

BL-8822SSA3

IEEE 802.11a/b/g/n/ac 2T2R SDIO WIFIModule
Integrated Bluetooth 2.1/3.0/4.1

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.

SPEC

Shenzhen Bilian Electronic Co., Ltd

1. 1特性**Features:**

- Operating Frequencies : 2.412~2.4835GHz and 5.180~5.835GHz
- TX Power: 18.5dBm (Max)
- Modules need to be used at 0-60 degrees Celsius.The power supply voltage is 3.3V. The module needs to be welded to the PCB board of SDIO. The antenna is drawn from the PCB board. The PCB path between the antenna and the module is increased by 0R resistance. The antenna gain is 2dB. The inner part is copper tube structure.

1.2 接收制式**Reserving System**

IEEE Std. 802.11b

IEEE Std. 802.11g

IEEE Std. 802.11n

IEEE Std. 802.11a

IEEE Std. 802.11ac

Bluetooth 2.1/3.0/4.1

1. 3芯片方案**Chip Solution**

Realtek: RTL8822BS

2. 结构大小**Size**

3. 13.0mmx 15.0mm x 2.0mm

4. Introduction

BL-8822SSA3 module design is based on RTL8822BS-CG solution, The Realtek RTL8822BS-CG is a highly integrated single-chip that support 2-stream 802.11ac solutions with Multi-user MIMO

(Multiple-Input, Multiple-Output) with integrated Bluetooth 2.1/3.0/4.1 controller, SDIO (SDIO 1.1/2.0/3.0) interface, and HS-UART mixed interface. It combines a WLAN MAC, a 2T2R capable WLAN baseband, and RF in s single chip. The RTL8822BS-CG provides a complete

solution for a high-performance integrated wireless and Bluetooth device. **1.1 RF module**

4.1 Overview

The general HW architecture for the module is shown in Figure 1.

Figure

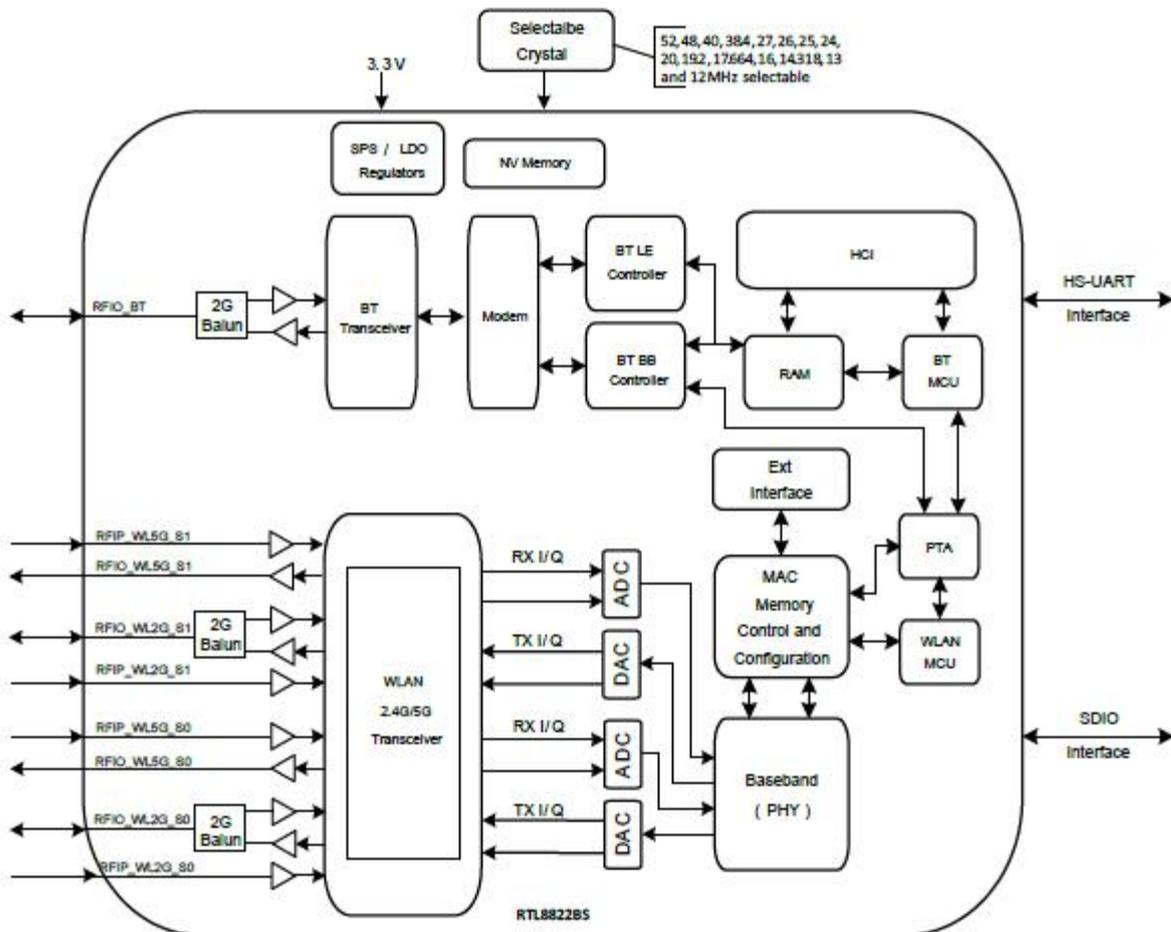


Figure 3 BL-M8811CU2 block diagram

4.2 Specification reference

This specification is based on additional references listed below.

- _ IEEE Std. 802.11b
- _ IEEE Std. 802.11g
- _ IEEE Std. 802.11n
- _ IEEE Std. 802.11a
- _ IEEE Std. 802.11ac
- _ BT 2.1/3.0/4.1

4.3 System Functions

Table1: General Specification as below:

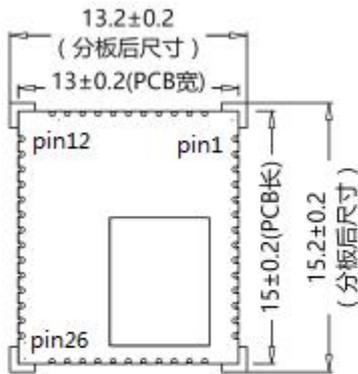
Main Chipset	RTL8822BS
Operating Frequency	2.4G/5G
WIFI Standard	802.11a/b/g/n/ac (2x2)
Bluetooth	2.1/3.0/4.1
Modulation	WIFI:11b: DBPSK, DQPSK and CCK and DSSS 11a/g: BPSK, QPSK, 16QAM, 64QAM and OFDM 11n: BPSK, QPSK, 16QAM, 64QAM and OFDM 11ac: BPSK, QPSK, 16QAM, 64QAM,256QAM and OFDM BT:FSHH,GFSK,DPSK,DQPSK
Data rates	11b: 1, 2, 5.5 and 11Mbps 11g: 6, 9, 12, 18, 24, 36, 48 and 54 Mbps 11n: MCS0~15, up to 300Mbps 11ac:MCS0~9,Nss=2,up to 866.7Mbps BT2.0:up to 3Mbps BT3.0/4.1:up to 24Mbps
Form factor	50pins
Host Interface	SDIO/UART/PCM
PCB Stack	4-layers design
Dimension	Typical, 13.0mmx 15.0mm x 1.8mm
Antenna	External Antennas Design
Operation Temperature	0°C to +60°C
Storage Temperature	-15°C to +45°C
Operation Voltage	3.0V~3.6V

5. Mechanical Specification

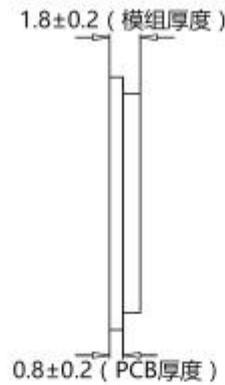
5.1 Mechanical Outline Drawing

Typical Dimension (W x L): 13.0mmx 15.0mm x 1.8mm

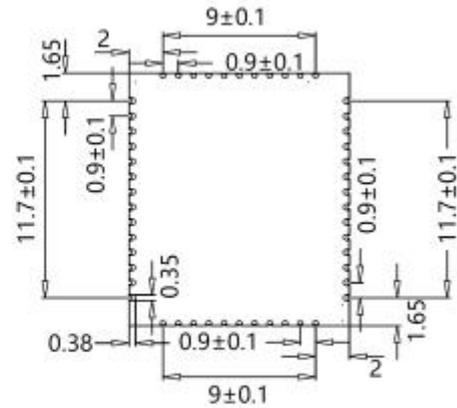
General tolerance: $\pm 0.2\text{mm}$;



正面视图



侧面视图



背面视图

Pin	Define	Description	Pin	Define	
1	GND	GND	26	Not connect	Not connect
2	S0	WIFI ANTB	27	PCM_SYNC	PCM Synchronization control, shared with GPIO2
3	GND	GND	28	PCM_IN	PCM data Input, shared with GPIO0
4	GND	GND	29	PCM_OUT	PCM data Out, shared with GPIO1
5	GND	GND	30	PCM_CLK	PCM Clock, shared with GPIO3
6	GND	GND	31	SUSCLK	Shared with EECS. External 32K or RTC clock input
7	GND	GND	32	GND	GND
8	GND	GND	33	Not connect	Not connect
9	S1	WIFI ANTA	34	VDD_GPIO	3.3V/1.8V Supply for GPIO(3.3V Recommended First)
10	GND	GND	35	Not connect	
11	GND	GND	36	VDD_3.3V	VDD INPUT(3.3V)
12	BT RF	BT RF	37	Not connect	Not connect
13	Not connect	Not connect	38	BT_DIS_N	Shared with GPIO11. This



					pin can externally shut down the RTL8822BS-CG BT function when BT_DIS# is pulled Low. When this pin is pulled low, UART interface will be also disabled. This pin can be also defined as the BT Radio-off function with host interface remaining connected
14	Not connect	Not connect	39	GND	GND
15	WL_DIS_N	Shared with GPIO15. This pin can externally shut down the RTL8822BS-CG, WLAN function when WL_DIS# is pulled low. When this pin is pulled low, SDIO interface will be disabled. This pin can also be configured as the WLAN Radio-off function with host interface remaining connected.	40	UART_TX	High-Speed UART Data Out
16	SD_WAKE	SDIO WAKE	41	UART_RX	High-Speed UART Data In
17	SD_CMD	SDIO Command Input	42	GND	GND
18	SD_CLK	SDIO Clock Input	43	UART_CTS	High-Speed UART CTS
19	SD_D3	SDIO Data Line 3	44	SD_RESET	SDIO RESET
20	SD_D2	SDIO Data Line 2	45	Not connect	Not connect
21	SD_D0	SDIO Data Line 0	46	Not connect	Not connect
22	SD_D1	SDIO Data Line 1	47	Not connect	Not connect
23	GND	GND	48	Not connect	Not connect
24	OOB	OOB	49	BT_WAKE	BT WAKE
25	Not connect	Not connect	50	UART_WAKE	UART WAKE

5.2 Pin define: (引脚对应正面视图)

5.3 SDIO Bus Speed Mode Choose:

Bus Speed Mode ^{*1}	Max. Bus Speed [MB/s]	Max. Clock Frequency [MHz]	Signal Voltage [V]	Max. Current ^{*2} [mA/3.6V VDD]		
				SDSC ^{*3}	SDHC ^{*4}	SDXC ^{*5}
SDR104	104	208	1.8	-	800 ^{*6}	800 ^{*6}
SDR50	50	100	1.8	-	400	400
DDR50	50	50	1.8	-	400	400
SDR25	25	50	1.8	-	200	200
SDR12	12.5	25	1.8	-	100	100/150 ^{*7}
High Speed	25	50	3.3	200	200	200
Default Speed	12.5	25	3.3	100	100	100/150 ^{*7}

5.4 Product Picture



TOP VIEW

6. Electrical Specification

This Specification is based-on conductive DVT testing result. The extreme condition include overall temperature (0°C,+25°C,+40°C) and overall voltage (3.0V,3.3V,3.6V).

6.1 IEEE 802.11g /a Section:

Items	Contents				
Specification	IEEE802.11g & IEEE802.11a				
Mode	BPSK, QPSK, 16QAM, 64QAM and OFDM				
Channel	CH1 to CH13 @ 11g CH36 to CH165 @ 11a				
Data rate	6, 9, 12, 18, 24, 36, 48, 54Mbps				
TX Characteristics	Min.	Typ.	Max.	Unit	Remark
1. Power Levels					
1) 15dBm Target (For Each antenna port) @ 11g	13	15	17	dBm	
2) 14dBm Target (For Each antenna port) @ 11a	12	14	16	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					
1) IEEE802.11g	-10	-	10	ppm	
2) IEEE802.11a	-10	-	10	ppm	
RX Characteristics	Min.	Typ.	Max.	Unit	
5. Minimum Input Level Sensitivity(each chain)					
1) 6Mbps (PER \leq 10%)	-	-	-87	dBm	
2) 9Mbps (PER \leq 10%)	-	-	-86	dBm	
3) 12Mbps (PER \leq 10%)	-	-	-84	dBm	
4) 18Mbps (PER \leq 10%)	-	-	-82	dBm	
5) 24Mbps (PER \leq 10%)	-	-	-79	dBm	
6) 36Mbps (PER \leq 10%)	-	-	-75	dBm	
7) 48Mbps (PER \leq 10%)	-	-	-71	dBm	
8) 54Mbps (PER \leq 10%)	-	-	-70	dBm	
6. Maximum Input Level (PER \leq 10%)					
1) IEEE802.11g	-20	-	-	dBm	
2) IEEE802.11a	-20	-	-	dBm	

6.2 IEEE 802.11b Section:

Items	Contents				
Specification	IEEE802.11b				
Mode	DBPSK, DQPSK and CCK and DSSS				
Channel	CH1 to CH13				
Data rate	1, 2, 5.5, 11Mbps				
TX Characteristics	Min.	Typ.	Max.	Unit	Remark
1. Power Levels(Calibrated)					
1) 17dBm Target (For Each antenna port) @1Mbps~11Mbps	15	17	19	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	-	-20	-10	dB	
2) 2Mbps	-	-20	-10	dB	
3) 5.5Mbps	-	-20	-10	dB	
4) 11Mbps	-	-20	-10	dB	
4. Frequency Error	-25	-	25	ppm	
RX Characteristics	Min.	Typ.	Max.	Unit	
5. Minimum Input Level Sensitivity(each chain)					

1) 1Mbps (FER \leq 8%)	-		-82	dBm	
2) 2Mbps (FER \leq 8%)	-		-80	dBm	
3) 5.5Mbps (FER \leq 8%)	-		-77	dBm	
4) 11Mbps (FER \leq 8%)	-		-78	dBm	
6. Maximum Input Level (FER \leq 8%)	-10	5	-	dBm	

6.3 IEEE 802.11n HT20 Section:

Items	Contents				
Specification	IEEE802.11n HT20 @ 2.4G/5G				
Mode	BPSK, QPSK, 16QAM, 64QAM and OFDM				
Channel	CH1 to CH13 @ 2.4G CH36 to CH165 @ 5G				
Data rate (MCS index)	MCS0/1/2/3/4/5/6/7/8/9/10/11/12/13/14/15				
TX Characteristics	Min.	Typ.	Max.	Unit	Remark
1. Power Levels					
1) 14dBm Target (For Each antenna port) @ 2.4G/MCS0~MCS7	12	14	16	dBm	
2) 13dBm Target (For Each antenna port) @ 5G/ MCS0~MCS7	11	13	15	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	-	-17	-5	dB	
2) MCS1	-	-	-10	dB	
3) MCS2	-	-	-13	dB	
4) MCS3	-	-	-16	dB	
5) MCS4	-	-19	-19	dB	
6) MCS5	-	-	-22	dB	
7) MCS6	-	-	-25	dB	
8) MCS7	-	-30	-28	dB	
		--	--	--	
4. Frequency Error					
1) IEEE802.11n HT20 @ 2.4G/5G	-10	-	10	ppm	
RX Characteristics	Min.	Typ.	Max.	Unit	
5. Minimum Input Level Sensitivity(each chain)					
1) MCS0 (PER \leq 10%)	-		-83	dBm	
2) MCS1 (PER \leq 10%)	-		-80	dBm	
3) MCS2 (PER \leq 10%)	-		-78	dBm	
4) MCS3 (PER \leq 10%)	-		-75	dBm	

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5) MCS4 (PER \leq 10%)	-		-71	dBm	
6) MCS5 (PER \leq 10%)	-		-67	dBm	
7) MCS6 (PER \leq 10%)	-		-66	dBm	
8) MCS7 (PER \leq 10%)	-		-66	dBm	
6. Maximum Input Level (PER \leq 10%)					
1) IEEE802.11n HT20 @ 2.4G/5G	-20	-6	-	dBm	

6.4 IEEE 802.11n HT40 Section:

Items	Contents				
Specification	IEEE802.11n HT40 @ 2.4G/5G				
Mode	BPSK, QPSK, 16QAM, 64QAM and OFDM				
Channel	CH3 to CH11 @ 2.4G CH38 to CH163 @ 5G				
Data rate (MCS index)	MCS0/1/2/3/4/5/6/7/8/9/10/11/12/13/14/15				
TX Characteristics	Min.	Typ.	Max.	Unit	Remark
1. Power Levels					
1) 14dBm Target (For Each antenna port) @ 2.4G/MCS0~MCS7	12	14	16	dBm	
2) 13dBm Target (For Each antenna port) @ 5G/MCS0~MCS7	11	13	15	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	-	-17	-5	dB	
2) MCS1	-	-	-10	dB	
3) MCS2	-	-	-13	dB	
4) MCS3	-	-	-16	dB	
5) MCS4	-	-19	-19	dB	
6) MCS5	-	-	-22	dB	
7) MCS6	-	-	-25	dB	
8) MCS7	-	-30	-28	dB	
4. Frequency Error					
1) IEEE802.11n HT40 @ 2.4G	-10	-	10	ppm	
RX Characteristics	Min.	Typ.	Max.	Unit	
5. Minimum Input Level Sensitivity(each chain)					
1) MCS0 (PER ≤ 10%)	-	-	-83	dBm	
2) MCS1 (PER ≤ 10%)	-	-	-80	dBm	
3) MCS2 (PER ≤ 10%)	-	-	-78	dBm	

4) MCS3 (PER \leq 10%)	-		-75	dBm	
5) MCS4 (PER \leq 10%)	-		-71	dBm	
6) MCS5 (PER \leq 10%)	-		-67	dBm	
7) MCS6 (PER \leq 10%)	-		-66	dBm	
8) MCS7 (PER \leq 10%)	-		-66	dBm	
6. Maximum Input Level (PER \leq 10%)					
1) IEEE802.11n HT40 @ 2.4G/5G	-20	-6	-	dBm	

6.5 IEEE 802.11n ac Section:

Items	Contents				
Specification	IEEE802.11ac @ 5G				
Mode	BPSK, QPSK, 16QAM, 64QAM, 256QAM and OFDM				
Channel	CH36 to CH165 @ VHT-20 CH38 to CH163 @ VHT-40 CH42 to CH157 @ VHT-80				
Data rate (MCS index)	MCS0/1/2/3/4/5/6/7/8/9/10/11/12/13/14/15				
TX Characteristics	Min.	Typ.	Max.	Unit	Remark
1. Power Levels					
1) 13dBm Target (For Each antenna port) @MCS0-MCS9	10	12	14	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		-17	-5	dB	
2) MCS1			-10	dB	
3) MCS2			-13	dB	
4) MCS3			-16	dB	
5) MCS4		-19	-19	dB	
6) MCS5			-22	dB	
7) MCS6			-25	dB	
8) MCS7			-27	dB	
9) MCS8			-30		
10) MCS9		-32	-32		
4. Frequency Error					
1) IEEE802.11ac	-10		10	ppm	
RX Characteristics			Max.	Unit	
5. Minimum Input Level Sensitivity(each chain)	VHT20	VHT40	VHT80		
1) MCS0 (PER \leq 10%)	-87	-84	-81	dBm	

2) MCS1 (PER \leq 10%)	-84	-81	-78	dBm	
3) MCS2 (PER \leq 10%)	-82	-79	-76	dBm	
4) MCS3 (PER \leq 10%)	-79	-76	-73	dBm	
5) MCS4 (PER \leq 10%)	-75	-72	-69	dBm	
6) MCS5 (PER \leq 10%)	-71	-68	-65	dBm	
7) MCS6 (PER \leq 10%)	-70	-67	-64	dBm	
8) MCS7 (PER \leq 10%)	-69	-66	-63	dBm	
9) MCS8 (PER \leq 10%)	-64	-61	-58		
10) MCS9 (PER \leq 10%)	-62	-59	-56		
6. Maximum Input Level (PER \leq 10%)					
1) IEEE802.11ac	-30		-	dBm	

3.5 Bluetooth Specification

3.5.1 BR Specification

Items	Contents				
Host Interface	UART				
Antenna Reference	Small antennas with 0~2 dBi peak gain				
Channel	CH0 to CH78				
Modulation	GFSK				
	Min.	Typ.	Max.	Unit	
TX Characteristics					
1. Output Average Power		4		dBm	
2. Modulation Characteristics					
1) Delta f1(Avg)		157		kHz	
2) Delta f2max(For at least 99.9% of all Delta f2max)		121		kHz	
3) Delta f2/ Delta f1		0.85		kHz	
3. Initial Carrier Frequency Tolerance		+/-20	-	kHz	
4. Carrier Frequency Drift					
1) One Slot packet drift (DH1)		+/-15		kHz	
2) Three Slot packet drift (DH3)		+/-15		kHz	
3) Five Slot packet drift (DH5)		+/-15		kHz	
4) Max Drift Rate		+/-15		kHz/50us	
RX Characteristics					
1. Receiver Sensitivity (BER<0.1%)		-92		dBm	
2. Maximum usable signal (BER<0.1%)		-5		dBm	

6.5.2 EDR Specification

Items	Contents				
Host Interface	UART				
Antenna Reference	Small antennas with 0~2 dBi peak gain				
Channel	CH0 to CH78				
Modulation	$\pi/4$ -DQPSK 、 8PSK				
	Min.	Typ.	Max.	Unit	
TX Characteristics					
1. Relative Transmit Power					
1) $\pi/4$ -DQPSK		-1.5		dBm	
2) 8PSK		-1.5		dBm	
2. Frequency Stability					
1) Omega-i		+/-4		kHz	
2) Omega-0		+/-4	-	kHz	
3) Omega-0 + Omega-i		+/-4			
3. Modulation Accuracy					
1) RMS DEVM					
$\pi/4$ -DQPSK		+/-9		%	
8PSK		+/-9		%	
2) Peak DEVM					
$\pi/4$ -DQPSK		+/-28		%	
8PSK		+/-21		%	
3) 99% DEVM					
$\pi/4$ -DQPSK		+/-15		%	
8PSK		+/-12		%	
RX Characteristics					
1. Receiver Sensitivity (BER<0.01%)					
1) $\pi/4$ -DQPSK		-91		dBm	
2) 8PSK		-85		dBm	
2. Maximum usable signal (BER<0.1%)					
1) $\pi/4$ -DQPSK		-5		dBm	
2) 8PSK		-5		dBm	

6.5.3 LE Specification

Items	Contents				
Host Interface	UART				
Antenna Reference	Small antennas with 0~2 dBi peak gain				
Channel	CH0 to CH39				
	Min.	Typ.	Max.	Unit	
TX Characteristics					
1. Output power at NOC		4		dBm	
2. Modulation Characteristics					
1)Delta f1(Avg)	225		275	kHz	
2)Delta f2max(For at least 99.9% of all Delta f2max)	185			kHz	
3)Delta f2/ Delta f1	0.8	0.94		Hz/Hz	
3. Carrier frequency offset and drift					
1) Frequency Offset	-150		150	kHz	
2) Frequency Drift	-50		50	kHz	
3) Max Drift Rate	-20		20	Hz/us	
4. In-band Spurious Emissions					
1)>/-2M offset			20	dBm	
2)>+/-3MHz offset			30	dBm	
RX Characteristics					
1. Receiver Sensitivity (BER<30.8%)		-95		dBm	
2. Maximum usable signal (BER<30.8%)		-5		dBm	

7. Software Requirements

The driver supports the following operating systems: Linux, Microsoft Windows XP, Vista and Win7.

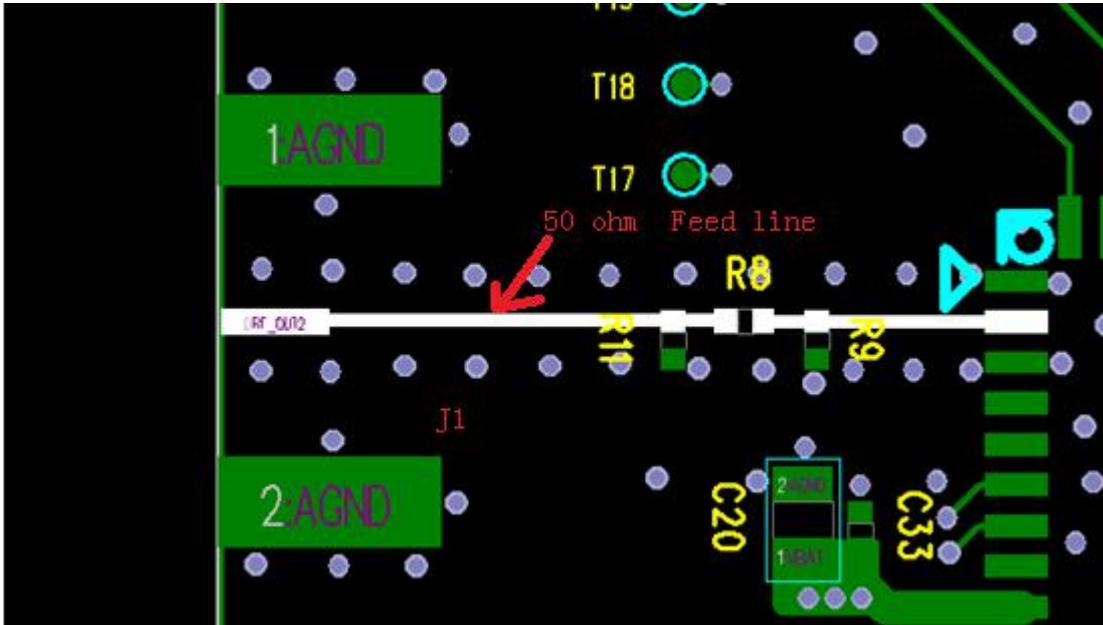
Mfg. software tool software tool version is XP_MP_Kit_RTL11ac_8822BS_SDIO_v0.21 or later.

8. Antenna

Any deviation(s) from the defined parameters of the antenna trace, as described by the instructions, the host product manufacturer must notify the module manufacturer that they wish to change the antenna trace design. Without module manufacturer approval, no changes can be made on antenna trace design.

The module needs to be attached to the PCB board and connected to the external antenna through the solder

joint of the circuit on the PCB. The gain of the external antenna is 2dB, the length of the antenna is 200mm, the internal structure is copper tube structure. A resistance of 0R is added between the module and the antenna at R8 to ensure that the impedance of the connection between the module and the antenna reaches 50R. J1 position on PCB is the position of external antenna.



9. Software introduction

BL-8822SSA3 module design is based on RTL8822BS-CG solution, The Realtek RTL8822BS-CG is a highly integrated single-chip that support 2-stream 802.11ac solutions with Multi-user MIMO

(Multiple-Input, Multiple-Output) with integrated Bluetooth 2.1/3.0/4.1 controller, SDIO (SDIO 1.1/2.0/3.0) interface, and HS-UART mixed interface. It combines a WLAN MAC, a 2T2R capable WLAN baseband, and RF in a single chip. The RTL8822BS-CG provides a complete solution for a high-performance integrated wireless and Bluetooth device.

10. FCC Compliance Warning Statements:

If the FCC identification number is not visible when the module installed in the host, then the outside of the device into which the module was installed in must also display a label referring to the enclosed module. This exterior label can use wording such as the following: "Contains Transmitter Module FCC ID:2AL6K-8822SSA3" or "Contains FCC ID:2 AL6K-8822SSA3"



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.

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.

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

FCC Radiation Exposure Statement:

This modular must be installed and operated with a minimum distance of 20 cm between the radiator and user body.

11. Host user manual requirements:

When the module is installed inside another device, the user manual of this device must contain below warning statements: 1. 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.

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

The devices must be installed and used in strict accordance with the manufacturer's instructions as described in the user documentation that comes with the product.

The 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.

The final host product still requires Part 15 Subpart B compliance testing with the modular transmitter installed. The end user manual shall include all required regulatory information/warning as shown in this manual, include: This product must be installed and operated with a minimum distance of 20 cm between the radiator and user body.