FCC RF Test Report

APPLICANT	:	LC Future Center Limited Taiwan Branch
EQUIPMENT	:	Notebook
BRAND NAME	:	Lenovo
MODEL NAME	:	TP00086A
FCC ID	:	2AJN7-TP00086AUC
STANDARD	:	FCC Part 15 Subpart E §15.407
CLASSIFICATION	:	(NII) Unlicensed National Information Infrastructure

This is a partial report which is included the conducted emission and radiated emission test items. The product was received on Nov. 18, 2016 and testing was completed on Dec. 27, 2016. We, SPORTON INTERNATIONAL INC., would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of SPORTON INTERNATIONAL INC., the test report shall not be reproduced except in full.

Reviewed by: Joseph Lin / Supervisor

Approved by: Jones Tsai / Manager

Testing Laboratory 1190

SPORTON INTERNATIONAL INC.
No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C.

TABLE OF CONTENTS

REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR6N0822-08E	Rev. 01	Initial issue of report	Jan. 04, 2017

SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.407(b)	Unwanted Emissions	15.407(b)(4)(i) &15.209(a)	Pass	Under limit 3.11 dB at 76.710 MHz
3.2	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 14.80 dB at 0.478 MHz

1 General Description

1.1 Applicant

LC Future Center Limited Taiwan Branch
7F., No.780, Bei'an Rd., Zhongshan Dist., Taipei City 104, Taiwan (R.O.C.)

1.2 Manufacturer

LC Future Center Limited Taiwan Branch
7F., No.780, Bei'an Rd., Zhongshan Dist., Taipei City 104, Taiwan (R.O.C.)

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Notebook
Brand Name	Lenovo
Model Name	TP00086A
FCC ID	2AJN7-TP00086AUC
Sample 1	EUT with Antenna 1
Sample 2	EUT with Antenna 2
Integrated WWAN Module	Manufacturer: Sierra Wireles Brand Name: AirPrime Model Name: EM7455
Integrated WLAN Module	Brand Name: Intel Model Name: 8260NGW
EUT supports Radios application	WCDMA/HSPA/LTE WLAN 11a/b/g/n HT20/HT40 WLAN 11ac VHT20/VHT40/VHT80 Bluetooth BR/EDR/LE
EUT Stage	Production Unit

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.4 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx/Rx Channel Frequency Range	5745 MHz ~ 5825 MHz
Type of Modulation	802.11a/n : OFDM (BPSK / QPSK / 16QAM / 64QAM) 802.11ac : OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM)
Antenna Function Description	

	Chain Port 1	Chain Port 2
802.11 a/n/ac	V	V
802.11 n/ac MIMO	V	V

Note: MIMO Chain Port 1+2 is a calculated result from sum of the power MIMO Chain Port 1 and MIMO Chain Port 2.

1.5 Modification of EUT

No modifications are made to the EUT during all test items.

1.6 Testing Location

Sporton Lab is accredited to ISO 17025 by Taiwan Accreditation Foundation (TAF code : 1190) and the FCC designation No. TW1022 under the FCC 2.948(e) by Mutual Recognition Agreement (MRA) in FCC Test.

Test Site	SPORTON INTERNATIONAL INC.	
Test Site Location	No. 52, Hwa Ya 1st Rd., Hwa Ya Technology Park, Kwei-Shan District, Tao Yuan City, Taiwan, R.O.C. TEL: +886-3-327-3456 FAX: +886-3-328-4978	
Test Site No.	**Sporton Site No.**	
	CO05-HY	03CH07-HY

Note: The test site complies with ANSI C63.4 2014 requirement.

1.7 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- FCC Part 15 Subpart E
- FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r03
- FCC KDB 662911 D01 Multiple Transmitter Output v02r01.
- FCC KDB 644545 D03 Guidance for IEEE 802 11ac New Rules v01
- ANSI C63.10-2013

Remark: All test items were verified and recorded according to the standards and without any deviation during the test.

2 Test Configuration of Equipment Under Test

The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conducted emission (150 kHz to 30 MHz) and radiated emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower).

2.1 Carrier Frequency and Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
5725-5850 MHz Band 4 (U-NII-3)	149	5745	157	5785
	151*	5755	159*	5795
	153	5765	161	5805
	155#	5775	165	5825

Note:

1. The above Frequency and Channel in "*" were 802.11n HT40 and 802.11ac VHT40.
2. The above Frequency and Channel in "#" were 802.11ac VHT80.

2.2 Test Mode

Final test mode of conducted test items and radiated spurious emissions are considering the modulation and worse data rates as below table.

Single Antenna

Modulation	Data Rate
802.11a	6 Mbps
802.11n HT20	MCS0
802.11n HT40	MCS0
802.11ac VHT80	MCS0

MIMO Antenna

Modulation	Data Rate
802.11n HT20	MCS0
802.11n HT40	MCS0
802.11ac VHT80	MCS0

Test Cases	
AC Conducted Emission	Mode 1 : WLAN (5GHz) Link + TF + TC

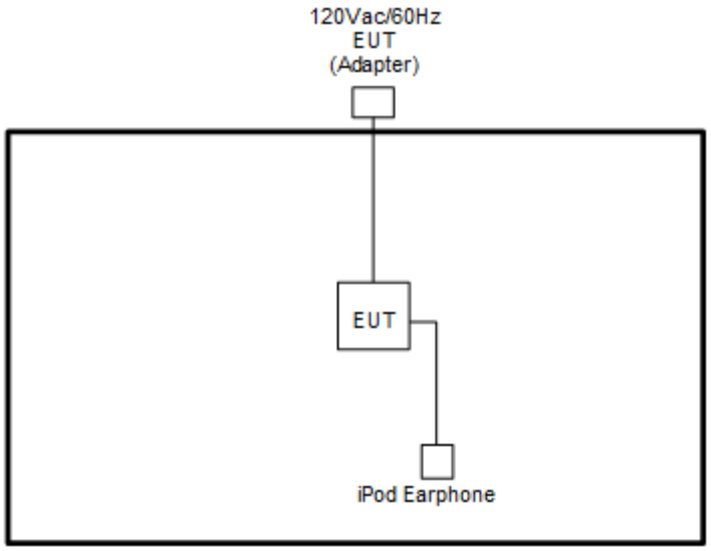
Remark:

1. TF stands for Test Function, and consists of MPEG4 and Camera.
2. TC stands for Test Configuration, and consists of Earphone, USB HD, iPod, Adapter, SD Card, and HDMI.
3. For conducted test items and radiated spurious emissions, all tests cases were performed with sample 1.

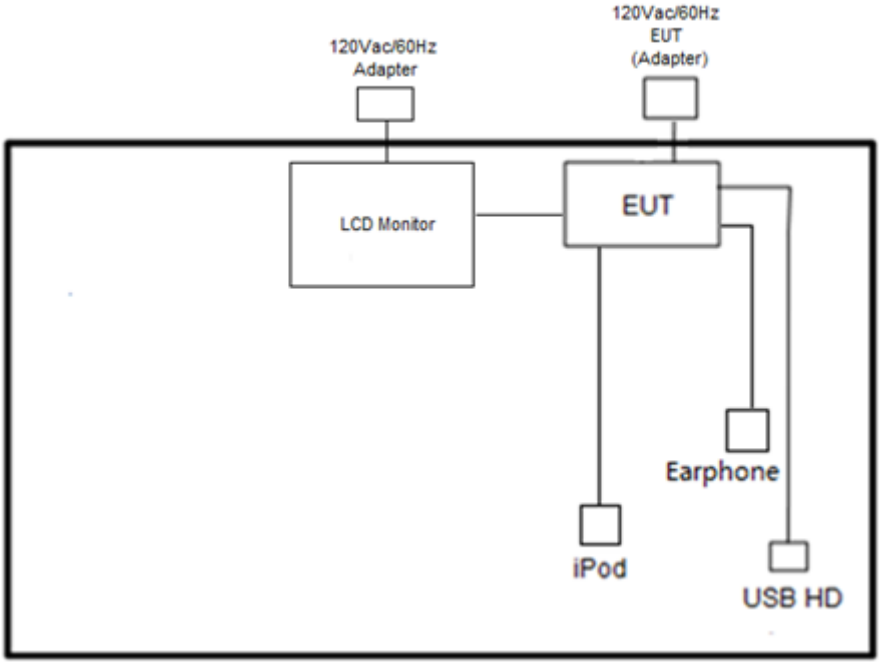
Ch. #		Band IV：5725-5850 MHz			
		802.11a	802.11n HT20	802.11n HT40	802.11ac VHT80
L	Low	149	149	151	-
M	Middle	157	157	-	155
H	High	165	165	159	-

2.3 Connection Diagram of Test System

<WLAN Tx Mode>



<AC Conducted Emission Mode>



2.4 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	LCD Monitor	DELL	U2410	FCC DoC	Shielded, 1.6 m	Unshielded, 1.8 m
2.	HD USB 3.0	lenovo	F310S	FCC DoC	Shielded, 0.5m	N/A
3.	SD Card	SanDisk	MicroSD HC	FCC DoC	N/A	N/A
4.	iPod	Apple	A1285	FCC DoC	Shielded, 1.0 m	N/A
5.	iPod Earphone	Apple	N/A	Verification	Unshielded, 1.0 m	N/A
6.	Earphone	lenovo	TS300-01MS21-8S	FCC DoC	Unshielded,1.2m	N/A

2.5 EUT Operation Test Setup

For WLAN function, programmed RF utility, “Tx Tool” installed in the notebook make the EUT provide functions like channel selection and power level for continuous transmitting and receiving signals.

3 Test Result

3.1 Unwanted Emissions Measurement

This section as specified in FCC Part 15.407(b) is to measure unwanted emissions through radiated measurement for band edge spurious emissions and out of band emissions measurement. The unwanted emissions shall comply with 15.407(b)(1) to (6), and restricted bands per FCC Part15.205.

3.1.1 Limit of Unwanted Emissions

(1) For transmitters operating in the 5.725-5.85 GHz band:

15.407(b)(4)(i) All emissions shall be limited to a level of -27 dBm/MHz at 75 MHz or more above or below the band edge increasing linearly to 10 dBm/MHz at 25 MHz above or below the band edge, and from 25 MHz above or below the band edge increasing linearly to a level of 15.6 dBm/MHz at 5 MHz above or below the band edge, and from 5 MHz above or below the band edge increasing linearly to a level of 27 dBm/MHz at the band edge.

(2) Unwanted spurious emissions fallen in restricted bands per FCC Part15.205 shall comply with the general field strength limits set forth in § 15.209 as below table,

Frequency (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: The following formula is used to convert the EIRP to field strength.

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

EIRP (dBm)	Field Strength at 3m (dBμV/m)
-17	78.3
- 27	68.3

(3) KDB 789033 D02 General UNII Test Procedures New Rules v01r03 G)2)c) As specified in 15.407(b), emissions above 1000 MHz that are outside of the restricted bands are subject to a peak emission limit of -27 dBm/MHz (or -17 dBm/MHz as specified in 15.407(b)(4)). However, an out-of-band emission that complies with both the average and peak limits of 15.209 is not required to satisfy the -27 dBm/MHz or -17 dBm/MHz peak emission limit.

3.1.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.1.3 Test Procedures

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r03. Section G) Unwanted emissions measurement.

   (1) Procedure for Unwanted Emissions Measurements Below 1000MHz

   - RBW = 120 kHz
   - VBW = 300 kHz
   - Detector = Peak
   - Trace mode = max hold

   (2) Procedure for Peak Unwanted Emissions Measurements Above 1000 MHz

   - RBW = 1 MHz
   - VBW ≥ 3 MHz
   - Detector = Peak
   - Sweep time = auto
   - Trace mode = max hold

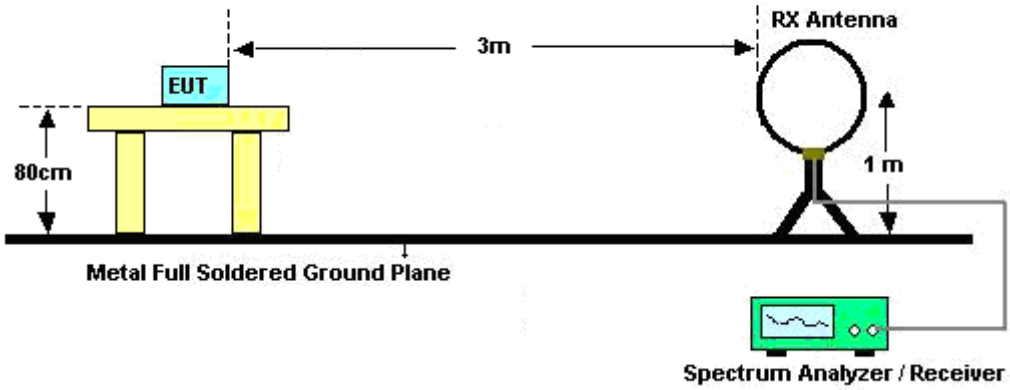
   (3) Procedures for Average Unwanted Emissions Measurements Above 1000MHz

   - RBW = 1 MHz
   - VBW = 10 Hz, when duty cycle is no less than 98 percent.
   - VBW ≥ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

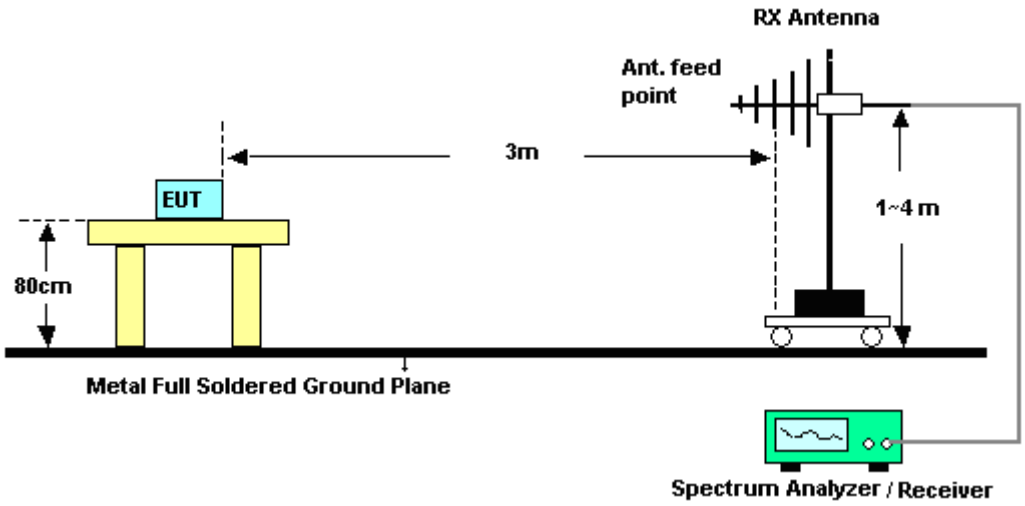
2. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
3. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
4. The antenna is a broadband antenna and its height is adjusted between one meter and four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
5. For each suspected emission, the EUT was arranged to its worst case and then adjust the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
6. For testing below 1GHz, if the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then peak values of EUT will be reported, otherwise, the emissions will be repeated one by one using the CISPR quasi-peak method and reported.
7. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than average limit (that means the emission level in average mode also complies with the limit in average mode), then peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.

3.1.4 Test Setup

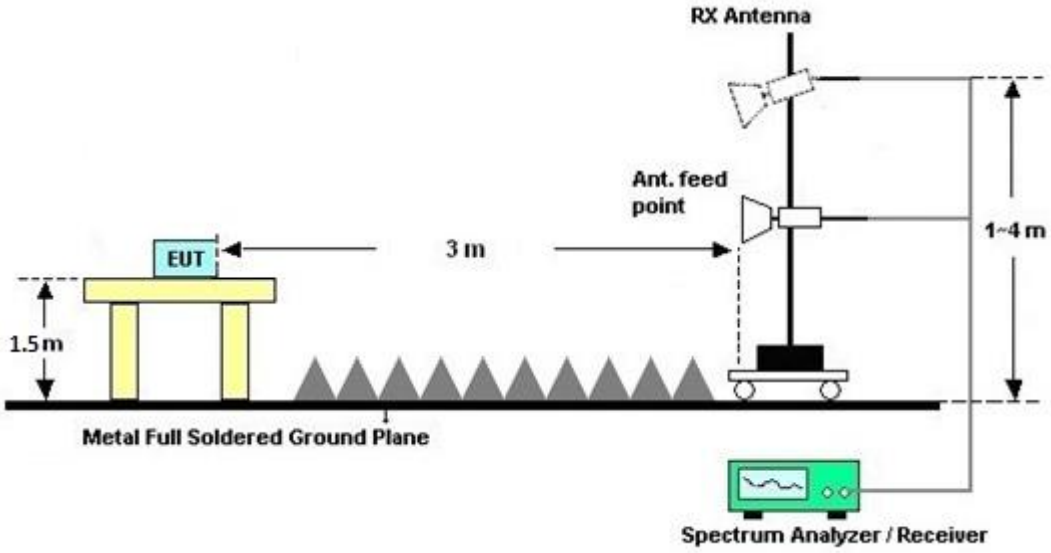
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



3.1.5 Test Results of Radiated Spurious Emissions (9 kHz ~ 30 MHz)

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line per 15.31(o) was not reported.

3.1.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix A and B.

3.1.7 Duty Cycle

Please refer to Appendix C.

3.1.8 Test Result of Radiated Spurious Emissions (30MHz ~ 10th Harmonic)

Please refer to Appendix A and B.

3.2 AC Conducted Emission Measurement

3.2.1 Limit of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

Frequency of emission (MHz)	Conducted limit (dBμV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

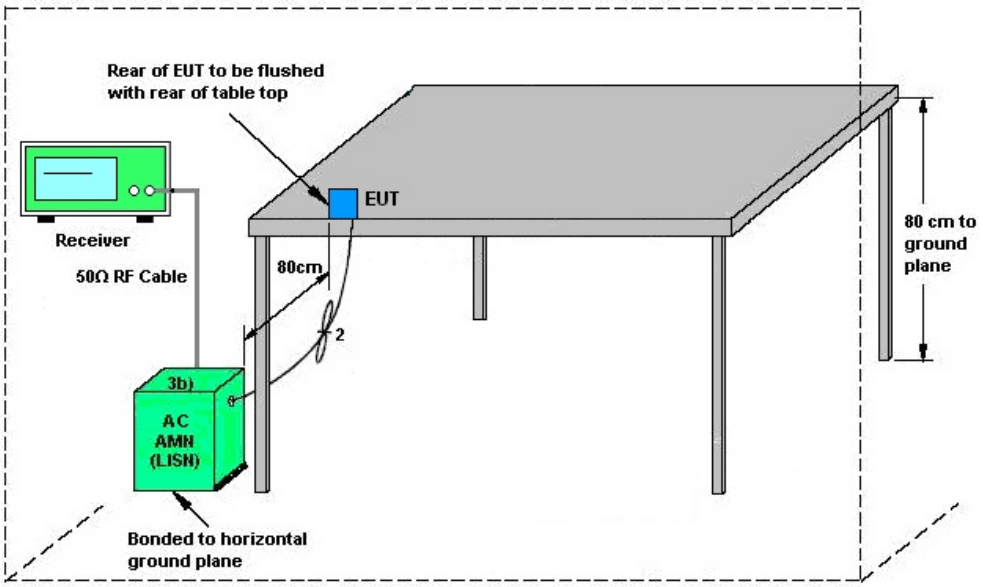
3.2.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

3.2.3 Test Procedures

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth with Maximum Hold Mode.

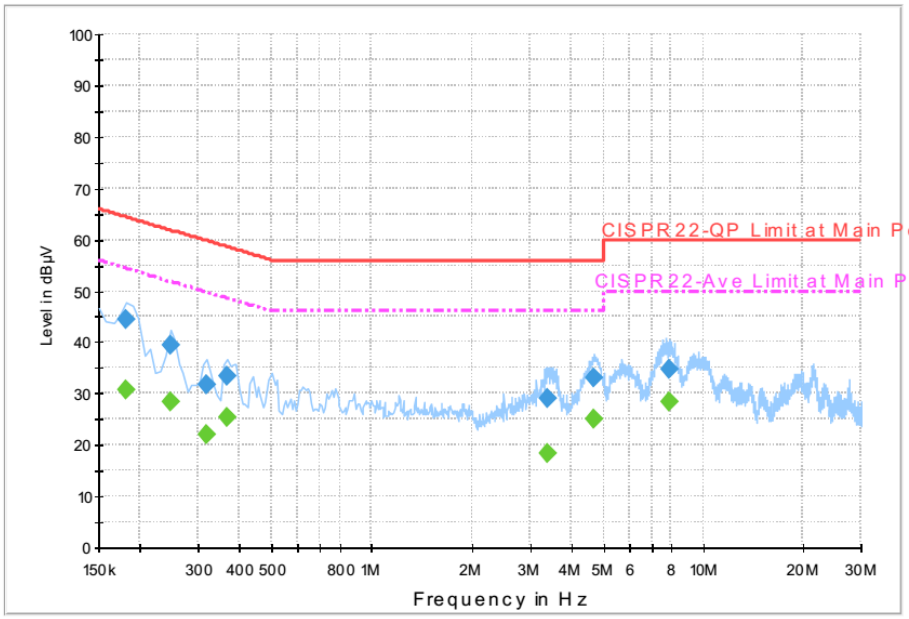
3.2.4 Test Setup



AMN = Artificial mains network (LISN)
AE = Associated equipment
EUT = Equipment under test
ISN = Impedance stabilization network

3.2.5 Test Result of AC Conducted Emission

Test Mode :	Mode 1	Temperature :	22~24℃
Test Engineer :	Arthur Hsieh	Relative Humidity :	50~53%
Test Voltage :	120Vac / 60Hz	Phase :	Line
Function Type :	WLAN (5GHz) Link + TF + TC		



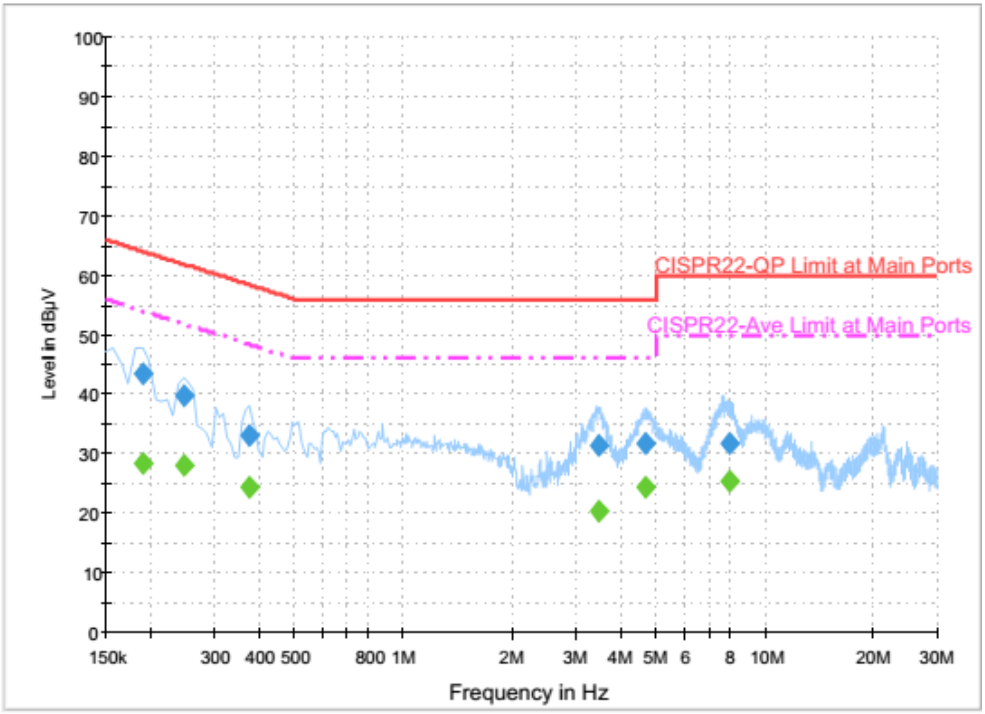
Final Result : QuasiPeak

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.182000	44.3	Off	L1	19.6	20.1	64.4
0.246000	39.5	Off	L1	19.6	22.4	61.9
0.318000	31.9	Off	L1	19.6	27.9	59.8
0.366000	33.3	Off	L1	19.6	25.3	58.6
3.414000	29.2	Off	L1	19.6	26.8	56.0
4.702000	32.9	Off	L1	19.6	23.1	56.0
7.894000	34.8	Off	L1	19.7	25.2	60.0

Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.182000	30.6	Off	L1	19.6	23.8	54.4
0.246000	28.3	Off	L1	19.6	23.6	51.9
0.318000	21.9	Off	L1	19.6	27.9	49.8
0.366000	25.5	Off	L1	19.6	23.1	48.6
3.414000	18.3	Off	L1	19.6	27.7	46.0
4.702000	25.1	Off	L1	19.6	20.9	46.0
7.894000	28.4	Off	L1	19.7	21.6	50.0

Test Mode :	Mode 1	Temperature :	22~24℃
Test Engineer :	Arthur Hsieh	Relative Humidity :	50~53%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Function Type :	WLAN (5GHz) Link + TF + TC		



Final Result : QuasiPeak

Frequency (MHz)	QuasiPeak (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.190000	43.5	Off	N	19.5	20.5	64.0
0.246000	39.9	Off	N	19.5	22.0	61.9
0.374000	33.1	Off	N	19.5	25.3	58.4
3.494000	31.4	Off	N	19.6	24.6	56.0
4.710000	31.8	Off	N	19.6	24.2	56.0
8.038000	31.9	Off	N	19.7	28.1	60.0

Final Result : Average

Frequency (MHz)	Average (dBµV)	Filter	Line	Corr. (dB)	Margin (dB)	Limit (dBµV)
0.190000	28.6	Off	N	19.5	25.4	54.0
0.246000	27.9	Off	N	19.5	24.0	51.9
0.374000	24.3	Off	N	19.5	24.1	48.4
3.494000	20.5	Off	N	19.6	25.5	46.0
4.710000	24.3	Off	N	19.6	21.7	46.0
8.038000	25.5	Off	N	19.7	24.5	50.0

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
AC Power Source	ChainTek	APC-1000W	N/A	N/A	N/A	Dec. 27, 2016	N/A	Conduction (CO05-HY)
EMI Test Receiver	Rohde & Schwarz	ESCI 7	100724	9kHz~7GHz	Aug. 30, 2016	Dec. 27, 2016	Aug. 29, 2017	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100080	9kHz~30MHz	Nov. 29, 2016	Dec. 27, 2016	Nov. 28, 2017	Conduction (CO05-HY)
LISN	Rohde & Schwarz	ENV216	100081	9kHz~30MHz	Dec. 06, 2016	Dec. 27, 2016	Dec. 05, 2017	Conduction (CO05-HY)
Bilog Antenna	TESEQ	CBL 6111D&00800 N1D01N-06	35419&03	30MHz to 1GHz	Jan. 13, 2016	Dec. 17, 2016 ~ Dec. 24, 2016	Jan. 12, 2017	Radiation (03CH07-HY)
Double Ridge Horn Antenna	ESCO	3117	00075962	1GHz ~ 18GHz	Aug. 19, 2016	Dec. 17, 2016 ~ Dec. 24, 2016	Aug. 18, 2017	Radiation (03CH07-HY)
EMI Test Receiver	Keysight	N9038A(MXE)	MY54130085	20Hz ~ 8.4GHz	Oct. 26, 2016	Dec. 17, 2016 ~ Dec. 24, 2016	Oct. 25, 2017	Radiation (03CH07-HY)
Loop Antenna	Rohde & Schwarz	HFH2-Z2	100315	9 kHz~30 MHz	Sep. 02, 2015	Dec. 17, 2016 ~ Dec. 24, 2016	Sep. 01, 2017	Radiation (03CH07-HY)
Preamplifier	MITEQ	AMF-7D-0010 1800-30-10P	1590075	1GHz ~ 18GHz	Apr. 15, 2016	Dec. 17, 2016 ~ Dec. 24, 2016	Apr. 14, 2017	Radiation (03CH07-HY)
Preamplifier	COM-POWER	PA-103A	161241	10MHz-1GHz	Mar. 18, 2016	Dec. 17, 2016 ~ Dec. 24, 2016	Mar. 17, 2017	Radiation (03CH07-HY)
Preamplifier	Agilent	8449B	3008A02362	1GHz~ 26.5GHz	Oct. 12, 2016	Dec. 17, 2016 ~ Dec. 24, 2016	Oct. 11, 2017	Radiation (03CH07-HY)
Spectrum Analyzer	Agilent	N9010A	MY53470118	10Hz~44GHz	Feb. 27, 2016	Dec. 17, 2016 ~ Dec. 24, 2016	Feb. 26, 2017	Radiation (03CH07-HY)
Antenna Mast	Max-Full	MFA520BS	N/A	1m~4m	N/A	Dec. 17, 2016 ~ Dec. 24, 2016	N/A	Radiation (03CH07-HY)
Turn Table	ChainTek	Chaintek 3000	N/A	0~360 Degree	N/A	Dec. 17, 2016 ~ Dec. 24, 2016	N/A	Radiation (03CH07-HY)
Loop Cable	Rohde & Schwarz	N/A	N/A	9KHz~30MHz	Nov. 20, 2016	Dec. 17, 2016 ~ Dec. 24, 2016	Nov. 19, 2017	Radiation (03CH07-HY)
Preamplifier	MITEQ	JS44-18004000-33-8P	1840917	18GHz ~ 40GHz	Jun. 14, 2016	Dec. 17, 2016 ~ Dec. 24, 2016	Jun. 13, 2017	Radiation (03CH07-HY)
SHF-EHF Horn Antenna	SCHWARZBECK	BBHA 9170	BBHA9170584	18GHz- 40GHz	Nov. 08, 2016	Dec. 17, 2016 ~ Dec. 24, 2016	Nov. 07, 2017	Radiation (03CH07-HY)

5 Uncertainty of Evaluation

Uncertainty of Conducted Emission Measurement (150kHz ~ 30MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**2.7**

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**5.7**

Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**5.5**

Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	**5.2**

Appendix A. Radiated Spurious Emission

Test Engineer :	Jesse Wang, James Chiu, and Daniel Lee	Temperature :	22~24°C
		Relative Humidity :	46~49%

Band 4 - 5725~5850MHz

WIFI 802.11a (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11a CH 149 5745MHz		5619.6	48.69	-19.51	68.2	37.32	34.6	11.89	35.12	380	121	P	H
		5692.8	49.6	-50.29	99.89	38.14	34.6	12	35.14	380	121	P	H
		5718	50.38	-59.86	110.24	38.86	34.6	12.06	35.14	380	121	P	H
		5724.6	50.56	-70.73	121.29	39.04	34.6	12.06	35.14	380	121	P	H
	*	5745	100.74	-	-	89.18	34.6	12.11	35.15	380	121	P	H
	*	5745	92.84	-	-	81.28	34.6	12.11	35.15	380	121	A	H
													H
													H
		5644.8	51.37	-16.83	68.2	39.95	34.6	11.95	35.13	300	187	P	V
		5683.8	54.14	-39.11	93.25	42.68	34.6	12	35.14	300	187	P	V
		5701.4	54.26	-51.33	105.59	42.74	34.6	12.06	35.14	300	187	P	V
		5725	56.8	-65.4	122.2	45.28	34.6	12.06	35.14	300	187	P	V
	*	5745	107.17	-	-	95.61	34.6	12.11	35.15	300	187	P	V
	*	5745	100.44	-	-	88.88	34.6	12.11	35.15	300	187	A	V
													V
													V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		5629.4	50.63	-17.57	68.2	39.21	34.6	11.95	35.13	380	120	P	H
		5651	49.51	-19.43	68.94	38.09	34.6	11.95	35.13	380	120	P	H
		5704.6	49.42	-57.07	106.49	37.9	34.6	12.06	35.14	380	120	P	H
		5724.4	48.52	-72.31	120.83	37	34.6	12.06	35.14	380	120	P	H
	*	5785	101.89	-	-	90.28	34.6	12.17	35.16	380	120	P	H
	*	5785	94.17	-	-	82.56	34.6	12.17	35.16	380	120	A	H
		5851.4	49.49	-69.52	119.01	37.78	34.6	12.28	35.17	380	120	P	H
		5867.6	49.48	-57.79	107.27	37.67	34.6	12.39	35.18	380	120	P	H
		5884.8	50.97	-46.95	97.92	39.17	34.6	12.39	35.19	380	120	P	H
		5942	50.01	-18.19	68.2	37.99	34.6	12.62	35.2	380	120	P	H
													H
802.11a CH 157 5785MHz													H
		5633.6	55.99	-12.21	68.2	44.57	34.6	11.95	35.13	281	194	P	V
		5693.6	53.49	-46.99	100.48	42.03	34.6	12	35.14	281	194	P	V
		5703.4	53.46	-52.69	106.15	41.94	34.6	12.06	35.14	281	194	P	V
		5720.2	51.99	-59.27	111.26	40.47	34.6	12.06	35.14	281	194	P	V
	*	5785	108.32	-	-	96.71	34.6	12.17	35.16	281	194	P	V
	*	5785	100.42	-	-	88.81	34.6	12.17	35.16	281	194	A	V
		5850	51.86	-70.34	122.2	40.15	34.6	12.28	35.17	281	194	P	V
		5858.6	52.32	-57.47	109.79	40.62	34.6	12.28	35.18	281	194	P	V
		5882.4	53.91	-45.79	99.7	42.1	34.6	12.39	35.18	281	194	P	V
		5934.6	53.23	-14.97	68.2	41.32	34.6	12.51	35.2	281	194	P	V
													V
													V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
	*	5825	100.49	-	-	88.78	34.6	12.28	35.17	380	116	P	H
	*	5825	92.62	-	-	80.91	34.6	12.28	35.17	380	116	A	H
		5855	49.18	-61.62	110.8	37.47	34.6	12.28	35.17	380	116	P	H
		5855	49.18	-61.62	110.8	37.47	34.6	12.28	35.17	380	116	P	H
		5884	50.45	-48.07	98.52	38.65	34.6	12.39	35.19	380	116	P	H
		5936.6	49.74	-18.46	68.2	37.83	34.6	12.51	35.2	380	116	P	H
													H
802.11a													H
CH 165	*	5825	107.54	-	-	95.83	34.6	12.28	35.17	302	193	P	V
5825MHz	*	5825	100.09	-	-	88.38	34.6	12.28	35.17	302	193	A	V
		5851	61.76	-58.16	119.92	50.05	34.6	12.28	35.17	302	193	P	V
		5858.2	54.4	-55.5	109.9	42.7	34.6	12.28	35.18	302	193	P	V
		5889.2	52.42	-42.24	94.66	40.62	34.6	12.39	35.19	302	193	P	V
		5933.2	50.93	-17.27	68.2	39.01	34.6	12.51	35.19	302	193	P	V
													V
													V
													V

Remark

1. No other spurious found.
2. All results are PASS against Peak and Average limit line.

Band 4 5725~5850MHz

WIFI 802.11a (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
802.11a CH 149 5745MHz		11490	44.37	-29.63	74	45.28	39.27	17.16	57.34	100	0	P	H
		17232	45.3	-22.9	68.2	38	42.43	20.76	55.89	100	0	P	H
													H
													H
		11490	44.83	-29.17	74	45.74	39.27	17.16	57.34	100	0	P	V
		17232	45.96	-22.24	68.2	38.66	42.43	20.76	55.89	100	0	P	V
													V
													V
802.11a CH 157 5785MHz		11570	43.93	-30.07	74	44.76	39.2	17.16	57.19	100	0	P	H
		17352	44.86	-23.34	68.2	37.72	42.24	20.84	55.94	100	0	P	H
													H
													H
		11570	43.92	-30.08	74	44.75	39.2	17.16	57.19	100	0	P	V
		17352	45.6	-22.6	68.2	38.46	42.24	20.84	55.94	100	0	P	V
													V
													V
802.11a CH 165 5825MHz		11650	44.08	-29.92	74	44.89	39.11	17.16	57.08	100	0	P	H
		17472	46.52	-21.68	68.2	39.53	42.05	20.93	55.99	100	0	P	H
													H
													H
		11650	44.17	-29.83	74	44.98	39.11	17.16	57.08	100	0	P	V
		17472	46.94	-21.26	68.2	39.95	42.05	20.93	55.99	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 4 5725~5850MHz

WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		5633.4	49.34	-18.86	68.2	37.92	34.6	11.95	35.13	380	119	P	H
		5681.6	50.06	-41.56	91.62	38.6	34.6	12	35.14	380	119	P	H
		5718.6	49.05	-61.36	110.41	37.53	34.6	12.06	35.14	380	119	P	H
		5725	54.31	-67.89	122.2	42.79	34.6	12.06	35.14	380	119	P	H
	*	5745	100.1	-	-	88.54	34.6	12.11	35.15	380	119	P	H
	*	5745	92.95	-	-	81.39	34.6	12.11	35.15	380	119	A	H
802.11n													H
HT20													H
CH 149		5649.4	52.05	-16.15	68.2	40.63	34.6	11.95	35.13	300	188	P	V
5745MHz		5695.2	53.81	-47.85	101.66	42.35	34.6	12	35.14	300	188	P	V
		5714.6	54.62	-54.67	109.29	43.1	34.6	12.06	35.14	300	188	P	V
		5725	62.73	-59.47	122.2	51.21	34.6	12.06	35.14	300	188	P	V
	*	5745	108.36	-	-	96.8	34.6	12.11	35.15	300	188	P	V
	*	5745	100.72	-	-	89.16	34.6	12.11	35.15	300	188	A	V
													V
													V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		5638	50.5	-17.7	68.2	39.08	34.6	11.95	35.13	380	119	P	H
		5665.8	50.59	-29.34	79.93	39.12	34.6	12	35.13	380	119	P	H
		5702.6	50.13	-55.8	105.93	38.61	34.6	12.06	35.14	380	119	P	H
		5724.4	49.42	-71.41	120.83	37.9	34.6	12.06	35.14	380	119	P	H
	*	5785	101.73	-	-	90.12	34.6	12.17	35.16	380	119	P	H
	*	5785	94.37	-	-	82.76	34.6	12.17	35.16	380	119	A	H
		5854.2	48.4	-64.22	112.62	36.69	34.6	12.28	35.17	380	119	P	H
		5873.2	49.71	-55.99	105.7	37.9	34.6	12.39	35.18	380	119	P	H
		5903.4	51.47	-32.68	84.15	39.55	34.6	12.51	35.19	380	119	P	H
		5940	50.01	-18.19	68.2	38.1	34.6	12.51	35.2	380	119	P	H
802.11n													H
HT20													H
CH 157		5635.8	55.51	-12.69	68.2	44.09	34.6	11.95	35.13	292	192	P	V
5785MHz		5684	52.32	-41.08	93.4	40.86	34.6	12	35.14	292	192	P	V
		5703.6	53.23	-52.98	106.21	41.71	34.6	12.06	35.14	292	192	P	V
		5723.8	51.69	-67.77	119.46	40.17	34.6	12.06	35.14	292	192	P	V
	*	5785	108.27	-	-	96.66	34.6	12.17	35.16	292	192	P	V
	*	5785	100.73	-	-	89.12	34.6	12.17	35.16	292	192	A	V
		5850.2	51.73	-70.01	121.74	40.02	34.6	12.28	35.17	292	192	P	V
		5865.8	51.79	-55.98	107.77	39.98	34.6	12.39	35.18	292	192	P	V
		5878.4	51.94	-50.73	102.67	40.13	34.6	12.39	35.18	292	192	P	V
		5935.4	52.83	-15.37	68.2	40.92	34.6	12.51	35.2	292	192	P	V
													V
													V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
	*	5825	99.98	-	-	88.27	34.6	12.28	35.17	380	118	P	H
	*	5825	92.68	-	-	80.97	34.6	12.28	35.17	380	118	A	H
		5850.6	53.15	-67.68	120.83	41.44	34.6	12.28	35.17	380	118	P	H
		5855.6	51.99	-58.64	110.63	40.28	34.6	12.28	35.17	380	118	P	H
		5889.6	51.06	-43.3	94.36	39.26	34.6	12.39	35.19	380	118	P	H
		5938.4	49.94	-18.26	68.2	38.03	34.6	12.51	35.2	380	118	P	H
802.11n													H
HT20													H
CH 165	*	5825	107.46	-	-	95.75	34.6	12.28	35.17	300	191	P	V
5825MHz	*	5825	99.81	-	-	88.1	34.6	12.28	35.17	300	191	A	V
		5852.2	53.1	-64.08	117.18	41.39	34.6	12.28	35.17	300	191	P	V
		5857.6	59.48	-50.59	110.07	47.77	34.6	12.28	35.17	300	191	P	V
		5922.8	52.32	-17.5	69.82	40.4	34.6	12.51	35.19	300	191	P	V
		5928.8	51.01	-17.19	68.2	39.09	34.6	12.51	35.19	300	191	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 4 5725~5850MHz

WIFI 802.11n HT20 (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		11490	45.54	-28.46	74	46.45	39.27	17.16	57.34	100	0	P	H
		17232	44.99	-23.21	68.2	37.69	42.43	20.76	55.89	100	0	P	H
802.11n													H
HT20													H
CH 149		11490	45.02	-28.98	74	45.93	39.27	17.16	57.34	100	0	P	V
5745MHz		17232	45.67	-22.53	68.2	38.37	42.43	20.76	55.89	100	0	P	V
													V
													V
		11570	43.48	-30.52	74	44.31	39.2	17.16	57.19	100	0	P	H
		17352	45.01	-23.19	68.2	37.87	42.24	20.84	55.94	100	0	P	H
802.11n													H
HT20													H
CH 157		11570	44.64	-29.36	74	45.47	39.2	17.16	57.19	100	0	P	V
5785MHz		17352	44.69	-23.51	68.2	37.55	42.24	20.84	55.94	100	0	P	V
													V
													V
		11650	41.2	-32.8	74	42.01	39.11	17.16	57.08	100	0	P	H
		17472	46.42	-21.78	68.2	39.43	42.05	20.93	55.99	100	0	P	H
802.11n													H
HT20													H
CH 165		11650	41.53	-32.47	74	42.34	39.11	17.16	57.08	100	0	P	V
5825MHz		17472	46.15	-22.05	68.2	39.16	42.05	20.93	55.99	100	0	P	V
													V
													V

Remark

1. No other spurious found.
2. All results are PASS against Peak and Average limit line.

Band 4 5725~5850MHz

WIFI 802.11n HT40 (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		5605	50.35	-17.85	68.2	38.98	34.6	11.89	35.12	366	120	P	H
		5661.6	49.62	-27.19	76.81	38.15	34.6	12	35.13	366	120	P	H
		5719.8	54.38	-56.36	110.74	42.86	34.6	12.06	35.14	366	120	P	H
		5723.6	54.86	-64.15	119.01	43.34	34.6	12.06	35.14	366	120	P	H
	*	5755	98.06	-	-	86.5	34.6	12.11	35.15	366	120	P	H
	*	5755	91.43	-	-	79.87	34.6	12.11	35.15	366	120	A	H
		5852.8	48.21	-67.61	115.82	36.5	34.6	12.28	35.17	366	120	P	H
		5861.4	48.66	-60.35	109.01	36.85	34.6	12.39	35.18	366	120	P	H
		5895.2	49.83	-40.38	90.21	38.03	34.6	12.39	35.19	366	120	P	H
		5939.8	49.72	-18.48	68.2	37.81	34.6	12.51	35.2	366	120	P	H
802.11n													H
HT40													H
CH 151		5603.6	53.62	-14.58	68.2	42.25	34.6	11.89	35.12	273	193	P	V
5755MHz		5690.4	53.5	-44.62	98.12	42.04	34.6	12	35.14	273	193	P	V
		5720	60.59	-50.21	110.8	49.07	34.6	12.06	35.14	273	193	P	V
		5723.6	64.09	-54.92	119.01	52.57	34.6	12.06	35.14	273	193	P	V
	*	5755	105.07	-	-	93.51	34.6	12.11	35.15	273	193	P	V
	*	5755	97.68	-	-	86.12	34.6	12.11	35.15	273	193	A	V
		5852	51.51	-66.13	117.64	39.8	34.6	12.28	35.17	273	193	P	V
		5859.8	51.85	-57.6	109.45	40.15	34.6	12.28	35.18	273	193	P	V
		5920	51.9	-19.99	71.89	39.98	34.6	12.51	35.19	273	193	P	V
		5939.6	49.94	-18.26	68.2	38.03	34.6	12.51	35.2	273	193	P	V
													V
													V

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		5634.2	49.75	-18.45	68.2	38.33	34.6	11.95	35.13	380	120	P	H
		5686.2	49.72	-45.3	95.02	38.26	34.6	12	35.14	380	120	P	H
		5715.4	48.6	-60.91	109.51	37.08	34.6	12.06	35.14	380	120	P	H
		5724.8	48.98	-72.76	121.74	37.46	34.6	12.06	35.14	380	120	P	H
	*	5795	98.59	-	-	86.98	34.6	12.17	35.16	380	120	P	H
	*	5795	93.46	-	-	81.85	34.6	12.17	35.16	380	120	A	H
		5853.8	49.96	-63.58	113.54	38.25	34.6	12.28	35.17	380	120	P	H
		5861.8	50.07	-58.82	108.89	38.26	34.6	12.39	35.18	380	120	P	H
		5892.8	50.11	-41.88	91.99	38.31	34.6	12.39	35.19	380	120	P	H
		5939	50.02	-18.18	68.2	38.11	34.6	12.51	35.2	380	120	P	H
802.11n													H
HT40													H
CH 159		5629	55.27	-12.93	68.2	43.85	34.6	11.95	35.13	277	193	P	V
5795MHz		5653.6	53.18	-17.69	70.87	41.76	34.6	11.95	35.13	277	193	P	V
		5712	53	-55.56	108.56	41.48	34.6	12.06	35.14	277	193	P	V
		5725	52.99	-69.21	122.2	41.47	34.6	12.06	35.14	277	193	P	V
	*	5795	105.71	-	-	94.1	34.6	12.17	35.16	277	193	P	V
	*	5795	98.07	-	-	86.46	34.6	12.17	35.16	277	193	A	V
		5853.6	51.48	-62.51	113.99	39.77	34.6	12.28	35.17	277	193	P	V
		5871.4	52.04	-54.17	106.21	40.23	34.6	12.39	35.18	277	193	P	V
		5882.2	51.87	-47.98	99.85	40.06	34.6	12.39	35.18	277	193	P	V
		5938.6	53.73	-14.47	68.2	41.82	34.6	12.51	35.2	277	193	P	V
													V
													V

Remark

1. No other spurious found.
2. All results are PASS against Peak and Average limit line.

Band 4 5725~5850MHz

WIFI 802.11n HT40 (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		11510	43.44	-30.56	74	44.28	39.3	17.16	57.3	100	0	P	H
		17268	45.23	-22.97	68.2	37.98	42.37	20.79	55.91	100	0	P	H
802.11n													H
HT40													H
CH 151		11510	44.49	-29.51	74	45.33	39.3	17.16	57.3	100	0	P	V
5755MHz		17268	44.12	-24.08	68.2	36.87	42.37	20.79	55.91	100	0	P	V
													V
													V
		11590	41.5	-32.5	74	42.32	39.18	17.16	57.16	100	0	P	H
		17388	45.98	-22.22	68.2	38.87	42.19	20.87	55.95	100	0	P	H
802.11n													H
HT40													H
CH 159		11590	41.01	-32.99	74	41.83	39.18	17.16	57.16	100	0	P	V
5795MHz		17388	45.1	-23.1	68.2	37.99	42.19	20.87	55.95	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 4 5725~5850MHz

WIFI 802.11ac VHT80 (Band Edge @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		5625.2	49.7	-18.5	68.2	38.27	34.6	11.95	35.12	380	103	P	H
		5659.6	52.12	-23.21	75.33	40.7	34.6	11.95	35.13	380	103	P	H
		5715.6	53.83	-55.74	109.57	42.31	34.6	12.06	35.14	380	103	P	H
		5720.4	52.91	-58.8	111.71	41.39	34.6	12.06	35.14	380	103	P	H
	*	5775	94.8	-	-	83.25	34.6	12.11	35.16	380	103	P	H
	*	5775	88.08	-	-	76.53	34.6	12.11	35.16	380	103	A	H
		5851.2	49.23	-70.23	119.46	37.52	34.6	12.28	35.17	380	103	P	H
		5867.6	49.53	-57.74	107.27	37.72	34.6	12.39	35.18	380	103	P	H
		5909.6	49.71	-29.85	79.56	37.79	34.6	12.51	35.19	380	103	P	H
		5929.6	50.1	-18.1	68.2	38.18	34.6	12.51	35.19	380	103	P	H
802.11ac													H
VHT80													H
CH 155		5643.8	53.05	-15.15	68.2	41.63	34.6	11.95	35.13	296	189	P	V
5775MHz		5696.4	58.72	-43.83	102.55	47.26	34.6	12	35.14	296	189	P	V
		5713.4	60.02	-48.93	108.95	48.5	34.6	12.06	35.14	296	189	P	V
		5722.4	62.21	-54.06	116.27	50.69	34.6	12.06	35.14	296	189	P	V
	*	5775	102.22	-	-	90.67	34.6	12.11	35.16	296	189	P	V
	*	5775	95.03	-	-	83.48	34.6	12.11	35.16	296	189	A	V
		5851.6	52.84	-65.71	118.55	41.13	34.6	12.28	35.17	296	189	P	V
		5861.2	52.19	-56.87	109.06	40.38	34.6	12.39	35.18	296	189	P	V
		5906	51.6	-30.62	82.22	39.68	34.6	12.51	35.19	296	189	P	V
		5931.4	51.36	-16.84	68.2	39.44	34.6	12.51	35.19	296	189	P	V
													V
													V

Remark

1. No other spurious found.
2. All results are PASS against Peak and Average limit line.

Band 4 5725~5850MHz

WIFI 802.11ac VHT80 (Harmonic @ 3m)

WIFI Ant. 1	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		11550	41.97	-32.03	74	42.8	39.23	17.16	57.22	100	0	P	H
		17328	44.88	-23.32	68.2	37.71	42.29	20.81	55.93	100	0	P	H
802.11ac													H
VHT80													H
CH 155		11550	42.1	-31.9	74	42.93	39.23	17.16	57.22	100	0	P	V
5775MHz		17328	44.95	-23.25	68.2	37.78	42.29	20.81	55.93	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Emission below 1GHz

5GHz WIFI 802.11a (LF @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
5GHz 802.11a LF		30	33.45	-6.55	40	37.73	26	1.07	31.35	-	-	P	H
		76.71	36.82	-3.18	40	53.64	13.46	1.28	31.56	100	0	P	H
		119.91	27.62	-15.88	43.5	39.68	17.9	1.55	31.51	-	-	P	H
		456.1	28.47	-17.53	46	33.44	23.23	2.89	31.09	-	-	P	H
		752.2	31.02	-14.98	46	30.62	27.23	3.82	30.65	-	-	P	H
		944.7	33.54	-12.46	46	29.92	30.08	4.07	30.53	-	-	P	H
													H
													H
													H
													H
													H
													H
		30	29.75	-10.25	40	34.03	26	1.07	31.35	-	-	P	V
		52.14	30.5	-9.5	40	46.55	14.48	1.07	31.6	-	-	P	V
		76.71	32.46	-7.54	40	49.28	13.46	1.28	31.56	100	0	P	V
		304.2	22.09	-23.91	46	31.02	19.93	2.41	31.27	-	-	P	V
		683.6	29.25	-16.75	46	30.1	26.24	3.65	30.74	-	-	P	V
		977.6	33.31	-20.69	54	29.5	30.26	4.07	30.52	-	-	P	V
													V
													V
													V
													V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against limit line.												

Note symbol

*	**Fundamental Frequency** which can be ignored. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency.
!	Test result is **over limit** line.
P/A	**P**eak or **A**verage
H/V	**H**orizontal or **V**ertical

A calculation example for radiated spurious emission is shown as below:

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b CH 01 2412MHz		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H

1. Level(dBµV/m) =

Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBµV) - Preamp Factor(dB)

2. Over Limit(dB) = Level(dBµV/m) – Limit Line(dBµV/m)

For Peak Limit @ 2390MHz:

1. Level(dBµV/m)

= Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBµV) - Preamp Factor(dB)

= 32.22(dB/m) + 4.58(dB) + 54.51(dBµV) – 35.86 (dB)

= 55.45 (dBµV/m)

2. Over Limit(dB)

= Level(dBµV/m) – Limit Line(dBµV/m)

= 55.45(dBµV/m) – 74(dBµV/m)

= -18.55(dB)

For Average Limit @ 2390MHz:

1. Level(dBµV/m)

= Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBµV) - Preamp Factor(dB)

= 32.22(dB/m) + 4.58(dB) + 42.6(dBµV) – 35.86 (dB)

= 43.54 (dBµV/m)

2. Over Limit(dB)

= Level(dBµV/m) – Limit Line(dBµV/m)

= 43.54(dBµV/m) – 54(dBµV/m)

= -10.46(dB)

Both peak and average measured complies with the limit line, so test result is "PASS".

Band 4 - 5725~5850MHz

WIFI 802.11n HT40 (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
2		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
		5600	51.07	-17.13	68.2	39.69	34.6	11.89	35.11	380	124	P	H
		5699.6	50.1	-54.81	104.91	38.64	34.6	12	35.14	380	124	P	H
		5718.6	58.31	-52.1	110.41	46.79	34.6	12.06	35.14	380	124	P	H
		5723.2	56.84	-61.26	118.1	45.32	34.6	12.06	35.14	380	124	P	H
	*	5755	100.4	-	-	88.84	34.6	12.11	35.15	380	124	P	H
	*	5755	93.46	-	-	81.9	34.6	12.11	35.15	380	124	A	H
		5852.8	49.22	-66.6	115.82	37.51	34.6	12.28	35.17	380	124	P	H
		5873.4	50.82	-54.83	105.65	39.01	34.6	12.39	35.18	380	124	P	H
		5912	50.19	-27.6	77.79	38.27	34.6	12.51	35.19	380	124	P	H
		5937	48.82	-19.38	68.2	36.91	34.6	12.51	35.2	380	124	P	H
802.11n													H
HT40													H
CH 151		5603.8	57.1	-11.1	68.2	45.73	34.6	11.89	35.12	256	184	P	V
5755MHz		5687.2	53.78	-41.98	95.76	42.32	34.6	12	35.14	256	184	P	V
		5717.2	63.13	-46.89	110.02	51.61	34.6	12.06	35.14	256	184	P	V
		5720	61.95	-48.85	110.8	50.43	34.6	12.06	35.14	256	184	P	V
	*	5755	105.86	-	-	94.3	34.6	12.11	35.15	256	184	P	V
	*	5755	98.66	-	-	87.1	34.6	12.11	35.15	256	184	A	V
		5850.2	50.94	-70.8	121.74	39.23	34.6	12.28	35.17	256	184	P	V
		5866	50.92	-56.8	107.72	39.11	34.6	12.39	35.18	256	184	P	V
		5905.4	52.59	-30.08	82.67	40.67	34.6	12.51	35.19	256	184	P	V
		5925.2	49.09	-19.11	68.2	37.17	34.6	12.51	35.19	256	184	P	V
													V
													V

Band 4 5725~5850MHz

WIFI 802.11n HT40 (Harmonic @ 3m)

WIFI Ant. 2	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		11510	46.48	-27.52	74	47.32	39.3	17.16	57.3	100	0	P	H
		17265	48.05	-20.15	68.2	40.8	42.37	20.79	55.91	100	0	P	H
802.11n													H
HT40													H
CH 151		11510	46	-28	74	46.84	39.3	17.16	57.3	100	0	P	V
5755MHz		17265	49.91	-18.29	68.2	42.66	42.37	20.79	55.91	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 4 5725~5850MHz

Emission below 1GHz

5GHz WIFI 802.11n HT40 (LF @ 3m)

WIFI Ant.	Note	Frequency	Level	Over Limit	Limit Line	Read Level	Antenna Factor	Cable Loss	Preamp Factor	Ant Pos	Table Pos	Peak Avg.	Pol.
2		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
5GHz 802.11n HT40 LF		30	33.29	-6.71	40	37.57	26	1.07	31.35	-	-	P	H
		76.71	35.25	-4.75	40	52.07	13.46	1.28	31.56	100	0	P	H
		154.47	26.95	-16.55	43.5	39.25	17.42	1.78	31.5	-	-	P	H
		456.1	28.69	-17.31	46	33.66	23.23	2.89	31.09	-	-	P	H
		737.5	31.12	-14.88	46	31.05	27	3.74	30.67	-	-	P	H
		948.2	33.66	-12.34	46	29.94	30.18	4.07	30.53	-	-	P	H
													H
													H
													H
													H
													H
													H
		30.27	30.04	-9.96	40	34.32	26	1.07	31.35	-	-	P	V
		52.14	30.78	-9.22	40	46.83	14.48	1.07	31.6	-	-	P	V
		76.71	32.33	-7.67	40	49.15	13.46	1.28	31.56	100	0	P	V
		456.1	27.45	-18.55	46	32.42	23.23	2.89	31.09	-	-	P	V
		652.1	30.07	-15.93	46	31.35	25.92	3.57	30.77	-	-	P	V
		897.8	33	-13	46	30.38	28.99	4.17	30.54	-	-	P	V
													V
													V
													V
													V
													V
													V

Remark

1. No other spurious found.
2. All results are PASS against limit line.

Note symbol

*	**Fundamental Frequency** which can be ignored. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency.
!	Test result is **over limit** line.
P/A	**P**eak or **A**verage
H/V	**H**orizontal or **V**ertical

A calculation example for radiated spurious emission is shown as below:

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
2		(MHz)	(dBµV/m)	(dB)	(dBµV/m)	(dBµV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b CH 01 2412MHz		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H

1. Level(dBµV/m) =

Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBµV) - Preamp Factor(dB)

2. Over Limit(dB) = Level(dBµV/m) – Limit Line(dBµV/m)

For Peak Limit @ 2390MHz:

1. Level(dBµV/m)

= Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBµV) - Preamp Factor(dB)

= 32.22(dB/m) + 4.58(dB) + 54.51(dBµV) – 35.86 (dB)

= 55.45 (dBµV/m)

2. Over Limit(dB)

= Level(dBµV/m) – Limit Line(dBµV/m)

= 55.45(dBµV/m) – 74(dBµV/m)

= -18.55(dB)

For Average Limit @ 2390MHz:

1. Level(dBµV/m)

= Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBµV) - Preamp Factor(dB)

= 32.22(dB/m) + 4.58(dB) + 42.6(dBµV) – 35.86 (dB)

= 43.54 (dBµV/m)

2. Over Limit(dB)

= Level(dBµV/m) – Limit Line(dBµV/m)

= 43.54(dBµV/m) – 54(dBµV/m)

= -10.46(dB)

Both peak and average measured complies with the limit line, so test result is "PASS".

Band 4 - 5725~5850MHz

WIFI 802.11n HT20 (Band Edge @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1+2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
		5619	49.08	-19.12	68.2	37.71	34.6	11.89	35.12	380	118	P	H
		5694.6	49.25	-51.97	101.22	37.79	34.6	12	35.14	380	118	P	H
		5716.4	50.73	-59.06	109.79	39.21	34.6	12.06	35.14	380	118	P	H
		5725	50.17	-72.03	122.2	38.65	34.6	12.06	35.14	380	118	P	H
	*	5745	103.26	-	-	91.7	34.6	12.11	35.15	380	118	P	H
	*	5745	95.06	-	-	83.5	34.6	12.11	35.15	380	118	A	H
802.11n													H
HT20													H
CH 149		5647.2	51.32	-16.88	68.2	39.9	34.6	11.95	35.13	281	186	P	V
5745MHz		5692	52.45	-46.85	99.3	40.99	34.6	12	35.14	281	186	P	V
		5713.6	54.12	-54.89	109.01	42.6	34.6	12.06	35.14	281	186	P	V
		5725	62.55	-59.65	122.2	51.03	34.6	12.06	35.14	281	186	P	V
	*	5745	109.26	-	-	97.7	34.6	12.11	35.15	281	186	P	V
	*	5745	101.26	-	-	89.7	34.6	12.11	35.15	281	186	A	V
													V
													V

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		5628.6	50.79	-17.41	68.2	39.37	34.6	11.95	35.13	372	119	P	H
		5697.8	50.21	-53.37	103.58	38.75	34.6	12	35.14	372	119	P	H
		5703.4	49.54	-56.61	106.15	38.02	34.6	12.06	35.14	372	119	P	H
		5723.6	49.72	-69.29	119.01	38.2	34.6	12.06	35.14	372	119	P	H
	*	5785	103.41	-	-	91.8	34.6	12.17	35.16	372	119	P	H
	*	5785	95.21	-	-	83.6	34.6	12.17	35.16	372	119	A	H
		5850	48.76	-73.44	122.2	37.05	34.6	12.28	35.17	372	119	P	H
		5874.2	49.71	-55.71	105.42	37.9	34.6	12.39	35.18	372	119	P	H
		5893.6	50.5	-40.9	91.4	38.7	34.6	12.39	35.19	372	119	P	H
		5940.2	50.54	-17.66	68.2	38.52	34.6	12.62	35.2	372	119	P	H
802.11n													H
HT20													H
CH 157		5634.4	54.78	-13.42	68.2	43.36	34.6	11.95	35.13	266	187	P	V
5785MHz		5687.4	51.98	-43.93	95.91	40.52	34.6	12	35.14	266	187	P	V
		5705.6	52.32	-54.45	106.77	40.8	34.6	12.06	35.14	266	187	P	V
		5723.4	53.38	-65.17	118.55	41.86	34.6	12.06	35.14	266	187	P	V
	*	5785	108.81	-	-	97.2	34.6	12.17	35.16	266	187	P	V
	*	5785	101.41	-	-	89.8	34.6	12.17	35.16	266	187	A	V
		5850.6	52.01	-68.82	120.83	40.3	34.6	12.28	35.17	266	187	P	V
		5858.4	51.55	-58.3	109.85	39.85	34.6	12.28	35.18	266	187	P	V
		5885.6	52.02	-45.31	97.33	40.22	34.6	12.39	35.19	266	187	P	V
		5942.8	53.76	-14.44	68.2	41.74	34.6	12.62	35.2	266	187	P	V
													V
													V

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
	*	5825	103.11	-	-	91.4	34.6	12.28	35.17	380	110	P	H
	*	5825	93.81	-	-	82.1	34.6	12.28	35.17	380	110	A	H
		5855	49.66	-61.14	110.8	37.95	34.6	12.28	35.17	380	110	P	H
		5855	49.66	-61.14	110.8	37.95	34.6	12.28	35.17	380	110	P	H
		5886.2	49.88	-47	96.88	38.08	34.6	12.39	35.19	380	110	P	H
		5941	50.33	-17.87	68.2	38.31	34.6	12.62	35.2	380	110	P	H
802.11n													H
HT20													H
CH 165	*	5825	108.51	-	-	96.8	34.6	12.28	35.17	271	186	P	V
5825MHz	*	5825	100.81	-	-	89.1	34.6	12.28	35.17	271	186	A	V
		5851.8	52.09	-66.01	118.1	40.38	34.6	12.28	35.17	271	186	P	V
		5855.8	62.09	-48.49	110.58	50.38	34.6	12.28	35.17	271	186	P	V
		5883.6	52.79	-46.02	98.81	40.99	34.6	12.39	35.19	271	186	P	V
		5927.2	50.06	-18.14	68.2	38.14	34.6	12.51	35.19	271	186	P	V
													V
													V

Remark

1. No other spurious found.
2. All results are PASS against Peak and Average limit line.

Band 4 5725~5850MHz

WIFI 802.11n HT20 (Harmonic @ 3m)

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		11490	44.9	-29.1	74	45.81	39.27	17.16	57.34	100	0	P	H
		17235	45.89	-22.31	68.2	38.59	42.43	20.76	55.89	100	0	P	H
802.11n													H
HT20													H
CH 149		11490	44.4	-29.6	74	45.31	39.27	17.16	57.34	100	0	P	V
5745MHz		17235	46.32	-21.88	68.2	39.02	42.43	20.76	55.89	100	0	P	V
													V
													V
		11570	43.55	-30.45	74	44.38	39.2	17.16	57.19	100	0	P	H
		17355	46.07	-22.13	68.2	38.93	42.24	20.84	55.94	100	0	P	H
802.11n													H
HT20													H
CH 157		11570	44.57	-29.43	74	45.4	39.2	17.16	57.19	100	0	P	V
5785MHz		17355	46.04	-22.16	68.2	38.9	42.24	20.84	55.94	100	0	P	V
													V
													V
		11650	44.3	-29.7	74	45.11	39.11	17.16	57.08	100	0	P	H
		17475	45.88	-22.32	68.2	38.89	42.05	20.93	55.99	100	0	P	H
802.11n													H
HT20													H
CH 165		11650	44.83	-29.17	74	45.64	39.11	17.16	57.08	100	0	P	V
5825MHz		17475	47.19	-21.01	68.2	40.2	42.05	20.93	55.99	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 4 5725~5850MHz

WIFI 802.11n HT40 (Band Edge @ 3m)

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		5600	51.01	-17.19	68.2	39.63	34.6	11.89	35.11	380	121	P	H
		5692	50.28	-49.02	99.3	38.82	34.6	12	35.14	380	121	P	H
		5718.4	52.82	-57.53	110.35	41.3	34.6	12.06	35.14	380	121	P	H
		5724.4	55.7	-65.13	120.83	44.18	34.6	12.06	35.14	380	121	P	H
	*	5755	99.06	-	-	87.5	34.6	12.11	35.15	380	121	P	H
	*	5755	92.16	-	-	80.6	34.6	12.11	35.15	380	121	A	H
		5854.6	50.24	-61.47	111.71	38.53	34.6	12.28	35.17	380	121	P	H
		5863.2	49.96	-58.54	108.5	38.15	34.6	12.39	35.18	380	121	P	H
		5923.2	50.25	-19.28	69.53	38.33	34.6	12.51	35.19	380	121	P	H
		5946	48.74	-19.46	68.2	36.72	34.6	12.62	35.2	380	121	P	H
802.11n													H
HT40													H
CH 151		5605.6	53.33	-14.87	68.2	41.96	34.6	11.89	35.12	257	185	P	V
5755MHz		5699.6	54.31	-50.6	104.91	42.85	34.6	12	35.14	257	185	P	V
		5718.8	57.63	-52.83	110.46	46.11	34.6	12.06	35.14	257	185	P	V
		5724.6	58.51	-62.78	121.29	46.99	34.6	12.06	35.14	257	185	P	V
	*	5755	104.76	-	-	93.2	34.6	12.11	35.15	257	185	P	V
	*	5755	98.06	-	-	86.5	34.6	12.11	35.15	257	185	A	V
		5854.2	51.06	-61.56	112.62	39.35	34.6	12.28	35.17	257	185	P	V
		5871	53.05	-53.27	106.32	41.24	34.6	12.39	35.18	257	185	P	V
		5918.2	54.64	-18.57	73.21	42.72	34.6	12.51	35.19	257	185	P	V
		5926.2	50.39	-17.81	68.2	38.47	34.6	12.51	35.19	257	185	P	V
													V
													V

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		5634.6	50.83	-17.37	68.2	39.41	34.6	11.95	35.13	374	119	P	H
		5691.2	49.67	-49.04	98.71	38.21	34.6	12	35.14	374	119	P	H
		5701.6	50.25	-55.4	105.65	38.73	34.6	12.06	35.14	374	119	P	H
		5724.6	50.89	-70.4	121.29	39.37	34.6	12.06	35.14	374	119	P	H
	*	5795	99.94	-	-	88.33	34.6	12.17	35.16	374	119	P	H
	*	5795	91.81	-	-	80.2	34.6	12.17	35.16	374	119	A	H
		5850.4	48.82	-72.47	121.29	37.11	34.6	12.28	35.17	374	119	P	H
		5872.4	50	-55.93	105.93	38.19	34.6	12.39	35.18	374	119	P	H
		5905	50	-32.96	82.96	38.08	34.6	12.51	35.19	374	119	P	H
		5931	50.98	-17.22	68.2	39.06	34.6	12.51	35.19	374	119	P	H
802.11n													H
HT40													H
CH 159		5634.8	54.52	-13.68	68.2	43.1	34.6	11.95	35.13	264	186	P	V
5795MHz		5654.4	52.85	-18.62	71.47	41.43	34.6	11.95	35.13	264	186	P	V
		5713	53.99	-54.85	108.84	42.47	34.6	12.06	35.14	264	186	P	V
		5723.2	53.39	-64.71	118.1	41.87	34.6	12.06	35.14	264	186	P	V
	*	5795	105.91	-	-	94.3	34.6	12.17	35.16	264	186	P	V
	*	5795	98.11	-	-	86.5	34.6	12.17	35.16	264	186	A	V
		5853.2	51.91	-62.99	114.9	40.2	34.6	12.28	35.17	264	186	P	V
		5855.6	52.75	-57.88	110.63	41.04	34.6	12.28	35.17	264	186	P	V
		5922.4	51.82	-18.3	70.12	39.9	34.6	12.51	35.19	264	186	P	V
		5940.2	52.33	-15.87	68.2	40.31	34.6	12.62	35.2	264	186	P	V
													V
													V

Remark

1. No other spurious found.
2. All results are PASS against Peak and Average limit line.

Band 4 5725~5850MHz

WIFI 802.11n HT40 (Harmonic @ 3m)

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		11510	45.7	-28.3	74	46.54	39.3	17.16	57.3	100	0	P	H
		17265	45.08	-23.12	68.2	37.83	42.37	20.79	55.91	100	0	P	H
802.11n													H
HT40													H
CH 151		11510	44.16	-29.84	74	45	39.3	17.16	57.3	100	0	P	V
5755MHz		17265	47.84	-20.36	68.2	40.59	42.37	20.79	55.91	100	0	P	V
													V
													V
		11590	41.74	-32.26	74	42.56	39.18	17.16	57.16	100	0	P	H
		17385	46.03	-22.17	68.2	38.92	42.19	20.87	55.95	100	0	P	H
802.11n													H
HT40													H
CH 159		11590	42.95	-31.05	74	43.77	39.18	17.16	57.16	100	0	P	V
5795MHz		17385	46.13	-22.07	68.2	39.02	42.19	20.87	55.95	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Band 4 5725~5850MHz

WIFI 802.11ac VHT80 (Band Edge @ 3m)

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBµV/m)	Over Limit (dB)	Limit Line (dBµV/m)	Read Level (dBµV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		5638.2	51.31	-16.89	68.2	39.89	34.6	11.95	35.13	380	120	P	H
		5699.6	52.78	-52.13	104.91	41.32	34.6	12	35.14	380	120	P	H
		5719	54.58	-55.94	110.52	43.06	34.6	12.06	35.14	380	120	P	H
		5724.2	56.62	-63.76	120.38	45.1	34.6	12.06	35.14	380	120	P	H
	*	5775	96.16	-	-	84.61	34.6	12.11	35.16	380	120	P	H
	*	5775	90.36	-	-	78.81	34.6	12.11	35.16	380	120	A	H
		5855	56.51	-54.29	110.8	44.8	34.6	12.28	35.17	380	120	P	H
		5855.2	56.98	-53.76	110.74	45.27	34.6	12.28	35.17	380	120	P	H
		5875.6	50.08	-54.67	104.75	38.27	34.6	12.39	35.18	380	120	P	H
		5936.4	49.89	-18.31	68.2	37.98	34.6	12.51	35.2	380	120	P	H
802.11ac													H
VHT80													H
CH 155		5628.8	53.41	-14.79	68.2	41.99	34.6	11.95	35.13	278	186	P	V
5775MHz		5692.6	57.48	-42.26	99.74	46.02	34.6	12	35.14	278	186	P	V
		5714.2	61.31	-47.87	109.18	49.79	34.6	12.06	35.14	278	186	P	V
		5723.6	60.66	-58.35	119.01	49.14	34.6	12.06	35.14	278	186	P	V
	*	5775	103.76	-	-	92.21	34.6	12.11	35.16	278	186	P	V
	*	5775	96.96	-	-	85.41	34.6	12.11	35.16	278	186	A	V
		5851	59.57	-60.35	119.92	47.86	34.6	12.28	35.17	278	186	P	V
		5855.2	58.11	-52.63	110.74	46.4	34.6	12.28	35.17	278	186	P	V
		5875	53.98	-51.22	105.2	42.17	34.6	12.39	35.18	278	186	P	V
		5940.4	50.57	-17.63	68.2	38.55	34.6	12.62	35.2	278	186	P	V
													V
													V

Remark

1. No other spurious found.
2. All results are PASS against Peak and Average limit line.

Band 4 5725~5850MHz

WIFI 802.11ac VHT80 (Harmonic @ 3m)

WIFI Ant. 1+2	Note	Frequency (MHz)	Level (dBμV/m)	Over Limit (dB)	Limit Line (dBμV/m)	Read Level (dBμV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamp Factor (dB)	Ant Pos (cm)	Table Pos (deg)	Peak Avg. (P/A)	Pol. (H/V)
		11550	44.31	-29.69	74	45.14	39.23	17.16	57.22	100	0	P	H
		17325	46.54	-21.66	68.2	39.37	42.29	20.81	55.93	100	0	P	H
802.11ac													H
VHT80													H
CH 155		11550	44.86	-29.14	74	45.69	39.23	17.16	57.22	100	0	P	V
5775MHz		17325	46.88	-21.32	68.2	39.71	42.29	20.81	55.93	100	0	P	V
													V
													V
Remark	1. No other spurious found. 2. All results are PASS against Peak and Average limit line.												

Emission below 1GHz

5GHz WIFI 802.11n HT20 (LF @ 3m)

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1+2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
		30	34.65	-5.35	40	38.93	26	1.07	31.35	-	-	P	H
		76.71	36.89	-3.11	40	53.71	13.46	1.28	31.56	100	0	P	H
		154.74	26.75	-16.75	43.5	39.12	17.35	1.78	31.5	-	-	P	H
		456.1	28.33	-17.67	46	33.3	23.23	2.89	31.09	-	-	P	H
		743.8	29.82	-16.18	46	29.55	27.11	3.82	30.66	-	-	P	H
		939.8	33.43	-12.57	46	29.88	29.96	4.12	30.53	-	-	P	H
													H
													H
													H
													H
5GHz													H
802.11n													H
HT20		30	29.66	-10.34	40	33.94	26	1.07	31.35	-	-	P	V
LF		52.14	30.88	-9.12	40	46.93	14.48	1.07	31.6	-	-	P	V
		76.71	32.08	-7.92	40	48.9	13.46	1.28	31.56	100	0	P	V
		442.1	25.77	-20.23	46	31	22.99	2.89	31.11	-	-	P	V
		652.1	28.94	-17.06	46	30.22	25.92	3.57	30.77	-	-	P	V
		977.6	33.54	-20.46	54	29.73	30.26	4.07	30.52	-	-	P	V
													V
													V
													V
													V
													V
													V

Remark

1. No other spurious found.
2. All results are PASS against limit line.

Note symbol

*	**Fundamental Frequency** which can be ignored. However, the level of any unwanted emissions shall not exceed the level of the fundamental frequency.
!	Test result is **over limit** line.
P/A	**P**eak or **A**verage
H/V	**H**orizontal or **V**ertical

A calculation example for radiated spurious emission is shown as below:

WIFI	Note	Frequency	Level	Over	Limit	Read	Antenna	Cable	Preamp	Ant	Table	Peak	Pol.
Ant.				Limit	Line	Level	Factor	Loss	Factor	Pos	Pos	Avg.	
1+2		(MHz)	(dBμV/m)	(dB)	(dBμV/m)	(dBμV)	(dB/m)	(dB)	(dB)	(cm)	(deg)	(P/A)	(H/V)
802.11b CH 01 2412MHz		2390	55.45	-18.55	74	54.51	32.22	4.58	35.86	103	308	P	H
		2390	43.54	-10.46	54	42.6	32.22	4.58	35.86	103	308	A	H

1. Level(dBμV/m) =

Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

2. Over Limit(dB) = Level(dBμV/m) – Limit Line(dBμV/m)

For Peak Limit @ 2390MHz:

1. Level(dBμV/m)

= Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

= 32.22(dB/m) + 4.58(dB) + 54.51(dBμV) – 35.86 (dB)

= 55.45 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 55.45(dBμV/m) – 74(dBμV/m)

= -18.55(dB)

For Average Limit @ 2390MHz:

1. Level(dBμV/m)

= Antenna Factor(dB/m) + Cable Loss(dB) + Read Level(dBμV) - Preamp Factor(dB)

= 32.22(dB/m) + 4.58(dB) + 42.6(dBμV) – 35.86 (dB)

= 43.54 (dBμV/m)

2. Over Limit(dB)

= Level(dBμV/m) – Limit Line(dBμV/m)

= 43.54(dBμV/m) – 54(dBμV/m)

= -10.46(dB)

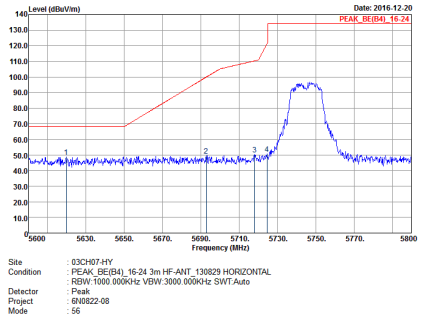
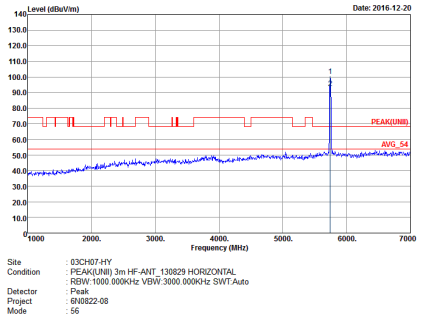
Both peak and average measured complies with the limit line, so test result is "PASS".

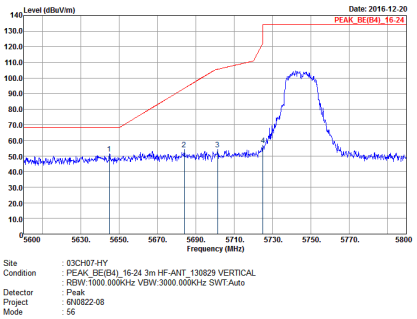
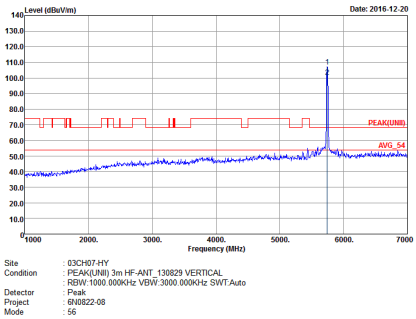
Appendix B. Radiated Spurious Emission Plots

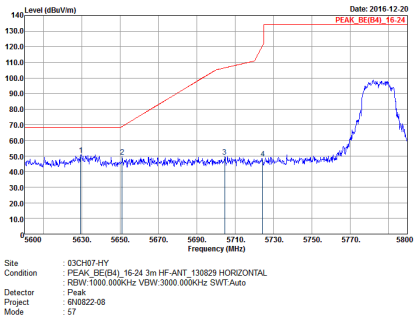
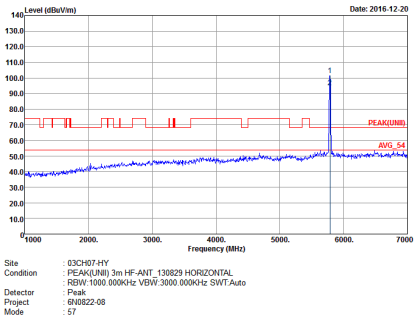
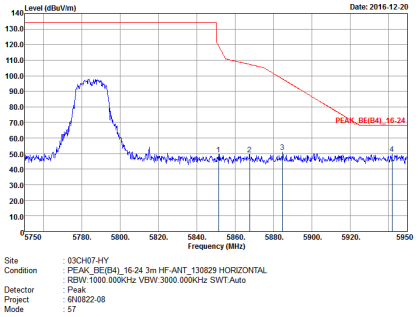
Test Engineer :	Jesse Wang, James Chiu, and Daniel Lee	Temperature :	22~24°C
		Relative Humidity :	46~49%

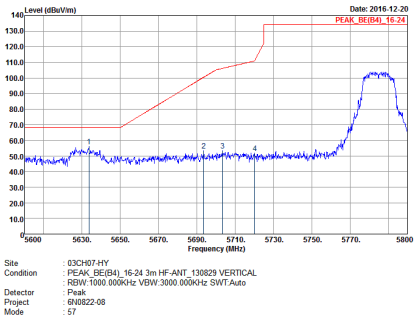
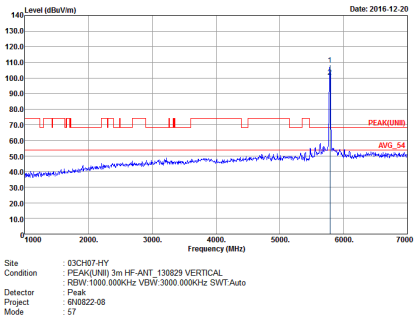
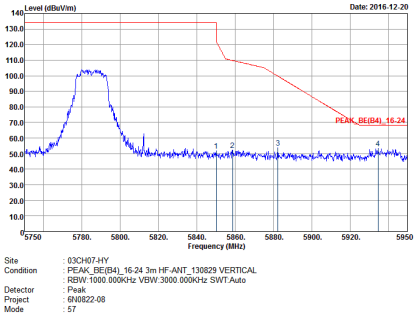
Band 4 - 5725~5850MHz

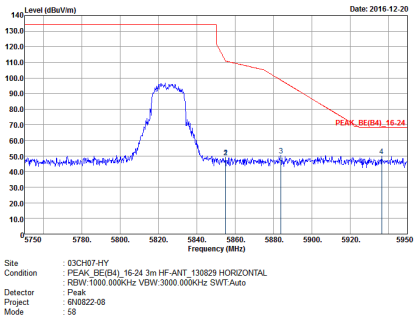
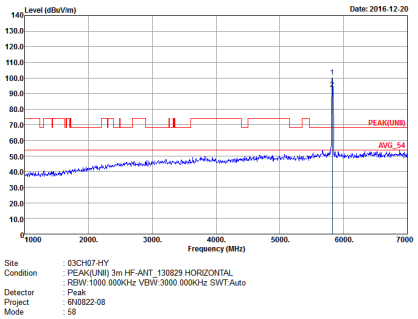
WIFI 802.11a (Band Edge @ 3m)

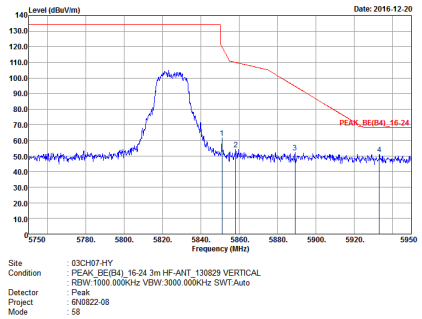
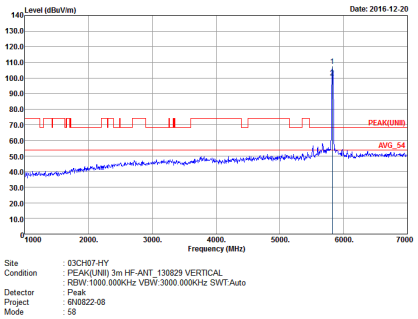
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH149 5745MHz	
1	Horizontal	Fundamental
Peak		

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH149 5745MHz	
1	Vertical	Fundamental
Peak		

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH157 5785MHz	
1	Horizontal	Fundamental
Peak		
Peak		Left blank

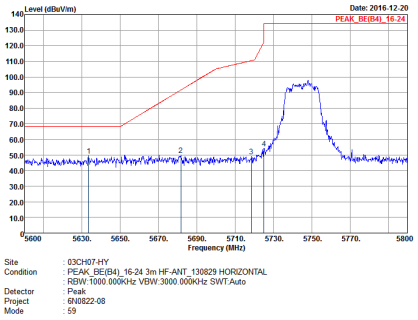
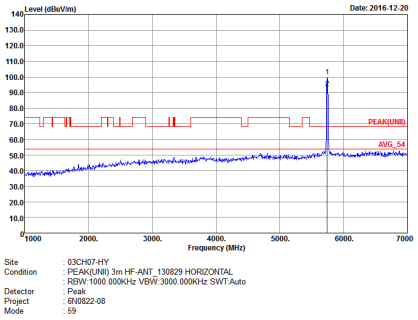
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH157 5785MHz	
1	Vertical	Fundamental
Peak		
Peak		Left blank

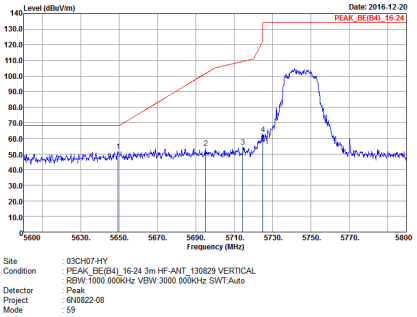
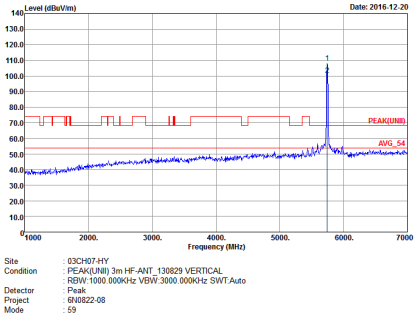
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH165 5825MHz	
1	Horizontal	Fundamental
Peak		

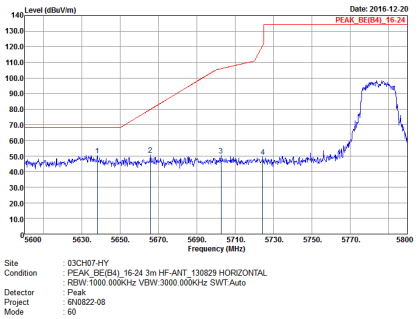
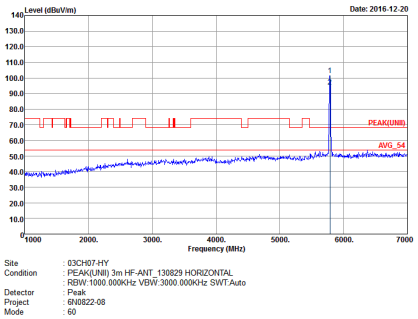
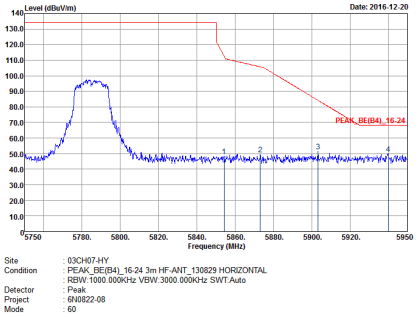
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11a CH165 5825MHz	
1	Vertical	Fundamental
Peak		

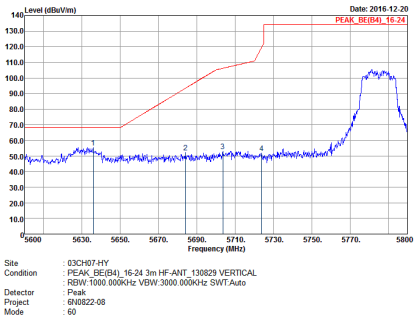
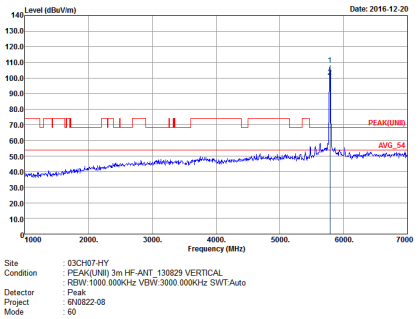
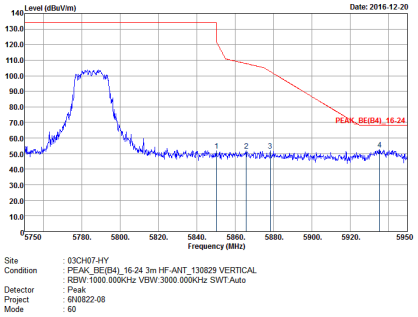
Band 4 5725~5850MHz

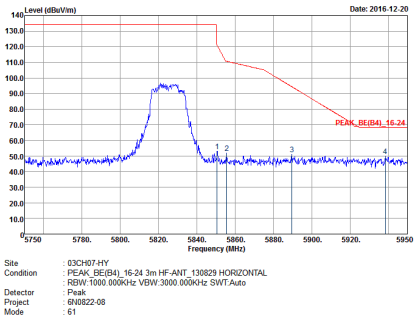
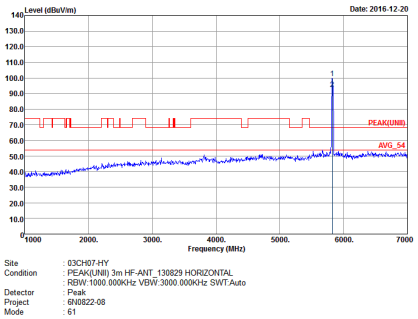
WIFI 802.11n HT20 (Band Edge @ 3m)

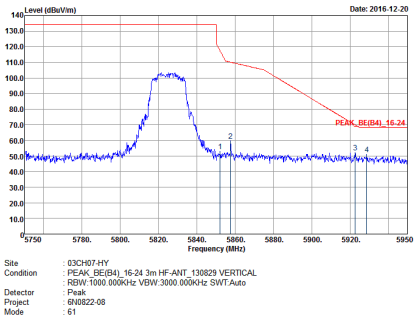
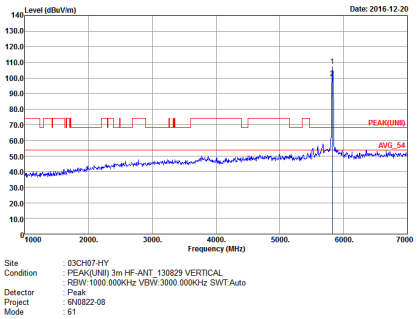
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH149 5745MHz	
1	Horizontal	Fundamental
Peak		

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH149 5745MHz	
1	Vertical	Fundamental
Peak		

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
1	Horizontal	Fundamental
Peak		
Peak		Left blank

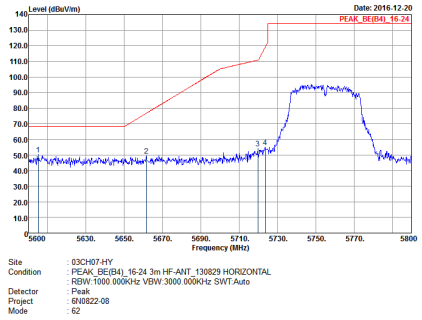
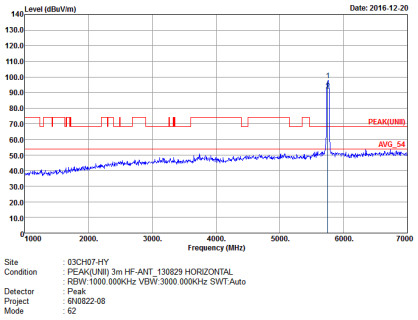
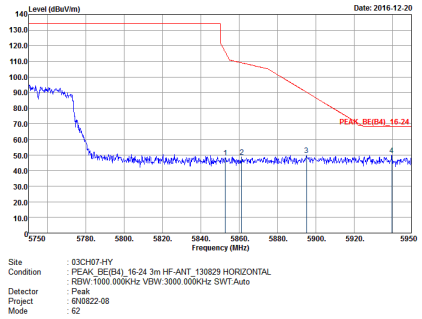
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
1	Vertical	Fundamental
Peak		
Peak		Left blank

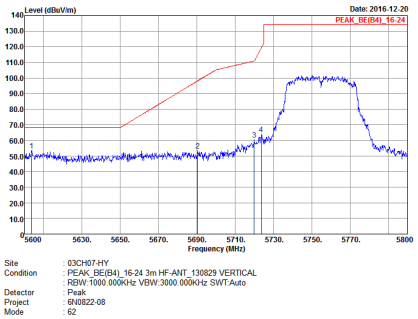
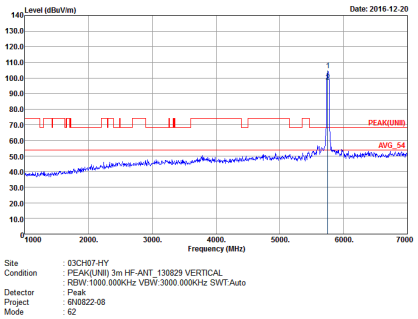
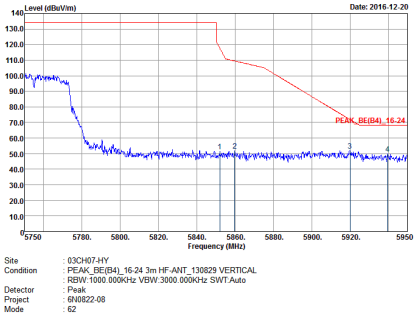
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH165 5825MHz	
1	Horizontal	Fundamental
Peak		

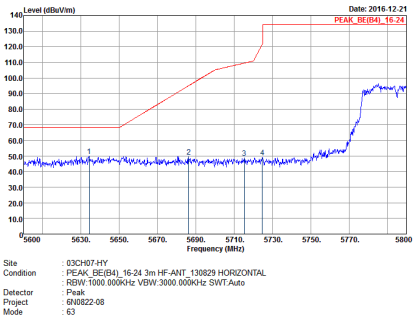
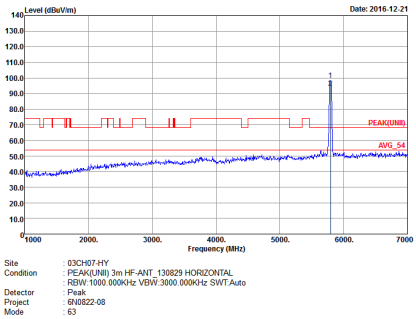
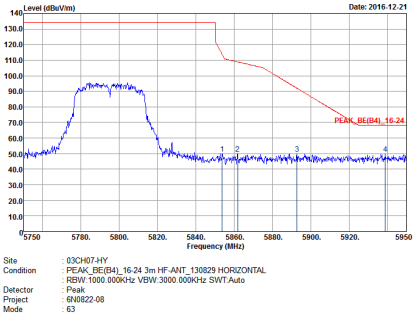
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH165 5825MHz	
1	Vertical	Fundamental
Peak		

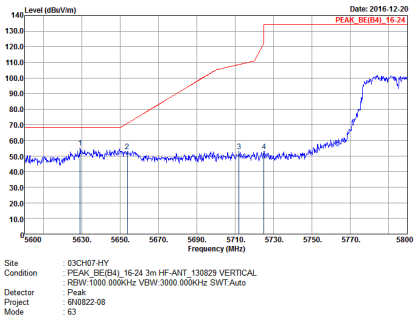
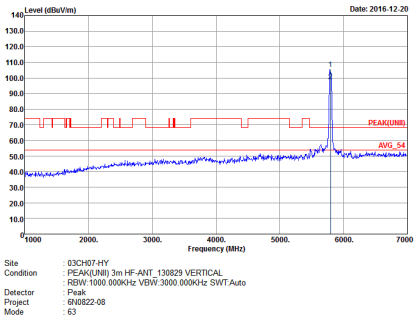
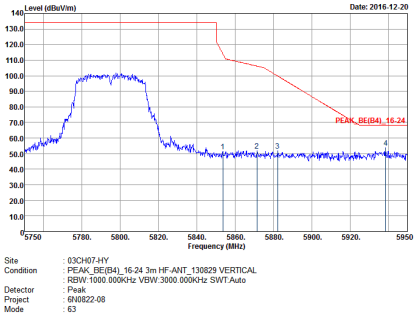
Band 4 5725~5850MHz

WIFI 802.11n HT40 (Band Edge @ 3m)

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH151 5755MHz	
1	Horizontal	Fundamental
Peak		
Peak		Left blank

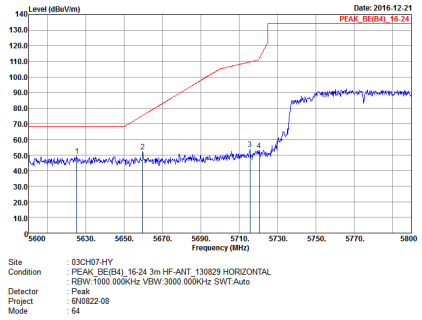
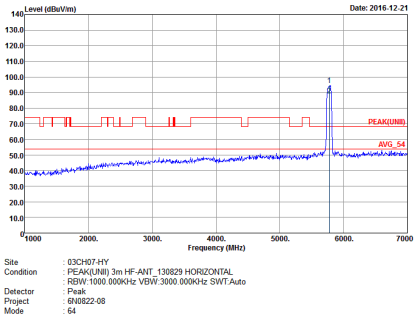
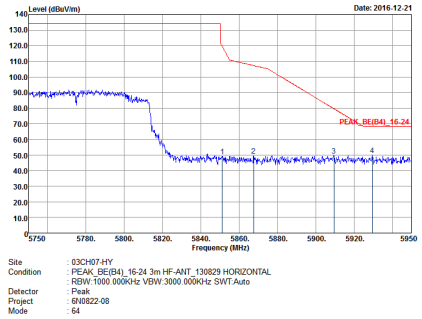
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH151 5755MHz	
1	Vertical	Fundamental
Peak		
Peak		Left blank

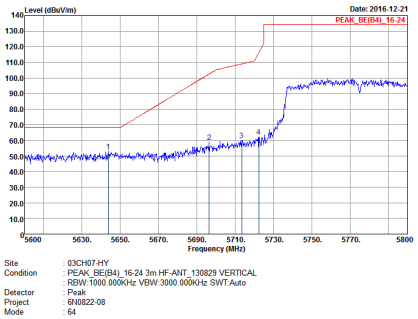
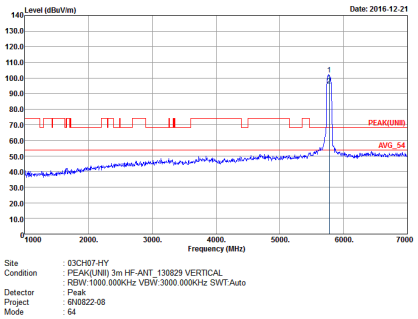
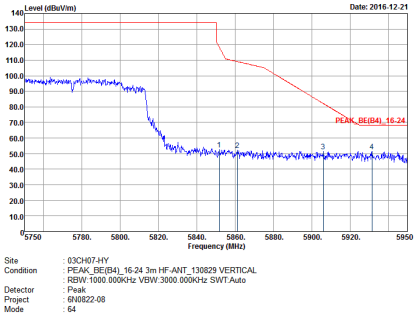
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH159 5795MHz	
1	Horizontal	Fundamental
Peak		
Peak		Left blank

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH159 5795MHz	
1	Vertical	Fundamental
Peak		
Peak		Left blank

Band 4 5725~5850MHz

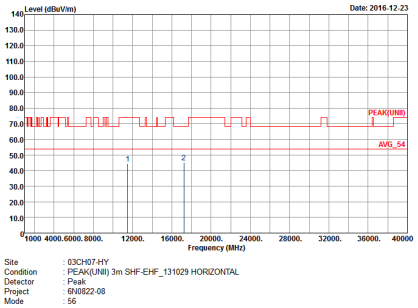
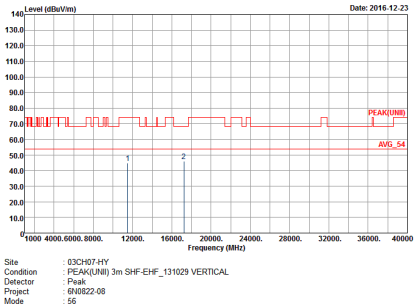
WIFI 802.11ac VHT80 (Band Edge @ 3m)

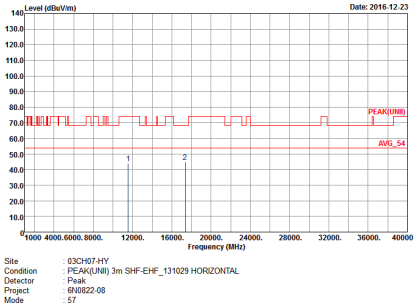
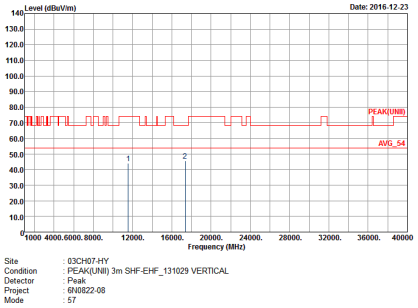
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH155 5775MHz	
1	Horizontal	Fundamental
Peak		
Peak		Left blank

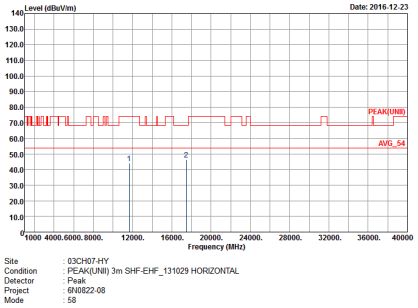
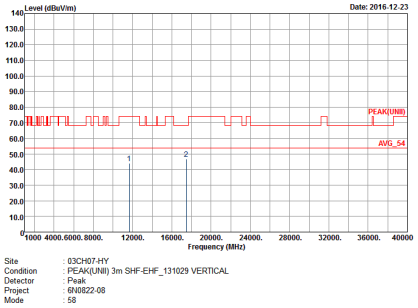
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH155 5775MHz	
1	Vertical	Fundamental
Peak		
Peak		Left blank

Band 4 - 5725~5850MHz

WIFI 802.11a (Harmonic @ 3m)

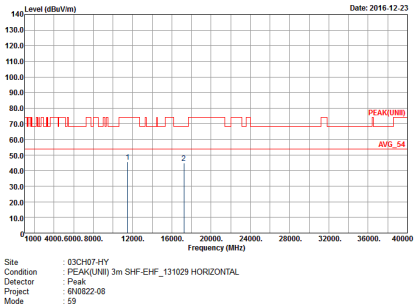
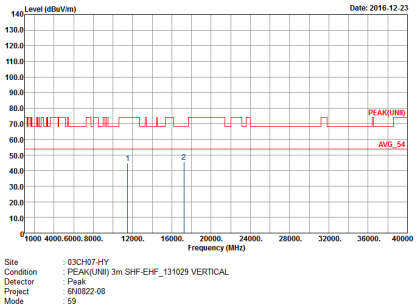
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH149 5745MHz	
1	Horizontal	Vertical
Peak Avg.		

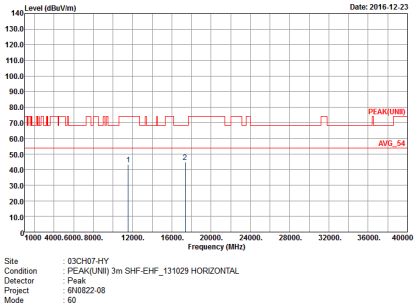
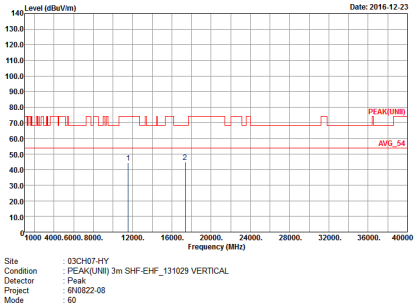
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH157 5785MHz	
1	Horizontal	Vertical
Peak Avg.		

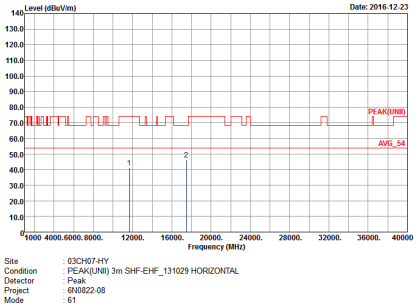
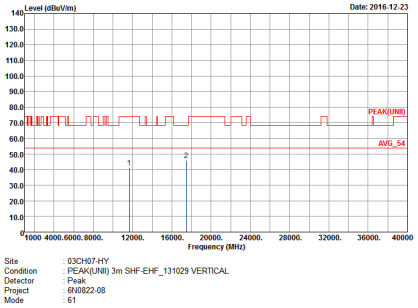
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11a CH165 5825MHz	
1	Horizontal	Vertical
Peak Avg.		

Band 4 5725~5850MHz

WIFI 802.11n HT20 (Harmonic @ 3m)

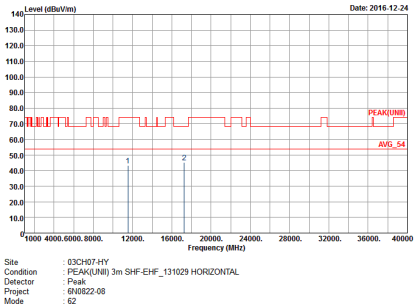
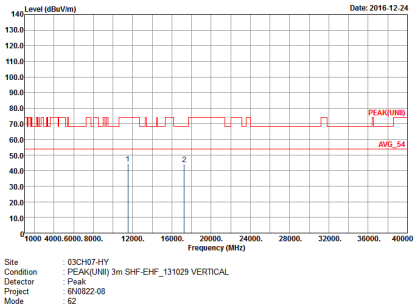
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT20 CH149 5745MHz	
1	Horizontal	Vertical
Peak Avg.		

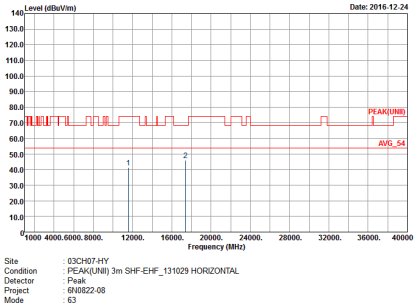
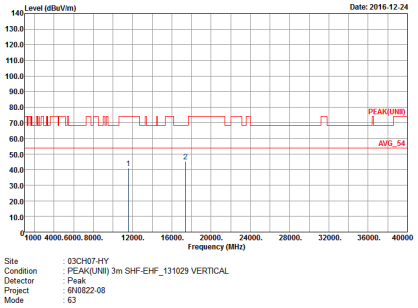
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
1	Horizontal	Vertical
Peak Avg.		

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT20 CH165 5825MHz	
1	Horizontal	Vertical
Peak Avg.		

Band 4 5725~5850MHz

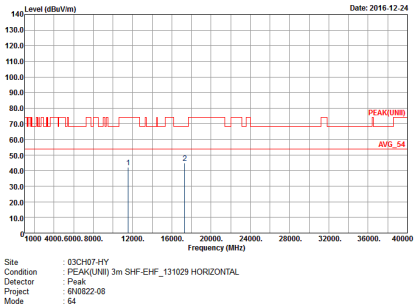
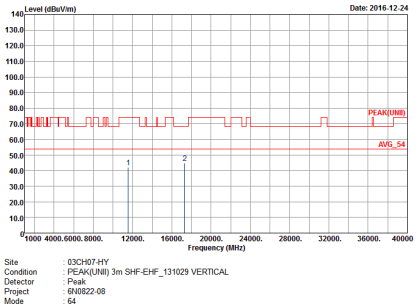
WIFI 802.11n HT40 (Harmonic @ 3m)

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT40 CH151 5755MHz	
1	Horizontal	Vertical
Peak Avg.		

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT40 CH159 5795MHz	
1	Horizontal	Vertical
Peak Avg.		

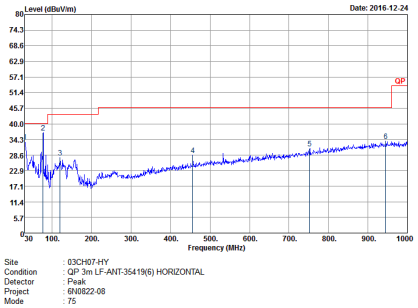
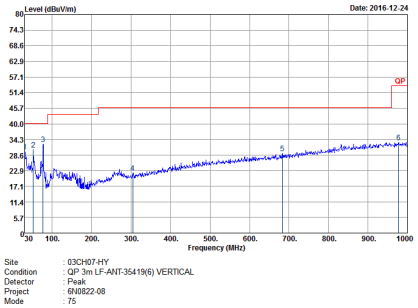
Band 4 5725~5850MHz

WIFI 802.11ac VHT80 (Harmonic @ 3m)

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11ac VHT80 CH155 5775MHz	
1	Horizontal	Vertical
Peak Avg.		

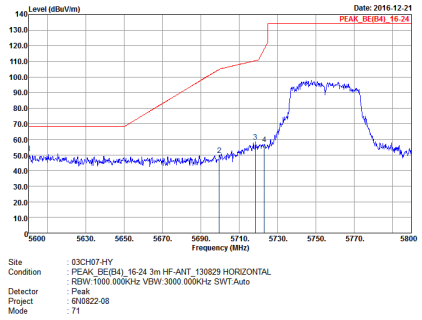
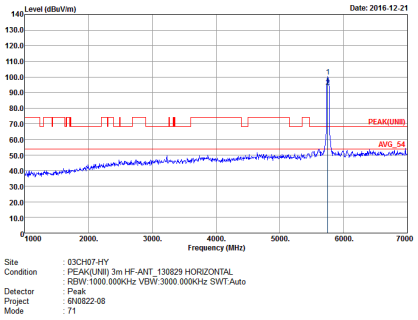
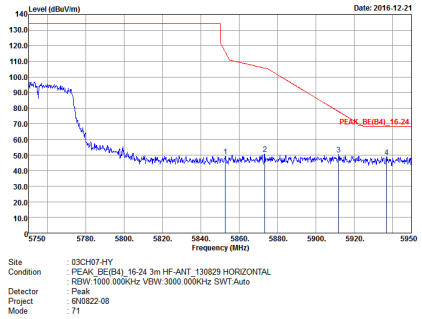
Emission below 1GHz

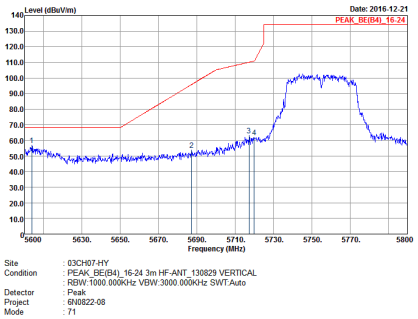
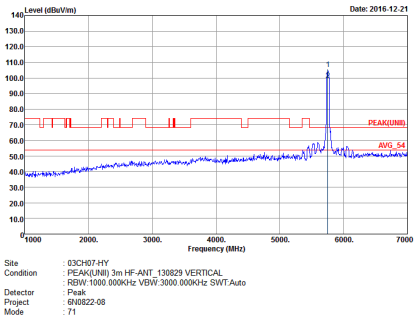
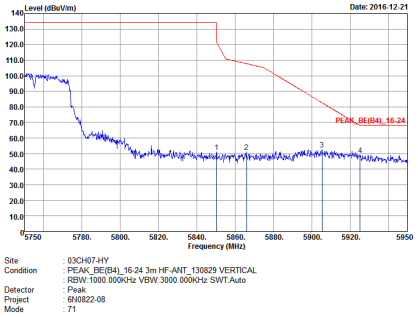
5GHz WIFI 802.11a (LF)

WIFI	5GHz 5725~5850MHz	
ANT	802.11a LF	
1	Horizontal	Vertical
QP / Peak		

Band 4 - 5725~5850MHz

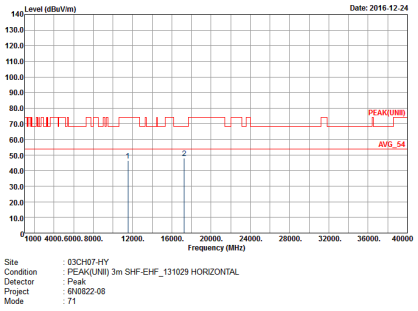
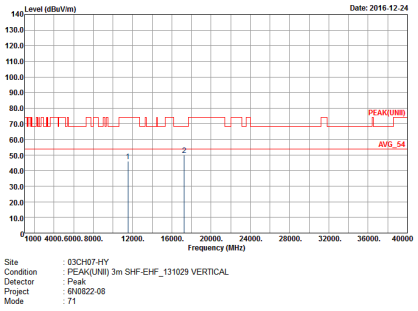
WIFI 802.11n HT40 (Band Edge @ 3m)

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH151 5755MHz	
2	Horizontal	Fundamental
Peak		
Peak		Left blank

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH151 5755MHz	
2	Vertical	Fundamental
Peak		
Peak		Left blank

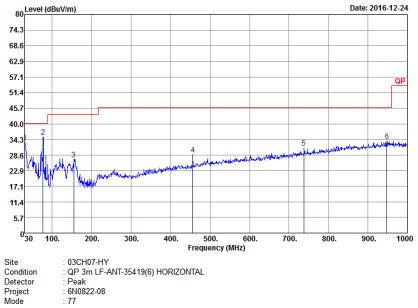
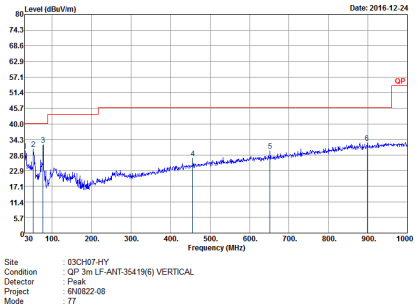
Band 4 - 5725~5850MHz

WIFI 802.11n HT40 (Harmonic @ 3m)

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT40 CH151 5755MHz	
2	Horizontal	Vertical
Peak Avg.		

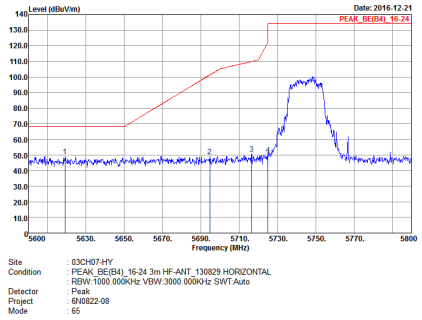
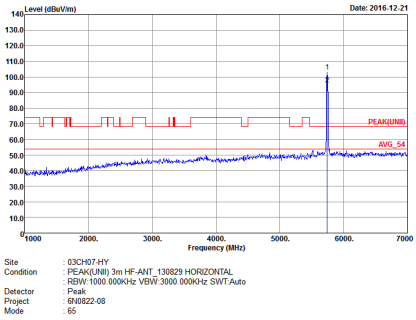
Emission below 1GHz

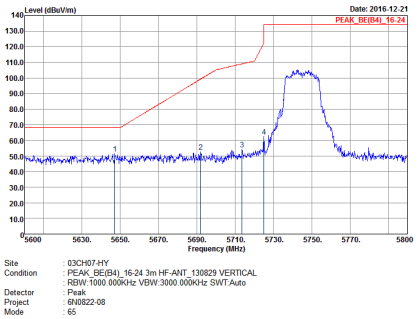
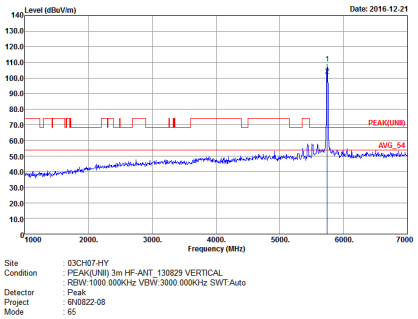
5GHz WIFI 802.11n HT40 (LF)

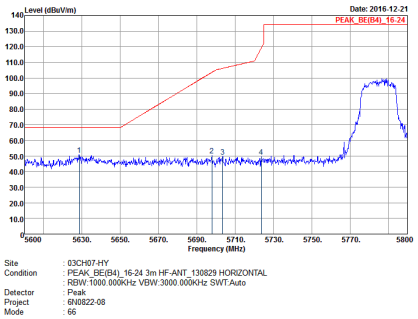
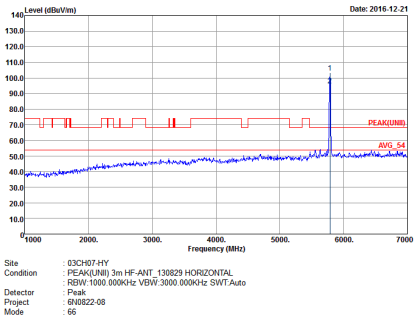
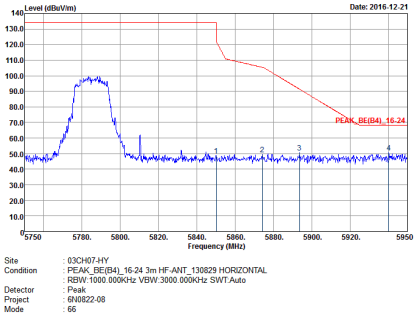
WIFI	5GHz 5725~5850MHz	
ANT	802.11n HT40 LF	
2	Horizontal	Vertical
QP / Peak		

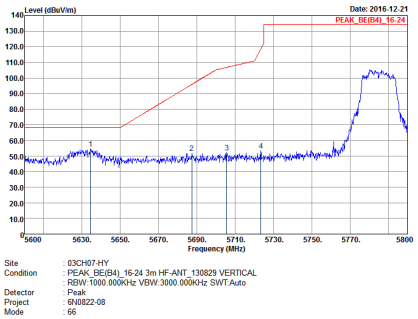
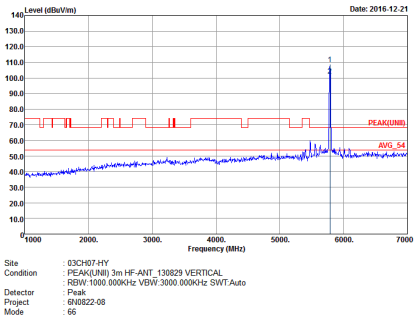
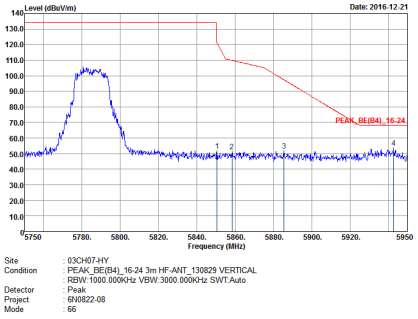
Band 4 - 5725~5850MHz

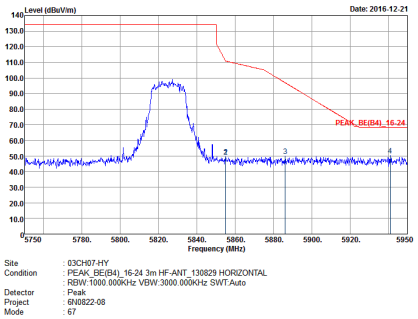
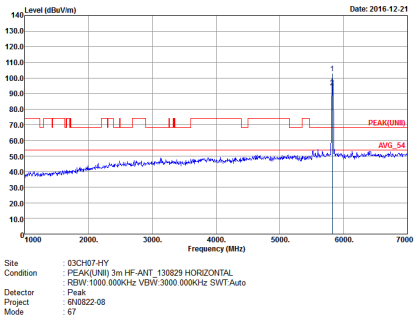
WIFI 802.11n HT20 (Band Edge @ 3m)

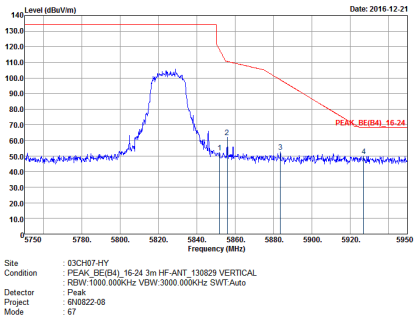
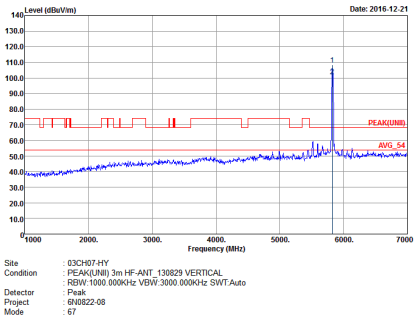
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH149 5745MHz	
1+2	Horizontal	Fundamental
Peak		

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH149 5745MHz	
1+2	Vertical	Fundamental
Peak		

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
1+2	Horizontal	Fundamental
Peak		
Peak		Left blank

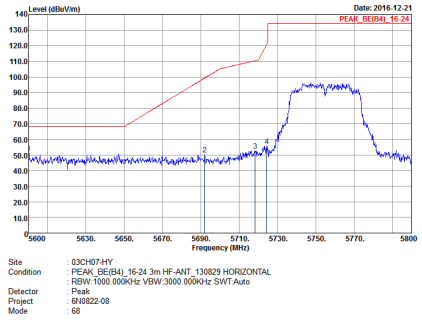
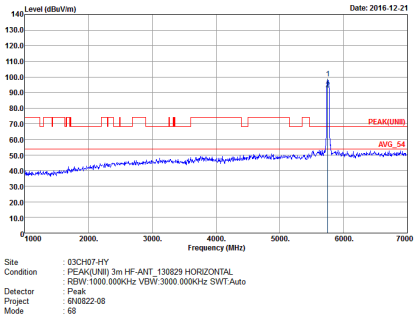
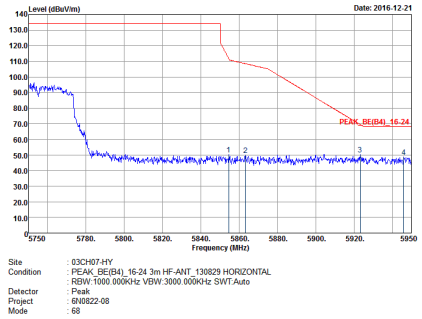
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
1+2	Vertical	Fundamental
Peak		
Peak		Left blank

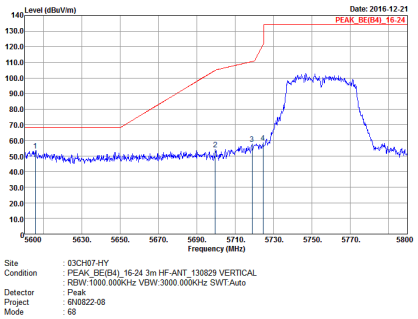
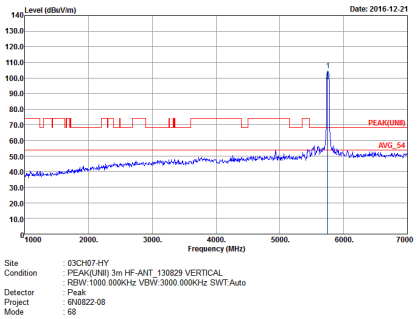
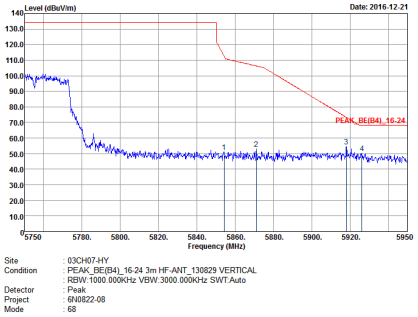
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH165 5825MHz	
1+2	Horizontal	Fundamental
Peak		

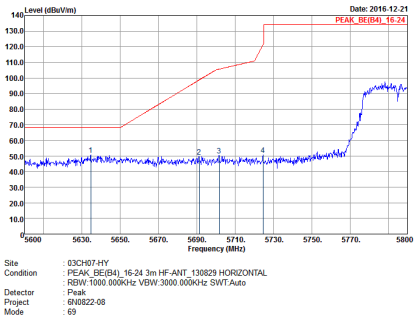
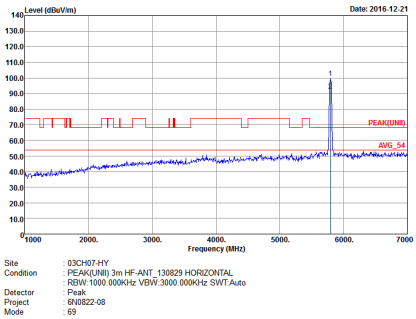
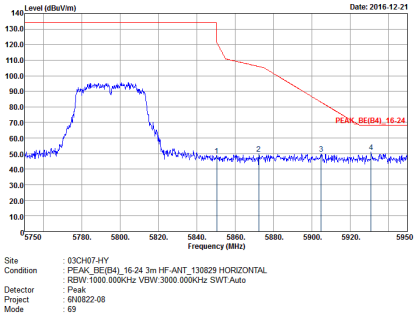
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT20 CH165 5825MHz	
1+2	Vertical	Fundamental
Peak		

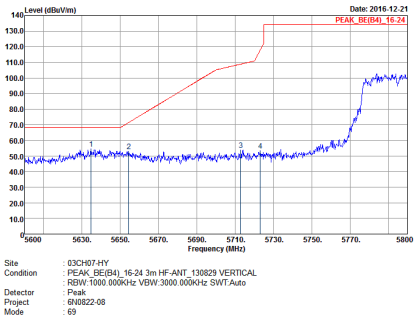
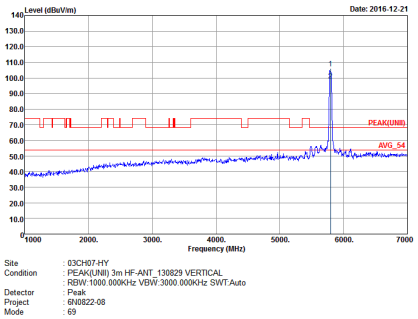
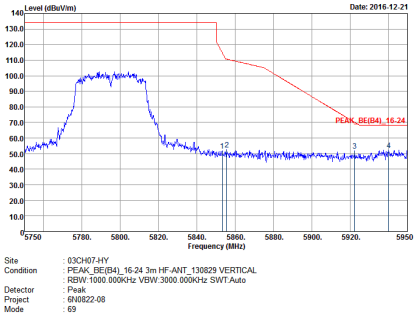
Band 4 5725~5850MHz

WIFI 802.11n HT40 (Band Edge @ 3m)

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH151 5755MHz	
1+2	Horizontal	Fundamental
Peak		
Peak		Left blank

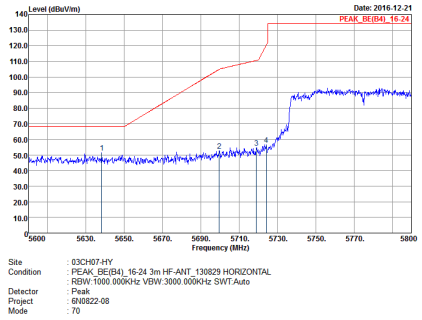
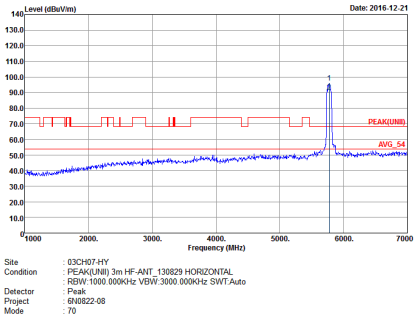
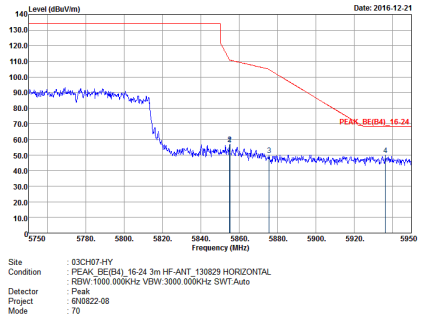
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH151 5755MHz	
1+2	Vertical	Fundamental
Peak		
Peak		Left blank

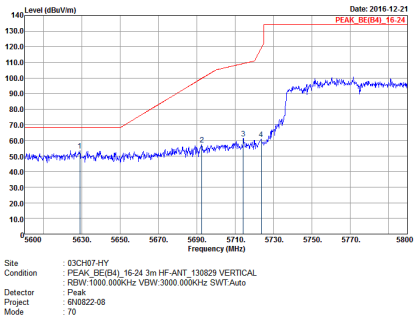
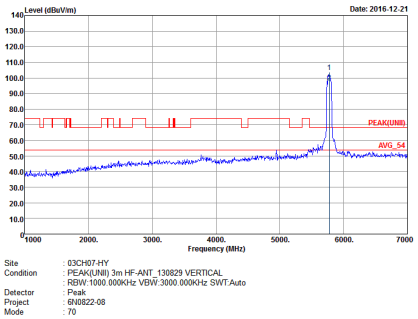
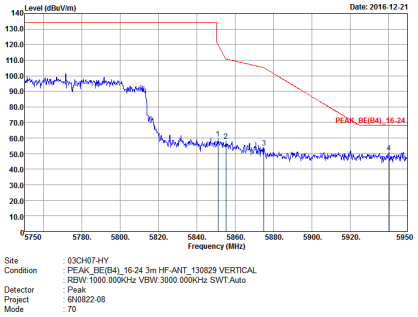
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH159 5795MHz	
1+2	Horizontal	Fundamental
Peak		
Peak		Left blank

WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11n HT40 CH159 5795MHz	
1+2	Vertical	Fundamental
Peak		
Peak		Left blank

Band 4 5725~5850MHz

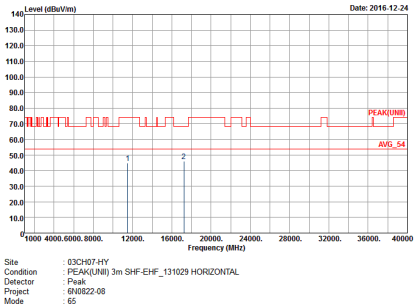
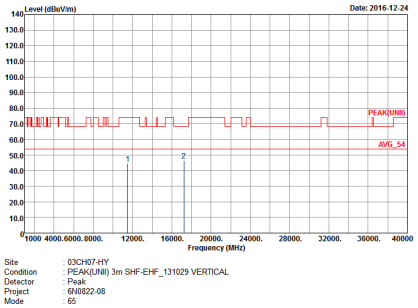
WIFI 802.11ac VHT80 (Band Edge @ 3m)

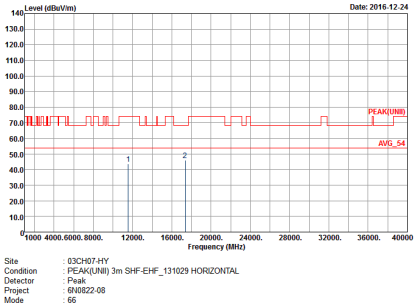
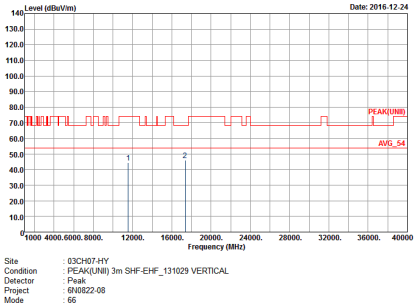
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH155 5775MHz	
1+2	Horizontal	Fundamental
Peak		
Peak		Left blank

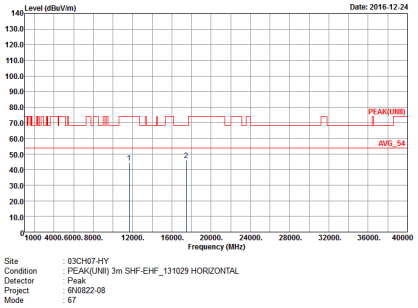
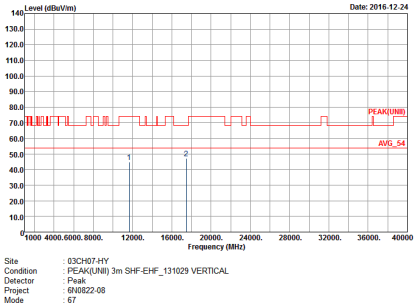
WIFI	Band 4 5725~5850MHz Band Edge @ 3m	
ANT	802.11ac VHT80 CH155 5775MHz	
1+2	Vertical	Fundamental
Peak		
Peak		Left blank

Band 4 - 5725~5850MHz

WIFI 802.11n HT20 (Harmonic @ 3m)

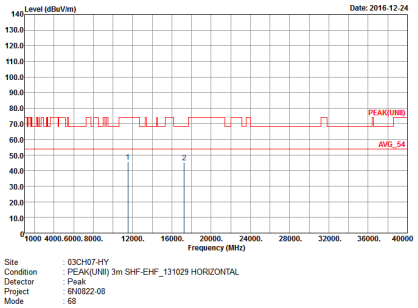
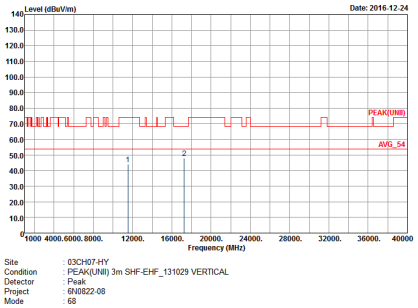
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT20 CH149 5745MHz	
1+2	Horizontal	Vertical
Peak Avg.		

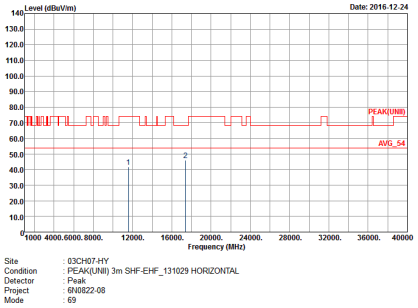
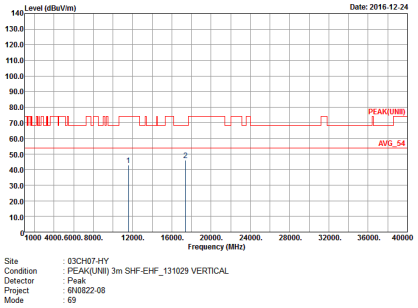
WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT20 CH157 5785MHz	
1+2	Horizontal	Vertical
Peak Avg.		

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT20 CH165 5825MHz	
1+2	Horizontal	Vertical
Peak Avg.		

Band 4 5725~5850MHz

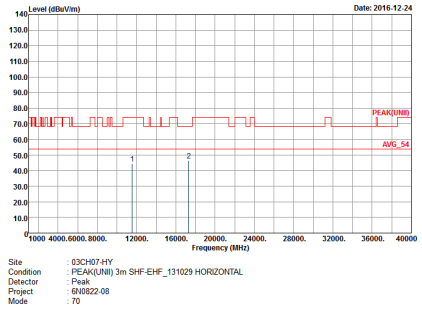
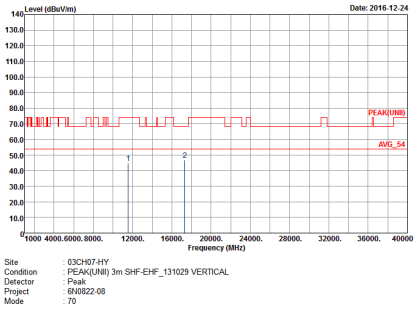
WIFI 802.11n HT40 (Harmonic @ 3m)

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT40 CH151 5755MHz	
1+2	Horizontal	Vertical
Peak Avg.		

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11n HT40 CH159 5795MHz	
1+2	Horizontal	Vertical
Peak Avg.		

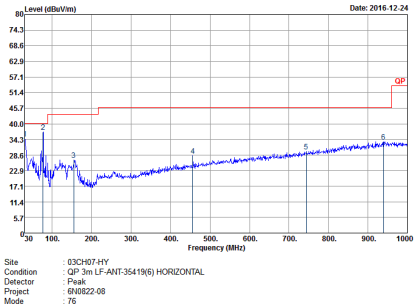
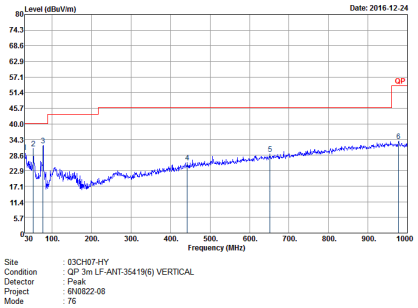
Band 4 5725~5850MHz

WIFI 802.11ac VHT80 (Harmonic @ 3m)

WIFI	Band 4 5725~5850MHz Harmonic @ 3m	
ANT	802.11ac VHT80 CH155 5775MHz	
1+2	Horizontal	Vertical
Peak Avg.		

Emission below 1GHz

5GHz WIFI 802.11n HT20 (LF)

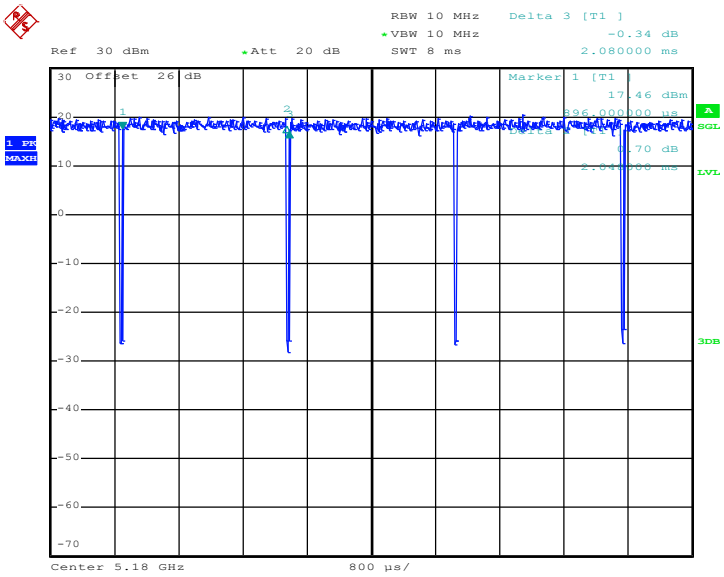
WIFI	5GHz 5725~5850MHz	
ANT	802.11n HT20 LF	
1+2	Horizontal	Vertical
QP / Peak		

Appendix C. Duty Cycle Plots

Antenna	Band	Duty Cycle(%)	T(us)	1/T(kHz)	VBW Setting
1	802.11a	98.46	-	-	10Hz
1	5GHz 802.11n HT20	97.95	1915.00	0.52	1kHz
1	5GHz 802.11n HT40	96.91	940.00	1.06	3kHz
1	5GHz 802.11n VHT80	93.83	456.00	2.19	3kHz
2	802.11a	98.09	-	-	10Hz
2	5GHz 802.11n HT20	98.21	-	-	10Hz
2	5GHz 802.11n HT40	95.88	930.00	1.08	3kHz
2	5GHz 802.11n VHT80	92.68	456.00	2.19	3kHz
1+2	5GHz 802.11n HT20 for Ant 1	96.08	980.00	1.02	3kHz
1+2	5GHz 802.11n HT40 for Ant 1	93.10	486.00	2.06	3kHz
1+2	5GHz 802.11n VHT80 for Ant 1	87.67	256.00	3.90	10kHz
1+2	5GHz 802.11n HT20 for Ant 2	95.12	975.00	1.03	3kHz
1+2	5GHz 802.11n HT40 for Ant 2	92.05	486.00	2.06	3kHz
1+2	5GHz 802.11n VHT80 for Ant 2	86.30	252.00	3.97	10kHz

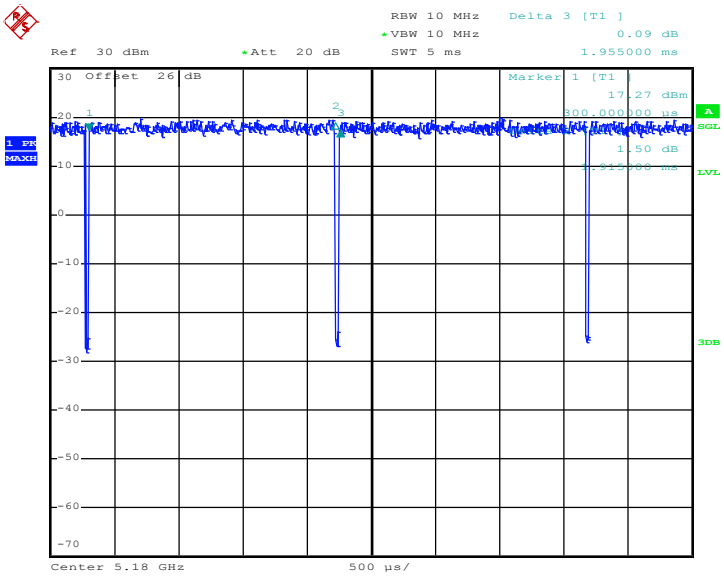
<Ant. 1>

802.11a



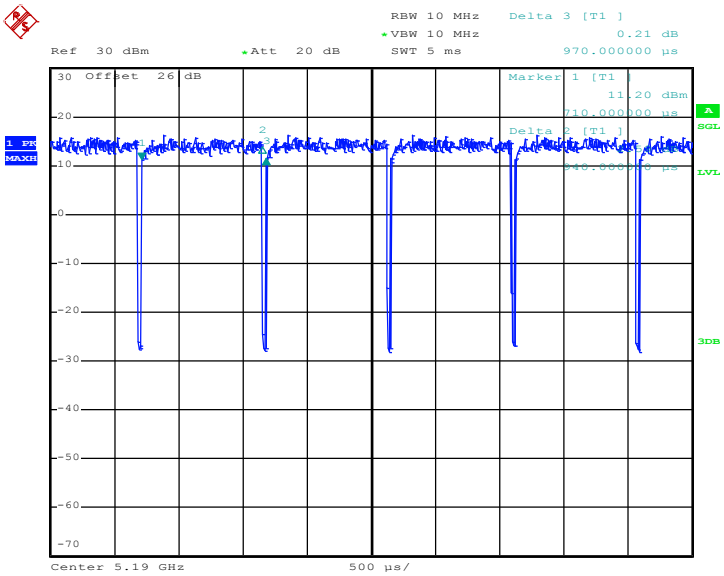
Date: 7.DEC.2016 01:17:28

802.11n HT20



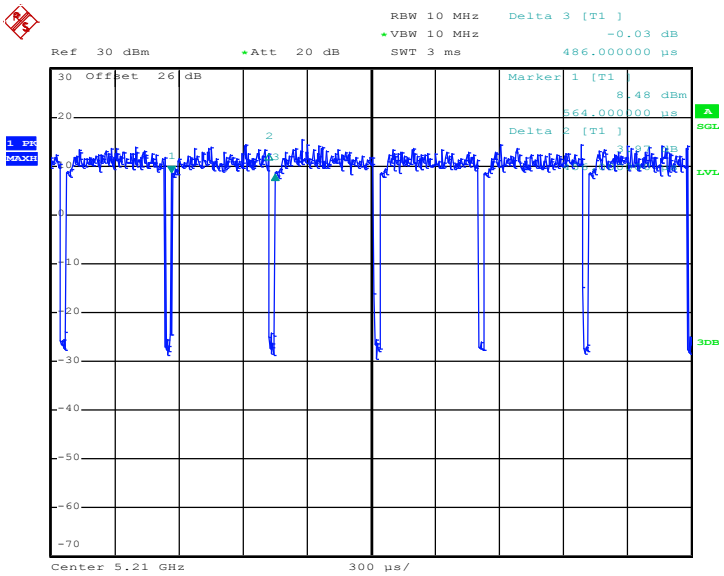
Date: 7.DEC.2016 01:22:19

802.11n HT40



Date: 7.DEC.2016 01:31:31

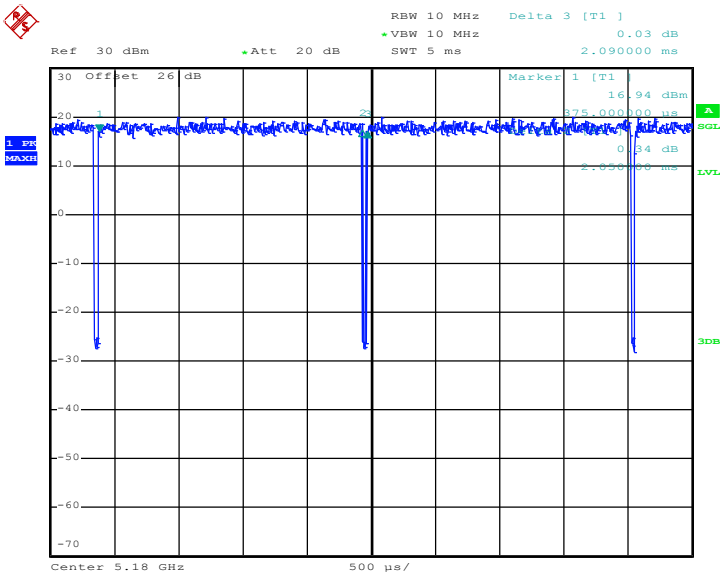
802.11ac VHT80



Date: 7.DEC.2016 01:45:27

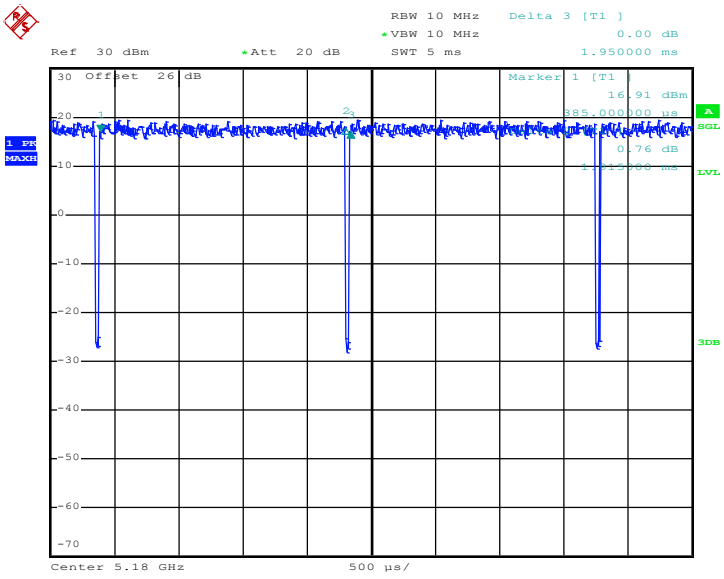
<Ant. 2>

802.11a



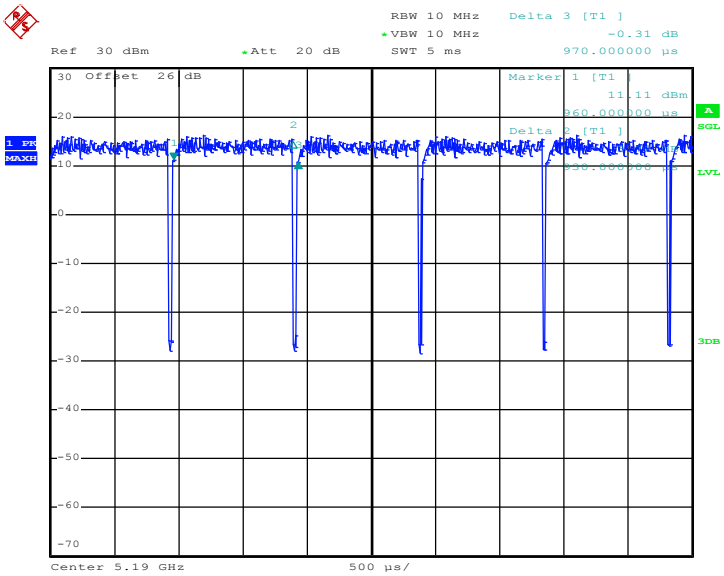
Date: 7.DEC.2016 01:19:05

802.11n HT20



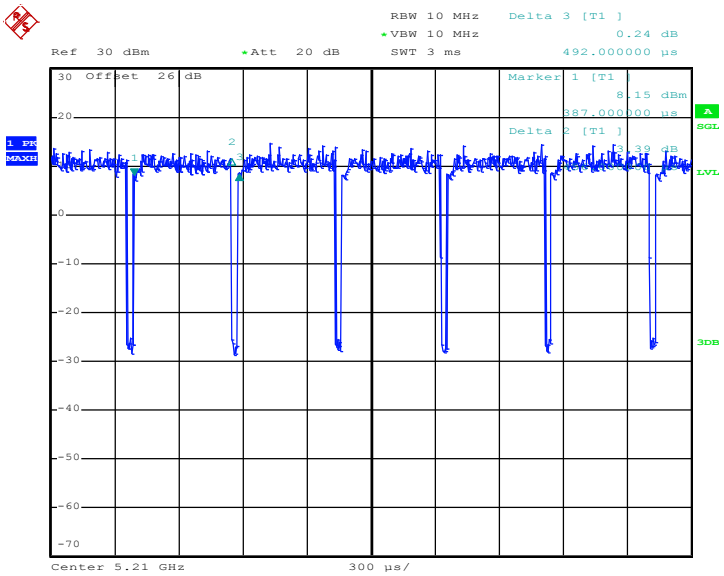
Date: 7.DEC.2016 01:24:24

802.11n HT40



Date: 7.DEC.2016 01:32:35

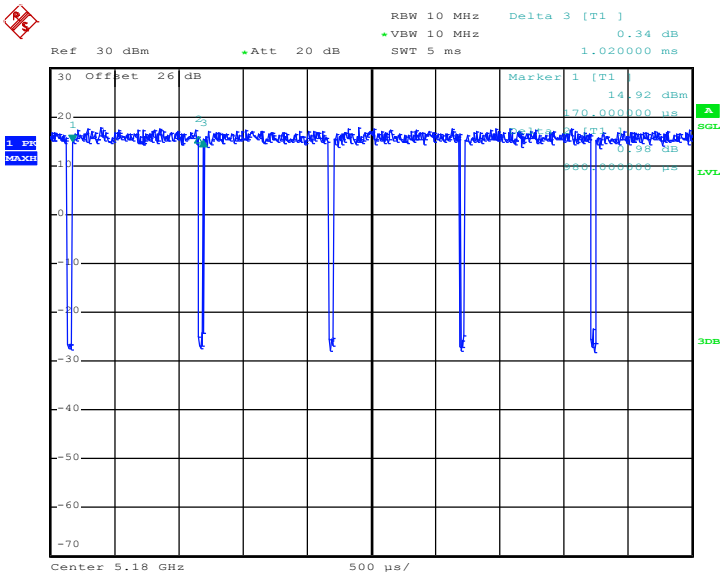
802.11ac VHT80



Date: 7.DEC.2016 01:46:19

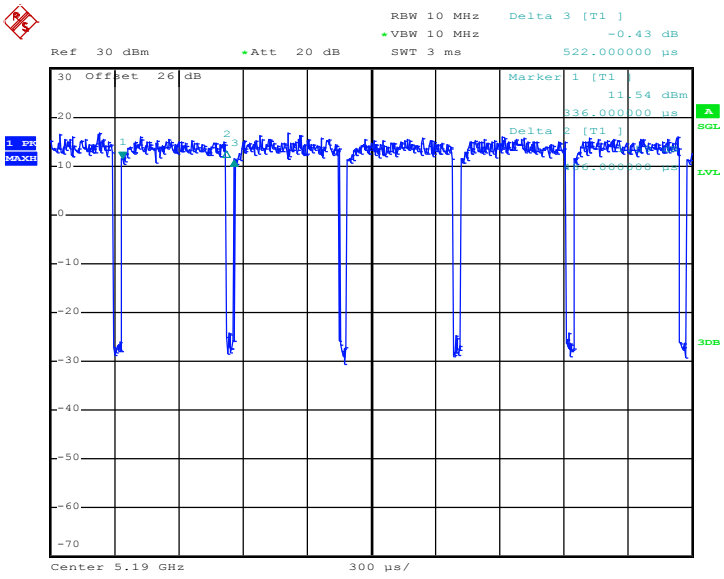
MIMO <Ant. 1+2(1)>

802.11n HT20



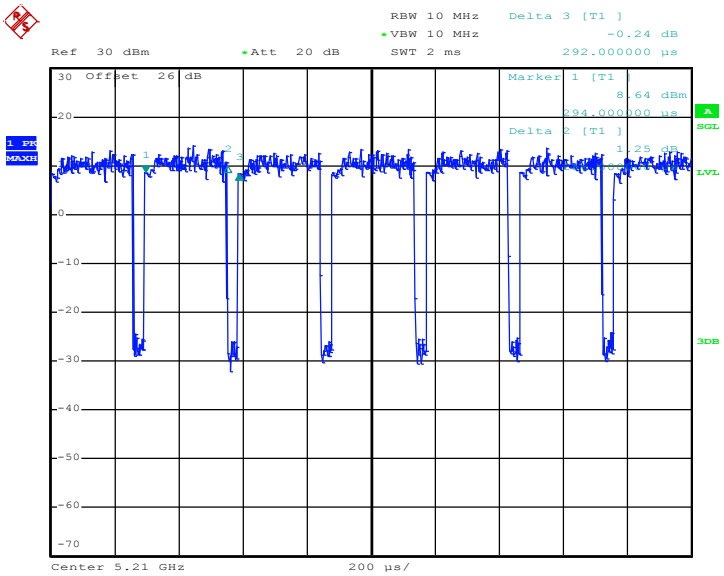
Date: 7.DEC.2016 01:26:25

802.11n HT40



Date: 7.DEC.2016 01:34:07

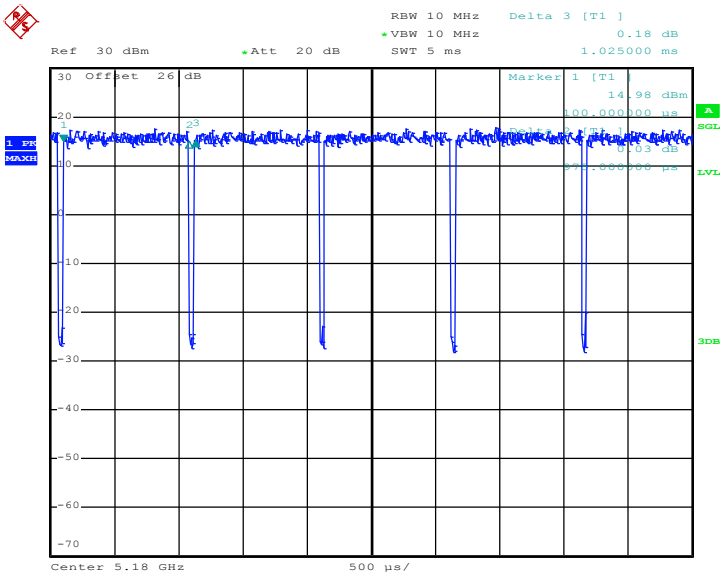
802.11ac VHT80



Date: 7.DEC.2016 01:48:24

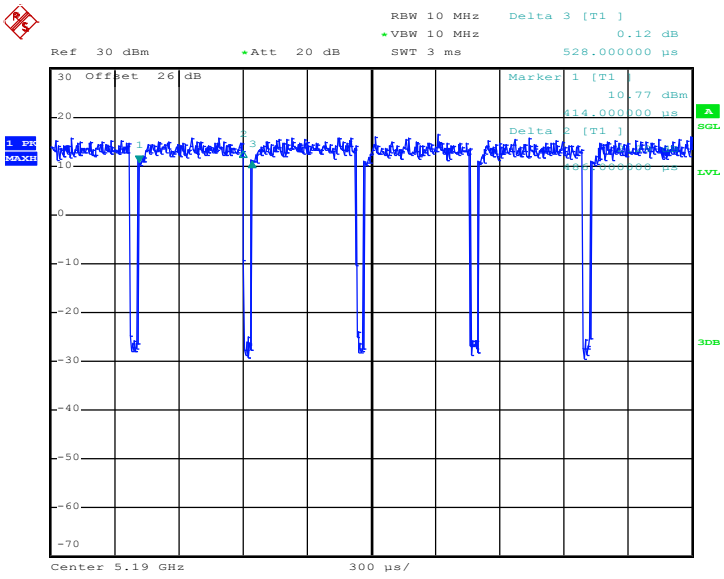
MIMO <Ant. 1+2(2)>

802.11n HT20



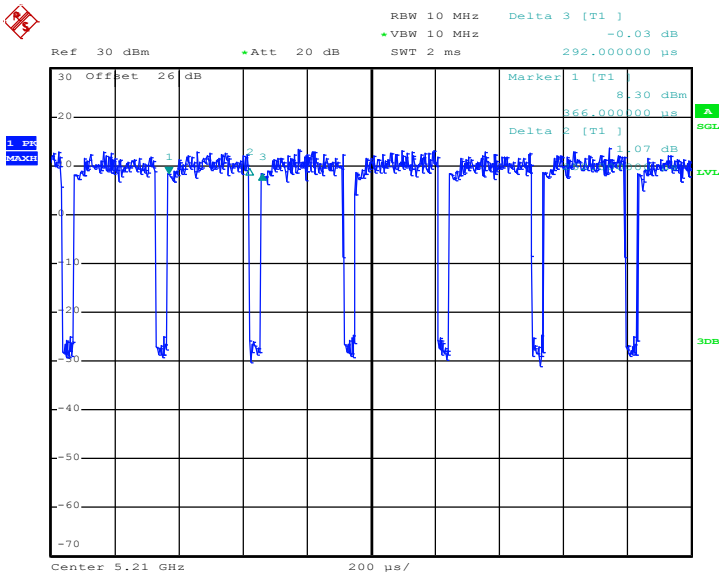
Date: 7.DEC.2016 01:27:15

802.11n HT40



Date: 7.DEC.2016 01:35:01

802.11ac VHT80



Date: 7.DEC.2016 01:49:07

Appendix E. Antenna Information

Antenna Information			
Antenna 1	Manufacturer	Amphenol	
	Antenna Type	Main: PIFA Antenna	Aux: PIFA Antenna
	Part number	LX7847-16-000-C	LX7848-16-000-C
	Peak gain	Main Antenna : WLAN(2.4GHz):-6.76 WLAN(5GHz):-1.84	Aux Antenna : WLAN(2.4GHz):-6.52 Bluetooth :-6.52 WLAN(5GHz):0.14
Antenna 2	Manufacturer	Speedwire	
	Antenna Type	Main: PIFA Antenna	Aux: PIFA Antenna
	Part number	F.0G.ZV-0006-003-00	F.0G.ZV-0006-004-00
	Peak gain	Main Antenna : WLAN(2.4GHz):1.5 WLAN(5GHz):-1.97	Aux Antenna : WLAN(2.4GHz):1.68 Bluetooth :1.68 WLAN(5GHz):-0.3