

FCC Test Report (Co-Located)

Report No.: RF190503C13B-2

FCC ID: MSQ-RTACRH01

Test Model: RT-ACRH15

Series Model: RT-AC1200GE, RT-AC59U, RT-AC1500G PLUS, RT-AC1500UHP,
RT-AC57U, RT-AC58U, RT-AC1300G PLUS (Refer to item 3.1 for more
details)

Received Date: May 03, 2019

Test Date: Aug. 21 ~ Aug. 22, 2019

Issued Date: Aug. 23, 2019

Applicant: ASUSTeK COMPUTER INC.

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch

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R.O.C.

Test Location: B2F., No. 215, Sec. 3, Beixin Rd., Xindian Dist., New Taipei City 231,
Taiwan, R.O.C.

FCC Registration / 427177 / TW0011
Designation Number:



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Release Control Record

Issue No.	Description	Date Issued
RF190503C13B-2	Original release.	Aug. 23, 2019

1 Certificate of Conformity

Product: Dual Band Gigabit WiFi Router

Brand: ASUS

Test Model: RT-ACRH15

Series Model: RT-AC1200GE, RT-AC59U, RT-AC1500G PLUS, RT-AC1500UHP, RT-AC57U, RT-AC58U, RT-AC1300G PLUS (Refer to item 3.1 for more details)

Sample Status: Engineering sample

Applicant: ASUSTeK COMPUTER INC.

Test Date: Aug. 21 ~ Aug. 22, 2019

Standards: 47 CFR FCC Part 15, Subpart C (Section 15.247)
47 CFR FCC Part 15, Subpart E (Section 15.407)
ANSI C63.10:2013

The above equipment has been tested by **Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch**, and found compliance with the requirement of the above standards. The test record, data evaluation & Equipment Under Test (EUT) configurations represented herein are true and accurate accounts of the measurements of the sample's RF characteristics under the conditions specified in this report.

Prepared by : Pettie Chen, **Date:** Aug. 23, 2019
Pettie Chen / Senior Specialist

Approved by : Bruce Chen, **Date:** Aug. 23, 2019
Bruce Chen / Project Engineer

2 Summary of Test Results

Applied Standard	47 CFR FCC Part 15, Subpart C (Section 15.247) 47 CFR FCC Part 15, Subpart E (Section 15.407)		
FCC Clause	Test Item	Result	Remarks
15.205 / 15.209 / 15.247(d) 15.407(b) (1/2/3/4/6)	Radiated Emissions	Pass	Meet the requirement of limit. Minimum passing margin is -5.00dB at 2362.00MHz.

*For U-NII-3 band compliance with rule part 15.407(b)(4)(i), the OOB test plots were recorded in Annex A.
Note: Determining compliance based on the results of the compliance measurement, not taking into account measurement instrumentation uncertainty.

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Radiated Emissions up to 1 GHz	9kHz ~ 30MHz	3.04 dB
	30MHz ~ 200MHz	2.0153 dB
	200MHz ~ 1000MHz	2.0224 dB
Radiated Emissions above 1 GHz	1GHz ~ 18GHz	1.0121 dB
	18GHz ~ 40GHz	1.1508 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Dual Band Gigabit WiFi Router
Brand	ASUS
Test Model	RT-ACRH15
Serial Model	RT-AC1200GE, RT-AC59U, RT-AC1500G PLUS, RT-AC1500UHP, RT-AC57U, RT-AC58U, RT-AC1300G PLUS
Model Difference	Refer to Note
Sample Status	Engineering sample
Power Supply Rating	12Vdc (adapter)
Modulation Type	CCK, DQPSK, DBPSK for DSSS 256QAM, 64QAM, 16QAM, QPSK, BPSK for OFDM
Modulation Technology	DSSS, OFDM
Transfer Rate	802.11b: 11/5.5/2/1Mbps 802.11g: 54/48/36/24/18/12/9/6Mbps 802.11a: 54/48/36/24/18/12/9/6Mbps 802.11n (2.4GHz): up to 600Mbps 802.11n (5.0GHz): up to 300Mbps 802.11ac: up to 866.7Mbps
Operating Frequency	2412~2462MHz, 5180~5240MHz, 5745~5825MHz
Number of Channel	2412~2462MHz: 802.11b, 802.11g, 802.11n (HT20), 802.11n (VHT20): 11 802.11n (HT40), 802.11n (VHT40): 7 5180~5240MHz: 802.11a, 802.11n (HT20), 802.11ac (VHT20): 4 802.11n (HT40), 802.11ac (VHT40): 2 802.11ac (VHT80): 1 5745~5825MHz: 802.11a, 802.11n (HT20), 802.11ac (VHT20): 5 802.11n (HT40), 802.11ac (VHT40): 2 802.11ac (VHT80): 1
Antenna Type	Refer to Note
Antenna Connector	Refer to Note
Accessory Device	Adapter
Cable Supplied	0.9m non-shielded RJ45 cable without core

Note:

1. The following models are provided to this EUT. The model of the RT-ACRH15 was chosen for final test.

Brand	Model	Difference
ASUS	RT-ACRH15	All models are electrically identical, different model names are for marketing purpose.
	RT-AC1200GE	
	RT-AC59U	
	RT-AC1500G PLUS	
	RT-AC1500UHP	
	RT-AC57U	
	RT-AC58U	
	RT-AC1300G PLUS	

2. The EUT incorporates a MIMO function. Physically, the EUT provides 4 completed transmitters and 4 receivers.

Band	Modulation Mode	CDD Mode	Beamforming Mode	TX Function
2.4GHz	802.11b	Support	Not Support	4TX/4RX
	802.11g	Support	Not Support	4TX/4RX
	802.11n (HT20)	Support	Not Support	4TX/4RX
	802.11n (HT40)	Support	Not Support	4TX/4RX
	802.11n (VHT20)	Support	Not Support	4TX/4RX
	802.11n (VHT40)	Support	Not Support	4TX/4RX
Band	Modulation Mode	CDD Mode	Beamforming Mode	TX Function
5.0GHz	802.11a	Support	Not Support	2TX/2RX
	802.11n (HT20)	Support	Support	2TX/2RX
	802.11n (HT40)	Support	Support	2TX/2RX
	802.11ac (VHT20)	Support	Support	2TX/2RX
	802.11ac (VHT40)	Support	Support	2TX/2RX
	802.11ac (VHT80)	Support	Support	2TX/2RX

* The modulation and bandwidth are similar for 802.11n mode for HT20/HT40 and 802.11ac mode for VHT20/VHT40, therefore investigated worst case to representative mode in test report. (Final test mode refer section 3.2.1)

* For 802.11n and 802.11ac, CDD mode and Beamforming mode are presented in power output test item. For other test items, CDD mode is the worst case for final tests after pretesting.

3. The EUT is powered by the following adapter.

Adapter	
Brand	Shenzhen Gongjin Electronics Co., Ltd.
Model	S18B22-120A150-CJ
Input Power	100-240Vac~50/60Hz Max 0.6A
Output Power	12Vdc, 1.5A
Power Line	1.45m power cable without core

4. The following antennas were provided to the EUT.

Ant. Type	Dipole		
Connector Type	I-PEX		
Brand	RenFeng		
Antenna Gain (dBi)			
Item	P/N	2.4G	5G
1	RF21C04368A	5	-
2	RF21C04369A	5	-
3	RF21C04370A	5	5
4	RF21C04371A	5	5
5	C6319-510239-A	5	-
6	C6319-510240-A	5	-
7	C6319-510241-A	5	5
8	C6319-510242-A	5	5

*Item 1~4 and item 5~8 are identical to each other, except the length, therefore only Item 1~4 were for final test and presented in the test report.

5. WLAN 2.4GHz and 5GHz technology can transmit at same time.

3.2 Description of Test Modes

2412~2462MHz:

11 channels are provided for 802.11b, 802.11g and 802.11n (HT20):

Channel	Frequency	Channel	Frequency
1	2412MHz	7	2442MHz
2	2417MHz	8	2447MHz
3	2422MHz	9	2452MHz
4	2427MHz	10	2457MHz
5	2432MHz	11	2462MHz
6	2437MHz		

7 channels are provided for 802.11n (HT40):

Channel	Frequency	Channel	Frequency
3	2422MHz	7	2442MHz
4	2427MHz	8	2447MHz
5	2432MHz	9	2452MHz
6	2437MHz		

5180~5240MHz:

4 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

Channel	Frequency	Channel	Frequency
36	5180MHz	44	5220MHz
40	5200MHz	48	5240MHz

2 channels are provided for 802.11n (HT40), 802.11ac (VHT40):

Channel	Frequency	Channel	Frequency
38	5190MHz	46	5230MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
42	5210MHz

5745~5825MHz:

5 channels are provided for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

Channel	Frequency	Channel	Frequency
149	5745MHz	161	5805MHz
153	5765MHz	165	5825MHz
157	5785MHz		

2 channels are provided for 802.11n (HT40), 802.11ac (VHT40):

Channel	Frequency	Channel	Frequency
151	5755MHz	159	5795MHz

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency
155	5775MHz

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable to	Description
	RE $\geq$ 1G	
-	√	-

Where RE $\geq$ 1G: Radiated Emission above 1GHz & Bandedge Measurement

Note:

- The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on X-plane.

Radiated Emission Test (Above 1GHz):

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Freq. Range (MHz)	Available Channel	Tested Channel	Modulation Technology
-	802.11n (HT20) + 802.11n (HT40)	2412-2462	1 to 11	6 + 151	OFDM
		5180-5240	38 to 46		OFDM
		5745-5825	151 to 159		

Radiated Emission Test (Below 1GHz):

- ☒ Pre-Scan has been conducted to determine the worst-case mode from all possible combinations between available modulations, data rates and antenna ports (if EUT with antenna diversity architecture).
- ☒ Following channel(s) was (were) selected for the final test as listed below.

EUT Configure Mode	Mode	Freq. Range (MHz)	Available Channel	Tested Channel	Modulation Technology
-	802.11n (HT20) + 802.11n (HT40)	2412-2462	1 to 11	6 + 151	OFDM
		5180-5240	38 to 46		OFDM
		5745-5825	151 to 159		

Test Condition:

Applicable to	Environmental Conditions	Input Power	Tested by
RE $\geq$ 1G	25 deg. C, 70% RH	120Vac, 60Hz	Harry Hsueh

3.3 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units. The following support units or accessories were used to form a representative test configuration during the tests.

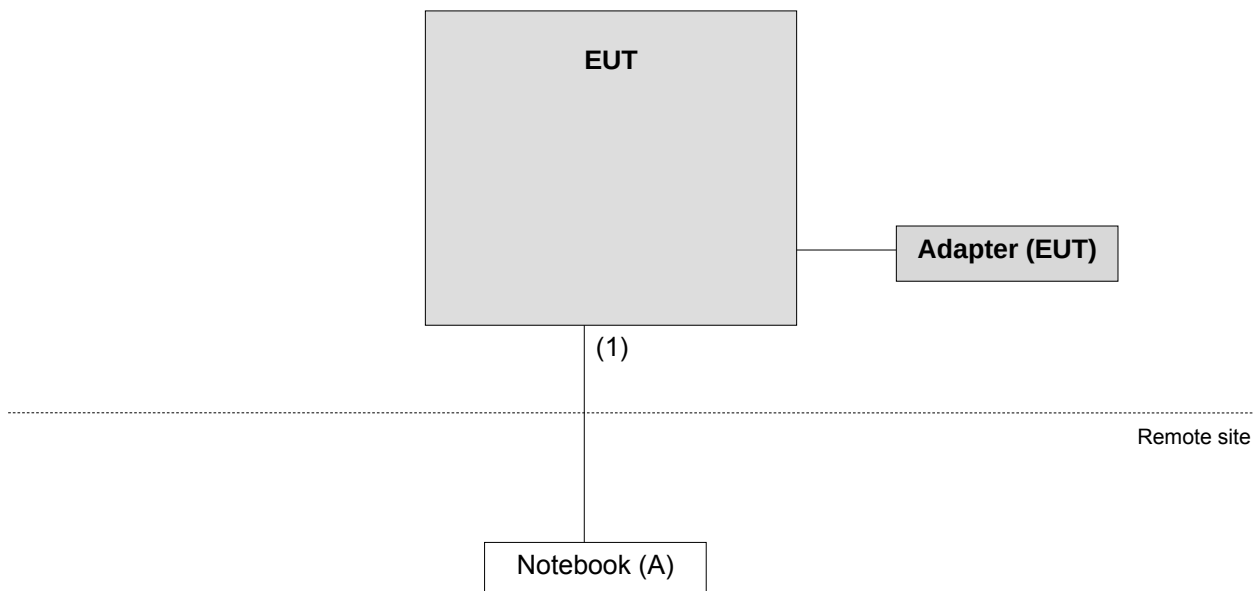
ID	Product	Brand	Model No.	Serial No.	FCC ID	Remarks
A.	Notebook	DELL	E6420	D3T96R1	FCC DoC Approved	-

Note:

1. All power cords of the above support units are non-shielded (1.8m).
2. Item A acted as a communication partner to transfer data.

ID	Descriptions	Qty.	Length (m)	Shielding (Yes/No)	Cores (Qty.)	Remarks
1.	RJ45 cable	1	10	N	0	Cat5e

3.3.1 Configuration of System under Test



3.4 General Description of Applied Standards

The EUT is a RF Product. According to the specification of the EUT declared by the manufacturer, it must comply with the requirements of the following standards:

FCC Part 15, Subpart C (15.247)

FCC Part 15, Subpart E (15.407)

ANSI C63.10-2013

All test items have been performed and recorded as per the above standards.

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 30dB below the highest level of the desired power.

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 ~ 0.490	2400/F(kHz)	300
0.490 ~ 1.705	24000/F(kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

NOTE:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20dB under any condition of modulation.

Limits of unwanted emission out of the restricted bands

Applicable To			Limit	
789033 D02 General UNII Test Procedure New Rules v02r01			Field Strength at 3m	
			PK: 74 (dBµV/m)	AV: 54 (dBµV/m)
Frequency Band	Applicable To		EIRP Limit	Equivalent Field Strength at 3m
5150~5250 MHz	15.407(b)(1)		PK: -27 (dBm/MHz)	PK: 68.2(dBµV/m)
5250~5350 MHz	15.407(b)(2)			
5470~5725 MHz	15.407(b)(3)			
5725~5850 MHz	☒	15.407(b)(4)(i)	PK: -27 (dBm/MHz) ^{*1} PK: 10 (dBm/MHz) ^{*2} PK: 15.6 (dBm/MHz) ^{*3} PK: 27 (dBm/MHz) ^{*4}	PK: 68.2 (dBµV/m) ^{*1} PK: 105.2 (dBµV/m) ^{*2} PK: 110.8 (dBµV/m) ^{*3} PK: 122.2 (dBµV/m) ^{*4}
	☐	15.407(b)(4)(ii)	Emission limits in section 15.247(d)	
^{*1} beyond 75 MHz or more above of the band edge.			^{*2} below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above.	
^{*3} below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above.			^{*4} from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.	

Note: The following formula is used to convert the equipment isotropic radiated power (eirp) to field strength:

$$E = \frac{1000000 \sqrt{30 P}}{3} \text{ } \mu\text{V/m, where P is the eirp (Watts).}$$

4.1.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Cal. Date	Cal. Due
Test Receiver Agilent Technologies	N9038A	MY55420137	Apr. 15, 2019	Apr. 14, 2020
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Apr. 15, 2019	Apr. 14, 2020
HORN Antenna ETS-Lindgren	3117	00143293	Nov. 25, 2018	Nov. 24, 2019
BILOG Antenna SCHWARZBECK	VULB 9168	9168-616	Nov. 27, 2018	Nov. 26, 2019
HORN Antenna SCHWARZBECK	BBHA 9170	9170-480	Nov. 25, 2018	Nov. 24, 2019
Fixed Attenuator Mini-Circuits	MDCS18N-10	MDCS18N-10-01	Apr. 15, 2019	Apr. 14, 2020
Preamplifier Agilent	310N	187226	Jun. 18, 2019	Jun. 17, 2020
Preamplifier Agilent	83017A	MY39501357	Jun. 18, 2019	Jun. 17, 2020
Preamplifier EMCI	EMC 184045	980116	Oct. 12, 2018	Oct. 11, 2019
Power Meter Anritsu	ML2495A	1012010	Sep. 05, 2018	Sep. 04, 2019
Power Sensor Anritsu	MA2411B	1315050	Sep. 04, 2018	Sep. 03, 2019
RF signal cable ETS-LINDGREN	5D-FB	Cable-CH1-01(RFC-S MS-100-SMS-120+RF C-SMS-100-SMS-400)	Jun. 18, 2019	Jun. 17, 2020
RF signal cable ETS-LINDGREN	8D-FB	Cable-CH1-02(RFC-S MS-100-SMS-24)	Jun. 18, 2019	Jun. 17, 2020
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
Software BV ADT	E3 8.130425b	NA	NA	NA
Antenna Tower MF	NA	NA	NA	NA
Turn Table MF	NA	NA	NA	NA
Antenna Tower & Turn Table Controller MF	MF-7802	NA	NA	NA

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in Xindian Chamber 1.

4.1.3 Test Procedures

For Radiated emission below 30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 meter chamber room. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

Note:

1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 9kHz at frequency below 30MHz.

For Radiated emission above 30MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters (for 30MHz ~ 1GHz) / 1.5 meters (for above 1GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detect function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

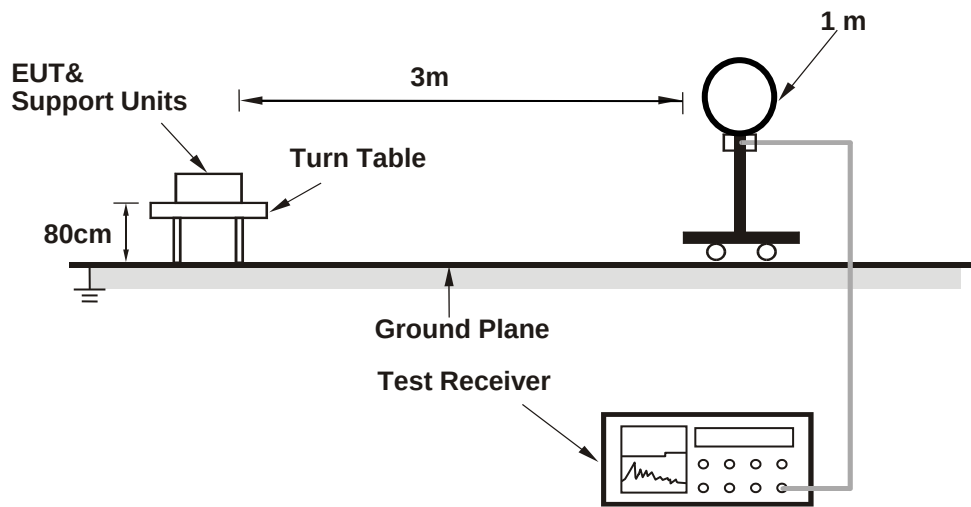
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120kHz for Quasi-peak detection (QP) at frequency below 1GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is $\geq 1/T$ (Duty cycle < 98%) or 10Hz (Duty cycle $\geq 98\%$) for Average detection (AV) at frequency above 1GHz. (2.4GHz: 802.11g: RBW = 1MHz, VBW = 10Hz; 5GHz: 802.11a: RBW = 1 MHz, VBW = 1 kHz)
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

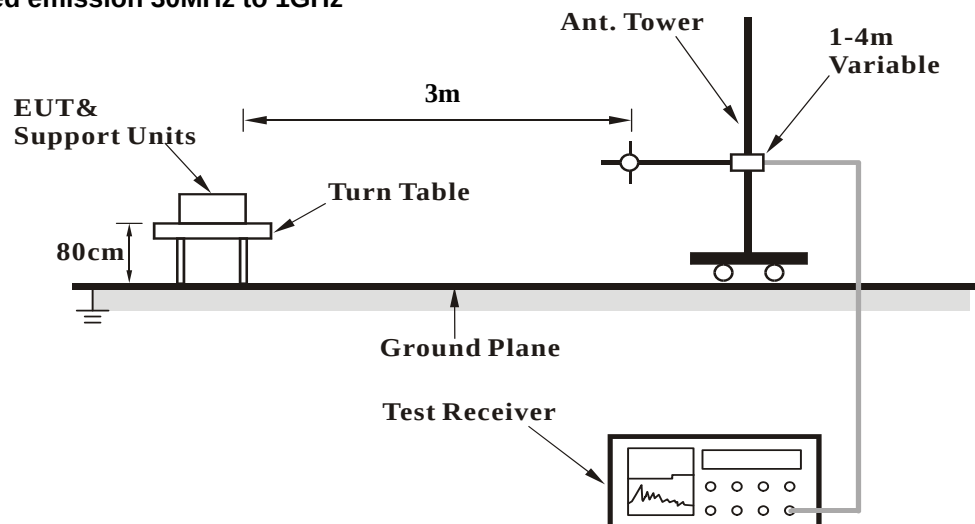
No deviation.

4.1.5 Test Setup

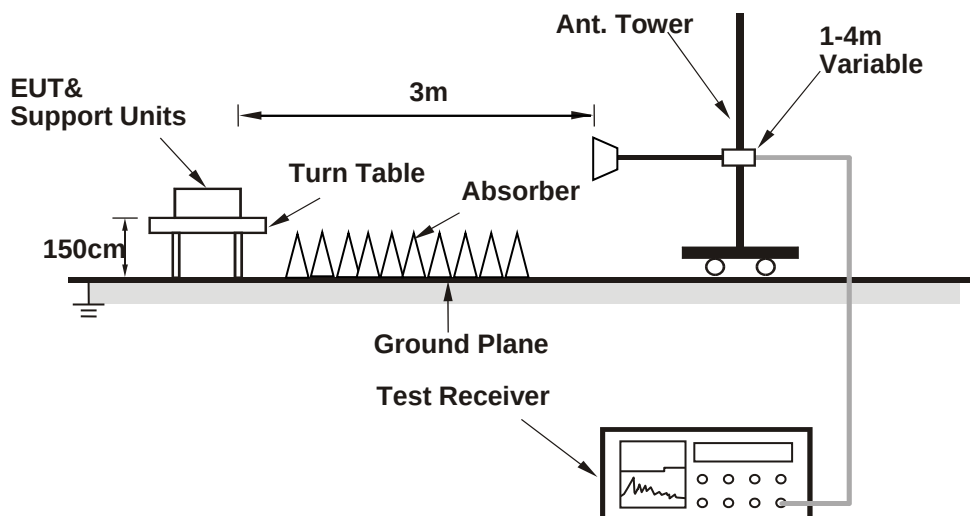
For Radiated emission below 30MHz



For Radiated emission 30MHz to 1GHz



For Radiated emission above 1GHz



For the actual test configuration, please refer to the attached file (Test Setup Photo).

4.1.6 EUT Operating Conditions

- Placed the EUT on the testing table.
- Prepared a notebook to act as a communication partner and placed it outside of testing area.
- The communication partner connected with EUT via a RJ45 cable and ran a test program (provided by manufacturer) to enable EUT under transmission condition continuously at specific channel frequency.
- The communication partner sent data to EUT by command "PING".

4.1.7 Test Results

Above 1GHz data:

802.11n (HT20), CH 6 + 802.11n (HT40), CH 151

Frequency Range	1GHz ~ 40GHz	Detector Function	Peak (PK) Average (AV)
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Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2382.00	47.04	42.57	4.47	54.00	-6.96	100	232	Average
2382.00	54.73	50.26	4.47	74.00	-19.27	100	232	Peak
*2437.00	102.91	98.32	4.59			100	232	Average
*2437.00	109.90	105.31	4.59			100	232	Peak
2494.00	46.24	41.57	4.67	54.00	-7.76	100	232	Average
2494.00	55.47	50.80	4.67	74.00	-18.53	100	232	Peak
4874.00	42.10	31.89	10.21	54.00	-11.90	166	195	Average
4874.00	48.18	37.97	10.21	74.00	-25.82	166	195	Peak
*5755.00	102.94	92.04	10.90			160	80	Average
*5755.00	109.65	98.75	10.90			160	80	Peak
11510.00	47.08	30.57	16.51	54.00	-6.92	167	184	Average
11510.00	55.07	38.56	16.51	74.00	-18.93	167	184	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2362.00	49.00	44.58	4.42	54.00	-5.00	200	275	Average
2362.00	56.49	52.07	4.42	74.00	-17.51	200	275	Peak
*2437.00	113.50	108.91	4.59			200	275	Average
*2437.00	120.89	116.30	4.59			200	275	Peak
2484.00	47.23	42.57	4.66	54.00	-6.77	200	275	Average
2484.00	55.14	50.48	4.66	74.00	-18.86	200	275	Peak
4874.00	41.77	31.56	10.21	54.00	-12.23	167	165	Average
4874.00	47.98	37.77	10.21	74.00	-26.02	167	165	Peak
*5755.00	110.65	99.75	10.90			200	95	Average
*5755.00	118.87	107.97	10.90			200	95	Peak
11510.00	47.41	30.90	16.51	54.00	-6.59	161	174	Average
11510.00	54.91	38.40	16.51	74.00	-19.09	161	174	Peak

Remarks:

1. Emission Level(dBuV/m) = Raw Value(dBuV) + Correction Factor(dB/m)
2. Correction Factor(dB/m) = Antenna Factor(dB/m) + Cable Factor(dB) – Pre-Amplifier Factor(dB)
3. The other emission levels were very low against the limit.
4. Margin value = Emission Level – Limit value
5. " * ": Fundamental frequency.

CHANNEL	TX Channel 151(OOBE)	DETECTOR FUNCTION	Peak (PK)
FREQUENCY RANGE	1GHz ~ 40GHz		Average (AV)

Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5567.200	53.33	42.63	10.70	68.20	-14.87	202	327	Peak
5653.300	51.71	42.61	9.10	70.64	-18.93	202	327	Peak
5920.000	52.16	42.78	9.38	71.90	-19.74	202	327	Peak
5962.525	52.71	41.48	11.23	68.20	-15.49	202	327	Peak
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5570.875	52.31	41.61	10.70	68.20	-15.89	103	25	Peak
5653.300	51.97	42.87	9.10	70.64	-18.67	103	25	Peak
5923.675	53.50	44.10	9.40	69.18	-15.68	103	25	Peak
5972.500	53.07	41.82	11.25	68.20	-15.13	103	25	Peak

Remarks:

1. Emission Level = Read Level + Factor

Margin value = Emission level – Limit value

2. The emission levels of other frequencies were very low against the limit.

Below 1GHz data:

802.11n (HT20), CH 6 + 802.11n (HT40), CH 151

CHANNEL	TX 802.11n (HT20), Channel 6+ 802.11n (HT40), Channel 151	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9kHz ~ 1GHz		

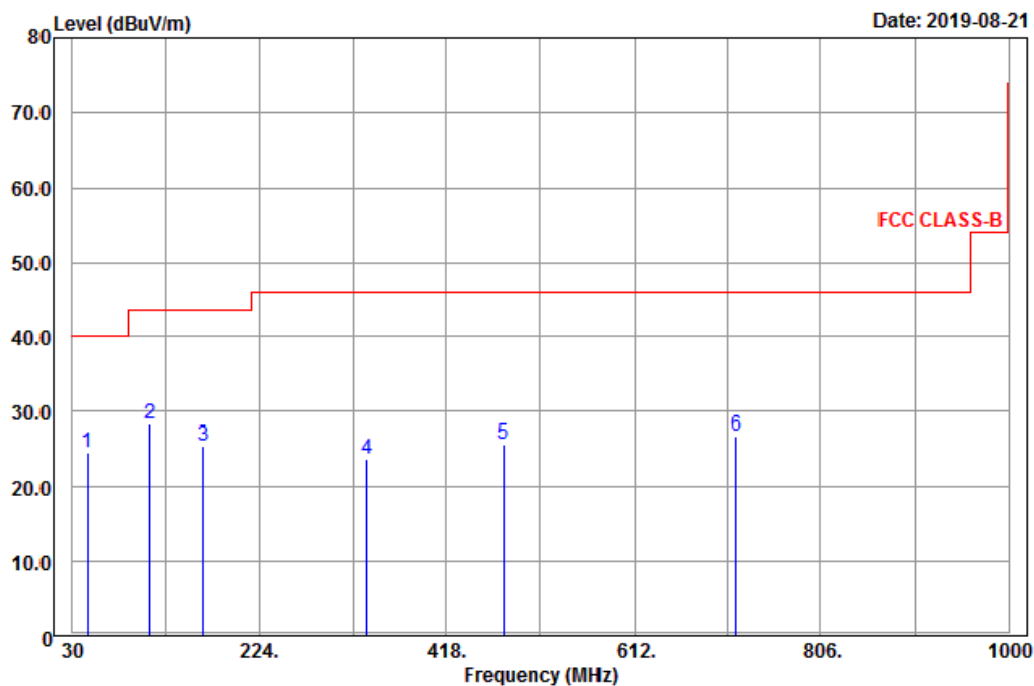
Antenna Polarity & Test Distance: Horizontal at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
45.66	24.73	40.03	-15.30	40.00	-15.27	102	165	QP
110.73	28.38	46.05	-17.67	43.50	-15.12	105	187	QP
166.62	25.43	45.83	-20.40	43.50	-18.07	102	144	QP
335.00	23.71	38.85	-15.14	46.00	-22.29	132	165	QP
477.80	25.67	38.41	-12.74	46.00	-20.33	169	157	QP
717.90	26.87	35.74	-8.87	46.00	-19.13	105	187	QP

Remarks:

1. Emission Level = Read Level + Factor

Margin value = Emission level – Limit value

2. The emission levels of other frequencies were very low against the limit.



CHANNEL	TX 802.11n (HT20), Channel 6+ 802.11n (HT40), Channel 151	DETECTOR FUNCTION	Quasi-Peak (QP)
FREQUENCY RANGE	9KHz ~ 1GHz		

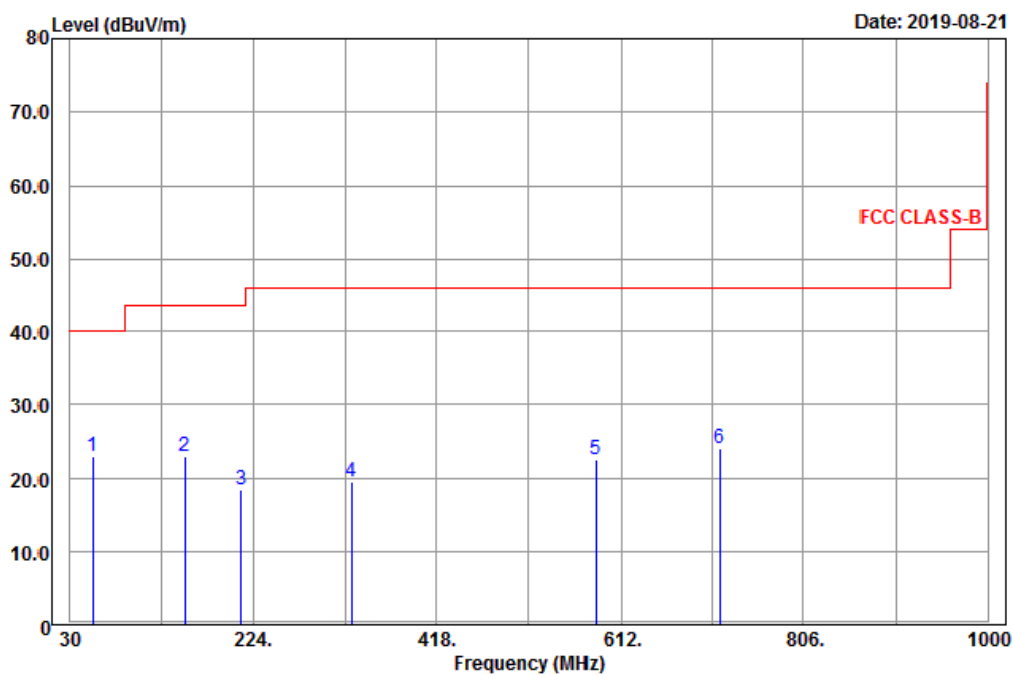
Antenna Polarity & Test Distance: Vertical at 3 m								
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Factor (dB/m)	Limit (dBuV/m)	Margin (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
53.76	23.01	38.37	-15.36	40.00	-16.99	105	198	QP
151.50	23.02	43.96	-20.94	43.50	-20.48	172	184	QP
211.98	18.46	36.53	-18.07	43.50	-25.04	132	165	QP
327.30	19.68	35.03	-15.35	46.00	-26.32	198	215	QP
585.60	22.61	33.52	-10.91	46.00	-23.39	143	167	QP
717.20	24.13	33.02	-8.89	46.00	-21.87	105	187	QP

Remarks:

1. Emission Level = Read Level + Factor

Margin value = Emission level – Limit value

2. The emission levels of other frequencies were very low against the limit.

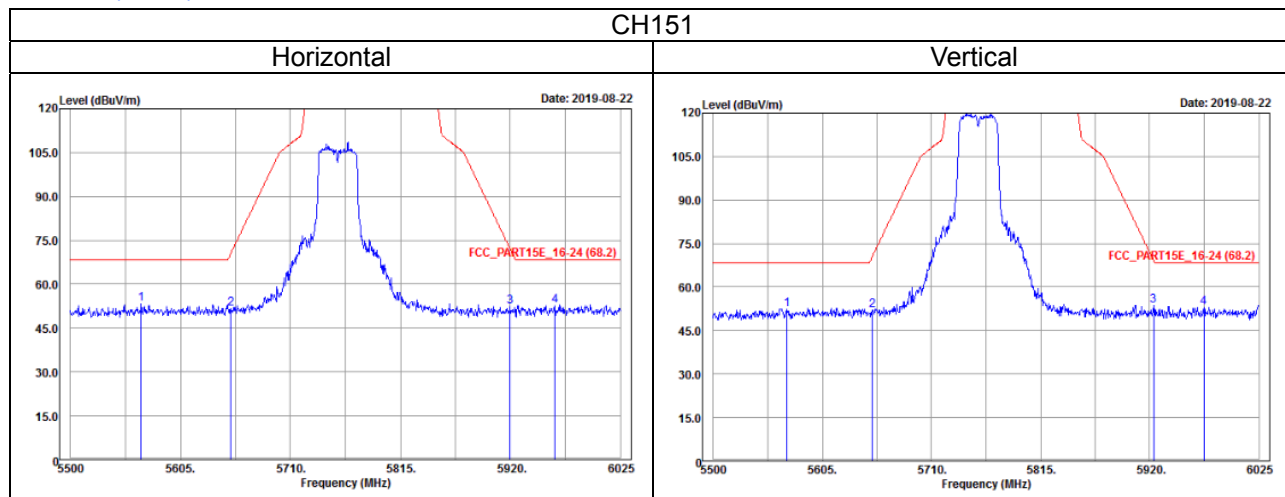


5 Pictures of Test Arrangements

Please refer to the attached file (Test Setup Photo).

Annex A- Radiated Out of Band Emission (OOBE) Measurement (For U-NII-3 band)

802.11n (HT40)



Appendix – Information of the Testing Laboratories

We, Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch, were founded in 1988 to provide our best service in EMC, Radio, Telecom and Safety consultation. Our laboratories are FCC recognized accredited test firms and accredited and approved according to ISO/IEC 17025.

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The address and road map of all our labs can be found in our web site also.

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