Product Specification

IEE802.11 b/g/n 2.4G 1T1R WIFI+BT V2.1+EDR/BT3.0/BT 3.0+HS/4.0 USB

MODULE   Version: 1.0

BL-R8723RB1

FCC Statement

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.

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

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.

The 150Mbps Wireless N SDIO
Module is designed to comply with the FCC statement. FCC ID is S8J-R8723RB1. The host system using 150Mbps Wireless N SDIO Module, should have label indicated it contain modular's
FCC ID：S8J-R8723RB1.
This radio module must not installed to colocate and operating simultaneously with other radios in host system , additional testing and equipment authorization
may be required to operating simultaneously with other radio.

RF warning for Mobile device:
This equipment complies with FCC 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.

Contents

1. General Description

BL-8723RB1 product Accord with FCC CE and is a small size and low profile of WiFi+BT combo module with LGA (Land-Grid Array) footprint, board size is 19.5mm*12.4 mm with module height 0.6mm. It is 150 wireless USB adapter which has lower power consumption, high linearity output power, accords with IEEE802.11B/G/N, and supports IEEE802.11i safety protocol, along with IEEE 802.11e standard service quality. It connects with other wireless device which accorded with these standards together, supports the new data encryption on 64/128 bit WEP and safety mechanism on WPA-PSK/WPA2-PSK, WPA/WPA2.Its wireless transmitting rate rises 150M, equivalent to 10 times of common 11b product. The inner AI high gain ceramics antenna adapts different kinds of work environment. It's easy and convenient to link to wireless network for the users using desktop, laptop and other device that needs connect to wireless network.

The WiFi throughput can go up to 150Mbps in theory by using 1x1 802.11n b/g/n MIMO technology and Bluetooth can support BT2.1+EDR/BT3.0 and BT4.0.

2. The range of applying

MID, networking camera, STB GPS, E-book, Hard disk player, Network Radios, PSP, etc, the device which need be supported by wireless networking.

3. Features

Feature	Implementation
Power supply	VCC_3.3V +-0.2V
Clock source	40MHz
Temperature range	Work temperature: -20ºC---70ºC Storage temperature -40°C ~ +80°C
The connect type of Antenna	Connect to the 6th pin of Module
Package	SMT 10 pins
WLAN and BT features	
General features	■ 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 BT 2.1, BT 3.0 and BT 4.0 Dual mode ■Support for Bluetooth Low Energy ■Integrated class 1, class 2, and class 3 PA and modem in Bluetooth Controlle
Host Interface	■ Complies with USB Specification Revision 2.0
Standards Supported	■ IEEE 802.11b/g/n compatible WLAN ■ 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 ■ BT v2.1, EDR/BT v3.0 and HS/BT v4.0
WLAN MAC Features	■ 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 ■ Transmit Opportunity (TXOP) Short Inter-Frame Space (SIFS) bursting for higher multimedia bandwidth
WLAN PHY Features	■ IEEE 802.11n OFDM ■ One Transmit and one Receive path (1T1R) ■ 20MHz and 40MHz bandwidth transmission ■ 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
BT Controller	■ 1Mbps for Basic Rate; 2,3Mbps for Enhanced Data Rate; 6,9,12,18,24,36,48,54Mbpsfor High Speed ■ AFH, Time Division for Media Access Control ■ 8DPSK, π/4 DQPSK, GFSK for Modulation Techniques ■PCM interface for audio data transmission via BT controller. ■Integrated MCU to execute Bluetooth protocol stack ■Support all packet types in basic rate and enhanced data rate ■Support SCO / eSCO link (allow one link for PCM interface and three links for HS-UART) ■Support 4 piconets in a scattern ■Support Secure Simple Pairing ■Support Low Power Mode (Sniff / Sniff Sub-rating / Hold / Park) ■Enhanced BT/WIFI Coexistence Control to improve transmission quality in different profiles ■Bluetooth 4.0 Dual Mode support: Simultaneous LE and BR/EDR ■Support multiple states of Low Energy to increase the flexibility of application
Bluetooth Transceiver Features	■Fast AGC control to improve receiving dynamic range ■Support AFH to dynamically detect channel quality to improve transmission quality ■Integrated internal class 1, class 2, and class 3 PA ■Bluetooth 3.0+HS compliant ■Power Control / Enhanced Power Control Supported ■Bluetooth Low Energy supported ■Integrated 32K oscillator for power management

4. DC Characteristics

Symbol	Parameter	Minimum	Typical	Maximum	Units
VD33A, VD33D	3.3V I/O Supply Voltage	3.0	3.3	3.6	v
VD28A, VD28D	1.2V Core Supply Voltage	1.10	1.2	1.32	v
VD15A,	1.5V Supply	1.425	1.5	1.575	v

VD15D	Voltage				

5. Functional Specifications

| Host Interface	USB2.0
Standard	WiFi: EEE 802.11b, IEEE 802.11g, IEEE 802.11n B T: V2.1+EDR/BT v3.0/BT v3.0+HS/BT v4.0
Frequency Range	2.4GHz~2.4835GHz
Modulation Type	802.11b: CCK, DQPSK, DBPSK 802.11g: 64 QAM, 16 QAM, QPSK, BPSK 802.11n: 64 QAM, 16 QAM, QPSK, BPSK B T: 8DPSK, π/4 DQPSK, GFSK
Working Mode	Infrastructure, Ad-Hoc

Data Transfer 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
	B T: 1 Mbps for Basic Rate
	        2,3 Mbps for Enhanced Data Rate

Spread Spectrum	IEEE 802.11b: DSSS (Direct Sequence Spread Spectrum) IEEE 802.11g/n:OFDM (Orthogonal Frequency Division Multiplexing) BT：FHSS(Frequency-Hopping Spread Spectrum)

Sensitivity @PER（Tolerance：+/-2dB）	Wi Fi: 1M: -92dBm@8%PER
	       6M: -89dBm@10%PER
	       11M:-86dBm@8%PER
	       54M:-73dBm@10%PER
	       135M:-67dBm@10%PER
	B T: -89dBm@1Mbps, -85dBm@2Mbps, -83dBm@3Mbps

RF Power	14 dBm@11b, 12dBm@11g , 11dBm@11n（Tolerance： +/-1.5dB） BT: MAX +4.5dBm

The connect type of Antenna	Connect to the external antenna through the half hole. The
	  antenna and other interface get connected to the external
	  devices by the edge half a circle welding plate.

6. The block diagram of product principle
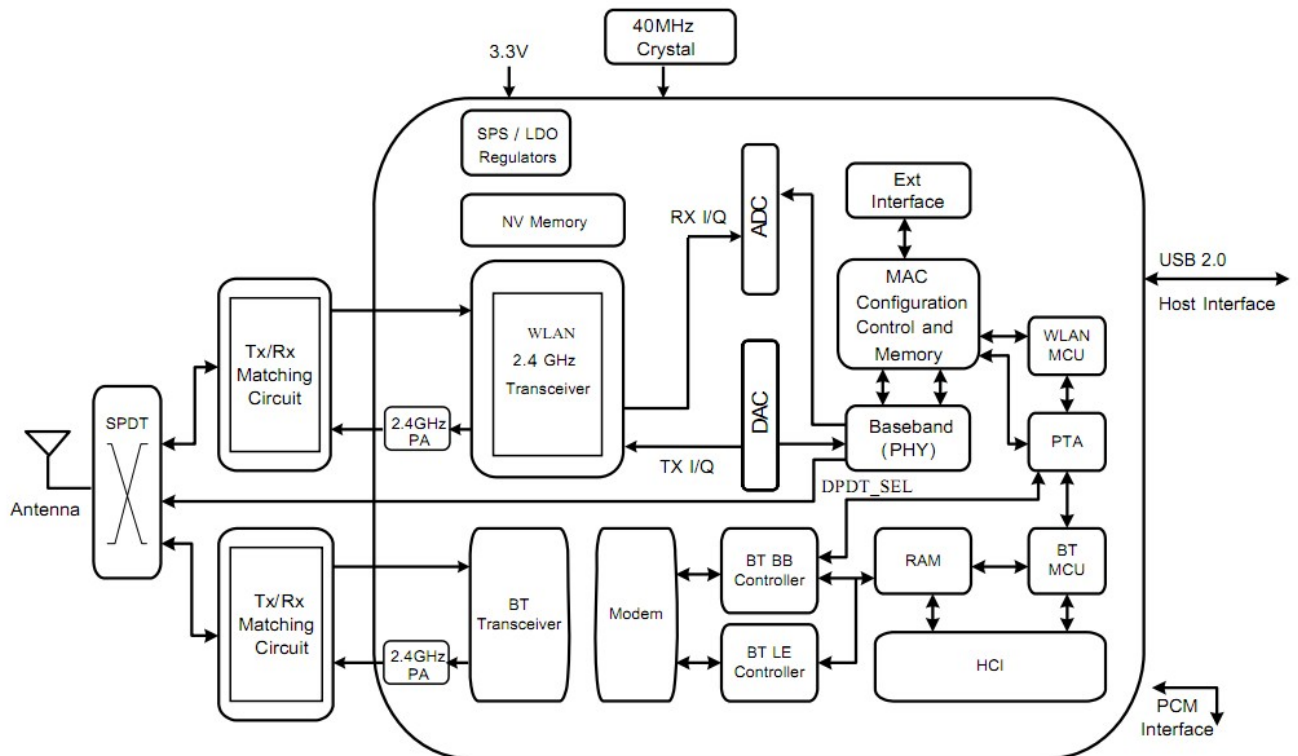
7. The supported platform

Operating System	CPU Framework	Driver
WIN2000/XP/VISTA/WIN7	X86 Platform	Enable
LINUX2.4/2.6	ARM, MIPSII	Enable
WINCE5.0/6.0	ARM ,MIPSII	Enable

8. The definition of product Pin
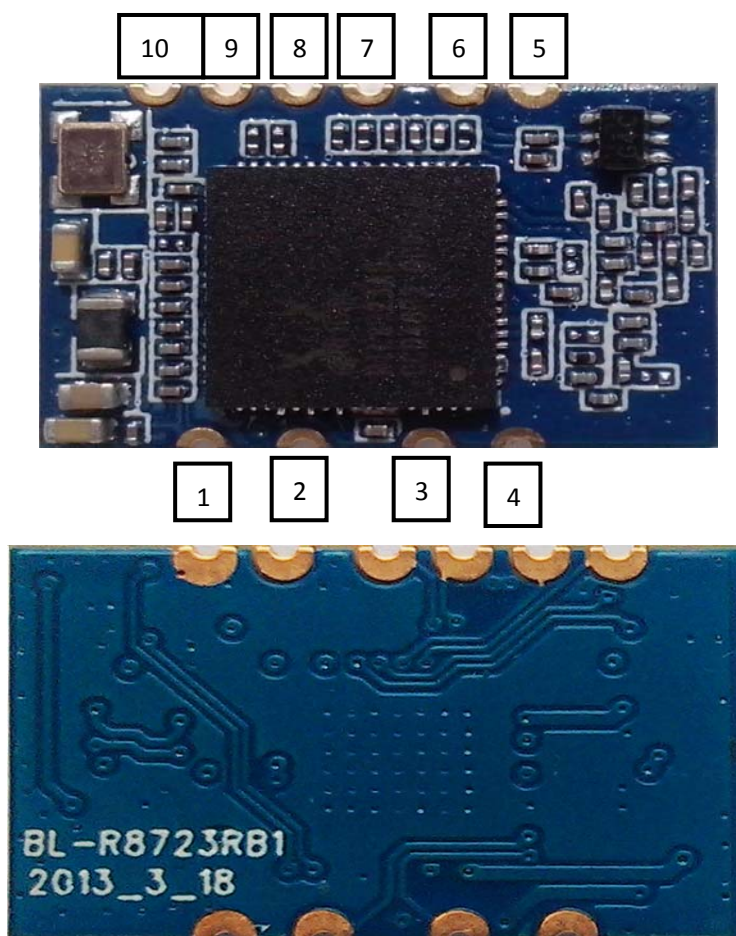
Top and bottom view of BL-8723RB1

Pin No：	TYPE	Description
1	P	DC:3.3V
2	I/O	UDM-
3	I/O	UDP+
4	P	GND
5	P	GND
6	O	ANT
7	P	BT_PCM_SYNC
8	P	BT_PCM_CLK
9	P	BT_PCM_IN
10	P	BT_PCM_OUT

9. The Structure and Size of product
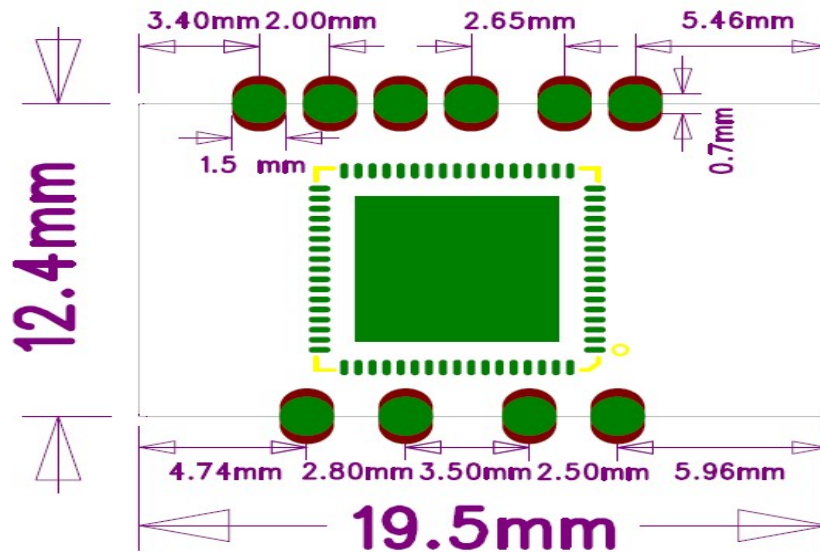
10: The ANT Pin connect to antenna, please refer to design demand

Connect to the 6th pin of Module

Connect to the 5th pin of Module
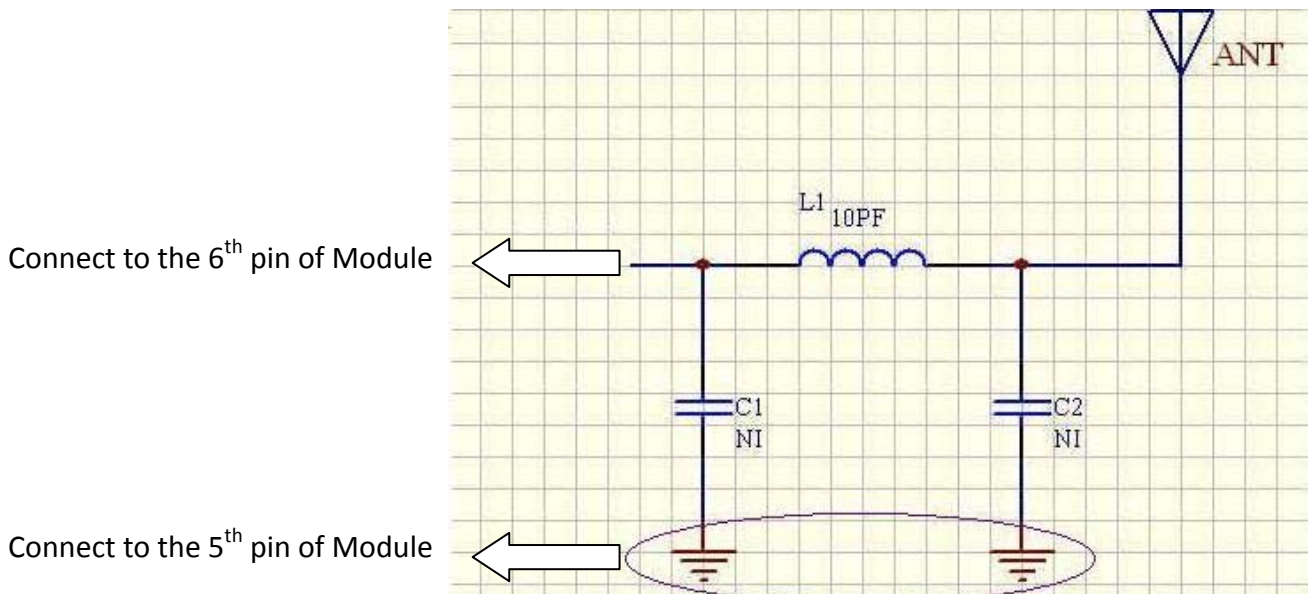
a) The current of 3.3V power supply must be >300mA, its ripple wave must be <30mV. The GND pins of module and external antenna need to be an incorporated part. The ground plane should be larger, module and antenna should keep far away from interference source.

b) The sixth pin is 2.4G high frequency output, coplanar impedance of layout line between this pin to antenna interface should be 50 Ω, we suggest use arc line or straight line, and beside the line there will be ground plane that its length as shout as possible, the longest length is no more than 50mm.

c) L1, C1, C2 constitute a π-type network that we preset, please make it close to antenna interface, this π-type network is used to match the antenna parameters and control the radiation. It should be adjusted according to the real condition when being used. Normally you can only mount L1 that its parameters are: 10pF, NP0 material. No need C1 and C2

USB interface Circuit reference pictures
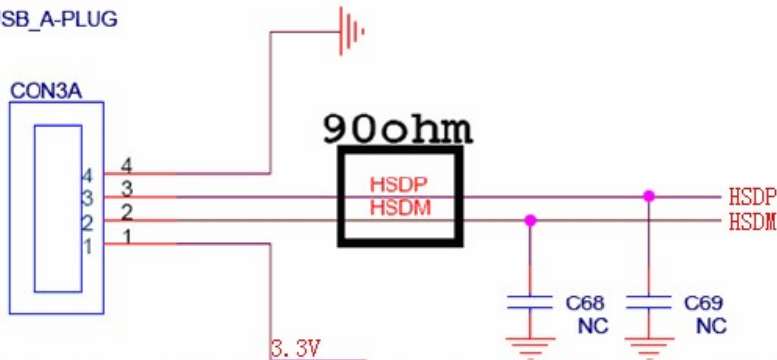
Two root go line do difference, but also required to make 90 O the impedance test

11. Typical Solder Reflow Profile