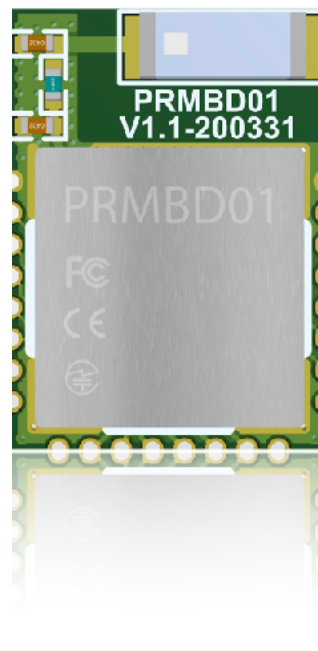


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# PRBMD0x Bluetooth 5 ready module

Data sheet version 1.3



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## Disclaimer

### Liability Disclaimer

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## Introduction

Base on PHY+ Microelectronics' PHY6212\* Bluetooth 5 ready core chip, PRBMD0x BT 5 ready module provides a reliable and easy BT5 solution, allowing user, even without any RF design experience, brings their their product or system, embedded with BT5 feature, to market in time.

Integrated with almost all peripheral components, such as RF matching network, Antenna, 16MHz Crystal, 32768Hz RC, and DC/DC inductor, which saves engineer resource from hardware design for BLE.

PRBMD0x family consists of two models: PRBMD01 and PRBMD00. PRBMD01 provides a tiny form factors which is suitable for application with limited space; where PRBMD00 provide more GPIOs, provide higher flexibility to user.

PRBMD0x is FCC, CE and Telec certified module, which reduces customer's resource for qualification and allows product to be time to market.



picture here



Picture here



Picture here

## Applications

- Phone accessories
- Computer peripherals
- CE remote controls for TV, STB and media systems
- Beacons
- Proximity and security alert tags
- Sports and fitness sensors
- Healthcare and lifestyle sensors
- Game controllers
- Home Automation
- Smart RF tags for tracking and social interaction

\*PHY62xx QDID is 112181

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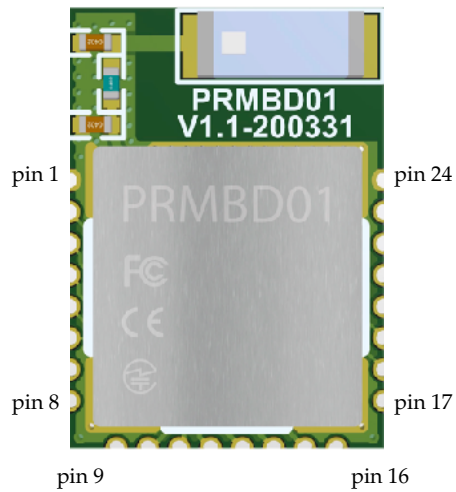
# Hardware information

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## Features

- 32bit Cortex™-M0 processor with 2.4GHz wireless
- On board chip antenna
- On board 16MHz crystal
- Internal 32K RC network
- On board DC/DC converter
- 512KB Flash, 138KB SRAM
- Small form factor: 10mm x 14m (PRBMD01); 12 x 18mm (PRBMD00)
- High GPIOs count : up to 31 (PRBMD00)
- Soft configurable interfaces: PWM (6), I2S (4), PDM (2), I2C (2), SPI (2), UART (1)
- JTAG for debugging
- Up to eight channels 12bit ADC (8)
- Bluetooth v5.0 compliant Protocol Stack (BLE)
- Low power consumption ( $2\mu\text{A}$  when sleep;  $0.7\mu$  when OFF)
- Support SIG\_Mesh feature: Friend node, Low Power node, Proxy node and Relay node
- Sensitivity up to -103dBm @125Kbps
- Tx power up to +10dBm
- FCC, CE, KCC and TELEC certifications (in progress)

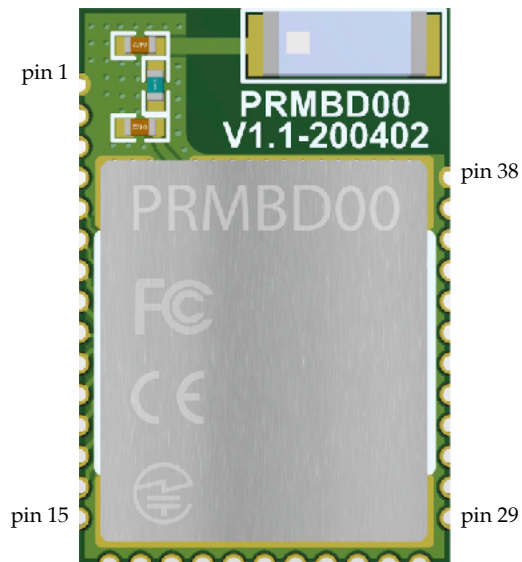
## Pin assignment



PRMBD01 pin assignment

| pin | name   | Description                                     |
|-----|--------|---|
| 1   | GND    | Power ground                                    |
| 2   | P23    | GPIO  |
| 3   | P24    | GPIO  |
| 4   | P25    | GPIO  |
| 5   | P31    | GPIO  |
| 6   | P32    | GPIO  |
| 7   | P33    | GPIO  |
| 8   | P34    | GPIO  |
| 9   | P00    | GPIO  |
| 10  | P01    | GPIO  |
| 11  | P02    | GPIO  |
| 12  | P03    | GPIO  |
| 13  | TM     | Mode select, pull high for firmware programming |
| 14  | P09/TX | GPIO/UART Tx                                    |

| pin | name      | Description                       |
|-----|-----------|-----------------------------------|
| 15  | P10/Rx    | GPIO/ UART Rx                     |
| 16  | RST       | Reset, Active low                 |
| 17  | VDD33     | VDD, 3.3 to 3.6VDC                |
| 18  | P14       | GPIO/ AIO3                        |
| 19  | P15       | GPIO/ AIO4                        |
| 20  | P16/32IN  | GPIO/ 32.768kHz crystal in/ AIO5  |
| 21  | P17/32OUT | GPIO/ 32.768kHz crystal out/ AIO6 |
| 22  | P18       | GPIO/ AIO7                        |
| 23  | P20       | GPIO/ AIO8                        |
| 24  | GND       | Power GND                         |

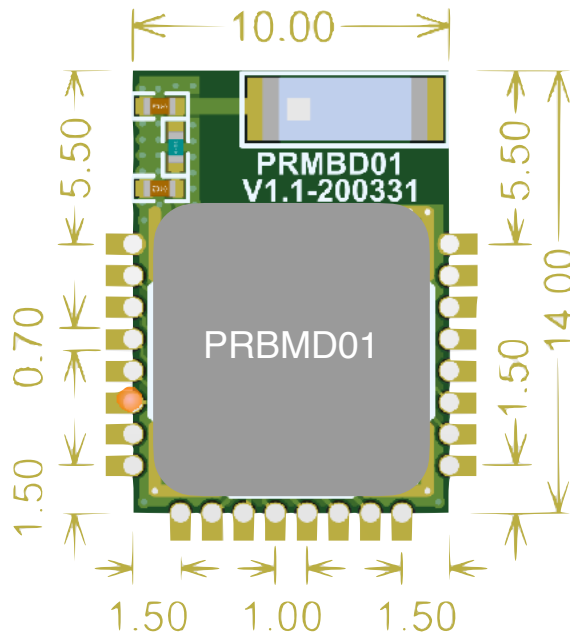
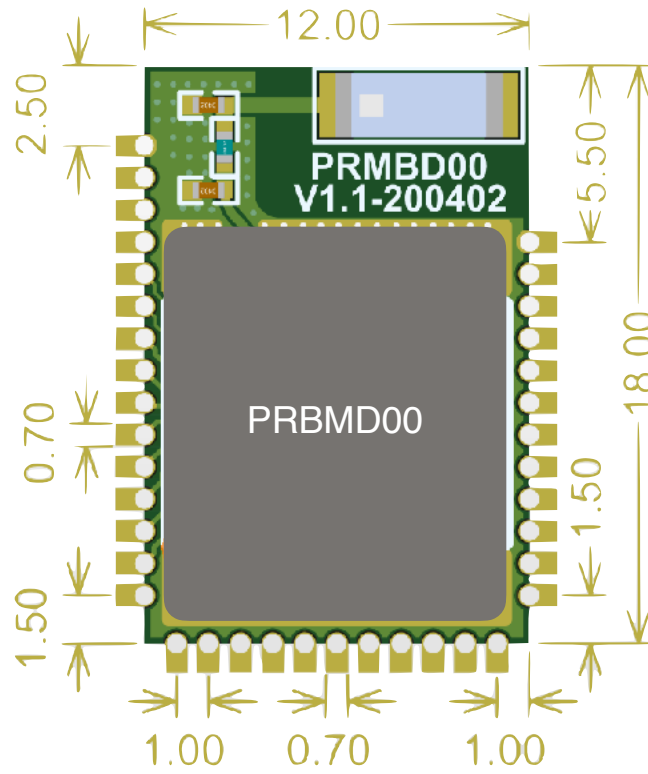


| pin | name | Description                                     |
|-----|------|---|
| 1   | GND  | Power ground                                    |
| 2   | P21  | GPIO  |
| 3   | P22  | GPIO  |
| 4   | P23  | GPIO  |
| 5   | P24  | GPIO  |
| 6   | P25  | GPIO  |
| 7   | P26  | GPIO  |
| 8   | P27  | GPIO  |
| 9   | P28  | GPIO  |
| 10  | P29  | GPIO  |
| 11  | P30  | GPIO  |
| 12  | P31  | GPIO  |
| 13  | P32  | GPIO  |
| 14  | P33  | GPIO  |
| 15  | P34  | GPIO  |
| 16  | P00  | GPIO  |
| 17  | P01  | GPIO  |
| 18  | P02  | GPIO  |
| 19  | P03  | GPIO  |
| 20  | P04  | GPIO  |
| 21  | P05  | GPIO  |
| 22  | P06  | GPIO  |
| 23  | TM   | Mode select, pull high for firmware programming |
| 24  | P09  | GPIO/UART TX                                    |



| pin | name | Description        |
|-----|------|--------------------|
| 25  | P10  | GPIO/UART RX       |
| 26  | RST  | Module power input |
| 27  | VDD  | VDD, 2.5 to 6V     |
| 28  | P11  | GPIO/AIO0          |
| 29  | P12  | GPIO/AIO1          |
| 30  | P13  | GPIO/AIO2          |
| 31  | P14  | GPIO/AIO3          |
| 32  | P15  | GPIO/AIO4          |
| 33  | P16  | GPIO/32K IN/ AIO5  |
| 34  | P17  | GPIO/32 OUT/AIO6   |
| 35  | P18  | GPIO/AIO7          |
| 36  | P19  | GPIO/AIO8          |
| 37  | P20  | GPIO/AIO9          |
| 38  | GND  | Power Ground       |

## Dimension



Unit: mm

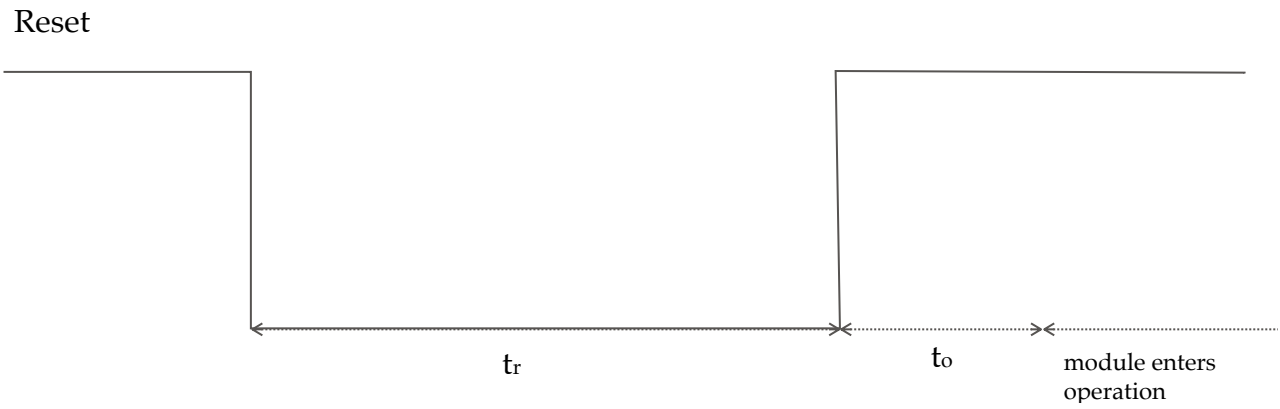
## Electrical Specification

|                | Description  | Typical  |
|----------------|--|--|
| <b>General</b> | Operation voltage  | 1.8V to 3.6V DC (PRMD01)<br>2.5V to 6V DC (PRMD00)   |
|                | Operation current (PRBMD00)<br>* base on the default firmware          | Advertising:<br>Average - 3mA; Max peak - 9mA<br>Connected<br>Average - 3.18mA; Max peak - 9mA |
|                | SLEEP mode current (PRBMD00 and PRBMD01)<br>* needed firmware activate | Sleep mode: ~3uA, with 32768Hz RTC   |
|                | OFF mode current   | TBC  |
|                | Microcontroller  | 32-bit ARM Cortex M0   |
|                | GPIO   | 19 configurable (PRMD01)<br>35 configurable (PRMD00)   |
|                | Oscillators  | 16MHz crystal oscillator<br>32kHz RTC oscillator (internal)                                    |
|                | Digital I/O  | X2 Hardware SPI master UART  |
|                | Operation temperature  | TBC  |
| <b>RF</b>      | Frequency band   | 2.4GHz ISM ( 2.40000 – 2.4835GHz)  |
|                | Modulation   | GFSK   |
|                | Data rate  | 250kbps, 1 Mbps, 2 Mbps  |
|                | TX Power   | -20 to +4dBm in 4dB steps  |
|                | Sensitivity  | -91dBm Bluetooth low energy<br>-94dBm at 250kb<br>-88dBm at 1Mbs<br>-83dBm at 2Mbs             |
|                | RF Range (indoor)  | to be determined   |

---

## Reset the module

A low signal will reset the module, and the timing is illustrated as following:



$t_r = \text{at least } 1\mu\text{s}$   
 $t_o = 500\mu\text{s}$

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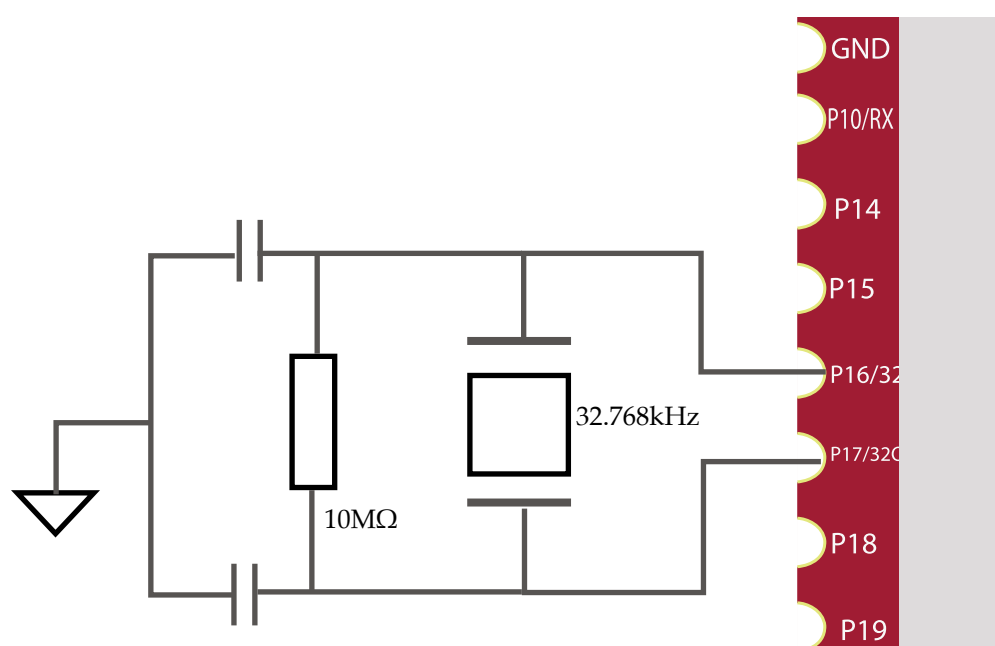
## The clock

### Main clock

PRMD0x embeds with a 16MHz main oscillator, and it is software configurable up scale to higher internal frequency: 32M, 48M, 64M or 96MHz. By default it is not up scaled.

### RTC

If 32.768kHz crystal is not installed (pin P16 and P17), internal RC oscillator circuit can be then enable by firmware and be use as real time clock. This internal RC oscillator circuit will be calibrated periodically. External 32.768KHz circuit is illustrated as below:



Using external crystal as RTC

---

## Firmware programming

User is able to program their own developed firmware (with SDK) into PRMD0x. The programming procedure is as following, programming software, PhyPlusKit.exe (for window) must be pre-installed, and UART-USB dongle may be needed:

1. Connect TM pin (pin 10 of PRBMD00; and pin 7 of PRBMD01) to 3.3V
2. Connect Tx and Rx (P09 and P10) pin to UART dongle
3. On PhyPlusKit, select the proper COM port and Baud Rate (default: 115200)
4. Click Erase to erase current firmware in PRBMD0x
5. Load the firmware and click Write to program into PRBMD0x
6. Connect TM pin to low level and apply reset. New firmware then starts to operate.

---

## GPIO and interfaces

Every GPIO can be configured as Input, Output and Interrupt, and can also be configured as weak pull-up, strong pull-up, weak pull-low or floating mode.

Except ADC, all interfaces are possible to map to different GPIOs by software. The interface including:

1. I2C: it supports 100KHz and 400KHz modes, 7-bit and 10-bit address
2. I2S: either master or slave mode can be enabled
3. UART: Asynchronous Rx/Tx, up to almost 1Mbps, supports parity and 9 bit-data
4. PWM: 6 channels PWM is multiplex with GPIO, and the frequency is base on the main clock (16MHz) as the following equation:

$$\text{Freq\_PWM} = 16\text{MHz} / (\text{N\_prescaler} \times \text{N\_top\_count});$$

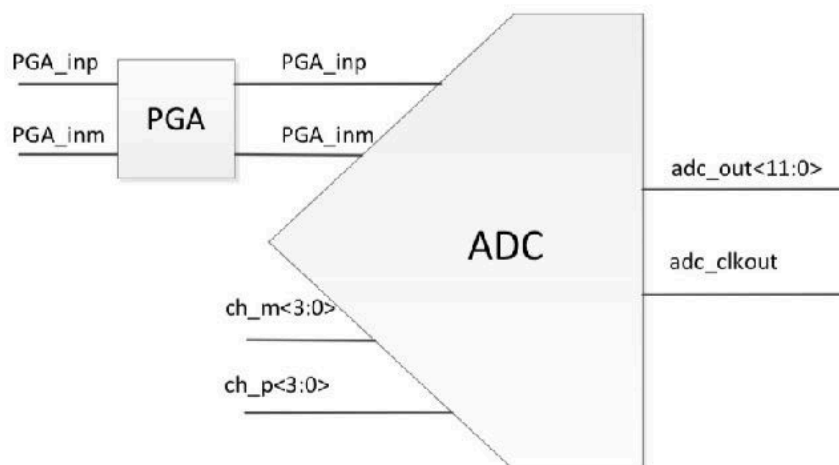
where the value in N\_top\_count register controls the frequency

and the Duty cycle is controlled by the following equation:

$$\text{Duty\_cycle\_PWM} = \text{N\_threshold} / \text{N\_top\_count}$$

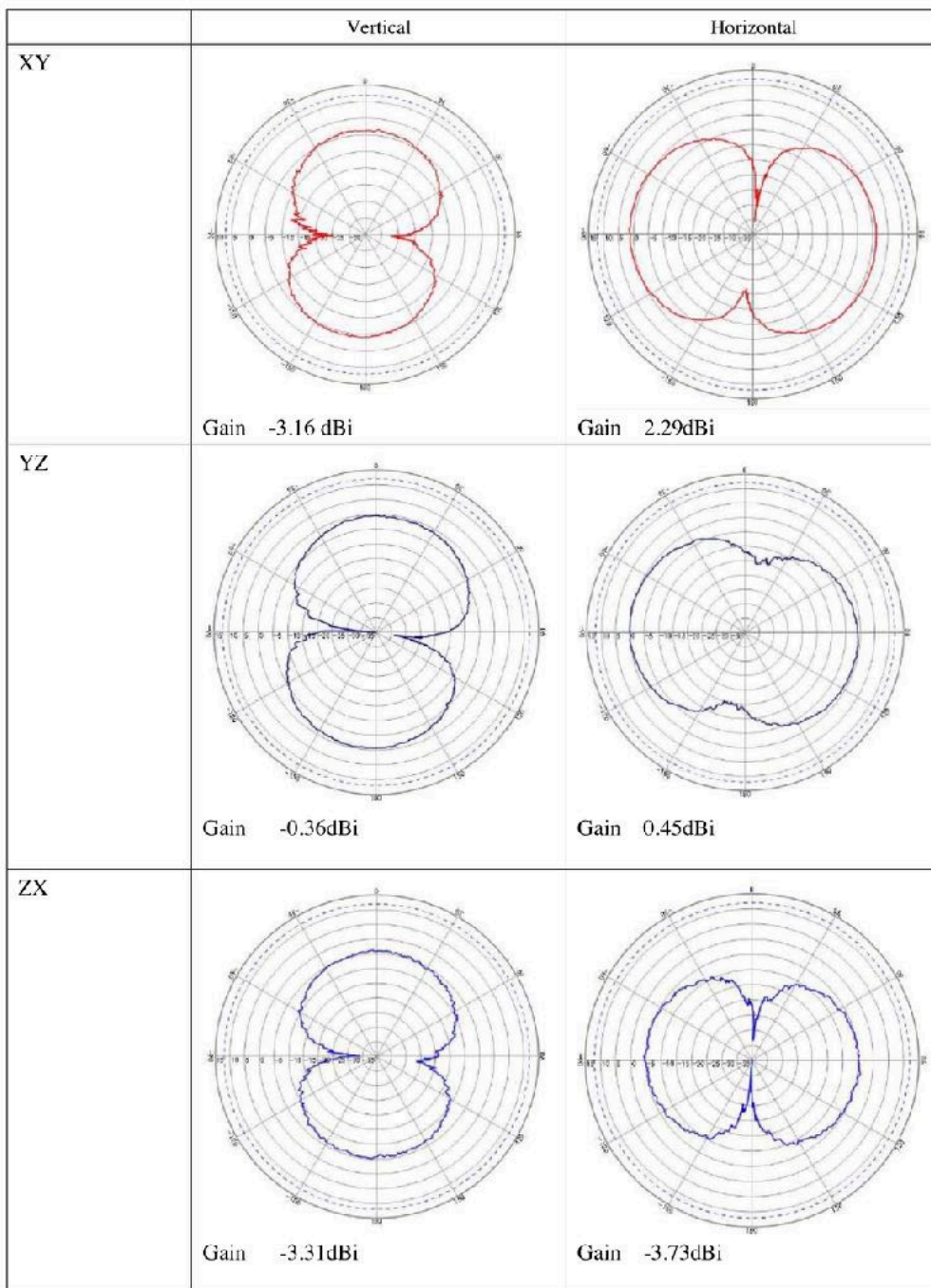
where the value in N\_threshold, together with N\_top\_count, control the duty cycle

5. Quadrature decoder: it can interface and decode signal from quadrature-encoded sensor, both mechanical and optical sensors. Input debounce filters is included.
6. Keyscan: it supports up to 16 rows by 18 columns key matrix. Multi-key-press support and de-bounce time is configurable.
- 7.
8. Analog to Digital converter (ADC) : Up to 10 12-bit SAR ADC, and two inputs are with PGA, which provides a software configurable 0 to 42dB with 3dB steps.



## Antenna characteristic

The chip antenna characteristic is illustrated as following:



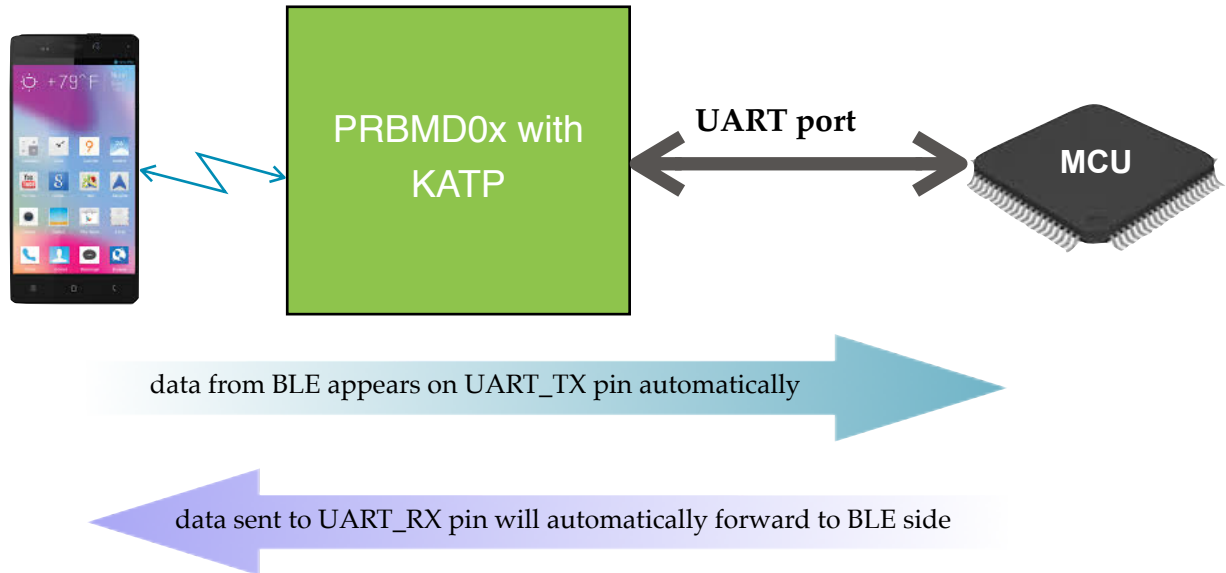


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# Firmware information

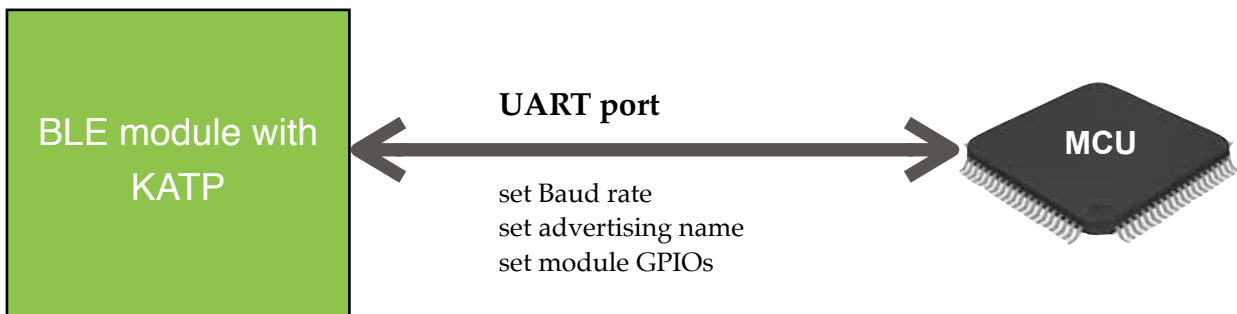
## Default firmware

PRBMD0x comes with default UART-BT firmware (firmware name: KATP), allowing user able to enable their product with BT feature without any extra engineer resources. The basic feature of KATP is to tunnel data between UART port Bluetooth device (Transparent mode). User can develop their own firmware by SDK as well.



### TRANSPARENT mode description

It also provides a AT-CMD mode for configuration:



### AT-CMD mode description

Sending a test mode command in AT-CMD mode will force KATP to testing mode, which allow user to fix the RF channel and power. Test mode is only for testing or certification purpose only.

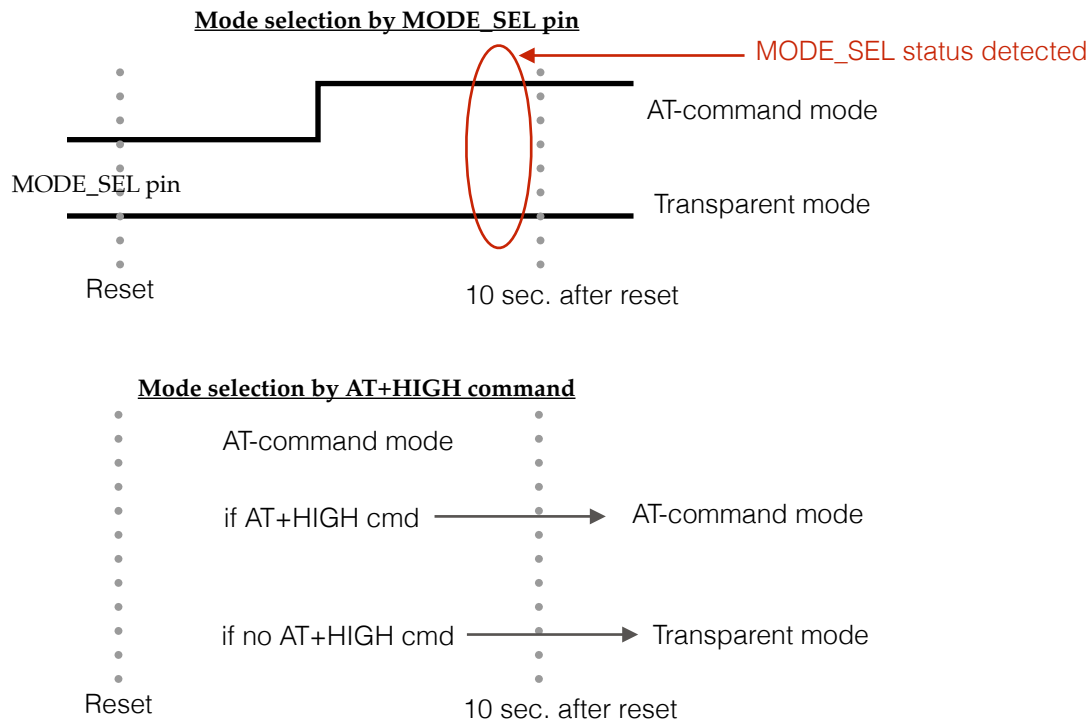
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## Mode selection

KATP will enter either AT-CMD or Transparent mode by the status of MODE\_SEL pin (P34) at 10 sec after reset or power up. If the pin is HIGH, PRBMD0x will enter AT-CMD mode, otherwise will enter Transparent mode.

In the 10-sec window, KATP will be at AT-CMD mode first, if command "AT+HIGH" is issue within this window, KATP will then stay at AT-CMD mode after the window period. It provide an alternative way to enter different mode.

In the AT-CMD mode, user is allowed to change settings of PRBMD0x, such as UART speed, Bluetooth name...etc. The table below lists all the available AT-CMD.



In AT-CMD mode, data can also tunnel between UART and Bluetooth. Any data from Bluetooth side will pass to UART port; Any data not started with "AT+" will be deemed as data and will pass to Bluetooth side.

## Default setting

The default setting of KATP are: BUAD=115200; NAME= PRBMD0x. User is able to change them in AT-CMD mode. There are two ways to change these setting to default value: 1. AT+DEFAULT command in AT-CMD mode; 2. Pull P03 to ground level while reset or power will also make KATP revert to default setting.

## Sleep mode

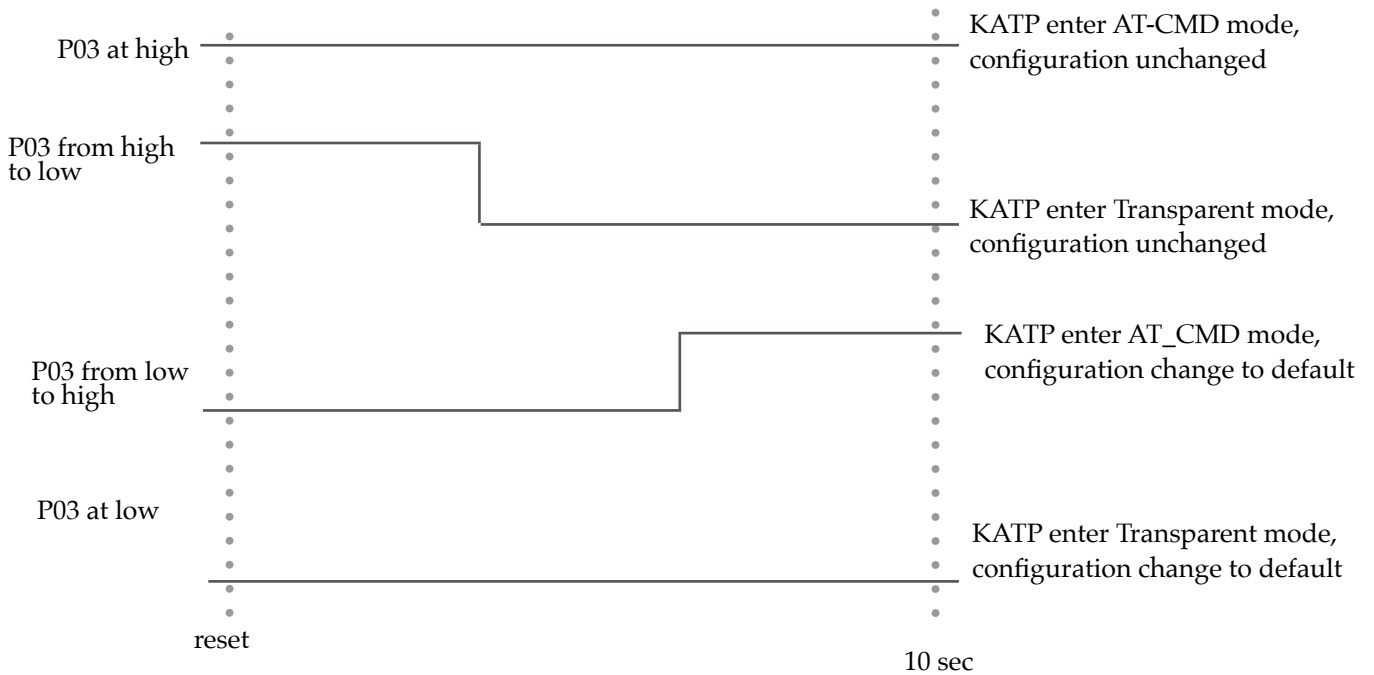
KATP will put PRBMD0x into sleep mode automatically after a while of idle.

## LED indication

KATP uses pin P34 as LED indication (sink), which indicates the connection status. It will flash at the rate of 20ms per second while advertising, and will turn on after connection is built.

### Pin P03

Since P03 is assigned two features, mode selection and default value, by KATP, here is a diagram for further description

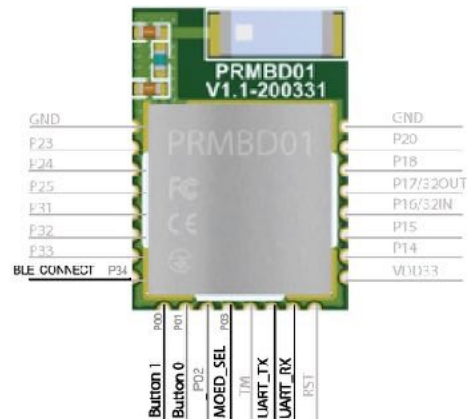
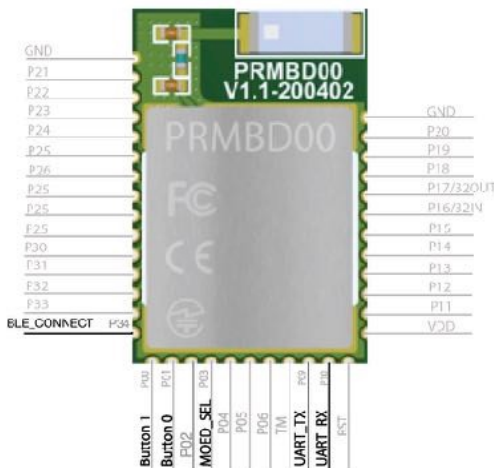


P03 will be detected at the first 5 sec after reset to determine return-to-default or not, and will determine to enter AT-CMD or Transparent mode at the 10 sec.

### Pin assignment

KATP defines pins of PRBMD0 as following:

| PRBMD0x pin | Function in KATP firmware | Description   |
|-------------|---------------------------|---|
| P34         | BLE_Connect (for LED)     | Indicates BT connection: Flash when advertising; Solid when connected |
| P03         | MODE_SEL                  | Goes to AT-CMD or Transparent mode after reset.                       |
| P09         | UART_TX                   | UART transmit - connect to Rx of external device                      |
| P10         | UART_RX                   | UART receive - connect to Tx of external device                       |



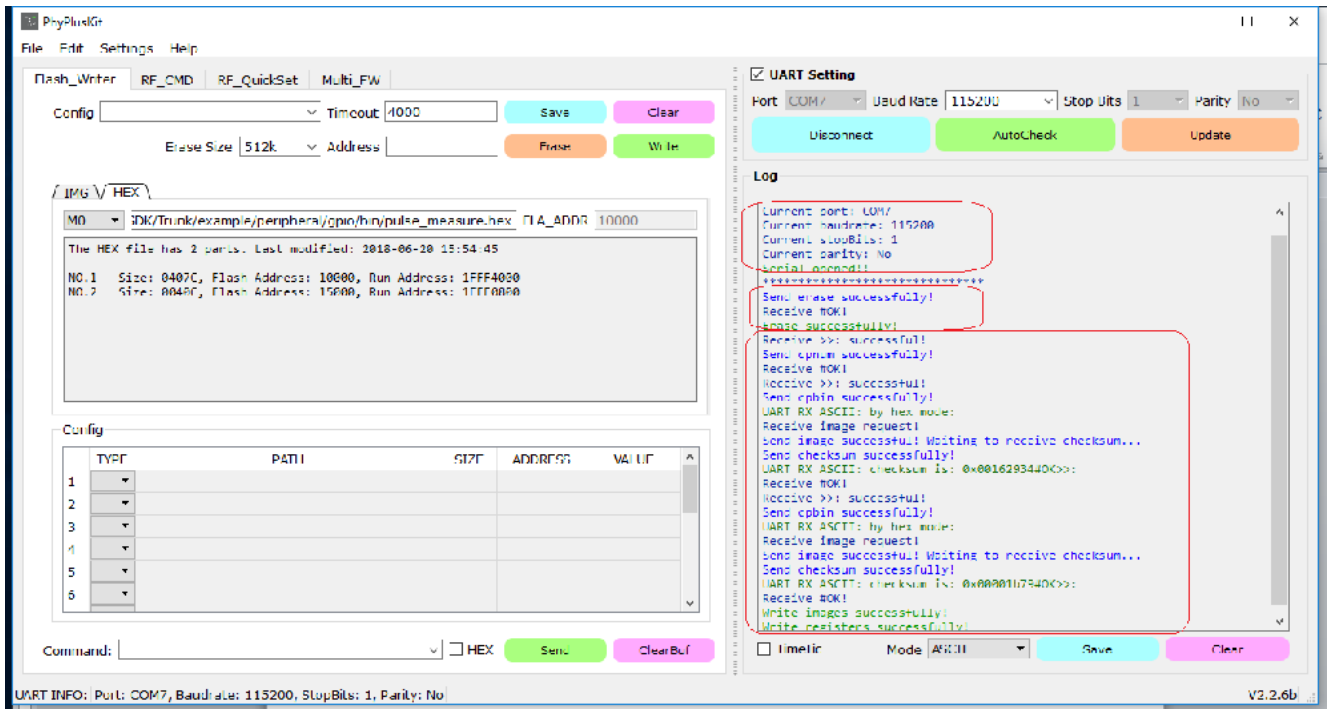
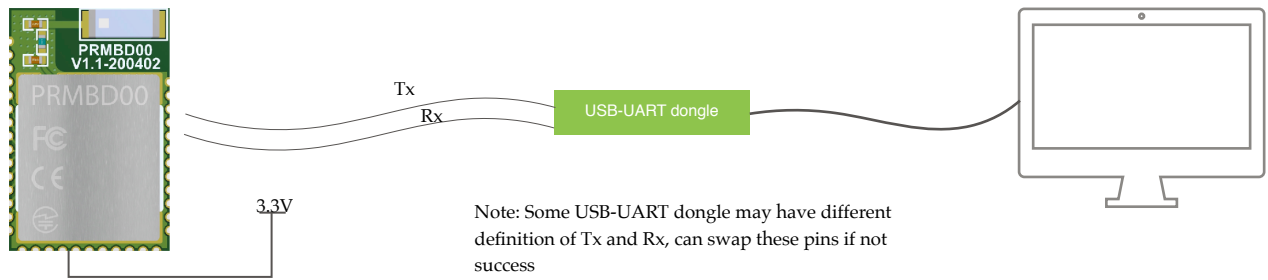
## AT-Command list in AT-CMD mode

|               | Action              | enquiry                        | return value                      | set   | return value   |
|---------------|---------------------|--------------------------------|-----------------------------------|---|--|
| System        | MAC addr *          | <b>AT+ID?</b>                  | Current address                   |   |  |
|               | Help                | <b>AT+HELP</b>                 | All AT commands                   |   |  |
|               | Reset               |                                |                                   | <b>AT+RESET</b>   |  |
|               | Factory Default     |                                |                                   | <b>AT+DEFAULT</b>   | - BAUD = 115200, TXP = 0, NAME = PRBMD0x, Flow control disabled                  |
|               | Exit AT-CMD mode    |                                |                                   | <b>AT+EXIT</b><br>- enter transparent mode from AT-CMD  |  |
| BLE           | Change name         | <b>AT+NAME?</b>                | - current name<br>Default:PRBMD0x | <b>AT+NAME= New name</b>  |  |
|               | Start advertising   |                                |                                   | <b>AT+BDCS</b>  |  |
|               | Stop advertising    |                                |                                   | <b>AT+BDCE</b>  |  |
| UART and GPIO | BAUD rate           | <b>AT+SPEED?</b>               | Current baud                      | <b>AT+SPEED=BAUD</b> ,<br>BAUD = 2400, 4800, 9600, 14400, 19200, 28800, 38400, 57600, 115200                                | - New BAUD if success<br>note: data byte, parity and stop bit are fixed at 8,N,1 |
|               | Turn P34 off        |                                |                                   | <b>AT+LEDOFF</b><br>- turn P34 off; P34 will turn on once it is connected, use this command to turn it off for saving power |  |
|               | Read and set IO pin | <b>AT+GPIOxx=?</b><br>xx:04-33 | level of the GPIO pin             | <b>AT+GPIOxx=y</b><br>xx:04-33  | y= 0 or 1, where 0 is low level and 1 is high level                              |
| RF test       | Set all GPIO high   |                                |                                   | <b>AT+HIGH</b>  |  |
|               | Set all GPIO low    |                                |                                   | <b>AT+LOW</b>   |  |
|               | Fix a Tx channel #  |                                |                                   | <b>AT+TXa=b</b><br>a= modulation data,<br>0: PRBS9<br>1: 1111000<br>2: 10101010<br>b= 0-39 Tx channel<br>i.e.: AT+TX1=20    |  |
|               | Fix a Rx channel#   |                                |                                   | <b>AT+RX=c</b><br>c=0-39 channel  |  |
|               | TX power            | <b>AT+TXP?</b>                 | Current TX Power value            | <b>AT+TXP= p</b><br>p : -20, -15, -10, -6, -5, -3, 0, 3, 4, 5   | - new value  |

\* MAC address can be programmed by PHY Plus Kit only, and it can be programmed for one time only.

# Reset is needed to leave the AT+RX=c and AT+TXa=b command.

# Firmware programming



PhyPlusKit interface

Note: More information will be described in PRMD0x Programming document.

## MAC address

Unless otherwise instructed, each PRMBD0x will be shipped with KATP pre-programmed but no MAC address is pre-programmed. User can program their own MAC address by PhyPlusKit. It is important to be reminded that *MAC address can be only written once and cannot be re-written.*

|   | TYPE | PATH | SIZE | ADDRESS | VALUE             |
|---|------|------|------|---------|-------------------|
| 1 | MAC  |      |      |         | 56:78:90:98:76:54 |
| 2 |      |      |      |         |                   |
| 3 |      |      |      |         |                   |
| 4 |      |      |      |         |                   |

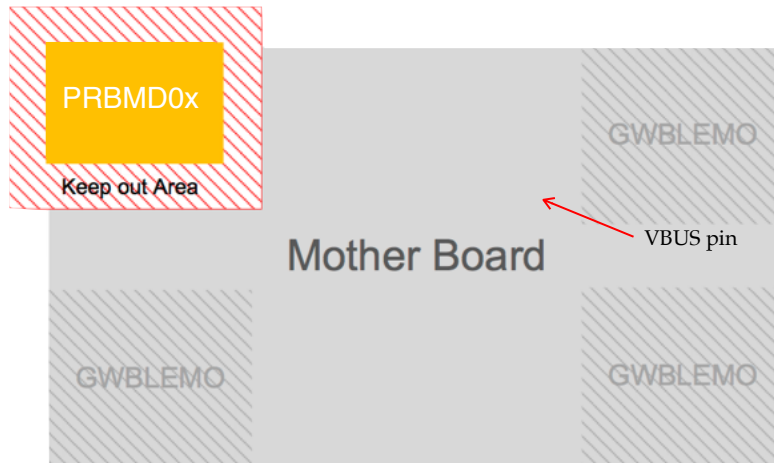
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## Mounting guide

PRBMD0x is RF sensitive; in order to obtain the best performance, it is recommended to mount the module at corner of mother board, and with some marginal space.

Also, keep it away from metal components, such like speakers, transformers, batteries, big aluminum capacitors, heat sinks and Metal Panels.

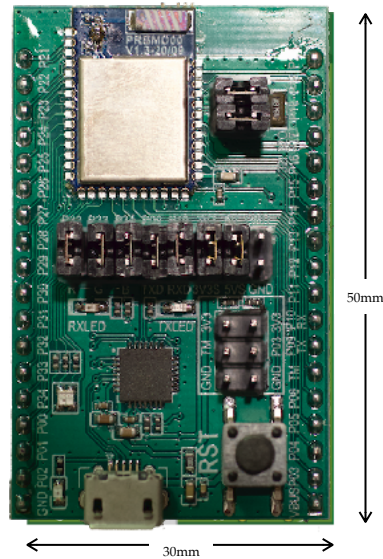
The figure below illustrates how to mount the PRBMD0x module. Improper mounting will decrease the RF performance dramatically.



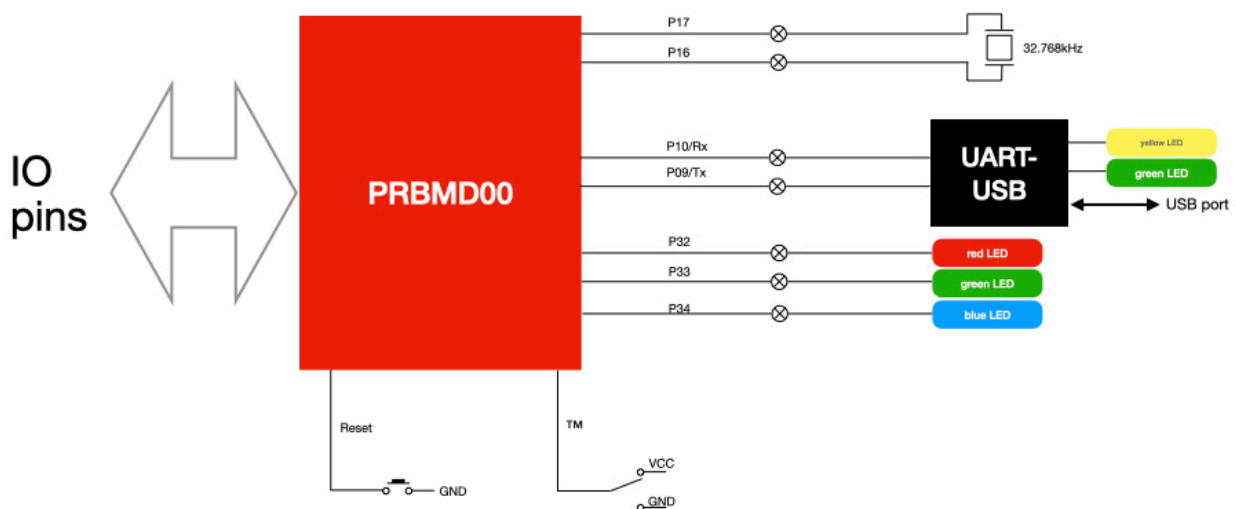
# Evaluation Board

Evaluation board (EVB) for PRBMD0x is available, helping engineer for the firmware development. It is in DIP form factor, allows engineer to connect with external circuit easily for debugging and testing.

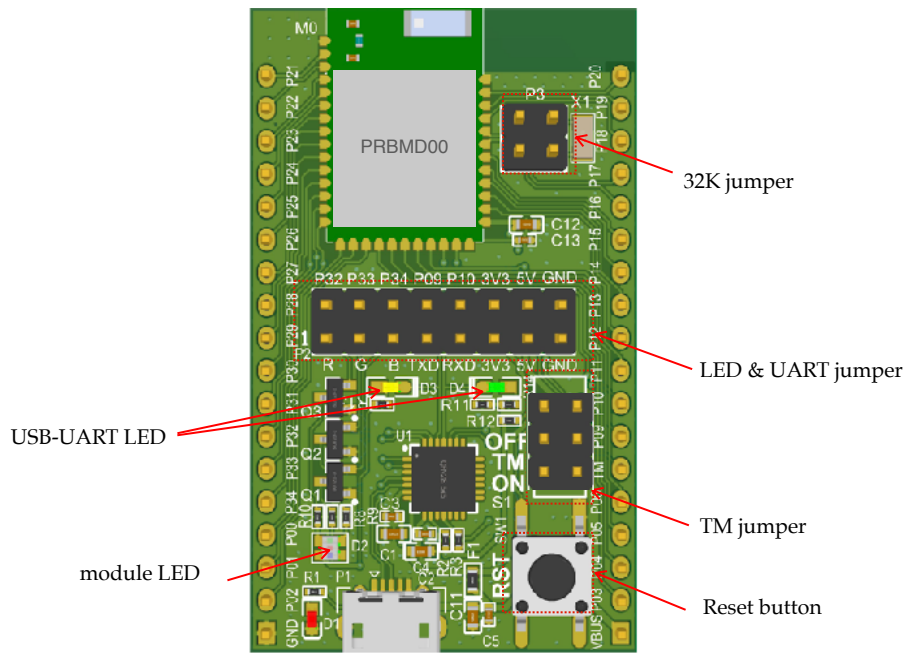
The EVB is illustrated as following:



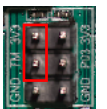
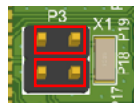
The EVK is in DIP format with PRBMD00 on it, and with on board 32.768KHz crystal and UART-USB chip, allow user to test and program the module easily. PRBMD00 is pre-programmed with the UART-BT tunnelling firmware. Below is the block diagram of the EVK:

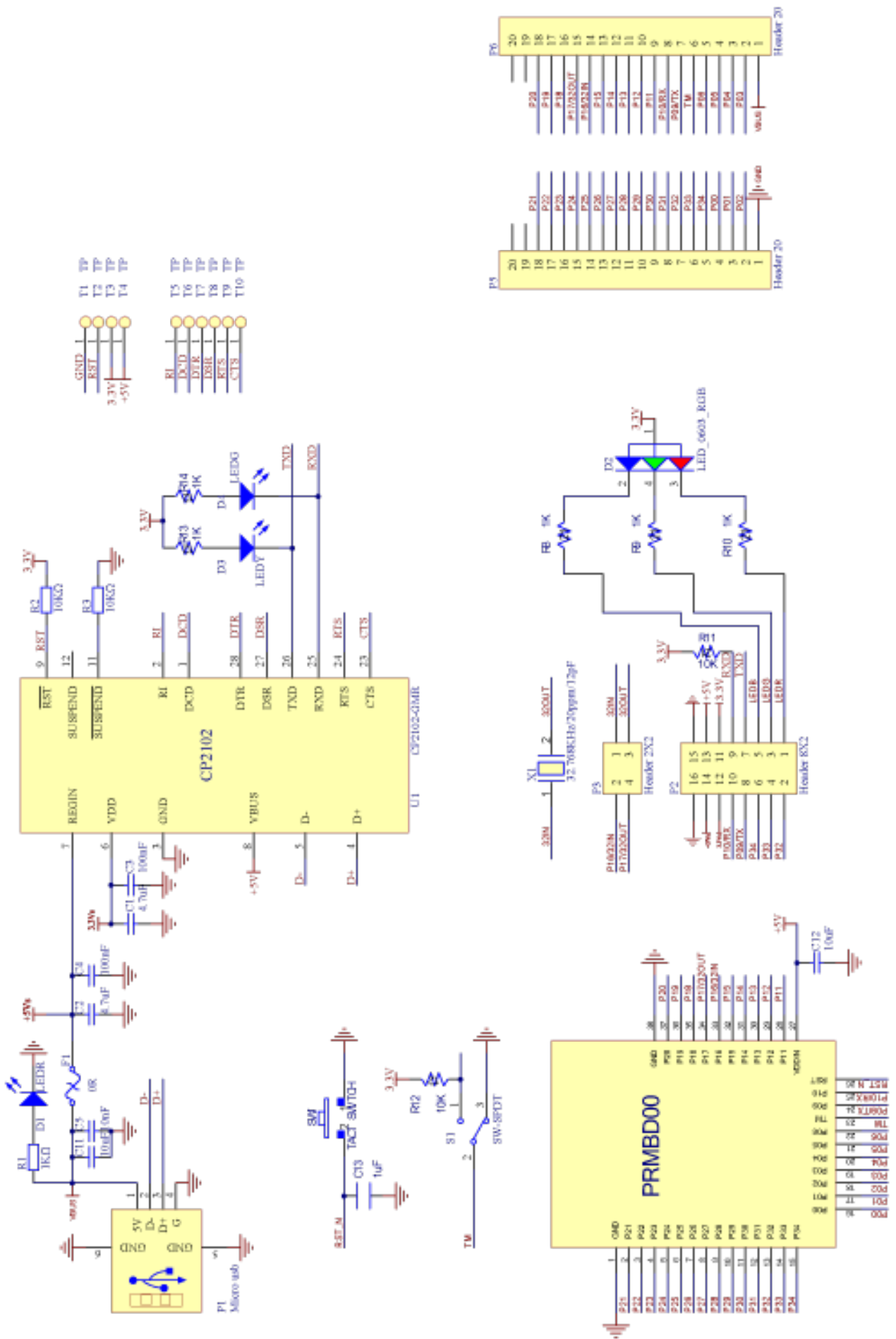






1. 32K jumper:  
Since P16,P17 are multiplex with external 32.768KHz oscillator, this jumper allows the PRBMD00 to connected with the on board 32.768JKHz oscillator.
2. LED & UART jumper:  
This jumper allows the module to connected with on-board LED and the on-board USB-UART chip. Connecting 5V allow PRBMD00 to be powered from USB. Connecting 3V3 will provides a 3.3VDC to the rest of the board
3. TM Jumper  
PRBMD00 goes into firmware programming mode if TM pin is connected to the 3V3 pin.
4. Reset button  
Pressing this button to reset PRBMD00 module
5. USB-UART LED:  
LEDs indicate UART traffic, yellow LED represents TXD and green LED represents RXD
6. module LED:  
LEDs connect to the LED & UART jumper, user can makes use of these LED by shorting the jumper.
7. VBus pin:  
The EVK can be powered by USB port, or a 5VDC can be applied to this pin to power up the board.





## Firmware development and SDK

User is allowed to developed their own firmware for PRBMD0x through SDK as following:

1. copy SDK to a working directory
2. install MDK Keil5 for ARM IDE
3. Example code in SDK can now be edit and compiled.

Experience on ARM core firmware development will be very helpful for development the firmware.

The SDK for PRBMD0x including the following resource:

|                     |  |
|---------------------|--|
| PHY62XXSDK          |  |
| components          | ; SDK components, including BLE API, GATT profile, drivers and other components    |
| example             | ; example  |
| ble_central         | ;  |
| ble_peripheral      | ;  |
| alternate_iBeacon   | ; alternate iBeacon example  |
| ancs                | ; Apple Notification Center Service example  |
| bleI2C_RawPass      | ; I2S tunnelling example   |
| bleSmartPeripheral  | ; General peripheral example   |
| bleUart-RawPass     | ; UART tunnelling example  |
| eddystone           | ; eddystone example  |
| HIDKeyboard         | ; HID example  |
| hrs                 | ; Heart rate profile example   |
| iBeacon             | ; iBeacon example  |
| otaDemo             | ; Basic OTA example  |
| pwmLight            | ; example of LED control by PWM, by BLE command                                    |
| RawAdv              | ; simple boardcasting example, for tire pressure monitor                           |
| Sensor_Broadcast    | ;  |
| wrist               | ; General example for sport bracelet   |
| wrist_aptm          | ; General example, real time timer base on AP Timer + OSAL Timer                   |
| XIPDemo             | ; Example of running within flash, for application not requiring realtime response |
| OTA                 | ;  |
| OTA_internal_flash  | ; OTA bootloader   |
| OTA_upgrade_2ndboot | ; Special example for upgrading OTA bootloader                                     |
| peripheral          | ;  |
| adc                 | ; ADC driver example   |
| ap_timer            | ; AP timer driving example   |
| fs                  | ; File system example  |
| gpio                | ; GPIO demo example  |
| kscan               | ; 4x4 keypad example   |
| lcd_ST7789VW        | ; 240x240 TFT display example  |
| pwm                 | ; PWM demo example   |
| qdec                | ; QDEC demo example  |
| spiflash            | ; SPI ext. device example  |
| voice               | ; Audio sampling example   |
| voice_sbc           | ; SBC coding format audio sampling example   |
| watchdog            | ; Watchdog example   |
| lib                 | ; lib and .h document, including Bluetooth stack and Font library                  |
| font                | ; Font resource document   |
| misc                | ; ROM symbol table and others  |

Please contact us for the details of the SDK.

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## Service

### **Firmware programming**

K-Solution provide pre-programming service, so that PRBMD0x will be shipped with firmware pre-programmed. Service charge is needed.

### **Software service from K-Solution**

K-Solution also provides firmware develop service for PRBMD0x module, hence customer do not need to spend their resource on the firmware development.

These services requires NRE charge. For the details, please contact our local sales representative or distributor.

### **Hardware design service**

K-Solution can also provide circuit design service base on PRBMD0x, so that customer can simply focus on the ID of their product.

### **Circuit board production service**

With our partners factory, K-Solution is able to provide SMT-ed PCB with PRBMD0x to customers, and helping customer the assembly their products.

### **Certification service**

K-Solution could introduce our partnered test lab to customer for their product certification, where K-Solution could facilitate the process.

# Certifications



AGC  
Abtestung & Global Certification  
Recognized by Chinese National Accreditation Administration  
Conformity Assessment & Taiwan Accreditation  
Foundation

100F, P.O. Box 1820  
# 100F, 100F, 200C, 910-1  
E-Mail: agc@agc-cert.com  
Web: www.agc-cert.com

7F, Building 2, Keyuan Industrial Park, High-Tech Park,  
Nanshan District, Shenzhen 518057, China  
Branch: Zhuhai, Zhongshan & H. China (20000)

### EU-RED Certificate of Conformity

**Radio Equipment Directive (RED) 2014/53/EU**

Registration No. AGC0251218021EE3  
Manufacturer: Gigawatt Electronics Limited  
308 Building 2B-2, Keyuan Industrial Park, High-Tech Park, Nanshan District, Shenzhen 518057, China  
Product Designation: GWBLEMC E-velco® Low Energy Module  
Brand Name: N/A  
Model / Service Model: GWBLEMCx  
Factory: Gigawatt Electronics Limited  
308 Building 2B-2, Keyuan Industrial Park, High-Tech Park, Nanshan District, Shenzhen 518057, China

| Requirement                               | Applied Standards                                      | Document Evidence               | Result  |
|---|--|---------------------------------|---------|
| Art. 3.1(a) Electromagnetic Compatibility | EN 62479:2010  | Test Report: AGC0251218021EE102 | Conform |
| Art. 3.1(b) Safety                        | EN 60564-1:2009 A11:2009<br>+A1:2010+A12:2011+A2:2013  | Test Report: AGC0251218021EE301 | Conform |
| Art. 3.1(c) EMC                           | Draft EN 301 489-1 V2.2.3<br>Draft EN 301 489-1 V3.2.3 | Test Report: AGC0251218021EE301 | Conform |
| Art. 3.2 Radio                            | EN 300 330 V2.1.1                                      | Test Report: AGC0251218021EE11  | Conform |

**CE**

Signed by Quality Manager  
Issue Date: Jun. 15, 2018

AGC

Recap: Issued by Abtestung of Global Certification (Shenzhen) Co., Ltd. in accordance with the RED (Directive 2014/53/EU) and related conformity assessment of the production of the Applicant of the certificate is an electronic device that is subject to a conformity assessment with EMC according to Directive 2014/53/EU. The certificate is only applicable to the equipment, model and version specified in this certificate. This certificate shall not be reproduced or used in any way without the written approval of Abtestung of Global Certification Co., Ltd.  
Note: This certificate is part of a full technical report which can be viewed at: www.agc-cert.com  
Version: 2.0

CE



telefication  
The Shenzhen  
Cluster of Science  
and Innovation  
www.telefication.com

### Certificate of Radio Equipment in JAPAN

No: 201-180365 / 00

This declaration is given as Conformity Assessment Body (CAB ID Number: 2011) with respect to Japan, declares that the above production complies with the Technical Regulations of Conformity Certification of Specified Radio Equipment (Articles of MTT No. 27, 1991).

Product designation: **GWBLEMCx**  
Trademark: Gigawatt  
App designation: GWBLEMCx  
Hardware / Software version: V2.5 / NA  
Variant: 800 / Annex 3

Manufacturer: Gigawatt Electronics Limited  
Address: Room 308, Building 2B, Keyuan West Industrial Area, Nanshan District  
City: Shenzhen, Guangdong  
Country: China

This certificate is granted to:  
Acme E-Solution Consulting Co., Ltd.  
Address: Bldg. M, 111F, 38 Yuet Wah Street, Kowloon Tong, Kowloon  
City: Hong Kong  
Country: China

This certificate has THREE Annexes.  
Dated: June 14, 2018

**CAB**

Signed by Product Assessor  
David Chen  
David Chen  
Product Assessor

PRODUCTS  
RVA C 224

LABORATORY      CERTIFICATE      APPROVAL

Telec



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The Netherlands  
Cluster of Science  
and Innovation  
www.telefication.com

### TECHNICAL ACCEPTANCE CERTIFICATE

CERTIFICATION No. 22948-049BMD0X  
TELEFICTION No. NA\_01\_TELFICTION  
TEST SITE No. 110244-1  
ISSUED TO: K-Solution Consulting Co., Ltd.  
DESIGNER: A  
TYPE OF EQUIPMENT: Bluetooth device  
TRADE NAME AND MODEL: N/A  
MAYRIQUE ET MODELE: Gigawatt GWBLEMCx  
CERTIFIED TO: SPECIFICATION  
CARRIER DES CHARGES: RSS-100  
ISSUE: 5  
EDITION: 1

Confirmation of equipment means only that the equipment has met the requirements of the applicable technical specifications. It does not constitute a guarantee of performance or a warranty of any kind. The certificate is only valid for the equipment, model and version specified in this certificate. This certificate shall not be reproduced or used in any way without the written approval of telefication. The certificate is only applicable to the equipment, model and version specified in this certificate. This certificate shall not be reproduced or used in any way without the written approval of telefication.

DATE: 03 Jun 2018  
This certificate has one annex.

Issued by Product Assessor  
Mohammed Elze  
Product Assessor

PRODUCTS  
RVA C 224

LABORATORY      CERTIFICATE      APPROVAL

IC

### TCB

**GRANT OF EQUIPMENT AUTHORIZATION**

Certification  
Issued Under the Authority of the  
Federal Communications Commission  
By:

MIGOM Labs  
575 Boulder Court  
Pleasanton, CA 94566  
Date of Grant: 02/13/2015  
Application Date: 02/13/2015

Gigawatt Electronics Limited  
Unit E, 40F Block B, Central Plaza, Bayswater Road,  
Xiaoyi Avenue, Baoan District,  
Shenzhen, 518057  
China

Attention: Charlie Pan, Purchasing Manager

**NOT TRANSFERABLE**

EQUIPMENT AUTHORIZATION is hereby granted to the named GRANTEE, and is VALID ONLY for the equipment identified herein for use under the Commission's Rules and Regulations listed below.

FCC IDENTIFIER: **QCCW51MDDX**  
Name of Grantee: Gigawatt Electronics Limited  
Equipment Class: Part 15 Low Power Communication Device Transmitter  
Notes: GWBLEMCx Bluetooth Low Energy Module  
Modular Type: Single Modular

| Grant Notes | FCC Rule Part | Frequency Range (MHz) | Output Watts | Frequency Tolerance | Emission Designator |
|-------------|---------------|-----------------------|--------------|---------------------|---------------------|
| 20          | 15C           | 2402.0 - 2480.0       |              |                     |                     |

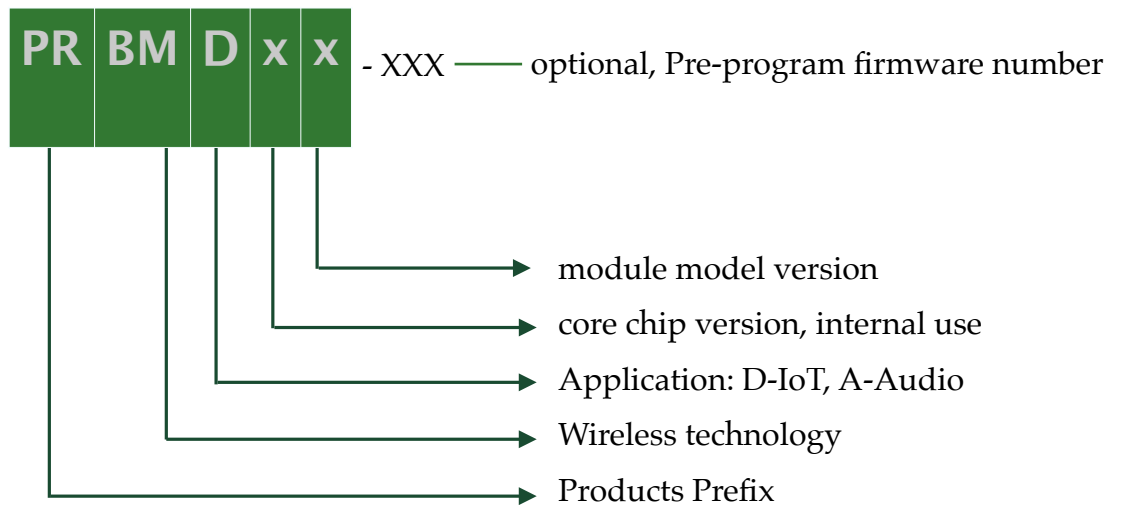
20: All electrical and mechanical devices enclosed for spurious radiation suppression (including any modifications made during certification testing) must be incorporated in each unit manufactured.

FEDERAL COMMUNICATIONS COMMISSION

FCC

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## Ordering part number



Available part number:

PRBMD00 - BT5 module, on board chip antenna, 38 pins, 12 x 18 mm, standard UART firmware

PRBMD01 - BT5 module, on board chip antenna, 24 pins, 10 x 14 mm standard UART firmware

PRBMDEVK - Evaluation board with PRBMD00 on board

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## Revision History

|            |  |
|------------|--|
| 2020-04-20 | version 0.9  |
| 2020-08-17 | version 1.1<br>AT-CMD list updated                   |
| 2020-08-28 | version 1.2<br>Current consumption test result added |
| 2020-10-07 | EVK information updated                              |

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## Reference

ADC Application Note  
ANCS Application Note  
Font Application Note  
GPIO Application Note  
OTA Note  
SDK Application Guide  
MESH Application Guide  
KATP product brief



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## Contact information

### Head quarter:

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