

FCC Test Report

Report No.: RF161013C32-2

FCC ID: TVE-2507T021

Test Model: FortiAP S221E, FortiAP S223E (refer to section 3.1 for more details)

Series Model: FortiAP S221Exxxxxx, FAP-S221Exxxxxx, FORTIAP-S221Exxxxxx, FortiAP S223Exxxxxx, FAP-S223Exxxxxx, FORTIAP-S223Exxxxxx (where "x" can be used as "A-Z", or "0-9", or "-", or blank for software changes or marketing purposes only) (refer to section 3.1 for more details)

Received Date: Oct. 13, 2016

Test Date: Nov. 03, 2016 ~ Mar. 16, 2017

Issued Date: Apr. 06, 2017

Applicant: Fortinet Inc.

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

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Release Control Record

Issue No.	Description	Date Issued
RF161013C32-2	Original Release	Apr. 06, 2017

1 Certificate of Conformity

Product: Secured Wireless Access Point

Brand: Fortinet Inc.

Test Model: FortiAP S221E, FortiAP S223E (refer to section 3.1 for more details)

Series Model: FortiAP S221Exxxxxx, FAP-S221Exxxxxx, FORTIAP-S221Exxxxxx, FortiAP S223Exxxxxx, FAP-S223Exxxxxx, FORTIAP-S223Exxxxxx (where "x" can be used as "A-Z", or "0-9", or "-", or blank for software changes or marketing purposes only) (refer to section 3.1 for more details)

Sample Status: Engineering Sample

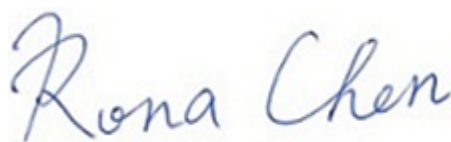
Applicant: Fortinet Inc.

Test Date: Nov. 03, 2016 ~ Mar. 16, 2017

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

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

Prepared by :



Date:

Apr. 06, 2017

Rona Chen / Specialist

Approved by :



Date:

Apr. 06, 2017

David Huang / 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 -9.77 dB at 0.36256 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 -1.04 dB at 5144.45 MHz.
15.407(a)(1/2/3)	Max Average Transmit Power	Pass	Meet the requirement of limit.
15.407(a)(1/2/3)	Peak Power Spectral Density	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	Antenna connector for FortiAP S221E is IPEX. Antenna connector for FortiAP S223E is RP SMA plug.

*For U-NII-3 band compliance with rule part 15.407(b)(4)(i), the OOB test plots were recorded in Annex A.

2.1 Measurement Uncertainty

Where relevant, the following measurement uncertainty levels have been estimated for tests performed on the EUT as specified in CISPR 16-4-2:

Measurement	Frequency	Expanded Uncertainty (k=2) (±)
Conducted Emissions at mains ports	150 kHz ~ 30 MHz	2.44 dB
Radiated Emissions up to 1 GHz	30 MHz ~ 200 MHz	2.93 dB
	200 MHz ~1000 MHz	2.95 dB
Radiated Emissions above 1 GHz	1 GHz ~ 18 GHz	2.26 dB
	18 GHz ~ 40 GHz	1.94 dB

2.2 Modification Record

There were no modifications required for compliance.

3 General Information

3.1 General Description of EUT

Product	Secured Wireless Access Point
Brand	Fortinet Inc.
Test Model	FortiAP S221E, FortiAP S223E
Series Model	FortiAP S221Exxxxxx, FAP-S221Exxxxxx, FORTIAP-S221Exxxxxx, FortiAP S223Exxxxxx, FAP-S223Exxxxxx, FORTIAP-S223Exxxxxx (where "x" can be used as "A-Z", or "0-9", or "-", or blank for software changes or marketing purposes only)
Model Difference	Refer to Note for more details
Status of EUT	Engineering Sample
Power Supply Rating	12.0 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 MCS15 802.11ac: up to V9
Operating Frequency	5180 ~ 5240 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) 5745 ~ 5825 MHz: 5 for 802.11a, 802.11n (HT20) 2 for 802.11n (HT40) 1 for 802.11ac (VHT80)
Output Power	CDD Mode: 49.431 mW for 5180 ~ 5240 MHz 576.766 mW for 5745 ~ 5825 MHz Beamforming Mode: 24.717 mW for 5180 ~ 5240 MHz 265.461 mW for 5745 ~ 5825 MHz
Antenna Type	Refer to Note as below
Antenna Connector	Refer to Note as below
Accessory Device	Refer to Note as below
Data Cable Supplied	N/A

Note:

1. All models are listed as below. Model: FAP-S221E and FAP-S223E were chosen for the final test.

Brand	Model		Difference
Fortinet Inc.	FortiAP S221Exxxxxx (Main test model: FortiAP S221E)	where "x" can be used as "A-Z", or "0-9", or "-", or blank for software changes or marketing purposes only	With Internal Antenna
	FAP-S221Exxxxxx		
	FORTIAP-S221Exxxxxx		
	FortiAP S223Exxxxxx (Main test model: FortiAP S223E)		With External Antenna
	FAP-S223Exxxxxx		
	FORTIAP-S223Exxxxxx		

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

Modulation Mode	TX Function	Beamforming
802.11a	2TX	Not Support
802.11n (HT20)	2TX	Support
802.11n (HT40)	2TX	Support
802.11ac (VHT20)	2TX	Support
802.11ac (VHT40)	2TX	Support
802.11ac (VHT80)	2TX	Support

* For 5GHz band, CDD mode is the worst case for final tests except out put power after pretesting CDD mode and beamforming mode.

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

3. The EUT uses following antennas.

For Model: FortiAP S221E (Internal antenna)

Antenna Type	PIFA	Antenna Connector	IPEX
Gain (dBi)	Frequency (MHz)		
	2400-2500	5150-5850	
Internal Ant. 1	4.36	-	
Internal Ant. 2	4.95	-	
Internal Ant. 3	-	5.64	
Internal Ant. 4	-	5.83	

Antenna Type	PIFA	Antenna Connector	IPEX
Gain (dBi)	Frequency (MHz)		
	2400-2500		
BT Ant.	3.67		

For Model: FortiAP S223E (External antenna)

Antenna Type	Dipole		Antenna Connector		RP SMA plug	
Gain (dBi)	Frequency (MHz)					
	2400	2450	2500	5150	5550	5850
External Ant.	4.06	4.26	4.58	5.27	5.35	5.04

Antenna Type	PIFA	Antenna Connector	IPEX
Gain (dBi)	Frequency (MHz)		
	2400-2500		
BT Ant.	3.67		

* The highest antenna gain was chosen for antenna port conducted measurement test only.

4. The EUT contains following accessory devices.

Product	Brand	Model	Description
Adapter	Asian Power Devices Inc.	WA-30J12R	I/P: 100-240 Vac, 50-60 Hz, 0.9 A O/P: 12 Vdc, 2.5 A

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

3.2 Description of Test Modes

For 5180 ~ 5240 MHz

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

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

2 channels are provided for 802.11n (HT40):

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

1 channel is provided for 802.11ac (VHT80):

Channel	Frequency (MHz)
42	5210

For 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	
A	√	√	√	√	Model: FortiAP S221E
B	√	√	√	-	Model: FortiAP S223E

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

NOTE: The EUT had been pre-tested on the positioned of each 3 axis. The worst case was found when positioned on Z-plane FortiAP S221E for and X-plane for FortiAP S223E.

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)
CDD Mode							
A, B	5180-5240	802.11a	36 to 48	36, 44, 48	OFDM	BPSK	6.0
		802.11n (HT20)	36 to 48	36, 44, 48	OFDM	BPSK	MCS0
		802.11n (HT40)	38 to 46	38, 46	OFDM	BPSK	MCS0
		802.11ac (VHT80)	42	42	OFDM	BPSK	MCS0
A, B	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	MCS0
		802.11n (HT40)	151 to 159	151, 159	OFDM	BPSK	MCS0
		802.11ac (VHT80)	155	155	OFDM	BPSK	MCS0
Beamforming Mode							
A, B	5180-5240	802.11n (HT20)	36 to 48	36, 44, 48	OFDM	BPSK	MCS0
		802.11n (HT40)	38 to 46	38, 46	OFDM	BPSK	MCS0
		802.11ac (VHT80)	42	42	OFDM	BPSK	MCS0
A, B	5745-5825	802.11n (HT20)	149 to 165	149, 157, 165	OFDM	BPSK	MCS0
		802.11n (HT40)	151 to 159	151, 159	OFDM	BPSK	MCS0
		802.11ac (VHT80)	155	155	OFDM	BPSK	MCS0

Radiated Emission Test (Below 1 GHz):

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

EUT Configure Mode	Frequency Band (MHz)	Mode	Available Channel	Tested Channel	Modulation Technology	Modulation Type	Data Rate (Mbps)
A, B	5180-5240	802.11ac (VHT80)	42	42	OFDM	BPSK	MCS0
A, B	5745-5825	802.11n (HT20)	149 to 165	149	OFDM	BPSK	MCS0

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)
A, B	5180-5240	802.11ac (VHT80)	42	42	OFDM	BPSK	MCS0

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)
A	5180-5240	802.11a	36 to 48	36, 44, 48	OFDM	BPSK	6.0
		802.11n (HT20)	36 to 48	36, 44, 48	OFDM	BPSK	MCS0
		802.11n (HT40)	38 to 46	38, 46	OFDM	BPSK	MCS0
		802.11ac (VHT80)	42	42	OFDM	BPSK	MCS0
A	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	MCS0
		802.11n (HT40)	151 to 159	151, 159	OFDM	BPSK	MCS0
		802.11ac (VHT80)	155	155	OFDM	BPSK	MCS0

Test Condition:

Applicable To	Environmental Conditions	Input Power	Tested by
RE $\geq$ 1G	25 deg. C, 65 % RH	120 Vac, 60 Hz	Gavin Wu
RE<1G	25 deg. C, 65 % RH	120 Vac, 60 Hz	Gavin Wu
PLC	25 deg. C, 65 % RH	120 Vac, 60 Hz	Toby Tian
APCM	25 deg. C, 65 % RH	120 Vac, 60 Hz	Frank FL Liu

3.3 Duty Cycle of Test Signal

MODULATION TYPE: BPSK

Duty cycle of test signal is > 98 %, duty factor is not required.

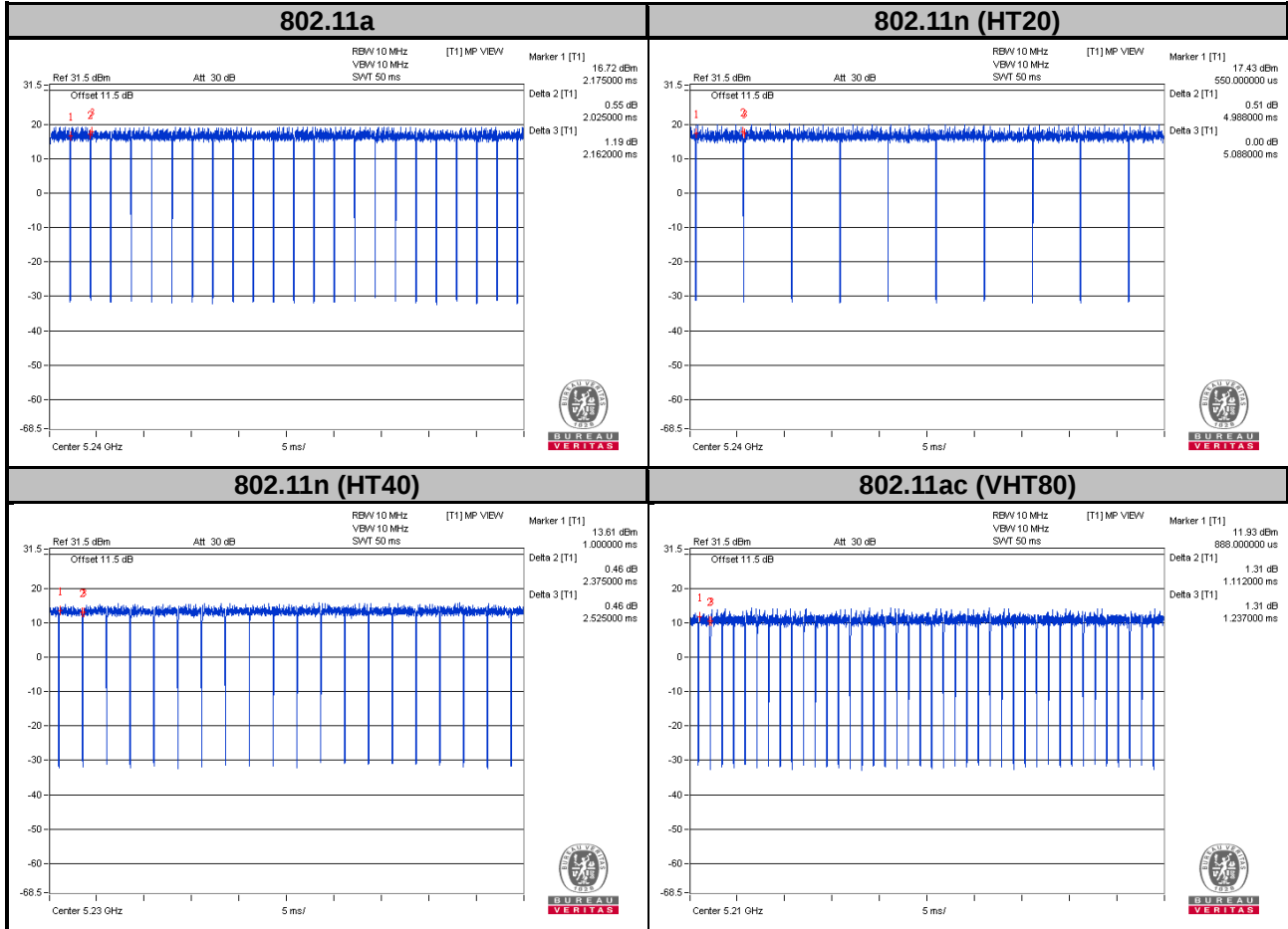
Duty cycle of test signal is < 98 %, duty factor is required.

802.11a: Duty cycle = $2.025/2.162 = 0.937$, Duty factor = $10 * \log(1/0.937) = 0.28$

802.11n (HT20): Duty cycle = $4.988/5.088 = 0.980$

802.11n (HT40): Duty cycle = $2.375/2.525 = 0.941$, Duty factor = $10 * \log(1/0.941) = 0.27$

802.11ac (VHT80): Duty cycle = $1.112/1.237 = 0.899$, Duty factor = $10 * \log(1/0.899) = 0.46$



3.4 Description of Support Units

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

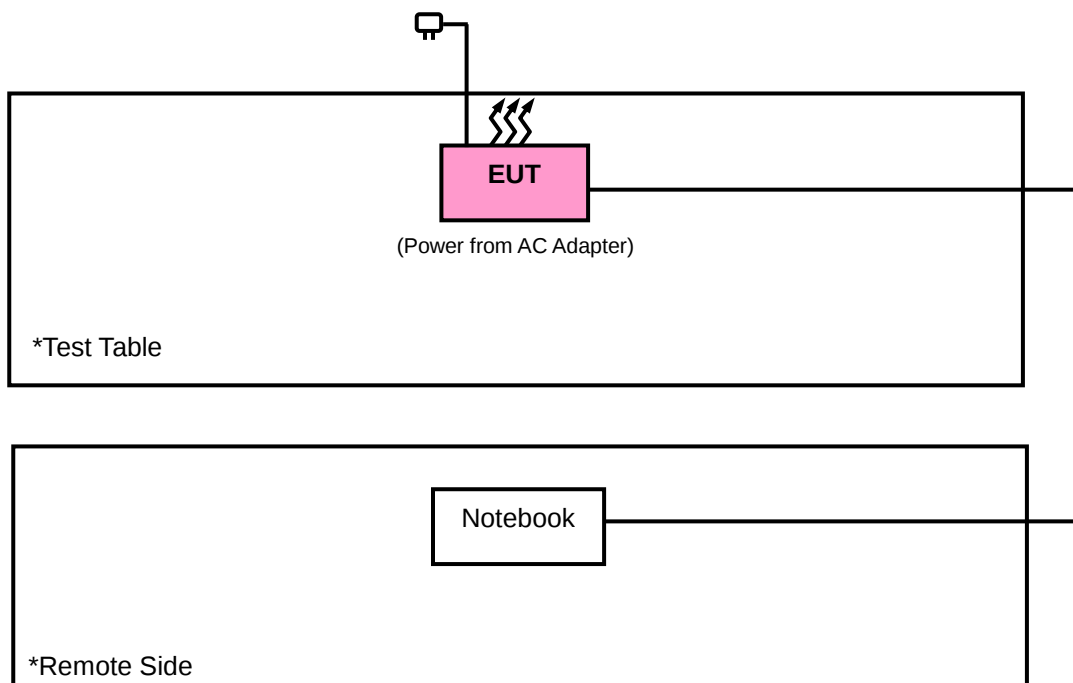
No.	Product	Brand	Model No.	Serial No.	FCC ID	Remark
1.	Notebook	DELL	Inspiron 14R	8LRKKW1	N/A	--
2.	Adapter	Asian Power Devices Inc.	WA-30J12R	N/A	N/A	Option of EUT I/P: 100-240 Vac, 50-60 Hz, 0.9 A Max. O/P: 12 Vdc, 2.5 A 1.8m power cable without core attached on adapter
3.	POE	EnGenius	EPA5006GAT	N/A	N/A	Option of EUT I/P: 100-240 Vac, 50-60 Hz, 0.8 A O/P: 54 Vdc, 0.6 A 10.5m power cable without core

No.	Signal Cable Description Of The Above Support Units
1.	N/A

Note:

1. All power cords of the above support units are non-shielded (1.8m).
2. Items 1 acted as communication partners to transfer data.
3. After pre-scanning Adapter mode and POE mode, Adapter mode was the worse case, and only this worse case was tested for the final test.

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)

789033 D02 General UNII Test Procedures New Rules v01r03

644545 D01 Guidance for IEEE 802 11ac v01r02

662911 D01 Multiple Transmitter Output v02r01

ANSI C63.10-2013

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

Note: The EUT has been verified to comply with the requirements of FCC Part 15, Subpart B, Class B (DoC).
The test report has been issued separately.

4 Test Types and Results

4.1 Radiated Emission and Bandedge Measurement

4.1.1 Limits of Radiated Emission and Bandedge Measurement

Radiated emissions which fall in the restricted bands must comply with the radiated emission limits specified as below table. Other emissions shall be at least 20 dB below the highest level of the desired power:

Frequencies (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 ~ 0.490	2400/F (kHz)	300
0.490 ~ 1.705	24000/F (kHz)	30
1.705 ~ 30.0	30	30
30 ~ 88	100	3
88 ~ 216	150	3
216 ~ 960	200	3
Above 960	500	3

Note:

1. The lower limit shall apply at the transition frequencies.
2. Emission level (dBuV/m) = 20 log Emission level (uV/m).
3. For frequencies above 1000 MHz, the field strength limits are based on average detector, however, the peak field strength of any emission shall not exceed the maximum permitted average limits, specified above by more than 20 dB under any condition of modulation.

4.1.2 Limits of Unwanted Emission Out of the Restricted Bands

Applicable To		Limit	
789033 D02 General UNII Test Procedures New Rules v01r03		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	N9038A	MY51210203	Jan. 21, 2016	Jan. 20, 2017
			Feb. 17, 2017	Feb. 16, 2018
Spectrum Analyzer Agilent	N9010A	MY52220314	Nov. 16, 2016	Nov. 15, 2017
			Dec. 16, 2016	Dec. 15, 2017
Spectrum Analyzer ROHDE & SCHWARZ	FSU43	101261	Dec. 17, 2015	Dec. 16, 2016
			Dec. 13, 2016	Dec. 12, 2017
BILOG Antenna SCHWARZBECK	VULB9168	9168-472	Jan. 07, 2016	Jan. 06, 2017
			Dec. 26, 2016	Dec. 27, 2017
HORN Antenna SCHWARZBECK	BBHA 9120 D	9120D-969	Jan. 04, 2016	Jan. 03, 2017
			Dec. 12, 2016	Dec. 13, 2017
HORN Antenna SCHWARZBECK	BBHA 9170	9170-480	Jan. 08, 2016	Jan. 07, 2017
			Dec. 14, 2016	Dec. 13, 2017
Fixed Attenuator Mini-Circuits	BW-N10W5+	NA	Jul. 08, 2016	Jul. 07, 2017
Loop Antenna	EM-6879	269	Aug. 11, 2016	Aug. 10, 2017
Preamplifier EMCI	EMC 012645	980115	Oct. 21, 2016	Oct. 20, 2017
Preamplifier EMCI	EMC 184045	980116	Oct. 21, 2016	Oct. 20, 2017
Preamplifier EMCI	EMC 330H	980112	Oct. 21, 2016	Oct. 20, 2017
Power Meter Anritsu	ML2495A	1232002	Sep. 08, 2016	Sep. 07, 2017
Power Sensor Anritsu	MA2411B	1207325	Sep. 08, 2016	Sep. 07, 2017
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	309219/4 2950114	Oct. 21, 2016	Oct. 20, 2017
RF signal cable HUBER+SUHNNER	SUCOFLEX 104	250130/4	Oct. 21, 2016	Oct. 20, 2017
RF Coaxial Cable Worken	8D-FB	Cable-Ch10-01	Oct. 21, 2016	Oct. 20, 2017
Software BV ADT	E3 6.120103	NA	NA	NA
Antenna Tower MF	MFA-440H	NA	NA	NA
Turn Table MF	MFT-201SS	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. 02, 2016	Sep. 01, 2017
DC Power Supply Topward	33010D	807748	Oct. 27, 2014	Oct. 26, 2016
			Oct. 25, 2016	Oct. 24, 2018
Digital Multimeter Fluke	87-III	70360742	Jul. 01, 2016	Jun. 30, 2017

- 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 Chamber 10.
 3. The horn antenna and preamplifier (model: EMC 184045) are used only for the measurement of emission frequency above 1 GHz if tested.
 4. The FCC Site Registration No. is 690701.
 5. The IC Site Registration No. is IC7450F-10.

4.1.4 Test Procedures

- a. The EUT was placed on the top of a rotating table 0.8 meters (for below 1 GHz) / 1.5 meters (for above 1 GHz) above the ground at 3 meter chamber room for test. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The height of antenna is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to quasi-peak detect function and specified bandwidth with maximum hold mode when the test frequency is below 1 GHz.
- f. The test-receiver system was set to peak and average detected function and specified bandwidth with maximum hold mode when the test frequency is above 1 GHz. If the peak reading value also meets average limit, measurement with the average detector is unnecessary.

Note:

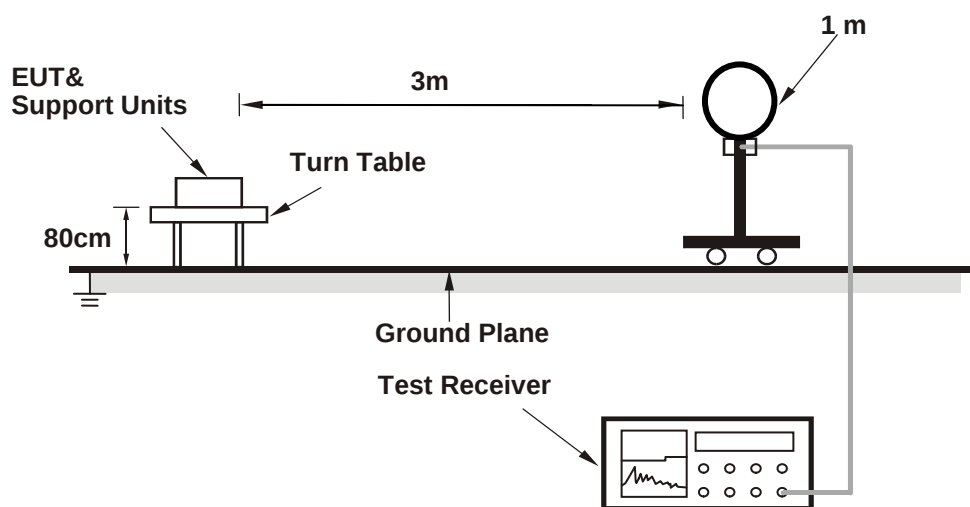
1. The resolution bandwidth and video bandwidth of test receiver/spectrum analyzer is 120 kHz & 360 kHz for Quasi-peak detection (QP) at frequency below 1 GHz.
2. The resolution bandwidth of test receiver/spectrum analyzer is 1 MHz and the video bandwidth is 3 MHz for Peak detection (PK) at frequency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

4.1.5 Deviation from Test Standard

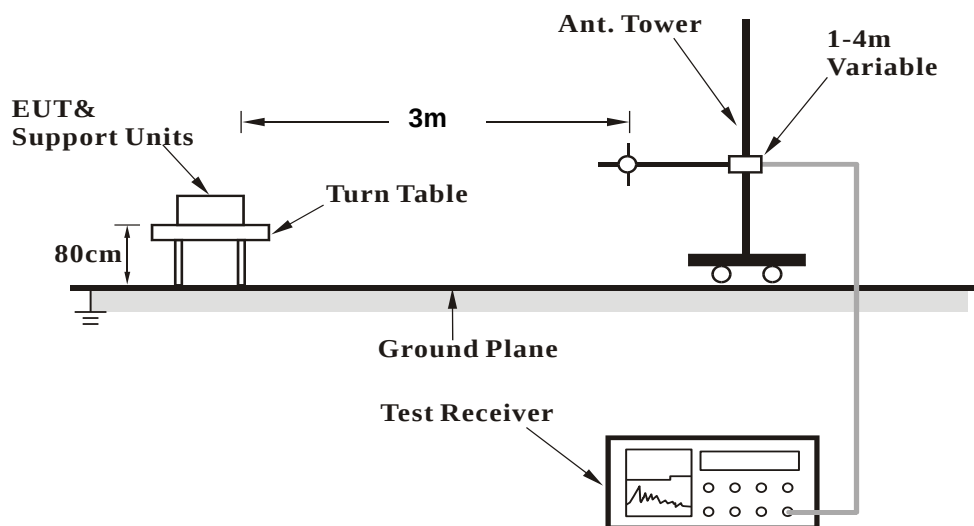
No deviation.

4.1.6 Test Set Up

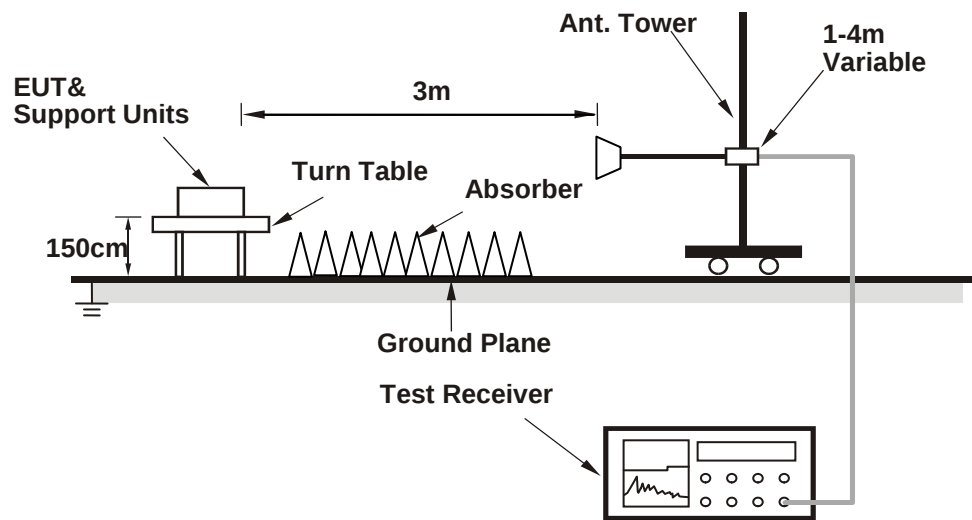
<Radiated emission below 30MHz>



<Frequency Range below 1 GHz>



<Frequency Range above 1 GHz>



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

4.1.7 EUT Operating Conditions

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

4.1.8 Test Results

Above 1 GHz Data :

Mode A

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	Gavin Wu

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
5149.4	44.69	44.49	54	-9.31	31.32	6.2	37.32	200	308	Average
5150	53.36	53.16	74	-20.64	31.32	6.2	37.32	200	308	Peak
5180	101.36	101.13			31.35	6.22	37.34	200	308	Average
5180	108.34	108.11			31.35	6.22	37.34	200	308	Peak
*10360	53.74	57.64	68.2	-14.46	39.19	9.05	52.14	131	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
5144.3	51.63	51.43	74	-22.37	31.32	6.2	37.32	200	28	Peak
5147.75	42.72	42.52	54	-11.28	31.32	6.2	37.32	200	28	Average
5180	98.98	98.75			31.35	6.22	37.34	200	28	Average
5180	106	105.77			31.35	6.22	37.34	200	28	Peak
*10360	53.56	57.46	68.2	-14.64	39.19	9.05	52.14	126	186	Peak

Remarks:

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

EUT Test Condition		Measurement Detail	
Channel	Channel 44	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Gavin Wu

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
5013.5	51.49	51.36	54	-11.48	31.21	6.15	37.23	198	54	Peak
5135.9	42.35	42.14	74	-23.16	31.31	6.2	37.3	198	54	Average
5220	100.8	100.55			31.37	6.24	37.36	198	54	Average
5220	107.97	107.72			31.37	6.24	37.36	198	54	Peak
5423.92	41.74	41.07	54	-11.92	31.53	6.32	37.18	198	54	Average
5439.98	51.23	50.47	74	-21.77	31.55	6.34	37.13	198	54	Peak
*10440	54.16	58.26	68.2	-14.04	39.29	9.09	52.48	100	178	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
5009	50.88	50.77	54	-12.06	31.21	6.13	37.23	198	28	Peak
5040.2	40.78	40.63	74	-23.33	31.24	6.15	37.24	198	28	Average
5220	98.75	98.5			31.37	6.24	37.36	198	28	Average
5220	106.19	105.94			31.37	6.24	37.36	198	28	Peak
5405	52.1	51.44	74	-21.68	31.52	6.32	37.18	198	28	Peak
5423.81	42.65	41.98	54	-11.68	31.53	6.32	37.18	198	28	Average
*10440	54.11	58.21	74	-19.89	39.29	9.09	52.48	100	97	Peak

Remarks:

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

EUT Test Condition		Measurement Detail	
Channel	Channel 48	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Gavin Wu

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	100.91	100.59	54	-9.31	31.39	6.25	37.32	200	317	Average
5240	107.69	107.37	74	-20.64	31.39	6.25	37.32	200	317	Peak
5391.69	52.09	51.45			31.51	6.31	37.18	200	317	Peak
5439.87	43.09	42.33			31.55	6.34	37.13	200	317	Average
*10480	53.3	57.55	68.2	-14.9	39.37	9.09	52.71	130	254	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	100.31	99.99	74	-22.37	31.39	6.25	37.32	171	30	Average
5240	106.38	106.06	54	-11.28	31.39	6.25	37.32	171	30	Peak
5424.14	42.32	41.65			31.53	6.32	37.18	171	30	Average
5428.76	51.58	50.84			31.55	6.32	37.13	171	30	Peak
*10480	53.74	57.99	68.2	-14.46	39.37	9.09	52.71	126	185	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
2. 5240 MHz: Fundamental Frequency
3. *: Out of Restricted Band

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

<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
5630.725	51.72	50.65	68.2	-16.48	31.79	6.56	37.28	100	68	Peak
5650.15	50.55	49.36	68.31	-17.76	31.85	6.62	37.28	100	68	Peak
5745	106.73	105.46			31.99	6.75	37.47	100	68	Average
5745	113.32	112.05			31.99	6.75	37.47	100	68	Peak
5924.725	50.47	48.67	68.4	-17.93	32.29	7.01	37.5	100	68	Peak
5950.45	51.88	49.98	68.2	-16.32	32.32	7.08	37.5	100	68	Peak
11490	46.33	49.22	54	-7.67	39.91	10.03	52.83	110	223	Average
11490	56.51	59.4	74	-17.49	39.91	10.03	52.83	110	223	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
5550.925	50.22	49.21	68.2	-17.98	31.68	6.42	37.09	184	37	Peak
5650.15	50.88	49.69	68.31	-17.43	31.85	6.62	37.28	184	37	Peak
5745	106.02	104.75			31.99	6.75	37.47	184	37	Average
5745	112.38	111.11			31.99	6.75	37.47	184	37	Peak
5919.475	52.61	50.84	72.27	-19.66	32.26	7.01	37.5	184	37	Peak
5989.825	51.99	49.96	68.2	-16.21	32.4	7.14	37.51	184	37	Peak
11490	45.51	48.4	54	-8.49	39.91	10.03	52.83	150	108	Average
11490	56.61	59.5	74	-17.39	39.91	10.03	52.83	150	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
5630.725	51.72	50.65	68.2	-16.48	31.79	6.56	37.28	100	68	Peak
5650.15	50.55	49.36	68.31	-17.76	31.85	6.62	37.28	100	68	Peak
5924.725	50.47	48.67	68.4	-17.93	32.29	7.01	37.5	100	68	Peak
5950.45	51.88	49.98	68.2	-16.32	32.32	7.08	37.5	100	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
5550.925	50.22	49.21	68.2	-17.98	31.68	6.42	37.09	184	37	Peak
5650.15	50.88	49.69	68.31	-17.43	31.85	6.62	37.28	184	37	Peak
5919.475	52.61	50.84	72.27	-19.66	32.26	7.01	37.5	184	37	Peak
5989.825	51.99	49.96	68.2	-16.21	32.4	7.14	37.51	184	37	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
2. 5745 MHz: Fundamental Frequency
3. *: Out of Restricted Band

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

<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
5501.05	51.14	50.24	68.2	-17.06	31.6	6.36	37.06	100	67	Peak
5651.725	49.89	48.7	69.48	-19.59	31.85	6.62	37.28	100	67	Peak
5785	111.03	109.71			32.04	6.82	37.54	100	67	Average
5785	116.02	114.7			32.04	6.82	37.54	100	67	Peak
5923.15	51.23	49.43	69.56	-18.33	32.29	7.01	37.5	100	67	Peak
5999.8	51.74	49.71	68.2	-16.46	32.4	7.14	37.51	100	67	Peak
11570	46.59	50.05	54	-7.41	39.78	10.09	53.33	108	225	Average
11570	56.49	59.95	74	-17.51	39.78	10.09	53.33	108	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
5604.475	50.98	49.87	68.2	-17.22	31.77	6.56	37.22	183	35	Peak
5654.35	49.73	48.6	71.43	-21.7	31.85	6.62	37.34	183	35	Peak
5785	110.25	108.93			32.04	6.82	37.54	183	35	Average
5785	115.35	114.03			32.04	6.82	37.54	183	35	Peak
5923.675	50.88	49.08	69.18	-18.3	32.29	7.01	37.5	183	35	Peak
5991.925	52.16	50.13	68.2	-16.04	32.4	7.14	37.51	183	35	Peak
11570	45.87	49.33	54	-8.13	39.78	10.09	53.33	148	111	Average
11570	57.13	60.59	74	-16.87	39.78	10.09	53.33	148	111	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
5501.05	51.14	50.24	68.2	-17.06	31.6	6.36	37.06	100	67	Peak
5651.725	49.89	48.7	69.48	-19.59	31.85	6.62	37.28	100	67	Peak
5923.15	51.23	49.43	69.56	-18.33	32.29	7.01	37.5	100	67	Peak
5999.8	51.74	49.71	68.2	-16.46	32.4	7.14	37.51	100	67	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
5604.475	50.98	49.87	68.2	-17.22	31.77	6.56	37.22	183	35	Peak
5654.35	49.73	48.6	71.43	-21.7	31.85	6.62	37.34	183	35	Peak
5923.675	50.88	49.08	69.18	-18.3	32.29	7.01	37.5	183	35	Peak
5991.925	52.16	50.13	68.2	-16.04	32.4	7.14	37.51	183	35	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
2. 5785 MHz: Fundamental Frequency
3. *: Out of Restricted Band

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

<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
5570.35	50.93	49.85	68.2	-17.27	31.71	6.49	37.12	100	66	Peak
5654.875	50.86	49.73	71.82	-20.96	31.85	6.62	37.34	100	66	Peak
5825	107.19	105.72			32.12	6.88	37.53	100	66	Average
5825	113.92	112.45			32.12	6.88	37.53	100	66	Peak
5923.15	52.5	50.7	69.56	-17.06	32.29	7.01	37.5	100	66	Peak
6017.65	52.41	50.32	68.2	-15.79	32.45	7.14	37.5	100	66	Peak
11650	46.32	49.87	54	-7.68	39.65	10.15	53.35	106	217	Average
11650	54.45	58	74	-19.55	39.65	10.15	53.35	106	217	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5562.475	52.29	51.24	68.2	-15.91	31.68	6.49	37.12	182	36	Peak
5651.725	50.85	49.66	69.48	-18.63	31.85	6.62	37.28	182	36	Peak
5825	106.3	104.83			32.12	6.88	37.53	182	36	Average
5825	112.96	111.49			32.12	6.88	37.53	182	36	Peak
5924.2	51.01	49.21	68.79	-17.78	32.29	7.01	37.5	182	36	Peak
5990.875	52.59	50.56	68.2	-15.61	32.4	7.14	37.51	182	36	Peak
11650	45.07	48.62	54	-8.93	39.65	10.15	53.35	159	119	Average
11650	54.2	57.75	74	-19.8	39.65	10.15	53.35	159	119	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
5570.35	50.93	49.85	68.2	-17.27	31.71	6.49	37.12	100	66	Peak
5654.875	50.86	49.73	71.82	-20.96	31.85	6.62	37.34	100	66	Peak
5923.15	52.5	50.7	69.56	-17.06	32.29	7.01	37.5	100	66	Peak
6017.65	52.41	50.32	68.2	-15.79	32.45	7.14	37.5	100	66	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5562.475	52.29	51.24	68.2	-15.91	31.68	6.49	37.12	182	36	Peak
5651.725	50.85	49.66	69.48	-18.63	31.85	6.62	37.28	182	36	Peak
5924.2	51.01	49.21	68.79	-17.78	32.29	7.01	37.5	182	36	Peak
5990.875	52.59	50.56	68.2	-15.61	32.4	7.14	37.51	182	36	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
2. 5825 MHz: Fundamental Frequency
3. *: Out of Restricted Band

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	Gavin Wu

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
5135.9	44.71	44.5	54	-9.31	31.31	6.2	37.3	200	301	Average
5148.95	53.37	53.17	74	-20.64	31.32	6.2	37.32	200	301	Peak
5180	101.45	101.22			31.35	6.22	37.34	200	301	Average
5180	108.87	108.64			31.35	6.22	37.34	200	301	Peak
*10360	53.69	57.59	68.2	-14.51	39.19	9.05	52.14	131	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
5135.6	51.6	51.39	74	-22.37	31.31	6.2	37.3	200	7	Peak
5135.9	42.41	42.2	54	-11.28	31.31	6.2	37.3	200	7	Average
5180	98.53	98.3			31.35	6.22	37.34	200	7	Average
5180	105.93	105.7			31.35	6.22	37.34	200	7	Peak
*10360	53.82	57.72	68.2	-14.38	39.19	9.05	52.14	126	186	Peak

Remarks:

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

EUT Test Condition		Measurement Detail	
Channel	Channel 44	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Gavin Wu

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
5135.9	42.52	42.31	54	-11.48	31.31	6.2	37.3	202	54	Average
5143.25	50.84	50.62	74	-23.16	31.32	6.2	37.3	202	54	Peak
5220	100.49	100.24			31.37	6.24	37.36	202	54	Average
5220	108.24	107.99			31.37	6.24	37.36	202	54	Peak
5423.92	42.08	41.41	54	-11.92	31.53	6.32	37.18	202	54	Average
5424.03	52.23	51.56	74	-21.77	31.53	6.32	37.18	202	54	Peak
*10440	53.55	57.65	68.2	-14.65	39.29	9.09	52.48	100	117	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
5039.9	41.94	41.79	54	-12.06	31.24	6.15	37.24	198	19	Average
5041.55	50.67	50.52	74	-23.33	31.24	6.15	37.24	198	19	Peak
5220	98.67	98.42			31.37	6.24	37.36	198	19	Average
5220	106.51	106.26			31.37	6.24	37.36	198	19	Peak
5423.59	52.32	51.65	74	-21.68	31.53	6.32	37.18	198	19	Peak
5423.92	42.32	41.65	54	-11.68	31.53	6.32	37.18	198	19	Average
*10440	54.23	58.33	68.2	-13.97	39.29	9.09	52.48	100	156	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
2. 5220 MHz: Fundamental Frequency
3. *: Out of Restricted Band

EUT Test Condition		Measurement Detail	
Channel	Channel 48	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Gavin Wu

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	100.5	100.18	54	-9.31	31.39	6.25	37.32	188	303	Average
5240	108.83	108.51	74	-20.64	31.39	6.25	37.32	188	303	Peak
5363.64	52.24	51.62			31.49	6.31	37.18	188	303	Peak
5439.87	42.39	41.63			31.55	6.34	37.13	188	303	Average
*10480	53.38	57.63	68.2	-14.82	39.37	9.09	52.71	130	254	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	98.58	98.26	74	-22.37	31.39	6.25	37.32	197	6	Average
5240	106.18	105.86	54	-11.28	31.39	6.25	37.32	197	6	Peak
5397.63	51.83	51.17			31.52	6.32	37.18	197	6	Peak
5423.92	42.24	41.57			31.53	6.32	37.18	197	6	Average
*10480	52.77	57.02	68.2	-15.43	39.37	9.09	52.71	125	186	Peak

Remarks:

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

EUT Test Condition		Measurement Detail	
Channel	Channel 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	Gavin Wu

<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
5593.45	51.63	50.56	68.2	-16.57	31.74	6.49	37.16	100	67	Peak
5652.775	51.82	50.63	70.26	-18.44	31.85	6.62	37.28	100	67	Peak
5745	107.24	105.97			31.99	6.75	37.47	100	67	Average
5745	113.64	112.37			31.99	6.75	37.47	100	67	Peak
5920.525	52.27	50.5	71.5	-19.23	32.26	7.01	37.5	100	67	Peak
6007.675	52.1	50.02	68.2	-16.1	32.45	7.14	37.51	100	67	Peak
11490	46.64	49.53	54	-7.36	39.91	10.03	52.83	115	231	Average
11490	56.39	59.28	74	-17.61	39.91	10.03	52.83	115	231	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
5571.4	51.59	50.51	68.2	-16.61	31.71	6.49	37.12	184	34	Peak
5651.2	50.88	49.69	69.09	-18.21	31.85	6.62	37.28	184	34	Peak
5745	106.58	105.31			31.99	6.75	37.47	184	34	Average
5745	112.91	111.64			31.99	6.75	37.47	184	34	Peak
5920.525	50.92	49.15	71.5	-20.58	32.26	7.01	37.5	184	34	Peak
5953.6	53.77	51.87	68.2	-14.43	32.32	7.08	37.5	184	34	Peak
11490	46.01	48.9	54	-7.99	39.91	10.03	52.83	152	105	Average
11490	56.7	59.59	74	-17.3	39.91	10.03	52.83	152	105	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
5593.45	51.63	50.56	68.2	-16.57	31.74	6.49	37.16	100	67	Peak
5652.775	51.82	50.63	70.26	-18.44	31.85	6.62	37.28	100	67	Peak
5920.525	52.27	50.5	71.5	-19.23	32.26	7.01	37.5	100	67	Peak
6007.675	52.1	50.02	68.2	-16.1	32.45	7.14	37.51	100	67	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
5571.4	51.59	50.51	68.2	-16.61	31.71	6.49	37.12	184	34	Peak
5651.2	50.88	49.69	69.09	-18.21	31.85	6.62	37.28	184	34	Peak
5920.525	50.92	49.15	71.5	-20.58	32.26	7.01	37.5	184	34	Peak
5953.6	53.77	51.87	68.2	-14.43	32.32	7.08	37.5	184	34	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
2. 5745 MHz: Fundamental Frequency
3. *: Out of Restricted Band

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

<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
5564.575	50.91	49.83	68.2	-17.29	31.71	6.49	37.12	100	66	Peak
5654.35	50.59	49.46	71.43	-20.84	31.85	6.62	37.34	100	66	Peak
5785	111.21	109.89			32.04	6.82	37.54	100	66	Average
5785	116.13	114.81			32.04	6.82	37.54	100	66	Peak
5918.95	51.14	49.37	72.66	-21.52	32.26	7.01	37.5	100	66	Peak
5943.1	52.42	50.52	68.2	-15.78	32.32	7.08	37.5	100	66	Peak
11570	46.53	49.99	54	-7.47	39.78	10.09	53.33	117	220	Average
11570	54.06	57.52	74	-19.94	39.78	10.09	53.33	117	220	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
5540.95	51.92	50.93	68.2	-16.28	31.66	6.42	37.09	183	36	Peak
5654.35	51.81	50.68	71.43	-19.62	31.85	6.62	37.34	183	36	Peak
5785	110.99	109.67			32.04	6.82	37.54	183	36	Average
5785	115.71	114.39			32.04	6.82	37.54	183	36	Peak
5921.05	50.66	48.89	71.11	-20.45	32.26	7.01	37.5	183	36	Peak
5978.8	50.61	48.67	68.2	-17.59	32.37	7.08	37.51	183	36	Peak
11570	45.93	49.39	54	-8.07	39.78	10.09	53.33	142	124	Average
11570	55.41	58.87	74	-18.59	39.78	10.09	53.33	142	124	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
5564.575	50.91	49.83	68.2	-17.29	31.71	6.49	37.12	100	66	Peak
5654.35	50.59	49.46	71.43	-20.84	31.85	6.62	37.34	100	66	Peak
5918.95	51.14	49.37	72.66	-21.52	32.26	7.01	37.5	100	66	Peak
5943.1	52.42	50.52	68.2	-15.78	32.32	7.08	37.5	100	66	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
5540.95	51.92	50.93	68.2	-16.28	31.66	6.42	37.09	183	36	Peak
5654.35	51.81	50.68	71.43	-19.62	31.85	6.62	37.34	183	36	Peak
5921.05	50.66	48.89	71.11	-20.45	32.26	7.01	37.5	183	36	Peak
5978.8	50.61	48.67	68.2	-17.59	32.37	7.08	37.51	183	36	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
2. 5785 MHz: Fundamental Frequency
3. *: Out of Restricted Band

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

<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
5614.45	51.33	50.22	68.2	-16.87	31.77	6.56	37.22	100	66	Peak
5654.875	50.81	49.68	71.82	-21.01	31.85	6.62	37.34	100	66	Peak
5825	108.16	106.69			32.12	6.88	37.53	100	66	Average
5825	114.31	112.84			32.12	6.88	37.53	100	66	Peak
5916.85	52.72	50.95	74.21	-21.49	32.26	7.01	37.5	100	66	Peak
5992.975	52.97	50.94	68.2	-15.23	32.4	7.14	37.51	100	66	Peak
11650	46.18	49.73	54	-7.82	39.65	10.15	53.35	111	219	Average
11650	54.64	58.19	74	-19.36	39.65	10.15	53.35	111	219	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5574.55	51.76	50.68	68.2	-16.44	31.71	6.49	37.12	182	34	Peak
5653.3	49.9	48.71	70.65	-20.75	31.85	6.62	37.28	182	34	Peak
5825	107.35	105.88			32.12	6.88	37.53	182	34	Average
5825	113.86	112.39			32.12	6.88	37.53	182	34	Peak
5922.1	52.18	50.38	70.34	-18.16	32.29	7.01	37.5	182	34	Peak
5988.775	52.7	50.7	68.2	-15.5	32.37	7.14	37.51	182	34	Peak
11650	44.86	48.41	54	-9.14	39.65	10.15	53.35	149	107	Average
11650	53.81	57.36	74	-20.19	39.65	10.15	53.35	149	107	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
5614.45	51.33	50.22	68.2	-16.87	31.77	6.56	37.22	100	66	Peak
5654.875	50.81	49.68	71.82	-21.01	31.85	6.62	37.34	100	66	Peak
5916.85	52.72	50.95	74.21	-21.49	32.26	7.01	37.5	100	66	Peak
5992.975	52.97	50.94	68.2	-15.23	32.4	7.14	37.51	100	66	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
5574.55	51.76	50.68	68.2	-16.44	31.71	6.49	37.12	182	34	Peak
5653.3	49.9	48.71	70.65	-20.75	31.85	6.62	37.28	182	34	Peak
5922.1	52.18	50.38	70.34	-18.16	32.29	7.01	37.5	182	34	Peak
5988.775	52.7	50.7	68.2	-15.5	32.37	7.14	37.51	182	34	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
2. 5825 MHz: Fundamental Frequency
3. *: Out of Restricted Band

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	Gavin Wu

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	46.86	46.66	54	-7.14	31.32	6.2	37.32	189	299	Average
5149.7	56.25	56.05	74	-17.75	31.32	6.2	37.32	189	299	Peak
5190	98.39	98.16			31.35	6.22	37.34	189	299	Average
5190	105.73	105.5			31.35	6.22	37.34	189	299	Peak
5429.53	50.98	50.24	74	-23.02	31.55	6.32	37.13	189	299	Peak
5439.87	41.29	40.53	54	-12.71	31.55	6.34	37.13	189	299	Average
*10380	53.85	57.84	68.2	-14.35	39.21	9.05	52.25	130	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
5149.4	52.99	52.79	74	-21.01	31.32	6.2	37.32	181	14	Peak
5150	45.33	45.13	54	-8.67	31.32	6.2	37.32	181	14	Average
5190	96.43	96.2			31.35	6.22	37.34	181	14	Average
5190	103.7	103.47			31.35	6.22	37.34	181	14	Peak
5424.91	51.93	51.21	74	-22.07	31.53	6.32	37.13	181	14	Peak
5439.87	41.41	40.65	54	-12.59	31.55	6.34	37.13	181	14	Average
*10380	53.94	57.93	68.2	-14.26	39.21	9.05	52.25	126	188	Peak

Remarks:

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

EUT Test Condition		Measurement Detail	
Channel	Channel 46	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Gavin Wu

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
5136.05	43.78	43.57	54	-10.22	31.31	6.2	37.3	202	299	Average
5148.8	53.75	53.55	74	-20.25	31.32	6.2	37.32	202	299	Peak
5230	98.88	98.57			31.39	6.24	37.32	202	299	Average
5230	105.43	105.12			31.39	6.24	37.32	202	299	Peak
5396.64	51.72	51.07	74	-22.28	31.52	6.31	37.18	202	299	Peak
5424.03	42.31	41.64	54	-11.69	31.53	6.32	37.18	202	299	Average
*10460	53.06	57.25	68.2	-15.14	39.32	9.09	52.6	125	253	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
5040.05	41.91	41.76	54	-12.09	31.24	6.15	37.24	172	13	Average
5079.35	50.48	50.31	74	-23.52	31.27	6.17	37.27	172	13	Peak
5230	96.32	96.01			31.39	6.24	37.32	172	13	Average
5230	103.68	103.37			31.39	6.24	37.32	172	13	Peak
5437.23	51.44	50.68	74	-22.56	31.55	6.34	37.13	172	13	Peak
5439.76	42.23	41.47	54	-11.77	31.55	6.34	37.13	172	13	Average
*10460	52.89	57.08	68.2	-15.31	39.32	9.09	52.6	125	188	Peak

Remarks:

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

EUT Test Condition		Measurement Detail	
Channel	Channel 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	Gavin Wu

<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
5603.425	51.07	49.96	68.2	-17.13	31.77	6.56	37.22	100	66	Peak
5651.2	51.48	50.29	69.09	-17.61	31.85	6.62	37.28	100	66	Peak
5755	103.11	101.82			32.01	6.75	37.47	100	66	Average
5755	110.78	109.49			32.01	6.75	37.47	100	66	Peak
5923.675	51.21	49.41	69.18	-17.97	32.29	7.01	37.5	100	66	Peak
5996.125	51.67	49.64	68.2	-16.53	32.4	7.14	37.51	100	66	Peak
11510	46.63	49.77	54	-7.37	39.9	10.03	53.07	108	229	Average
11510	56.51	59.65	74	-17.49	39.9	10.03	53.07	108	229	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
5547.775	51.98	50.97	68.2	-16.22	31.68	6.42	37.09	184	35	Peak
5655.4	49.93	48.8	72.21	-22.28	31.85	6.62	37.34	184	35	Peak
5755	103.2	101.91			32.01	6.75	37.47	184	35	Average
5755	109.76	108.47			32.01	6.75	37.47	184	35	Peak
5918.95	51.46	49.69	72.66	-21.2	32.26	7.01	37.5	184	35	Peak
5941	52.56	50.66	68.2	-15.64	32.32	7.08	37.5	184	35	Peak
11510	45.57	48.71	54	-8.43	39.9	10.03	53.07	143	115	Average
11510	55.68	58.82	74	-18.32	39.9	10.03	53.07	143	115	Peak

<Out of Band Emission (OOBE)>

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5603.425	51.07	49.96	68.2	-17.13	31.77	6.56	37.22	100	66	Peak
5651.2	51.48	50.29	69.09	-17.61	31.85	6.62	37.28	100	66	Peak
5923.675	51.21	49.41	69.18	-17.97	32.29	7.01	37.5	100	66	Peak
5996.125	51.67	49.64	68.2	-16.53	32.4	7.14	37.51	100	66	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
5547.775	51.98	50.97	68.2	-16.22	31.68	6.42	37.09	184	35	Peak
5655.4	49.93	48.8	72.21	-22.28	31.85	6.62	37.34	184	35	Peak
5918.95	51.46	49.69	72.66	-21.2	32.26	7.01	37.5	184	35	Peak
5941	52.56	50.66	68.2	-15.64	32.32	7.08	37.5	184	35	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
2. 5755 MHz: Fundamental Frequency
3. *: Out of Restricted Band

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

<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
5599.225	51.31	50.21	68.2	-16.89	31.77	6.49	37.16	100	67	Peak
5654.35	50.52	49.39	71.43	-20.91	31.85	6.62	37.34	100	67	Peak
5795	105.64	104.29			32.07	6.82	37.54	100	67	Average
5795	112.57	111.22			32.07	6.82	37.54	100	67	Peak
5920.525	52.46	50.69	71.5	-19.04	32.26	7.01	37.5	100	67	Peak
5975.65	52.48	50.54	68.2	-15.72	32.37	7.08	37.51	100	67	Peak
11590	45.69	49.19	54	-8.31	39.74	10.09	53.33	112	224	Average
11590	54.53	58.03	74	-19.47	39.74	10.09	53.33	112	224	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
5544.1	51.3	50.31	68.2	-16.9	31.66	6.42	37.09	182	37	Peak
5654.875	50.74	49.61	71.82	-21.08	31.85	6.62	37.34	182	37	Peak
5795	105.56	104.21			32.07	6.82	37.54	182	37	Average
5795	111.96	110.61			32.07	6.82	37.54	182	37	Peak
5920	50.74	48.97	71.89	-21.15	32.26	7.01	37.5	182	37	Peak
5949.925	52.17	50.27	68.2	-16.03	32.32	7.08	37.5	182	37	Peak
11590	44.88	48.38	54	-9.12	39.74	10.09	53.33	156	123	Average
11590	54.41	57.91	74	-19.59	39.74	10.09	53.33	156	123	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
5599.225	51.31	50.21	68.2	-16.89	31.77	6.49	37.16	100	67	Peak
5654.35	50.52	49.39	71.43	-20.91	31.85	6.62	37.34	100	67	Peak
5920.525	52.46	50.69	71.5	-19.04	32.26	7.01	37.5	100	67	Peak
5975.65	52.48	50.54	68.2	-15.72	32.37	7.08	37.51	100	67	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
5544.1	51.3	50.31	68.2	-16.9	31.66	6.42	37.09	182	37	Peak
5654.875	50.74	49.61	71.82	-21.08	31.85	6.62	37.34	182	37	Peak
5920	50.74	48.97	71.89	-21.15	32.26	7.01	37.5	182	37	Peak
5949.925	52.17	50.27	68.2	-16.03	32.32	7.08	37.5	182	37	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
2. 5795 MHz: Fundamental Frequency
3. *: Out of Restricted Band

802.11ac (VHT80)

EUT Test Condition		Measurement Detail	
Channel	Channel 42	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Gavin Wu

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5144.9	60.67	60.47	74	-13.33	31.32	6.2	37.32	197	294	Peak
5146.25	51.58	51.38	54	-2.42	31.32	6.2	37.32	197	294	Average
5210	96.54	96.29			31.37	6.24	37.36	197	294	Average
5210	104.04	103.79			31.37	6.24	37.36	197	294	Peak
5350.44	43.96	43.37	54	-10.04	31.48	6.29	37.18	197	294	Average
5367.82	53.13	52.51	74	-20.87	31.49	6.31	37.18	197	294	Peak
*10420	53.82	57.82	68.2	-14.38	39.27	9.09	52.36	130	125	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5131.25	56.41	56.2	74	-17.59	31.31	6.2	37.3	134	9	Peak
5150	48.16	47.96	54	-5.84	31.32	6.2	37.32	134	9	Average
5210	95.03	94.78			31.37	6.24	37.36	134	9	Average
5210	101.62	101.37			31.37	6.24	37.36	134	9	Peak
5350.22	41.84	41.25	54	-12.16	31.48	6.29	37.18	134	9	Average
5357.37	51.18	50.57	74	-22.82	31.48	6.31	37.18	134	9	Peak
*10420	53.67	57.67	68.2	-14.53	39.27	9.09	52.36	126	180	Peak

Remarks:

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

EUT Test Condition		Measurement Detail	
Channel	Channel 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	Gavin Wu

<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
5582.95	51.96	50.89	68.2	-16.24	31.74	6.49	37.16	100	68	Peak
5654.875	59.52	58.39	71.82	-12.3	31.85	6.62	37.34	100	68	Peak
5775	100.85	99.49			32.04	6.82	37.5	100	68	Average
5775	107.22	105.86			32.04	6.82	37.5	100	68	Peak
5922.625	55.85	54.05	69.95	-14.1	32.29	7.01	37.5	100	68	Peak
5981.425	51.99	50.05	68.2	-16.21	32.37	7.08	37.51	100	68	Peak
11550	45.88	49.22	54	-8.12	39.81	10.09	53.24	120	213	Average
11550	54.06	57.4	74	-19.94	39.81	10.09	53.24	120	213	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5632.825	57.95	56.85	68.2	-10.25	31.82	6.56	37.28	182	36	Peak
5653.825	56.93	55.8	71.04	-14.11	31.85	6.62	37.34	182	36	Peak
5775	100.09	98.73			32.04	6.82	37.5	182	36	Average
5775	106.35	104.99			32.04	6.82	37.5	182	36	Peak
5923.15	54.9	53.1	69.56	-14.66	32.29	7.01	37.5	182	36	Peak
5948.35	54.15	52.25	68.2	-14.05	32.32	7.08	37.5	182	36	Peak
11550	44.84	48.18	54	-9.16	39.81	10.09	53.24	157	102	Average
11550	54.39	57.73	74	-19.61	39.81	10.09	53.24	157	102	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
5582.95	51.96	50.89	68.2	-16.24	31.74	6.49	37.16	100	68	Peak
5654.875	59.52	58.39	71.82	-12.3	31.85	6.62	37.34	100	68	Peak
5922.625	55.85	54.05	69.95	-14.1	32.29	7.01	37.5	100	68	Peak
5981.425	51.99	50.05	68.2	-16.21	32.37	7.08	37.51	100	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
5632.825	57.95	56.85	68.2	-10.25	31.82	6.56	37.28	182	36	Peak
5653.825	56.93	55.8	71.04	-14.11	31.85	6.62	37.34	182	36	Peak
5923.15	54.9	53.1	69.56	-14.66	32.29	7.01	37.5	182	36	Peak
5948.35	54.15	52.25	68.2	-14.05	32.32	7.08	37.5	182	36	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
2. 5775 MHz: Fundamental Frequency
3. *: Out of Restricted Band

Mode B

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	Gavin Wu

Antenna Polarity & Test Distance: Horizontal at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5147.9	43.85	43.65	54	-10.15	31.32	6.2	37.32	123	94	Average
5150	52.56	52.36	74	-21.44	31.32	6.2	37.32	123	94	Peak
5180	101.08	100.85			31.35	6.22	37.34	123	94	Average
5180	108.29	108.06			31.35	6.22	37.34	123	94	Peak
*10360	54.52	58.42	68.2	-13.68	39.19	9.05	52.14	105	224	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
5039.9	41.9	41.75	54	-12.1	31.24	6.15	37.24	211	200	Average
5134.7	51.17	50.96	74	-22.83	31.31	6.2	37.3	211	200	Peak
5180	96.62	96.39			31.35	6.22	37.34	211	200	Average
5180	103.84	103.61			31.35	6.22	37.34	211	200	Peak
*10360	53.84	57.74	68.2	-14.36	39.19	9.05	52.14	127	346	Peak

Remarks:

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

EUT Test Condition		Measurement Detail	
Channel	Channel 44	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Gavin Wu

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
5135.9	43.09	42.88	54	-10.91	31.31	6.2	37.3	121	92	Average
5137.25	51.51	51.3	74	-22.49	31.31	6.2	37.3	121	92	Peak
5220	101.45	101.2			31.37	6.24	37.36	121	92	Average
5220	108.53	108.28			31.37	6.24	37.36	121	92	Peak
5386.19	51.52	50.88	74	-22.48	31.51	6.31	37.18	121	92	Peak
5423.81	42.59	41.92	54	-11.41	31.53	6.32	37.18	121	92	Average
*10440	54.58	58.68	68.2	-13.62	39.29	9.09	52.48	112	201	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
5039.9	41.63	41.48	54	-12.37	31.24	6.15	37.24	212	197	Average
5149.85	50.52	50.32	74	-23.48	31.32	6.2	37.32	212	197	Peak
5220	96.62	96.37			31.37	6.24	37.36	212	197	Average
5220	104.04	103.79			31.37	6.24	37.36	212	197	Peak
5376.29	41.45	40.83	54	-12.55	31.49	6.31	37.18	212	197	Average
5395.65	51.03	50.38	74	-22.97	31.52	6.31	37.18	212	197	Peak
*10440	55.21	59.31	68.2	-12.99	39.29	9.09	52.48	128	340	Peak

Remarks:

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

EUT Test Condition		Measurement Detail	
Channel	Channel 48	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Gavin Wu

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
5039.75	43.2	43.05	54	-10.8	31.24	6.15	37.24	120	91	Average
5139.95	51.35	51.13	74	-22.65	31.32	6.2	37.3	120	91	Peak
5240	101.23	100.91			31.39	6.25	37.32	120	91	Average
5240	108.29	107.97			31.39	6.25	37.32	120	91	Peak
5376.07	41.84	41.22	54	-12.16	31.49	6.31	37.18	120	91	Average
5406.87	51.65	50.99	74	-22.35	31.52	6.32	37.18	120	91	Peak
10480	53.79	58.04	68.2	-14.41	39.37	9.09	52.71	109	211	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
5039.9	42.2	42.05	54	-11.8	31.24	6.15	37.24	208	202	Average
5054.9	50.71	50.54	74	-23.29	31.25	6.17	37.25	208	202	Peak
5240	96.52	96.2			31.39	6.25	37.32	208	202	Average
5240	103.72	103.4			31.39	6.25	37.32	208	202	Peak
5423.7	41.28	40.61	54	-12.72	31.53	6.32	37.18	208	202	Average
5455.05	50.94	50.12	74	-23.06	31.56	6.34	37.08	208	202	Peak
10480	54.19	58.44	68.2	-14.01	39.37	9.09	52.71	118	339	Peak

Remarks:

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

EUT Test Condition		Measurement Detail	
Channel	Channel 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	Gavin Wu

<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
5643.575	52.05	50.89	68.2	-16.15	31.82	6.62	37.28	103	94	Peak
5656.4	52.31	51.18	72.95	-20.64	31.85	6.62	37.34	103	94	Peak
5745	108.38	107.11			31.99	6.75	37.47	103	94	Average
5745	114.64	113.37			31.99	6.75	37.47	103	94	Peak
5922.875	52.12	50.32	69.77	-17.65	32.29	7.01	37.5	103	94	Peak
5963.25	52.95	51.04	68.2	-15.25	32.34	7.08	37.51	103	94	Peak
11490	46.8	49.69	54	-7.2	39.91	10.03	52.83	104	322	Average
11490	55.66	58.55	74	-18.34	39.91	10.03	52.83	104	322	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
5643.1	50.92	49.76	68.2	-17.28	31.82	6.62	37.28	202	203	Peak
5654.5	50.61	49.48	71.54	-20.93	31.85	6.62	37.34	202	203	Peak
5745	103.31	102.04			31.99	6.75	37.47	202	203	Average
5745	110.5	109.23			31.99	6.75	37.47	202	203	Peak
5921.925	51.02	49.22	70.47	-19.45	32.29	7.01	37.5	202	203	Peak
5961.35	50.83	48.92	68.2	-17.37	32.34	7.08	37.51	202	203	Peak
11490	46.2	49.09	54	-7.8	39.91	10.03	52.83	129	72	Average
11490	55.73	58.62	74	-18.27	39.91	10.03	52.83	129	72	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
5643.575	52.05	50.89	68.2	-16.15	31.82	6.62	37.28	103	94	Peak
5656.4	52.31	51.18	72.95	-20.64	31.85	6.62	37.34	103	94	Peak
5922.875	52.12	50.32	69.77	-17.65	32.29	7.01	37.5	103	94	Peak
5963.25	52.95	51.04	68.2	-15.25	32.34	7.08	37.51	103	94	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
5643.1	50.92	49.76	68.2	-17.28	31.82	6.62	37.28	202	203	Peak
5654.5	50.61	49.48	71.54	-20.93	31.85	6.62	37.34	202	203	Peak
5921.925	51.02	49.22	70.47	-19.45	32.29	7.01	37.5	202	203	Peak
5961.35	50.83	48.92	68.2	-17.37	32.34	7.08	37.51	202	203	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
2. 5745 MHz: Fundamental Frequency
3. *: Out of Restricted Band

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

<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
5608.9	51.86	50.75	68.2	-16.34	31.77	6.56	37.22	103	94	Peak
5655.925	51.1	49.97	72.6	-21.5	31.85	6.62	37.34	103	94	Peak
5785	112.73	111.41			32.04	6.82	37.54	102	93	Average
5785	117.07	115.75			32.04	6.82	37.54	102	93	Peak
5917.175	53.12	51.35	73.97	-20.85	32.26	7.01	37.5	103	94	Peak
5979.4	52.7	50.76	68.2	-15.5	32.37	7.08	37.51	103	94	Peak
11570	46.19	49.65	54	-7.81	39.78	10.09	53.33	107	330	Average
11570	54.35	57.81	74	-19.65	39.78	10.09	53.33	107	330	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
5612.7	50.67	49.56	68.2	-17.53	31.77	6.56	37.22	201	208	Peak
5661.625	49.61	48.48	76.83	-27.22	31.85	6.62	37.34	201	208	Peak
5785	106.41	105.09			32.04	6.82	37.54	200	205	Average
5785	112.87	111.55			32.04	6.82	37.54	200	205	Peak
5914.8	49.97	48.2	75.72	-25.75	32.26	7.01	37.5	201	208	Peak
5990.325	50.51	48.48	68.2	-17.69	32.4	7.14	37.51	201	208	Peak
11570	45.68	49.14	54	-8.32	39.78	10.09	53.33	137	82	Average
11570	55.33	58.79	74	-18.67	39.78	10.09	53.33	137	82	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
5608.9	51.86	50.75	68.2	-16.34	31.77	6.56	37.22	103	94	Peak
5655.925	51.1	49.97	72.6	-21.5	31.85	6.62	37.34	103	94	Peak
5917.175	53.12	51.35	73.97	-20.85	32.26	7.01	37.5	103	94	Peak
5979.4	52.7	50.76	68.2	-15.5	32.37	7.08	37.51	103	94	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
5612.7	50.67	49.56	68.2	-17.53	31.77	6.56	37.22	201	208	Peak
5661.625	49.61	48.48	76.83	-27.22	31.85	6.62	37.34	201	208	Peak
5914.8	49.97	48.2	75.72	-25.75	32.26	7.01	37.5	201	208	Peak
5990.325	50.51	48.48	68.2	-17.69	32.4	7.14	37.51	201	208	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
2. 5785 MHz: Fundamental Frequency
3. *: Out of Restricted Band

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

<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
5575.175	50.5	49.42	68.2	-17.7	31.71	6.49	37.12	101	95	Peak
5657.35	50.33	49.2	73.66	-23.33	31.85	6.62	37.34	101	95	Peak
5825	108.36	106.89			32.12	6.88	37.53	101	95	Average
5825	114.64	113.17			32.12	6.88	37.53	101	95	Peak
5923.35	52.22	50.42	69.42	-17.2	32.29	7.01	37.5	101	95	Peak
5983.2	52.07	50.13	68.2	-16.13	32.37	7.08	37.51	101	95	Peak
11650	45.86	49.41	54	-8.14	39.65	10.15	53.35	101	335	Average
11650	53.73	57.28	74	-20.27	39.65	10.15	53.35	101	335	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
5634.55	50.49	49.39	68.2	-17.71	31.82	6.56	37.28	198	205	Peak
5650.7	50.14	48.95	68.72	-18.58	31.85	6.62	37.28	198	205	Peak
5825	103.36	101.89			32.12	6.88	37.53	200	207	Average
5825	110.22	108.75			32.12	6.88	37.53	200	207	Peak
5918.125	50.86	49.09	73.27	-22.41	32.26	7.01	37.5	198	205	Peak
5954.7	50.98	49.08	68.2	-17.22	32.32	7.08	37.5	198	205	Peak
11650	45.36	48.91	54	-8.64	39.65	10.15	53.35	129	81	Average
11650	54.21	57.76	74	-19.79	39.65	10.15	53.35	129	81	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
5575.175	50.5	49.42	68.2	-17.7	31.71	6.49	37.12	101	95	Peak
5657.35	50.33	49.2	73.66	-23.33	31.85	6.62	37.34	101	95	Peak
5923.35	52.22	50.42	69.42	-17.2	32.29	7.01	37.5	101	95	Peak
5983.2	52.07	50.13	68.2	-16.13	32.37	7.08	37.51	101	95	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
5634.55	50.49	49.39	68.2	-17.71	31.82	6.56	37.28	198	205	Peak
5650.7	50.14	48.95	68.72	-18.58	31.85	6.62	37.28	198	205	Peak
5918.125	50.86	49.09	73.27	-22.41	32.26	7.01	37.5	198	205	Peak
5954.7	50.98	49.08	68.2	-17.22	32.32	7.08	37.5	198	205	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
2. 5825 MHz: Fundamental Frequency
3. *: Out of Restricted Band

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	Gavin Wu

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	53.27	53.07	74	-20.73	31.32	6.2	37.32	122	92	Peak
5150	44.3	44.1	54	-9.7	31.32	6.2	37.32	122	92	Average
5180	101.29	101.06			31.35	6.22	37.34	122	92	Average
5180	108.58	108.35			31.35	6.22	37.34	122	92	Peak
*10360	53.52	57.42	68.2	-14.68	39.19	9.05	52.14	102	213	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
5039.9	42.52	42.37	54	-11.48	31.24	6.15	37.24	209	199	Average
5147.9	51.45	51.25	74	-22.55	31.32	6.2	37.32	209	199	Peak
5180	97.13	96.9			31.35	6.22	37.34	209	199	Average
5180	104.24	104.01			31.35	6.22	37.34	209	199	Peak
*10360	53.55	57.45	68.2	-14.65	39.19	9.05	52.14	129	331	Peak

Remarks:

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

EUT Test Condition		Measurement Detail	
Channel	Channel 44	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Gavin Wu

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
5039.9	43.49	43.34	54	-10.51	31.24	6.15	37.24	120	89	Average
5149.1	51.78	51.58	74	-22.22	31.32	6.2	37.32	120	89	Peak
5220	101.8	101.55			31.37	6.24	37.36	120	89	Average
5220	108.87	108.62			31.37	6.24	37.36	120	89	Peak
5376.07	51.96	51.34	74	-22.04	31.49	6.31	37.18	120	89	Peak
5424.03	42.13	41.46	54	-11.87	31.53	6.32	37.18	120	89	Average
*10440	54.09	58.19	68.2	-14.11	39.29	9.09	52.48	108	215	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
5039.9	42.28	42.13	54	-11.72	31.24	6.15	37.24	208	198	Average
5119.55	51.09	50.91	74	-22.91	31.29	6.19	37.3	208	198	Peak
5220	97.46	97.21			31.37	6.24	37.36	208	198	Average
5220	104.47	104.22			31.37	6.24	37.36	208	198	Peak
5423.92	41.6	40.93	54	-12.4	31.53	6.32	37.18	208	198	Average
5441.63	51.72	50.96	74	-22.28	31.55	6.34	37.13	208	198	Peak
*10440	53.9	58	68.2	-14.3	39.29	9.09	52.48	122	345	Peak

Remarks:

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

EUT Test Condition		Measurement Detail	
Channel	Channel 48	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Gavin Wu

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
5039.9	43.4	43.25	54	-10.6	31.24	6.15	37.24	119	95	Average
5129.15	52	51.79	74	-22	31.31	6.2	37.3	119	95	Peak
5240	101.76	101.44			31.39	6.25	37.32	119	95	Average
5240	108.88	108.56			31.39	6.25	37.32	119	95	Peak
5375.85	41.9	41.28	54	-12.1	31.49	6.31	37.18	119	95	Average
5416.11	51.9	51.23	74	-22.1	31.53	6.32	37.18	119	95	Peak
*10480	54.17	58.42	68.2	-14.03	39.37	9.09	52.71	107	198	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
5040.05	42.32	42.17	54	-11.68	31.24	6.15	37.24	207	202	Average
5058.8	50.84	50.67	74	-23.16	31.25	6.17	37.25	207	202	Peak
5240	97.4	97.08			31.39	6.25	37.32	207	202	Average
5240	104.48	104.16			31.39	6.25	37.32	207	202	Peak
5372.33	50.63	50.01	74	-23.37	31.49	6.31	37.18	207	202	Peak
5424.14	41.25	40.58	54	-12.75	31.53	6.32	37.18	207	202	Average
*10480	53.57	57.82	68.2	-14.63	39.37	9.09	52.71	124	348	Peak

Remarks:

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

EUT Test Condition		Measurement Detail	
Channel	Channel 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	Gavin Wu

<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
5575.175	52.71	51.63	68.2	-15.49	31.71	6.49	37.12	103	92	Peak
5652.6	52.02	50.83	70.13	-18.11	31.85	6.62	37.28	103	92	Peak
5745	108.38	107.11			31.99	6.75	37.47	102	92	Average
5745	113.81	112.54			31.99	6.75	37.47	102	92	Peak
5916.225	51.4	49.63	74.67	-23.27	32.26	7.01	37.5	103	92	Peak
5973.225	52.27	50.33	68.2	-15.93	32.37	7.08	37.51	103	92	Peak
11490	46.98	49.87	54	-7.02	39.91	10.03	52.83	106	341	Average
11490	56.6	59.49	74	-17.4	39.91	10.03	52.83	106	341	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
5586.1	50.71	49.64	68.2	-17.49	31.74	6.49	37.16	202	204	Peak
5652.125	50.05	48.86	69.78	-19.73	31.85	6.62	37.28	202	204	Peak
5745	102.52	101.25			31.99	6.75	37.47	202	204	Average
5745	111.29	110.02			31.99	6.75	37.47	202	204	Peak
5917.65	50.33	48.56	73.62	-23.29	32.26	7.01	37.5	202	204	Peak
5995.55	51.44	49.41	68.2	-16.76	32.4	7.14	37.51	202	204	Peak
11490	46.25	49.14	54	-7.75	39.91	10.03	52.83	132	79	Average
11490	55.39	58.28	74	-18.61	39.91	10.03	52.83	132	79	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
5575.175	52.71	51.63	68.2	-15.49	31.71	6.49	37.12	103	92	Peak
5652.6	52.02	50.83	70.13	-18.11	31.85	6.62	37.28	103	92	Peak
5916.225	51.4	49.63	74.67	-23.27	32.26	7.01	37.5	103	92	Peak
5973.225	52.27	50.33	68.2	-15.93	32.37	7.08	37.51	103	92	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
5586.1	50.71	49.64	68.2	-17.49	31.74	6.49	37.16	202	204	Peak
5652.125	50.05	48.86	69.78	-19.73	31.85	6.62	37.28	202	204	Peak
5917.65	50.33	48.56	73.62	-23.29	32.26	7.01	37.5	202	204	Peak
5995.55	51.44	49.41	68.2	-16.76	32.4	7.14	37.51	202	204	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
2. 5745 MHz: Fundamental Frequency
3. *: Out of Restricted Band

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

<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
5714	65.04	63.85	74	-8.96	31.93	6.69	37.43	102	94	Peak
5725	66.35	65.07	74	-7.65	31.96	6.75	37.43	102	94	Peak
5785	108.85	107.53			32.04	6.82	37.54	102	94	Average
5785	116.98	115.66			32.04	6.82	37.54	102	94	Peak
5850	71.17	69.65	74	-2.83	32.15	6.88	37.51	102	94	Peak
5861	65.9	64.27	74	-8.1	32.18	6.95	37.5	102	94	Peak
11570	46.43	49.89	54	-7.57	39.78	10.09	53.33	107	330	Average
11570	54.29	57.75	74	-19.71	39.78	10.09	53.33	107	330	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
5714	59.68	58.49	74	-14.32	31.93	6.69	37.43	200	4	Peak
5725	67.35	66.07	74	-6.65	31.96	6.75	37.43	200	4	Peak
5785	102.32	101			32.04	6.82	37.54	200	4	Average
5785	110.88	109.56			32.04	6.82	37.54	200	4	Peak
5850	62.7	61.18	74	-11.3	32.15	6.88	37.51	200	4	Peak
5861	61.05	59.42	74	-12.95	32.18	6.95	37.5	200	4	Peak
11570	45.03	48.49	54	-8.97	39.78	10.09	53.33	140	80	Average
11570	54.95	58.41	74	-19.05	39.78	10.09	53.33	140	80	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
5559.025	51.02	49.97	68.2	-17.18	31.68	6.49	37.12	102	94	Peak
5656.875	51.53	50.4	73.31	-21.78	31.85	6.62	37.34	102	94	Peak
5915.275	51.86	50.09	75.37	-23.51	32.26	7.01	37.5	102	94	Peak
5945.2	51.65	49.75	68.2	-16.55	32.32	7.08	37.5	102	94	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
5605.1	50.62	49.51	68.2	-17.58	31.77	6.56	37.22	200	356	Peak
5658.775	50.66	49.53	74.72	-24.06	31.85	6.62	37.34	200	356	Peak
5919.55	50.69	48.92	72.22	-21.53	32.26	7.01	37.5	200	356	Peak
5952.8	51.94	50.04	68.2	-16.26	32.32	7.08	37.5	200	356	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
2. 5785 MHz: Fundamental Frequency
3. *: Out of Restricted Band

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

<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
5597.025	51.6	50.53	68.2	-16.6	31.74	6.49	37.16	101	95	Peak
5656.875	50.8	49.67	73.31	-22.51	31.85	6.62	37.34	101	95	Peak
5825	107.34	105.87			32.12	6.88	37.53	101	95	Average
5825	114.6	113.13			32.12	6.88	37.53	101	95	Peak
5919.55	53.33	51.56	72.22	-18.89	32.26	7.01	37.5	101	95	Peak
5950.9	53.21	51.31	68.2	-14.99	32.32	7.08	37.5	101	95	Peak
11650	45.69	49.24	54	-8.31	39.65	10.15	53.35	300	360	Average
11650	54.84	58.39	74	-19.16	39.65	10.15	53.35	300	360	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
5635.025	50.86	49.76	68.2	-17.34	31.82	6.56	37.28	200	205	Peak
5652.6	48.83	47.64	70.13	-21.3	31.85	6.62	37.28	200	205	Peak
5825	100.9	99.43			32.12	6.88	37.53	200	205	Average
5825	109.09	107.62			32.12	6.88	37.53	200	205	Peak
5919.075	48.66	46.89	72.57	-23.91	32.26	7.01	37.5	200	205	Peak
5957.075	50.95	49.03	68.2	-17.25	32.34	7.08	37.5	200	205	Peak
11650	45.01	48.56	54	-8.99	39.65	10.15	53.35	126	77	Average
11650	54.42	57.97	74	-19.58	39.65	10.15	53.35	126	77	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
5597.025	51.6	50.53	68.2	-16.6	31.74	6.49	37.16	101	95	Peak
5656.875	50.8	49.67	73.31	-22.51	31.85	6.62	37.34	101	95	Peak
5919.55	53.33	51.56	72.22	-18.89	32.26	7.01	37.5	101	95	Peak
5950.9	53.21	51.31	68.2	-14.99	32.32	7.08	37.5	101	95	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
5635.025	50.86	49.76	68.2	-17.34	31.82	6.56	37.28	200	205	Peak
5652.6	48.83	47.64	70.13	-21.3	31.85	6.62	37.28	200	205	Peak
5919.075	48.66	46.89	72.57	-23.91	32.26	7.01	37.5	200	205	Peak
5957.075	50.95	49.03	68.2	-17.25	32.34	7.08	37.5	200	205	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
2. 5825 MHz: Fundamental Frequency
3. *: Out of Restricted Band

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	Gavin Wu

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
5146.85	47.42	47.22	54	-6.58	31.32	6.2	37.32	121	86	Average
5146.85	56.28	56.08	74	-17.72	31.32	6.2	37.32	121	86	Peak
5190	99.7	99.47			31.35	6.22	37.34	121	86	Average
5190	107.04	106.81			31.35	6.22	37.34	121	86	Peak
5375.85	42.34	41.72	54	-11.66	31.49	6.31	37.18	121	86	Average
5410.5	51.7	51.04	74	-22.3	31.52	6.32	37.18	121	86	Peak
*10380	54.29	58.28	68.2	-13.91	39.21	9.05	52.25	115	220	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
5143.25	43.29	43.07	54	-10.71	31.32	6.2	37.3	210	201	Average
5147.15	52.24	52.04	74	-21.76	31.32	6.2	37.32	210	201	Peak
5190	95.22	94.99			31.35	6.22	37.34	210	201	Average
5190	102.36	102.13			31.35	6.22	37.34	210	201	Peak
5375.85	41.55	40.93	54	-12.45	31.49	6.31	37.18	210	201	Average
5440.75	51.2	50.44	74	-22.8	31.55	6.34	37.13	210	201	Peak
*10380	54.44	58.43	68.2	-13.76	39.21	9.05	52.25	131	338	Peak

Remarks:

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

EUT Test Condition		Measurement Detail	
Channel	Channel 46	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Gavin Wu

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
5135.75	44.38	44.17	54	-9.62	31.31	6.2	37.3	122	97	Average
5136.2	52.89	52.68	74	-21.11	31.31	6.2	37.3	122	97	Peak
5230	99.73	99.42			31.39	6.24	37.32	122	97	Average
5230	107.03	106.72			31.39	6.24	37.32	122	97	Peak
5375.85	42.49	41.87	54	-11.51	31.49	6.31	37.18	122	97	Average
5384.98	51.85	51.21	74	-22.15	31.51	6.31	37.18	122	97	Peak
*10460	53.1	57.29	68.2	-15.1	39.32	9.09	52.6	108	216	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
5040.05	42.63	42.48	54	-11.37	31.24	6.15	37.24	208	202	Average
5067.05	51.11	50.94	74	-22.89	31.25	6.17	37.25	208	202	Peak
5230	95.49	95.18			31.39	6.24	37.32	208	202	Average
5230	102.87	102.56			31.39	6.24	37.32	208	202	Peak
5371.67	51.17	50.55	74	-22.83	31.49	6.31	37.18	208	202	Peak
5439.98	41.28	40.52	54	-12.72	31.55	6.34	37.13	208	202	Average
*10460	53.39	57.58	68.2	-14.81	39.32	9.09	52.6	129	351	Peak

Remarks:

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

EUT Test Condition		Measurement Detail	
Channel	Channel 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	Gavin Wu

<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
5601.3	51.9	50.73	68.2	-16.3	31.77	6.56	37.16	102	93	Peak
5660.2	52.26	51.13	75.77	-23.51	31.85	6.62	37.34	102	93	Peak
5755	102.37	101.08			32.01	6.75	37.47	101	93	Average
5755	109.2	107.91			32.01	6.75	37.47	101	93	Peak
5914.8	52.17	50.4	75.72	-23.55	32.26	7.01	37.5	102	93	Peak
5935.225	52.83	51.03	68.2	-15.37	32.29	7.01	37.5	102	93	Peak
11510	46.43	49.57	54	-7.57	39.9	10.03	53.07	103	329	Average
11510	54.75	57.89	74	-19.25	39.9	10.03	53.07	103	329	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
5590.85	50.65	49.58	68.2	-17.55	31.74	6.49	37.16	202	204	Peak
5659.25	50.14	49.01	75.07	-24.93	31.85	6.62	37.34	202	204	Peak
5755	97.03	95.74			32.01	6.75	37.47	202	204	Average
5755	104.57	103.28			32.01	6.75	37.47	202	204	Peak
5920.5	48.89	47.12	71.52	-22.63	32.26	7.01	37.5	202	204	Peak
5993.175	51.45	49.42	68.2	-16.75	32.4	7.14	37.51	202	204	Peak
11510	45.83	48.97	54	-8.17	39.9	10.03	53.07	135	75	Average
11510	55.55	58.69	74	-18.45	39.9	10.03	53.07	135	75	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
5601.3	51.9	50.73	68.2	-16.3	31.77	6.56	37.16	102	93	Peak
5660.2	52.26	51.13	75.77	-23.51	31.85	6.62	37.34	102	93	Peak
5914.8	52.17	50.4	75.72	-23.55	32.26	7.01	37.5	102	93	Peak
5935.225	52.83	51.03	68.2	-15.37	32.29	7.01	37.5	102	93	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
5590.85	50.65	49.58	68.2	-17.55	31.74	6.49	37.16	202	204	Peak
5659.25	50.14	49.01	75.07	-24.93	31.85	6.62	37.34	202	204	Peak
5920.5	48.89	47.12	71.52	-22.63	32.26	7.01	37.5	202	204	Peak
5993.175	51.45	49.42	68.2	-16.75	32.4	7.14	37.51	202	204	Peak

Remarks:

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

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

<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
5593.225	51.1	50.03	68.2	-17.1	31.74	6.49	37.16	102	95	Peak
5651.175	52.19	51	69.07	-16.88	31.85	6.62	37.28	102	95	Peak
5795	104.45	103.1			32.07	6.82	37.54	101	94	Average
5795	112.04	110.69			32.07	6.82	37.54	101	94	Peak
5920.025	53.83	52.06	71.87	-18.04	32.26	7.01	37.5	102	95	Peak
5944.725	52.17	50.27	68.2	-16.03	32.32	7.08	37.5	102	95	Peak
11590	45.64	49.14	54	-8.36	39.74	10.09	53.33	111	323	Average
11590	54.42	57.92	74	-19.58	39.74	10.09	53.33	111	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
5599.4	50.46	49.36	68.2	-17.74	31.77	6.49	37.16	201	205	Peak
5665.9	51.45	50.32	80	-28.55	31.85	6.62	37.34	201	205	Peak
5795	98.83	97.48			32.07	6.82	37.54	201	205	Average
5795	105.71	104.36			32.07	6.82	37.54	201	205	Peak
5916.7	51.41	49.64	74.32	-22.91	32.26	7.01	37.5	201	205	Peak
5951.85	51.7	49.8	68.2	-16.5	32.32	7.08	37.5	201	205	Peak
11590	45.27	48.77	54	-8.73	39.74	10.09	53.33	142	88	Average
11590	55.54	59.04	74	-18.46	39.74	10.09	53.33	142	88	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
5593.225	51.1	50.03	68.2	-17.1	31.74	6.49	37.16	102	95	Peak
5651.175	52.19	51	69.07	-16.88	31.85	6.62	37.28	102	95	Peak
5920.025	53.83	52.06	71.87	-18.04	32.26	7.01	37.5	102	95	Peak
5944.725	52.17	50.27	68.2	-16.03	32.32	7.08	37.5	102	95	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
5599.4	50.46	49.36	68.2	-17.74	31.77	6.49	37.16	201	205	Peak
5665.9	51.45	50.32	80	-28.55	31.85	6.62	37.34	201	205	Peak
5916.7	51.41	49.64	74.32	-22.91	32.26	7.01	37.5	201	205	Peak
5951.85	51.7	49.8	68.2	-16.5	32.32	7.08	37.5	201	205	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
2. 5795 MHz: Fundamental Frequency
3. *: Out of Restricted Band

802.11ac (VHT80)

EUT Test Condition		Measurement Detail	
Channel	Channel 42	Frequency Range	1 GHz ~ 40 GHz
Input Power	120 Vac, 60 Hz	Detector Function	Peak (PK) Average (AV)
Environmental Conditions	25 deg. C, 65 % RH	Tested By	Gavin Wu

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
5142.35	61.25	61.03	74	-12.75	31.32	6.2	37.3	121	81	Peak
5144.45	52.96	52.76	54	-1.04	31.32	6.2	37.32	121	81	Average
5210	97.95	97.7			31.37	6.24	37.36	121	81	Average
5210	105.4	105.15			31.37	6.24	37.36	121	81	Peak
5350.66	44.21	43.62	54	-9.79	31.48	6.29	37.18	121	81	Average
5368.48	52.81	52.19	74	-21.19	31.49	6.31	37.18	121	81	Peak
*10420	54.2	58.2	68.2	-14	39.27	9.09	52.36	103	217	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
5139.95	48.11	47.89	54	-5.89	31.32	6.2	37.3	208	199	Average
5142.05	57.56	57.34	74	-16.44	31.32	6.2	37.3	208	199	Peak
5210	93.83	93.58			31.37	6.24	37.36	208	199	Average
5210	100.91	100.66			31.37	6.24	37.36	208	199	Peak
5352.42	42.27	41.68	54	-11.73	31.48	6.29	37.18	208	199	Average
5382.45	51.76	51.12	74	-22.24	31.51	6.31	37.18	208	199	Peak
*10420	54.53	58.53	68.2	-13.67	39.27	9.09	52.36	125	342	Peak

Remarks:

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

EUT Test Condition		Measurement Detail	
Channel	Channel 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	Gavin Wu

<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
5647.375	56.15	54.99	68.2	-12.05	31.82	6.62	37.28	102	94	Peak
5650.7	56.56	55.37	68.72	-12.16	31.85	6.62	37.28	102	94	Peak
5775	99.02	97.66			32.04	6.82	37.5	102	94	Average
5775	106.45	105.09			32.04	6.82	37.5	102	94	Peak
5922.4	54.43	52.63	70.12	-15.69	32.29	7.01	37.5	102	94	Peak
5931.9	54.52	52.72	68.2	-13.68	32.29	7.01	37.5	102	94	Peak
11550	45.96	49.3	54	-8.04	39.81	10.09	53.24	115	337	Average
11550	54.14	57.48	74	-19.86	39.81	10.09	53.24	115	337	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
5645.475	54.25	53.09	68.2	-13.95	31.82	6.62	37.28	202	189	Peak
5652.125	51.48	50.29	69.78	-18.3	31.85	6.62	37.28	202	189	Peak
5775	92.83	91.47			32.04	6.82	37.5	202	189	Average
5775	100.97	99.61			32.04	6.82	37.5	202	189	Peak
5923.35	49.78	47.98	69.42	-19.64	32.29	7.01	37.5	202	189	Peak
5936.65	52.09	50.29	68.2	-16.11	32.29	7.01	37.5	202	189	Peak
11550	44.81	48.15	54	-9.19	39.81	10.09	53.24	133	84	Average
11550	53.9	57.24	74	-20.1	39.81	10.09	53.24	133	84	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
5647.375	56.15	54.99	68.2	-12.05	31.82	6.62	37.28	102	94	Peak
5650.7	56.56	55.37	68.72	-12.16	31.85	6.62	37.28	102	94	Peak
5922.4	54.43	52.63	70.12	-15.69	32.29	7.01	37.5	102	94	Peak
5931.9	54.52	52.72	68.2	-13.68	32.29	7.01	37.5	102	94	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
5645.475	54.25	53.09	68.2	-13.95	31.82	6.62	37.28	202	189	Peak
5652.125	51.48	50.29	69.78	-18.3	31.85	6.62	37.28	202	189	Peak
5923.35	49.78	47.98	69.42	-19.64	32.29	7.01	37.5	202	189	Peak
5936.65	52.09	50.29	68.2	-16.11	32.29	7.01	37.5	202	189	Peak

Remarks:

1. Emission Level = Read Level + Antenna Factor + Cable Loss - Preamp Factor
Margin value = Emission level – Limit value
2. 5775 MHz: Fundamental Frequency
3. *: Out of Restricted Band

9 kHz ~ 30 MHz DATA:

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

30 MHz ~ 1 GHz WORST-CASE DATA:

Mode A

802.11ac (VHT80)

EUT Test Condition		Measurement Detail	
Channel	Channel 42	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	Gavin Wu

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
55.22	26.66	44.79	40	-13.34	12.45	0.75	31.33	119	298	Peak
81.41	24.61	47.12	40	-15.39	8.15	0.9	31.56	131	116	Peak
110.51	22.27	42.92	43.5	-21.23	10.09	1.11	31.85	105	176	Peak
128.94	30.61	49.74	43.5	-12.89	11.61	1.14	31.88	117	244	Peak
213.33	26.27	46.62	43.5	-17.23	9.93	1.35	31.63	117	278	Peak
272.5	23.98	42.25	46	-22.02	12.14	1.56	31.97	118	189	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
38.73	30.13	47.11	40	-9.87	13.39	0.63	31	109	97	Peak
56.19	26.91	45.14	40	-13.09	12.35	0.76	31.34	107	190	Peak
68.8	33.46	53.49	40	-6.54	10.89	0.85	31.77	114	6	Peak
120.21	28.66	48.38	43.5	-14.84	11.02	1.16	31.9	104	118	Peak
286.08	27.32	44.92	46	-18.68	12.54	1.59	31.73	133	341	Peak
366.59	24.47	40.06	46	-21.53	14.54	1.81	31.94	138	248	Peak

Remarks:

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

802.11n (HT20)

EUT Test Condition		Measurement Detail	
Channel	Channel 149	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	Gavin Wu

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
54.25	26.05	44.08	40	-13.95	12.56	0.74	31.33	104	211	Peak
70.74	23.5	43.91	40	-16.5	10.53	0.85	31.79	102	263	Peak
127	29.23	48.5	43.5	-14.27	11.48	1.14	31.89	132	316	Peak
213.33	25.27	45.62	43.5	-18.23	9.93	1.35	31.63	122	137	Peak
284.14	25.19	42.88	46	-20.81	12.48	1.59	31.76	135	241	Peak
407.33	31.21	45.84	46	-14.79	15.48	1.92	32.03	127	7	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
38.73	32.13	49.11	40	-7.87	13.39	0.63	31	115	211	Peak
55.22	30.38	48.51	40	-9.62	12.45	0.75	31.33	125	176	Peak
68.8	31.46	51.49	40	-8.54	10.89	0.85	31.77	121	145	Peak
127.97	27.31	46.5	43.5	-16.19	11.55	1.14	31.88	134	270	Peak
274.44	24.38	42.55	46	-21.62	12.2	1.56	31.93	123	178	Peak
403.45	29.32	44.07	46	-16.68	15.41	1.92	32.08	112	130	Peak

Remarks:

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

Mode B

802.11ac (VHT80)

EUT Test Condition		Measurement Detail	
Channel	Channel 42	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	Gavin Wu

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
55.22	23.8	41.93	40	-16.2	12.45	0.75	31.33	110	258	Peak
151.25	30.48	48.29	43.5	-13.02	12.71	1.12	31.64	116	314	Peak
229.82	29.6	49.42	46	-16.4	10.62	1.42	31.86	125	126	Peak
290.93	28.24	45.64	46	-17.76	12.68	1.61	31.69	107	293	Peak
391.81	31.75	46.78	46	-14.25	15.14	1.89	32.06	137	53	Peak
481.05	24.67	37.51	46	-21.33	16.95	2.05	31.84	106	24	Peak
Antenna Polarity & Test Distance: Vertical at 3 m										
Frequency (MHz)	Emission Level (dBuV/m)	Read Level (dBuV)	Limit (dBuV/m)	Margin (dB)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Antenna Height (cm)	Table Angle (Degree)	Remark
53.28	32.04	49.98	40	-7.96	12.66	0.73	31.33	110	230	Peak
122.15	29.6	49.2	43.5	-13.9	11.15	1.15	31.9	129	91	Peak
222.06	31.98	52.04	46	-14.02	10.3	1.38	31.74	136	243	Peak
278.32	32.74	50.71	46	-13.26	12.31	1.58	31.86	105	249	Peak
377.26	29.4	44.69	46	-16.6	14.8	1.85	31.94	130	166	Peak
555.74	27.99	39.24	46	-18.01	18.59	2.18	32.02	115	289	Peak

Remarks:

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

802.11n (HT20)

EUT Test Condition		Measurement Detail	
Channel	Channel 149	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	Gavin Wu

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
54.25	24.53	42.56	40	-15.47	12.56	0.74	31.33	105	46	Peak
135.73	30.29	48.81	43.5	-13.21	12.08	1.14	31.74	109	146	Peak
227.88	32.31	52.19	46	-13.69	10.54	1.41	31.83	138	223	Peak
287.05	28.26	45.81	46	-17.74	12.57	1.6	31.72	123	346	Peak
383.08	31	46.18	46	-15	14.94	1.86	31.98	138	28	Peak
584.84	23.83	34.47	46	-22.17	19.26	2.23	32.13	118	31	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
54.25	31.53	49.56	40	-8.47	12.56	0.74	31.33	105	318	Peak
121.18	29.04	48.69	43.5	-14.46	11.09	1.16	31.9	114	323	Peak
222.06	32.1	52.16	46	-13.9	10.3	1.38	31.74	125	324	Peak
280.26	32.21	50.08	46	-13.79	12.37	1.58	31.82	137	188	Peak
384.05	29.46	44.63	46	-16.54	14.96	1.86	31.99	112	74	Peak
537.31	28.4	39.79	46	-17.6	18.17	2.16	31.72	134	69	Peak

Remarks:

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

4.2 Conducted Emission Measurement

4.2.1 Limits of Conducted Emission Measurement

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

Note: 1. The lower limit shall apply at the transition frequencies.

2. The limit decreases in line with the logarithm of the frequency in the range of 0.15 to 0.50 MHz.

4.2.2 Test Instruments

Description & Manufacturer	Model No.	Serial No.	Date of Calibration	Due Date of Calibration
Test Receiver ROHDE & SCHWARZ	ESCI	100613	Nov. 21, 2016	Nov. 20, 2017
RF signal cable (with 10dB PAD) Woken	5D-FB	Cable-cond1-01	Dec. 22, 2016	Dec. 21, 2017
LISN ROHDE & SCHWARZ (EUT)	ESH3-Z5	835239/001	Feb. 26, 2016	Feb. 25, 2017
LISN ROHDE & SCHWARZ (Peripheral)	ESH3-Z5	100311	Jul. 28, 2016	Jul. 27, 2017
Software ADT	BV ADT_Cond_ V7.3.7.3	NA	NA	NA

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

2. The test was performed in HwaYa Shielded Room 1.

3. The VCCI Site Registration No. is C-2040.

4.2.3 Test Procedures

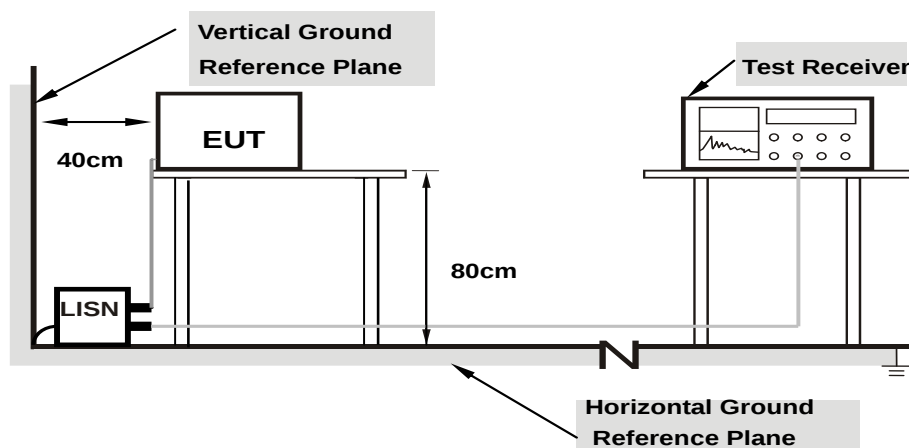
- The EUT was placed 0.4 meters from the conducting wall of the shielded room with EUT being connected to the power mains through a line impedance stabilization network (LISN). Other support units were connected to the power mains through another LISN. The two LISNs provide 50 ohm/ 50uH of coupling impedance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

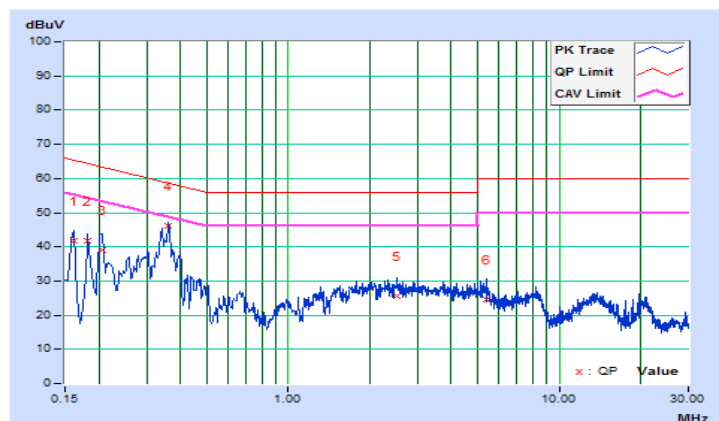
Mode A

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	Toby Tian	Test Date	2016/12/25

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	0.16190	10.12	31.56	13.75	41.68	23.87	65.37	55.37	-23.69	-31.50
2	0.18228	10.13	31.47	16.10	41.60	26.23	64.38	54.38	-22.78	-28.15
3	0.20523	10.14	28.95	16.24	39.09	26.38	63.40	53.40	-24.31	-27.02
4	0.36256	10.16	36.04	28.74	46.20	38.90	58.67	48.67	-12.47	-9.77
5	2.52200	10.28	15.19	9.86	25.47	20.14	56.00	46.00	-30.53	-25.86
6	5.40600	10.45	14.24	7.84	24.69	18.29	60.00	50.00	-35.31	-31.71

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

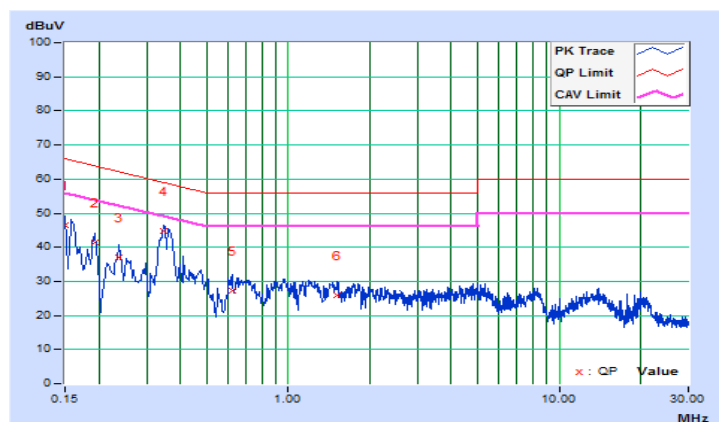


Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25°C, 65%RH
Tested by	Toby Tian	Test Date	2016/12/25

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.12	36.43	22.71	46.55	32.83	66.00	56.00	-19.45	-23.17
2	0.19367	10.15	31.20	19.16	41.35	29.31	63.88	53.88	-22.53	-24.57
3	0.23800	10.16	26.80	18.81	36.96	28.97	62.17	52.17	-25.21	-23.20
4	0.34668	10.17	34.77	27.32	44.94	37.49	59.04	49.04	-14.10	-11.55
5	0.62057	10.18	16.96	10.17	27.14	20.35	56.00	46.00	-28.86	-25.65
6	1.52392	10.23	15.85	11.54	26.08	21.77	56.00	46.00	-29.92	-24.23

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



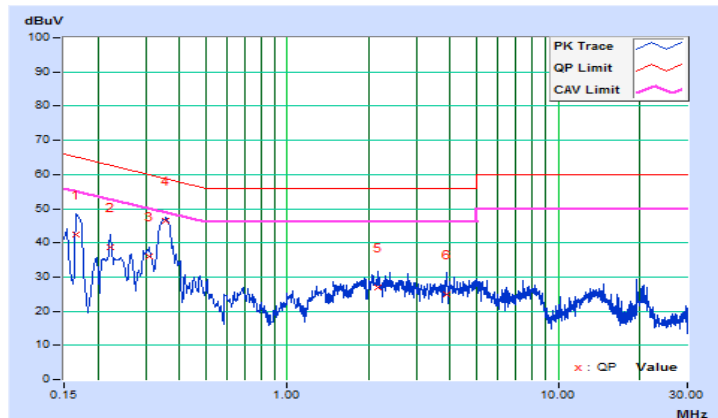
Mode B

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	Toby Tian	Test Date	2016/12/25

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	0.16623	10.12	32.24	15.31	42.36	25.43	65.15	55.15	-22.79	-29.72
2	0.22200	10.14	28.71	18.68	38.85	28.82	62.74	52.74	-23.89	-23.92
3	0.30955	10.16	25.83	17.40	35.99	27.56	59.98	49.98	-23.99	-22.42
4	0.35800	10.16	36.26	28.16	46.42	38.32	58.77	48.77	-12.35	-10.45
5	2.15000	10.26	16.53	11.61	26.79	21.87	56.00	46.00	-29.21	-24.13
6	3.86600	10.36	14.44	8.59	24.80	18.95	56.00	46.00	-31.20	-27.05

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

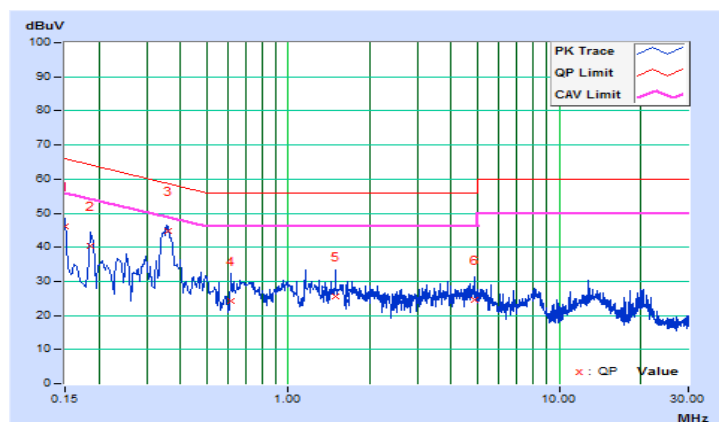


Frequency Range	150kHz ~ 30MHz	Detector Function & Resolution Bandwidth	Quasi-Peak (QP) / Average (AV), 9kHz
Input Power	120Vac, 60Hz	Environmental Conditions	25°C, 65%RH
Tested by	Toby Tian	Test Date	2016/12/25

Phase Of Power : Neutral (N)										
No	Frequency (MHz)	Correction Factor (dB)	Reading Value (dBuV)		Emission Level (dBuV)		Limit (dBuV)		Margin (dB)	
			Q.P.	AV.	Q.P.	AV.	Q.P.	AV.	Q.P.	AV.
1	0.15000	10.12	35.88	22.81	46.00	32.93	66.00	56.00	-20.00	-23.07
2	0.18600	10.14	30.11	15.14	40.25	25.28	64.21	54.21	-23.96	-28.93
3	0.36161	10.17	34.73	27.83	44.90	38.00	58.69	48.69	-13.79	-10.69
4	0.61400	10.18	13.90	8.16	24.08	18.34	56.00	46.00	-31.92	-27.66
5	1.49400	10.22	15.46	11.54	25.68	21.76	56.00	46.00	-30.32	-24.24
6	4.85000	10.44	14.11	7.52	24.55	17.96	56.00	46.00	-31.45	-28.04

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 $N_{ANT} \leq 4$;

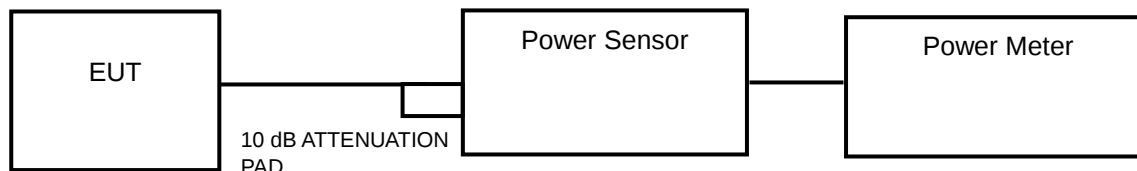
Array Gain = 0 dB (i.e., no array gain) for channel widths ≥ 40 MHz for any N_{ANT} ;

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

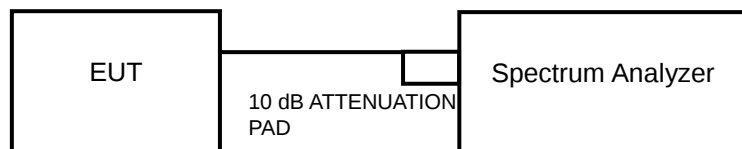
For power measurements on all other devices: Array Gain = $10 \log(N_{ANT}/N_{SS})$ dB.

4.3.2 Test Setup

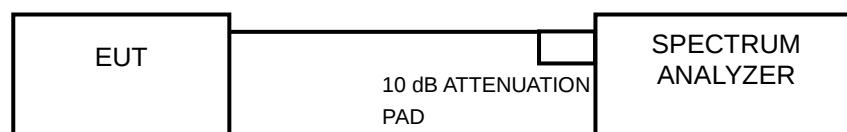
<Power Output Measurement>



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)>

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

26 dB Bandwidth

- 1) Set RBW = approximately 1 % of the emission bandwidth.
- 2) Set the VBW > RBW.
- 3) Detector = Peak.
- 4) Trace mode = max hold.
- 5) 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 Result

Power Output:

CDD Mode

802.11a

Channel	Frequency (MHz)	Maximum Conducted Power (dBm)		Total Power (mW)	Total Power (dBm)	Power Limit (dBm)	Pass / Fail
		Chain 0	Chain 1				
36	5180	12.78	12.68	37.497	15.74	30	Pass
44	5220	12.36	12.21	33.884	15.30	30	Pass
48	5240	12.33	12.42	34.594	15.39	30	Pass
149	5745	20.24	19.43	193.197	22.86	30	Pass
157	5785	24.25	24.93	576.766	27.61	30	Pass
165	5825	20.14	19.38	190.108	22.79	30	Pass

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	12.79	12.85	38.282	15.83	30	Pass
44	5220	12.82	13.13	39.719	15.99	30	Pass
48	5240	13.01	13.08	40.365	16.06	30	Pass
149	5745	19.17	19.22	166.341	22.21	30	Pass
157	5785	23.91	24.54	530.884	27.25	30	Pass
165	5825	19.23	18.53	154.882	21.90	30	Pass

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	13.88	13.98	49.431	16.94	30	Pass
46	5230	13.86	13.93	49.091	16.91	30	Pass
151	5755	17.24	16.54	97.949	19.91	30	Pass
159	5795	18.98	18.78	154.525	21.89	30	Pass

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	13.29	13.12	41.879	16.22	30	Pass
155	5775	16.47	16.24	86.497	19.37	30	Pass

Beamforming Mode

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	9.78	9.84	19.143	12.82	30	Pass
44	5220	9.81	10.12	19.861	12.98	30	Pass
48	5240	10	10.07	20.184	13.05	30	Pass
149	5745	16.16	16.21	83.176	19.20	30	Pass
157	5785	20.9	21.53	265.461	24.24	30	Pass
165	5825	16.22	15.52	77.446	18.89	30	Pass

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	10.87	10.97	24.717	13.93	30	Pass
46	5230	10.85	10.92	24.547	13.90	30	Pass
151	5755	14.23	13.53	48.978	16.90	30	Pass
159	5795	15.97	15.77	77.268	18.88	30	Pass

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	10.28	10.11	20.941	13.21	30	Pass
155	5775	13.46	13.23	43.251	16.36	30	Pass

26 dB Bandwidth:

802.11a

Channel	Frequency (MHz)	26 dBc Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	19.27	19.46
44	5220	19.25	19.41
48	5240	19.36	19.49

802.11n (HT20)

Channel	Frequency (MHz)	26 dBc Bandwidth (MHz)	
		Chain 0	Chain 1
36	5180	20.32	20.43
44	5220	20.36	20.38
48	5240	20.40	20.42

802.11n (HT40)

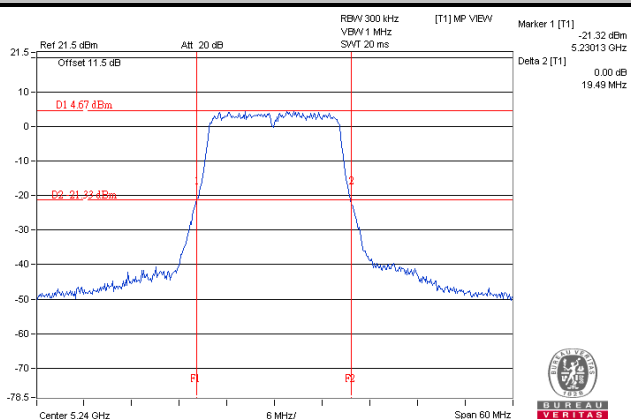
Channel	Frequency (MHz)	26 dBc Bandwidth (MHz)	
		Chain 0	Chain 1
38	5190	41.01	40.88
46	5230	41.00	40.89

802.11ac (VHT80)

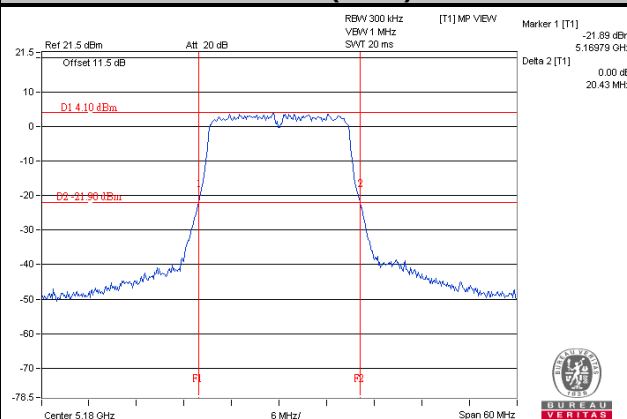
Channel	Frequency (MHz)	26 dBc Bandwidth (MHz)	
		Chain 0	Chain 1
42	5210	83.70	83.83

Spectrum Plot of Worst Value

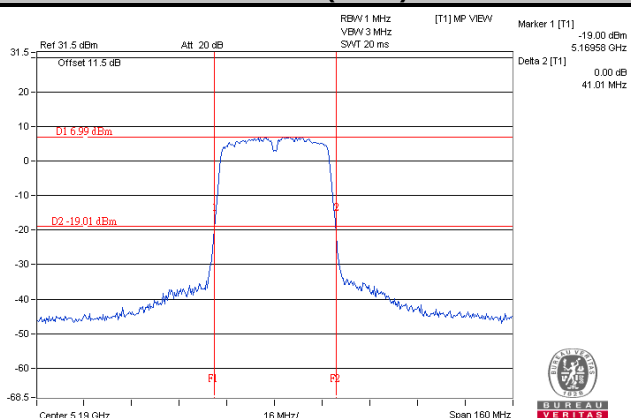
802.11a



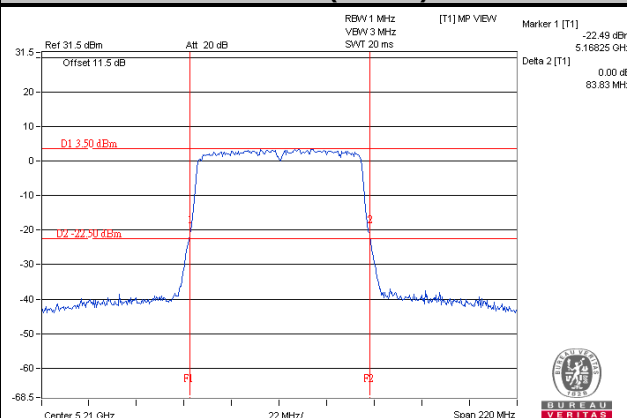
802.11n (HT20)



802.11n (HT40)



802.11ac (VHT80)

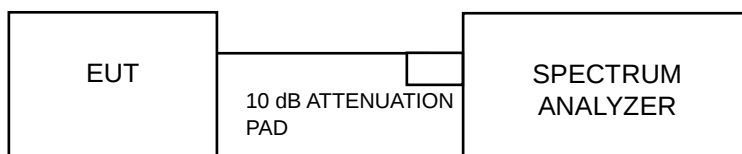


4.4 Peak Power Spectral Density Measurement

4.4.1 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

4.4.2 Test Setup



4.4.3 Test Instruments

Refer to section 4.1.3 to get information of above instrument.

4.4.4 Test Procedures

For U-NII-1:

Using method SA-1, without duty cycle & Duty cycle >98%

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 1 MHz, Set VBW ≥ 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

Using method SA-2, with duty cycle & Duty cycle <98%

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 1 MHz, Set VBW ≥ 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:

without duty cycle & Duty cycle >98 %

1. Set span to encompass the entire emission bandwidth (EBW) of the signal.
2. Set RBW = 500 kHz, Set VBW $\geq$ 3 RBW, Detector = RMS
3. Use the peak marker function to determine the maximum power level in any 500 kHz band segment within the fundamental EBW.
4. Sweep time = auto, trigger set to "free run".
5. Trace average at least 100 traces in power averaging mode.
6. Record the max value

✖For U-NII-3:

with duty cycle & Duty cycle <98 %

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

4.4.5 Deviation from Test Standard

No deviation.

4.4.6 EUT Operating Conditions

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

4.4.7 Test Results

For U-NII-1 Band:

802.11a

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	-2.15	-2.27	0.28	1.08	14.16	Pass
44	5220	-2.36	-2.57	0.28	0.83	14.16	Pass
48	5240	-2.33	-2.46	0.28	0.90	14.16	Pass

Note:

1. Method 1 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.
2. Directional gain = 5.83 dBi + 10log(2) = 8.84 dBi > 6 dBi , so the power density limit shall be reduced to 17-(8.84-6) = 14.16 dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT20)

Channel	Frequency (MHz)	PSD (dBm/MHz)		Total Power Density (dBm/MHz)	Max. Limit (dBm/MHz)	Pass / Fail
		Chain 0	Chain 1			
36	5180	-2.26	-2.65	0.56	14.16	Pass
44	5220	-2.11	-2.38	0.77	14.16	Pass
48	5240	-2.10	-2.18	0.87	14.16	Pass

Note:

1. Method 1 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.
2. Directional gain = 5.83 dBi + 10log(2) = 8.84 dBi > 6 dBi , so the power density limit shall be reduced to 17-(8.84-6) = 14.16 dBm.

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	-4.01	-4.08	0.27	-0.77	14.16	Pass
46	5230	-3.79	-3.93	0.27	-0.58	14.16	Pass

Note:

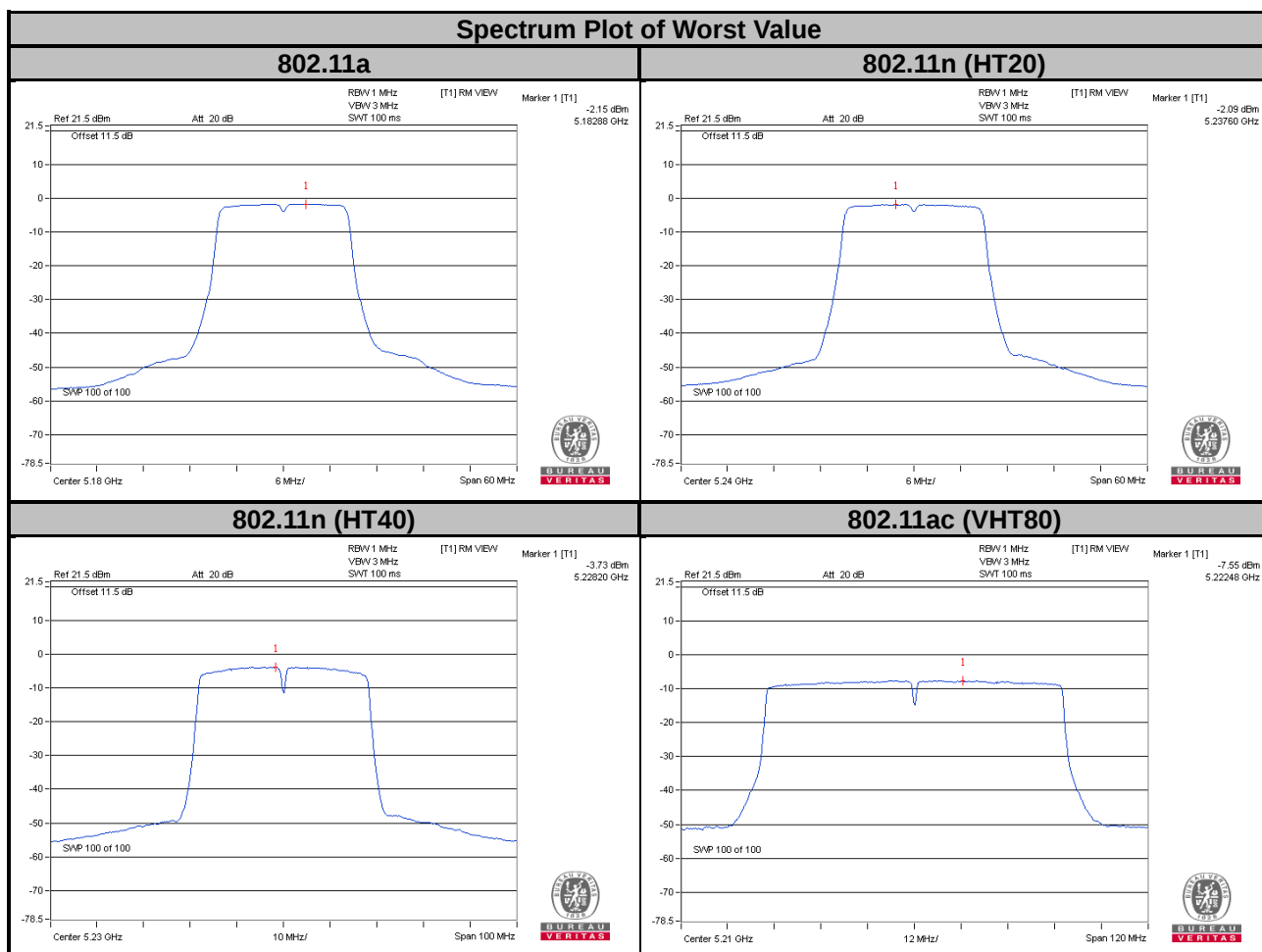
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 5.83 dBi + 10log(2) = 8.84 dBi > 6 dBi , so the power density limit shall be reduced to 17-(8.84-6) = 14.16 dBm.
3. 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	-7.55	-7.69	0.46	-4.15	14.16	Pass

Note:

1. Method 1 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.
2. Directional gain = 5.83 dBi + 10log(2) = 8.84 dBi > 6 dBi , so the power density limit shall be reduced to 17-(8.84-6) = 14.16 dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.



For U-NII-3 Band

802.11a

TX Chain	Channel	Frequency (MHz)	PSD (dBm/300 kHz)	PSD (dBm/500 kHz)	10 log (N=2) dB	Duty Factor (dB)	Total PSD with Duty Factor (dBm/500 kHz)	Limit (dBm/500 kHz)	Pass / Fail
0	149	5745	-2.71	-0.49	3.01	0.28	2.80	27.16	Pass
	157	5785	1.17	3.39	3.01	0.28	6.68	27.16	Pass
	165	5825	-3.13	-0.91	3.01	0.28	2.38	27.16	Pass
1	149	5745	-2.50	-0.28	3.01	0.28	3.01	27.16	Pass
	157	5785	0.90	3.12	3.01	0.28	6.41	27.16	Pass
	165	5825	-3.21	-0.99	3.01	0.28	2.30	27.16	Pass

Note:

1. Method 1 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.
2. Directional gain = 5.83 dBi + 10log(2) = 8.84 dBi > 6 dBi , so the power density limit shall be reduced to 30-(8-6) = 27.16 dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11n (HT20)

TX Chain	Channel	Freq. (MHz)	PSD (dBm/300 kHz)	PSD (dBm/500 kHz)	10 log (N=2) dB	Total PSD (dBm/500 kHz)	Limit (dBm/500 kHz)	Pass / Fail
0	149	5745	-3.42	-1.20	3.01	1.81	27.16	Pass
	157	5785	0.84	3.06	3.01	6.07	27.16	Pass
	165	5825	-4.00	-1.78	3.01	1.23	27.16	Pass
1	149	5745	-3.27	-1.05	3.01	1.96	27.16	Pass
	157	5785	0.51	2.73	3.01	5.74	27.16	Pass
	165	5825	-3.95	-1.73	3.01	1.28	27.16	Pass

Note:

1. Directional gain = 5.83 dBi + 10log(2) = 8.84 dBi > 6 dBi , so the power density limit shall be reduced to 30-(8-6) = 27.16 dBm.

802.11n (HT40)

TX Chain	Channel	Frequency (MHz)	PSD (dBm/300 kHz)	PSD (dBm/500 kHz)	10 log (N=2) dB	Duty Factor (dB)	Total PSD with Duty Factor (dBm/500 kHz)	Limit (dBm/500 kHz)	Pass / Fail
0	151	5755	-8.83	-6.61	3.01	0.27	-3.33	27.16	Pass
	159	5795	-7.10	-4.88	3.01	0.27	-1.60	27.16	Pass
1	151	5755	-8.48	-6.26	3.01	0.27	-2.98	27.16	Pass
	159	5795	-6.90	-4.68	3.01	0.27	-1.40	27.16	Pass

Note:

1. Method 1 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.
2. Directional gain = 5.83 dBi + 10log(2) = 8.84 dBi > 6 dBi , so the power density limit shall be reduced to 30-(8-6) = 27.16 dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

802.11ac (VHT80)

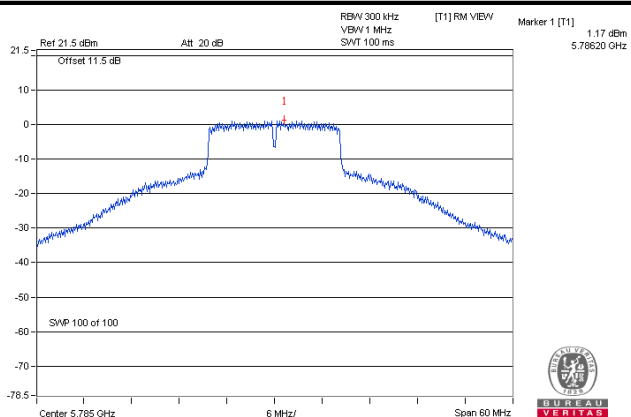
TX Chain	Channel	Frequency (MHz)	PSD (dBm/300 kHz)	PSD (dBm/500 kHz)	10 log (N=2) dB	Duty Factor (dB)	Total PSD with Duty Factor (dBm/500 kHz)	Limit (dBm/500 kHz)	Pass / Fail
0	155	5775	-13.26	-11.04	3.01	0.46	-7.57	27.16	Pass
1	155	5775	-13.11	-10.89	3.01	0.46	-7.42	27.16	Pass

Note:

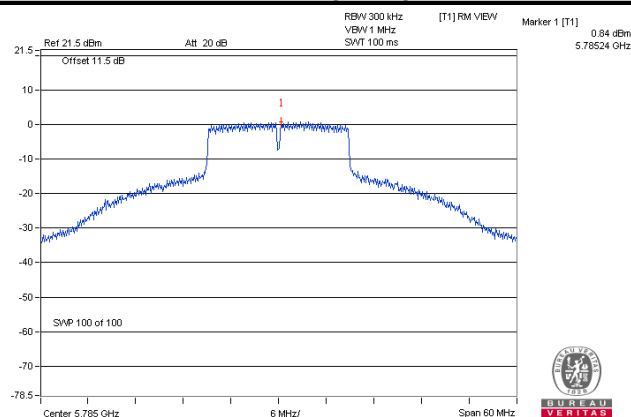
1. Method 1 of power density measurement of KDB 662911 is using for calculating total power density. Total power density is summing entire spectra across corresponding frequency bins on the various outputs by computer.
2. Directional gain = 5.83 dBi + 10log(2) = 8.84 dBi > 6 dBi , so the power density limit shall be reduced to 30-(8-6) = 27.16 dBm.
3. Refer to section 3.3 for duty cycle spectrum plot.

Spectrum Plot of Worst Value

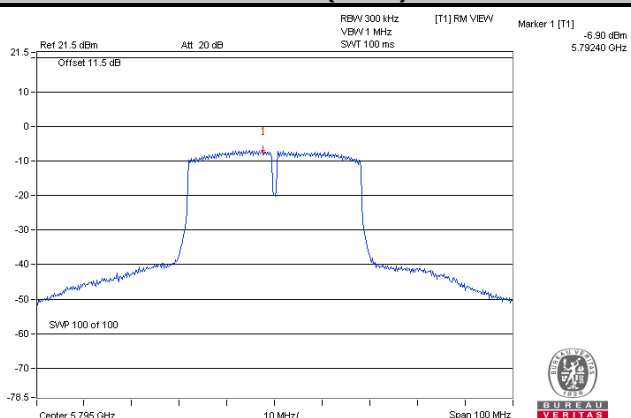
802.11a



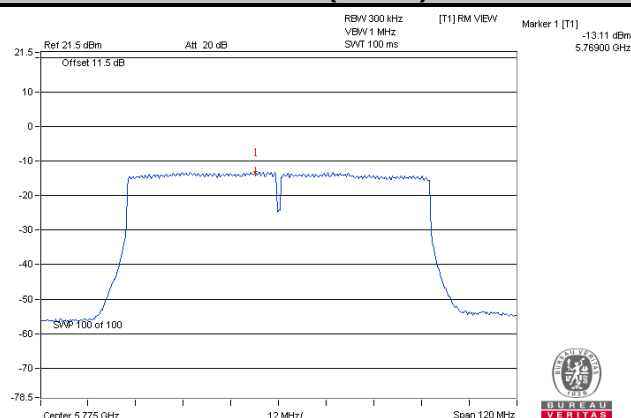
802.11n (HT20)



802.11n (HT40)



802.11ac (VHT80)

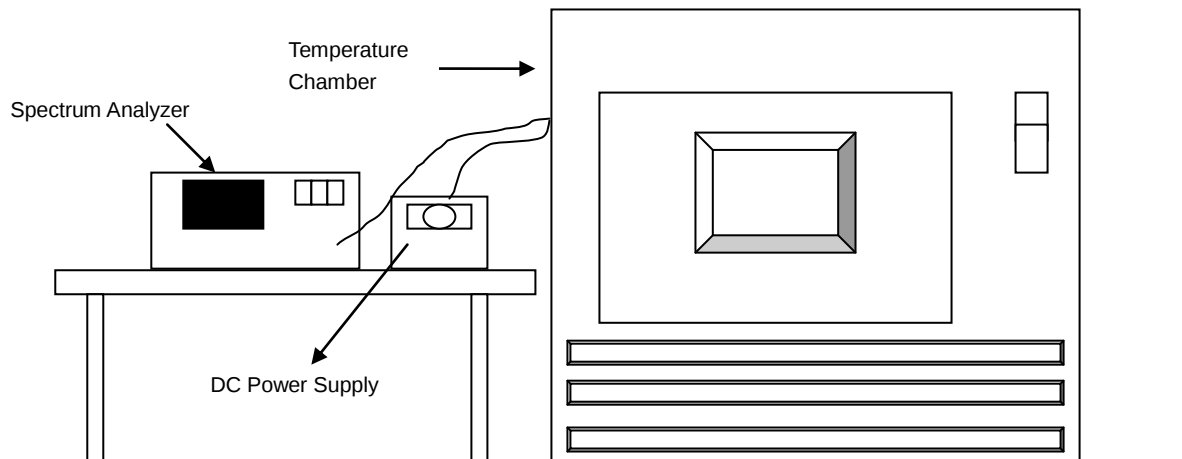


4.5 Frequency Stability

4.5.1 Limit of Frequency Stability Measurement

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

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 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.

4.5.5 Deviation from Test Standard

No deviation.

4.5.6 EUT Operating Condition

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

4.5.7 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)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)
50	120	5179.9835	-0.00032	5179.9835	-0.00032	5179.9801	-0.00038	5179.9832	-0.00032
40	120	5179.9745	-0.00049	5179.9732	-0.00052	5179.9759	-0.00047	5179.9758	-0.00047
30	120	5179.9872	-0.00025	5179.9856	-0.00028	5179.9892	-0.00021	5179.9881	-0.00023
20	120	5179.9768	-0.00045	5179.9768	-0.00045	5179.9765	-0.00045	5179.9753	-0.00048
10	120	5179.9809	-0.00037	5179.9811	-0.00036	5179.9799	-0.00039	5179.9783	-0.00042
0	120	5180.0264	0.00051	5180.0238	0.00046	5180.0275	0.00053	5180.0236	0.00046
-10	120	5179.9983	-0.00003	5179.9984	-0.00003	5179.9993	-0.00001	5179.9996	-0.00001
-20	120	5179.9863	-0.00026	5179.9863	-0.00026	5179.9843	-0.00030	5179.9829	-0.00033
-30	120	5179.9767	-0.00045	5179.9721	-0.00054	5179.9748	-0.00049	5179.9722	-0.00054

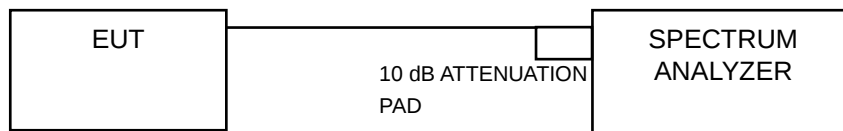
Frequency Stability Versus Temp.									
Operating Frequency: 5180 MHz									
Temp. (°C)	Power Supply (Vac)	0 Minute		2 Minute		5 Minute		10 Minute	
		Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)	Measured Frequency (MHz)	Frequency Drift (ppm)
20	138	5179.9763	-0.00046	5179.9772	-0.00044	5179.976	-0.00046	5179.9756	-0.00047
	120	5179.9768	-0.00045	5179.9768	-0.00045	5179.9765	-0.00045	5179.9753	-0.00048
	102	5179.9772	-0.00044	5179.9773	-0.00044	5179.977	-0.00044	5179.9756	-0.00047

4.6 6 dB Bandwidth Measurement

4.6.1 Limits of 6 dB Bandwidth Measurement

The minimum of 6 dB Bandwidth Measurement is 0.5 MHz.

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

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

4.6.5 Deviation from Test Standard

No deviation.

4.6.6 EUT Operating Condition

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

4.6.7 Test Results

802.11a

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	16.40	16.42	0.5	Pass
157	5785	16.34	16.37	0.5	Pass
165	5825	16.39	16.42	0.5	Pass

802.11n (HT20)

Channel	Frequency (MHz)	6 dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
149	5745	17.64	17.63	0.5	Pass
157	5785	17.62	17.58	0.5	Pass
165	5825	17.62	17.66	0.5	Pass

802.11n (HT40)

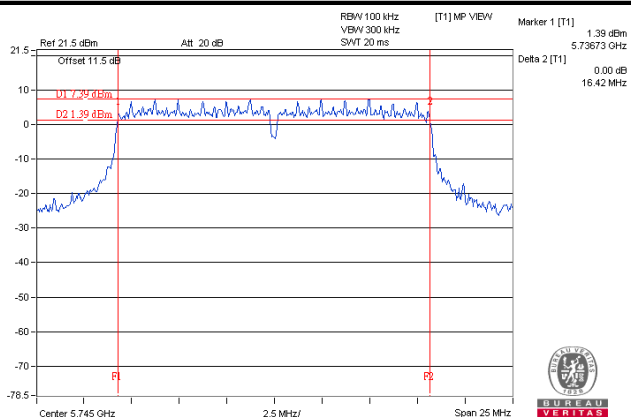
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
151	5755	35.37	35.50	0.5	Pass
159	5795	35.39	35.34	0.5	Pass

802.11ac (VHT80)

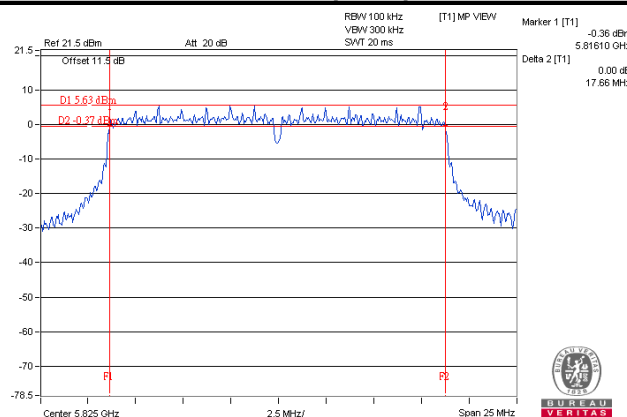
Channel	Frequency (MHz)	6 dB Bandwidth (MHz)		Minimum Limit (MHz)	Pass / Fail
		Chain 0	Chain 1		
155	5775	76.11	76.05	0.5	Pass

Spectrum Plot of Worst Value

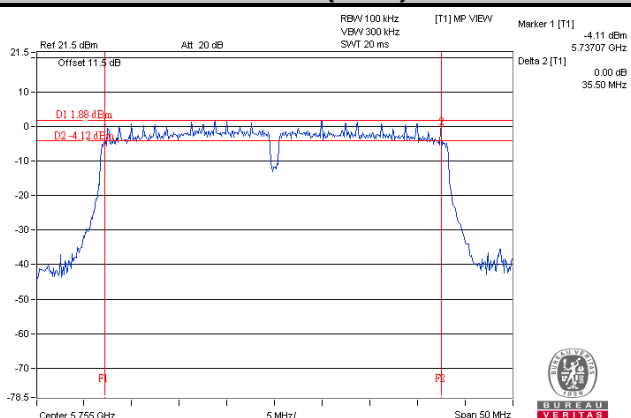
802.11a



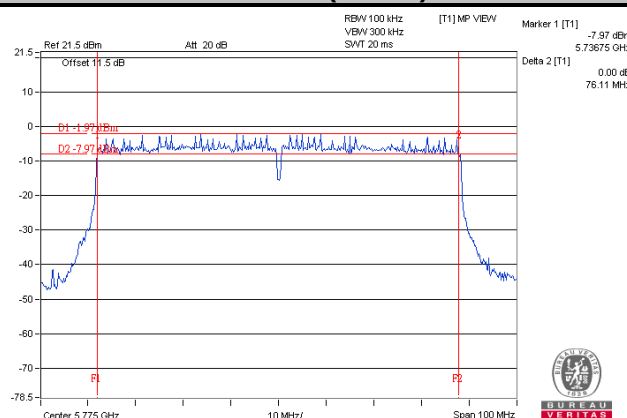
802.11n (HT20)



802.11n (HT40)



802.11ac (VHT80)



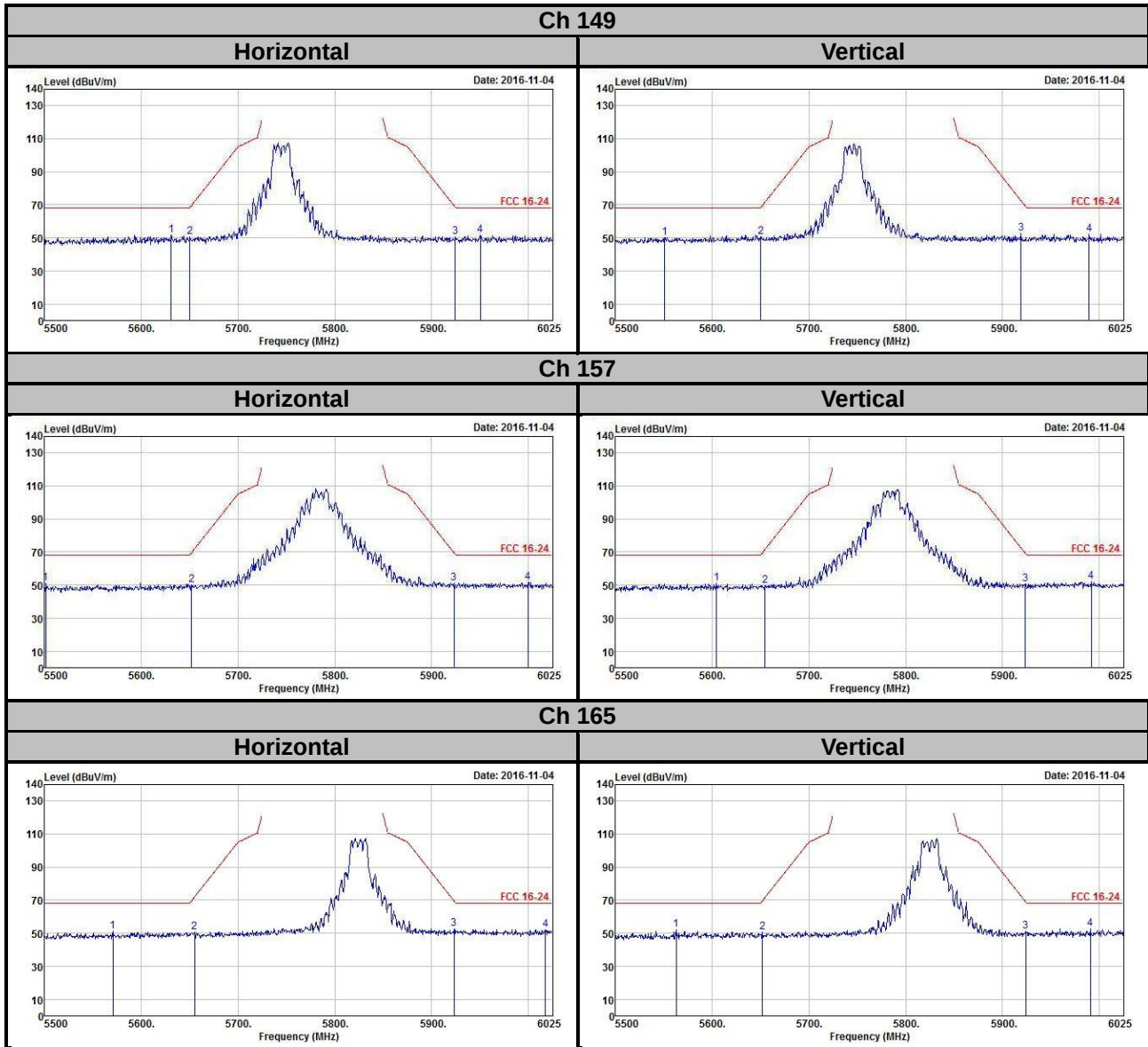
5 Pictures of Test Arrangements

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

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

Mode A

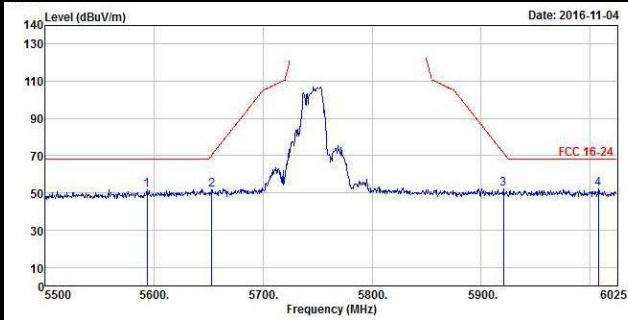
802.11a



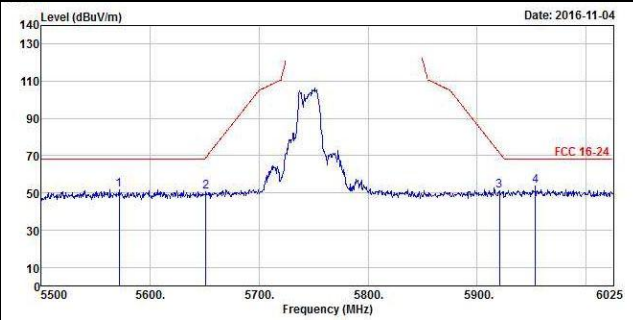
802.11n (HT20)

Ch 149

Horizontal

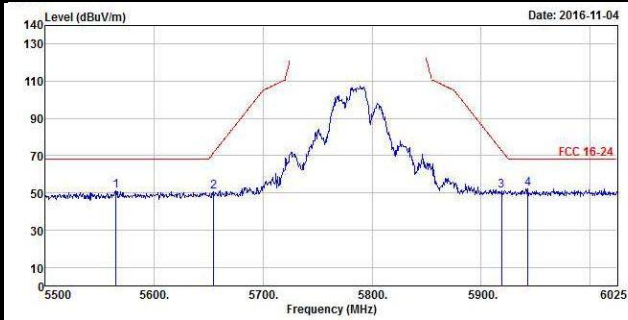


Vertical

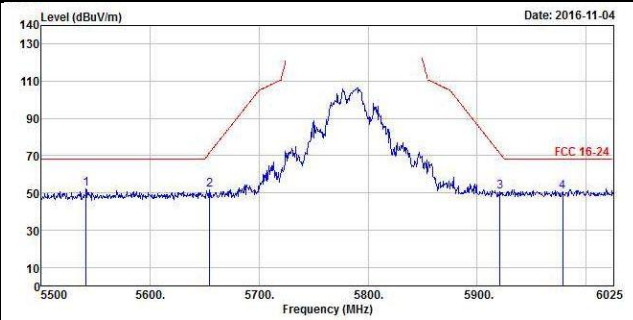


Ch 157

Horizontal

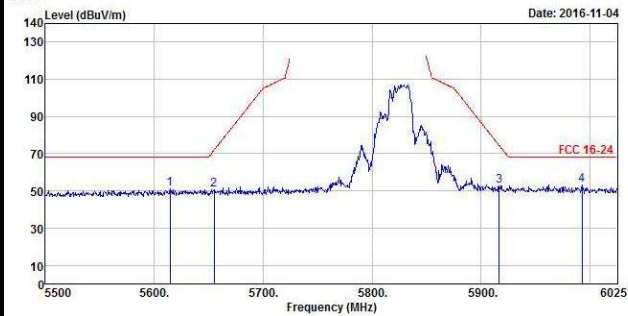


Vertical

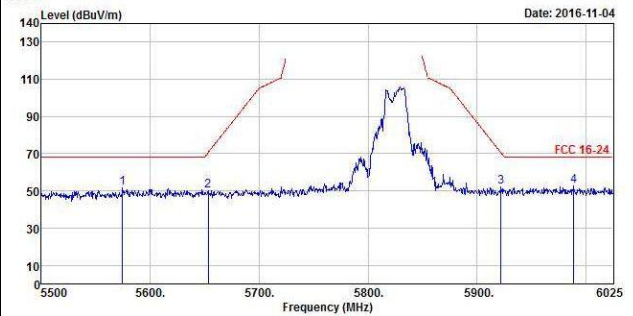


Ch 165

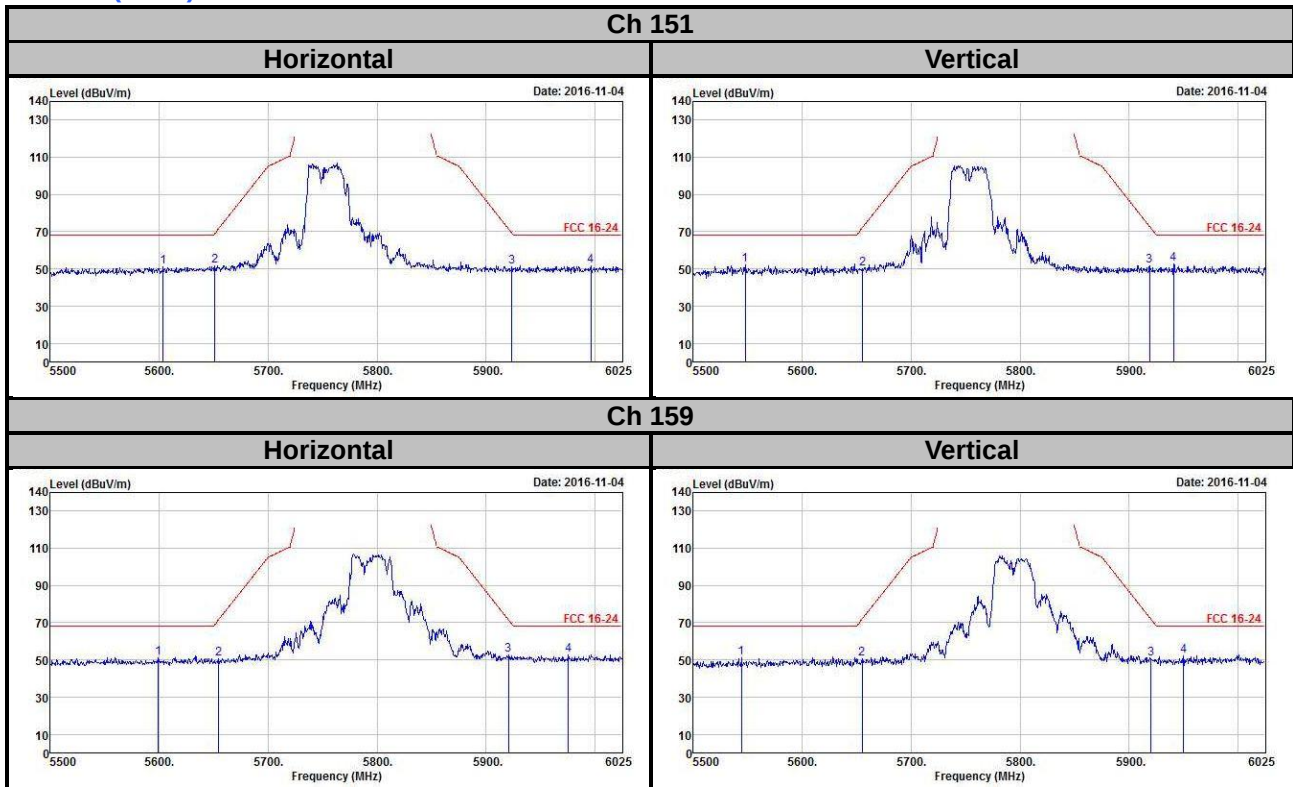
Horizontal



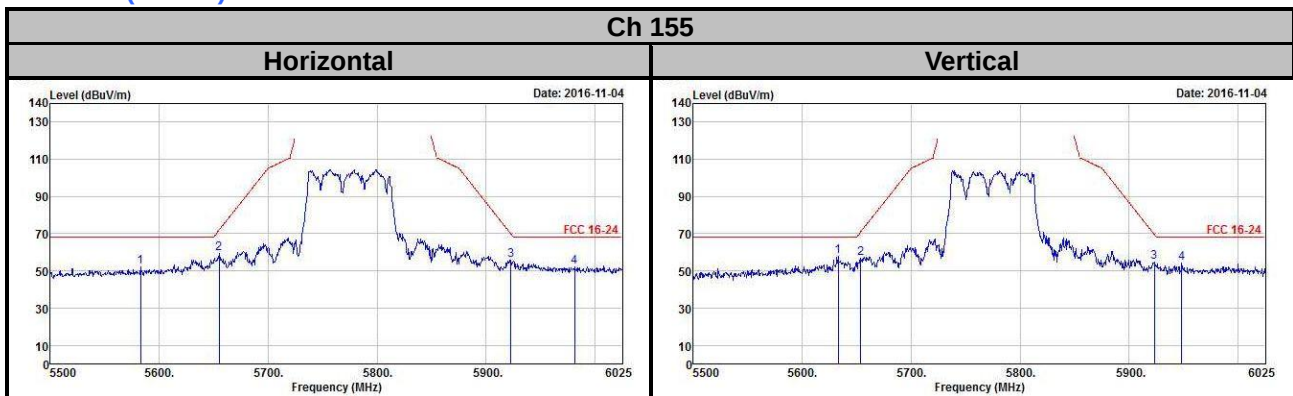
Vertical



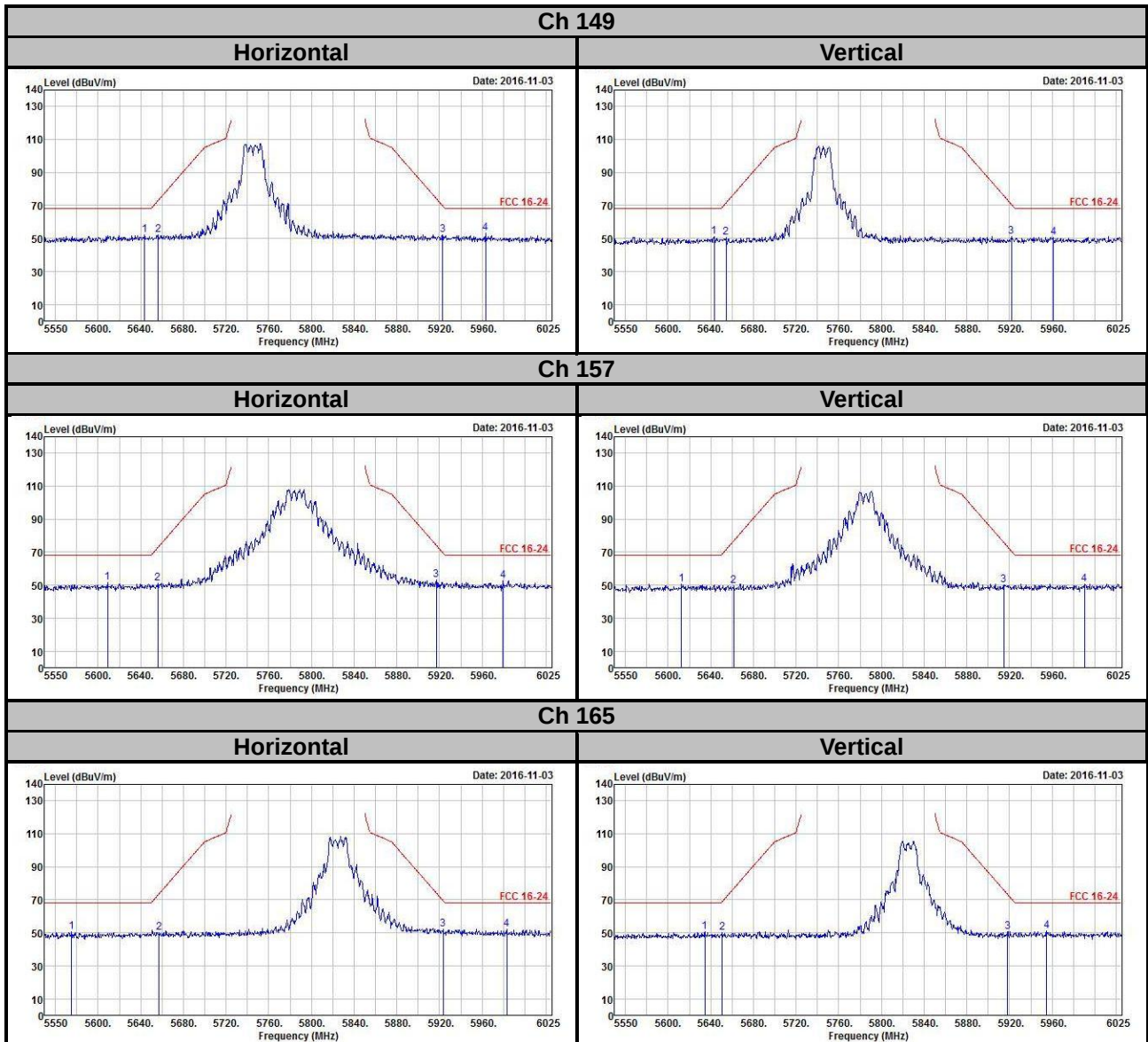
802.11n (HT40)



802.11ac (VHT80)



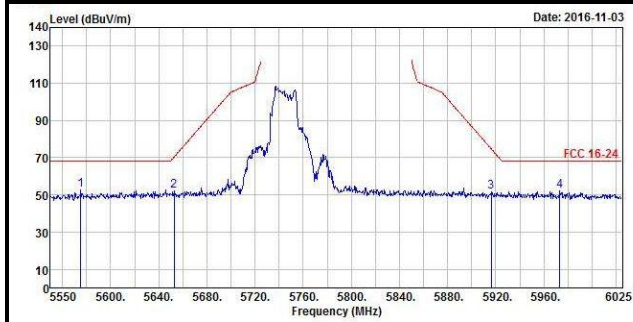
Mode B
802.11a



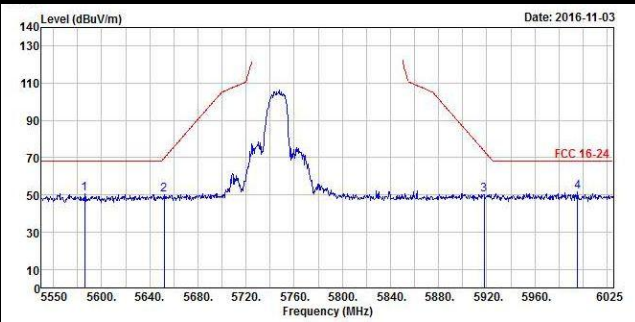
802.11n (HT20)

Ch 149

Horizontal

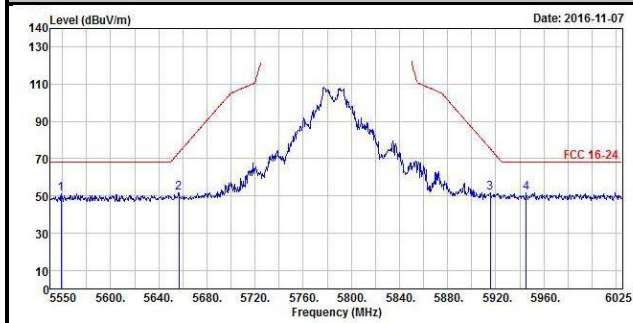


Vertical

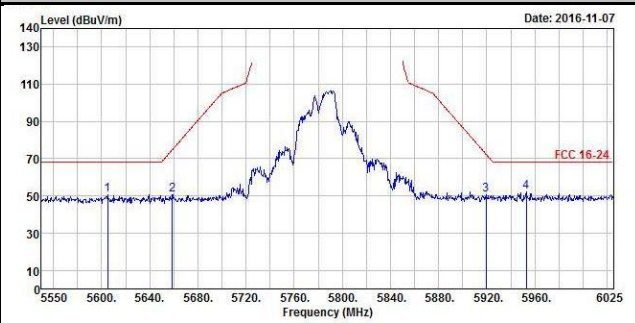


Ch 157

Horizontal

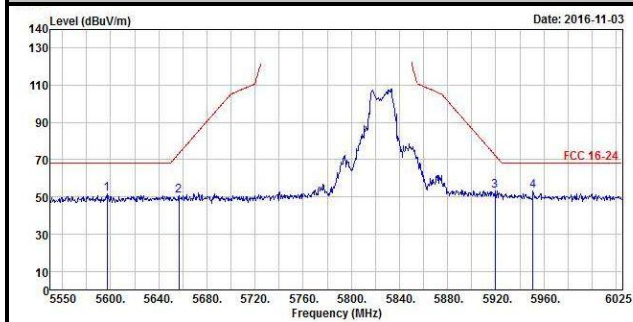


Vertical

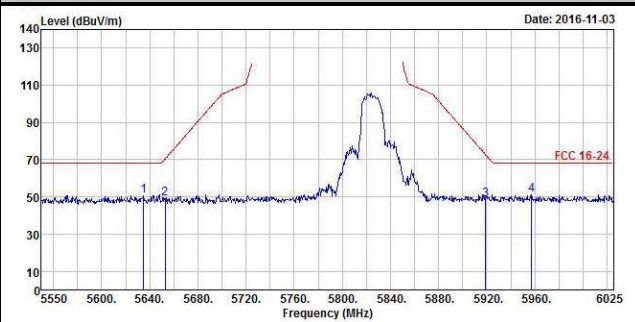


Ch 165

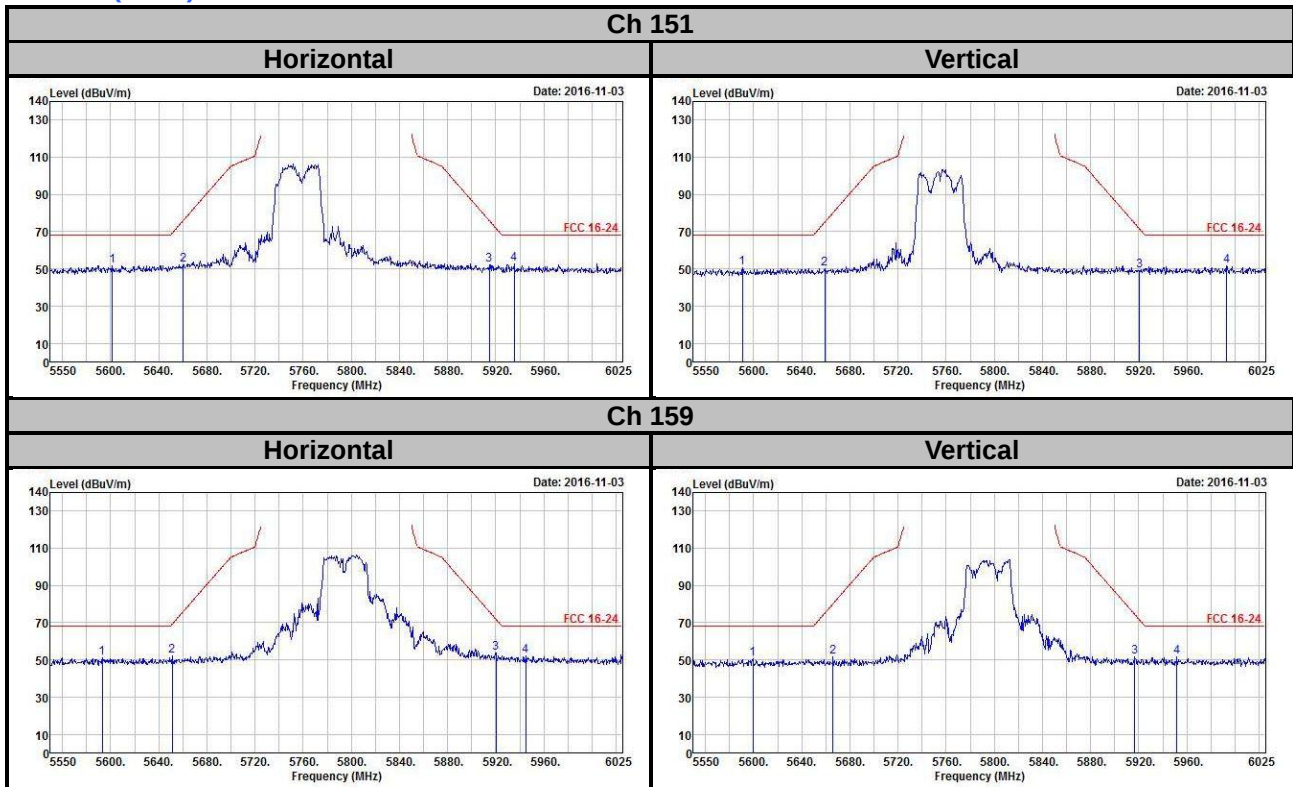
Horizontal



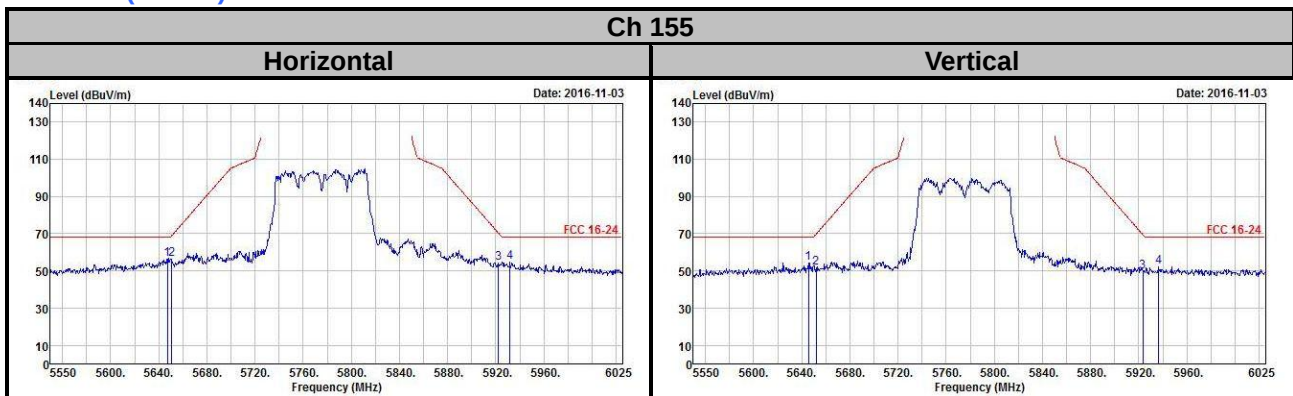
Vertical



802.11n (HT40)



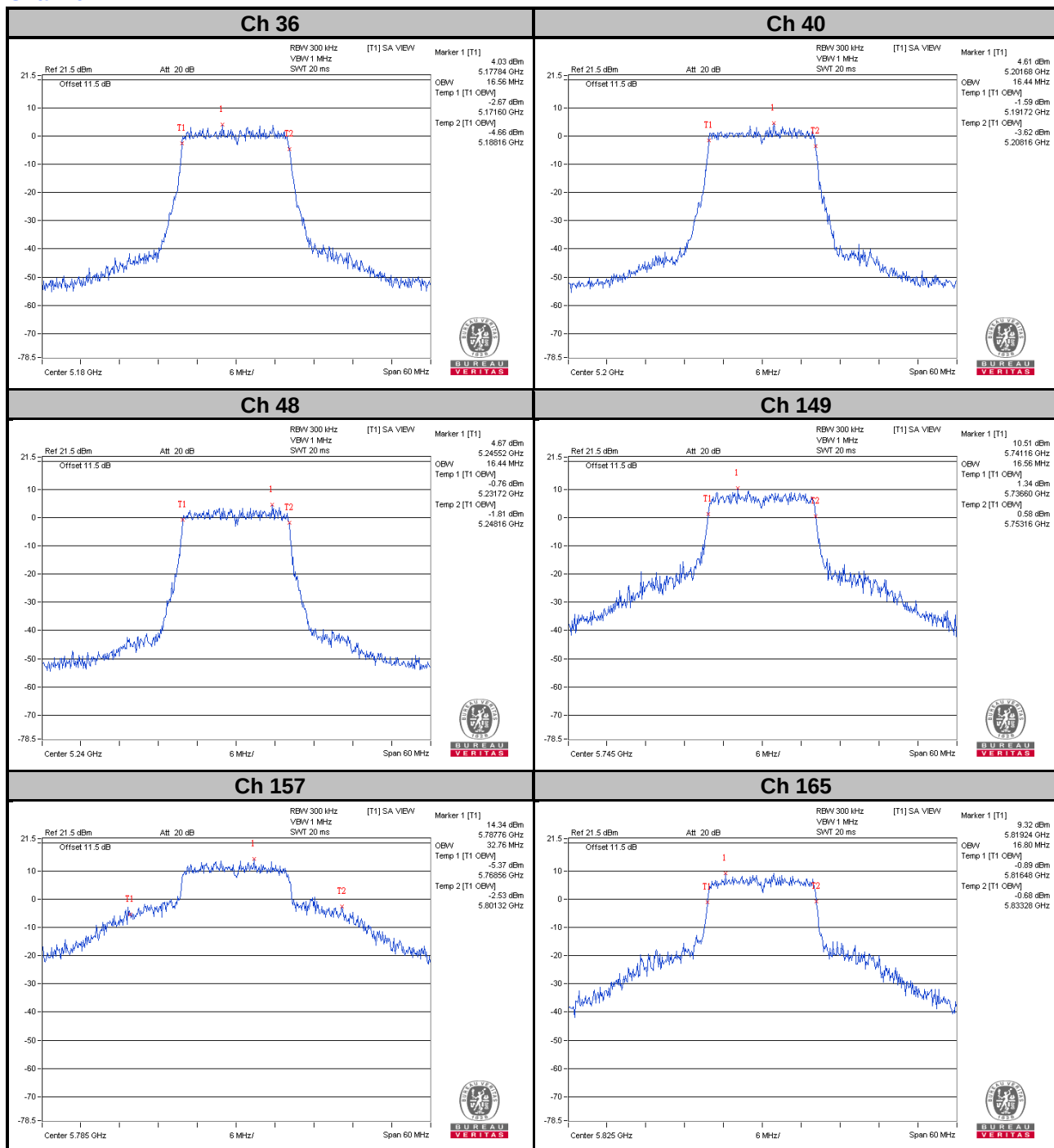
802.11ac (VHT80)



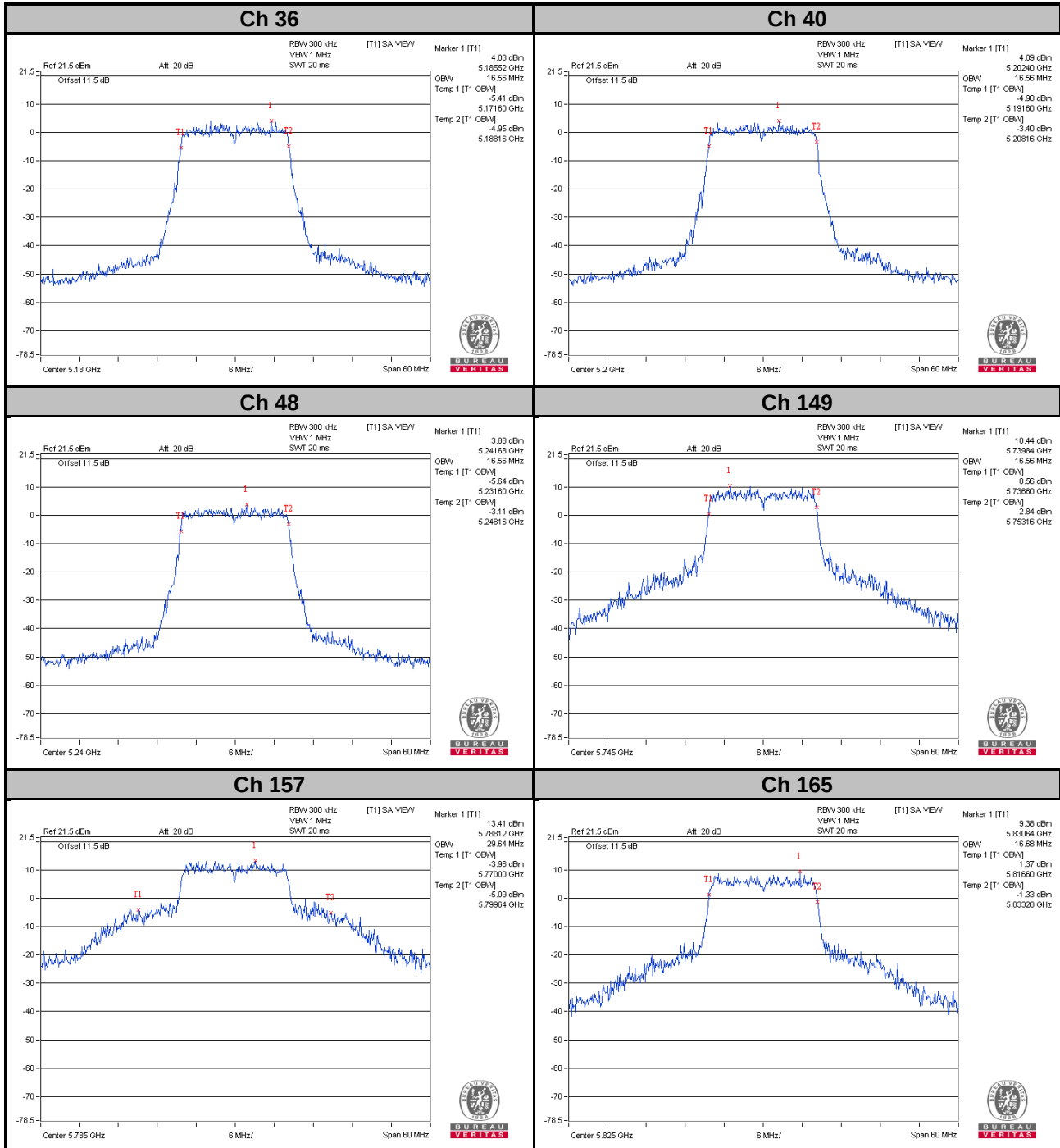
Annex B- Occupied Bandwidth

802.11a

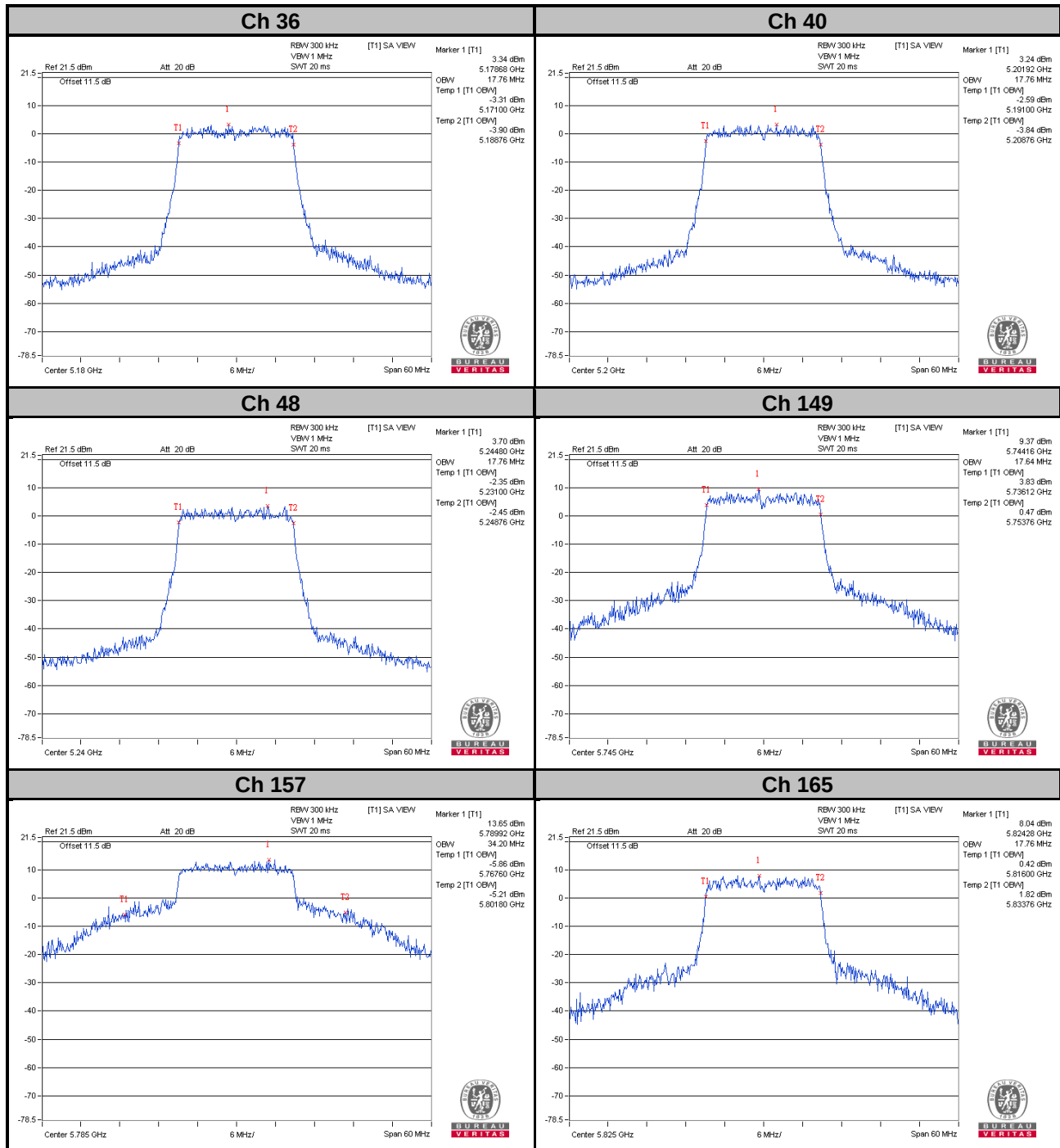
Chain 0



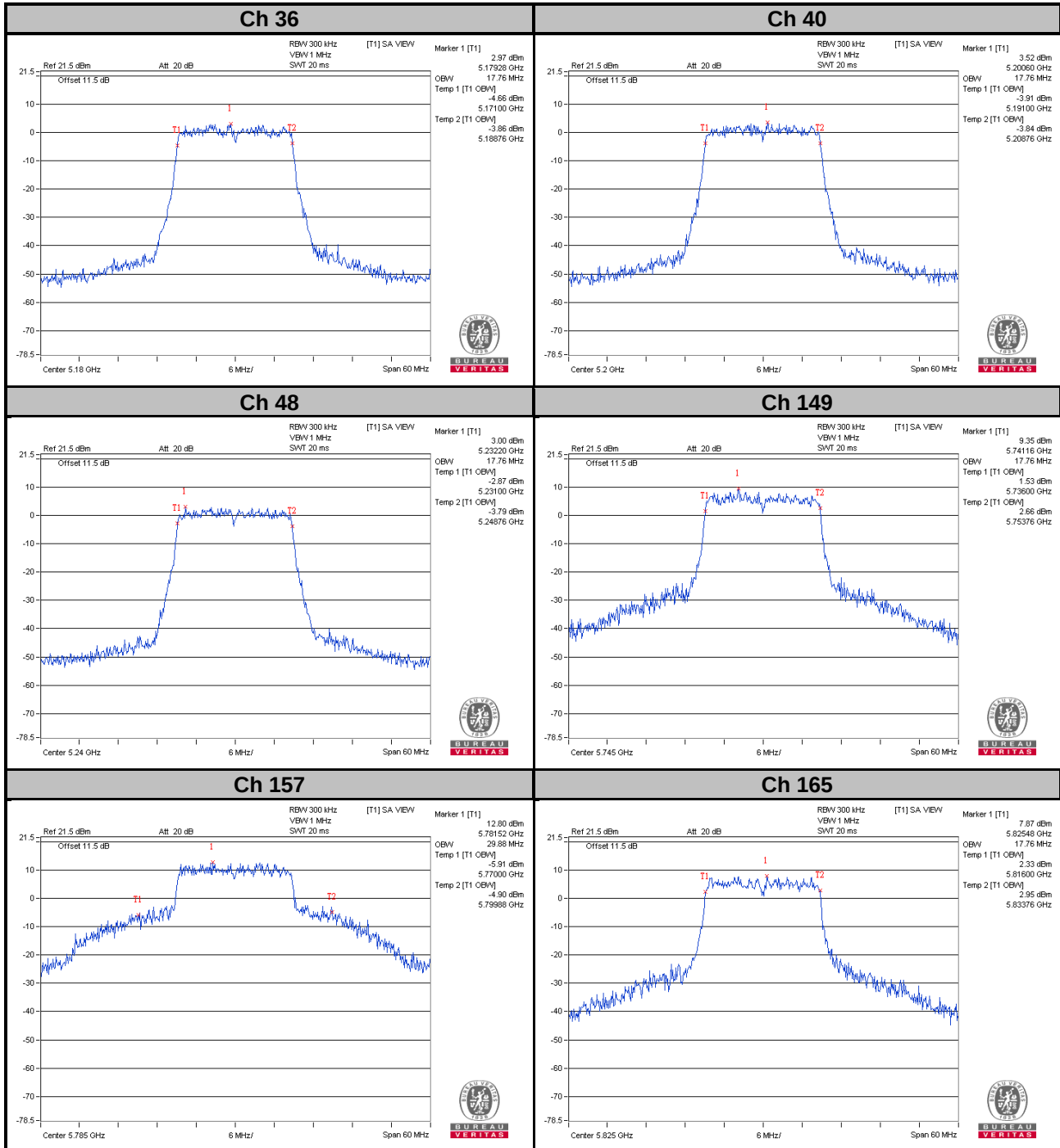
Chain 1



802.11n (HT20) Chain 0

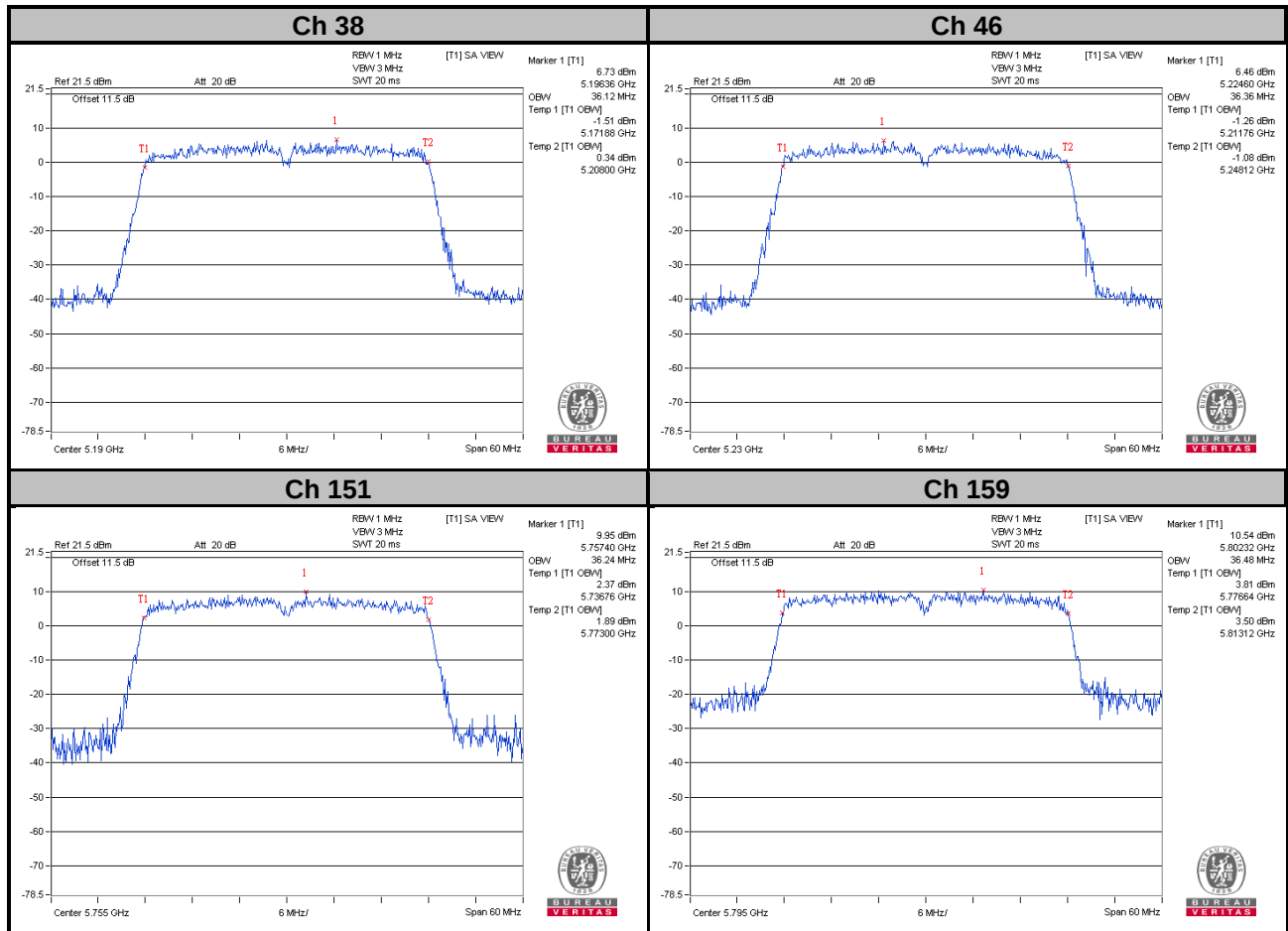


Chain 1

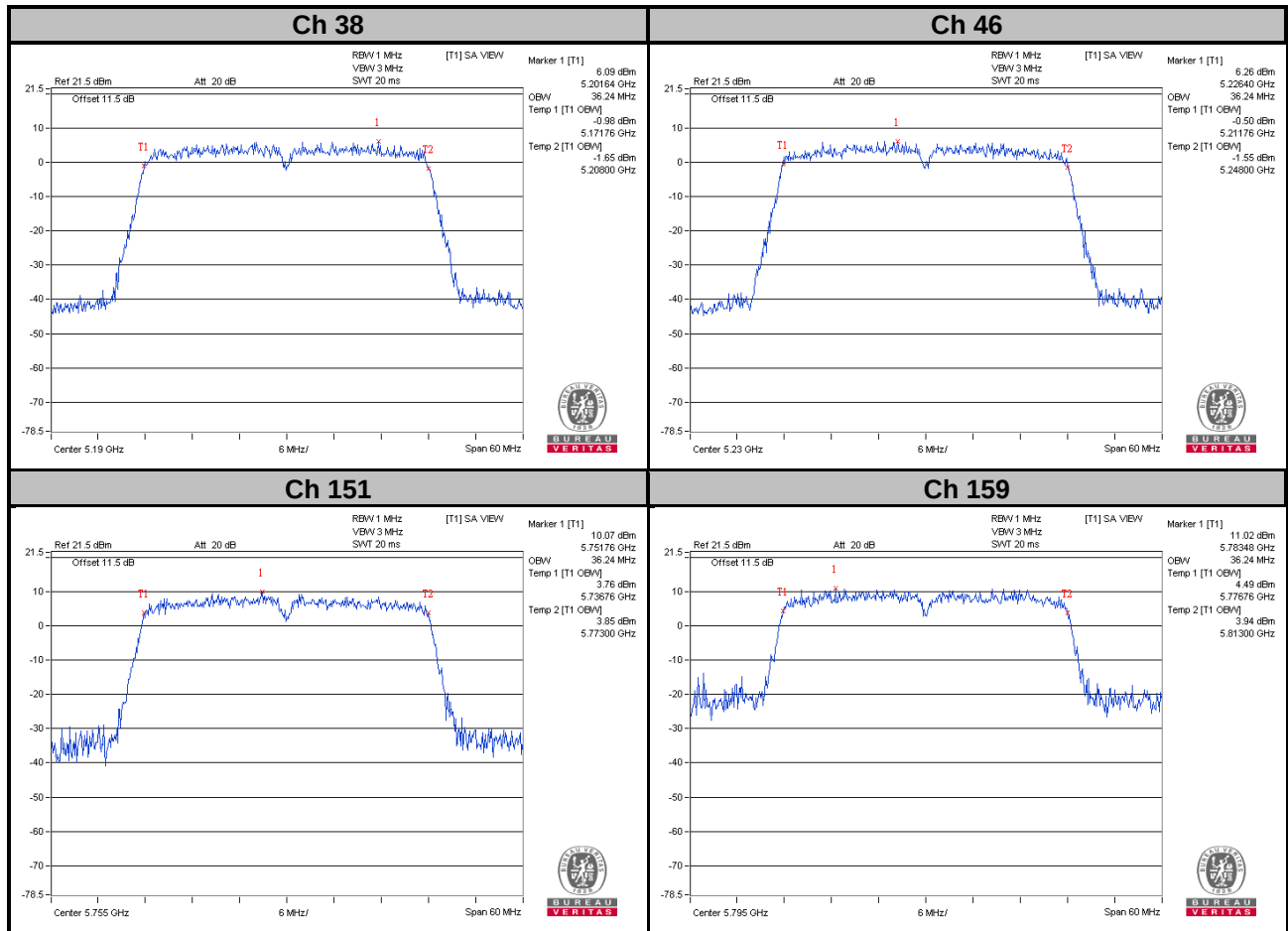


802.11n (HT40)

Chain 0

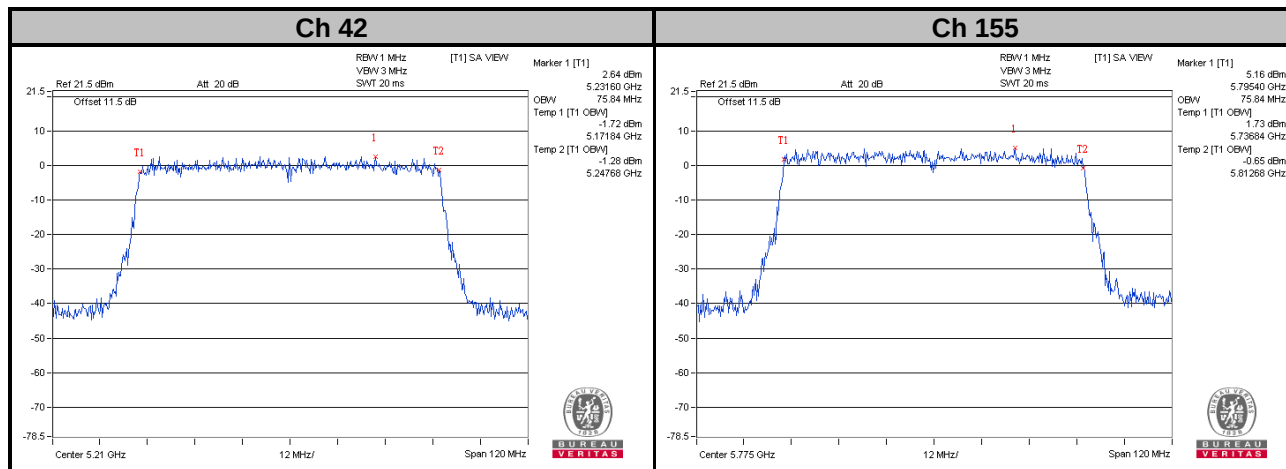


Chain 1

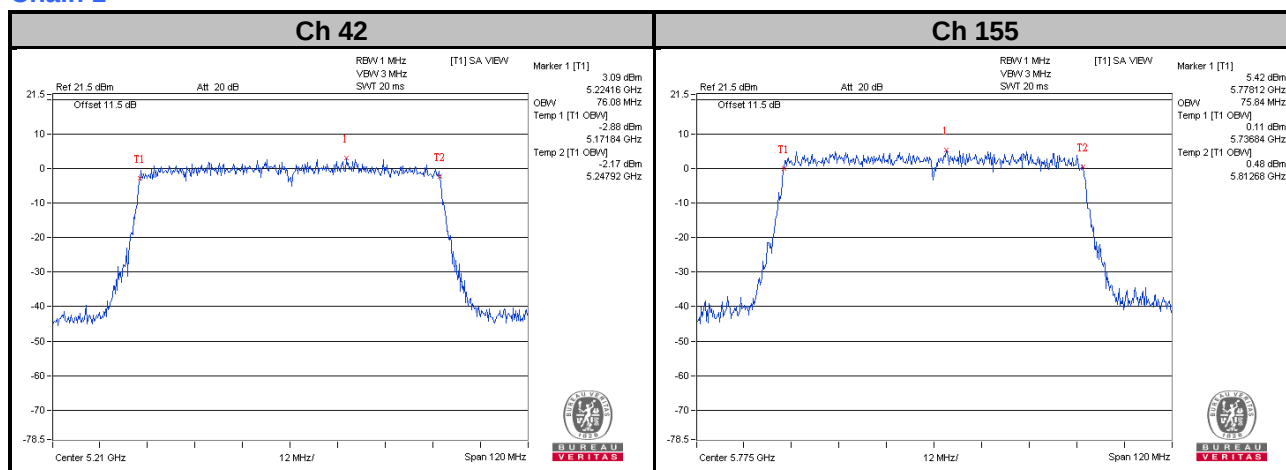


802.11ac (VHT80)

Chain 0



Chain 1



Appendix – Information on the Testing Laboratories

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

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

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Fax: 886-2-26051924

Hsin Chu EMC/RF/Telecom Lab

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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.

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