_PWM_POS | O | Bridge output signal(Phase difference of 180°), output PWM signal to drive piezo buzzer | 3.3V |

Module has a built-in DCDC boost circuit which has 4 level $V_{PP}$ voltage, then it can drives buzzer output four volume level.

| Volume Level | nRF52840 Pin | | | $V_{PP}$ Voltage |
|---|---|---|---|---|
| | P0.07 | P1.15 | P1.14 | |
| 1(Mute) | H | NC | NC | -0.3～0.3V, typical 0V |
| 2(Normal) | H | H | L | 13.5~17.5V, typical 15.5V |
| 3(Medium) | H | L | H | 20.5~24.5V, typical 22.5V |
| 4(Loud) | H | H | H | 28~32V, typical 30V |

The typical volume value of piezo on module is 100dB@Level 4(background noise is lower than 40dB).

The sound test environment in audio lab is as Figure 3-5:

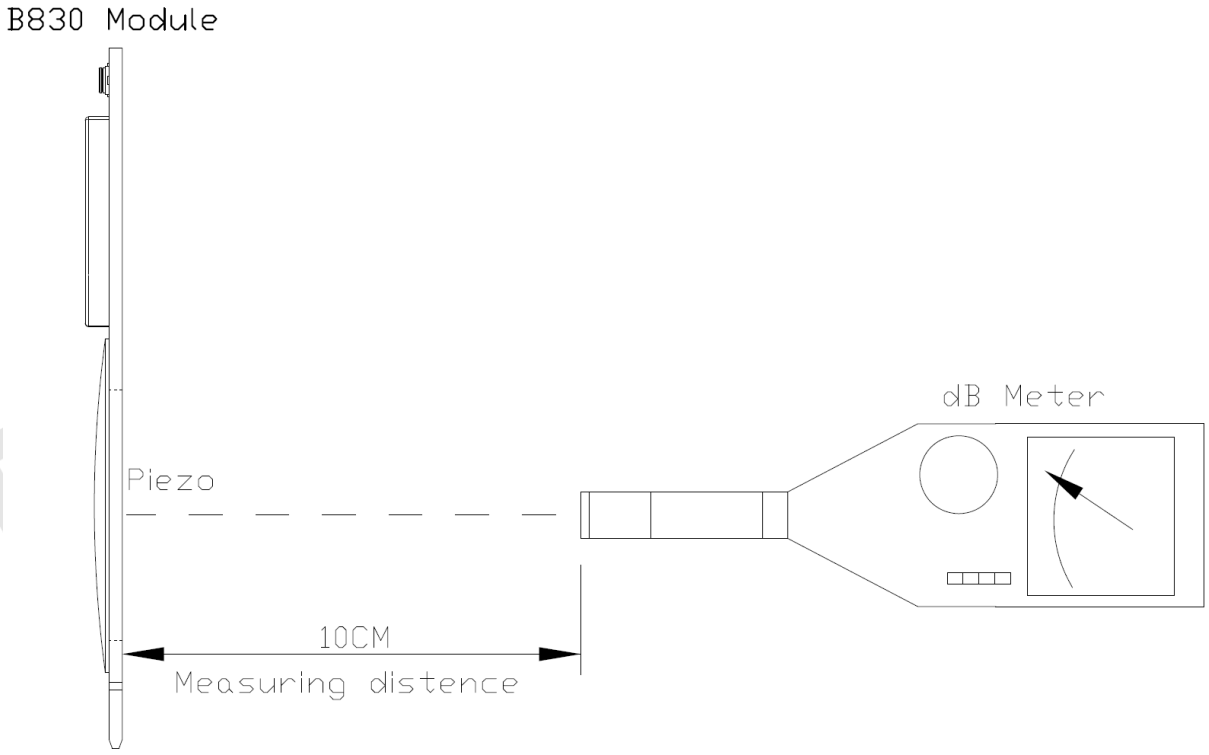


Figure 3-5 Sound Test Environment

# 4 Radio Frequency

## 4.1 RF Interface

### 4.1.1 RF Interface Functionality

The B830 module supports RF connector used for external antenna connection, as the Figure 4-1 shows.

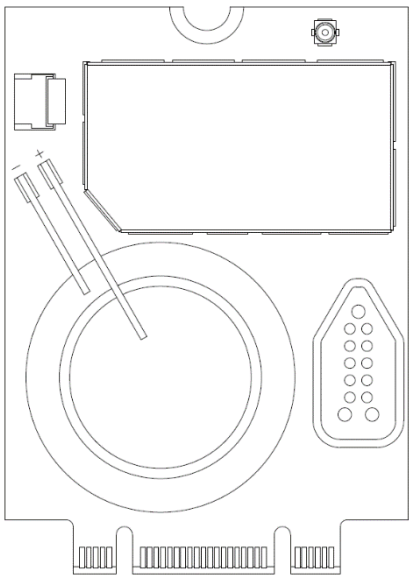

Figure 4-1 RF connectors

### 4.1.2 RF Connector Characteristic

| Rated Condition | | Environment Condition |
|---|---|---|
| Frequency Range | DC to 6GHz | Temperature Range |
| Characteristic Impedance | 50Ω | –40°C to +85°C |

### 4.1.3 RF Connector Dimension

The B830 module adopts standard M.2 module RF connector, the model name is 818004607 from ECT Corporation, and the connector size is 2*2*0.6m. The connector dimension is shown as following picture:

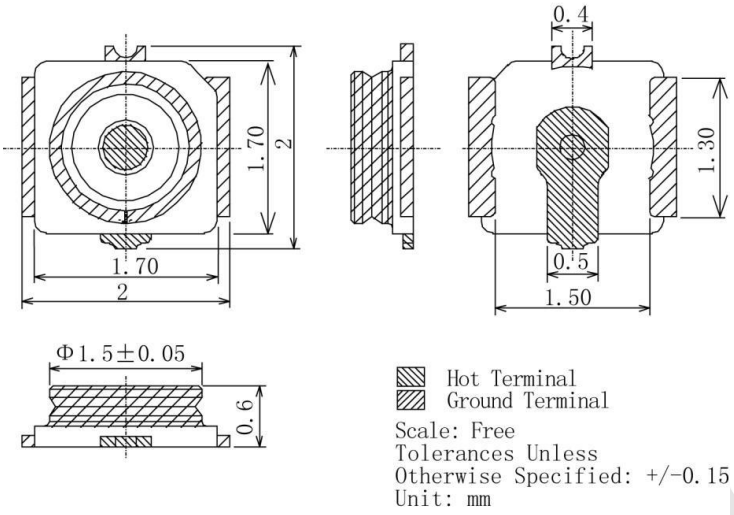


Figure 4-2 RF connector dimensions

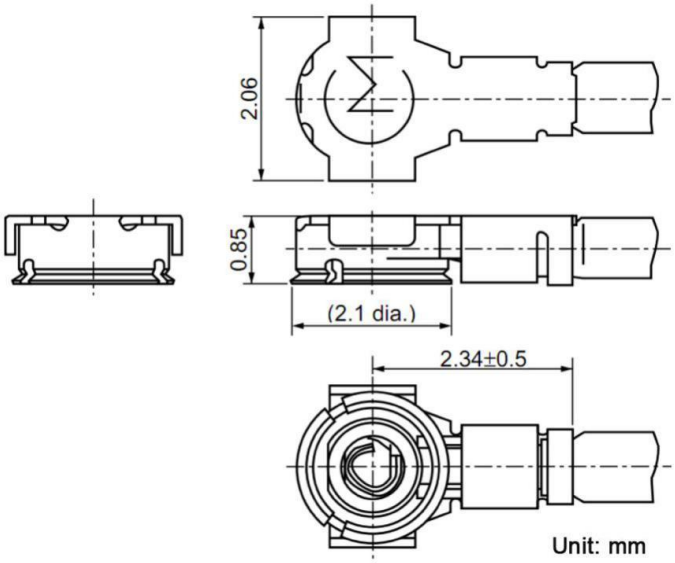


Figure 4-3 0.81mm coaxial antenna dimensions

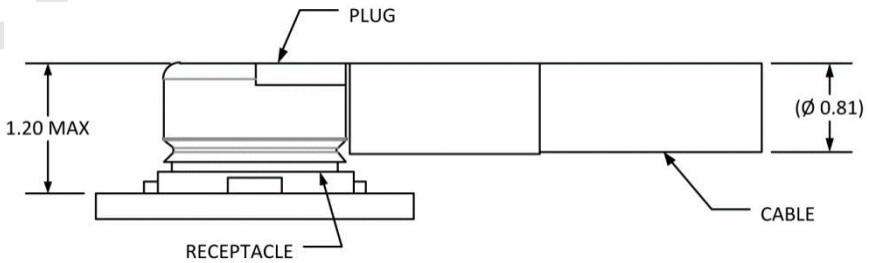


Figure 4-4 Schematic diagram of 0.81mm coaxial antenna connected to the RF connector

## 4.2 Operating Mode

The B830 module operating mode of the antenna is as follows:

| Mode | Operation Mode | Tx (MHz) | Rx (MHz) |
|---|---|---|---|
| Bluetooth | LE | 2400 – 2483.5 | 2400 – 2483.5 |

## 4.3 Transmitting Power

The transmitting power of the B830 module is as shown in the following table:

| Mode | Operation Mode | BT SIG Requirement | Tx Power(dBm) | Note |
|---|---|---|---|---|
| Bluetooth | LE | -20≤Power≤10 | ≤8 | |

## 4.4 Receiver Sensitivity

The receiver sensitivity of the B830 module is as shown in the following table:

| Mode | PHY | BT SIG Requirement | Rx Sensitivity(dBm) Typical | Note |
|---|---|---|---|---|
| BLE | 1LE | -70 | -92.5 | PER<30.8% |
| | 2LE | -70 | -88.5 | PER<30.8% |
| | S2 | -75 | -98.5 | PER<30.8% |
| | S8 | -82 | -102.5 | PER<30.8% |

**Note:**

Typical data is based on Nordic nRF52840 chipset Spec V1.1, and with 0.5dB module loss.

## 4.5 Antenna Design

The B830 module antenna design requirements as shown in the following table:

| B830 module Main antenna requirements | |
|---|---|
| Frequency range | The most proper antenna to adapt the frequencies should be used. |
| Bandwidth | BT: 2.400 – 2.4835GHz |
| Impedance | 50 ohm |

| B830 module Main antenna requirements | |
|---|---|
| Input power | > 13dBm BT power |
| Recommended standing-wave ratio (SWR) | ≤ 2:1 |

# 5 Structure Specification

## 5.1 Product Appearance

The product appearance for B830 module is shown in Figure 5-1:


Figure 5-1 Module Appearance

## 5.2 Dimension of Structure

The structural dimension of the B830 module is shown in Figure 5-2:

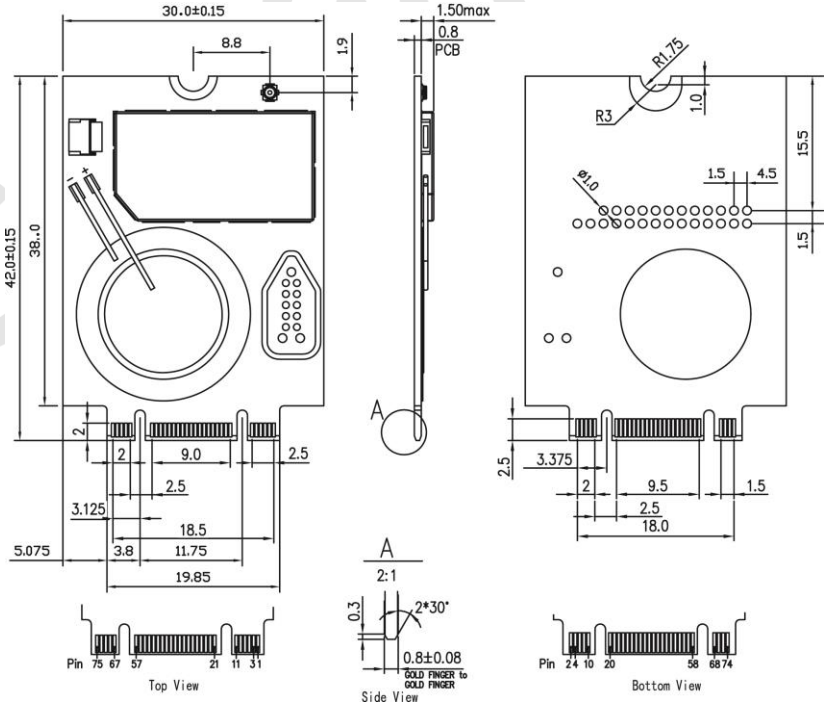


Figure 5-2 Dimension of Structure

## 5.3 M.2 Interface Model

The B830 M.2 module adopts 75-pin gold finger as external interface, where 59 pins are signal pins and 16 pins are notch pins as shown in Figure7-1. For module dimension, please refer to chapter 7.2 Dimension of Structure. Based on the M.2 interface definition, B830 module adopts Type 3042-S3-B-M interface (30x42mm, the component maximum height on t top layer is 1.5mm, PCB thickness is 0.8mm, and KEY ID is B-M).

**Module Nomenclature**
**Sample type** 3042-S3-B-M

Type XX XX - XX - X - X[1]

| Width (mm) |
|---|
| 12 |
| 16 |
| 22 |
| 30 |

| Length (mm) |
|---|
| 16 |
| 26 |
| 30 |
| 38 |
| 42 |
| 60 |
| 80 |
| 110 |

| | Component Max Ht (mm) | |
|---|---|---|
| | Top Max[1] | Bottom Max[1] |
| S1 | 1.2 | 0**** |
| S2 | 1.35 | 0**** |
| S3 | 1.5 | 0**** |
| D1 | 1.2 | 1.35 |
| D2 | 1.35 | 1.35 |
| D3 | 1.5 | 1.35 |
| D4 | 1.5 | 0.7 |
| D5 | 1.5 | 1.5 |

| Key ID | Pin | Interface |
|---|---|---|
| A | 8-15 | 2x PCIe x1 / USB 2.0 / I2C / DP x4 |
| B | 12-19 | PCIe x2/SATA/USB 2.0/USB 3.0/HSIC/SSIC/Audio/UIM/I2C |
| C | 16-23 | Reserved for Future Use |
| D | 20-27 | Reserved for Future Use |
| E | 24-31 | 2x PCIe x1 / USB 2.0 / I2C / SDIO / UART / PCM |
| F | 28-35 | Future Memory Interface (FMI) |
| G | 39-46 | Generic (Not used for M.2)*** |
| H | 43-50 | Reserved for Future Use |
| J | 47-54 | Reserved for Future Use |
| K | 51-58 | Reserved for Future Use |
| L | 55-62 | Reserved for Future Use |
| M | 59-66 | PCIe x4 / SATA |

☒ Use ONLY when a double slot is being specified
☒☒ Label included in height dimension
☒☒☒ Key G is intended for custom use. Devices with this key will not be M.2-compliant. Use at your own risk!
☒☒☒☒ Insulating label allowed on connector-based designs

## 5.4 M.2 Connector

The B830 module connects to AP via M.2 connector, it is recommended to use M.2 connector from LOTES Corporation with the model APCI0026-P001A as shown in Figure 5-3. The package of connector, please refer to the specification.

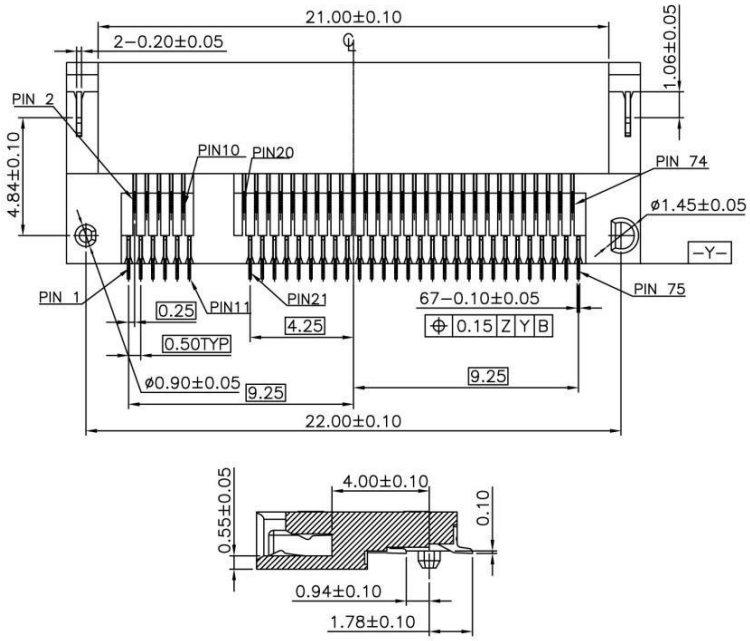


Figure 5-3 M.2 Dimension of Structure

# 5.5 Storage

## 5.5.1 Storage Life

Storage Conditions (recommended): Temperature is 23 ± 5 ℃, relative humidity is less than RH 60%.

Storage period: Under the recommended storage conditions, the storage life is 12 months.

# 5.6 Packing

The B830 module uses the tray sealed packing, combined with the outer packing method using the hard cartoon box, so that the storage, transportation and the usage of modules can be protected to the greatest extent.

**Note:**

The module is a precision electronic product, and may suffer permanent damage if no correct electrostatic protection measures are taken.

## 5.6.1 Tray Package

The B830 module uses tray package, 20 pcs are packed in each tray, with 5 trays including one empty tray on top in each box and 5 boxes in each case. Tray packaging process is shown in Figure 5-4:

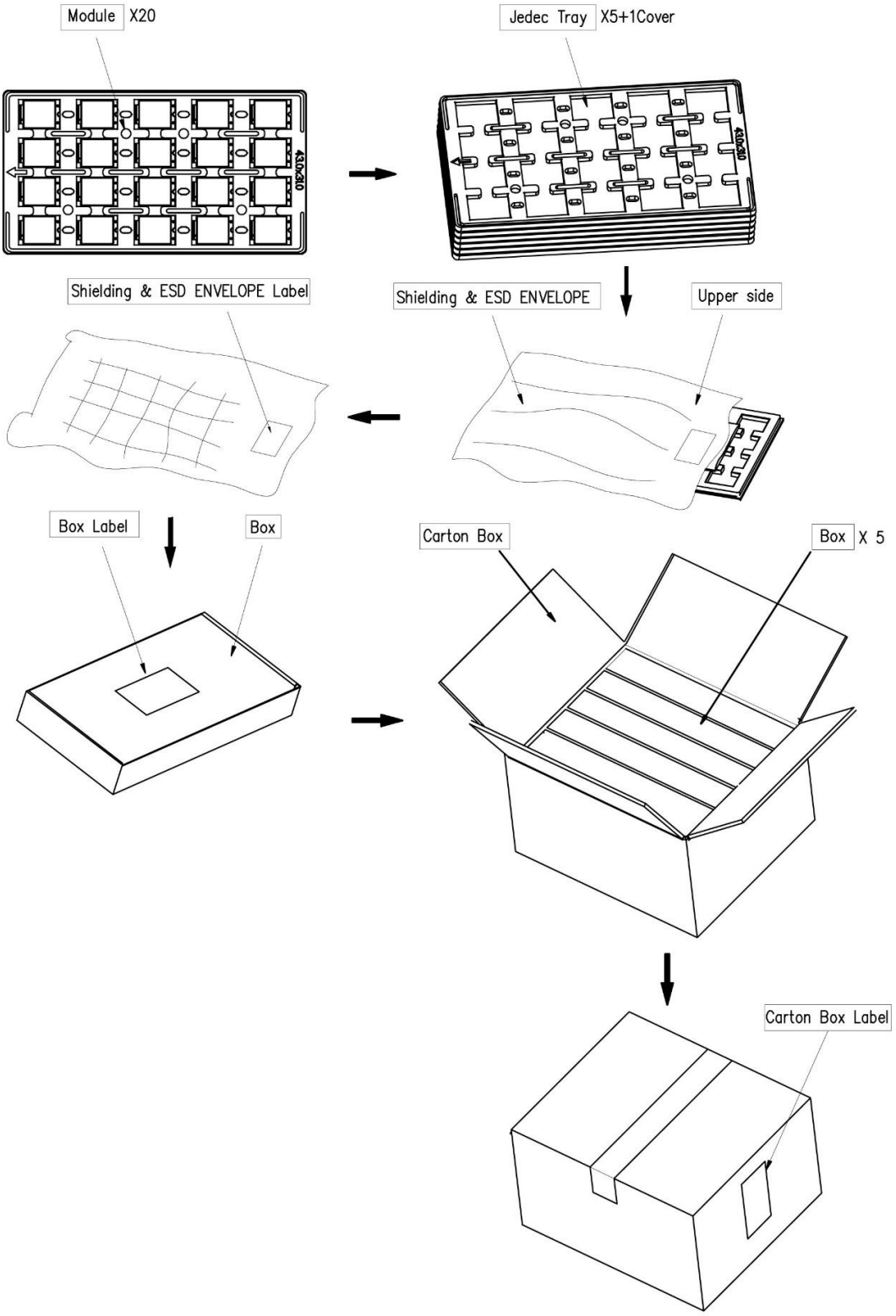


Figure 5-4 Tray Packaging Process

## 5.6.2 Tray size

The pallet size of B830 serial module is 315*170*6.5mm, as shown in Figure 5-5:

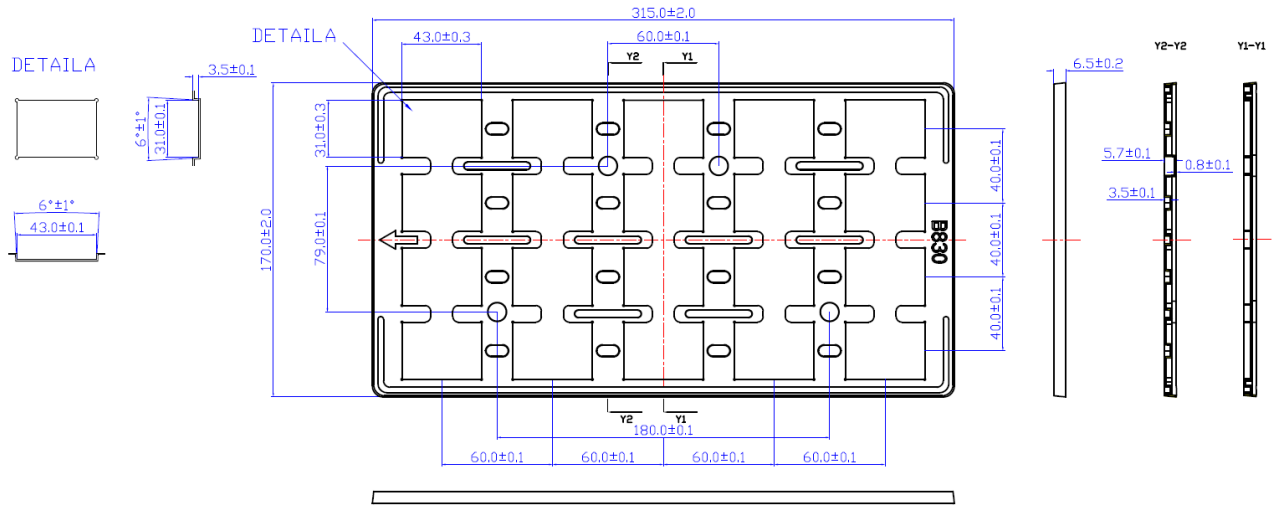


Figure 5-5 Tray Size