

User Manual		
Specification		
产品型号: B-Z13 Product Model: B-Z13		客户型号: Customer Model:
产品版本: V1 Product version: V1		客户检测: Customer test:
产品图片: Product pictures:		客户承认: Customer approval:
编制/日期	审核/日期	批准/日期
2025/7/18	2025/7/18	2025/7/18
1. 范围 Range		
1.1 这份说明书只适用于本公司的蓝牙模块, 若需要使用到其它的产品上, 请咨询我司。 1.1 This manual is only applicable to our company's Bluetooth Player module, If you need to use it on other products, Please contact us.		
2. 种类型号Types and models		
2.1种类 外接蓝牙模块 Bluetooth player module with external power supply 2.2型号 BZ13为我们公司的型号 Company model		

3. Technical Specification

3.1 Radio Frequency Parameters

Parameter	Value			
Protocol	BLE 5.0			
Modulation	BLE: GFSK			
Channel Number	BLE:40			
Channel Bandwidth	BLE:2MHz			
Basic Transmitting Rate	BLE:1Mbps/125Kbps/500Kbps			
Antenna Type	PCB Antenna			
Antenna Gain	1.74dBi			
Parameter	Min.	Typ.	Max.	Unit
Frequency	2400	--	2483.5	MHz
Frequency Offset	-40	--	40	KHz
Receiving Sensitivity	--	--	-102	dBm
Remark:				
Above data are based on 25°C ambient temperature and 3.3V supply voltage.				

Chart 1. RF Parameters

3.2 Pin Definition

3.2.1 Default and Multiplexing Pin Definition

There are 16 pins in B-Z13 module, refer to below chart 5 for pin definition. "Default Pin Definition" in Chart 5 means the recommended pin function definition. Usually, customers need to choose target pins according to the pin definition in this column of Chart 5. In some special projects, if "default pin definition" can't meet the needs of products, then "Multiplexing Pin Definition" function can be chosen. However, when choosing this multiplexing function, need to consider whether other modules that have the same package, also have the same multiplexing function.

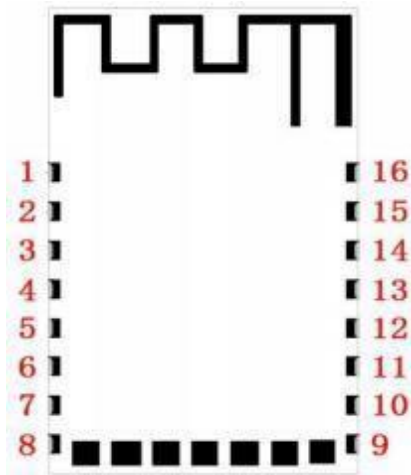


Chart 2.Module Pin Number

Module Pin Number	Pin of IC	Pin Function Description	Remark
1	RESET	Chip reset	NC
2	PC01	GPIO	
3	PD02	GPIO	
4	PC00	GPIO	

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5	PA00	GPIO	
6	PA03	GPIO	
7	PA04	/	
8	VCC	3.3V Power supply	3.3V Power supply
9	GND	GND	GND
10	PD01	GPIO	
11	PD00	GPIO	
12	PC02	GPIO	
13	PB00	GPIO	
14	PB01	GPIO	
15	PA06	GPIO	
16	PA05	GPIO	
Remark: For a more detailed definition of multiplexing pin, please refer to the IC datasheet.			

Chart 3.Pin Definition

3.3 Electrical Performance

Parameter	Min.	Typ.	Max.	Unit	Remark
Operating Voltage	1.8	3.3	3.8	V	
Standby Current	4.5	5	8	uA	Deep sleep mode
RX Current	--	10	12	mA	
TX Current	--	200	206	mA	+20dBm
TX Current	--	62	64	mA	+10dBm
TX Current	--	26	28	mA	+0dBm

Chart 4.Electrical performance parameters

3.4 Operating Condition

Parameter	Unit	Min.	Typ.	Max.	Remark
Operating Temperature	°C	-40	—	125	The ambient temperature on components of B-Z13 where the module is working.
Storage Temperature	°C	-40	25	150	Recommend to store it in antistatic vacuum bag at 25°C.
Operating Humidity	%	10	—	90	Relative humidity.
Storage Humidity	°C	5	—	95	Relative humidity.

Chart 5.Operating Condition

3.5 PCB Features

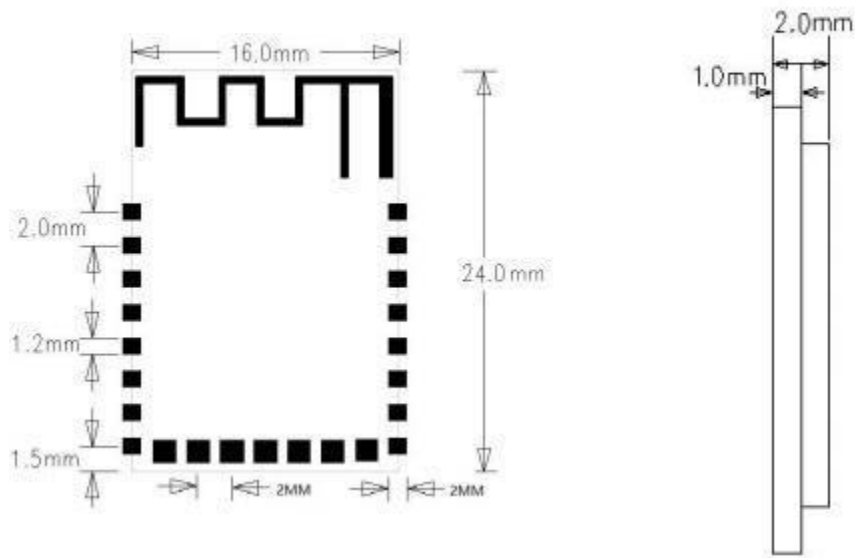
PCB Material	Number of Layers	Surface Finish	Thickness (mm)	Solder Color	Color of Character	Special Technology
FR-4	2	Immersion Gold	1	Black	White	50 Ω Impedance

Chart 6.PCB Features

This module needs to be installed in mobile products, such as routers, which are more than 20 centimeters away from the end user.

4. Mechanical Dimension

4.1 Single Module Dimension



16*24*2mm ($\pm 0.2\text{mm}$)
Chart 7. Single Module Dimension (Unit: mm)

4.2 Layout Package Suggestion

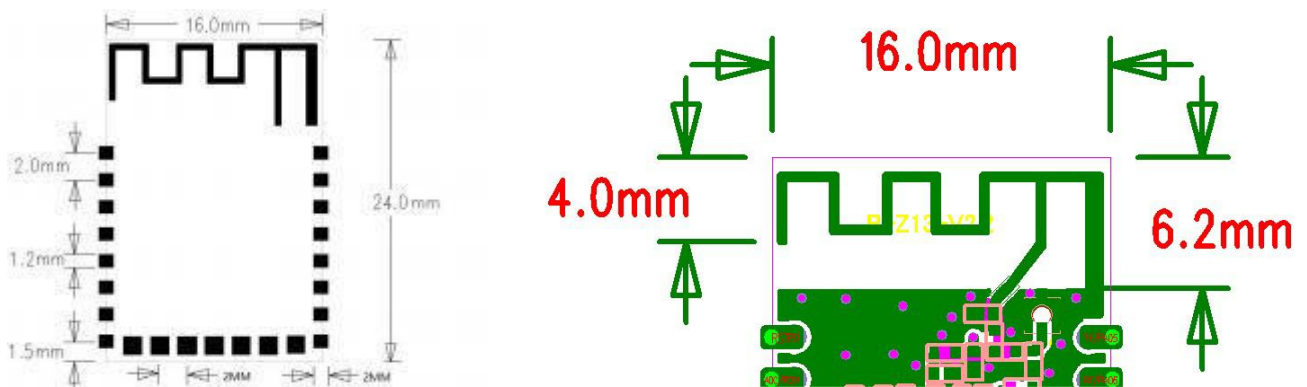


Chart 8. Layout Package Suggestion

FCC regulatory compliance statement

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.

Information to user

Warning: changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

- **List of applicable FCC rules:**

47 CFR Part 15.247

- **Summarize the specific operational use conditions**

This module can be used in terminal router devices, the input voltage to the module is nominally 3.3V.

- **Limited module procedures**

This module is a Limited Modular.

- **Trace antenna designs**

The antenna is not a trace antenna.

- **RF exposure considerations**

This Module complies with FCC radiation exposure limits set forth for an uncontrolled environment. This equipment should be installed and operated with a minimum distance of 20cm between the radiator and your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

- **Antennas**

If you desire to increase antenna gain and either change antenna type or use same antenna type certified, a Class II permissive change application is required to be filed by us, or you (host manufacturer) can take responsibility through the change in FCC ID (new application) procedure followed by a Class II permissive change application.

- **Label and compliance information**

Please notice that if the FCC identification number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following: "Contains FCC ID: 2AOPR-BZ13" any similar wording that expresses the same meaning may be used.

§ 15.19 Labelling requirements shall be complied on end user device.

Labelling rules for special device, please refer to §2.925, § 15.19 (a)(5) and relevant KDB publications. For E-label, please refer to §2.935.

- **Information on test modes and additional testing requirements**

The OEM integrator is responsible for ensuring that the end-user has no manual instruction to remove or install module.

The module is limited to installation in mobile application, a separate approval is required for all other operating configurations, including portable configurations with respect to §2.1093 and difference antenna configurations.

- **FCC other Parts, Part 15B Compliance Requirements for Host product manufacturer**

This modular transmitter is only FCC authorized for the specific rule parts listed on our grant, host product manufacturer is responsible for compliance to any other FCC rules that apply to the host not covered by the modular transmitter grant of certification.

Host manufacturer in any case shall ensure host product which is installed and operating with the module is in compliant with Part 15B requirements.

Please note that For a Class B or Class A digital device or peripheral, the instructions furnished the user manual of the end-user product shall include statement set out in §15.105 *Information to the user* or such similar statement and place it in a prominent location in the text of host product manual. Original texts as following:

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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.

Due to limited module certification, each new host configuration must be submitted by the grantee to the FCC C2PC. In addition, the host integrator must contact the grantee for the C2PC submission.

Grantee Name: KE2 Therm Solutions, Inc.

Contact Name: Steve Roberts

Telephone Number: 636.266.0140

Email: steve.roberts@ke2therm.com

ISED Compliance Statements

This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s). Operation is subject to the following two conditions:

- (1) This device may not cause interference.
- (2) This device must accept any interference, including interference that may cause undesired operation of the device.

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes:

- (1) L'appareil ne doit pas produire de brouillage;
- (2) L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Please notice that if the IC identification number is not visible when the module is installed inside another device, then the outside of the device into which the module is installed must also display a label referring to the enclosed module. This exterior label can use wording such as the following: "Contains IC: **23544-BZ13**" any similar wording that expresses the same meaning may be used.

L'étiquette d'homologation d'un module d'Innovation, Sciences et Développement économique Canada devra être posée sur le produit hôte à un endroit bien en vue, en tout temps. En l'absence d'étiquette, le produit hôte doit porter une étiquette sur laquelle figure le numéro d'homologation du module d'Innovation, Sciences et Développement économique Canada, précédé du mot « contient », ou d'une formulation similaire allant dans le même sens et qui va comme suit: Contient IC : **23544-BZ13** est le numéro d'homologation du module.

RF Exposure Compliance

This equipment complies with FCC/IC RSS-102 radiation exposure limits set forth for an uncontrolled environment. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter. This equipment should be installed and operated with minimum distance 20cm between the radiator and your body.

Cet équipement est conforme aux limites d'exposition aux radiations IC CNR-102 établies pour un environnement non contrôlé. Cet émetteur ne doit pas être colocalisé ou fonctionner en conjonction avec une autre antenne ou un autre émetteur. Cet équipement doit être installé et utilisé avec une distance minimale de 20cm entre le radiateur et votre corps.

Test Plan for host Product:

This module does not contain a shield and therefore is limited. The host integrator will be required to file a Class II Permissive Change for each host specific installation. The following testing should be performed to demonstrate continued compliance.

1. Part 15 Subpart B disclaimer

Host manufacturer is responsible for compliance of the host system with module installed with all other applicable requirements for the system such as Part 15B. These tests should be based on ANSI C63.4 as guidance.

Item	Standard	Method	Remark
Conducted Emissions at Mains Terminals (150kHz-30MHz)	47 CFR Part 15, Subpart B	ANSI C63.4:2014	AC Power Line Conducted Emissions Voltage need to evaluate according to FCC Part 15.207(a) requirement when the host product is designed to be connected to the public utility (AC) power line.
Radiated Emissions (9KHz-30MHz)	47 CFR Part 15, Subpart B	ANSI C63.4:2014	According to FCC Part15.33
Radiated Emissions (30MHz-1GHz)	47 CFR Part 15, Subpart B	ANSI C63.4:2014	According to FCC Part15.33
Radiated Emissions (Above 1GHz)	47 CFR Part 15, Subpart B	ANSI C63.4:2014	According to FCC Part15.33 Test :1GHz to 5th harmonic of the highest frequency or 40 GHz, whichever is lower.
Test mode: Host normal operation with BLE.			

2. The host product will need to evaluate according to FCC Part 15 Subpart C 15.247 for BLE:

(1). Radiated spurious emissions and band edge on2402MHz-2480MHz with the other co-located transmitters. The test modes for these tests need to be setting as below, These tests can be based on C63.10 as guidance and radiated emissions which fall in the restricted bands, as defined in § 15.205(a), must also comply with the radiated emission limits specified in § 15.209(a).

Test Channels for RSE	Operation mode
2402MHz~2480MHz	Tx continue mode

Test Channels for Band-edge	Operation mode
2402MHz~2480MHz	Tx continue mode

(2). Power Spectrum Density, the testing modes for these tests need to be set as follows. These tests can be guided by C63.10. The test results meet the limit requirements in Part 15, Subpart C 15.247(e).

Test Channels for PSD	Operation mode
2402MHz~2480MHz	Tx continue mode

(3). Conducted Peak Output Power, the testing modes for these tests need to be set as follows. These tests can be guided by C63.10. The test results meet the limit requirements in Part 15, Subpart C 15.247(b)(3).

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Test Channels for PSD	Operation mode
2402MHz~2480MHz	Tx continue mode

(4). Conducted Emissions at AC Power Line, the testing modes for these tests need to be set as follows. These tests can be guided by C63.10. The test results meet the limit requirements in Part 15, Subpart C 15.207.

Test Channels	Operation mode
2402MHz~2480MHz	Tx continue mode

RF Exposure evaluation: The host product operating conditions must be such that there is a minimum separation distance of 20 cm (or possibly greater than 20 cm) between the antenna radiating structures and nearby persons. The host manufacturer is obligated to confirm the use conditions of the host product to ensure that the distance specified in the instructions is met. In this case the host product is classified as either a mobile device or a fixed device for RF exposure purposes.

If the modular transmitter is authorized to be used in a specific type of host platform and installed such that it can be operated at closer than 20 cm to users or nearby persons, please follow below guidance.

If the portable host product has only stand-alone mode, the maximum Conducted power from the original grant is 15.57dBm, so it can meet SAR exemption requirements.

If the portable host product has multiple transmitters, it requires routine evaluation or SAR testing for the simultaneous transmission of the co-located transmitters according to KDB 447498. The portable host product shall be evaluated for ensuring to continue compliance FCC rule part 2.1093 & part

1.1310 by C2PC. The additional guidance for the portable host products is provided in KDB Publication 996369 D02 and D04. For the host product is not installed according to this guide, the module certification will be invalid, and a new grant certification will be required for the host product.