

Partial FCC Test Report

Report No.: RF170927C20B-3

FCC ID: B949260NGWM

Test Model: TPN-Q200

Received Date: Oct. 27, 2017

Test Date: Nov. 24, 2017 ~ Nov. 26, 2017

Issued Date: Nov. 30, 2017

Applicant: HP Inc.

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

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**FCC Registration /
Designation Number:** 427177 / TW0011



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Release Control Record

Issue No.	Description	Date Issued
RF170927C20B-3	Original Release	Nov. 30, 2017

1 Certificate of Conformity

Product: Notebook Computer

Brand: HP

Test Model: TPN-Q200

Sample Status: Production Unit

Applicant: HP Inc.

Test Date: Nov. 24, 2017 ~ Nov. 26, 2017

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

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

Prepared by : Evonne Liu, **Date:** Nov. 30, 2017
Evonne Liu / Specialist

Approved by : Dylan Chiou, **Date:** Nov. 30, 2017
Dylan Chiou / Project Engineer

2 Summary of Test Results

47 CFR FCC Part 15, Subpart E (Section 15.407)			
FCC Clause	Test Item	Result	Remarks
15.407(b)(6)	AC Power Conducted Emissions	N/A	Refer to Note
15.407(b) (1/2/3/4(i/ii)/6)	Radiated Emissions & Band Edge Measurement	Pass	Meet the requirement of limit. Minimum passing margin is -1.00 dB at 5350.77 MHz
15.407(a)(1/2/3)	Max Average Transmit Power	Pass	Meet the requirement of limit.
15.407(a)(1/2/3)	Peak Power Spectral Density	N/A	Refer to Note
15.407(e)	6 dB Bandwidth	N/A	Refer to Note
15.407(g)	Frequency Stability	N/A	Refer to Note
15.203	Antenna Requirement	N/A	Refer to Note

Note: Only test item of Radiated Emissions and Transmit Power were performed for this report. For other test data, please refer to BV Report No.: 170524-01.TR01/170524-01.TR02/170524-01.TR03 for WLAN module (Brand: Intel, Model: 9260NGW).

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	Expended Uncertainty (k=2) (±)
Radiated Emissions up to 1 GHz	30 MHz ~ 200 MHz	2.0153 dB
	200 MHz ~1000 MHz	2.0224 dB
Radiated Emissions above 1 GHz	1 GHz ~ 18 GHz	1.0121 dB
	18 GHz ~ 40 GHz	1.1508 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Notebook Computer
Brand	HP
Test Model	TPN-Q200
Status of EUT	Production Unit
Power Supply Rating	19.5 Vdc (Adapter)
Modulation Type	256QAM, 64QAM, 16QAM, QPSK, BPSK
Modulation Technology	OFDM
Transfer Rate	802.11a: 54.0/ 48.0/ 36.0/ 24.0/ 18.0/ 12.0/ 9.0/ 6.0 Mbps 802.11n: up to MCS7 802.11ac: up to V9
Operating Frequency	5180 ~ 5240 MHz, 5260 ~ 5320 MHz, 5500 ~ 5700 MHz, 5745 ~ 5825 MHz
Number of Channel	5180 ~ 5240 MHz: 4 for 802.11a, 802.11n (HT20) 2 for 802.11n (HT40) 1 for 802.11ac (VHT80) 5260 ~ 5320 MHz: 4 for 802.11a, 802.11n (HT20) 2 for 802.11n (HT40) 1 for 802.11ac (VHT80) 5500 ~ 5700 MHz: 11 for 802.11a, 802.11n (HT20) 5 for 802.11n (HT40) 2 for 802.11ac (VHT80) 5745 ~ 5825 MHz: 5 for 802.11a, 802.11n (HT20) 2 for 802.11n (HT40) 1 for 802.11ac (VHT80)
Antenna Type	Refer to Note as below
Antenna Connector	N/A
Accessory Device	N/A
Data Cable Supplied	N/A

Note:

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

Modulation Mode	Tx Function
802.11a	2TX
802.11n (HT20)	2TX
802.11n (HT40)	2TX
802.11ac (VHT80)	2TX

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

2. The antenna information is listed as below.

Antenna Type	Mode	Manufacturer	Parts Number	Antenna Gain			
				WLAN 2.4 GHz	WLAN 5.15~5.35 GHz	WLAN 5.47~5.725 GHz	WLAN 5.725~5.850 GHz
PIFA	NB	WNC	WLAN Main Antenna: DQ6415GB200 WLAN Aux Antenna: DQ6415GB200	2.48	2.39	-0.16	-1.17
	Tablet	WNC	WLAN Main Antenna: DQ6415GB200 WLAN Aux Antenna: DQ6415GB200	1.21	2.38	1.45	0.82

* Only the antenna which has the worst gain is chosen as a representative for final test.

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

3.2 Description of Test Modes

For 5180 ~ 5240 MHz

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

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

2 channels are provided for 802.11n (HT40):

Channel	Frequency (MHz)	Channel	Frequency (MHz)
38	5190	46	5230

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency (MHz)
42	5210

For 5260 ~ 5320 MHz

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

Channel	Frequency (MHz)	Channel	Frequency (MHz)
52	5260	60	5300
56	5280	64	5320

2 channels are provided for 802.11n (HT40):

Channel	Frequency (MHz)	Channel	Frequency (MHz)
54	5270	62	5310

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency (MHz)
58	5290

For 5500 ~ 5700 MHz

11 channels are provided for 802.11a, 802.11n (HT20):

Channel	Frequency (MHz)	Channel	Frequency (MHz)
100	5500	124	5620
104	5520	128	5640
108	5540	132	5660
112	5560	136	5680
116	5580	140	5700
120	5600		

5 channels are provided for 802.11n (HT40):

Channel	Frequency (MHz)	Channel	Frequency (MHz)
102	5510	126	5630
110	5550	134	5670
118	5590		

2 channels are provided for 802.11ac (VHT80):

Channel	Frequency (MHz)	Channel	Frequency (MHz)
106	5530	122	5610

For 5745 ~ 5825 MHz:

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

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

2 channels are provided for 802.11n (HT40):

Channel	Frequency (MHz)	Channel	Frequency (MHz)
151	5755	159	5795

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency (MHz)
155	5775

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:

- The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on X-plane for 5180-5320 and Y-plan for 5500-5825.
- "-" 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	Frequency Band (MHz)	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	5180-5240	802.11a	36 to 48	36, 44, 48	OFDM	BPSK	6.0
		802.11n (VHT20)	36 to 48	36, 44, 48	OFDM	BPSK	MCS0
		802.11n (VHT40)	38 to 46	38, 46	OFDM	BPSK	MCS0
		802.11ac (VHT80)	42	42	OFDM	BPSK	MCS0
	5260-5320	802.11a	52 to 64	52, 60, 64	OFDM	BPSK	6.0
		802.11n (VHT20)	52 to 64	52, 60, 64	OFDM	BPSK	MCS0
		802.11n (VHT40)	54 to 62	54, 62	OFDM	BPSK	MCS0
		802.11ac (VHT80)	58	58	OFDM	BPSK	MCS0
	5500-5700	802.11a	100 to 140	100, 116, 140	OFDM	BPSK	6.0
		802.11n (VHT20)	100 to 140	100, 116, 140	OFDM	BPSK	MCS0
		802.11n (VHT40)	102 to 134	102, 110, 134	OFDM	BPSK	MCS0
		802.11ac (VHT80)	106 to 122	106, 122	OFDM	BPSK	MCS0
	5745-5825	802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6.0
		802.11n (VHT20)	149 to 165	149, 157, 165	OFDM	BPSK	MCS0
		802.11n (VHT40)	151 to 159	151, 159	OFDM	BPSK	MCS0
		802.11ac (VHT80)	155	155	OFDM	BPSK	MCS0

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	Frequency Band (MHz)	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	5260-5320	802.11a	52 to 64	60	OFDM	BPSK	6.0

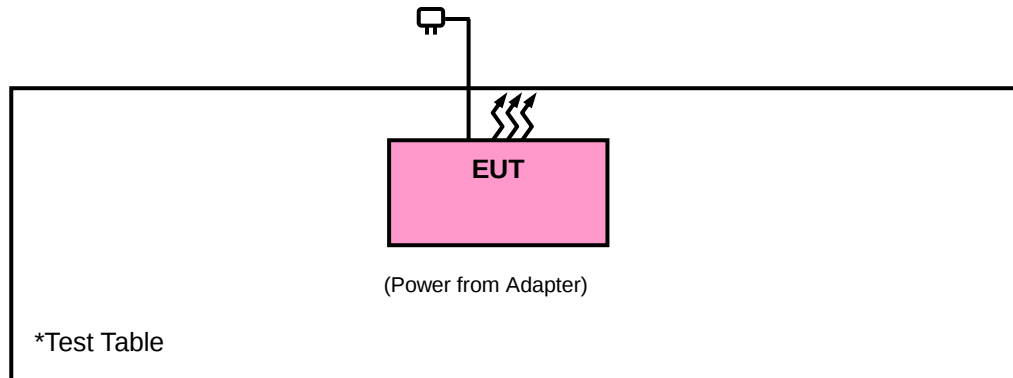
Test Condition:

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

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 E (15.407)

789033 D02 General UNII Test Procedures New Rules v01r04

644545 D01 Guidance for IEEE 802 11ac v01r02

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 Limits of Unwanted Emission Out of the Restricted Bands

Applicable To		Limit	
789033 D02 General UNII Test Procedures New Rules v01r04		Field Strength at 3 m	
		PK: 74 (dBμV/m)	AV: 54 (dBμV/m)
Frequency Band	Applicable To	EIRP Limit	Equivalent Field Strength at 3 m
5150~5250 MHz	15.407(b)(1)	PK: -27 (dBm/MHz)	PK: 68.2 (dBμV/m)
5250~5350 MHz	15.407(b)(2)		
5470~5725 MHz	15.407(b)(3)		
5725~5850 MHz	15.407(b)(4)(i)	PK:-27 (dBm/MHz) ^{*1} PK:10 (dBm/MHz) ^{*2} PK:15.6 (dBm/MHz) ^{*3} PK:27 (dBm/MHz) ^{*4}	PK: 68.2 (dBμV/m) ^{*1} PK:105.2 (dBμV/m) ^{*2} PK: 110.8 (dBμV/m) ^{*3} PK:122.2 (dBμV/m) ^{*4}
	15.407(b)(4)(ii)	Emission limits in section 15.247(d)	

^{*1} beyond 75 MHz or more above of the band edge.

^{*2} below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above.

^{*3} below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above.

^{*4} from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

Note:

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

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

4.1.3 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver Agilent Technologies	N9038A	MY52260177	Jul. 05, 2017	Jul. 04, 2018
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Dec. 13, 2016	Dec. 12, 2017
BILOG Antenna SCHWARZBECK	VULB9168	9168-472	Dec. 16, 2016	Dec. 15, 2017
HORN Antenna ETS-Lindgren	3117	00143293	Dec. 29, 2016	Dec. 28, 2017
HORN Antenna SCHWARZBECK	BBHA 9170	9170-480	Dec. 14, 2016	Dec. 13, 2017
Fixed Attenuator Mini-Circuits	MDCS18N-10	MDCS18N-10-01	Apr. 17, 2017	Apr. 16, 2018
Bluetooth Tester	CBT	100980	Jun. 28, 2017	Jun. 27, 2019
Loop Antenna	HLA 6121	45745	May 19, 2017	May 18, 2018
Preamplifier Agilent	310N	187226	Jun. 23, 2017	Jun. 22, 2018
Preamplifier Agilent	83017A	MY39501357	Jun. 23, 2017	Jun. 22, 2018
Power Meter Anritsu	ML2495A	1012010	Aug. 15, 2017	Aug. 14, 2018
Power Sensor Anritsu	MA2411B	1315050	Aug. 15, 2017	Aug. 14, 2018
RF signal cable ETS-LINDGREN	5D-FB	Cable-CH1-01(R FC-SMS-100-SM S-120+RFC-SMS -100-SMS-400)	Jun. 23, 2017	Jun. 22, 2018
RF signal cable ETS-LINDGREN	8D-FB	Cable-CH1-02(R FC-SMS-100-SM S-24)	Jun. 23, 2017	Jun. 22, 2018
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 / 24 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HsinTien Chamber 1.
3. The horn antenna and preamplifier (model: 83017A) are used only for the measurement of emission frequency above 1 GHz if tested.
4. The IC Site Registration No. is IC7450I-1.

4.1.4 Test Procedures

- a. The EUT was placed on the top of a rotating table 0.8 meters (for below 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:

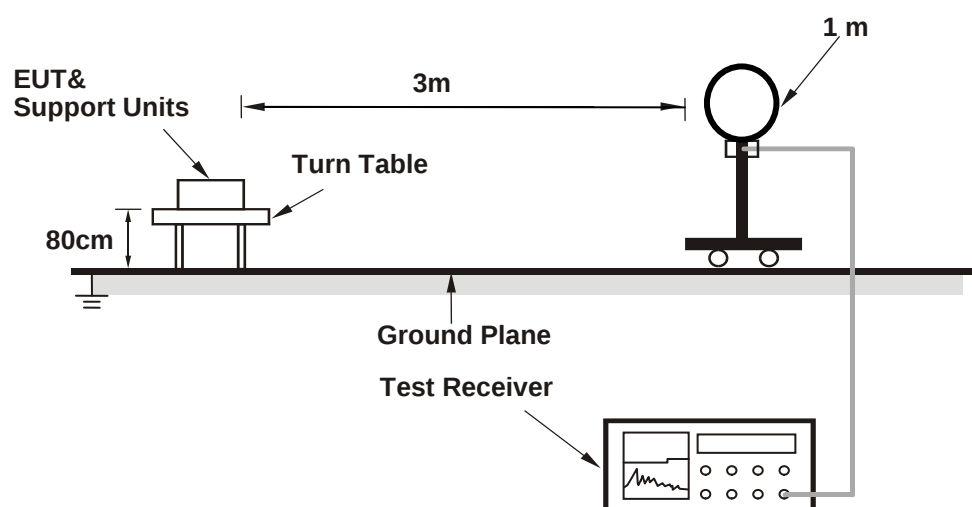
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz & 360 kHz for Quasi-peak detection (QP) at frequency below 1 GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1 GHz.
3. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 1/T for Average (Duty cycle < 98 %) detection at frequency above 1 GHz.
4. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 10 Hz (Duty cycle ≥ 98 %) for Average detection (AV) at frequency above 1 GHz.
5. All modes of operation were investigated and the worst-case emissions are reported.

4.1.5 Deviation from Test Standard

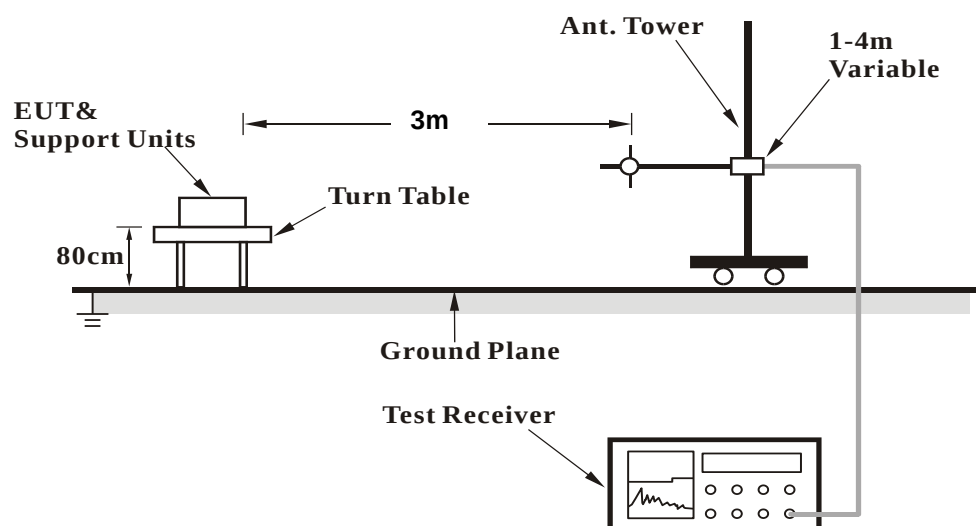
No deviation.

4.1.6 Test Set Up

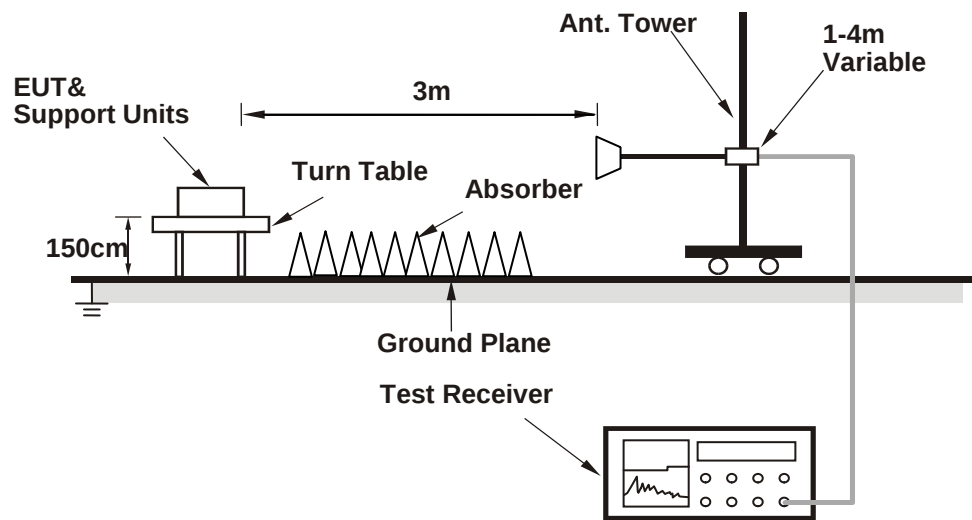
<Radiated emission below 30 MHz>



<Frequency Range below 1 GHz>



<Frequency Range above 1 GHz>



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

4.1.7 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.

4.1.8 Test Results

Above 1 GHz Data :

802.11a

EUT Test Condition		Measurement Detail	
Channel	Channel 36	Frequency Range	1 GHz ~ 40 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)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5149.85	50.74	42.49	54	-3.26	34.12	8.13	34	100	43	Average
5149.85	63.79	55.54	74	-10.21	34.12	8.13	34	100	43	Peak
5180	101.49	93.18			34.15	8.16	34	100	43	Average
5180	109.06	100.75			34.15	8.16	34	100	43	Peak
*10360	55.2	40.9	68.2	-13	37.12	12.3	35.12	135	300	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5149.55	44.98	36.73	54	-9.02	34.12	8.13	34	200	142	Average
5149.55	59.13	50.88	74	-14.87	34.12	8.13	34	200	142	Peak
5180	93.36	85.05			34.15	8.16	34	200	142	Average
5180	101.69	93.38			34.15	8.16	34	200	142	Peak
*10360	57.37	43.07	68.2	-10.83	37.12	12.3	35.12	154	222	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5180 MHz: Fundamental Frequency
- *: Out of Restricted Band

EUT Test Condition		Measurement Detail	
Channel	Channel 44	Frequency Range	1 GHz ~ 40 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)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5148.65	47.72	39.47	54	-6.28	34.12	8.13	34	100	43	Average
5148.65	60.69	52.44	74	-13.31	34.12	8.13	34	100	43	Peak
5220	104.65	96.26			34.17	8.22	34	100	43	Average
5220	112.32	103.93			34.17	8.22	34	100	43	Peak
5375.19	45.12	36.46	54	-8.88	34.29	8.41	34.04	100	43	Average
5375.19	55.89	47.23	74	-18.11	34.29	8.41	34.04	100	43	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5148.65	44.41	36.16	54	-9.59	34.12	8.13	34	200	142	Average
5148.65	55.8	47.55	74	-18.2	34.12	8.13	34	200	142	Peak
5220	96.49	88.1			34.17	8.22	34	200	142	Average
5220	104.49	96.1			34.17	8.22	34	200	142	Peak
5367.6	42.98	34.31	54	-11.02	34.29	8.41	34.03	200	142	Average
5367.6	53.47	44.8	74	-20.53	34.29	8.41	34.03	200	142	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5220 MHz: Fundamental Frequency
- *: Out of Restricted Band

EUT Test Condition		Measurement Detail	
Channel	Channel 48	Frequency Range	1 GHz ~ 40 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)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5240	104.65	96.21			34.19	8.26	34.01	100	43	Average
5240	112.26	103.82			34.19	8.26	34.01	100	43	Peak
5399.39	45.32	36.6	54	-8.68	34.32	8.44	34.04	100	43	Average
5399.39	55.33	46.61	74	-18.67	34.32	8.44	34.04	100	43	Peak
*10480	57.03	42.52	68.2	-11.17	37.19	12.53	35.21	158	8	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5240	96.63	88.19			34.19	8.26	34.01	200	142	Average
5240	104.43	95.99			34.19	8.26	34.01	200	142	Peak
5391.91	43.18	34.5	54	-10.82	34.31	8.41	34.04	200	142	Average
5391.91	53.47	44.79	74	-20.53	34.31	8.41	34.04	200	142	Peak
*10480	56.98	42.47	68.2	-11.22	37.19	12.53	35.21	131	119	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5240 MHz: Fundamental Frequency
- *: Out of Restricted Band

EUT Test Condition		Measurement Detail	
Channel	Channel 52	Frequency Range	1 GHz ~ 40 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)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5148.2	44.73	36.48	54	-9.27	34.12	8.13	34	100	34	Average
5148.2	55.45	47.2	74	-18.55	34.12	8.13	34	100	34	Peak
5260	105.49	97.03			34.21	8.26	34.01	100	34	Average
5260	113.53	105.07			34.21	8.26	34.01	100	34	Peak
*10520	56.43	41.84	68.2	-11.77	37.21	12.61	35.23	124	213	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5120	43.06	34.86	54	-10.94	34.09	8.1	33.99	212	132	Average
5120	53.9	45.7	74	-20.1	34.09	8.1	33.99	212	132	Peak
5260	97.77	89.31			34.21	8.26	34.01	212	132	Average
5260	105.7	97.24			34.21	8.26	34.01	212	132	Peak
*10520	56.45	41.86	68.2	-11.75	37.21	12.61	35.23	171	99	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5260 MHz: Fundamental Frequency
- *: Out of Restricted Band

EUT Test Condition		Measurement Detail	
Channel	Channel 60	Frequency Range	1 GHz ~ 40 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)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5144.15	44.12	35.87	54	-9.88	34.12	8.13	34	100	34	Average
5144.15	54.26	46.01	74	-19.74	34.12	8.13	34	100	34	Peak
5300	103.27	94.73			34.24	8.32	34.02	100	34	Average
5300	111.22	102.68			34.24	8.32	34.02	100	34	Peak
5350.77	53	44.37	54	-1	34.28	8.38	34.03	100	34	Average
5350.77	64.23	55.6	74	-9.77	34.28	8.38	34.03	100	34	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5120	42.75	34.55	54	-11.25	34.09	8.1	33.99	212	132	Average
5120	53.6	45.4	74	-20.4	34.09	8.1	33.99	212	132	Peak
5300	95.52	86.98			34.24	8.32	34.02	212	132	Average
5300	103.07	94.53			34.24	8.32	34.02	212	132	Peak
5350	47.06	38.43	54	-6.94	34.28	8.38	34.03	212	132	Average
5350	57.46	48.83	74	-16.54	34.28	8.38	34.03	212	132	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5300 MHz: Fundamental Frequency
- *: Out of Restricted Band

EUT Test Condition		Measurement Detail	
Channel	Channel 64	Frequency Range	1 GHz ~ 40 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)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5320	100.88	92.3			34.25	8.35	34.02	100	34	Average
5320	108.48	99.9			34.25	8.35	34.02	100	34	Peak
5350.77	47.92	39.29	54	-6.08	34.28	8.38	34.03	100	34	Average
5350.77	60.65	52.02	74	-13.35	34.28	8.38	34.03	100	34	Peak
10640	46.97	32.24	54	-7.03	37.31	12.71	35.29	129	290	Average
10640	56.29	41.56	74	-17.71	37.31	12.71	35.29	129	290	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5320	92.53	83.95			34.25	8.35	34.02	212	132	Average
5320	100.62	92.04			34.25	8.35	34.02	212	132	Peak
5350.33	44.01	35.38	54	-9.99	34.28	8.38	34.03	212	132	Average
5350.33	53.53	44.9	74	-20.47	34.28	8.38	34.03	212	132	Peak
10640	46.86	32.13	54	-7.14	37.31	12.71	35.29	134	310	Average
10640	56.3	41.57	74	-17.7	37.31	12.71	35.29	134	310	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5320 MHz: Fundamental Frequency
- *: Out of Restricted Band

EUT Test Condition		Measurement Detail	
Channel	Channel 100	Frequency Range	1 GHz ~ 40 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)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5459.28	43.24	34.42	54	-10.76	34.36	8.51	34.05	100	52	Average
5459.28	54.33	45.51	74	-19.67	34.36	8.51	34.05	100	52	Peak
*5469.84	54.49	45.66	68.2	-13.71	34.37	8.51	34.05	100	52	Peak
5500	91.96	83.04	54	37.96	34.4	8.57	34.05	100	52	Average
5500	99.76	90.84	74	25.76	34.4	8.57	34.05	100	52	Peak
11000	48.41	33.33	54	-5.59	37.6	12.96	35.48	127	54	Average
11000	58.4	43.32	74	-15.6	37.6	12.96	35.48	127	54	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5458.48	45.6	36.78	54	-8.4	34.36	8.51	34.05	211	326	Average
5458.48	55.75	46.93	74	-18.25	34.36	8.51	34.05	211	326	Peak
*5468.4	61.95	53.12	68.2	-6.25	34.37	8.51	34.05	211	326	Peak
5500	100.44	91.52	54	46.44	34.4	8.57	34.05	211	326	Average
5500	108.43	99.51	74	34.43	34.4	8.57	34.05	211	326	Peak
11000	48.37	33.29	54	-5.63	37.6	12.96	35.48	139	254	Average
11000	57.12	42.04	74	-16.88	37.6	12.96	35.48	139	254	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5500 MHz: Fundamental Frequency
- *: Out of Restricted Band

EUT Test Condition		Measurement Detail	
Channel	Channel 116	Frequency Range	1 GHz ~ 40 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)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5456.88	43.22	34.4	54	-10.78	34.36	8.51	34.05	100	52	Average
5456.88	53.91	45.09	74	-20.09	34.36	8.51	34.05	100	52	Peak
5468.88	53.15	44.32	68.2	-15.05	34.37	8.51	34.05	100	52	Peak
5580	95.46	86.47			34.47	8.6	34.08	100	52	Average
5580	103.51	94.52			34.47	8.6	34.08	100	52	Peak
5724.28	52.54	43.38	68.2	-15.66	34.62	8.65	34.11	100	52	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5419.44	45.51	36.74	54	-8.49	34.33	8.48	34.04	211	326	Average
5419.44	55.14	46.37	74	-18.86	34.33	8.48	34.04	211	326	Peak
5470.48	60	51.17	68.2	-8.2	34.37	8.51	34.05	211	326	Peak
5580	104.77	95.78			34.47	8.6	34.08	211	326	Average
5580	112.55	103.56			34.47	8.6	34.08	211	326	Peak
5723.96	53.84	44.68	68.2	-14.36	34.62	8.65	34.11	211	326	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5580 MHz: Fundamental Frequency
- *: Out of Restricted Band

EUT Test Condition		Measurement Detail	
Channel	Channel 140	Frequency Range	1 GHz ~ 40 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)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5700	92.52	83.39	54	38.52	34.59	8.64	34.1	100	52	Average
5700	100.18	91.05	74	26.18	34.59	8.64	34.1	100	52	Peak
*5725.4	52.98	43.82	68.2	-15.22	34.62	8.65	34.11	100	52	Peak
11400	47.39	32.29	54	-6.61	37.84	12.67	35.41	113	355	Average
11400	56.63	41.53	74	-17.37	37.84	12.67	35.41	113	355	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5700	101.26	92.13	54	47.26	34.59	8.64	34.1	211	326	Average
5700	109.04	99.91	74	35.04	34.59	8.64	34.1	211	326	Peak
*5724.28	60.07	50.91	68.2	-8.13	34.62	8.65	34.11	211	326	Peak
11400	47.43	32.33	54	-6.57	37.84	12.67	35.41	137	255	Average
11400	56.94	41.84	74	-17.06	37.84	12.67	35.41	137	255	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5700 MHz: Fundamental Frequency
- *: Out of Restricted Band

EUT Test Condition		Measurement Detail	
Channel	Channel 149	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Karl Lee

<Spurious Emission>

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5745	94.99	85.8			34.64	8.66	34.11	100	16	Average
5745	102.9	93.71			34.64	8.66	34.11	100	16	Peak
11490	47.7	32.58	54	-6.3	37.89	12.62	35.39	114	185	Average
11490	58.03	42.91	74	-15.97	37.89	12.62	35.39	114	185	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5745	101.24	92.05			34.64	8.66	34.11	208	340	Average
5745	109.51	100.32			34.64	8.66	34.11	208	340	Peak
11490	47.51	32.39	54	-6.49	37.89	12.62	35.39	121	201	Average
11490	57.42	42.3	74	-16.58	37.89	12.62	35.39	121	201	Peak

<Out of Band Emission (OOBE)>

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
*5587.675	53.87	44.86	68.2	-14.33	34.49	8.6	34.08	100	16	Peak
5652.25	53.81	44.72	69.86	-16.05	34.56	8.62	34.09	100	16	Peak
5920.525	52.16	42.78	71.51	-19.35	34.81	8.73	34.16	100	16	Peak
*5949.4	53.95	44.52	68.2	-14.25	34.85	8.74	34.16	100	16	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
*5577.175	55.31	46.31	68.2	-12.89	34.47	8.6	34.07	208	340	Peak
5653.825	54.61	45.52	71.03	-16.42	34.56	8.63	34.1	208	340	Peak
5921.575	53.52	44.12	70.73	-17.21	34.83	8.73	34.16	208	340	Peak
*5956.225	54.13	44.68	68.2	-14.07	34.87	8.74	34.16	208	340	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5745 MHz: Fundamental Frequency
- *: Out of Restricted Band

EUT Test Condition		Measurement Detail	
Channel	Channel 157	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Karl Lee

<Spurious Emission>

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5785	94.35	85.12			34.68	8.68	34.13	100	15	Average
5785	102.51	93.28			34.68	8.68	34.13	100	15	Peak
11570	47.87	32.56	54	-6.13	38	12.68	35.37	137	219	Average
11570	57.57	42.26	74	-16.43	38	12.68	35.37	137	219	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5785	101.1	91.87			34.68	8.68	34.13	208	340	Average
5785	109.04	99.81			34.68	8.68	34.13	208	340	Peak
11570	47.66	32.35	54	-6.34	38	12.68	35.37	195	200	Average
11570	57.13	41.82	74	-16.87	38	12.68	35.37	195	200	Peak

<Out of Band Emission (OOBE)>

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
*5591.875	54.54	45.53	68.2	-13.66	34.49	8.6	34.08	100	15	Peak
5652.25	52.48	43.39	69.86	-17.38	34.56	8.62	34.09	100	15	Peak
5916.85	52.74	43.36	74.23	-21.49	34.81	8.73	34.16	100	15	Peak
*5972.5	54.34	44.89	68.2	-13.86	34.87	8.75	34.17	100	15	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
*5562.475	54.4	45.43	68.2	-13.8	34.45	8.59	34.07	208	340	Peak
5655.4	52.44	43.35	72.2	-19.76	34.56	8.63	34.1	208	340	Peak
5911.075	54.55	45.18	78.5	-23.95	34.81	8.72	34.16	208	340	Peak
*6022.9	54.14	44.63	68.2	-14.06	34.92	8.77	34.18	208	340	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5785 MHz: Fundamental Frequency
- *: Out of Restricted Band

EUT Test Condition		Measurement Detail	
Channel	Channel 165	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Karl Lee

<Spurious Emission>

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5825	94.31	85.02			34.73	8.69	34.13	100	15	Average
5825	102.5	93.21			34.73	8.69	34.13	100	15	Peak
11650	48.07	32.54	54	-5.93	38.09	12.8	35.36	180	326	Average
11650	57.81	42.28	74	-16.19	38.09	12.8	35.36	180	326	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5825	101.2	91.91			34.73	8.69	34.13	208	340	Average
5825	109.11	99.82			34.73	8.69	34.13	208	340	Peak
11650	48.03	32.5	54	-5.97	38.09	12.8	35.36	121	320	Average
11650	58.13	42.6	74	-15.87	38.09	12.8	35.36	121	320	Peak

<Out of Band Emission (OOBE)>

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
*5603.425	54.53	45.5	68.2	-13.67	34.5	8.61	34.08	100	15	Peak
5659.075	52.02	42.93	74.92	-22.9	34.56	8.63	34.1	100	15	Peak
5921.05	52.36	42.98	71.12	-18.76	34.81	8.73	34.16	100	15	Peak
*5994.025	54.77	45.28	68.2	-13.43	34.9	8.76	34.17	100	15	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
*5594.5	54.7	45.69	68.2	-13.5	34.49	8.6	34.08	208	340	Peak
5656.975	52.33	43.24	73.36	-21.03	34.56	8.63	34.1	208	340	Peak
5915.275	52.92	43.54	75.4	-22.48	34.81	8.73	34.16	208	340	Peak
*5927.35	54.23	44.83	68.2	-13.97	34.83	8.73	34.16	208	340	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5825 MHz: Fundamental Frequency
- *: Out of Restricted Band

802.11ac (VHT20)

EUT Test Condition		Measurement Detail	
Channel	Channel 36	Frequency Range	1 GHz ~ 40 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)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5149.85	45.43	37.18	54	-8.57	34.12	8.13	34	102	43	Average
5149.85	55.95	47.7	74	-18.05	34.12	8.13	34	102	43	Peak
5180	96.37	88.06			34.15	8.16	34	102	43	Average
5180	103.13	94.82			34.15	8.16	34	102	43	Peak
*10360	55.93	41.63	68.2	-12.27	37.12	12.3	35.12	122	5	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5150	52.86	44.61	54	-1.14	34.12	8.13	34	229	314	Average
5150	64.86	56.61	74	-9.14	34.12	8.13	34	229	314	Peak
5180	103.57	95.26			34.15	8.16	34	220	314	Average
5180	110.52	102.21			34.15	8.16	34	220	314	Peak
*10360	56.06	41.76	68.2	-12.14	37.12	12.3	35.12	124	85	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5180 MHz: Fundamental Frequency
- *: Out of Restricted Band

EUT Test Condition		Measurement Detail	
Channel	Channel 44	Frequency Range	1 GHz ~ 40 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)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5147.9	42.96	34.71	54	-11.04	34.12	8.13	34	102	43	Average
5147.9	53.23	44.98	74	-20.77	34.12	8.13	34	102	43	Peak
5220	97.46	89.07			34.17	8.22	34	102	43	Average
5220	104.19	95.8			34.17	8.22	34	102	43	Peak
5448.67	42.94	34.11	54	-11.06	34.36	8.51	34.04	102	43	Average
5448.67	54.14	45.31	74	-19.86	34.36	8.51	34.04	102	43	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5149.85	44.85	36.6	54	-9.15	34.12	8.13	34	220	314	Average
5149.85	54.27	46.02	74	-19.73	34.12	8.13	34	220	314	Peak
5220	104.34	95.95			34.17	8.22	34	220	314	Average
5220	111.81	103.42			34.17	8.22	34	220	314	Peak
5371.34	45.07	36.4	54	-8.93	34.29	8.41	34.03	220	314	Average
5371.34	55.05	46.38	74	-18.95	34.29	8.41	34.03	220	314	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5220 MHz: Fundamental Frequency
- *: Out of Restricted Band

EUT Test Condition		Measurement Detail	
Channel	Channel 48	Frequency Range	1 GHz ~ 40 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)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5240	99.85	91.41			34.19	8.26	34.01	102	43	Average
5240	106.48	98.04			34.19	8.26	34.01	102	43	Peak
5442.18	42.69	33.9	54	-11.31	34.35	8.48	34.04	102	43	Average
5442.18	54.11	45.32	74	-19.89	34.35	8.48	34.04	102	43	Peak
*10480	56.95	42.44	68.2	-11.25	37.19	12.53	35.21	154	8	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5240	106.47	98.03			34.19	8.26	34.01	220	314	Average
5240	113.56	105.12			34.19	8.26	34.01	220	314	Peak
5350.33	45.48	36.85	54	-8.52	34.28	8.38	34.03	220	314	Average
5350.33	55.82	47.19	74	-18.18	34.28	8.38	34.03	220	314	Peak
*10480	57.16	42.65	68.2	-11.04	37.19	12.53	35.21	119	314	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5240 MHz: Fundamental Frequency
- *: Out of Restricted Band

EUT Test Condition		Measurement Detail	
Channel	Channel 52	Frequency Range	1 GHz ~ 40 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)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5144.6	42.61	34.36	54	-11.39	34.12	8.13	34	189	293	Average
5144.6	52.7	44.45	74	-21.3	34.12	8.13	34	189	293	Peak
5260	94.95	86.49			34.21	8.26	34.01	189	293	Average
5260	102.76	94.3			34.21	8.26	34.01	189	293	Peak
*10520	56.97	42.38	68.2	-11.23	37.21	12.61	35.23	185	102	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5149.7	45.24	36.99	54	-8.76	34.12	8.13	34	208	316	Average
5149.7	56.58	48.33	74	-17.42	34.12	8.13	34	208	316	Peak
5260	109.69	101.23			34.21	8.26	34.01	208	316	Average
5260	116.55	108.09			34.21	8.26	34.01	208	316	Peak
*10520	56.33	41.74	68.2	-11.87	37.21	12.61	35.23	143	221	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5260 MHz: Fundamental Frequency
- *: Out of Restricted Band

EUT Test Condition		Measurement Detail	
Channel	Channel 60	Frequency Range	1 GHz ~ 40 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)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5144.3	42.67	34.42	54	-11.33	34.12	8.13	34	189	293	Average
5144.3	53.51	45.26	74	-20.49	34.12	8.13	34	189	293	Peak
5300	97.39	88.85			34.24	8.32	34.02	189	293	Average
5300	104.85	96.31			34.24	8.32	34.02	189	293	Peak
5350.11	45.23	36.6	54	-8.77	34.28	8.38	34.03	189	293	Average
5350.11	55.5	46.87	74	-18.5	34.28	8.38	34.03	189	293	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5149.7	44.74	36.49	54	-9.26	34.12	8.13	34	208	316	Average
5149.7	54.45	46.2	74	-19.55	34.12	8.13	34	208	316	Peak
5300	107.17	98.63			34.24	8.32	34.02	208	316	Average
5300	114.37	105.83			34.24	8.32	34.02	208	316	Peak
5350.55	52.37	43.74	54	-1.63	34.28	8.38	34.03	200	319	Average
5350.55	64.23	55.6	74	-9.77	34.28	8.38	34.03	200	319	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5300 MHz: Fundamental Frequency
- *: Out of Restricted Band

EUT Test Condition		Measurement Detail	
Channel	Channel 64	Frequency Range	1 GHz ~ 40 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)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5320	94.86	86.28			34.25	8.35	34.02	189	293	Average
5320	102.1	93.52			34.25	8.35	34.02	189	293	Peak
5351.21	43.76	35.13	54	-10.24	34.28	8.38	34.03	189	293	Average
5351.21	53.51	44.88	74	-20.49	34.28	8.38	34.03	189	293	Peak
10640	47.25	32.52	54	-6.75	37.31	12.71	35.29	126	53	Average
10640	57.18	42.45	74	-16.82	37.31	12.71	35.29	126	53	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5320	104.66	96.08			34.25	8.35	34.02	208	316	Average
5320	110.78	102.2			34.25	8.35	34.02	208	316	Peak
5351.21	50.05	41.42	54	-3.95	34.28	8.38	34.03	199	305	Average
5351.21	61.92	53.29	74	-12.08	34.28	8.38	34.03	199	305	Peak
10640	47.13	32.4	54	-6.87	37.31	12.71	35.29	162	185	Average
10640	56.84	42.11	74	-17.16	37.31	12.71	35.29	162	185	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5320 MHz: Fundamental Frequency
- *: Out of Restricted Band

EUT Test Condition		Measurement Detail	
Channel	Channel 100	Frequency Range	1 GHz ~ 40 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)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5460.08	46.38	37.56	54	-7.62	34.36	8.51	34.05	138	37	Average
5460.08	58.8	49.98	74	-15.2	34.36	8.51	34.05	138	37	Peak
*5468.56	67.02	58.19	68.2	-1.18	34.37	8.51	34.05	138	37	Peak
5500	104.76	95.84			34.4	8.57	34.05	149	24	Average
5500	111.27	102.35			34.4	8.57	34.05	149	24	Peak
11000	48.11	33.03	54	-5.89	37.6	12.96	35.48	196	241	Average
11000	57.54	42.46	74	-16.46	37.6	12.96	35.48	196	241	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5453.36	43.31	34.49	54	-10.69	34.36	8.51	34.05	195	64	Average
5453.36	53.46	44.64	74	-20.54	34.36	8.51	34.05	195	64	Peak
*5468.56	57.95	49.12	68.2	-10.25	34.37	8.51	34.05	195	64	Peak
5500	96.71	87.79			34.4	8.57	34.05	146	66	Average
5500	104.02	95.1			34.4	8.57	34.05	146	66	Peak
11000	47.61	32.53	54	-6.39	37.6	12.96	35.48	156	208	Average
11000	57.39	42.31	74	-16.61	37.6	12.96	35.48	156	208	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5500 MHz: Fundamental Frequency
- *: Out of Restricted Band

EUT Test Condition		Measurement Detail	
Channel	Channel 116	Frequency Range	1 GHz ~ 40 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)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5418.64	46.22	37.49	54	-7.78	34.33	8.44	34.04	142	24	Average
5418.64	55.12	46.39	74	-18.88	34.33	8.44	34.04	142	24	Peak
*5469.84	53.18	44.35	68.2	-15.02	34.37	8.51	34.05	142	24	Peak
5580	108.87	99.88	54	54.87	34.47	8.6	34.08	142	24	Average
5580	115.13	106.14	74	41.13	34.47	8.6	34.08	142	24	Peak
*5725.96	54.81	45.65	68.2	-13.39	34.62	8.65	34.11	142	24	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5434.48	43.02	34.23	54	-10.98	34.35	8.48	34.04	110	60	Average
5434.48	53.25	44.46	74	-20.75	34.35	8.48	34.04	110	60	Peak
*5469.84	52.93	44.1	68.2	-15.27	34.37	8.51	34.05	110	60	Peak
5580	99.44	90.45	54	45.44	34.47	8.6	34.08	110	60	Average
5580	107.25	98.26	74	33.25	34.47	8.6	34.08	110	60	Peak
*5724.92	53.12	43.96	68.2	-15.08	34.62	8.65	34.11	110	60	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5580 MHz: Fundamental Frequency
- *: Out of Restricted Band

EUT Test Condition		Measurement Detail	
Channel	Channel 140	Frequency Range	1 GHz ~ 40 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)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5700	104.63	95.5			34.59	8.64	34.1	136	26	Average
5700	111.89	102.76			34.59	8.64	34.1	136	26	Peak
*5724.76	67.14	57.98	68.2	-1.06	34.62	8.65	34.11	155	59	Peak
11400	47.35	32.25	54	-6.65	37.84	12.67	35.41	174	242	Average
11400	57.03	41.93	74	-16.97	37.84	12.67	35.41	174	242	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5700	94.16	85.03			34.59	8.64	34.1	122	60	Average
5700	102.36	93.23			34.59	8.64	34.1	122	60	Peak
*5724.44	58.7	49.54	68.2	-9.5	34.62	8.65	34.11	128	37	Peak
11400	48.26	33.16	54	-5.74	37.84	12.67	35.41	129	305	Average
11400	57.92	42.82	74	-16.08	37.84	12.67	35.41	129	305	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5700 MHz: Fundamental Frequency
- *: Out of Restricted Band

EUT Test Condition		Measurement Detail	
Channel	Channel 149	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Karl Lee

<Spurious Emission>

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5745	105.39	96.2			34.64	8.66	34.11	121	39	Average
5745	113.19	104			34.64	8.66	34.11	121	39	Peak
11490	48.33	33.21	54	-5.67	37.89	12.62	35.39	127	185	Average
11490	57.03	41.91	74	-16.97	37.89	12.62	35.39	127	185	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5745	99.01	89.82			34.64	8.66	34.11	152	39	Average
5745	107.74	98.55			34.64	8.66	34.11	152	39	Peak
11490	48.2	33.08	54	-5.8	37.89	12.62	35.39	123	187	Average
11490	57.99	42.87	74	-16.01	37.89	12.62	35.39	123	187	Peak

<Out of Band Emission (OOBE)>

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
*5586.1	55.24	46.23	68.2	-12.96	34.49	8.6	34.08	121	39	Peak
5654.35	56.37	47.28	71.42	-15.05	34.56	8.63	34.1	121	39	Peak
5923.15	50.86	41.46	69.57	-18.71	34.83	8.73	34.16	121	39	Peak
*5994.025	52.75	43.26	68.2	-15.45	34.9	8.76	34.17	121	39	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
*5585.05	53.83	44.82	68.2	-14.37	34.49	8.6	34.08	152	39	Peak
5651.725	50.57	41.48	69.48	-18.91	34.56	8.62	34.09	152	39	Peak
5923.675	48.86	39.46	69.18	-20.32	34.83	8.73	34.16	152	39	Peak
*5956.75	52.85	43.4	68.2	-15.35	34.87	8.74	34.16	152	39	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5745 MHz: Fundamental Frequency
- *: Out of Restricted Band

EUT Test Condition		Measurement Detail	
Channel	Channel 157	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Karl Lee

<Spurious Emission>

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5785	105.64	96.41			34.68	8.68	34.13	121	39	Average
5785	112.75	103.52			34.68	8.68	34.13	121	39	Peak
11570	48.53	33.22	54	-5.47	38	12.68	35.37	147	125	Average
11570	57.02	41.71	74	-16.98	38	12.68	35.37	147	125	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5785	98.74	89.51			34.68	8.68	34.13	152	39	Average
5785	106.67	97.44			34.68	8.68	34.13	152	39	Peak
11570	48.09	32.78	54	-5.91	38	12.68	35.37	165	108	Average
11570	57.2	41.89	74	-16.8	38	12.68	35.37	165	108	Peak

<Out of Band Emission (OOBE)>

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
*5626.525	55.62	46.57	68.2	-12.58	34.52	8.61	34.08	121	39	Peak
5652.25	51.66	42.57	69.86	-18.2	34.56	8.62	34.09	121	39	Peak
5923.675	49.52	40.12	69.18	-19.66	34.83	8.73	34.16	121	39	Peak
*5996.125	54.91	45.42	68.2	-13.29	34.9	8.76	34.17	121	39	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
*5573.5	54.01	45.02	68.2	-14.19	34.47	8.59	34.07	152	39	Peak
5651.725	50.9	41.81	69.48	-18.58	34.56	8.62	34.09	152	39	Peak
5923.15	47.96	38.56	69.57	-21.61	34.83	8.73	34.16	152	39	Peak
*6008.725	52.97	43.46	68.2	-15.23	34.92	8.76	34.17	152	39	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5785 MHz: Fundamental Frequency
- *: Out of Restricted Band

EUT Test Condition		Measurement Detail	
Channel	Channel 165	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Karl Lee

<Spurious Emission>

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5825	105.59	96.3			34.73	8.69	34.13	121	39	Average
5825	112.63	103.34			34.73	8.69	34.13	121	39	Peak
11650	47.85	32.32	54	-6.15	38.09	12.8	35.36	168	257	Average
11650	56.95	41.42	74	-17.05	38.09	12.8	35.36	168	257	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5825	99.12	89.83			34.73	8.69	34.13	152	39	Average
5825	106.82	97.53			34.73	8.69	34.13	152	39	Peak
11650	47.95	32.42	54	-6.05	38.09	12.8	35.36	103	95	Average
11650	57.24	41.71	74	-16.76	38.09	12.8	35.36	103	95	Peak

<Out of Band Emission (OOBE)>

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
*5636.5	54.32	45.25	68.2	-13.88	34.54	8.62	34.09	121	39	Peak
5652.25	50.86	41.77	69.86	-19	34.56	8.62	34.09	121	39	Peak
5923.675	51.62	42.22	69.18	-17.56	34.83	8.73	34.16	121	39	Peak
*5932.075	53.73	44.33	68.2	-14.47	34.83	8.73	34.16	121	39	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
*5585.575	53.2	44.19	68.2	-15	34.49	8.6	34.08	152	39	Peak
5652.25	50.21	41.12	69.86	-19.65	34.56	8.62	34.09	152	39	Peak
5923.15	49.63	40.23	69.57	-19.94	34.83	8.73	34.16	152	39	Peak
*5975.125	52.42	42.96	68.2	-15.78	34.88	8.75	34.17	152	39	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5825 MHz: Fundamental Frequency
- *: Out of Restricted Band

802.11ac (VHT40)

EUT Test Condition		Measurement Detail	
Channel	Channel 38	Frequency Range	1 GHz ~ 40 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)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5134.85	43.23	34.98	54	-10.77	34.11	8.13	33.99	102	43	Average
5134.85	53.82	45.57	74	-20.18	34.11	8.13	33.99	102	43	Peak
5190	90.3	81.96			34.15	8.19	34	102	43	Average
5190	97.38	89.04			34.15	8.19	34	102	43	Peak
5454.5	43.28	34.46	54	-10.72	34.36	8.51	34.05	102	43	Average
5454.5	53.68	44.86	74	-20.32	34.36	8.51	34.05	102	43	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5150	46.25	38	54	-7.75	34.12	8.13	34	220	314	Average
5150	54.54	46.29	74	-19.46	34.12	8.13	34	220	314	Peak
5190	97.49	89.15			34.15	8.19	34	220	314	Average
5190	104.16	95.82			34.15	8.19	34	220	314	Peak
5351.21	44.09	35.46	54	-9.91	34.28	8.38	34.03	220	314	Average
5351.21	53.88	45.25	74	-20.12	34.28	8.38	34.03	220	314	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5190 MHz: Fundamental Frequency
- *: Out of Restricted Band

EUT Test Condition		Measurement Detail	
Channel	Channel 46	Frequency Range	1 GHz ~ 40 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)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5148.95	45.48	37.23	54	-8.52	34.12	8.13	34	102	43	Average
5148.95	55.76	47.51	74	-18.24	34.12	8.13	34	102	43	Peak
5230	93.35	84.95			34.19	8.22	34.01	102	43	Average
5230	100.33	91.93			34.19	8.22	34.01	102	43	Peak
5397.85	43.46	34.74	54	-10.54	34.32	8.44	34.04	102	43	Average
5397.85	54.26	45.54	74	-19.74	34.32	8.44	34.04	102	43	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5148.8	51.96	43.71	54	-2.04	34.12	8.13	34	223	314	Average
5148.8	62.66	54.41	74	-11.34	34.12	8.13	34	223	314	Peak
5230	100.24	91.84			34.19	8.22	34.01	220	314	Average
5230	107.29	98.89			34.19	8.22	34.01	220	314	Peak
5351.87	46.94	38.31	54	-7.06	34.28	8.38	34.03	220	314	Average
5351.87	58.29	49.66	74	-15.71	34.28	8.38	34.03	220	314	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5230 MHz: Fundamental Frequency
- *: Out of Restricted Band

EUT Test Condition		Measurement Detail	
Channel	Channel 54	Frequency Range	1 GHz ~ 40 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)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5125.1	43.01	34.79	54	-10.99	34.11	8.1	33.99	193	294	Average
5125.1	53.19	44.97	74	-20.81	34.11	8.1	33.99	193	294	Peak
5270	92.14	83.65			34.21	8.29	34.01	193	294	Average
5270	99.21	90.72			34.21	8.29	34.01	193	294	Peak
5453.95	43.28	34.46	54	-10.72	34.36	8.51	34.05	193	294	Average
5453.95	53.28	44.46	74	-20.72	34.36	8.51	34.05	193	294	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5129	43.33	35.11	54	-10.67	34.11	8.1	33.99	208	316	Average
5129	53.29	45.07	74	-20.71	34.11	8.1	33.99	208	316	Peak
5270	102.03	93.54			34.21	8.29	34.01	208	316	Average
5270	109.68	101.19			34.21	8.29	34.01	208	316	Peak
5355.83	43.91	35.28	54	-10.09	34.28	8.38	34.03	208	316	Average
5355.83	54.5	45.87	74	-19.5	34.28	8.38	34.03	208	316	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5270 MHz: Fundamental Frequency
- *: Out of Restricted Band

EUT Test Condition		Measurement Detail	
Channel	Channel 62	Frequency Range	1 GHz ~ 40 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)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5144.45	42.96	34.71	54	-11.04	34.12	8.13	34	193	294	Average
5144.45	53.76	45.51	74	-20.24	34.12	8.13	34	193	294	Peak
5310	90.2	81.65			34.25	8.32	34.02	193	294	Average
5310	97.69	89.14			34.25	8.32	34.02	193	294	Peak
5372	43.45	34.78	54	-10.55	34.29	8.41	34.03	193	294	Average
5372	54.8	46.13	74	-19.2	34.29	8.41	34.03	193	294	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5140.7	43.36	35.1	54	-10.64	34.12	8.13	33.99	206	316	Average
5140.7	53.82	45.56	74	-20.18	34.12	8.13	33.99	206	316	Peak
5310	100.42	91.87			34.25	8.32	34.02	206	316	Average
5310	107.18	98.63			34.25	8.32	34.02	206	316	Peak
5352.53	48.65	40.02	54	-5.35	34.28	8.38	34.03	206	316	Average
5352.53	57.83	49.2	74	-16.17	34.28	8.38	34.03	206	316	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5310 MHz: Fundamental Frequency
- *: Out of Restricted Band

EUT Test Condition		Measurement Detail	
Channel	Channel 102	Frequency Range	1 GHz ~ 40 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)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5460.08	50.74	41.92	54	-3.26	34.36	8.51	34.05	171	23	Average
5460.08	65.07	56.25	74	-8.93	34.36	8.51	34.05	171	23	Peak
*5469.84	66.77	57.94	68.2	-1.43	34.37	8.51	34.05	171	23	Peak
5510	100.49	91.58			34.4	8.57	34.06	148	39	Average
5510	109.27	100.36			34.4	8.57	34.06	148	39	Peak
*5724.76	53.17	44.01	68.2	-15.03	34.62	8.65	34.11	148	39	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5458.96	45.74	36.92	54	-8.26	34.36	8.51	34.05	135	66	Average
5458.96	58.11	49.29	74	-15.89	34.36	8.51	34.05	135	66	Peak
*5468.4	59.46	50.63	68.2	-8.74	34.37	8.51	34.05	135	66	Peak
5510	93.56	84.65			34.4	8.57	34.06	135	66	Average
5510	102.89	93.98			34.4	8.57	34.06	135	66	Peak
*5724.28	53.34	44.18	68.2	-14.86	34.62	8.65	34.11	135	66	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5510 MHz: Fundamental Frequency
- *: Out of Restricted Band

EUT Test Condition		Measurement Detail	
Channel	Channel 110	Frequency Range	1 GHz ~ 40 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)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5459.76	51.79	42.97	54	-2.21	34.36	8.51	34.05	162	11	Average
5459.76	62.36	53.54	74	-11.64	34.36	8.51	34.05	162	11	Peak
5470.64	67.19	58.36	68.2	-1.01	34.37	8.51	34.05	162	11	Peak
5550	104.08	95.11			34.45	8.59	34.07	138	26	Average
5550	110.96	101.99			34.45	8.59	34.07	138	26	Peak
5724.28	54.91	45.75	68.2	-13.29	34.62	8.65	34.11	138	26	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5455.92	46.24	37.42	54	-7.76	34.36	8.51	34.05	109	60	Average
5455.92	56.2	47.38	74	-17.8	34.36	8.51	34.05	109	60	Peak
5470.16	57.06	48.23	68.2	-11.14	34.37	8.51	34.05	109	60	Peak
5550	94.73	85.76			34.45	8.59	34.07	110	60	Average
5550	102.93	93.96			34.45	8.59	34.07	110	60	Peak
5724.2	53.13	43.97	68.2	-15.07	34.62	8.65	34.11	110	60	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5550 MHz: Fundamental Frequency
- *: Out of Restricted Band

EUT Test Condition		Measurement Detail	
Channel	Channel 134	Frequency Range	1 GHz ~ 40 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)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5458.8	42.73	33.91	54	-11.27	34.36	8.51	34.05	135	26	Average
5458.8	52.52	43.7	74	-21.48	34.36	8.51	34.05	135	26	Peak
*5470	52.14	43.31	68.2	-16.06	34.37	8.51	34.05	135	26	Peak
5670	102.6	93.5			34.57	8.63	34.1	135	26	Average
5670	109.92	100.82			34.57	8.63	34.1	135	26	Peak
*5724.04	57.6	48.44	68.2	-10.6	34.62	8.65	34.11	139	25	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5392.4	42.8	34.12	54	-11.2	34.31	8.41	34.04	112	60	Average
5392.4	52.57	43.89	74	-21.43	34.31	8.41	34.04	112	60	Peak
*5468.24	51.87	43.04	68.2	-16.33	34.37	8.51	34.05	112	60	Peak
5670	92.17	83.07			34.57	8.63	34.1	122	60	Average
5670	99.54	90.44			34.57	8.63	34.1	122	60	Peak
*5725.24	54.68	45.52	68.2	-13.52	34.62	8.65	34.11	122	60	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5670 MHz: Fundamental Frequency
- *: Out of Restricted Band

EUT Test Condition		Measurement Detail	
Channel	Channel 151	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Karl Lee

<Spurious Emission>

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5755	102.92	93.71			34.66	8.66	34.11	116	39	Average
5755	110.08	100.87			34.66	8.66	34.11	116	39	Peak
11510	47.43	32.32	54	-6.57	37.9	12.6	35.39	195	227	Average
11510	56.95	41.84	74	-17.05	37.9	12.6	35.39	195	227	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5755	96.62	87.41			34.66	8.66	34.11	152	39	Average
5755	103.74	94.53			34.66	8.66	34.11	152	39	Peak
11510	48.54	33.43	54	-5.46	37.9	12.6	35.39	183	172	Average
11510	58.09	42.98	74	-15.91	37.9	12.6	35.39	183	172	Peak

<Out of Band Emission (OOBE)>

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
*5645.425	61.31	52.24	68.2	-6.89	34.54	8.62	34.09	116	39	Peak
5652.25	59.89	50.8	69.86	-9.97	34.56	8.62	34.09	116	39	Peak
5923.15	50.64	41.24	69.57	-18.93	34.83	8.73	34.16	116	39	Peak
*5967.25	53.2	43.75	68.2	-15	34.87	8.75	34.17	116	39	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
*5650.15	55.19	46.1	68.31	-13.12	34.56	8.62	34.09	152	39	Peak
5652.25	54.27	45.18	69.86	-15.59	34.56	8.62	34.09	152	39	Peak
5923.675	50.74	41.34	69.18	-18.44	34.83	8.73	34.16	152	39	Peak
*5939.95	52.31	42.88	68.2	-15.89	34.85	8.74	34.16	152	39	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5755 MHz: Fundamental Frequency
- *: Out of Restricted Band

EUT Test Condition		Measurement Detail	
Channel	Channel 159	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Karl Lee

<Spurious Emission>

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5795	103.8	94.56			34.69	8.68	34.13	116	39	Average
5795	110.87	101.63			34.69	8.68	34.13	116	39	Peak
11590	48.26	32.89	54	-5.74	38.02	12.72	35.37	103	157	Average
11590	57.98	42.61	74	-16.02	38.02	12.72	35.37	103	157	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5795	97.14	87.9			34.69	8.68	34.13	152	39	Average
5795	104.6	95.36			34.69	8.68	34.13	152	39	Peak
11590	47.83	32.46	54	-6.17	38.02	12.72	35.37	177	113	Average
11590	56.98	41.61	74	-17.02	38.02	12.72	35.37	177	113	Peak

<Out of Band Emission (OOBE)>

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
*5641.225	63.13	54.06	68.2	-5.07	34.54	8.62	34.09	116	39	Peak
5652.25	61.13	52.04	69.86	-8.73	34.56	8.62	34.09	116	39	Peak
5922.625	59.14	49.74	69.96	-10.82	34.83	8.73	34.16	116	39	Peak
*5928.4	61.36	51.96	68.2	-6.84	34.83	8.73	34.16	116	39	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
*5639.125	55.17	46.1	68.2	-13.03	34.54	8.62	34.09	152	39	Peak
5652.25	55.39	46.3	69.86	-14.47	34.56	8.62	34.09	152	39	Peak
5922.1	56.74	47.34	70.35	-13.61	34.83	8.73	34.16	152	39	Peak
*5927.35	57.19	47.79	68.2	-11.01	34.83	8.73	34.16	152	39	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5795 MHz: Fundamental Frequency
- *: Out of Restricted Band

802.11ac (VHT80)

EUT Test Condition		Measurement Detail	
Channel	Channel 42	Frequency Range	1 GHz ~ 40 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)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5140.25	43.79	35.53	54	-10.21	34.12	8.13	33.99	102	43	Average
5140.25	54.07	45.81	74	-19.93	34.12	8.13	33.99	102	43	Peak
5210	88.76	80.4			34.17	8.19	34	102	43	Average
5210	95.54	87.18			34.17	8.19	34	102	43	Peak
5452.19	43.54	34.72	54	-10.46	34.36	8.51	34.05	102	43	Average
5452.19	53.82	45	74	-20.18	34.36	8.51	34.05	102	43	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5150	48.34	40.09	54	-5.66	34.12	8.13	34	221	315	Average
5150	58.44	50.19	74	-15.56	34.12	8.13	34	221	315	Peak
5210	95.86	87.5			34.17	8.19	34	220	314	Average
5210	102.67	94.31			34.17	8.19	34	220	314	Peak
5375.85	44.49	35.83	54	-9.51	34.29	8.41	34.04	220	314	Average
5375.85	55.01	46.35	74	-18.99	34.29	8.41	34.04	220	314	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5210 MHz: Fundamental Frequency
- *: Out of Restricted Band

EUT Test Condition		Measurement Detail	
Channel	Channel 58	Frequency Range	1 GHz ~ 40 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)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5108.75	42.99	34.79	54	-11.01	34.09	8.1	33.99	189	293	Average
5108.75	53.28	45.08	74	-20.72	34.09	8.1	33.99	189	293	Peak
5290	86.95	78.42			34.23	8.32	34.02	189	293	Average
5290	95.07	86.54			34.23	8.32	34.02	189	293	Peak
5364.85	43.48	34.84	54	-10.52	34.29	8.38	34.03	189	293	Average
5364.85	54.1	45.46	74	-19.9	34.29	8.38	34.03	189	293	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5131.4	43.63	35.41	54	-10.37	34.11	8.1	33.99	219	316	Average
5131.4	53.72	45.5	74	-20.28	34.11	8.1	33.99	219	316	Peak
5290	95.99	87.46			34.23	8.32	34.02	219	316	Average
5290	105.19	96.66			34.23	8.32	34.02	219	316	Peak
5350.66	48.53	39.9	54	-5.47	34.28	8.38	34.03	219	316	Average
5350.66	58.36	49.73	74	-15.64	34.28	8.38	34.03	219	316	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5290 MHz: Fundamental Frequency
- *: Out of Restricted Band

EUT Test Condition		Measurement Detail	
Channel	Channel 106	Frequency Range	1 GHz ~ 40 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)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5457.84	46.26	37.44	54	-7.74	34.36	8.51	34.05	124	39	Average
5457.84	55.84	47.02	74	-18.16	34.36	8.51	34.05	124	39	Peak
*5470.64	56.79	47.96	68.2	-11.41	34.37	8.51	34.05	124	39	Peak
5530	97.34	88.41			34.42	8.58	34.07	124	39	Average
5530	105.85	96.92			34.42	8.58	34.07	124	39	Peak
*5725.8	52.95	43.79	68.2	-15.25	34.62	8.65	34.11	124	39	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5458.96	44.07	35.25	54	-9.93	34.36	8.51	34.05	126	60	Average
5458.96	54.24	45.42	74	-19.76	34.36	8.51	34.05	126	60	Peak
*5470.8	53.27	44.41	68.2	-14.93	34.37	8.54	34.05	126	60	Peak
5530	90.75	81.82			34.42	8.58	34.07	126	60	Average
5530	98.24	89.31			34.42	8.58	34.07	126	60	Peak
*5724.04	52.32	43.16	68.2	-15.88	34.62	8.65	34.11	126	60	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5530 MHz: Fundamental Frequency
- *: Out of Restricted Band

EUT Test Condition		Measurement Detail	
Channel	Channel 122	Frequency Range	1 GHz ~ 40 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)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5459.76	50.91	42.09	54	-3.09	34.36	8.51	34.05	129	25	Average
5459.76	60.36	51.54	74	-13.64	34.36	8.51	34.05	129	25	Peak
5469.36	62.57	53.74	68.2	-5.63	34.37	8.51	34.05	129	25	Peak
5610	101.07	92.04			34.5	8.61	34.08	138	25	Average
5610	109.25	100.22			34.5	8.61	34.08	138	25	Peak
5724.04	66.85	57.69	68.2	-1.35	34.62	8.65	34.11	129	25	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5458	44.97	36.15	54	-9.03	34.36	8.51	34.05	110	60	Average
5458	54.36	45.54	74	-19.64	34.36	8.51	34.05	110	60	Peak
5468.88	53.95	45.12	68.2	-14.25	34.37	8.51	34.05	110	60	Peak
5610	90.4	81.37			34.5	8.61	34.08	110	60	Average
5610	99.55	90.52			34.5	8.61	34.08	110	60	Peak
5725.24	56.43	47.27	68.2	-11.77	34.62	8.65	34.11	110	60	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5610 MHz: Fundamental Frequency
- *: Out of Restricted Band

EUT Test Condition		Measurement Detail	
Channel	Channel 155	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Karl Lee

<Spurious Emission>

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5775	99.15	89.92			34.68	8.67	34.12	126	39	Average
5775	107.79	98.56			34.68	8.67	34.12	126	39	Peak
11550	47.32	32.05	54	-6.68	37.97	12.68	35.38	185	249	Average
11550	56.86	41.59	74	-17.14	37.97	12.68	35.38	185	249	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5775	92.39	83.16			34.68	8.67	34.12	152	39	Average
5775	101.13	91.9			34.68	8.67	34.12	152	39	Peak
11550	48.23	32.96	54	-5.77	37.97	12.68	35.38	132	196	Average
11550	57.21	41.94	74	-16.79	37.97	12.68	35.38	132	196	Peak

<Out of Band Emission (OOBE)>

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
*5641.225	64.07	55	68.2	-4.13	34.54	8.62	34.09	126	39	Peak
5652.775	62.51	53.41	70.25	-7.74	34.56	8.63	34.09	126	39	Peak
5922.625	55.35	45.95	69.96	-14.61	34.83	8.73	34.16	126	39	Peak
*5929.45	56.44	47.04	68.2	-11.76	34.83	8.73	34.16	126	39	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
*5647	58.13	49.06	68.2	-10.07	34.54	8.62	34.09	152	39	Peak
5652.25	53.81	44.72	69.86	-16.05	34.56	8.62	34.09	152	39	Peak
5922.1	52.09	42.69	70.35	-18.26	34.83	8.73	34.16	152	39	Peak
*5956.75	53.71	44.26	68.2	-14.49	34.87	8.74	34.16	152	39	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5775 MHz: Fundamental Frequency
- *: Out of Restricted Band

9 kHz ~ 30 MHz Data:

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

30 MHz ~ 1 GHz Worst-Case Data:

802.11n (HT20)

EUT Test Condition		Measurement Detail	
Channel	Channel 36	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

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
44.04	8.72	25.87	40	-31.28	14.17	0.9	32.22	135	129	Peak
115.32	13.1	32.77	43.5	-30.4	11.3	1.28	32.25	154	162	Peak
228.72	22.37	40.98	46	-23.63	11.72	1.85	32.18	194	216	Peak
332.9	19.54	35.58	46	-26.46	13.86	2.19	32.09	127	131	Peak
398	13.4	28.33	46	-32.6	14.95	2.34	32.22	198	203	Peak
833.4	20.38	28.07	46	-25.62	20.81	3.38	31.88	154	321	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
39.18	17.34	35.65	40	-22.66	13.18	0.74	32.23	135	164	Peak
70.77	18.83	40.13	40	-21.17	9.81	1.11	32.22	169	310	Peak
168.78	15.92	37.58	43.5	-27.58	9.06	1.52	32.24	158	273	Peak
472.9	15.31	28.92	46	-30.69	15.95	2.56	32.12	154	180	Peak
728.4	20.02	29.38	46	-25.98	19.6	3.16	32.12	193	124	Peak
893.6	21.63	28.24	46	-24.37	21.42	3.49	31.52	177	162	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value

4.2 Transmit Power Measurement

4.2.1 Limits of Transmit Power Measurement

Operation Band	EUT Category		Limit
U-NII-1		Outdoor Access Point	1 Watt (30 dBm) (Max. e.i.r.p $\leq$ 125 mW (21 dBm) at any elevation angle above 30 degrees as measured from the horizon)
		Fixed point-to-point Access Point	1 Watt (30 dBm)
		Indoor Access Point	1 Watt (30 dBm)
	✓	Mobile and Portable client device	250 mW (24 dBm)
U-NII-2A	✓		250 mW (24 dBm) or 11 dBm + 10 log B*
U-NII-2C	✓		250 mW (24 dBm) or 11 dBm + 10 log B*
U-NII-3	✓		1 Watt (30 dBm)

*B is the 26 dB emission bandwidth in megahertz

Per KDB 662911 Method of conducted output power measurement on IEEE 802.11 devices,

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

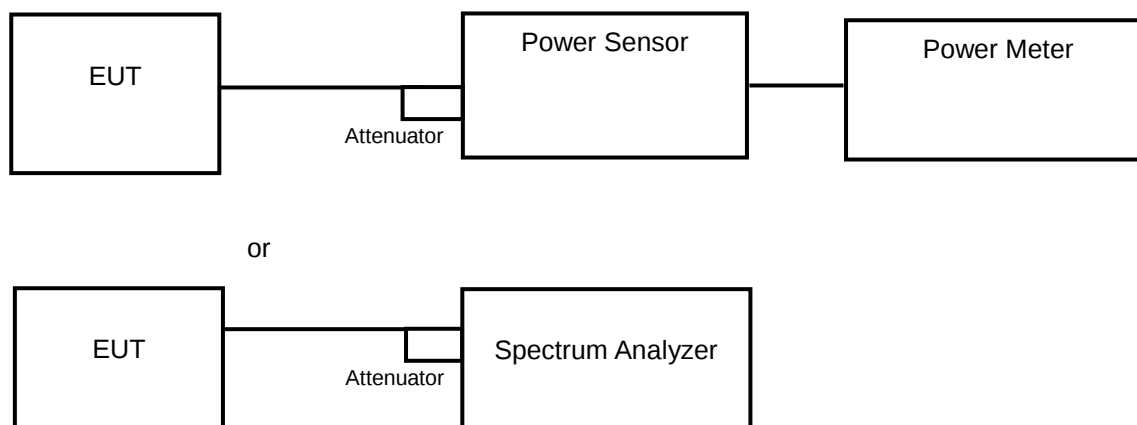
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT} ;

Array Gain = $5 \log(N_{ANT}/N_{SS})$ dB or 3 dB, whichever is less for 20 MHz channel widths with $N_{ANT} \geq 5$.

For power measurements on all other devices: Array Gain = $10 \log(N_{ANT}/N_{SS})$ dB.

4.2.2 Test Setup

<Power Output Measurement>



4.2.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.2.4 Test Procedure

Average Power Measurement

<802.11a, 802.11n (HT20), 802.11n (HT40)>

Method PM is 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.

<802.11ac (VHT80)>

Method SA-1 is used to perform output power measurement, trigger and gating function of spectrum analyzer is enabled to measure max output power of TX on burst. Duty factor is not added to measured value.

4.2.5 Deviation from Test Standard

No deviation.

4.2.6 EUT Operating Conditions

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

4.2.7 Test Result

Power Output:

802.11a

Channel	Frequency (MHz)	Maximum Conducted Power (dBm)	
		Chain 0	Chain 1
36	5180	17.33	17.83
44	5220	20.83	20.94
48	5240	20.72	20.87
52	5260	20.77	20.85
60	5300	20.86	19.12
64	5320	17.34	17.46
100	5500	16.84	17.95
116	5580	20.67	20.86
140	5700	20.75	20.89
149	5745	20.84	20.92
157	5785	20.72	20.89
165	5825	20.78	20.83

802.11n (HT20)

Channel	Frequency (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
36	5180	14.12	14.37	53.21	17.26
44	5220	15.61	15.84	74.82	18.74
48	5240	15.68	15.91	76.03	18.81
52	5260	15.62	15.83	74.82	18.74
60	5300	15.64	15.83	74.99	18.75
64	5320	13.61	13.92	47.64	16.78
100	5500	13.64	13.94	47.86	16.80
116	5580	15.73	15.95	76.74	18.85
140	5700	13.68	13.92	47.97	16.81
149	5745	15.72	15.87	76.03	18.81
157	5785	15.66	15.84	75.16	18.76
165	5825	15.71	15.86	75.86	18.80

802.11n (HT40)

Channel	Frequency (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
38	5190	11.72	11.88	30.27	14.81
46	5230	15.17	15.46	68.08	18.33
54	5270	14.61	14.82	59.29	17.73
62	5310	15.07	15.42	66.99	18.26
102	5510	13.57	13.92	47.42	16.76
110	5550	15.66	15.89	75.68	18.79
134	5670	15.66	15.78	74.64	18.73
151	5755	14.72	14.93	60.81	17.84
159	5795	15.11	15.43	67.30	18.28

802.11ac (VHT80)

Channel	Frequency (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)
		Chain 0	Chain 1		
42	5210	11.68	11.89	30.20	14.80
58	5290	11.03	11.37	26.36	14.21
106	5530	12.14	12.43	33.88	15.30
122	5610	15.63	15.83	74.82	18.74
155	5775	14.11	14.37	53.09	17.25

5 Pictures of Test Arrangements

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

Appendix – Information on the Testing Laboratories

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

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

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Web Site: www.bureauveritas-adt.com

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

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