FCC 15.19 Warning

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 of the device.

FCC 15.105Warning

(a) For a Class A digital device or peripheral, the instructions furnished the user shall include the following or similar statement, placed in a prominent location in the text of the manual:

Note: This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

—Reorient or relocate the receiving antenna.

—Increase the separation between the equipment and receiver.

—Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

—Consult the dealer or an experienced radio/TV technician for help.

FCC 15.21 Warning

Any changes or modifications not expressly approved by the party responsible for compliance could void the authority to operate equipment.

This device and itsantenna must not be co-located or operating in conjunction with any other antenna or transmitter.

For product available in the USA/Canada market, only channel 1~11 can be operated. Selection of other channels is not possible

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.

Modular Approval

OEM INTEGRATION INSTRUCTIONS:

This device is intended only for OEM integrators under the following conditions: 1) The module must be installed in the host equipment such that 20 cm is maintained between the antenna and users, and 2) the transmitter module may not be co-located with any other transmitter or antenna. As long as 2 conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.).

Any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment.

IMPORTANT NOTE:

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

USERS MANUAL OF THE END PRODUCT:

The OEM integrator has to 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 product which integrates this module. The end user manual shall include all required regulatory information/warning as show in this manual.

LABEL OF THE END PRODUCT:

The final end product must be labeled in a visible area with the following " Contains TX FCC ID: W3TM8811CU5 ". The following FCC part 15.19 statement has to also be available on the label: This device complies with Part 15 of 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.

IC Warning

RSS-Gen Issue 4 8.4

This device complies with Industry Canada's licence-exempt RSSs. Operation is subject to the following two conditions: (1) This device may not cause interference; and (2) This device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes: (1) l'appareil ne doit pas produire de brouillage, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

Industry Canada ICES-003 Compliance Label:

CAN ICES-3 (A)/NMB-3(A)

Co-located

This device and its antenna(s) must not be co-located or operating in conjunction with any other antenna or transmitter.

Cet appareil et son antenne (s) ne doivent pas être situés ou fonctionner en conjonction avec une autre antenne ou émetteur.

This radio transmitter (26044-M8811CU5) has been approved by Industry Canada to operate with the antenna types listed below with the maximum permissible gain indicated. Antenna types not included in this list, having a gain greater than the maximum gain indicated for that type, are strictly prohibited for use with this device.

(i)the device for operation in the band 5150–5250 MHz is only for indoor use to reduce the potential for harmful interference to co-channel mobile satellite systems; (For devices installed in vehicles point i. is not required.)

(ii) for devices with detachable antenna(s), the maximum antenna gain permitted for devices in the bands 5250-5350 MHz and 5470-5725 MHz shall be such that the equipment still complies with the e.i.r.p. limit;

(iii) for devices with detachable antenna(s), the maximum antenna gain permitted for devices in the band 5725-5850 MHz shall be such that the equipment still complies with the e.i.r.p. limits specified for point-to-point and non-point-to-point operation as appropriate; and

(iv) where applicable, antenna type(s), antenna models(s), and worst-case tilt angle(s) necessary to remain compliant with the e.i.r.p. elevation mask requirement set forth in section 6.2.2.3 shall be clearly indicated.

Users should also be advised that high-power radars are allocated as primary users (i.e. priority users) of the bands 5250-5350 MHz and 5650-5850 MHz and that these radars could cause interference and/or damage to LE-LAN devices.

(i) l'appareil pour fonctionner dans la bande 5150-5250 MHz est réservé à une utilisation en intérieur afin de réduire les risques d'interférences nuisibles à la co-canal systèmes mobiles par satellite;

(ii) pour les appareils avec antenne (s) détachable, le gain d'antenne maximal autorisé pour les appareils dans les bandes 5250-5350 MHz et 5470-5725 MHz doit être telle que l'équipement satisfait encore la pire limite;

(iii) pour les appareils avec antenne (s) détachable, le gain d'antenne maximal autorisé pour les appareils dans la bande 5725-5850 MHz doit être telle que l'équipement satisfait encore la pire limites spécifiées pour le point-à-point et non point-à-point, le cas échéant; opération et

(iv) l'angle d'inclinaison du pire (s) nécessaire pour rester conforme à la pire exigence de masque d'élévation énoncées dans la section 6.2.2 (3) doit être clairement indiqué.

Devraient également être informés les utilisateurs que les radars à haute puissance sont désignés comme utilisateurs principaux (c.-à-utilisateurs prioritaires) des bandes 5250-5350 MHz et 5650-5850 MHz et que ces radars pourraient provoquer des interférences et / ou endommager les appareils LE-LAN.

Modular Approval

OEM INTEGRATION INSTRUCTIONS:

This device is intended only for OEM integrators under the following conditions: 1)The module must be installed in the host equipment such that 20 cm is maintained between the antenna and users, and 2)the transmitter module may not be co-located with any other transmitter or antenna. As long as 2 conditions above are met, further transmitter test will not be required. However, the OEM integrator is still responsible for testing their end-product for any additional compliance requirements required with this module installed (for example, digital device emissions, PC peripheral requirements, etc.).

Any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment.

IMPORTANT NOTE:

In the event that these conditions can not be met (for example certain laptop configurations or co-location with another transmitter), then the ISED authorization for this module in combination with the host equipment is no longer considered valid and the ISED ID of the module cannot be used on the final product. In these circumstances, the OEM integrator will be responsible for re-evaluating the end product (including the transmitter) and obtaining a separate Canada authorization.

USERS MANUAL OF THE END PRODUCT:

The OEM integrator has to 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 product which integrates this module. The end user manual shall include all required regulatory information/warning as show in this manual.

LABEL OF THE END PRODUCT:

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 product must be labeled in a visible area with the following: “Contains transmitter module IC: 26044-M8811CU5

Product Specification

Revision	V1.0		
Date	2019-9-19		
Model Name	WiFi BL-M8811CU5		
Product Name	IEEE 802.11a/b/g/n/ac(1T1R) USB2.0 WLAN Module		
Bilian Approve Field			
Engineer	**QC**	**Sales**	
Customer Approve Field			
Engineer	**QC**	**Manufactory**	**Purchasing**

Shenzhen Bilian Electronic Co.，Ltd
Address: 10 - 11 / F, Block A1, Huaqiang Creative Industrial Park, Sightseeing Road, Guangming District,
Homepage: www.b-link.net.cn

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Revision History

Date	Document Revision	Product Revision	Description
2019/8/14	0.1	V0.1	First Release
2019/9/19	1.0	V1.0	Update pictures and descriptions

1. Introduction

1.1 General Description

WiFi BL-M8811CU5 module is designed base on RTL8811CU. It supports IEEE 802.11a/b/g/n/ac 1T1R with high throughput data rate for WLAN products and provides the highest PHY rate up to 433.3Mbps. It combines a WLAN MAC, a 1T1R capable WLAN baseband, modem and offers stable, high rate, long distance wireless connectivity through external antenna. It can be used on the IP Camera/ Smart TV and other wireless devices easily.

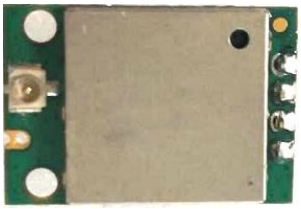

Figure 1 Top View

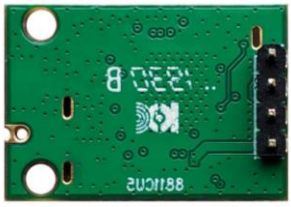

Figure 2 Bottom View

Note: The above pictures are for reference only

1.2 Features

- Operating Frequencies : 2.412~2.4835GHz or 5.180~5.835GHz
- Host Interface is USB 2.0
- IEEE Standards : IEEE 802.11a/b/g/n/ac
- Wireless data rate can reach up to 433.3Mbps
- Connect to external antenna through the IPEX
- Power Supply:3.3V±0.3V

1.3 Applications

- MID
- IP Camera
- STB
- Smart TV
- E-book
- Other devices which need to be supported by wireless network

2. Functional Block Diagram

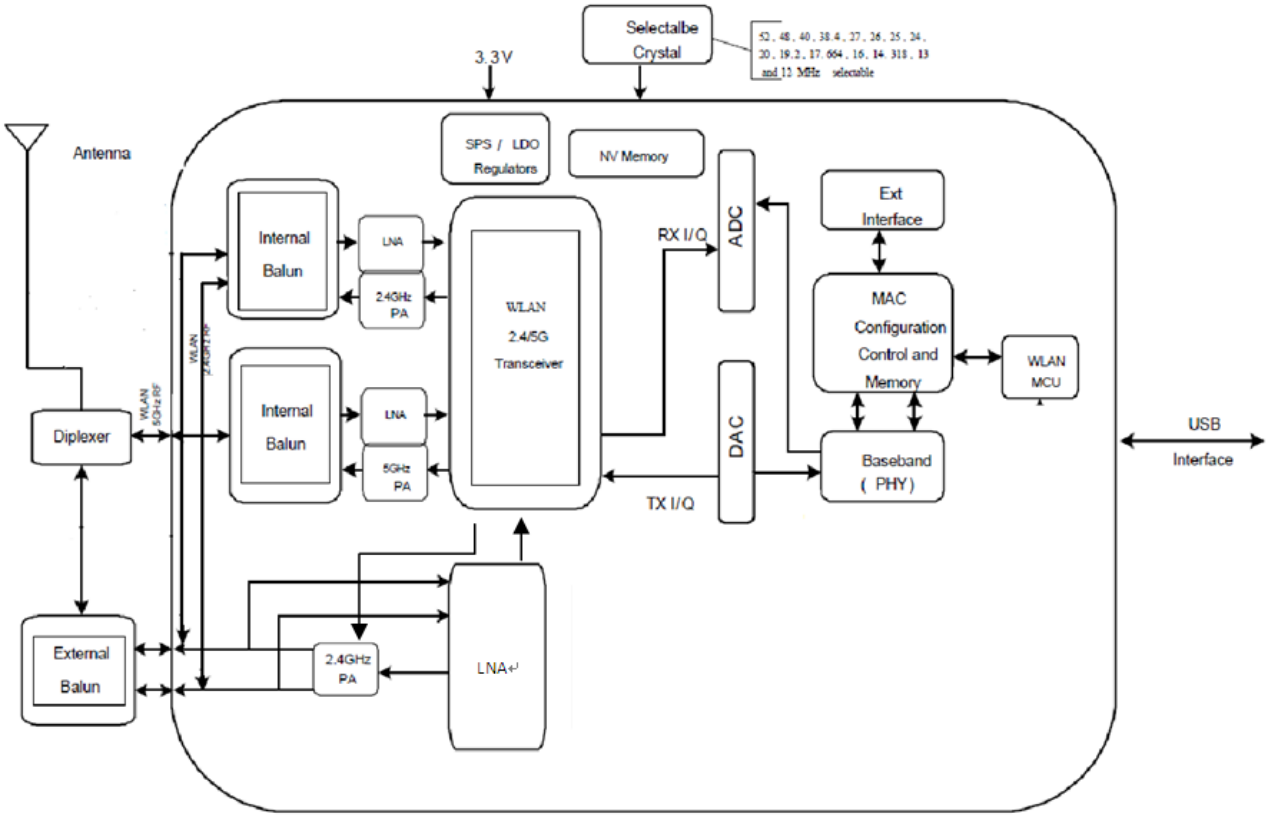

Figure 3 WiFi BL-M8811CU5 block diagram

3. Product Technical Specifications

3.1 General Specifications

Item	Description
Product Name	WiFi BL-M8811CU5
Main Chip	RTL8811CU
Host Interface	USB 2.0
IEEE Standards	IEEE 802.11a/b/g/n/ac
Operating Frequencies	2.4GHz~2.4835GHz, 5.15GHz~5.85GHz
Modulation	802.11b DSSS: CCK, DQPSK, DBPSK 802.11a/g OFDM: 64-QAM,16-QAM, QPSK, BPSK 802.11n OFDM: 64-QAM,16-QAM, QPSK, BPSK 802.11ac OFDM: 256-QAM, 64-QAM,16-QAM, QPSK, BPSK
Working Mode	Infrastructure, Ad-Hoc

Wireless Data Rate	802.11b: 1, 2 ,5.5,11Mbps 802.11a/g: 6,9,12,18,24,36,48,54Mbps 802.11n-2.4/5G HT20: MCS0~7, 6.5~72.2Mbps, 802.11n-2.4/5G HT40: MCS0~7, 13~150Mbps, 802.11ac-VHT20:MCS0~8,VHT40、80:MCS0~9,reach up to 433.3Mbps,
Rx Sensitivity	-96dBm (Min)
TX Power	18.5dBm (Max)
Antenna Type	Connect to external antenna through the IPEX
Dimension(L*W*H)	20.3*14.0*2.35mm (L*W*H) Tolerance:+/-0.15mm
Clock Source	40MHz
Working Temperature	-10 °C to +70 °C
Storage Temperature	-40 °C to +85 °C

3.2 DC Power Consumption

VDD=3.3V，Ta = 25 °C，unit: mA		
Supply current	Typ	Max
RX sense mode(No Link)	125	146

802.11b	1Mbps		11Mbps	
Supply current	Typ.	Max.	Typ.	Max.
Continuous TX mode	328	382	308	386
RX mode	141	160	143	164
802.11g	6Mbps		54Mbps	
Supply current	Typ.	Max.	Typ.	Max.
Continuous TX mode	294	336	292	330
RX mode	142	166	142	162
802.11n HT20 (2.4G)	MCS0		MCS7	
Supply current	Typ.	Max.	Typ.	Max.
Continuous TX mode	278	324	296	322
RX mode	140	164	141	160
802.11n HT40 (2.4G)	MCS0		MCS9	
Supply current	Typ.	Max.	Typ.	Max.
Continuous TX mode	280	326	292	320
RX mode	142	164	143	164
802.11a	6Mbps		54Mbps	

Supply current	Typ.	Max.	Typ.	Max.
Continuous TX mode	340	408	346	392
RX mode	162	182	163	180
802.11n HT20 (5G）	MCS0		MCS7	
Supply current	Typ.	Max.	Typ.	Max.
Continuous TX mode	334	398	330	380
RX mode	160	184	161	182
802.11n HT40 (5G)	MCS0		MCS7	
Supply current	Typ.	Max.	Typ.	Max.
Continuous TX mode	314	372	338	372
RX mode	163	182	162	181
802.11acVHT80	MCS0		MCS9	
Supply current	Typ.	Max.	Typ.	Max.
Continuous TX mode	304	360	328	364
RX mode	161	181	162	180

3.3 RF Parameters

WiFi 2.4G	Frequency (MHz)	Frequency (MHz)	Power Taget (dBm)	Tolerance (dBm)	Max. Tune-up Power(dBm)
IEEE 802.11b 1Mbps	1	2412	20.0	±1.5	21.5
	6	2437	20.0	±1.5	21.5
	11	2462	20.0	±1.5	21.5
IEEE 802.11g 6Mbps	1	2412	15.5	±1.5	17.0
	6	2437	15.5	±1.5	17.0
	11	2462	15.0	±1.5	16.5
IEEE 802.11n 20MHz MCS0	1	2412	15.5	±1.5	17.0
	6	2437	15.5	±1.5	17.0
	11	2462	15.0	±1.5	16.5
IEEE 802.11n 40MHz MCS0	3	2422	15.5	±1.5	17.0
	6	2437	15.5	±1.5	17.0
	9	2452	15.0	±1.5	16.5

WiFi 5G Band 1	Frequency (MHz)	Frequency (MHz)	Power Taget (dBm)	Tolerance (dBm)	Max. Tune-up Power(dBm)
IEEE 802.11a 6Mbps	36	5180	15.5	±2	17.5
	44	5220	15.5	±2	17.5
	48	5240	16.0	±2	18.0
IEEE 802.11n 20MHz MCS0	36	5180	16.0	±2	18.0
	44	5220	16.0	±2	18.0
	48	5240	15.5	±2	17.5
IEEE 802.11n 40MHz MCS0	38	5190	16.0	±2	18.0
	46	5230	16.5	±2	18.5
IEEE 802.11ac 80MHz MCS0	42	5210	15.5	±2	17.5

WiFi 5G Band 2	Frequency (MHz)	Frequency (MHz)	Power Taget (dBm)	Tolerance (dBm)	Max. Tune-up Power(dBm)
IEEE 802.11a 6Mbps	52	5260	16.0	±2	18.0
	56	5280	16.0	±2	18.0
	64	5320	16.0	±2	18.0
IEEE 802.11n 20MHz MCS0	52	5260	16.5	±2	18.5
	56	5280	16.5	±2	18.5
	64	5320	16.5	±2	18.5
IEEE 802.11n 40MHz MCS0	54	5270	17.0	±2	19.0
	62	5310	16.5	±2	18.5
IEEE 802.11ac 80MHz MCS0	58	5290	16.5	±2	18.5

WiFi 5G Band 3	Frequency (MHz)	Frequency (MHz)	Power Taget (dBm)	Tolerance (dBm)	Max. Tune-up Power(dBm)
IEEE 802.11a 6Mbps	100	5500	15.5	±2	17.5
	116	5580	16.0	±2	18.0
	140	5700	16.0	±2	18.0
IEEE 802.11n 20MHz MCS0	100	5500	16.0	±2	18.0
	116	5580	15.5	±2	17.5
	140	5700	16.5	±2	18.5
IEEE 802.11n 40MHz MCS0	102	5510	16.5	±2	18.5
	110	5550	16.0	±2	18.0
	134	5670	16.5	±2	18.5
IEEE 802.11ac 80MHz MCS0	106	5530	16.0	±2	18.0

WiFi 5G Band 4	Frequency (MHz)	Frequency (MHz)	Power Taget (dBm)	Tolerance (dBm)	Max. Tune-up Power(dBm)
IEEE 802.11a 6Mbps	149	5745	15.5	±2	17.5
	157	5785	15.0	±2	17.0
	165	5825	14.0	±2	16.0
IEEE 802.11n 20MHz MCS0	149	5745	15.0	±2	17.0
	157	5785	15.5	±2	17.5
	165	5825	15.0	±2	17.0
IEEE 802.11n 40MHz MCS0	151	5755	15.0	±2	17.0
	159	5795	14.5	±2	16.5
IEEE 802.11ac 80MHz MCS0	155	5775	14.5	±2	16.5

RF Test Report										
2.4G										
Mode	Rate(Mbps)	Power(dBm)			EVM(dB)			Sensitivity(dBm)		
		CH1	CH7	CH13	CH1	CH7	CH13	CH1	CH7	CH13
11b	1	17	17	17	-26	-26	-26	-96	-96	-96
	11	17	17	17	-23	-23	-23	-88	-88	-88
11g	6	16	16	16	-25	-25	-25	-91	-91	-91
	54	15	15	15	-30	-30	-30	-75	-75	-75
Mode	Rate(Mbps)	Power(dBm)			EVM(dB)			Sensitivity(dBm)		
		CH3	CH7	CH11	CH3	CH7	CH11	CH3	CH7	CH11

11n HT40	MCS0	16	16	16	-29	-29	-29	-88	-88	-88
	MCS7	14	14	14	-31	-31	-31	-70	-70	-70

RF Test Report												
5G												
Mode	Rate(Mbps)	Power(dBm)				EVM(dB)				Sensitivity(dBm)			
		CH 36	CH 100	CH 140	CH 161	CH 36	CH100	CH140	CH161	CH 36	CH 100	CH 140	CH 161
11a	6	15	15	15	15	-23	-23	-23	-25	-90	-90	-90	-90
	54	13	13	13	13	-30	-30	-30	-30	-73	-73	-73	-73
Mode	Rate(Mbps)	Power(dBm)				EVM(dB)				Sensitivity(dBm)			
		CH 38	CH 102	CH 142	CH 159	CH 38	CH102	CH142	CH159	CH 38	CH 102	CH 142	CH 159
11n HT40	MCS0	14	14	14	14	-27	-27	-27	-27	-88	-87	-87	-87
	MCS7	12	12	12	12	-31	-31	-31	-31	-69	-69	-69	-69
Mode	Rate(Mbps)	Power(dBm)				EVM(dB)				Sensitivity(dBm)			
		CH 42	CH 106	CH 138	CH 155	CH 42	CH106	CH138	CH155	CH 42	CH 106	CH 138	CH 155
11ac VHT80	MCS0	13	13	13	13	-28	-28	-28	-28	-83	-83	-83	-83
	MCS9	11	11	11	11	-34	-34	-34	-34	-59	-59	-59	-59

ESD CAUTION: Although this module is designed to be as robust as possible, Electrostatic Discharge (ESD) can damage this module. It must be protected from ESD at all times and handled under the protection of ESD.

4. Pin Assignments

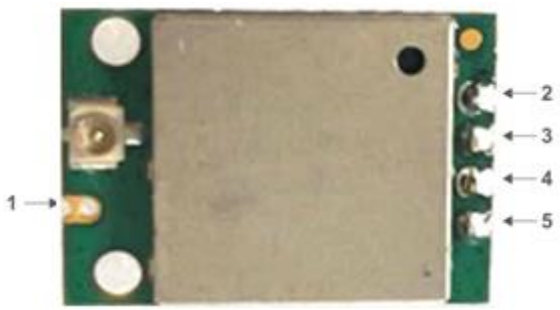

Figure 4 BL-M8811CU5 TOP View

PIN	Function	Description
1	NC	No attribute positioning hole
2	GND	Ground
3	UDP	USB Transmitter/Receiver Differential Pair
4	UDM	USB Transmitter/Receiver Differential Pair
5	VDD33	3.3V Power Supply

5. Typical Application Circuit

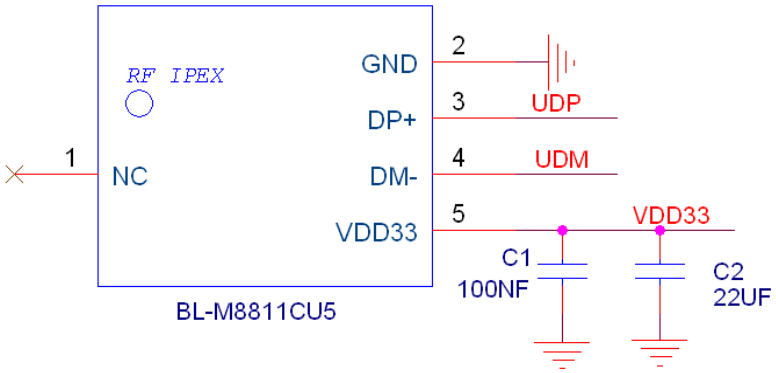

Figure 5 Typical application circuit

NOTE:

a. USB differential pair needs to keep 90ohm impedance.

b. Connect to external antenna through the IPEX

6. Mechanical Specifications

Module dimension, typical (L*W * H): 20.3mm*14.0mm*2.35mm, tolerance: +/-0.15mm

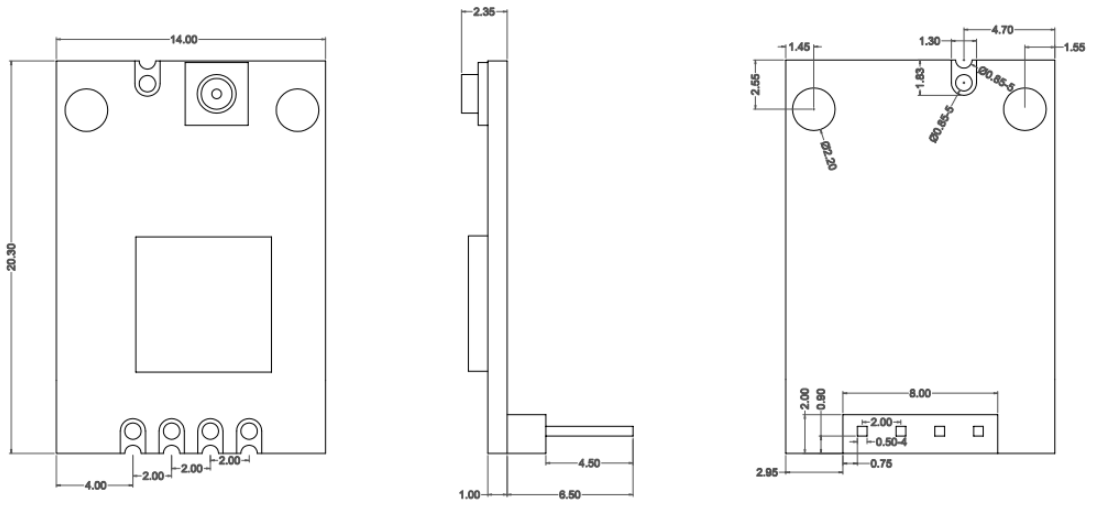

Figure 6 Module three view

NOTE:

a. The module USB interface uses 4-pin header, if need to connect through half hole please contact us, it could be made to order.

7. Others

7.1 Package Information

Figure 7 Package Information

7.2 Storage Temperature and Humidity

1. Storage Condition: Moisture barrier bag must be stored under 30℃, humidity under 85% RH. Humidity indicator cards must be blue, <30%.
2. Products require baking before mounting if humidity indicator cards reads > 30% temp < 30℃, humidity < 70% RH, over 96 hours.
   Baking condition: 125℃, 12 hours.
   Baking times: 1 time.

7.3 Recommended Reflow Profile

Reflow soldering shall be done according to the solder reflow profile,Typical Solder Reflow Profile is illustrated in Figures 15. The peak temperature is 245℃.

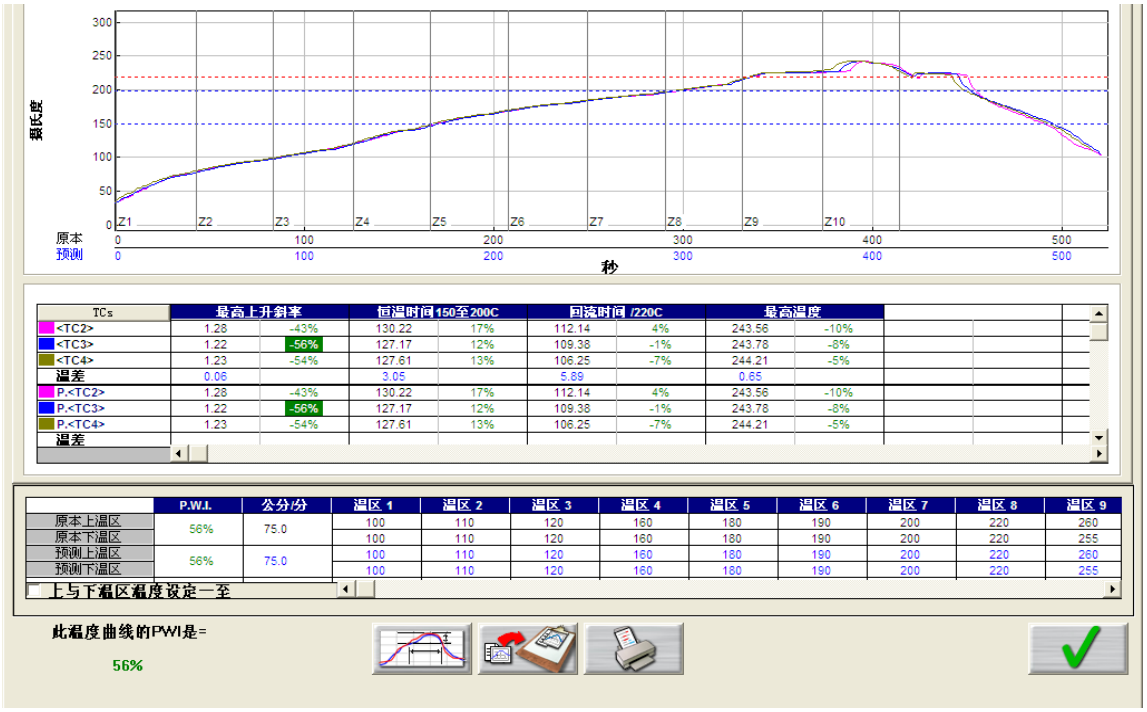

Figure 8 Typical Solder Reflow Profile