



PRODUCT SPECIFICATION

Version 1.0

IEEE 802.11 a/b/g/n/ac 2T/2R Band USB2.0 Module

**Model Number: WC0HR2601
(REALTEK RTL8812BU)**

2.4G channel: 1-13
5G channel: 36-48 149-165

(MAC address from GSD)

客户认可 Custom Approval Section		
Custom Name		
Department		
Approval	Date:	

拟制 DESIGN	审核 CHECK	批准 APPROVAL
高照	陈宇科	熊运自
2016.09.26	2016.09.26	2016.09.26

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Document revision history

Revision	Date	Approved by	Remarks
Version 1.0	2016-09-26		Draft

1. General Description

This document is to specify the product requirements for 802.11a/b/g/n/ac and Bluetooth USB Module. This Card is based on REALTEK RTL8812BU chipset .It is a complete dual-band(2.4GHz and 5GHz)WIFI 2×2 MIMO MAC/PHY/Radio System-on-a-Chip. This module provides a high level of integration with a dual-stream IEEE 802.11ac MAC/ base band /radio.The WLAN operation supports 20MHz,40MHz and 80MHz channels for data rates up to 866.7Mbps. It is also backward complied with IEEE 802.11a standard from 5.15~5.825GHz wideband and IEEE 802.11b/g standard from 2.4~2.5GHz. It can be used to provide up to 54Mbps for IEEE 802.11a and IEEE 802.11g, 11Mbps for IEEE 802.11b and 300Mbps for IEEE 802.11n.

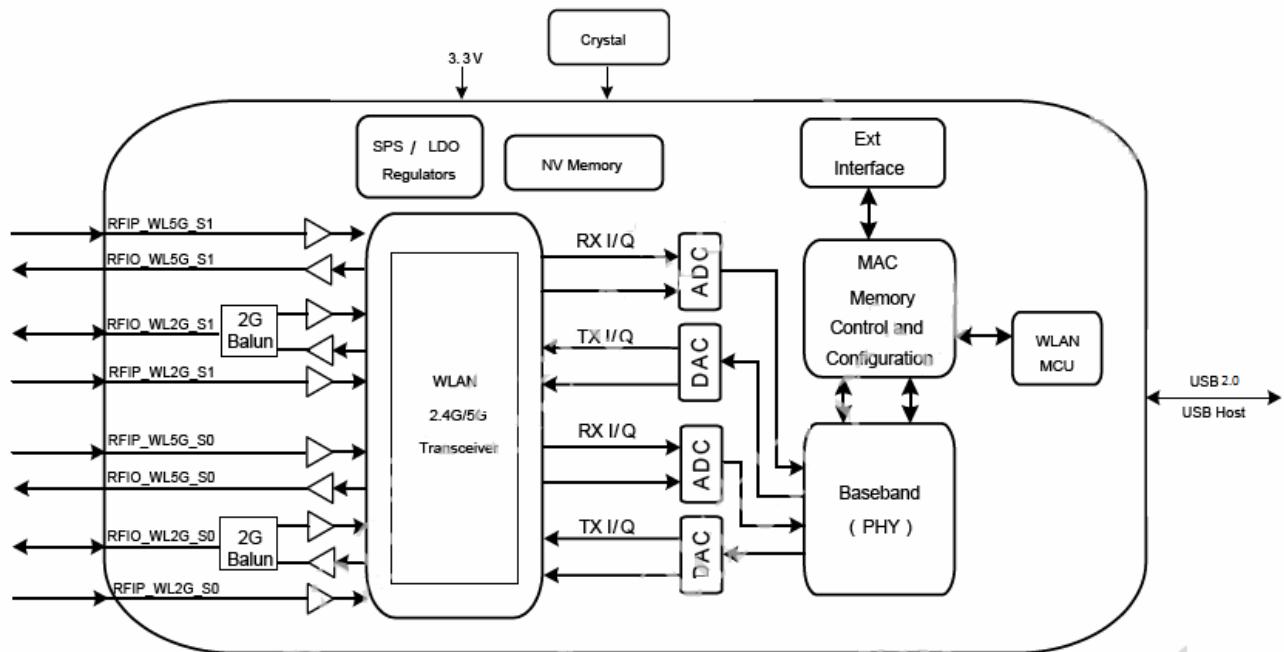
With seamless roaming, fully interoperability and advanced security with WEP standard, 802.11 a/b/g/n/ac USB2.0 Module offers absolute interoperability with different vendors 802.11a/b/g/n/ac. Access Points through the wireless LAN.

2. Features

- Compatible with IEEE 802.11b standard to provide wireless 11Mbps data rate.
- Compatible with IEEE 802.11g standard to provide wireless 54Mbps data rate.
- Compatible with IEEE 802.11a standard to provide wireless 54Mbps data rate.
- Compatible with IEEE 802.11n standard to provide wireless 300Mbps data rate.
- Compatible with IEEE 802.11ac standard to provide wireless 866.7Mbps data rate.
- Operation at 2.4~2.5GHz and 5.15~5.825GHz frequency band to meet worldwide regulations
- Provides simple legacy and 20MHz/40MHz/80MHz co-existence mechanisms to ensure backward and network compatibility.
- Supports infrastructure networks via Access Point and ad-hoc network via peer-to-peer communication
- Supports IEEE 802.11i (WPA and WPA2),WAPI,. enhanced security
- Friendly user configuration and diagnostic utilities
- Drivers support Win10,Win8,Win7,XP,Linux
- High speed USB 2.0 interface
- ROHS compliant

3. Application Diagrams

3.1 Functional Block Diagram



3.2 General Requirements

3.2.1 IEEE 802.11b Section

	Feature	Detailed Description
3.2.1.1	Standard	<ul style="list-style-type: none"> IEEE 802.11b
3.2.1.2	Radio and Modulation Schemes	<ul style="list-style-type: none"> DQPSK, DBPSK, DSSS, and CCK
3.2.1.3	Operating Frequency	<ul style="list-style-type: none"> 2400 ~ 2483.5MHz ISM band
3.2.1.4	Channel Numbers	<ul style="list-style-type: none"> 11 channels for United States 13 channels for Europe Countries 14 channels for Japan
3.2.1.5	Data Rate	<ul style="list-style-type: none"> 11, 5.5, 2, and 1Mbps
3.2.1.6	Media Access Protocol	<ul style="list-style-type: none"> CSMA/CA with ACK
3.2.1.7	Transmitter Output Power at Antenna Connector	<ul style="list-style-type: none"> Typical RF Output Power (tolerance±2dB) at each RF chain, Data Rate and at room Temp. 25 degree C 19 dBm at 1Mbps 16 dBm at 11Mbps
3.2.1.8	Receiver Sensitivity at Antenna Connector	<ul style="list-style-type: none"> Typical Sensitivity at Which Frame(1000-byte PDUs) Error Rate=8% -88 dBm at 1Mbps -82 dBm at 11Mbps

3.2.2 IEEE 802.11g Section

	Feature	Detailed Description
3.2.2.1	Standard	<ul style="list-style-type: none"> IEEE 802.11g
3.2.2.2	Radio and Modulation Type	<ul style="list-style-type: none"> QPSK , BPSK , 16QAM ,64QAM with OFDM
3.2.2.3	Operating Frequency	<ul style="list-style-type: none"> 2400 ~ 2483.5MHz ISM band
3.2.2.4	Channel Numbers	<ul style="list-style-type: none"> 11 channels for United States 13 channels for Europe Countries 13 channels for Japan
3.2.2.5	Data Rate	<ul style="list-style-type: none"> 6,9,12,18,24,36,48,54Mbps
3.2.2.6	Media Access Protocol	<ul style="list-style-type: none"> CSMA/CA with ACK
3.2.2.7	Transmitter Output Power at Antenna Connector	<ul style="list-style-type: none"> Typical RF Output Power(tolerance±2dB) at each RF chain, Data Rate and at room Temp. 25degree C +18 dBm at 6Mbps +14 dBm at 54Mbps
3.2.2.8	Receiver Sensitivity at Antenna Connector	<ul style="list-style-type: none"> Typical Sensitivity at each RF chain. Frame(1000-byte PDUs)Error Rate<10% at room Temp 25 degree C -86 dBm at 6Mbps -73 dBm at 54Mbps

3.2.3 IEEE 802.11a Section

	Feature	Detailed Description
3.2.3.1	Standard	<ul style="list-style-type: none"> IEEE 802.11a
3.2.3.2	Radio and Modulation Type	<ul style="list-style-type: none"> QPSK , BPSK , 16QAM ,64QAM with OFDM
3.2.3.3	Operating Frequency	<ul style="list-style-type: none"> 5.15~5.35GHz and 5.725~5.825GHz for US and Canada 5.15~5.35GHz and 5.47~5.725GHz for Japan 5.15~5.35GHz and 5.47~5.725GHz for Europe 5.725~5.825GHz for China
3.2.3.4	Channel Numbers	<ul style="list-style-type: none"> 12 non-overlapping channels for US and Canada 8 non-overlapping channels for Japan 19 non-overlapping channels for Europe 4 non-overlapping channels for China
3.2.3.5	Data Rate	<ul style="list-style-type: none"> 6,9,12,18,24,36,48,54Mbps
3.2.3.6	Media Access Protocol	<ul style="list-style-type: none"> CSMA/CA with ACK
3.2.3.7	Transmitter Output Power at Antenna Connector	<ul style="list-style-type: none"> Typical RF Output Power(tolerance±2dB) at each RF chain, Data Rate and at room Temp. 25degree C +18 dBm at 6Mbps +14dBm at 54Mbps
3.2.3.8	Receiver Sensitivity at Antenna Connector	<ul style="list-style-type: none"> Typical Sensitivity at each RF chain. Frame(1000-byte PDUs)Error Rate<10% at room Temp 25 degree C -86 dBm at 6Mbps -73 dBm at 54Mbps

3.2.4 IEEE 802.11n Section

	Feature	Detailed Description							
3.2.4.1	Standard	<ul style="list-style-type: none"> IEEE 802.11n 							
3.2.4.2	Radio and Modulation Type	<ul style="list-style-type: none"> BPSK , QPSK , 16QAM ,64QAM with OFDM 							
3.2.4.3	Operating Frequency	<ul style="list-style-type: none"> 2.4GHz band:2400 ~ 2483.5MHz 5GHz and:5150 ~ 5825MHz 							
3.2.4.4	Data Rate	MCS	GI=800ns		GI=400ns				
			20MHz	40MHz	20MHz	40MHz			
		0	6.5	13.5	7.2	15			
		1	13	27	14.4	30			
		2	19.5	40.5	21.7	45			
		3	26	54	28.9	60			
		4	39	81	43.3	90			
		5	52	108	57.8	120			
		6	58.5	121.5	65.0	135			
		7	65	135	72.2	150			
		8	13	27	14.444	30			
		9	26	54	28.889	60			
		10	39	81	43.333	90			
		11	52	108	57.778	120			
		12	78	162	86.667	180			
		13	104	216	115.556	240			
		14	117	243	130.000	170			
		15	130	270	144.444	300			
3.2.4.5	Media Access Protocol	<ul style="list-style-type: none"> CSMA/CA with ACK 							
3.2.4.6	Transmitter Output Power at Antenna Connector	<ul style="list-style-type: none"> Typical RF Output Power (tolerance±2dB) at each RF chain, Data Rate and at room Temp. 25 degree C 			<ul style="list-style-type: none"> 2.4GHz Band/HT20 				
		<ul style="list-style-type: none"> 18 dBm at MCS0 12 dBm at MCS7 			<ul style="list-style-type: none"> 2.4GHz Band/HT40 				
		<ul style="list-style-type: none"> 5GHz Band/HT20 			<ul style="list-style-type: none"> 18 dBm at MCS0 12 dBm at MCS7 				
		<ul style="list-style-type: none"> 18 dBm at MCS0 12 dBm at MCS7 			<ul style="list-style-type: none"> 5GHz Band/HT40 				
		<ul style="list-style-type: none"> 18 dBm at MCS0 12 dBm at MCS7 			<ul style="list-style-type: none"> 18 dBm at MCS0 12 dBm at MCS7 				
3.2.4.7	Receiver Sensitivity at Antenna Connector	Typical Sensitivity at each RF chain at Which Frame(1000-byte PDUs)Error Rate=10% and at room Temp.25 degree C							
		2.4GHz Band/HT20		2.4GHz Band/HT40					
		<ul style="list-style-type: none"> -86 dBm at MCS0 -70 dBm at MCS7 		<ul style="list-style-type: none"> -83 dBm at MCS0 -66 dBm at MCS7 					
		5GHz Band/HT20		5GHz Band/HT40					
		<ul style="list-style-type: none"> -86 dBm at MCS0 -71 dBm at MCS7 		<ul style="list-style-type: none"> -83 dBm at MCS0 -67 dBm at MCS7 					

3.2.5 IEEE 802.11ac Section

	Feature	Detailed Description	
3.2.5.1	Standard	<ul style="list-style-type: none"> IEEE 802.11ac 	
3.2.5.2	Radio and Modulation Type	<ul style="list-style-type: none"> QPSK , BPSK , 16QAM ,64QAM,256QAM with OFDM 	
3.2.5.3	Operating Frequency	<ul style="list-style-type: none"> 5.15~5.35GHz and 5.725~5.825GHz for US and Canada 5.15~5.35GHz and 5.47~5.725GHz for Japan 5.15~5.35GHz and 5.47~5.725GHz for Europe 5.725~5.825GHz for China 	
3.2.5.4	Channel Numbers	<ul style="list-style-type: none"> 12 non-overlapping channels for US and Canada 8 non-overlapping channels for Japan 19 non-overlapping channels for Europe 4 non-overlapping channels for China 	
3.2.5.5	Data Rate	<ul style="list-style-type: none"> at most 866.7 Mbps 	
3.2.5.6	Media Access Protocol	<ul style="list-style-type: none"> CSMA/CA with ACK 	
3.2.5.7	Transmitter Output Power at Antenna Connector	<ul style="list-style-type: none"> Typical RF Output Power(tolerance $\pm 2\text{dB}$) at each RF chain, Data Rate and at room Temp. 25degree C 	
		HT20	HT40
		<ul style="list-style-type: none"> 18 dBm at MCS0 12 dBm at MCS7 11 dBm at MCS8 	<ul style="list-style-type: none"> 18 dBm at MCS0 12 dBm at MCS8 11 dBm at MCS9
3.2.5.8	Receiver Sensitivity at Antenna Connector	<ul style="list-style-type: none"> Typical Sensitivity at each RF chain. Frame(1000-byte PDUs)Error Rate<10% at room Temp 25 degree C 	
		5GHz Band / HT20	5GHz Band / HT40
		<ul style="list-style-type: none"> -64dBm at MCS8 	<ul style="list-style-type: none"> -61dBm at MCS9
		5GHz Band / HT80	
		<ul style="list-style-type: none"> -58dBm at MCS9 	

4. Electrical and Thermal Characteristics

4.1 Environmental Requirements

Parameter	Minimum	Maximum	Units
Storage Temperature	-40	+80	°C
Ambient Operating Temperature	0	60	°C
Junction Temperature	0	125	°C

4.2 General Section

	Feature	Detailed Description
5.2.1	Antenna Type	<ul style="list-style-type: none">• WIFI ANT :PIFA Antenna and IPEX
5.2.2	Operating Voltage	<ul style="list-style-type: none">• 3.3 V±10%
5.2.3	Current Consumption	<ul style="list-style-type: none">• <1000mA
5.2.4	Form Factor and Interface	<ul style="list-style-type: none">• High Speed USB2.0 Interface

4.3 Software

Driver	Win10,Win8,Win7, XP, Linux, MAC
Security	64/128-bits WEP, WPA, WPA2

4.4 Mechanical Dimensions

	Feature	Detailed Description
4.4.1	Length	<ul style="list-style-type: none">• 47mm
4.4.2	Width	<ul style="list-style-type: none">• 30mm
4.4.3	Height	<ul style="list-style-type: none">• 7.0mm(PCB 1.0mm)

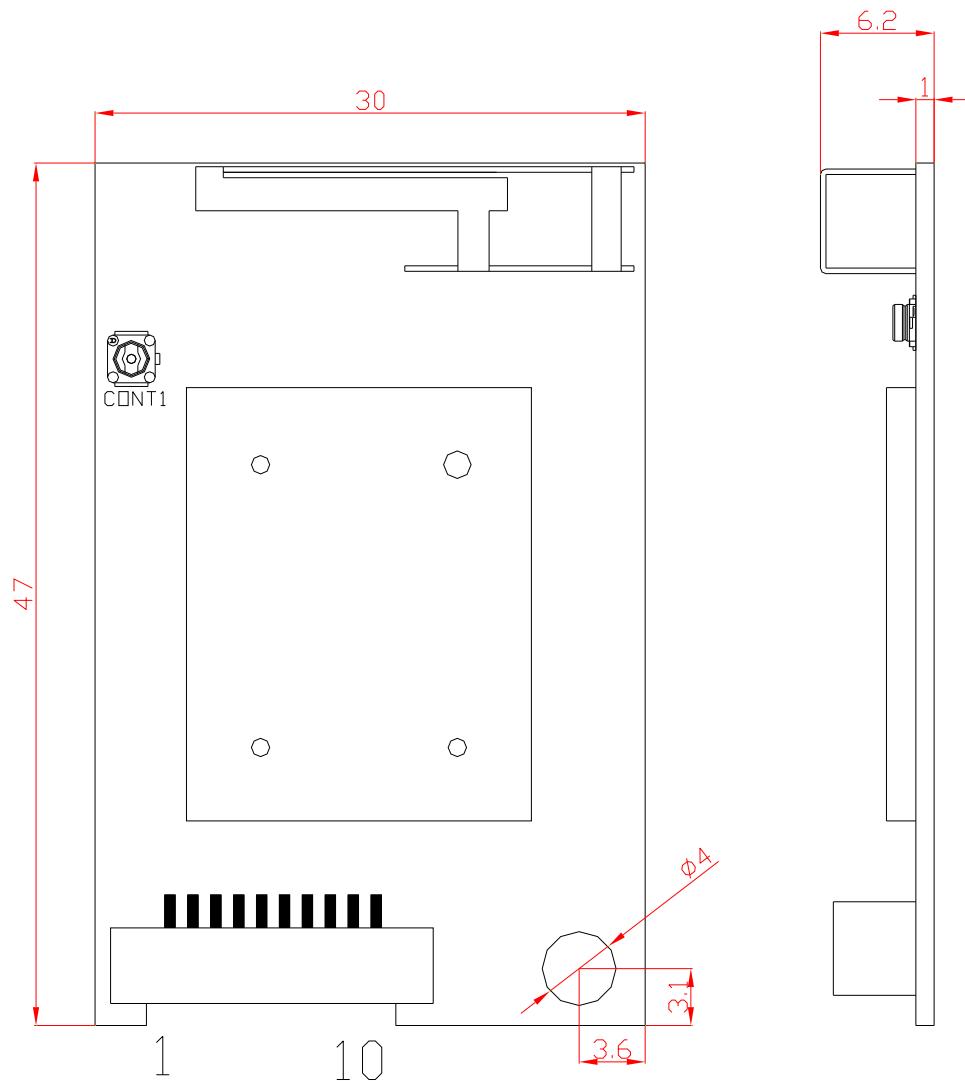
5 Connector Definition

10-Pin 1.25 mm connector (Horizontal Type)

Pin	1	3	3	4	5	6	7	8	9	10
Definition	3. 3V	3. 3V	D-	D+	GND	WOWn	RST	GND	NC	GND

6 Mechanical Dimensions

Note1: The below is left-off-board ANT diagram

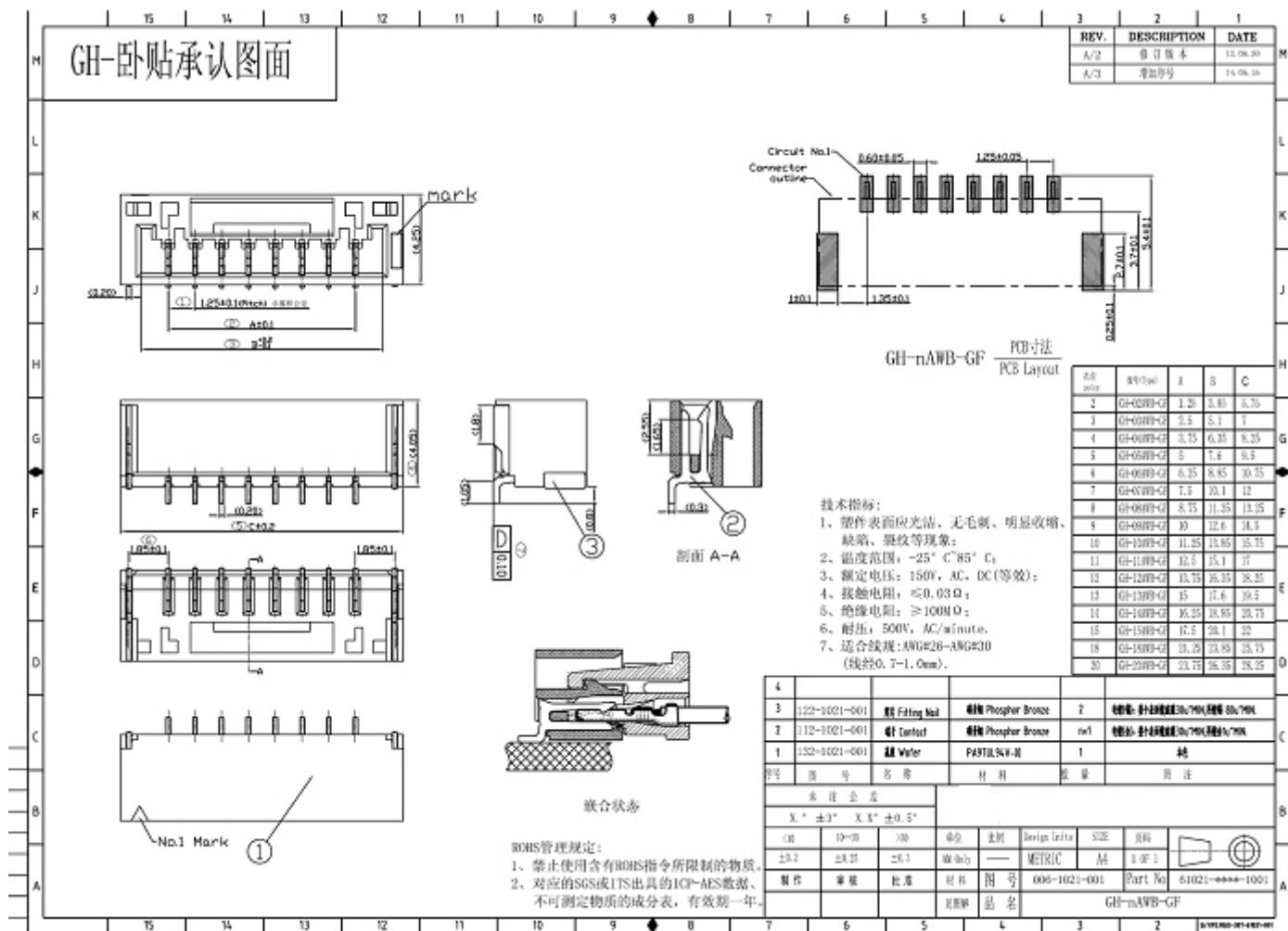


Note2:TOLERANCES ARE +/-0.5mm UNLESS OTHERWISE SPECIFIED

* UNITE :mm

Appendix 1 : SMT connector GH-10AWB-GF

This is the N pin connector which is in common use. You can select 10 pins according to your requirement.



FCC Statement

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.

To assure continued compliance, any changes or modifications not expressly approved by the party.

Responsible for compliance could void the user's authority to operate this equipment. (Example- use only shielded interface cables when connecting to computer or peripheral devices).

This equipment 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.

FCC Radiation Exposure Statement:

The equipment complies with FCC Radiation exposure limits set forth for uncontrolled environment. This equipment should be installed and operated with minimum distance 20cm between the radiator and your body.

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