



# **Product Specification**

## **C704T0**

### **IEEE 802.11BGN 1T1R & BT4.0**

### **Combo USB LGA Module**

**Version: 0.4**

Jan. 12, 2013

**Release History**

<b>DATE</b>	<b>REV</b>	<b>Description of Change</b>
2012/08/01	0.1	Preliminary specification release
2012/09/10	0.2	Correct pin definitions
2012/09/13	0.3	Update RF specification
2013/01/28	0.4	Update mechanical drawing



## C704T0

### IEEE 802.11 BGN 1T1R + BT 4.0

### Combo USB LGA Module

## 1 Product Features

### ■ WLAN

- Complies with IEEE802.11 b/g/n 1T1R standard for 2.4GHz band, supports 20MHz and 40MHz bandwidth transmission, Short Guard Interval (400ns)
- Supports 802.11e QoS Enhancement (WMM), 802.11h TPC, Spectrum Measurement and 802.11i (WPA, WPA2)
- 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

### ■ Bluetooth

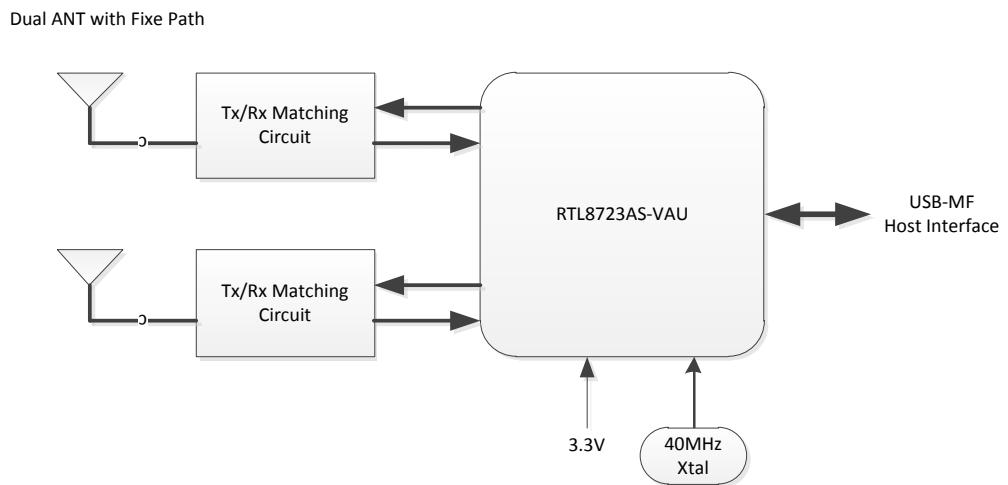
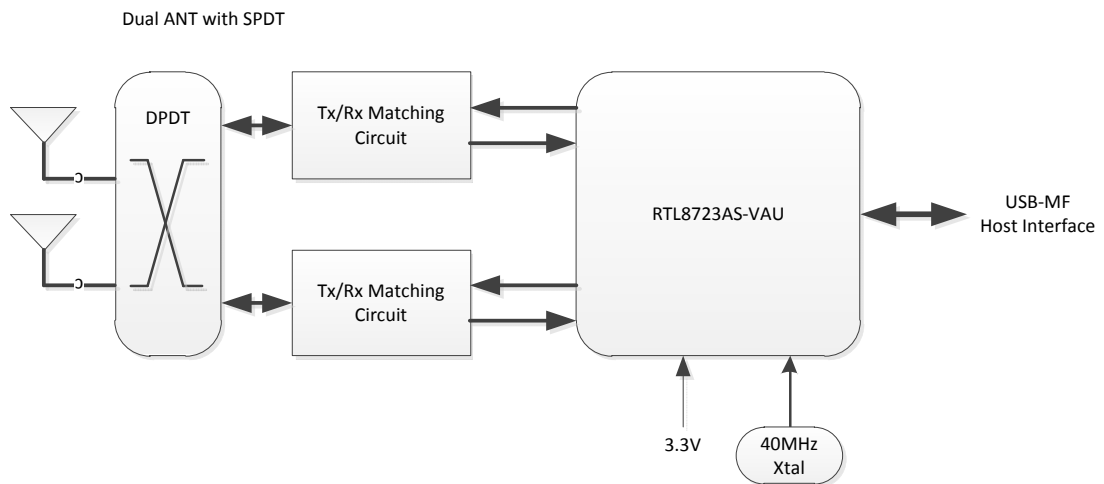
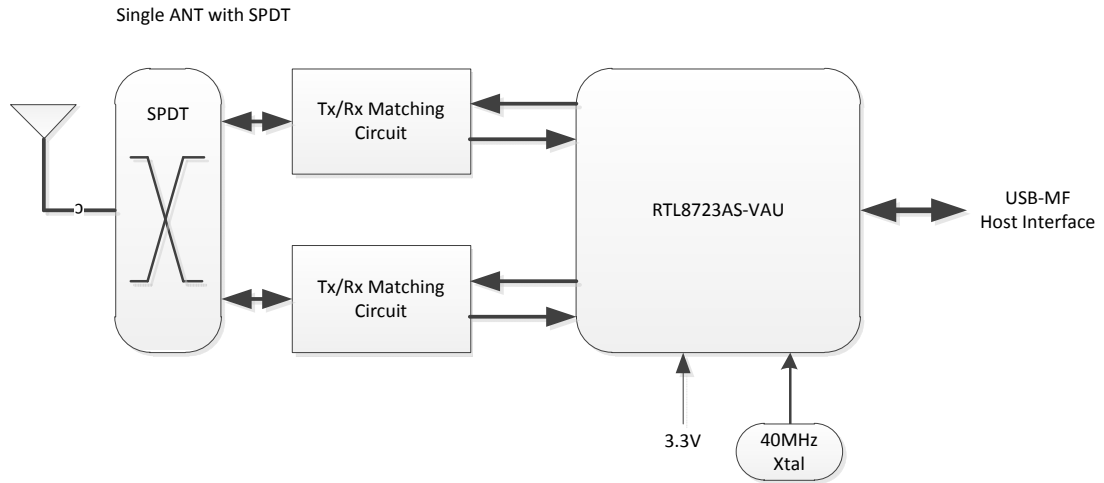
- Qualified Bluetooth v2.1, v3.0 and v4.0 LE Systems, supports Bluetooth Low Energy
- Integrated MCU to execute Bluetooth protocol stack
- Support 3 SCO links simultaneously
- Support 3 scatternets
- Enhanced BT/WIFI Coexistence Control to improve transmission quality in different profiles
- Bluetooth Low Energy Dual Mode support
- Fast AGC control to improve receiving dynamic range
- Support AFH to dynamically detect channel quality to improve transmission quality
- Integrated 32K oscillator

### ■ Host interface

- 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
- 44-pin QFN like module form factor.

## 2 Block Diagram



### 3 General Specification

■ <b>Module Name</b>						
• C704T0						
<b>WLAN Specifications</b>						
■ <b>Product Specification</b>						
• WLAN Standard		IEEE 802.11BGN				
• Host interface		USB 2.0 for WLAN and Bluetooth				
• Major Chipset		Realtek RTL8723AS-VAU-CG				
• Dimensions						
		Minimum	Typical	Maximum	Unit	
	Length	9.8	10	10.2	mm	
	Width	19.8	20	20.2	mm	
	Height		TBD		mm	
	Weight		TBD		g	
• Antenna Connector		One I/O pad for RF signal port				
■ <b>Operating Condition</b>						
		Minimum	Typical	Maximum	Unit	
• Voltage		DC 3.3V	3.15	3.3	3.45	V
		DC 1.5V	1.425	1.5	1.575	V
		DC 1.2V	1.10	1.2	1.32	V
• Temperature			0		70	°C
• Storage temperature			-20		70	°C
• Humidity Non-Operating			10		80	%
■ <b>Electrical Specification</b>						
• Frequency Range		2400 – 2483.5MHz				
• Modulation		BPSK, QPSK, 16QAM, 64QAM, DBPSK, DQPSK, and CCK				
• Output power						
		Minimum	Typical	Maximum	Unit	
802.11b Mode	11Mbps	13	15	17	dBm	
802.11g Mode	54Mbps	11	13	15	dBm	
802.11n Mode	HT20-MCS7	9	11	13	dBm	
802.11n Mode	HT40-MCS7	9	11	13	dBm	
• Receiver Sensitivity						
2.4GHz						
		Minimum	Typical	Maximum	Unit	
802.11g Mode	54Mbps			-70	dBm	
802.11n Mode	HT20 MCS7			-64	dBm	
802.11n Mode	HT40 MCS7			-61	dBm	

<b>Bluetooth Specifications</b>	
Radio Standard	Bluetooth V4.0+BLE, V3.0+HS and V2.1+EDR
Frequency Band	2400-2483.5 MHz
Data Rate	Up to 3Mbps
Channel	79 sub-channels
Transmission	FHSS (Frequency Hopping Spread Spectrum)
Modulation	GFSK@1Mbps, $\pi/4$ DQPSK@2Mbps, 8DPSK@3Mbps
Antenna Type	UF.L Antenna connector support
Output Power	Class II; -6~+4dBm
Receiver Sensitivity	-70 dBm @ BER<0.1%

## 4 Power Consumption

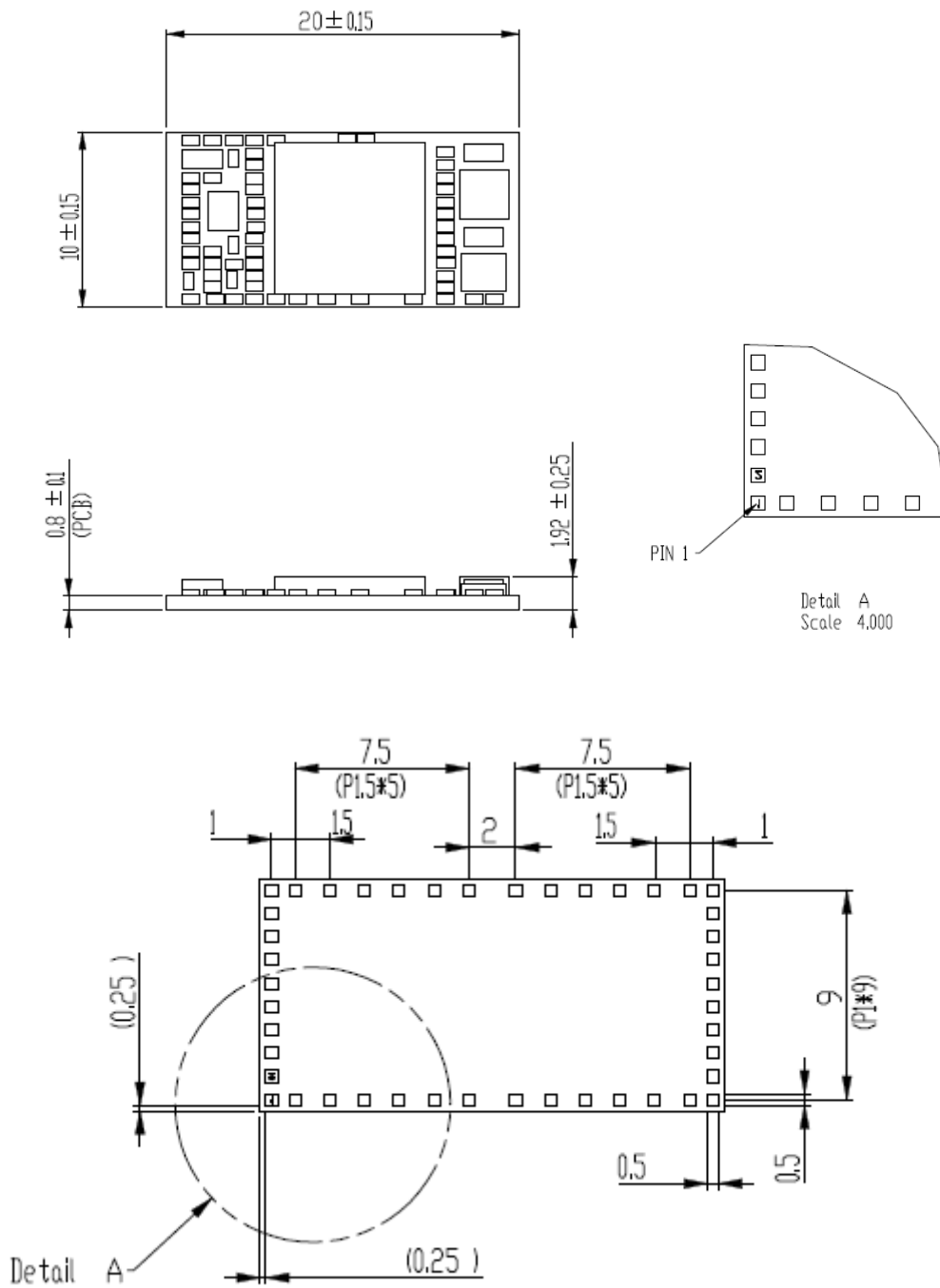
### WiFi

Item	Description	Current (mA @3.3V)
Continue TX	B mode 1Mbps	TBD
Continue TX	B mode 11Mbps	TBD
Continue TX	G mode 6Mbps	TBD
Continue TX	G mode 54Mbps	TBD
Continue TX	N mode HT20 MCS0	TBD
Continue TX	N mode HT20 MCS7	TBD
Continue TX	N modeHT40 MCS0	TBD
Continue TX	N modeHT40 MCS7	TBD
Continue RX	B mode 1Mbps	TBD
Continue RX	B mode 11Mbps	TBD
Continue RX	G mode 6Mbps	TBD
Continue RX	G mode 54Mbps	TBD
Continue RX	N mode HT20 MCS0	TBD
Continue RX	N mode HT20 MCS7	TBD
Continue RX	N modeHT40 MCS0	TBD
Continue RX	N modeHT40 MCS7	TBD
Idle	Associated with AP	TBD
Idle	Unassociated with AP	TBD
Radio off	Hotkey turn off WiFi radio (Adapter)	TBD
	Battery (L1 mode, 5mins)	TBD
Driver disable	Disable DUT on device Mgmt	TBD
OS		
Driver Version		

### Bluetooth

Mode	Current (3.3V) (mA)
Continue TX	TBD
Continue RX	TBD
Idle	TBD
Search	TBD
Connection	TBD
OS	
Driver Version	
*1--->Stack software from Atheros	

## 5 Mechanical Dimensions





## 6 Connector Pin-out Definitions

Pin	Definition	Type	Description
1	GND	P	Ground.
2	GND	P	Ground.
3	RF1	RF	RF I/O port
4	GND	P	Ground.
5	RF0	RF	RF I/O port
6	GND	P	Ground.
7	RF2	RF	RF I/O port
8	GND	P	Ground.
9	VDD33	P	DC 3.3V input
10	GND	P	Ground.
11	GPIO3	I/O	GPIO3
12	GPIO2	I/O	GPIO2
13	SPS_LDO_SEL	I	Left floating. Internal switching regulator is set by internal circuit.
14	TEST_MODE_SEL	I	Left floating, Normal operation mode is set by internal circuit.
15	GPIO12/WPS	I	This pin can be detected by WIFI controller to initiate WPS procedure
16	BT_DISn	I	This Pin Can Externally Shutdown the RTL8723AS-VAU (no requirement for Extra Power Switch) when WL_DISn is pulled low. This pin can also support the BT Radio-off function with host interface remaining connected.
17	GND	P	Ground.
18	WL_DISn	I	This Pin Can Externally Shutdown the RTL8723AS-VAU (no requirement for Extra Power Switch) when BT_DISn is pulled low This pin can also support the WLAN Radio-off function with host interface remaining connected.
19	NC		
20	NC		
21	NC		
22	NC		
23	GND	P	Ground.
24	UART_VDIO	P	DC 3.3V input

Pin	Definition	Type	Description
25	NC		
26	NC		
27	NC		
28	INT_VDD12	P	Internal Analog 1.2V output.
29	HSDP	I/O	High-Speed USB D+ Signal
30	HSDM	I/O	High-Speed USB D- Signal
31	VDD33	P	DC 3.3V input
32	GND	P	Ground.
33	INT_VDD15	P	Internal 1.5V output.
34	VDD33_SPS	P	DC 3.3V input
35	INT_VDD12	P	Internal Analog 1.2V output.
36	LED	O	LED Pins (Active Low)
37	LED_BT	O	LED Pins (Active Low)
38	LED_WL	O	LED Pins (Active Low)
39	GND	P	Ground.
40	GND	P	Ground.
41	GND	P	Ground.
42	GND	P	Ground.
43	EEPROM_SEL	I	Power on value="0" for internal NV memory select
44	GND	P	Ground.

P: Power/Ground; I: Input; O: Output; RF: RF port

## 7 RF I/O Port Definitions

Mode	RF0	RF1	RF2
Single ANT w' SPDT	RF	NC	NC
Dual ANT w' DPDT	NC	WLAN/ BT	WLAN/ BT
Dual ANT w' fixed-path	NC	BT	WLAN