

Partial FCC Test Report

Report No.: RF191205C07-2

FCC ID: J9C-QCNFA524

Test Model: QCNFA524

Received Date: Dec. 31, 2019

Test Date: Jan. 18 ~ Feb. 26, 2020

Issued Date: Mar. 05, 2020

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Issued By: Bureau Veritas Consumer Products Services (H.K.) Ltd., Taoyuan Branch
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FCC Registration / 788550 / TW0003

Designation Number: 427177 / TW0011



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Release Control Record

Issue No.	Description	Date Issued
RF191205C07-2	Original Release	Mar. 05, 2020

1 Certificate of Conformity

Product: Wi-Fi 6 + BT 5.1 M.2 1216 Module

Brand: Qualcomm

Test Model: QCNFA524

Sample Status: Engineering Sample

Applicant: Qualcomm Technologies, Inc.

Test Date: Jan. 18 ~ Feb. 26, 2020

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: Mar. 05, 2020
Lena Wang / Specialist

Approved by : Dylan Chiou , Date: Mar. 05, 2020
Dylan Chiou / Senior 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 -5.15 dB at 0.15000 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 2389.02 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. This is a partial report. Only test item of AC Power Conducted Emission, Maximum Peak Output Power and Radiated Emissions tests were performed for this report. Other testing data please refer to BV CPS report no.: RF190716E01-6 for module (Brand: Qualcomm, Model: QCNFA524)
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	2.79 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	Wi-Fi 6 + BT 5.1 M.2 1216 Module
Brand	Qualcomm
Test Model	QCNFA524
Status of EUT	Engineering Sample
Power Supply Rating	3.3 Vdc (host equipment)
Modulation Type	CCK, DQPSK, DBPSK for DSSS 256QAM, 64QAM, 16QAM, QPSK, BPSK for OFDM 1024QAM for OFDMA
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 Mbps 802.11ac: up to 866.7 Mbps 802.11ax: up to 1201.0 Mbps
Operating Frequency	2412 ~ 2472 MHz
Number of Channel	13 for 802.11b, 802.11g, 802.11n (HT20) , 802.11ac (VHT20), 802.11ax (HE20) 9 for 802.11n (HT40) , 802.11ac (VHT40), 802.11ax (HE40)
Output Power	620.869 mW
Antenna Type	Refer to Note as below
Antenna Connector	N/A
Accessory Device	Refer to Note as below
Data Cable Supplied	Refer to Note as below

Note:

- The EUT is authorized for use in specific End-product. Please refer to below table for further details.

Product Name	Brand Name	Model	Description
Portable Computer	DELL	P91F	--

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

Modulation Mode	Tx Function
802.11b	2TX
802.11g	2TX
802.11n (HT20)	2TX
802.11n (HT40)	2TX
802.11ac (HT20)	2TX
802.11ac (HT40)	2TX
802.11ax (HE20)	2TX
802.11ax (HE40)	2TX

* The modulation and bandwidth are similar for 802.11n mode for HT20 / HT40 and 802.11ac mode for VHT20 / VHT40 / VHT80 and 802.11ax mode for HE20 / HE40 / HE80, therefore investigated worst case to representative mode in test report. (Final test mode refer section 3.2.1)

3. The antenna information is listed as below.

Color White	Antenna Type	Antenna Mode	Manufacturer	Parts Number	Antenna Gain (dBi)			
					BT / WLAN 2.4 GHz	WLAN 5.15~5.35 GHz	WLAN 5.47~5.72 5 GHz	WLAN 5.725~5.8 5 GHz
Black	Slot	0	Speedwire	Main Antenna: F.0G.FH-6101-004-00 (DC33002CW3L)	Main: -3.46 Aux.: -2.31	Main: 2.38 Aux.: -2.47	Main: 0.35 Aux.: -3.33	Main: -2.01 Aux.: -3.24
		1		Aux. Antenna: F.0G.FH-6101-003-00 (DC33002CW2L)	Main: -3.53 Aux.: -2.41	Main: 0.11 Aux.: -1.31	Main: -1.56 Aux.: -1.61	Main: -1.56 Aux.: -2.78
White	Slot	0	Speedwire	Main Antenna: F.0G.FH-6101-008-00 (DC33002CW7L)	Main: -2.78 Aux.: -1.56	Main: 2.77 Aux.: -1.86	Main: 1.32 Aux.: -2.68	Main: -1.36 Aux.: -2.68
		1		Aux. Antenna: F.0G.FH-6101-007-00 (DC33002CW6L)	Main: -2.97 Aux.: -1.88	Main: 0.96 Aux.: -0.70	Main: -0.61 Aux.: -0.97	Main: -0.61 Aux.: -1.95
Black	Slot	0	Wistron Neweb Corporation	Main Antenna: 81ELAS15.G34 (DC33002CV3L)	Main: -3.46 Aux.: -2.31	Main: 2.38 Aux.: -2.47	Main: 2.21 Aux.: -3.33	Main: -2.01 Aux.: -3.24
		1		Aux. Antenna: 81ELAS15.G33 (DC33002CV2L)	Main: -3.53 Aux.: -2.41	Main: 0.11 Aux.: -1.31	Main: -1.56 Aux.: -1.61	Main: -1.56 Aux.: -2.78
White	Slot	0	Wistron Neweb Corporation	Main Antenna: 81ELAS15.G69 (DC33002CV7L)	Main: -5.12 Aux.: -1.78	Main: -3.01 Aux.: 2.26	Main: -4.82 Aux.: -0.47	Main: -4.82 Aux.: -4.31
		1		Aux. Antenna: 81ELAS15.G70 (DC33002CV6L)	Main: -2.47 Aux.: -1.69	Main: -0.61 Aux.: 0.91	Main: -4.87 Aux.: -2.96	Main: -5.17 Aux.: -5.07

4. The End-product contains following accessory devices.

Product	Brand	Model	Description
Adapter	DELL	HA130PM170	I/P: 100-240Vac, 50-60Hz, 1.8A O/P: 20Vdc, 6.5A or 5Vdc, 1A
Battery 1	DELL	8FCTC	11.4Vdc, 4650mAh, 56Wh
Battery 2	DELL	69KF2	11.4Vdc, 7167mAh, 86Wh

5. 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		

9 channels are provided for 802.11n (HT40):

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

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: "-" 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 13	1, 11, 12, 13	DSSS	DBPSK	1.0
-	802.11g	1 to 13	1, 2, 6, 11, 12, 13	OFDM	BPSK	6.0
-	802.11n (HT20)	1 to 13	1, 2, 6, 11, 12, 13	OFDM	BPSK	6.5
-	802.11n (HT40)	3 to 9	3, 4, 6, 9, 10, 11	OFDM	BPSK	13.5
-	802.11ax (HE20)	1 to 13	1, 2, 6, 11, 12, 13		BPSK	6.5
-	802.11ax (HE40)	3 to 9	3, 4, 6, 9, 10, 11		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)
-	802.11ax (HE40)	1 to 13	3	OFDM	BPSK	13.5

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)
-	802.11ax (HE40)	1 to 13	3	OFDM	BPSK	13.5

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)
-	802.11b	1 to 13	1, 6, 11, 12, 13	DSSS	DBPSK	1.0
-	802.11g	1 to 13	1, 2, 6, 10, 11, 12, 13	OFDM	BPSK	6.0
-	802.11n (HT20)	1 to 13	1, 2, 6, 10, 11, 12, 13	OFDM	BPSK	6.5
-	802.11n (HT40)	3 to 9	3, 4, 6, 8, 9, 10, 11	OFDM	BPSK	13.5
	802.11ax (HE20)	1 to 13	1, 2, 6, 10, 11, 12, 13	OFDMA	BPSK	6.5
	802.11ax (HE40)	3 to 9	3, 4, 6, 8, 9, 10, 11	OFDMA	BPSK	13.5

Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested by
RE $\geq$ 1G	25 deg. C, 65 % RH	120 Vac, 60 Hz	Charles 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	Jones Chang
APCM	25 deg. C, 65 % RH	11.4 Vdc	Wayne Lin

3.3 Description of Support Units

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

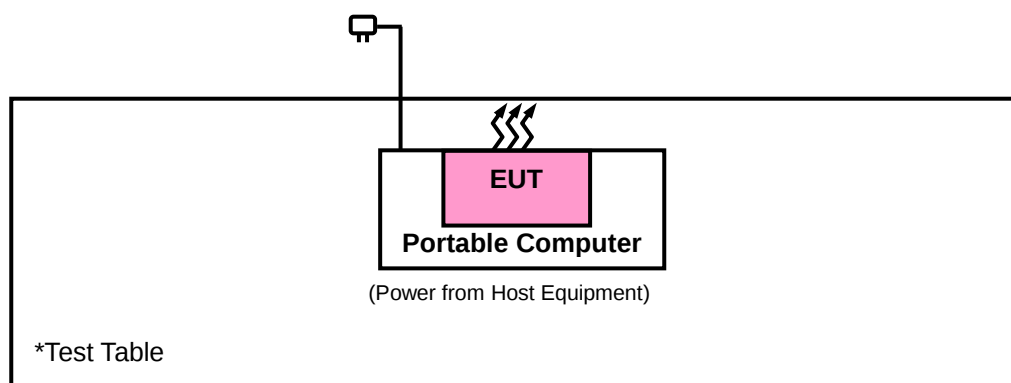
No.	Product	Brand	Model No.	Serial No.	FCC ID
1.	Adapter	DELL	HA130PM170	NA	NA
2.	Portable Computer	DELL	P91F	NA	FCC DoC Approved

No.	Signal Cable Description of The Above Support Units
1.	Type C cable: 0.85m

Note:

1. All power cords of the above support units are non-shielded (1.8m).
2. Item 1, 2 was provided by client

3.3.1 Configuration of System under Test



3.4 General Description of Applied Standards and References

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

Test Standard:

FCC Part 15, Subpart C (15.247)

ANSI C63.10-2013

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

References Test Guidance:

KDB 558074 D01 Meas Guidance v05r02

KDB 662911 D01 Multiple Transmitter Output v02r01

All test items have been performed as a reference to the above KDB test guidance.

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. 26, 2019	Aug. 25, 2020
HORN Antenna ETS-Lindgren	3117	00143293	Nov. 24, 2019	Nov. 23, 2020
BILOG Antenna SCHWARZBECK	VULB 9168	9168-616	Nov. 12, 2019	Nov. 11, 2020
HORN Antenna SCHWARZBECK	BBHA 9170	9170-480	Nov. 24, 2019	Nov. 23, 2020
Fixed Attenuator Mini-Circuits	MDCS18N-10	MDCS18N-10-01	Apr. 15, 2019	Apr. 14, 2020
Loop Antenna	EM-6879	269	Sep. 16, 2019	Sep. 15, 2020
Preamplifier Agilent	310N	187226	Jun. 18, 2019	Jun. 17, 2020
Preamplifier Agilent	83017A	MY39501357	Jun. 18, 2019	Jun. 17, 2020
Power Meter Anritsu	ML2495A	1012010	Sep. 04, 2019	Sep. 03, 2020
Power Meter Anritsu	MA2411B	1315050	Sep. 04, 2019	Sep. 03, 2020
RF signal cable ETS-LINDGREN	5D-FB	Cable-CH1-01(RFC-SMS-100-SMS-120+RFC-SMS-100-SMS-400)	Jun. 18, 2019	Jun. 17, 2020
RF signal cable ETS-LINDGREN	8D-FB	Cable-CH1-02(RFC-SMS-100-SMS-24)	Jun. 18, 2019	Jun. 17, 2020
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
Software BV ADT	E3 8.130425b	NA	NA	NA
Antenna Tower MF	NA	NA	NA	NA
Turn Table MF	NA	NA	NA	NA
Antenna Tower & Turn Table Controller MF	MF-7802	NA	NA	NA

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

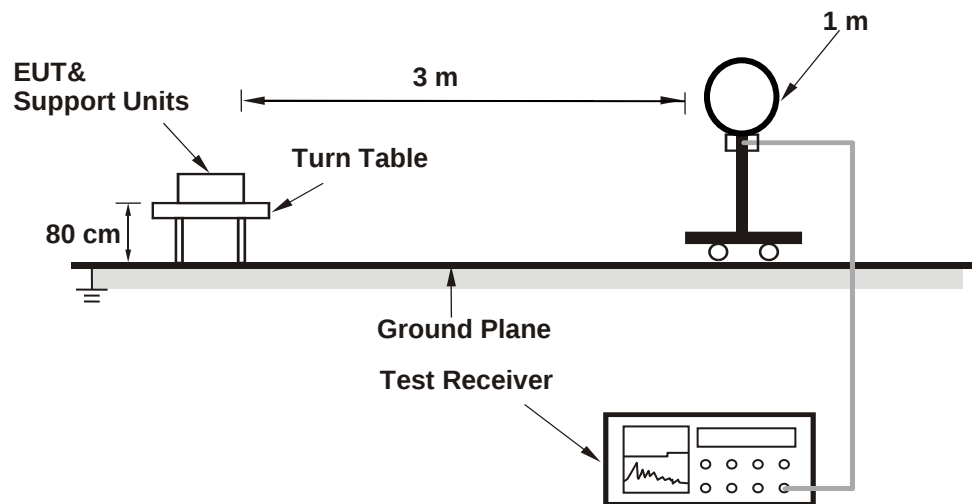
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection (QP) or Peak detection (PK) at frequency below 1 GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1 GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is $\geq 1/T$ (Duty cycle < 98 %) or 10 Hz (Duty cycle ≥ 98 %) for Average detection (AV) at frequency above 1 GHz.
(11b: RBW = 1 MHz, VBW = 1 Hz ; 11g: RBW = 1 MHz, VBW = 3 kHz ;
11n (HT20): RBW = 1 MHz, VBW = 1 kHz ; 11n (HT40): RBW = 1 MHz, VBW = 1 kHz; 11ax (HE20):
RBW = 1 MHz, VBW = 1 kHz ; 11ax (HE40): RBW = 1 MHz, VBW = 1 kHz)
4. All modes of operation were investigated and the worst-case emissions are reported.

4.1.4 Deviation from Test Standard

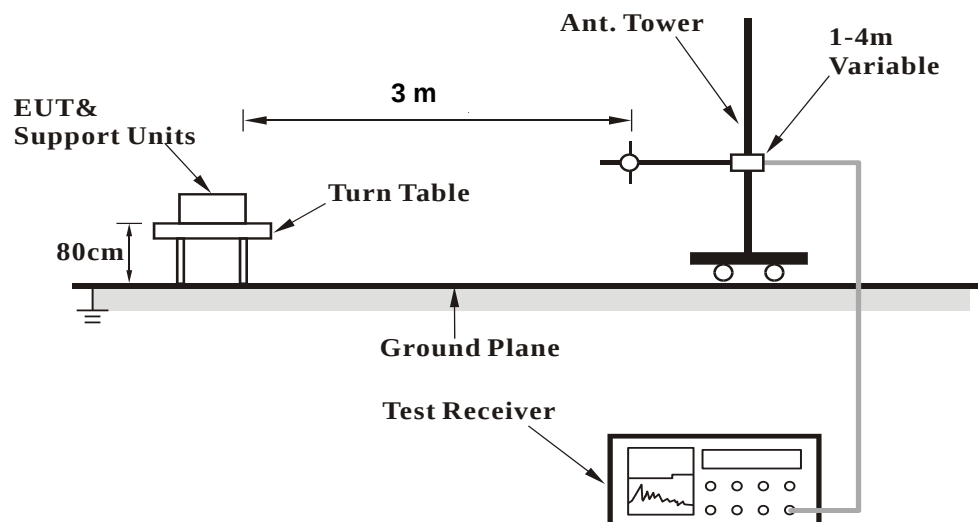
No deviation.

4.1.5 Test Set Up

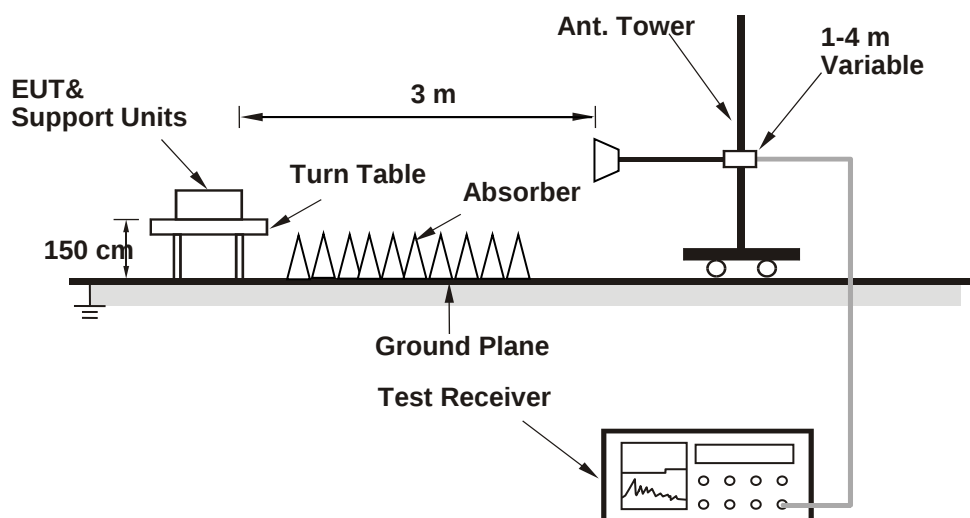
<Radiated Emission below 30 MHz>



<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 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
2361.93	40.04	35.62	4.42	54	-13.96	298	22	Average
2361.93	51.24	46.82	4.42	74	-22.76	298	22	Peak
2412	94.48	89.93	4.55			298	22	Average
2412	97.86	93.31	4.55			298	22	Peak
4824	41.78	31.49	10.29	54	-12.22	180	147	Average
4824	47.18	36.89	10.29	74	-26.82	180	147	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
2389.56	41.39	36.9	4.49	54	-12.61	242	285	Average
2389.56	51.76	47.27	4.49	74	-22.24	242	285	Peak
2412	102.54	97.99	4.55			242	285	Average
2412	105.15	100.6	4.55			242	285	Peak
4824	42.05	31.76	10.29	54	-11.95	124	205	Average
4824	48	37.71	10.29	74	-26	124	205	Peak

Remarks:

- Emission Level = Read Level + 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 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 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	94.65	90.03	4.62			298	307	Average
2462	97.29	92.67	4.62			298	307	Peak
2498.92	41.72	37.05	4.67	54	-12.28	298	307	Average
2498.92	52.68	48.01	4.67	74	-21.32	298	307	Peak
4924	41.76	31.51	10.25	54	-12.24	170	108	Average
4924	48.97	38.72	10.25	74	-25.03	170	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	102.59	97.97	4.62			242	285	Average
2462	105.2	100.58	4.62			242	285	Peak
2497	41.97	37.3	4.67	54	-12.03	242	285	Average
2497	52.18	47.51	4.67	74	-21.82	242	285	Peak
4924	41.82	31.57	10.25	54	-12.18	119	146	Average
4924	47.92	37.67	10.25	74	-26.08	119	146	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 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	93.55	88.92	4.63			298	307	Average
2467	96.52	91.89	4.63			298	307	Peak
2492.6	41.58	36.91	4.67	54	-12.42	298	307	Average
2492.6	51.42	46.75	4.67	74	-22.58	298	307	Peak
4934	41.86	31.6	10.26	54	-12.14	122	325	Average
4934	49.02	38.76	10.26	74	-24.98	122	325	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	101.48	96.85	4.63			242	285	Average
2467	104.75	100.12	4.63			242	285	Peak
2484.12	41.9	37.24	4.66	54	-12.1	242	285	Average
2484.12	51.98	47.32	4.66	74	-22.02	242	285	Peak
4934	41.83	31.57	10.26	54	-12.17	124	145	Average
4934	48.75	38.49	10.26	74	-25.25	124	145	Peak

Remarks:

- Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
- 2467 MHz: Fundamental frequency.
- 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 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	86.52	81.88	4.64			298	307	Average
2472	89.07	84.43	4.64			298	307	Peak
2495.16	41.59	36.92	4.67	54	-12.41	298	307	Average
2495.16	51.41	46.74	4.67	74	-22.59	298	307	Peak
4944	42.09	31.74	10.35	54	-11.91	158	8	Average
4944	48.54	38.19	10.35	74	-25.46	158	8	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	94.36	89.72	4.64			242	285	Average
2472	97.08	92.44	4.64			242	285	Peak
2483.56	41.69	37.03	4.66	54	-12.31	242	285	Average
2483.56	52.39	47.73	4.66	74	-21.61	242	285	Peak
4944	41.94	31.59	10.35	54	-12.06	135	256	Average
4944	49.39	39.04	10.35	74	-24.61	135	256	Peak

Remarks:

- Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
- 2472 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 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
2364.99	40.75	36.32	4.43	54	-13.25	298	22	Average
2364.99	51.26	46.83	4.43	74	-22.74	298	22	Peak
2412	88.54	83.99	4.55			298	22	Average
2412	95.72	91.17	4.55			298	22	Peak
4824	41.84	31.55	10.29	54	-12.16	156	307	Average
4824	49.89	39.6	10.29	74	-24.11	156	307	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	44.42	39.92	4.5	54	-9.58	242	285	Average
2389.92	59.14	54.64	4.5	74	-14.86	242	285	Peak
2412	96.65	92.1	4.55			242	285	Average
2412	103.11	98.56	4.55			242	285	Peak
4824	41.88	31.59	10.29	54	-12.12	154	174	Average
4824	48.16	37.87	10.29	74	-25.84	154	174	Peak

Remarks:

- Emission Level = Read Level + 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 2	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 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
2387.49	42.75	38.26	4.49	54	-11.25	298	22	Average
2387.49	53.19	48.7	4.49	74	-20.81	298	22	Peak
2417	91.55	87.01	4.54			298	22	Average
2417	98.24	93.7	4.54			298	22	Peak
4834	41.78	31.49	10.29	54	-12.22	120	24	Average
4834	48.28	37.99	10.29	74	-25.72	120	24	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
2388.39	48.19	43.7	4.49	54	-5.81	242	285	Average
2388.39	61.58	57.09	4.49	74	-12.42	242	285	Peak
2417	99.65	95.11	4.54			242	285	Average
2417	106.45	101.91	4.54			242	285	Peak
4834	41.88	31.59	10.29	54	-12.12	113	325	Average
4834	47.48	37.19	10.29	74	-26.52	113	325	Peak

Remarks:

4. Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
5. 2417 MHz: Fundamental frequency.
6. 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 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
2384.61	40.84	36.37	4.47	54	-13.16	298	307	Average
2384.61	51.24	46.77	4.47	74	-22.76	298	307	Peak
2437	90.57	85.98	4.59			298	307	Average
2437	97.93	93.34	4.59			298	307	Peak
2497.72	41.18	36.51	4.67	54	-12.82	298	307	Average
2497.72	51.89	47.22	4.67	74	-22.11	298	307	Peak
4874	41.58	31.37	10.21	54	-12.42	158	57	Average
4874	47.55	37.34	10.21	74	-26.45	158	57	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
2382.27	40.93	36.46	4.47	54	-13.07	242	285	Average
2382.27	51.39	46.92	4.47	74	-22.61	242	285	Peak
2437	98.58	93.99	4.59			242	285	Average
2437	105.63	101.04	4.59			242	285	Peak
2486.96	41.69	37.03	4.66	54	-12.31	242	285	Average
2486.96	51.99	47.33	4.66	74	-22.01	242	285	Peak
4874	41.94	31.73	10.21	54	-12.06	124	206	Average
4874	48.21	38	10.21	74	-25.79	124	206	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 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	89.59	84.97	4.62			298	307	Average
2462	96.32	91.7	4.62			298	307	Peak
2496.36	41.43	36.76	4.67	54	-12.57	298	307	Average
2496.36	51.61	46.94	4.67	74	-22.39	298	307	Peak
4924	41.85	31.6	10.25	54	-12.15	164	196	Average
4924	48.48	38.23	10.25	74	-25.52	164	196	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	97.49	92.87	4.62			247	285	Average
2462	104.16	99.54	4.62			247	285	Peak
2483.68	43.52	38.86	4.66	54	-10.48	247	285	Average
2483.68	54.36	49.7	4.66	74	-19.64	247	285	Peak
4924	41.83	31.58	10.25	54	-12.17	142	166	Average
4924	47.49	37.24	10.25	74	-26.51	142	166	Peak

Remarks:

- Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
- 2462 MHz: Fundamental frequency.
- 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 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	87.47	82.84	4.63			298	307	Average
2467	94.45	89.82	4.63			298	307	Peak
2483.6	43	38.34	4.66	54	-11	298	307	Average
2483.6	52.48	47.82	4.66	74	-21.52	298	307	Peak
4934	41.9	31.64	10.26	54	-12.1	188	196	Average
4934	48.58	38.32	10.26	74	-25.42	188	196	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	95.45	90.82	4.63			242	285	Average
2467	102.72	98.09	4.63			242	285	Peak
2483.52	49.3	44.64	4.66	54	-4.7	247	285	Average
2483.52	61.05	56.39	4.66	74	-12.95	247	285	Peak
4934	41.8	31.54	10.26	54	-12.2	132	226	Average
4934	48.13	37.87	10.26	74	-25.87	132	226	Peak

Remarks:

- Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
- 2467 MHz: Fundamental frequency.
- 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 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	86.69	82.05	4.64			262	360	Average
2472	94.07	89.43	4.64			262	360	Peak
2483.52	44.44	39.78	4.66	54	-9.56	262	360	Average
2483.52	59.67	55.01	4.66	74	-14.33	262	360	Peak
4944	41.48	31.13	10.35	54	-12.52	169	165	Average
4944	48.31	37.96	10.35	74	-25.69	169	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
2472	92.69	88.05	4.64	54	38.69	290	293	Average
2472	99.7	95.06	4.64	74	25.7	290	293	Peak
2483.52	51.35	46.69	4.66	54	-2.65	290	293	Average
2483.52	64.2	59.54	4.66	74	-9.8	290	293	Peak
4944	40.57	30.22	10.35	54	-13.43	124	154	Average
4944	48.57	38.22	10.35	74	-25.43	124	154	Peak

Remarks:

- Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
- 2472 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	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
2388.57	40.1	35.61	4.49	54	-13.9	311	13	Average
2388.57	51.76	47.27	4.49	74	-22.24	311	13	Peak
2412	89.09	84.54	4.55			311	13	Average
2412	97.12	92.57	4.55			311	13	Peak
4824	42.06	31.77	10.29	54	-11.94	109	136	Average
4824	48.12	37.83	10.29	74	-25.88	109	136	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	44.47	39.98	4.49	54	-9.53	266	288	Average
2389.65	59.97	55.48	4.49	74	-14.03	266	288	Peak
2412	96.83	92.28	4.55			266	288	Average
2412	105.14	100.59	4.55			266	288	Peak
4824	43.63	33.34	10.29	54	-10.37	134	176	Average
4824	49.97	39.68	10.29	74	-24.03	134	176	Peak

Remarks:

- Emission Level = Read Level + 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 2	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	41.29	36.8	4.49	54	-12.71	311	13	Average
2389.74	51.37	46.88	4.49	74	-22.63	311	13	Peak
2417	91.82	87.28	4.54			311	13	Average
2417	99.77	95.23	4.54			311	13	Peak
4834	41.86	31.57	10.29	54	-12.14	129	243	Average
4834	48.02	37.73	10.29	74	-25.98	129	243	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	44.37	39.87	4.5	54	-9.63	269	291	Average
2389.92	59.97	55.47	4.5	74	-14.03	269	291	Peak
2417	98.41	93.87	4.54			269	291	Average
2417	107.53	102.99	4.54			269	291	Peak
4834	42.16	31.87	10.29	54	-11.84	150	273	Average
4834	48.33	38.04	10.29	74	-25.67	150	273	Peak

Remarks:

4. Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
5. 2417 MHz: Fundamental frequency.
6. 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
2386.14	41.1	36.61	4.49	54	-12.9	311	13	Average
2386.14	51.22	46.73	4.49	74	-22.78	311	13	Peak
2437	90.77	86.18	4.59			311	13	Average
2437	98.7	94.11	4.59			311	13	Peak
2486.76	41.56	36.9	4.66	54	-12.44	311	13	Average
2486.76	52.12	47.46	4.66	74	-21.88	311	13	Peak
4874	41.77	31.56	10.21	54	-12.23	163	219	Average
4874	48.1	37.89	10.21	74	-25.9	163	219	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
2389.11	41.17	36.68	4.49	54	-12.83	300	293	Average
2389.11	51.82	47.33	4.49	74	-22.18	300	293	Peak
2437	98.28	93.69	4.59			300	293	Average
2437	107.03	102.44	4.59			300	293	Peak
2483.84	41.73	37.07	4.66	54	-12.27	300	293	Average
2483.84	51.84	47.18	4.66	74	-22.16	300	293	Peak
4874	41.57	31.36	10.21	54	-12.43	125	43	Average
4874	47.84	37.63	10.21	74	-26.16	125	43	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	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
2462	89.06	84.44	4.62			311	13	Average
2462	97.8	93.18	4.62			311	13	Peak
2485.92	41.53	36.87	4.66	54	-12.47	311	13	Average
2485.92	52.04	47.38	4.66	74	-21.96	311	13	Peak
4924	43.06	32.81	10.25	54	-10.94	106	317	Average
4924	49.23	38.98	10.25	74	-24.77	106	317	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	96.59	91.97	4.62			293	290	Average
2462	105.25	100.63	4.62			293	290	Peak
2483.64	42.68	38.02	4.66	54	-11.32	293	290	Average
2483.64	60.05	55.39	4.66	74	-13.95	293	290	Peak
4924	41.28	31.03	10.25	54	-12.72	131	76	Average
4924	47.52	37.27	10.25	74	-26.48	131	76	Peak

Remarks:

- Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
- 2462 MHz: Fundamental frequency.
- 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	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
2467	85.79	81.16	4.63			311	13	Average
2467	93.6	88.97	4.63			311	13	Peak
2484	41.9	37.24	4.66	54	-12.1	311	13	Average
2484	52.44	47.78	4.66	74	-21.56	311	13	Peak
4934	41.9	31.64	10.26	54	-12.1	138	12	Average
4934	48.07	37.81	10.26	74	-25.93	138	12	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	93.36	88.73	4.63			293	290	Average
2467	102.19	97.56	4.63			293	290	Peak
2483.52	46.72	42.06	4.66	54	-7.28	293	290	Average
2483.52	61.51	56.85	4.66	74	-12.49	293	290	Peak
4934	40.96	30.7	10.26	54	-13.04	145	124	Average
4934	47.15	36.89	10.26	74	-26.85	145	124	Peak

Remarks:

- Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
- 2467 MHz: Fundamental frequency.
- 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	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
2472	73.08	68.44	4.64			311	13	Average
2472	81.14	76.5	4.64			311	13	Peak
2483.52	43.03	38.37	4.66	54	-10.97	311	13	Average
2483.52	54.54	49.88	4.66	74	-19.46	311	13	Peak
4944	41.73	31.38	10.35	54	-12.27	183	190	Average
4944	47.81	37.46	10.35	74	-26.19	183	190	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	81.15	76.51	4.64			293	287	Average
2472	89.45	84.81	4.64			293	287	Peak
2483.52	48.7	44.04	4.66	54	-5.3	293	287	Average
2483.52	64.16	59.5	4.66	74	-9.84	293	287	Peak
4944	41.46	31.11	10.35	54	-12.54	152	173	Average
4944	47.63	37.28	10.35	74	-26.37	152	173	Peak

Remarks:

- Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
- 2472 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	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
2389.56	42.08	37.59	4.49	54	-11.92	311	13	Average
2389.56	53.53	49.04	4.49	74	-20.47	311	13	Peak
2422	84.82	80.26	4.56			311	13	Average
2422	92.46	87.9	4.56			311	13	Peak
2485.76	41.59	36.93	4.66	54	-12.41	311	13	Average
2485.76	52.04	47.38	4.66	74	-21.96	311	13	Peak
4844	41.89	31.66	10.23	54	-12.11	135	161	Average
4844	48.04	37.81	10.23	74	-25.96	135	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
2389.83	48.37	43.87	4.5	54	-5.63	243	291	Average
2389.83	62.9	58.4	4.5	74	-11.1	243	291	Peak
2422	91.71	87.15	4.56			243	291	Average
2422	100.82	96.26	4.56			243	291	Peak
2484.48	41.06	36.4	4.66	54	-12.94	243	291	Average
2484.48	52.78	48.12	4.66	74	-21.22	243	291	Peak
4844	41.25	31.02	10.23	54	-12.75	173	102	Average
4844	47.42	37.19	10.23	74	-26.58	173	102	Peak

Remarks:

- Emission Level = Read Level + 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 4	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
2389.2	41.16	36.67	4.49	54	-12.84	311	13	Average
2389.2	54.17	49.68	4.49	74	-19.83	311	13	Peak
2427	86.57	82.01	4.56			311	13	Average
2427	93.48	88.92	4.56			311	13	Peak
2483.76	40.8	36.14	4.66	54	-13.2	311	13	Average
2483.76	52.3	47.64	4.66	74	-21.7	311	13	Peak
4844	41.89	31.66	10.23	54	-12.11	135	161	Average
4844	48.04	37.81	10.23	74	-25.96	135	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
2388.57	47.99	43.5	4.49	54	-6.01	243	291	Average
2388.57	64.15	59.66	4.49	74	-9.85	243	291	Peak
2427	94.57	90.01	4.56			243	291	Average
2427	101.2	96.64	4.56			243	291	Peak
2483.52	42.39	37.73	4.66	54	-11.61	243	291	Average
2483.52	57.02	52.36	4.66	74	-16.98	243	291	Peak
4844	41.25	31.02	10.23	54	-12.75	173	102	Average
4844	47.42	37.19	10.23	74	-26.58	173	102	Peak

Remarks:

4. Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
5. 2427 MHz: Fundamental frequency.
6. 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
2389.83	41.29	36.79	4.5	54	-12.71	311	13	Average
2389.83	51.71	47.21	4.5	74	-22.29	311	13	Peak
2437	88.14	83.55	4.59			311	13	Average
2437	96.75	92.16	4.59			311	13	Peak
2485.96	41.76	37.1	4.66	54	-12.24	311	13	Average
2485.96	52.37	47.71	4.66	74	-21.63	311	13	Peak
4874	41.1	30.89	10.21	54	-12.9	131	37	Average
4874	47.28	37.07	10.21	74	-26.72	131	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
2389.92	45.99	41.49	4.5	54	-8.01	300	293	Average
2389.92	58.9	54.4	4.5	74	-15.1	300	293	Peak
2437	95.26	90.67	4.59			300	293	Average
2437	105.19	100.6	4.59			300	293	Peak
2484.12	45.95	41.29	4.66	54	-8.05	300	293	Average
2484.12	60.17	55.51	4.66	74	-13.83	300	293	Peak
4874	41.02	30.81	10.21	54	-12.98	102	243	Average
4874	47.12	36.91	10.21	74	-26.88	102	243	Peak

Remarks:

- Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
- 2437 MHz: Fundamental frequency.
- 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
2386.86	40.86	36.37	4.49	54	-13.14	311	13	Average
2386.86	51.52	47.03	4.49	74	-22.48	311	13	Peak
2452	82.44	77.84	4.6			311	13	Average
2452	91.53	86.93	4.6			311	13	Peak
2485.92	41.66	37	4.66	54	-12.34	311	13	Average
2485.92	51.69	47.03	4.66	74	-22.31	311	13	Peak
4904	41.03	30.89	10.14	54	-12.97	163	185	Average
4904	48.16	38.02	10.14	74	-25.84	163	185	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
2389.56	41.1	36.61	4.49	54	-12.9	293	290	Average
2389.56	51.24	46.75	4.49	74	-22.76	293	290	Peak
2452	91.07	86.47	4.6			293	290	Average
2452	99.78	95.18	4.6			293	290	Peak
2483.6	44.12	39.46	4.66	54	-9.88	293	290	Average
2483.6	58.43	53.77	4.66	74	-15.57	293	290	Peak
4904	41.74	31.6	10.14	54	-12.26	112	175	Average
4904	47.93	37.79	10.14	74	-26.07	112	175	Peak

Remarks:

- Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
- 2452 MHz: Fundamental frequency.
- 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
2389.02	39.93	35.44	4.49	54	-14.07	311	10	Average
2389.02	51.33	46.84	4.49	74	-22.67	311	10	Peak
2457	80.88	76.26	4.62			311	10	Average
2457	87.53	82.91	4.62			311	10	Peak
2483.72	42.3	37.64	4.66	54	-11.7	311	10	Average
2483.72	57	52.34	4.66	74	-17	311	10	Peak
4914	41.25	31.1	10.15	54	-12.75	176	124	Average
4914	47.48	37.33	10.15	74	-26.52	176	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
2368.23	40.1	35.67	4.43	54	-13.9	293	292	Average
2368.23	51.56	47.13	4.43	74	-22.44	293	292	Peak
2457	88.58	83.96	4.62			293	292	Average
2457	95.91	91.29	4.62			293	292	Peak
2483.6	50.86	46.2	4.66	54	-3.14	293	292	Average
2483.6	64.4	59.74	4.66	74	-9.6	293	292	Peak
4914	40.94	30.79	10.15	54	-13.06	183	121	Average
4914	47.16	37.01	10.15	74	-26.84	183	121	Peak

Remarks:

1. Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
2. 2457 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	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
2386.5	41.04	36.55	4.49	54	-12.96	311	13	Average
2386.5	50.96	46.47	4.49	74	-23.04	311	13	Peak
2462	71.16	66.54	4.62			311	13	Average
2462	79.75	75.13	4.62			311	13	Peak
2483.72	43.35	38.69	4.66	54	-10.65	311	13	Average
2483.72	55.1	50.44	4.66	74	-18.9	311	13	Peak
4924	41.6	31.35	10.25	54	-12.4	125	317	Average
4924	47.85	37.6	10.25	74	-26.15	125	317	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
2384.79	41.17	36.7	4.47	54	-12.83	293	290	Average
2384.79	51.47	47	4.47	74	-22.53	293	290	Peak
2462	80.96	76.34	4.62	54	26.96	293	290	Average
2462	90.22	85.6	4.62			293	290	Peak
2483.52	50.29	45.63	4.66			293	290	Average
2483.52	63.93	59.27	4.66	74	-10.07	293	290	Peak
4924	42.71	32.46	10.25	54	-11.29	156	112	Average
4924	48.87	38.62	10.25	74	-25.13	156	112	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.

802.11ax (HE20)

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 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
2388.3	40.44	35.95	4.49	54	-13.56	298	22	Average
2388.3	53.01	48.52	4.49	74	-20.99	298	22	Peak
2412	89.87	85.32	4.55			298	22	Average
2412	96.46	91.91	4.55			298	22	Peak
4824	41.86	31.57	10.29	54	-12.14	135	55	Average
4824	47.78	37.49	10.29	74	-26.22	135	55	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
2389.74	46.6	42.11	4.49	54	-7.4	242	285	Average
2389.74	62.14	57.65	4.49	74	-11.86	242	285	Peak
2412	97.48	92.93	4.55			242	285	Average
2412	104.1	99.55	4.55			242	285	Peak
4824	41.85	31.56	10.29	54	-12.15	115	254	Average
4824	48.32	38.03	10.29	74	-25.68	115	254	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 2	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 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
2389.65	40.97	36.48	4.49	54	-13.03	298	22	Average
2389.65	55.09	50.6	4.49	74	-18.91	298	22	Peak
2417	91.67	87.13	4.54			298	22	Average
2417	98.17	93.63	4.54			298	22	Peak
4834	41.79	31.5	10.29	54	-12.21	145	274	Average
4834	48.06	37.77	10.29	74	-25.94	145	274	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	44.27	39.78	4.49	54	-9.73	242	285	Average
2389.65	61.31	56.82	4.49	74	-12.69	242	285	Peak
2417	99.74	95.2	4.54			242	285	Average
2417	106.62	102.08	4.54			242	285	Peak
4834	41.93	31.64	10.29	54	-12.07	113	324	Average
4834	47.5	37.21	10.29	74	-26.5	113	324	Peak

Remarks:

1. Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
2. 2417 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 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
2385.96	40.25	35.76	4.49	54	-13.75	298	22	Average
2385.96	51.44	46.95	4.49	74	-22.56	298	22	Peak
2437	90.58	85.99	4.59			298	22	Average
2437	97.63	93.04	4.59			298	22	Peak
2483.88	40.67	36.01	4.66	54	-13.33	298	22	Average
2483.88	52.25	47.59	4.66	74	-21.75	298	22	Peak
4874	41.73	31.52	10.21	54	-12.27	147	101	Average
4874	47.68	37.47	10.21	74	-26.32	147	101	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
2387.13	40.22	35.73	4.49	54	-13.78	242	285	Average
2387.13	51.29	46.8	4.49	74	-22.71	242	285	Peak
2437	98.74	94.15	4.59			242	285	Average
2437	105.11	100.52	4.59			242	285	Peak
2499.68	40.95	36.28	4.67	54	-13.05	242	285	Average
2499.68	52.05	47.38	4.67	74	-21.95	242	285	Peak
4874	41.86	31.65	10.21	54	-12.14	124	208	Average
4874	47.93	37.72	10.21	74	-26.07	124	208	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 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	88.57	83.95	4.62			298	307	Average
2462	95.32	90.7	4.62			298	307	Peak
2484.64	40.81	36.15	4.66	54	-13.19	298	307	Average
2484.64	51.65	46.99	4.66	74	-22.35	298	307	Peak
4924	42.14	31.89	10.25	54	-11.86	166	253	Average
4924	48.82	38.57	10.25	74	-25.18	166	253	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	95.55	90.93	4.62			247	285	Average
2462	103.71	99.09	4.62			247	285	Peak
2483.64	44.12	39.46	4.66	54	-9.88	247	285	Average
2483.64	59.92	55.26	4.66	74	-14.08	247	285	Peak
4924	41.82	31.57	10.25	54	-12.18	134	174	Average
4924	47.68	37.43	10.25	74	-26.32	134	174	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 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	86.49	81.86	4.63			298	307	Average
2467	93.11	88.48	4.63			298	307	Peak
2483.52	41.05	36.39	4.66	54	-12.95	298	307	Average
2483.52	53.36	48.7	4.66	74	-20.64	298	307	Peak
4934	41.81	31.55	10.26	54	-12.19	145	19	Average
4934	47.7	37.44	10.26	74	-26.3	145	19	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	94.71	90.08	4.63			247	285	Average
2467	101.08	96.45	4.63			247	285	Peak
2483.52	48	43.34	4.66	54	-6	247	285	Average
2483.52	62.94	58.28	4.66	74	-11.06	247	285	Peak
4934	41.8	31.54	10.26	54	-12.2	241	144	Average
4934	48.58	38.32	10.26	74	-25.42	241	144	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 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	72.14	67.5	4.64			298	307	Average
2472	79.06	74.42	4.64			298	307	Peak
2483.56	41.79	37.13	4.66	54	-12.21	298	307	Average
2483.56	54.69	50.03	4.66	74	-19.31	298	307	Peak
4944	42.22	31.87	10.35	54	-11.78	189	296	Average
4944	49.6	39.25	10.35	74	-24.4	189	296	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	80.08	75.44	4.64			247	285	Average
2472	87.86	83.22	4.64			247	285	Peak
2483.52	52.13	47.47	4.66	54	-1.87	277	285	Average
2483.52	65.01	60.35	4.66	74	-8.99	277	285	Peak
4944	41.89	31.54	10.35	54	-12.11	135	256	Average
4944	47.92	37.57	10.35	74	-26.08	135	256	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.

802.11ax (HE20_RU26)

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	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
2382.99	41.17	36.7	4.47	54	-12.83	115	319	Average
2382.99	54.14	49.67	4.47	74	-19.86	115	319	Peak
2412	100.22	95.67	4.55			115	319	Average
2412	109.07	104.52	4.55			115	319	Peak
4824	41.26	30.97	10.29	54	-12.74	143	87	Average
4824	47.56	37.27	10.29	74	-26.44	143	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
2384.34	43	38.53	4.47	54	-11	264	286	Average
2384.34	60	55.53	4.47	74	-14	264	286	Peak
2412	105.83	101.28	4.55			264	286	Average
2412	113.67	109.12	4.55			264	286	Peak
4824	41.31	31.02	10.29	54	-12.69	108	237	Average
4824	47.59	37.3	10.29	74	-26.41	108	237	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.

802.11ax (HE20_RU52)

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	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
2385.6	41.21	36.72	4.49	54	-12.79	115	312	Average
2385.6	54.22	49.73	4.49	74	-19.78	115	312	Peak
2412	94.33	89.78	4.55			115	312	Average
2412	103.99	99.44	4.55			115	312	Peak
4824	42.11	31.82	10.29	54	-11.89	184	19	Average
4824	48.26	37.97	10.29	74	-25.74	184	19	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
2389.38	42.25	37.76	4.49	54	-11.75	264	290	Average
2389.38	59.39	54.9	4.49	74	-14.61	264	290	Peak
2412	100.51	95.96	4.55			264	290	Average
2412	109.42	104.87	4.55			264	290	Peak
4824	41.09	30.8	10.29	54	-12.91	175	131	Average
4824	47.13	36.84	10.29	74	-26.87	175	131	Peak

Remarks:

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

802.11ax (HE20_RU106)

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	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
2382.27	41.19	36.72	4.47	54	-12.81	115	312	Average
2382.27	53.88	49.41	4.47	74	-20.12	115	312	Peak
2412	97.72	93.17	4.55			115	312	Average
2412	106.15	101.6	4.55			115	312	Peak
4824	41.86	31.57	10.29	54	-12.14	164	181	Average
4824	48.17	37.88	10.29	74	-25.83	164	181	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
2389.38	42.27	37.78	4.49	54	-11.73	265	289	Average
2389.38	59.68	55.19	4.49	74	-14.32	265	289	Peak
2412	103.41	98.86	4.55			265	289	Average
2412	111.84	107.29	4.55			265	289	Peak
4824	41.2	30.91	10.29	54	-12.8	115	248	Average
4824	47.36	37.07	10.29	74	-26.64	115	248	Peak

Remarks:

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

802.11ax (HE40)

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 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
2389.47	47.74	43.25	4.49	54	-6.26	298	15	Average
2389.47	62.01	57.52	4.49	74	-11.99	298	15	Peak
2422	86.58	82.02	4.56			298	15	Average
2422	93.42	88.86	4.56			298	15	Peak
2485.36	41.39	36.73	4.66	54	-12.61	298	15	Average
2485.36	52.75	48.09	4.66	74	-21.25	298	15	Peak
4844	41.92	31.69	10.23	54	-12.08	156	256	Average
4844	47.27	37.04	10.23	74	-26.73	156	256	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	52.84	48.35	4.49	54	-1.16	237	285	Average
2389.02	66.8	62.31	4.49	74	-7.2	237	285	Peak
2422	93.65	89.09	4.56			242	285	Average
2422	100.41	95.85	4.56			242	285	Peak
2483.96	42.53	37.87	4.66	54	-11.47	242	285	Average
2483.96	55.22	50.56	4.66	74	-18.78	242	285	Peak
4844	42.01	31.78	10.23	54	-11.99	143	265	Average
4844	49.14	38.91	10.23	74	-24.86	143	265	Peak

Remarks:

- Emission Level = Read Level + 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 4	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 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
2389.65	41.95	37.46	4.49	54	-12.05	298	15	Average
2389.65	53.37	48.88	4.49	74	-20.63	298	15	Peak
2427	87.74	83.18	4.56			298	15	Average
2427	94.87	90.31	4.56			298	15	Peak
2491.12	40.79	36.11	4.68	54	-13.21	298	15	Average
2491.12	51.96	47.28	4.68	74	-22.04	298	15	Peak
4854	41.7	31.47	10.23	54	-12.3	166	165	Average
4854	47.17	36.94	10.23	74	-26.83	166	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
2387.76	42.04	37.55	4.49	54	-11.96	242	285	Average
2387.76	58.53	54.04	4.49	74	-15.47	242	285	Peak
2427	94.46	89.9	4.56			242	285	Average
2427	101.49	96.93	4.56			242	285	Peak
2485.04	40.85	36.19	4.66	54	-13.15	242	285	Average
2485.04	52.92	48.26	4.66	74	-21.08	242	285	Peak
4854	41.81	31.58	10.23	54	-12.19	152	65	Average
4854	47.2	36.97	10.23	74	-26.8	152	65	Peak

Remarks:

1. Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
2. 2427 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 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
2389.65	41.91	37.42	4.49	54	-12.09	298	15	Average
2389.65	56.31	51.82	4.49	74	-17.69	298	15	Peak
2437	88.54	83.95	4.59			298	15	Average
2437	95.74	91.15	4.59			298	15	Peak
2483.52	43.07	38.41	4.66	54	-10.93	298	15	Average
2483.52	58.57	53.91	4.66	74	-15.43	298	15	Peak
4874	41.71	31.5	10.21	54	-12.29	155	196	Average
4874	47.76	37.55	10.21	74	-26.24	155	196	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
2389.56	47.81	43.32	4.49	54	-6.19	242	285	Average
2389.56	60.84	56.35	4.49	74	-13.16	242	285	Peak
2437	96.84	92.25	4.59			242	285	Average
2437	103.35	98.76	4.59			242	285	Peak
2484.04	45.86	41.2	4.66	54	-8.14	242	285	Average
2484.04	63.62	58.96	4.66	74	-10.38	242	285	Peak
4874	41.78	31.57	10.21	54	-12.22	157	240	Average
4874	47.4	37.19	10.21	74	-26.6	157	240	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	Charles 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
2388.84	40.27	35.78	4.49	54	-13.73	298	307	Average
2388.84	51.45	46.96	4.49	74	-22.55	298	307	Peak
2452	85.59	80.99	4.6			298	307	Average
2452	92.02	87.42	4.6			298	307	Peak
2484.44	44.55	39.89	4.66	54	-9.45	298	307	Average
2484.44	58.5	53.84	4.66	74	-15.5	298	307	Peak
4904	41.78	31.64	10.14	54	-12.22	135	263	Average
4904	48.32	38.18	10.14	74	-25.68	135	263	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
2388.48	40.62	36.13	4.49	54	-13.38	247	289	Average
2388.48	52.73	48.24	4.49	74	-21.27	247	289	Peak
2452	92.14	87.54	4.6			247	289	Average
2452	99.13	94.53	4.6			247	289	Peak
2483.88	46.97	42.31	4.66	54	-7.03	247	289	Average
2483.88	66	61.34	4.66	74	-8	247	289	Peak
4904	41.72	31.58	10.14	54	-12.28	133	254	Average
4904	46.91	36.77	10.14	74	-27.09	133	254	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	Charles 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
2388.66	40.16	35.67	4.49	54	-13.84	298	307	Average
2388.66	51.46	46.97	4.49	74	-22.54	298	307	Peak
2457	80.59	75.97	4.62			298	307	Average
2457	87.77	83.15	4.62			298	307	Peak
2483.52	43.02	38.36	4.66	54	-10.98	298	307	Average
2483.52	56.5	51.84	4.66	74	-17.5	298	307	Peak
4914	41.81	31.66	10.15	54	-12.19	162	53	Average
4914	47.34	37.19	10.15	74	-26.66	162	53	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
2381.91	40.27	35.8	4.47	54	-13.73	247	289	Average
2381.91	51.19	46.72	4.47	74	-22.81	247	289	Peak
2457	87.48	82.86	4.62			247	289	Average
2457	94.51	89.89	4.62			247	289	Peak
2483.52	45.82	41.16	4.66	54	-8.18	247	289	Average
2483.52	61.31	56.65	4.66	74	-12.69	247	289	Peak
4914	41.69	31.54	10.15	54	-12.31	114	174	Average
4914	47.43	37.28	10.15	74	-26.57	114	174	Peak

Remarks:

1. Emission Level = Read Level + Factor
Margin value = Emission level – Limit value
2. 2457 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 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
2388.93	40.21	35.72	4.49	54	-13.79	298	307	Average
2388.93	51.31	46.82	4.49	74	-22.69	298	307	Peak
2462	74.49	69.87	4.62			298	307	Average
2462	81.21	76.59	4.62			298	307	Peak
2483.56	43.51	38.85	4.66	54	-10.49	298	307	Average
2483.56	59.05	54.39	4.66	74	-14.95	298	307	Peak
4924	41.64	31.39	10.25	54	-12.36	162	253	Average
4924	47.85	37.6	10.25	74	-26.15	162	253	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
2347.35	40.06	35.68	4.38	54	-13.94	247	289	Average
2347.35	51.92	47.54	4.38	74	-22.08	247	289	Peak
2462	81.87	77.25	4.62			247	289	Average
2462	88.26	83.64	4.62			247	289	Peak
2483.52	47.75	43.09	4.66	54	-6.25	247	289	Average
2483.52	65.27	60.61	4.66	74	-8.73	247	289	Peak
4924	41.73	31.48	10.25	54	-12.27	164	255	Average
4924	48.31	38.06	10.25	74	-25.69	164	255	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.

9 kHz ~ 30 MHz Data:

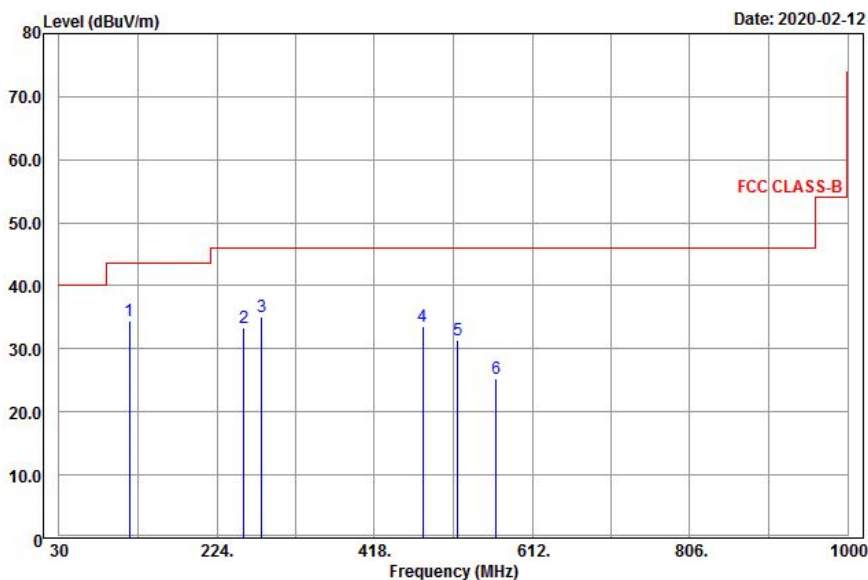
The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

30 MHz ~ 1 GHz Worst-Case Data:

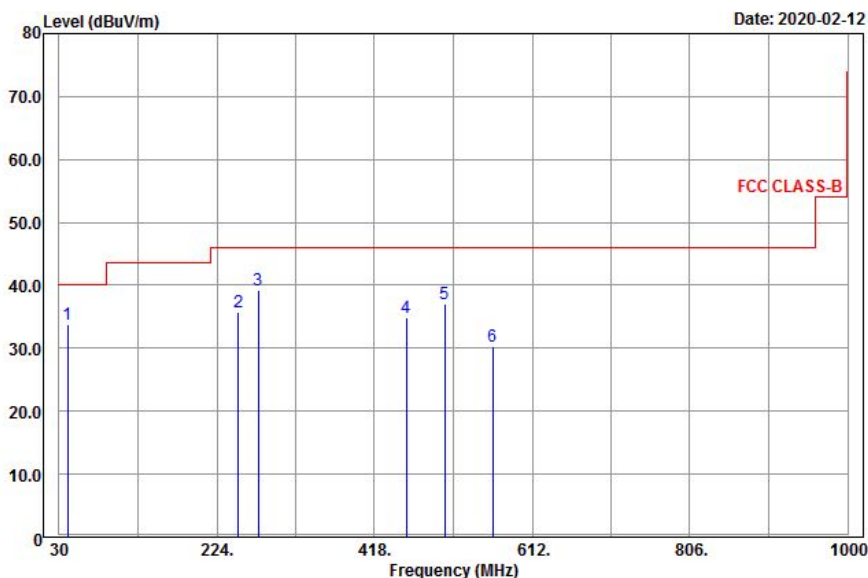
802.11ax (HE40)

EUT Test Condition		Measurement Detail	
Channel	Channel 3	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
116.67	34.35	52.87	-18.52	43.5	-9.15	116	65	Peak
257.07	33.33	50.04	-16.71	46	-12.67	105	288	Peak
278.94	35.02	51.46	-16.44	46	-10.98	150	344	Peak
477.1	33.53	46.3	-12.77	46	-12.47	174	47	Peak
520.5	31.45	43.52	-12.07	46	-14.55	133	326	Peak
567.4	25.33	36.54	-11.21	46	-20.67	174	188	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
40.53	33.81	49.94	-16.13	40	-6.19	140	144	Peak
250.32	35.81	52.64	-16.83	46	-10.19	132	22	Peak
275.43	39.19	55.65	-16.46	46	-6.81	105	246	Peak
457.5	34.97	48.13	-13.16	46	-11.03	175	165	Peak
504.4	37.03	49.31	-12.28	46	-8.97	150	24	Peak
563.9	30.31	41.61	-11.3	46	-15.69	174	116	Peak

Remarks:

- Emission Level = Read Level + Factor
Margin value = Emission level – Limit value.
- 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. 11, 2019	Dec. 10, 2020
RF signal cable Woken	5D-FB	Cable-cond1-01	Sep. 05, 2019	Sep. 04, 2020
LISN ROHDE & SCHWARZ (EUT)	ENV216	101826	Feb. 20, 2020	Feb. 19, 2021
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Aug. 22, 2019	Aug. 21, 2020
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

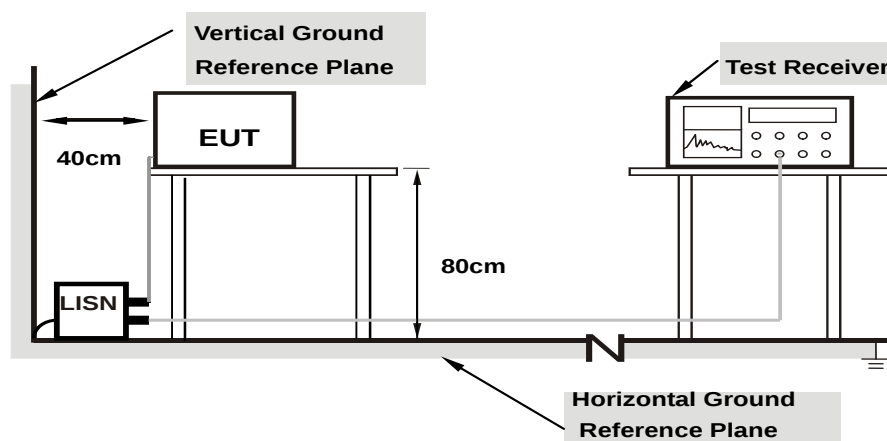
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/50 uH of coupling impedance 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.

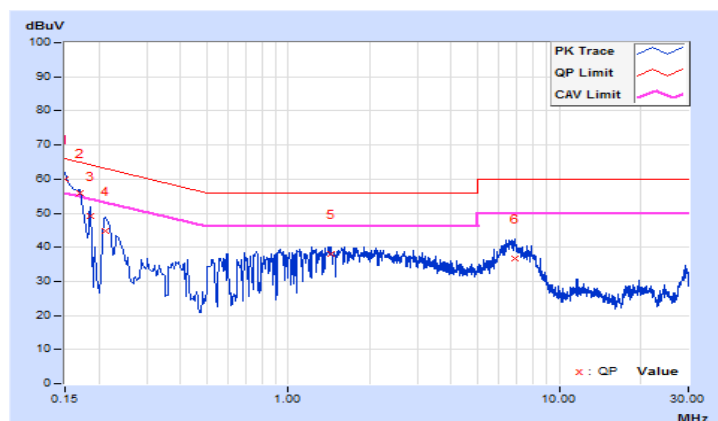
4.2.7 Test Results

Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25°C, 75%RH
Tested by	Jones Chang	Test Date	2020/2/26

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	0.15000	9.63	50.23	41.22	59.86	50.85	66.00	56.00	-6.14	-5.15
2	0.16955	9.63	46.21	37.39	55.84	47.02	64.98	54.98	-9.14	-7.96
3	0.18519	9.62	39.60	19.32	49.22	28.94	64.25	54.25	-15.03	-25.31
4	0.21256	9.62	35.13	18.15	44.75	27.77	63.10	53.10	-18.35	-25.33
5	1.44812	9.70	28.50	16.63	38.20	26.33	56.00	46.00	-17.80	-19.67
6	6.85956	9.83	27.00	21.09	36.83	30.92	60.00	50.00	-23.17	-19.08

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

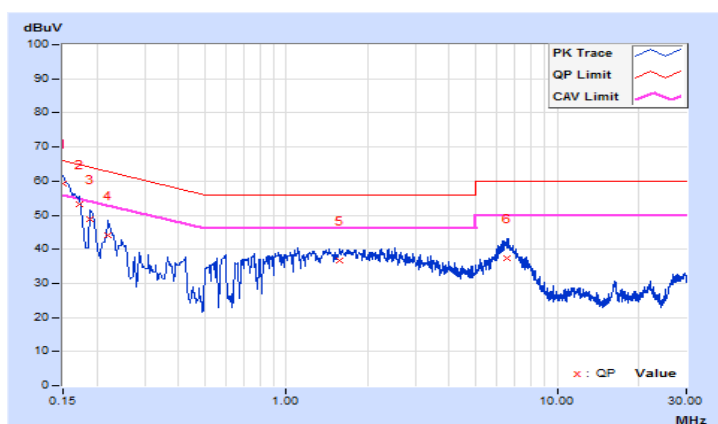


Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25°C, 75%RH
Tested by	Jones Chang	Test Date	2020/2/26

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	0.15000	9.66	49.71	40.89	59.37	50.55	66.00	56.00	-6.63	-5.45
2	0.17283	9.65	43.61	35.47	53.26	45.12	64.82	54.82	-11.56	-9.70
3	0.18910	9.64	39.23	18.80	48.87	28.44	64.08	54.08	-15.21	-25.64
4	0.22038	9.64	34.39	22.27	44.03	31.91	62.80	52.80	-18.77	-20.89
5	1.56933	9.73	27.10	14.70	36.83	24.43	56.00	46.00	-19.17	-21.57
6	6.52721	9.86	27.63	21.51	37.49	31.37	60.00	50.00	-22.51	-18.63

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,

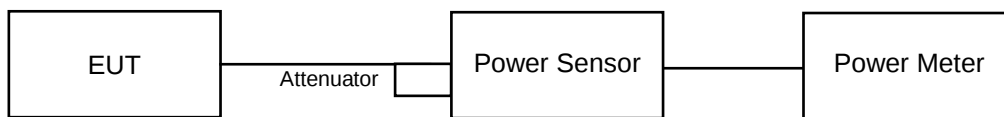
Array Gain = 0 dB (i.e., no array gain) for $NANT \leq 4$;

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 $NANT \geq 5$.

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.

Average power sensor was used to perform output power measurement, trigger and gating function of wide band power meter is enabled to measure max output power of TX on burst. Duty factor is not added to measured value.

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 (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	19.00	20.66	195.884	22.92	30	Pass
6	2437	18.90	20.54	190.985	22.81	30	Pass
11	2462	19.03	20.39	189.234	22.77	30	Pass
12	2467	19.00	20.38	188.365	22.75	30	Pass
13	2472	13.88	15.13	57.016	17.56	30	Pass

802.11g

Channel	Frequency (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	23.83	23.73	477.529	26.79	30	Pass
2	2417	24.56	24.51	568.853	27.55	30	Pass
6	2437	23.56	25.18	557.186	27.46	30	Pass
10	2457	24.68	24.77	594.292	27.74	30	Pass
11	2462	20.89	24.48	403.645	26.06	30	Pass
12	2467	19.88	24.48	377.572	25.77	30	Pass
13	2472	15.98	12.99	59.566	17.75	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	22.91	22.82	387.258	25.88	30	Pass
2	2417	20.43	22.62	293.089	24.67	30	Pass
6	2437	24.66	24.68	586.138	27.68	30	Pass
10	2457	20.16	22.70	289.734	24.62	30	Pass
11	2462	21.32	23.31	349.945	25.44	30	Pass
12	2467	21.10	21.55	271.644	24.34	30	Pass
13	2472	12.23	9.29	25.177	14.01	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	22.43	22.72	362.243	25.59	30	Pass
4	2427	22.05	22.63	343.558	25.36	30	Pass
6	2437	23.84	24.02	494.311	26.94	30	Pass
8	2447	22.93	23.46	417.830	26.21	30	Pass
9	2452	22.05	22.19	325.837	25.13	30	Pass
10	2457	15.88	16.43	82.604	19.17	30	Pass
11	2462	11.55	9.97	24.210	13.84	30	Pass

802.11ax (HE20_CDD)

Channel	Frequency (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	22.74	22.49	365.595	25.63	30	Pass
2	2417	20.18	22.53	283.139	24.52	30	Pass
6	2437	24.51	24.55	567.545	27.54	30	Pass
10	2457	21.03	22.54	306.196	24.86	30	Pass
11	2462	21.16	23.20	339.625	25.31	30	Pass
12	2467	21.34	21.25	269.774	24.31	30	Pass
13	2472	11.91	9.46	24.378	13.87	30	Pass

802.11ax (HE40_CDD)

Channel	Frequency (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	22.38	22.65	357.273	25.53	30	Pass
4	2427	21.97	23.83	399.025	26.01	30	Pass
6	2437	23.72	23.94	483.059	26.84	30	Pass
8	2447	22.24	22.52	345.939	25.39	30	Pass
9	2452	21.97	23.21	366.438	25.64	30	Pass
10	2457	15.78	17.84	98.628	19.94	30	Pass
11	2462	11.51	9.91	23.933	13.79	30	Pass

802.11ax (HE20_RU26)

Channel	Frequency (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	21.85	24.62	442.588	26.46	30	Pass
2	2417	21.68	24.61	436.516	26.40	30	Pass
6	2437	24.40	24.48	555.904	27.45	30	Pass
10	2457	24.12	24.36	530.884	27.25	30	Pass
11	2462	20.18	20.12	207.014	23.16	30	Pass
12	2467	12.96	14.64	48.865	16.89	30	Pass
13	2472	13.46	11.23	35.481	15.50	30	Pass

802.11ax (HE20_RU52)

Channel	Frequency (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	22.15	24.56	449.780	26.53	30	Pass
2	2417	22.68	24.67	478.630	26.80	30	Pass
6	2437	24.23	24.30	534.564	27.28	30	Pass
10	2457	23.83	24.03	494.311	26.94	30	Pass
11	2462	20.08	20.02	202.302	23.06	30	Pass
12	2467	12.66	14.51	46.666	16.69	30	Pass
13	2472	13.23	11.21	34.277	15.35	30	Pass

802.11ax (HE20_RU106)

Channel	Frequency (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	23.58	24.61	517.607	27.14	30	Pass
2	2417	23.66	24.74	529.663	27.24	30	Pass
6	2437	24.14	24.22	523.600	27.19	30	Pass
10	2457	23.89	23.99	495.450	26.95	30	Pass
11	2462	20.00	19.95	199.067	22.99	30	Pass
12	2467	13.36	13.96	46.559	16.68	30	Pass
13	2472	13.21	11.41	34.754	15.41	30	Pass

802.11ax (HE20_RU242)

Channel	Frequency (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	19.01	18.95	158.125	21.99	30	Pass
2	2417	22.45	24.60	464.515	26.67	30	Pass
6	2437	24.16	24.19	523.600	27.19	30	Pass
10	2457	23.37	24.55	502.343	27.01	30	Pass
11	2462	19.92	20.02	198.609	22.98	30	Pass
12	2467	13.10	11.83	35.645	15.52	30	Pass
13	2472	14.12	12.52	43.652	16.40	30	Pass

802.11ax (HE40_RU484)

Channel	Frequency (MHz)	Peak Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	21.43	20.09	240.991	23.82	30	Pass
4	2427	21.91	20.82	276.058	24.41	30	Pass
6	2437	24.89	24.95	620.869	27.93	30	Pass
8	2447	21.46	21.56	283.139	24.52	30	Pass
9	2452	19.69	20.02	193.642	22.87	30	Pass
10	2457	17.41	16.86	103.514	20.15	30	Pass
11	2462	11.49	9.88	23.823	13.77	30	Pass

802.11b

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	16.67	18.15	111.686	20.48	30	Pass
6	2437	16.55	18.07	109.396	20.39	30	Pass
11	2462	16.69	17.91	108.393	20.35	30	Pass
12	2467	16.61	17.88	107.152	20.30	30	Pass
13	2472	11.24	12.54	31.261	14.95	30	Pass

802.11g

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	15.14	15.22	65.917	18.19	30	Pass
2	2417	17.09	17.26	104.472	20.19	30	Pass
6	2437	16.67	18.10	110.917	20.45	30	Pass
10	2457	17.06	17.57	107.895	20.33	30	Pass
11	2462	14.67	16.14	70.469	18.48	30	Pass
12	2467	13.17	14.67	50.003	16.99	30	Pass
13	2472	6.46	4.53	7.261	8.61	30	Pass

802.11ac (VHT20)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	14.71	14.76	59.566	17.75	30	Pass
2	2417	15.45	16.79	82.794	19.18	30	Pass
6	2437	17.44	17.48	111.429	20.47	30	Pass
10	2457	15.35	16.88	82.985	19.19	30	Pass
11	2462	13.76	14.98	55.208	17.42	30	Pass
12	2467	12.56	12.97	37.844	15.78	30	Pass
13	2472	2.49	0.13	2.805	4.48	30	Pass

802.11ac (VHT40)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	13.83	14.11	49.888	16.98	30	Pass
4	2427	13.98	14.49	53.088	17.25	30	Pass
6	2437	15.97	17.13	91.201	19.60	30	Pass
8	2447	15.05	15.40	66.681	18.24	30	Pass
9	2452	13.30	13.40	43.251	16.36	30	Pass
10	2457	7.75	8.09	12.388	10.93	30	Pass
11	2462	2.04	0.11	2.624	4.19	30	Pass

802.11ax (HE20_CDD)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	14.78	14.83	60.534	17.82	30	Pass
2	2417	15.12	16.85	80.910	19.08	30	Pass
6	2437	17.40	17.43	110.408	20.43	30	Pass
10	2457	15.23	16.78	80.910	19.08	30	Pass
11	2462	13.65	14.85	53.703	17.30	30	Pass
12	2467	12.43	12.97	37.325	15.72	30	Pass
13	2472	2.26	0.08	2.704	4.32	30	Pass

802.11ax (HE40_CDD)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	13.77	14.06	49.317	16.93	30	Pass
4	2427	13.90	14.40	52.119	17.17	30	Pass
6	2437	16.05	17.30	93.972	19.73	30	Pass
8	2447	14.58	14.74	58.479	17.67	30	Pass
9	2452	13.26	13.23	42.267	16.26	30	Pass
10	2457	7.68	7.89	12.023	10.80	30	Pass
11	2462	1.91	0.09	2.570	4.10	30	Pass

802.11ax (HE20_RU26)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	14.67	16.09	69.984	18.45	30	Pass
2	2417	14.47	15.80	66.069	18.20	30	Pass
6	2437	17.29	17.45	109.144	20.38	30	Pass
10	2457	17.10	17.42	106.414	20.27	30	Pass
11	2462	11.87	11.83	30.620	14.86	30	Pass
12	2467	4.82	2.88	4.977	6.97	30	Pass
13	2472	1.87	0.82	2.748	4.39	30	Pass

802.11ax (HE20_RU52)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	14.52	15.83	66.527	18.23	30	Pass
2	2417	14.43	16.12	68.707	18.37	30	Pass
6	2437	17.15	17.36	106.414	20.27	30	Pass
10	2457	16.94	17.27	102.802	20.12	30	Pass
11	2462	11.80	11.78	30.200	14.80	30	Pass
12	2467	4.80	2.78	4.920	6.92	30	Pass
13	2472	1.80	0.66	2.679	4.28	30	Pass

802.11ax (HE20_RU106)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	14.43	15.88	66.527	18.23	30	Pass
2	2417	14.72	16.03	69.663	18.43	30	Pass
6	2437	17.10	17.23	104.232	20.18	30	Pass
10	2457	16.98	17.19	102.329	20.10	30	Pass
11	2462	11.78	11.73	29.992	14.77	30	Pass
12	2467	4.72	2.54	4.764	6.78	30	Pass
13	2472	1.89	0.70	2.723	4.35	30	Pass

802.11ax (HE20_RU242)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
1	2412	10.45	10.41	22.080	13.44	30	Pass
2	2417	13.79	15.46	59.156	17.72	30	Pass
6	2437	17.12	17.15	103.514	20.15	30	Pass
10	2457	14.05	15.33	59.566	17.75	30	Pass
11	2462	11.70	11.80	29.923	14.76	30	Pass
12	2467	4.37	3.11	4.786	6.80	30	Pass
13	2472	1.81	0.34	2.600	4.15	30	Pass

802.11ax (HE40_RU484)

Channel	Frequency (MHz)	Average Power (dBm)		Total Power (mW)	Total Power (dBm)	Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
3	2422	11.20	9.55	22.182	13.46	30	Pass
4	2427	12.22	10.54	27.990	14.47	30	Pass
6	2437	16.40	16.45	87.902	19.44	30	Pass
8	2447	11.35	11.45	27.606	14.41	30	Pass
9	2452	9.68	10.02	19.320	12.86	30	Pass
10	2457	7.45	6.34	9.863	9.94	30	Pass
11	2462	1.88	0.07	2.559	4.08	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.

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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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