Partial FCC Test Report

Report No.:	RF180907C24C-2
FCC ID:	QYL9260NG
Model:	V110, V110G5
Received Date:	Apr. 30, 2019
Test Date:	Jun. 03 ~ Jun. 09, 2019
Issued Date:	Jul. 10, 2019
Applicant:	Getac Technology Corporation.
Address:	5F., Building A, No. 209, Sec.1, Nangang Rd.,Nangang Dist., Taipei City 11568, Taiwan, R.O.C.
Issued By:	Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
Lab Address:	No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan (R.O.C)
Test Location (1):	No.19, Hwa Ya 2nd Rd., Wen Hwa Vil., Kwei Shan Dist., Taoyuan City 33383, Taiwan, R.O.C.
Test Location (2):	B2F., No.215, Sec. 3, Beixin Rd., Xindian Dist., New Taipei City 231, Taiwan, R.O.C
FCC Registration / Designation Number:	788550 / TW0003 427177 / TW0011

Testing Laboratory
2021

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Release Control Record

Issue No.	Description	Date Issued
RF180907C24C-2	Original Release	Jul. 10, 2019

1 Certificate of Conformity

Product:	Notebook
Brand:	Getac
Test Model:	V110, V110G5
Sample Status:	Engineering Sample
Applicant:	Getac Technology Corporation.
Test Date:	Jun. 03 ~ Jun. 09, 2019
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 : Lena Wang , **Date:** Jul. 10, 2019

Lena Wang / Specialist

Approved by : , **Date:** Jul. 10, 2019

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 -17.98 dB at 0.39242 MHz.
15.205 / 15.209 / 15.247(d)	Radiated Emissions and Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -1.16 dB at 2483.72 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	Pass	Meet the requirement of limit.
15.247(e)	Power Spectral Density	N/A	Refer to Note
15.203	Antenna Requirement	N/A	Refer to Note

Note:
1. Only test item of Radiated Emissions test, Conducted Emission tests and Conducted power were performed for this report. For other test data, please refer to Intel Report No.: 170524-01.TR04 for module (Brand: Intel, Model: 9260NGW).
2. 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) (±)**
Conducted Emissions at mains ports	150 kHz ~ 30 MHz	2.94 dB
Radiated Emissions up to 1 GHz	9 kHz ~ 30 MHz	3.04 dB
	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	Notebook
Brand	Getac
Model	V110, V110G5
Model Difference	Refer to Note
Status of EUT	Engineering Sample
Power Supply Rating	19 Vdc (adapter) 11.1 Vdc (Li-ion battery)
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 ~ 2472 MHz
Number of Channel	13 for 802.11b, 802.11g, 802.11n (HT20) 9 for 802.11n (HT40)
Antenna Type	PIFA antenna with 2.52 dBi gain
Antenna Connector	N/A
Accessory Device	Refer to Note as below
Cable Supplied	Refer to Note as below

Note:

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

Modulation Mode	Tx Function
802.11b	1TX
802.11g	1TX
802.11n (HT20)	2TX
802.11n (HT40)	2TX

2. All models are listed as below.

Brand	Model	Difference
Getac	V110	All models are electrically identical, different model names are for marketing purpose.
	V110G5	

3. The EUT contains following accessory devices.

Product	Brand	Model	Description
Adapter	FSP	FSP065-RBBN3	I/P: 100-240 Vac, 50-60 Hz, 1.5 A O/P: 19 Vdc, 3.42 A 1.7 m shielded cable with1 core
Battery	Getac Technology Corp.	BP3S1P2100-S	11.1 Vdc, 2100 mAh
LCD Panel 1	AUO	B116XAV05.0	11.6 inch
LCD Panel 2	New IPS KD	KD116N11-30NP-A9	11.6 inch
WLAN/BT Module	Intel	Intel 9260NGW	Support 2.4/ 5G
WWAN Module	Sierra Wireless, Inc.	EM7455	--
WWAN Module	Sierra Wireless, Inc.	EM7511	--
Digitizer	Microchip	PIC32MX270	--
GPS	GlobalSat	MC1010	--

4. 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

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

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	8	2447
2	2417	9	2452
3	2422	10	2457
4	2427	11	2462
5	2432	12	2467
6	2437	13	2472
7	2442		

11 channels are provided for 802.11n (HT40):

Channel	Frequency (MHz)	Channel	Frequency (MHz)
3	2422	9	2452
4	2427	10	2457
5	2432	11	2462
6	2437	12	2467
7	2442	13	2472
8	2447		

3.2.1 Test Mode Applicability and Tested Channel Detail

EUT Configure Mode	Applicable To				Description
	RE≥1G	RE<1G	PLC	APCM	
A	√	√	√	√	1TX
B	√	-	-	√	2TX

Where **RE≥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 (tablet mode) and NB mode. The worst case was found when positioned on NB mode.
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)
A	802.11b	1 to 13	1, 6, 11, 12, 13	DSSS	DBPSK	1.0
	802.11g	1 to 13	1, 6, 11, 12, 13	OFDM	BPSK	6.0
B	802.11n (HT20)	1 to 13	1, 6, 11, 12, 13	OFDM	BPSK	6.5
	802.11n (HT40)	3 to 11	3, 6, 9, 10, 11	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)
A	802.11g	1 to 13	6	OFDM	BPSK	6.0

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)
A	802.11g	1 to 13	6	OFDM	BPSK	6.0

Antenna Port Conducted Measurement:

☒ This item includes all test value of each mode, but only includes spectrum plot of worst value of each mode.
☒ 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)
A	802.11b	1 to 13	1, 6, 11, 12, 13	DSSS	DBPSK	1.0
A	802.11g	1 to 13	1, 6, 11, 12, 13	OFDM	BPSK	6.0
B	802.11n (HT20)	1 to 13	1, 6, 11, 12, 13	OFDM	BPSK	6.5
B	802.11n (HT40)	3 to 11	3, 6, 9, 10, 11	OFDM	BPSK	13.5

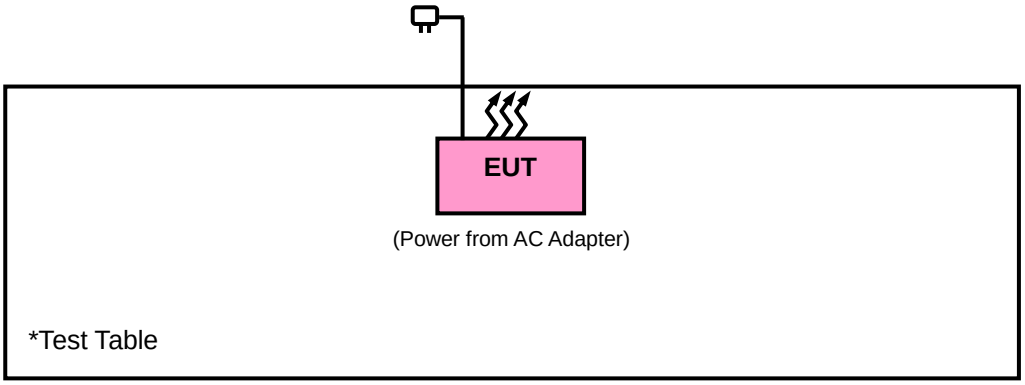
Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested by
RE≥1G	25 deg. C, 65 % RH	120 Vac, 60 Hz	Charles Hsiao, Harry Hsueh, Karl Lee
RE<1G	25 deg. C, 65 % RH	120 Vac, 60 Hz	Karl Lee
PLC	25 deg. C, 65 % RH	120 Vac, 60 Hz	Jisyong Wang
APCM	25 deg. C, 65 % RH	11.1 Vac	Jisyong 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 15.247 Meas Guidance v05r02
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	MY52260177	Aug. 20, 2018	Aug. 19, 2019
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
Loop Antenna	EM-6879	269	Sep. 07, 2018	Sep. 06, 2019
Preamplifier Agilent	310N	187226	Jun. 19, 2018	Jun. 18, 2019
Preamplifier Agilent	83017A	MY39501357	Jun. 19, 2018	Jun. 18, 2019
Preamplifier EMCI	EMC 184045	980116	Oct. 12, 2018	Oct. 11, 2019
Power Meter Anritsu	ML2495A	1232002	Dec. 17, 2018	Dec. 16, 2019
Power Sensor Anritsu	MA2411B	1207325	Dec. 17, 2018	Dec. 16, 2019
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
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 HsinTien Chamber 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:

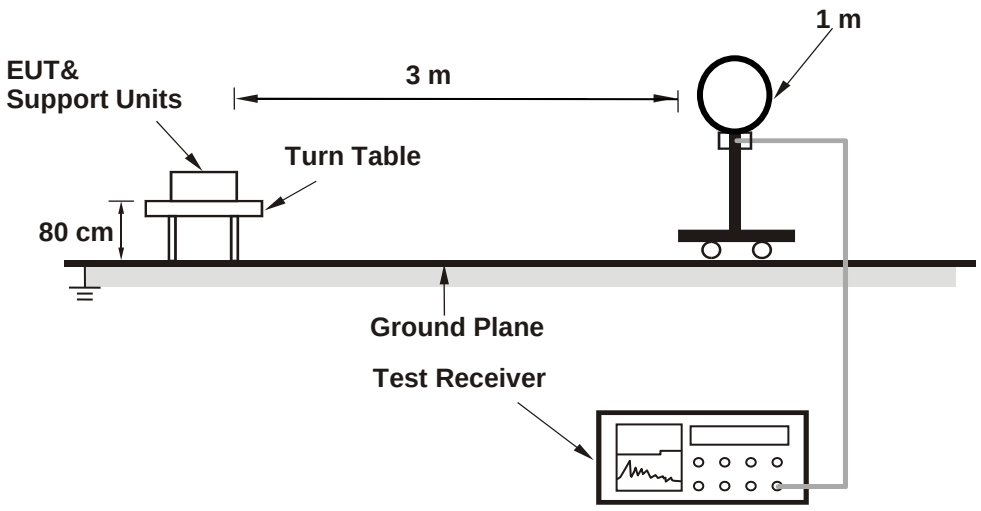
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection (QP) or Peak detection (PK) at frequency below 1 GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1 GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is ≥ 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 =10 Hz ; 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

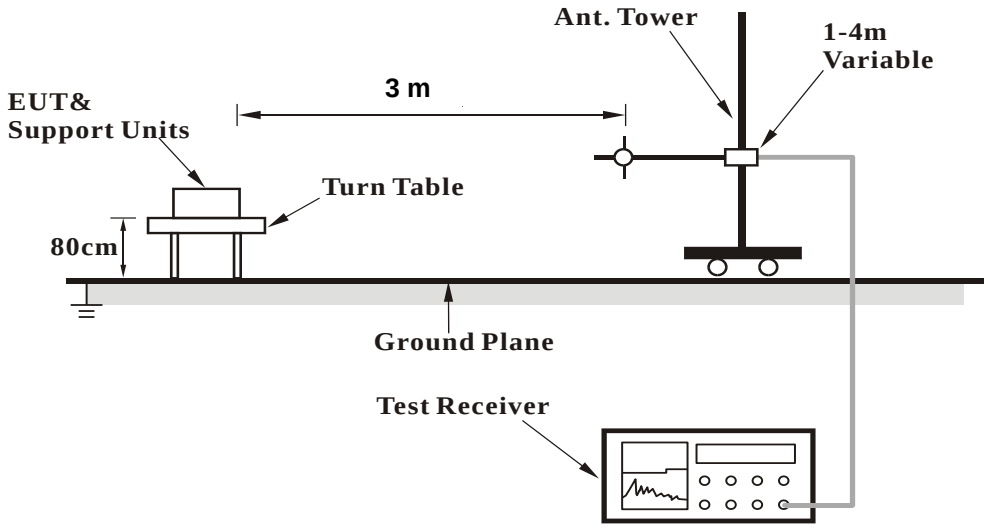
No deviation.

4.1.5 Test Set Up

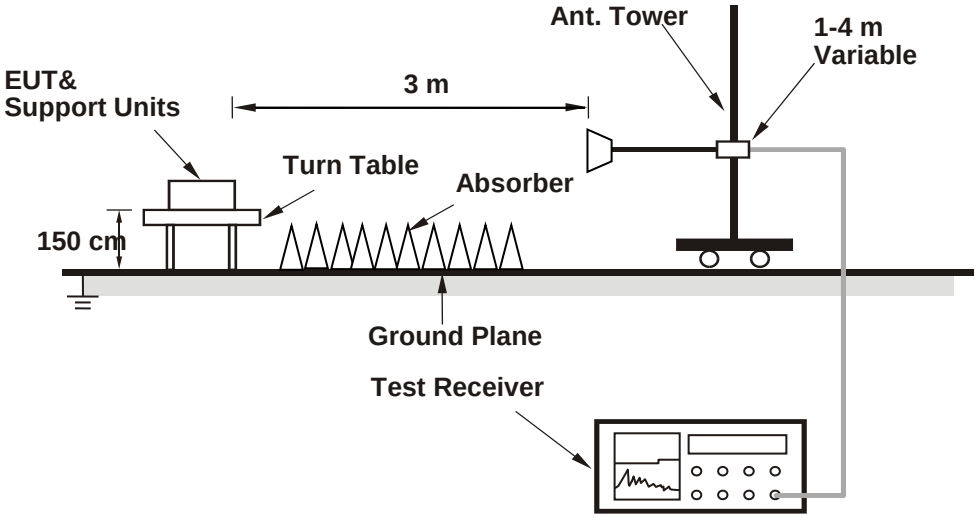
<Radiated Emission below 30 MHz>



<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

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

4.1.7 Test Results

Above 1 GHz Data：

Mode A

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

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**
2386.14	52.13	50.42	1.71	54	-1.87	147	239	Average
2386.14	62.76	61.05	1.71	74	-11.24	147	239	Peak
2412	101.52	99.75	1.77			147	239	Average
2412	104.99	103.22	1.77			147	239	Peak
4824	38.36	30.23	8.13	54	-15.64	141	27	Average
4824	48	39.87	8.13	74	-26	141	27	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**
2386.23	51.23	49.52	1.71	54	-2.77	186	360	Average
2386.23	61.89	60.18	1.71	74	-12.11	186	360	Peak
2412	99.58	97.81	1.77			186	360	Average
2412	102.55	100.78	1.77			186	360	Peak
4824	37.07	28.94	8.13	54	-16.93	157	111	Average
4824	46.56	38.43	8.13	74	-27.44	157	111	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 2412 MHz: Fundamental frequency.
3. 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

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**
2386.86	48.22	46.51	1.71	54	-5.78	176	298	Average
2386.86	54.85	53.14	1.71	74	-19.15	176	298	Peak
2437	103.57	101.72	1.85			176	298	Average
2437	106.55	104.7	1.85			176	298	Peak
2487.36	46.81	44.82	1.99	54	-7.19	176	298	Average
2487.36	55.33	53.34	1.99	74	-18.67	176	298	Peak
4874	37.15	28.96	8.19	54	-16.85	132	87	Average
4874	46.85	38.66	8.19	74	-27.15	132	87	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**
2386.86	45.41	43.7	1.71	54	-8.59	186	360	Average
2386.86	53.61	51.9	1.71	74	-20.39	186	360	Peak
2437	101.66	99.81	1.85			186	360	Average
2437	104.93	103.08	1.85			186	360	Peak
2487.28	45.91	43.92	1.99	54	-8.09	186	360	Average
2487.28	54.16	52.17	1.99	74	-19.84	186	360	Peak
4874	36.18	27.99	8.19	54	-17.82	160	191	Average
4874	45.67	37.48	8.19	74	-28.33	160	191	Peak

Remarks:

1. Emission Level = Read Level + 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

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**
2462	100.51	98.58	1.93			147	239	Average
2462	103.61	101.68	1.93			147	239	Peak
2487.88	52.28	50.27	2.01	54	-1.72	147	239	Average
2487.88	64.43	62.42	2.01	74	-9.57	147	239	Peak
4924	37.14	28.89	8.25	54	-16.86	138	226	Average
4924	46.85	38.6	8.25	74	-27.15	138	226	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**
2462	97.46	95.53	1.93			186	360	Average
2462	100.33	98.4	1.93			186	360	Peak
2487.76	50.42	48.41	2.01	54	-3.58	186	360	Average
2487.76	64.32	62.31	2.01	74	-9.68	186	360	Peak
4924	36.28	28.03	8.25	54	-17.72	100	138	Average
4924	45.86	37.61	8.25	74	-28.14	100	138	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 2462 MHz: Fundamental frequency.
3. The emission levels of other frequencies were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 12	**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

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**
2467	98.59	96.64	1.95			147	304	Average
2467	101.4	99.45	1.95			147	304	Peak
2492.84	51.7	49.68	2.02	54	-2.3	147	304	Average
2492.84	66.88	64.86	2.02	74	-7.12	147	304	Peak
4934	36.17	27.91	8.26	54	-17.83	190	124	Average
4934	45.69	37.43	8.26	74	-28.31	190	124	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**
2467	96.19	94.24	1.95			186	360	Average
2467	99.41	97.46	1.95			186	360	Peak
2492.8	51.97	49.95	2.02	54	-2.03	186	360	Average
2492.8	66.28	64.26	2.02	74	-7.72	186	360	Peak
4934	36.68	28.42	8.26	54	-17.32	183	231	Average
4934	46.2	37.94	8.26	74	-27.8	183	231	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 2467 MHz: Fundamental frequency.
3. The emission levels of other frequencies were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 13	**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

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**
2472	98.37	96.41	1.96			147	304	Average
2472	101.27	99.31	1.96			147	304	Peak
2489.4	50.03	48.02	2.01	54	-3.97	147	304	Average
2489.4	70.01	68	2.01	74	-3.99	147	304	Peak
4944	36.31	28.04	8.27	54	-17.69	122	315	Average
4944	45.73	37.46	8.27	74	-28.27	122	315	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**
2472	96.49	94.53	1.96			186	360	Average
2472	99.02	97.06	1.96			186	360	Peak
2489.4	50.49	48.48	2.01	54	-3.51	186	360	Average
2489.4	70.02	68.01	2.01	74	-3.98	186	360	Peak
4944	36.72	28.45	8.27	54	-17.28	127	109	Average
4944	46.2	37.93	8.27	74	-27.8	127	109	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 2472 MHz: Fundamental frequency.
3. 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

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**
2389.92	51.04	49.31	1.73	54	-2.96	147	239	Average
2389.92	64.82	63.09	1.73	74	-9.18	147	239	Peak
2412	98.57	96.8	1.77			147	239	Average
2412	105.54	103.77	1.77			147	239	Peak
4824	36.93	28.8	8.13	54	-17.07	167	125	Average
4824	46.52	38.39	8.13	74	-27.48	167	125	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**
2389.92	49.48	47.75	1.73	54	-4.52	186	360	Average
2389.92	64.89	63.16	1.73	74	-9.11	186	360	Peak
2412	95.66	93.89	1.77			186	360	Average
2412	102.7	100.93	1.77			186	360	Peak
4824	36.46	28.33	8.13	54	-17.54	126	112	Average
4824	46.02	37.89	8.13	74	-27.98	126	112	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 2412 MHz: Fundamental frequency.
3. 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

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**
2389.92	50.73	49	1.73	54	-3.27	176	298	Average
2389.92	63.47	61.74	1.73	74	-10.53	176	298	Peak
2437	101.09	99.24	1.85			176	298	Average
2437	108.19	106.34	1.85			176	298	Peak
2483.72	**52.84**	**50.88**	**1.96**	**54**	**-1.16**	**176**	**298**	**Average**
2483.72	65.37	63.41	1.96	74	-8.63	176	298	Peak
4874	36.43	28.24	8.19	54	-17.57	187	164	Average
4874	46	37.81	8.19	74	-28	187	164	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**
2389.92	48.48	46.75	1.73	54	-5.52	186	360	Average
2389.92	61.79	60.06	1.73	74	-12.21	186	360	Peak
2437	98.77	96.92	1.85			186	360	Average
2437	105.33	103.48	1.85			186	360	Peak
2483.52	51.25	49.29	1.96	54	-2.75	186	360	Average
2483.52	65.2	63.24	1.96	74	-8.8	186	360	Peak
4874	37.15	28.96	8.19	54	-16.85	153	296	Average
4874	46.62	38.43	8.19	74	-27.38	153	296	Peak

Remarks:

1. Emission Level = Read Level + 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

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**
2462	96.76	94.83	1.93			176	298	Average
2462	103.35	101.42	1.93			176	298	Peak
2483.6	50.15	48.19	1.96	54	-3.85	176	298	Average
2483.6	63.77	61.81	1.96	74	-10.23	176	298	Peak
4924	36.37	28.12	8.25	54	-17.63	133	269	Average
4924	45.91	37.66	8.25	74	-28.09	133	269	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**
2462	93.79	91.86	1.93			186	360	Average
2462	100.68	98.75	1.93			186	360	Peak
2483.52	48.1	46.14	1.96	54	-5.9	186	360	Average
2483.52	62.4	60.44	1.96	74	-11.6	186	360	Peak
4924	36.87	28.62	8.25	54	-17.13	108	220	Average
4924	46.3	38.05	8.25	74	-27.7	108	220	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 2462 MHz: Fundamental frequency.
3. The emission levels of other frequencies were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 12	**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

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**
2467	95.48	93.53	1.95			176	298	Average
2467	102.47	100.52	1.95			176	298	Peak
2483.52	51.38	49.42	1.96	54	-2.62	176	298	Average
2483.52	65.19	63.23	1.96	74	-8.81	176	298	Peak
4934	38.03	29.77	8.26	54	-15.97	177	161	Average
4934	47.57	39.31	8.26	74	-26.43	177	161	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**
2467	92.57	90.62	1.95			186	360	Average
2467	99.4	97.45	1.95			186	360	Peak
2483.52	50.44	48.48	1.96	54	-3.56	186	360	Average
2483.52	64.14	62.18	1.96	74	-9.86	186	360	Peak
4934	36.68	28.42	8.26	54	-17.32	118	39	Average
4934	46.32	38.06	8.26	74	-27.68	118	39	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 2467 MHz: Fundamental frequency.
3. The emission levels of other frequencies were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 13	**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

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**
2472	78.55	76.59	1.96			176	298	Average
2472	85.32	83.36	1.96			176	298	Peak
2483.52	49.24	47.28	1.96	54	-4.76	176	298	Average
2483.52	61.94	59.98	1.96	74	-12.06	176	298	Peak
4944	37.54	29.27	8.27	54	-16.46	150	37	Average
4944	47.06	38.79	8.27	74	-26.94	150	37	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**
2472	75.14	73.18	1.96			186	360	Average
2472	82.2	80.24	1.96			186	360	Peak
2483.56	48.16	46.2	1.96	54	-5.84	186	360	Average
2483.56	60.67	58.71	1.96	74	-13.33	186	360	Peak
4944	36.27	28	8.27	54	-17.73	150	238	Average
4944	45.68	37.41	8.27	74	-28.32	150	238	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 2472 MHz: Fundamental frequency.
3. The emission levels of other frequencies were very low against the limit.

Mode B

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**	Harry Hsueh

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**
2386.95	41.26	39.55	1.71	54	-12.74	221	7	Average
2386.95	52.37	50.66	1.71	74	-21.63	221	7	Peak
2412	94.1	92.33	1.77			221	7	Average
2412	101.85	100.08	1.77			221	7	Peak
4824	37.25	29.12	8.13	54	-16.75	155	209	Average
4824	46.76	38.63	8.13	74	-27.24	155	209	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**
2389.02	41.69	39.98	1.71	54	-12.31	180	1	Average
2389.02	52	50.29	1.71	74	-22	180	1	Peak
2412	94.64	92.87	1.77			180	1	Average
2412	102.4	100.63	1.77			180	1	Peak
4824	37.16	29.03	8.13	54	-16.84	131	52	Average
4824	46.79	38.66	8.13	74	-27.21	131	52	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 2412 MHz: Fundamental frequency.
3. 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**	Harry Hsueh

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**
2387.94	40.68	38.97	1.71	54	-13.32	221	7	Average
2387.94	52.91	51.2	1.71	74	-21.09	221	7	Peak
2437	93.88	92.03	1.85			221	7	Average
2437	101.79	99.94	1.85			221	7	Peak
2495.04	41.52	39.5	2.02	54	-12.48	221	7	Average
2495.04	52.95	50.93	2.02	74	-21.05	221	7	Peak
4874	37.04	28.85	8.19	54	-16.96	158	206	Average
4874	46.47	38.28	8.19	74	-27.53	158	206	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**
2388.93	40.93	39.22	1.71	54	-13.07	180	1	Average
2388.93	52.36	50.65	1.71	74	-21.64	180	1	Peak
2437	94.17	92.32	1.85			180	1	Average
2437	102.47	100.62	1.85			180	1	Peak
2488	41.33	39.32	2.01	54	-12.67	180	1	Average
2488	52.71	50.7	2.01	74	-21.29	180	1	Peak
4874	35.93	27.74	8.19	54	-18.07	134	107	Average
4874	45.68	37.49	8.19	74	-28.32	134	107	Peak

Remarks:

1. Emission Level = Read Level + 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**	Harry Hsueh

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**
2462	93.22	91.29	1.93			221	7	Average
2462	101.82	99.89	1.93			221	7	Peak
2487.88	41.7	39.69	2.01	54	-12.3	221	7	Average
2487.88	52.77	50.76	2.01	74	-21.23	221	7	Peak
4924	37.02	28.77	8.25	54	-16.98	164	108	Average
4924	46.46	38.21	8.25	74	-27.54	164	108	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**
2462	95.22	93.29	1.93			180	1	Average
2462	103.22	101.29	1.93			180	1	Peak
2484.08	41.69	39.73	1.96	54	-12.31	180	1	Average
2484.08	53.03	51.07	1.96	74	-20.97	180	1	Peak
4924	36.96	28.71	8.25	54	-17.04	134	121	Average
4924	46.68	38.43	8.25	74	-27.32	134	121	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 2462 MHz: Fundamental frequency.
3. The emission levels of other frequencies were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 12	**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**	Harry Hsueh

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**
2467	91.95	90	1.95			221	7	Average
2467	99.85	97.9	1.95			221	7	Peak
2483.52	44.68	42.72	1.96	54	-9.32	221	7	Average
2483.52	55.78	53.82	1.96	74	-18.22	221	7	Peak
4934	37.26	29	8.26	54	-16.74	160	329	Average
4934	46.73	38.47	8.26	74	-27.27	160	329	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**
2467	93.93	91.98	1.95			180	1	Average
2467	101.5	99.55	1.95			180	1	Peak
2483.52	45.28	43.32	1.96	54	-8.72	180	1	Average
2483.52	56.59	54.63	1.96	74	-17.41	180	1	Peak
4934	37.35	29.09	8.26	54	-16.65	126	207	Average
4934	46.96	38.7	8.26	74	-27.04	126	207	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 2467 MHz: Fundamental frequency.
3. The emission levels of other frequencies were very low against the limit.

EUT Test Condition		Measurement Detail	
Channel	Channel 13	**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**	Harry Hsueh

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**
2472	77.95	75.99	1.96			221	7	Average
2472	85.45	83.49	1.96			221	7	Peak
2483.52	49.33	47.37	1.96	54	-4.67	221	7	Average
2483.52	62.3	60.34	1.96	74	-11.7	221	7	Peak
4944	36.85	28.58	8.27	54	-17.15	121	54	Average
4944	46.46	38.19	8.27	74	-27.54	121	54	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**
2472	79.91	77.95	1.96			180	1	Average
2472	86.72	84.76	1.96			180	1	Peak
2483.52	52.04	50.08	1.96	54	-1.96	180	1	Average
2483.52	63.91	61.95	1.96	74	-10.09	180	1	Peak
4944	37.51	29.24	8.27	54	-16.49	163	238	Average
4944	46.68	38.41	8.27	74	-27.32	163	238	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 2472 MHz: Fundamental frequency.
3. 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**	Karl Lee

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**
2389.92	42.97	41.24	1.73	54	-11.03	221	2	Average
2389.92	52.12	50.39	1.73	74	-21.88	221	2	Peak
2422	90.61	88.81	1.8			221	2	Average
2422	98.69	96.89	1.8			221	2	Peak
2491.12	41.88	39.87	2.01	54	-12.12	221	2	Average
2491.12	52.22	50.21	2.01	74	-21.78	221	2	Peak
4844	37.21	29.06	8.15	54	-16.79	190	315	Average
4844	46.84	38.69	8.15	74	-27.16	190	315	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**
2389.92	44.45	42.72	1.73	54	-9.55	211	1	Average
2389.92	54.89	53.16	1.73	74	-19.11	211	1	Peak
2422	93.37	91.57	1.8			211	1	Average
2422	101.83	100.03	1.8			211	1	Peak
2491.68	42.17	40.16	2.01	54	-11.83	210	1	Average
2491.68	53.93	51.92	2.01	74	-20.07	210	1	Peak
4844	37.21	29.06	8.15	54	-16.79	178	124	Average
4844	46.63	38.48	8.15	74	-27.37	178	124	Peak

Remarks:

1. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
2. 2422 MHz: Fundamental frequency.
3. 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**	Karl Lee

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**
2389.74	43.8	42.09	1.71	54	-10.2	221	15	Average
2389.74	54.46	52.75	1.71	74	-19.54	221	15	Peak
2437	92.6	90.75	1.85			221	2	Average
2437	100.69	98.84	1.85			221	2	Peak
2483.88	42.45	40.49	1.96	54	-11.55	221	2	Average
2483.88	53.4	51.44	1.96	74	-20.6	221	2	Peak
4874	36.84	28.65	8.19	54	-17.16	142	31	Average
4874	46.47	38.28	8.19	74	-27.53	142	31	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**
2389.65	46.57	44.86	1.71	54	-7.43	204	167	Average
2389.65	56.31	54.6	1.71	74	-17.69	204	167	Peak
2437	95.81	93.96	1.85			224	1	Average
2437	103.66	101.81	1.85			224	1	Peak
2483.84	44.09	42.13	1.96	54	-9.91	260	7	Average
2483.84	55.05	53.09	1.96	74	-18.95	260	7	Peak
4874	36.13	27.94	8.19	54	-17.87	136	151	Average
4874	45.68	37.49	8.19	74	-28.32	136	151	Peak

Remarks:

1. Emission Level = Read Level + 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**	Karl Lee

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**
2371.29	41.25	39.59	1.66	54	-12.75	221	2	Average
2371.29	51.71	50.05	1.66	74	-22.29	221	2	Peak
2452	90.86	88.99	1.87			221	2	Average
2452	98.28	96.41	1.87			221	2	Peak
2483.88	43.11	41.15	1.96	54	-10.89	208	13	Average
2483.88	54.07	52.11	1.96	74	-19.93	208	13	Peak
4904	37.41	29.19	8.22	54	-16.59	180	261	Average
4904	46.73	38.51	8.22	74	-27.27	180	261	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**
2388.66	41.95	40.24	1.71	54	-12.05	224	1	Average
2388.66	52.55	50.84	1.71	74	-21.45	224	1	Peak
2452	94.66	92.79	1.87			224	1	Average
2452	102.28	100.41	1.87			224	1	Peak
2483.52	46.78	44.82	1.96	54	-7.22	214	12	Average
2483.52	57.08	55.12	1.96	74	-16.92	214	12	Peak
4904	37.13	28.91	8.22	54	-16.87	161	321	Average
4904	46.61	38.39	8.22	74	-27.39	161	321	Peak

Remarks:

1. Emission Level = Read Level + 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.

EUT Test Condition		Measurement Detail	
Channel	Channel 10	**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**	Karl Lee

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**
2388.66	41.68	39.97	1.71	54	-12.32	221	2	Average
2388.66	52.04	50.33	1.71	74	-21.96	221	2	Peak
2457	90.26	88.37	1.89			221	2	Average
2457	97.79	95.9	1.89			221	2	Peak
2484.12	47.75	45.79	1.96	54	-6.25	189	2	Average
2484.12	62.98	61.02	1.96	74	-11.02	189	2	Peak
4914	37.33	29.11	8.22	54	-16.67	109	315	Average
4914	46.88	38.66	8.22	74	-27.12	109	315	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**
2389.92	42.29	40.56	1.73	54	-11.71	224	0	Average
2389.92	53.44	51.71	1.73	74	-20.56	224	0	Peak
2457	92.56	90.67	1.89			224	0	Average
2457	101.29	99.4	1.89			224	0	Peak
2483.92	52.18	50.22	1.96	54	-1.82	224	0	Average
2483.92	66.77	64.81	1.96	74	-7.23	224	0	Peak
4914	37.56	29.34	8.22	54	-16.44	140	271	Average
4914	47.11	38.89	8.22	74	-26.89	140	271	Peak

Remarks:

4. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
5. 2457 MHz: Fundamental frequency.
6. 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**	Karl Lee

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**
2383.44	40.62	38.93	1.69	54	-13.38	221	2	Average
2383.44	52.12	50.43	1.69	74	-21.88	221	2	Peak
2462	81.67	79.74	1.93			221	2	Average
2462	89.93	88	1.93			221	2	Peak
2483.56	44.93	42.97	1.96	54	-9.07	196	2	Average
2483.56	59.07	57.11	1.96	74	-14.93	196	2	Peak
4924	37.21	28.96	8.25	54	-16.79	137	165	Average
4924	46.73	38.48	8.25	74	-27.27	137	165	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**
2372.91	40.73	39.07	1.66	54	-13.27	168	0	Average
2372.91	51.96	50.3	1.66	74	-22.04	168	0	Peak
2462	85.21	83.28	1.93			224	0	Average
2462	93.5	91.57	1.93			224	0	Peak
2483.52	52.01	50.05	1.96	54	-1.99	168	0	Average
2483.52	66.41	64.45	1.96	74	-7.59	168	0	Peak
4924	37.45	29.2	8.25	54	-16.55	186	332	Average
4924	46.96	38.71	8.25	74	-27.04	186	332	Peak

Remarks:

7. Emission Level = Read Level + Factor
   Margin value = Emission level – Limit value
8. 2462 MHz: Fundamental frequency.
9. The emission levels of other frequencies were very low against the limit.

9 kHz ~ 30 MHz Data:

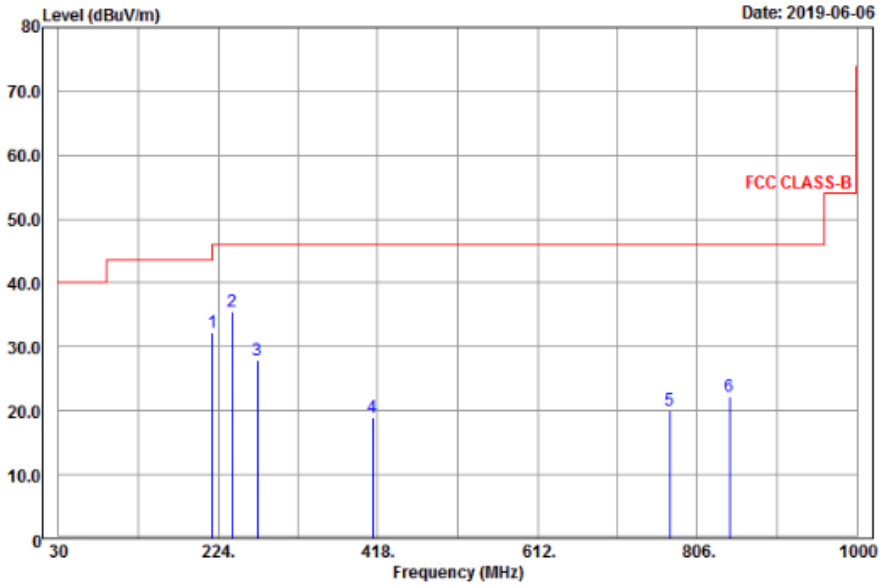
The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

30 MHz ~ 1 GHz Worst-Case Data:

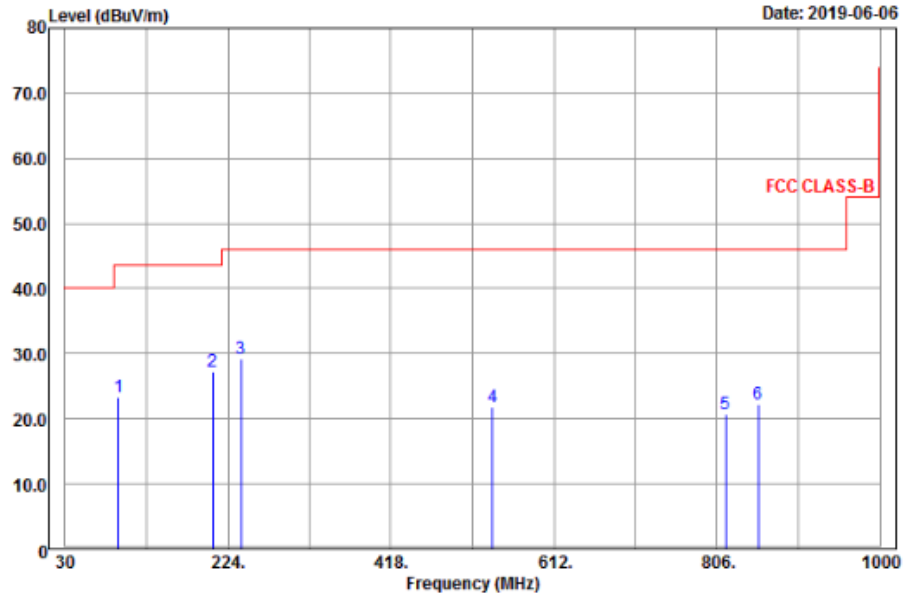
802.11g

EUT Test Condition		Measurement Detail	
Channel	Channel 6	**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



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**
217.11	32.17	51.46	-19.29	46	-13.83	111	145	Peak
240.87	35.5	53.68	-18.18	46	-10.5	163	326	Peak
271.65	27.85	45.37	-17.52	46	-18.15	185	5	Peak
412	18.86	33.51	-14.65	46	-27.14	187	112	Peak
772.5	20.16	28.95	-8.79	46	-25.84	164	200	Peak
845.3	22.16	29.63	-7.47	46	-23.84	154	45	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**
93.45	23.23	42.84	-19.61	43.5	-20.27	111	132	Peak
205.77	27.36	46.86	-19.5	43.5	-16.14	187	9	Peak
239.79	29.22	47.43	-18.21	46	-16.78	105	25	Peak
539.4	21.86	34.41	-12.55	46	-24.14	187	8	Peak
816.6	20.63	28.69	-8.06	46	-25.37	154	206	Peak
855.1	22.28	29.5	-7.22	46	-23.72	155	56	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.

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	Dec. 10, 2018	Dec. 09, 2019
RF signal cable Woken	5D-FB	Cable-cond1-01	Sep. 05, 2018	Sep. 04, 2019
LISN ROHDE & SCHWARZ (EUT)	ENV216	101826	Feb. 21, 2019	Feb. 20, 2020
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Aug. 19, 2018	Aug. 18, 2019
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-12040.

4.2.3 Test Procedures

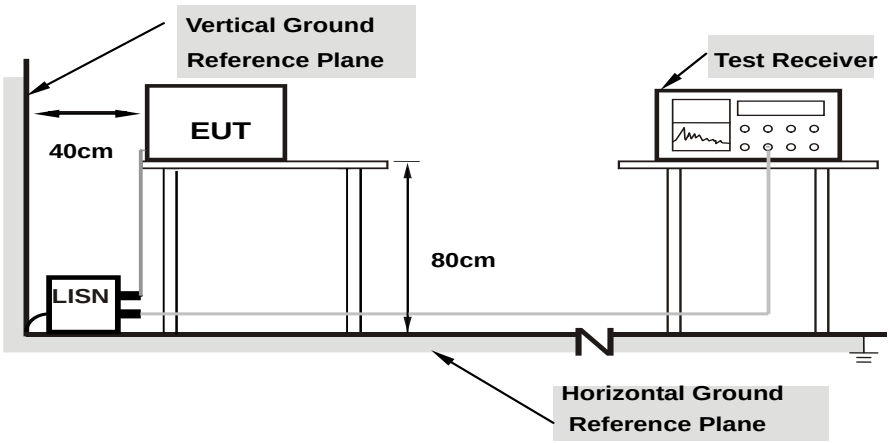
a. The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/50 uH of coupling impedance for the measuring instrument.
b. Both lines of the power mains connected to the EUT were checked for maximum conducted interference.
c. 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

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

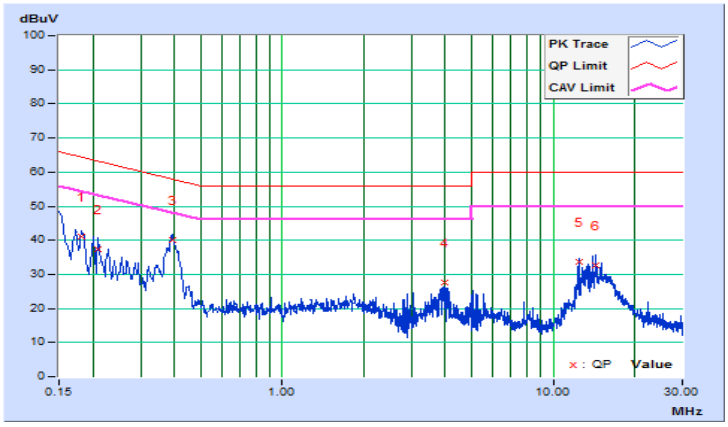
4.2.7 Test Results

Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25℃, 65%RH
Tested by	Jisyong Wang	Test Date	2019/6/9

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	0.18122	9.68	31.48	10.87	41.16	20.55	64.43	54.43	-23.27	-33.88
2	0.20865	9.68	27.64	10.26	37.32	19.94	63.26	53.26	-25.94	-33.32
3	**0.39242**	**9.68**	**30.35**	**10.79**	**40.03**	**20.47**	**58.01**	**48.01**	**-17.98**	**-27.54**
4	3.97007	9.75	17.77	4.03	27.52	13.78	56.00	46.00	-28.48	-32.22
5	12.41958	9.89	23.94	4.95	33.83	14.84	60.00	50.00	-26.17	-35.16
6	14.32375	9.90	22.61	8.97	32.51	18.87	60.00	50.00	-27.49	-31.13

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

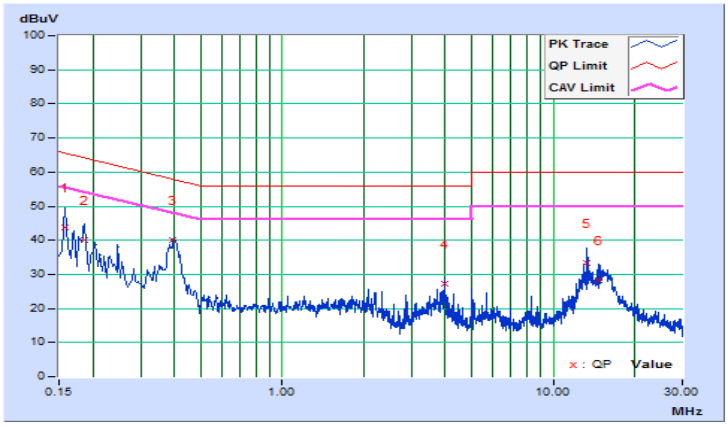


Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25℃, 65%RH
Tested by	Jisyong Wang	Test Date	2019/6/9

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	0.15782	9.66	34.12	15.35	43.78	25.01	65.58	55.58	-21.80	-30.57
2	0.18519	9.66	30.30	13.89	39.96	23.55	64.25	54.25	-24.29	-30.70
3	0.39635	9.65	30.28	15.98	39.93	25.63	57.93	47.93	-18.00	-22.30
4	3.97789	9.72	17.46	2.95	27.18	12.67	56.00	46.00	-28.82	-33.33
5	13.37362	9.90	23.50	5.96	33.40	15.86	60.00	50.00	-26.60	-34.14
6	14.79686	9.93	18.44	4.18	28.37	14.11	60.00	50.00	-31.63	-35.89

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



4.3 Conducted Output Power Measurement

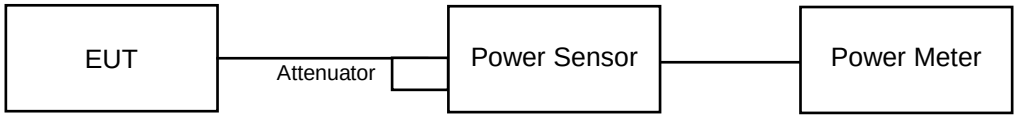
4.3.1 Limits of Conducted Output Power Measurement

For systems using digital modulation in the 2400–2483.5 MHz bands: 1 Watt (30 dBm)
Per KDB 662911 D01 Multiple Transmitter Output Method of conducted output power measurement on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for NANT ≤ 4;
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any NANT;
Array Gain = 5 log(NANT/NSS) dB or 3 dB, whichever is less for 20 MHz channel widths with NANT ≥ 5.

For power measurements on all other devices: Array Gain = 10 log(NANT/NSS) dB.

4.3.2 Test Setup



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 Test Procedures

A peak power sensor was used on the output port of the EUT. A power meter was used to read the response of the peak power sensor. Record the power level.

4.3.5 Deviation from Test Standard

No deviation.

4.3.6 EUT Operating Conditions

The software provided by client to enable the EUT under transmission condition continuously at lowest, middle and highest channel frequencies individually.

4.3.7 Test Results

802.11b

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	104.72	20.19	30	Pass
6	2437	117.01	22.48	30	Pass
11	2462	104.72	20.19	30	Pass
12	2467	68.70	18.37	30	Pass
13	2472	61.37	17.88	30	Pass

802.11g

Channel	Frequency (MHz)	Peak Power (mW)	Peak Power (dBm)	Limit (dBm)	Pass / Fail
1	2412	144.21	21.59	30	Pass
6	2437	252.34	24.02	30	Pass
11	2462	149.27	21.74	30	Pass
12	2467	91.83	19.63	30	Pass
13	2472	1.96	2.94	30	Pass

802.11n (HT20)

Channel	Frequency (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	22.25	22.44	137.73	25.36	30	Pass
6	2437	22.91	23.34	176.65	26.14	30	Pass
11	2462	22.92	23.14	162.21	26.04	30	Pass
12	2467	20.77	20.90	88.74	23.85	30	Pass
13	2472	-0.05	-0.31	0.59	2.83	30	Pass

802.11n (HT40)

Channel	Frequency (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	20.33	20.62	77.27	23.49	30	Pass
6	2437	23.05	23.34	177.34	26.21	30	Pass
9	2452	22.23	21.91	30.78	25.08	30	Pass
10	2457	18.72	19.19	43.14	21.97	30	Pass
11	2462	10.72	11.57	4.00	13.95	30	Pass

5 Pictures of Test Arrangements

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

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 according to ISO/IEC 17025.

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

Lin Kou EMC/RF Lab
Tel: 886-2-26052180
Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab
Tel: 886-3-6668565
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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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