

Partial FCC Test Report

Report No.: RF180604C04-5 R1

FCC ID: A4R-WT4

Test Model: AW-CM389NF

Received Date: Jun. 04, 2018

Test Date: Jul. 18, 2018 ~ Jul. 19, 2018

Issued Date: Sep. 03, 2018

Applicant: Google LLC

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FCC Registration /
Designation Number: 427177 / TW0011



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Release Control Record

Issue No.	Description	Date Issued
RF180604C04-5	Original Release	Jul. 23, 2018
RF180604C04-5 R1	Revised to C2PC.	Sep. 03, 2018

1 Certificate of Conformity

Product: IEEE 802.11 2X2 MIMO a/b/g/n/ac Wireless LAN + Bluetooth + NFC NGFF Module

Brand: AzureWave

Test Model: AW-CM389NF

Sample Status: Production Unit

Applicant: Google LLC

Test Date: Jul. 18, 2018 ~ Jul. 19, 2018

Standards: 47 CFR FCC Part 15, Subpart C (Section 15.247)
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 : Rona Chen, **Date:** Sep. 03, 2018
Rona Chen / Specialist

Approved by : Dylan Chiou, **Date:** Sep. 03, 2018
Dylan Chiou / Project Engineer

2 Summary of Test Results

47 CFR FCC Part 15, Subpart C (Section 15.247)			
FCC Clause	Test Item	Result	Remarks
15.207	AC Power Conducted Emission	Pass	Meet the requirement of limit. Minimum passing margin is -11.69 dB at 0.56418 MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -1 dB at 2389.83 MHz.
15.247(d)	Antenna Port Emission	N/A	Refer to Note
15.247(a)(2)	6 dB Bandwidth	N/A	Refer to Note
---	Occupied Bandwidth Measurement	N/A	Refer to Note
15.247(b)	Conducted power	N/A	Refer to Note
15.247(e)	Power Spectral Density	N/A	Refer to Note
15.203	Antenna Requirement	N/A	Refer to Note

Note: This is a partial report. Therefore, only test item of AC Power Conducted Emission and Radiated Emissions test were performed for this report. Other testing data please refer to BV CPS report no.: RF140407E07D for module (Brand: AzureWave, Model: AW-CM389NF).

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) (±)
Conducted Emissions at mains ports	150 kHz ~ 30 MHz	2.44 dB
Radiated Emissions up to 1 GHz	30 MHz ~ 200 MHz	2.0153 dB
	200 MHz ~ 1000 MHz	2.0224 dB
Radiated Emissions above 1 GHz	1 GHz ~ 18 GHz	1.0121 dB
	18 GHz ~ 40 GHz	1.1508 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	IEEE 802.11 2X2 MIMO a/b/g/n/ac Wireless LAN + Bluetooth + NFC NGFF Module
Brand	AzureWave
Test Model	AW-CM389NF
Status of EUT	Production Unit
Nominal Voltage	5.0 Vdc (Host equipment)
Modulation Type	CCK, DQPSK, DBPSK for DSSS 64QAM, 16QAM, QPSK, BPSK for OFDM
Modulation Technology	DSSS, OFDM
Transfer Rate	802.11b: 11.0 / 5.5 / 2.0 / 1.0 Mbps 802.11g: 54.0 / 48.0 / 36.0 / 24.0 / 18.0 / 12.0 / 9.0 / 6.0 Mbps 802.11n: up to 300.0 Mbps
Operating Frequency	2412 ~ 2462 MHz
Number of Channel	11 for 802.11b, 802.11g, 802.11n (HT20) 7 for 802.11n (HT40)
Antenna Type	PIFA antenna with 2.42 dBi gain
Antenna Connector	N/A
Accessory Device	Refer to Note as below
Data Cable Supplied	Refer to Note as below

Note:

- The EUT was installed in a specific End-product.

Product	Brand	Model
Study Hub	Verily	WT3

- The EUT incorporates a MIMO function. Physically, the EUT provides two completed transmitters and two receivers.

Modulation Mode	TX Function
802.11b	2TX (MIMO)
802.11g	2TX (MIMO)
802.11n (HT20)	2TX (MIMO)
802.11n (HT40)	2TX (MIMO)

- The End-product contains following accessory devices.

Product	Brand	Model	Description
Adapter	TPT	MSS050200WI	I/P: 100-240 Vac, 50-60 Hz, 0.3 A O/P: 5 Vdc, 2 A 1.5m shielded cable w/o core
BT/WLAN Module	AzureWave	AW-CM389NF	--
WWAN Module	Fibocom	L850-GL	--

- The above EUT information is declared by manufacturer and for more detailed features description, please refers to the manufacturer's specifications or user's manual.

3.2 Description of Test Modes

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

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

7 channels are provided for 802.11n (HT40):

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

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable To				Description
	RE $\geq$ 1G	RE<1G	PLC	APCM	
-	√	√	√	-	-

Where **RE $\geq$ 1G**: Radiated Emission above 1 GHz
RE<1G: Radiated Emission below 1 GHz
PLC: Power Line Conducted Emission
APCM: Antenna Port Conducted Measurement

NOTE:

1. The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on **X-plane**.
2. "-" means no effect.

Radiated Emission Test (Above 1 GHz):

- ☒ 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	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	802.11b	1 to 11	1, 6, 11	DSSS	DBPSK	1.0
-	802.11g	1 to 11	1, 6, 11	OFDM	BPSK	6.0
-	802.11n (HT20)	1 to 11	1, 6, 11	OFDM	BPSK	6.5
-	802.11n (HT40)	3 to 9	3, 6, 9	OFDM	BPSK	13.5

Radiated Emission Test (Below 1 GHz):

- ☒ 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	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	802.11n (HT20)	1 to 11	1	OFDM	BPSK	6.5

Power Line Conducted Emission Test:

- ☒ 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	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	802.11n (HT20)	1 to 11	1	OFDM	BPSK	6.5

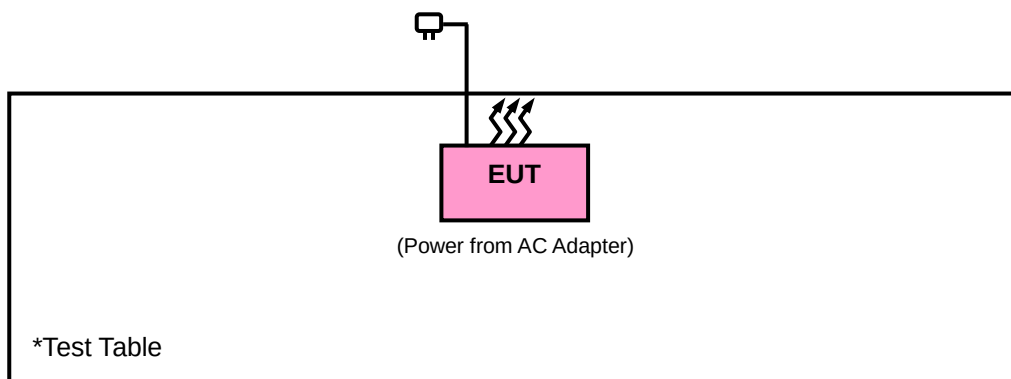
Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested by
RE $\geq$ 1G	25 deg. C, 65 % RH	120 Vac, 60 Hz	Charles Hsiao
RE<1G	25 deg. C, 65 % RH	120 Vac, 60 Hz	Karl Lee
PLC	25 deg. C, 65 % RH	120 Vac, 60 Hz	Jisyoung Wang

3.3 Description of Support Units

The EUT has been tested as an independent unit together with other necessary accessories or support units.

3.3.1 Configuration of System under Test



3.4 General Description of Applied Standards

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

FCC Part 15, Subpart C (15.247)

KDB 558074 D01 DTS Meas Guidance v04

KDB 662911 D01 Multiple Transmitter Output v02r01

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 20 dB 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 1000 MHz, 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 20 dB under any condition of modulation.

4.1.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver Agilent Technologies	N9038A	MY51210203	Mar. 16, 2018	Mar. 15, 2019
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Jan. 11, 2018	Jan. 10, 2019
BILOG Antenna SCHWARZBECK	VULB9168	9168-472	Dec. 06, 2017	Dec. 05, 2018
HORN Antenna ETS-Lindgren	3117	00143293	Dec. 13, 2017	Dec. 12, 2018
HORN Antenna SCHWARZBECK	BBHA 9170	9170-480	Dec. 01, 2017	Nov. 30, 2018
Fixed Attenuator Mini-Circuits	MDCS18N-10	MDCS18N-10-01	Apr. 16, 2018	Apr. 15, 2019
Loop Antenna	EM-6879	269	Aug. 11, 2017	Aug. 10, 2018
Preamplifier Agilent	310N	187226	Jun. 19, 2018	Jun. 18, 2019
Preamplifier Agilent	83017A	MY39501357	Jun. 19, 2018	Jun. 18, 2019
Power Meter Anritsu	ML2495A	1012010	Aug. 15, 2017	Aug. 14, 2018
Power Sensor Anritsu	MA2411B	1315050	Aug. 15, 2017	Aug. 14, 2018
RF signal cable ETS-LINDGREN	5D-FB	Cable-CH1-01(RFC-SMS-100-SMS-120+RFC-SMS-100-SMS-400)	Jun. 19, 2018	Jun. 18, 2019
RF signal cable ETS-LINDGREN	8D-FB	Cable-CH1-02(RFC-SMS-100-SMS-24)	Jun. 19, 2018	Jun. 18, 2019
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 HsinTien Chamber 1.
3. The horn antenna and preamplifier (model: 83017A) are used only for the measurement of emission frequency above 1 GHz if tested.
4. The IC Site Registration No. is IC7450I-1.

4.1.3 Test Procedures

For Radiated Emission below 30 MHz

- 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 9 kHz at frequency below 30 MHz.

For Radiated Emission above 30 MHz

- a. The EUT was placed on the top of a rotating table 0.8 meters (for 30 MHz ~ 1 GHz) / 1.5 meters (for above 1 GHz) 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 detected 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:

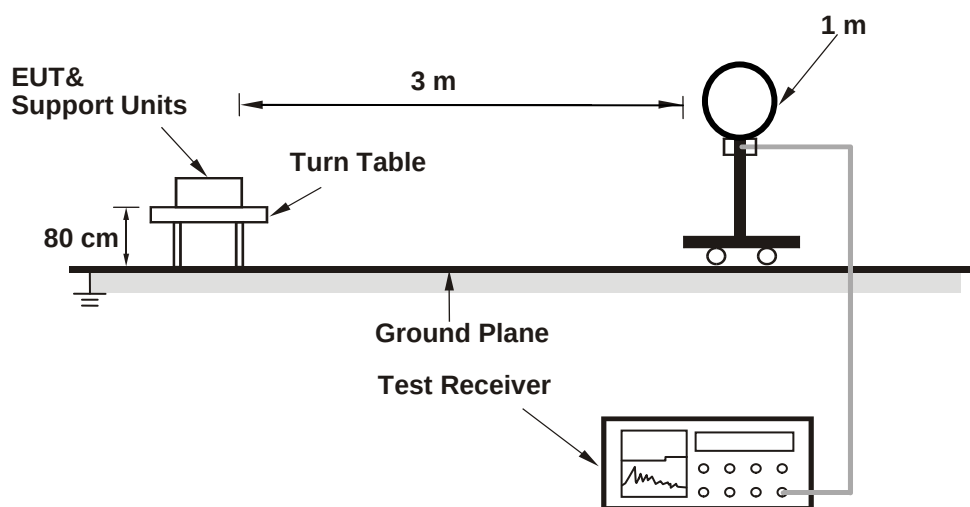
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection (QP) at frequency below 1 GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1 GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is $\geq 1/T$ (Duty cycle < 98 %) or 10 Hz (Duty cycle ≥ 98 %) for Average detection (AV) at frequency above 1 GHz.
(11b: RBW = 1 MHz, VBW = 1 kHz ; 11g: RBW = 1 MHz, VBW = 1 kHz ;
11n (HT20): RBW = 1 MHz, VBW = 1 kHz ; 11n (HT40): RBW = 1 MHz, VBW = 2 kHz)
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

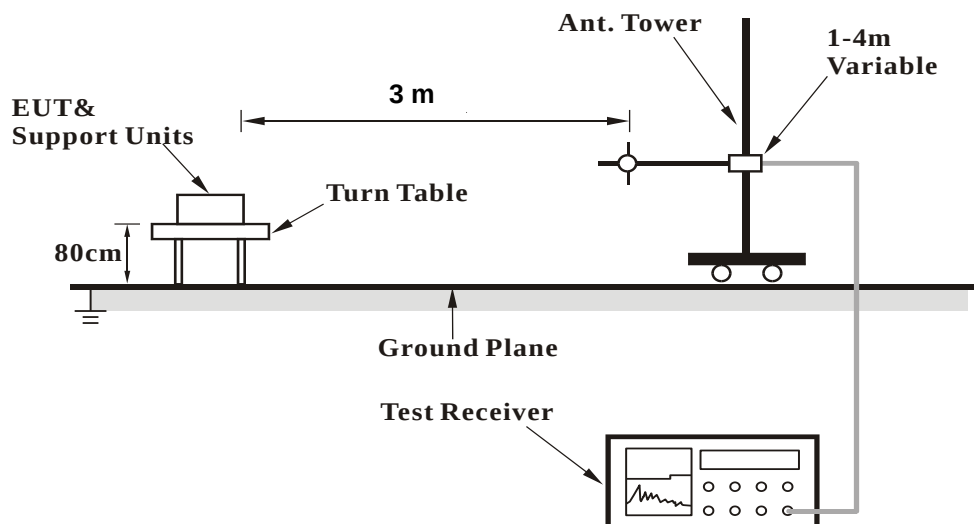
No deviation.

4.1.5 Test Set Up

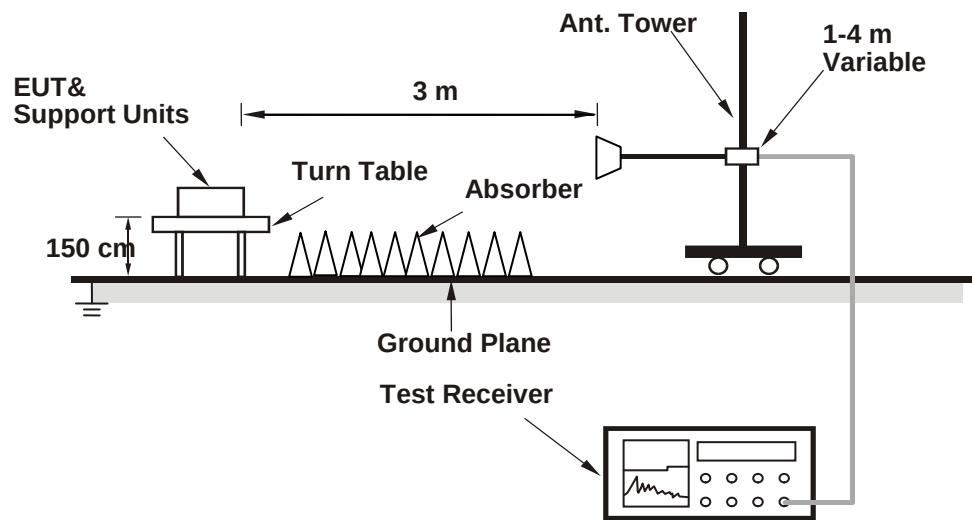
<Radiated Emission below 30 MHz>



<Radiated Emission 30 MHz to 1 GHz>



<Radiated Emission above 1 GHz>



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

4.1.6 EUT Operating Conditions

- Placed the EUT on a testing table.
- Use the software to control the EUT under transmission condition continuously at specific channel frequency.

4.1.7 Test Results

Above 1 GHz Data : 802.11b

EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Charles Hsiao

Antennal Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2389.47	44.91	43.2	54	-9.09	31.8	5.4	35.49	160	13	Average
2389.47	52.88	51.17	74	-21.12	31.8	5.4	35.49	160	13	Peak
2412	98.35	96.58			31.81	5.43	35.47	160	13	Average
2412	101.4	99.63			31.81	5.43	35.47	160	13	Peak
4824	46.13	38	54	-7.87	33.97	8.26	34.1	106	127	Average
4824	51.52	43.39	74	-22.48	33.97	8.26	34.1	106	127	Peak
Antennal Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2386.14	52.72	51.01	54	-1.28	31.8	5.4	35.49	244	107	Average
2386.14	54.35	52.64	74	-19.65	31.8	5.4	35.49	244	107	Peak
2412	99.58	97.81			31.81	5.43	35.47	122	107	Average
2412	102.4	100.63			31.81	5.43	35.47	122	107	Peak
4824	48.83	40.7	54	-5.17	33.97	8.26	34.1	105	236	Average
4824	54.05	45.92	74	-19.95	33.97	8.26	34.1	105	236	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2412 MHz: Fundamental frequency.
- The emission levels of other frequencies were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 6	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Charles Hsiao

Antennal Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2381.19	40.45	38.76	54	-13.55	31.78	5.4	35.49	160	13	Average
2381.19	51.33	49.64	74	-22.67	31.78	5.4	35.49	160	13	Peak
2437	99.68	97.83			31.85	5.46	35.46	160	13	Average
2437	102.18	100.33			31.85	5.46	35.46	160	13	Peak
2500	40.93	38.91	54	-13.07	31.9	5.53	35.41	160	13	Average
2500	51.88	49.86	74	-22.12	31.9	5.53	35.41	160	13	Peak
4874	49.37	41.18	54	-4.63	33.98	8.27	34.06	106	135	Average
4874	54.18	45.99	74	-19.82	33.98	8.27	34.06	106	135	Peak
Antennal Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2377.95	40.55	38.89	54	-13.45	31.78	5.37	35.49	122	107	Average
2377.95	51.83	50.17	74	-22.17	31.78	5.37	35.49	122	107	Peak
2437	100.14	98.29			31.85	5.46	35.46	122	107	Average
2437	103	101.15			31.85	5.46	35.46	122	107	Peak
2495	40.94	38.92	54	-13.06	31.9	5.53	35.41	122	107	Average
2495	51.92	49.9	74	-22.08	31.9	5.53	35.41	122	107	Peak
4874	50.44	42.25	54	-3.56	33.98	8.27	34.06	105	236	Average
4874	55.88	47.69	74	-18.12	33.98	8.27	34.06	105	236	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
2. 2437 MHz: Fundamental frequency.
3. The emission levels of other frequencies were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 11	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Charles Hsiao

Antennal Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2462	96.55	94.62			31.87	5.5	35.44	160	13	Average
2462	99.45	97.52			31.87	5.5	35.44	160	13	Peak
2489.08	41.06	39.05	54	-12.94	31.9	5.53	35.42	160	13	Average
2489.08	51.8	49.79	74	-22.2	31.9	5.53	35.42	160	13	Peak
4924	40.49	32.24	54	-13.51	33.99	8.28	34.02	106	127	Average
4924	45.99	37.74	74	-28.01	33.99	8.28	34.02	106	127	Peak
Antennal Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2462	97.49	95.56			31.87	5.5	35.44	235	107	Average
2462	100.82	98.89			31.87	5.5	35.44	235	107	Peak
2497.52	41.05	39.03	54	-12.95	31.9	5.53	35.41	235	107	Average
2497.52	52.57	50.55	74	-21.43	31.9	5.53	35.41	235	107	Peak
4924	43.47	35.22	54	-10.53	33.99	8.28	34.02	105	236	Average
4924	49.36	41.11	74	-24.64	33.99	8.28	34.02	105	236	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2462 MHz: Fundamental frequency.
- The emission levels of other frequencies were very low against the limit.

802.11g

EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Charles Hsiao

Antennal Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2385.87	49.84	48.13	54	-4.16	31.8	5.4	35.49	160	13	Average
2385.87	56.35	54.64	74	-17.65	31.8	5.4	35.49	160	13	Peak
2412	94.47	92.7			31.81	5.43	35.47	160	13	Average
2412	101.86	100.09			31.81	5.43	35.47	160	13	Peak
4824	50.93	42.8	54	-3.07	33.97	8.26	34.1	106	127	Average
4824	56.16	48.03	74	-17.84	33.97	8.26	34.1	106	127	Peak
Antennal Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2386.14	50.83	49.12	54	-3.17	31.8	5.4	35.49	220	107	Average
2386.14	58.7	56.99	74	-15.3	31.8	5.4	35.49	220	107	Peak
2412	95.65	93.88			31.81	5.43	35.47	218	107	Average
2412	102.3	100.53			31.81	5.43	35.47	218	107	Peak
4824	52.49	44.36	54	-1.51	33.97	8.26	34.1	105	236	Average
4824	58.32	50.19	74	-15.68	33.97	8.26	34.1	105	236	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2412 MHz: Fundamental frequency.
- The emission levels of other frequencies were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 6	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Charles Hsiao

Antennal Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2389.02	43.98	42.27	54	-10.02	31.8	5.4	35.49	160	90	Average
2389.02	52.27	50.56	74	-21.73	31.8	5.4	35.49	160	90	Peak
2437	99.47	97.62			31.85	5.46	35.46	160	90	Average
2437	106.24	104.39			31.85	5.46	35.46	160	90	Peak
2484.44	41.16	39.17	54	-12.84	31.88	5.53	35.42	160	90	Average
2484.44	51.85	49.86	74	-22.15	31.88	5.53	35.42	160	90	Peak
4874	51.89	43.7	54	-2.11	33.98	8.27	34.06	106	135	Average
4874	58	49.81	74	-16	33.98	8.27	34.06	106	135	Peak
Antennal Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2389.2	43.87	42.16	54	-10.13	31.8	5.4	35.49	241	107	Average
2389.2	52.49	50.78	74	-21.51	31.8	5.4	35.49	241	107	Peak
2437	100.65	98.8			31.85	5.46	35.46	241	107	Average
2437	107.29	105.44			31.85	5.46	35.46	241	107	Peak
2484.52	42.05	40.06	54	-11.95	31.88	5.53	35.42	241	107	Average
2484.52	52.53	50.54	74	-21.47	31.88	5.53	35.42	241	107	Peak
4874	52.95	44.76	54	-1.05	33.98	8.27	34.06	105	236	Average
4874	59.23	51.04	74	-14.77	33.98	8.27	34.06	105	236	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
2. 2437 MHz: Fundamental frequency.
3. The emission levels of other frequencies were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 11	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Charles Hsiao

Antennal Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2462	91.55	89.62			31.87	5.5	35.44	160	13	Average
2462	98.39	96.46			31.87	5.5	35.44	160	13	Peak
2484.48	41.3	39.31	54	-12.7	31.88	5.53	35.42	160	13	Average
2484.48	52.75	50.76	74	-21.25	31.88	5.53	35.42	160	13	Peak
4924	46.24	37.99	54	-7.76	33.99	8.28	34.02	106	148	Average
4924	51.2	42.95	74	-22.8	33.99	8.28	34.02	106	148	Peak
Antennal Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2462	92.36	90.43			31.87	5.5	35.44	235	107	Average
2462	99.4	97.47			31.87	5.5	35.44	235	107	Peak
2483.52	41.94	39.98	54	-12.06	31.88	5.5	35.42	235	107	Average
2483.52	53.62	51.66	74	-20.38	31.88	5.5	35.42	235	107	Peak
4924	48.24	39.99	54	-5.76	33.99	8.28	34.02	105	236	Average
4924	53.09	44.84	74	-20.91	33.99	8.28	34.02	105	236	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2462 MHz: Fundamental frequency.
- The emission levels of other frequencies were very low against the limit.

802.11n (HT20)

EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Charles Hsiao

Antennal Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2389.92	50.23	48.5	54	-3.77	31.8	5.4	35.47	160	13	Average
2389.92	68.1	66.37	74	-5.9	31.8	5.4	35.47	160	13	Peak
2412	93.62	91.85			31.81	5.43	35.47	160	13	Average
2412	100.43	98.66			31.81	5.43	35.47	160	13	Peak
4824	39.43	31.3	54	-14.57	33.97	8.26	34.1	100	21	Average
4824	47.34	39.21	74	-26.66	33.97	8.26	34.1	100	21	Peak
Antennal Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2389.83	53	51.27	54	-1	31.8	5.4	35.47	148	107	Average
2389.83	72.36	70.63	74	-1.64	31.8	5.4	35.47	148	107	Peak
2412	94.65	92.88			31.81	5.43	35.47	218	107	Average
2412	101.91	100.14			31.81	5.43	35.47	218	107	Peak
4824	39.71	31.58	54	-14.29	33.97	8.26	34.1	154	109	Average
4824	46.94	38.81	74	-27.06	33.97	8.26	34.1	154	109	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2412 MHz: Fundamental frequency.
- The emission levels of other frequencies were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 6	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Charles Hsiao

Antennal Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2389.47	44.01	42.3	54	-9.99	31.8	5.4	35.49	160	13	Average
2389.47	56.84	55.13	74	-17.16	31.8	5.4	35.49	160	13	Peak
2437	95.25	93.4			31.85	5.46	35.46	160	13	Average
2437	102.23	100.38			31.85	5.46	35.46	160	13	Peak
2483.88	42.45	40.49	54	-11.55	31.88	5.5	35.42	160	13	Average
2483.88	54.84	52.88	74	-19.16	31.88	5.5	35.42	160	13	Peak
4874	39.66	31.47	54	-14.34	33.98	8.27	34.06	124	111	Average
4874	45.42	37.23	74	-28.58	33.98	8.27	34.06	124	111	Peak
Antennal Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2389.83	48.08	46.35	54	-5.92	31.8	5.4	35.47	146	107	Average
2389.83	61.08	59.35	74	-12.92	31.8	5.4	35.47	146	107	Peak
2437	96.54	94.69			31.85	5.46	35.46	218	107	Average
2437	103.01	101.16			31.85	5.46	35.46	218	107	Peak
2484.16	45.43	43.47	54	-8.57	31.88	5.5	35.42	218	107	Average
2484.16	59.69	57.73	74	-14.31	31.88	5.5	35.42	218	107	Peak
4874	39.65	31.46	54	-14.35	33.98	8.27	34.06	187	200	Average
4874	45.85	37.66	74	-28.15	33.98	8.27	34.06	187	200	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
2. 2437 MHz: Fundamental frequency.
3. The emission levels of other frequencies were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 11	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Charles Hsiao

Antennal Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2462	91.47	89.54			31.87	5.5	35.44	160	13	Average
2462	98.87	96.94			31.87	5.5	35.44	160	13	Peak
2483.52	43.96	42	54	-10.04	31.88	5.5	35.42	160	13	Average
2483.52	56.35	54.39	74	-17.65	31.88	5.5	35.42	160	13	Peak
4924	39.23	30.98	54	-14.77	33.99	8.28	34.02	105	222	Average
4924	44.83	36.58	74	-29.17	33.99	8.28	34.02	105	222	Peak
Antennal Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2462	92.58	90.65			31.87	5.5	35.44	218	107	Average
2462	99.81	97.88			31.87	5.5	35.44	218	107	Peak
2483.64	50.18	48.22	54	-3.82	31.88	5.5	35.42	218	90	Average
2483.64	62.75	60.79	74	-11.25	31.88	5.5	35.42	218	90	Peak
4924	39.67	31.42	54	-14.33	33.99	8.28	34.02	147	336	Average
4924	45.79	37.54	74	-28.21	33.99	8.28	34.02	147	336	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2462 MHz: Fundamental frequency.
- The emission levels of other frequencies were very low against the limit.

802.11n (HT40)

EUT Test Condition		Measurement Detail	
Channel	Channel 3	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Charles Hsiao

Antennal Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2386.86	50.87	49.16	54	-3.13	31.8	5.4	35.49	160	13	Average
2386.86	63.07	61.36	74	-10.93	31.8	5.4	35.49	160	13	Peak
2422	86.62	84.82			31.83	5.43	35.46	160	13	Average
2422	93.92	92.12			31.83	5.43	35.46	160	13	Peak
2487.48	41.59	39.6	54	-12.41	31.88	5.53	35.42	160	13	Average
2487.48	52.07	50.08	74	-21.93	31.88	5.53	35.42	160	13	Peak
4844	40.4	32.25	54	-13.6	33.97	8.26	34.08	124	226	Average
4844	44.76	36.61	74	-29.24	33.97	8.26	34.08	124	226	Peak
Antennal Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2387.4	52.99	51.28	54	-1.01	31.8	5.4	35.49	145	107	Average
2387.4	65.91	64.2	74	-8.09	31.8	5.4	35.49	145	107	Peak
2422	87.59	85.79			31.83	5.43	35.46	218	107	Average
2422	94.25	92.45			31.83	5.43	35.46	218	107	Peak
2485.28	42.2	40.21	54	-11.8	31.88	5.53	35.42	218	107	Average
2485.28	53.02	51.03	74	-20.98	31.88	5.53	35.42	218	107	Peak
4844	40.73	32.58	54	-13.27	33.97	8.26	34.08	115	165	Average
4844	43.75	35.6	74	-30.25	33.97	8.26	34.08	115	165	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 2422 MHz: Fundamental frequency.
- The emission levels of other frequencies were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 6	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Charles Hsiao

Antennal Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2386.86	47.68	45.97	54	-6.32	31.8	5.4	35.49	160	13	Average
2386.86	64.19	62.48	74	-9.81	31.8	5.4	35.49	160	13	Peak
2437	88.66	86.81			31.85	5.46	35.46	160	13	Average
2437	95.92	94.07			31.85	5.46	35.46	160	13	Peak
2484.12	45.14	43.18	54	-8.86	31.88	5.5	35.42	160	13	Average
2484.12	57.15	55.19	74	-16.85	31.88	5.5	35.42	160	13	Peak
4874	41.07	32.88	54	-12.93	33.98	8.27	34.06	143	323	Average
4874	43.7	35.51	74	-30.3	33.98	8.27	34.06	143	323	Peak
Antennal Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2389.56	50.92	49.21	54	-3.08	31.8	5.4	35.49	135	108	Average
2389.56	66	64.29	74	-8	31.8	5.4	35.49	135	108	Peak
2437	89.8	87.95			31.85	5.46	35.46	218	107	Average
2437	96.89	95.04			31.85	5.46	35.46	218	107	Peak
2484.04	48.39	46.43	54	-5.61	31.88	5.5	35.42	218	107	Average
2484.04	61.98	60.02	74	-12.02	31.88	5.5	35.42	218	107	Peak
4874	41.19	33	54	-12.81	33.98	8.27	34.06	104	204	Average
4874	44.54	36.35	74	-29.46	33.98	8.27	34.06	104	204	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
2. 2437 MHz: Fundamental frequency.
3. The emission levels of other frequencies were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 9	Frequency Range	1 GHz ~ 25 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Charles Hsiao

Antennal Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2386.41	42.15	40.44	54	-11.85	31.8	5.4	35.49	160	13	Average
2386.41	52.41	50.7	74	-21.59	31.8	5.4	35.49	160	13	Peak
2452	86.52	84.65			31.85	5.46	35.44	160	13	Average
2452	93.04	91.17			31.85	5.46	35.44	160	13	Peak
2486.36	47.05	45.06	54	-6.95	31.88	5.53	35.42	160	13	Average
2486.36	58.69	56.7	74	-15.31	31.88	5.53	35.42	160	13	Peak
4904	41	32.78	54	-13	33.98	8.28	34.04	154	7	Average
4904	46.04	37.82	74	-27.96	33.98	8.28	34.04	154	7	Peak
Antennal Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
2389.11	41.89	40.18	54	-12.11	31.8	5.4	35.49	218	107	Average
2389.11	53.02	51.31	74	-20.98	31.8	5.4	35.49	218	107	Peak
2452	87.48	85.61			31.85	5.46	35.44	218	107	Average
2452	94.33	92.46			31.85	5.46	35.44	218	107	Peak
2485.8	52.85	50.86	54	-1.15	31.88	5.53	35.42	218	91	Average
2485.8	66.38	64.39	74	-7.62	31.88	5.53	35.42	218	91	Peak
4904	41.45	33.23	54	-12.55	33.98	8.28	34.04	160	165	Average
4904	45.6	37.38	74	-28.4	33.98	8.28	34.04	160	165	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
2. 2452 MHz: Fundamental frequency.
3. The emission levels of other frequencies were very low against the limit.

9 kHz ~ 30 MHz Data:

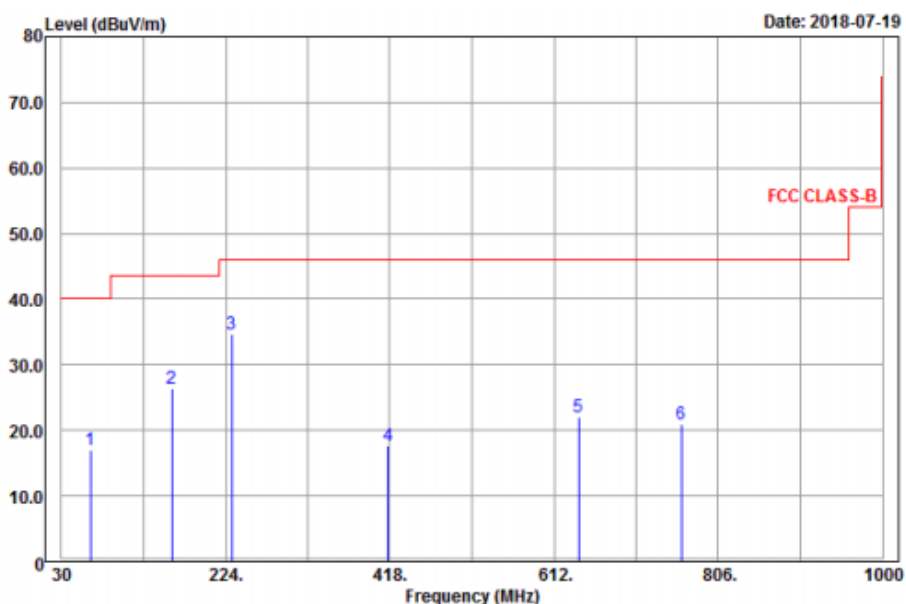
The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

30 MHz ~ 1 GHz Worst-Case Data:

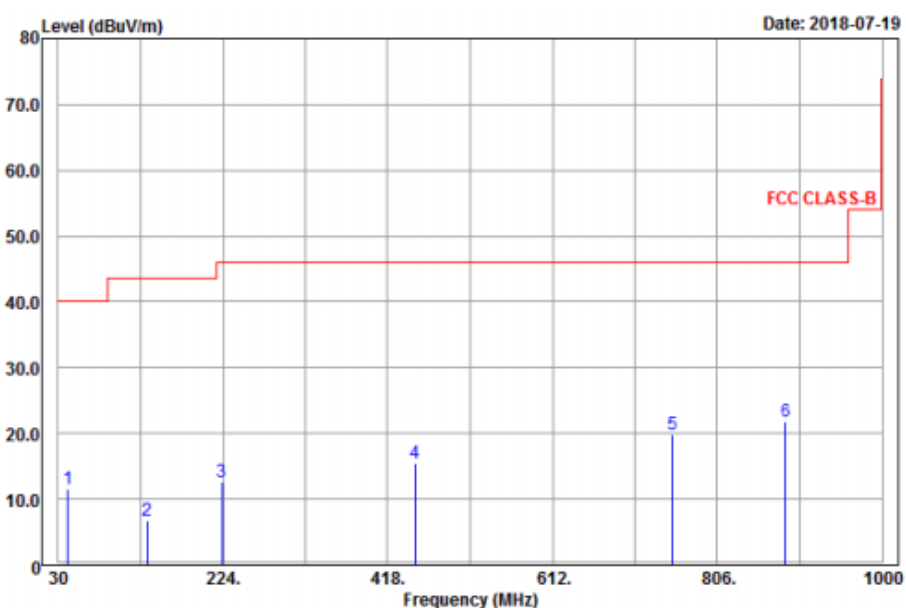
802.11n (HT20)

EUT Test Condition		Measurement Detail	
Channel	Channel 1	Frequency Range	30 MHz ~ 1 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Quasi-peak (QP)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Karl Lee

Horizontal



Vertical



Antennal Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
64.56	17.11	36.34	40	-22.89	12.09	0.9	32.22	135	201	Peak
160.41	26.46	48.46	43.5	-17.04	8.75	1.52	32.27	195	333	Peak
231.42	34.68	53.18	46	-11.32	11.82	1.85	32.17	167	151	Peak
416.2	17.68	32.29	46	-28.32	15.18	2.41	32.2	167	243	Peak
640.9	22.08	32.94	46	-23.92	18.31	2.99	32.16	133	24	Peak
762.7	20.89	29.85	46	-25.11	19.94	3.22	32.12	198	256	Peak
Antennal Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
41.34	11.65	29.35	40	-28.35	13.78	0.74	32.22	189	221	Peak
135.3	6.66	28.88	43.5	-36.84	8.65	1.38	32.25	175	161	Peak
222.51	12.57	31.71	46	-33.43	11.42	1.65	32.21	103	239	Peak
450.5	15.38	29.45	46	-30.62	15.58	2.49	32.14	145	265	Peak
753.6	19.9	28.97	46	-26.1	19.85	3.22	32.14	160	357	Peak
886.6	21.8	28.51	46	-24.2	21.37	3.49	31.57	152	216	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- The emission levels of other frequencies were very low against the limit.

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

4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

Frequency (MHz)	Conducted Limit (dBuV)	
	Quasi-Peak	Average
0.15 - 0.5	66 - 56	56 - 46
0.50 - 5.0	56	46
5.0 - 30.0	60	50

Note: 1. The lower limit shall apply at the transition frequencies.
2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.

4.2.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver ROHDE & SCHWARZ	ESCI	100613	Nov. 23, 2017	Nov. 22, 2018
RF signal cable (with 10dB PAD) Woken	5D-FB	Cable-cond1-01	Sep. 05, 2017	Sep. 04, 2018
LISN/AMN ROHDE & SCHWARZ (EUT)	ENV216	101826	Feb. 26, 2018	Feb. 25, 2019
LISN/AMN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Aug. 15, 2017	Aug. 14, 2018
Software ADT	BV ADT_Cond_ V7.3.7.4	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 HwaYa Shielded Room 1.
3. The VCCI Site Registration No. is C-2040.

4.2.3 Test Procedures

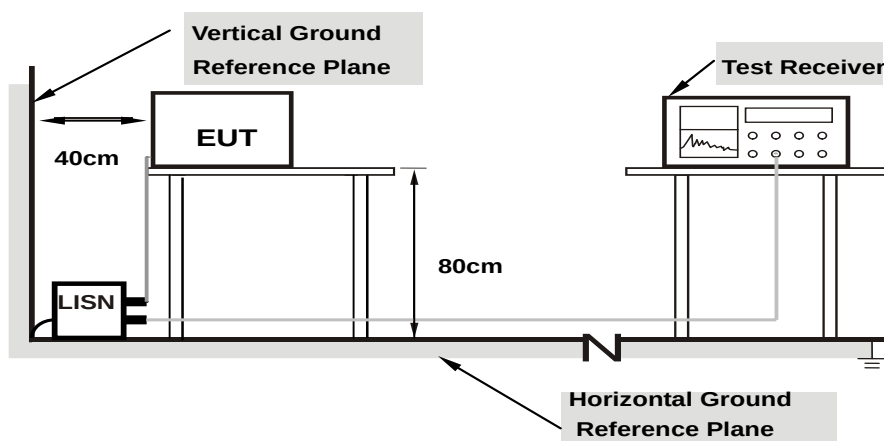
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/50 uH of coupling impedance for the measuring instrument.
- Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
- The frequency range from 150 kHz to 30 MHz was searched. Emission levels under (Limit – 20 dB) was not recorded.

Note: The resolution bandwidth and video bandwidth of test receiver is 9 kHz for quasi-peak detection (QP) and average detection (AV) at frequency 0.15 MHz – 30 MHz.

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



Note: 1.Support units were connected to second LISN.

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

4.2.6 EUT Operating Conditions

- Placed the EUT on a testing table.
- Use the software to control the EUT under transmission condition continuously at specific channel frequency.

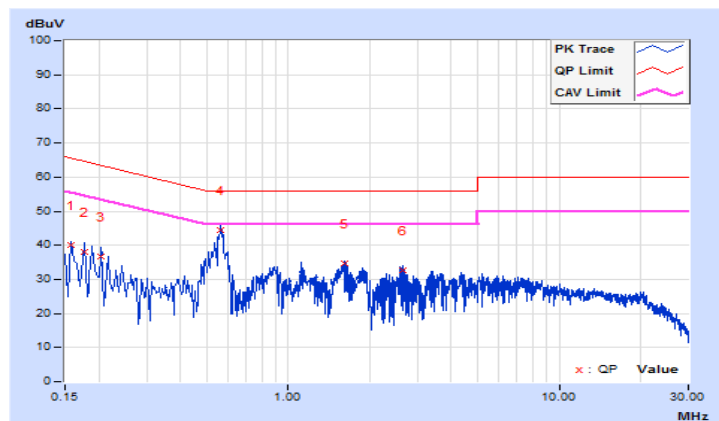
4.2.7 Test Results

Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25°C, 65%RH
Tested by	Jisyong Wang	Test Date	2018/7/19

Phase Of Power : Line (L)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15782	9.67	30.29	16.17	39.96	25.84	65.58	55.58	-25.62	-29.74
2	0.17698	9.67	28.53	14.35	38.20	24.02	64.63	54.63	-26.43	-30.61
3	0.20474	9.67	26.90	14.48	36.57	24.15	63.42	53.42	-26.85	-29.27
4	0.56418	9.67	34.64	20.73	44.31	30.40	56.00	46.00	-11.69	-15.60
5	1.62016	9.70	24.91	10.83	34.61	20.53	56.00	46.00	-21.39	-25.47
6	2.64849	9.73	22.80	9.81	32.53	19.54	56.00	46.00	-23.47	-26.46

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value

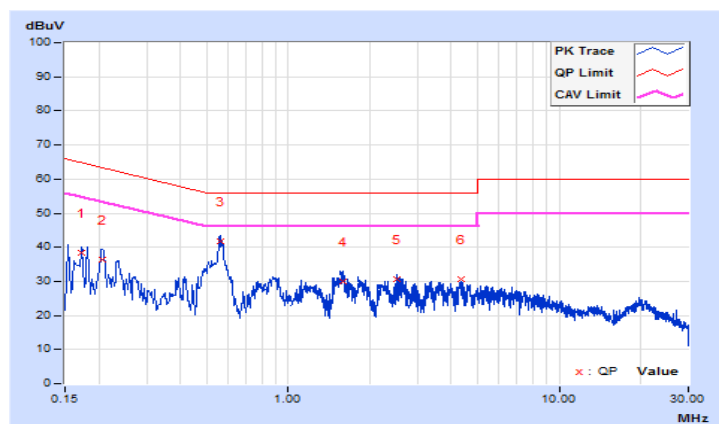


Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25°C, 65%RH
Tested by	Jisyong Wang	Test Date	2018/7/19

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.17346	9.68	28.61	15.72	38.29	25.40	64.79	54.79	-26.50	-29.39
2	0.20511	9.68	26.85	11.66	36.53	21.34	63.40	53.40	-26.87	-32.06
3	0.56446	9.68	32.04	19.61	41.72	29.29	56.00	46.00	-14.28	-16.71
4	1.58888	9.70	20.10	6.97	29.80	16.67	56.00	46.00	-26.20	-29.33
5	2.53119	9.72	20.86	6.41	30.58	16.13	56.00	46.00	-25.42	-29.87
6	4.35325	9.76	20.86	7.63	30.62	17.39	56.00	46.00	-25.38	-28.61

Remarks:

1. Q.P. and AV. are abbreviations of quasi-peak and average individually.
2. The emission levels of other frequencies were very low against the limit.
3. Margin value = Emission level – Limit value
4. Correction factor = Insertion loss + Cable loss
5. Emission Level = Correction Factor + Reading Value



5 Pictures of Test Arrangements

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

Appendix – Information on 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 according to ISO/IEC 17025.

If you have any comments, please feel free to contact us at the following:

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Web Site: www.bureauveritas-adt.com

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

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