

S P E C I F I C A T I O N

TR5R822S3

**IEEE 802.11a/b/g/n/ac SDIO 2T2R+Bluetooth 5.0
Combo Module**

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1. Device Overview

1.1 Descriptions

The TR5R822S3 is a highly integrated module that supports 2T2R 802.11 a/b/g/n/ac with Wireless LAN (WLAN) SDIO (SDIO 1.1/2.0/3.0) interface controller and Bluetooth 5.0 HS-UART interface controller. The high speed FFT/IFFT paths, combined with BPSK, QPSK, 16QAM, 64QAM and 256QAM modulation of the individual subcarriers, and compatible coding rate of 1/2, 2/3, 3/4, 5/6, provide up to 866.7Mbps for IEEE 802.11ac MIMO OFDM. The TR5R822S3 MAC supports 802.11e for multimedia applications, 802.11i and WAPI for security.

The TR5R822S3 provides a complete solution for a high-performance integrated wireless and Bluetooth device.

1.2 Features

1.2.1 General Features

- Supports 3.3V power supply
- Complies with SDIO 1.1/2.0/3.0 for WLAN with clock rate up to 208MHz
- CMOS MAC, Baseband PHY and RF in a single module for IEEE 802.11a/b/g/n/ac compatible WLAN
- IEEE 802.11i (WPA, WPA2, WPA3). Open, shared key, and pair-wise key authentication services
- IEEE 802.11k Radio Resource Measurement
- WAPI(Wireless Authentication Privacy Infrastructure) certified
- Wi-Fi Direct supports wireless peer to peer application
- IEEE802.11h DFS,Spectrum Measurement

1.2.2 Wi-Fi Key Features

- IEEE 802.11a/b/g/n/ac compatible WLAN
- Two Transmit and Two Receive paths
- IEEE 802.11ac MIMO OFDM
- IEEE 802.11n MIMO OFDM
- Supports 2.4Ghz and 5Ghz band channels
- 20MHz / 40MHz / 80MHz bandwidth transmission
- Maximum data rate 54Mbps in 802.11g, 300Mbps in 802.11n, and 866.7Mbps in 802.11ac OFDM with BPSK, QPSK, 16QAM, 64QAM and 256QAM modulation. Convolutional Coding Rate: 1/2, 2/3, 3/4, and 5/6

- DSSS with DBPSK and DQPSK, CCK modulation with long and short preamble
- Support STBC, LDPC

1.2.3 Bluetooth Key Features

- Supports Bluetooth 5.0 system
- Compatible with Bluetooth V2.1 systems
- Enhanced BT/Wi-Fi Coexistence Control to improve transmission quality in different profiles
- Dual Mode support: Simultaneous LE and BR/EDR
- Integrated internal Class 1, Class 2, and Class 3 PA
- Supports Enhanced Power Control
- Supports Bluetooth Low Energy
- Integrated 32K oscillator for power management
- Complies with HS-UART with configurable baud rate for Bluetooth

1.3 Functional Block Diagram

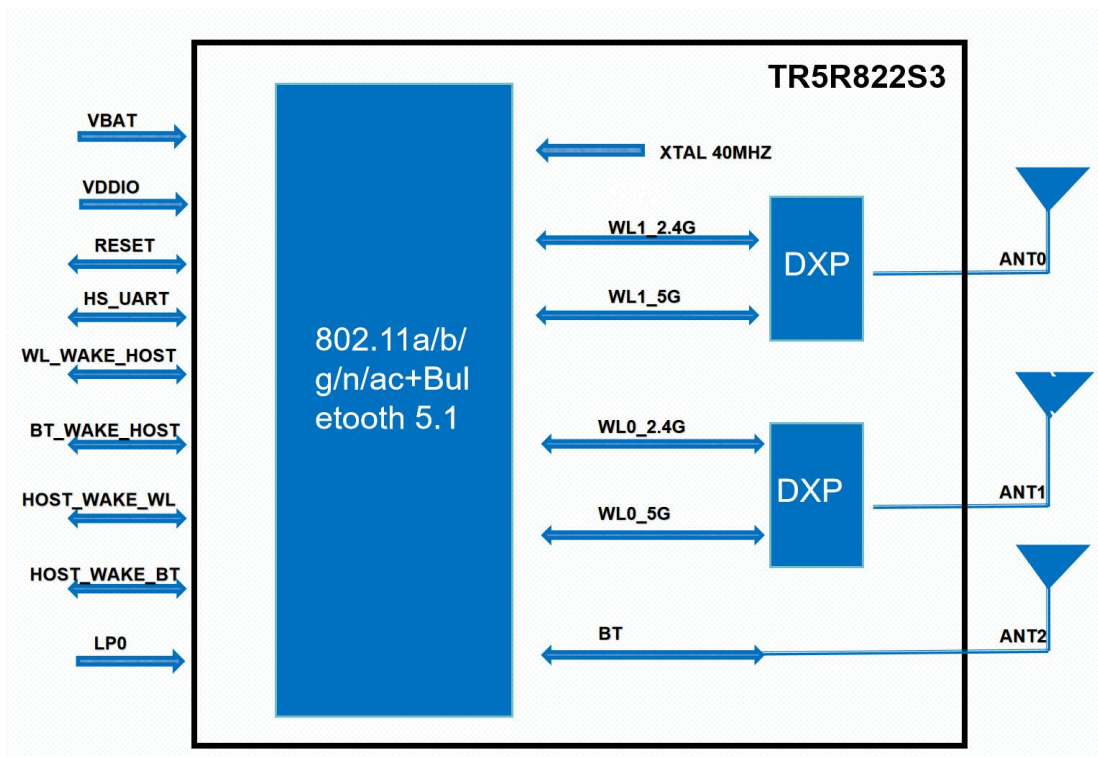


Figure 1. Block Diagram of TR5R822S3

2. Pin Configuration and Functions

2.1 Module Pin Diagram

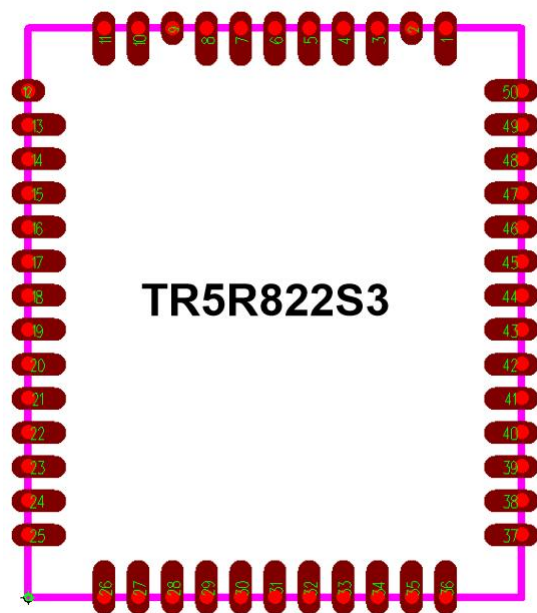


Figure 2.Pin Diagram of TR5R822S3

2.2 Pin Functions

Pin	Name	Description
1	GND	Ground
2	WL/BT_ANT0	RF input/output of path B S1 WLAN(3 Antennas Version) RF input/output of path B S1 WLAN and BT(2 Antennas Version)
3	GND	Ground
4	GND	Ground
5	GND	Ground
6	GND	Ground
7	GND	Ground
8	GND	Ground
9	WL_ANT1	RF input/output of path A S0 WLAN
10	GND	Ground
11	GND	Ground
12	BT_TRX	RF input/output port for BT(3 Antennas Version)

13	GND	Ground
14	G_BT	No connect, keep floating
15	WL_REG_ON	This pin can externally shut down the TR5R822S3_3 WLAN function when WL_REG_ON is pulled low.
16	WL_WAKE_HOST	Output and open drain active low signal. This signal is used to request that the system return from a sleep/suspended state to service a function initiated wake event.
17	SDIO_CMD	SDIO command input
18	SDIO_CLK	SDIO clock input
19	SDIO_DATA3	SDIO port data 3
20	SDIO_DATA2	SDIO port data 2
21	SDIO_DATA0	SDIO port data 0
22	SDIO_DATA1	SDIO port data 1
23	GND	Ground
24	WL_WAKE_HOST	Output and open drain active low signal. This signal is used to request that the system return from a sleep/suspended state to service a function initiated wake event.
25	NC	No connect, keep floating
26	NC	No connect, keep floating
27	PCM_SYNC	PCM sync signal
28	PCM_IN	PCM data input
29	PCM_OUT	PCM data output
30	PCM_CLK	PCM clock
31	LPO	External 32.768K or RTC clock input
32	GND	Ground
33	GPIO6	No connect, keep floating
34	VDDIO	Power supply for GPIOs, SUS_CLK, EESK, CHIIP_EN.3.3V or 1.8V is alternative.
35	NC	No connect, keep floating
36	VBAT	3.3V power supply
37	NC	No connect, keep floating
38	BT_REG_ON	This pin can externally shut down the TR5R822S3_3 BT function

		when BT_REG_ON 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
39	GND	Ground
40	UART_TXD	BT High-Speed UART Data Out
41	UART_RXD	BT High-Speed UART Data In
42	UART_RTS_N	BT High-Speed UART RTS
43	UART_CTS_N	BT High-Speed UART CTS
44	SD_RESET	Input and active low signal, this signal can externally shut down the module. When this pin is pulled low, SDIO interface will be disabled.
45	G_WL	WL TEST_MODE_SEL 0:Normal operation mode; 1:Test/Debug mode
46	GND	Ground
47	NC	No connect, keep floating
48	GND	Ground
49	HOST_WAKE_BT	Input signal, Host wake up BT
50	BT_WAKE_HOST	Output signal, BT wake up host

3. Specifications

3.1 General Characteristics

Category	Descriptions
Dimension	L*W*H :15.0mm (±0.3mm)*13.0mm (±0.3mm)*2.4mm (±0.2mm)
Standard	IEEE 802.11a/b/g/n/ac+BT 5.0
Frequency Band	2.4GHZ Band: 2412~2500MHZ
	5GHZ Band: 5150~5250MHZ@Band1 5250~5350MHZ@Band2 5470~5725MHZ@Band3 5725~5850MHZ@Band4
Bandwidth	20/40/80 MHz
Interface	WLAN: SDIO(1.1/2.0/3.0), Bluetooth: UART
PHY Rate	Maximum PHY data rate up to 173.3 Mbps using 20MHz bandwidth; Maximum PHY data rate up to 400 Mbps using 40MHz bandwidth; Maximum PHY data rate up to 866.7 Mbps using 80MHz bandwidth .
Data Security	WEP,WPA/WPA2/WPA3
Transmit Power	EDR: 6.52 dBm BLE 1M/2M: 4.44 dBm WIFI 2.4G: 17.12 dBm WIFI 5.2G: 12.66 dBm WIFI 5.3G: 13.64 dBm WIFI 5.6G: 13.26 dBm WIFI 5.8G: 14.2 dBm
Frequency Error	< ±20ppm/802.11b/g/n/a/ac
Rx Sensitivity	2.4G: 11b 11M:-89dBm@8% PER 11g 54M: -75dBm@10% PER 11n HT20 MCS7: -73dBm@10% PER 11n HT40 MCS7: -69dBm@10% PER 5G:

	11a 54M : -77dBm@10% PER 11n HT20 MCS7: -75dBm@10% PER 11n HT40 MCS7: -73dBm@10% PER 11ac VTH20 MCS8: -67dBm@10% PER 11ac VTH40 MCS9: -65dBm@10% PER 11ac VTH80 MCS9: -62dBm@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
Frequency Error	2.4GHz:<±25 ppm(11b),<±20 ppm(11g/n);5GHz:<±20 ppm
Ambient Temperature	0℃~70℃
Storage Temperature	-40℃~85℃
Antenna	External RF antenna
Operating System	Windows /Linux /Android
Operating Voltage	VBAT:3.3V;VDDIO:1.8V or 3.3V

3.2 RF Characteristics

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

Parameter	Conditions		Min.	Nom.	Max.	Unit
Receive input frequency						
2.4GHz	802.11b/g/n 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
	MCS3		-	-	-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
	MCS3		-	-	-74	dBm
	MCS3.		-	-	-71	dBm
	MCS4.		-	-	-67	dBm
	MCS5.		-	-	-63	dBm
	MCS6.		-	-	-62	dBm
	MCS7.		-	-	-61	dBm
Maximum input level						
802.11b	FER<8%		-10	-	-	dBm
802.11g	FER<10%		-20	-	-	dBm
802.11n	FER<10%		-30			dBm

3.2.1 Receiver RF Specifications

Parameter	Conditions		Min.	Nom.	Max.	Unit
Receive input frequency						
5GHz	802.11a/n/ac 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 (HT40)	MCS0.	PER<10%, Packet size= 4,096bytes	-	-	-79	dBm
	MCS1.		-	-	-77	dBm
	MCS3		-	-	-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
	MCS3		-	-	-71	dBm
	MCS3.		-	-	-68	dBm
	MCS4.		-	-	-64	dBm
	MCS5.		-	-	-60	dBm
	MCS6.		-	-	-59	dBm
	MCS7.		-	-	-58	dBm
	MCS8.		-	-	-53	dBm
	MCS9.		-	-	-51	dBm
Maximum input level						
802.11a	FER<10%		-30	-	-	dBm
802.11n	FER<10%		-30	-	-	dBm
802.11ac	FER<10%		-30	-	-	dBm

3.2.2 Transmitter RF Specifications

Parameter	Condition	Min.	Nom.	Max.	Unit.
Receive input frequency					
802.11b/g/n	2.4GHz	2400	-	2500	MHz
Transmit power					
802.11b	11Mbps	17.5	19.5	21.5	dBm
802.11g	54Mbps	16	18	20	dBm
802.11n	HT20, MCS7	15	17	19	dBm
	HT40, MCS7	15	17	19	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
Center frequency tolerance					
802.11b		-20	-	+20	pmm
802.11g/n		-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
	MCS3	-	-	-13	dB
	MCS3.	-	-	-16	dB
	MCS4.	-	-	-19	dB
	MCS5.	-	-	-22	dB
	MCS6.	-	-	-25	dB
	MCS7.	-	-	-28	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	5GHz	4900	-	5845	MHz
Transmit power					
802.11a	54Mbps	15	17	19	dBm
802.11n	HT20, MCS7	14	16	18	dBm
	HT40, MCS7	14	16	18	dBm
802.11ac	VHT20,MCS8	13	15	17	dBm
	VHT40,MCS9	13	15	17	dBm
	VHT80,MCS9	13	15	17	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
Center frequency tolerance					
802.11a/n/ac		-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
	MCS3	-	-	-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
	MCS3	-	-	-13	dB
	MCS3.	-	-	-16	dB
	MCS4.	-	-	-19	dB
	MCS5.	-	-	-22	dB
	MCS6.	-	-	-25	dB
	MCS7.	-	-	-27	dB
	MCS8.	-	-	-30	dB
	MCS9.	-	-	-32	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	-	-85	-	dBm
	2 Mbps	-	-85	-	dBm
	3 Mbps	-	-85	-	dBm
Initial carrier frequency offset		-24	5	24	KHz
Output power	BR	4	6	8	dBm
	EDR	3	5	7	dBm
	LE	3	5	7	dBm

4. Application and Implementation

4.1 Application Diagram

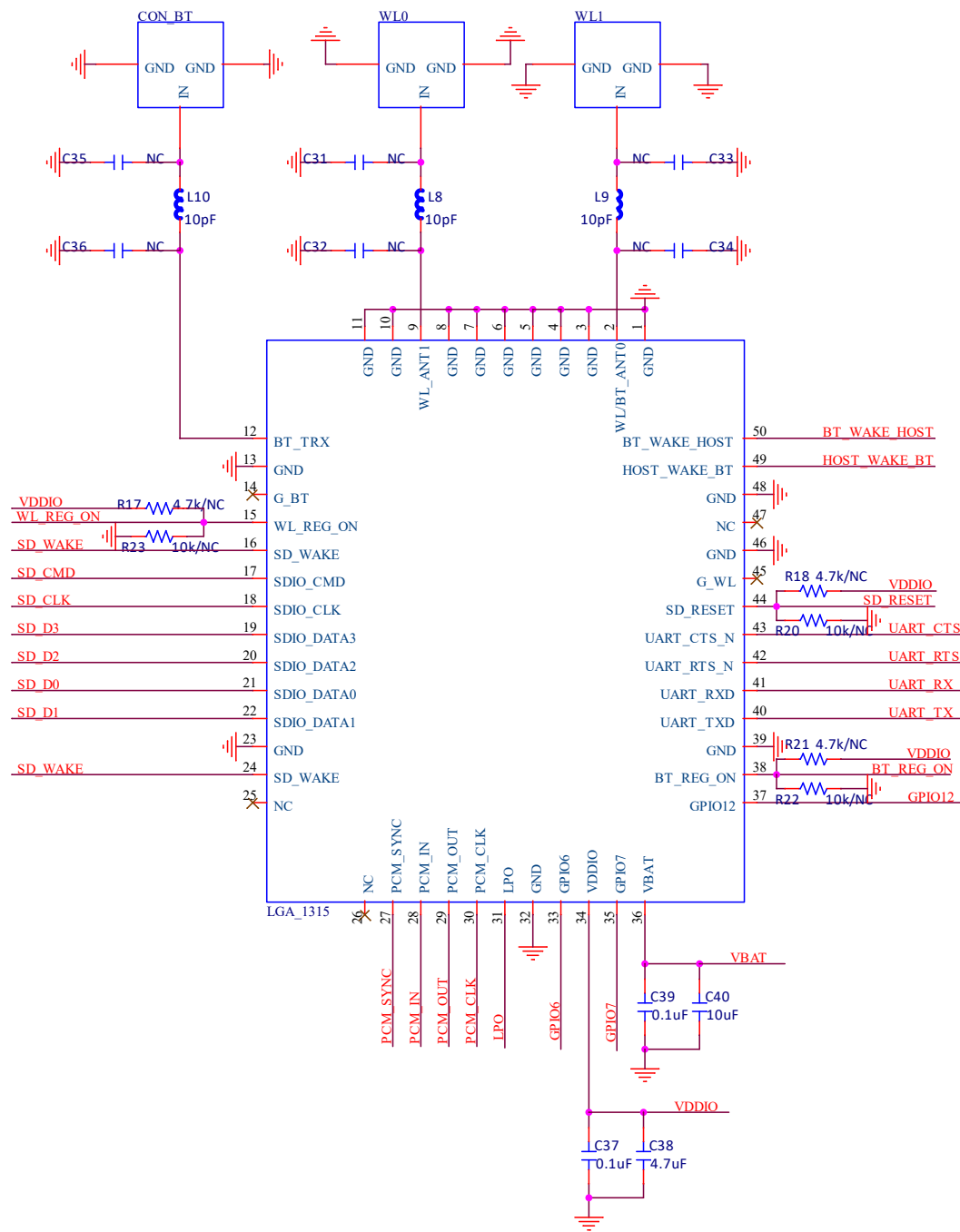


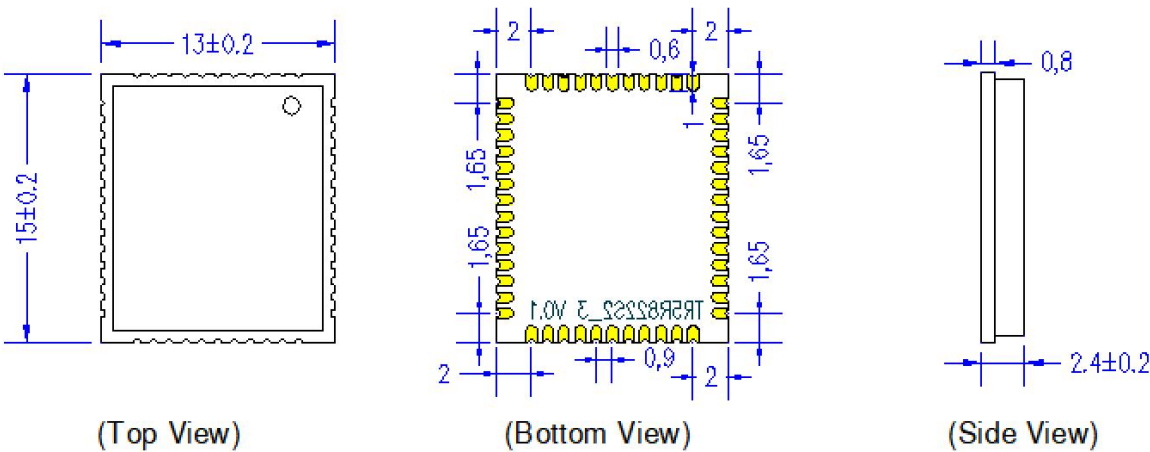
Figure 3. Application Schematic Diagram of TR5R822S3

4.2 Working principle of the module

The VBAT power supply voltage of the TTR5R822S2 module is 3.3 volts, and the VDDIO power supply voltage is 1.8 volts. After the module is powered on, it drives the RTL8822CS-VS-CG chip to work in coordination with the 40 MHz crystal oscillator. Through the peripheral RF components duplexer IC and related circuits, 2.4G and 5G WIFI signals as well as BT signals are transmitted to the antenna. The antenna converts the electrical signals into electromagnetic wave wireless signals, thereby achieving WIFI communication and Bluetooth communication with routers or other products.

5. Mechanical and Package

5.1 Mechanical Size



Note:L*W*H: 15.0mm (±0.3mm)*13.0mm (±0.3mm)*2.4mm (±0.2mm)

Figure 4. Mechanical Size of TR5R822S3

5.2 Recommended Land Pattern

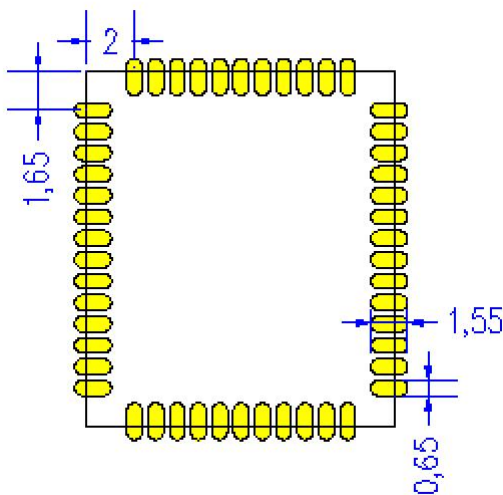


Figure 5. On Board Pad Suggest: 1.55*0.65 (Unit: mm)

5.3 Package Information

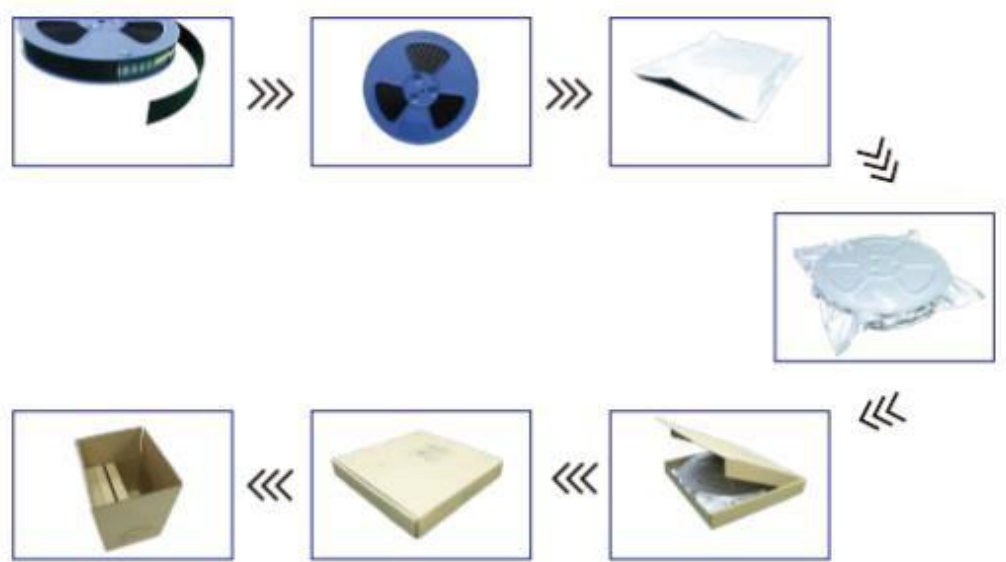


Figure 6. Brief Packaging Process of TR5R822S3 Modules

6. Thermal Reflow

Referred to IPC/JEDEC standard.

Peak temperature: <250℃

Number of times: ≤2

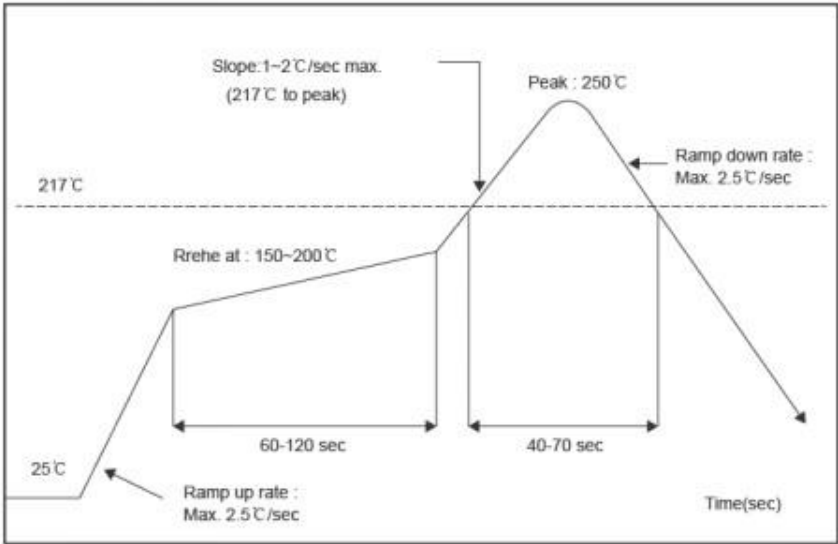


Figure 7. Recommended Reflow for Lead Free Solder

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

7. Ordering Information

Part NO.	Working Voltage	ANT	Shielding Cover	Remark
TR5R822S3	3.3V	Detachable 2 antennas	Included	SDIO
TR5R822S3	3.3V	Detachable 3 antennas	Included	SDIO

8. Revision History

Version	Change Content	Reviser	Date
V0.1	Draft Version	Grant dou	2024.11.28

9. FCC Caution

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

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.

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

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.

To maintain compliance with FCC's RF Exposure guidelines, This equipment should be installed and operated with minimum distance between 20cm the radiator your body: Use only the supplied antenna.

1. FCC Certification

1.1 Integration instructions for host product manufacturers according to KDB 996369 D03 OEM Manual v01r01

2.2 List of applicable FCC rules

TheTR5R822S3 is an 802.11a/b/g/n/ac 2T2R WiFi+Bluetooth 5.0 SDIO Module. It is within U.S. FCC part 15.247,15.407 standard

2.3 Specific operational use conditions The EUT is a 802.11a/b/g/n/ac 2T2R WiFi+Bluetooth 5.0 SDIO Module

Operation Frequency: 2402-2480MHz for BT; 2412-2462MHz for WIFI2.4G, 5150-5250/5250MHz~5350MHz/5470MHz~5725MHz/ 5725-5850MHz/ for WIFI 5G Modulation Type: GFSK, $\pi/4$ -DQPSK, 8-DPSK for BT, GFSK for BLE,WLAN(DSSS/OFDM)

2.4 Limited module procedures

Not applicable; Single Modular Approval Request

2.5 Trace antenna designs

TheTR5R822S3 is an 802.11a/b/g/n/ac 2T2R WiFi+Bluetooth 5.0 SDIO Module beams signals and communicates with its antenna, which is FPC Antenna

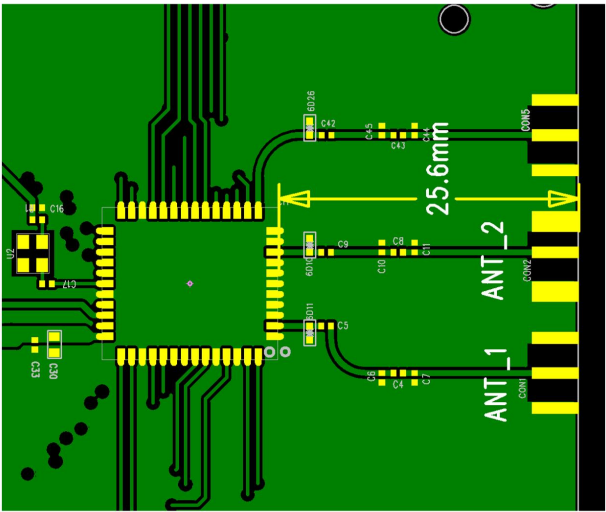
Users should connect antennas to half hole pad through FP types of RF trace and the trace impedance must be controlled in 50Ω. recommends that the total insertion loss between the antenna pads and antennas should meet the following requirements:

Trace loss

Frequency	Loss
2400MHz-2500MHz	<0.8dB
5150MHz-5850MHz	<1.5dB

To facilitate the antenna tuning and certification test, a RF connector and an antenna matching circuit should be added. The following figure is the recommended circuit.

From CON3 and CON4 port to PCB module, the C4: 0Ω, C5: 0Ω,C8: 0Ω,C9: 0Ω C6: NC(Normally Closed) C7: NC(Normally Closed)C10: NC(Normally Closed) and C11:NC (Normally Closed)



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 internal structure is FPC. A resistance of 0R is added between the module and the antenna at C4/C8 to ensure that the impedance of the connection between the module and the antenna reaches 50R.The ANT1 position on the PCB is where the external antenna is connected.

2.6 RF exposure considerations

To maintain compliance with FCC's RF Exposure guidelines, This equipment should be installed and operated with minimum distance between 20cm the radiator your body: Use only the supplied antenna.

2.7 Antennas

The TR5R822S3 is an 802.11a/b/g/n/ac 2T2R WiFi+Bluetooth 5.0 SDIO Module beams signals and communicates with its antenna, which have two FPC Antenna

The antenna pads and antennas should meet the following requirements:

Antenna Type	Antenna model	Antenna Supplier	cable loss	cable length	Connector
Ant1:	A25458101	TRULY ELECTRONICS MFG., LTD	2.4G: 0.3dB 5G: 0.8dB	108±2mm	RP-SMA PLUG
Ant2:	A25458101	TRULY ELECTRONICS MFG., LTD	2.4G: 0.3dB 5G: 1dB	108±2mm	RP-SMA PLUG

Antenna Designation:

2.4G: Ant1: 2.53dBi; Ant2: 2.53dBi

5G: Ant1: 3.16dBi; Ant2: 3.16dBi

2.8 Label and compliance information

The final end product must be label in a visible area , the Host must Contains FCC ID:2BOHY-TR5R822S3 .

2.9 Information on test modes and additional testing requirements

Data transfer module demo board can control the EUT work in RF test mode at specified test channel.

2.10 Additional testing, Part 15 Subpart B disclaimer

The module without unintentional-radiator digital circuit, so the module does not required an evaluation by FCC Part 15 Subpart B. The host should be evaluated by the FCC Subpart B

2.11 OEM integration instructions:

This device is intended only for OEM integrators under the following conditions: The transmitter module may not be co-located with any other transmitter or antenna. The module shall be only used with the external antenna(s) that has been originally tested and certified with this module. As long as the 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.).

2.12 Validity of using the module certification:

In the event that these conditions cannot 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.

ATTENTION

This device is intended only for OEM integrators under the following conditions:

- 1) The antenna must be installed such that at 20mm maintained between the antenna and users, and
- 2) This device and its antenna(s) must not be co-located with any other transmitters except in accordance with FCC multi-transmitter product procedures. Referring to the multi-transmitter policy, multiple transmitter(s) and module(s) can be operated simultaneously without C2PC.
- 3) For all products market in US, OEM has to limit the Operating Frequency: 2402-2480MHz for BT; 2412-2462MHz for WIFI 2.4G, 5150-5250 / 5250MHz~5350MHz/5470MHz~5725MHz/ 5725-5850MHz for WIFI 5G by supplied firmware programming tool. OEM shall not supply any tool or info to the end user regarding to Regulatory Domain change.

USERS MANUAL OF THE END PRODUCT:

In the user manual of the end product, the end user has to be informed to keep at least 20cm separation with the antenna while this end product is installed and operated. The end user has to be informed that the FCC radio frequency exposure guidelines for an uncontrolled environment can be satisfied. The end user has to also be informed that any changes or modifications not expressly approved by the manufacturer could void the user's authority to operate this equipment.

FCC Caution:

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

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

Radiation Exposure Statement

This equipment complies with Canada 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.

Déclaration d'exposition aux radiations

Cet équipement est conforme Canada limites d'exposition aux radiations dans un environnement non contrôlé. Cet équipement doit être installé et utilisé à distance minimum de 20cm entre le radiateur et votre corps.

This device is intended only for OEM integrators under the following condition:

The transmitter module may not be co-located with any other transmitter or antenna.

As long as the condition above is 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.

Cet appareil est destiné uniquement aux intégrateurs OEM dans les conditions suivantes : Le module émetteur ne peut pas être placé à côté d'un autre émetteur ou d'une autre antenne.

Tant que la condition ci-dessus est remplie, aucun test supplémentaire de l'émetteur ne sera nécessaire. Cependant, l'intégrateur OEM est toujours responsable de tester son produit final pour toute exigence de conformité supplémentaire requise avec ce module installé.

Important Note:

In the event that these conditions cannot be met (for example certain laptop configurations or co-location with another transmitter), then the Canada authorization is no longer considered valid and the IC 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.

Note Importante:

Dans le cas où ces conditions ne peuvent être satisfaites (par exemple pour certaines configurations d'ordinateur portable ou de certaines co-localisation avec un autre émetteur), l'autorisation du Canada n'est plus considérée comme valide et l'IC ne peut pas être utilisé sur le produit final. Dans ces circonstances, l'intégrateur OEM sera chargé de réévaluer le produit final (y compris l'émetteur) et l'obtention d'une autorisation distincte au Canada.

End Product Labeling

The final end product must be labeled in a visible area with the following: Contains IC:2BOHY-TR5R822S3

Plaque signalétique du produit final

Le produit final doit être étiqueté dans un endroit visible avec l'inscription suivante: Contient des IC:2BOHY-TR5R822S3

Manual Information to the End User

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.

Manuel d'information à l'utilisateur final

L'intégrateur OEM doit être conscient de ne pas fournir des informations à l'utilisateur final quant à la façon d'installer ou de supprimer ce module RF dans le manuel de l'utilisateur du produit final qui intègre ce module.

Le manuel de l'utilisateur final doit inclure toutes les informations réglementaires requises et avertissements comme indiqué dans ce manuel.

Caution:

- (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;
- (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 EIRP 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 EIRP limits specified for point-to-point and non-point-to-point operation as appropriate; and Operations in the 5.25-5.35GHz band are restricted to indoor usage only.

Avertissement:

- (i) les dispositifs fonctionnant dans la bande de 5150 à 5250 MHz sont réservés uniquement pour une utilisation à l'intérieur afin de réduire les risques de brouillage préjudiciable aux systèmes de satellites mobiles utilisant les mêmes canaux;
- (ii) pour les dispositifs munis d'antennes amovibles, le gain maximal d'antenne permis pour les dispositifs utilisant les bandes de 5250 à 5350 MHz et de 5470 à 5725 MHz doit être conforme à la limite de la p.i.r.e.;
- (iii) pour les dispositifs munis d'antennes amovibles, le gain maximal d'antenne permis pour les dispositifs utilisant la bande de 5725 à 5850 MHz doit être conforme à la limite de la p.i.r.e. spécifiée pour l'exploitation point à point et l'exploitation non point à point, selon le cas; Les opérations dans la bande de 5.25-5.35GHz sont limitées à un usage intérieur seulement.