SPECIFICATION

SKI.WB800D.3 B21495

IEEE 802.11a/b/g/n/ac/ax 1T1R Wi-Fi Module

Integrated BT 5.2

Approved by Shikun		
Checked by	Rechecked by	Approved by
Hao Xu	Guitian Lv	Aaron Wu

Please send the original back to us after you have approved and signed.

Approved by customer		
Comments	Approved by	Company's seal
Customer's Name:		

REVISION HISTORY.

VERSION	DATE	BOARD ID	PAGE	DESCRIPTION	AUTHOR
V0.0	2021.6.16	SKI.WB800D.3A (21175)	All	First Issued	Fan
V1.0	2021.9.7	SKI.WB800D.3B(21272)	All	Modify module block diagram, Bluetooth power, physical diagram	Fan
V1.1	2021.11.24	SKI.WB800D.3B(21272)	All	Add reference schematics, furnace temperature marks, reliability standards	Fan
V1.2	2022.08.23	SKI.WB800D.3B(21495)	All	Added the description of power configuration	Fan

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1. Introduction

SKI.WB800D.3 module is based on AICSEMI AIC8800D solution.SKI.WB800D.3 is a Wi-Fi 6 / BT 5.2 combo low-power, high-performance and high-integrated wireless communication module， which is designed for meeting the customers' needs of small size and low cost. This module supports both WLAN and BT functions. Its WLAN/BT function supports the USB 2.0 interface, and the module meets the requirements of standard protocol IEEE 802.11 b/g/n/ax. Such units as power management, power amplifier and low-noise amplifier are integrated in the main chip of the module.This documentation describes the engineering requirements specification.

2. Features

Protocol	IEEE Std. 802.11b/g/a/n/ac/ax
	BT 5.2
Chip Solution	AIC8800D
Band	2.4GHz：2400~2483.5MHz 5GHz: **B1:**5150~5250MHz **B2:**5250~5350MHz **B3:**5350~5470MHz **B4:**5745~5825MHz
Bandwidth	20MHz/40MHz
Dimensions	19mm×17mm×3.2mm
Remark	

model	Install way	Supported Standards	Data rate	frequency band	antenna interface	remark
SKI.WB800D.3	SMD	IEEE 802.11a/b/g/n/ac/ax	229Mbps	2.4GHz/5GHz	Stamp hole *2	

3. Block Diagram

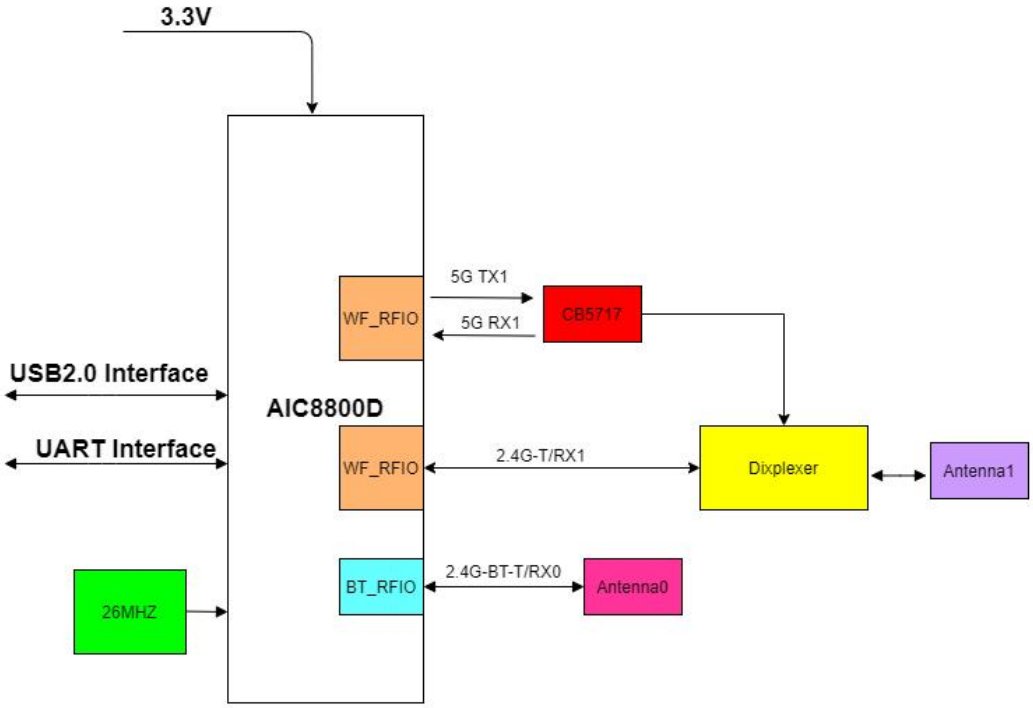
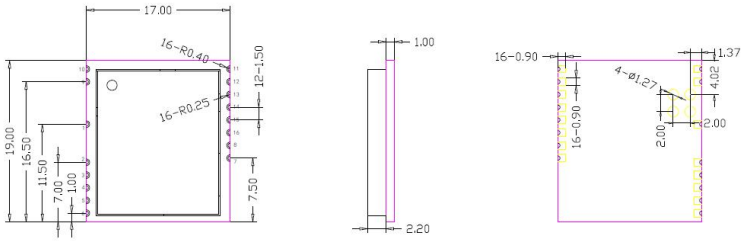


Figure 1 SKI.WB800D.3 Block Diagram

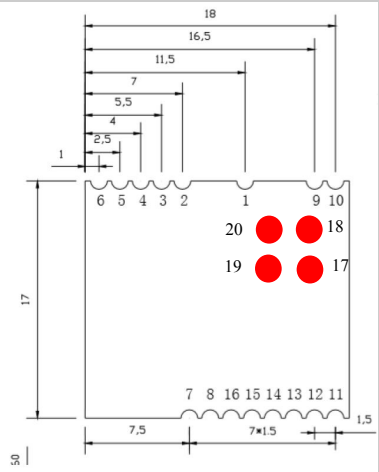
4. Package Outline and Mounting



模组俯视图　　模组侧视图　　模组底视图

NOTE:
1. 板内顶层器件最高2.2mm;
2. 模组外形尺寸公差为±0.15mm，板厚以及未标注公差为±0.1mm;

5. Pin Definition



PIN	SYMBOL	DESCRIPTION
1	LED	LED0
2	AGND	Ground
3	MAIN	Wi-Fi RF port0(2.4G+5G)connect to external antenna
4	AGND	Ground
5	AUX	Wi-Fi RF port1(BT)connect to external antenna
6	AGND	Ground
7	BT_DIS	BT Disable, L Active
8	WL_DIS	WIFI Disable, L Active
9	VDD33	3.3V input
10	AGND	Ground
11	WL_USB_DM	WLAN USB2.0 DM Signal
12	WL_USB_DP	WLAN USB2.0 DP Signal
13	AGND	Ground
14	PDN	Power Down, L Active
15	D_WAKE_H	WIFI Device Wake Host, L Active
16	H_WAKE_D	Host Wake WIFI Device, L Active
17	0_TX	WIFI&BT Uart0_TX
18	0_RX	WIFI&BT Uart0_RX
19	1_TX	BT Uart1_TX
20	1_RX	BT Uart1_TX

6. Product Pictures

top view

bottom view

Screen printing description:

(1) The character in the red box is the PCB model of the product;

(2) The characters in the yellow box are the product cycle number;

(3) Other characters are non-key characters and do not need to be controlled

7. Key Materials

serial number	Key name	model	Specifications/ Materials	remark
1	integrated circuit	AIC8800D	48-QFN	
2	PCB	SKI.WB800D.3	FR-4,4LAY	
3	crystal oscillator	SMD3225	26MHz	
4	Duplexer	SLFD18-5R950G-07T	/	
5	FEM	CB5717	/	

8. General Requirements

No.	Feature	Description
8-1	Operation Voltage	3.3V+/-0.3
8-2	Current Consumption	600mA
8-3	Ripple	120mV
8-4	Operation Temperature	0°C to +40°C
8-5	Antenna Type	External antenna
8-6	USB	High Speed USB 2.0 Interface
8-7	Storage Temperature	-40°C to +85°C

*** Ripple: The definition is the ripple requirement at the point where the motherboard supplies power to the module**

*RF Power Configuration Requirements

txpwr_index_2.4g:
[0]=8(ofdmlowrate)
[1]=8(ofdm64qam)
[2]=8(ofdm256qam)
[3]=8(ofdm1024qam)
[4]=8(dsss)

txpwr_index_5g:
[0]=9(ofdmlowrate)
[1]=9(ofdm64qam)
[2]=9(ofdm256qam)
[3]=8(ofdm1024qam)

The upper board needs to configure the userconfig value table according to the above requirements, so that the actual power value of the module is changed, if the above value is changed, a value is relatively increased or decreased by 2dBm, the adjustable range is (1~11), control requirements: according to the test performance requirements of the upper board, it can be relatively regulated.

9. Electrical Characteristics

The Test for electrical specification was performed under the following condition unless otherwise specified:

Ambient condition Temperature :25℃ ± 5℃;

Power supply voltages: 3.3V+/-0.3 input power at the Module;

9.1 IEEE 802.11b Section(2.4GHz)

Items	Contents				
Specification	IEEE802.11b				
Mode	CCK				
Channel	CH1 to CH13				
Data rate	1, 2, 5.5, 11Mbps				
TX Characteristics	Min.	Typ.	Max.	Unit	Remark
1. Power Levels(Calibrated)					
1) For antenna port (CCK 11M)	14.0	16.0	18.0	dBm	
2. Spectrum Mask @ target power					
1) fc +/-11MHz to +/-22MHz	-	-	-30	dBr	
2) fc > +/-22MHz	-	-	-50	dBr	
3 Constellation Error(EVM)@ target power					
1) 1Mbps	-	-	-10	dB	
2) 2Mbps	-	-	-10	dB	
3) 5.5Mbps	-	-	-10	dB	
4) 11Mbps	-	-	-10	dB	
4. Frequency Error	-20	-	20	ppm	
RX Characteristics	Min.	Typ.	Max.	Unit	
5 Minimum Input Level Sensitivity (each chain)					
1) 1Mbps (FER ≦8%)	-	-	-83	dBm	
2) 2Mbps (FER ≦8%)	-	-	-80	dBm	
3) 5.5Mbps (FER ≦8%)	-	-	-79	dBm	
4) 11Mbps (FER ≦8%)	-	-	-76	dBm	
6 Maximum Input Level (FER ≦8%)	-10	-	-	dBm	

9.2 IEEE 802.11g Section(2.4GHz)

Items	Contents
Specification	IEEE802.11g
Mode	OFDM
Channel	CH1 to CH13

Data rate	6, 9, 12, 18, 24, 36, 48, 54Mbps				
TX Characteristics	Min.	Typ.	Max.	Unit	Remark
1. Power Levels					
1) For antenna port（54M）	11.0	13.0	15.0	dBm	
2. Spectrum Mask @ target power					
1) at fc +/-11MHz	-	-	-20	dBr	
2) at fc +/-20MHz	-	-	-28	dBr	
3) at fc > +/-30MHz	-	-	-40	dBr	
3 Constellation Error(EVM)@ target power					
1) 6Mbps	-	-	-5	dB	
2) 9Mbps	-	-	-8	dB	
3) 12Mbps	-	-	-10	dB	
4) 18Mbps	-	-	-13	dB	
5) 24Mbps	-	-	-16	dB	
6) 36Mbps	-	-	-19	dB	
7) 48Mbps	-	-	-22	dB	
8) 54Mbps	-	-	-25	dB	
4 Frequency Error	-20	-	20	ppm	
RX Characteristics	Min.	Typ.	Max.	Unit	
5 Minimum Input Level Sensitivity (each chain)					
1) 6Mbps (PER ≦10%)	-	-	-85	dBm	
2) 9Mbps (PER ≦10%)	-	-	-84	dBm	
3) 12Mbps (PER ≦10%)	-	-	-82	dBm	
4) 18Mbps (PER ≦10%)	-	-	-80	dBm	
5) 24Mbps (PER ≦10%)	-	-	-77	dBm	
6) 36Mbps (PER ≦10%)	-	-	-73	dBm	
7) 48Mbps (PER ≦10%)	-	-	-69	dBm	
8) 54Mbps (PER ≦10%)	-	-	-65	dBm	
6 Maximum Input Level (PER ≦10%)	-20	-	-	dBm	

9.3 IEEE 802.11n HT20/40 Section(2.4GHz)

Items	Contents				
Specification	IEEE802.11n HT20/40@2.4GHz				
Mode	OFDM				
Channel	HT20:CH1 to CH13 HT40:CH3 to CH11				
Data rate (MCS index)	MCS0/1/2/3/4/5/6/7				
TX Characteristics	Min.	Typ.	Max.	Unit	
1. Power Levels					

1) For antenna port（MCS7）	11.0	13.0	15.0		dBm	
2. Spectrum Mask @ target power						
1) at fc +/-11MHz	-	-	-20		dBr	
2) at fc +/-20MHz	-	-	-28		dBr	
3) at fc > +/-30MHz	-	-	-45		dBr	
3. Constellation Error(EVM)@ target power						
1) MCS0	-	-	-5		dB	
2) MCS1	-	-	-10		dB	
3) MCS2	-	-	-13		dB	
4) MCS3	-	-	-16		dB	
5) MCS4	-	-	-19		dB	
6) MCS5	-	-	-22		dB	
7) MCS6	-	-	-25		dB	
8) MCS7	-	-	-28		dB	
4. Frequency Error	-20	-	20		ppm	
RX Characteristics	Min.	Typ.	Max.		Unit	
5.Minimum Input Level Sensitivity (each chain)			HT20	HT40		
1) MCS0 (PER ≦10%)	-	-	-82	-79	dBm	
2) MCS1 (PER ≦10%)	-	-	-79	-76	dBm	
3) MCS2 (PER ≦10%)	-	-	-77	-74	dBm	
4) MCS3 (PER ≦10%)	-	-	-74	-71	dBm	
5) MCS4 (PER ≦10%)	-	-	-70	-67	dBm	
6) MCS5 (PER ≦10%)	-	-	-66	-63	dBm	
7) MCS6 (PER ≦10%)	-	-	-65	-62	dBm	
8) MCS7 (PER ≦10%)	-	-	-64	-61	dBm	
7. Maximum Input Level (PER ≦10%)	-20	-	-		dBm	

9.4 IEEE 802.11ax HE20/40 Section(2.4GHz)

Items	Contents				
Specification	IEEE802.11ax HE20/40@2.4GHz				
Mode	OFDMA				
Channel	HE20:CH1 to CH13 HE40:CH3 to CH11				
Data rate (MCS index)	MCS0/1/2/3/4/5/6/7/8/9				
TX Characteristics	Min.	Typ.	Max.	Unit	
1. Power Levels (Calibrated)					
1) For antenna port（MCS9）	11.0	13.0	15.0	dBm	
2. Spectrum Mask @VHT20/VHT40 target power					
1) at fc +/-11MHz/21MHz/41MHz	-	-	-20	dBr	
2) at fc +/-20MHz/40MHz/80MHz	-	-	-28	dBr	
3) at fc +/-30MHz/60MHz/120MHz	-	-	-40	dBr	

3. Constellation Error(EVM)@ target power					
1) MCS0	-	-	-5	dB	
2) MCS1	-	-	-10	dB	
3) MCS2	-	-	-13	dB	
4) MCS3	-	-	-16	dB	
5) MCS4	-	-	-19	dB	
6) MCS5	-	-	-22	dB	
7) MCS6	-	-	-25	dB	
8) MCS7	-	-	-27	dB	
9) MCS8	-	-	-30	dB	
10) MCS9	-	-	-32	dB	
4. Frequency Error	-20	-	20	ppm	
RX Characteristics	Min.	Typ.	Max.	Unit	
5.Minimum Input Level Sensitivity (each chain)			HE20 / HE40		
1) MCS0 (PER ≦10%)	-	-	-82 / -79	dBm	
2) MCS1 (PER ≦10%)	-	-	-79 / -76	dBm	
3) MCS2 (PER ≦10%)	-	-	-77 / -74	dBm	
4) MCS3 (PER ≦10%)	-	-	-74 / -71	dBm	
5) MCS4 (PER ≦10%)	-	-	-70 / -67	dBm	
6) MCS5 (PER ≦10%)	-	-	-66 / -63	dBm	
7) MCS6 (PER ≦10%)	-	-	-65 / -62	dBm	
8) MCS7 (PER ≦10%)	-	-	-64 / -61	dBm	
9) MCS8(PER ≦10%)	-	-	-59 / -56	dBm	
10) MCS9(PER ≦10%)	-	-	-57 / -54	dBm	
6. Maximum Input Level (PER ≦10%)	-30	-	-	dBm	

9.5 IEEE 802.11a Section(5GHz)

Items	Contents				
Specification	IEEE802.11a				
Mode	OFDM				
Channel	CH36 to CH165				
Data rate (MCS index)	6, 9, 12, 18, 24, 36, 48, 54Mbps				
TX Characteristics	Min.	Typ.	Max.	Unit	
1. Power Levels (Calibrated)					
1) For antenna port（54M）	9.0	11.0	13.0	dBm	
2. Spectrum Mask @target power					
1) at fc +/-11MHz	-	-	-20	dBr	
2) at fc +/-20MHz	-	-	-28	dBr	
3) at fc > +/-30MHz	-	-	-40	dBr	
3. Constellation Error(EVM)@ target power					
1) 6Mbps	-	-	-5	dB	
2) 9Mbps	-	-	-8	dB	

3) 12Mbps	-	-	-10	dB	
4) 18Mbps	-	-	-13	dB	
5) 24Mbps	-	-	-16	dB	
6) 36Mbps	-	-	-19	dB	
7) 48Mbps	-	-	-22	dB	
8) 54Mbps	-	-	-25	dB	
4 Frequency Error	-20	-	20	ppm	
RX Characteristics	Min.	Typ.	Max.	Unit	
5 Minimum Input Level Sensitivity (each chain)					
1) 6Mbps (PER ≦10%)	-	-	-82	dBm	
2) 9Mbps (PER ≦10%)	-	-	-81	dBm	
3) 12Mbps (PER ≦10%)	-	-	-79	dBm	
4) 18Mbps (PER ≦10%)	-	-	-77	dBm	
5) 24Mbps (PER ≦10%)	-	-	-74	dBm	
6) 36Mbps (PER ≦10%)	-	-	-70	dBm	
7) 48Mbps (PER ≦10%)	-	-	-66	dBm	
8) 54Mbps (PER ≦10%)	-	-	-65	dBm	
6. Maximum Input Level (PER ≦10%)	-30	-	-	dBm	

9.6 IEEE 802.11n HT20/40 Section(5GHz)

Items	Contents				
Specification	IEEE802.11n HT20/40@5GHz				
Mode	OFDM				
Channel	HT20:CH36 to CH165 HT40:CH38 to CH163				
Data rate (MCS index)	MCS0/1/2/3/4/5/6/7				
TX Characteristics	Min.	Typ.	Max.	Unit	
1. Power Levels (Calibrated)					
1) For antenna port（MCS7）	9.0	11.0	13.0	dBm	
2. Spectrum Mask @target power					
1) at fc +/-11MHz	-	-	-20	dBr	
2) at fc +/-20MHz	-	-	-28	dBr	
3) at fc > +/-30MHz	-	-	-45	dBr	
3. Constellation Error(EVM)@ target power					
1) MCS0	-	-	-5	dB	
2) MCS1	-	-	-10	dB	
3) MCS2	-	-	-13	dB	
4) MCS3	-	-	-16	dB	
5) MCS4	-	-	-19	dB	
6) MCS5	-	-	-22	dB	
7) MCS6	-	-	-25	dB	

8) MCS7	-	-	-28		dB	
4. Frequency Error	-20	-	20		ppm	
RX Characteristics	Min.	Typ.	Max.		Unit	
5. Minimum Input Level Sensitivity (each chain)			HT20	HT40		
1) MCS0 (PER ≦10%)	-	-	-82	-79	dBm	
2) MCS1 (PER ≦10%)	-	-	-79	-77	dBm	
3) MCS2 (PER ≦10%)	-	-	-77	-74	dBm	
4) MCS3 (PER ≦10%)	-	-	-74	-70	dBm	
5) MCS4 (PER ≦10%)	-	-	-70	-66	dBm	
6) MCS5 (PER ≦10%)	-	-	-66	-65	dBm	
7) MCS6 (PER ≦10%)	-	-	-65	-64	dBm	
8) MCS7 (PER ≦10%)	-	-	-64	-61	dBm	
6. Maximum Input Level (PER ≦10%)	-30	-	-		dBm	

9.7 IEEE 802.11ac VHT20/40 Section(5GHz)

Items	Contents				
Specification	IEEE802.11ac VHT20/40@5GHz				
Mode	OFDM				
Channel	VHT20:CH36 to CH165 VHT40:CH38 to CH163				
Data rate (MCS index)	MCS0/1/2/3/4/5/6/7/8/9				
TX Characteristics	Min.	Typ.	Max.	Unit	
1. Power Levels (Calibrated)					
1) For antenna port（MCS9）	9.0	11.0	13.0	dBm	
2. Spectrum Mask @VHT20/VHT40 target power					
1) at fc +/-11MHz/21MHz/41MHz	-	-	-20	dBr	
2) at fc +/-20MHz/40MHz/80MHz	-	-	-28	dBr	
3) at fc +/-30MHz/60MHz/120MHz	-	-	-40	dBr	
3. Constellation Error(EVM)@ target power					
1) MCS0	-	-	-5	dB	
2) MCS1	-	-	-10	dB	
3) MCS2	-	-	-13	dB	
4) MCS3	-	-	-16	dB	
5) MCS4	-	-	-19	dB	
6) MCS5	-	-	-22	dB	
7) MCS6	-	-	-25	dB	
8) MCS7	-	-	-27	dB	
9) MCS8	-	-	-30	dB	
10) MCS9	-	-	-32	dB	
4. Frequency Error	-20	-	20	ppm	
RX Characteristics	Min.	Typ.	Max.	Unit	

5.Minimum Input Level Sensitivity			VHT20	VHT40		
1) MCS0 (PER ≦10%)	-	-	-82	-79	dBm	
2) MCS1 (PER ≦10%)	-	-	-79	-76	dBm	
3) MCS2 (PER ≦10%)	-	-	-77	-74	dBm	
4) MCS3 (PER ≦10%)	-	-	-74	-71	dBm	
5) MCS4 (PER ≦10%)	-	-	-70	-67	dBm	
6) MCS5 (PER ≦10%)	-	-	-66	-63	dBm	
7) MCS6 (PER ≦10%)	-	-	-65	-62	dBm	
8) MCS7 (PER ≦10%)	-	-	-64	-61	dBm	
9) MCS8(PER ≦10%)	-	-	-59	-56	dBm	
10) MCS9(PER ≦10%)	-	-	-57	-54	dBm	
6. Maximum Input Level (PER ≦10%)	-30	-	-		dBm	

9.8 IEEE 802.11ax HE20/40 Section(5GHz)

Items	Contents					
Specification	IEEE802.11ax HE20/40@5GHz					
Mode	OFDMA					
Channel	HE20:CH36 to CH165 HE40:CH38 to CH163					
Data rate (MCS index)	MCS0/1/2/3/4/5/6/7/8/9					
TX Characteristics	Min.	Typ.	Max.		Unit	
1. Power Levels (Calibrated)						
1) For antenna port（MCS9）	9.0	11.0	13.0		dBm	
2. Spectrum Mask @VHT20/VHT40 target power						
1) at fc +/-11MHz/21MHz/41MHz	-	-	-20		dBr	
2) at fc +/-20MHz/40MHz/80MHz	-	-	-28		dBr	
3) at fc +/-30MHz/60MHz/120MHz	-	-	-40		dBr	
3. Constellation Error(EVM)@ target power						
1) MCS0	-	-	-5		dB	
2) MCS1	-	-	-10		dB	
3) MCS2	-	-	-13		dB	
4) MCS3	-	-	-16		dB	
5) MCS4	-	-	-19		dB	
6) MCS5	-	-	-22		dB	
7) MCS6	-	-	-25		dB	
8) MCS7	-	-	-27		dB	
9) MCS8	-	-	-30		dB	
10) MCS9	-	-	-32		dB	
4. Frequency Error	-20	-	20		ppm	
RX Characteristics	Min.	Typ.	Max.		Unit	
5.Minimum Input Level Sensitivity			HE20	HE40		
1) MCS0 (PER ≦10%)	-	-	-82	-79	dBm	

2) MCS1 (PER ≦10%)	-	-	-79	-76	dBm	
3) MCS2 (PER ≦10%)	-	-	-77	-74	dBm	
4) MCS3 (PER ≦10%)	-	-	-74	-71	dBm	
5) MCS4 (PER ≦10%)	-	-	-70	-67	dBm	
6) MCS5 (PER ≦10%)	-	-	-66	-63	dBm	
7) MCS6 (PER ≦10%)	-	-	-65	-62	dBm	
8) MCS7 (PER ≦10%)	-	-	-64	-61	dBm	
9) MCS8(PER ≦10%)	-	-	-59	-56	dBm	
10) MCS9(PER ≦10%)	-	-	-57	-54	dBm	
6. Maximum Input Level (PER ≦10%)	-30	-	-		dBm	

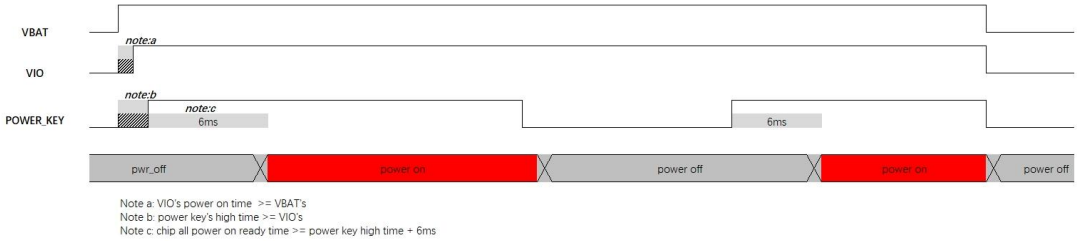
9.9 Bluetooth Section

Items	Contents				
Specification	BT2.1+EDR/4.2/5.2 with BLE				
Mode	FHSS,GFSK,DPSK,DQPSK				
Number of Channel	79 Channels				
Frequency Band	2.402 GHz ~2.480GHz				
	Min.	Typ.	Max.	Unit	Remark
1. Output Power	-	3.0	-	dBm	
2. Gain step	-	1	-	dB	
3. Receiver sensitivity (BER ≦0.1%)	-	-93.5	-80	dBm	
4. Maximum usable signal (BER ≦0.1%)	-	-5	-		
5. C/I co-channel (BER<0.1%)	-	4	11	dB	
6. C/I 1MHz (BER<0.1%)	-	-14	0	dB	
7. C/I 2MHz (BER<0.1%)	-	-42	-30	dB	
8. C/I≥3MHz (BER<0.1%)	-	-49	-40	dB	
9. C/I Image channel (BER<0.1%)	-	-25	-9	dB	
10. C/I Image 1MHz (BER<0.1%)	-	-50	-20	dB	
11. Inter-modulation	-	-13	-	dB	
12. Out-of-band blocking					
1). 30MHz to 2000MHz	-10	-	-	dBm	
2). 2000MHz to 2399MHz	-27	-	-	dBm	
3). 2498MHz to 3000MHz	-27	-	-	dBm	
4). 3000MHz to 12.75GHz	-10	-	-	dBm	
13. Modulation characteristics					
1). Δf1avg	140	157	175	KHz	
2). Δf2max (For at least 99.9% of all Δf2max)	115	140	-	KHz	
3). Δf1avg /Δf2avg	0.8	0.98	-	KHz	
14. ICFT	-75	±20	+75	KHz	
15. Carrier frequency drift					
1). One slot packet (DH1)	-25	±15	+25	KHz	
2). Two slot packet (DH3)	-40	±15	+40	KHz	
3). Five slot packet (DH5)	-40	±15	+40	KHz	

4). Max drift rate	-	6	20	KHz/50us	
16. TX output spectrum(20dB bandwidth)	-	922	1000	KHz	
17. In-Band spurious emission					
1). ±2MHz offset	-	-45	-20	dBm	
2). ±3MHz offset	-	-48	-40	dBm	
3). >±3MHz offset	-	-48	-40	dBm	

10. Reference Design

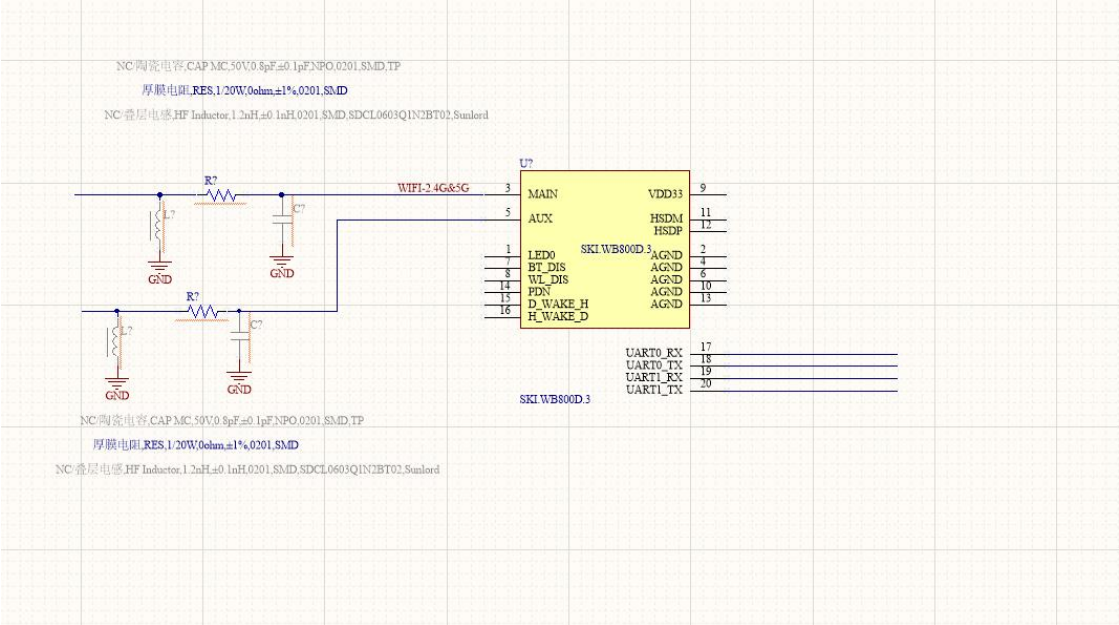
10.1 Timing specification



10.2 DC Electrical Characteistics

Symbol	Description	conditions	Min.	Typ.	Max.	Unit
VDD33	Power supplies	-	3.0	3.3	3.6	V
VDDIO	I/O input power supplies	-	3.0	3.3	3.6	V
			1.7	1.8	1.9	
I_{VDD33}	Power supply current	-	-	-	800	mA
I_{VDDIO}	I/O supply current	-	-	-	50	mA
V_{IH}	High-level input voltage	VDDIO=3.3V	VDDIO*0.625	-	VDDIO+0.3	V
		VDDIO=1.8V	VDDIO*0.65			
V_{IL}	Low-level input voltage	VDDIO=3.3V	-0.3	-	VDDIO*0.25	V
		VDDIO=1.8V			VDDIO*0.35	
V_{OH}	High-level output voltage	VDDIO=3.3V	VDDIO-0.4	-	VDDIO+0.3	V
		VDDIO=1.8V	VDDIO-0.2			
V_{OL}	Low-level output voltage	VDDIO=3.3V	-0.3	-	0.4	V
		VDDIO=1.8V			0.2	
R_{PU}	Internal pull-up resistor	VDDIO=3.3V	40	75	190	kΩ
		VDDIO=1.8V	10	50	100	
R_{PD}	Internal pull-down resistor	VDDIO=3.3V	40	75	190	kΩ
		VDDIO=1.8V	10	50	100	

10.3 Reference schematic



Reference schematic diagram

Note:

1. The MAIN is the WIFI-2.4G&5G antenna interface, and the AUX is the BT antenna interface, which needs to be controlled according to 50Ω impedance.

2. Ensure that the GND PIN near the antenna port is properly grounded (direct copper laying is recommended).

3. In order to facilitate the adjustment of RF performance, a π-type matching circuit should be reserved between RF_ANT and the antenna. The π circuit should be placed close to the antenna and the specifications should be selected according to the actual situation. When both the antenna and RF wiring have good performance, attach 0Ω through, and the NC of the devices on both sides is not attached. When the impedance of the antenna is mismatched, it can be matched and debuggable through this circuit.

4.RF wiring should be as short as possible, and avoid right and acute Angle wiring.

5. Try to reserve the UART0&UART1 cable design on the motherboard to facilitate RF performance testing and debugging.

11. Mechanical,Environmental and Reliability Tests

Test Items		Test Conditions	Qty	Criteria Condition
11-1	**Drop test**	The packed samples was tested at below condition: Drop height: 760mm(0.5~9.5kg) 610mm(9.5~18.5kg) Drop time: 1x corner, 3x	1xBox	After test, the outer box and inner box will not been broken by appearance visual inspection, and the products should be ok.

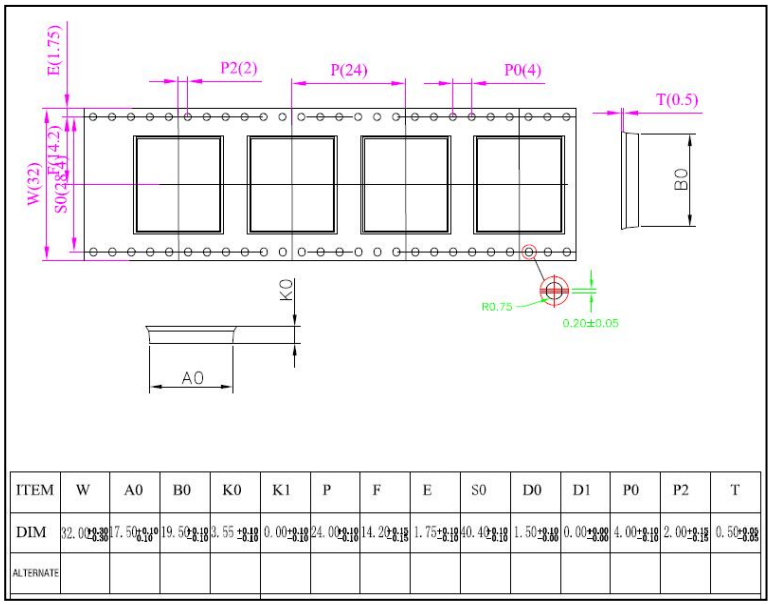
		edge and 6x face.		
11-2	**Vibration test**	X-Y-Z direction, first Frequency changing from 10Hz to 30Hz to 10Hz,amplitude 2.0mm, 5 times vibrations, 5x times vibration.	1xBox	After test, the outer box and inner box will not been broken by appearance visual inspection and the products should be ok.
11-3	**Soldering ability test (Only for SKI module)**	Soldering temperature: 245±5℃ Soldering duration: 3±0.5S	3	1.After soldering, the soldered area must be covered by a smooth bright solder layer, some deficiencies such as a small amount of the pinhole, not wetting are allowed, but the deficiencies can not be in the same place; 2. At least 90% of soldered area shall be covered continuously by the soldering material.
11-4	**High Temperature and Humidity Operation Test**	Leave samples in 60℃, 90% RH @ 24 hours	4	After test, the products appearance, power, EVM and frequency error functional parameter shall be satisfied with the test specification.
11-5	**Low Temperature Operation Test**	Leave samples in -15℃ @24 hours	4	After test, the products appearance, power, EVM and frequency error functional parameter shall be satisfied with the test specification.

11-6	**High Temperature and Humidity Start Test**	Leave samples in 60℃, 90% RH for 4x hours	4	After test, power on and off the samples for 3x tiems, the samples should be able to start normally
11-7	**Low temperature start test**	Leave samples in -15℃ for 4x hours	4	After test, power on and off the samples for 3x tiems, the samples should be able to start normally
11-8	**High Temperature and Humidity Storage Test**	Leave samples in 85℃, 95% RH @ 48 hours	4	After test, the products appearance, power, EVM and frequency error functional parameter shall be satisfied with the test specification.
11-9	**Low Temperature**	Leave samples in -40℃, @48 hours	4	After test, the products appearance, power, EVM and frequency error

	Storage Test			functional parameter shall be satisfied with the test specification.
11-10	**Thermal Shock Test**	-40~85℃，dwell time：30min，50cycles	4	After test, the products appearance, power, EVM and frequency error functional parameter shall be satisfied with the test specification.
11-11	**Aging Test**	60℃，120Hrs	10	The products at high temperature for a long time can continuous work normally
11-12	**Salt spray test**	NSS,35℃,PH:6.5~7.2, 24H	2	The Sample shall has no minor or major defects, such as physical damage, crack, corrosion, deformation etc;
11-13	**ESD**	Discharge voltage: 1kV C: 150pF Discharge resistance：330Ω Positive10 times 1 time for each second	3	The products can recoverable smoothly after ESD test.

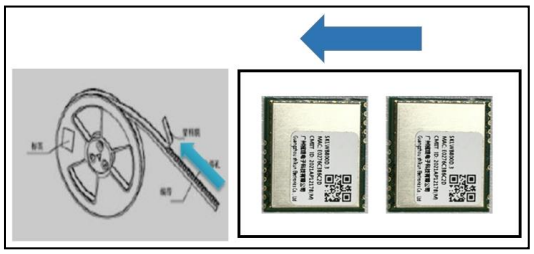
12. Package

（1）braid packaging

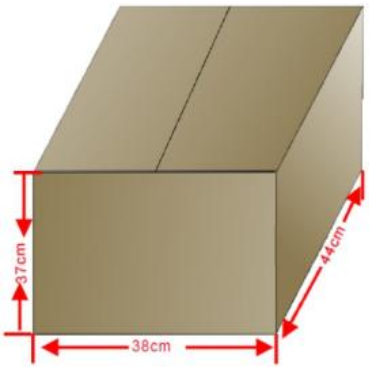


ITEM	W	A0	B0	K0	K1	P	F	E	S0	D0	D1	P0	P2	T
DIM	32.00±0.30	17.50±0.10	19.50±0.10	3.55±0.10	0.00±0.10	24.00±0.10	14.20±0.15	1.75±0.10	40.40±0.10	1.50±0.10	0.00±0.00	4.00±0.10	2.00±0.15	0.50±0.05
ALTERNATE														

（2）Braid direction



（3）Carton size



（4）Packing Quantity

Each plate is packed with 700 PCS, each box is packed with 7 PCS, the quantity of each box =700*7=4900pcs

13. Storage and Production

13.1 Storage requirements

This product has a humidity sensitivity of Class 4 (MSL4) and is shipped in vacuum sealed bags. Product handling, storage, and processing must follow IPC/JEDEC J-STD-033. When the ambient temperature is below 40 degrees Celsius and the air humidity is less than 90%, the product can be stored for 12 months under vacuum packaging. During the product storage period, if it is found that the vacuum packaging has air leakage, the humidity sensitive card discoloration reaches the baking standard, and the opening exposure time exceeds 72H, it needs to be used after baking.

13.2 Production parameters

The maximum furnace temperature shall not exceed 250℃, and 240℃ is recommended.

The recommended temperature curve of SMT welding furnace is shown in the figure below

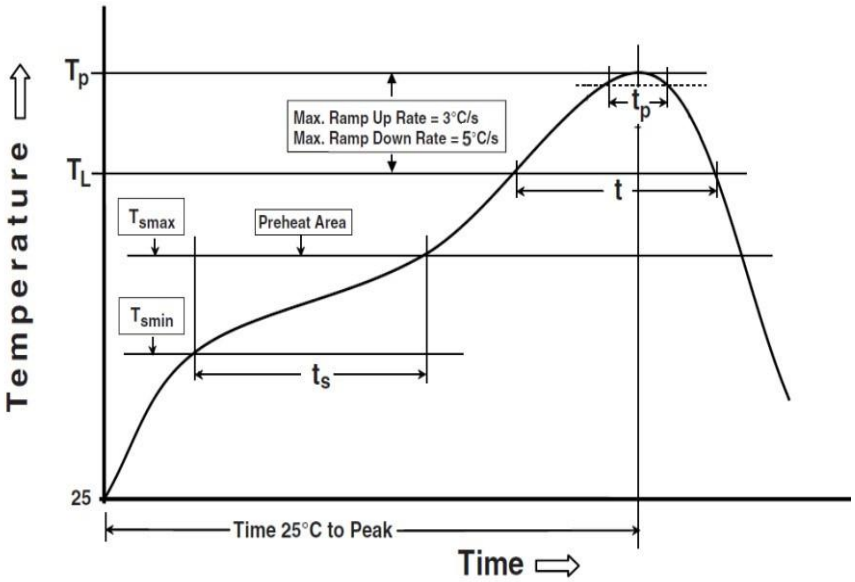


Figure 13-1 Recommended furnace temperature curve

Table 13-2 Parameters of the furnace temperature curve

Reflow Process	MIX	TYP	MAX	UNIT
Minimum temperature in preheating zone	150			℃
Maximum temperature of preheating zone			200	℃
Preheating rise time	60		120	s
Reflow zone heating rate (TL to Tp)			3	℃/s
Low temperature in reflow zone		220		℃
Peak temperature in reflow zone	235	240	250	℃
Reflow peak temperature time tp (Tp fluctuation range 5℃			30	s
Reflow Zone cooling rate (Tp to TL)	-5	-3	-1	℃/s
Reflux time	40		60	s

FCC Statement

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 inaccordance 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.

This equipment 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.

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

equipment.

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:2AL3T-WB800D" any similar wording that expresses the same meaning may be used.

This equipment 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 & your body. This transmitter must not be co-located or operating in conjunction with any other antenna or transmitter.

The module is limited to OEM installation ONLY.
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 Part 2.1093 and difference antenna configurations. There is requirement that the grantee provide guidance to the host manufacturer for compliance with Part 15B requirements.
The module complies with FCC Part 15.247 / Part 15.407 and apply for Single module approval.

Instructions for use

SKI.WB800D.3 is a Wi-Fi module used in commercial display, and the first batch of home appliances are IFPD and TV . The module is implemented by AIC8800D Wi-Fi IC, which is provided to customers in the form of modules. The hardware and software architecture based on the module can realize the networking and connect to the Wi-Fi router or Bluetooth equipment. The module meets the requirements of standard protocol IEEE 802.11 b/g/n/ax and Bluetooth 5.2 with BLE and it is connected to Main Soc by USB interface. The power management, power amplifier and low-noise amplifier are integrated in the AIC8800D chip of the module which provide a low power consumption for users.