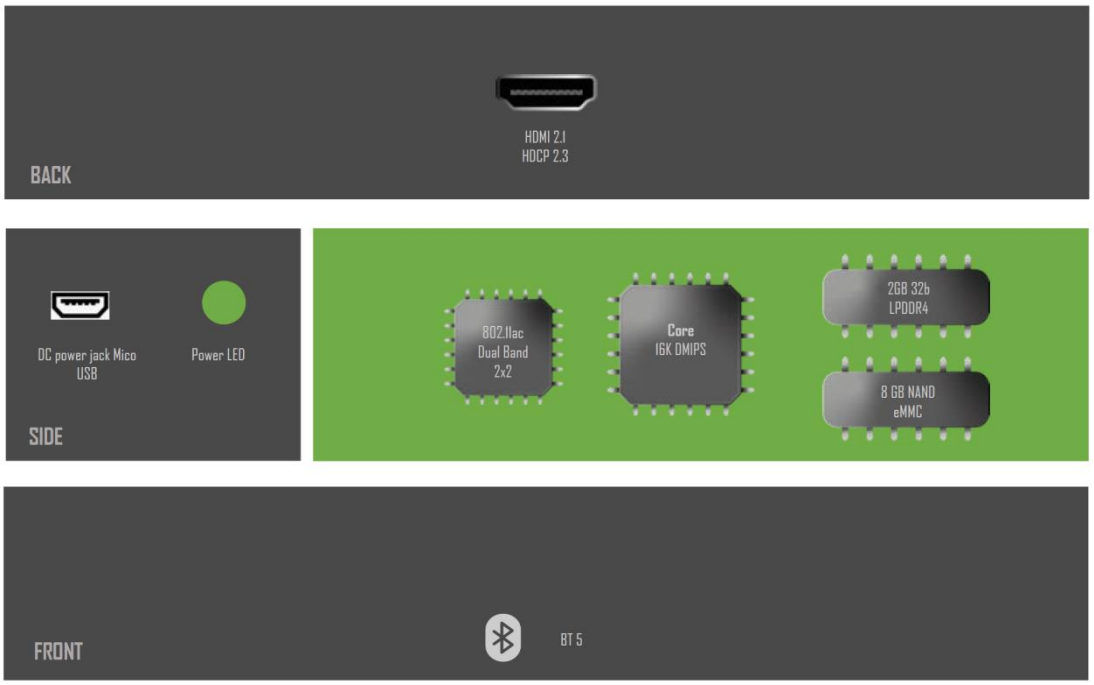
User’s Manual

Product: PJ-WPD-800
Brand: ViewSonic
Model: VS20085


HDMI 2.1
HDCP 2.3
BACK
DC power jack Mico USB
Power LED
SIDE
802.11ac Dual Band 2x2
Core
16K DMIPS
2GB 32b LPDDR4
8 GB NAND eMMC
FRONT
BT 5

Core

- Amlogic S905Y4 Quad A35
- 16000 DMIPS
- 32K I/D cache
- 512KB L2 cache
- ARM G31 MP2
- OpenGL ES 3.2 Graphics engine

Wi-Fi

- 802.11ac 2x2 + BT5
- Dual Band 2.4GHz & 5GHz
- MIMO
- Wave 2 Mu-MIMIO

Video Formats

- 4:3 and 16:9 aspect ratio
- 480i, 480p, 576i, 576p, 720p, 1080i, 1080p24, 1080p30, 1080p60
- 4Kx2Kp30, 4Kx2Kp60
- HEVC H.265
- MPEG-4,MP@ML, MP@HL profiles
- AV1, VC-1/VP8/VP9
- HDR-10, HDR-10+, HLG,

Audio Formats

- 32KHz to 192KHz sample rates
- MPEG Audio Layers 1, 2 and 3
- Dolby Digital MS12

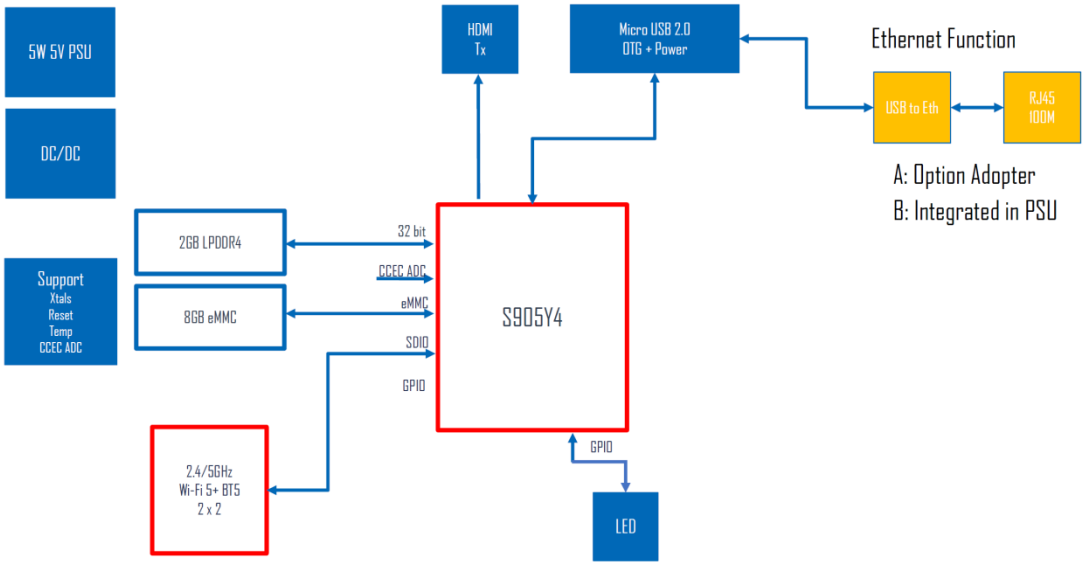
Power

- Mains supply voltage 110-240V
- Frequency 50-60Hz
- 5W External AC-DC PSU power module

Environment

- Mains supply voltage 100-240V
- Frequency 50-60Hz
- Operation Temperature: 0~40 ℃
- Storage Temperature: -10~70 ℃
- Operation Humidity: 5%~90%
- Storage Temperature: 0~95%
- Surge Protection: 4Kv

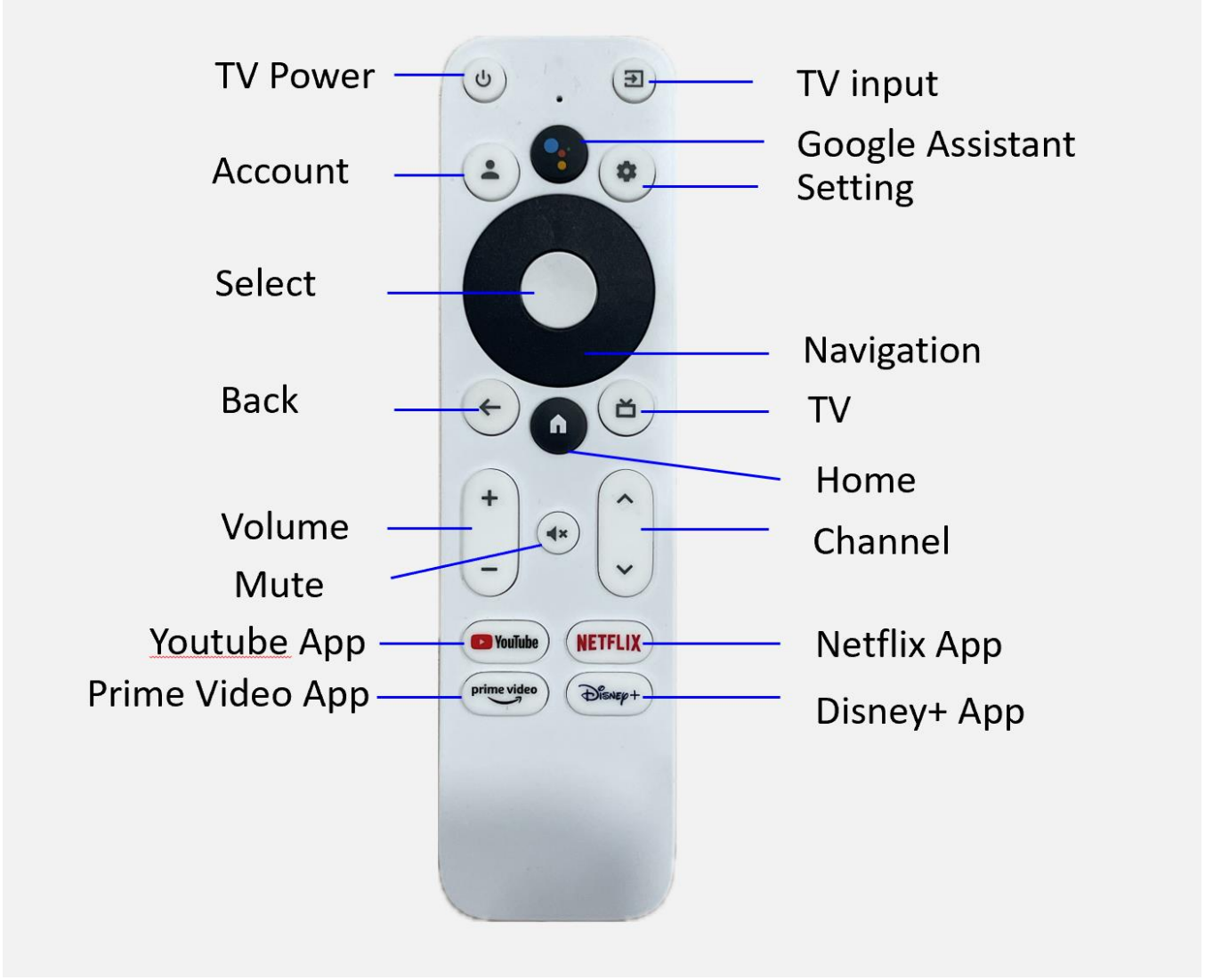
S905Y4 Stick Block Diagram



Accessories

- USB Power Cable
- BT RCU

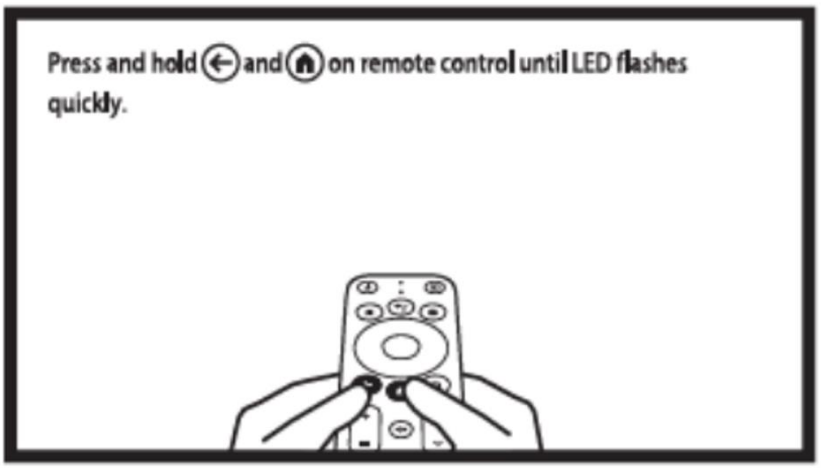
Remote Control



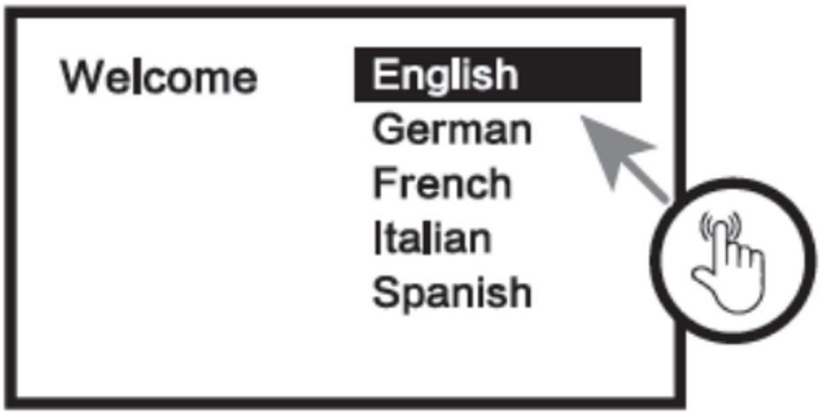
Initial Setup

1. Plug in Dongle
   Plug your dongle into a power outlet and an HDMI port on your TV
2. Switch TV Input
   Turn on your TV and switch to the input/source your dongle is plugged into
3. Put batteries in your voice remote

1.



2.



4. Get the Google Home app

   Follow the step on your TV and in the app

Wi-Fi Module: EWN-8822CSB2AC

IEEE802.11b/g/n/a/ac SDIO Wireless+Bluetooth 2.1/3.0/4.2.5.0 Module

1. General Specifications

The module provides a complete solution for a high-performance integrated wireless and Bluetooth device . It provides SDIO interface for WiFi and HS-UART interface for Bluetooth. The module complies with IEEE 802.11 a/b/g/n/ac 2T2R MIMO standard , and Maximum PHY data rate up to 173.3 Mbps using 20 MHz bandwidth ,400 Mbps using 40 MHz bandwidth, and 866.7 Mbps using 80 MHz bandwidth.

2. Features

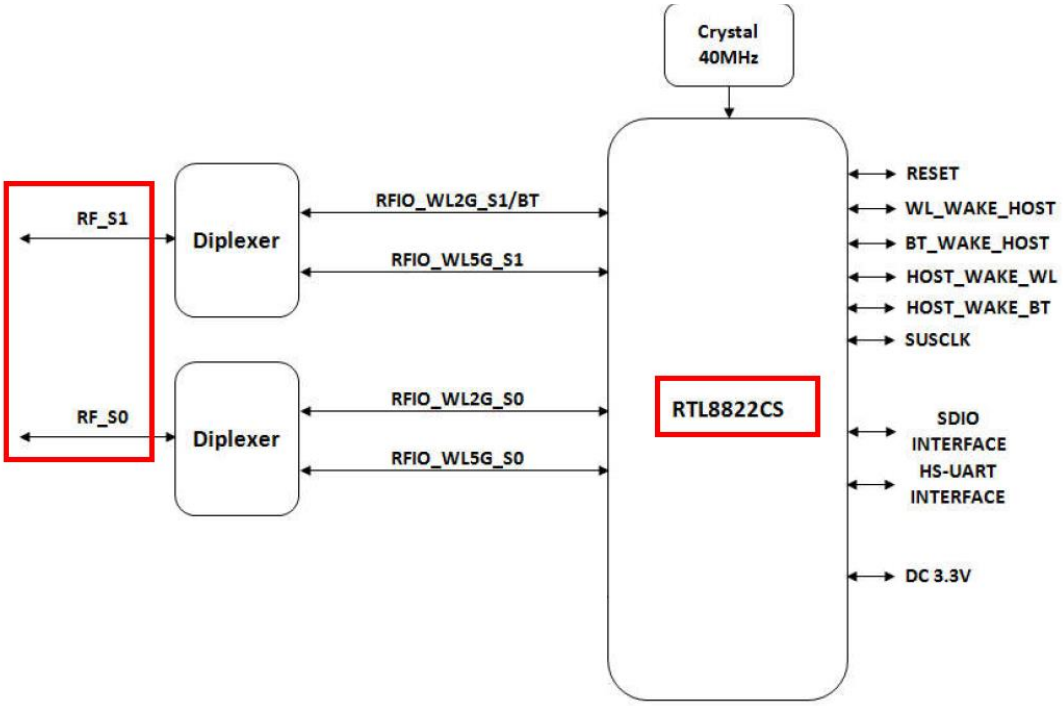
2.1 WLAN

- Supports 802.11ac 2x2, Wave-2 compliant with MU-MIMO
- Completes 802.11n MIMO solution for 2.4GHz and 5GHz band
- Maximum PHY data rate up to 173.3Mbps using 20MHz bandwidth, 400Mbps using 40 MHz bandwidth, and 866.7Mbps using 80MHz bandwidth
- Backward compatible with 802.11a/b/g devices while operating at 802.11n data rates
- Backward compatible with 802.11a/n devices while operating at 802.11ac data rates
- Complies with SDIO 1.1/2.0/3.0 for WLAN with clock rate up to 208MHz
- support standard SDIO v3.0 (up to SDR104 mode at 208 MHz) host interfaces
- complies with HS-UART with configurable baud rate for Bluetooth
- IEEE 802.11a/b/g/n/ac compatible WLAN
- Channel management and co-existence
- Wi-Fi Direct supports wireless peer to peer
- CCA on secondary through RTS/CTS handshake
- Two Transmit and Two Receive paths
- 5MHz/10MHz/20MHz/40MHz/80MHz bandwidth transmission
- Supports 2.4GHz and 5GHz band channels
- Short Guard Interval(400ns)
- Sounding packet

2.2 Bluetooth

- Compatible with Bluetooth v2.1 and v3.0 Systems
- Supports Bluetooth 4.1 features
- Supports Bluetooth 4.2 LE Secure Connection by upper layer software upgrade
- Support Bluetooth 5.0 and LE 5.0 system
- Supports all packet types in basic rate and enhanced data rate
- Supports pico-nets in a scatter-net
- Supports Secure Simple Pairing
- Bluetooth 5.0 Dual Mode support: Simultaneous LE and BR/EDR

3. System Block Diagram



4. PHY Specification

4.1 Wi-Fi Specification

Protocol	IEEE 802.11b/g/n/a/ac	
Interface	SDIO 1.1 / 2.0 / 3.0	
Frequency	2.4GHz band CH1~CH14/2400-2483.5MHz	
	5GHz Band CH36~CH48/5150-5250MHz CH52~CH64/5250-5350MHz CH100~CH140/5470-5725MHz CH149~CH165/5725-5850MHz	
Bandwidth	2.4G&5G Band Refer to Channel Plan Domain Code	
PHY Rate	20/40/80 MHz	
Frequency Error	Maximum PHY data rate up to 173.3 Mbps using 20MHz bandwidth;	
	Maximum PHY data rate up to 400 Mbps using 40MHz bandwidth;	
Mask	Maximum PHY data rate up to 866.7 Mbps using 80MHz bandwidth .	
	<±10ppm/802.11b/g/n/a/ac	
	-20dB/±11MHz/OFDM;	
	-28dB/±20MHz/OFDM;	
	-30dB/±11MHz/DSSS, CCK;	
	-50dB/±20MHz/DSSS, CCK.	
2.4G Transmit Power	802.11b (2.4G 11Mbps):	18 +1/-2dBm
	802.11g (2.4G 54Mbps):	17 +1/-2dBm
	802.11n (2.4G HT20 MCS7):	16 +1/-2dBm
	802.11n (2.4G HT40 MCS7):	16 +1/-2dBm
	Other TX power rate see the “power by rate”	
2.4G EVM	802.11b (2.4G 1Mbps):	≤-13dB
	802.11b (2.4G 11Mbps):	≤-13dB
	802.11g (2.4G 6Mbps):	≤-8dB
	802.11g (2.4G 24Mbps):	≤-19dB
	802.11g (2.4G 54Mbps):	≤-28dB
	802.11n (2.4G HT20 MCS0):	≤-8dB
	802.11n (2.4G HT20 MCS4):	≤-22dB
	802.11n (2.4G HT20 MCS7):	≤-30dB
	802.11n (2.4G HT40 MCS0):	≤-8dB

	802.11n (2.4G HT40 MCS4):	≤-22dB	
	802.11n (2.4G HT40 MCS7):	≤-30dB	
5G Transmit Power	802.11a (5G 54Mbps):	17 +1/-2dBm	
	802.11n (5G HT20 MCS7):	16 +1/-2dBm	
	802.11n (5G HT40 MCS7):	16 +1/-2dBm	
	802.11ac (5G VHT20 MCS8):	14 +1/-2dBm	
	802.11ac (5G VHT40 MCS9):	14 +1/-2dBm	
	802.11ac (5G VHT80 MCS9):	14 +1/-2dBm	
	Other TX power rate see the “power by rate”		
5G EVM	802.11a (5G 6Mbps):	-8dB	
	802.11a (5G 24Mbps):	-19dB	
	802.11a (5G 54Mbps):	-28dB	
	802.11n (5G HT20 MCS0):	-8dB	
	802.11n (5G HT20 MCS4):	-22dB	
	802.11n (5G HT20 MCS7):	-30dB	
	802.11n (5G HT40 MCS0):	-8dB	
	802.11n (5G HT40 MCS4):	-22dB	
	802.11n (5G HT40 MCS7):	-30dB	
	802.11ac (5G VHT20 MCS0):	-8dB	
	802.11ac (5G VHT20 MCS5):	-25dB	
	802.11ac (5G VHT20 MCS8):	-33dB	
2.4G Receive Sensitivity @ PER<10%	802.11ac (5G VHT40 MCS0):	-8dB	
	802.11ac (5G VHT40 MCS5):	-25dB	
	802.11ac (5G VHT40 MCS9):	-35dB	
	802.11ac (5G VHT80 MCS0):	≤-8dB	
	802.11ac (5G VHT80 MCS5):	≤-25dB	
	802.11ac (5G VHT80 MCS9):	≤-35dB	
	802.11b (2.4G 1Mbps):	-91dBm (Max.)	-97dBm (Typ.)
	802.11b (2.4G 11Mbps):	-85dBm (Max.)	-93dBm (Typ.)
	802.11g (2.4G 6Mbps):	-87dBm (Max.)	-96dBm (Typ.)
	802.11g (2.4G 24Mbps):	-79dBm (Max.)	-83dBm (Typ.)
	802.11g (2.4G 54Mbps):	-70dBm (Max.)	-77dBm (Typ.)
	802.11n (2.4G HT20 MCS0):	-87dBm (Max.)	-95dBm (Typ.)
	802.11n (2.4G HT20 MCS4):	-75dBm (Max.)	-80dBm (Typ.)

5G Receive Sensitivity @ PER<10%	802.11n (2.4G HT20 MCS7):	-69dBm (Max.)	-77dBm (Typ.)
	802.11n (2.4G HT40 MCS0):	-84dBm (Max.)	-92dBm (Typ.)
	802.11n (2.4G HT40 MCS4):	-72dBm (Max.)	-76dBm (Typ.)
	802.11n (2.4G HT40 MCS7):	-66dBm (Max.)	-73dBm (Typ.)
	802.11a (5G 6Mbps):	-87dBm (Max.)	-94dBm (Typ.)
	802.11a (5G 24Mbps):	-79dBm (Max.)	-88dBm (Typ.)
	802.11a (5G 54Mbps):	-70dBm (Max.)	-79dBm (Typ.)
	802.11n (5G HT20 MCS0):	-87dBm (Max.)	-93dBm (Typ.)
	802.11n (5G HT20 MCS4):	-75dBm (Max.)	-80dBm (Typ.)
	802.11n (5G HT20 MCS7):	-69dBm (Max.)	-77dBm (Typ.)
	802.11n (5G HT40 MCS0):	-84dBm (Max.)	-92dBm (Typ.)
	802.11n (5G HT40 MCS4):	-72dBm (Max.)	-76dBm (Typ.)
	802.11n (5G HT40 MCS7):	-66dBm (Max.)	-73dBm (Typ.)
	802.11ac (5G VHT20 MCS0):	-87dBm (Max.)	-94dBm (Typ.)
	802.11ac (5G VHT20 MCS5):	-71dBm (Max.)	-76dBm (Typ.)
	802.11ac (5G VHT20 MCS8):	-64dBm (Max.)	-72dBm (Typ.)
	802.11ac (5G VHT40 MCS0):	-84dBm (Max.)	-91dBm (Typ.)
	802.11ac (5G VHT40 MCS5):	-68dBm (Max.)	-72dBm (Typ.)
	802.11ac (5G VHT40 MCS9):	-59dBm (Max.)	-68dBm (Typ.)
	802.11ac (5G VHT80 MCS0):	-81dBm (Max.)	-87dBm (Typ.)
	802.11ac (5G VHT80 MCS5):	-65dBm (Max.)	-70dBm (Typ.)
	802.11ac (5G VHT80 MCS9):	-56dBm (Max.)	-65dBm (Typ.)

4.2 BT Specification

Protocol	BTv2.1+EDR/BTv3.0/BTv3.0+HS/BT v4.2/BT v5.0
Interface	UART
Frequency	2400 MHz ~ 2483.5 MHz (79 channels)
Modulation	GFSK, π/4-DQPSK, 8-DPSK

PHY Rate	1Mbps for Basic Rate; 2、 3 Mbps for Enhanced Data Rate; 1、 2 Mbps for BLE
Transmit Power	6dBm, typical
Receive Sensitivity	<-89dBm @ BER=0.1% for GFSK (1Mbps); <-90dBm @ BER=0.01% for π/4-DQPSK (2Mbps); <-83dBm @ BER=0.01% for 8-DPSK (3Mbps); <-90dBm @ PER=30.8% for BLE
Maximum Input level	GFSK(1Mbps): -20dBm; π/4-DQPSK (2Mbps): -20dBm; 8-DPSK(3Mbps): -20dBm.

5. Other Specifications

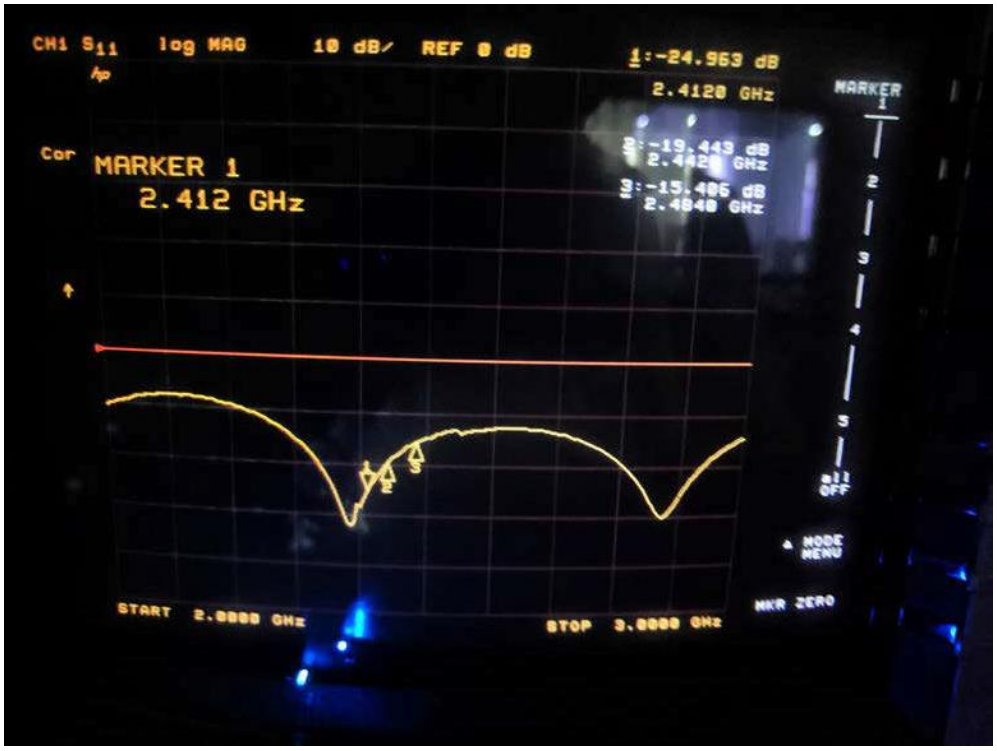
Ambient Operating Temperature	0℃ ~+70℃
Metal Case Temperature	86℃ @ Ta=70℃ Power Dissipation=2W
Storage Temperature	Module: -20℃ ~+125℃ Package: -20℃ ~+70℃
Operating Humidity	RH 95%(Non-Condensing)
Storage Humidity	RH 95%(Non-Condensing)
Humidity level	Level 3
Security	WEP 64/128bit,WPA,WPA2,TKIP,AES,WAPI
Other characteristics:	QoS-WMM, WMM-PS
Operation System	Windows XP/Win7/Linux/Android
ESD(IEC61000-4-2)	±1.5kV(Contact) @ RF Port

6. DC Characteristics

Symbol	Parameter	Min.	Typical	Max.	Unit
VDD_3.3V	3.3V Supply Voltage	3.0	3.3	3.6	V
IDD_3.3V	3.3V Rating Current	-	-	800	mA
VDDIO	SDIO I/O Voltage	Depend on the SDIO protocol (1.8V or 3.3V)			

7. S11 Report

FEWN-8822CSB2AC 2.4G Path A



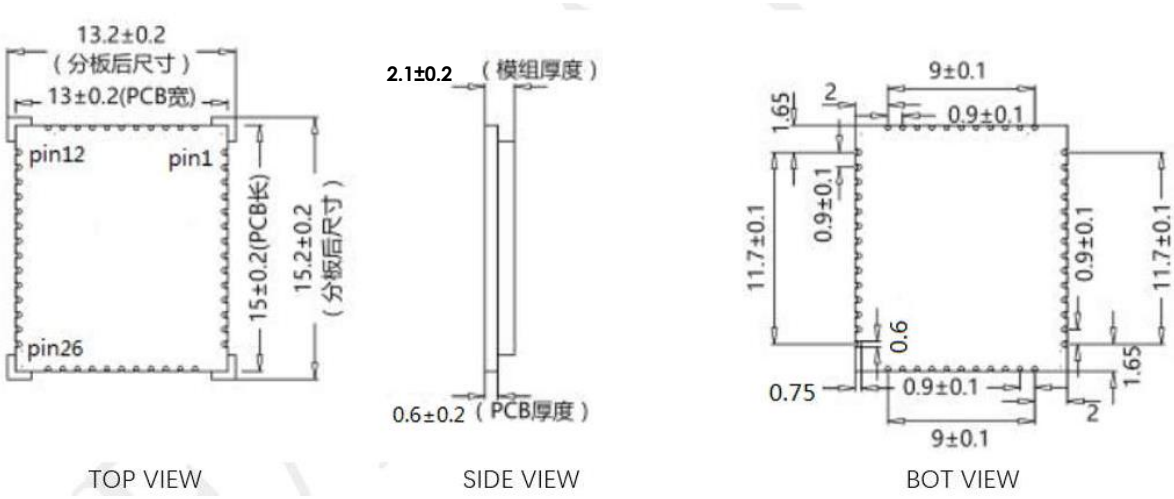
EWN-8822CSB2AC 2.4G Path B

4 EWN-8822CSB2AC 5G Path A

EWN-8822CSB2AC 5G Path B

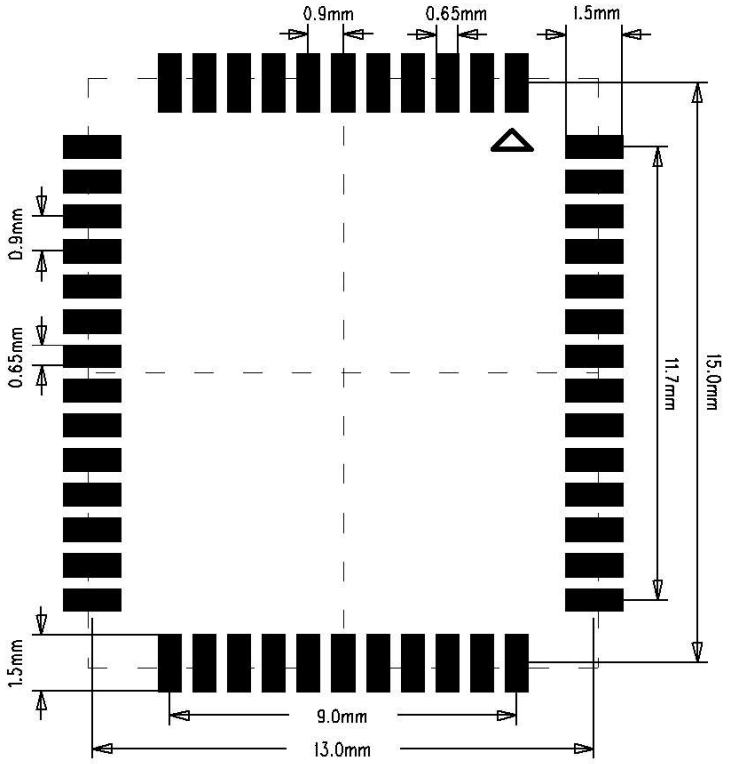
8. Module configurations

Module Dimension (L*W*T) ： 15.2±0.2mm*13.2±0.2mm*2.1±0.2mm。



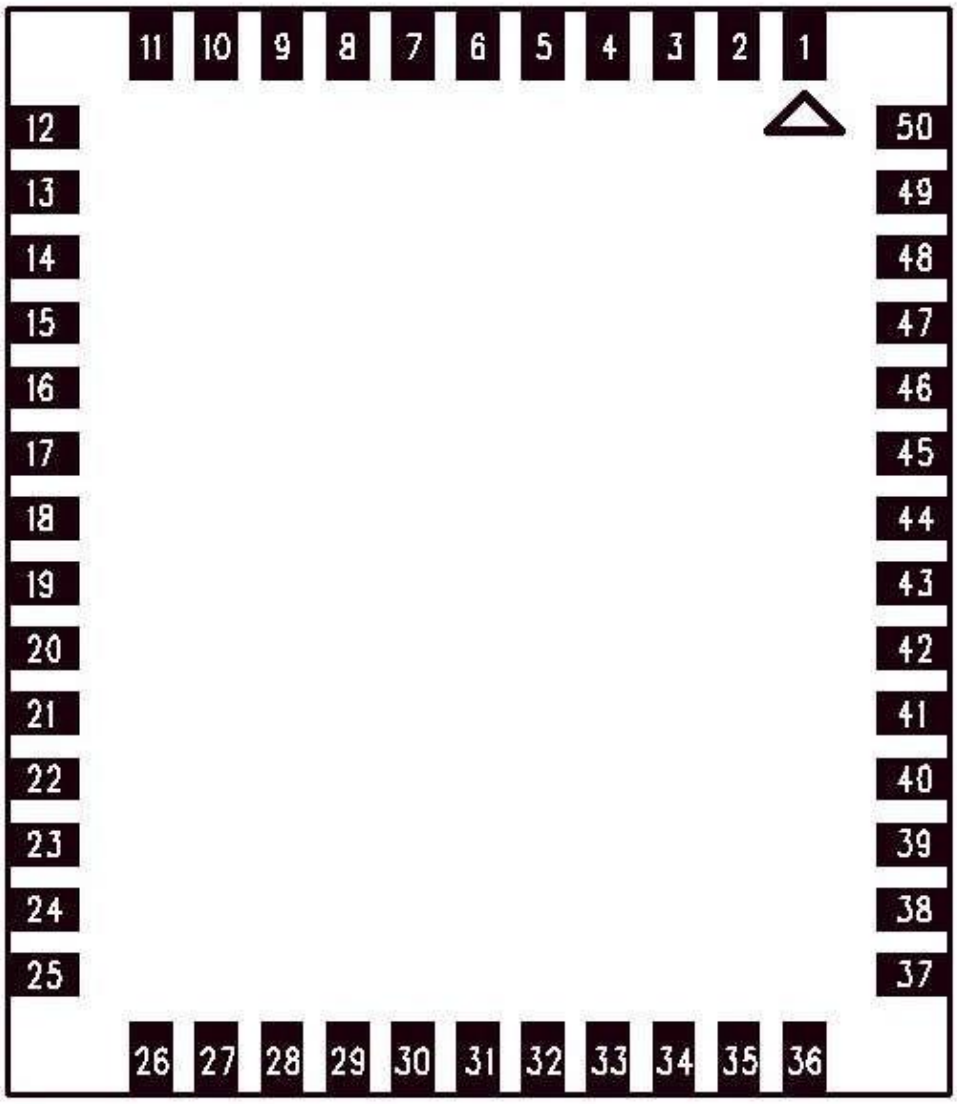
EWN-8822CSB2AC Module Dimension

Recommended



EWN-8822CSB2AC Module Dimension

9. Pin Definition



TOP VIEW

See table for the module hardware pin definition.

Pin	Definition	Type	Description	Default Pull	Power level
1	GND	-	Ground	-	-
2	Wi-Fi B	I/O	Wi-Fi Path B ANT I/O port	-	-
3	GND	-	Ground	-	-
4	GND	-	Ground	-	-
5	GND	-	Ground	-	-

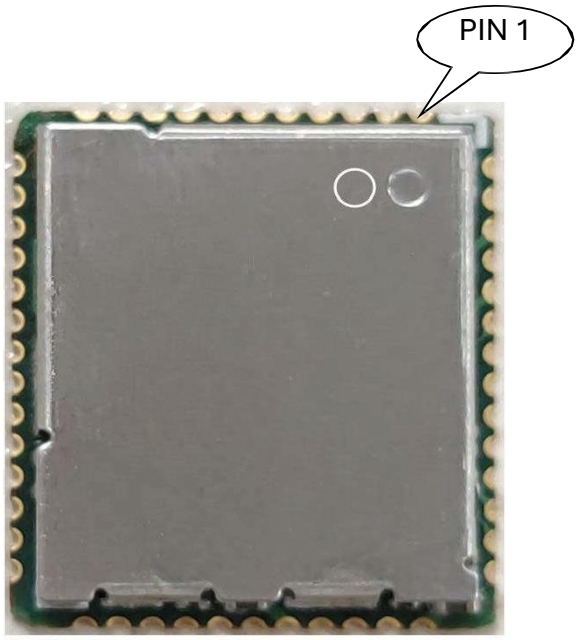
Pin	Definition	Type	Description	Default Pull	Power level
6	GND	-	Ground	-	-
7	GND	-	Ground	-	-
8	GND	-	Ground	-	-
9	Wi-Fi A	I/O	Wi-Fi Path A ANT I/O port	-	-
10	GND	-	Ground	-	-
11	GND	-	Ground	-	-
12	BT_ANT	I/O	Bluetooth ANT I/O port	-	-
13	GPIO6	I/O	General Purpose Input/Output Pin	Internal PD	VDDIO
14	G_BT	I/O	General Purpose Input/Output Pin	Internal PD	VDDIO
15	WL_REG_ON	I	General Purpose Input/Output Pin	-	VDDIO
16	WL_WAKE_HOST	O	WLAN to wake-up the host	-	VDDIO
17	SDIO _CMD	I/O	SDIO interface command line	Internal PU	VDDIO
18	SDIO _CLK	I/O	SDIO interface clock line	-	VDDIO
19	SDIO _DATA_3	I/O	SDIO interface data line 3	Internal PU	VDDIO
20	SDIO _DATA_2	I/O	SDIO interface data line 2	Internal PU	VDDIO
21	SDIO _DATA_0	I/O	SDIO interface data line 0	Internal PU	VDDIO
22	SDIO _DATA_1	I/O	SDIO interface data line 1	Internal PU	VDDIO
23	GND	-	Ground	-	-
24	WL_WAKE_HOST	O	WLAN to wake-up the host	-	VDDIO
25	GPIO7	I/O	General Purpose Input/Output Pin	-	VDDIO
26	NC	-	No connect	-	-

Pin	Definition	Type	Description	Default Pull	Power level
27	PCM_SYNC	I/O	PCM SYNC signal	-	VDDIO
28	PCM_IN	I	PCM data input	-	VDDIO
29	PCM_OUT	O	PCM data output	-	VDDIO
30	PCM_CLK	I/O	PCM clock	-	VDDIO
31	SUSCLK	I/O	External low power clock input (32.768KHz)	Internal PD	VDDIO
32	GND	-	Ground	-	-
33	NC	-	No connect	-	-
34	VDDIO	I/O	I/O voltage supply input (1.8V typ.)	-	VDDIO
35	NC	-	No connect	-	-
36	VDD_3.3V	I/O	Main power voltage source input (3.3V±10%)	-	DC 3.3V±0.3V
37	NC	-	No connect	-	-
38	BT_REG_ON	I	Enable pin for Bluetooth device ON:pull high;OFF:pull low External pull low to shut down BT	Internal PU	VDDIO
39	GND	-	Ground	-	-
40	UART_TXD	O	Bluetooth UART interface(connect to host UART RX)	-	VDDIO
41	UART_RXD	I	Bluetooth UART interface(connect to host UART TX)	-	VDDIO
42	UART_RTS_N	O	Bluetooth UART interface	-	VDDIO
43	UART_CTS_N	I	Bluetooth UART interface	-	VDDIO
44	SD_RESET	I	Reset pin for SDIO bus External pull low to reset SDIO bus	Internal PU	VDDIO
45	G_WL	I/O	General Purpose Input/Output Pin	Internal PD	VDDIO
46	GND	-	Ground	-	-

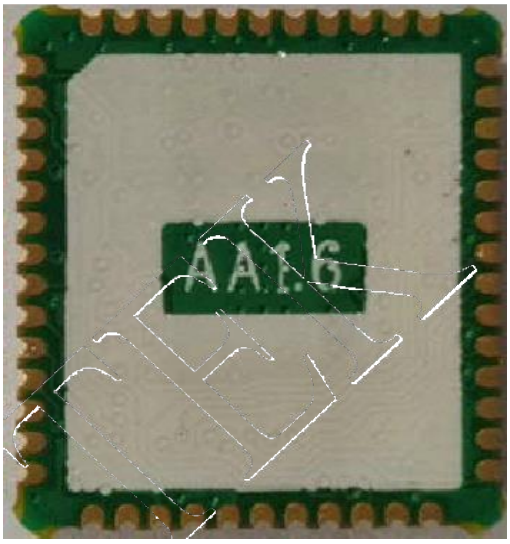
Pin	Definition	Type	Description	Default Pull	Power level
47	NC	-	No connect	-	-
48	GND	-	Ground	-	-
49	HOST_WAKE_BT	I	Host wake-up Bluetooth	Internal PD	VDDIO
50	BT_WAKE_HOST	O	Bluetooth to wake-up the host	Output High	VDDIO

Note: The internal pull-up/down resistances of the chip are about 50K~100K ohm

10. Module Photos



TOP VIEW



BOTTOM VIEW

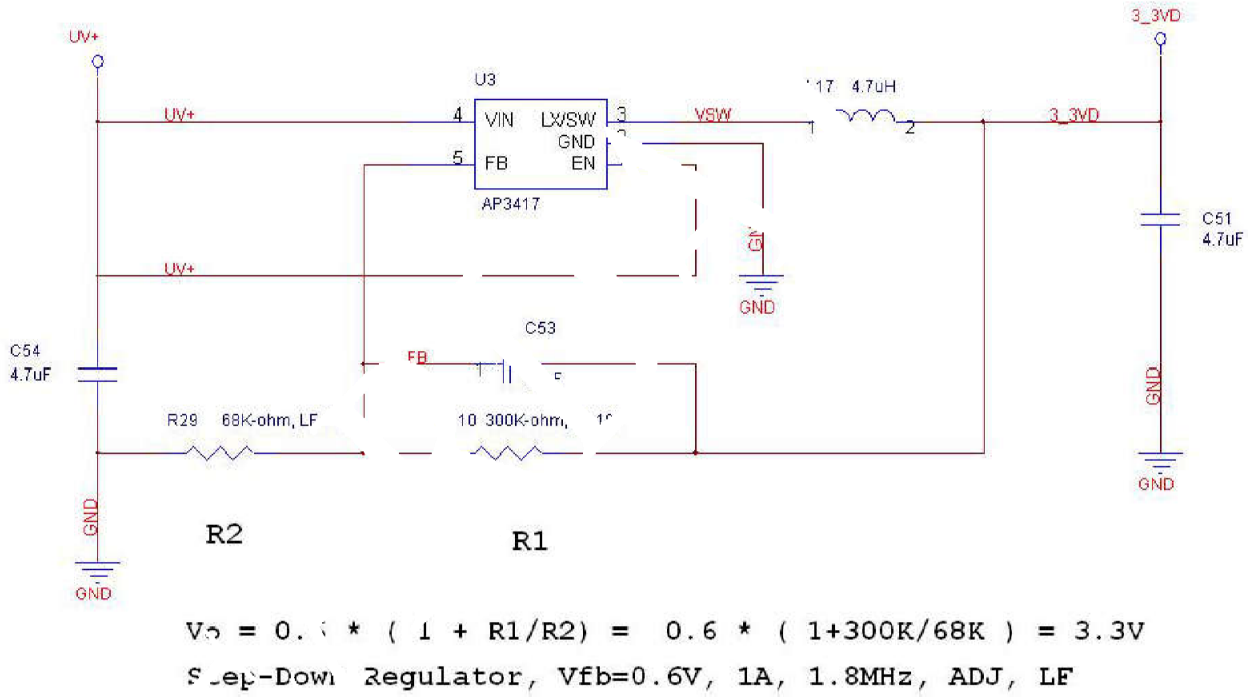
11. Key material list

Type	Model	Footprint	QTY.
Diplexers	LD18D2450LAN-D40/M	1608	2PCS
	RFDIP1607L132A8D1T		
IC	RTL8822CS-VBS-CG	QFN76	1 PCS
Crystal	40MHz（CX/YDL/JWT/TJ）	X3225	1 PCS

12. Reference design

12.1 Power supply requirement

The module power supply voltage is DC+3.3V, and the maximum module current is 800mA. The power supply design needs to consider the output current and power interference. To avoid the +3.3V power supply from interfering with other circuits on the motherboard, it is recommended to supply to the module using the regulator circuit alone. the recommended DC-DC circuit structure shown in the figure below. A 4.7uF~10uF capacitor is connected in parallel at 3_3VD output to filter out the interference. A bead is connected in series at 3_3VD output. The bead and capacitor must be placed as close to the module as possible. If you need to share +3.3V with other circuits, consider whether the current of the shared power supply is sufficient.



Power supply Circuit schematic

Table DC Characteristics

Symbol	Parameter	Minimum	Typical	Maximum	Peak Current
VDD_3.3V (PIN36)	3.3V Supply Voltage	3.0V	3.3V	3.6V	0.8A

Table Platform Power Rail Requirements

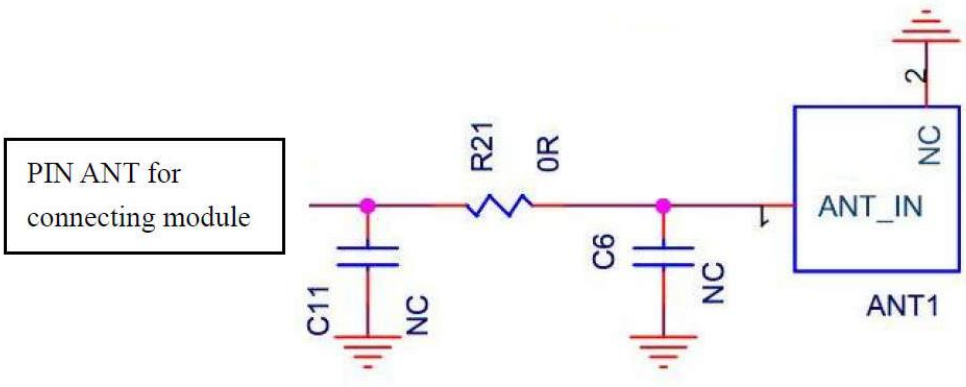
VDD_3.3V Power range	VDD_3.3V Ripple	VDD_3.3V Noise	Rise time	
			Min	Max
+/-0.165V	300mVpp@switching frequency > 100KHz		0.5ms	5ms

12.2 SDIO Interface

The SDIO interface has 4 data lines, a cock signal line and a command signal line. all of the SDIO lines must be equal length. In order to avoid mutual interference, SDIO lines should be avoided to be adjacent and parallel to other data lines, RF lines and power lines, and Surround the data line and clock line with ground copper.

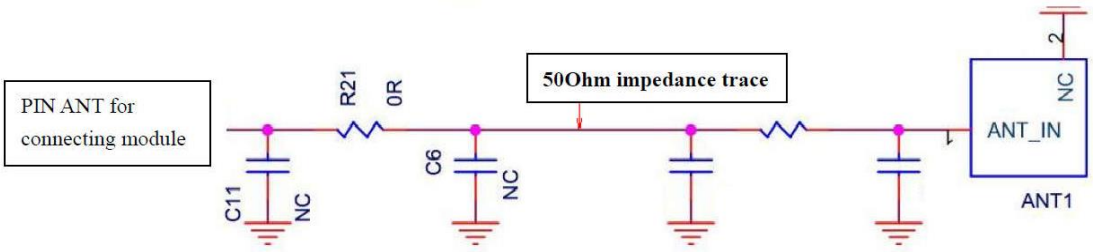
12.3 RF circuit

Due to the SMD package, the RF port impedance must be offset after the module is soldered to the motherboard. In order to achieve the best performance, it is recommended to add a PI-type matching network to the motherboard, as shown below (C11, R21,C6). The value of the PI type matching network needs to be debugged according to the actual motherboard to match RF port impedance to 50 Ohm.



Connect 50 Ohm matching antenna reference circuit

The antenna ANT1 in the figure above must be 50 Ohm. If the antenna is not matched, it is recommended to add a set of PI type matching network at the front of the antenna to match the antenna. Generally, the antenna manufacturers will give Suggestions on matching parameters.



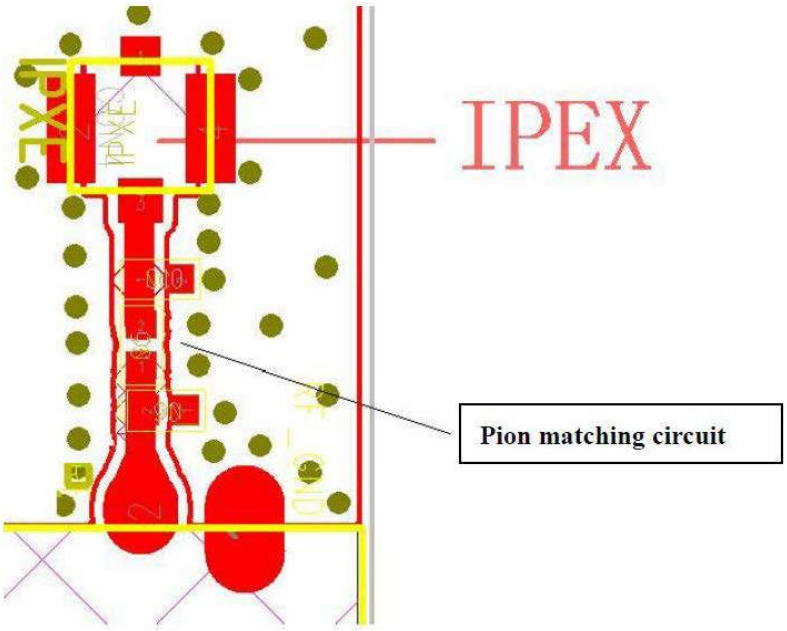
Connect the unmatched antenna reference circuit

The RF line layout should be matched according to 50ohm. The line impedance is related to the plate, plate thickness, line width and copper spacing. Professional software can be used to calculate the line width. Note: for multilayer plates, the plate thickness should calculate the distance from RF routing layer to GND of the next layer. There are RF lines Layout principles

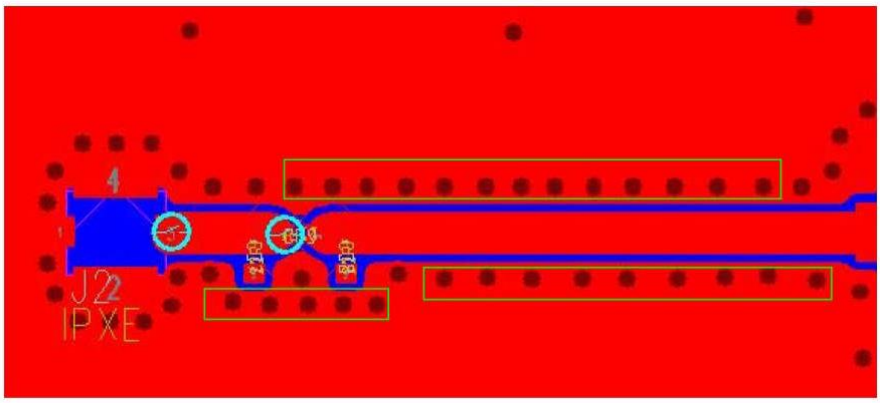
1. RF line layout needs to match 50 ohms. The line width can be calculated by professional software. (Note: If it is a multi-layer board, The board thickness should

calculate the distance from the RF trace layer to the next ground layer.)

2. The RF line must be surrounded by ground copper and ground holes.
3. The PI-type matching circuit for adjusting the impedance of the module is placed close to the module. The PI type matching circuit for matching the antenna is placed close to the antenna



The PI type matching circuit Layout

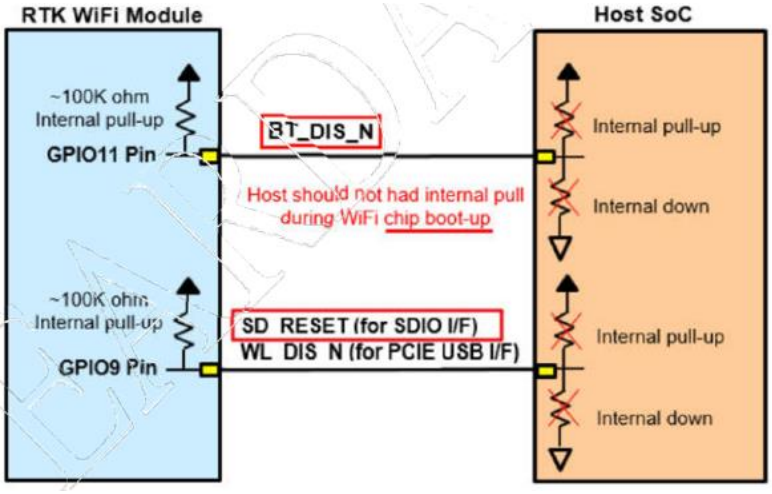


The RF line Layout

12.4 Application Circuit for SD_RESET and BT_DIS_N with Platform

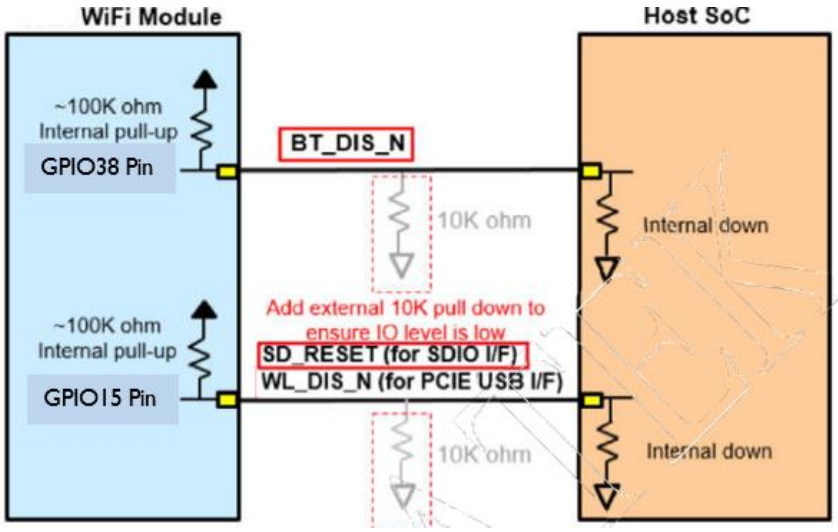
There is internal pull-up, about 100K, resistor design in SD_RESET and BT_DIS_N pad.

If Host SOC need to control these two pins, choose host GPIO without pull capability to avoid voltage divider. Middle range of IO voltage would affect WiFi booting up



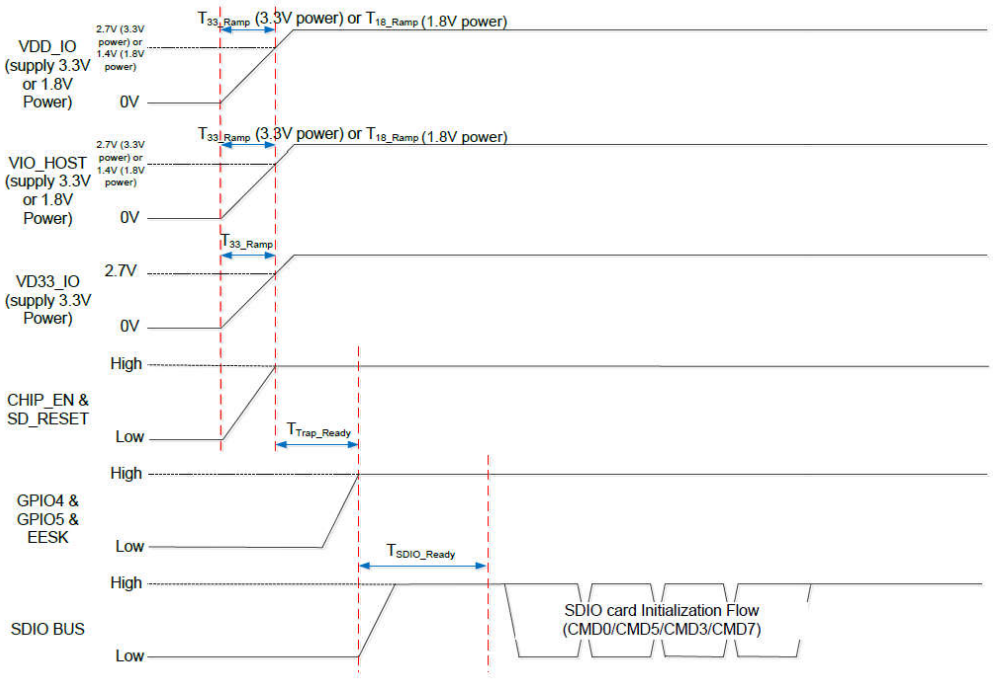
Host GPIO control WL_DIS_N and BT_DIS_N

If Host GPIO has pull-down capability and it can't be avoided, suggest to add 10K pull down resistor in circuit to ensure IO is in low level. In this way, WiFi chip internal pull-up 100K could be neglected (FIG 22). Please note external pull-down will cause additional static current.



Host WL_DIS_N and BT_DIS_N pin, add external pull down resistor to ensure low level

12.5 SDIO Power On Sequence



SDIO Power On Sequence

12.6 Motherboard interference avoidance

Motherboard interference comes from: high-speed data interface (HDMI), the Operating frequency of main chip, DDR, DC-DC power supply. The method of avoiding interference according to the characteristics of various signals is also different. The main methods of interference avoidance include :

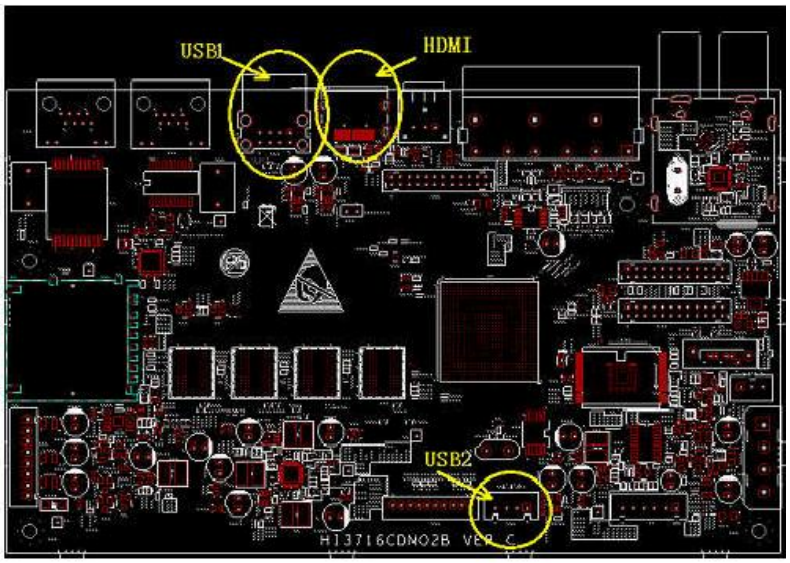
1. keeping away from the source of interference;
2. Adding shields to avoid interference leakage
3. Reasonable layout to eliminate interference

12.6.1 Interface interference

When HDMI uses the 74.2MHz frequency, its 33x frequency is in the 2.4G band of Wi-Fi, which will seriously interfere with the Wi-Fi signal. If the HDMI frequency is 148.5MHz,

although the 16x frequency is not in the Wi-Fi band, the isolation of the frequency is not good, and the Wi-Fi signal will be interfered to some extent. If the distance between the HDMI interface and the Wi-Fi module on the PCB is less than 5cm, the HDMI output display will interfere with the Wi-Fi signal, resulting in problems such as Wi-Fi connection failure and throughput drop. Therefore, keep the location of the Wi-Fi module away from the HDMI port on the hardware layout to avoid interference.

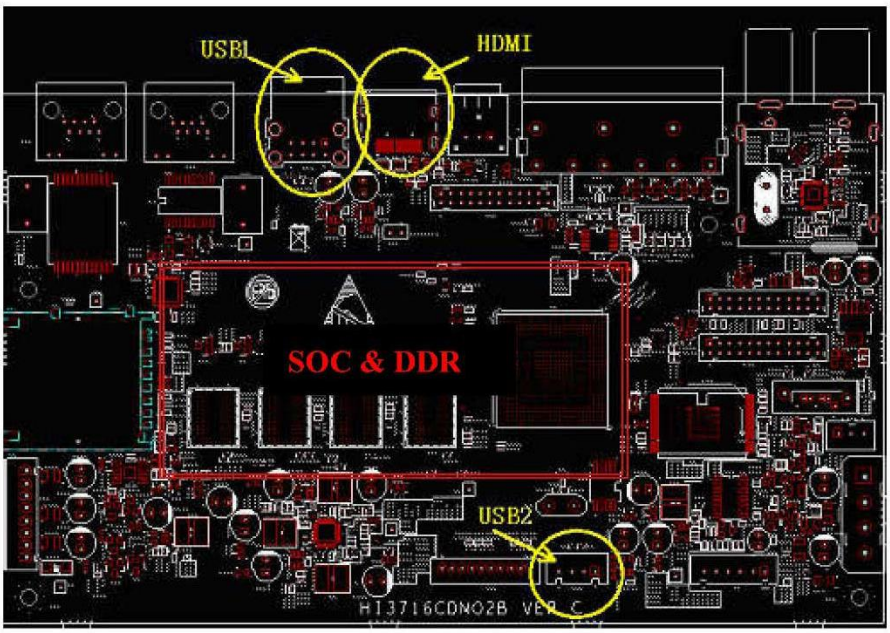
At the same time, if the Wi-Fi antenna is built-in the motherboard, its placement must also be carefully considered to be far from the interface interference. If the antenna is placed in an incorrect position, even if the module is shielded, the interference signal is coupled through the antenna, which will eventually result in a lower Wi-Fi throughput. (Note: In addition to interference, the placement of the internal antenna should also evaluate the effect of the metal interface, motherboard, and housing material on the antenna impedance.)



HDIM and USB interference

12.6.2 The main chip interferes with DDR

Because the main chips operate at about 800MHz or DDR2 operate at 667MHz, 3x frequency of 800MHz and 4x frequency of 667MHz are near 2.4GHz band. It must to place Wi-Fi modules and antennas far away from the main chip and DDR. It is strongly recommended that the main chip be isolated from the DDR by a shield. As shown in the figure



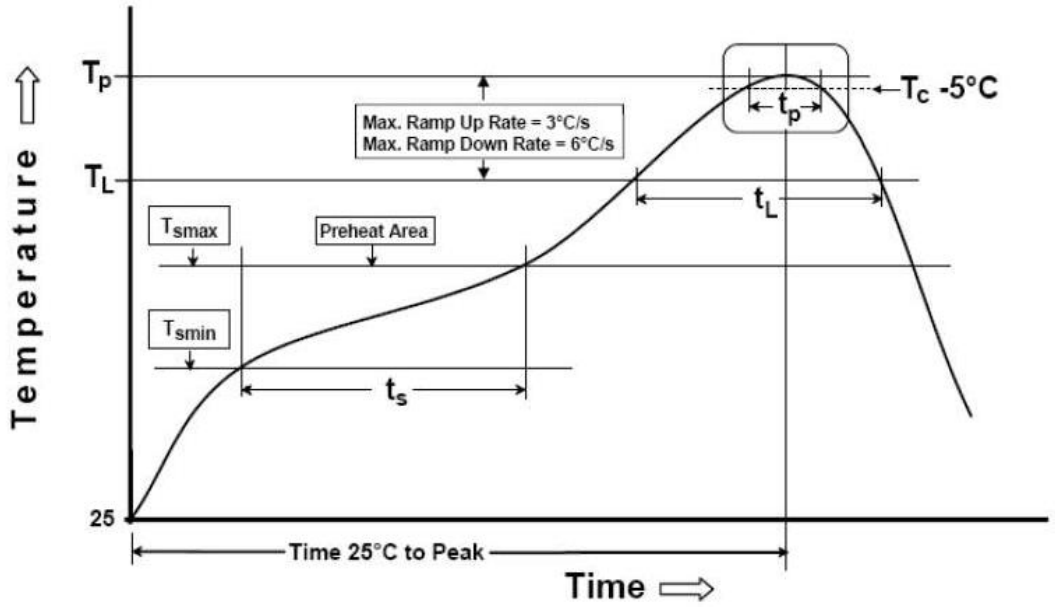
below.

12.7 Recommended secondary reflux temperature curve

The number of reflux shall not exceed 2 times, and the tin feeding height of the half hole of the module shall be no less than 1/4.

The lead-free reflux curve requirements of Wi-Fi module products are shown in figure24 ：

Stage	Note	Pb-free assembly
Average ramp-up rate	T_L to Tp	3 ℃/ second max.
Preheat	Temperature min (T_{smin})	150℃
	Temperature max (Tsmax)	200℃
	Time (t_{smin} to t_{smax})	60 – 120 seconds
Time maintained above	Temperature(T_L)	217℃
	Time (t_L)	60 – 150 seconds
Peak package body temperature (Tp)		Tp must not exceed the specified classification temp(Tc=245℃).
Time(tp) within 5℃ of the specified classification temperature (Tc)		30 seconds
Ramp-down rate (Tp to T_L)		6 ℃ / seconds max.
Time 25℃ to peak temperature		8 minutes max.



Furnace temperature curve

NOTE:

1. The maximum furnace temperature of the module is 260℃ , don't exceed this temperature.

2. The gold plating thickness of the module pad is 2u".

ISED Compliance Statement

Section 8.4 of RSS-GEN

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

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

FCC Compliance Statement (Part 15.19)

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.

Warning (Part 15.21)

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

FCC Interference Statement (Part 15.105 (b))

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 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.

WARNINGS:

To comply with FCC/IC RF exposure limits for general population / uncontrolled exposure, the antenna(s) used for this transmitter must be installed to provide a separation distance of at least 20 cm from all persons and must not be co-located or operating in conjunction with any other antenna or transmitter.