

# Datasheet

## EMB1082

BLE module

Vision: 1.2

Date: 2020-03-18

Number: DS0135EN

### Abstract

#### Features

- Based on an ultra-low power BLE SOC
  - ARM Cortex-M4F Core 20MHz
  - 160KB RAM
  - 512KB Flash in chip, and support external flash up to 8Mbyte
  - 32K RCOSC in chip, and support external 32K clock
- Operating Voltage: 2.7V~3.3V
- Support up to 16 IOs pin mux.
- Bluetooth Features
  - Support Bluetooth 5.0 (BLE single mode)
  - Max RF data rate 1Mbps
  - Max TX power: 7dBm
  - Min RX sensitivity: -96dBm@1Mbps
  - Support BLE Master/ Slave mode
  - Support broadcasting, data encryption, and adaptive frequency hopping
  - Support LE L2CAP
  - Support LE data length expansion
- Operating Temperature: -40℃ to +105℃
- Antenna: PCB antenna or IPEX connector (Optional)



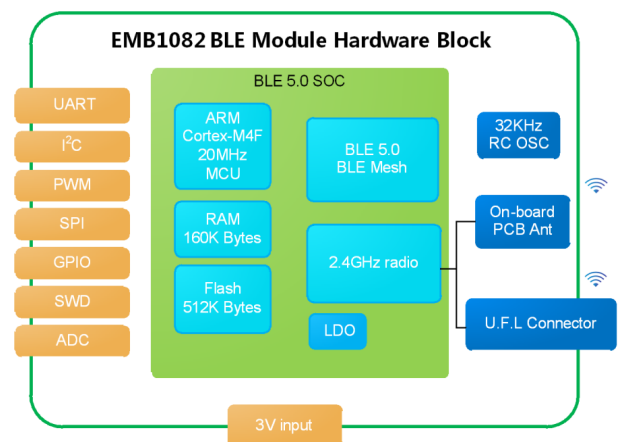
#### Application

- Intelligent lighting
- Smart Home Application
- Wearables
- Smart healthcare
- Portable devices

#### Module Type

| Type      | Note           |
|-----------|----------------|
| EMB1082-P | PCB antenna    |
| EMB1082-E | IPEX connector |

#### Hardware Block



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## Version history

| Date       | Vision | Details                   |
|------------|--------|---------------------------|
| 2018-10-23 | 1.0    | Initial release           |
| 2019-03-25 | 1.1    | Update power consumpition |
| 2020-03-18 | 1.2    | Update product image      |
|            |        |                           |
|            |        |                           |

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## 1. Product Introduction

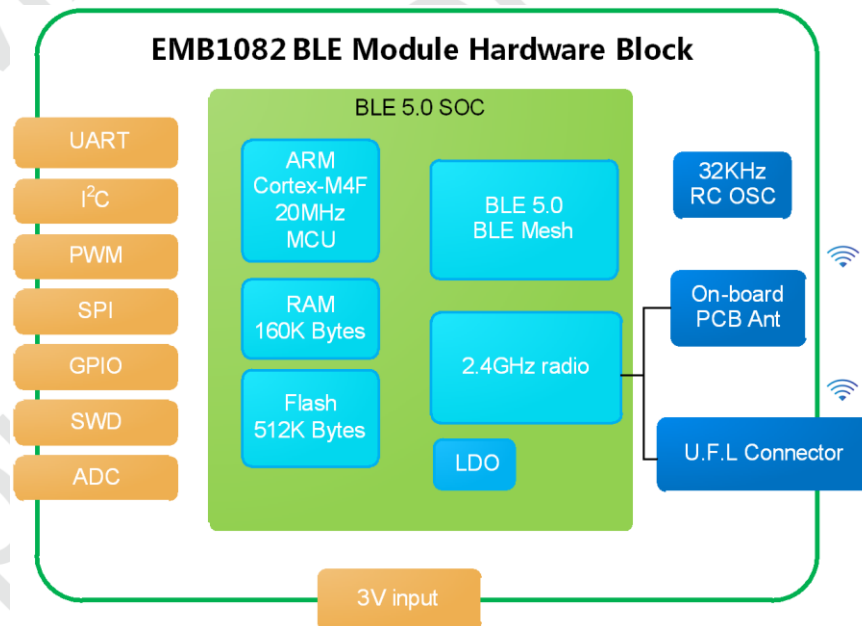
EMB1082 is an embedded BLE module by MXCHIP. It integrates a BLE5.0 single mode SOC, including ARM Cortex-M4F Core, BLE/2.4G Radio, 160KB RAM, 512KB Flash and rich peripherals. EMB1082 uses half-hole package which is easy for soldering, and also DIP package.

Hardware diagram is shown below with three main parts:

- 32-bit Cortex-M4F Core
- BLE 2.4GHz RF
- Power management

With:

1. Up to 20MHz ARM Cortex-M4F MCU with 160KB RAM, 512KB FLASH, UART, I2C, SPI, ADC, SWD, Timer/PWM
2. RF part: support PCB antenna or IPEX connector
3. Power management: DC3.0V power supply, operating voltage range: 2.7V~3.3V



EMB1082 Hardware block

## 2. Pins and dimension

### 2.1 Pin Arrangement

EMB1082 has 21 pins, with 2.0mm pin pitch.

EMB1082 uses half-hole package and DIP package (as shown in figure 2, figure3) , which could effectively reduce the quality risk of SMT re-flow.

Solder mask openness has the same size with land. The width of solder mask is suggested to be 0.12mm to 0.14mm in SMT.

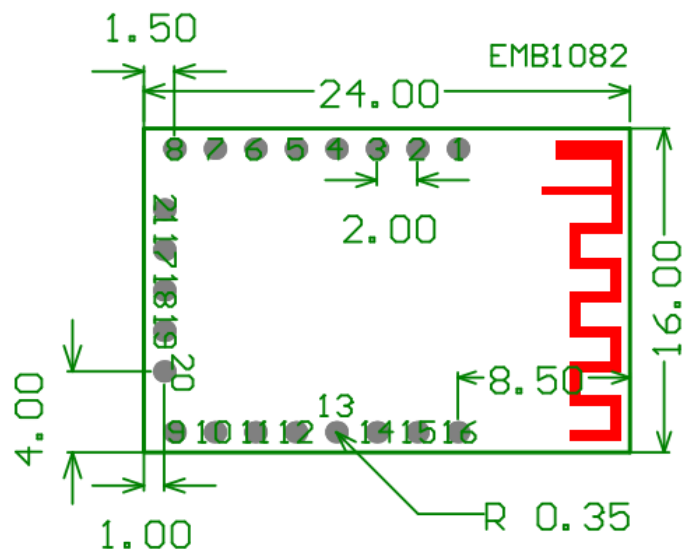


Figure 1 EMB1082 DIP package

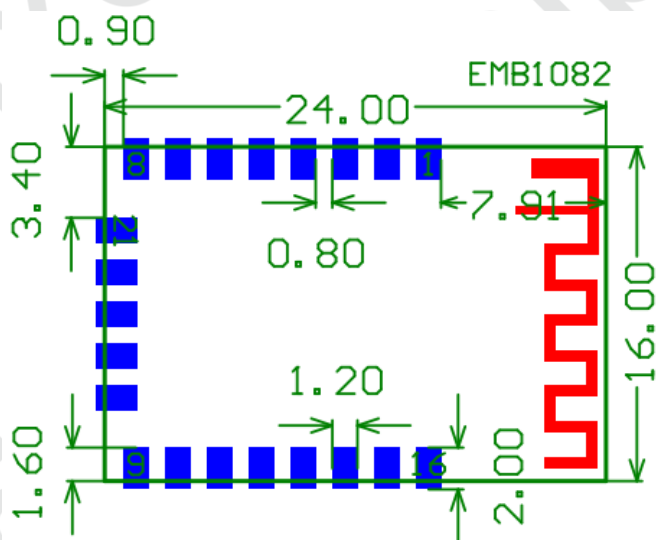


Figure 2 EMB1082 half hole package

## 2.2 Pin Definition

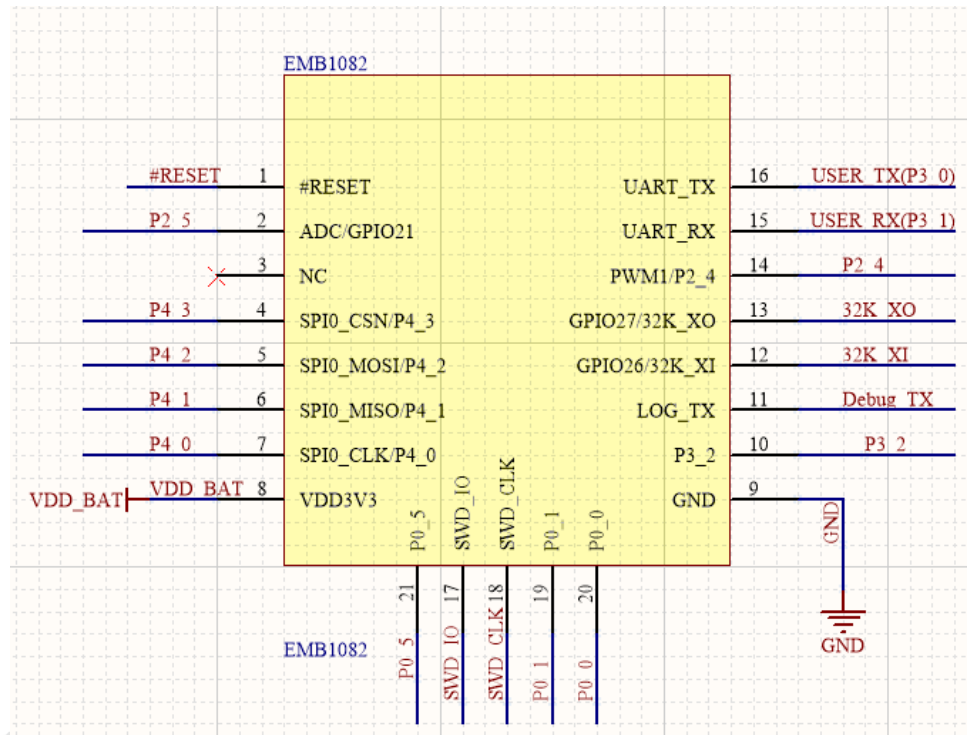


Figure 3 EMB1082 Package Definition

Table 1 EMB1082 Pin Definition

| NO. | Name      | Type | IO     | Note                                                                 |
|-----|-----------|------|--------|----------------------------------------------------------------------|
| 1   | RESET     | I    |        | Reset, active low                                                    |
| 2   | ADC       | IO   | GPIO21 | ADC/PWM/I2C/SPI/UART, max drive current 8mA                          |
| 3   | NC        |      |        |                                                                      |
| 4   | SPI0_CSN  | IO   | GPIO31 | SPI_CSN/PWM/I2C/SPI/UART, max drive current 8mA                      |
| 5   | SPI0_MOSI | IO   | GPIO30 | SPI_MOSI/PWM/I2S/SPI/UART, max drive current 8mA                     |
| 6   | SPI0_MISO | IO   | GPIO29 | SPI_MISO/PWM/I2C/SPI/UART, max drive current 8mA                     |
| 7   | SPI0_CLK  | IO   | GPIO28 | SPI_CLK/PWM/I2C/SPI/UART, max drive current 8mA                      |
| 8   | VDD       | S    |        | DC 3.0V                                                              |
| 9   | GND       | S    |        | Ground                                                               |
| 10  | P3_2      | IO   | GPIO26 | P3_2/PWM/I2C/SPI/UART, max drive current 8mA                         |
| 11  | Debug_TX  | IO   | GPIO3  | Debug log output, can' t be used as other function                   |
| 12  | 32K_XI    | A/IO | GPIO26 | 32K_XI/PWM/I2C/SPI/UART, max drive current 8mA                       |
| 13  | 32K_XO    | A/IO | GPIO27 | 32K_XO/PWM/I2C/SPI/UART, max drive current 8mA                       |
| 14  | PWM1      | IO   | GPIO20 | ADC/PWM/I2C/SPI/UART, max drive current 8mA                          |
| 15  | UART_RX   | IO   | GPIO25 | UART_RX, or FW programming, not recommended to use as other function |
| 16  | UART_TX   | IO   | GPIO24 | UART_TX, or FW programming, not                                      |



| NO. | Name    | Type | IO    | Note                                                     |
|-----|---------|------|-------|----------------------------------------------------------|
|     |         |      |       | recommended to use as other function                     |
| 17  | SWD_IO  | IO   | GPIO8 | FW programming, not recommended to use as other function |
| 18  | SWD_CLK | IO   | GPIO9 | FW programming, not recommended to use as other function |
| 19  | P0_1    | IO   | GPIO1 | GPIO/PWM/I2C/SPI/UART, max drive current 8mA             |
| 20  | P0_0    | IO   | GPIO0 | GPIO/PWM/I2C/SPI/UART, max drive current 8mA             |
| 21  | P0_5    | IO   | GPIO5 | GPIO/PWM/I2C/SPI/UART, max drive current 8mA             |

- Type S: power/ground, I/O: GPIO, A: Analog;

- Both UART\_TX/RX and SWD can be used for firmware programming. Pull down Debug\_TX and then power on the module to enter UART programming mode.

- All the IO pins can be used as other functions.

- SPI date rate: 5MHz

- 400ksps, 12bit, AUXADC

- The register setting of IO pins refer to below table:

表2 引脚复用功能与对应的寄存

|    |          |    |                           |    |                          |    |            |
|----|----------|----|---------------------------|----|--------------------------|----|------------|
| 0  | IDEL     | 25 | reserved                  | 50 | SPI0_CLK (master only)   | 75 | KEY_COL_17 |
| 1  | reserved | 26 | reserved                  | 51 | SPI0_MO (master only)    | 76 | KEY_COL_18 |
| 2  | reserved | 27 | UART2_TX                  | 52 | SPI0_MI (master only)    | 77 | KEY_COL_19 |
| 3  | reserved | 28 | UART2_RX                  | 53 | SPI2W_DATA (master only) | 78 | KEY_ROW_0  |
| 4  | reserved | 29 | UART1_TX                  | 54 | SPI2W_CLK (master only)  | 79 | KEY_ROW_1  |
| 5  | I2C0_CLK | 30 | UART1_RX                  | 55 | SPI2W_CS (master only)   | 80 | KEY_ROW_2  |
| 6  | I2C0_DAT | 31 | UART1_CTS                 | 56 | reserved                 | 81 | KEY_ROW_3  |
| 7  | I2C1_CLK | 32 | UART1_RTS                 | 57 | reserved                 | 82 | KEY_ROW_4  |
| 8  | I2C1_DAT | 33 | IRDA_TX                   | 58 | KEY_COL_0                | 83 | KEY_ROW_5  |
| 9  | PWM2_P   | 34 | IRDA_RX                   | 59 | KEY_COL_1                | 84 | KEY_ROW_6  |
| 10 | PWM2_N   | 35 | UART0_TX                  | 60 | KEY_COL_2                | 85 | KEY_ROW_7  |
| 11 | PWM3_P   | 36 | UART0_RX                  | 61 | KEY_COL_3                | 86 | KEY_ROW_8  |
| 12 | PWM3_N   | 37 | UART0_CTS                 | 62 | KEY_COL_4                | 87 | KEY_ROW_9  |
| 13 | PWM0     | 38 | UART0_RTS                 | 63 | KEY_COL_5                | 88 | KEY_ROW_10 |
| 14 | PWM1     | 39 | SPI1_SS_N_0 (master only) | 64 | KEY_COL_6                | 89 | KEY_ROW_11 |
| 15 | PWM2     | 40 | SPI1_SS_N_1 (master only) | 65 | KEY_COL_7                | 90 | DWGPIO     |
| 16 | PWM3     | 41 | SPI1_SS_N_2 (master only) | 66 | KEY_COL_8                | -  | -          |
| 17 | PWM4     | 42 | SPI1_CLK (master only)    | 67 | KEY_COL_9                | -  | -          |
| 18 | PWM5     | 43 | SPI1_MO (master only)     | 68 | KEY_COL_10               | -  | -          |
| 19 | PWM6     | 44 | SPI1_MI (master only)     | 69 | KEY_COL_11               | -  | -          |
| 20 | PWM7     | 45 | SPI0_SS_N_0 (slave)       | 70 | KEY_COL_12               | -  | -          |
| 21 | reserved | 46 | SPI0_CLK (slave)          | 71 | KEY_COL_13               | -  | -          |
| 22 | reserved | 47 | SPI0_SO (slave)           | 72 | KEY_COL_14               | -  | -          |
| 23 | reserved | 48 | SPI0_SI (slave)           | 73 | KEY_COL_15               | -  | -          |
| 24 | reserved | 49 | SPI0_SS_N_0 (master only) | 74 | KEY_COL_16               | -  | -          |

### 3. Electrical Parameters

#### 3.1 Operating Conditions

EMB1082 would be unstable when input voltage is less than the lowest rated voltage.

Table 2 Range of input voltage

| Symbol | Illustration | Condition | Details |     |         |      |
|--------|--------------|-----------|---------|-----|---------|------|
|        |              |           | Minimum | Typ | Maximum | Unit |
| VDD    | Power Supply |           | 2.7     | 3.0 | 3.3     | V    |

There would be permanent damage in hardware if the device operates at the voltage over rated value. Meanwhile, reliability could be influenced when the device has a long-term operating at maximum voltage.

Table 3 Absolute maximum voltage rating

| Symbol | Description          | Minimum | Typ | Unit |
|--------|----------------------|---------|-----|------|
| VDD    | Module input voltage | –       | 3.3 | V    |
| VIN    | GPIO input voltage   | –       | 3.6 | V    |

#### 3.2 Power Consumption

Table 4 EMB1082 Power Consumption

| Mode                | Description                                                            | Average | Max     |
|---------------------|------------------------------------------------------------------------|---------|---------|
|                     |                                                                        | TA=25°C | TA=25°C |
| Sleep mode          | Wait for 10 minutes to stop broadcasting, and test for 5 minutes       | 4.7uA   | 4.8uA   |
| Normal working mode | Connect to Tmall Genie and control it by voice, and test for 5 minutes | 14.9mA  | 15.1mA  |

Actual working current is variable at different operating mode.

### 3.3 Working Environment

Table 5 Temperature and humidity condition

| Symbol   | Name                              | Maximum     | Unit |
|----------|-----------------------------------|-------------|------|
| TSTG     | Storage Temperature               | -40 to +110 | °C   |
| TA       | Operation Temperature             | -40 to +105 | °C   |
| Humidity | Non-condensing, Relative humidity | 95          | %    |

### 3.4 Electrostatic Discharge

Table 6 Electrostatic Discharge Parameters

| Symbol                 | Name                                                      | Details                   | Level | Maximum | Unit |
|------------------------|-----------------------------------------------------------|---------------------------|-------|---------|------|
| V <sub>ESD</sub> (HBM) | Electrostatic discharge voltage<br>(Human Body Model)     | TA = +25 °C , JESD22-A114 | 2     | 2000    | V    |
| V <sub>ESD</sub> (CDM) | Electrostatic discharge voltage<br>(Charged Device Model) | TA = +25 °C , JESD22-C101 | II    | 500     |      |

## 4. RF parameters

### 4.1 Basic RF parameters

Table 7 Radio-frequency standards

| Name                    | Illustration                               |
|-------------------------|--------------------------------------------|
| Working frequency       | 2.4GHz ISM band                            |
| Wi-Fi wireless standard | Bluetooth5.0                               |
| Modulation              | GFSK                                       |
| Data rate               | 1Mbps                                      |
| Antenna type            | PCB (Default)<br>IPEX Connector (Optional) |

### 4.2 GFSK Parameters

Table 8 GFSK mode parameters

| Item            | Notes                       |
|-----------------|-----------------------------|
| Modulation      | GFSK                        |
| Frequency range | 2.400GHz-2.4835GHz ISM band |
| Data rate       | 1Mbps                       |

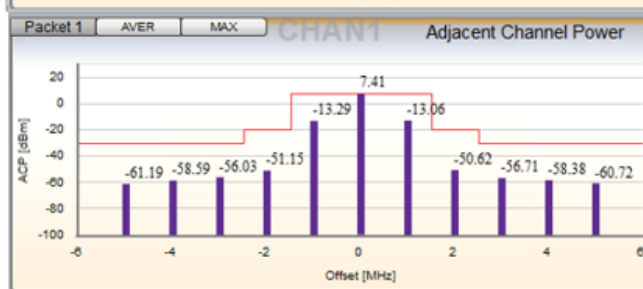
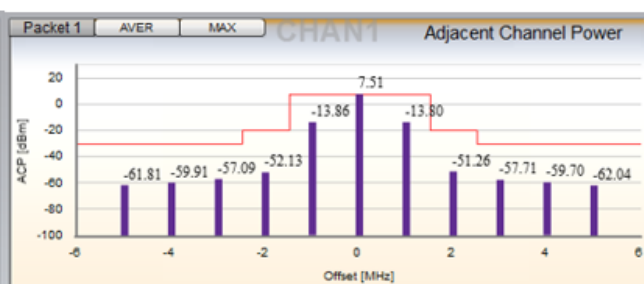
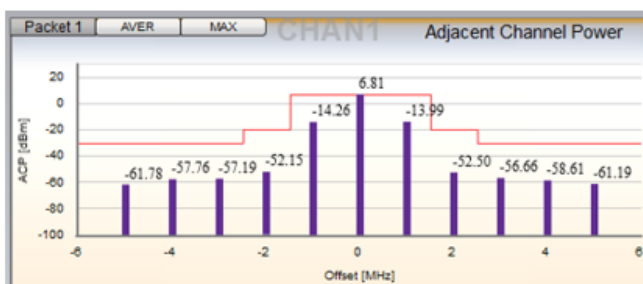
Table 9 GFSK mode RX parameters

| RX parameter    | Min | Typ. | Max | Unit |
|-----------------|-----|------|-----|------|
| Sensitivity     | -97 | -96  | -95 | dBm  |
| Frequency error | -10 |      | +10 | KHz  |

Table 10 GFSK TX parameters

| test item                                     | datarate           | BT Spec |         |        | Measurement |         |        | Channel Frequency |                   |                   |
|-----------------------------------------------|--------------------|---------|---------|--------|-------------|---------|--------|-------------------|-------------------|-------------------|
|                                               |                    | Min     | Typical | Max    | Max         | Average | Min    | CH0<br>(2402MHz)  | CH19<br>(2440MHz) | CH39<br>(2480MHz) |
| 输出功率<br>(POWER_AVERAGE)                       | LE                 | -20     | 6.5     | 7.5    | 6.49        |         | 6.18   | 6.18              | 6.49              | 6.31              |
| 初始载波频率容许量<br>(Frequency Drift Error)          | LE                 | -50KHz  |         | 50KHz  | 2.501       |         | -3.055 | 1.398             | 2.501             | -3.055            |
| Carrier frequency offset<br>and drift at NOC: | 在正常操作模式下的载波频率偏移和漂移 |         |         |        |             |         |        |                   |                   |                   |
| Fn max                                        | LE                 | -150KHz |         | 150KHz | 4.858       |         | 2.872  | 2.872             | 4.858             | 4.007             |
| F0-Fn                                         | LE                 |         |         | 50KHz  | 4.394       |         | 2.636  | 2.636             | 4.394             | 3.707             |
| F1-F0                                         | LE                 |         |         | 20KHz  | 2.339       |         | 0.313  | 0.313             | 2.339             | 0.648             |
| Fn-F(n-5) <br>n=6,7,8...k                     | LE                 |         |         | 20KHz  | 3.547       |         | 2.335  | 2.335             | 3.337             | 3.547             |
| Modulation characteristics:                   | 调制特性               |         |         |        |             |         |        |                   |                   |                   |
| $\Delta F_{1avg}$                             | LE                 | 225KHz  |         | 275KHz | 249.489     |         | 242.04 | 248.111           | 242.043           | 249.489           |
| $\Delta F_{2avg}$                             | LE                 | 185KHz  |         | 275KHz | 248.284     |         | 231.35 | 241.481           | 231.353           | 248.284           |
| $\Delta F_{2avg}/\Delta F_{1avg}$             | LE                 | 0.8     |         |        | 0.99517     |         | 0.9558 | 0.9732781         | 0.9558343         | 0.995170128       |

带内杂散测试:



## 5. Antenna Information

### 5.1 Antenna Type

EMB1082 has two types of antenna: PCB antenna (EMB1082-P), IPEX connector (EMB1082-E).

### 5.2 PCB Antenna Clearance Zone

Main PCB should have a distance over 16mm with other metal elements when using PCB antenna in Wi-Fi device. Shadow parts in the figure below should keep away from metal elements, sensor, interference source and other material that could cause signal interference.

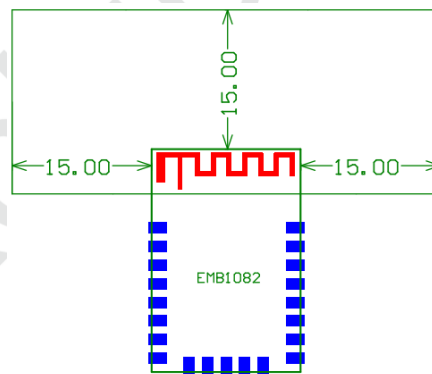


Figure 4 Minimum Clearance Zone of PCB Antenna (Unit: mm)

### 5.3 External Antenna Connector

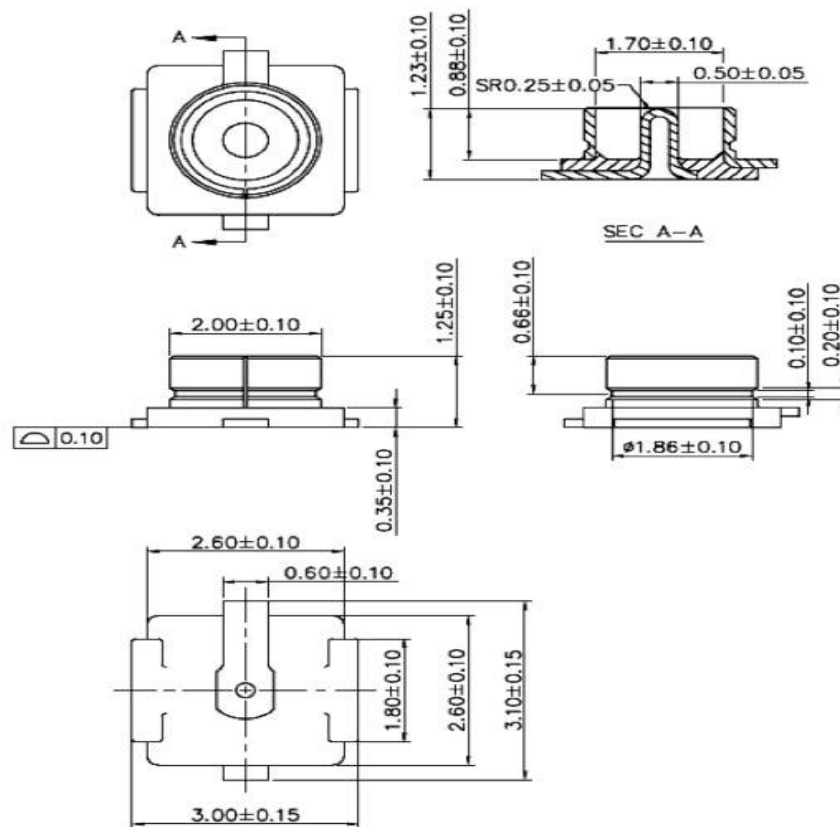


Figure 5 Size of External Antenna Connector



## 6. Assembly Information and Production Guidance

### 6.1 Assembly Size

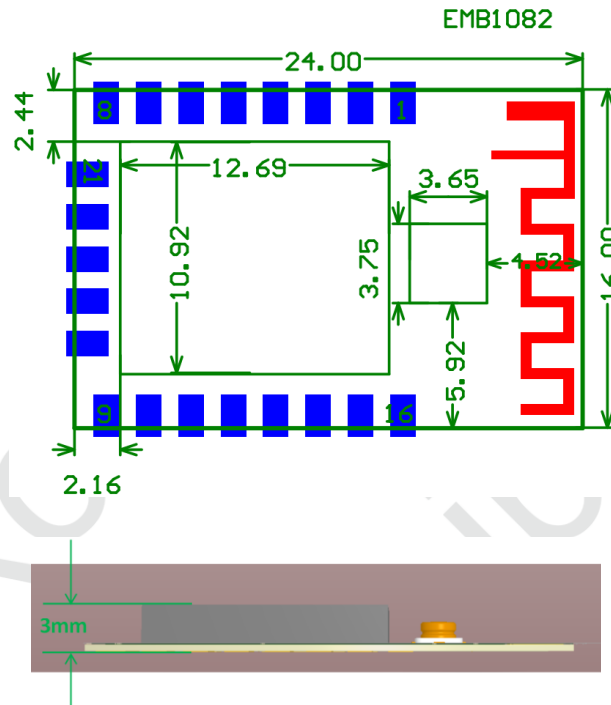


Figure 6 EWB1082 mechanical size (Unit: mm)

### 6.2 Production Guidance (Important)

- The stamp hole package module produced by Mxchip must completely being patched by SMT machine in 24 hours after open firmware package. Otherwise the module should be re-package by vacuum pumping and drying before patch.
  - Devices for SMT patch:
    - (1) Reflow soldering machine
    - (2) AOI detector
    - (3) Suction nozzle with 6-8mm caliber
  - Device for drying:
    - (1) Cabinet type oven
    - (2) Anti-static and high thermos tolerant tray
    - (3) Anti-static and high thermos tolerant gloves
- Conditions of product storage (Storage environment is shown in figure 8):

- Moisture bag must be stored in temperature below 30 and humidity less than 85%RH.
- Dry packaging products, the guarantee period should be from 6 months date of packing seal.
- Humidity indicator card is in the hermetic package.



Figure 7 Humidity Card

- Humidity indicator card and drying situation:
  - 2 hours drying for module if the color ring at 30%, 40%, 50% in humidity indicator card is blue after unpacking;
  - 4 hours drying for module if the color ring at 30% in humidity indicator card is pink after unpacking;
  - 6 hours drying for module if the color ring at 30%, 40% in humidity indicator card is pink after unpacking;
  - 12 hours drying for module if the color ring at 30%, 40%, 50% in humidity indicator card is pink after unpacking.
- Drying parameters:
  - Drying temperature:  $125^{\circ}\text{C} \pm 5^{\circ}\text{C}$ ;
  - Alarm temperature:  $130^{\circ}\text{C}$ ;
  - SMT patch when the device cool down below  $36^{\circ}\text{C}$  in natural condition;
  - Dry times: 1;
  - Please dry again if the module is unsoldering in 12 hours after last drying.
- SMT is unsuitable if the module packed over 3 months. There would be serious oxidation of the pad because of immersion gold and cause false welding and lack of weld. Mxchip does not assume the corresponding responsibility;
- ESD protection is required before SMT;
- SMT patch should on the basis of reflow profile diagram, maximum temperature  $245^{\circ}\text{C}$ , reflow profile diagram is shown in figure 10;

- In order to guarantee the reflow soldering qualification rate, vision and AOI detection should be done in 10% products for the first patch to make sure the rationality of temperature control, device adsorption mode and position. Detect 5 to 10 sample every hour in the following batch production.

### 6.3 Considerations

- Operator should wear anti-static gloves during producing;
- No more than drying time;
- Any explosive, flammable and corrosive material is not allowed to add in drying;
- Module should be put into oven with high thermotolerant tray. Ventilation should exist between each module and no direct contact with oven;
- Make sure oven is closed when drying to prevent temperature leaking;
- Reduce opening time or keep closing the door of the oven during drying;
- Use anti-static glove to take out module when its temperature below 36°C by natural cool down after drying;
- Make sure no water and dirt in the bottom of the module;
- Temperature and humidity control is level 3 for initial modules. Storage and drying conditions are based on IPC/JEDEC J-STD-020.

## 6.4 Storage Condition

|                                                                                                                                                        |                                                         |              |
|--------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------|--------------|
|                                                                       | <b>CAUTION</b>                                          | <b>LEVEL</b> |
|                                                                                                                                                        | <b>This bag contains<br/>MOISTURE-SENSITIVE DEVICES</b> | <b>3</b>     |
| <small>If Blank, see adjacent bar code label</small>                                                                                                   |                                                         |              |
| 1. Calculated shelf life in sealed bag: 12 months at $< 40^{\circ}\text{C}$ and $< 90\%$ relative humidity (RH)                                        |                                                         |              |
| 2. Peak package body temperature: <u>260</u> $^{\circ}\text{C}$<br><small>If Blank, see adjacent bar code label</small>                                |                                                         |              |
| 3. After bag is opened, devices that will be subjected to reflow solder or other high temperature process must                                         |                                                         |              |
| a) Mounted within: <u>168</u> hrs. of factory conditions<br><small>If Blank, see adjacent bar code label</small>                                       |                                                         |              |
| $\leq 30^{\circ}\text{C}/60\%\text{RH}$ , OR                                                                                                           |                                                         |              |
| b) Stored at $<10\%$ RH                                                                                                                                |                                                         |              |
| 4. Devices require bake, before mounting, if:                                                                                                          |                                                         |              |
| a) Humidity Indicator Card is $> 10\%$ when read at $23 \pm 5^{\circ}\text{C}$                                                                         |                                                         |              |
| b) 3a or 3b not met.                                                                                                                                   |                                                         |              |
| 5. If baking is required, devices may be baked for 48 hrs. at $125 \pm 5^{\circ}\text{C}$                                                              |                                                         |              |
| Note: If device containers cannot be subjected to high temperature or shorter bake times are desired, reference IPC/JEDEC J-STD-033 for bake procedure |                                                         |              |
| Bag Seal Date: _____<br><small>If Blank, see adjacent bar code label</small>                                                                           |                                                         |              |
| Note: Level and body temperature defined by IPC/JEDEC J-STD-020                                                                                        |                                                         |              |

Figure 8 Storage Condition

## 6.5 Temperature Curve of Secondary Reflow

Suggested solder paste type: SAC305, unleaded, solder paste thickness from 0.12 to 0.15, less than 2 times reflow.

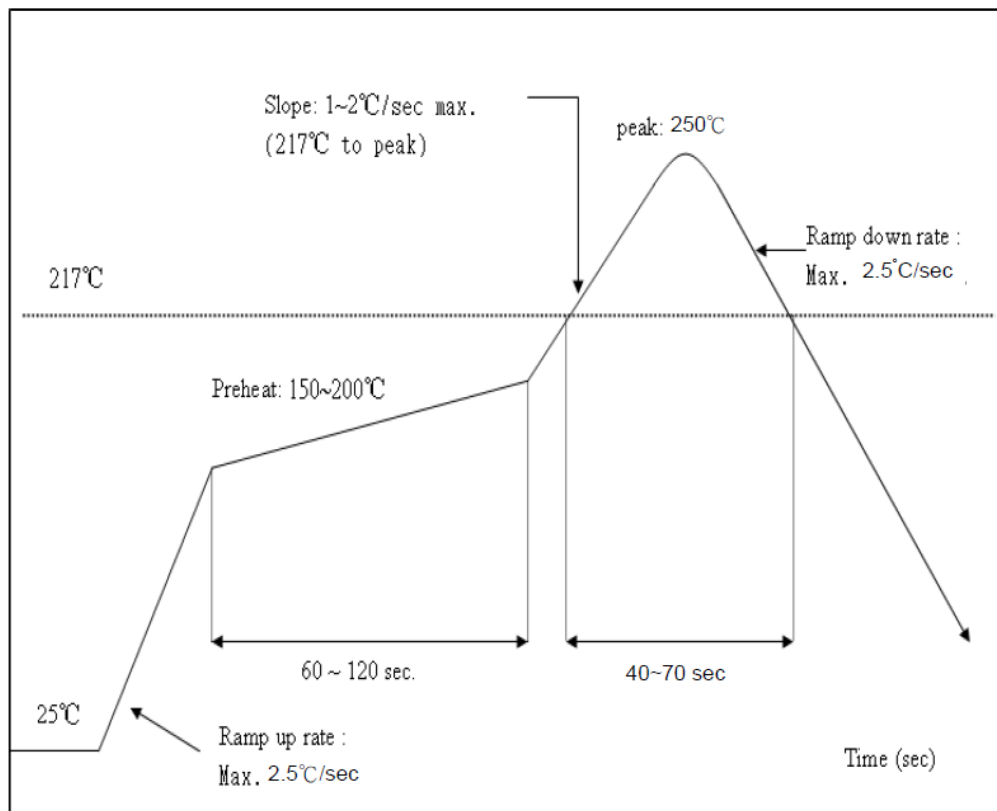


Figure 9 Temperature Curve of Secondary Reflow

## 7. Reference Circuit

Power source circuit is shown in figure 11, USB to UART is shown in figure 12, external interface circuit is shown in figure 13.

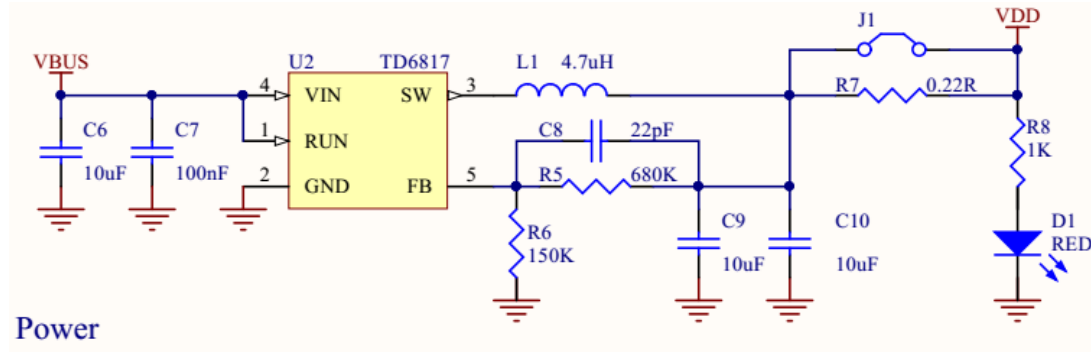


Figure 10 Power Source Circuit

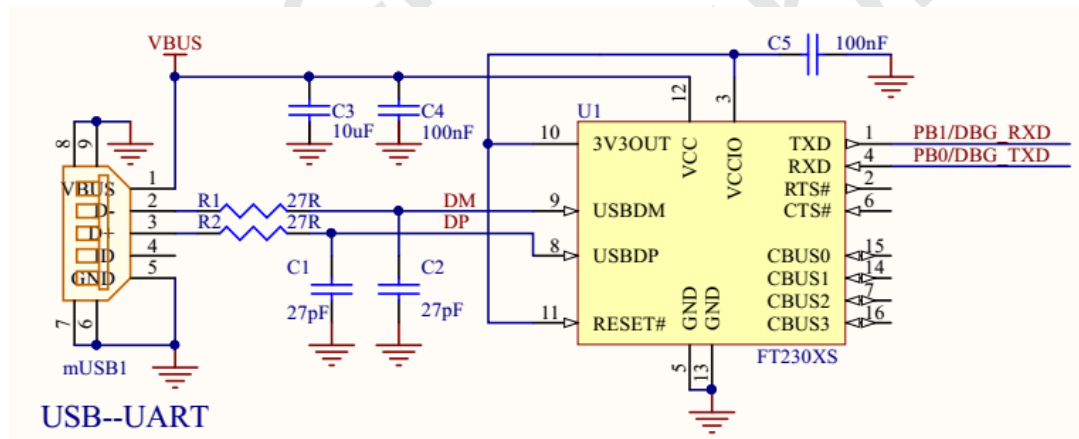


Figure 11 USB to UART

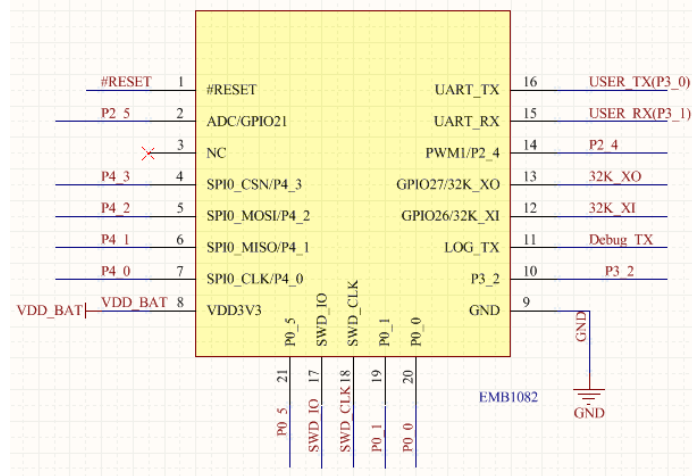


Figure 12 External Interface Circuit of EMB1082

Voltage of EMB1082 UART is 3.3V. 5V UART should convert to 3.3V UART for the users that have 5V chips. Convert circuit is shown in figure 14.

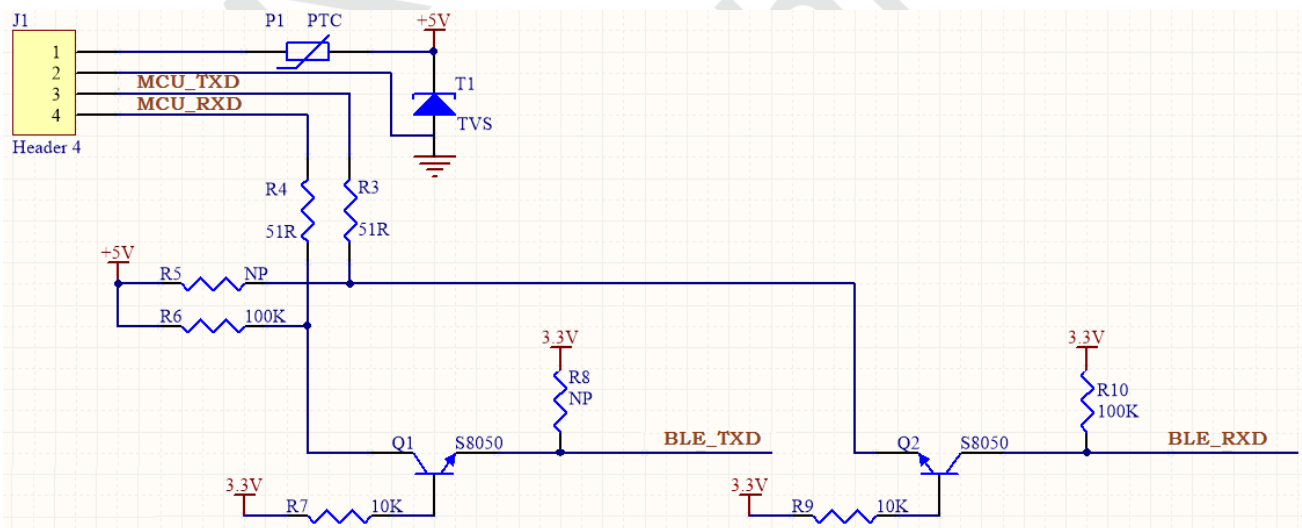


Figure 13 3.3V UART- 5V UART Convert Circuit

## 8. FCC and IC Information

### 8.1 FCC Warning

✓ Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

✓ Note: 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 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.
- ✓ The device has been evaluated to meet general RF exposure requirement. The device can be used in portable exposure condition without restriction. 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 complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator & your body.

### 8.2 IC warning

- ✓ - **English:**
  - ✓ This device complies with Industry Canada license-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.
- ✓ - **French:**
  - ✓ Le présent appareil est conforme aux CNR d'Industrie Canada applicable 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.



Note 1: Compliance of this device in all final host configurations is the responsibility of the Grantee. OEM integrators are responsible to satisfy RF exposure requirements.

Note 2: Any modifications made to the module will void the Grant of Certification, this module is limited to OEM installation only and must not be sold to end-users, end-user has no manual instructions to remove or install the device, only software or operating procedure shall be placed in the end-user operating manual of final products.

Note 3: The device must not transmit simultaneously with any other antenna or transmitter.

Note 4: To ensure compliance with all non-transmitter functions the host manufacturer is responsible for ensuring compliance with the module(s) installed and fully operational. For example, if a host was previously authorized as an unintentional radiator under the Declaration of Conformity procedure without a transmitter certified module and a module is added, the host manufacturer is responsible for ensuring that after the module is installed and operational the host continues to be compliant with the Part 15B unintentional radiator requirements. Since this may depend on the details of how the module is integrated with the host, Shanghai MXCHIP Information Technology Co., Ltd. shall provide guidance to the host manufacturer for compliance with the Part 15B requirements. The transmitter module must be installed and used in strict accordance with the manufacturer's instructions as described in the user documentation that comes with the host product. Shanghai MXCHIP Information Technology Co., Ltd. is responsible for the compliance of the module in all final hosts.

Note 5: The module is limited to installation in mobile or fixed application

Note 6: The module support max antenna Gain is 2dBi

Note 7: This exterior label can use wording such as the following: "Contains Transmitter Module FCC ID: P53-EMB1082" or "Contains FCC ID: P53-EMB1082" "Contains IC: 23507-EMB1082"

Note 8: The user can get the device MAC address via scanning the QR Code

## 9. Module MOQ and Package Information

Table 11 Module MOQ and Package Information

| PN                     | MOQ(pcs) | Package type |
|------------------------|----------|--------------|
| EMW1082-P<br>EMW1082-E | 2240     | ATray        |

## 10. Sales Information and Technical Support

For consultation or purchase the product, please contact Mxchip during working hours:

From Monday to Friday, morning 9:00~12:00, afternoon 13:00~18:00

Telephone: +86-21-52655026

Contact address: 9thFloor, No.5, Lane2145 JinshaJiang Road Putuo District, ShangHai.

Postcode: 200333

Email: [sales@mxchip.com](mailto:sales@mxchip.com)

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