



TEST REPORT

Report Reference No...... : **TRE1810023701** R/C.....: 20546

FCC ID..... : **T58W1R**

Applicant's name..... : **NETIS SYSTEMS CO., LTD.**

Address..... : Building 6, IC Park, Baolong 4th Road, Baolong Street, Longgang District, Shenzhen, China, 518116

Manufacturer..... : NETIS SYSTEMS CO., LTD.

Address..... : Building 6, IC Park, Baolong 4th Road, Baolong Street, Longgang District, Shenzhen, China, 518116

Test item description : **300Mbps Wireless N Router**

Trade Mark : netis

Model/Type reference..... : W1

Listed Model(s) : -

Standard : **FCC CFR Title 47 Part 15 Subpart C Section 15.247**

Date of receipt of test sample..... : Oct.30,2018

Date of testing..... : Oct.30,2018 ~ Nov.19,2018

Date of issue..... : Nov.19,2018

Result..... : **PASS**

Compiled by
(position+printedname+signature).... : File administrators Yueming Li

Supervised by
(position+printedname+signature)..... : Project Engineer Tom Ouyang

Approved by
(position+printedname+signature)..... : RF Manager Hans Hu

Yueming Li

Tom Ouyang

Hans Hu

Testing Laboratory Name : **Shenzhen Huatongwei International Inspection Co., Ltd.**

Address..... : 1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China

Shenzhen Huatongwei International Inspection Co., Ltd. All rights reserved.

This publication may be reproduced in whole or in part for non-commercial purposes as long as the Shenzhen Huatongwei International Inspection Co., Ltd. is acknowledged as copyright owner and source of the material. Shenzhen Huatongwei International Inspection Co., Ltd. takes no responsibility for and will not assume liability for damages resulting from the reader's interpretation of the reproduced material due to its placement and context.

The test report merely correspond to the test sample.

Contents

<u>1.</u>	<u>TEST STANDARDS AND REPORT VERSION</u>	<u>3</u>
1.1.	Test Standards	3
1.2.	Report Version	3
<u>2.</u>	<u>TEST DESCRIPTION</u>	<u>4</u>
<u>3.</u>	<u>SUMMARY</u>	<u>5</u>
3.1.	Client Information	5
3.2.	Product Description	5
3.3.	Operation State	6
3.4.	EUT Configuration	7
3.5.	Modifications	7
<u>4.</u>	<u>TEST ENVIRONMENT</u>	<u>8</u>
4.1.	Address of the test laboratory	8
4.2.	Test Facility	8
4.3.	Environmental Conditions	9
4.4.	Statement of the measurement uncertainty	9
4.5.	Equipments Used during the Test	10
<u>5.</u>	<u>TEST CONDITIONS AND RESULTS</u>	<u>12</u>
5.1.	Antenna Requirement	12
5.2.	Conducted Emissions (AC Main)	13
5.3.	Conducted Peak Output Power	16
5.4.	Power Spectral Density	17
5.5.	6dB Bandwidth	27
5.6.	Restricted Band	37
5.7.	Band Edge and Spurious Emissions (Conducted)	57
5.8.	Spurious Emissions (Radiated)	90
<u>6.</u>	<u>TEST SETUP PHOTOS</u>	<u>97</u>
<u>7.</u>	<u>EXTERNAL AND INTERNAL PHOTOS</u>	<u>98</u>

1. TEST STANDARDS AND REPORT VERSION

1.1. Test Standards

The tests were performed according to following standards:

[FCC Rules Part 15.247](#): Frequency Hopping, Direct Spread Spectrum and Hybrid Systems that are in operation within the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz.

[ANSI C63.10:2013](#): American National Standard for Testing Unlicensed Wireless Devices

[KDB 558074 D01 DTS Meas Guidance v04](#): Guidance for Performing Compliance Measurements on Digital Transmission Systems (DTS) Operating under §15.247

[KDB662911 D01 Multiple Transmitter Output v02r01](#): Emissions Testing of Transmitters with Multiple Outputs in the Same Band (e.g., MIMO, Smart Antenna, etc)

[KDB662911 D02 MIMO with Cross-Polarized Antennas v01](#): MIMO with Cross-Polarized Antenna

1.2. Report Version

Version No.	Date of issue	Description
N/A	2018-11-19	Original

2. TEST DESCRIPTION

Test Item	FCC Rule	Result	Test Engineer
Antenna requirement	15.203/15.247(c)	Pass	Xiaokang Tan
Line Conducted Emissions (AC Main)	15.207	Pass	Xiaokang Tan
Conducted Peak Output Power	15.247(b)(3)	Pass	Xiaokang Tan
Power Spectral Density	15.247(e)	Pass	Xiaokang Tan
6dB Bandwidth	15.247(a)(2)	Pass	Xiaokang Tan
Restricted band	15.247(d)/15.205	Pass	Xiaokang Tan
Spurious Emissions	15.247(d)/15.209	Pass	Xiaokang Tan

Note: The measurement uncertainty is not included in the test result.

3. SUMMARY

3.1. Client Information

Applicant:	NETIS SYSTEMS CO., LTD.
Address:	Building 6, IC Park, Baolong 4th Road, Baolong Street, Longgang District, Shenzhen, China, 518116
Manufacturer:	NETIS SYSTEMS CO., LTD.
Address:	Building 6, IC Park, Baolong 4th Road, Baolong Street, Longgang District, Shenzhen, China, 518116

3.2. Product Description

Name of EUT:	300Mbps Wireless N Router
Trade Mark:	netis
Model No.:	W1
Listed Model(s):	-
Power supply:	DC 9V from adapter
Adapter information:	Model:NTT97090050UL Input:100~240Va.c.,0.3A 50/60Hz Output:DC9Vd.c.500mA
Hardware version:	PB-7444-M02G
Software version:	V3.X.XXXXX
WIFI	
Supported type:	802.11b/802.11g/802.11n(HT20)/802.11n(HT40)
Modulation:	DSSS for 802.11b OFDM for 802.11g/802.11n(HT20)/802.11n(HT40)
Operation frequency:	2412MHz~2462MHz for 802.11b/802.11g/802.11n(HT20) 2422MHz~2452MHz for 802.11n(HT40)
Channel number:	11 for 802.11b/802.11g/802.11n(HT20) 7 for 802.11n(HT40)
Channel separation:	5MHz
Antenna number:	2
Antenna gain:	3 dBi

3.3. Operation State

➤ Test frequency list

According to section 15.31(m), regards to the operating frequency range over 10 MHz, must select three channel which were tested. the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, please see the above gray bottom.

802.11b/g/n(HT20)		802.11n(HT40)	
Channel	Frequency (MHz)	Channel	Frequency (MHz)
01	2412	01	-
02	2417	02	-
03	2422	03	2422
04	2427	04	2427
05	2432	05	2432
06	2437	06	2437
07	2442	07	2442
08	2447	08	2447
09	2452	09	2452
10	2457	10	-
11	2462	11	-

➤ Per-scan all kind of data rate in lowest channel, and found the follow list which it was worst case.

Mode	Data rate	Tune-up Maximum PK conducted output power(dBm) (dBm)
802.11b	1 Mbps	16.50-17.50
802.11g	6 Mbps	15.50-16.50
Mode	Data rate	Tune-up Maximum PK conducted output power(dBm) (dBm) ANT1+ANT2
802.11n(HT20)	MCS0	17.50-18.50
802.11n(HT40)	MCS0	16.50-17.50

➤ Test mode

For RF test items
The engineering test program was provided and enabled to make EUT continuous transmit (duty cycle>98%).
For AC power line conducted emissions:
The EUT was set to connect with the WLAN AP under large package sizes transmission.
For RF test axis
EUT in each of three orthogonal axis emissions had been tested ,but only the worst case (X axis) data Recorded in the report.

3.4. EUT Configuration

The following peripheral devices and interface cables were connected during the measurement:

- - supplied by the manufacturer
- - supplied by the lab

○	/	Manufacturer:	/
		Model No.:	/
○	/	Manufacturer:	/
		Model No.:	/

3.5. Modifications

No modifications were implemented to meet testing criteria.

4. TEST ENVIRONMENT

4.1. Address of the test laboratory

Laboratory: Shenzhen Huatongwei International Inspection Co., Ltd.

Address: 1/F, Bldg 3, Hongfa Hi-tech Industrial Park, Genyu Road, Tianliao, Gongming, Shenzhen, China

4.2. Test Facility

CNAS-Lab Code: L1225

Shenzhen Huatongwei International Inspection Co., Ltd. has been assessed and proved to be in compliance with CNAS-CL01 Accreditation Criteria for Testing and Calibration Laboratories (identical to ISO/IEC17025: 2005 General Requirements) for the Competence of Testing and Calibration Laboratories.

A2LA-Lab Cert. No.: 3902.01

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory has been accredited by A2LA for technical competence in the field of electrical testing, and proved to be in compliance with ISO/IEC 17025: 2005 General Requirements for the Competence of Testing and Calibration Laboratories and any additional program requirements in the identified field of testing.

FCC-Registration No.: 762235

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory has been registered and fully described in a report filed with the FCC (Federal Communications Commission). The acceptance letter from the FCC is maintained in our files.

IC-Registration No.:5377B-1

Two 3m Alternate Test Site of Shenzhen Huatongwei International Inspection Co., Ltd. has been registered by Certification and Engineering Bureau of Industry Canada for the performance of radiated measurements with Registration No.: 5377B-1.

ACA

Shenzhen Huatongwei International Inspection Co., Ltd. EMC Laboratory can also perform testing for the Australian C-Tick mark as a result of our A2LA accreditation.

4.3. Environmental Conditions

During the measurement the environmental conditions were within the listed ranges:

Temperature:	15~35°C
Relative Humidity:	30~60 %
Air Pressure:	950~1050mba

4.4. Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate. The reader is cautioned that there may be errors in calibration limits of the equipment and facilities. The measurement uncertainty was calculated for all measurements listed in this test report according to TR-100028-01 "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 1" and TR-100028-02 "Electromagnetic compatibility and Radio spectrum Matters (ERM); Uncertainties in the measurement of mobile radio equipment characteristics; Part 2" and is documented in the Shenzhen Huatongwei International Inspection Co., Ltd. quality system according to ISO/IEC 17025. Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Here after the best measurement capability for Shenzhen Huatongwei International Inspection Co., Ltd. is reported:

Test Items	Measurement Uncertainty	Notes
Transmitter power conducted	0.63 dB	(1)
Conducted spurious emissions 9kHz~40GHz	0.63 dB	(1)
Conducted Disturbance 150kHz~30MHz	3.35 dB	(1)
Radiated Emissions below 1GHz	4.28 dB	(1)
Radiated Emissions above 1GHz	5.16 dB	(1)
Occupied Bandwidth	69 Hz	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=1.96$.

4.5. Equipments Used during the Test

Conducted Emissions						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. (mm-dd-yy)	Next Cal. (mm-dd-yy)
1	EMI Test Receiver	R&S	ESCI	101247	10/27/2018	10/26/2019
2	Artificial Mains	SCHWARZBECK	NNLK 8121	573	10/27/2018	10/26/2019
3	Pulse Limiter	R&S	ESH3-Z2	101488	10/27/2018	10/26/2019
4	RF Connection Cable	HUBER+SUHNER	EF400	N/A	11/14/2017	11/13/2019
5	Test Software	R&S	ES-K1	N/A	N/A	N/A
6	Temperature and Humidity Meter	MIAOXIN	TH10R	N/A	10/30/2018	10/29/2019

Radiated Emissions(Below 1GHz)						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. (mm-dd-yy)	Next Cal. (mm-dd-yy)
1	Semi-Anechoic Chamber	Albatross projects	SAC-3m-02	C11121	09/30/2018	09/29/2021
2	EMI Test Receiver	R&S	ESCI	100900	10/28/2018	10/27/2019
3	Loop Antenna	R&S	HFH2-Z2	100020	04/02/2018	04/02/2021
4	Ultra-Broadband Antenna	SCHWARZBECK	VULB9163	546	04/05/2017	04/04/2020
5	RF Connection Cable	HUBER+SUHNER	N/A	N/A	09/28/2018	09/27/2019
6	RF Connection Cable	HUBER+SUHNER	SUCOFLEX104	501184/4	09/28/2018	09/27/2019
7	Test Software	R&S	ES-K1	N/A	N/A	N/A
8	Turntable	Maturo Germany	TT2.0-1T	N/A	N/A	N/A
9	Antenna Mast	Maturo Germany	TAM-4.0-P	N/A	N/A	N/A
10	Temperature and Humidity Meter	KEJIAN	KJ03	N/A	10/30/2018	10/29/2019

Radiated Emissions(Above 1GHz)						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. (mm-dd-yy)	Next Cal. (mm-dd-yy)
1	Anechoic Chamber	Albatross projects	SAC-3m-01	C11121	09/30/2018	09/29/2021
2	Horn Antenna	SCHWARZBECK	9120D	1011	03/27/2017	03/26/2020
3	Broadband Horn Antenna	SCHWARZBECK	BBHA9170	BBHA9170 472	03/27/2017	03/26/2020
4	Preamplifier	BONN	BLWA0160-2M	1811887	11/14/2018	11/13/2019
5	Pre-amplifier	SCHWARZBECK	BBV 9743	9743-0022	10/17/2018	10/16/2019
6	Broadband Pre-amplifier	SCHWARZBECK	BBV 9718	9718-248	04/28/2018	04/27/2019
7	Spectrum Analyzer	R&S	FSP40	100597	10/27/2018	10/26/2019
8	RF Connection Cable	HUBER+SUHNER	RE-7-FL	N/A	11/15/2018	11/14/2019
9	RF Connection Cable	HUBER+SUHNER	RE-7-FH	N/A	11/15/2018	11/14/2019
10	Test Software	Audix	E3	N/A	N/A	N/A
11	Turntable	Maturo Germany	TT2.0-1T	N/A	N/A	N/A
12	Antenna Mast	Maturo Germany	CAM-4.0-P-12	N/A	N/A	N/A
13	Temperature and Humidity Meter	MINGLE	YH101	N/A	10/30/2018	10/29/2019

RF Conducted Test						
Item	Test Equipment	Manufacturer	Model No.	Serial No.	Last Cal. (mm-dd-yy)	Next Cal. (mm-dd-yy)
1	Spectrum Analyzer	R&S	FSV40	100048	10/28/2018	10/27/2019
2	EXA Signal Analyzer	Agilent	N9020A	MY5050187	09/29/2018	09/28/2019
3	Power Meter	Anritsu	ML249A	N/A	09/29/2018	09/28/2019
4	OSP	R&S	OSP120	101317	N/A	N/A

5. TEST CONDITIONS AND RESULTS

5.1. Antenna Requirement

REQUIREMENT:

FCC CFR Title 47 Part 15 Subpart C Section 15.203:

An intentional radiator shall be designed to ensure that no antenna other than that furnished by the responsible party shall be used with the device. The use of a permanently attached antenna or of an antenna that uses a unique coupling to the intentional radiator, the manufacturer may design the unit so that a broken antenna can be replaced by the user, but the use of a standard antenna jack or electrical connector is prohibited.

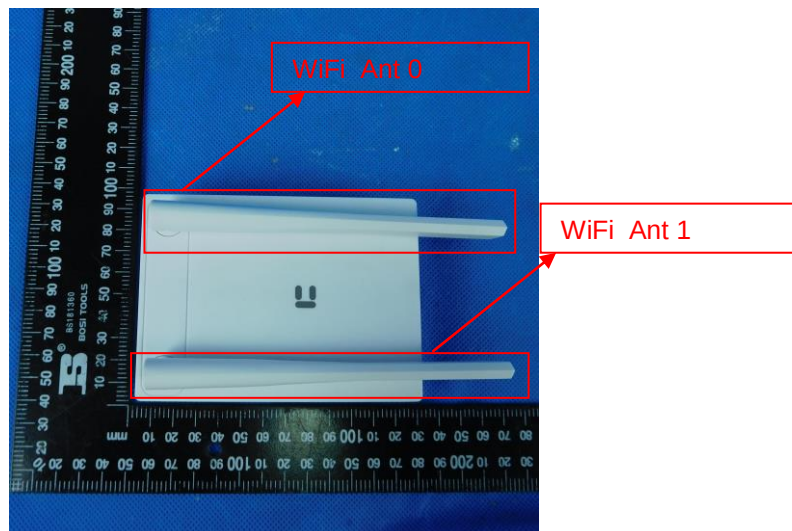
FCC CFR Title 47 Part 15 Subpart C Section 15.247(c) (1)(i):

(i) Systems operating in the 2400~2483.5 MHz band that is used exclusively for fixed. Point-to-point operations may employ transmitting antennas with directional gain greater than 6 dBi provided the maximum conducted output power of the intentional radiator is reduced by 1 dB for every 3 dB that the directional gain of the antenna exceeds 6 dBi.

TEST RESULTS

☒ Passed ☐ Not Applicable

The directional gain of the antenna less than 6 dBi, please refer to the below antenna photo.



5.2. Conducted Emissions (AC Main)

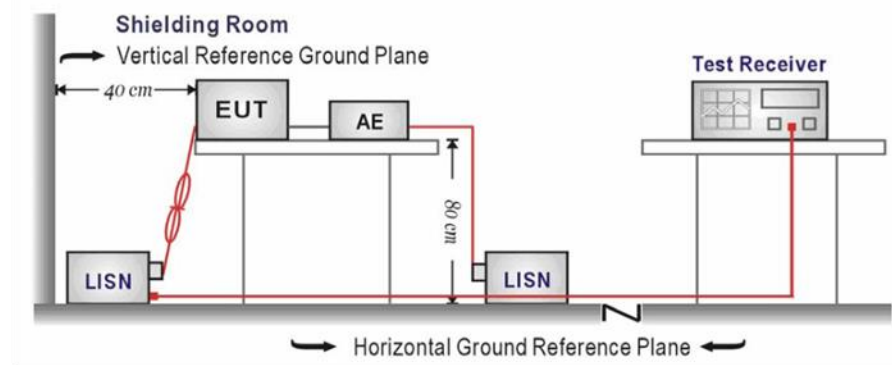
LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.207:

Frequency range (MHz)	Limit (dBuV)	
	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.

TEST CONFIGURATION



TEST PROCEDURE

1. The EUT was setup according to ANSI C63.10:2013 requirements.
2. The EUT was placed on a platform of nominal size, 1 m by 1.5 m, raised 80 cm above the conducting ground plane. The vertical conducting plane was located 40 cm to the rear of the EUT. All other surfaces of EUT were at least 80 cm from any other grounded conducting surface.
3. The EUT and simulators are connected to the main power through a line impedances stabilization network (LISN). The LISN provides a 50 ohm /50uH coupling impedance for the measuring equipment.
4. The peripheral devices are also connected to the main power through a LISN. (Please refer to the block diagram of the test setup and photographs)
5. Each current-carrying conductor of the EUT power cord, except the ground (safety) conductor, was individually connected through a LISN to the input power source.
6. The excess length of the power cord between the EUT and the LISN receptacle were folded back and forth at the center of the lead to form a bundle not exceeding 40 cm in length.
7. Conducted Emissions were investigated over the frequency range from 0.15MHz to 30MHz using a receiver bandwidth of 9 kHz.
8. During the above scans, the emissions were maximized by cable manipulation.

TEST MODE:

Please refer to the clause 3.3

TEST RESULTS

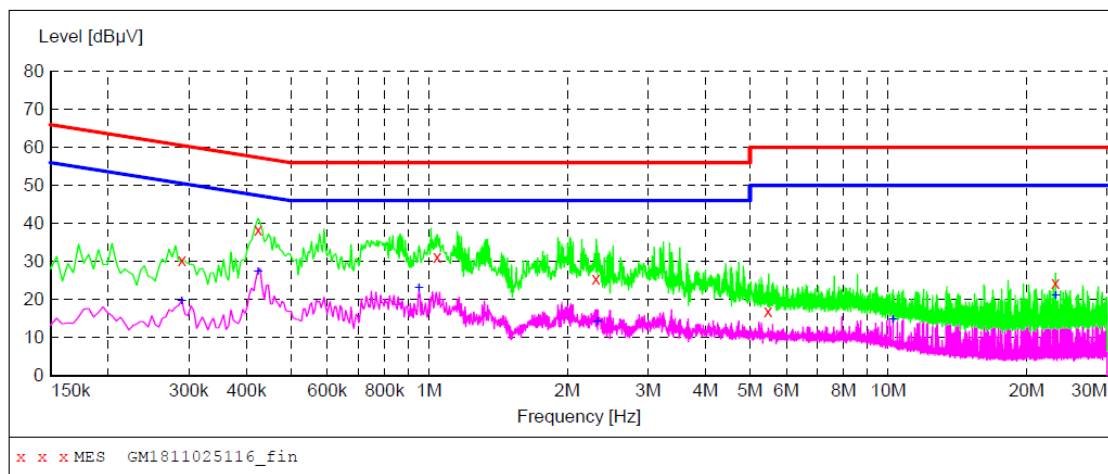
☒ Passed ☐ Not Applicable

Note:

- 1) Transd=Cable lose+ Pulse Limiter Factor + Artificial Mains Factor
- 2) Margin= Limit –Level
- 3) EUT test voltage:120V/60Hz
- 4) Test when EUT's Ant0 & Ant1 are both on

Test Line:

L

**MEASUREMENT RESULT: "GM1811025116_fin"**

11/2/2018 8:21PM

Frequency MHz	Level dBμV	dB	dBμV	dB		PE
0.289500	30.50	10.2	61	30.0	QP	L1 GND
0.424500	38.50	10.1	57	18.9	QP	L1 GND
1.041000	31.30	10.0	56	24.7	QP	L1 GND
2.310000	25.40	10.0	56	30.6	QP	L1 GND
5.478000	16.90	10.0	60	43.1	QP	L1 GND
23.127000	24.50	10.4	60	35.5	QP	L1 GND

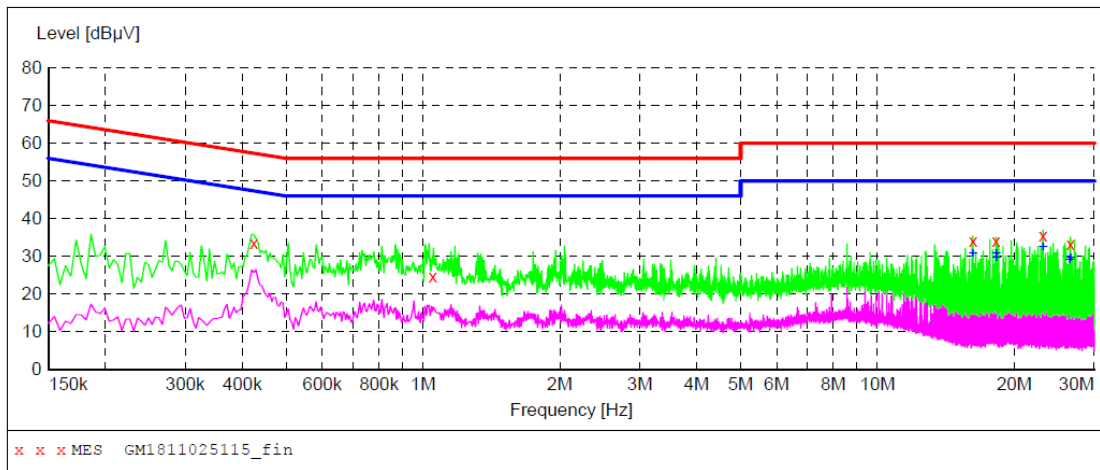
MEASUREMENT RESULT: "GM1811025116_fin2"

11/2/2018 8:21PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.289500	19.40	10.2	51	31.1	AV	L1	GND
0.424500	27.20	10.1	47	20.2	AV	L1	GND
0.951000	23.10	9.9	46	22.9	AV	L1	GND
2.323500	14.00	10.0	46	32.0	AV	L1	GND
10.243500	14.80	10.2	50	35.2	AV	L1	GND
23.127000	21.00	10.4	50	29.0	AV	L1	GND

Test Line:

N

**MEASUREMENT RESULT: "GM1811025115_fin"**

11/2/2018 8:18PM

Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
0.424500	33.50	10.1	57	23.9	QP	N	GND
1.050000	24.70	10.0	56	31.3	QP	N	GND
16.228500	34.00	10.3	60	26.0	QP	N	GND
18.244500	34.10	10.3	60	25.9	QP	N	GND
23.127000	35.50	10.4	60	24.5	QP	N	GND
26.610000	33.30	10.5	60	26.7	QP	N	GND

MEASUREMENT RESULT: "GM1811025115_fin2"

11/2/2018 8:18PM

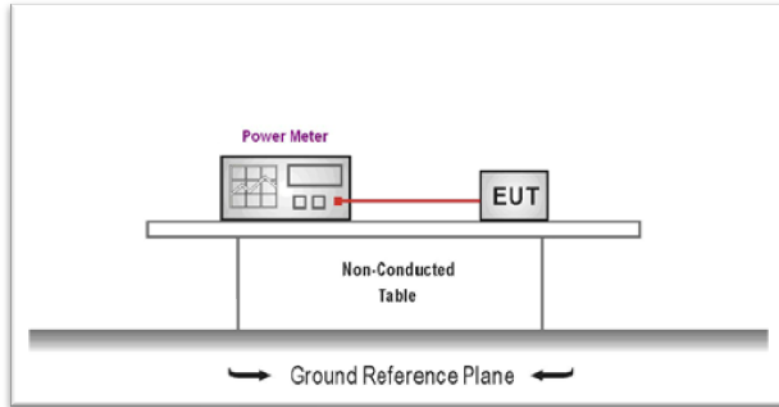
Frequency MHz	Level dBμV	Transd dB	Limit dBμV	Margin dB	Detector	Line	PE
16.228500	30.60	10.3	50	19.4	AV	N	GND
18.244500	30.70	10.3	50	19.3	AV	N	GND
18.303000	29.60	10.3	50	20.4	AV	N	GND
23.127000	32.50	10.4	50	17.5	AV	N	GND
26.488500	28.80	10.5	50	21.2	AV	N	GND
26.610000	29.60	10.5	50	20.4	AV	N	GND

5.3. Conducted Peak Output Power

LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (b)(3): **30dBm**:

TEST CONFIGURATION



TEST PROCEDURE

1. The EUT was tested according to ANSI C63.10: 2013 and KDB 558074 D01 for compliance to FCC 47 CFR 15.247 requirements.
2. The maximum peak conducted output power may be measured using a broadband peak RF power meter.
3. The power meter shall have a video bandwidth that is greater than or equal to the DTS bandwidth and shall utilize a fast-responding diode detector
4. Record the measurement data.

TEST MODE:

Please refer to the clause 3.3

TEST RESULTS

☒ Passed ☐ Not Applicable

Type	Channel	Output power (dBm)				Limit (dBm)	Result
		PK Antenna 0	AV Antenna 0	PK Antenna 1	AV Antenna 1		
802.11b	01	17.14	14.88	17.02	14.66	≤30.00	Pass
	06	17.13	14.84	17.01	14.70		
	11	17.03	14.68	17.17	14.69		
802.11g	01	16.06	12.21	15.86	12.12	≤30.00	Pass
	06	16.03	12.30	15.85	12.26		
	11	15.94	12.11	15.88	12.22		

MIMO

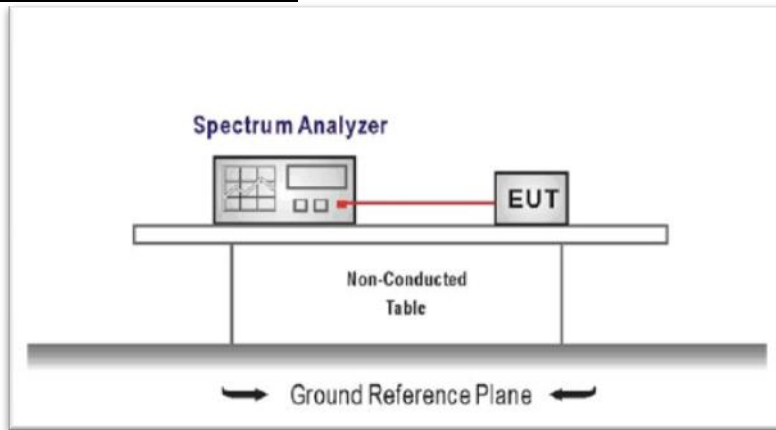
Type	Channel	Output power (dBm)				Total Power (dBm)	Limit (dBm)	Result
		PK Antenna 0	AV Antenna 0	PK Antenna 1	AV Antenna 1			
802.11n(HT20)	01	14.96	11.24	15.17	11.41	18.11	≤30.00	Pass
	06	15.00	11.25	15.07	11.53	18.06		
	11	14.90	11.27	15.10	11.61	18.01		
802.11n(HT40)	03	14.27	10.64	14.29	10.78	17.31	≤30.00	Pass
	06	14.11	10.66	14.18	10.59	17.16		
	09	14.00	10.96	14.16	10.52	17.11		

5.4. Power Spectral Density

LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (e):For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission.

TEST CONFIGURATION



TEST PROCEDURE

1. Connect the antenna port(s) to the spectrum analyzer input,
2. Configure the spectrum analyzer as shown below:
Center frequency=DTS channel center frequency
Span =1.5 times the DTS bandwidth
 $RBW = 3\text{ kHz} \leq RBW \leq 100\text{ kHz}$, $VBW \geq 3 \times RBW$
Sweep time = auto couple
Detector = peak
Trace mode = max hold
3. Place the radio in continuous transmit mode, allow the trace to stabilize, view the transmitter wave form on the spectrum analyzer.
4. Use the peak marker function to determine the maximum amplitude level within the RBW.
5. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

TEST MODE:

Please refer to the clause 3.3

TEST RESULTS

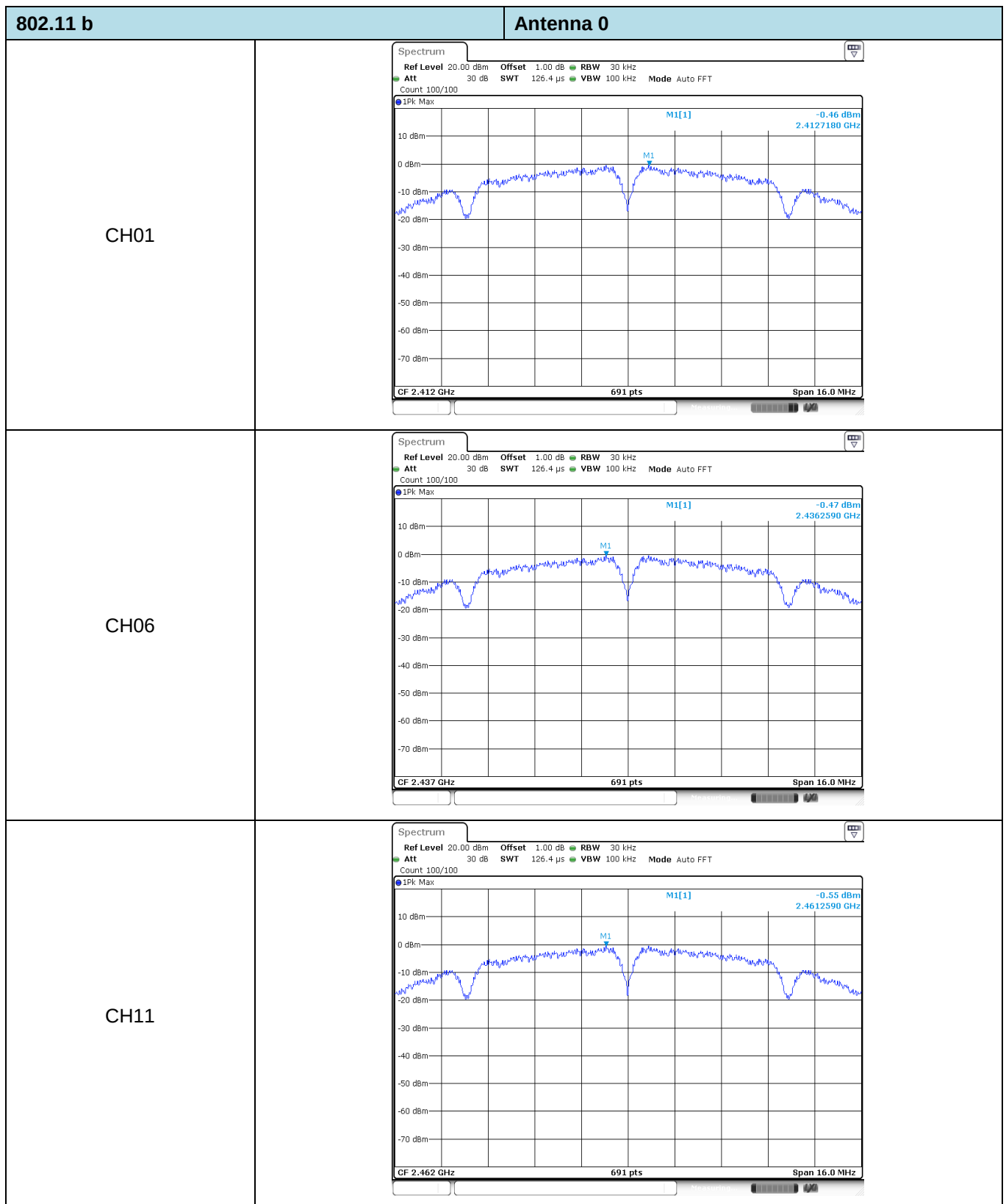
☒ Passed ☐ Not Applicable

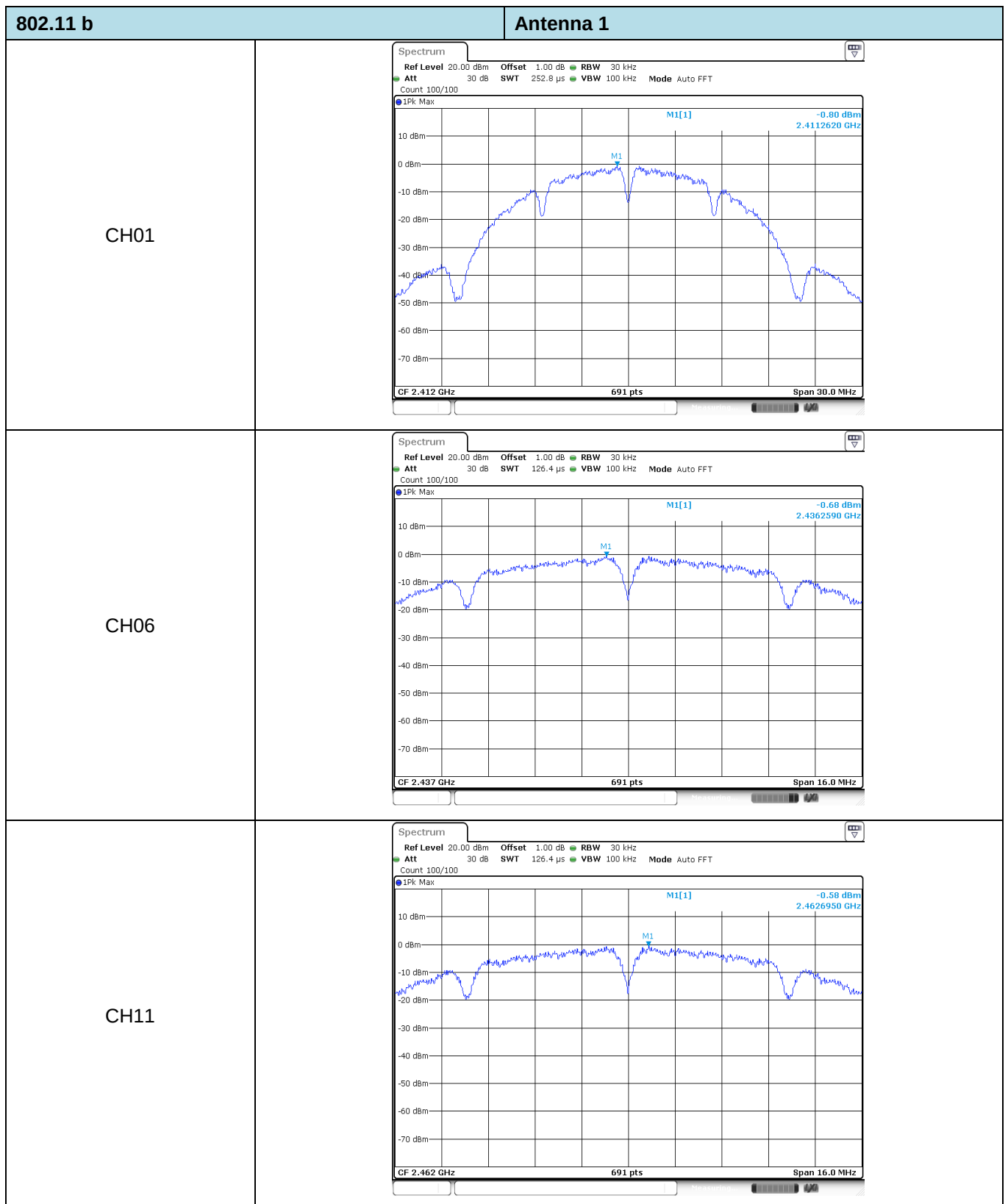
Type	Channel	Power Spectral Density (dBm/30KHz)		Limit (dBm/3KHz)	Result
		Antenna 0	Antenna 1		
802.11b	01	-0.46	-0.80	≤8.00	Pass
	06	-0.47	-0.68		
	11	-0.55	-0.58		
802.11g	01	-8.00	-8.19	≤8.00	Pass
	06	-8.03	-8.09		
	11	-8.04	-8.57		

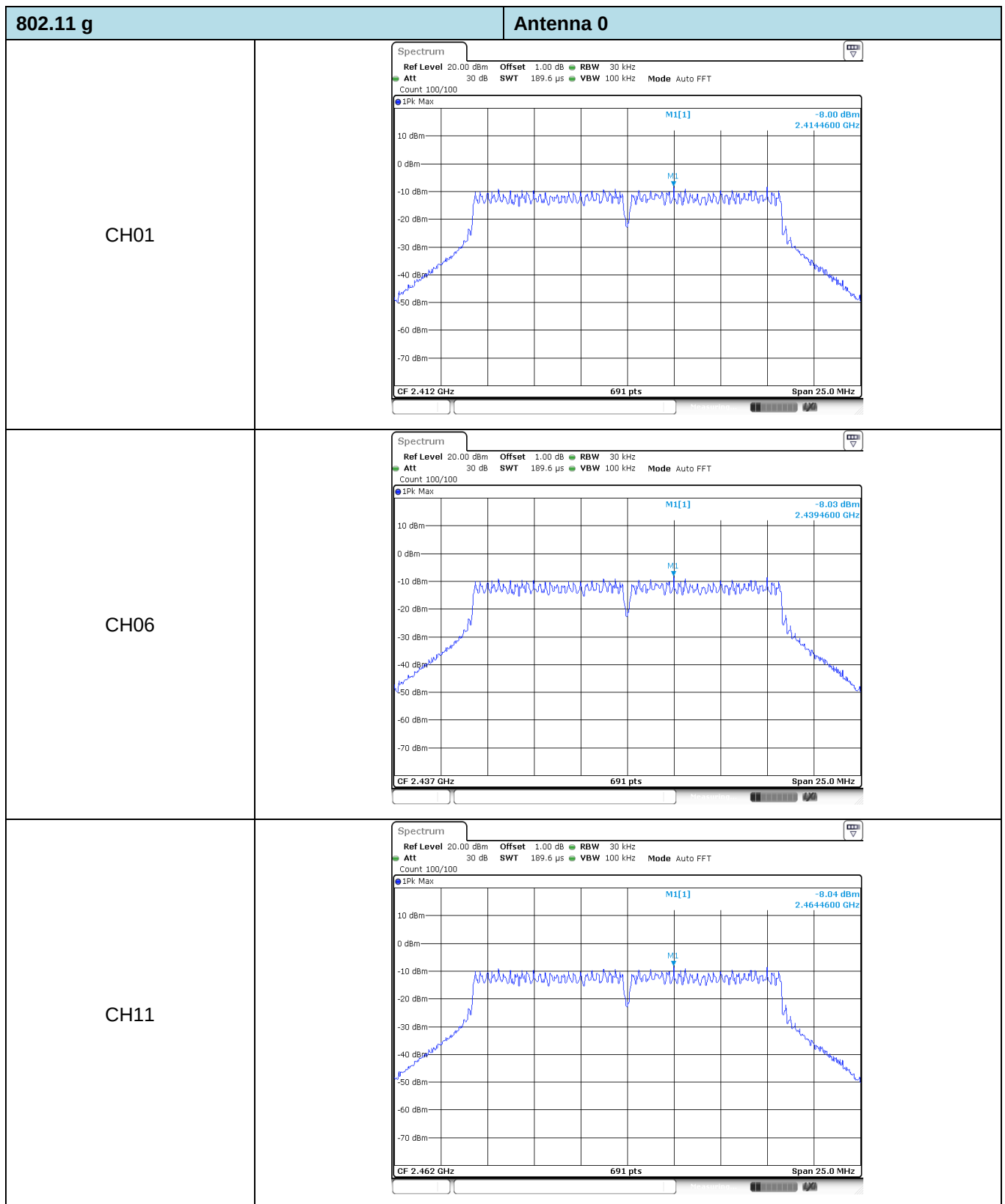
MIMO

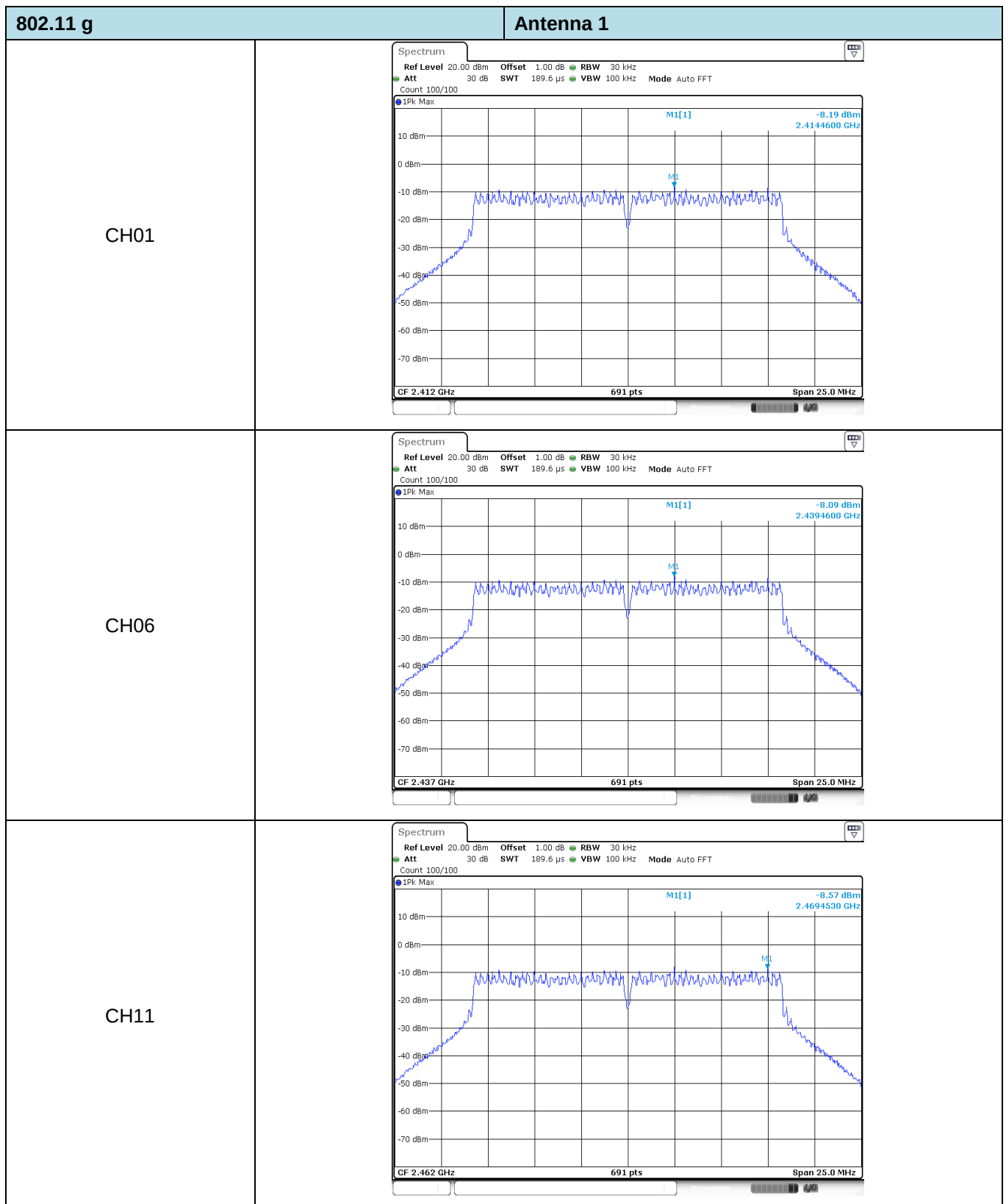
Type	Channel	Power Spectral Density (dBm/30KHz)		Total Power Spectral Density (dBm/30KHz)	Limit (dBm/ 3KHz)	Result
		Antenna 0	Antenna 1			
802.11n(HT20)	01	-8.80	-9.55	-6.15	≤8.00	Pass
	06	-9.08	-9.51	-6.28		
	11	-9.19	-9.48	-6.32		
802.11n(HT40)	03	-13.43	-13.42	-10.41	≤8.00	Pass
	06	-13.52	-13.44	-10.47		
	09	-13.59	-13.43	-10.50		

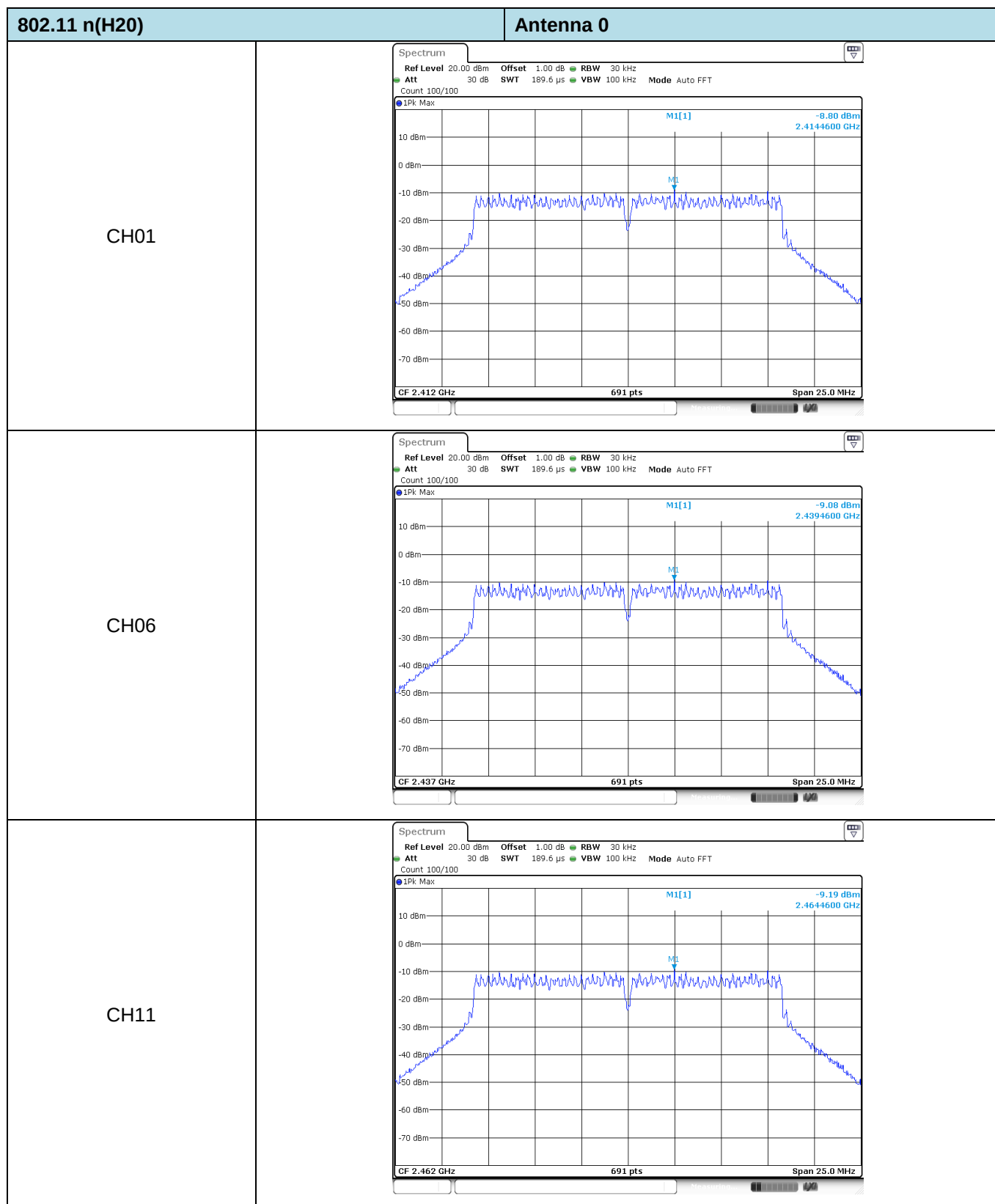
Test plot as follows:

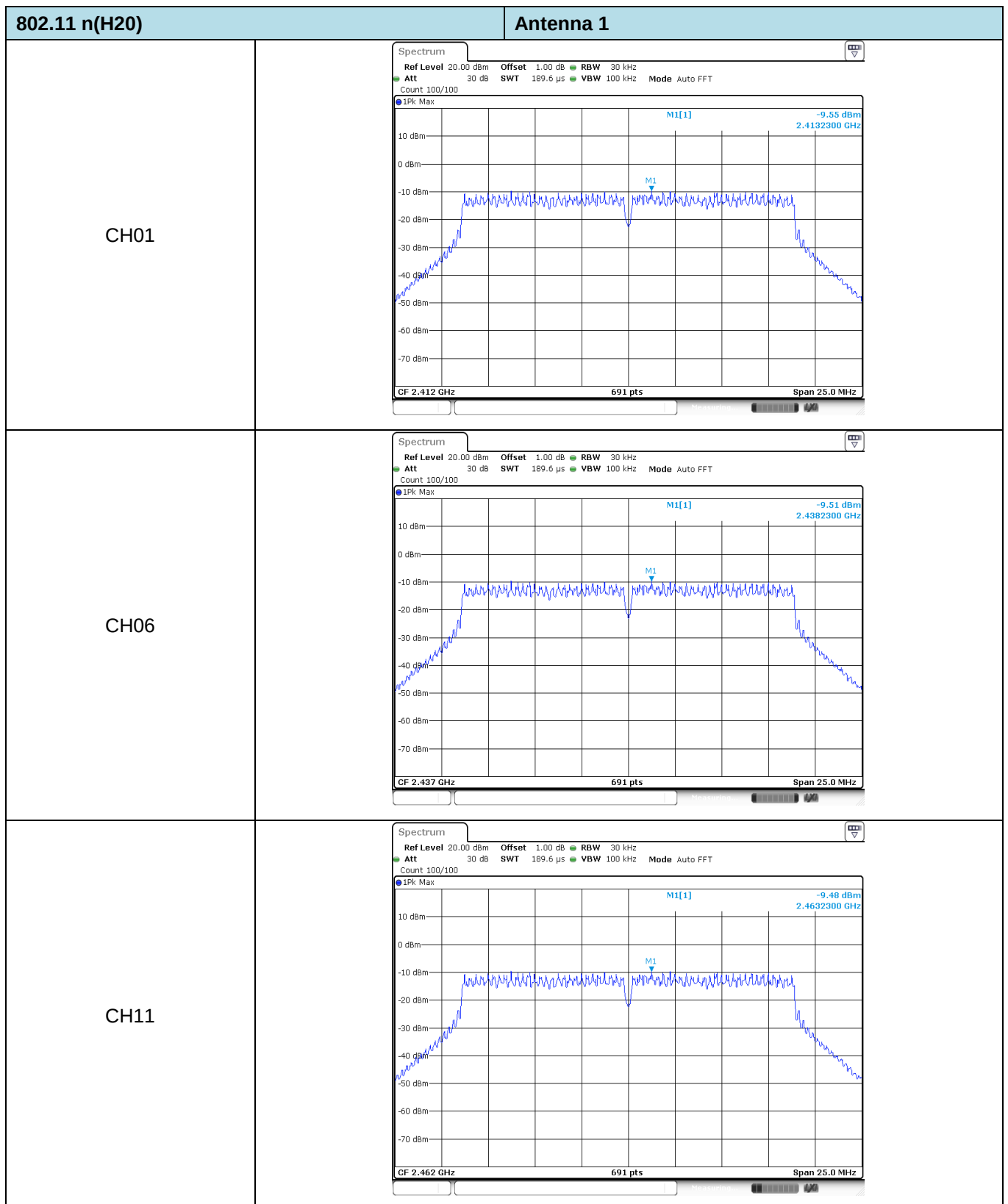


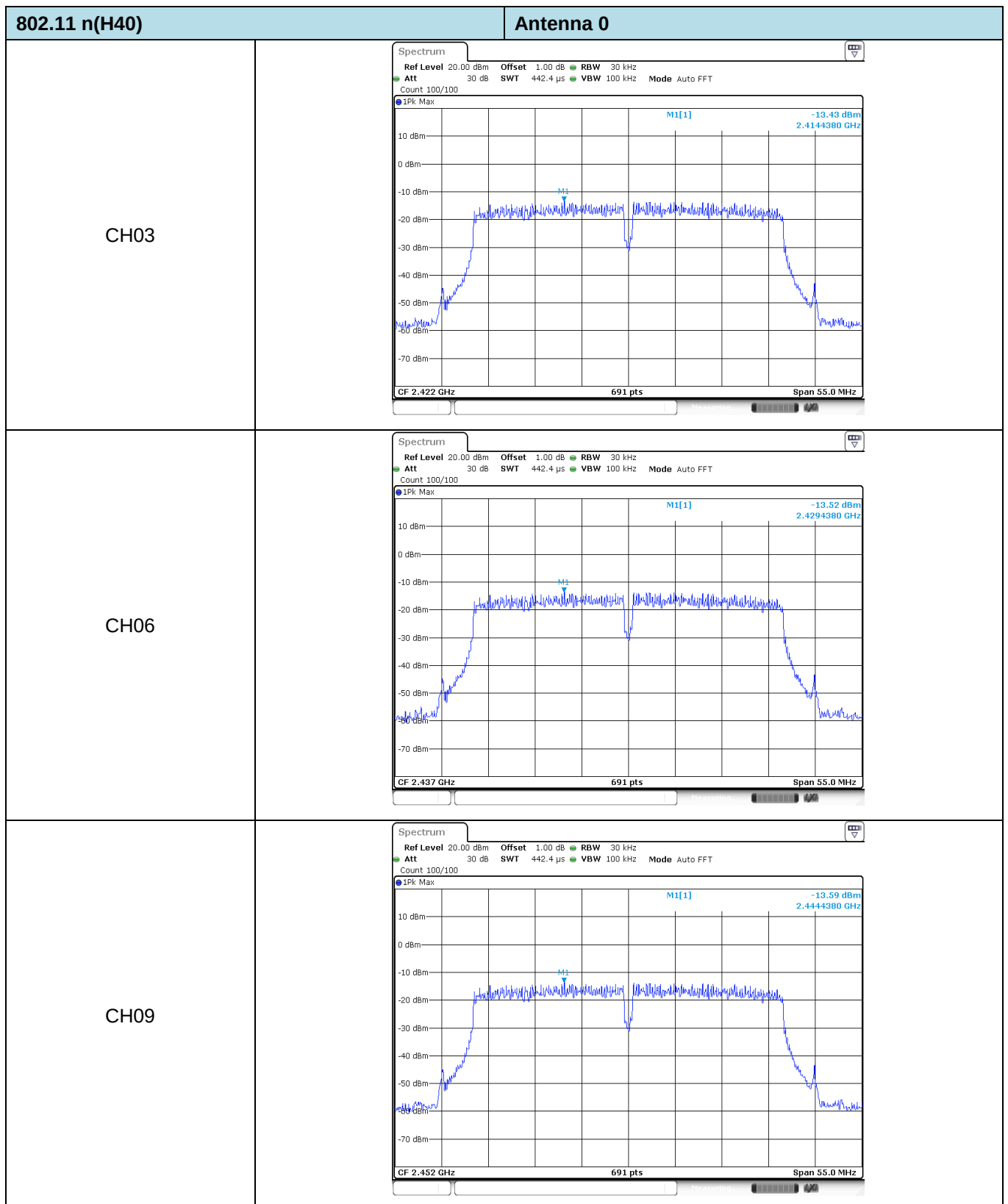


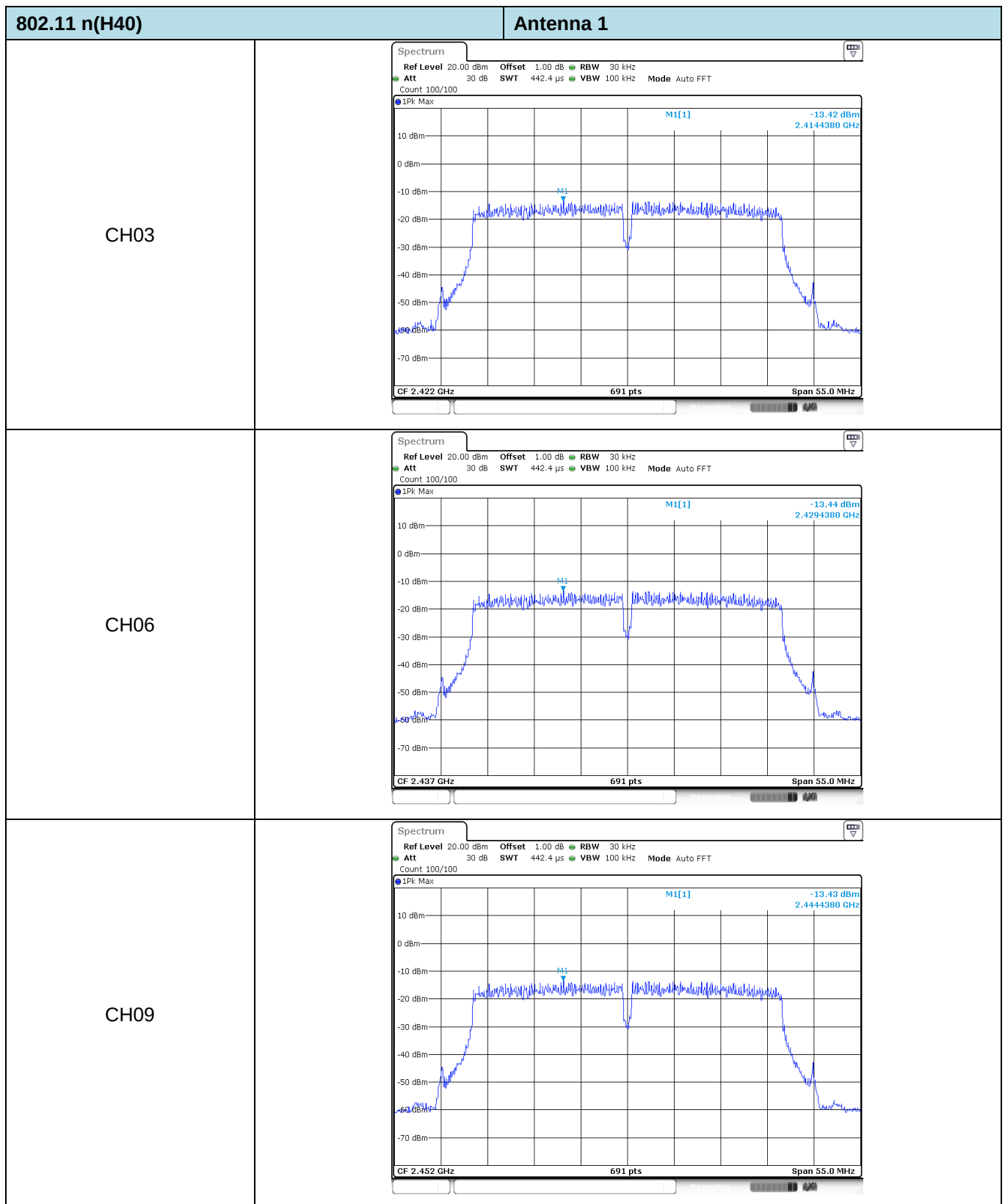










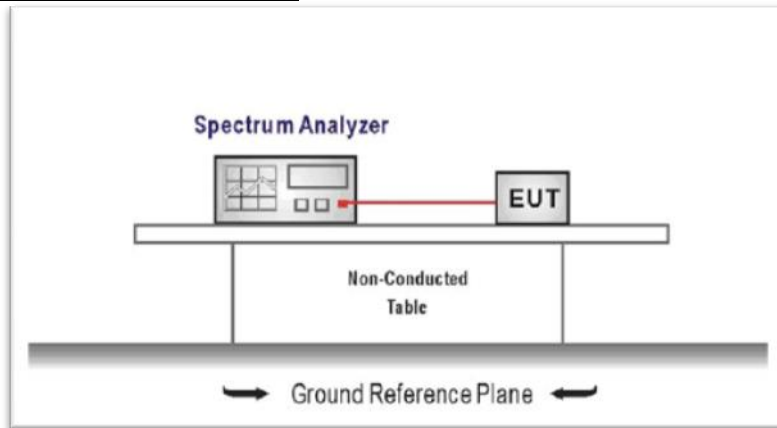


5.5. 6dB Bandwidth

LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (a)(2):For digital modulation systems, the minimum 6 dB bandwidth shall be at least 500 kHz.

TEST CONFIGURATION



TEST PROCEDURE

1. Connect the antenna port(s) to the spectrum analyzer input.
2. Configure the spectrum analyzer as shown below (enter all losses between the transmitter output and the spectrum analyzer).
Center Frequency = DTS channel center frequency
Span = 2 × DTS bandwidth
RBW = 100 kHz, VBW ≥ 3 × RBW
Sweep time = auto couple
Detector = Peak
Trace mode = max hold
3. Place the radio in continuous transmit mode, allow the trace to stabilize, view the transmitter wave form on the spectrum analyzer.
4. Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission, and record the pertinent measurements.

TEST MODE:

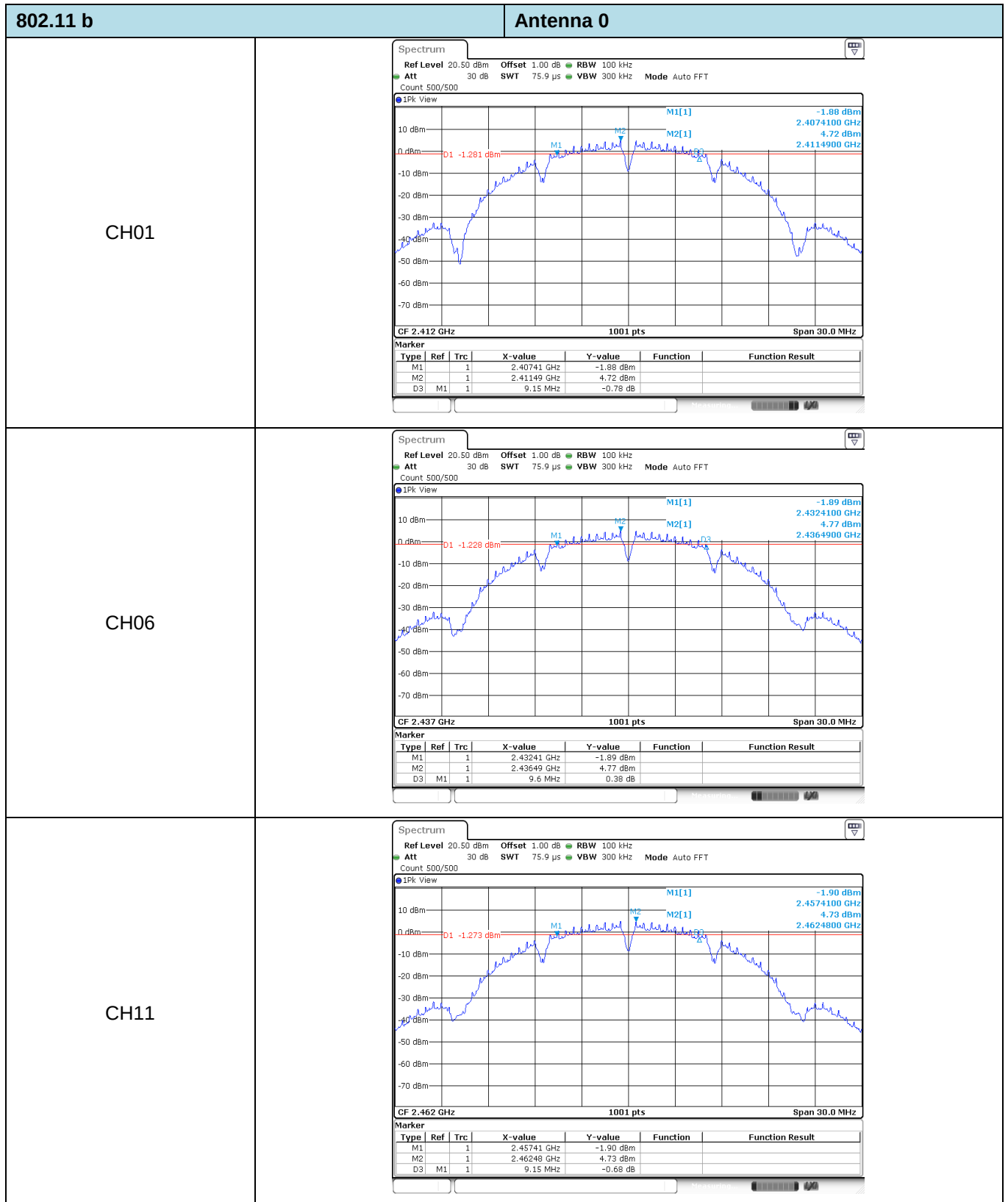
Please refer to the clause 3.3

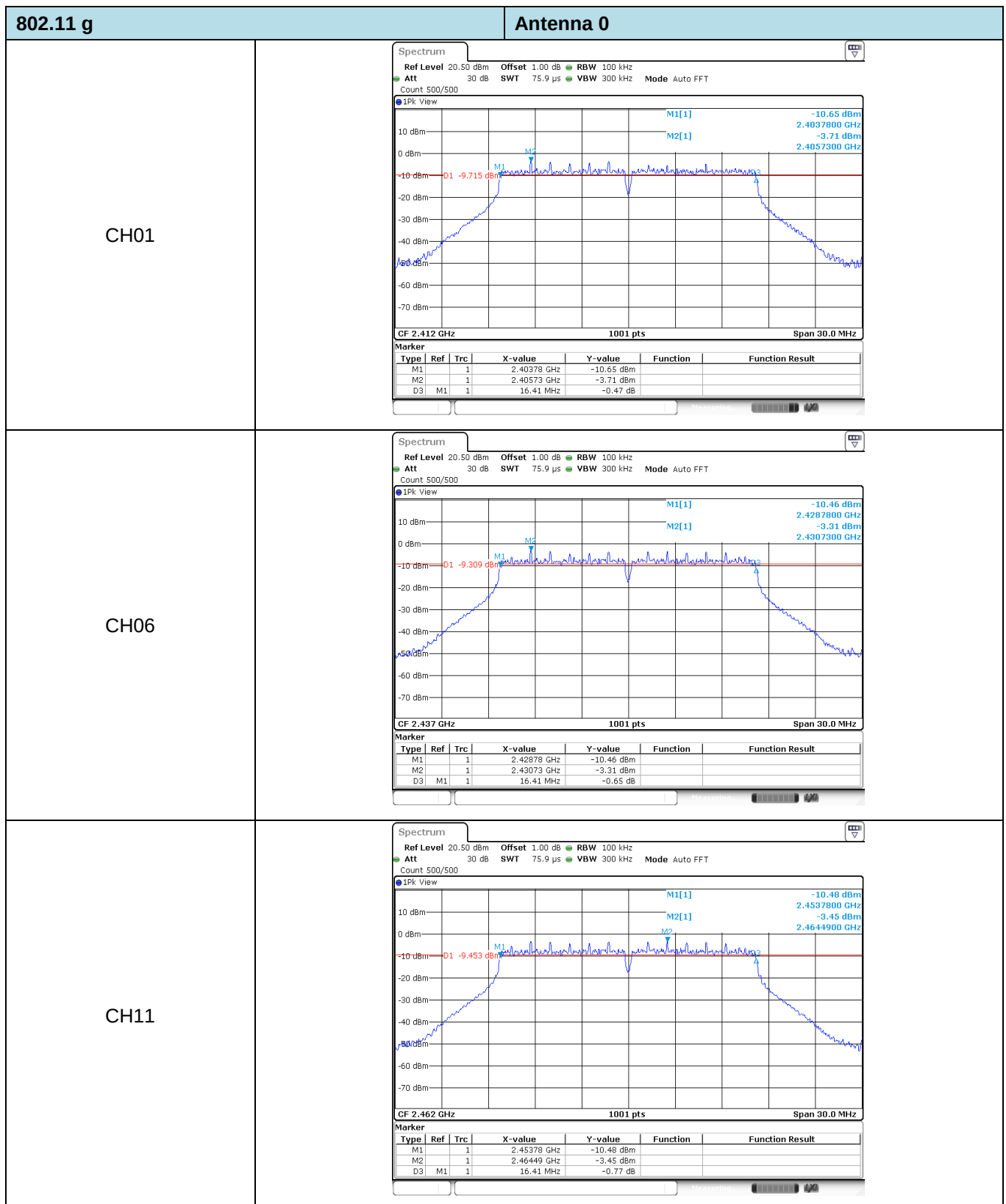
TEST RESULTS

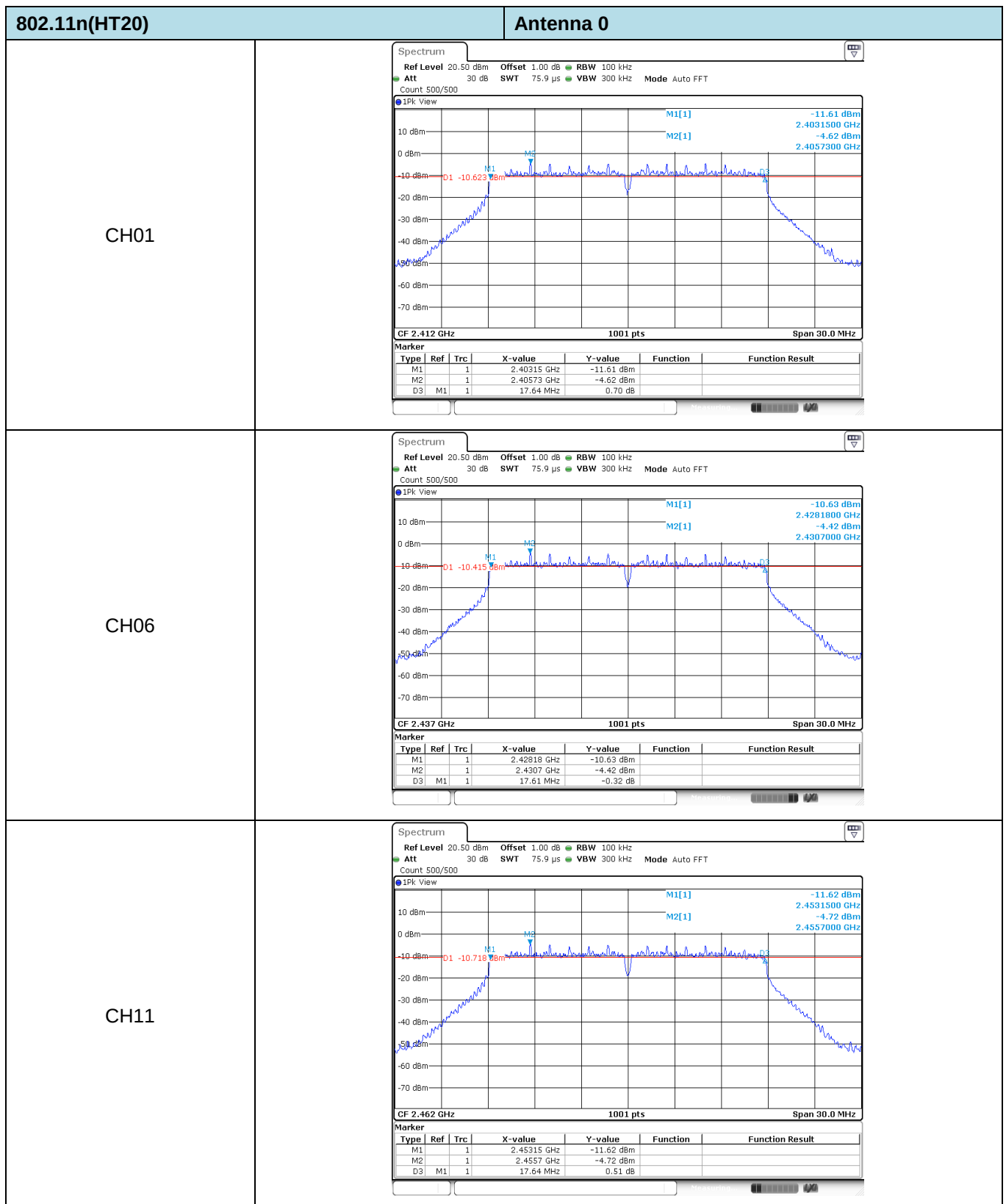
☒ Passed ☐ Not Applicable

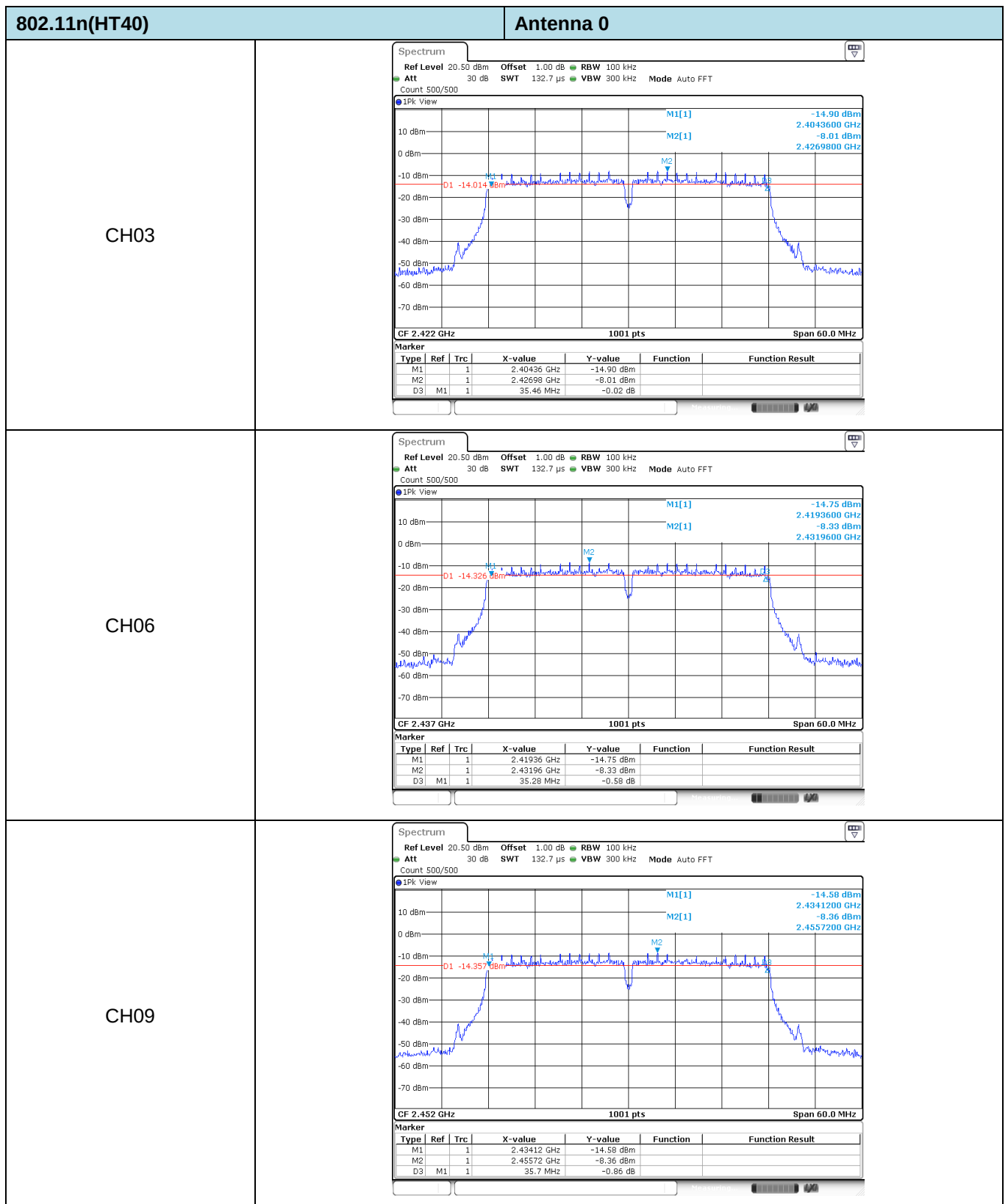
Type	Channel	6dB Bandwidth (MHz)		Limit (kHz)	Result
		Antenna 0	Antenna 1		
802.11b	01	9.15	10.05	≥500	Pass
	06	9.60	9.60		
	11	9.15	10.08		
802.11g	01	16.41	16.41	≥500	Pass
	06	16.41	16.41		
	11	16.41	16.41		
802.11n(HT20)	01	17.64	17.64	≥500	Pass
	06	17.61	17.64		
	11	17.64	17.64		
802.11n(HT40)	03	35.46	35.46	≥500	Pass
	06	35.28	35.46		
	09	35.70	35.46		

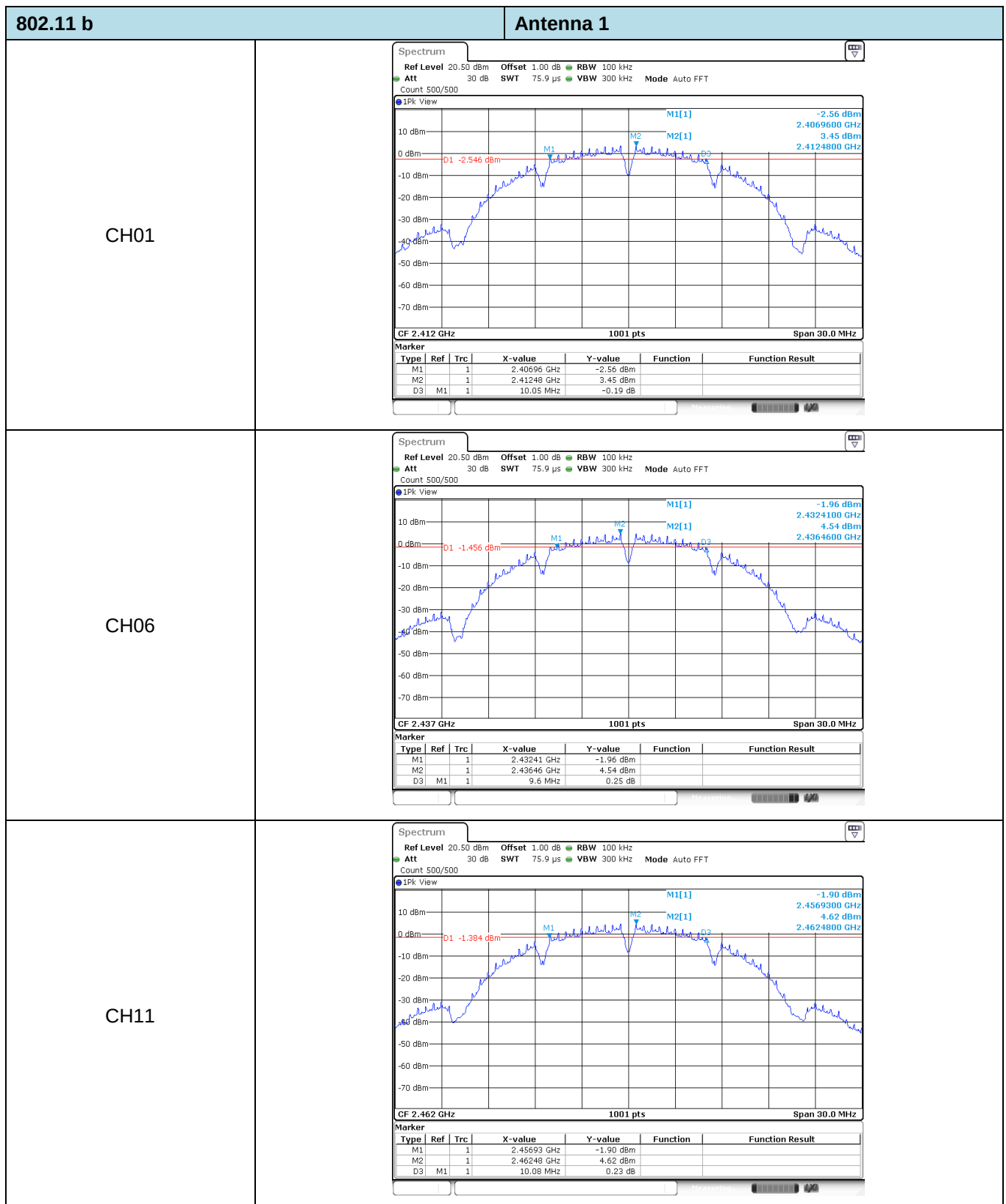
Test plot as follows:

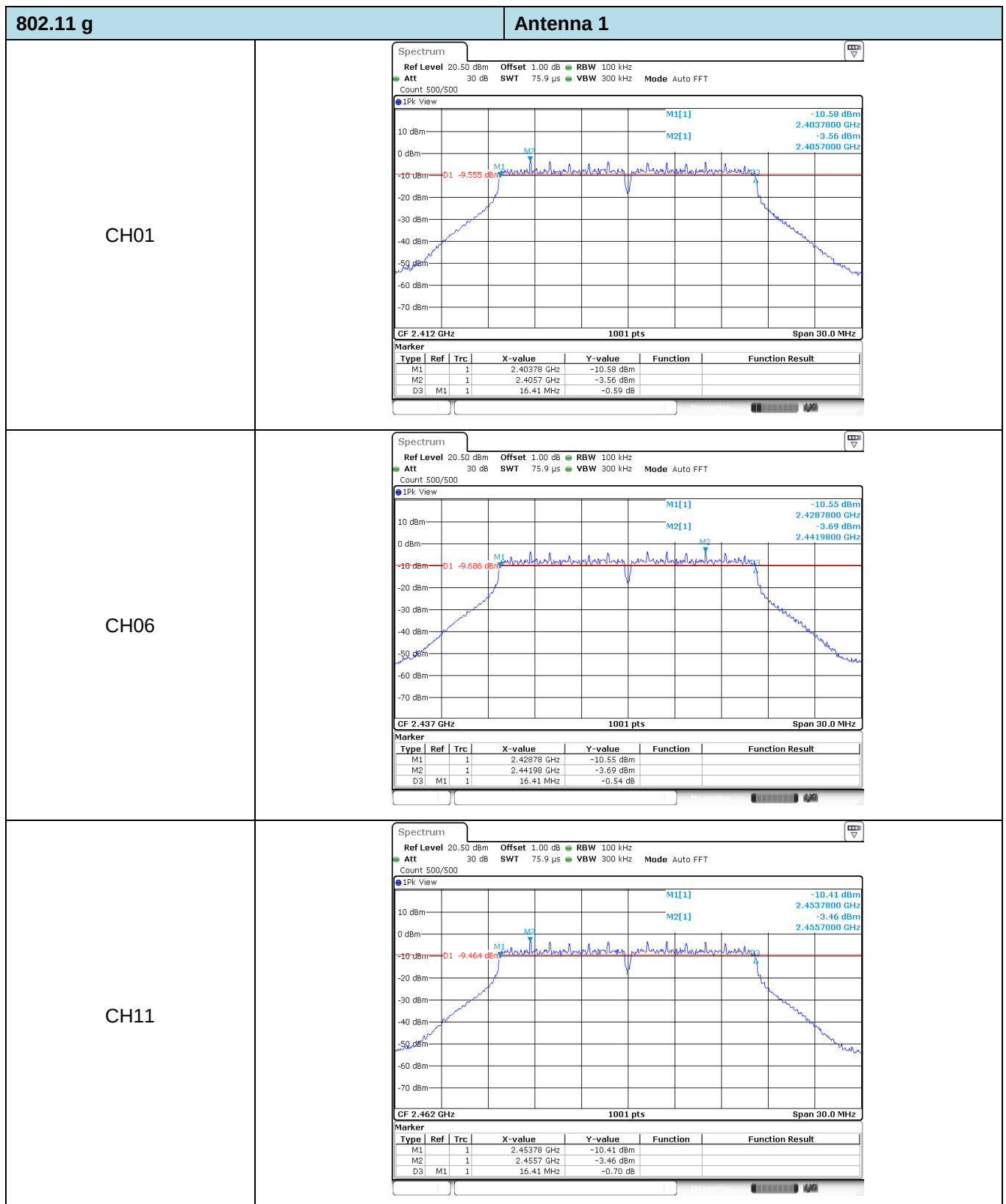


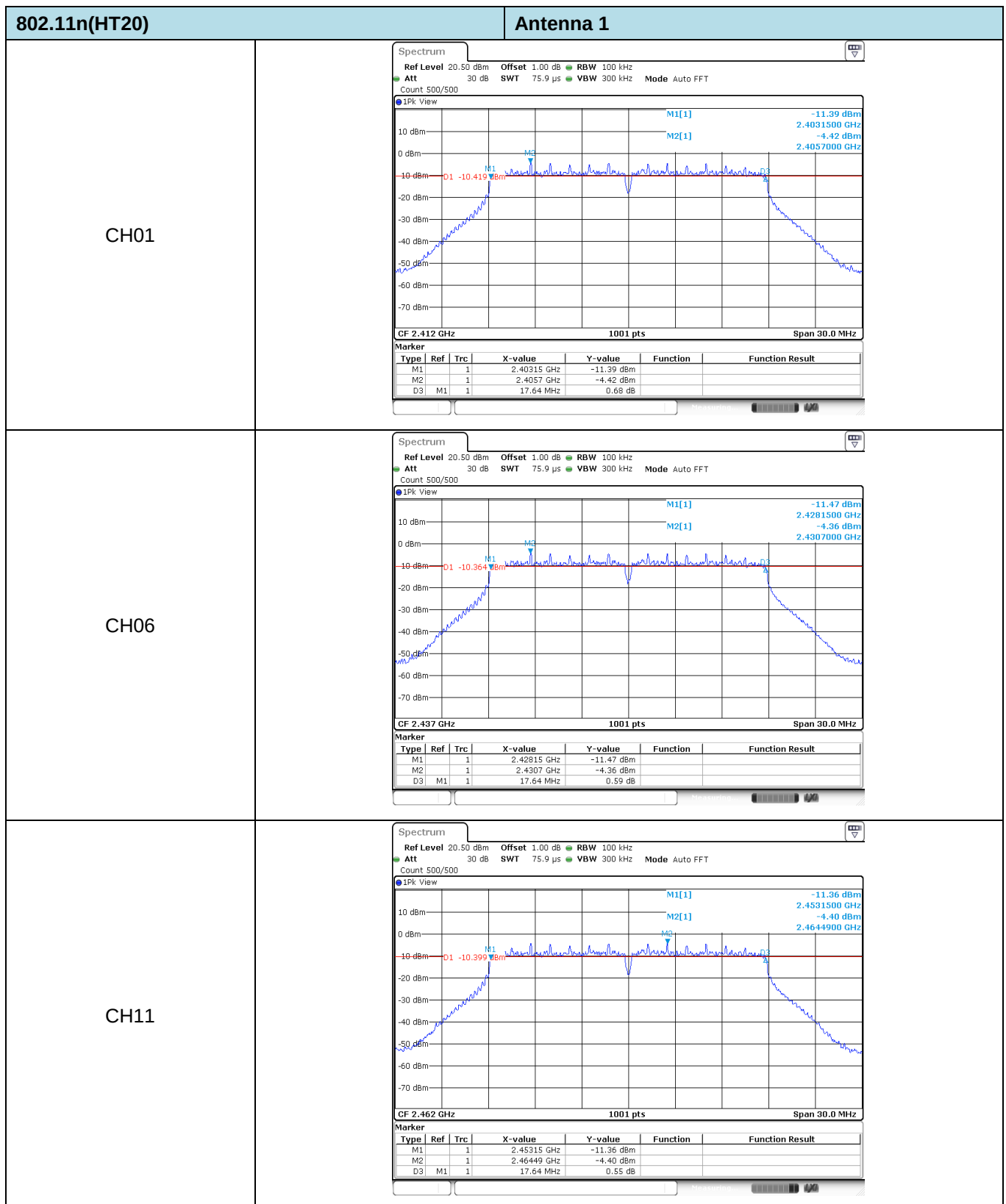


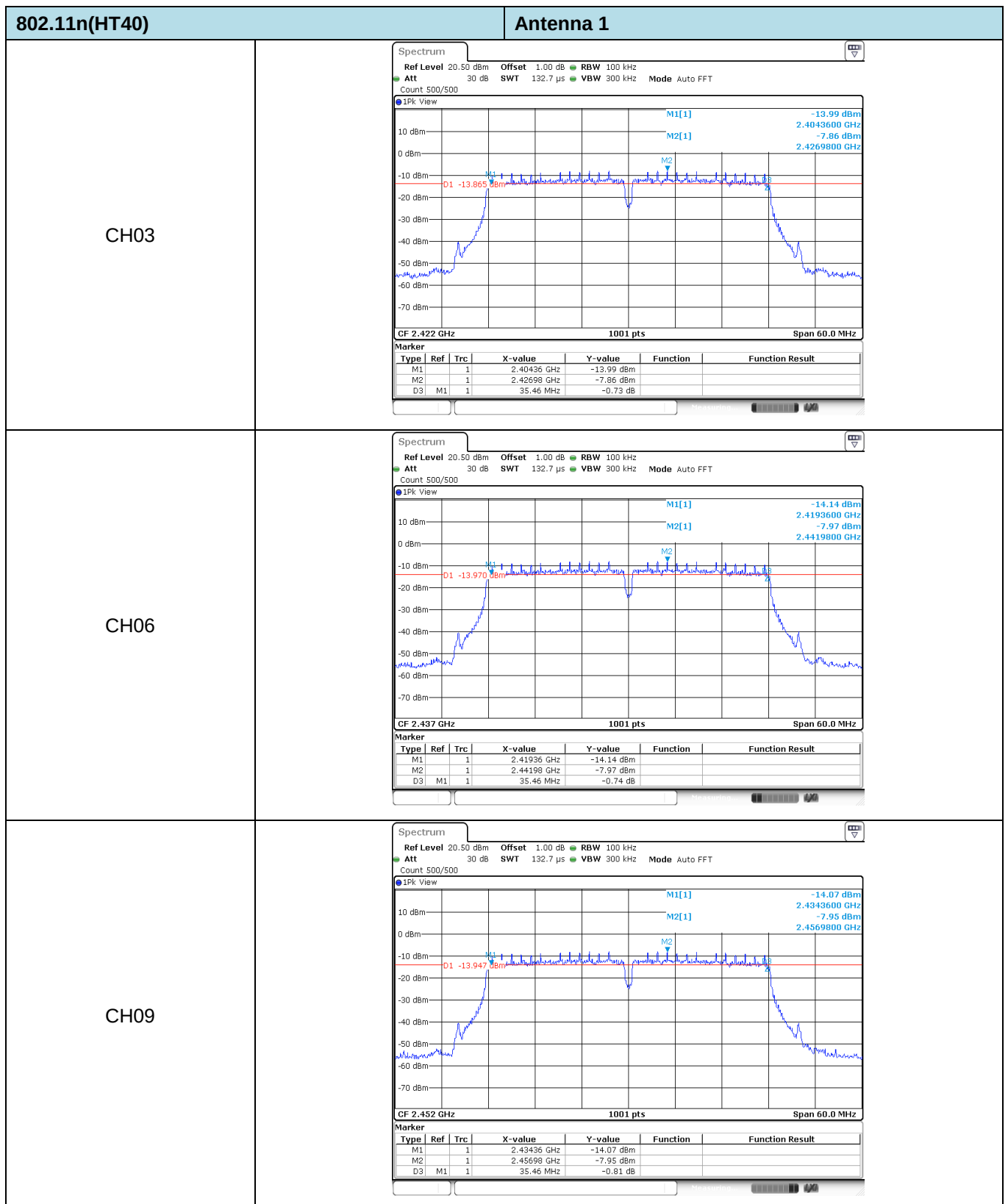










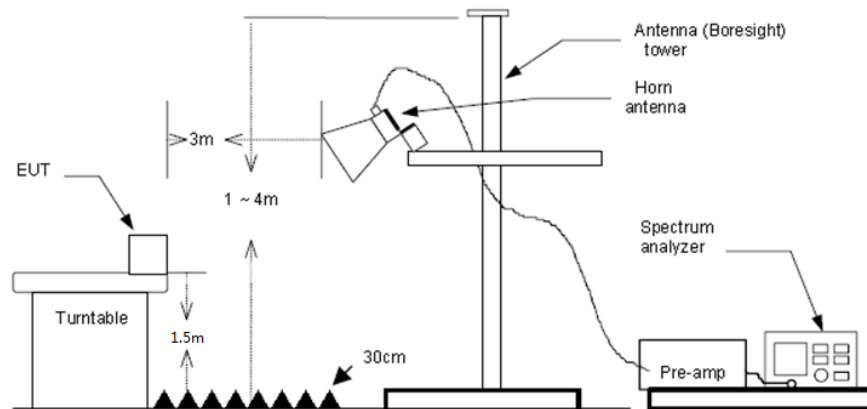


5.6. Restricted Band

LIMIT

FCC CFR Title 47 Part 15 Subpart C Section 15.247 (d): In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, Radiated Emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the Radiated Emissions limits specified in §15.209(a) (see §15.205(c)).

TEST CONFIGURATION



TEST PROCEDURE

- 1) The EUT was setup and tested according to ANSI C63.10:2013 for compliance to FCC 47CFR 15.247 requirements.
- 2) The EUT is placed on a turn table which is 1.5 meter above ground. The turn table is rotated 360 degrees to determine the position of the maximum emission level.
- 3) The EUT was positioned such that the distance from antenna to the EUT was 3 meters.
- 4) The antenna is scanned from 1 meter to 4 meters to find out the maximum emission level. This is repeated for both horizontal and vertical polarization of the antenna. In order to find the maximum emission, all of the interface cables were manipulated according to ANSI C63.10:2013 on radiated measurement.
- 5) The receiver set as follow:
 RBW=1MHz, VBW=3MHz PEAK detector for Peak value.
 RBW=1MHz, VBW=3MHz RMS detector for Average value.

TEST MODE:

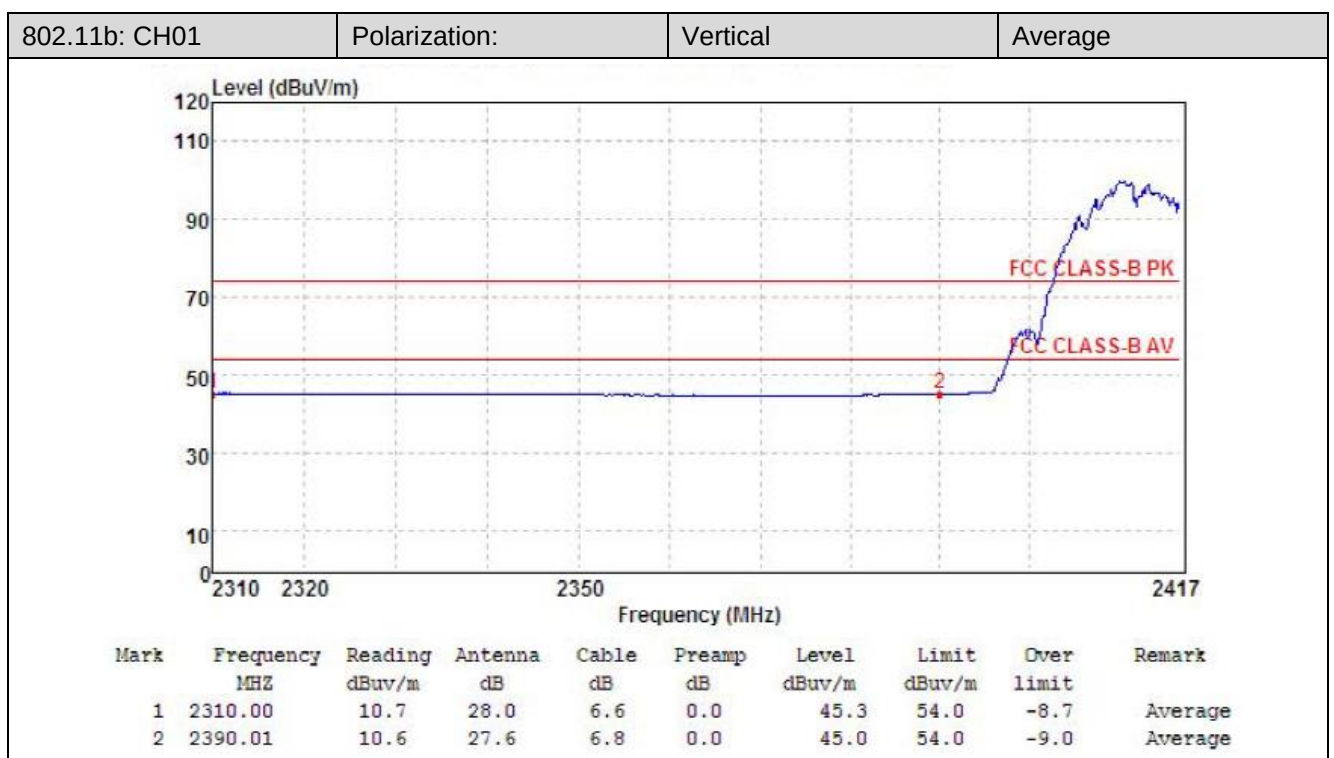
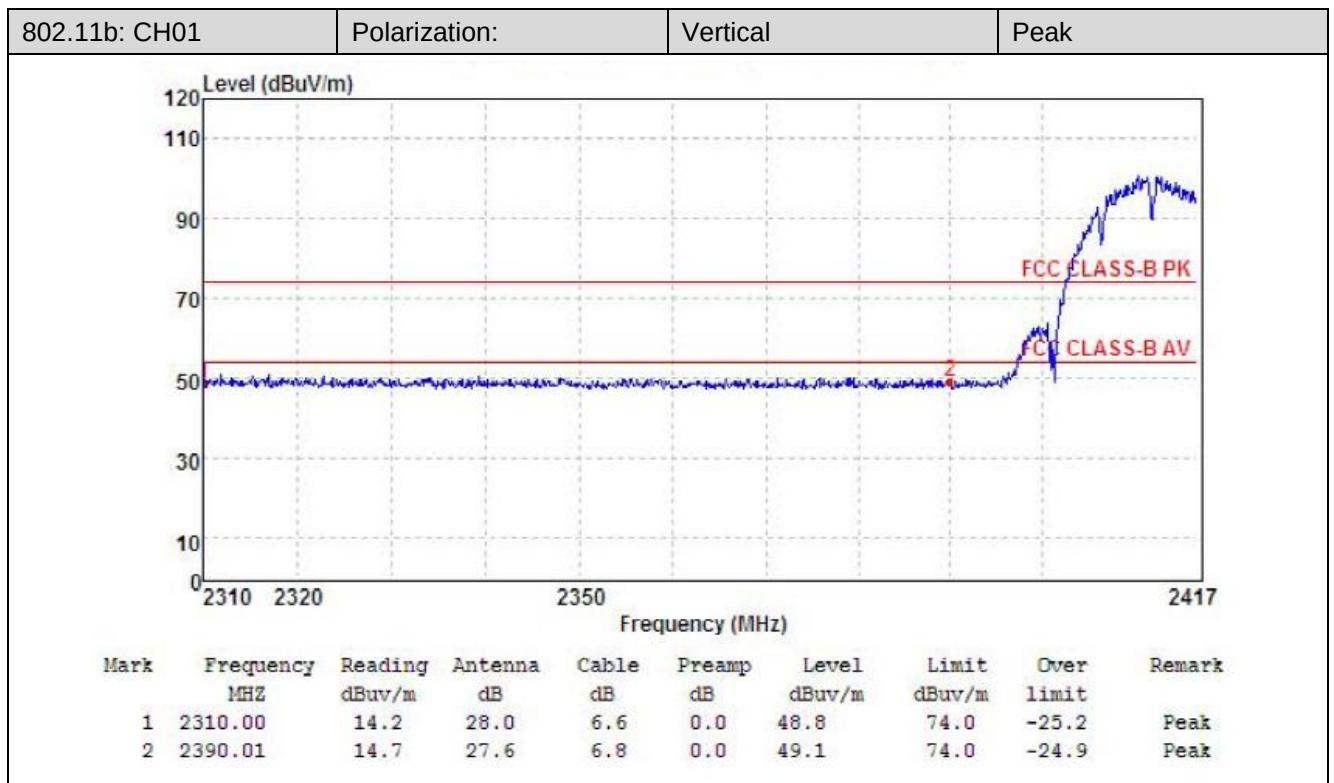
Please refer to the clause 3.3

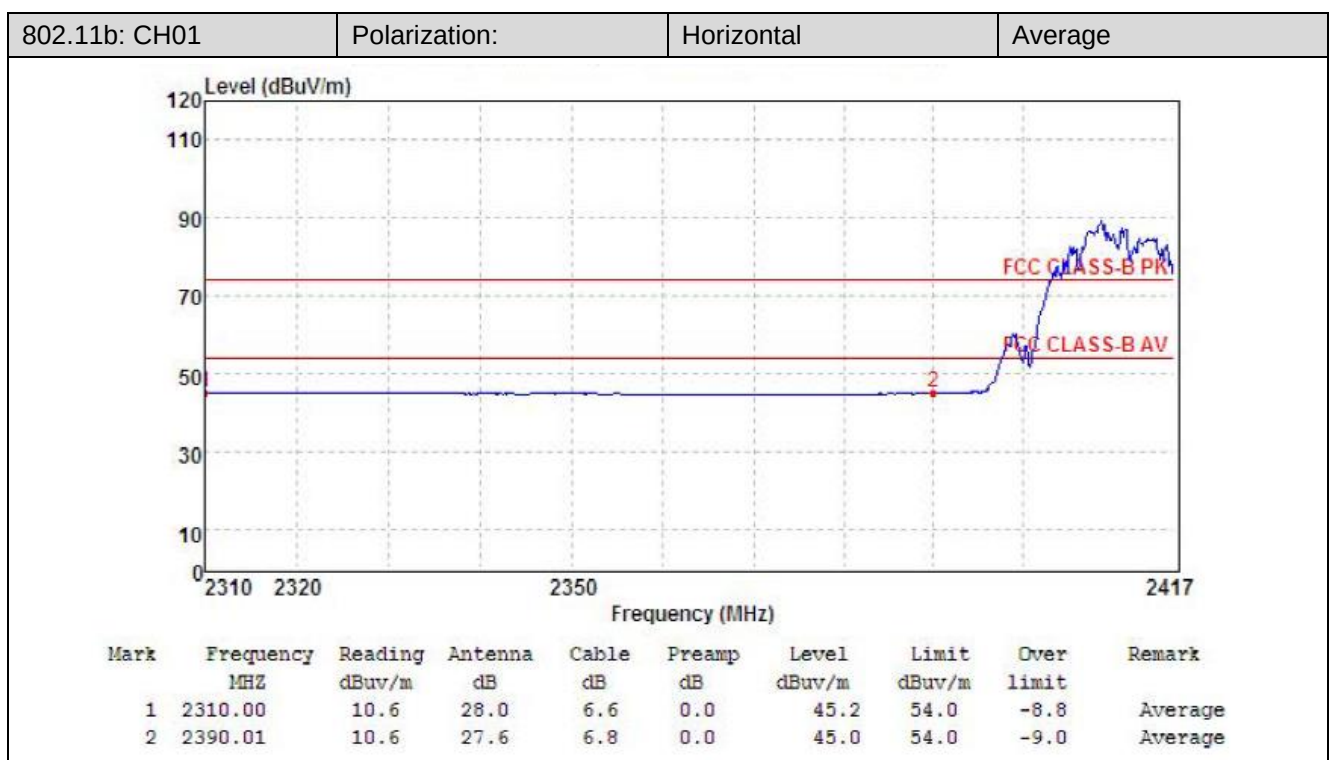
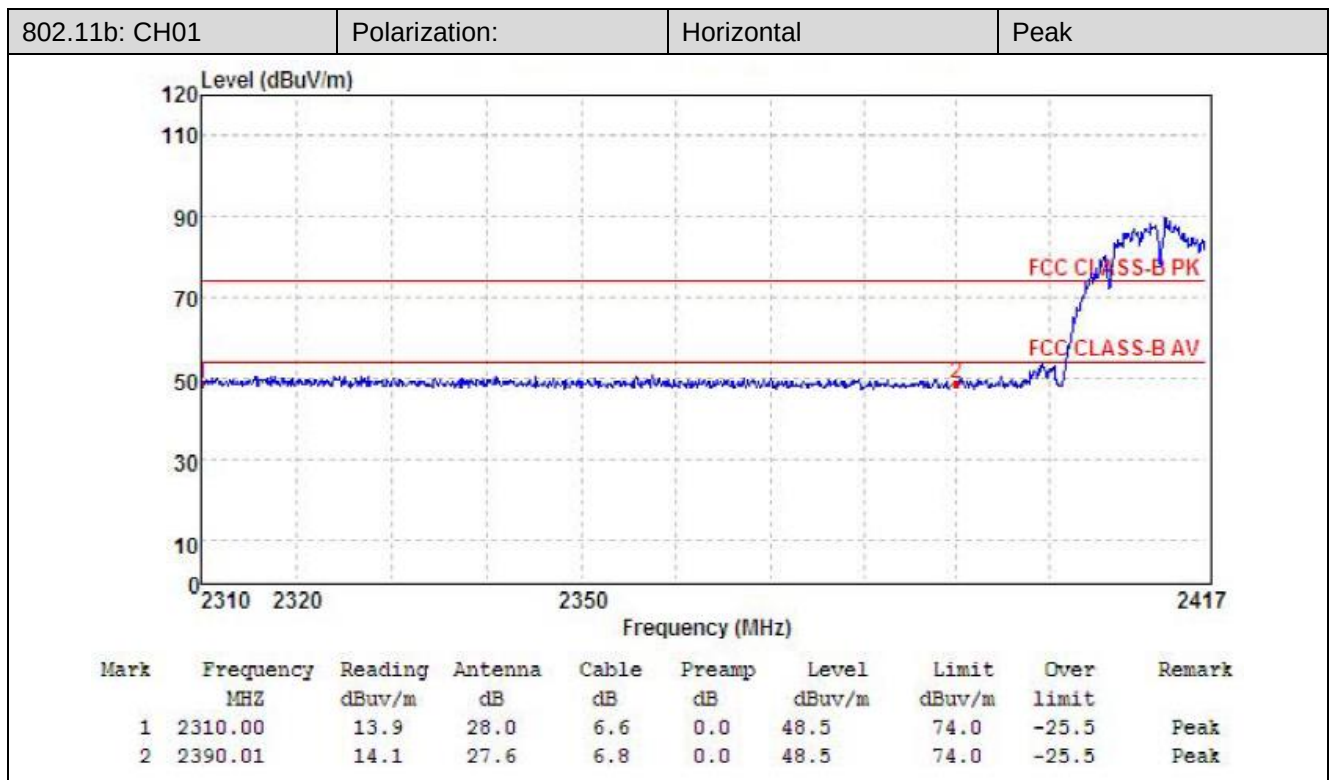
TEST RESULTS

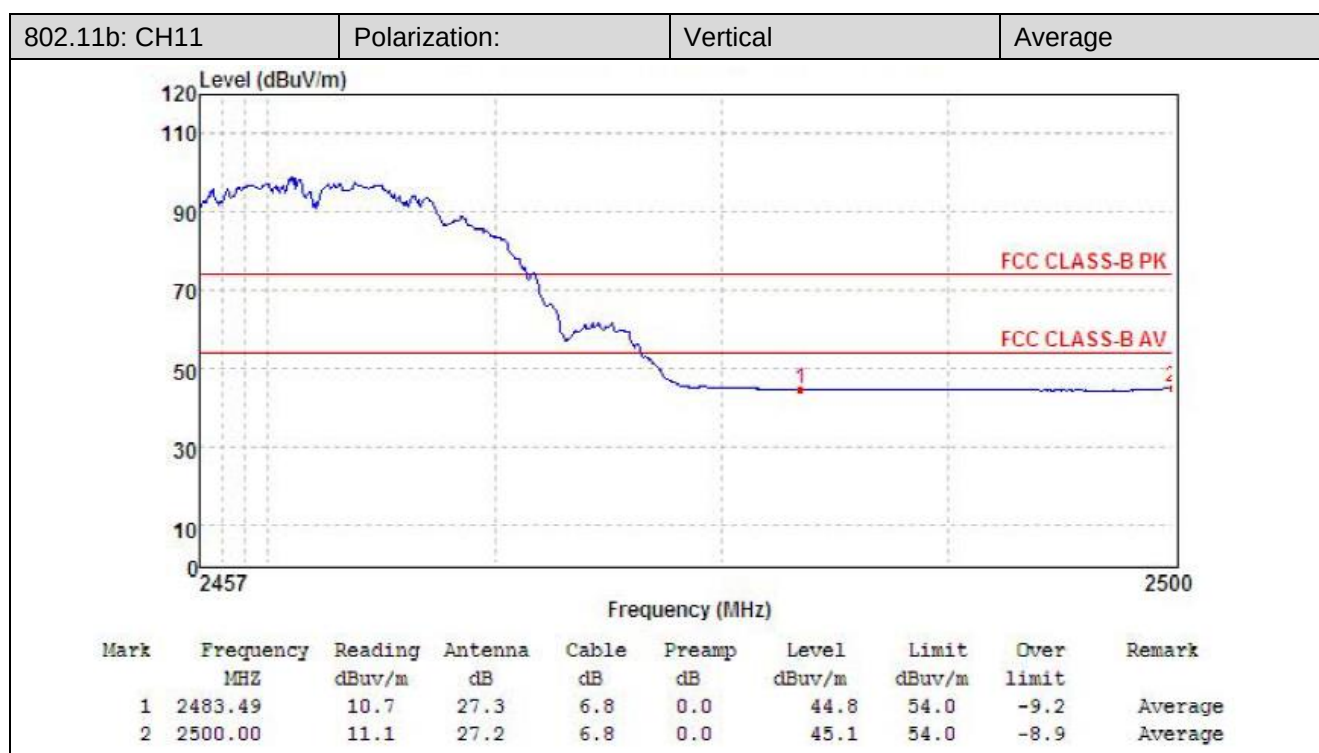
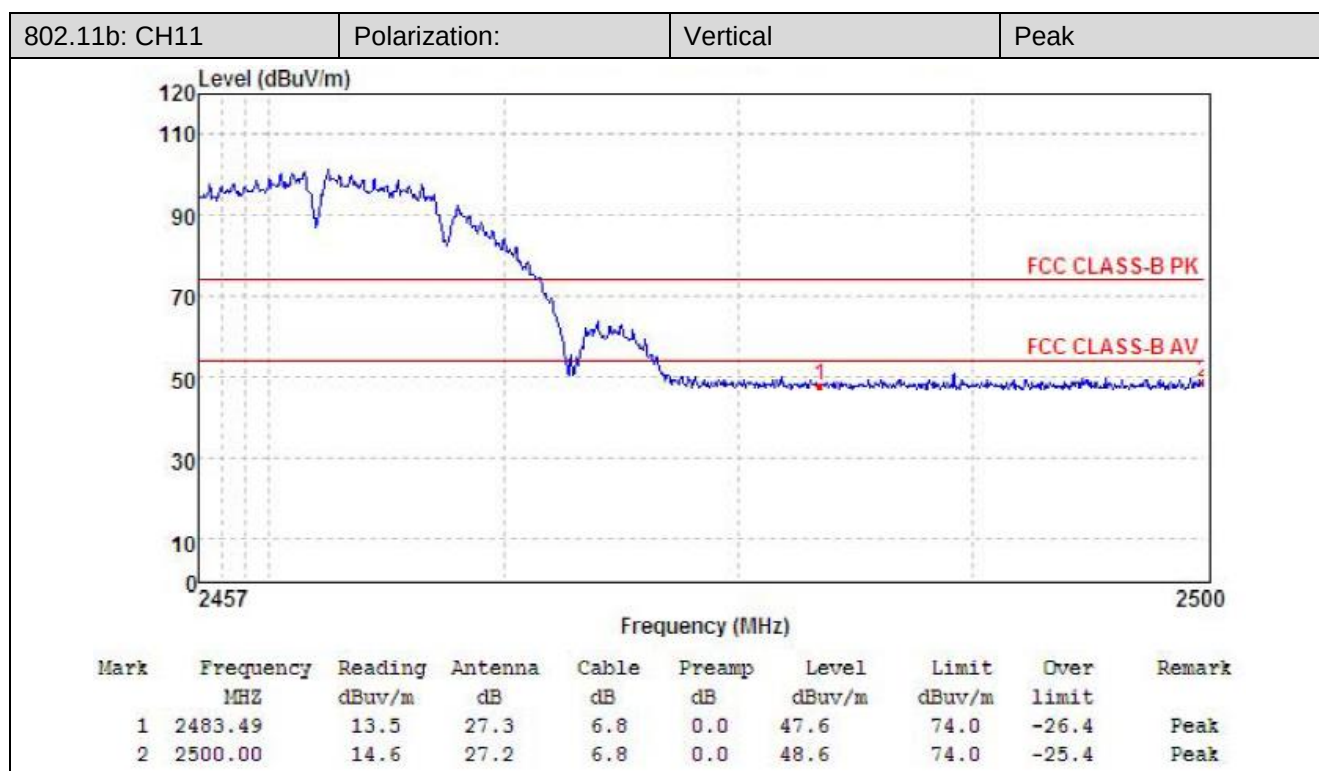
☒ Passed ☐ Not Applicable

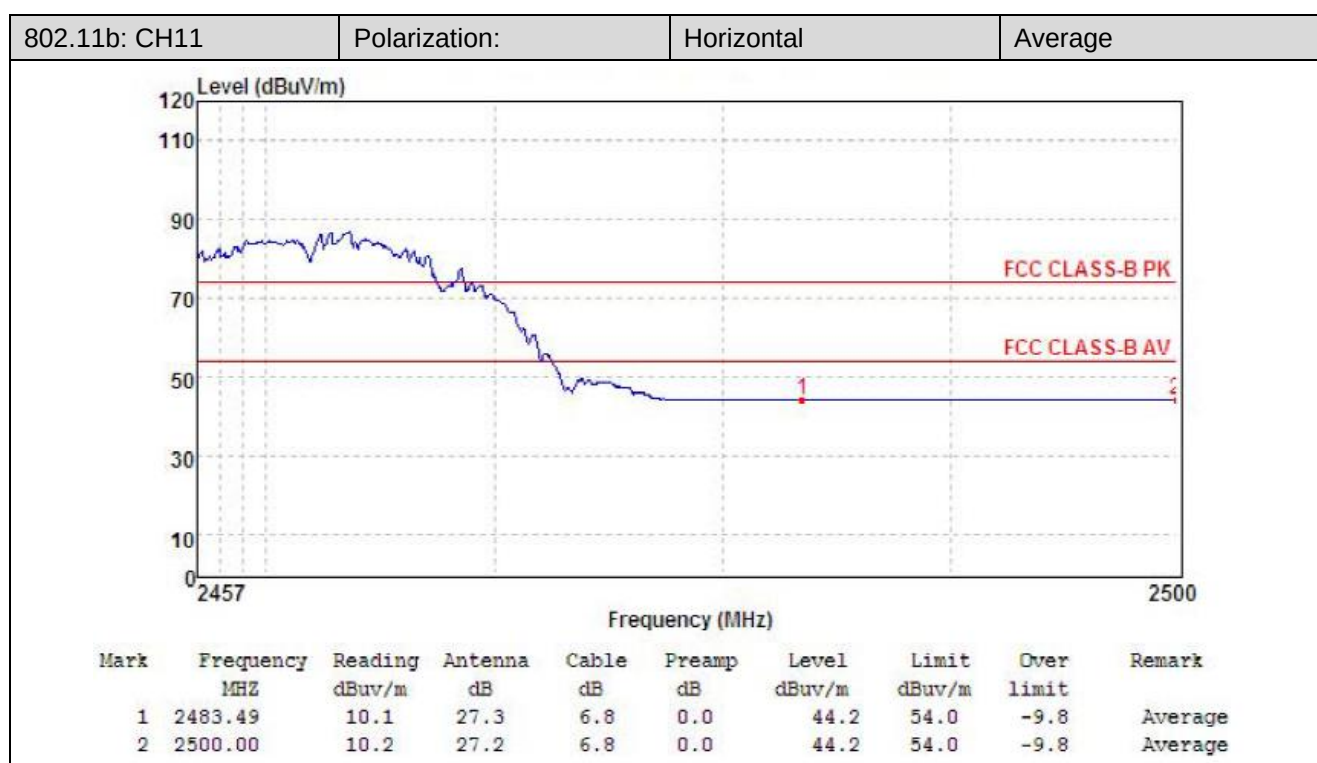
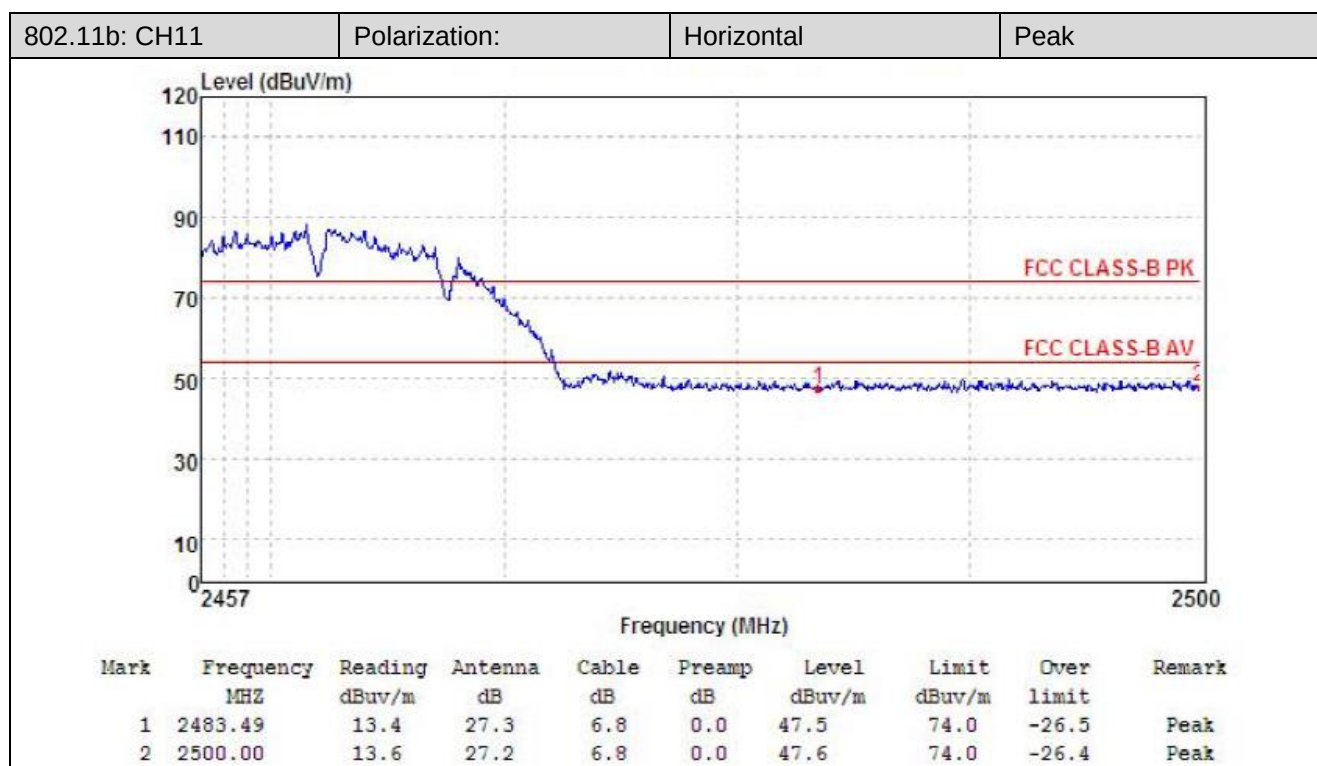
Note:

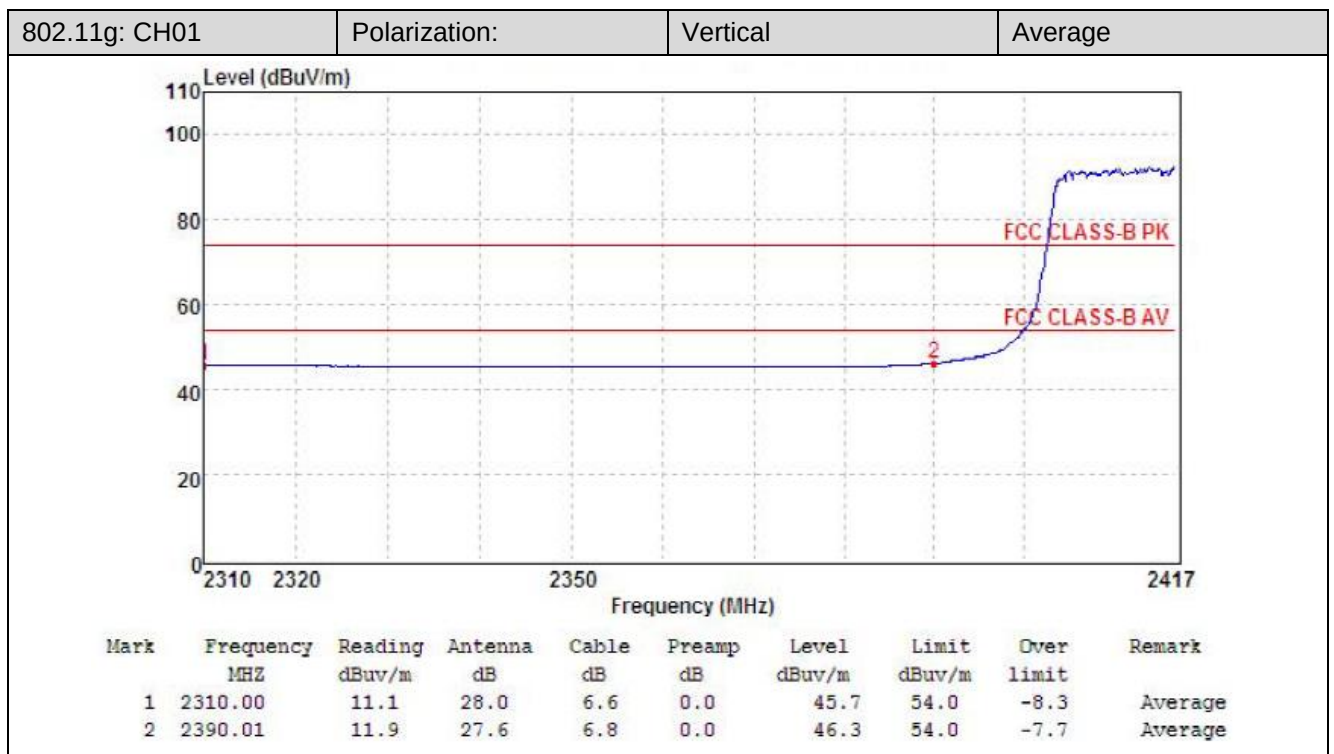
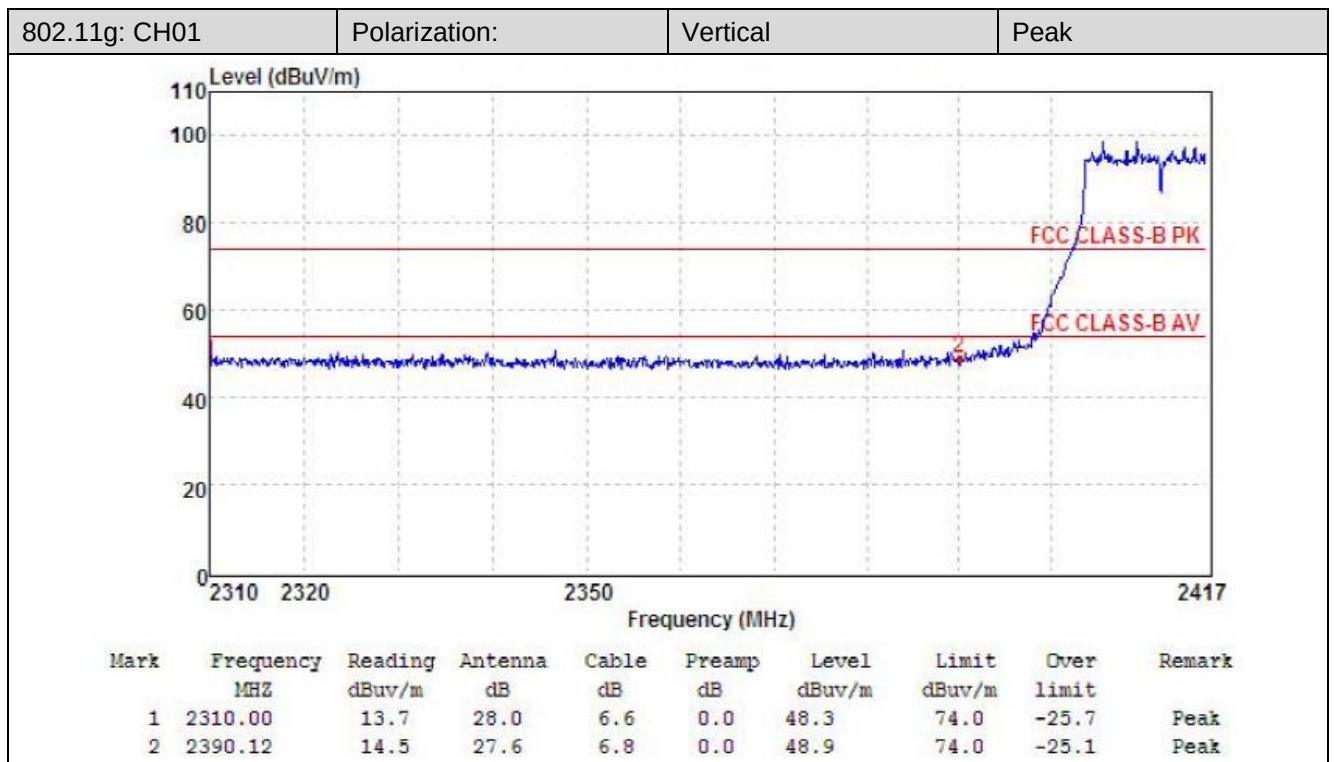
- 1) Final level= Read level + Antenna Factor+ Cable Loss- Preamp Factor

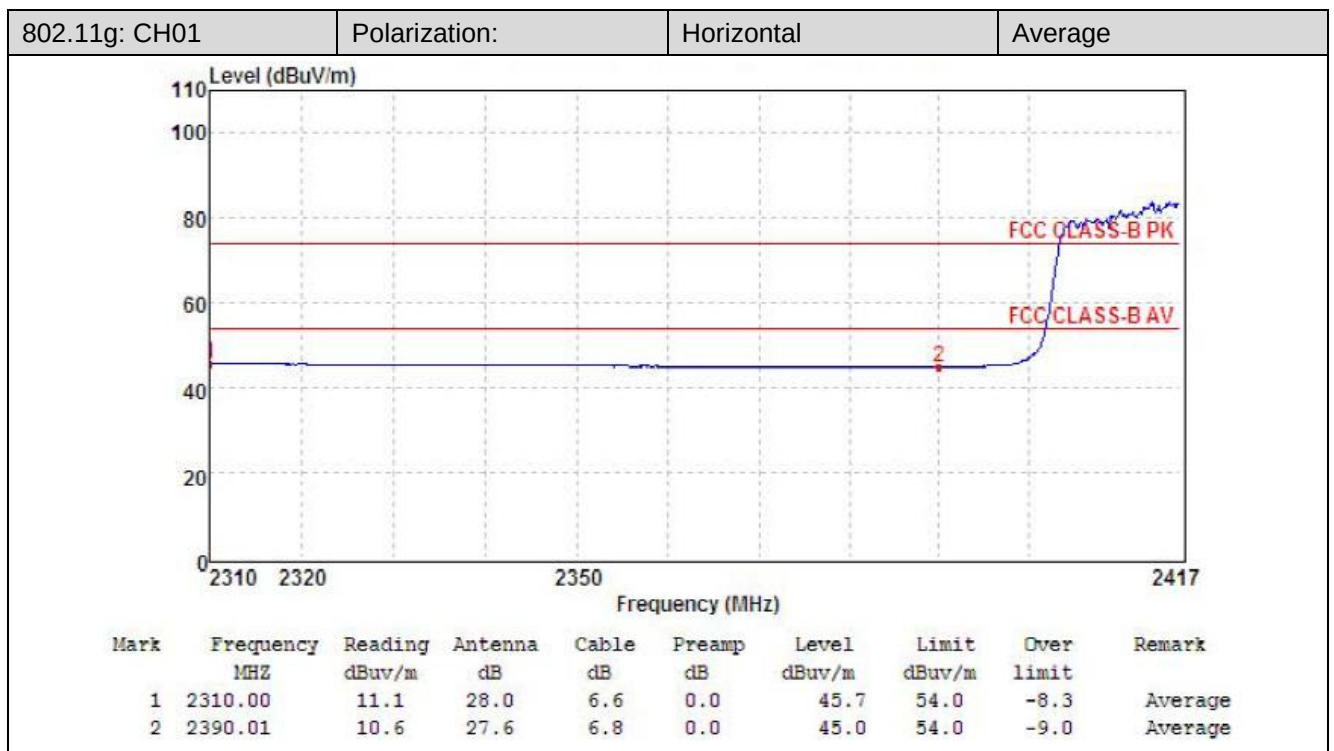
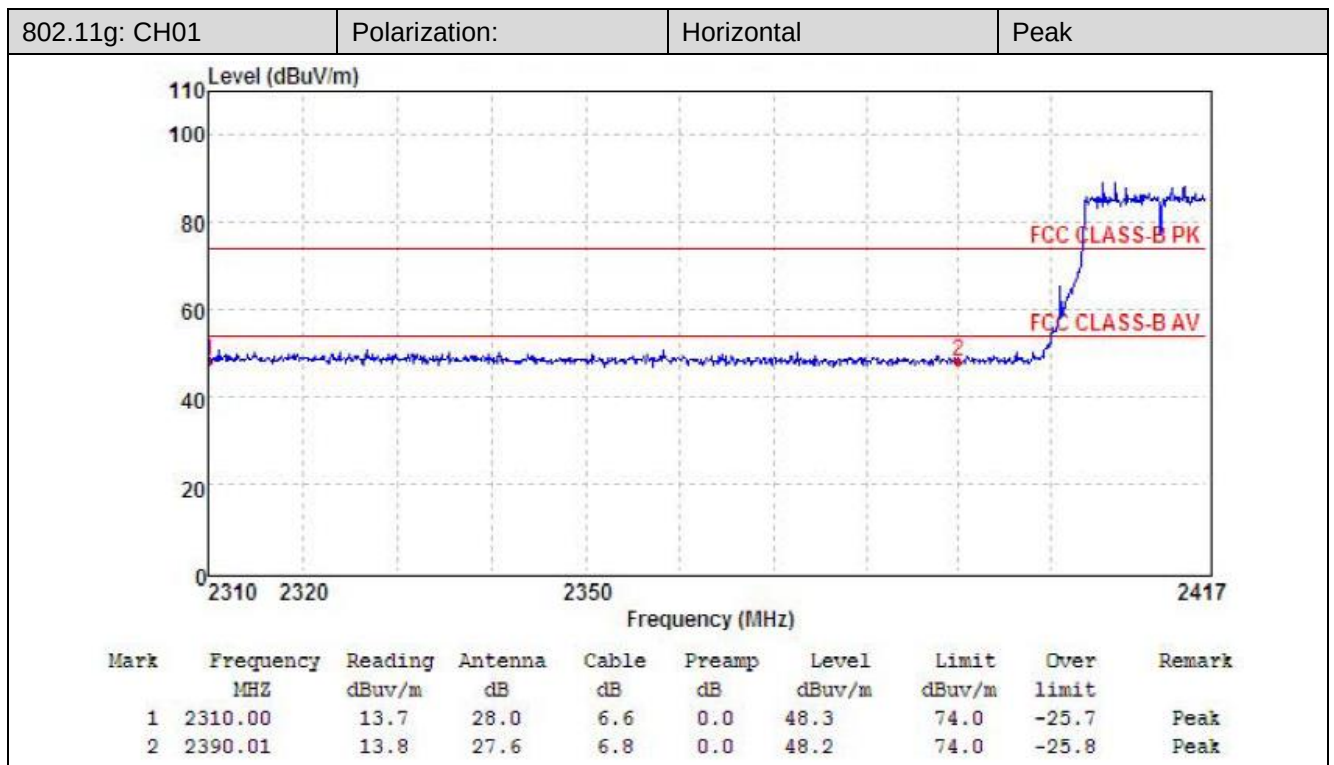


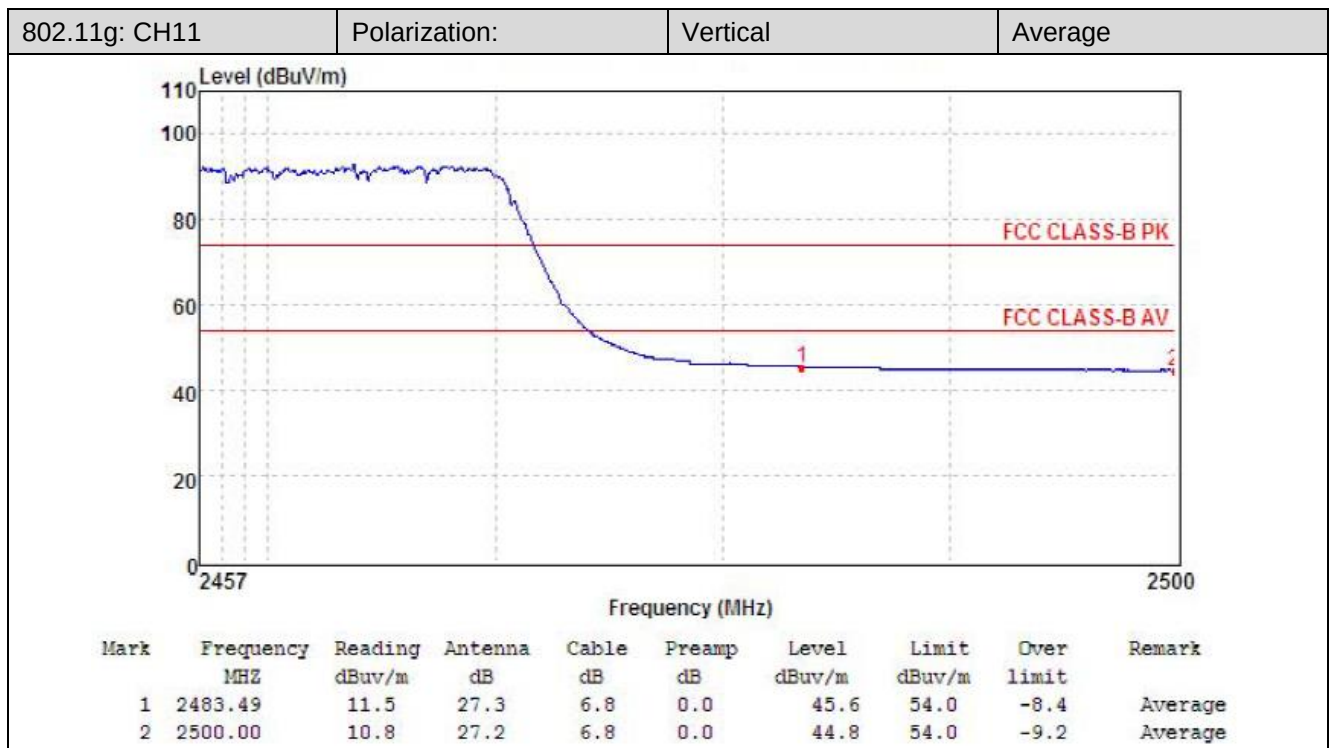
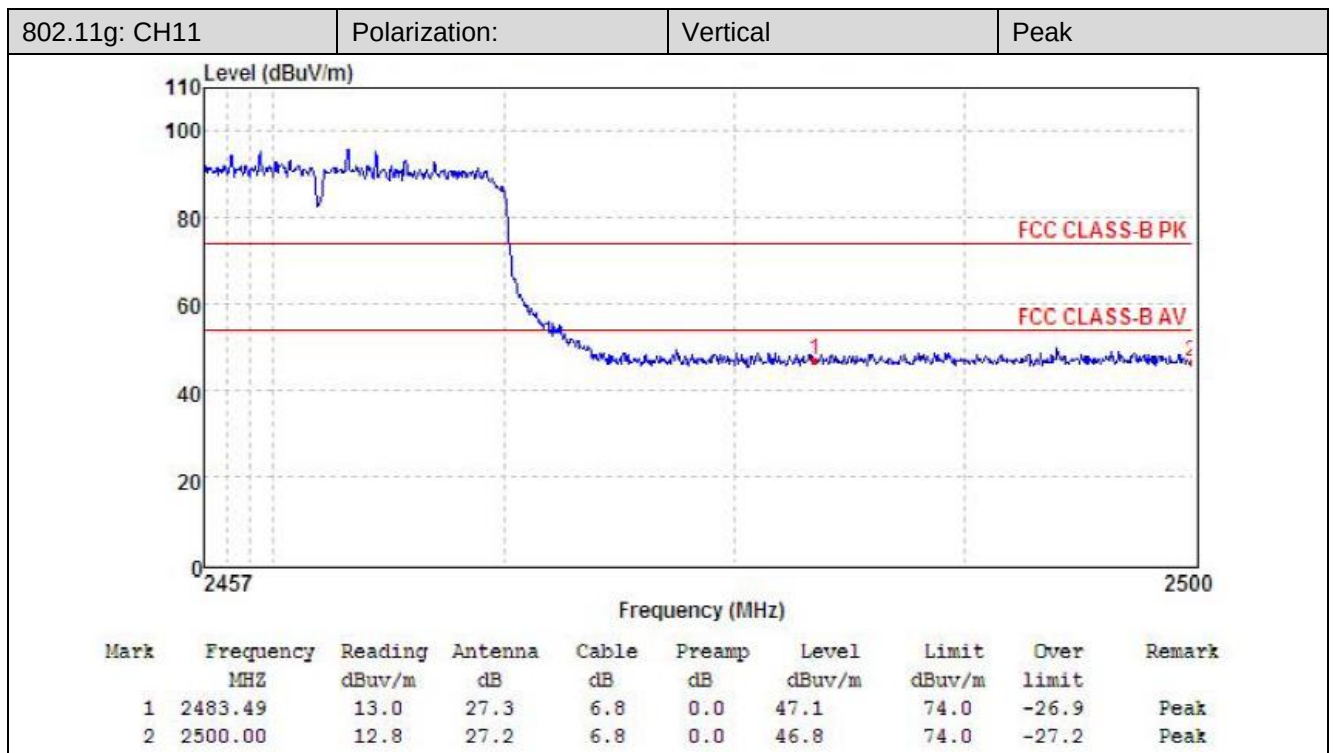


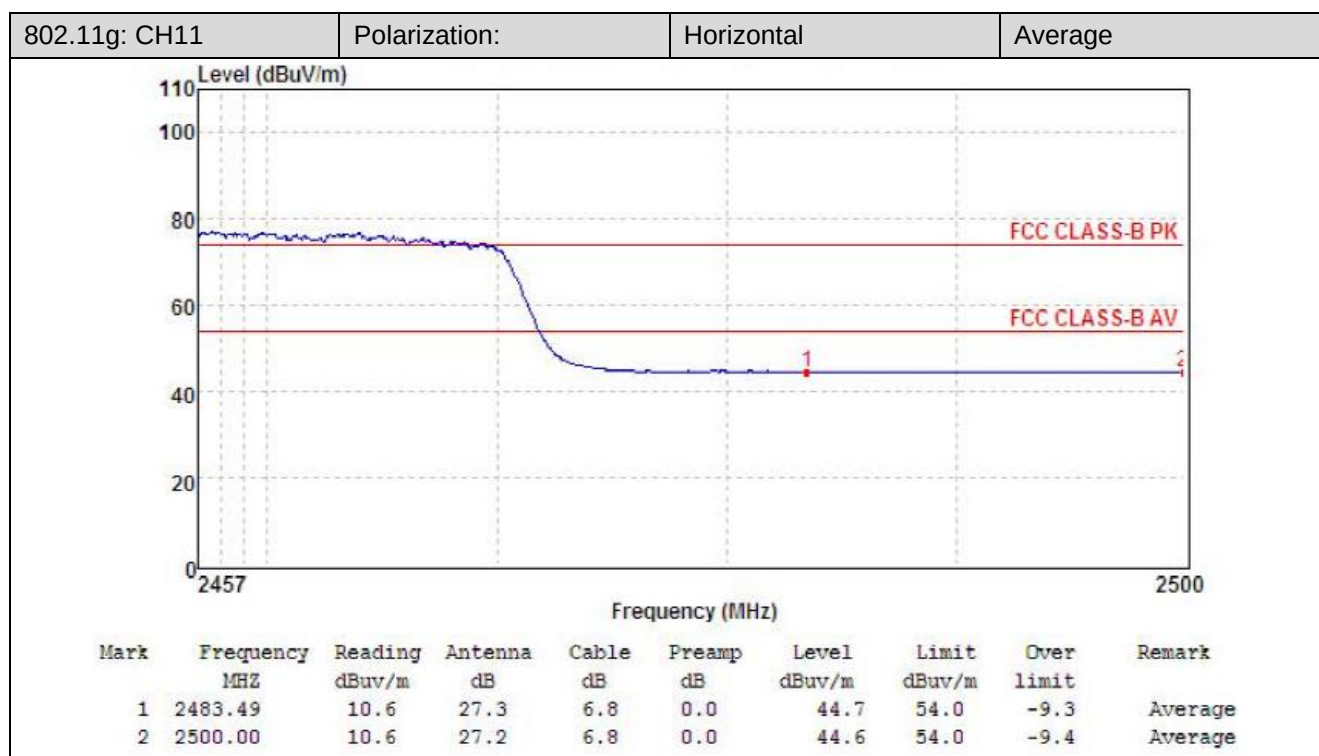
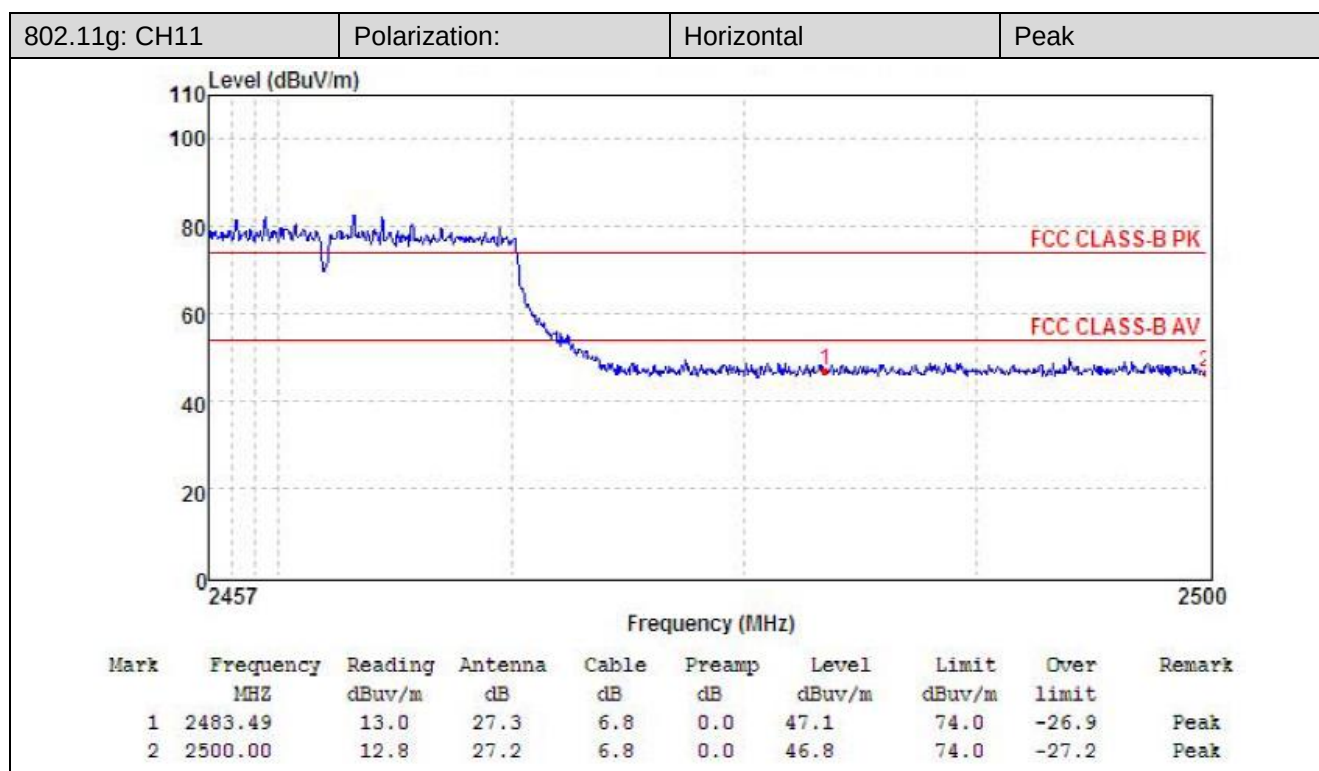


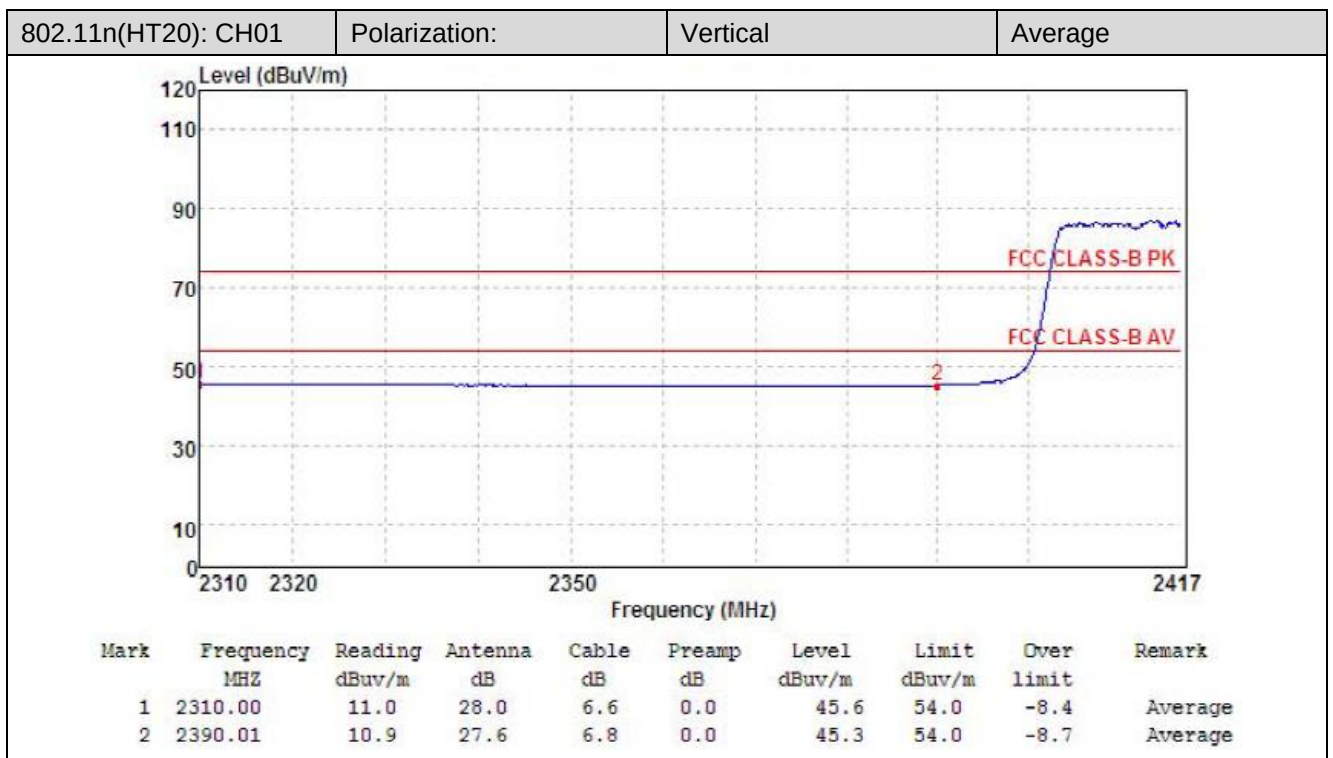
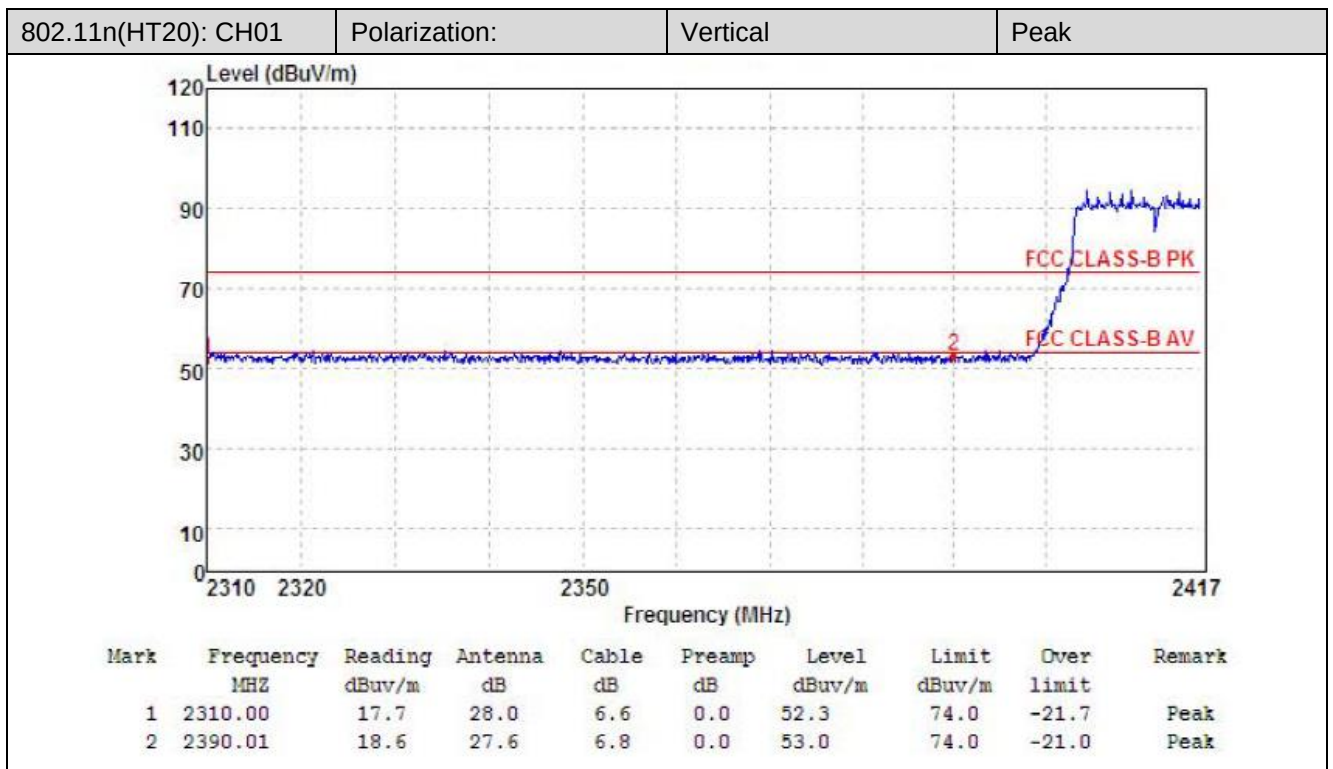


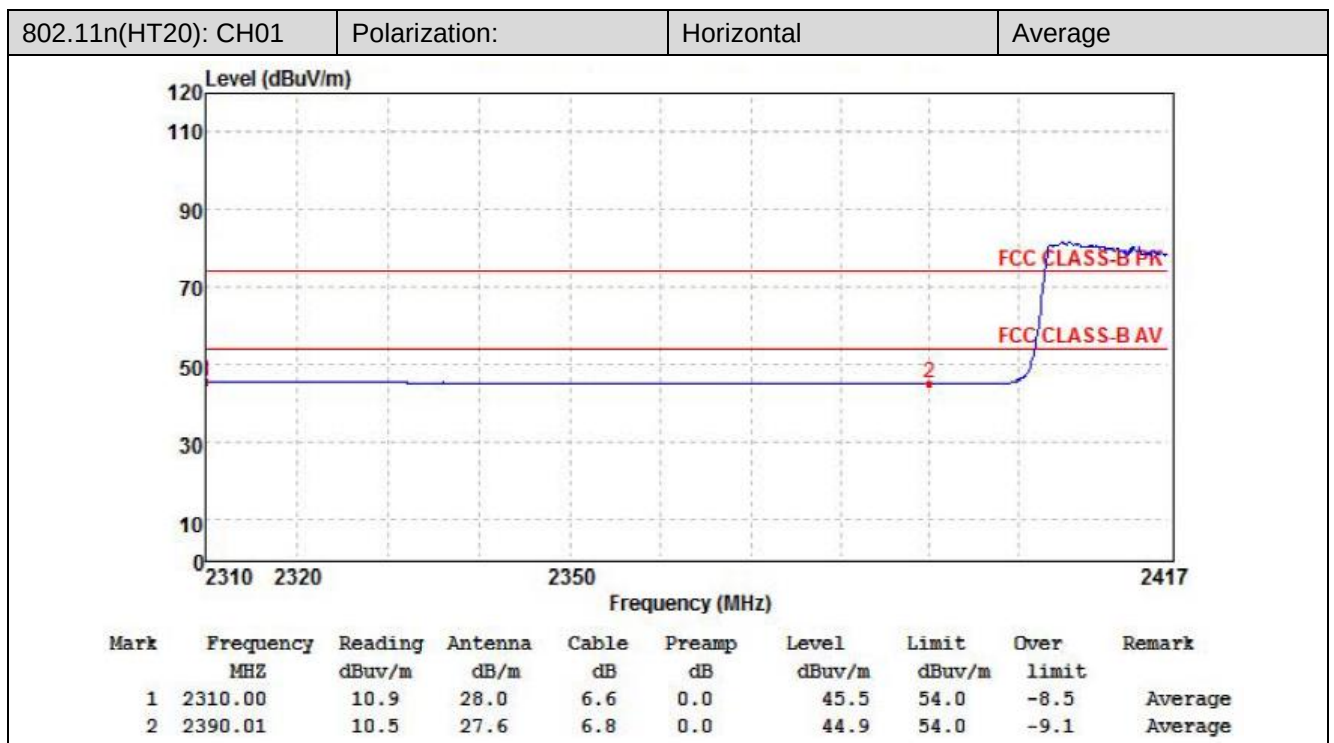
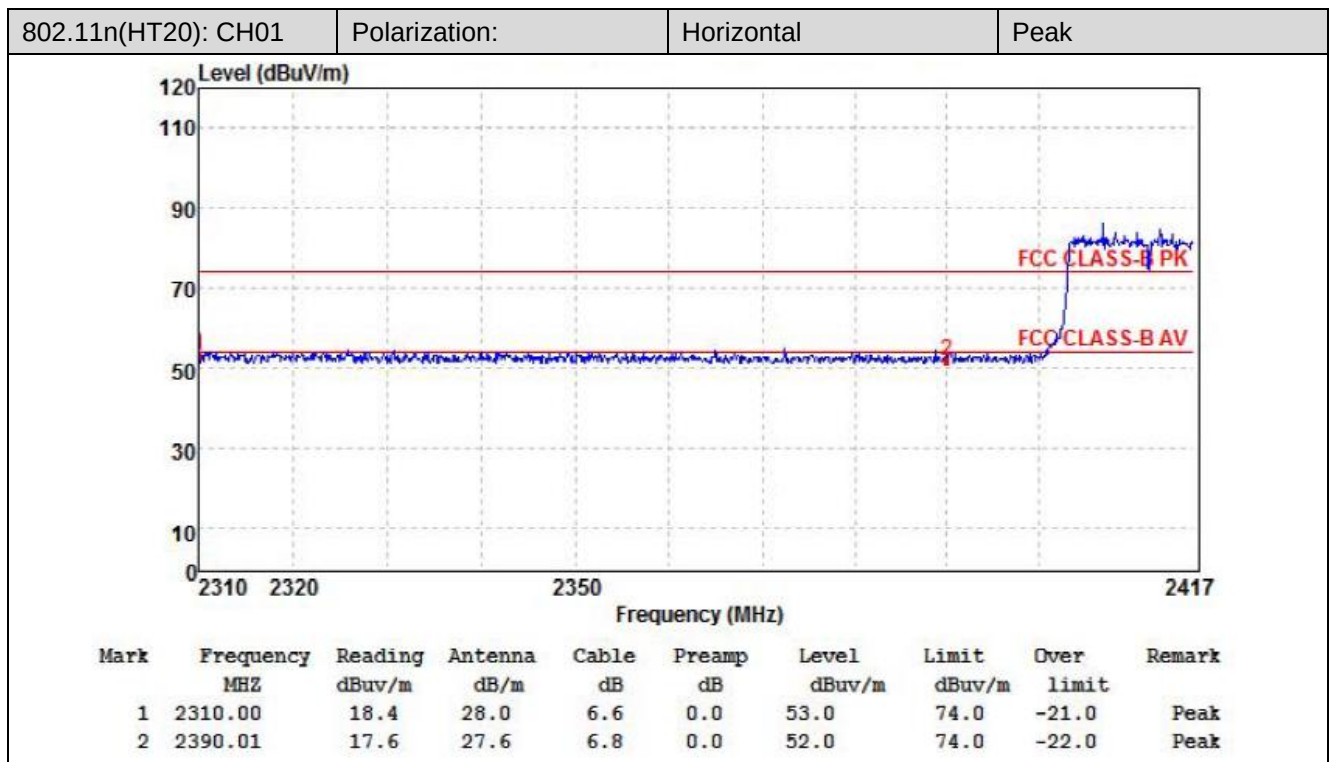


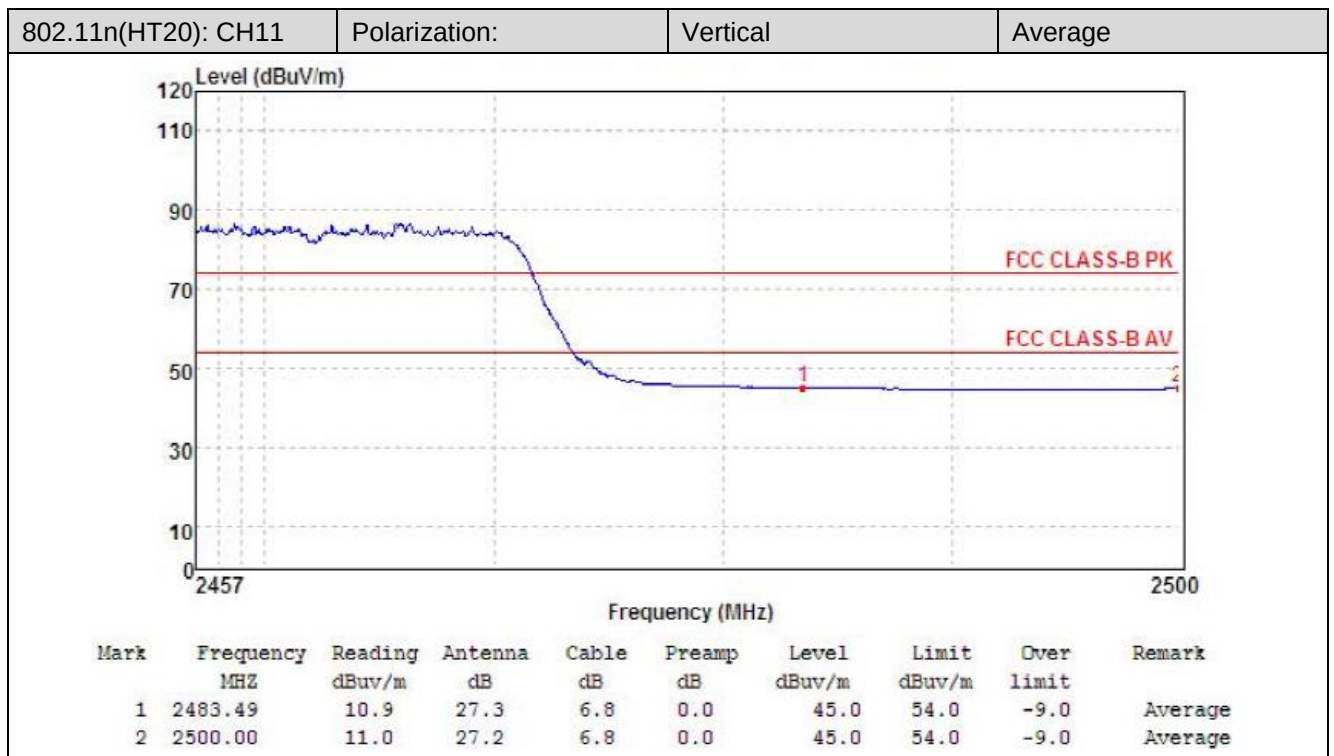
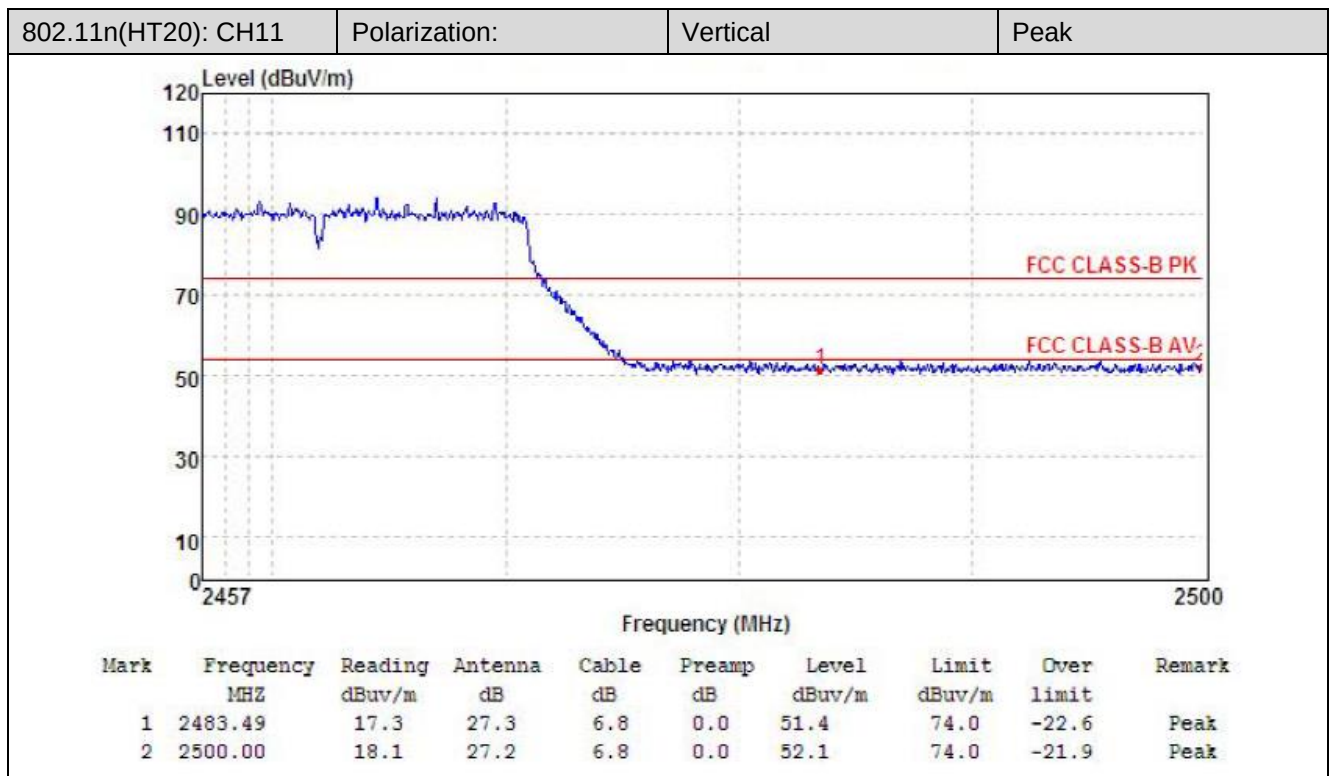


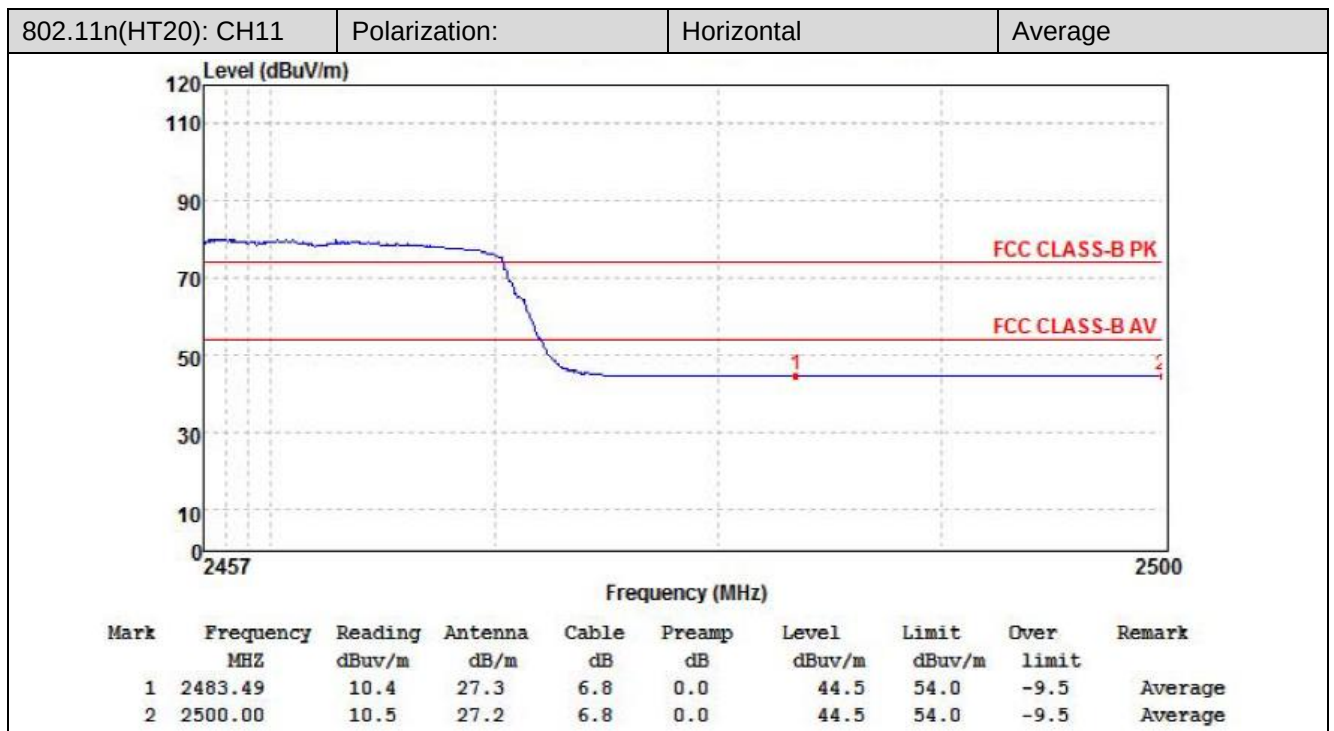
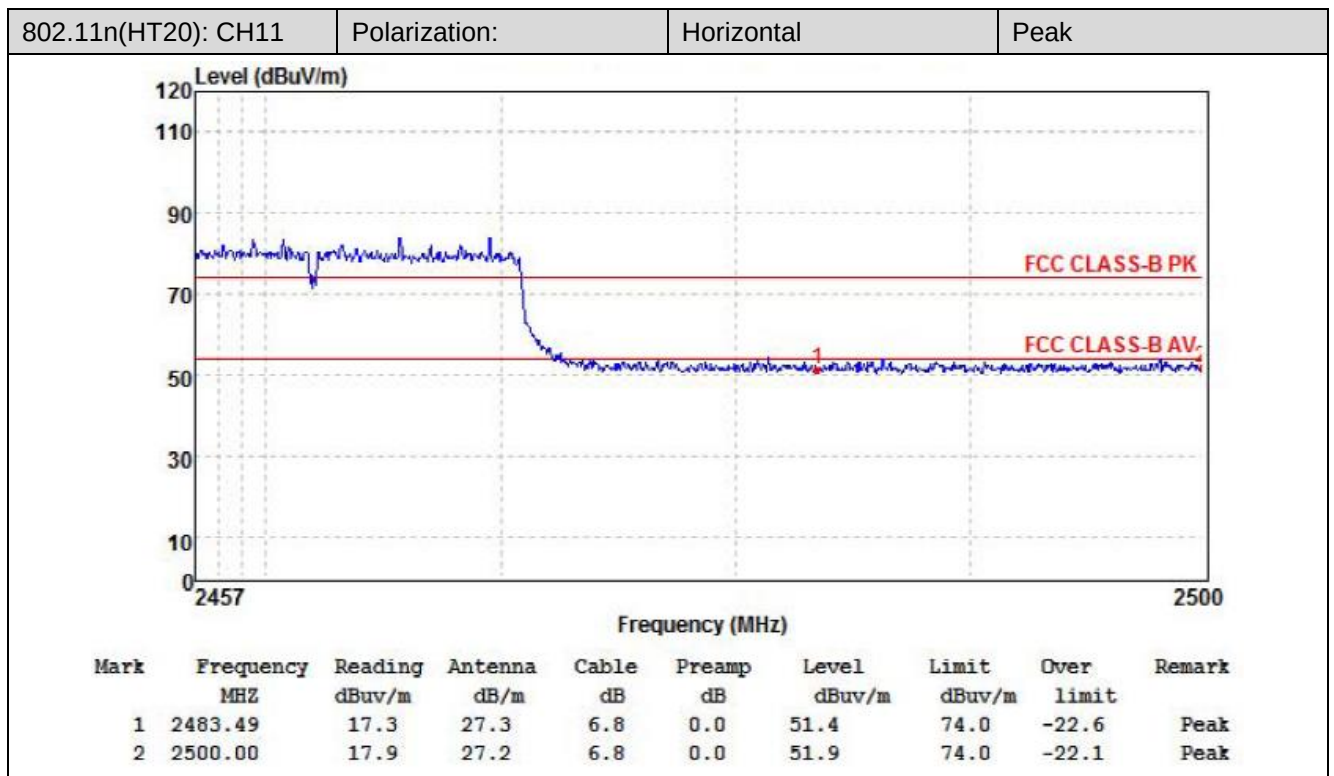


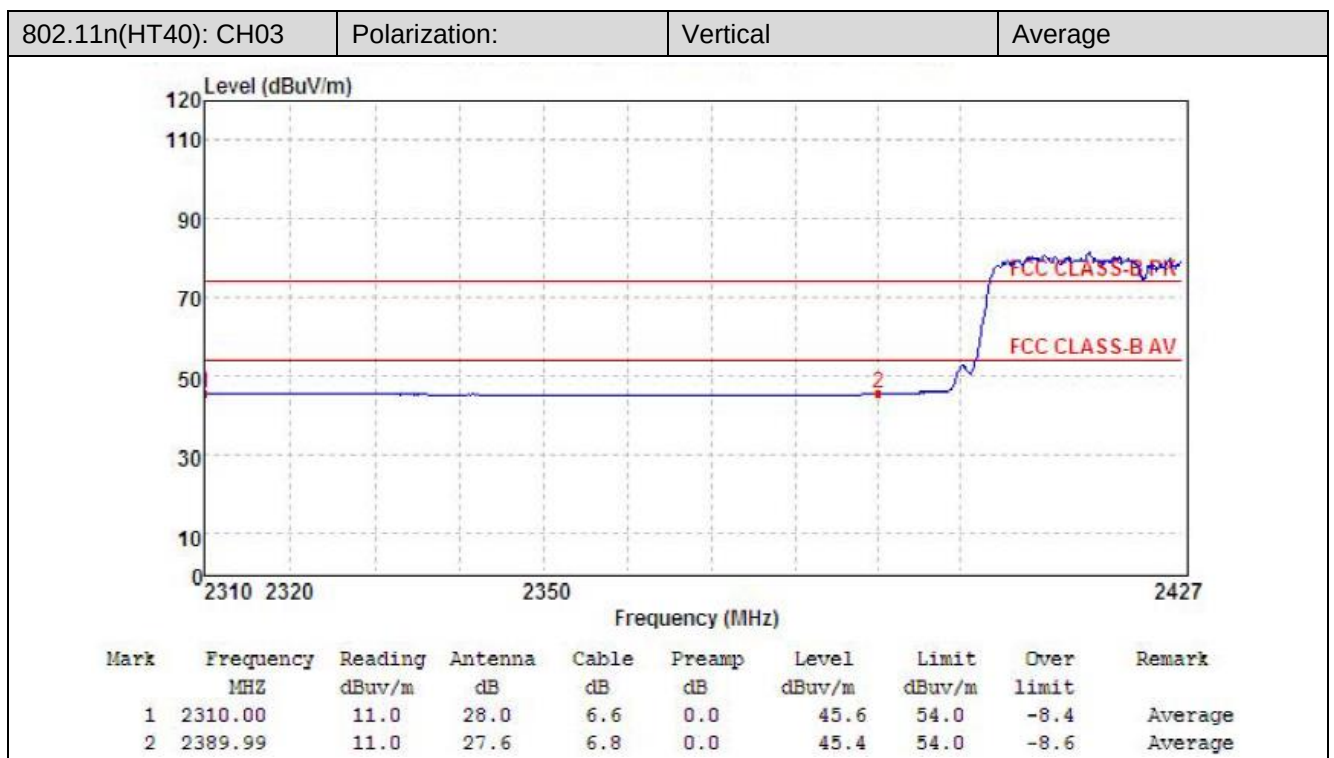
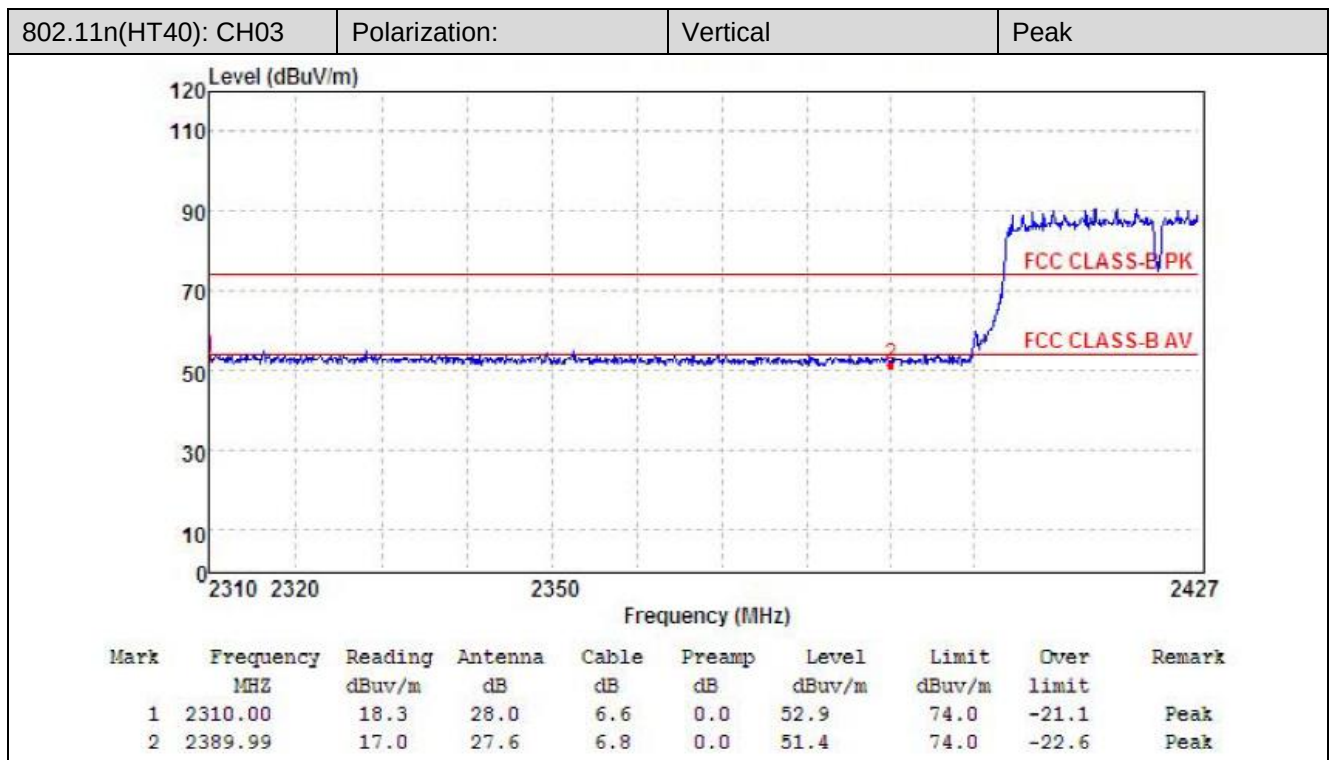


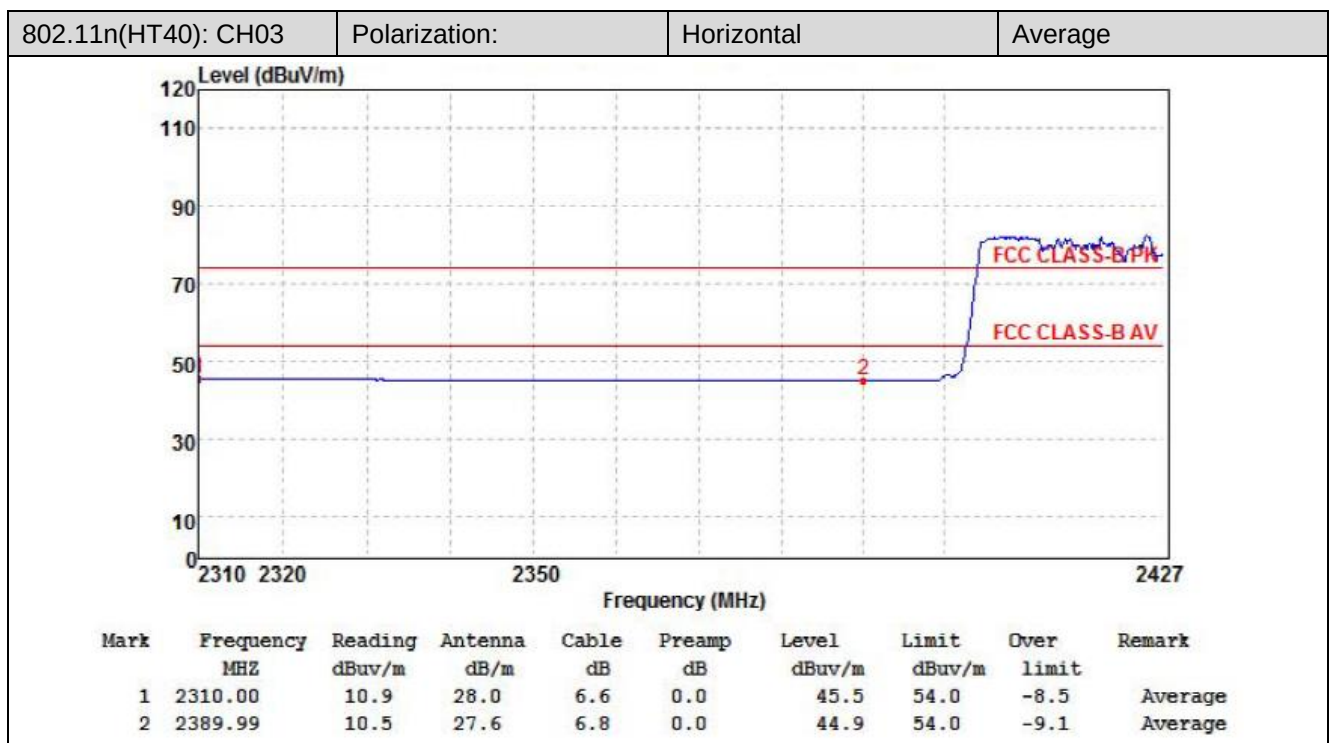
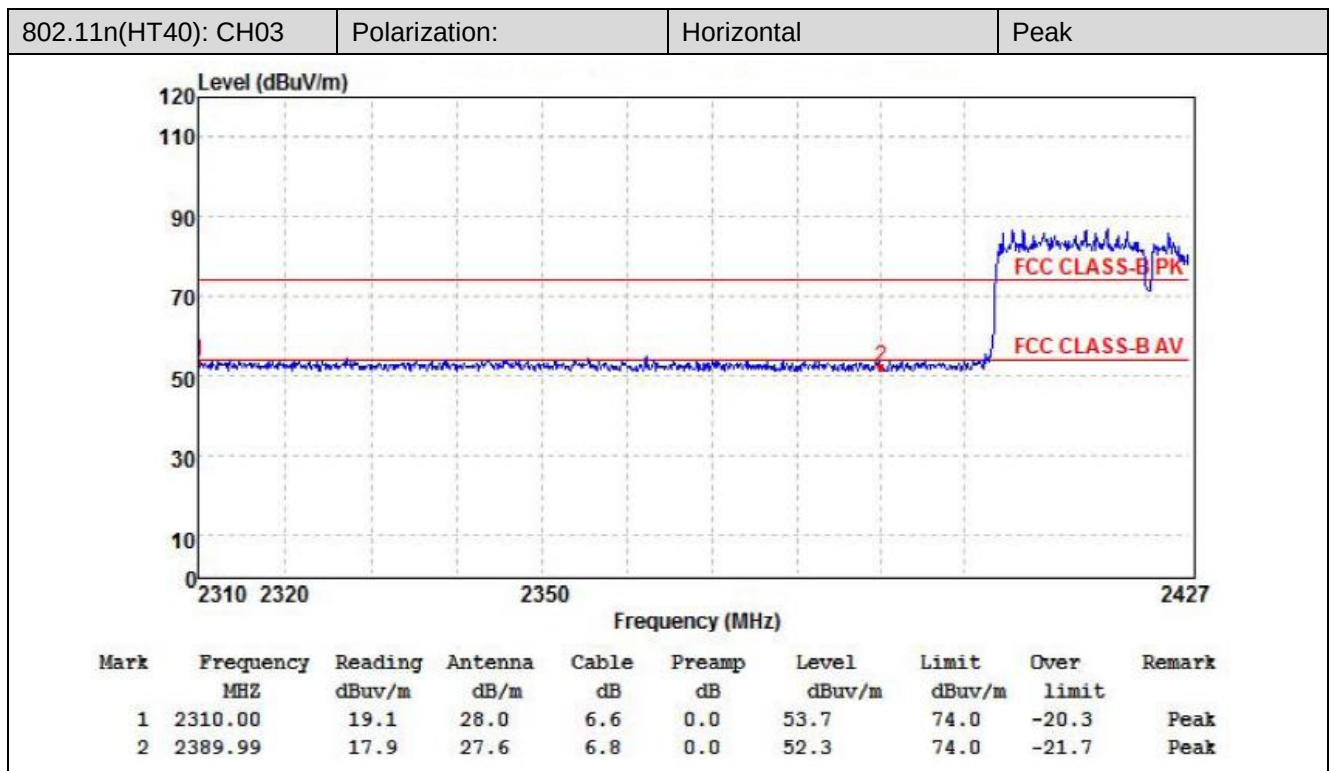


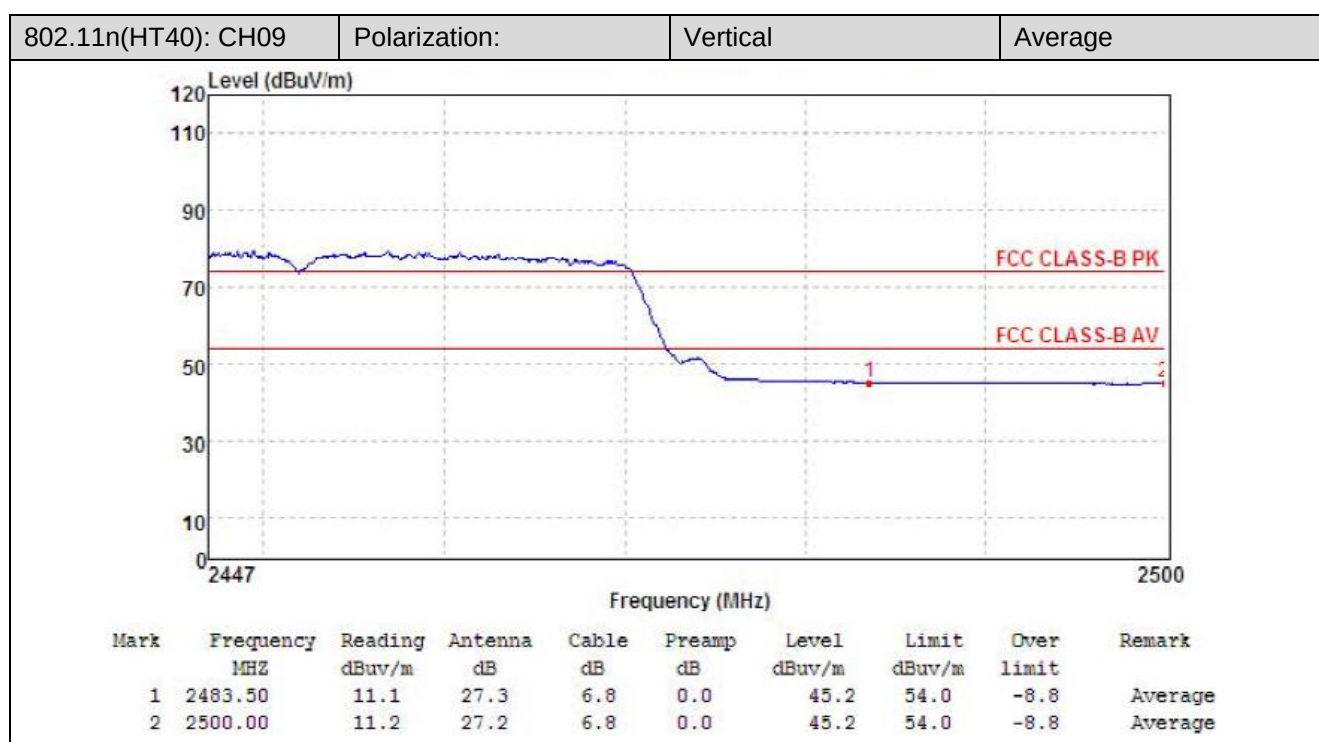
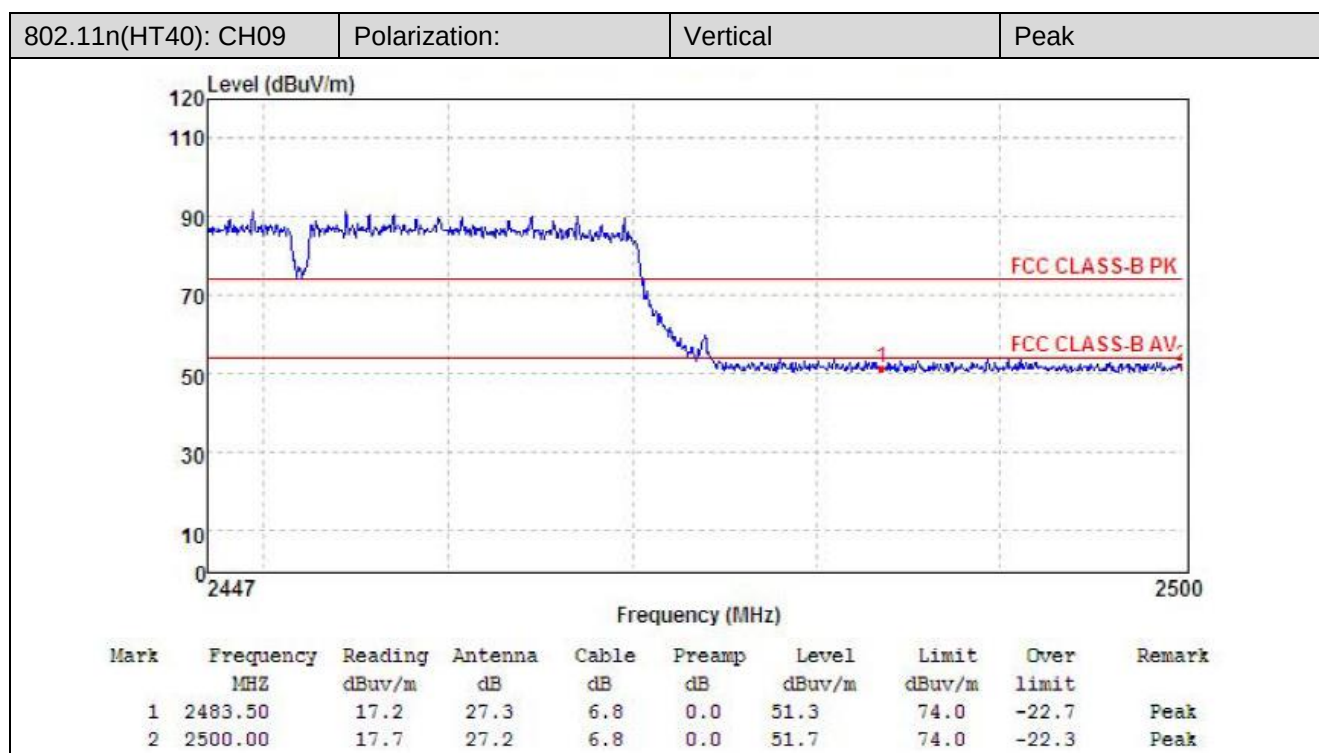


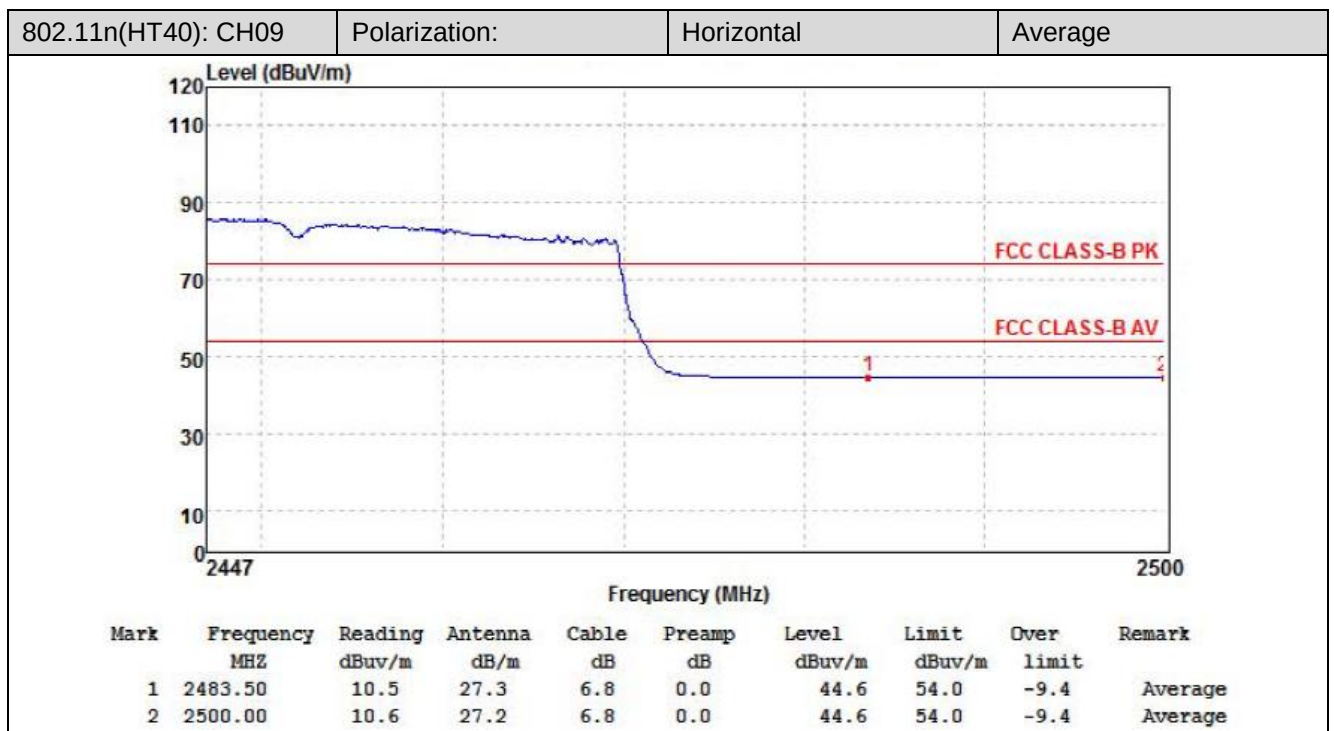
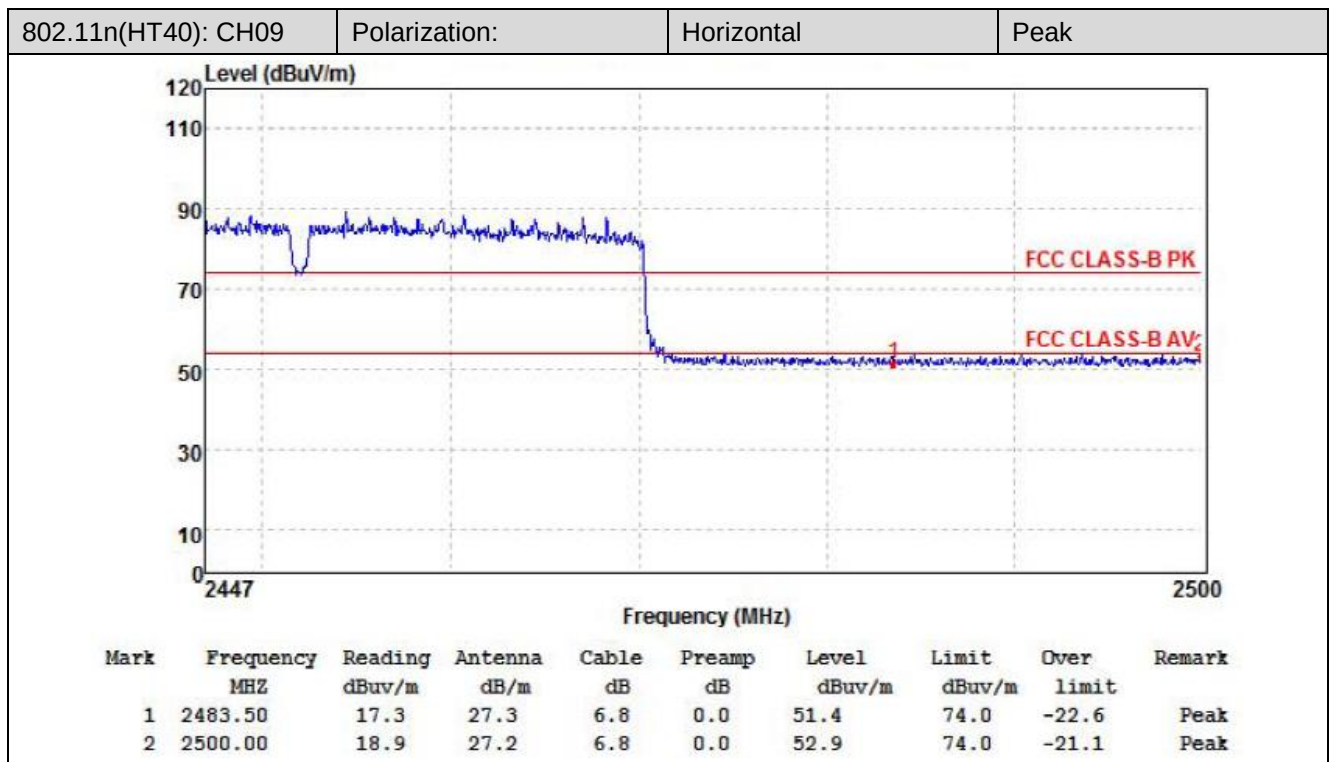












802.11b					CH01				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	Test value
2310.00	14.15	28.05	6.62	0.00	48.82	74.00	-25.18	Vertical	Peak
2390.01	14.70	27.65	6.75	0.00	49.10	74.00	-24.90	Vertical	Peak
2310.00	13.85	28.05	6.62	0.00	48.52	74.00	-25.48	Horizontal	Peak
2390.01	14.05	27.65	6.75	0.00	48.45	74.00	-25.55	Horizontal	Peak
2310.00	10.60	28.05	6.62	0.00	45.27	54.00	-8.73	Vertical	Average
2390.01	10.59	27.65	6.75	0.00	44.99	54.00	-9.01	Vertical	Average
2310.00	10.54	28.05	6.62	0.00	45.21	54.00	-8.79	Horizontal	Average
2390.01	10.58	27.65	6.75	0.00	44.98	54.00	-9.02	Horizontal	Average

802.11b					CH11				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	Test value
2483.49	13.51	27.26	6.83	0.00	47.60	74.00	-26.40	Vertical	Peak
2500.00	14.58	27.20	6.84	0.00	48.62	74.00	-25.38	Vertical	Peak
2483.49	13.39	27.26	6.83	0.00	47.48	74.00	-26.52	Horizontal	Peak
2500.00	13.54	27.20	6.84	0.00	47.58	74.00	-26.42	Horizontal	Peak
2483.49	10.67	27.26	6.83	0.00	44.76	54.00	-9.24	Vertical	Average
2500.00	11.04	27.20	6.84	0.00	45.08	54.00	-8.92	Vertical	Average
2483.49	10.10	27.26	6.83	0.00	44.19	54.00	-9.81	Horizontal	Average
2500.00	10.14	27.20	6.84	0.00	44.18	54.00	-9.82	Horizontal	Average

802.11g					CH01				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	Test value
2310.00	13.59	28.05	6.62	0.00	48.26	74	-25.74	Vertical	Peak
2390.01	14.54	27.65	6.75	0.00	48.94	74	-25.06	Vertical	Peak
2310.00	13.64	28.05	6.62	0.00	48.31	74	-25.69	Horizontal	Peak
2390.01	13.81	27.65	6.75	0.00	48.21	74	-25.79	Horizontal	Peak
2310.00	11.07	28.05	6.62	0.00	45.74	54	-8.26	Vertical	Average
2390.01	11.88	27.65	6.75	0.00	46.28	54	-7.72	Vertical	Average
2310.00	10.91	28.05	6.62	0.00	45.21	54	-8.79	Horizontal	Average
2390.01	10.48	27.65	6.75	0.00	44.53	54	-9.47	Horizontal	Average

802.11g					CH11				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	Test value
2483.49	13.03	27.26	6.83	0.00	47.12	74	-26.88	Vertical	Peak
2500.00	12.72	27.20	6.84	0.00	46.76	74	-27.24	Vertical	Peak
2483.49	13.03	27.26	6.83	0.00	47.12	74	-26.88	Horizontal	Peak
2500.00	12.72	27.20	6.84	0.00	46.76	74	-27.24	Horizontal	Peak
2483.49	11.50	27.26	6.83	0.00	45.59	54	-8.41	Vertical	Average
2500.00	10.71	27.20	6.84	0.00	44.75	54	-9.25	Vertical	Average
2483.49	10.57	27.26	6.83	0.00	44.66	54	-9.34	Horizontal	Average
2500.00	10.57	27.20	6.84	0.00	44.61	54	-9.39	Horizontal	Average

802.11n(HT20)					CH01				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	Test value
2310.00	17.66	28.05	6.62	0.00	52.33	74.00	-21.67	Vertical	Peak
2390.01	18.62	27.65	6.75	0.00	53.02	74.00	-20.98	Vertical	Peak
2310.00	18.33	28.05	6.62	0.00	53.00	74.00	-21.00	Horizontal	Peak
2390.01	17.55	27.65	6.75	0.00	51.95	74.00	-22.05	Horizontal	Peak
2310.00	10.92	28.05	6.62	0.00	45.59	54.00	-8.41	Vertical	Average
2390.01	10.86	27.65	6.75	0.00	45.26	54.00	-8.74	Vertical	Average
2310.00	10.88	28.05	6.62	0.00	45.55	54.00	-8.45	Horizontal	Average
2390.01	10.49	27.65	6.75	0.00	44.89	54.00	-9.11	Horizontal	Average

802.11n(HT20)					CH11				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	Test value
2483.49	17.26	27.26	6.83	0.00	51.35	74.00	-22.65	Vertical	Peak
2500.00	18.09	27.20	6.84	0.00	52.13	74.00	-21.87	Vertical	Peak
2483.49	17.32	27.26	6.83	0.00	51.41	74.00	-22.59	Horizontal	Peak
2500.00	17.83	27.20	6.84	0.00	51.87	74.00	-22.13	Horizontal	Peak
2483.49	10.94	27.26	6.83	0.00	45.03	54.00	-8.97	Vertical	Average
2500.00	10.99	27.20	6.84	0.00	45.03	54.00	-8.97	Vertical	Average
2483.49	10.45	27.26	6.83	0.00	44.54	54.00	-9.46	Horizontal	Average
2500.00	10.45	27.20	6.84	0.00	44.49	54.00	-9.51	Horizontal	Average

802.11n(HT40)					CH03				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	Test value
2310.00	18.23	28.05	6.62	0.00	52.90	74.00	-21.10	Vertical	Peak
2389.99	17.02	27.65	6.75	0.00	51.42	74.00	-22.58	Vertical	Peak
2310.00	19.07	28.05	6.62	0.00	53.74	74.00	-20.26	Horizontal	Peak
2389.99	17.87	27.65	6.75	0.00	52.27	74.00	-21.73	Horizontal	Peak
2310.00	10.92	28.05	6.62	0.00	45.59	54.00	-8.41	Vertical	Average
2389.99	10.96	27.65	6.75	0.00	45.36	54.00	-8.64	Vertical	Average
2310.00	10.88	28.05	6.62	0.00	45.55	54.00	-8.45	Horizontal	Average
2389.99	10.49	27.65	6.75	0.00	44.89	54.00	-9.11	Horizontal	Average

802.11n(HT40)					CH09				
Frequency (MHz)	Read Level (dBuV)	Antenna Factor (dB/m)	Cable Loss (dB)	Preamplifier Factor (dB)	Level (dBuV/m)	Limit Line (dBuV/m)	Over Limit (dB)	Polarization	Test value
2483.50	17.18	27.26	6.83	0.00	51.27	74.00	-22.73	Vertical	Peak
2500.00	17.65	27.20	6.84	0.00	51.69	74.00	-22.31	Vertical	Peak
2483.50	17.32	27.26	6.83	0.00	51.41	74.00	-22.59	Horizontal	Peak
2500.00	18.89	27.20	6.84	0.00	52.93	74.00	-21.07	Horizontal	Peak
2483.50	11.16	27.26	6.83	0.00	45.25	54.00	-8.75	Vertical	Average
2500.00	11.16	27.20	6.84	0.00	45.20	54.00	-8.80	Vertical	Average
2483.50	10.56	27.26	6.83	0.00	44.65	54.00	-9.35	Horizontal	Average
2500.00	10.57	27.20	6.84	0.00	44.61	54.00	-9.39	Horizontal	Average