

HK NATER TECH LIMITED

NT-UM02WBS-8723VAU模块 承认书

客户名称

Customer: _____

样品名称

Description: NT-UM02WBS-8723VAU 模块 V1.4

客户料号

Customer P/N: _____

日期

Date: _____

客户栏 Customer		
核准Approve	审核Auditing	承认Admit

供应商栏 Provider		
核准Approve	审核Auditing	承认Admit

客户名称:

公司地址:

电话:

传真:

联系人:

E-mail:

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尊敬的客户: 请收到我公司样品承认书三日内传首页, 谢谢!

USB PRODUCT SPECIFICATION

**IEEE 802.11 b/g/n 2.4GHz 1T1R WiFi with Bluetooth
v2.1+EDR/Bluetooth 3.0/3.0+HS/4.0**

**NT-UM02WBS (Realtek RTL8723AS-VAU)
Combo Module**

Version 1.4

1. General Description

The Realtek is a highly integrated single-chip 802.11n Wireless LAN (WLAN) USB-MF (USB Multi-function) network interface controller with integrated Bluetooth 2.1/3.0/4.0 controller. It combines a WLAN MAC, a 1T1R capable WLAN baseband, and RF in a single chip. The RTL8723AS-VAU provides a complete solution for a high-performance integrated wireless and Bluetooth device.

The integration provides better coordination between 802.11 and Bluetooth, and with sophisticated dynamic power control and packet traffic arbitration, RTL8723AS-VAU is able to provide the best coexistence performance.

RTL8723AS-VAU also integrates RF/PA/LNA for both 802.11n and Bluetooth so that the number of external components is reduced to minimum. The 802.11 part supports 150Mbps PHY rate and delivers reliable throughput from an extended distance.

The Bluetooth part supports latest 3.0+HS/4.0+LE operation and provides smooth user experience under all usage scenarios. Optimized RF architecture and baseband algorithms provide superb performance and lowest power consumption.

2. IC Features

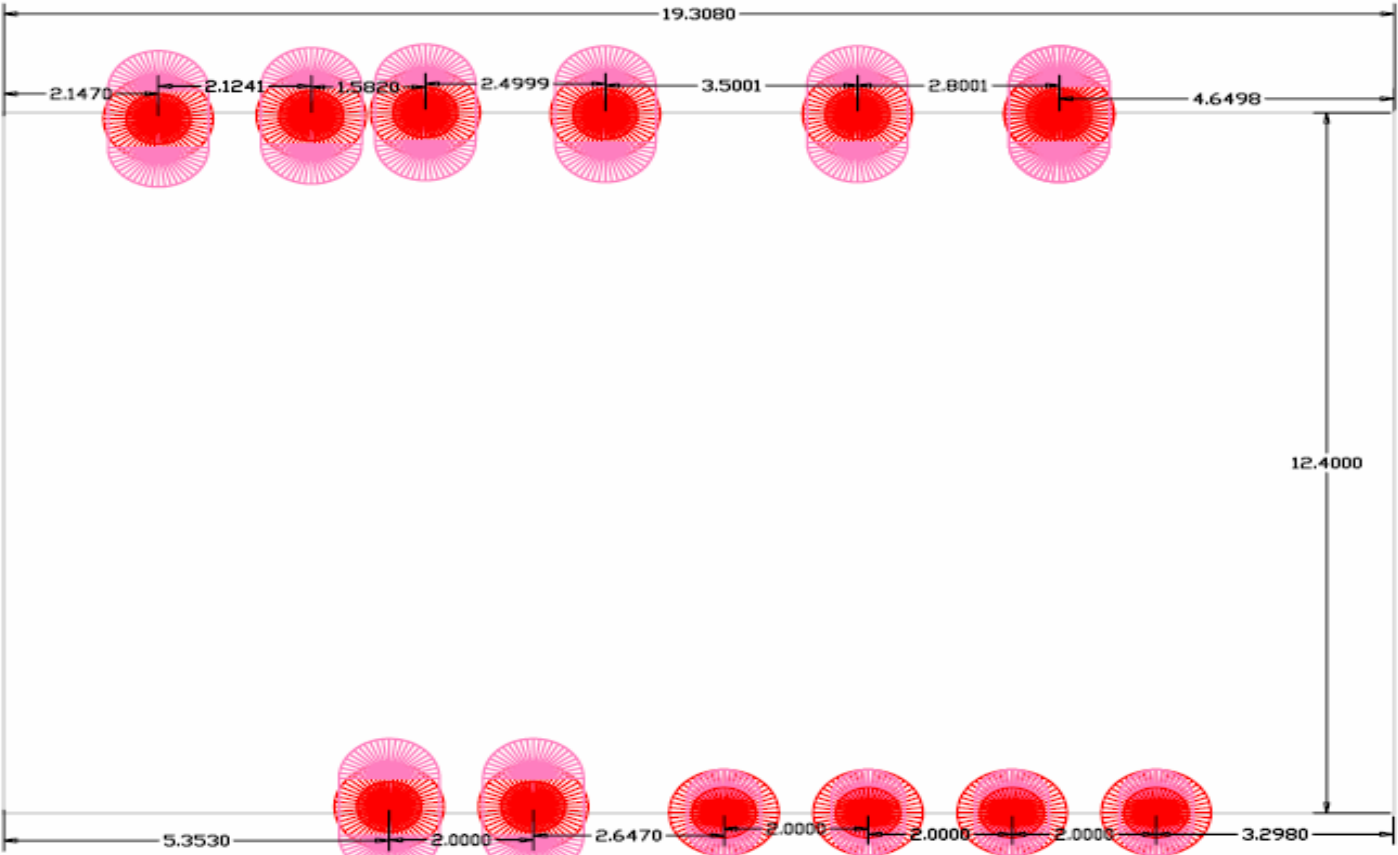
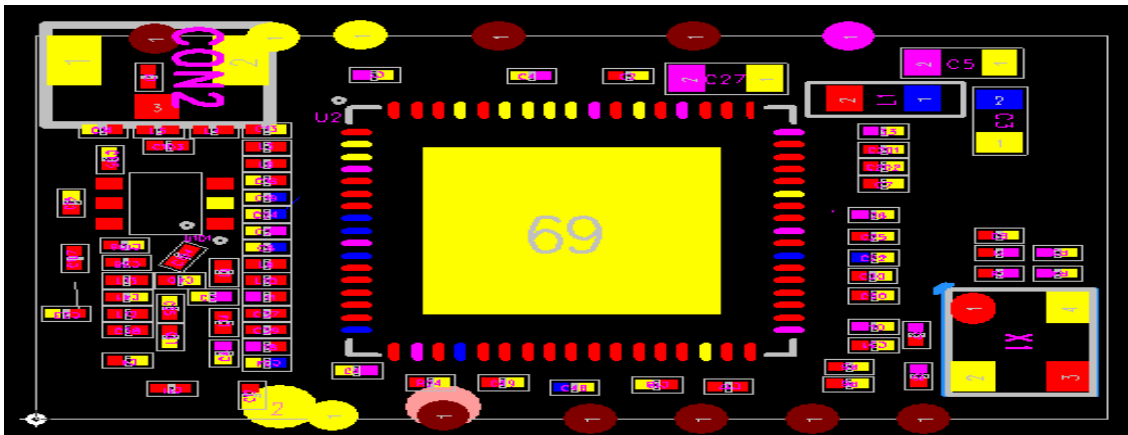
<p>General</p> <ul style="list-style-type: none"> 68-pin QFN CMOS MAC, Baseband PHY, and RF in a single chip for IEEE 802.11b/g/n compatible WLAN Complete 802.11n solution for 2.4GHz band 72.2Mbps receive PHY rate and 72.2Mbps transmit PHY rate using 20MHz bandwidth 150Mbps receive PHY rate and 150Mbps transmit PHY rate using 40MHz bandwidth Compatible with 802.11n specification Backward compatible with 802.11b/g devices while operating in 802.11n mode Qualified Bluetooth v2.1+EDR, v3.0+HS and v4.0 LE Systems Support for v4.0 Bluetooth Low Energy Integrated class1, class2, and class3 PA and modem in Bluetooth Controller <p>Host Interface</p> <ul style="list-style-type: none"> Complies with USB Specification Revision 2.0 for WLAN and Bluetooth controller Bluetooth controller is configured as USB function 0 and WLAN controller is configured as USB function 1 Support USB2.0 L1-LPM and L2-SS specification <p>Standards Supported</p> <ul style="list-style-type: none"> IEEE 802.11b/g/n compatible WLAN Short Guard Interval (400ns) DSSS with DBPSK and DQPSK, CCK modulation with long and short preamble OFDM with BPSK, QPSK, 16QAM, and 64QAM modulation. Convolutional Coding Rate: 1/2, 2/3, 3/4, and 5/6 Maximum data rate 54Mbps in 802.11g and 150Mbps in 802.11n Switch diversity for DSSS/CCK Hardware antenna diversity Selectable receiver FIR filters Programmable scaling in transmitter and receiver to trade quantization noise against increased probability of clipping Fast receiver Automatic Gain Control (AGC) On-chip ADC and DAC <p>BT Controller</p> <ul style="list-style-type: none"> Integrated MCU to execute Bluetooth protocol stack Support 3 SCO links simultaneously Support 3 scatternets 	<ul style="list-style-type: none"> IEEE 802.11e QoS Enhancement (WMM) IEEE 802.11h TPC, Spectrum Measurement 802.11i (WPA, WPA2). Open, shared key, and pair-wise key authentication services Cisco Compatible Extensions (CCX) for WLAN devices <p>WLAN MAC Features</p> <ul style="list-style-type: none"> Frame aggregation for increased MAC efficiency (A-MSDU, A-MPDU) Low latency immediate High-Throughput Block Acknowledgement (HT-BA) Long NAV for media reservation with CF-End for NAV release PHY-level spoofing to enhance legacy compatibility Power saving mechanism Channel management and co-existence Multiple BSSID feature allows the RTL8723AS-VAU to assume multiple MAC identities when used as a wireless bridge Transmit Opportunity (TXOP) Short Inter-Frame Space (SIFS) bursting for higher multimedia bandwidth <p>WLAN PHY Features</p> <ul style="list-style-type: none"> IEEE 802.11n OFDM One Transmit and one Receive path (1T1R) 20MHz and 40MHz bandwidth transmission Enhanced BT/WIFI Coexistence Control to improve transmission quality in different profiles Bluetooth Low Energy Dual Mode support <p>Bluetooth Transceiver Features</p> <ul style="list-style-type: none"> Fast AGC control to improve receiving dynamic range Support AFH to dynamically detect channel quality to improve transmission quality Integrated internal class1, class2, and class3 PA Bluetooth 3.0 compliant Bluetooth Low Energy supported Integrated 32K oscillator <p>Peripheral Interfaces</p> <ul style="list-style-type: none"> General Purpose Input/Output (11 pins) 4-wire EEPROM control interface (93C46) Three configurable LED pins Configurable Bluetooth Coexistence Interface
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PRODUCT SPECIFICATIONS

Module Name	NT-UM02WBS-8723AS-VAU		
Main chipset	RTL8723AS-VAU		
Standards	WiFi: IEEE 802.11b, IEEE 802.11g, Draft IEEE 802.11n, IEEE 802.11d, IEEE 802.11e, IEEE 802.11h, IEEE 802.11i BT: V2.1+EDR/BT v3.0/BT v3.0+HS/BT v4.0		
Bus Interface	WiFi: USB BT: USB		
Form Factor	L*W*H = 19.3mm*12.4mm*1.8mm		
Data Rate	WiFi: 802.11b: 11, 5.5, 2, 1 Mbps 802.11g: 54, 48, 36, 24, 18, 12, 9, 6 Mbps 802.11n: MCS 0 to 7 for HT20MHz MCS 0 to 7 for HT40MHz BT: 1 Mbps for Basic Rate 2,3 Mbps for Enhanced Data Rate		
Media Access Control	WiFi: CSMA/CA with ACK BT: AFH, Time Division		
Modulation Techniques	WiFi: 802.11b: CCK, DQPSK, DBPSK 802.11g: 64 QAM, 16 QAM, QPSK, BPSK 802.11n: 64 QAM, 16 QAM, QPSK, BPSK BT: 8DPSK, $\pi/4$ DQPSK, GFSK		
Network Architecture	WiFi: Ad-hoc mode (Peer-to-Peer), Infrastructure mode BT: Pico Net, Scatter Net		
Operating Channel	WiFi 2.4GHz: 11: (Ch. 1-11) – United States 13: (Ch. 1-13) – Europe 14: (Ch. 1-14) – Japan BT 2.4GHz: Ch. 0 ~78		
Frequency Range	2.400GHz ~ 2.4835 GHz		
Transmit Output Power – 1x1 (Tolerance: ± 1.5 dBm)	WiFi :		
	802.11b@11Mbps 16dBm	802.11g@6Mbps 16dBm 802.11g@54Mbps 14dBm	802.11n 16dBm (MCS 0_HT20) 13dBm (MCS 7_HT20) 13dBm (MCS 0_HT40) 13dBm (MCS 7_HT40)
	BT: Max +5dBm		
Receiver Sensitivity	WiFi :		
	802.11b@11Mbps -84dBm	802.11g@54Mbps -72dBm	802.11n -69dBm (MCS 7_HT20) -66dBm (MCS 7_HT40)
	BT: -89dBm@1Mbps, -90dBm@2Mbps, -83dBm@3Mbps		
Security	WiFi : WPA, WPA-PSK, WPA2, WPA2-PSK, WEP 64bit & 128bit, IEEE 802.11x, IEEE 802.11i BT: Simple Paring		
Operating Voltage	3.3 V ± 0.2 V I/O supply voltage		
OS supported	Windows XP/Win7/Linux/Android		
Power Consumption (3.3V) (Typical)	WiFi : TX Mode: (Conituous mode) 190mA (MCS7/BW40/13dBm) RX Mode: (Conituous mode) 150mA (MCS7/BW40/-60dBm) Associated Idle: 120mA Unassociated Idle: 130mA RF disable Mode: 120mA BT : Inquiry & Page Scan: 1.7mA ACL no traffic: 15mA SCO HV3: 30mA Parked 1.28s beacon: 1.12mA Reset: 0.05mA		

Mechanical

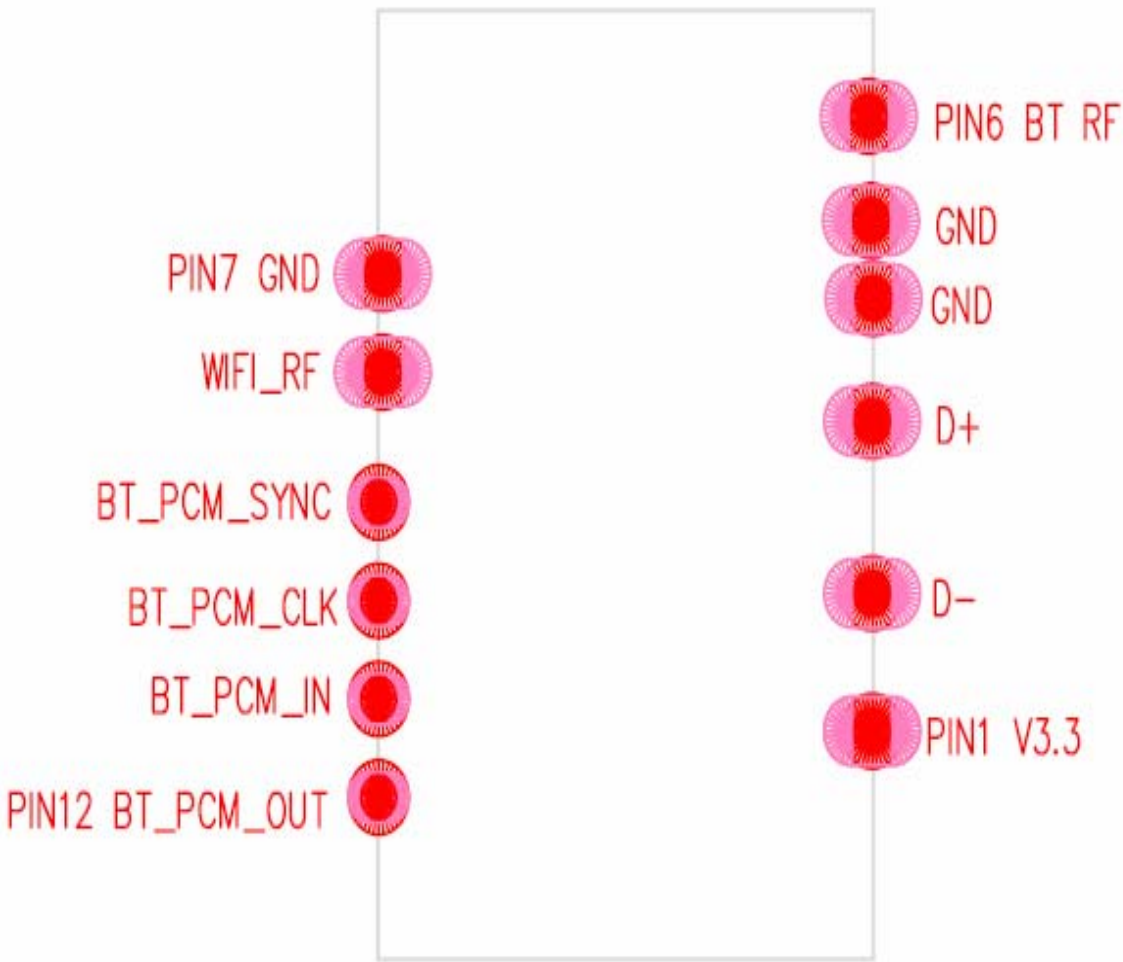
	Length	Width	Height
Dimensions (mm)	19.3 (Tolerance:±0.2mm)	12.4 (Tolerance:±0.2mm)	1.8 (Tolerance:±0.2mm)



MODULE PIN ASSIGNMENT

Pin	Function	Pin	Function
1	VCC3.3V	7	GND
2	D-	8	WIFI RF
3	D+	9	BT_PCM_SYNC
4	GND	10	BT_PCM_CLK
5	GND	11	BT_PCM_IN
6	BT RF	12	BT_PCM_OUT

Module PIN feet definition figure



Block Diagram

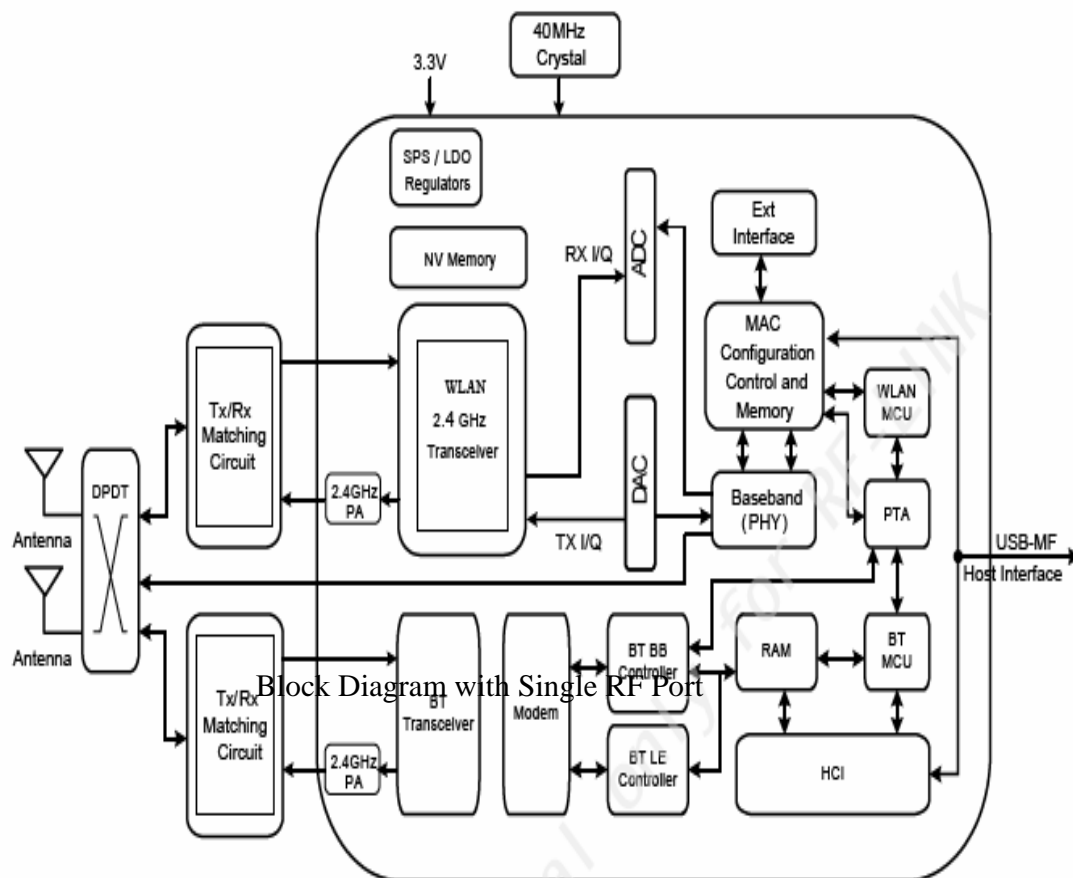


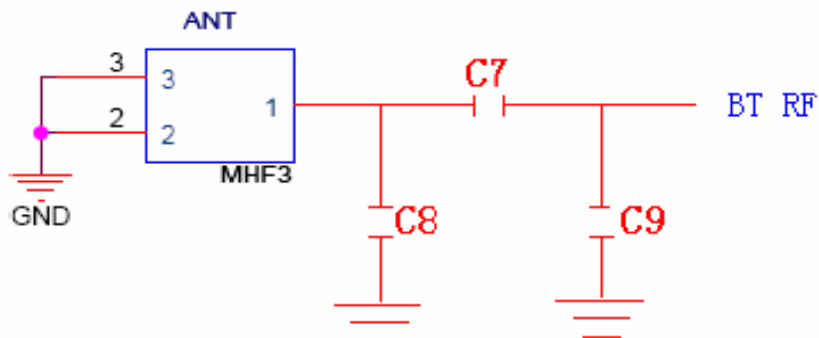
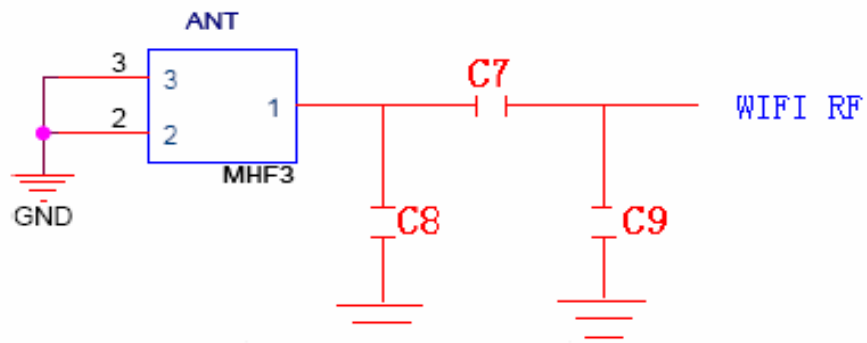
Figure 2. Single-Band 11n (1x1) and Integrated Bluetooth Controller Solution with Antenna Diversity

(1) Option for single antenna. WiFi/BT shares the single RF port and a SPDT required for switching between BT and WiFi.

(2) Default this module only require 3.3V single power source and core voltage generated by internal voltage regulator.

(3) This module reserves flexibility for external power source if system can provide VD12/VD15 for this module

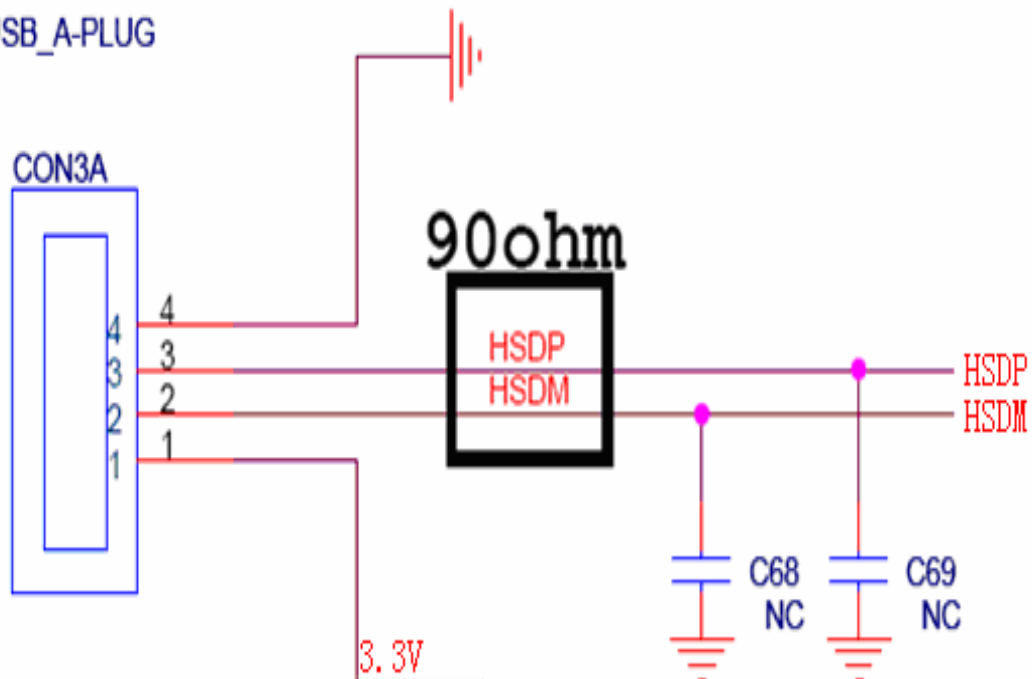
WIFI\BT RF Circuit reference pictures



注：以上 RF 走线要做 50 欧的阻抗，走线不能走 90 度，走线不能长于 15MM。

USB interface Circuit reference pictures

USB_A-PLUG



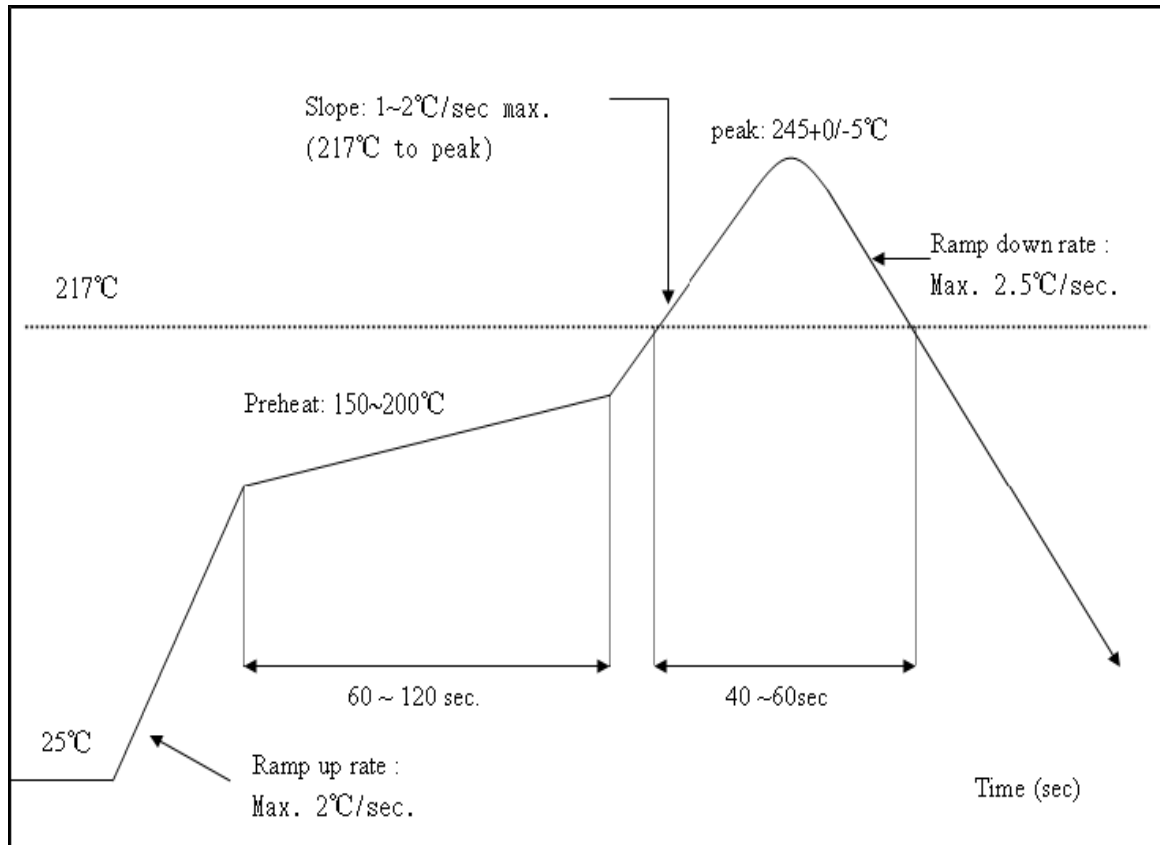
Two root go line do difference, but also required to make 90 0 the impedance test

Recommended Reflow Profile

Referred to IPC/JEDEC standard.

Peak Temperature : $<250^{\circ}\text{C}$

Number of Times : ≤ 2 times



ID SETTING INFORMATION

Reg Domain	World Wide 13 Channels 1-11 with active scan Channels 12,13 with passive scan Channel 14 with no scan
Reg Domain Code	0x0A
Vendor ID	WiFi : 0x0BDA BT : 0x0BDA
Device ID	WiFi : 0x0724 BT : 0x0724 (PID)
Subsystem Device ID	0x0724 (Realtek demoboard)
Subsystem Vendor ID	0x0BDA