1. INTRODUCTION

1.1 Scope

The WM201-RTL8723-1 CSR is a highly integrated 11b/g/n WLAN and Bluetooth v2.1 / 3.0 / 4.0 single chip solution with Wi-Fi PCI express interface and BT USB interface that combines MAC/ 1T1R baseband PHY/ RF that support up to WLAN 150Mbps PHY rate. The Bluetooth supports BT 2.1+EDR / BT3.0+HS / BT4.0 Low Energy dual mode for easily establish the Bluetooth connection. The enhanced Wi-Fi/BT coexistence control for better RF transmission quality in different BT profiles.

1.2 Features

General

- Complies with PCI Express Base Specification Revision 1.1 for WLAN
- Complies with USB 1.1 Specification Revision 1.1 for Bluetooth.
- Form factor: Half-Mini card.
- Bus Interface: Wi-Fi: PCIe bus interface.   BT: USB bus interface.
- Windows 7 Operation system supported only.
- Enhanced Wi-Fi/BT coexistence control for better transmission quality.
- RoHS compliant.

WLAN Features

- Complete 802.11n 1T1R (1x1) solution for 2.4GHz band
- Backward compatible with 802.11b/g devices while operating at 802.11n data rates.
- Support for 150Mbps PHY rate.
- 20MHz/40MHz bandwidth.
- WEP 64/128, WPA, WPA2, TKIP, AES.
- QoS-WMM, WMM-PS.
- WPS, PIN, PBC.
- Supports 16 BSSIDs.
- Cisco CCX Support up to v5.0

Bluetooth Features

- BT v.2.1+EDR/BT 3.0/ BT 4.0 Dual-mode low energy.
- Class1, Class 2, Class 3 supported.
- Measured Maximum TX output power: 5dBm, maximum distance range 20m.(Class1 Level)
- RoHS compliant.

1.3 Module Appearance

Top View

Bottom View

1.4 Model Definition

Model Name	WM201-RTL8723
RF Connector #	2 (IPEX)
Antenna design	External Antenna connection via IPEX connector. (note: external antenna is excluded for module)

2. SPECIFICATION

2.1 HARDWARE SPECIFICATION

2.1.1 Wi-Fi Specification

Standard	IEEE 802.11 b/g/n Wireless Local Area Networks
WLAN Security	WEP 64/128, WPA, WPA2, TKIP, AES.
WLAN PHY Rate	Max.150Mbps PHY Rate for both transmit and receiving
RF Frequency Range	2.412G~2.484GHz
Operating Voltage	3.3V
Interface	PCIe bus interface 1.1

2.1.2 Bluetooth Specification

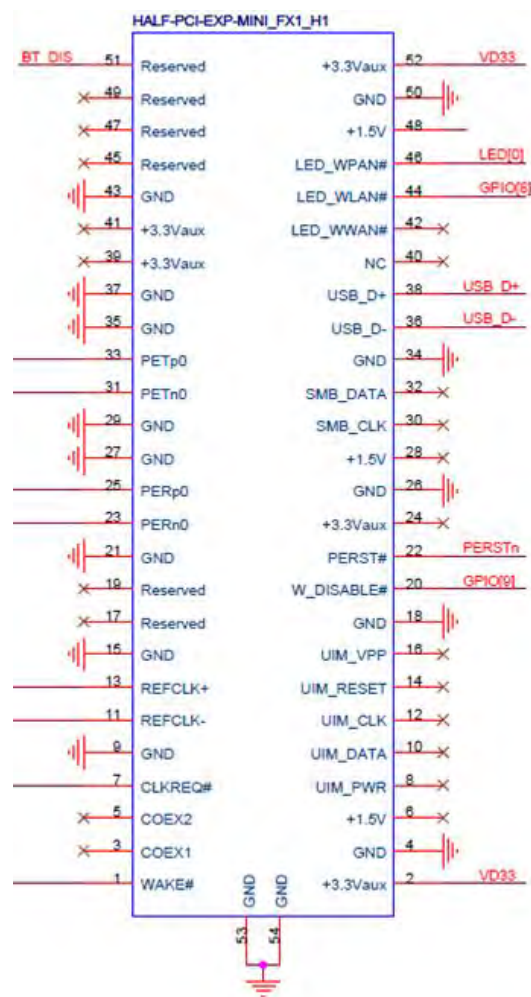|	
Standard	Bluetooth v2.1+EDR / v3.0+HS / v4.0 BLE dual mode
Radio Technology	FHSS (Frequency Hopping Speed Spectrum)
Basic Data Rate	1Mbps (GFSK)
Enhanced Data Rate	2Mbps (DQPSK); 3Mbps(8-DPSK)
Operating Frequency	2.45GHz (2.402 ~ 2.480GHz), ISM band
Channel number	79 Channels , 1MHz bandwidth
Operating Voltage	3.3V
Interface	USB bus interface 1.1

2.1.3 Board Specification

WLAN Chip	Realtek RTL8723AE WLAN+BT Single Chip
Antenna	IPEX connector for external antenna connection
Form Factor	Half Mini Card
PCB Dimension	29.85mm(W)x26.65mm(H)x1mm(D)

2.1.4 Environmental

Operating	Operating temperature: 0 to 85 degree C
	Relative Humidity : 5-90% (non-condensing)
Storage	Temperature: -20 to 85 degree C
	Relative Humidity : 5-95% (non-condensing)

2.1.5 PIN Define

PIN	Definition	Remark	PIN	Definition	Remark
1	WAKE#	Power Management Event: active low.	2	+3.3V	+3.3V
3	COEX1		4	GND	GND
5	COEX2		6	+1.5V	NU
7	CLKREQ#	Reference Clock Request Signal	8	UIM_PWR	NU
9	GND	GND	10	UIM_DATA	NU
11	REFCLK-		12	UIM_CLK	NU
13	REFCLK+		14	UIM_RESET	NU
15	GND	GND	16	UIM_VPP	NU
17	RESERVED	NU[1]	18	GND	GND
19	RESERVED	NU	20	W_DISABE#	0: WiFi Radio OFF 1: WiFi Radio ON
21	GND	GND	22	PERST#	0: to Disable WiFi (power off)[2] 1: to Enable WiFi
23	PERn0		24	+3.3Vaux	NU
25	PETp0		26	GND	GND
27	GND	GND	28	+1.5V	NU
29	GND	GND	30	SMB_CLK	NU
31	PETn0		32	SMB_DATA	NU
33	PETp0		34	GND	GND
35	GND	GND	36	USB_D-	USB_D-
37	GND	GND	38	USB_D+	USB_D+
39	+3.3Vaux	NU	40	NC	NU
41	+3.3Vaux	NU	42	LED_WWAN#	NU
43	GND	GND	44	LED_WLAN#	LED for WiFi
45	RESERVED	NU	46	LED_WPAN#	LED for WPAN
47	RESERVED	NU	48	+1.5V	NU
49	RESERVED	NU	50	GND	GND
51	BT_DISABE#	0: BT Radio OFF 1: BT Radio ON	52	+3.3V	+3.3V

2.1.6 Power Consumption

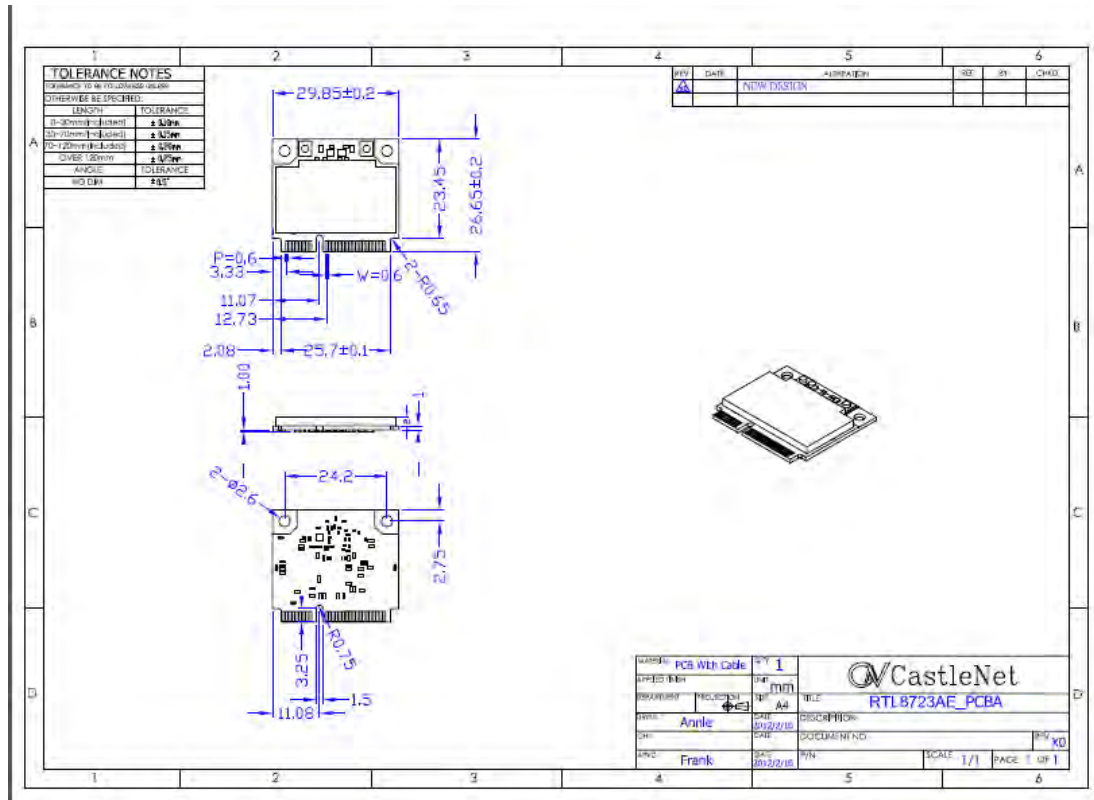| WLAN Mode (2.4GHz frequency band)	Power consumption (mA) / 3.3V				
	Uplink	Downlink	Radio off	Idle	Disable
11b mode	273	263	10	230	10
11g mode	272	261	10	230	10
11n HT20 mode	271	263	10	230	10
11n HT40 mode	272	262	10	230	10

Bluetooth	Power consumption (mA) / 3.3V
Continuous TX Supply Current	75mA
Continuous RX Supply Current	67mA
Bluetooth Power On (RF off)	20mA
Idle	30mA

2.2 MECHANICAL SPECIFICATION

2.2.1 Board Dimension

Form factor	Half-Mini Card.	
PCB Dimension	29.85mm(W)x26.65mm(H)　(+/- 0.20mm)	
PCB thickness	1.0mm (+/-0.10mm)	
SMD	Single side	
Max. height of components (from PCB)	Top side	3.0mm (shielding case: 2.0mm)
	Bottom side	0mm

2.2.2 Mechanical Drawing (unit: mm)

2.3 SOFTWARE SPECIFICATION

2.3.1 Operating system

- Windows: Win7 only.

2.3.2 Bluetooth Software Stack

- BT software stack is provided by Realtek.