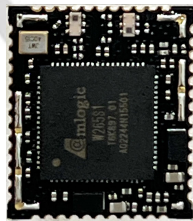


AW65S1-50B1(2)

IEEE 802.11a/b/g/n/ac/ax 2T2R+Bluetooth 5.2 Combo Module (Draft)



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1. Device Overview

1.1 Descriptions

The AW65S1-50B1(2) is a highly integrated module that supports 2T2R 802.11 a/b/g/n/ac/ax with Wireless LAN (WLAN) SDIO3.0 interface controller and Bluetooth 5.2 HS-UART interface controller. The max PHY data rate can reach up to 1201Mbps when operating at 80MHz bandwidth. The Bluetooth modem supports BDR,EDR2/EDR3 modulations, and LE1M, LE2M, LE2S and LE8S BLE rates.The AW65S1-50B1(2) MAC supports 802.11e for multimedia applications, 802.11i and WAPI for security.The AW65S1-50B1(2) provides a complete solution for a high-performance integrated wireless and Bluetooth device.It provides advanced wireless performance for 4k/8k video scenarios such as IPTV STB, smart TV, smart speaker, tablet and other consumer products. It is also applied to emerging applications like AR/VR, service robots, etc.

1.2 Features

1.2.1 General Features

- 32bit RISC-V MCU for Wi-Fi protocols and host offload
- 32bit RISC-V MCU for Bluetooth controller
- Supports 3.3V power supply
- SDIO 3.0 interface up to 208MHz
- High speed UART interface with hardware flow control
- Wi-Fi and Bluetooth co-existence
- Shared Bluetooth antenna with WLAN 2.4GHz
- LGA package
- 2 antennas version(AW65S1-50B1) and 3 antennas version(AW65P1-50B2)

1.2.2 Wi-Fi Key Features

- IEEE 802.11a/b/g/n/ac/ax compatible WLAN
- Supports two spatial streams 2T2R MIMO
- Supports 2.4GHz and 5GHz
- Supports 20/40/80MHz bandwidth and modulation up to 1024-QAM
- Supports MU-MIMO RX
- Supports OFDMA RX and TB OFDMA TX
- Supports SU/MU RX Beamformee
- Supports STBC and LDPC
- Supports DFS

- Supports Wake-on-WLAN with programmable magic packet
- Security features:
 - Supports WEP-40/WEP-104, AES/TKIP/CCMP/GCMP
 - Supports WPA/WPA2/WPA3 personal, WPA2/WPA3 enterprise
 - Supports WPS2.0
 - Supports WAPI

1.2.3 Bluetooth Key Features

- Supports Bluetooth v5.2 with BLE audio
- Supports dual mode BDR/EDR and BLE
- Supports LE 1Mbps, LE 2Mbps, and LE coded for Long Range
- Supports Bluetooth Class 1 or Class 2 TX output power
- Supports dedicated Bluetooth antenna, or shared Bluetooth antenna with WLAN 2.4GHz
- Supports Bluetooth/Wi-Fi coexistence
- Supports LE privacy, DPLE, and LE secure connection
- Supports SCO/eSCO and A2DP
- Supports LE isochronous channels
- Supports HS-UART and PCM interfaces
- Backward-compatible with previous Bluetooth standards

1.3 Functional Block Diagram

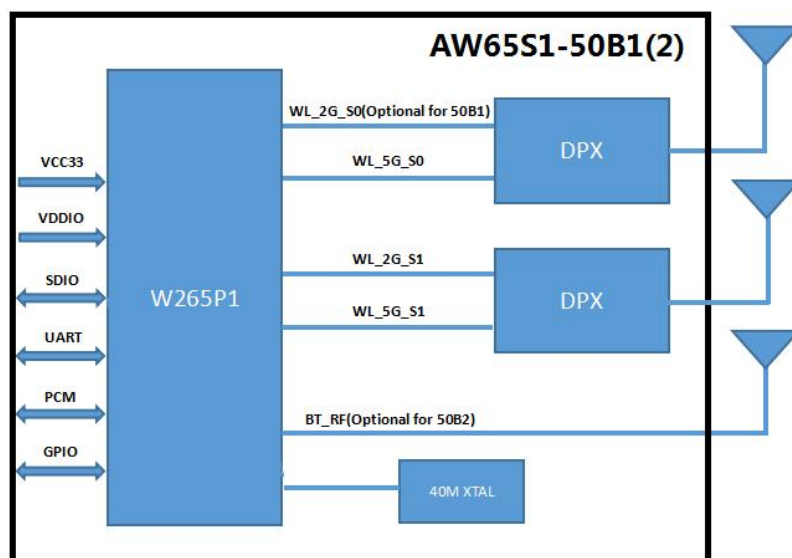


Figure 1. Block Diagram of AW65S1-50B1(2)

2. Pin Configuration and Functions

2.1 Module Pin Diagram

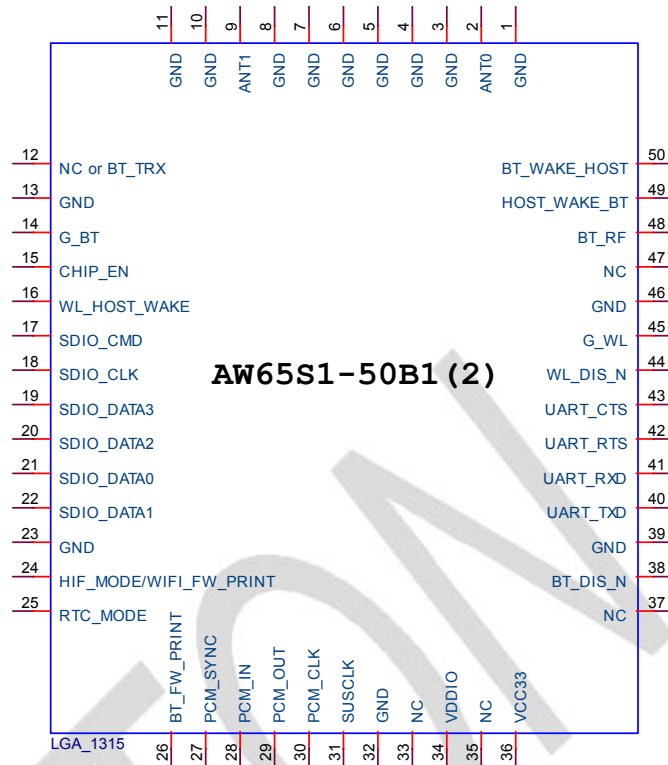


Figure 2.Pin Diagram of AW65S1-50B1(2)

2.2 Pin Functions

Pin	Name	Description
1	GND	Ground
2	ANT0	RF input/output of path WF0 WLAN(AW65S1-50B2) RF input/output of path WF0 WLAN and BT(AW65S1-50B1)
3	GND	Ground
4	GND	Ground
5	GND	Ground
6	GND	Ground
7	GND	Ground
8	GND	Ground
9	ANT1	RF input/output of path WF1 WLAN

10	GND	Ground
11	GND	Ground
12	NC or BT_TRX	No connect, keep floating
13	GND	Ground
14	G_BT	No connect, keep floating
15	CHIP_EN	Chip Enable/Disable Pin
16	WL_HOST_WAKE	WLAN wake up the Host
17	SDIO_CMD	SDIO Command Input
18	SDIO_CLK	SDIO Clock Input
19	SDIO_DATA3	SDIO Data Line 3
20	SDIO_DATA2	SDIO Data Line 2
21	SDIO_DATA0	SDIO Data Line 0
22	SDIO_DATA1	SDIO Data Line 1
23	GND	Ground
24	HIF_MODE/WIFI_FW_PRINT	Default Low.No connect, keep floating.
25	RTC_MODE	CHIP Interface select for ext rtc/inner rtc, 0: ext; 1,inner Default High.
26	BT_WF_PRINT	External Grant,default High.No connect, keep floating.
27	PCM_SYNC	Bluetooth PCM sync
28	PCM_IN	Bluetooth PCM input
29	PCM_OUT	Bluetooth PCM output
30	PCM_CLK	Bluetooth PCM clock
31	SUSCLK	32K Chip RTC clock input.
32	GND	Ground
33	NC	No connect, keep floating
34	VDDIO	1.8V/3.3V power supply
35	NC	No connect, keep floating
36	VCC33	3.3V power supply
37	NC	No connect, keep floating
38	BT_DIS_N	Bluetooth Chip Enable,Low asserting reset for Bluetooth core.

39	GND	Ground
40	UART_TXD	Bluetooth High-Speed UART Data Out
41	UART_RXD	Bluetooth High-Speed UART Data In
42	UART_RTS	Bluetooth High-Speed UART RTS
43	UART_CTS	Bluetooth High-Speed UART CTS
44	WL_DIS_N	WLAN Chip Enable,Low asserting reset for WLAN core.
45	G_WL	No connect, keep floating
46	GND	Ground
47	NC	No connect, keep floating
48	BT_RF	RF input/output port for BT(AW65S1-50B2) No connect for AW65S1-50B1
49	HOST_WAKE_BT	Host wake up BT
50	BT_WAKE_HOST	BT wake up Host

3. Specifications

3.1 General Characteristics

Category	Descriptions
Dimension	L*W*H :15.0mm (±0.2mm)*13.0mm (±0.2mm)*2.4mm (±0.2mm)
Chip-set	W265S1
Standard	IEEE 802.11a/b/g/n/ac/ax+BT 5.2
Modulation Type	CCK, OFDM (16 QAM/64 QAM/256 QAM/1024 QAM),OFDMA
Frequency Band	2400~2500MHz,4900-5845MHz
Interface	WLAN: SDIO, Bluetooth: UART
Data Security	WEP-40,WEP-104,AES/TKIP/CCMP/GCMP,WPA/WPA2/WPA3
Transmit Power	2.4G: 11b 11M:17dBm 11g 54M:16dBm 11n HT20 MCS7:15dBm 11n HT40 MCS7:15dBm 11ax HE20 MCS11:12dBm 11ax HE40 MCS11:12dBm 5G: 11a 54M:12dBm 11n HT20 MCS7:12dBm 11n HT40 MCS7:12dBm 11ac VHT20 MCS8:11dBm 11ac VHT40 MCS9:11dBm 11ac VHT80 MCS9:11dBm 11ax HE20 MCS11:10dBm 11ax HE40 MCS11:10dBm 11ax HE80 MCS11:10dBm
Rx Sensitivity	2.4G: 11b 11M:TBD@8% PER 11g 54M: -73@10% PER 11n HT20 MCS7: -70@10% PER 11n HT40 MCS7: -68@10% PER 11ax HE40 MCS11: -57@10% PER 5G: 11a 54M: -73@10% PER 11n HT20 MCS7: -71@10% PER

	11n HT40 MCS7: -70@10% PER 11ac VTH80 MCS9: -59@10% PER 11ax HE40 MCS11: -57@10% PER 11ax HE80 MCS11: -55@10% PER
Data Rate	802.11b [11,5.5,2 and 1Mbps] 802.11g [54,48,36,24,18,12,9&6Mbps] 802.11n HT20: up to 144.4Mbps 802.11n HT40: up to 300Mbps 802.11ac VHT80: up to 866.7Mbps 802.11ax HE20: up to 286.8Mbps 802.11ax HE40: up to 573.6Mbps 802.11ax HE80: up to 1201Mbps
Frequency Error	2.4GHz:<±25 ppm(11b),<±20 ppm(11g/n);5GHz:<±20 ppm
Ambient Temperature	0°C~70°C
Storage Temperature	-40°C~125°C
Antenna	External antenna
Operating System	Android, Linux
Operating Voltage	VCC33:3.3V VDDIO:3.3V or 1.8V

3.2 RF Characteristics

All measurements are made under nominal supply voltage, room temperature and conducted conditions at each antenna port rather than antenna.

3.2.1 Receiver RF Specifications

Parameter	Conditions		Min.	Nom.	Max.	Unit
Receive input frequency						
2.4GHz	802.11b/g/n/ax mode		2400	-	2500	MHz
Receiver sensitivity						
802.11b	1Mbps	FER<8%, Packet size= 1,024bytes	-	-	-82	dBm
	2Mbps		-	-	-80	dBm
	5.5Mbps		-	-	-78	dBm
	11Mbps		-	-	-76	dBm
802.11g	6Mbps	PER<10%, Packet size= 1,024bytes	-	-	-82	dBm
	9Mbps		-	-	-81	dBm
	12Mbps		-	-	-79	dBm

	18Mbps		-	-	-77	dBm
	24Mbps		-	-	-74	dBm
	36Mbps		-	-	-70	dBm
	48Mbps		-	-	-66	dBm
	54Mbps		-	-	-65	dBm
802.11n (HT20)	MCS0.	PER<10%, Packet size= 4,096bytes	-	-	-82	dBm
	MCS1.		-	-	-79	dBm
	MCS2		-	-	-77	dBm
	MCS3.		-	-	-74	dBm
	MCS4.		-	-	-70	dBm
	MCS5.		-	-	-66	dBm
	MCS6.		-	-	-65	dBm
	MCS7.		-	-	-64	dBm
802.11n (HT40)	MCS0.	PER<10%, Packet size= 4,096bytes	-	-	-79	dBm
	MCS1.		-	-	-77	dBm
	MCS2		-	-	-74	dBm
	MCS3.		-	-	-71	dBm
	MCS4.		-	-	-67	dBm
	MCS5.		-	-	-63	dBm
	MCS6.		-	-	-62	dBm
	MCS7.		-	-	-61	dBm
802.11ax (HE20)	MCS0.	PER<10%, Packet size= 4,096bytes	-	-	-82	dBm
	MCS1.		-	-	-79	dBm
	MCS2		-	-	-77	dBm
	MCS3.		-	-	-74	dBm
	MCS4.		-	-	-70	dBm
	MCS5.		-	-	-66	dBm
	MCS6.		-	-	-65	dBm
	MCS7.		-	-	-64	dBm
	MCS8.		-	-	-59	dBm
	MCS9.		-	-	-57	dBm
	MCS10.		-	-	-54	dBm
	MCS11.		-	-	-52	dBm
802.11ax (HE40)	MCS0.	PER<10%, Packet size= 4,096bytes	-	-	-79	dBm
	MCS1.		-	-	-76	dBm
	MCS2		-	-	-74	dBm

	MCS3.		-	-	-71	dBm
	MCS4.		-	-	-67	dBm
	MCS5.		-	-	-63	dBm
	MCS6.		-	-	-62	dBm
	MCS7.		-	-	-61	dBm
	MCS8.		-	-	-56	dBm
	MCS9.		-	-	-54	dBm
	MCS10.		-	-	-51	dBm
	MCS11.		-	-	-49	dBm
Maximum input level						
802.11b	FER<8%		-10	-	-	dBm
802.11g	FER<10%		-20	-	-	dBm
802.11n	FER<10%		-30			dBm
802.11ax	FER<10%		-20			dBm

Parameter	Conditions		Min.	Nom.	Max.	Unit
Receive input frequency						
5GHz	802.11a/n/ac/ax mode		4900	-	5845	MHz
Receiver sensitivity						
802.11a	6Mbps	FER<10%, Packet size= 1,024bytes	-	-	-82	dBm
	9Mbps		-	-	-81	dBm
	12Mbps		-	-	-79	dBm
	18Mbps		-	-	-77	dBm
	24Mbps		-	-	-74	dBm
	36Mbps		-	-	-70	dBm
	48Mbps		-	-	-66	dBm
	54Mbps		-	-	-65	dBm
802.11n (HT20)	6Mbps	PER<10%, Packet size= 4,096bytes	-	-	-82	dBm
	9Mbps		-	-	-79	dBm
	12Mbps		-	-	-77	dBm
	18Mbps		-	-	-74	dBm
	24Mbps		-	-	-70	dBm
	36Mbps		-	-	-66	dBm
	48Mbps		-	-	-65	dBm
	54Mbps		-	-	-64	dBm
802.11n	MCS0.		-	-	-79	dBm

(HT40)	MCS1.	PER<10%, Packet size= 4,096bytes	-	-	-77	dBm
	MCS2		-	-	-74	dBm
	MCS3.		-	-	-71	dBm
	MCS4.		-	-	-67	dBm
	MCS5.		-	-	-63	dBm
	MCS6.		-	-	-62	dBm
	MCS7.		-	-	-61	dBm
802.11ac (VHT80)	MCS0.	PER<10%, Packet size= 4,096bytes	-	-	-76	dBm
	MCS1.		-	-	-73	dBm
	MCS2		-	-	-71	dBm
	MCS3.		-	-	-68	dBm
	MCS4.		-	-	-64	dBm
	MCS5.		-	-	-60	dBm
	MCS6.		-	-	-59	dBm
	MCS7.		-	-	-58	dBm
	MCS8.		-	-	-53	dBm
	MCS9.		-	-	-51	dBm
802.11ax (HE80)	MCS0.	PER<10%, Packet size= 4,096bytes	-	-	-76	dBm
	MCS1.		-	-	-73	dBm
	MCS2		-	-	-71	dBm
	MCS3.		-	-	-68	dBm
	MCS4.		-	-	-64	dBm
	MCS5.		-	-	-60	dBm
	MCS6.		-	-	-59	dBm
	MCS7.		-	-	-58	dBm
	MCS8.		-	-	-53	dBm
	MCS9.		-	-	-51	dBm
	MCS10.		-	-	-48	dBm
	MCS11.		-	-	-46	dBm
Maximum input level						
802.11a	FER<10%		-30	-	-	dBm
802.11n	FER<10%		-30	-	-	dBm
802.11ac	FER<10%		-30	-	-	dBm
802.11ax	FER<10%		-30	-	-	dBm

3.2.2 Transmitter RF Specifications

Parameter	Condition	Min.	Nom.	Max.	Unit.
Receive input frequency					
802.11b/g/n/ax	2.4GHz	2400	-	2500	MHz
Transmit power					
802.11b	11Mbps	15	17	19	dBm
802.11g	54Mbps	14	16	18	dBm
802.11n	HT20, MCS7	13	15	17	dBm
	HT40, MCS7	13	15	17	dBm
802.11ax	HE20, MCS11	10	12	14	dBm
	HE40, MCS11	10	12	14	dBm
Spectrum mask					
802.11b	$f_c - 22\text{MHz} < f < f_c - 11\text{MHz} \& f_c + 11\text{MHz} < f < f_c + 22\text{MHz}$	-	-	-30	dBr
	$f_c - 55\text{MHz} < f < f_c - 22\text{MHz} \& f_c + 22\text{MHz} < f < f_c + 55\text{MHz}$	-	-	-50	dBr
802.11g	$f_c \pm 9\text{MHz}$	-	-	0	dBr
	$f_c \pm 11\text{MHz}$	-	-	-20	dBr
	$f_c \pm 20\text{MHz}$	-	-	-28	dBr
	$f_c \pm 30\text{MHz}$	-	-	-40	dBr
802.11n	$f_c \pm 9\text{MHz}$	-	-	0	dBr
	$f_c \pm 11\text{MHz}$	-	-	-20	dBr
	$f_c \pm 20\text{MHz}$	-	-	-28	dBr
	$f_c \pm 30\text{MHz}$	-	-	-45	dBr
802.11ax (HE40)	$f_c \pm 19.5\text{MHz}$	-	-	0	dBr
	$f_c \pm 20.5\text{MHz}$	-	-	-20	dBr
	$f_c \pm 40\text{MHz}$	-	-	-28	dBr
	$f_c \pm 60\text{MHz}$	-	-	-40	dBr
Center frequency tolerance					
802.11b		-25	-	+25	pmm
802.11g/n/ax		-20	-	+20	pmm
EVM (Error Vector Magnitude)*					
802.11b	1Mbps	-	-	35	%
	2Mbps	-	-	35	%
	5.5Mbps	-	-	35	%
	11Mbps	-	-	35	%

802.11g	6Mbps	-	-	-5	%
	9Mbps	-	-	-8	dB
	12Mbps	-	-	-10	dB
	18Mbps	-	-	-13	dB
	24Mbps	-	-	-16	dB
	36Mbps	-	-	-19	dB
	48Mbps	-	-	-22	dB
	54Mbps	-	-	-25	dB
802.11n	MCS0.	-	-	-5	dB
	MCS1.	-	-	-10	dB
	MCS2	-	-	-13	dB
	MCS3.	-	-	-16	dB
	MCS4.	-	-	-19	dB
	MCS5.	-	-	-22	dB
	MCS6.	-	-	-25	dB
	MCS7.	-	-	-28	dB
802.11ax	MCS0.	-	-	-5	dB
	MCS1.	-	-	-10	dB
	MCS2	-	-	-13	dB
	MCS3.	-	-	-16	dB
	MCS4.	-	-	-19	dB
	MCS5.	-	-	-22	dB
	MCS6.	-	-	-25	dB
	MCS7.	-	-	-27	dB
	MCS8.	-	-	-30	dB
	MCS9.	-	-	-32	dB
	MCS10.	-	-	-35	dB
	MCS11.	-	-	-35	dB

Remarks

EVM :
 <Test condition>
 Method: composite EVM method.
 Phase correction: Symbol-by-symbol correction.
 Channel estimation: Raw channel estimate Raw Long Symbols.
 Symbol timing correction: on.
 Frequency Sync: Long training symbol.

Parameter	Condition	Min.	Nom.	Max.	Unit.
Receive input frequency					
802.11a/n/ac/ax	5GHz	4900	-	5845	MHz
Transmit power					
802.11a	54Mbps	10	12	14	dBm
802.11n	HT20, MCS7	10	12	14	dBm
	HT40, MCS7	10	12	14	dBm
802.11ac	VHT20, MCS8	9	11	13	dBm
	VHT40, MCS9	9	11	13	dBm
	VHT80, MCS9	9	11	13	dBm
802.11ax	HE20, MCS11	8	10	12	dBm
	HE40, MCS11	8	10	12	dBm
	HE80, MCS11	8	10	12	dBm
Spectrum mask					
802.11a	$f_c \pm 9\text{MHz}$	-	-	0	dBr
	$f_c \pm 11\text{MHz}$	-	-	-20	dBr
	$f_c \pm 20\text{MHz}$	-	-	-28	dBr
	$f_c \pm 30\text{MHz}$	-	-	-40	dBr
802.11n	$f_c \pm 9\text{MHz}$	-	-	0	dBr
	$f_c \pm 11\text{MHz}$	-	-	-20	dBr
	$f_c \pm 20\text{MHz}$	-	-	-28	dBr
	$f_c \pm 30\text{MHz}$	-	-	-45	dBr
802.11ac (VHT80)	$f_c \pm 39\text{MHz}$	-	-	0	dBr
	$f_c \pm 41\text{MHz}$	-	-	-20	dBr
	$f_c \pm 80\text{MHz}$	-	-	-28	dBr
	$f_c \pm 120\text{MHz}$	-	-	-40	dBr
802.11ax (HE80)	$f_c \pm 39.5\text{MHz}$	-	-	0	dBr
	$f_c \pm 40.5\text{MHz}$	-	-	-20	dBr
	$f_c \pm 80\text{MHz}$	-	-	-28	dBr
	$f_c \pm 120\text{MHz}$	-	-	-40	dBr
Center frequency tolerance					
802.11a/n/ac/ax		-20	-	+20	pmm
EVM (Error Vector Magnitude)*					
802.11a	6Mbps	-	-	-5	%
	9Mbps	-	-	-8	dB
	12Mbps	-	-	-10	dB

	18Mbps	-	-	-13	dB
	24Mbps	-	-	-16	dB
	36Mbps	-	-	-19	dB
	48Mbps	-	-	-22	dB
	54Mbps	-	-	-25	dB
802.11n	MCS0.	-	-	-5	dB
	MCS1.	-	-	-10	dB
	MCS2	-	-	-13	dB
	MCS3.	-	-	-16	dB
	MCS4.	-	-	-19	dB
	MCS5.	-	-	-22	dB
	MCS6.	-	-	-25	dB
	MCS7.	-	-	-28	dB
802.11ac	MCS0.	-	-	-5	dB
	MCS1.	-	-	-10	dB
	MCS2	-	-	-13	dB
	MCS3.	-	-	-16	dB
	MCS4.	-	-	-19	dB
	MCS5.	-	-	-22	dB
	MCS6.	-	-	-25	dB
	MCS7.	-	-	-27	dB
	MCS8.	-	-	-30	dB
	MCS9.	-	-	-32	dB
802.11ax	MCS0.	-	-	-5	dB
	MCS1.	-	-	-10	dB
	MCS2	-	-	-13	dB
	MCS3.	-	-	-16	dB
	MCS4.	-	-	-19	dB
	MCS5.	-	-	-22	dB
	MCS6.	-	-	-25	dB
	MCS7.	-	-	-27	dB
	MCS8.	-	-	-30	dB
	MCS9.	-	-	-32	dB
	MCS10.	-	-	-35	dB
	MCS11.	-	-	-35	dB
Remarks					

EVM :

<Test condition>

Method: composite EVM method.

Phase correction: Symbol-by-symbol correction.

Channel estimation: Raw channel estimate Raw Long Symbols.

Symbol timing correction: on.

Frequency Sync: Long training symbol.

3.2.3 Bluetooth RF Specifications

Parameter	Conditions	Minimum	Typical	Maximum	Unit
Frequency range		2402		2480	MHz
RX sensitivity	1 Mbps	-	TBD	-	dBm
	2 Mbps	-	TBD	-	dBm
	3 Mbps	-	TBD	-	dBm
	LE1M	-	TBD	-	dBm
	LE2M	-	TBD	-	dBm
Initial carrier frequency offset		-24	5	24	KHz
Output power	Class 1/GFSK	-	5	-	dBm
	Class 2/GFSK	-	TBD	-	dBm

4. Application and Implementation

4.1 Application Diagram

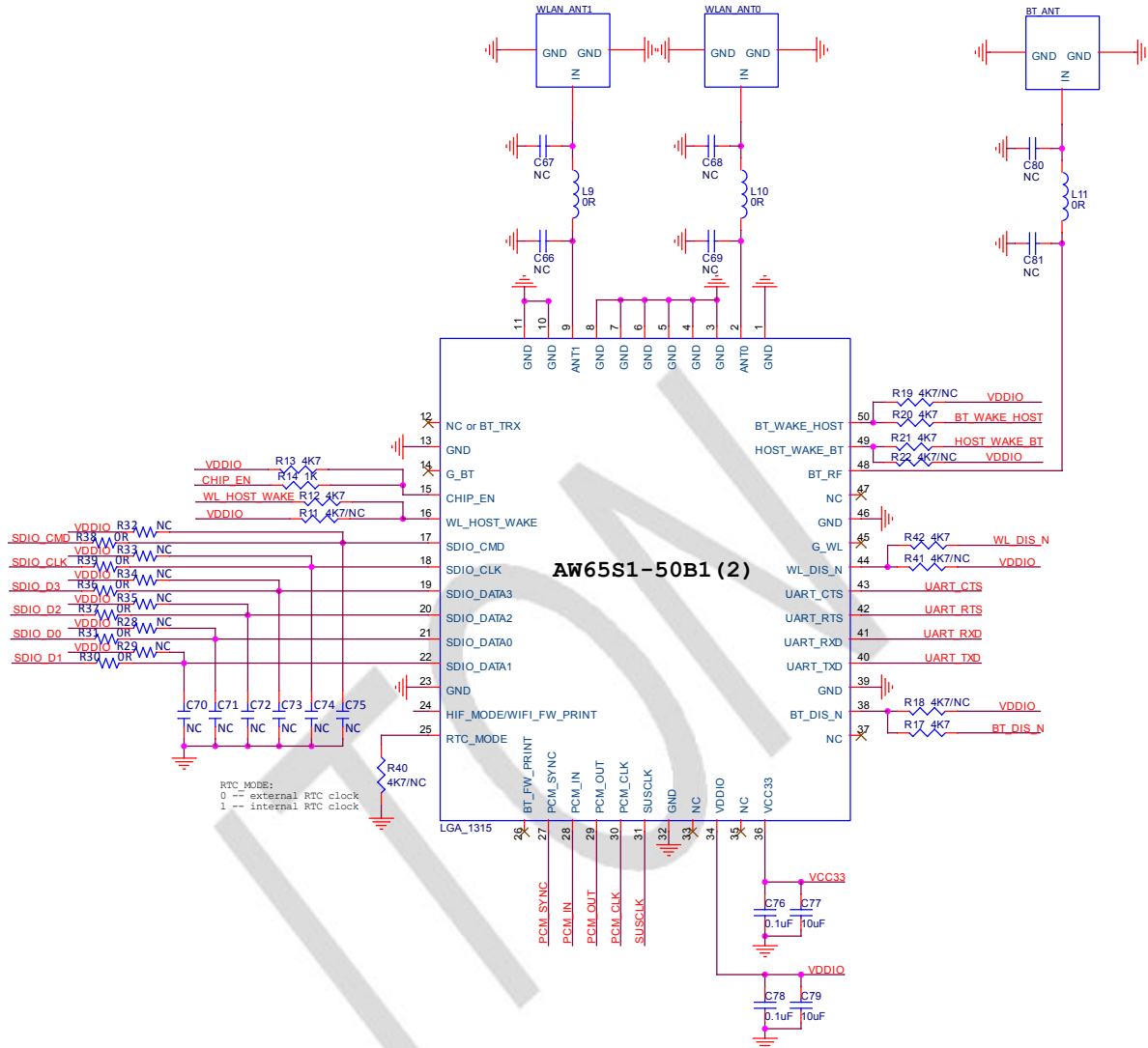


Figure 3. Application Schematic Diagram of AW65S1-50B1(2)

5. Mechanical and Package

5.1 Mechanical Size

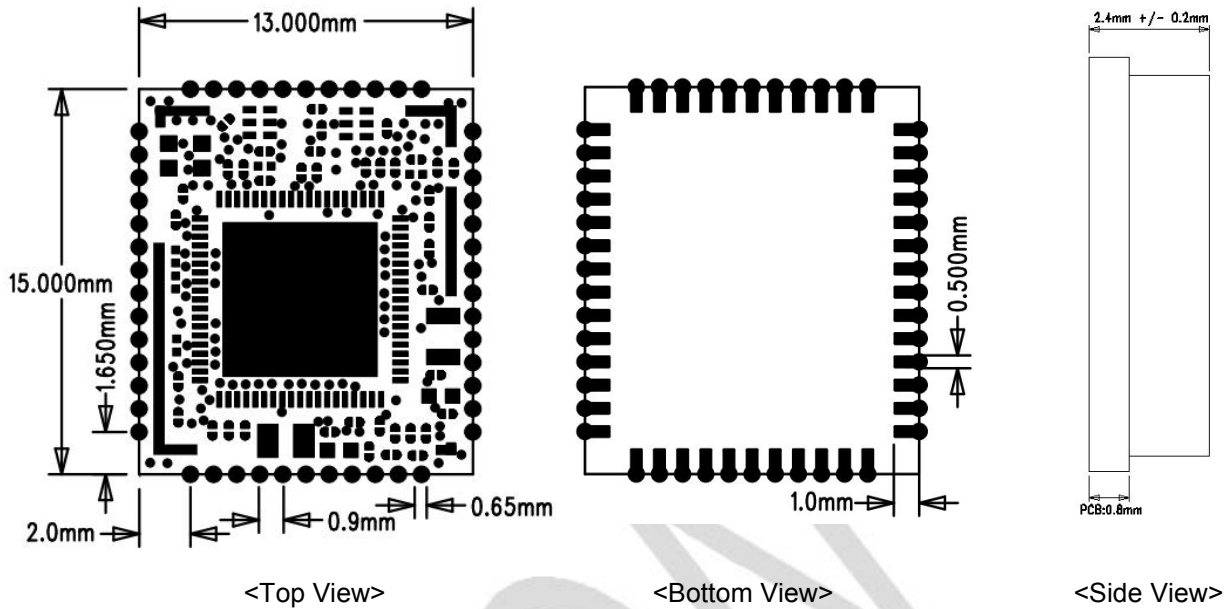


Figure 4. Mechanical Size of AW65S1-50B1(2)

5.2 Recommended Land Pattern

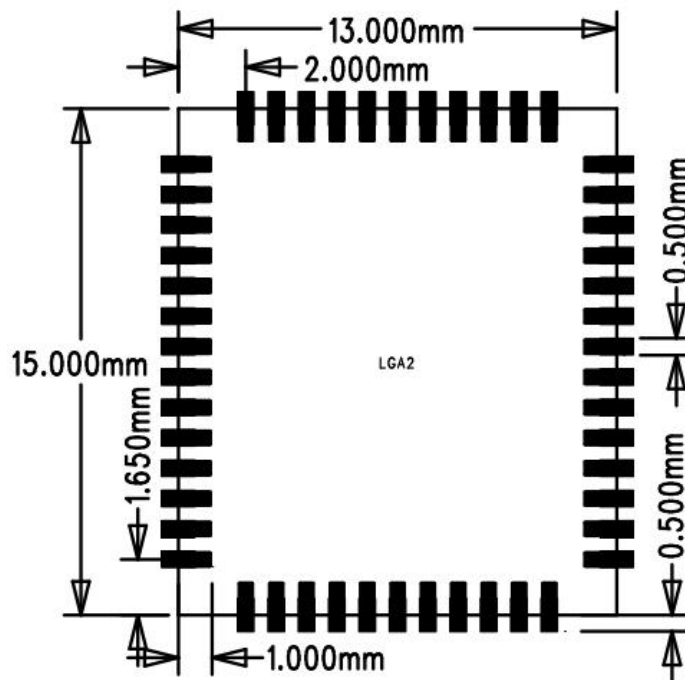


Figure 5. Recommended Land Pattern of AW65S1-50B1(2)

5.3 Package Information

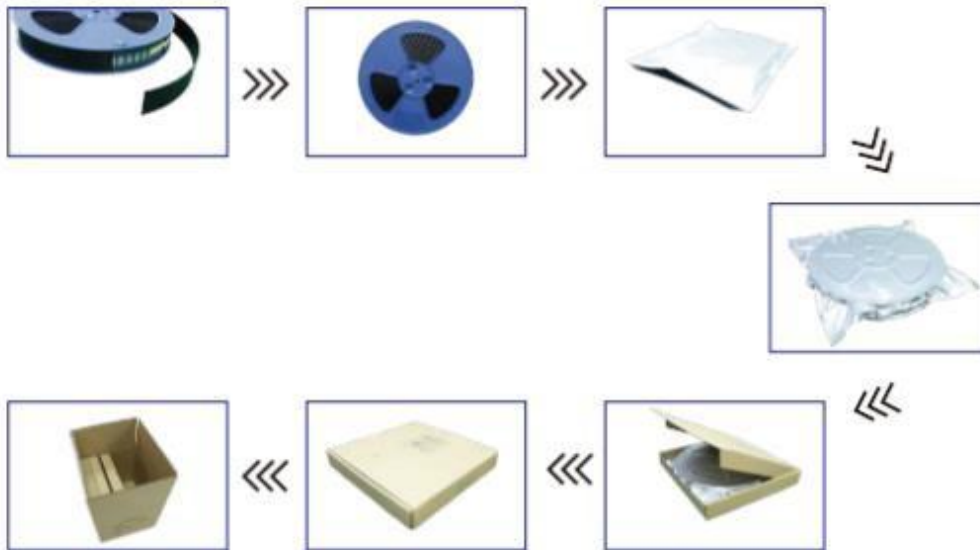


Figure 6. Brief Packaging Process of AW65S1-50B1(2) Modules

6. Thermal Reflow

Referred to IPC/JEDEC standard.

Peak temperature: <math><250^{\circ}\text{C}</math>

Number of times: ≤ 2

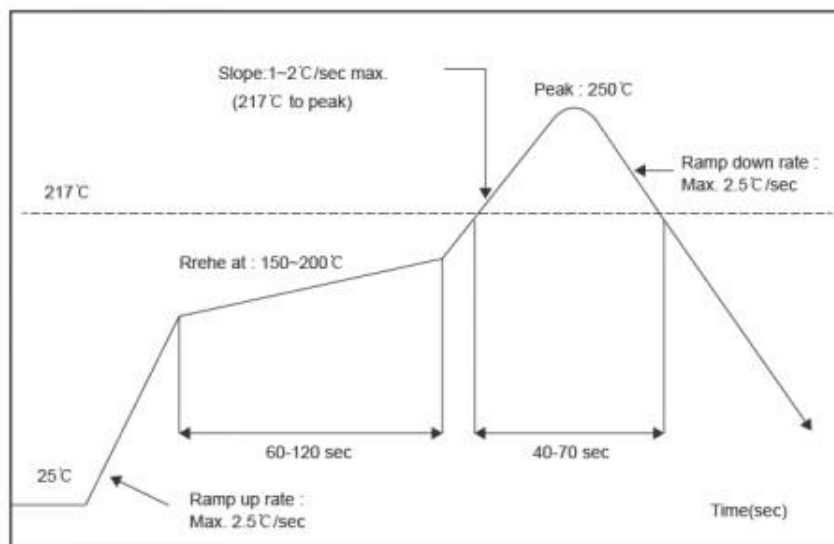


Figure 7. Recommended Reflow for Lead Free Solder

Note: The module is recommended not to go through reflow over twice.

7. Ordering Information

Part NO.	Working Voltage	ANT	Shielding Cover	Remark
AW65S1-50B1	3.3V	External antenna	Included	2 antennas
AW65S1-50B2	3.3V	External antenna	Included	3 antennas

8. Revision History

Version	Change Content	Reviser	Date
V0.1	Draft Version	Phil Ye	2023.03.20

FCC

The OEM must certify the final end product to comply with unintentional radiators (FCC Sections 15.107 and 15.109) before declaring compliance of the final product to Part 15 of the FCC rules and regulations. Integration into devices that are directly or indirectly connected to AC lines must add with Class II Permissive Change.

The OEM must comply with the FCC labeling requirements. If the module’s label is not visible when installed, then an additional permanent label must be applied on the outside of the finished product which states: “Contains transmitter module FCC ID: VYV-AW65S1-50B1” .

Additionally, the following statement should be included on the label and in the final product’s user manual:

“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 interferences, and

(2) this device must accept any interference received, including interference that may cause undesired

operation.” The module is limited to installation in applications. Separate approval is required for all other operating

configurations, including portable configuration with respect to Part 2.1093 and different antenna configurations. A

module or modules can only be used without additional authorizations if they have been tested and granted under the

same intended end - use operational conditions, including simultaneous transmission operations. When they have not

been tested and granted in this manner, additional testing and/or FCC application filing may be required. The most

straightforward approach to address additional testing conditions is to have the grantee responsible for the certification of

at least one of the modules submit a permissive change application. When having a module grantee file a permissive

change is not practical or feasible, the following guidance

provides some additional options for host manufacturers. Integrations using modules where additional testing and/or FCC

application filing(s) may be required are: (A) a module used in devices requiring additional RF exposure compliance

information (e.g., MPE evaluation or SAR testing); (B) limited and/or split modules not meeting all of the module

requirements; and (C) simultaneous transmissions for independent collocated transmitters not previously granted together.

This Module is full modular approval, it is limited to OEM installation ONLY. Integration into devices that are directly or

indirectly connected to AC lines must add with Class II Permissive Change. (OEM) Integrator has to assure compliance of the entire end product include the integrated Module.

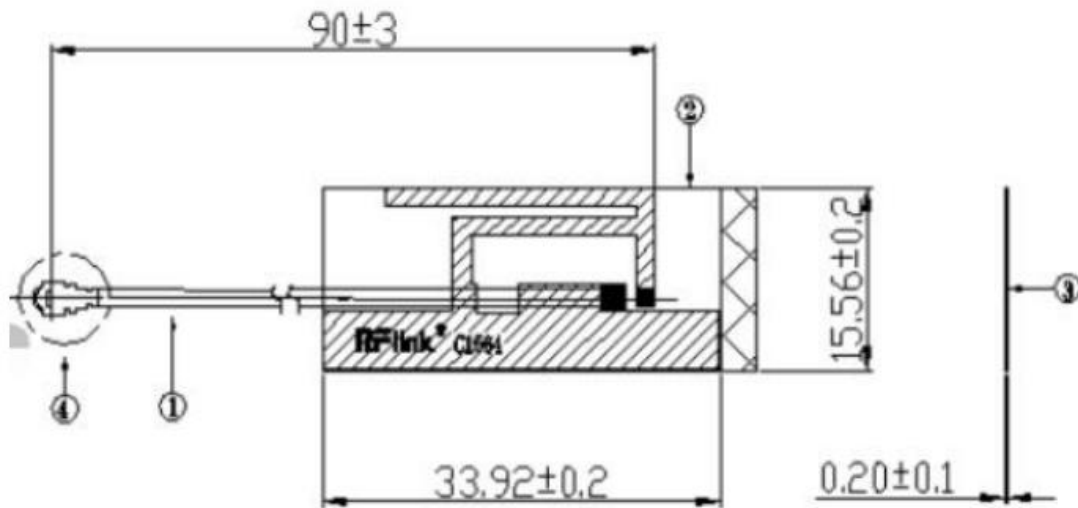
Additional measurements (15B) and/or equipment authorizations (e.g. Verification) may need to be addressed depending on co-location or simultaneous transmission issues if applicable. (OEM) Integrator is reminded to assure that these installation instructions will not be made available to the end user

The EUT is In door use only

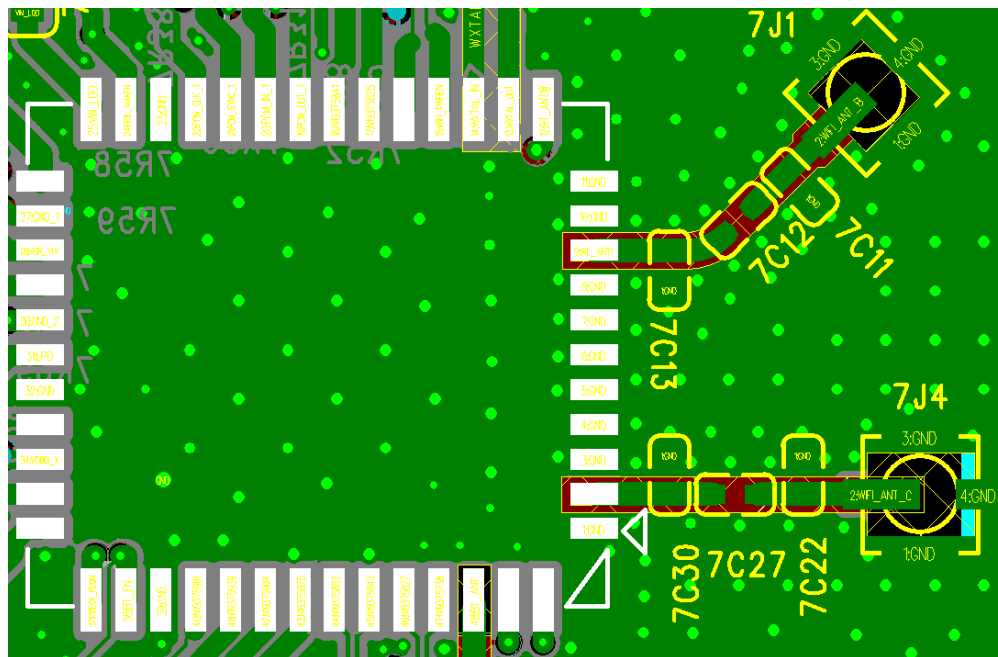


FPC antenna specification

You can see antenna size is 33.92mm*15.56mm* From below Specification.



Please refer to the chart below for PCB size of RF line terminal.



Scrape a GND off the side of the 7J1 and 7J4, connect the FPC antenna to the PCB at the position of the 7J1 and 7J4 connector.

[The line between the FPC antenna and the WiFi module] must be 50 ohm.

7C12 and 7C27 are 10pF Capacitors.