

FCC Test Report

Report No.: RF190320C04-4

FCC ID: HV4DTHW1321

Test Model: DTH-W1321

Series Model: DTH-W1321*****; DTHW1321***** (* may be alphanumeric/symbol or blank)

(refer to item 3.1 for more details)

Received Date: Mar. 20, 2019

Test Date: Apr. 09 ~ Apr. 26, 2019

Issued Date: May 07, 2019

Applicant: Wacom Co., Ltd.

Address: 2-510-1, Toyonodai, Kazo-Shi, Saitama, 349-1148 Japan

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

Lab Address: No. 47-2, 14th Ling, Chia Pau Vil., Lin Kou Dist., New Taipei City, Taiwan (R.O.C)

Test Location (1): No. 19, Hwa Ya 2nd Rd, Wen Hwa Tsuen, Kwei Shan Hsiang, Taoyuan Hsien 333, Taiwan, R.O.C.

Test Location (2): B2F., No.215, Sec. 3, Beixin Rd., Xindian Dist., New Taipei City 231, Taiwan, R.O.C

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



This report is for your exclusive use. Any copying or replication of this report to or for any other person or entity, or use of our name or trademark, is permitted only with our prior written permission. This report sets forth our findings solely with respect to the test samples identified herein. The results set forth in this report are not indicative or representative of the quality or characteristics of the lot from which a test sample was taken or any similar or identical product unless specifically and expressly noted. Our report includes all of the tests requested by you and the results thereof based upon the information that you provided to us. You have 60 days from date of issuance of this report to notify us of any material error or omission caused by our negligence, provided, however, that such notice shall be in writing and shall specifically address the issue you wish to raise. A failure to raise such issue within the prescribed time shall constitute your unqualified acceptance of the completeness of this report, the tests conducted and the correctness of the report contents. Unless specific mention, the uncertainty of measurement has been explicitly taken into account to declare the compliance or non-compliance to the specification. The report must not be used by the client to claim product certification, approval, or endorsement by TAF or any government agencies.

Table of Contents

Release Control Record	4
1 Certificate of Conformity	5
2 Summary of Test Results.....	6
2.1 Measurement Uncertainty.....	6
2.2 Modification Record	6
3 General Information	7
3.1 General Description of EUT	7
3.2 Description of Test Modes.....	9
3.2.1 Test Mode Applicability and Tested Channel Detail.....	12
3.3 Duty Cycle of Test Signal	14
3.4 Description of Support Units	15
3.4.1 Configuration of System under Test	15
3.5 General Description of Applied Standards.....	15
4 Test Types and Results	16
4.1 Radiated Emission and Bandedge Measurement	16
4.1.1 Limits of Radiated Emission and Bandedge Measurement	16
4.1.2 Limits of Unwanted Emission Out of the Restricted Bands	17
4.1.3 Test Instruments	18
4.1.4 Test Procedures.....	19
4.1.5 Deviation from Test Standard	20
4.1.6 Test Setup.....	20
4.1.7 EUT Operating Conditions.....	21
4.1.8 Test Results	22
4.2 Conducted Emission Measurement.....	68
4.2.1 Limits of Conducted Emission Measurement	68
4.2.2 Test Instruments	68
4.2.3 Test Procedures.....	69
4.2.4 Deviation from Test Standard	69
4.2.5 Test Setup.....	69
4.2.6 EUT Operating Conditions.....	69
4.2.7 Test Results	70
4.3 Transmit Power Measurement.....	72
4.3.1 Limits of Transmit Power Measurement	72
4.3.2 Test Setup.....	72
4.3.3 Test Instruments	73
4.3.4 Test Procedure	73
4.3.5 Deviation from Test Standard	73
4.3.6 EUT Operating Conditions.....	73
4.3.7 Test Results	74
4.4 Occupied Bandwidth Measurement.....	81
4.4.1 Test Setup.....	81
4.4.2 Test Instruments	81
4.4.3 Test Procedure	81
4.4.4 Test Results	82
4.5 Peak Power Spectral Density Measurement	85
4.5.1 Limits of Peak Power Spectral Density Measurement	85
4.5.2 Test Setup.....	85
4.5.3 Test Instruments	85
4.5.4 Test Procedures.....	86
4.5.5 Deviation from Test Standard	86
4.5.6 EUT Operating Conditions.....	86
4.5.7 Test Results	87
4.6 Frequency Stability	94

4.6.1	Limit of Frequency Stability Measurement	94
4.6.2	Test Setup	94
4.6.3	Test Instruments	94
4.6.4	Test Procedure	94
4.6.5	Deviation from Test Standard	94
4.6.6	EUT Operating Condition	94
4.6.7	Test Results	95
4.7	6 dB Bandwidth Measurement.....	96
4.7.1	Limits of 6 dB Bandwidth Measurement.....	96
4.7.2	Test Setup.....	96
4.7.3	Test Instruments	96
4.7.4	Test Procedure	96
4.7.5	Deviation from Test Standard	96
4.7.6	EUT Operating Condition	96
4.7.7	Test Results	97
5	Pictures of Test Arrangements.....	99
	Annex A- Radiated Out of Band Emission (OOBE) Measurement (For U-NII-3 band)	100
	Appendix – Information of the Testing Laboratories	103

Release Control Record

Issue No.	Description	Date Issued
RF190320C04-4	Original Release	May 07, 2019

1 Certificate of Conformity

Product: GRAPHICS TABLET COMPUTER

Brand: Wacom

Test Model: DTH-W1321

Series Model: DTH-W1321*****; DTHW1321***** (* may be alphanumeric/symbol or blank)
(refer to item 3.1 for more details)

Sample Status: Production Unit

Applicant: Wacom Co., Ltd.

Test Date: Apr. 09 ~ Apr. 26, 2019

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 RF characteristics under the conditions specified in this report.

Prepared by :



Date: May 07, 2019

Ivonne Wu / Supervisor

Approved by :



Date: May 07, 2019

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	Pass	Meet the requirement of limit. Minimum passing margin is -20.84 dB at 0.17744 MHz.
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 dB at 5350 MHz.
15.407(a)(1/2/3)	Max Average Transmit Power	Pass	Meet the requirement of limit.
---	Occupied Bandwidth Measurement	-	Reference only
15.407(a)(1/2/3)	Peak Power Spectral Density	Pass	Meet the requirement of limit.
15.407(e)	6 dB Bandwidth	Pass	Meet the requirement of limit. (U-NII-3 Band only)
15.407(g)	Frequency Stability	Pass	Meet the requirement of limit.
15.203	Antenna Requirement	Pass	No antenna connector is used.

Note:

- For U-NII-3 band compliance with rule part 15.407(b)(4)(i), the OOB test plots were recorded in Annex A.
- 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	2.44 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	GRAPHICS TABLET COMPUTER
Brand	Wacom
Test Model	DTH-W1321
Series Model	DTH-W1321*****; DTHW1321***** (* may be alphanumeric/symbol or blank)
Status of EUT	Production Unit
Power Supply Rating	20 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 300.0 Mbps 802.11ac: up to 1733.6 Mbps
Operating Frequency	5180 ~ 5240 MHz, 5260 ~ 5320 MHz, 5500 ~ 5720 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) 1 for 802.11ac (VHT160) 5260 ~ 5320 MHz: 4 for 802.11a, 802.11n (HT20) 2 for 802.11n (HT40) 1 for 802.11ac (VHT80) 5500 ~ 5720 MHz: 12 for 802.11a, 802.11n (HT20) 6 for 802.11n (HT40) 3 for 802.11ac (VHT80) 1 for 802.11ac (VHT160) 5745 ~ 5825 MHz: 5 for 802.11a, 802.11n (HT20) 2 for 802.11n (HT40) 1 for 802.11ac (VHT80)
Output Power	175.644 mW for 5180 ~ 5240 MHz 130.493 mW for 5260 ~ 5320 MHz 187.268 mW for 5500 ~ 5720 MHz 287.636 mW for 5745 ~ 5825 MHz
Antenna Type	PIFA antenna with 1.84 dBi gain (5180 ~ 5240 MHz) PIFA antenna with 1.84 dBi gain (5260 ~ 5320 MHz) PIFA antenna with 2.13 dBi gain (5500 ~ 5720 MHz) PIFA antenna with 1.38 dBi gain (5745 ~ 5825 MHz)
Antenna Connector	N/A
Accessory Device	Refer to Note as below
Data Cable Supplied	Refer to Note as below

Note:

1. All models are listed as below.

Brand	Model	Description
Wacom	DTH-W1321	Main test
	DTH-W1321***** (* may be alphanumeric/symbol or blank)	For marketing purpose
	DTHW1321***** (* may be alphanumeric/symbol or blank)	

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

Modulation Mode	Tx Function
802.11a	1TX
802.11n (HT20)	2TX
802.11n (HT40)	2TX
802.11ac (VHT20)	2TX
802.11ac (VHT40)	2TX
802.11ac (VHT80)	2TX
802.11ac (VHT160)	2TX

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

3. The EUT contains following accessory devices.

Product	Brand	Model	Description
Adapter	WACOM	ADP-100PB B	I/P: 100-240 Vac, 50-60 Hz, 1.5 A O/P: 5 Vdc, 3 A or 20 Vdc, 5 A 1.8m / 1 core
WLAN/BT Module	Intel	9260NGW	--
GPS Module	U-Blox	EVA-8M	--

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

3.2 Description of Test Modes

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

1 channel is provided for 802.11ac (VHT160):

Channel	Frequency (MHz)
50	5250

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 ~ 5720 MHz

12 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	144	5720

6 channels are provided for 802.11n (HT40):

Channel	Frequency (MHz)	Channel	Frequency (MHz)
102	5510	126	5630
110	5550	134	5670
118	5590	142	5710

3 channels are provided for 802.11ac (VHT80):

Channel	Frequency (MHz)	Channel	Frequency (MHz)
106	5530	138	5690
122	5610		

1 channel is provided for 802.11ac (VHT160):

Channel	Frequency (MHz)
114	5570

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:

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

Radiated Emission Test (Above 1 GHz):

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

EUT Configure Mode	Frequency Band (MHz)	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	5180-5240	802.11a	36 to 48	36, 40, 48	OFDM	BPSK	6.0
-		802.11n (HT20)	36 to 48	36, 40, 48	OFDM	BPSK	6.5
-		802.11n (HT40)	38 to 46	38, 46	OFDM	BPSK	13.5
-		802.11ac (VHT80)	42	42	OFDM	BPSK	29.3
-		802.11ac (VHT160)	50	50	OFDM	BPSK	58.5
-	5260-5320	802.11a	52 to 64	52, 60, 64	OFDM	BPSK	6.0
-		802.11n (HT20)	52 to 64	52, 60, 64	OFDM	BPSK	6.5
-		802.11n (HT40)	54 to 62	54, 62	OFDM	BPSK	13.5
-		802.11ac (VHT80)	58	58	OFDM	BPSK	29.3
-	5500-5720	802.11a	100 to 144	100, 116, 140, 144	OFDM	BPSK	6.0
-		802.11n (HT20)	100 to 144	100, 116, 140, 144	OFDM	BPSK	6.5
-		802.11n (HT40)	102 to 142	102, 110, 134, 142	OFDM	BPSK	13.5
-		802.11ac (VHT80)	106 to 138	106, 122, 138	OFDM	BPSK	29.3
-		802.11ac (VHT160)	114	114	OFDM	BPSK	58.5
-	5745-5825	802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6.0
-		802.11n (HT20)	149 to 165	149, 157, 165	OFDM	BPSK	6.5
-		802.11n (HT40)	151 to 159	151, 159	OFDM	BPSK	13.5
-		802.11ac (VHT80)	155	155	OFDM	BPSK	29.3

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	802.11n (HT40)	54 to 62	62	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	Frequency Band (MHz)	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	5260-5320	802.11n (HT40)	54 to 62	62	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	Frequency Band (MHz)	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
-	5180-5240	802.11a	36 to 48	36, 40, 48	OFDM	BPSK	6.0
-		802.11n (HT20)	36 to 48	36, 40, 48	OFDM	BPSK	6.5
-		802.11n (HT40)	38 to 46	38, 46	OFDM	BPSK	13.5
-		802.11ac (VHT80)	42	42	OFDM	BPSK	29.3
-		802.11ac (VHT160)	50	50	OFDM	BPSK	58.5
-	5260-5320	802.11a	52 to 64	52, 60, 64	OFDM	BPSK	6.0
-		802.11n (HT20)	52 to 64	52, 60, 64	OFDM	BPSK	6.5
-		802.11n (HT40)	54 to 62	54, 62	OFDM	BPSK	13.5
-		802.11ac (VHT80)	58	58	OFDM	BPSK	29.3
-	5500-5720	802.11a	100 to 144	100, 116, 140, 144	OFDM	BPSK	6.0
-		802.11n (HT20)	100 to 144	100, 116, 140, 144	OFDM	BPSK	6.5
-		802.11n (HT40)	102 to 142	102, 110, 134, 142	OFDM	BPSK	13.5
-		802.11ac (VHT80)	106 to 138	106, 122, 138	OFDM	BPSK	29.3
-		802.11ac (VHT160)	114	114	OFDM	BPSK	58.5
-	5745-5825	802.11a	149 to 165	149, 157, 165	OFDM	BPSK	6.0
-		802.11n (HT20)	149 to 165	149, 157, 165	OFDM	BPSK	6.5
-		802.11n (HT40)	151 to 159	151, 159	OFDM	BPSK	13.5
-		802.11ac (VHT80)	155	155	OFDM	BPSK	29.3

Test Condition:

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

3.3 Duty Cycle of Test Signal

Duty cycle of test signal is < 98 %, duty factor is required.

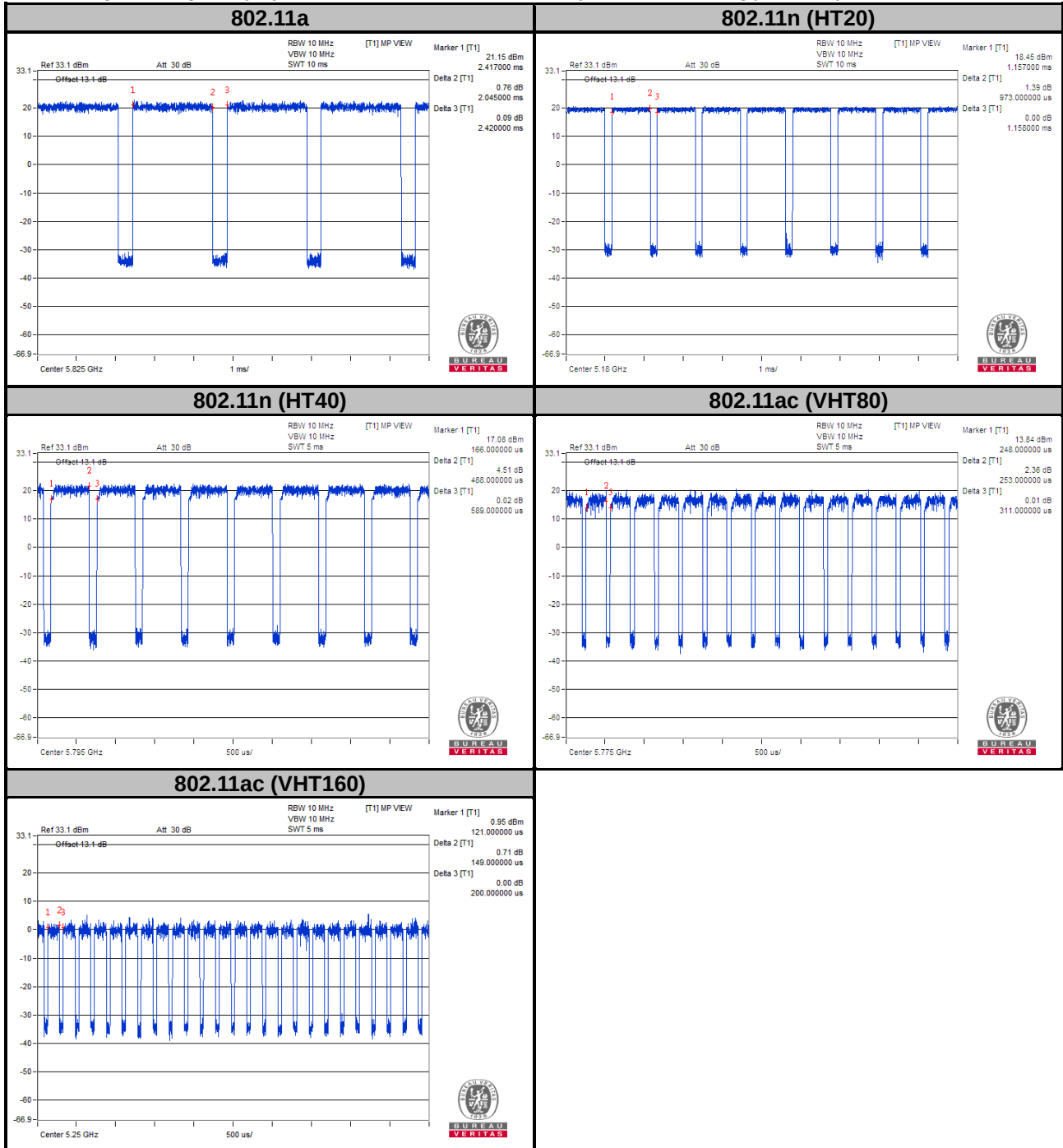
802.11a: Duty cycle = $2.045/2.42 = 0.845$, Duty factor = $10 * \log(1/0.845) = 0.73$

802.11n (HT20): Duty cycle = $0.973/1.158 = 0.840$, Duty factor = $10 * \log(1/0.840) = 0.76$

802.11n (HT40): Duty cycle = $0.488/0.589 = 0.829$, Duty factor = $10 * \log(1/0.829) = 0.81$

802.11ac (VHT80): Duty cycle = $0.253/0.311 = 0.814$, Duty factor = $10 * \log(1/0.814) = 0.89$

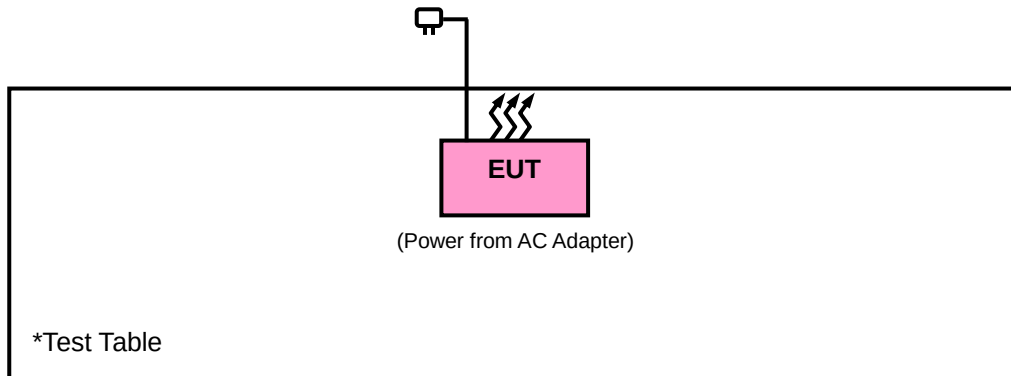
802.11ac (VHT160): Duty cycle = $0.149/0.200 = 0.745$, Duty factor = $10 * \log(1/0.745) = 1.28$



3.4 Description of Support Units

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

3.4.1 Configuration of System under Test



3.5 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)

KDB 789033 D02 General UNII Test Procedures New Rules v02r01

KDB 662911 D01 Multiple Transmitter Output v02r01

ANSI C63.10-2013

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

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table.

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 v02r01		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	MY51210203	Mar. 18, 2019	Mar. 17, 2020
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	100115	Jan. 21, 2019	Jan. 20, 2020
HORN Antenna ETS-Lindgren	3117	00143293	Nov. 25, 2018	Nov. 24, 2019
BILOG Antenna SCHWARZBECK	VULB9168	9168-616	Nov. 27, 2018	Nov. 26, 2019
HORN Antenna SCHWARZBECK	BBHA 9170	9170-480	Nov. 25, 2018	Nov. 24, 2019
Fixed Attenuator Mini-Circuits	MDCS18N-10	MDCS18N-10-01	Apr. 16, 2018 Apr. 15, 2019	Apr. 15, 2019 Apr. 14, 2020
Loop Antenna	EM-6879	269	Sep. 07, 2018	Sep. 06, 2019
Preamplifier Agilent	310N	187226	Jun. 19, 2018	Jun. 18, 2019
Preamplifier Agilent	83017A	MY39501357	Jun. 19, 2018	Jun. 18, 2019
Power Meter Anritsu	ML2495A	1012010	Sep. 05, 2018	Sep. 04, 2019
Power Sensor Anritsu	MA2411B	1315050	Sep. 04, 2018	Sep. 03, 2019
RF signal cable ETS-LINDGREN	5D-FB	Cable-CH1-01(RFC -SMS-100-SMS-12 0+RFC-SMS-100-S MS-400)	Jun. 19, 2018	Jun. 18, 2019
RF signal cable ETS-LINDGREN	8D-FB	Cable-CH1-02(RFC -SMS-100-SMS-24)	Jun. 19, 2018	Jun. 18, 2019
Boresight Antenna Fixture	FBA-01	FBA-SIP01	NA	NA
Software BV ADT	E3 8.130425b	NA	NA	NA
Antenna Tower MF	NA	NA	NA	NA
Turn Table MF	NA	NA	NA	NA
Antenna Tower & Turn Table Controller MF	MF-7802	NA	NA	NA
Temperature & Humidity Chamber	GTH-120-40-CP-A R	MAA1306-019	Sep. 05, 2018	Sep. 04, 2019
DC Power Supply Topward	33010D	807748	NA	NA
Digital Multimeter Fluke	87-III	70360742	Jun. 29, 2018	Jun. 28, 2019

- Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
2. The test was performed in HsinTien Chamber 1.
3. The horn antenna and preamplifier (model: 83017A) are used only for the measurement of emission frequency above 1 GHz if tested.
4. The IC Site Registration No. is 7450I-1.

4.1.4 Test Procedures

For Radiated Emission below 30 MHz

- 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.
- The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- Both Parallel, perpendicular, and ground-parallel orientations of the antenna are set to make the measurement.
- 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.
- The test-receiver system was set to Quasi-Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

Note:

- 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

- 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.
- The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- 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.
- 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.
- 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.
- 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:

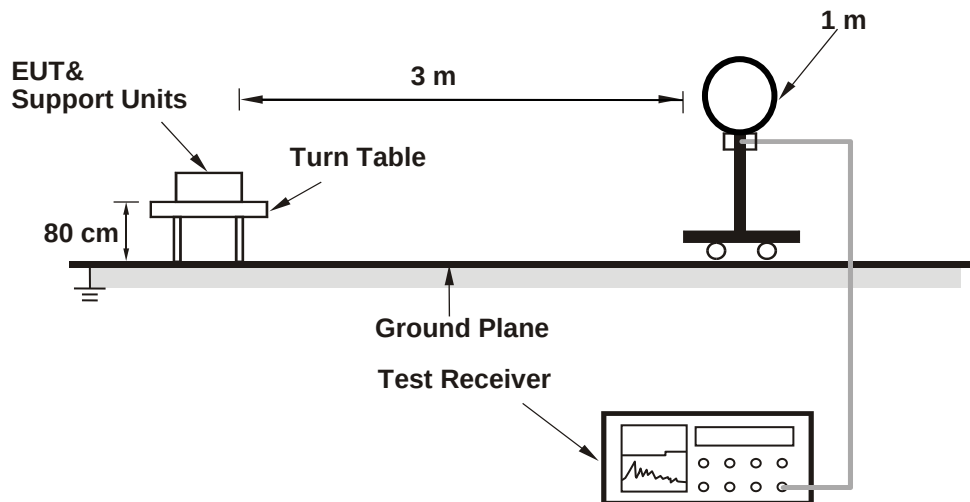
- The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz for Quasi-peak detection (QP) or Peak detection (PK) at frequency below 1 GHz.
- The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency above 1 GHz.
- 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 $\geq 98\%$) for Average detection (AV) at frequency above 1 GHz.
 (11a: RBW = 1 MHz, VBW = 1 kHz ; 11n (HT20): RBW = 1 MHz, VBW = 3 kHz ;
 11n (HT40): RBW = 1 MHz, VBW = 3 kHz ; 11ac (VHT80): RBW = 1 MHz, VBW = 10 kHz
 11ac (VHT160): RBW = 1 MHz, VBW = 10 kHz)
- All modes of operation were investigated and the worst-case emissions are reported.

4.1.5 Deviation from Test Standard

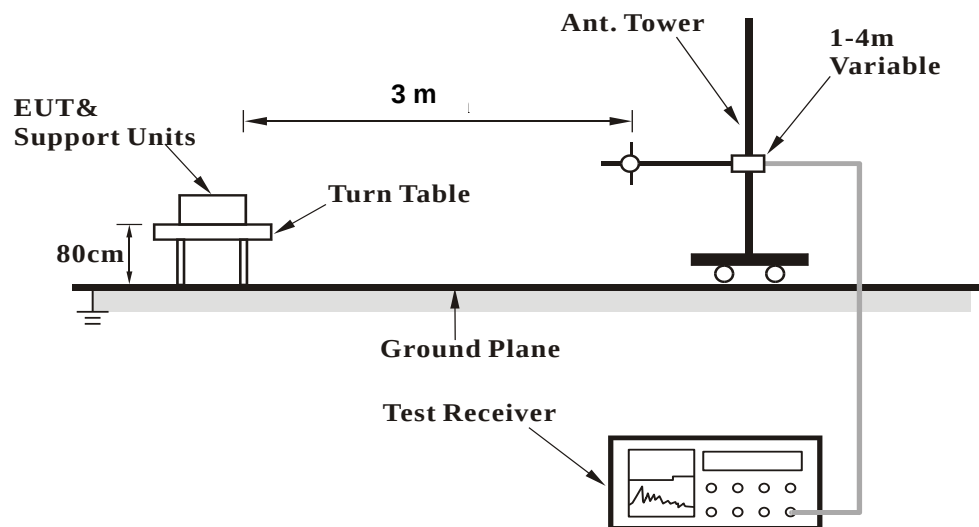
No deviation.

4.1.6 Test Setup

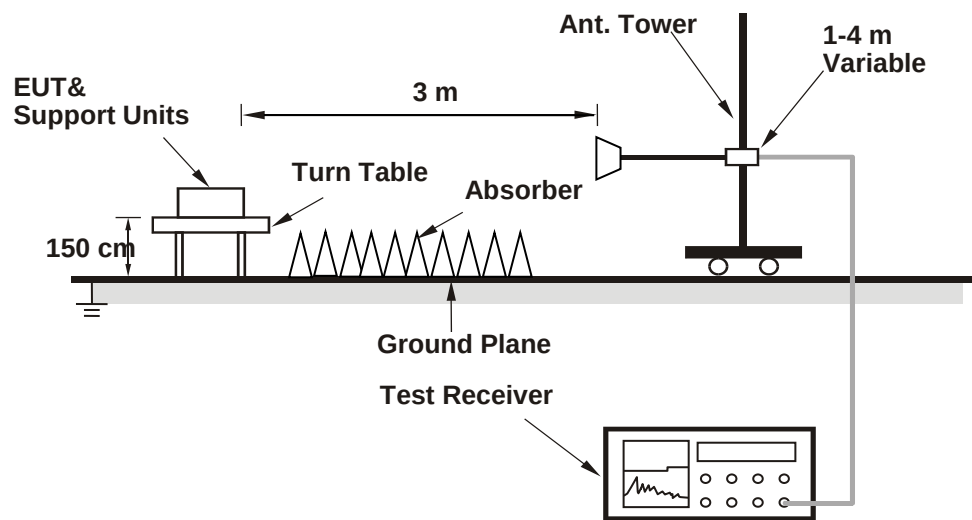
<Radiated Emission below 30 MHz>



<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).

4.1.7 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	Charles Hsiao

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
5150	47.03	38.78	54	-6.97	34.12	8.13	34	215	354	Average
5150	61.22	52.97	74	-12.78	34.12	8.13	34	215	354	Peak
5180	100.8	92.49			34.15	8.16	34	215	354	Average
5180	107.63	99.32			34.15	8.16	34	215	354	Peak
*10360	53.96	39.66	68.2	-14.24	37.12	12.3	35.12	170	68	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
5148.95	43.21	34.96	54	-10.79	34.12	8.13	34	292	80	Average
5148.95	53.48	45.23	74	-20.52	34.12	8.13	34	292	80	Peak
5180	91.18	82.87			34.15	8.16	34	292	80	Average
5180	98.52	90.21			34.15	8.16	34	292	80	Peak
*10360	54.19	39.89	68.2	-14.01	37.12	12.3	35.12	153	192	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
- The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 40	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	Charles Hsiao

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
5149.7	50.63	42.38	54	-3.37	34.12	8.13	34	215	354	Average
5149.7	61.29	53.04	74	-12.71	34.12	8.13	34	215	354	Peak
5200	103.74	95.39			34.16	8.19	34	215	354	Average
5200	110.01	101.66			34.16	8.19	34	215	354	Peak
5350	44.99	36.36	54	-9.01	34.28	8.38	34.03	215	354	Average
5350	55.24	46.61	74	-18.76	34.28	8.38	34.03	215	354	Peak
*10400	54.59	40.25	68.2	-13.61	37.14	12.36	35.16	169	323	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	44.93	36.68	54	-9.07	34.12	8.13	34	292	80	Average
5149.7	55.41	47.16	74	-18.59	34.12	8.13	34	292	80	Peak
5200	94.35	86			34.16	8.19	34	292	80	Average
5200	102.15	93.8			34.16	8.19	34	292	80	Peak
5373.98	42.58	33.92	54	-11.42	34.29	8.41	34.04	292	80	Average
5373.98	52.73	44.07	74	-21.27	34.29	8.41	34.04	292	80	Peak
*10400	54.35	40.01	68.2	-13.85	37.14	12.36	35.16	162	268	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5200 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The emission levels of other frequencies were very low against the limit

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	Charles Hsiao

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	103.99	95.55			34.19	8.26	34.01	215	354	Average
5240	110.62	102.18			34.19	8.26	34.01	215	354	Peak
5396.97	44.74	36.02	54	-9.26	34.32	8.44	34.04	215	354	Average
5396.97	54.8	46.08	74	-19.2	34.32	8.44	34.04	215	354	Peak
*10480	54.47	39.96	68.2	-13.73	37.19	12.53	35.21	121	168	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	93.45	85.01			34.19	8.26	34.01	292	80	Average
5240	100.93	92.49			34.19	8.26	34.01	292	80	Peak
5366.5	42.5	33.86	54	-11.5	34.29	8.38	34.03	292	80	Average
5366.5	53.96	45.32	74	-20.04	34.29	8.38	34.03	292	80	Peak
*10480	54.88	40.37	68.2	-13.32	37.19	12.53	35.21	155	207	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
- The emission levels of other frequencies were very low against the limit

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	Charles Hsiao

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	42.79	34.54	54	-11.21	34.12	8.13	34	215	350	Average
5148.65	53.67	45.42	74	-20.33	34.12	8.13	34	215	350	Peak
5260	104.12	95.66			34.21	8.26	34.01	215	350	Average
5260	110.74	102.28			34.21	8.26	34.01	215	350	Peak
*10520	58.08	43.49	68.2	-10.12	37.21	12.61	35.23	157	143	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
5131.7	42.43	34.21	54	-11.57	34.11	8.1	33.99	292	80	Average
5131.7	52.81	44.59	74	-21.19	34.11	8.1	33.99	292	80	Peak
5260	94.08	85.62			34.21	8.26	34.01	292	80	Average
5260	101.43	92.97			34.21	8.26	34.01	292	80	Peak
*10520	54.33	39.74	68.2	-13.87	37.21	12.61	35.23	105	96	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
2. 5260 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

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	Charles Hsiao

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
5148.35	42.91	34.66	54	-11.09	34.12	8.13	34	215	350	Average
5148.35	53.03	44.78	74	-20.97	34.12	8.13	34	215	350	Peak
5300	103.23	94.69			34.24	8.32	34.02	215	350	Average
5300	109.75	101.21			34.24	8.32	34.02	215	350	Peak
5350	52.34	43.71	54	-1.66	34.28	8.38	34.03	215	350	Average
5350	63.2	54.57	74	-10.8	34.28	8.38	34.03	215	350	Peak
10600	46.18	31.5	54	-7.82	37.28	12.67	35.27	175	214	Average
10600	55.87	41.19	74	-18.13	37.28	12.67	35.27	175	214	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	42.36	34.16	54	-11.64	34.09	8.1	33.99	292	80	Average
5120	53.1	44.9	74	-20.9	34.09	8.1	33.99	292	80	Peak
5300	92.19	83.65			34.24	8.32	34.02	292	80	Average
5300	99.36	90.82			34.24	8.32	34.02	292	80	Peak
5350.44	43.66	35.03	54	-10.34	34.28	8.38	34.03	292	80	Average
5350.44	53.24	44.61	74	-20.76	34.28	8.38	34.03	292	80	Peak
10600	44.63	29.95	54	-9.37	37.28	12.67	35.27	123	227	Average
10600	54.02	39.34	74	-19.98	37.28	12.67	35.27	123	227	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
2. 5300 MHz: Fundamental Frequency
3. The emission levels of other frequencies were very low against the limit

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	Charles Hsiao

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	101.27	92.69			34.25	8.35	34.02	215	350	Average
5320	108.34	99.76			34.25	8.35	34.02	215	350	Peak
5350.22	52.98	44.35	54	-1.02	34.28	8.38	34.03	215	350	Average
5350.22	66.57	57.94	74	-7.43	34.28	8.38	34.03	215	350	Peak
10640	45.16	30.43	54	-8.84	37.31	12.71	35.29	121	314	Average
10640	54.68	39.95	74	-19.32	37.31	12.71	35.29	121	314	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	91.89	83.31			34.25	8.35	34.02	292	80	Average
5320	98.56	89.98			34.25	8.35	34.02	292	80	Peak
5350	43.92	35.29	54	-10.08	34.28	8.38	34.03	292	80	Average
5350	54.68	46.05	74	-19.32	34.28	8.38	34.03	292	80	Peak
10640	45.87	31.14	54	-8.13	37.31	12.71	35.29	182	133	Average
10640	55.36	40.63	74	-18.64	37.31	12.71	35.29	182	133	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
2. 5320 MHz: Fundamental Frequency
3. The emission levels of other frequencies were very low against the limit

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	Charles Hsiao

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	45.55	36.73	54	-8.45	34.36	8.51	34.05	190	350	Average
5459.76	57.28	48.46	74	-16.72	34.36	8.51	34.05	190	350	Peak
*5470.96	66.73	57.87	68.2	-1.47	34.37	8.54	34.05	190	350	Peak
5500	100.57	91.65			34.4	8.57	34.05	190	350	Average
5500	107.74	98.82			34.4	8.57	34.05	190	350	Peak
11000	45.48	30.4	54	-8.52	37.6	12.96	35.48	184	121	Average
11000	55.11	40.03	74	-18.89	37.6	12.96	35.48	184	121	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
5453.2	42.65	33.83	54	-11.35	34.36	8.51	34.05	292	80	Average
5453.2	52.95	44.13	74	-21.05	34.36	8.51	34.05	292	80	Peak
*5470.32	53.63	44.8	68.2	-14.57	34.37	8.51	34.05	292	80	Peak
5500	91.83	82.91			34.4	8.57	34.05	292	80	Average
5500	98.63	89.71			34.4	8.57	34.05	292	80	Peak
11000	45.13	30.05	54	-8.87	37.6	12.96	35.48	154	206	Average
11000	54.5	39.42	74	-19.5	37.6	12.96	35.48	154	206	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
- The emission levels of other frequencies were very low against the limit

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	Charles Hsiao

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
5449.36	43.67	34.84	54	-10.33	34.36	8.51	34.04	190	18	Average
5449.36	54.85	46.02	74	-19.15	34.36	8.51	34.04	190	18	Peak
*5470.8	52.75	43.89	68.2	-15.45	34.37	8.54	34.05	190	18	Peak
5580	103.81	94.82			34.47	8.6	34.08	190	18	Average
5580	110.9	101.91			34.47	8.6	34.08	190	18	Peak
*5725	52.56	43.4	68.2	-15.64	34.62	8.65	34.11	190	18	Peak
11160	46.27	31.19	54	-7.73	37.7	12.83	35.45	159	121	Average
11160	55.71	40.63	74	-18.29	37.7	12.83	35.45	159	121	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
5440.72	42.46	33.67	54	-11.54	34.35	8.48	34.04	292	80	Average
5440.72	53.03	44.24	74	-20.97	34.35	8.48	34.04	292	80	Peak
*5470.16	52.45	43.62	68.2	-15.75	34.37	8.51	34.05	292	80	Peak
5580	94.49	85.5			34.47	8.6	34.08	292	80	Average
5580	101.84	92.85			34.47	8.6	34.08	292	80	Peak
*5725	51.85	42.69	68.2	-16.35	34.62	8.65	34.11	292	80	Peak
11160	46.93	31.85	54	-7.07	37.7	12.83	35.45	146	351	Average
11160	56.44	41.36	74	-17.56	37.7	12.83	35.45	146	351	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
2. 5580 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

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	Charles Hsiao

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	100.55	91.42			34.59	8.64	34.1	224	344	Average
5700	107.85	98.72			34.59	8.64	34.1	224	344	Peak
*5725	60.8	51.64	68.2	-7.4	34.62	8.65	34.11	224	344	Peak
11400	46.27	31.17	54	-7.73	37.84	12.67	35.41	198	255	Average
11400	55.85	40.75	74	-18.15	37.84	12.67	35.41	198	255	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	91.09	81.96			34.59	8.64	34.1	292	80	Average
5700	98.81	89.68			34.59	8.64	34.1	292	80	Peak
*5725	54.15	44.99	68.2	-14.05	34.62	8.65	34.11	292	80	Peak
11400	46.03	30.93	54	-7.97	37.84	12.67	35.41	162	138	Average
11400	55.49	40.39	74	-18.51	37.84	12.67	35.41	162	138	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
- The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 144	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	Charles Hsiao

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
5458.64	42.75	33.93	54	-11.25	34.36	8.51	34.05	234	344	Average
5458.64	53.97	45.15	74	-20.03	34.36	8.51	34.05	234	344	Peak
*5469.2	52.19	43.36	68.2	-16.01	34.37	8.51	34.05	234	344	Peak
5720	99.66	90.5			34.62	8.65	34.11	234	344	Average
5720	107.83	98.67			34.62	8.65	34.11	234	344	Peak
11440	45.83	30.72	54	-8.17	37.86	12.65	35.4	179	205	Average
11440	55.36	40.25	74	-18.64	37.86	12.65	35.4	179	205	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
5442	42.47	33.68	54	-11.53	34.35	8.48	34.04	292	80	Average
5442	53.29	44.5	74	-20.71	34.35	8.48	34.04	292	80	Peak
*5470.32	51.33	42.5	68.2	-16.87	34.37	8.51	34.05	292	80	Peak
5720	90.77	81.61			34.62	8.65	34.11	292	80	Average
5720	98.13	88.97			34.62	8.65	34.11	292	80	Peak
11440	45.81	30.7	54	-8.19	37.86	12.65	35.4	195	263	Average
11440	55.23	40.12	74	-18.77	37.86	12.65	35.4	195	263	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5720 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The emission levels of other frequencies were very low against the limit

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	Charles Hsiao

<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	102.35	93.16			34.64	8.66	34.11	234	345	Average
5745	109.91	100.72			34.64	8.66	34.11	234	345	Peak
11490	47.15	32.03	54	-6.85	37.89	12.62	35.39	164	53	Average
11490	56.57	41.45	74	-17.43	37.89	12.62	35.39	164	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
5745	97.43	88.24			34.64	8.66	34.11	203	360	Average
5745	105.1	95.91			34.64	8.66	34.11	203	360	Peak
11490	47.34	32.22	54	-6.66	37.89	12.62	35.39	160	108	Average
11490	56.99	41.87	74	-17.01	37.89	12.62	35.39	160	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
*5599.75	54.53	45.51	68.2	-13.67	34.5	8.6	34.08	234	345	Peak
5653.3	51.96	42.86	70.64	-18.68	34.56	8.63	34.09	234	345	Peak
5921.575	51.78	42.38	70.73	-18.95	34.83	8.73	34.16	234	345	Peak
*5934.7	53.49	44.09	68.2	-14.71	34.83	8.73	34.16	234	345	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
*5647.525	53.34	44.27	68.2	-14.86	34.54	8.62	34.09	203	360	Peak
5654.35	52.16	43.07	71.42	-19.26	34.56	8.63	34.1	203	360	Peak
5923.675	51.52	42.12	69.18	-17.66	34.83	8.73	34.16	203	360	Peak
*6007.15	53.56	44.05	68.2	-14.64	34.92	8.76	34.17	203	360	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
- The emission levels of other frequencies were very low against the limit

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	Charles Hsiao

<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	101.45	58.09			34.68	8.68	0	234	345	Average
5785	108.86	65.5			34.68	8.68	0	234	345	Peak
11570	46.18	30.87	54	-7.82	38	12.68	35.37	126	305	Average
11570	55.7	40.39	74	-18.3	38	12.68	35.37	126	305	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	96.54	87.31			34.68	8.68	34.13	203	360	Average
5785	104.13	94.9			34.68	8.68	34.13	203	360	Peak
11570	46.44	31.13	54	-7.56	38	12.68	35.37	151	120	Average
11570	56.05	40.74	74	-17.95	38	12.68	35.37	151	120	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
*5559.85	54.05	45.08	68.2	-14.15	34.45	8.59	34.07	234	345	Peak
5653.3	51.49	42.39	70.64	-19.15	34.56	8.63	34.09	234	345	Peak
5922.625	50.47	41.07	69.96	-19.49	34.83	8.73	34.16	234	345	Peak
*5936.275	53.75	44.35	68.2	-14.45	34.83	8.73	34.16	234	345	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
*5628.625	52.96	43.91	68.2	-15.24	34.52	8.62	34.09	203	360	Peak
5655.4	52.19	43.1	72.2	-20.01	34.56	8.63	34.1	203	360	Peak
5919.475	51.81	42.43	72.29	-20.48	34.81	8.73	34.16	203	360	Peak
*6005.575	52.86	43.37	68.2	-15.34	34.9	8.76	34.17	203	360	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
- The emission levels of other frequencies were very low against the limit

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	Charles Hsiao

<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	101.57	92.28			34.73	8.69	34.13	234	345	Average
5825	109.39	100.1			34.73	8.69	34.13	234	345	Peak
11650	45.21	29.68	54	-8.79	38.09	12.8	35.36	195	234	Average
11650	54.85	39.32	74	-19.15	38.09	12.8	35.36	195	234	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	96.65	87.36			34.73	8.69	34.13	203	360	Average
5825	104.43	95.14			34.73	8.69	34.13	203	360	Peak
11650	46.23	30.7	54	-7.77	38.09	12.8	35.36	148	127	Average
11650	55.73	40.2	74	-18.27	38.09	12.8	35.36	148	127	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
*5638.6	53.7	44.63	68.2	-14.5	34.54	8.62	34.09	234	345	Peak
5654.35	52.35	43.26	71.42	-19.07	34.56	8.63	34.1	234	345	Peak
5921.575	52.71	43.31	70.73	-18.02	34.83	8.73	34.16	234	345	Peak
*6017.65	53.91	44.4	68.2	-14.29	34.92	8.77	34.18	234	345	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
*5568.775	52.88	43.89	68.2	-15.32	34.47	8.59	34.07	203	360	Peak
5652.25	50.94	41.85	69.86	-18.92	34.56	8.62	34.09	203	360	Peak
5918.95	52.78	43.4	72.68	-19.9	34.81	8.73	34.16	203	360	Peak
*5972.5	53.34	43.89	68.2	-14.86	34.87	8.75	34.17	203	360	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
- The emission levels of other frequencies were very low against the limit

802.11n (HT20)

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	Charles Hsiao

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
5150	47.41	39.16	54	-6.59	34.12	8.13	34	103	350	Average
5150	61.56	53.31	74	-12.44	34.12	8.13	34	103	350	Peak
5180	101.17	92.86			34.15	8.16	34	103	350	Average
5180	108.92	100.61			34.15	8.16	34	103	350	Peak
*10360	53.12	38.82	68.2	-15.08	37.12	12.3	35.12	182	206	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
5149.25	44.7	36.45	54	-9.3	34.12	8.13	34	193	205	Peak
5149.25	59.28	51.03	74	-14.72	34.12	8.13	34	193	205	Peak
5180	95.83	87.52			34.15	8.16	34	193	205	Average
5180	103.36	95.05			34.15	8.16	34	193	205	Peak
*10360	53.67	39.37	68.2	-14.53	37.12	12.3	35.12	184	127	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
- The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 40	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	Charles Hsiao

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
5149.55	45.73	37.48	54	-8.27	34.12	8.13	34	103	350	Average
5149.55	57.93	49.68	74	-16.07	34.12	8.13	34	103	350	Peak
5200	101.21	92.86			34.16	8.19	34	103	350	Average
5200	108.94	100.59			34.16	8.19	34	103	350	Peak
5355.5	44.35	35.72	54	-9.65	34.28	8.38	34.03	103	350	Average
5355.5	55.04	46.41	74	-18.96	34.28	8.38	34.03	103	350	Peak
*10400	53.3	38.96	68.2	-14.9	37.14	12.36	35.16	196	174	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	48.45	40.2	54	-5.55	34.12	8.13	34	193	205	Average
5150	54.23	45.98	74	-19.77	34.12	8.13	34	193	205	Peak
5200	96.92	88.57			34.16	8.19	34	193	205	Average
5200	104.74	96.39			34.16	8.19	34	193	205	Peak
5387.4	43.04	34.36	54	-10.96	34.31	8.41	34.04	193	205	Average
5387.4	53.94	45.26	74	-20.06	34.31	8.41	34.04	193	205	Peak
*10400	54.52	40.18	68.2	-13.68	37.14	12.36	35.16	153	126	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
2. 5200 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

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	Charles Hsiao

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	101.34	92.9			34.19	8.26	34.01	103	350	Average
5240	108.72	100.28			34.19	8.26	34.01	103	350	Peak
5391.36	44.98	36.3	54	-9.02	34.31	8.41	34.04	103	350	Average
5391.36	54.44	45.76	74	-19.56	34.31	8.41	34.04	103	350	Peak
10480	53.96	39.45	68.2	-14.24	37.19	12.53	35.21	127	115	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	98.01	89.57			34.19	8.26	34.01	194	205	Average
5240	105.71	97.27			34.19	8.26	34.01	194	205	Peak
5400.38	43.38	34.66	54	-10.62	34.32	8.44	34.04	194	205	Average
5400.38	54.4	45.68	74	-19.6	34.32	8.44	34.04	194	205	Peak
10480	55.29	40.78	68.2	-12.91	37.19	12.53	35.21	137	155	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
- The emission levels of other frequencies were very low against the limit

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	Charles Hsiao

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
5114	43.19	34.99	54	-10.81	34.09	8.1	33.99	221	29	Average
5114	54.24	46.04	74	-19.76	34.09	8.1	33.99	221	29	Peak
5260	103.65	95.19			34.21	8.26	34.01	221	29	Average
5260	110.28	101.82			34.21	8.26	34.01	221	29	Peak
*10520	54.19	39.6	68.2	-14.01	37.21	12.61	35.23	136	6	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
5106.2	42.57	34.4	54	-11.43	34.09	8.07	33.99	200	199	Average
5106.2	53.1	44.93	74	-20.9	34.09	8.07	33.99	200	199	Peak
5260	100.57	92.11			34.21	8.26	34.01	200	199	Average
5260	107.19	98.73			34.21	8.26	34.01	200	199	Peak
*10520	54.26	39.67	68.2	-13.94	37.21	12.61	35.23	124	322	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
2. 5260 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

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	Charles Hsiao

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
5147.6	42.98	34.73	54	-11.02	34.12	8.13	34	221	29	Average
5147.6	54.54	46.29	74	-19.46	34.12	8.13	34	221	29	Peak
5300	103.77	95.23			34.24	8.32	34.02	221	29	Average
5300	110.21	101.67			34.24	8.32	34.02	221	29	Peak
5350.66	51.05	42.42	54	-2.95	34.28	8.38	34.03	221	40	Average
5350.66	60.57	51.94	74	-13.43	34.28	8.38	34.03	221	40	Peak
10600	46.93	32.25	54	-7.07	37.28	12.67	35.27	147	4	Average
10600	53.5	38.82	74	-20.5	37.28	12.67	35.27	147	4	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
5132.6	42.42	34.2	54	-11.58	34.11	8.1	33.99	200	199	Average
5132.6	52.89	44.67	74	-21.11	34.11	8.1	33.99	200	199	Peak
5300	100.57	92.03			34.24	8.32	34.02	200	199	Average
5300	107.86	99.32			34.24	8.32	34.02	200	199	Peak
5350.77	47.82	39.19	54	-6.18	34.28	8.38	34.03	200	199	Average
5350.77	58.44	49.81	74	-15.56	34.28	8.38	34.03	200	199	Peak
10600	46.93	32.25	54	-7.07	37.28	12.67	35.27	126	255	Average
10600	54.49	39.81	74	-19.51	37.28	12.67	35.27	126	255	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5300 MHz: Fundamental Frequency
- The emission levels of other frequencies were very low against the limit

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	Charles Hsiao

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	101.47	92.89			34.25	8.35	34.02	221	29	Average
5320	108.3	99.72			34.25	8.35	34.02	221	29	Peak
5350.33	51.94	43.31	54	-2.06	34.28	8.38	34.03	221	43	Average
5350.33	62	53.37	74	-12	34.28	8.38	34.03	221	43	Peak
10640	47.13	32.4	54	-6.87	37.31	12.71	35.29	147	158	Average
10640	54.33	39.6	74	-19.67	37.31	12.71	35.29	147	158	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	98.95	90.37			34.25	8.35	34.02	200	199	Average
5320	105.31	96.73			34.25	8.35	34.02	200	199	Peak
5350.44	49.88	41.25	54	-4.12	34.28	8.38	34.03	200	199	Average
5350.44	61.59	52.96	74	-12.41	34.28	8.38	34.03	200	199	Peak
10640	47.08	32.35	54	-6.92	37.31	12.71	35.29	158	99	Average
10640	53.91	39.18	74	-20.09	37.31	12.71	35.29	158	99	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
2. 5320 MHz: Fundamental Frequency
3. The emission levels of other frequencies were very low against the limit

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	Charles Hsiao

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
5459.92	44.9	36.08	54	-9.1	34.36	8.51	34.05	204	350	Average
5459.92	57.77	48.95	74	-16.23	34.36	8.51	34.05	204	350	Peak
*5470.64	60.9	52.07	68.2	-7.3	34.37	8.51	34.05	204	350	Peak
5500	102.57	93.65			34.4	8.57	34.05	204	350	Average
5500	109.18	100.26			34.4	8.57	34.05	204	350	Peak
11000	47.44	32.36	54	-6.56	37.6	12.96	35.48	132	2	Average
11000	55.55	40.47	74	-18.45	37.6	12.96	35.48	132	2	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
5459.92	43.73	34.91	54	-10.27	34.36	8.51	34.05	188	195	Average
5459.92	54	45.18	74	-20	34.36	8.51	34.05	188	195	Peak
*5470.64	58.15	49.32	68.2	-10.05	34.37	8.51	34.05	188	195	Peak
5500	99.68	90.76			34.4	8.57	34.05	188	195	Average
5500	106.5	97.58			34.4	8.57	34.05	188	195	Peak
11000	47.62	32.54	54	-6.38	37.6	12.96	35.48	195	299	Average
11000	56.67	41.59	74	-17.33	37.6	12.96	35.48	195	299	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
2. 5500 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

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	Charles Hsiao

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
5428.72	43.8	35.01	54	-10.2	34.35	8.48	34.04	204	350	Average
5428.72	54.87	46.08	74	-19.13	34.35	8.48	34.04	204	350	Peak
*5468.4	53.44	44.61	68.2	-14.76	34.37	8.51	34.05	204	350	Peak
5580	104.45	95.46			34.47	8.6	34.08	204	350	Average
5580	111.2	102.21			34.47	8.6	34.08	204	350	Peak
*5725	52.39	43.23	68.2	-15.81	34.62	8.65	34.11	204	350	Peak
11160	47.61	32.53	54	-6.39	37.7	12.83	35.45	145	136	Average
11160	55.42	40.34	74	-18.58	37.7	12.83	35.45	145	136	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
5424.4	43.11	34.34	54	-10.89	34.33	8.48	34.04	188	195	Average
5424.4	54.84	46.07	74	-19.16	34.33	8.48	34.04	188	195	Peak
*5470.48	52.16	43.33	68.2	-16.04	34.37	8.51	34.05	188	195	Peak
5580	101.47	92.48			34.47	8.6	34.08	188	195	Average
5580	108.58	99.59			34.47	8.6	34.08	188	195	Peak
*5725	52.46	43.3	68.2	-15.74	34.62	8.65	34.11	188	195	Peak
11160	47.6	32.52	54	-6.4	37.7	12.83	35.45	124	177	Average
11160	57.01	41.93	74	-16.99	37.7	12.83	35.45	124	177	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
2. 5580 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

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	Charles Hsiao

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	100.54	91.41			34.59	8.64	34.1	204	350	Average
5700	107.34	98.21			34.59	8.64	34.1	204	350	Peak
*5725	55.94	46.78	68.2	-12.26	34.62	8.65	34.11	204	350	Peak
11400	47.64	32.54	54	-6.36	37.84	12.67	35.41	105	25	Average
11400	55.82	40.72	74	-18.18	37.84	12.67	35.41	105	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
5700	97.52	88.39			34.59	8.64	34.1	188	195	Average
5700	104.01	94.88			34.59	8.64	34.1	188	195	Peak
*5725	56.98	47.82	68.2	-11.22	34.62	8.65	34.11	188	195	Peak
11400	47.57	32.47	54	-6.43	37.84	12.67	35.41	158	55	Average
11400	55.87	40.77	74	-18.13	37.84	12.67	35.41	158	55	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
2. 5700 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 144	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	Charles Hsiao

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
5459.12	43.66	34.84	54	-10.34	34.36	8.51	34.05	204	350	Average
5459.12	53.58	44.76	74	-20.42	34.36	8.51	34.05	204	350	Peak
*5470	53.24	44.41	68.2	-14.96	34.37	8.51	34.05	204	350	Peak
5720	100.47	91.31			34.62	8.65	34.11	204	350	Average
5720	107.09	97.93			34.62	8.65	34.11	204	350	Peak
11440	47.67	32.56	54	-6.33	37.86	12.65	35.4	159	9	Average
11440	55.28	40.17	74	-18.72	37.86	12.65	35.4	159	9	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
5452.24	43.21	34.39	54	-10.79	34.36	8.51	34.05	188	195	Average
5452.24	54.54	45.72	74	-19.46	34.36	8.51	34.05	188	195	Peak
*5468.88	52.2	43.37	68.2	-16	34.37	8.51	34.05	188	195	Peak
5720	97.49	88.33			34.62	8.65	34.11	188	195	Average
5720	104.63	95.47			34.62	8.65	34.11	188	195	Peak
11440	47.52	32.41	54	-6.48	37.86	12.65	35.4	135	288	Average
11440	55.53	40.42	74	-18.47	37.86	12.65	35.4	135	288	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5720 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The emission levels of other frequencies were very low against the limit

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	Charles Hsiao

<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	104.55	95.36			34.64	8.66	34.11	101	10	Average
5745	112.78	103.59			34.64	8.66	34.11	101	10	Peak
11490	47.35	32.23	54	-6.65	37.89	12.62	35.39	139	265	Average
11490	56.97	41.85	74	-17.03	37.89	12.62	35.39	139	265	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	98.87	89.68			34.64	8.66	34.11	188	195	Average
5745	106.39	97.2			34.64	8.66	34.11	188	195	Peak
11490	46.86	31.74	54	-7.14	37.89	12.62	35.39	135	165	Average
11490	56.49	41.37	74	-17.51	37.89	12.62	35.39	135	165	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
*5594.5	54.82	45.81	68.2	-13.38	34.49	8.6	34.08	101	10	Peak
5653.3	54.76	45.66	70.64	-15.88	34.56	8.63	34.09	101	10	Peak
5922.625	50.39	40.99	69.96	-19.57	34.83	8.73	34.16	101	10	Peak
*6012.925	54.27	44.77	68.2	-13.93	34.92	8.76	34.18	101	10	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
*5592.925	54.7	45.69	68.2	-13.5	34.49	8.6	34.08	188	195	Peak
5655.4	54.81	45.72	72.2	-17.39	34.56	8.63	34.1	188	195	Peak
5923.675	51.46	42.06	69.18	-17.72	34.83	8.73	34.16	188	195	Peak
*5937.325	53.53	44.13	68.2	-14.67	34.83	8.73	34.16	188	195	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
- The emission levels of other frequencies were very low against the limit

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	Charles Hsiao

<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	105.59	96.36			34.68	8.68	34.13	100	10	Average
5785	112.08	102.85			34.68	8.68	34.13	100	10	Peak
11570	47.05	31.74	54	-6.95	38	12.68	35.37	121	150	Average
11570	56.43	41.12	74	-17.57	38	12.68	35.37	121	150	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	98.98	89.75			34.68	8.68	34.13	195	205	Average
5785	106.39	97.16			34.68	8.68	34.13	195	205	Peak
11570	46.35	31.04	54	-7.65	38	12.68	35.37	136	211	Average
11570	55.8	40.49	74	-18.2	38	12.68	35.37	136	211	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	54.31	45.24	68.2	-13.89	34.54	8.62	34.09	100	10	Peak
5652.775	50.49	41.39	70.25	-19.76	34.56	8.63	34.09	100	10	Peak
5922.625	50.78	41.38	69.96	-19.18	34.83	8.73	34.16	100	10	Peak
*5939.95	54.22	44.79	68.2	-13.98	34.85	8.74	34.16	100	10	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	53.58	44.51	68.2	-14.62	34.54	8.62	34.09	195	205	Peak
5651.725	50.43	41.34	69.48	-19.05	34.56	8.62	34.09	195	205	Peak
5923.15	51	41.6	69.57	-18.57	34.83	8.73	34.16	195	205	Peak
*5939.95	54.47	45.04	68.2	-13.73	34.85	8.74	34.16	195	205	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
- The emission levels of other frequencies were very low against the limit

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	Charles Hsiao

<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	105.94	96.65			34.73	8.69	34.13	100	10	Average
5825	112.18	102.89			34.73	8.69	34.13	100	10	Peak
11650	45.66	30.13	54	-8.34	38.09	12.8	35.36	147	53	Average
11650	55.13	39.6	74	-18.87	38.09	12.8	35.36	147	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
5825	99.12	89.83			34.73	8.69	34.13	218	194	Average
5825	106.85	97.56			34.73	8.69	34.13	218	194	Peak
11650	46.93	31.4	54	-7.07	38.09	12.8	35.36	135	106	Average
11650	56.51	40.98	74	-17.49	38.09	12.8	35.36	135	106	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
*5611.3	53.45	44.42	68.2	-14.75	34.5	8.61	34.08	100	10	Peak
5653.825	52.24	43.15	71.03	-18.79	34.56	8.63	34.1	100	10	Peak
5923.675	52.48	43.08	69.18	-16.7	34.83	8.73	34.16	100	10	Peak
*6020.8	54.17	44.66	68.2	-14.03	34.92	8.77	34.18	100	10	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
*5599.225	54.51	45.49	68.2	-13.69	34.5	8.6	34.08	218	194	Peak
5653.825	51.69	42.6	71.03	-19.34	34.56	8.63	34.1	218	194	Peak
5921.575	53.02	43.62	70.73	-17.71	34.83	8.73	34.16	218	194	Peak
*5970.4	53.63	44.18	68.2	-14.57	34.87	8.75	34.17	218	194	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
- The emission levels of other frequencies were very low against the limit

802.11n (HT40)

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	Charles Hsiao

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
5146.4	45.31	37.06	54	-8.69	34.12	8.13	34	103	350	Average
5146.4	54.24	45.99	74	-19.76	34.12	8.13	34	103	350	Peak
5190	94.87	86.53			34.15	8.19	34	103	350	Average
5190	102.32	93.98			34.15	8.19	34	103	350	Peak
5357.59	43.73	35.1	54	-10.27	34.28	8.38	34.03	103	350	Average
5357.59	53.95	45.32	74	-20.05	34.28	8.38	34.03	103	350	Peak
*10380	53.9	39.55	68.2	-14.3	37.13	12.36	35.14	168	203	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	43.29	35.04	54	-10.71	34.12	8.13	34	194	205	Average
5149.85	53.44	45.19	74	-20.56	34.12	8.13	34	194	205	Peak
5190	89.93	81.59			34.15	8.19	34	194	205	Average
5190	97.55	89.21			34.15	8.19	34	194	205	Peak
5429.53	43.07	34.28	54	-10.93	34.35	8.48	34.04	194	205	Average
5429.53	53.84	45.05	74	-20.16	34.35	8.48	34.04	194	205	Peak
*10380	54.35	40	68.2	-13.85	37.13	12.36	35.14	128	243	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
- The emission levels of other frequencies were very low against the limit

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	Charles Hsiao

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
5150	48.38	40.13	54	-5.62	34.12	8.13	34	103	350	Average
5150	57.6	49.35	74	-16.4	34.12	8.13	34	103	350	Peak
5230	98.27	89.87			34.19	8.22	34.01	103	350	Average
5230	105.98	97.58			34.19	8.22	34.01	103	350	Peak
5350.44	45.51	36.88	54	-8.49	34.28	8.38	34.03	103	350	Average
5350.44	55.2	46.57	74	-18.8	34.28	8.38	34.03	103	350	Peak
*10460	53.03	38.52	68.2	-15.17	37.17	12.53	35.19	175	122	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	48.03	39.78	54	-5.97	34.12	8.13	34	194	205	Average
5150	53.44	45.19	74	-20.56	34.12	8.13	34	194	205	Peak
5230	91.27	82.87			34.19	8.22	34.01	194	205	Average
5230	99.84	91.44			34.19	8.22	34.01	194	205	Peak
5350.99	43.69	35.06	54	-10.31	34.28	8.38	34.03	194	205	Average
5350.99	53.4	44.77	74	-20.6	34.28	8.38	34.03	194	205	Peak
*10460	54.27	39.76	68.2	-13.93	37.17	12.53	35.19	142	316	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
- The emission levels of other frequencies were very low against the limit

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	Charles Hsiao

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
5150	43.52	35.27	54	-10.48	34.12	8.13	34	221	29	Average
5150	53.87	45.62	74	-20.13	34.12	8.13	34	221	29	Peak
5270	100.55	92.06			34.21	8.29	34.01	221	29	Average
5270	107.32	98.83			34.21	8.29	34.01	221	29	Peak
5350.44	52.69	44.06	54	-1.31	34.28	8.38	34.03	213	7	Average
5350.44	64.58	55.95	74	-9.42	34.28	8.38	34.03	213	7	Peak
*10540	54.1	39.48	68.2	-14.1	37.23	12.63	35.24	195	6	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
5149.1	43.31	35.06	54	-10.69	34.12	8.13	34	200	199	Average
5149.1	53.27	45.02	74	-20.73	34.12	8.13	34	200	199	Peak
5270	97.44	88.95			34.21	8.29	34.01	200	199	Average
5270	104.32	95.83			34.21	8.29	34.01	200	199	Peak
5351.1	51.85	43.22	54	-2.15	34.28	8.38	34.03	200	199	Average
5351.1	61.95	53.32	74	-12.05	34.28	8.38	34.03	200	199	Peak
*10540	53.92	39.3	68.2	-14.28	37.23	12.63	35.24	105	265	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
- The emission levels of other frequencies were very low against the limit

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	Charles Hsiao

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	42.92	34.67	54	-11.08	34.12	8.13	34	221	40	Average
5148.2	52.7	44.45	74	-21.3	34.12	8.13	34	221	40	Peak
5310	97.49	88.94			34.25	8.32	34.02	221	40	Average
5310	104.45	95.9			34.25	8.32	34.02	221	40	Peak
5350	53	44.37	54	-1	34.28	8.38	34.03	221	42	Average
5350	62.34	53.71	74	-11.66	34.28	8.38	34.03	221	42	Peak
10620	47.15	32.44	54	-6.85	37.3	12.69	35.28	158	145	Average
10620	54.31	39.6	74	-19.69	37.3	12.69	35.28	158	145	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
5130.8	42.81	34.59	54	-11.19	34.11	8.1	33.99	200	199	Average
5130.8	52.94	44.72	74	-21.06	34.11	8.1	33.99	200	199	Peak
5310	94.67	86.12			34.25	8.32	34.02	200	199	Average
5310	101.82	93.27			34.25	8.32	34.02	200	199	Peak
5350.44	50.47	41.84	54	-3.53	34.28	8.38	34.03	200	199	Average
5350.44	61.55	52.92	74	-12.45	34.28	8.38	34.03	200	199	Peak
10620	46.96	32.25	54	-7.04	37.3	12.69	35.28	158	9	Average
10620	53.94	39.23	74	-20.06	37.3	12.69	35.28	158	9	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5310 MHz: Fundamental Frequency
- The emission levels of other frequencies were very low against the limit

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	Charles Hsiao

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
5459.92	46.87	38.05	54	-7.13	34.36	8.51	34.05	204	350	Average
5459.92	58.41	49.59	74	-15.59	34.36	8.51	34.05	204	350	Peak
*5468.88	58.59	49.76	68.2	-9.61	34.37	8.51	34.05	204	350	Peak
5510	99.36	90.45			34.4	8.57	34.06	204	350	Average
5510	106.68	97.77			34.4	8.57	34.06	204	350	Peak
*5726.04	53.41	44.25	68.2	-14.79	34.62	8.65	34.11	204	350	Peak
11020	47.63	32.56	54	-6.37	37.61	12.94	35.48	114	200	Average
11020	55.28	40.21	74	-18.72	37.61	12.94	35.48	114	200	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
5458.64	45.55	36.73	54	-8.45	34.36	8.51	34.05	188	195	Average
5458.64	56.15	47.33	74	-17.85	34.36	8.51	34.05	188	195	Peak
*5470.64	59.05	50.22	68.2	-9.15	34.37	8.51	34.05	188	195	Peak
5510	96.14	87.23			34.4	8.57	34.06	188	195	Average
5510	103.35	94.44			34.4	8.57	34.06	188	195	Peak
*5725.4	52.84	43.68	68.2	-15.36	34.62	8.65	34.11	188	195	Peak
11020	47.71	32.64	54	-6.29	37.61	12.94	35.48	161	214	Average
11020	55.05	39.98	74	-18.95	37.61	12.94	35.48	161	214	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
2. 5510 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

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	Charles Hsiao

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	44.67	35.85	54	-9.33	34.36	8.51	34.05	204	350	Average
5458.8	53.97	45.15	74	-20.03	34.36	8.51	34.05	204	350	Peak
*5470.32	54.69	45.86	68.2	-13.51	34.37	8.51	34.05	204	350	Peak
5550	99.22	90.25			34.45	8.59	34.07	204	350	Average
5550	106.61	97.64			34.45	8.59	34.07	204	350	Peak
*5725.96	52.54	43.38	68.2	-15.66	34.62	8.65	34.11	204	350	Peak
11100	47.78	32.69	54	-6.22	37.66	12.89	35.46	122	165	Average
11100	55.29	40.2	74	-18.71	37.66	12.89	35.46	122	165	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
5459.76	43.86	35.04	54	-10.14	34.36	8.51	34.05	188	195	Average
5459.76	53.39	44.57	74	-20.61	34.36	8.51	34.05	188	195	Peak
*5469.68	53.41	44.58	68.2	-14.79	34.37	8.51	34.05	188	195	Peak
5550	96.35	87.38			34.45	8.59	34.07	188	195	Average
5550	103.59	94.62			34.45	8.59	34.07	188	195	Peak
*5725	53.03	43.87	68.2	-15.17	34.62	8.65	34.11	188	195	Peak
11100	47.83	32.74	54	-6.17	37.66	12.89	35.46	166	195	Average
11100	53.98	38.89	74	-20.02	37.66	12.89	35.46	166	195	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
2. 5550 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

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	Charles Hsiao

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
5445.36	43.51	34.69	54	-10.49	34.35	8.51	34.04	204	350	Average
5445.36	54.49	45.67	74	-19.51	34.35	8.51	34.04	204	350	Peak
*5468.4	52.87	44.04	68.2	-15.33	34.37	8.51	34.05	204	350	Peak
5670	97.47	88.37			34.57	8.63	34.1	204	350	Average
5670	104.45	95.35			34.57	8.63	34.1	204	350	Peak
*5725	53.82	44.66	68.2	-14.38	34.62	8.65	34.11	204	350	Peak
11340	47.79	32.7	54	-6.21	37.8	12.71	35.42	195	9	Average
11340	55.09	40	74	-18.91	37.8	12.71	35.42	195	9	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
5459.92	43.34	34.52	54	-10.66	34.36	8.51	34.05	188	195	Average
5459.92	52.95	44.13	74	-21.05	34.36	8.51	34.05	188	195	Peak
*5468.88	52.88	44.05	68.2	-15.32	34.37	8.51	34.05	188	195	Peak
5670	94.14	85.04			34.57	8.63	34.1	188	195	Average
5670	101.18	92.08			34.57	8.63	34.1	188	195	Peak
*5725	53.89	44.73	68.2	-14.31	34.62	8.65	34.11	188	195	Peak
11340	47.63	32.54	54	-6.37	37.8	12.71	35.42	141	300	Average
11340	55.41	40.32	74	-18.59	37.8	12.71	35.42	141	300	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
2. 5670 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 142	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	Charles Hsiao

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
5449.68	43.62	34.79	54	-10.38	34.36	8.51	34.04	204	350	Average
5449.68	53.72	44.89	74	-20.28	34.36	8.51	34.04	204	350	Peak
*5469.68	52.08	43.25	68.2	-16.12	34.37	8.51	34.05	204	350	Peak
5710	99.65	90.5			34.61	8.65	34.11	204	350	Average
5710	106.43	97.28			34.61	8.65	34.11	204	350	Peak
11420	47.65	32.55	54	-6.35	37.85	12.65	35.4	188	8	Average
11420	55.56	40.46	74	-18.44	37.85	12.65	35.4	188	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
5452.08	43.28	34.46	54	-10.72	34.36	8.51	34.05	188	195	Average
5452.08	53.21	44.39	74	-20.79	34.36	8.51	34.05	188	195	Peak
*5468.56	52.68	43.85	68.2	-15.52	34.37	8.51	34.05	188	195	Peak
5710	96.46	87.31			34.61	8.65	34.11	188	195	Average
5710	103.03	93.88			34.61	8.65	34.11	188	195	Peak
11420	47.64	32.54	54	-6.36	37.85	12.65	35.4	185	57	Average
11420	55.83	40.73	74	-18.17	37.85	12.65	35.4	185	57	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5710 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The emission levels of other frequencies were very low against the limit

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	Charles Hsiao

<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	100.18	90.97			34.66	8.66	34.11	100	10	Average
5755	107.71	98.5			34.66	8.66	34.11	100	10	Peak
11510	45.68	30.57	54	-8.32	37.9	12.6	35.39	136	225	Average
11510	55.18	40.07	74	-18.82	37.9	12.6	35.39	136	225	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	93.89	84.68			34.66	8.66	34.11	218	194	Average
5755	101.38	92.17			34.66	8.66	34.11	218	194	Peak
11510	45.43	30.32	54	-8.57	37.9	12.6	35.39	135	222	Average
11510	54.91	39.8	74	-19.09	37.9	12.6	35.39	135	222	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
*5646.475	60.41	51.34	68.2	-7.79	34.54	8.62	34.09	100	10	Peak
5652.775	62.42	53.32	70.25	-7.83	34.56	8.63	34.09	100	10	Peak
5921.05	53.17	43.79	71.12	-17.95	34.81	8.73	34.16	100	10	Peak
*5926.825	55.25	45.85	68.2	-12.95	34.83	8.73	34.16	100	10	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
*5648.575	57.63	48.56	68.2	-10.57	34.54	8.62	34.09	218	194	Peak
5654.35	56.18	47.09	71.42	-15.24	34.56	8.63	34.1	218	194	Peak
5920.525	54.64	45.26	71.51	-16.87	34.81	8.73	34.16	218	194	Peak
*5964.1	53.82	44.38	68.2	-14.38	34.87	8.74	34.17	218	194	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
- The emission levels of other frequencies were very low against the limit

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	Charles Hsiao

<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	101.23	91.99			34.69	8.68	34.13	100	10	Average
5795	108.6	99.36			34.69	8.68	34.13	100	10	Peak
11590	45.27	29.9	54	-8.73	38.02	12.72	35.37	195	325	Average
11590	54.72	39.35	74	-19.28	38.02	12.72	35.37	195	325	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	95.61	86.37			34.69	8.68	34.13	217	195	Average
5795	103.18	93.94			34.69	8.68	34.13	217	195	Peak
11590	44.47	29.1	54	-9.53	38.02	12.72	35.37	125	136	Average
11590	54.01	38.64	74	-19.99	38.02	12.72	35.37	125	136	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
*5645.95	55.27	46.2	68.2	-12.93	34.54	8.62	34.09	100	10	Peak
5651.725	53.44	44.35	69.48	-16.04	34.56	8.62	34.09	100	10	Peak
5922.625	57.46	48.06	69.96	-12.5	34.83	8.73	34.16	100	10	Peak
*5925.775	56.17	46.77	68.2	-12.03	34.83	8.73	34.16	100	10	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
*5626.525	54.14	45.09	68.2	-14.06	34.52	8.61	34.08	217	195	Peak
5655.4	51.56	42.47	72.2	-20.64	34.56	8.63	34.1	217	195	Peak
5922.625	51.68	42.28	69.96	-18.28	34.83	8.73	34.16	217	195	Peak
*5937.85	53.12	43.72	68.2	-15.08	34.83	8.73	34.16	217	195	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
- The emission levels of other frequencies were very low against the limit

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	Charles Hsiao

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
5150	48.02	39.77	54	-5.98	34.12	8.13	34	103	350	Average
5150	53.94	45.69	74	-20.06	34.12	8.13	34	103	350	Peak
5210	90.26	81.9			34.17	8.19	34	103	350	Average
5210	98.65	90.29			34.17	8.19	34	103	350	Peak
5350	43.68	35.05	54	-10.32	34.28	8.38	34.03	103	350	Average
5350	54.6	45.97	74	-19.4	34.28	8.38	34.03	103	350	Peak
*10420	53.69	39.28	68.2	-14.51	37.15	12.42	35.16	126	59	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
5149.25	43.94	35.69	54	-10.06	34.12	8.13	34	194	205	Average
5149.25	53.6	45.35	74	-20.4	34.12	8.13	34	194	205	Peak
5210	88.22	79.86			34.17	8.19	34	194	205	Average
5210	95.06	86.7			34.17	8.19	34	194	205	Peak
5442.95	43.38	34.59	54	-10.62	34.35	8.48	34.04	194	205	Average
5442.95	53.13	44.34	74	-20.87	34.35	8.48	34.04	194	205	Peak
*10420	53.87	39.46	68.2	-14.33	37.15	12.42	35.16	146	208	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
- The emission levels of other frequencies were very low against the limit

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	Charles Hsiao

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
5130.95	43.1	34.88	54	-10.9	34.11	8.1	33.99	221	60	Average
5130.95	52.56	44.34	74	-21.44	34.11	8.1	33.99	221	60	Peak
5290	92.57	84.04			34.23	8.32	34.02	221	60	Average
5290	99.78	91.25			34.23	8.32	34.02	221	60	Peak
5354.29	47.52	38.89	54	-6.48	34.28	8.38	34.03	221	60	Average
5354.29	57.46	48.83	74	-16.54	34.28	8.38	34.03	221	60	Peak
*10580	54.61	39.96	68.2	-13.59	37.27	12.65	35.27	189	9	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
5144.15	43.06	34.81	54	-10.94	34.12	8.13	34	200	199	Average
5144.15	54.51	46.26	74	-19.49	34.12	8.13	34	200	199	Peak
5290	89.85	81.32			34.23	8.32	34.02	200	199	Average
5290	96.99	88.46			34.23	8.32	34.02	200	199	Peak
5350	46.44	37.81	54	-7.56	34.28	8.38	34.03	200	199	Average
5350	56.45	47.82	74	-17.55	34.28	8.38	34.03	200	199	Peak
*10580	54.78	40.13	68.2	-13.42	37.27	12.65	35.27	141	146	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
- The emission levels of other frequencies were very low against the limit

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	Charles Hsiao

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	47.84	39.02	54	-6.16	34.36	8.51	34.05	204	350	Average
5458.8	58.71	49.89	74	-15.29	34.36	8.51	34.05	204	350	Peak
*5468.08	57.7	48.87	68.2	-10.5	34.37	8.51	34.05	204	350	Peak
5530	95.58	86.65			34.42	8.58	34.07	204	350	Average
5530	102.7	93.77			34.42	8.58	34.07	204	350	Peak
*5725.64	52.54	43.38	68.2	-15.66	34.62	8.65	34.11	204	350	Peak
11060	47.55	32.47	54	-6.45	37.64	12.91	35.47	145	1	Average
11060	54.74	39.66	74	-19.26	37.64	12.91	35.47	145	1	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
5451.12	46.29	37.47	54	-7.71	34.36	8.51	34.05	188	195	Average
5451.12	56.63	47.81	74	-17.37	34.36	8.51	34.05	188	195	Peak
*5468.24	55.46	46.63	68.2	-12.74	34.37	8.51	34.05	188	195	Peak
5530	92.47	83.54			34.42	8.58	34.07	188	195	Average
5530	99.63	90.7			34.42	8.58	34.07	188	195	Peak
*5726.04	51.66	42.5	68.2	-16.54	34.62	8.65	34.11	188	195	Peak
11060	47.93	32.85	54	-6.07	37.64	12.91	35.47	195	346	Average
11060	54.25	39.17	74	-19.75	37.64	12.91	35.47	195	346	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
2. 5530 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

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	Charles Hsiao

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
5459.6	52.81	43.99	54	-1.19	34.36	8.51	34.05	203	351	Average
5459.6	61.91	53.09	74	-12.09	34.36	8.51	34.05	203	351	Peak
*5468.88	65.13	56.3	68.2	-3.07	34.37	8.51	34.05	203	351	Peak
5610	99.36	90.33			34.5	8.61	34.08	204	350	Average
5610	106.83	97.8			34.5	8.61	34.08	204	350	Peak
*5725.64	64.53	55.37	68.2	-3.67	34.62	8.65	34.11	204	350	Peak
11220	47.98	32.89	54	-6.02	37.73	12.8	35.44	147	14	Average
11220	56.46	41.37	74	-17.54	37.73	12.8	35.44	147	14	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
5456.88	50.92	42.1	54	-3.08	34.36	8.51	34.05	188	195	Average
5456.88	61.5	52.68	74	-12.5	34.36	8.51	34.05	188	195	Peak
*5470.96	62.52	53.66	68.2	-5.68	34.37	8.54	34.05	188	195	Peak
5610	96.74	87.71			34.5	8.61	34.08	188	195	Average
5610	103.49	94.46			34.5	8.61	34.08	188	195	Peak
*5725.4	63	53.84	68.2	-5.2	34.62	8.65	34.11	188	195	Peak
11220	47.89	32.8	54	-6.11	37.73	12.8	35.44	173	266	Average
11220	55.4	40.31	74	-18.6	37.73	12.8	35.44	173	266	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
2. 5610 MHz: Fundamental Frequency
3. *: Out of Restricted Band
4. The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 138	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	Charles Hsiao

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
5454.8	47.83	39.01	54	-6.17	34.36	8.51	34.05	204	350	Average
5454.8	58.26	49.44	74	-15.74	34.36	8.51	34.05	204	350	Peak
*5468.08	58.06	49.23	68.2	-10.14	34.37	8.51	34.05	204	350	Peak
5690	98.87	89.74			34.59	8.64	34.1	204	350	Average
5690	105.24	96.11			34.59	8.64	34.1	204	350	Peak
11380	47.97	32.86	54	-6.03	37.83	12.69	35.41	145	16	Average
11380	54.9	39.79	74	-19.1	37.83	12.69	35.41	145	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
5454.16	47.64	38.82	54	-6.36	34.36	8.51	34.05	188	195	Average
5454.16	56.3	47.48	74	-17.7	34.36	8.51	34.05	188	195	Peak
*5470.32	56.42	47.59	68.2	-11.78	34.37	8.51	34.05	188	195	Peak
5690	95.36	86.23			34.59	8.64	34.1	188	195	Average
5690	102.14	93.01			34.59	8.64	34.1	188	195	Peak
11380	47.69	32.58	54	-6.31	37.83	12.69	35.41	138	178	Average
11380	54.92	39.81	74	-19.08	37.83	12.69	35.41	138	178	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5690 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The emission levels of other frequencies were very low against the limit

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	Charles Hsiao

<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	98.2	88.97			34.68	8.67	34.12	100	10	Average
5775	105.93	96.7			34.68	8.67	34.12	100	10	Peak
11550	45.12	29.85	54	-8.88	37.97	12.68	35.38	156	137	Average
11550	54.51	39.24	74	-19.49	37.97	12.68	35.38	156	137	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	92.21	82.98			34.68	8.67	34.12	217	195	Average
5775	99.63	90.4			34.68	8.67	34.12	217	195	Peak
11550	45.27	30	54	-8.73	37.97	12.68	35.38	125	137	Average
11550	55.08	39.81	74	-18.92	37.97	12.68	35.38	125	137	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
*5639.65	61.07	52	68.2	-7.13	34.54	8.62	34.09	100	10	Peak
5652.775	59.58	50.48	70.25	-10.67	34.56	8.63	34.09	100	10	Peak
5921.575	58.08	48.68	70.73	-12.65	34.83	8.73	34.16	100	10	Peak
*5926.825	58.37	48.97	68.2	-9.83	34.83	8.73	34.16	100	10	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
*5642.275	56.7	47.63	68.2	-11.5	34.54	8.62	34.09	217	195	Peak
5652.25	56.23	47.14	69.86	-13.63	34.56	8.62	34.09	217	195	Peak
5922.625	51.63	42.23	69.96	-18.33	34.83	8.73	34.16	217	195	Peak
*5953.6	53.97	44.54	68.2	-14.23	34.85	8.74	34.16	217	195	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
- The emission levels of other frequencies were very low against the limit

802.11ac (VHT160)

EUT Test Condition		Measurement Detail	
Channel	Channel 50	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	Charles Hsiao

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
5150	43.1	30.56	54	-10.9	34.12	8.13	29.71	126	154	Average
5150	52.79	40.25	74	-21.21	34.12	8.13	29.71	126	154	Peak
5250	88.35	75.62			34.2	8.26	29.73	126	154	Average
5250	93.96	81.23			34.2	8.26	29.73	126	154	Peak
5375.5	44.2	31.25	54	-9.8	34.29	8.41	29.75	155	187	Average
5375.5	56.55	43.6	74	-17.45	34.29	8.41	29.75	155	187	Peak
*10500	51.13	36.57	68.2	-17.07	37.2	12.59	35.23	127	184	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
5125	40.62	28.12	54	-13.38	34.11	8.1	29.71	129	188	Average
5125	51.02	38.52	74	-22.98	34.11	8.1	29.71	129	188	Peak
5250	80.96	68.23			34.2	8.26	29.73	129	188	Average
5250	86.59	73.86			34.2	8.26	29.73	129	188	Peak
5395	39.88	26.87	54	-14.12	34.32	8.44	29.75	163	123	Average
5395	51.58	38.57	74	-22.42	34.32	8.44	29.75	163	123	Peak
*10500	52.09	37.53	68.2	-16.11	37.2	12.59	35.23	182	195	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5250 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The emission levels of other frequencies were very low against the limit

EUT Test Condition		Measurement Detail	
Channel	Channel 114	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	Charles Hsiao

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	43.64	30.53	54	-10.36	34.36	8.51	29.76	125	166	Average
5460	58.64	45.53	74	-15.36	34.36	8.51	29.76	125	166	Peak
*5470	60.28	47.16	68.2	-7.92	34.37	8.51	29.76	125	166	Peak
5570	90.8	77.53			34.47	8.59	29.79	125	166	Average
5570	97.92	84.65			34.47	8.59	29.79	125	166	Peak
*5725	55.77	42.36	68.2	-12.43	34.62	8.65	29.86	195	187	Peak
11140	45.29	30.21	54	-8.71	37.68	12.85	35.45	195	187	Average
11140	54.67	39.59	74	-19.33	37.68	12.85	35.45	195	187	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
5457	39.97	26.86	54	-14.03	34.36	8.51	29.76	166	210	Average
5457	50.69	37.58	74	-23.31	34.36	8.51	29.76	166	210	Peak
*5469	52.04	38.92	68.2	-16.16	34.37	8.51	29.76	166	210	Peak
5570	74.5	61.23			34.47	8.59	29.79	166	210	Average
5570	81.78	68.51			34.47	8.59	29.79	166	210	Peak
*5725.5	50.27	36.86	68.2	-17.93	34.62	8.65	29.86	195	168	Peak
11140	43.97	28.89	54	-10.03	37.68	12.85	35.45	105	142	Average
11140	52.93	37.85	74	-21.07	37.68	12.85	35.45	105	142	Peak

Remarks:

- Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
- 5570 MHz: Fundamental Frequency
- *: Out of Restricted Band
- The emission levels of other frequencies were very low against the limit

9 kHz ~ 30 MHz Data:

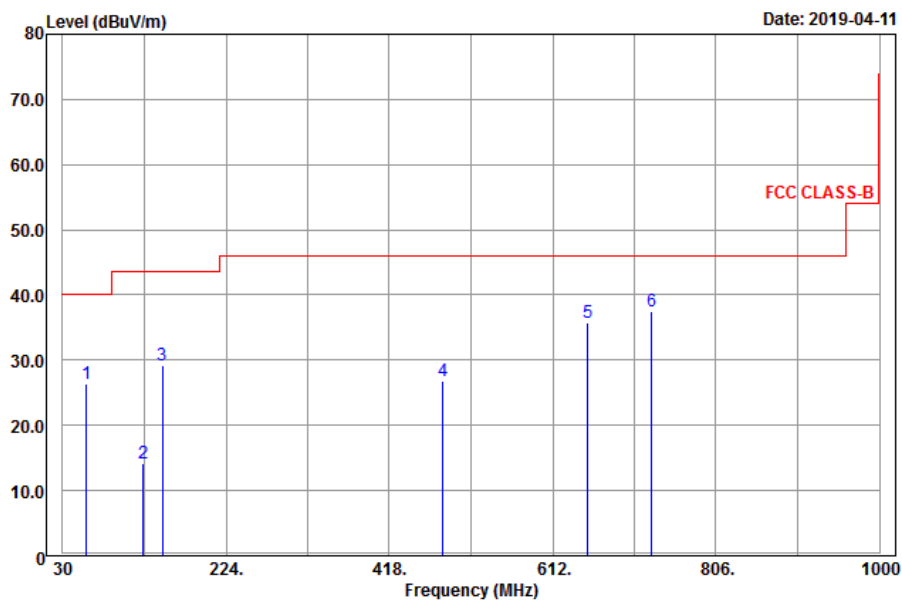
The amplitude of spurious emissions attenuated more than 20 dB below the permissible value is not required to be report.

30 MHz ~ 1 GHz Worst-Case Data:

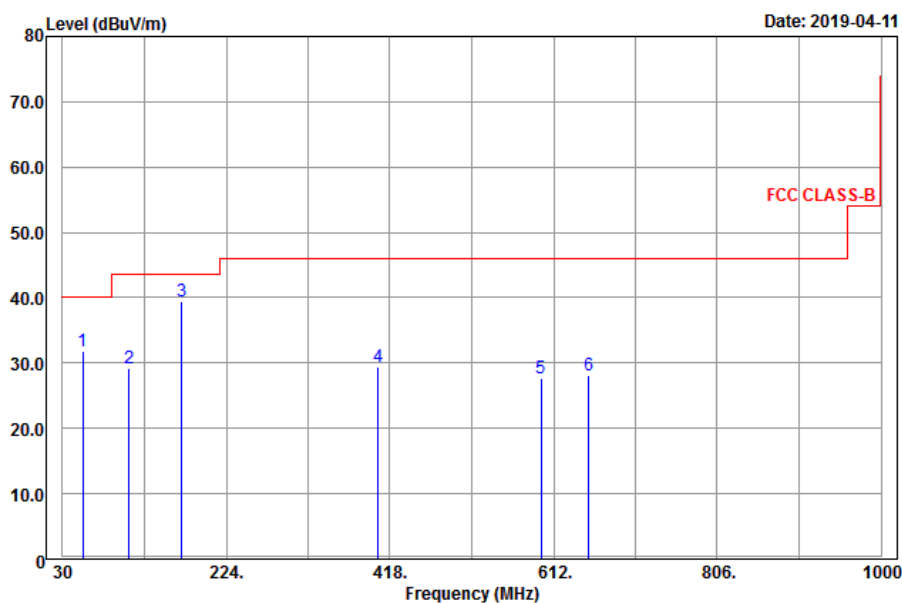
802.11n (HT40)

EUT Test Condition		Measurement Detail	
Channel	Channel 62	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	Charles Hsiao

Horizontal



Vertical



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
58.35	26.43	50.81	40	-13.57	6.95	0.9	32.23	166	169	Peak
125.85	14.2	36.06	43.5	-29.3	9	1.38	32.24	105	172	Peak
148.26	29.31	50.08	43.5	-14.19	9.98	1.52	32.27	136	142	Peak
481.3	26.81	37.44	46	-19.19	18.92	2.56	32.11	157	184	Peak
653.5	35.78	42.61	46	-10.22	22.32	2.99	32.14	199	168	Peak
729.8	37.57	43.16	46	-8.43	23.37	3.16	32.12	105	172	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
53.76	31.74	55.68	40	-8.26	7.39	0.9	32.23	187	172	Peak
108.84	29.11	50.64	43.5	-14.39	9.44	1.28	32.25	144	152	Peak
171.48	39.47	60.12	43.5	-4.03	10.07	1.52	32.24	105	195	Peak
404.3	29.41	41.26	46	-16.59	18.03	2.34	32.22	142	153	Peak
597.5	27.71	36.05	46	-18.29	20.98	2.87	32.19	182	165	Peak
653.5	28.03	34.86	46	-17.97	22.32	2.99	32.14	177	184	Peak

Remarks:

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

4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

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

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

4.2.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver ROHDE & SCHWARZ	ESCI	100613	Dec. 10, 2018	Dec. 09, 2019
RF signal cable Woken	5D-FB	Cable-cond1-01	Sep. 05, 2018	Sep. 04, 2019
LISN/AMN ROHDE & SCHWARZ (EUT)	ENV216	101826	Feb. 21, 2019	Feb. 20, 2020
LISN/AMN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Aug. 19, 2018	Aug. 18, 2019
Software ADT	BV ADT_Cond_ V7.3.7.4	NA	NA	NA

Note: 1. The calibration interval of the above test instruments is 12 months and the calibrations are traceable to NML/ROC and NIST/USA.
 2. The test was performed in HwaYa Shielded Room 1.
 3. The VCCI Site Registration No. is C-12040.

4.2.3 Test Procedures

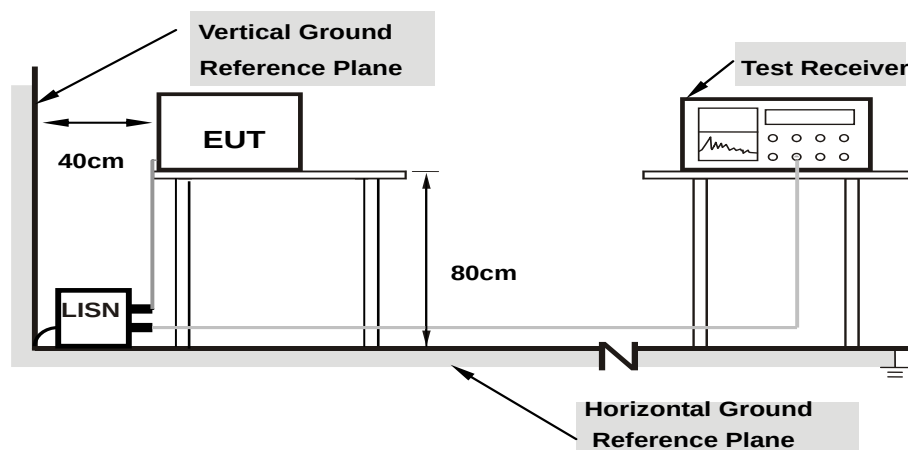
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance 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: All modes of operation were investigated and the worst-case emissions are reported.

4.2.4 Deviation from Test Standard

No deviation.

4.2.5 Test Setup



- Note:** 1.Support units were connected to second LISN.
2.Both of LISNs (AMN) are 80 cm from EUT and at least 80 cm from other units and other metal planes

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

4.2.6 EUT Operating Conditions

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

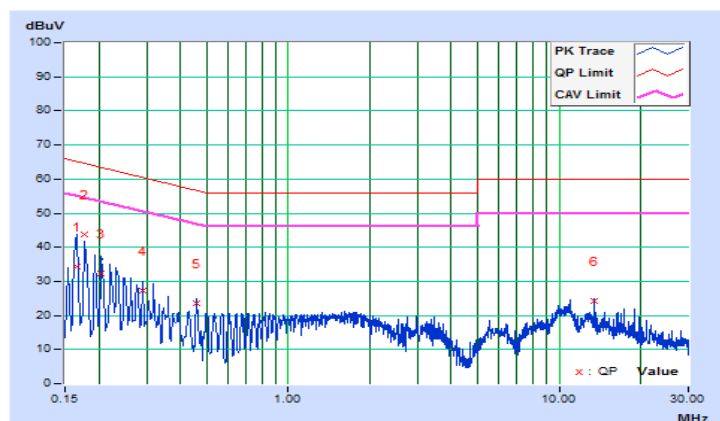
4.2.7 Test Results

Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25°C, 65%RH
Tested by	Jisyong Wang	Test Date	2019/4/26

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	0.16564	0.26	34.05	14.50	34.31	14.76	65.18	55.18	-30.87	-40.42
2	0.17744	0.26	43.50	27.90	43.76	28.16	64.60	54.60	-20.84	-26.44
3	0.20474	0.24	31.95	8.35	32.19	8.59	63.42	53.42	-31.23	-44.83
4	0.29043	0.24	27.07	13.93	27.31	14.17	60.51	50.51	-33.20	-36.34
5	0.45889	0.23	23.31	1.35	23.54	1.58	56.71	46.71	-33.17	-45.13
6	13.55739	5.10	19.15	1.98	24.25	7.08	60.00	50.00	-35.75	-42.92

Remarks:

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

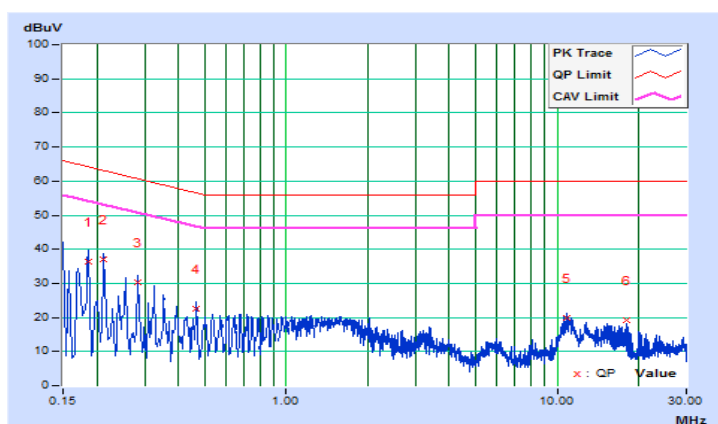


Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25°C, 65%RH
Tested by	Jisyong Wang	Test Date	2019/4/26

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	0.18519	0.25	36.05	19.82	36.30	20.07	64.25	54.25	-27.95	-34.18
2	0.21256	0.24	36.81	20.16	37.05	20.40	63.10	53.10	-26.05	-32.70
3	0.28294	0.24	29.90	11.19	30.14	11.43	60.73	50.73	-30.59	-39.30
4	0.46669	0.24	22.37	1.64	22.61	1.88	56.57	46.57	-33.96	-44.69
5	10.83212	3.45	16.35	1.82	19.80	5.27	60.00	50.00	-40.20	-44.73
6	18.10863	4.70	14.33	1.17	19.03	5.87	60.00	50.00	-40.97	-44.13

Remarks:

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



4.3 Transmit Power Measurement

4.3.1 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 $N_{ANT} \leq 4$;

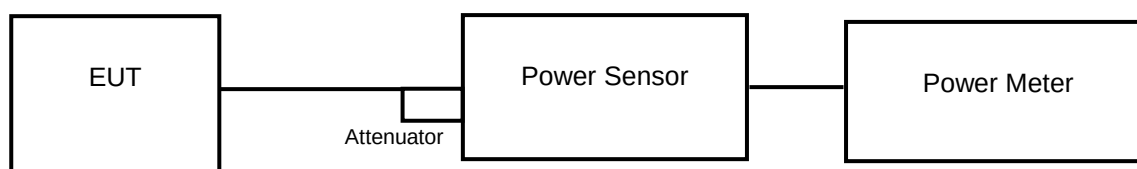
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT} ;

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

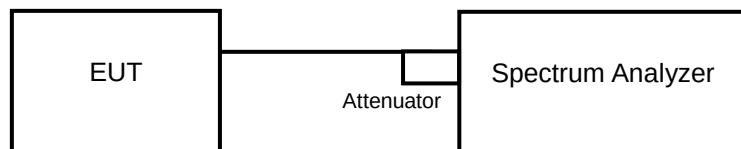
For power measurements on all other devices: Array Gain = $10 \log(N_{ANT}/N_{SS})$ dB.

4.3.2 Test Setup

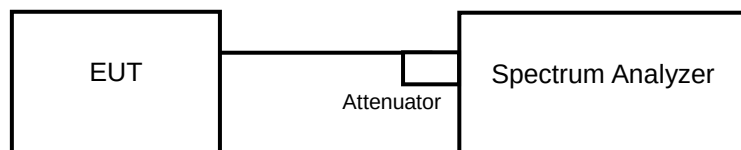
<Power Output Measurement>



or



<26 dB Bandwidth>



4.3.3 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.3.4 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), 802.11ac (VHT160)>

- a. Set span to encompass the entire 26 dB EBW (or, alternatively, the entire 99 % occupied bandwidth) of the signal.
- b. Set sweep trigger to "free run".
- c. Set RBW = 1 MHz.
- d. Set VBW $\geq$ 3 MHz
- e. Number of points in sweep $\geq$ 2 Span / RBW.
- f. Sweep time $\leq$ (number of points in sweep) * T
- g. Using emission bandwidth to determine the frequency span for integration the channel bandwidth.
- h. Detector = RMS.
- i. Trace mode = max hold.
- j. Allow max hold to run for at least 60 seconds, or longer as needed to allow the trace to stabilize.

26 dB Bandwidth

- a. Set RBW = approximately 1 % of the emission bandwidth.
- b. Set the VBW > RBW.
- c. Detector = Peak.
- d. Trace mode = max hold.
- e. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1 %.

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

Power Output:

802.11a

Channel	Frequency (MHz)	Maximum Conducted Power (mW)	Maximum Conducted Power (dBm)	Power Limit (dBm)	Pass / Fail
36	5180	54.075	17.33	24	Pass
40	5200	112.720	20.52	24	Pass
48	5240	123.595	20.92	24	Pass
52	5260	68.077	18.33	24	Pass
60	5300	67.920	18.32	24	Pass
64	5320	66.069	18.20	24	Pass
100	5500	59.979	17.78	24	Pass
116	5580	86.298	19.36	24	Pass
140	5700	76.913	18.86	24	Pass
144	5720 (U-NII-2C)	52.723	17.22	23.25	Pass
144	5720 (U-NII-3)	20.749	13.17	30	Pass
149	5745	78.343	18.94	30	Pass
157	5785	76.913	18.86	30	Pass
165	5825	77.090	18.87	30	Pass

Note:

For U-NII-2A, U-NII-2C Band:

1. $11 \text{ dBm} + 10\log(24.29) = 24.85 \text{ dBm} > 24 \text{ dBm}$.
2. $11 \text{ dBm} + 10\log(24.01) = 24.80 \text{ dBm} > 24 \text{ dBm}$.
3. $11 \text{ dBm} + 10\log(24.57) = 24.90 \text{ dBm} > 24 \text{ dBm}$.
4. $11 \text{ dBm} + 10\log(24.11) = 24.82 \text{ dBm} > 24 \text{ dBm}$.
5. $11 \text{ dBm} + 10\log(24.58) = 24.90 \text{ dBm} > 24 \text{ dBm}$.
6. $11 \text{ dBm} + 10\log(23.87) = 24.77 \text{ dBm} > 24 \text{ dBm}$.
7. $11 \text{ dBm} + 10\log(16.79) = 23.25 \text{ dBm} < 24 \text{ dBm}$.

802.11n (HT20)

Channel	Frequency (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	16.86	17.10	99.815	19.99	24	Pass
40	5200	18.94	18.64	151.457	21.80	24	Pass
48	5240	19.53	19.34	175.644	22.45	24	Pass
52	5260	18.36	17.92	130.493	21.16	24	Pass
60	5300	18.30	17.95	129.981	21.14	24	Pass
64	5320	17.84	17.88	122.190	20.87	24	Pass
100	5500	16.43	16.65	90.192	19.55	24	Pass
116	5580	19.42	19.56	177.863	22.50	24	Pass
140	5700	16.75	17.12	98.838	19.95	24	Pass
144	5720 (U-NII-2C)	17.06	17.40	105.77	20.24	23.37	Pass
144	5720 (U-NII-3)	13.45	13.72	45.681	16.60	30	Pass
149	5745	21.10	21.39	266.546	24.26	30	Pass
157	5785	21.41	21.74	287.636	24.59	30	Pass
165	5825	21.18	21.45	270.857	24.33	30	Pass

Note:

For U-NII-2A, U-NII-2C Band:

Chain 0

1. $11 \text{ dBm} + 10\log(25.54) = 25.07 \text{ dBm} > 24 \text{ dBm}$.
2. $11 \text{ dBm} + 10\log(25.20) = 25.01 \text{ dBm} > 24 \text{ dBm}$.
3. $11 \text{ dBm} + 10\log(25.01) = 24.98 \text{ dBm} > 24 \text{ dBm}$.
4. $11 \text{ dBm} + 10\log(24.76) = 24.93 \text{ dBm} > 24 \text{ dBm}$.
5. $11 \text{ dBm} + 10\log(24.64) = 24.91 \text{ dBm} > 24 \text{ dBm}$.
6. $11 \text{ dBm} + 10\log(24.23) = 24.84 \text{ dBm} > 24 \text{ dBm}$.
7. $11 \text{ dBm} + 10\log(17.27) = 23.37 \text{ dBm} < 24 \text{ dBm}$.

Chain 1

1. $11 \text{ dBm} + 10\log(24.13) = 24.82 \text{ dBm} > 24 \text{ dBm}$.
2. $11 \text{ dBm} + 10\log(24.72) = 24.93 \text{ dBm} > 24 \text{ dBm}$.
3. $11 \text{ dBm} + 10\log(24.38) = 24.87 \text{ dBm} > 24 \text{ dBm}$.
4. $11 \text{ dBm} + 10\log(24.03) = 24.80 \text{ dBm} > 24 \text{ dBm}$.
5. $11 \text{ dBm} + 10\log(25.27) = 25.02 \text{ dBm} > 24 \text{ dBm}$.
6. $11 \text{ dBm} + 10\log(24.13) = 24.82 \text{ dBm} > 24 \text{ dBm}$.
7. $11 \text{ dBm} + 10\log(17.58) = 23.45 \text{ dBm} < 24 \text{ dBm}$.

802.11n (HT40)

Channel	Frequency (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
38	5190	14.50	14.62	57.157	17.57	24	Pass
46	5230	17.80	17.56	117.272	20.69	24	Pass
54	5270	18.07	18.03	127.654	21.06	24	Pass
62	5310	15.88	15.85	77.185	18.88	24	Pass
102	5510	16.56	16.72	92.279	19.65	24	Pass
110	5550	16.36	16.58	88.750	19.48	24	Pass
134	5670	16.46	16.41	88.011	19.45	24	Pass
142	5710 (U-NII-2C)	17.13	17.55	19.647	12.93	24	Pass
142	5710 (U-NII-3)	10.24	10.42	2.5332	4.04	30	Pass
151	5755	18.93	18.17	143.778	21.58	30	Pass
159	5795	20.14	19.58	194.058	22.88	30	Pass

Note:

For U-NII-2A, U-NII-2C Band:

Chain 0

1. $11 \text{ dBm} + 10\log(43.24) = 27.35 \text{ dBm} > 24 \text{ dBm}$.
2. $11 \text{ dBm} + 10\log(43.60) = 27.39 \text{ dBm} > 24 \text{ dBm}$.
3. $11 \text{ dBm} + 10\log(44.79) = 27.51 \text{ dBm} > 24 \text{ dBm}$.
4. $11 \text{ dBm} + 10\log(42.46) = 27.27 \text{ dBm} > 24 \text{ dBm}$.
5. $11 \text{ dBm} + 10\log(45.07) = 27.53 \text{ dBm} > 24 \text{ dBm}$.
6. $11 \text{ dBm} + 10\log(37.69) = 26.76 \text{ dBm} > 24 \text{ dBm}$.

Chain 1

1. $11 \text{ dBm} + 10\log(42.47) = 27.28 \text{ dBm} > 24 \text{ dBm}$.
2. $11 \text{ dBm} + 10\log(42.54) = 27.28 \text{ dBm} > 24 \text{ dBm}$.
3. $11 \text{ dBm} + 10\log(43.19) = 27.35 \text{ dBm} > 24 \text{ dBm}$.
4. $11 \text{ dBm} + 10\log(42.29) = 27.26 \text{ dBm} > 24 \text{ dBm}$.
5. $11 \text{ dBm} + 10\log(45.22) = 27.55 \text{ dBm} > 24 \text{ dBm}$.
6. $11 \text{ dBm} + 10\log(37.50) = 26.74 \text{ dBm} > 24 \text{ dBm}$.

802.11ac (VHT80)

Channel	Frequency (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
42	5210	14.94	13.74	54.848	17.39	24	Pass
58	5290	14.87	13.58	53.493	17.28	24	Pass
106	5530	15.29	14.95	65.067	18.13	24	Pass
122	5610	19.99	19.42	187.268	22.72	24	Pass
138	5690 (U-NII-2C)	18.50	18.85	147.531	21.69	24	Pass
138	5690 (U-NII-3)	8.09	9.26	14.875	11.72	30	Pass
155	5775	18.60	18.28	139.742	21.45	30	Pass

Note:

For U-NII-2A, U-NII-2C Band:

Chain 0

1. 11 dBm + 10log (85.11) = 30.29 dBm > 24 dBm.
2. 11 dBm + 10log (86.23) = 30.35 dBm > 24 dBm.
3. 11 dBm + 10log (89.92) = 30.53 dBm > 24 dBm.
4. 11 dBm + 10log (80.76) = 30.07 dBm > 24 dBm.

Chain 1

1. 11 dBm + 10log (85.67) = 30.32 dBm > 24 dBm.
2. 11 dBm + 10log (85.54) = 30.32 dBm > 24 dBm.
3. 11 dBm + 10log (87.01) = 30.39 dBm > 24 dBm.
4. 11 dBm + 10log (80.42) = 30.05 dBm > 24 dBm.

802.11ac (VHT160)

Channel	Frequency (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
50	5250	10.85	9.84	21.8	13.38	24	Pass
114	5570	13.32	12.90	40.976	16.13	24	Pass

Note:

For U-NII-2A, U-NII-2C Band:

Chain 0

1. 11 dBm + 10log (162.92) = 33.12 dBm > 24 dBm.

Chain 1

1. 11 dBm + 10log (162.43) = 33.11 dBm > 24 dBm.

26 dB Bandwidth:
802.11a

Channel	Frequency (MHz)	26 dBc Bandwidth (MHz)
36	5180	24.39
40	5200	40.36
48	5240	23.65
52	5260	24.29
60	5300	24.01
64	5320	24.57
100	5500	24.11
116	5580	24.58
140	5700	23.87
144	5720 (U-NII-2C)	16.79
144	5720 (U-NII-3)	6.60

802.11n (HT20)

Channel	Frequency (MHz)	26 dBc Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	24.24	24.19
40	5200	25.23	25.38
48	5240	34.35	27.63
52	5260	25.54	24.13
60	5300	25.20	24.72
64	5320	25.01	24.38
100	5500	24.76	24.03
116	5580	24.64	25.27
140	5700	24.23	24.13
144	5720 (U-NII-2C)	17.27	17.58
144	5720 (U-NII-3)	7.52	7.52

802.11n (HT40)

Channel	Frequency (MHz)	26 dBc Bandwidth (MHz)	
		Chain 0	Chain 1
38	5190	45.93	43.88
46	5230	44.17	43.10
54	5270	43.24	42.47
62	5310	43.60	42.54
102	5510	44.79	43.19
110	5550	42.46	42.29
134	5670	45.07	45.22
142	5710 (U-NII-2C)	37.69	37.50
142	5710 (U-NII-3)	7.72	7.26

802.11ac (VHT80)

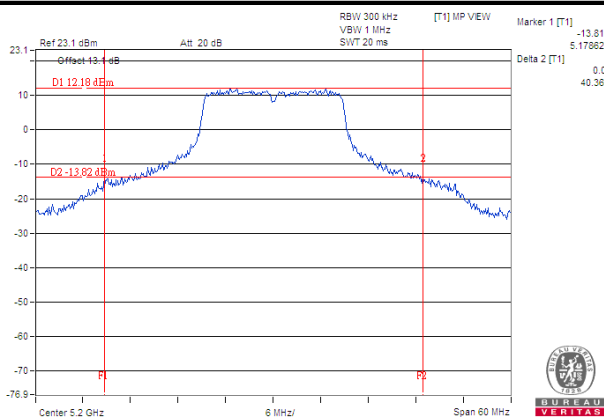
Channel	Frequency (MHz)	26 dBc Bandwidth (MHz)	
		Chain 0	Chain 1
42	5210	85.10	83.99
58	5290	85.11	85.67
106	5530	86.23	85.54
122	5610	89.92	87.01
138	5690 (U-NII-2C)	80.76	80.42
138	5690 (U-NII-3)	7.35	8.85

802.11ac (VHT160)

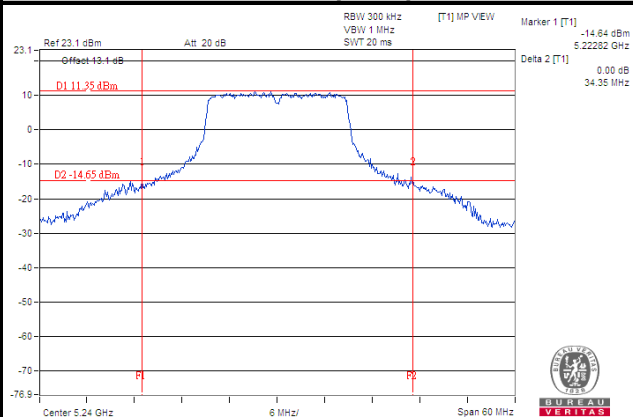
Channel	Frequency (MHz)	26 dBc Bandwidth (MHz)	
		Chain 0	Chain 1
50	5250	162.81	162.57
114	5570	162.92	162.43

Spectrum Plot of Worst Value

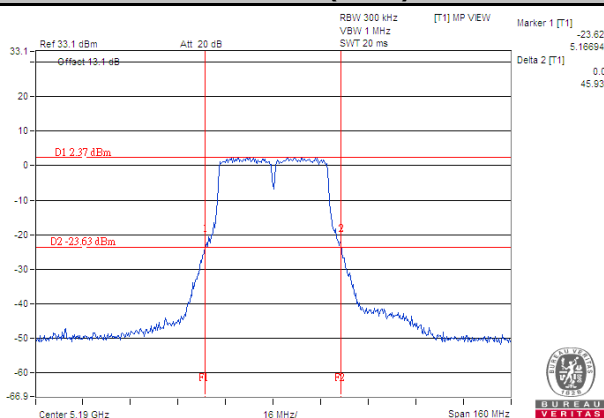
802.11a



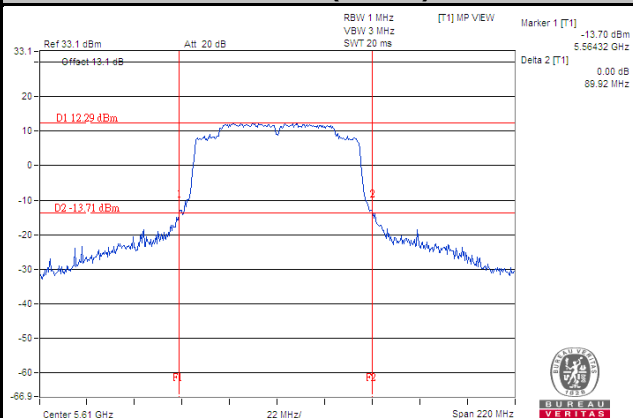
802.11n (HT20)



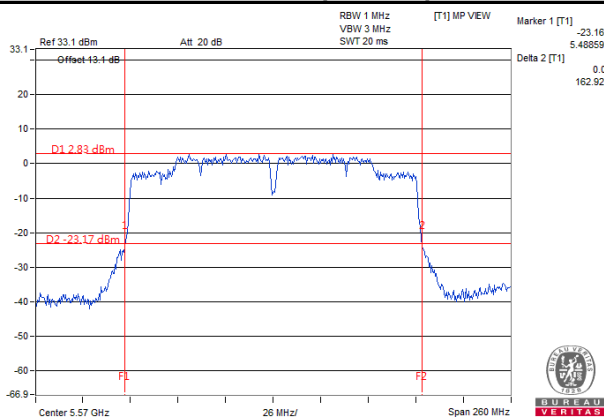
802.11n (HT40)



802.11ac (VHT80)

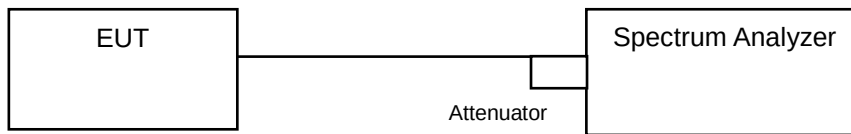


802.11ac (VHT160)



4.4 Occupied Bandwidth Measurement

4.4.1 Test Setup



4.4.2 Test Instruments

Refer to section 4.1.2 to get information of above instrument.

4.4.3 Test Procedure

The transmitter output was connected to the spectrum analyzer through an attenuator. The bandwidth of the fundamental frequency was measured by spectrum analyzer with resolution bandwidth in the range of 1 % to 5 % of the anticipated emission bandwidth, and a video bandwidth at least 3x the resolution bandwidth and set the detector to SAMPLE. The width of a frequency band such that, below the lower and above the upper frequency limits, the mean powers emitted are each equal to a specified percentage 0.5 % of the total mean power of a given emission.

4.4.4 Test Results

802.11a

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)
36	5180	18.12
40	5200	19.56
48	5240	16.92
52	5260	18.12
60	5300	18.12
64	5320	18.12
100	5500	18.12
116	5580	18.12
140	5700	18.12
144	5720 (U-NII-2C)	13.40
144	5720 (U-NII-3)	3.16
149	5745	18.24
157	5785	18.18
165	5825	18.18

802.11n (HT20)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	18.12	18.00
40	5200	18.12	18.12
48	5240	18.60	18.24
52	5260	18.12	18.00
60	5300	18.12	18.00
64	5320	18.12	17.88
100	5500	18.12	18.12
116	5580	18.12	18.12
140	5700	18.12	17.88
144	5720 (U-NII-2C)	14.00	14.00
144	5720 (U-NII-3)	3.76	3.76
149	5745	25.26	24.66
157	5785	18.06	24.90
165	5825	18.06	26.52

802.11n (HT40)

Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
38	5190	36.96	36.72
46	5230	36.84	36.84
54	5270	36.84	36.84
62	5310	36.84	36.72
102	5510	36.84	36.72
110	5550	36.84	36.72
134	5670	36.72	36.72
142	5710 (U-NII-2C)	33.60	33.48
142	5710 (U-NII-3)	3.36	3.24
151	5755	37.02	37.08
159	5795	36.78	37.20

802.11ac (VHT80)

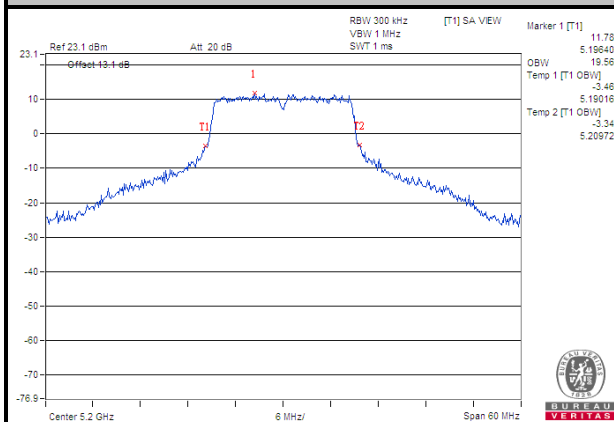
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
42	5210	75.12	75.12
58	5290	75.36	75.36
106	5530	75.12	75.12
122	5610	75.36	75.36
138	5690 (U-NII-2C)	72.92	72.92
138	5690 (U-NII-3)	2.44	2.44
155	5775	75.36	75.24

802.11ac (VHT160)

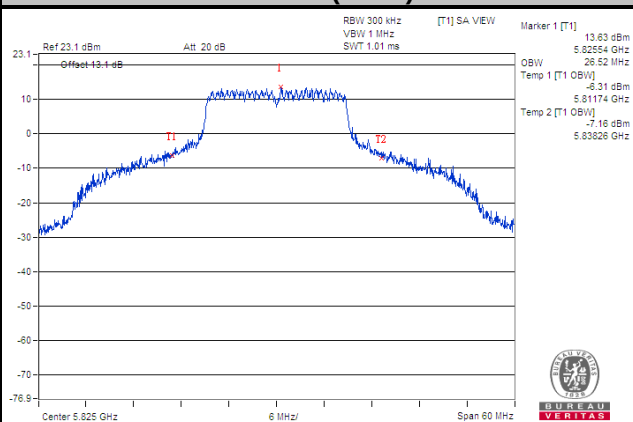
Channel	Channel Frequency (MHz)	Occupied Bandwidth (MHz)	
		Chain 0	Chain 1
50	5250	153.60	152.80
114	5570	153.20	154.00

Spectrum Plot of Worst Value

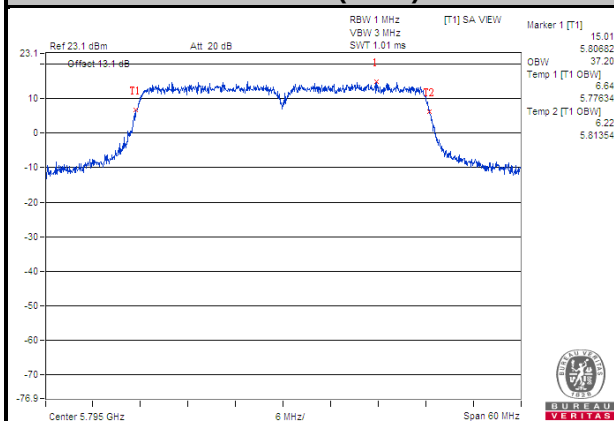
802.11a



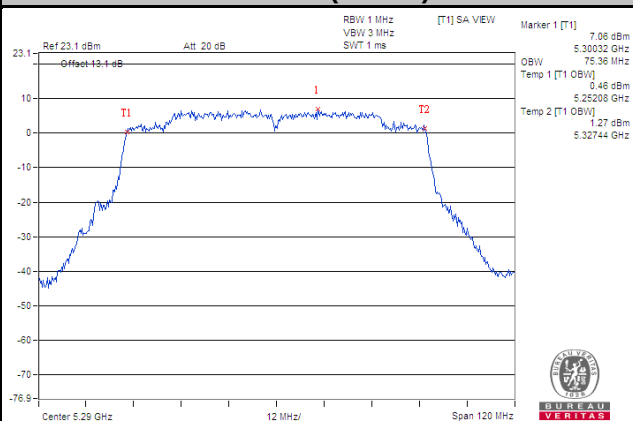
802.11n (HT20)



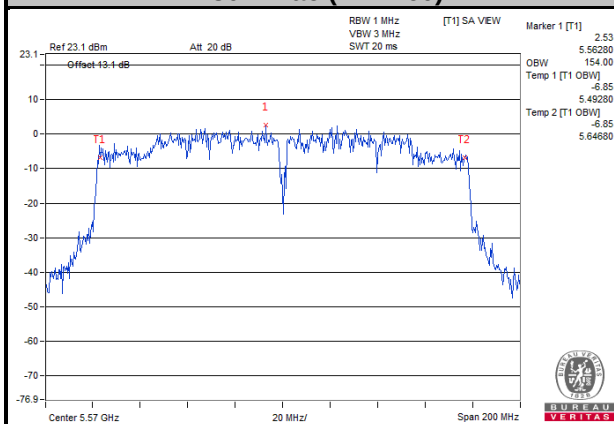
802.11n (HT40)



802.11ac (VHT80)



802.11ac (VHT160)

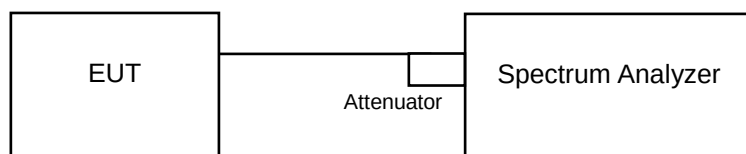


4.5 Peak Power Spectral Density Measurement

4.5.1 Limits of Peak Power Spectral Density Measurement

Operation Band	EUT Category		Limit
U-NII-1		Outdoor Access Point	17 dBm/MHz
		Fixed point-to-point Access Point	
		Indoor Access Point	
	√	Mobile and Portable client device	11 dBm/MHz
U-NII-2A	√		11 dBm/MHz
U-NII-2C	√		11 dBm/MHz
U-NII-3	√		30 dBm/500 kHz

4.5.2 Test Setup



4.5.3 Test Instruments

Refer to section 4.1.3 to get information of above instrument.

4.5.4 Test Procedures

For U-NII-1, U-NII-2A, U-NII-2C band:

Using method SA-2

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 1 MHz, Set VBW $\geq$ 3 RBW, Detector = RMS
3. Sweep time = auto, trigger set to "free run".
4. Trace average at least 100 traces in power averaging mode.
5. Record the max value and add 10 log (1/duty cycle)

✕ For U-NII-3:

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 300 kHz, Set VBW $\geq$ 1 RBW, Detector = RMS
3. Use the peak marker function to determine the maximum power level in any 300 kHz band segment within the fundamental EBW.
4. Scale the observed power level to an equivalent value in 500 kHz by adjusting (reducing) the measured power by a bandwidth correction factor (BWCF) where $BWCF = 10\log(500 \text{ kHz} / 300 \text{ kHz})$.
5. Sweep time = auto, trigger set to "free run".
6. Trace average at least 100 traces in power averaging mode.
7. Record the max value and add 10 log (1/duty cycle)

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Conditions

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

4.5.7 Test Results

802.11a

Channel	Frequency (MHz)	PSD w/o Duty Factor (dBm/MHz)	Duty Factor (dB)	PSD with Duty Factor (dBm/MHz)	Maximum Limit (dBm/MHz)	Pass / Fail
36	5180	2.26	0.73	2.99	11	Pass
40	5200	5.89	0.73	6.62	11	Pass
48	5240	3.53	0.73	4.26	11	Pass
52	5260	3.32	0.73	4.05	11	Pass
60	5300	3.09	0.73	3.82	11	Pass
64	5320	3.19	0.73	3.92	11	Pass
100	5500	3.68	0.73	4.41	11	Pass
116	5580	4.61	0.73	5.34	11	Pass
140	5700	3.84	0.73	4.57	11	Pass
144	5720 (U-NII-2C)	3.90	0.73	4.63	11	Pass

Note: Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT20)

Channel	Frequency (MHz)	PSD (dBm/MHz)		Duty Factor (dB)	Total PSD with Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
36	5180	3.60	4.27	0.76	7.72	11	Pass
40	5200	5.62	5.33	0.76	9.24	11	Pass
48	5240	6.19	6.27	0.76	10.00	11	Pass
52	5260	4.98	4.82	0.76	8.67	11	Pass
60	5300	4.61	4.67	0.76	8.41	11	Pass
64	5320	4.41	4.28	0.76	8.11	11	Pass
100	5500	3.21	3.87	0.76	7.32	11	Pass
116	5580	6.52	6.76	0.76	10.41	11	Pass
140	5700	3.64	3.97	0.76	7.58	11	Pass
144	5720 (U-NII-2C)	5.35	7.45	0.76	10.29	11	Pass

Note:

- Method E) 2) a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
- For U-NII-1, U-NII-2A Band:**
Directional gain = $1.84\text{dBi} + 10\log(2) = 4.85\text{ dBi} < 6\text{ dBi}$, so the limit does not need to reduced.
For U-NII-2C Band:
Directional gain = $2.13\text{ dBi} + 10\log(2) = 5.14\text{ dBi} < 6\text{ dBi}$, so the limit does not need to reduced.
- Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT40)

Channel	Frequency (MHz)	PSD (dBm/MHz)		Duty Factor (dB)	Total PSD with Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
38	5190	-2.09	-1.97	0.81	1.80	11	Pass
46	5230	2.08	2.32	0.81	6.03	11	Pass
54	5270	1.63	2.04	0.81	5.66	11	Pass
62	5310	-0.89	-0.47	0.81	3.15	11	Pass
102	5510	0.37	0.73	0.81	4.38	11	Pass
110	5550	0.31	1.07	0.81	4.53	11	Pass
134	5670	0.33	1.09	0.81	4.55	11	Pass
142	5710 (U-NII-2C)	2.58	3.18	0.81	6.72	11	Pass

Note:

- Method E) 2) a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
- For U-NII-1, U-NII-2A Band:**
Directional gain = $1.84\text{dBi} + 10\log(2) = 4.85\text{ dBi} < 6\text{ dBi}$, so the limit does not need to reduced.
For U-NII-2C Band:
Directional gain = $2.13\text{ dBi} + 10\log(2) = 5.14\text{ dBi} < 6\text{ dBi}$, so the limit does not need to reduced.
- Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80)

Channel	Frequency (MHz)	PSD (dBm/MHz)		Duty Factor (dB)	Total PSD with Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
42	5210	-3.33	-4.26	0.89	0.13	11	Pass
58	5290	-3.48	-4.61	0.89	-0.10	11	Pass
106	5530	-3.02	-3.50	0.89	0.65	11	Pass
122	5610	1.74	1.61	0.89	5.58	11	Pass
138	5690 (U-NII-2C)	1.80	2.02	0.89	5.82	11	Pass

Note:

- Method E) 2) a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
- For U-NII-1, U-NII-2A Band:**
Directional gain = $1.84\text{dBi} + 10\log(2) = 4.85\text{ dBi} < 6\text{ dBi}$, so the limit does not need to reduced.
For U-NII-2C Band:
Directional gain = $2.13\text{ dBi} + 10\log(2) = 5.14\text{ dBi} < 6\text{ dBi}$, so the limit does not need to reduced.
- Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT160)

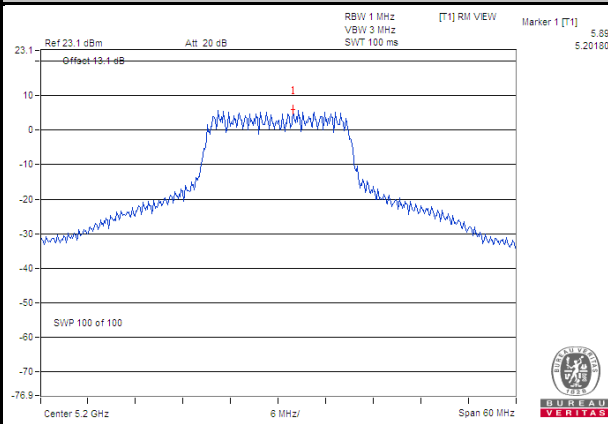
Channel	Frequency (MHz)	PSD (dBm/MHz)		Duty Factor (dB)	Total PSD with Duty Factor (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1				
50	5250	-12.22	-12.53	1.28	-8.08	11	Pass
114	5570	-9.37	-9.28	1.28	-5.04	11	Pass

Note:

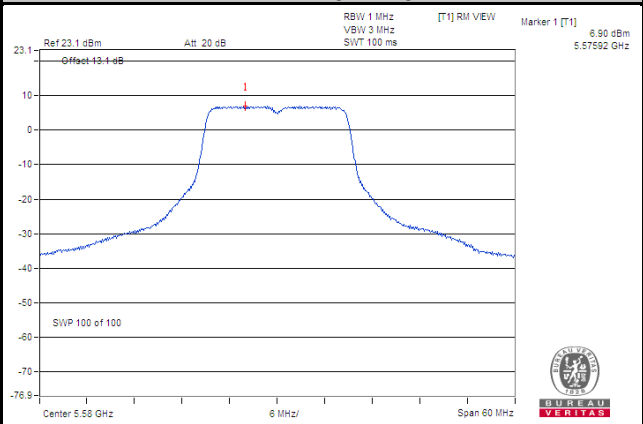
- Method E) 2) a) of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
- For U-NII-1, U-NII-2A Band:**
Directional gain = $1.84\text{dBi} + 10\log(2) = 4.85\text{ dBi} < 6\text{ dBi}$, so the limit does not need to reduced.
For U-NII-2C Band:
Directional gain = $2.13\text{ dBi} + 10\log(2) = 5.14\text{ dBi} < 6\text{ dBi}$, so the limit does not need to reduced.
- Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

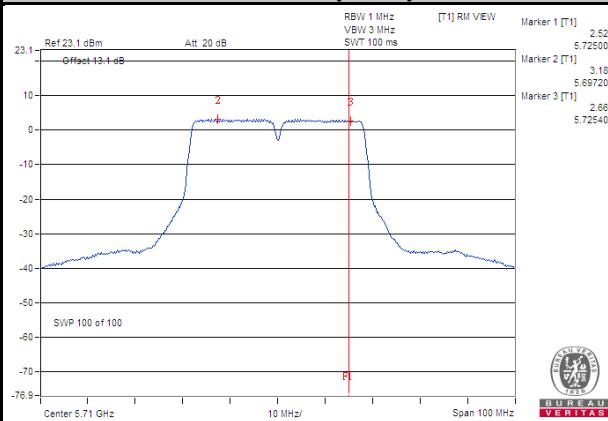
802.11a



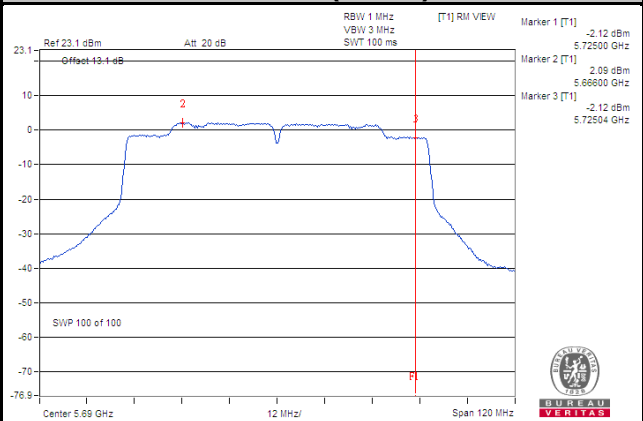
802.11n (HT20)



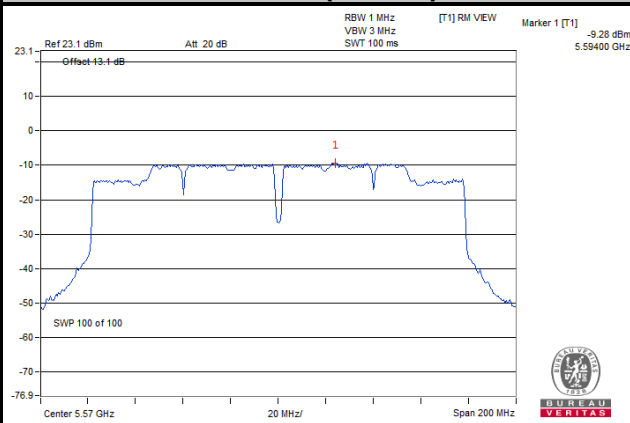
802.11n (HT40)



802.11ac (VHT80)



802.11ac (VHT160)



For U-NII-3 Band

802.11a

Channel	Frequency (MHz)	PSD w/o Duty Factor		Duty Factor (dB)	PSD with Duty Factor (dBm/500 kHz)	Limit (dBm/500 kHz)	Pass / Fail
		(dBm/300 kHz)	(dBm/500 kHz)				
144	5720 (U-NII-3)	-0.39	1.83	0.73	2.56	30	Pass
149	5745	-1.60	0.62	0.73	1.35	30	Pass
157	5785	-0.71	1.51	0.73	2.24	30	Pass
165	5825	-1.26	0.96	0.73	1.69	30	Pass

Note: Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT20)

TX Chain	Channel	Frequency (MHz)	PSD		10 log (N=2) dB	Duty Factor (dB)	Total PSD with Duty Factor (dBm/500 kHz)	Limit (dBm/500 kHz)	Pass / Fail
			(dBm/300 kHz)	(dBm/500 kHz)					
0	144	5720 (U-NII-3)	0.06	2.28	3.01	0.76	6.05	30	Pass
	149	5745	-1.26	0.96	3.01	0.76	4.73	30	Pass
	157	5785	-0.81	1.41	3.01	0.76	5.18	30	Pass
	165	5825	-1.28	0.94	3.01	0.76	4.71	30	Pass
1	144	5720 (U-NII-3)	1.96	4.18	3.01	0.76	7.95	30	Pass
	149	5745	-1.08	1.14	3.01	0.76	4.91	30	Pass
	157	5785	-1.25	0.97	3.01	0.76	4.74	30	Pass
	165	5825	-0.97	1.25	3.01	0.76	5.02	30	Pass

Note:

1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density.
2. Directional gain = $1.38 \text{ dBi} + 10\log(2) = 4.39 \text{ dBi} < 6 \text{ dBi}$, so the limit does not need to reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT40)

TX Chain	Channel	Frequency (MHz)	PSD		10 log (N=2) dB	Duty Factor (dB)	Total PSD with Duty Factor (dBm/500 kHz)	Limit (dBm/500 kHz)	Pass / Fail
			(dBm/300 kHz)	(dBm/500 kHz)					
0	142	5710 (U-NII-3)	-2.30	-0.08	3.01	0.81	3.74	30	Pass
	151	5755	-2.08	0.14	3.01	0.81	3.96	30	Pass
	159	5795	-0.60	1.62	3.01	0.81	5.44	30	Pass
1	142	5710 (U-NII-3)	-2.16	0.06	3.01	0.81	3.88	30	Pass
	151	5755	-2.34	-0.12	3.01	0.81	3.70	30	Pass
	159	5795	-1.13	1.09	3.01	0.81	4.91	30	Pass

Note:

1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density.
2. Directional gain = 1.38 dBi +10log(2) = 4.39 dBi < 6 dBi, so the limit does not need to reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80)

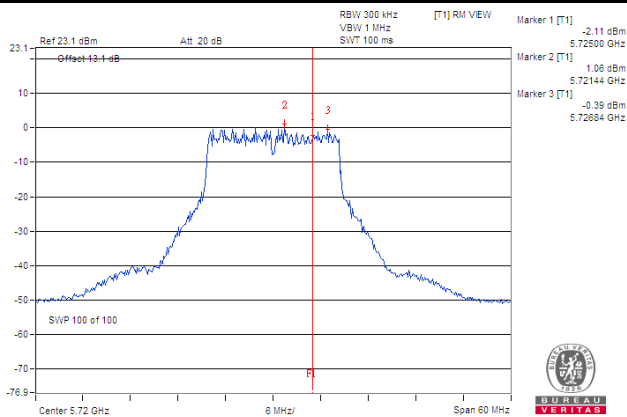
TX Chain	Channel	Frequency (MHz)	PSD		10 log (N=2) dB	Duty Factor (dB)	Total PSD with Duty Factor (dBm/500 kHz)	Limit (dBm/500 kHz)	Pass / Fail
			(dBm/300 kHz)	(dBm/500 kHz)					
0	138	5690 (U-NII-3)	-7.82	-5.60	3.01	0.89	-1.70	30	Pass
	155	5775	-3.37	-1.15	3.01	0.89	2.75	30	Pass
1	138	5690 (U-NII-3)	-6.59	-4.37	3.01	0.89	-0.47	30	Pass
	155	5775	-3.78	-1.56	3.01	0.89	2.34	30	Pass

Note:

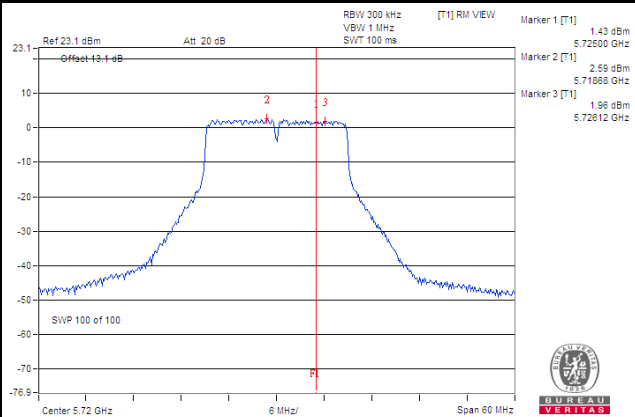
1. Method E) 2) c) of power density measurement of KDB 662911 is using for calculating total power density.
2. Directional gain = 1.38 dBi +10log(2) = 4.39 dBi < 6 dBi, so the limit does not need to reduced.
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

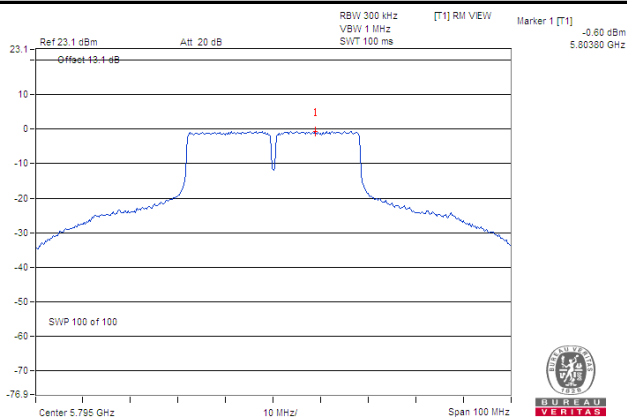
802.11a



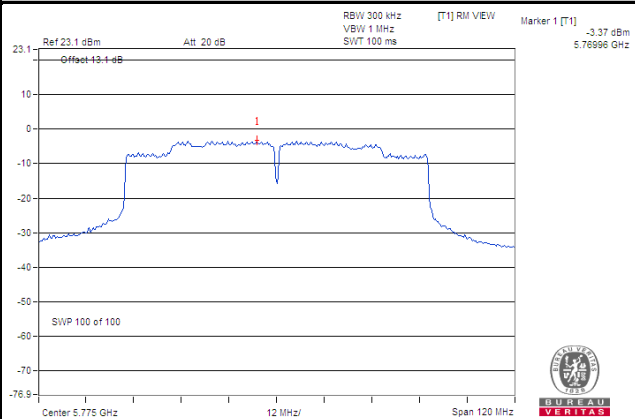
802.11n (HT20)



802.11n (HT40)



802.11ac (VHT80)

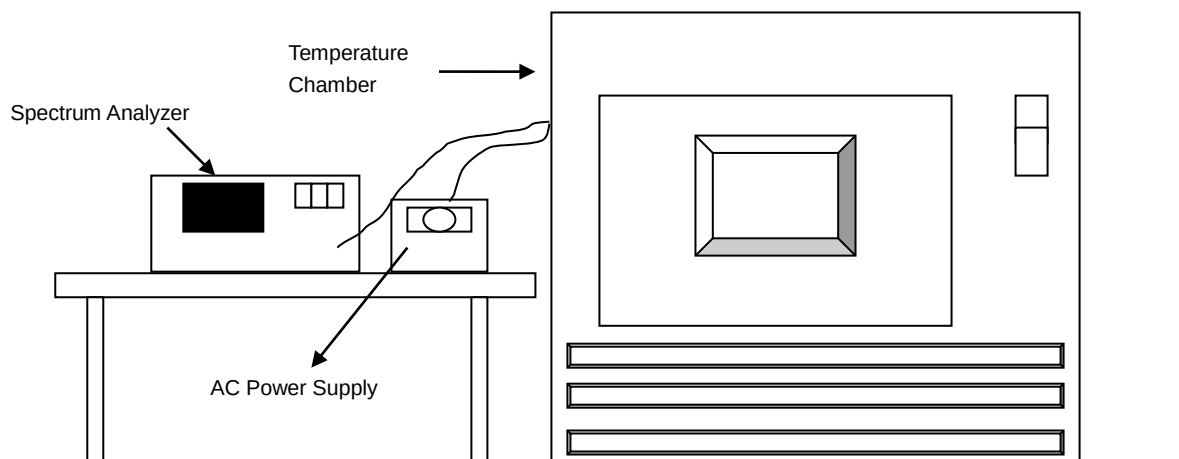


4.6 Frequency Stability

4.6.1 Limit of Frequency Stability Measurement

The frequency of the carrier signal shall be maintained within band of operation.

4.6.2 Test Setup



4.6.3 Test Instruments

Refer to section 4.1.3 to get information of above instrument.

4.6.4 Test Procedure

- To ensure emission at the band edge is maintained within the authorized band, those values shall be measured by radiation emissions at upper and lower frequency points, and finally compensated by frequency deviation as procedures below.
- The EUT was operated at the maximum output power, and connected to the spectrum analyzer, which is set to maximum hold function and peak detector. The peak value of the power envelope was measured and noted. The upper and lower frequency points were respectively measured relatively 10 dB lower than the measured peak value.
- The frequency deviation was calculated by adding the upper frequency point and the lower frequency point divided by two. Those detailed values of frequency deviation are provided in table below.

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

Set the EUT transmit at un-modulation mode to test frequency stability.

4.6.7 Test Results

Frequency Stability Versus Temp.									
Operating Frequency: 5180 MHz									
Temp. (°C)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result
50	120	5180.0157	PASS	5180.0184	PASS	5180.0156	PASS	5180.0167	PASS
40	120	5180.0219	PASS	5180.0201	PASS	5180.019	PASS	5180.021	PASS
30	120	5180.0012	PASS	5179.9986	PASS	5180.001	PASS	5180.0006	PASS
20	120	5179.9885	PASS	5179.9892	PASS	5179.9893	PASS	5179.9903	PASS
10	120	5180.0115	PASS	5180.0109	PASS	5180.0105	PASS	5180.0113	PASS
0	120	5179.9779	PASS	5179.9766	PASS	5179.9761	PASS	5179.9752	PASS
-10	120	5179.9982	PASS	5179.9962	PASS	5179.9938	PASS	5179.9962	PASS
-20	120	5179.9978	PASS	5179.9971	PASS	5179.9995	PASS	5179.999	PASS
-30	120	5179.9763	PASS	5179.976	PASS	5179.9746	PASS	5179.9738	PASS

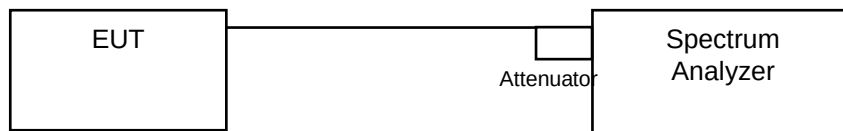
Frequency Stability Versus Voltage									
Operating Frequency: 5180 MHz									
Temp. (°C)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result	Measured Frequency (MHz)	Result
20	138	5179.9888	PASS	5179.9892	PASS	5179.989	PASS	5179.9903	PASS
	120	5179.9885	PASS	5179.9892	PASS	5179.9893	PASS	5179.9903	PASS
	102	5179.9878	PASS	5179.9892	PASS	5179.9889	PASS	5179.9903	PASS

4.7 6 dB Bandwidth Measurement

4.7.1 Limits of 6 dB Bandwidth Measurement

The minimum of 6 dB Bandwidth Measurement is 0.5 MHz.

4.7.2 Test Setup



4.7.3 Test Instruments

Refer to section 4.1.3 to get information of above instrument.

4.7.4 Test Procedure

MEASUREMENT PROCEDURE REF

- Set resolution bandwidth (RBW) = 100 kHz
- Set the video bandwidth (VBW) $\geq 3 \times$ RBW, Detector = Peak.
- Trace mode = max hold.
- Sweep = auto couple.
- Measure the maximum width of the emission that is constrained by the frequencies associated with the two amplitude points (upper and lower) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission

4.7.5 Deviation from Test Standard

No deviation.

4.7.6 EUT Operating Condition

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

4.7.7 Test Results

802.11a

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)	Minimum Limit (MHz)	Pass / Fail
144	5720 (U-NII-3)	3.17	0.5	Pass
149	5745	17.60	0.5	Pass
157	5785	17.60	0.5	Pass
165	5825	17.60	0.5	Pass

802.11n (HT20)

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
144	5720 (U-NII-3)	3.78	3.80	0.5	Pass
149	5745	17.58	17.60	0.5	Pass
157	5785	17.59	17.62	0.5	Pass
165	5825	17.60	17.62	0.5	Pass

802.11n (HT40)

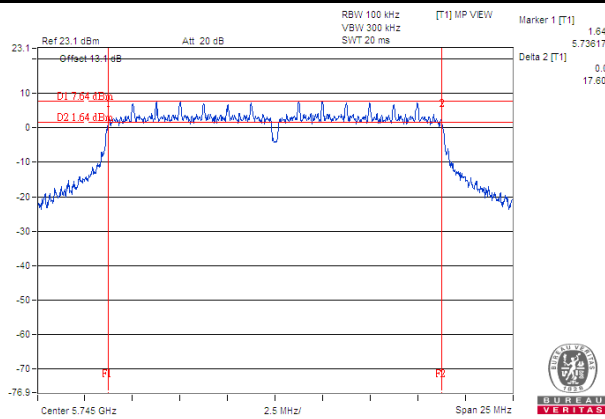
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
142	5710 (U-NII-3)	3.20	3.22	0.5	Pass
151	5755	36.37	36.39	0.5	Pass
159	5795	36.34	36.39	0.5	Pass

802.11ac (VHT80)

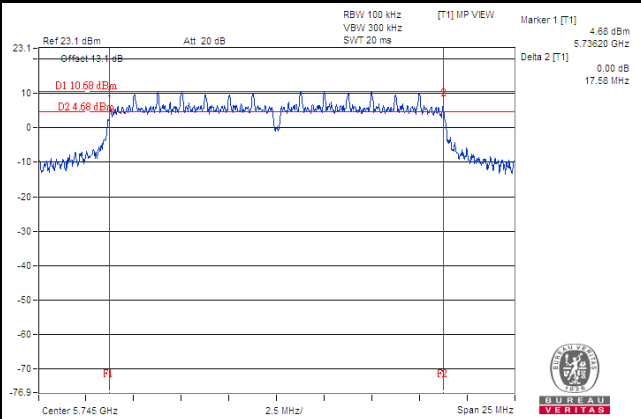
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
138	5690 (U-NII-3)	2.60	2.61	0.5	Pass
155	5775	75.26	75.25	0.5	Pass

Spectrum Plot of Worst Value

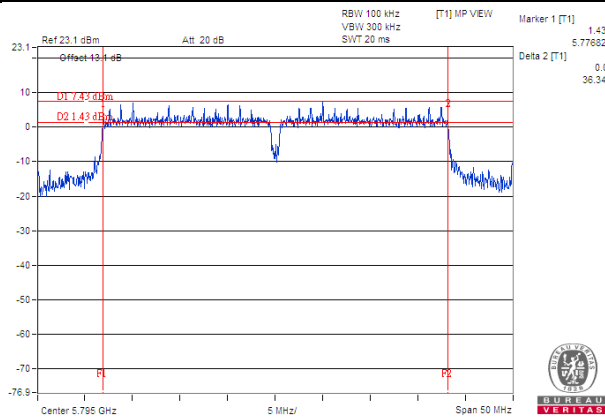
802.11a



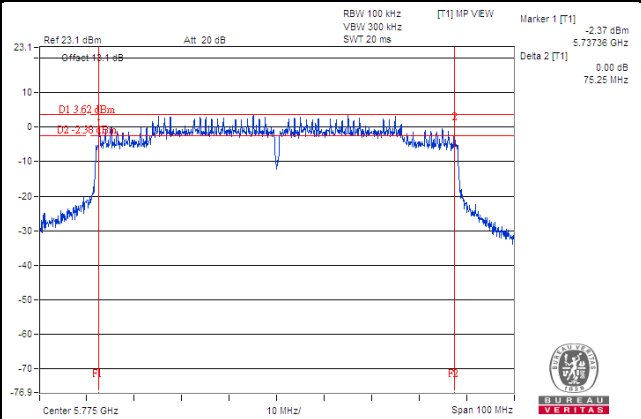
802.11n (HT20)



802.11n (HT40)



802.11ac (VHT80)



Note:

For Ch144 (UNII-3 Band: The 6 dB bandwidth above 5725 MHz = Marker 1 + Delta 2 – 5725 MHz

For Ch142 (UNII-3 Band: The 6 dB bandwidth above 5725 MHz = Marker 1 + Delta 2 – 5725 MHz

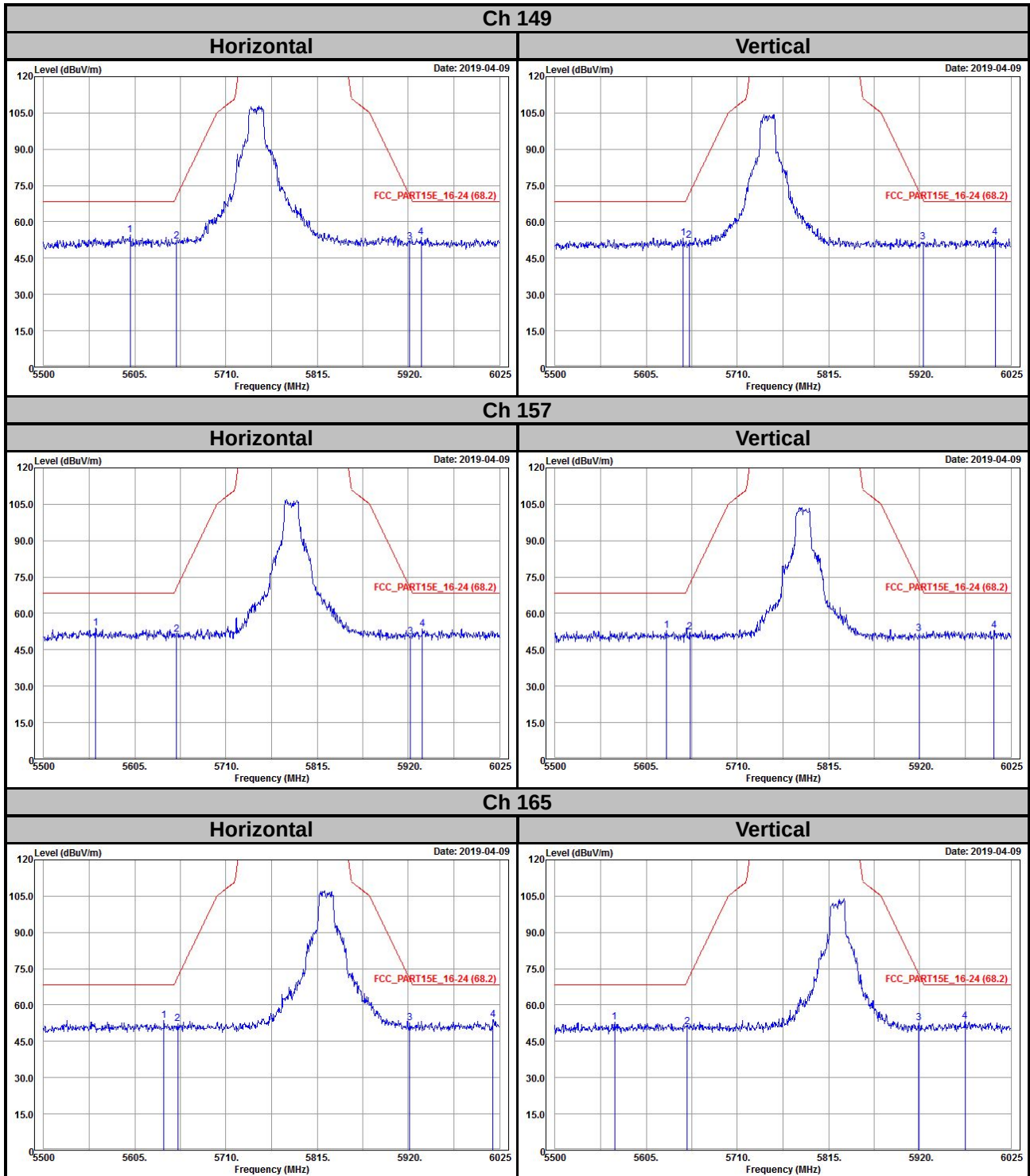
For Ch138 (UNII-3 Band: The 6 dB bandwidth above 5725 MHz = Marker 1 + Delta 2 – 5725 MHz

5 Pictures of Test Arrangements

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

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

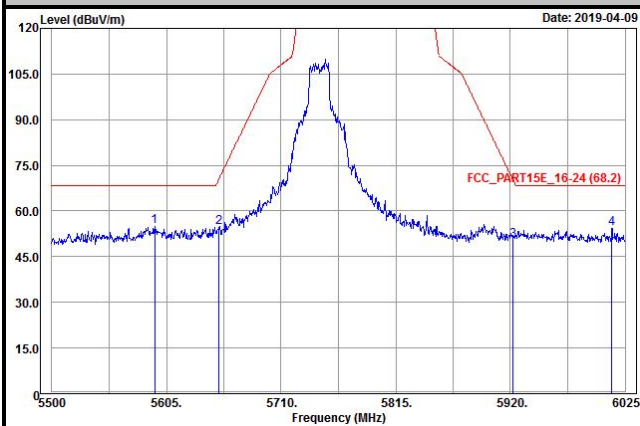
802.11a



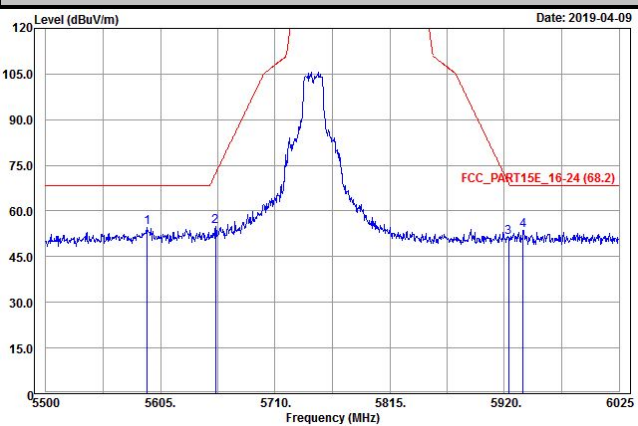
802.11n (HT20)

Ch 149

Horizontal

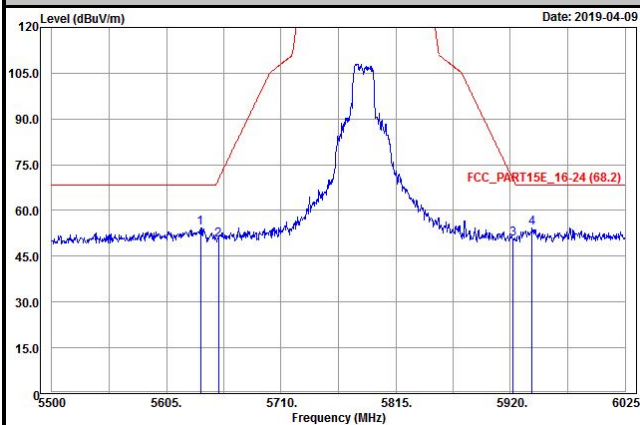


Vertical

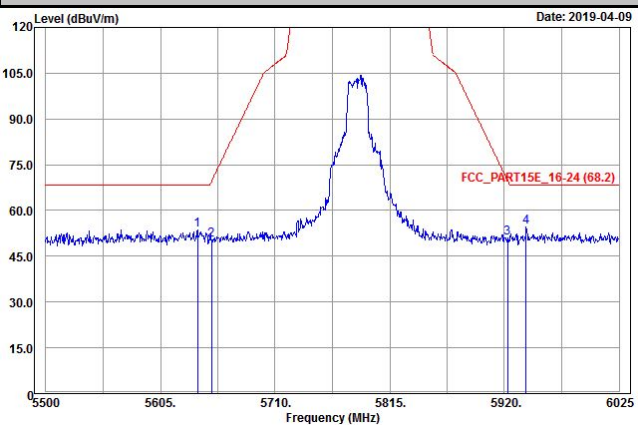


Ch 157

Horizontal

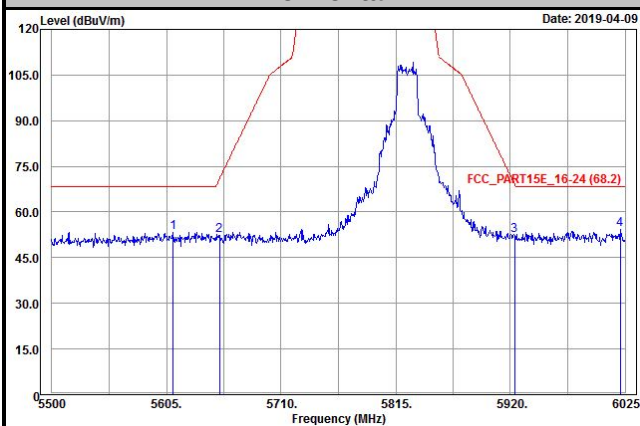


Vertical

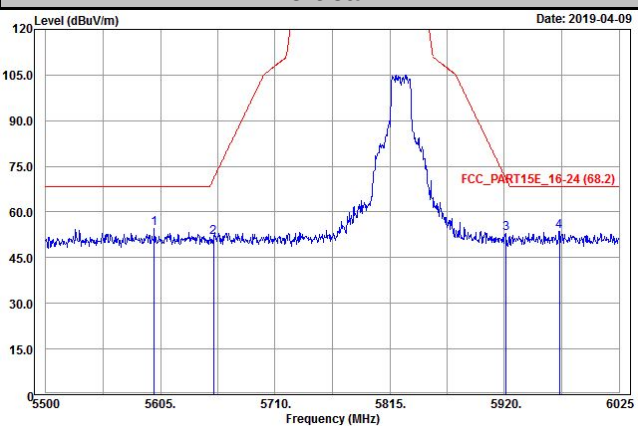


Ch 165

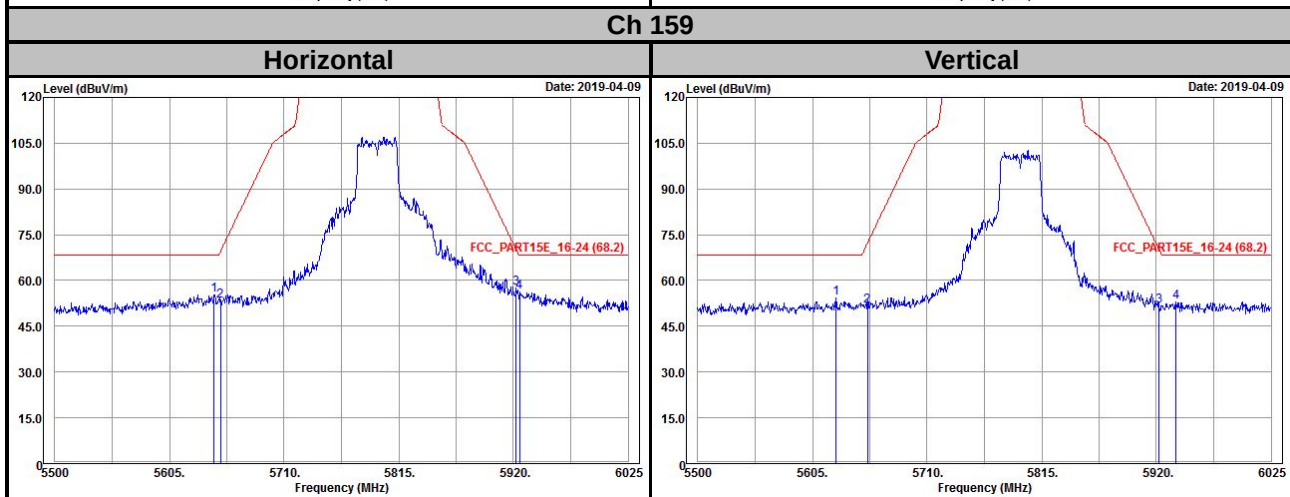
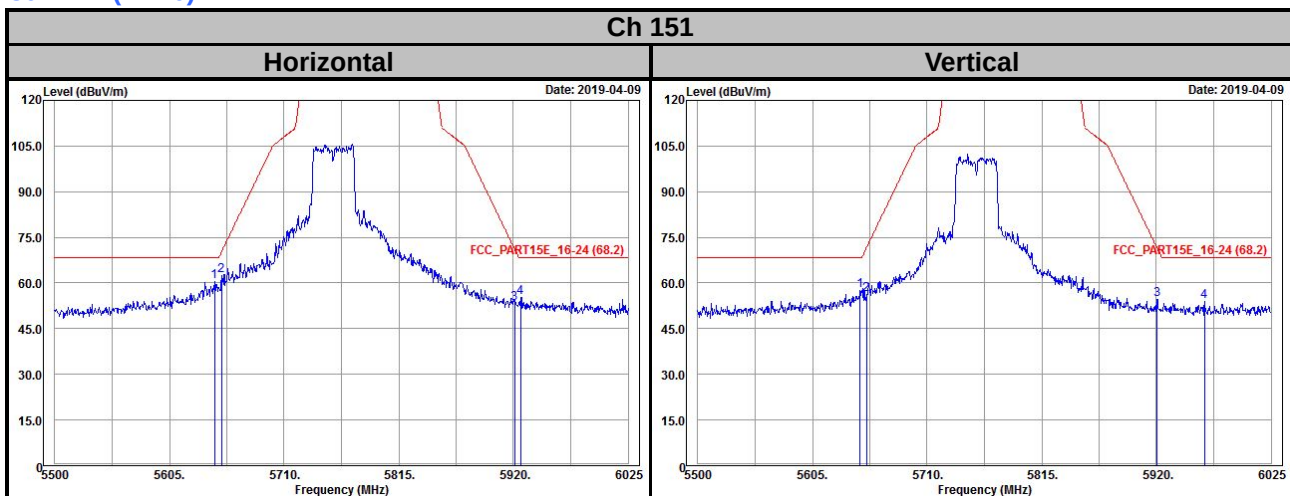
Horizontal



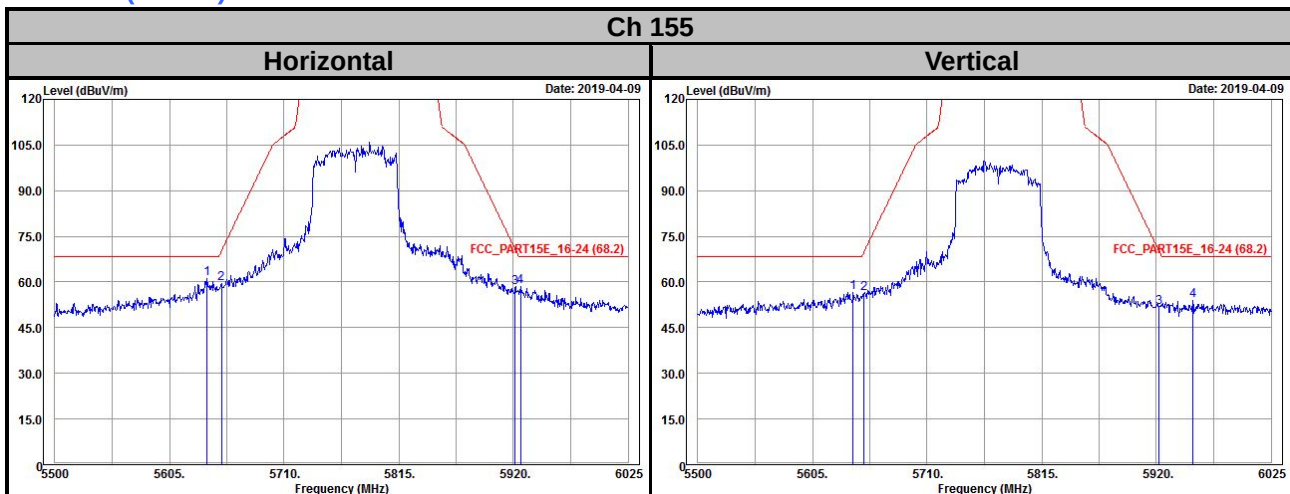
Vertical



802.11n (HT40)



802.11ac (VHT80)



Appendix – Information of the Testing Laboratories

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

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

Lin Kou EMC/RF Lab

Tel: 886-2-26052180

Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab

Tel: 886-3-6668565

Fax: 886-3-6668323

Hwa Ya EMC/RF/Safety Lab

Tel: 886-3-3183232

Fax: 886-3-3270892

Email: service.adt@tw.bureauveritas.com

Web Site: www.bureauveritas-adt.com

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

--- END ---