



PRODUCT SPECIFICATION

Bluetooth 5.2 BLE Module

Model Number: YGB-T2LB

Custom Approval Section	
Custom Name	
Department	
Approval	Date:

DESIGN	CHECK	APPROVAL
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Document revision history

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1. Overview

YGB-T2LB is a low power embedded Bluetooth module developed by ARGRACE. It consists of a highly integrated Bluetooth chip TG7120B and a several peripheral components. It has built-in Bluetooth network communication protocol stack and rich library functions. The YGB-T2LB also includes a low-power 32-bit MCU that supports Bluetooth SIG MESH, BLE5.2/2.4G Radio, 3 reusable I/O ports, 512KB built-in FLASH, and OTA (over-the-air) support.

2. Features

- Built-in low power 32-bit MCU, which can also function as an application processor.
- Operating voltage: $3.3 \pm 0.3\text{V}$
- Peripheral: 3xPWM, IIC, UART
- BLE RF features - BLE5.2 TX transmit power: +8dBm, RX receive sensitivity: -93dBm
- Operating temperature: -40°C to $+105^\circ\text{C}$
- Application area
 - Smart LED lights
 - Smart households
 -
- **MSL Level: 3, Pay attention on the storage and re-bake condition.**

3. Electrical Parameters

3.1 Absolute electrical parameters

Parameter	Description	Min.	Max.	Unit
Ts	Storage temperature	-40	120	$^\circ\text{C}$
VCC	Supply voltage	-0.3	3.6	V
ESD_HBM	ESD voltage (human body model)	-	2000	V
ESD_MM	ESD voltage (machine model)	-	500	V

3.2 Electrical conditions

Parameter	Description	Minimum value	Typical value	Maximum value	Unit
Ta	Working temperature	-40	-	105	$^\circ\text{C}$

VCC	Working voltage	3.0	3.3	3.6	V
VIL	IO low-level input	VSS	-	VCC*0.3	V
VIH	IO high-level input	VCC*0.7	-	VCC	V
VOL	IO low-level output	VSS	-	VCC*0.1	V
VOH	IO high-level output	VCC*0.9	-	VCC	V

3.3 RF current consumption

Symbol	Condition	Typical value	Unit
Itx	Constant transmission, 0 dBm output power	12	mA
Itx	Constant transmission, 10 dBm output power	25	mA
Ir _x	Constant receiving	12	mA
I _{deepsleep}	Deep sleep mode (retention RAM)	4	uA

*Please supply the power for the module with 3.3VDC/50mA at least.

4. RF parameters

4.1 Basic RF features

Parameter	Description
Frequency band	2.4GHz ISM band
Wireless standard	BLE 5.2
Data transmission rate	1Mbps, 2Mbps
Antenna type	Onboard PCB antenna

4.2 RF output power

Parameter	Minimum value	Typical value	Maximum value	Unit
Average RF output power	-20	0	8	dBm

4.3 RF sensitivity

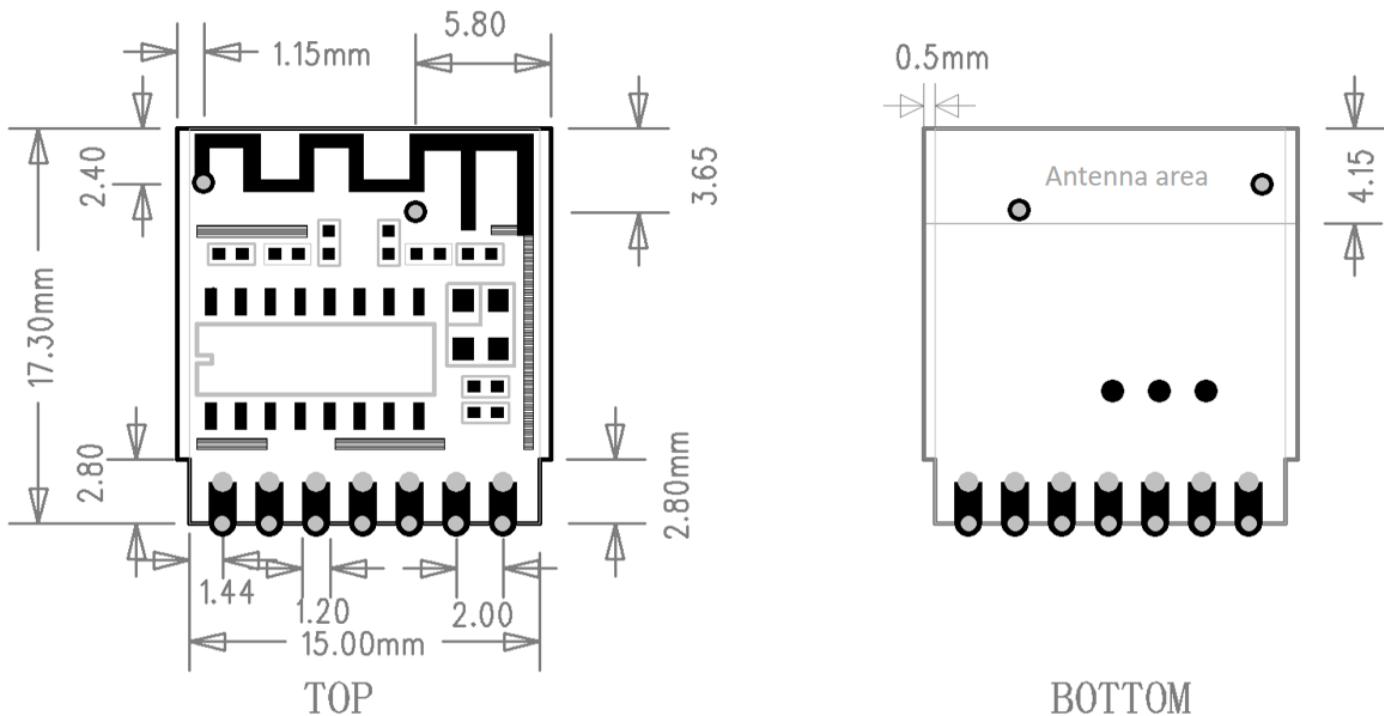
Parameter	Minimum value	Typical value	Maximum value	Unit
RX sensitivity (1Mbps)	-	-93	-	dBm
Co-channel interference suppression	-	-6	-	dB

5. Dimensions and footprint

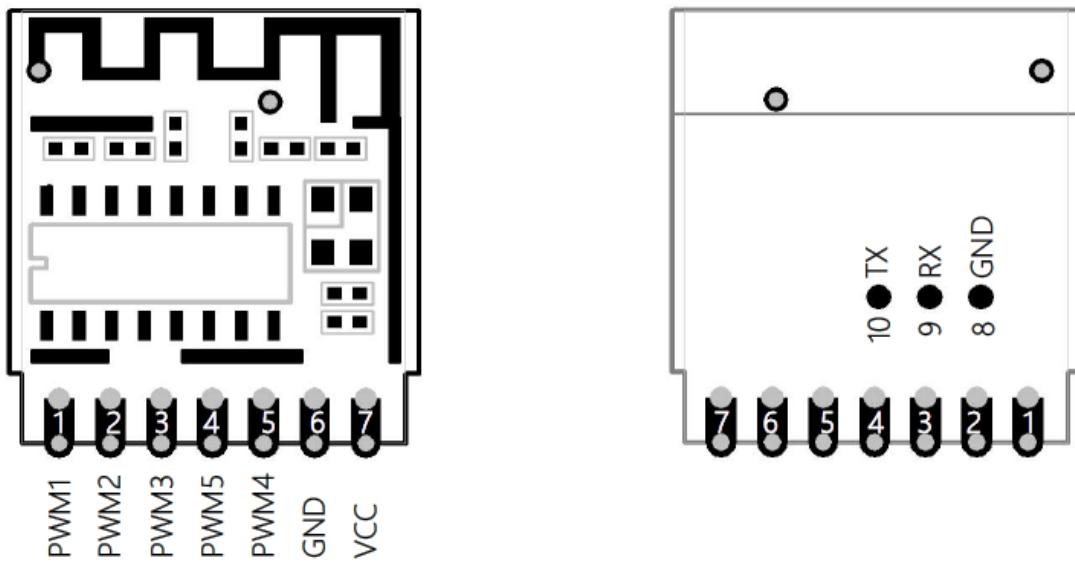
5.1 Dimensions

YGB-T2LB has 7pins and spacing is 2.0mm.

YGB-T2LB size: $16.0 \pm 0.3\text{mm(W)} \times 17.3 \pm 0.3\text{mm(L)} \times 3.0 \pm 0.3\text{mm(H)}$, wherein PCB thickness $0.8\text{mm} \pm 0.1\text{mm}$, package as shown as below.



5.2 Pin definition



Note: P indicates the power pin, I/O indicates an input/output pin, and AI indicates an analog input.

Pin#	Symbol	I/O	Function
1	PWM1	I/O	GPIO Port, which can be used as a PWM output of the LED drive and is connected to pin P2 on the IC
2	PWM2	I/O	GPIO Port, which can be used as a PWM output of the LED drive and is connected to pin P3 on the IC
3	PWM3	I/O	GPIO Port, which can be used as a PWM output of the LED drive and is connected to pin P7 on the IC
4	PWM5	I/O	GPIO Port, which can be used as a PWM output of the LED drive and is connected to pin P20 on the IC
5	PWM4	I/O	GPIO Port, which can be used as a PWM output of the LED drive and is connected to pin P18 on the IC
6	GND	P	Power supply reference ground pin
7	VCC	P	Power supply pin (3.3 V)
Test point 8	GND	P	Power supply reference ground
Test point 9	RX	I/O	UART RX, which is connected to pin P10 on the IC
Test point 10	TX	I/O	UART TX, which is connected to pin P9 on the IC

Notice: Please reserve a shunt resistor (default 3.3K OHM) at the PWM port suppressing the light flash at the power on moment in the lighting application.

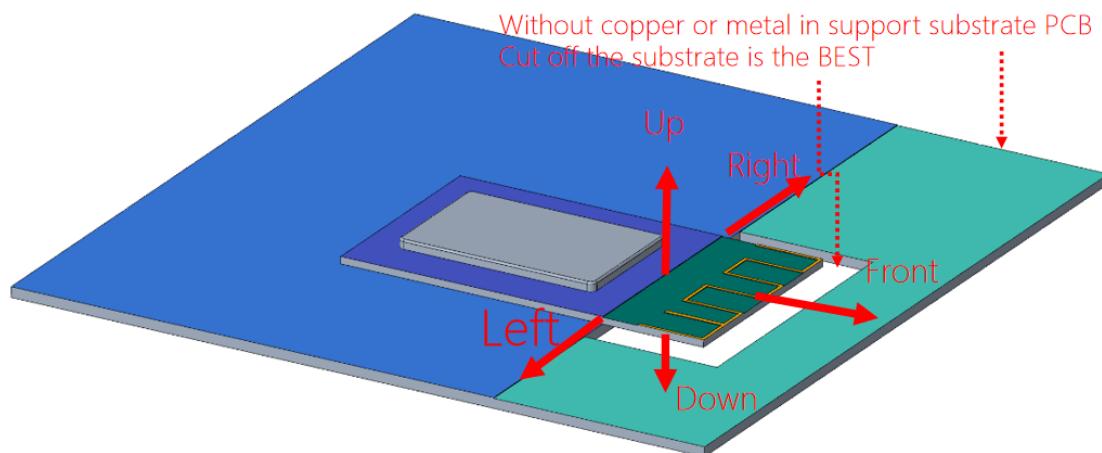
6. Antenna notices

To ensure optimal module performance when the module uses an onboard PCB antenna, it is recommended that the antenna be at least 15mm away from other metal parts.

- ◆ Place the antenna outside the PCB frame.
- ◆ Place the antenna along with the PCB frame without copper nearby.
- ◆ Place the antenna in a carved area on the PCB.

The preceding solutions ensure that there are no substrate media above or below the antenna and that copper is at a certain distance away from the antenna to maximize the antenna radiation performance.

Antenna Keeout Up/Down/Left/Right and Front without Metal
, at least 15mm away from other metal parts



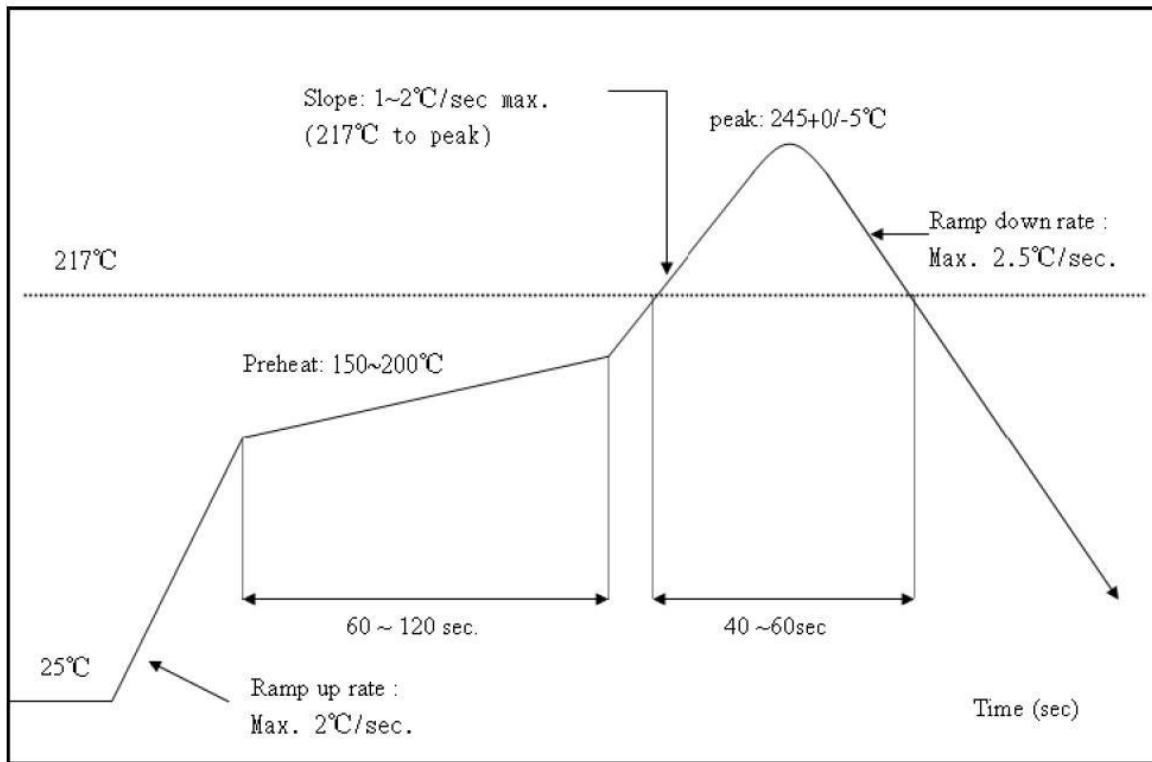
7. Production instructions

7.1 Recommended Reflow Profile

Referred to IPC/JEDEC standard

Peak Temperature: <250°C

Number of Times : ≤2 times



7.2 Module before the SMT note

1. When customers Open stencil advice sure the hole bigger to the Wireless module plate, please enlarge 0.7 mm is widened to open outward, the thickness of 0.12 mm.
2. Can't get the module bare hands when needs, must we wear the gloves and static ring.
3. The furnace temperature according to the size of the customer the mainboard, generally like to stick on a tablet standard temperature of 250 + - 5.

Storage and use module control should pay attention to the following matters:

- Module of the storage life of vacuum packaging:

- 1-1.Storage life: 12 months. Storage conditions:<40 °C. Relative humidity:<90%R.H.
- 1-2.After this bag is opened, devices that will be subjected to infrared reflow, vapor-phase reflow, or equivalent processing must be :
- 1-3.Check the humidity card: stored at $\leq 20\%$ RH.If: 30%~40%(pink)or greater than 40%(red). Labeling module has moisture absorption.
 - (i) Mounted within 168 hours at factory conditions of: $t \leq 30^\circ\text{C}$, $\leq 60\%$ R.H.
 - (ii) Once opened, the workshop the preservation of life for 168 hours.
- 1-4.If baking is required, devices may be baked for:

(i) Modules must be to remove module moisture problem.

(ii) Baking temperature: 125 °C, 8 hours.

(iii) After baking, put proper amount of desiccant to seal packages.

1-5. The actual number of module vacuum packing which is based on the actual number of packages to the customer requirements.

2.Module reel packaging items as follows.

2-1.Storage life: 12 months. Storage conditions:<40 °C. Relative humidity:<90%R.H.

2-2.Module apart packing after 168 hours,To launch patch need to bake, to remove the module hygroscopic, baking temperature conditions:125 °C,8hours.

2-3. The actual number of module reel packing which is based on the actual number of packages to the customer requirements.

3.Module pallet packaging items as follows :

3-1.Storage life: 3 months. Storage conditions:<40 °C. Relative humidity:<90%R.H.

3-2.Module if not used within 48 hours, before launch the need for baking, baking temperature: 125 °C, 8 hours.

8. Regulatory Module Integration Instructions

Common specific operation conditions:

This module can be used in household electrical appliances as well as lighting products. The input voltage to the module should be nominally 3.0~3.6VDC, typical value 3.3VDC and the ambient temperature of the module should not exceed 105°C.

This module is embedded a PCB on board antenna, which can not change of any antenna design. The antenna is not replaceable.

It is recommended that the host product manufacturer, installing the modular transmitter, perform EMI and EMC measurements to confirm that the resulting composite system does not exceed the spurious emissions limits or band edge limits.

9. FCC Statement

Warning: Changes or modifications to this unit 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 or 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 must not be co-located or operating in conjunction with any other antenna or transmitter. This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions.

This device may not cause harmful interference, and this device must accept any interference received, including interference that may cause undesired operation.

The minimum separation generally be used is at least 20cm.

The DUT are produced with a standard PVC enclosure that does not affect wireless transmission and reception characteristics.

This device is intended only for OEM integrators under the following conditions:

IMPORTANT NOTE:

In the event that these conditions cannot 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 cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end products (including the transmitter) and obtaining a separate FCC authorization.

End Product Labeling:

This transmitter module is authorized only for use in device where the antenna may be installed such that 20 cm may be maintained between the antenna and users. The final end products must be labeled in a visible area with the following: "Contains FCC ID: 2AYYQ-YGB-T2LB". The grantee's FCC ID can be used only when all FCC compliance requirements are met.

Manual Information to the End User:

The OEM integrator must be aware not to provide information to the end user regarding how to install or remove this RF module in the user's manual of the end products which integrates this module. The end user manual shall include all required regulatory information/warning as show in this manual.

We, Hangzhou Yaguan Technology Co., LTD, declared that our module YGB-T2LB (FCC ID :2AYYQ-YGB-T2LB) is only FCC authorized for the FCC rule parts 15B/15C .The host product manufacturer is responsible for compliance to other rules that our module not cover. Please be noticed that the final host product still requires Part 15 Subpart B compliance testing with our module installed.

10. Industry Canada statement

1. 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.
1. 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.
2. This Class B digital apparatus complies with Canadian ICES-003.

2. Cet appareil numérique de la classe B est conforme à la norme NMB-003 du Canada.
3. This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter, except tested built-in radios.
3. Cet appareil et son antenne ne doivent pas être situés ou fonctionner en conjonction avec une autre antenne ou un autre émetteur, exception faites des radios intégrées qui ont été testées.
4. The County Code Selection feature is disabled for products marketed in the US/ Canada.
4. La fonction de sélection de l'indicatif du pays est désactivée pour les produits commercialisés aux États-Unis et au Canada.

FOR DEVICE (>20cm from body / low power)

Radiation Exposure Statement:

This equipment complies with IC 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.

Déclaration d'exposition aux radiations:

Cet équipement est conforme aux limites d'exposition aux rayonnements IC établies pour un environnement non contrôlé. Cet équipement doit être installé et utilisé avec un minimum de 20 cm de distance entre la source de rayonnement et votre corps.

The final end product must be labelled in a visible area with the following: The Industry Canada certification label of a module shall be clearly visible at all times when installed in the host device, otherwise the host device must be labelled to display the Industry Canada certification number of the module, preceded by the words "Contains transmitter module", or the word "Contains", or similar wording expressing the same meaning, as follows:

Contains transmitter module IC: 32523-YGBT2LB

This End equipment should be installed and operated with a minimum distance of 20 centimeters between the radiator and your body. Cet équipement devrait être installé et actionné avec une distance minimum de 20 centimètres entre le radiateur et votre corps.

The thisThe end user manual shall include all required regulatory information/warning as shown in this manual.