

FCC TEST REPORT
for
Winner Wave Limited

EZCast LAN
Model No.: EZCast LAN Box, EZCast Pro LAN Box

Prepared for : Winner Wave Limited
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Taiwan, R.O.C.

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Report Number : R011507060I
Date of Test : Jul. 03~ Aug. 14, 2015
Date of Report : Aug. 17, 2015

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TEST REPORT

Applicant : Winner Wave Limited
Manufacturer : Winner Wave Limited
EUT : EZCast LAN
Model No. : EZCast LAN Box, EZCast Pro LAN Box
Serial No. : N.A.
Trade Mark : EZCast
Rating : DC 5V, 1A

Measurement Procedure Used:
FCC Part15 Subpart C 2014, Paragraph 15.247

The device described above is tested by Shenzhen Anbotek Compliance Laboratory Limited to determine the maximum emission levels emanating from the device and the severe levels of the device can endure and its performance criterion. The measurement results are contained in this test report and Shenzhen Anbotek Compliance Laboratory Limited is assumed full of responsibility for the accuracy and completeness of these measurements. Also, this report shows that the EUT (Equipment Under Test) is technically compliant with the FCC Part 15 Subpart C requirements.

This report applies to above tested sample only and shall not be reproduced in part without written approval of Shenzhen Anbotek Compliance Laboratory Limited.

Date of Test : Jul. 03~ Aug. 14, 2015

Prepared by : (Tested Engineer / Kebo Zhang)

Reviewer : (Project Manager / Amy Ding)

Approved & Authorized Signer : (Manager / Tom Chen)

1. GENERAL INFORMATION

1.1. Description of Device (EUT)

EUT : EZCast LAN

Model Number : EZCast LAN Box, EZCast Pro LAN Box
(Note: All samples are the same except the model number and colour, so we prepare “EZCast LAN Box” for test only.)

Test Power Supply : AC 120V, 60Hz and AC 240V, 60Hz for adapter

RF Transmission Frequency : 2412MHz~2462MHz (802.11b/802.11g/802.11n(HT20))
2422MHz~2452MHz (802.11n(HT40))

Channels : 11 For (802.11b/802.11g/802.11n(HT20))
7 For (802.11n(HT40))

Modulation : 802.11b CCK; 802.11g OFDM; 802.11n MCS

Antenna Gain: : -0.5 dBi

Applicant Address : Winner Wave Limited
: 4F-5, No.736, Jhongjheng Road, Jhonghe Dist., New Taipei City, Taiwan, R.O.C.

Manufacturer Address : Winner Wave Limited
: 4F-5, No.736, Jhongjheng Road, Jhonghe Dist., New Taipei City, Taiwan, R.O.C.

Factory Address : Winner Wave Limited
: 4F-5, No.736, Jhongjheng Road, Jhonghe Dist., New Taipei City, Taiwan, R.O.C.

Date of receipt : Jul. 03, 2015

Date of Test : Jul. 03~ Aug. 14, 2015

1.2. Auxiliary Equipment Used during Test

TV	: Manufacturer: SONY M/N: KDL-26EX550 S/N: 1012240 CE , FCC
Adapter	: Manufacturer: Samsung M/N: ETA-U90CBC S/N: RT6FB17ZS/B-E Input: AC 100-240V, 50-60Hz, 0.35A Output: DC 5V, 2A

1.3. Description of Test Facility

The test facility is recognized, certified, or accredited by the following organizations:

CNAS - LAB Code: L3503

Shenzhen Anbotek Compliance Laboratory Limited., Laboratory has been assessed and in compliance with CNAS/CL01: 2006 accreditation criteria for testing laboratories (identical to ISO/IEC 17025:2005 General Requirements) for the Competence of Testing Laboratories.

FCC-Registration No.: 752021

Shenzhen Anbotek Compliance Laboratory Limited, 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. Registration 752021, July 10, 2013.

IC-Registration No.: 8058A-1

Shenzhen Anbotek Compliance Laboratory Limited., EMC Laboratory has been registered and fully described in a report filed with the (IC) Industry Canada. The acceptance letter from the IC is maintained in our files. Registration 8058A, February 22, 2013.

Test Location

All Emissions tests were performed at Shenzhen Anbotek Compliance Laboratory Limited. at 1/F., Building 1, SEC Industrial Park, No.0409 Qianhai Road, Nanshan District, Shenzhen, Guangdong, China

1.4. Measurement Uncertainty

Radiation Uncertainty : Ur = 4.1 dB (Horizontal)
Ur = 4.3 dB (Vertical)

Conduction Uncertainty : Uc = 3.4dB

2. TEST METHODOLOGY

The tests documented in this report were performed in accordance with ANSI C63.10: 2013 and FCC Part 15, Paragraph 15.247.

2.1. Summary of Test Results

The EUT has been tested according to the following specifications:

Standard	Test Type	Result	Notes
FCC Part 15, Paragraph 15.107, 15.207	Conducted Emission Test	PASS	Complies
FCC Part 15, Paragraph 15.247(b)(1)	Maximum Output Power	PASS	Complies
FCC Part 15, Paragraph 15.247(a)(2)	6dB Bandwidth	PASS	Complies
FCC Part 15, Paragraph 15.247(c)	100kHz Bandwidth of Frequency Band Edges	PASS	Complies
FCC Part 15, Paragraph 15.209(a)(f)	Spurious Emission	PASS	Complies
FCC Part 15, Paragraph 15.247(a)(1)	Frequency Separation	-	N/A
FCC Part 15, Paragraph 15.247(a)(1)(iii)	Number of Hopping Frequency	-	N/A
FCC Part 15, Paragraph 15.247(a)(1)(iii)	Time of Occupancy	-	N/A
FCC Part 15, Paragraph 15.247(c)	Peak Power Density	PASS	Complies

2.2. Description of Test Modes

The EUT has been tested under operating condition.

Software used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

IEEE802.11b: Channel 1(2412MHz), Channel 6(2437MHz) and Channel 11(2462MHz) with 1 Mbps lowest data rate (worst case) are chosen for the final testing.

IEEE802.11g: Channel 1(2412MHz), Channel 6(2437MHz) and Channel 11(2462MHz) with 6 Mbps lowest data rate (the worst case) are chosen for the final testing.

IEEE802.11n (HT20): Channel 1(2412MHz), Channel 6(2437MHz) and Channel 11(2462MHz) with MCS 0 Mbps lowest data rate (the worst case) are chosen for the final testing.

IEEE802.11n (HT40): Channel 3(2422MHz), Channel 6(2437MHz) and Channel 9(2452MHz) with MCS 0 Mbps lowest data rate (the worst case) are chosen for the final testing.

2.3. List of channels:

✓ - available

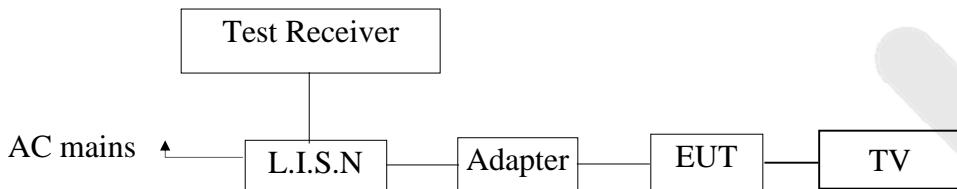
X - tested

Number	Frequency(MHz)		802.11 b/g/n (HT20)	802.11 b/g/n (HT40)
1	2412	✓	X	
2	2417	✓		
3	2422	✓		X
4	2427	✓		
5	2432	✓		
6	2437	✓	X	X
7	2442	✓		
8	2447	✓		
9	2452	✓		X
10	2457	✓		
11	2462	✓	X	

3. Conducted Emission Test

3.1. Block Diagram of Test Setup

3.1.1. Block diagram of connection between the EUT and simulators



3.2. Power Line Conducted Emission Measurement Limits (15.207)

Frequency MHz	Limits dB(μ V)	
	Quasi-peak Level	Average Level
0.15 ~ 0.50	66 ~ 56*	56 ~ 46*
0.50 ~ 5.00	56	46
5.00 ~ 30.00	60	50

Notes: 1. *Decreasing linearly with logarithm of frequency.
2. The lower limit shall apply at the transition frequencies.

3.3. Configuration of EUT on Measurement

The following equipments are installed on Power Line Conducted Emission Measurement to meet the commission requirement and operating regulations in a manner which tends to maximize its emission characteristics in a normal application.

3.4. Operating Condition of EUT

- 3.4.1. Setup the EUT and simulator as shown as Section 3.1.
- 3.4.2. Turn on the power of all equipment.
- 3.4.3. Let the EUT work in test mode (ON) and measure it.

3.5. Test Procedure

The EUT system is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC line are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to FCC ANSI C63.10-2013 on Conducted Emission Measurement.

The bandwidth of test receiver (ESCI) set at 9KHz.

The frequency range from 150KHz to 30MHz is checked.

The test results are reported on Section 3.6.

3.6. Test equipment

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Two-Line V-network	Rohde & Schwarz	ENV216	100055	Apr. 17, 2015	1 Year
2.	EMI Test Receiver	Rohde & Schwarz	ESCI	100627	Apr. 17, 2015	1 Year
3.	RF Switching Unit	Compliance Direction	RSU-M2	38303	Apr. 17, 2015	1 Year

3.7. Power Line Conducted Emission Measurement Results

PASS.

The frequency range from 150KHz to 30 MHz is investigated.

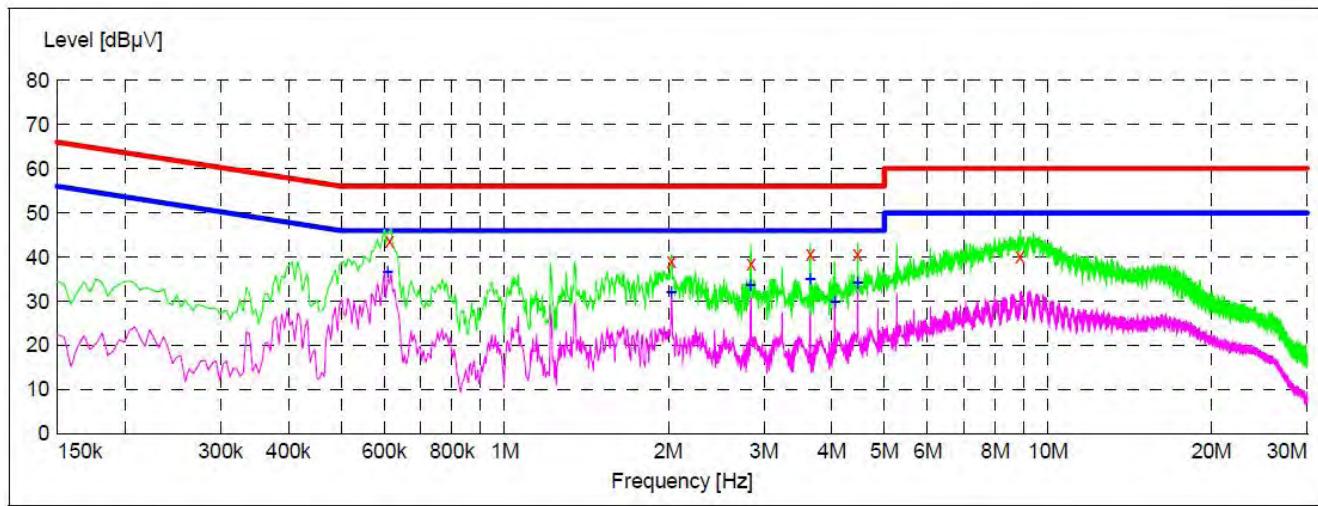
Please refer the following pages.

CONDUCTED EMISSION TEST DATA

Test Site: 1# Shielded Room
 Operating Condition: ON
 Test Specification: AC 120V, 60Hz for adapter
 Comment: Live Line
 Tem.:25°C Hum.:50%

SCAN TABLE: "Voltage (150K~30M) FIN"

Short Description: 150K-30M Disturbance Voltages



Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Detector	Line	PE
0.613500	43.70	20.1	56	12.3	QP	L1	GND
2.026000	39.00	20.3	56	17.0	QP	L1	GND
2.840500	38.60	20.4	56	17.4	QP	L1	GND
3.650500	40.60	20.4	56	15.4	QP	L1	GND
4.460500	40.60	20.5	56	15.4	QP	L1	GND
8.875000	40.30	20.6	60	19.7	QP	L1	GND

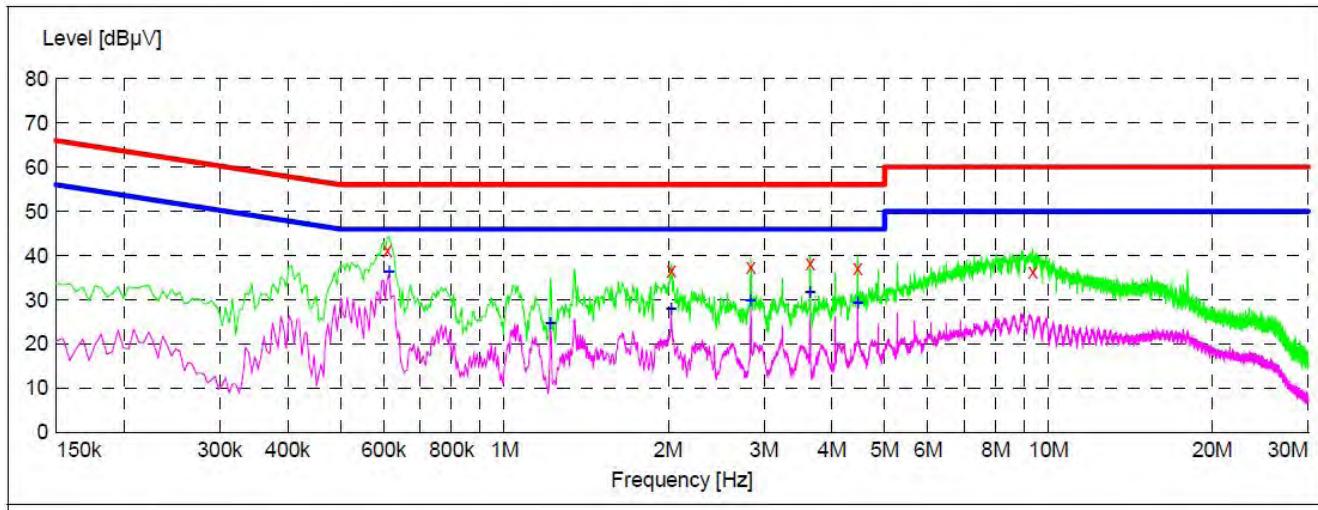
Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Detector	Line	PE
0.609000	36.60	20.1	46	9.4	AV	L1	GND
2.026000	32.20	20.3	46	13.8	AV	L1	GND
2.836000	33.80	20.4	46	12.2	AV	L1	GND
3.650500	35.10	20.4	46	10.9	AV	L1	GND
4.055500	29.80	20.5	46	16.2	AV	L1	GND
4.460500	34.10	20.5	46	11.9	AV	L1	GND

CONDUCTED EMISSION TEST DATA

Test Site: 1# Shielded Room
 Operating Condition: ON
 Test Specification: AC 120V, 60Hz for adapter
 Comment: Neutral Line
 Tem.:25°C Hum.:50%

SCAN TABLE: "Voltage (150K~30M) FIN"

Short Description: 150K-30M Disturbance Voltages



Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Detector	Line	PE
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0.609000	41.20	20.1	56	14.8	QP	N	GND
2.026000	36.60	20.3	56	19.4	QP	N	GND
2.836000	37.40	20.4	56	18.6	QP	N	GND
3.646000	38.30	20.4	56	17.7	QP	N	GND
4.460500	37.30	20.5	56	18.7	QP	N	GND
9.356500	36.30	20.6	60	23.7	QP	N	GND

Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Detector	Line	PE
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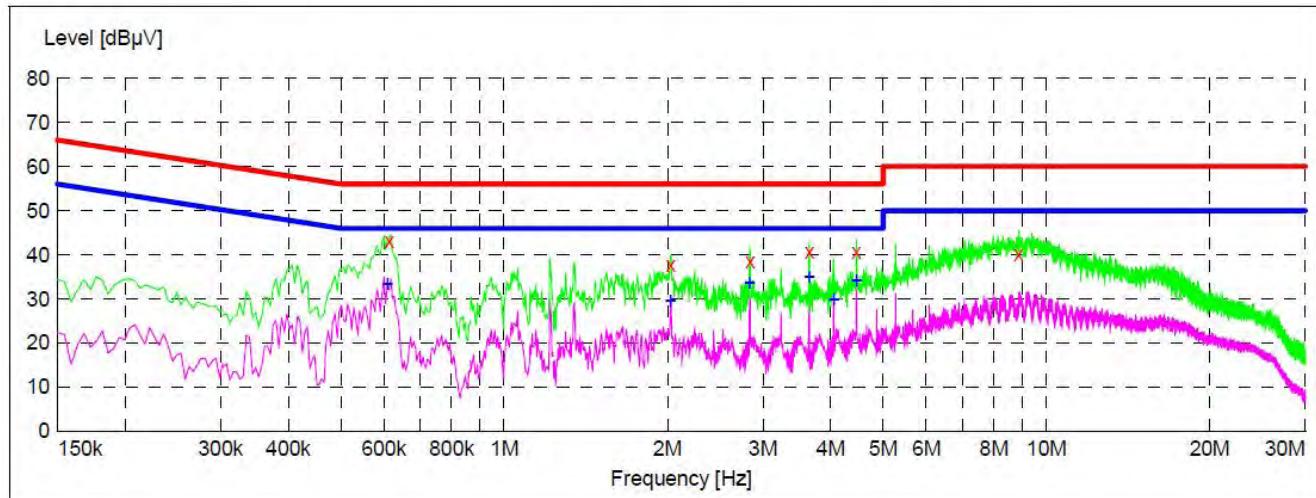
0.613500	36.40	20.1	46	9.6	AV	N	GND
1.216000	24.80	20.2	46	21.2	AV	N	GND
2.026000	28.10	20.3	46	17.9	AV	N	GND
2.836000	29.90	20.4	46	16.1	AV	N	GND
3.646000	31.80	20.4	46	14.2	AV	N	GND
4.460500	29.50	20.5	46	16.5	AV	N	GND

CONDUCTED EMISSION TEST DATA

Test Site: 1# Shielded Room
 Operating Condition: ON
 Test Specification: AC 240V, 60Hz for adapter
 Comment: Live Line
 Tem.:25°C Hum.:50%

SCAN TABLE: "Voltage (150K~30M) FIN"

Short Description: 150K-30M Disturbance Voltages



Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Detector	Line	PE
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0.613500	42.50	20.1	56	13.5	QP	L1	GND
2.026000	37.70	20.3	56	18.3	QP	L1	GND
2.840500	38.60	20.4	56	17.4	QP	L1	GND
3.650500	40.60	20.4	56	15.4	QP	L1	GND
4.460500	40.60	20.5	56	15.4	QP	L1	GND
8.875000	40.30	20.6	60	19.7	QP	L1	GND

Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Detector	Line	PE
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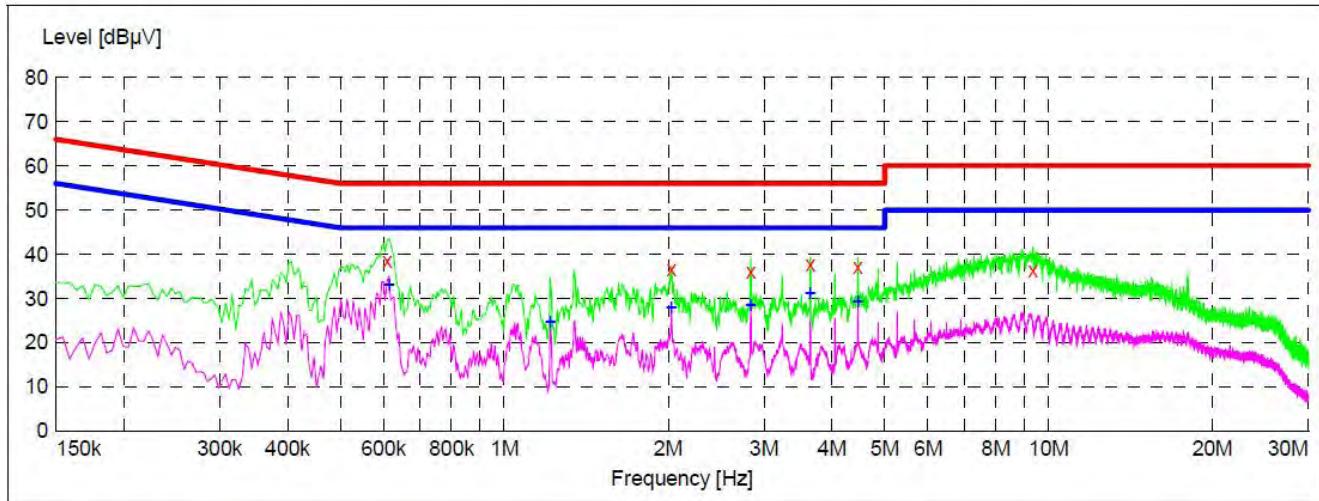
0.609000	34.10	20.1	46	11.9	AV	L1	GND
2.026000	30.20	20.3	46	15.8	AV	L1	GND
2.836000	33.80	20.4	46	12.2	AV	L1	GND
3.650500	35.10	20.4	46	10.9	AV	L1	GND
4.055500	29.80	20.5	46	16.2	AV	L1	GND
4.460500	34.10	20.5	46	11.9	AV	L1	GND

CONDUCTED EMISSION TEST DATA

Test Site: 1# Shielded Room
 Operating Condition: ON
 Test Specification: AC 240V, 60Hz for adapter
 Comment: Neutral Line
 Tem.:25°C Hum.:50%

SCAN TABLE: "Voltage (150K~30M) FIN"

Short Description: 150K-30M Disturbance Voltages



Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Detector	Line	PE
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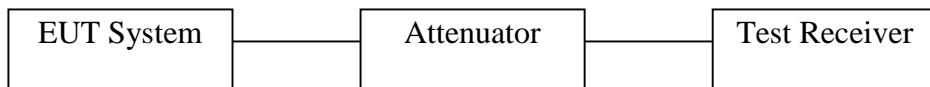
0.609000	38.20	20.1	56	17.8	QP	N	GND
2.026000	36.60	20.3	56	19.4	QP	N	GND
2.836000	35.30	20.4	56	20.7	QP	N	GND
3.646000	37.40	20.4	56	18.6	QP	N	GND
4.460500	37.30	20.5	56	18.7	QP	N	GND
9.356500	36.30	20.6	60	23.7	QP	N	GND

Frequency MHz	Level dB μ V	Transd dB	Limit dB μ V	Margin dB	Detector	Line	PE
------------------	---------------------	--------------	---------------------	--------------	----------	------	----

0.613500	34.30	20.1	46	11.7	AV	N	GND
1.216000	24.80	20.2	46	21.2	AV	N	GND
2.026000	26.30	20.3	46	19.7	AV	N	GND
2.836000	28.40	20.4	46	17.6	AV	N	GND
3.646000	31.80	20.4	46	14.2	AV	N	GND
4.460500	29.50	20.5	46	16.5	AV	N	GND

4. FCC Part 15.247 Requirements for DS-SS & OFDM Modulation

4.1 Test Setup



4.2 6dB Bandwidth

a. Limit

For the direct sequence systems, the minimum 6dB bandwidth shall be at least 500kHz.

b. Test Procedure

1. Place the EUT on the table and set it in the transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.
3. Set the spectrum analyzer as:
RBW = 100kHz, VBW $\geq 3 \times RBW = 300\text{kHz}$,
Detector= Peak
Trace mode= Max hold.
Sweep- auto couple.
4. Mark the peak frequency and -6dB (upper and lower) frequency.
5. Repeat until all the rest channels are investigated.

20dB Bandwidth:

C63.10

Occupied Bandwidth (OBW=20dB Bandwidth)

1. Set RBW=1%~5% OBW
2. Set the VBW $\geq 3 \times RBW$
3. Set the span range between 2 times and 5 times of the OBW
4. Sweep Time= Auto
Detector= Peak
Trace= Max hold
5. Once the reference level is established, the equipment is conditioned with typical modulating signals to produce the worst case (i.e. the widest) bandwidth. Unless otherwise specified for an unlicensed wireless device, measure the bandwidth at the -20dB levels with respect to the reference level.

c. Test Setup See 4.1**d. Test Equipment**

Item	Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
1.	Spectrum Analysis	Agilent	E4407B	US39390582	Apr. 17, 2015	1 Year
2.	Preamplifier	Instruments corporation	EMC011830	980100	Apr. 17, 2015	1 Year
3.	EMI Test Receiver	Rohde & Schwarz	ESPI	101604	Apr. 17, 2015	1 Year
4.	Double Ridged Horn Antenna	Instruments corporation	GTH-0118	351600	Apr. 20, 2015	1 Year
5.	Bilog Broadband Antenna	Schwarzbeck	VULB9163	VULB 9163-289	Apr. 20, 2015	1 Year
6.	Pre-amplifier	SONOMA	310N	186860	Apr. 17, 2015	1 Year
7.	EMI Test Software EZ-EMC	SHURPLE	N/A	N/A	N/A	N/A

e. Test Results

Pass.

f. Test Data

6dB Bandwidth

ANT A

Test mode: IEEE 802.11b

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Results
Low	2412	10.07		Pass
Mid	2437	10.07	>500	Pass
High	2462	10.06		Pass

Test mode: IEEE 802.11g

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Results
Low	2412	16.57		Pass
Mid	2437	16.57	>500	Pass
High	2462	16.57		Pass

Test mode: IEEE 802.11n (HT20)

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Results
Low	2412	17.79		Pass
Mid	2437	17.80	>500	Pass
High	2462	17.80		Pass

Test mode: IEEE 802.11n (HT40)

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Results
Low	2422	36.42		Pass
Mid	2437	36.43	>500	Pass
High	2452	36.41		Pass

Test Plots See the following page.

ANT B

Test mode: IEEE 802.11b

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Results
Low	2412	10.07		Pass
Mid	2437	10.07	>500	Pass
High	2462	10.07		Pass

Test mode: IEEE 802.11g

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Results
Low	2412	16.58		Pass
Mid	2437	16.57	>500	Pass
High	2462	16.57		Pass

Test mode: IEEE 802.11n (HT20)

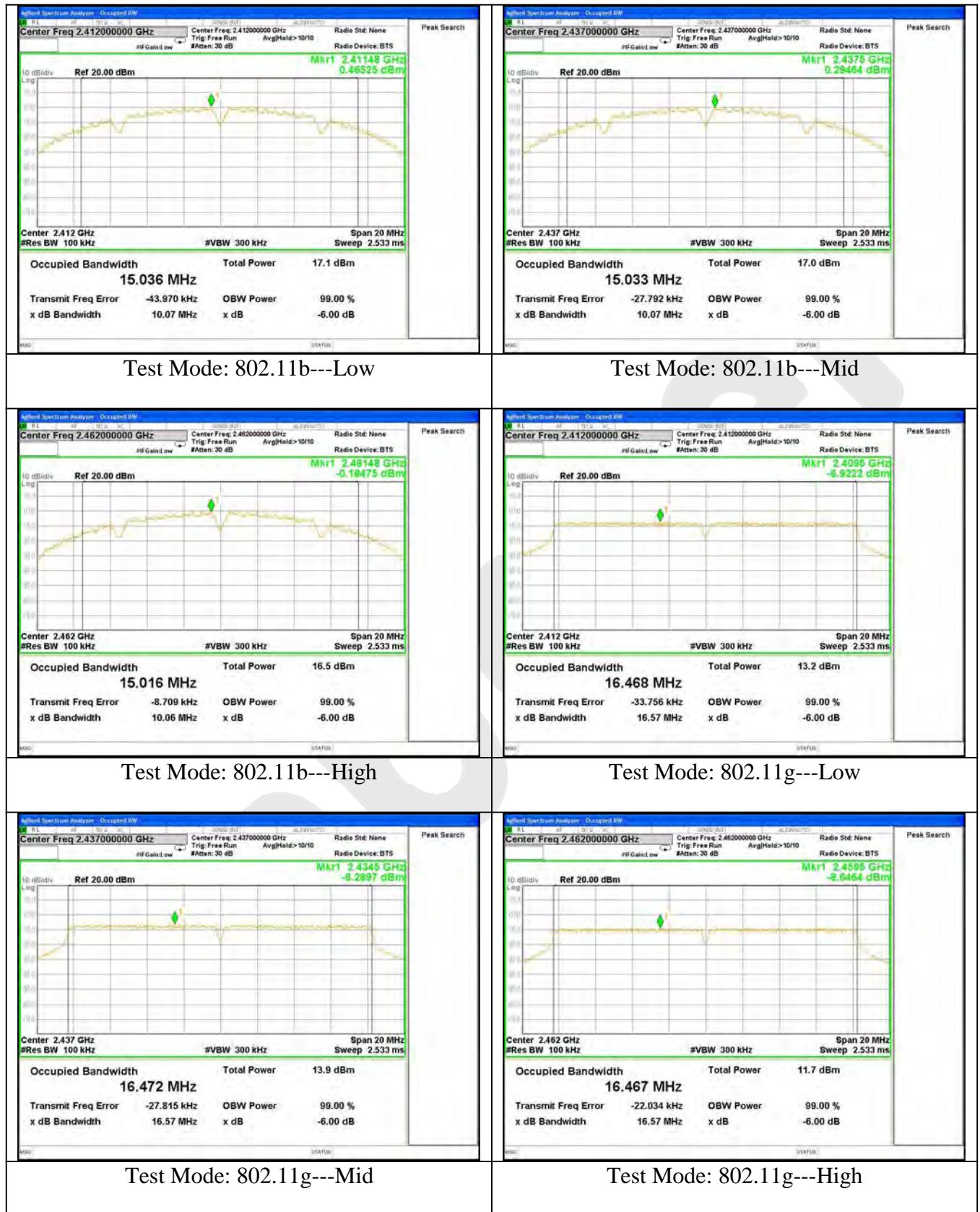
Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Results
Low	2412	17.81		Pass
Mid	2437	17.83	>500	Pass
High	2462	17.81		Pass

Test mode: IEEE 802.11n (HT40)

Channel	Frequency (MHz)	Bandwidth (MHz)	Limit (kHz)	Results
Low	2422	36.46		Pass
Mid	2437	36.45	>500	Pass
High	2452	36.43		Pass

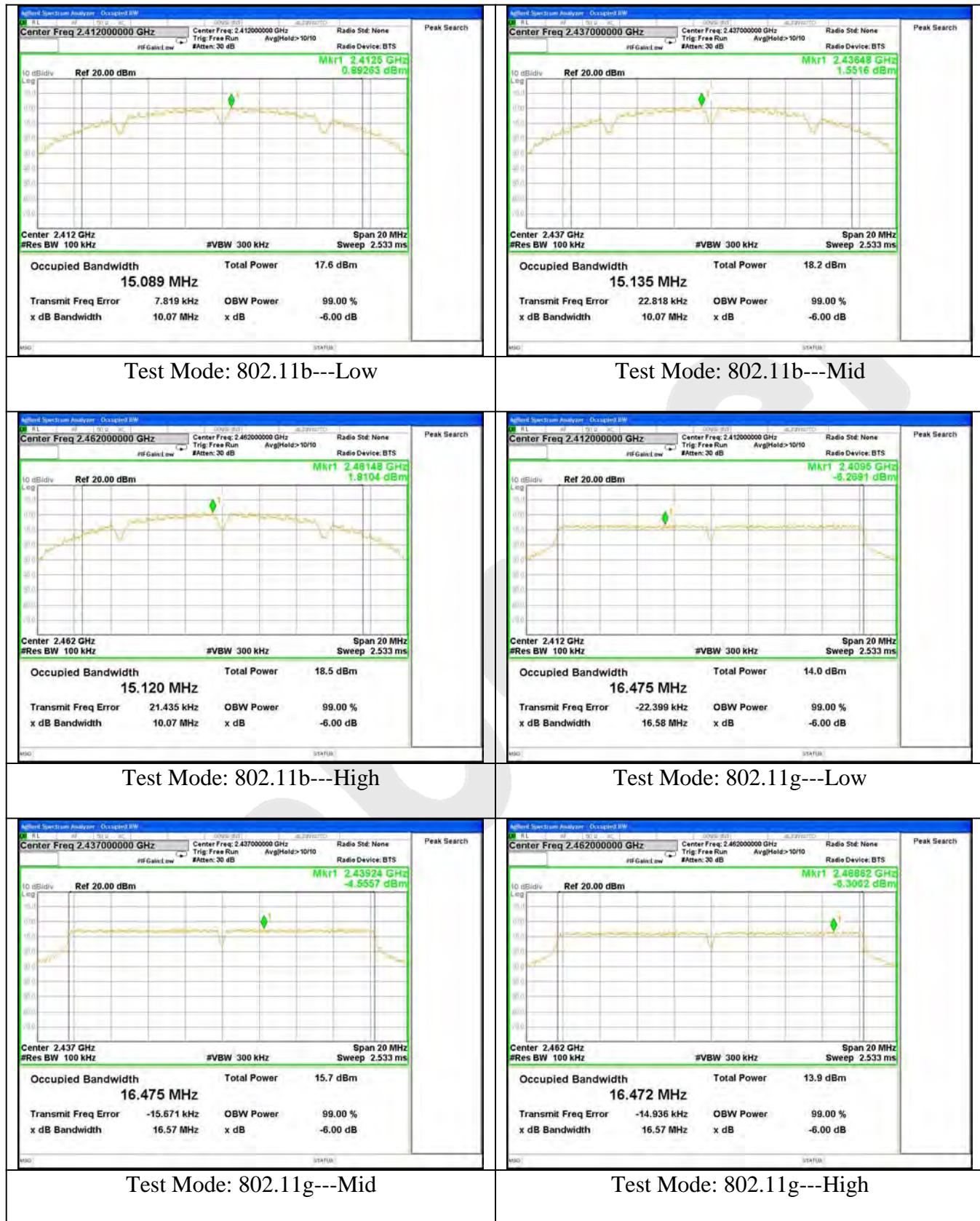
Test Plots See the following page.

ANT A





ANT B





20dB Bandwidth

ANT A

Test mode: IEEE 802.11b

Channel	Frequency (MHz)	Bandwidth (MHz)	Results
Low	2412	17.25	Pass
Mid	2437	17.25	Pass
High	2462	17.24	Pass

Test mode: IEEE 802.11g

Channel	Frequency (MHz)	Bandwidth (MHz)	Results
Low	2412	19.55	Pass
Mid	2437	19.57	Pass
High	2462	19.60	Pass

Test mode: IEEE 802.11n (HT20)

Channel	Frequency (MHz)	Bandwidth (MHz)	Results
Low	2412	20.39	Pass
Mid	2437	20.47	Pass
High	2462	20.47	Pass

Test mode: IEEE 802.11n (HT40)

Channel	Frequency (MHz)	Bandwidth (MHz)	Results
Low	2422	38.56	Pass
Mid	2437	38.64	Pass
High	2452	38.53	Pass

Test Plots See the following page.

ANT B

Test mode: IEEE 802.11b

Channel	Frequency (MHz)	Bandwidth (MHz)	Results
Low	2412	17.27	Pass
Mid	2437	17.28	Pass
High	2462	17.28	Pass

Test mode: IEEE 802.11g

Channel	Frequency (MHz)	Bandwidth (MHz)	Results
Low	2412	19.68	Pass
Mid	2437	19.52	Pass
High	2462	19.58	Pass

Test mode: IEEE 802.11n (HT20)

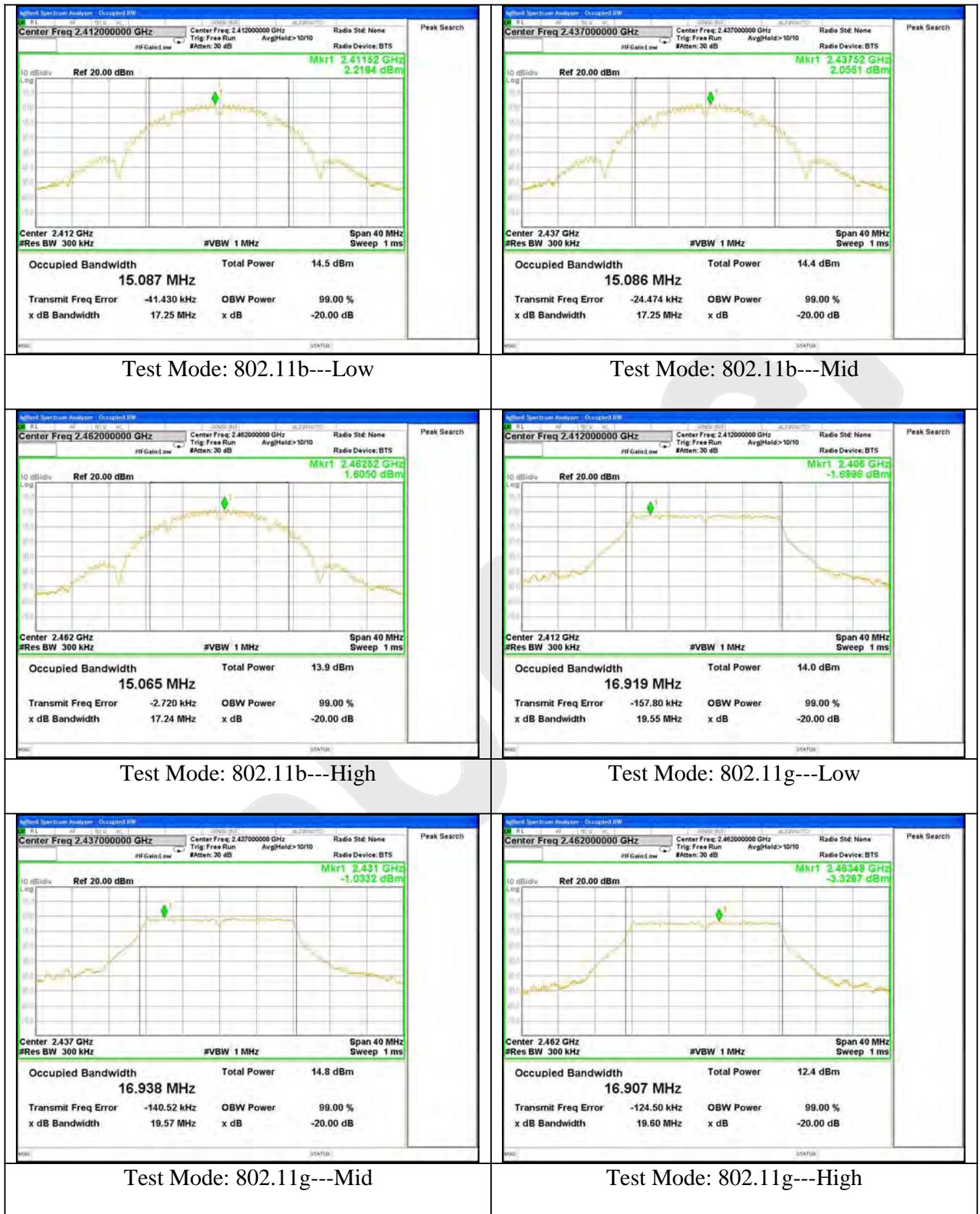
Channel	Frequency (MHz)	Bandwidth (MHz)	Results
Low	2412	20.52	Pass
Mid	2437	20.75	Pass
High	2462	20.56	Pass

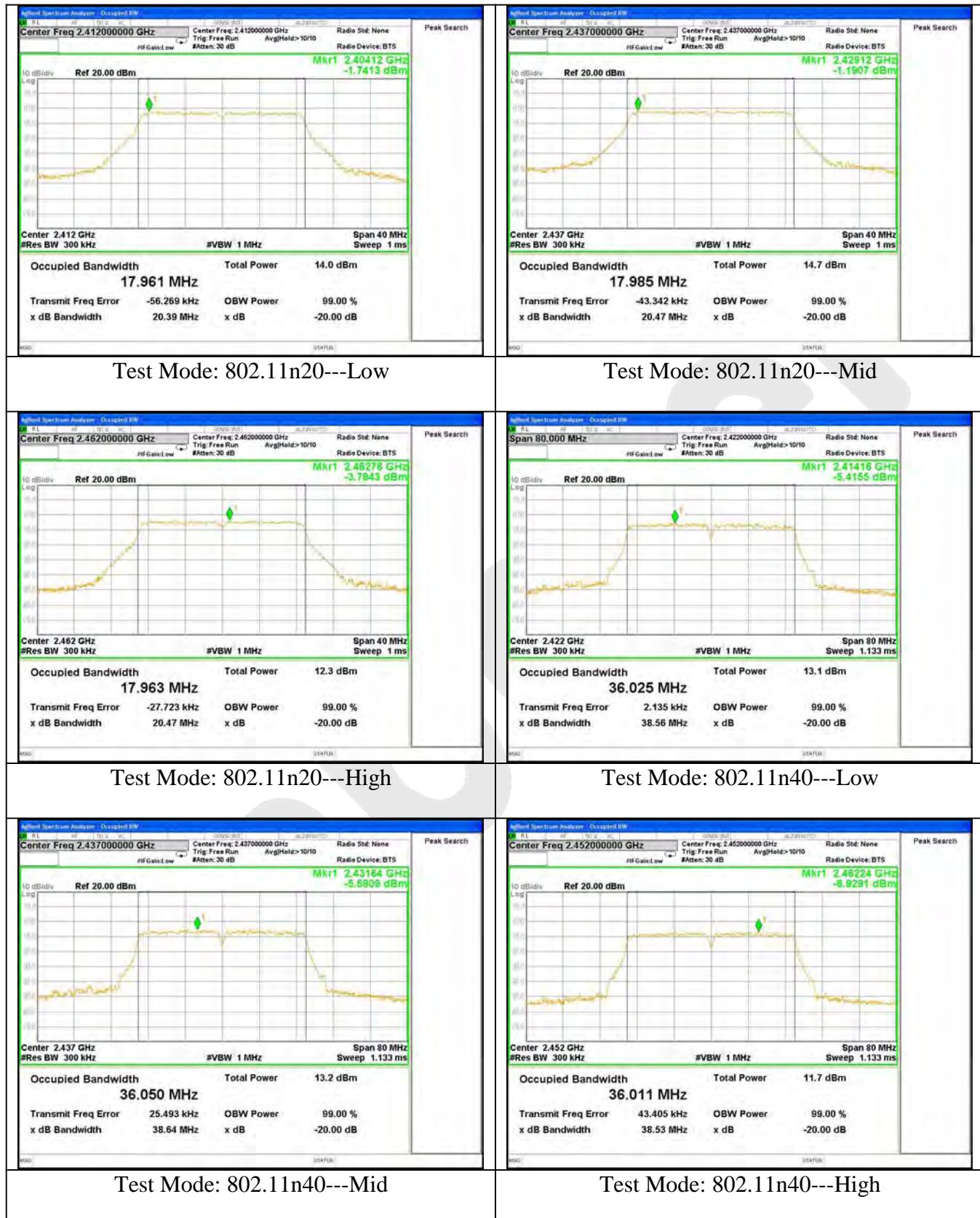
Test mode: IEEE 802.11n (HT40)

Channel	Frequency (MHz)	Bandwidth (MHz)	Results
Low	2422	38.79	Pass
Mid	2437	38.70	Pass
High	2452	38.67	Pass

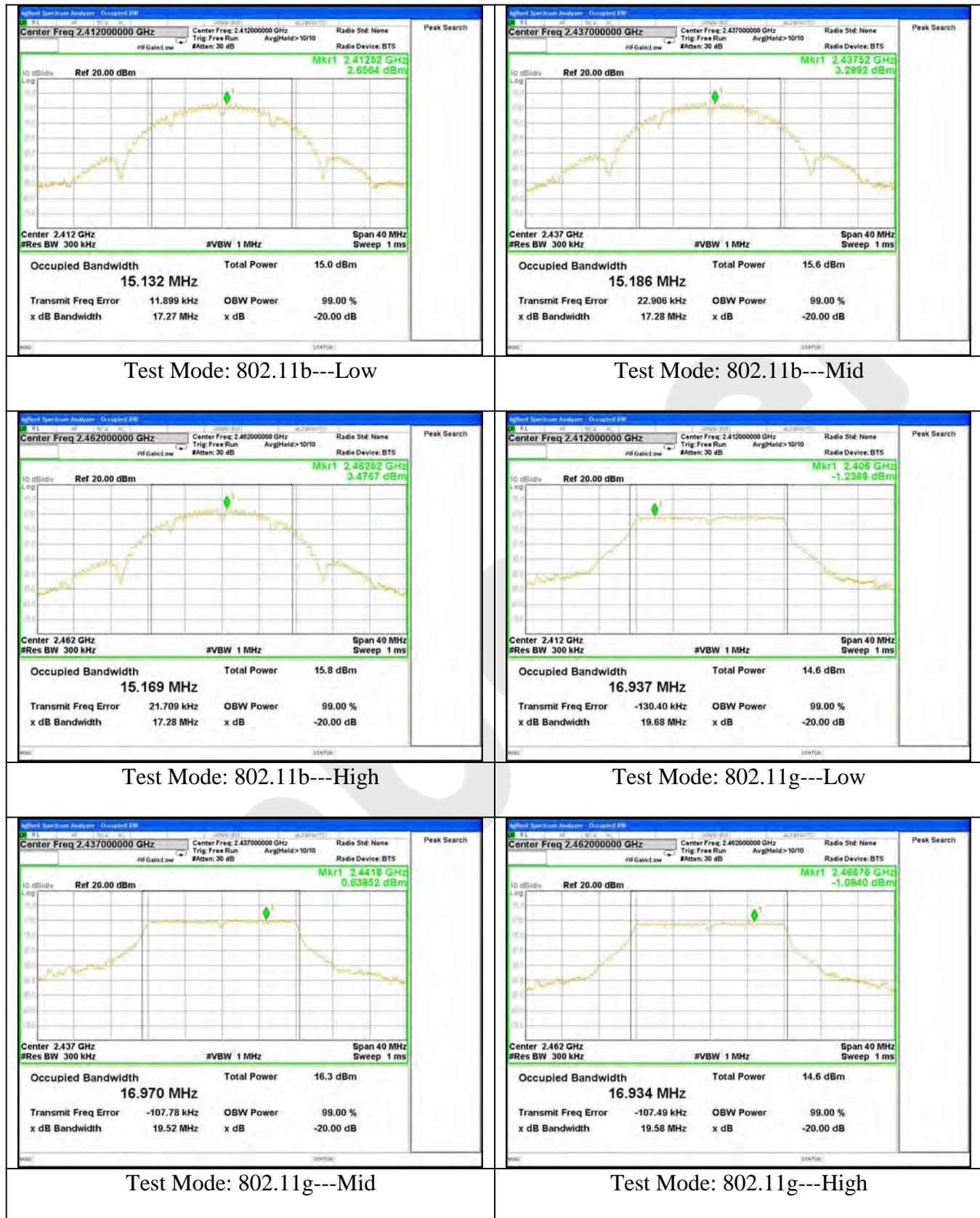
Test Plots See the following page.

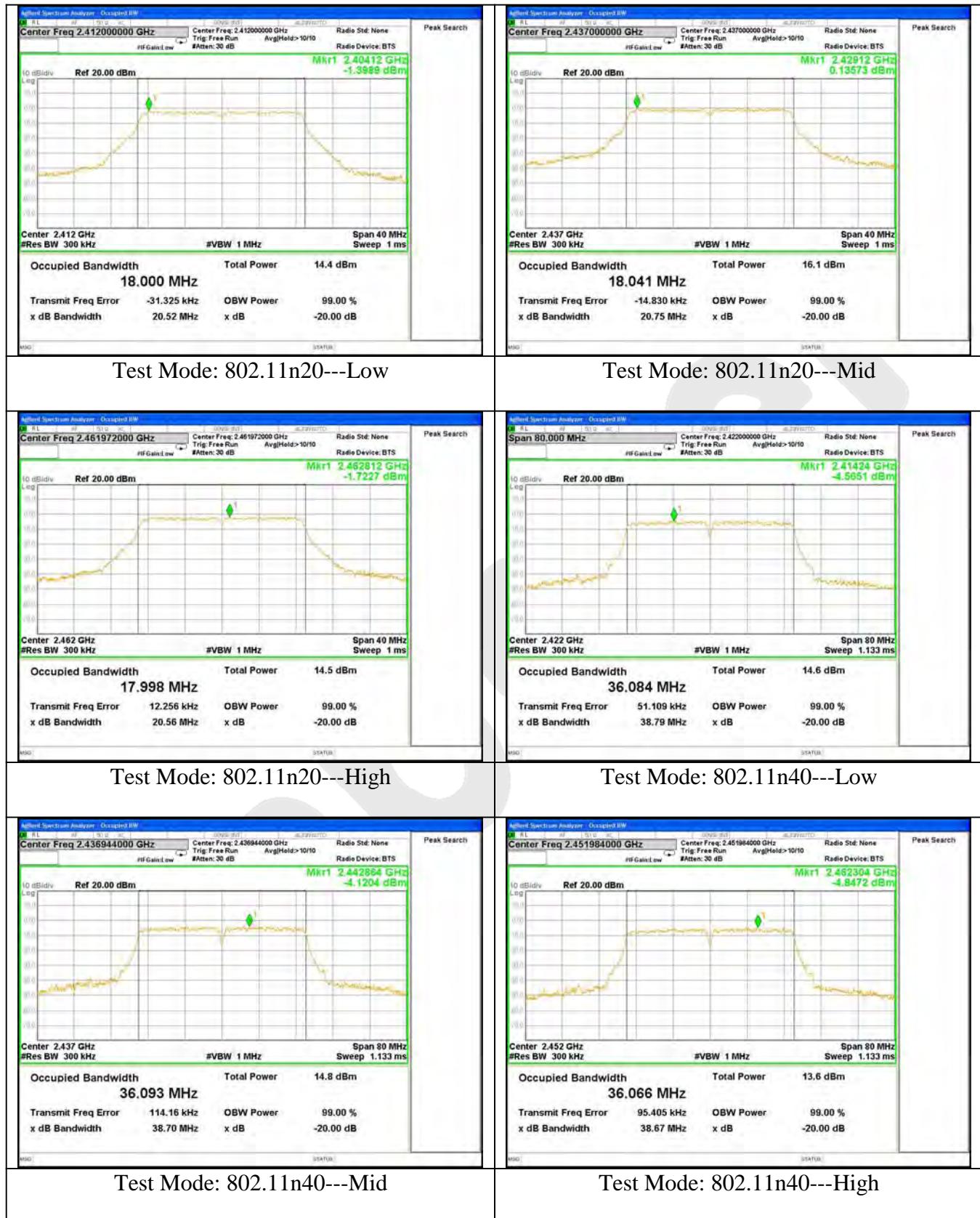
ANT A





ANT B





4.3. Maximum Output Power Test

a. Limit

The maximum output power of the intentional radiator shall not exceed the following:

1. For systems using digital modulation in the bands of 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz: 1 watt (30dBm).
2. Except as shown in paragraphs (b)(3) (i), (ii) and (iii) of this section, if transmitting antenna of directional gain greater than 6 dBi are used the peak output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1) or (b)(2) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

b. Configuration of Measurement



c. Data Rates

IEEE802.11b: Channel 1(2412MHz), Channel 6(2437MHz) and Channel 11(2462MHz) with 1 Mbps data rate (worst case) are chosen for the final testing.

IEEE802.11g: Channel 1(2412MHz), Channel 6(2437MHz) and Channel 11(2462MHz) with 6 Mbps data rate (the worst case) are chosen for the final testing.

IEEE802.11n (HT20: Channel 1(2412MHz), Channel 6(2437MHz) and Channel 11(2462MHz) with 6.5Mbps data rate (the worst case) are chosen for the final testing.

IEEE802.11n (HT40: Channel 3(2422MHz), Channel 6(2437MHz) and Channel 9(2452MHz) with 13.5Mbps data rate (the worst case) are chosen for the final testing.

d. Test Procedure

This test was according the kDB 558074 9.2.2:

1. Set span to at least 1.5 times the OBW.
2. Set the RBW =1~5% of the OBW, not to exceed 1MHz.
3. Set VBW \geqslant 3*RBW.
4. Detector = Average.
5. Sweep time = auto couple.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.

e. Test Equipment

Same as the equipment listed in 4.2.

f. Test Results

Pass.

g. Test Data

Antenna A Gain= -0.5 dBi

Antenna B Gain= -0.5 dBi

Array Gain= 2.51 dBi= $G_{ANT}+10*\log(N_{ANT})$ dBi

ANT A

Test mode: IEEE 802.11b

Channel	Frequency (MHz)	Maximum transmit power	Limit		Result
		(dBm)	(dBm)	(watts)	
Low	2412	14.79	30	1	Pass
Mid	2437	14.43			Pass
High	2462	13.74			Pass

Test mode: IEEE 802.11g

Channel	Frequency (MHz)	Maximum transmit power	Limit		Result
		(dBm)	(dBm)	(watts)	
Low	2412	14.02	30	1	Pass
Mid	2437	14.75			Pass
High	2462	12.27			Pass

Test mode: IEEE 802.11n (HT20)

Channel	Frequency (MHz)	Maximum transmit power	Limit		Result
		(dBm)	(dBm)	(watts)	
Low	2412	14.03	30	1	Pass
Mid	2437	14.64			Pass
High	2462	12.22			Pass

Test mode: IEEE 802.11n (HT40)

Channel	Frequency (MHz)	Maximum transmit power	Limit		Result
		(dBm)	(dBm)	(watts)	
Low	2422	13.17	30	1	Pass
Mid	2437	13.32			Pass
High	2452	11.77			Pass

ANT B

Test mode: IEEE 802.11b

Channel	Frequency (MHz)	Maximum transmit power	Limit		Result
		(dBm)	(dBm)	(watts)	
Low	2412	15.37	30	1	Pass
Mid	2437	15.61			Pass
High	2462	15.77			Pass

Test mode: IEEE 802.11g

Channel	Frequency (MHz)	Maximum transmit power	Limit		Result
		(dBm)	(dBm)	(watts)	
Low	2412	14.93	30	1	Pass
Mid	2437	16.31			Pass
High	2462	14.52			Pass

Test mode: IEEE 802.11n (HT20)

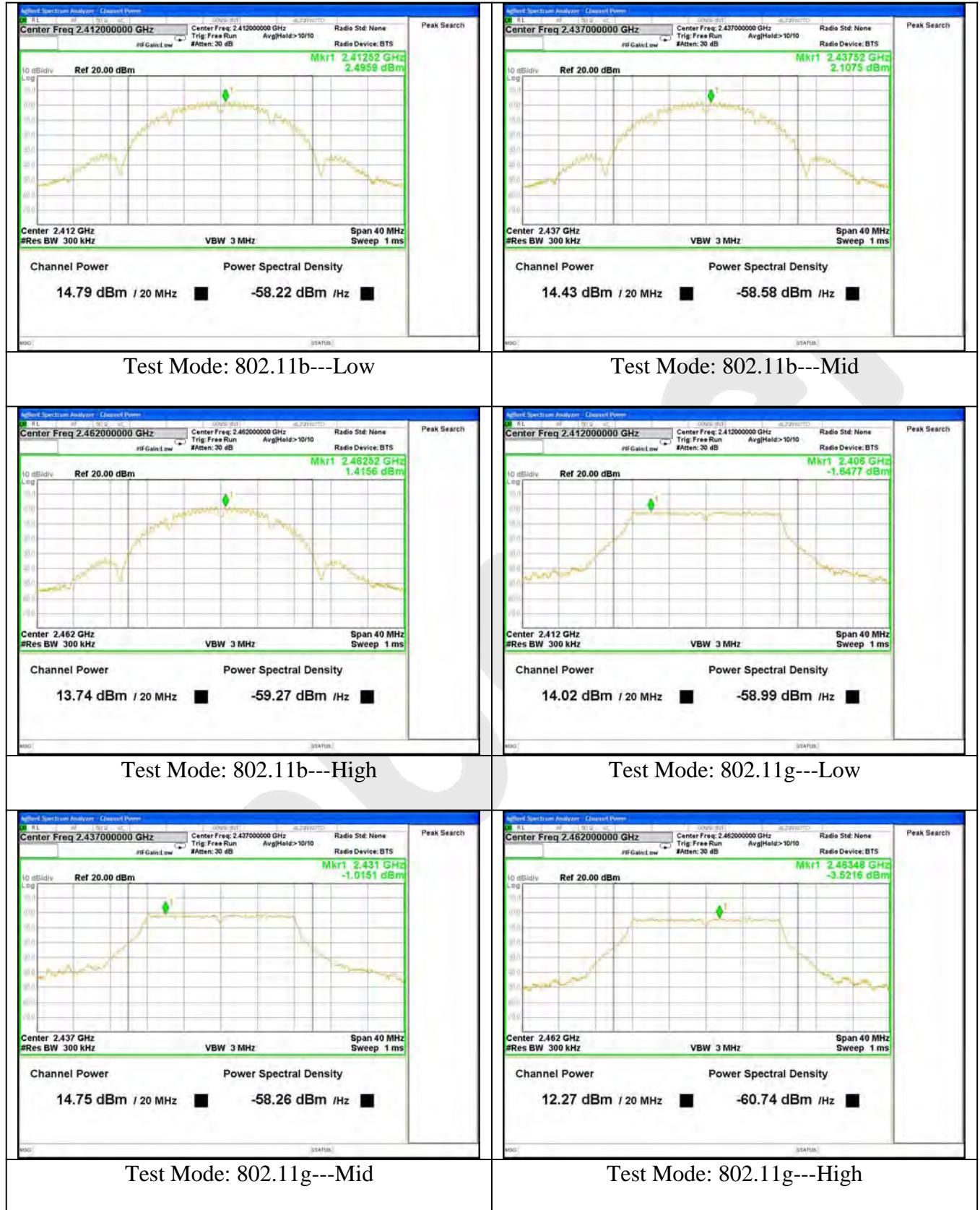
Channel	Frequency (MHz)	Maximum transmit power	Limit		Result
		(dBm)	(dBm)	(watts)	
Low	2412	14.79	30	1	Pass
Mid	2437	16.16			Pass
High	2462	14.38			Pass

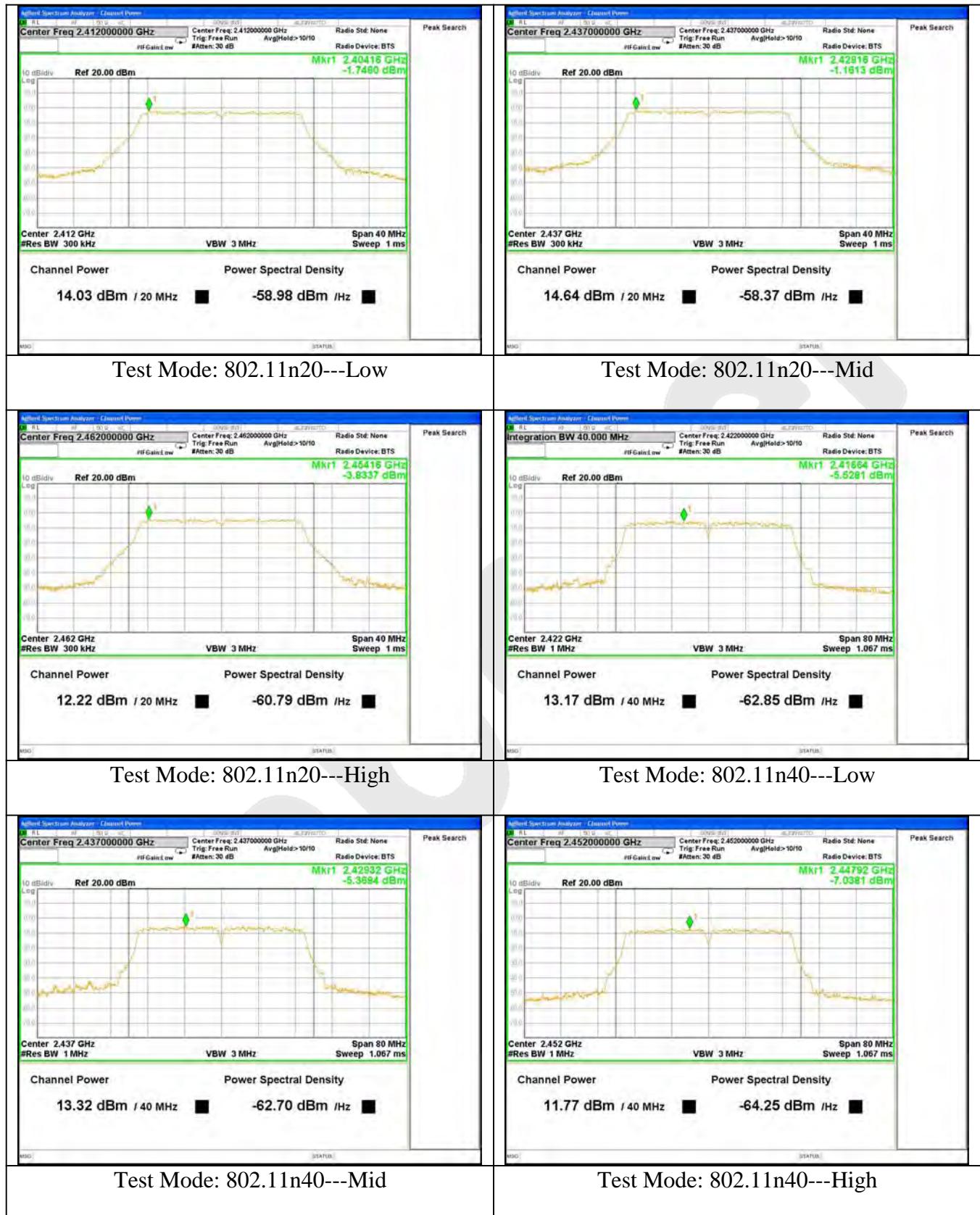
Test mode: IEEE 802.11n (HT40)

Channel	Frequency (MHz)	Maximum transmit power	Limit		Result
		(dBm)	(dBm)	(watts)	
Low	2422	14.31	30	1	Pass
Mid	2437	14.73			Pass
High	2452	13.56			Pass

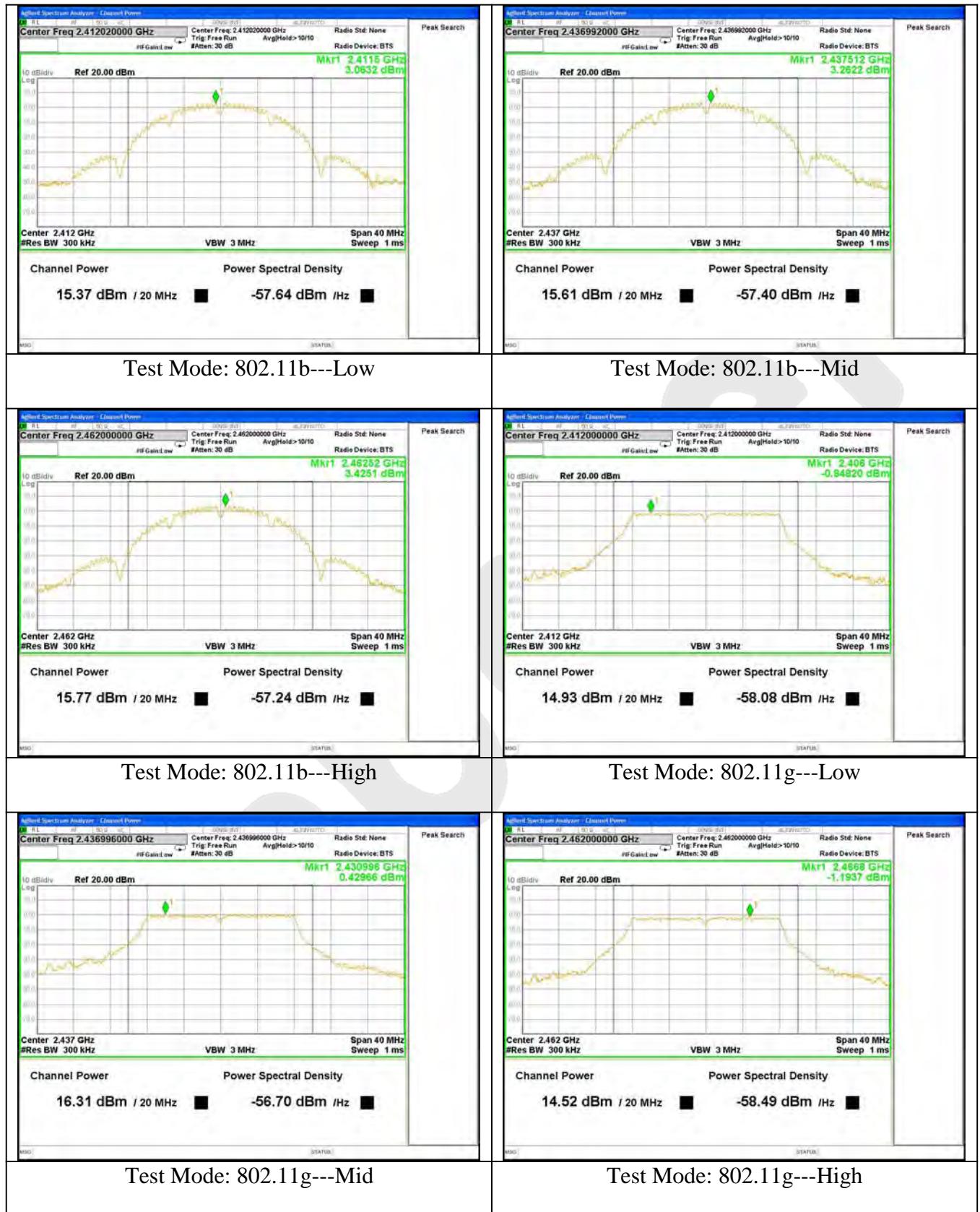
Channel	Channel Frequency (MHz)	ANT A Output Power (dBm)	ANT B Output Power (dBm)	Data Rate (Mbps)	MIMO Output Power (dBm)	Limit (dBm)
802.11n (20M MIMO) mode						
Low	2412	14.03	14.79	MCS0	17.44	30
Middle	2437	14.64	16.16	MCS0	18.48	30
High	2462	12.22	14.38	MCS0	16.44	30
802.11n (40M MIMO) mode						
Low	2422	13.17	14.31	MCS0	16.79	30
Middle	2437	13.32	14.73	MCS0	17.09	30
High	2452	11.77	13.56	MCS0	15.28	30

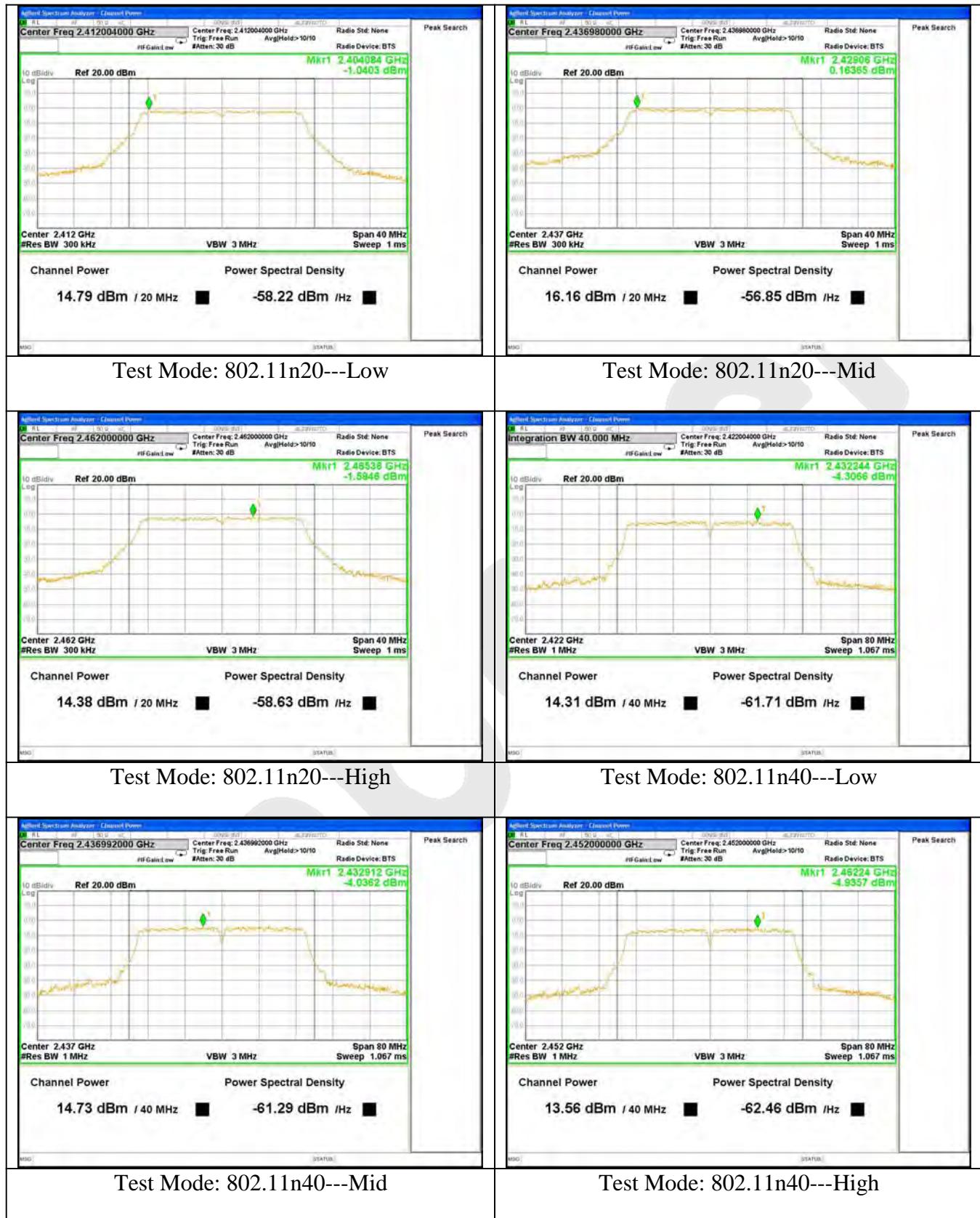
ANT A





ANT B





4.4. Band Edges Measurement

a. Limit

According to §15.247(c), in any 100 kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20dB below that in the 100kHz bandwidth within the band that contains the highest level of the desired power. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in 15.209(a).

b. Test Procedure

1. Conducted Method:

- 1) Set RBW=100KHz, VBW=300KHz
- 2) Detector=peak
- 3) Sweep time= auto
- 4) Trace mode=max hold.

2. Radiated Method:

1) For below 1GHz: The EUT is placed on a turntable, which is 0.8m above the ground plane. The EUT is tested in 9*6*6 Chamber.

For above 1GHz: The EUT is placed on a turntable, which is 1.5m above the ground plane. The EUT is tested in 9*6*6 Chamber.

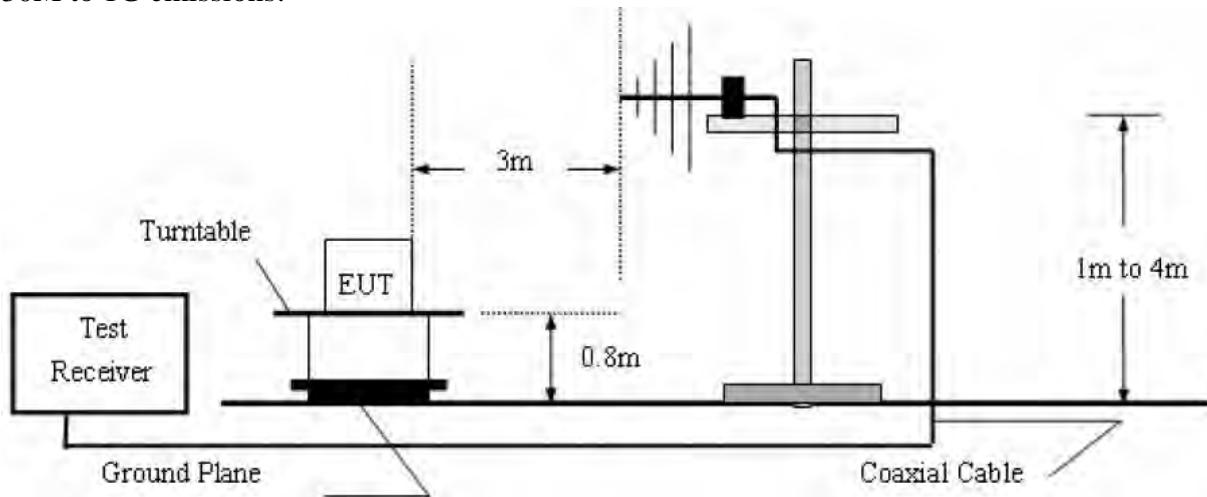
2) The turntable shall be rotated for 360 degrees to determine the position of maximum emission level.

3) EUT is set 3m away from the receiving antenna, which is varied from 1m to 4m to find out the highest emission.

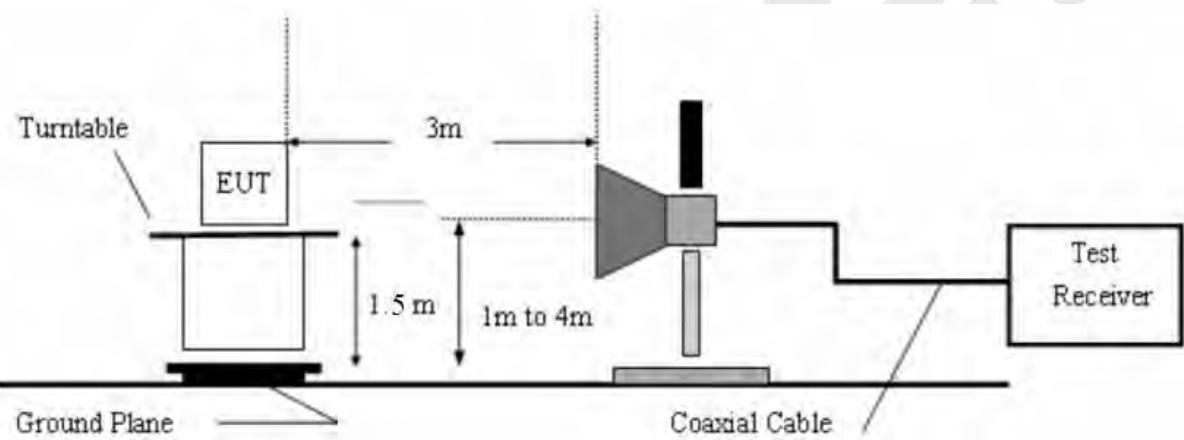
4) Peak detector: RBW=1MHz, VBW=3MHz, SWT=AUTO
Average detector: RBW=1MHz, VBW=10Hz, SWT=AUTO
The EUT is tested in 9*6*6 Chamber.

5) Repeat the procedures until all the PEAK and AVERAGE versus POLARIZATION are measured.

30M to 1G emissions:



1G to 40G emissions:



c. Test Equipment

Same as the equipment listed in 4.2.

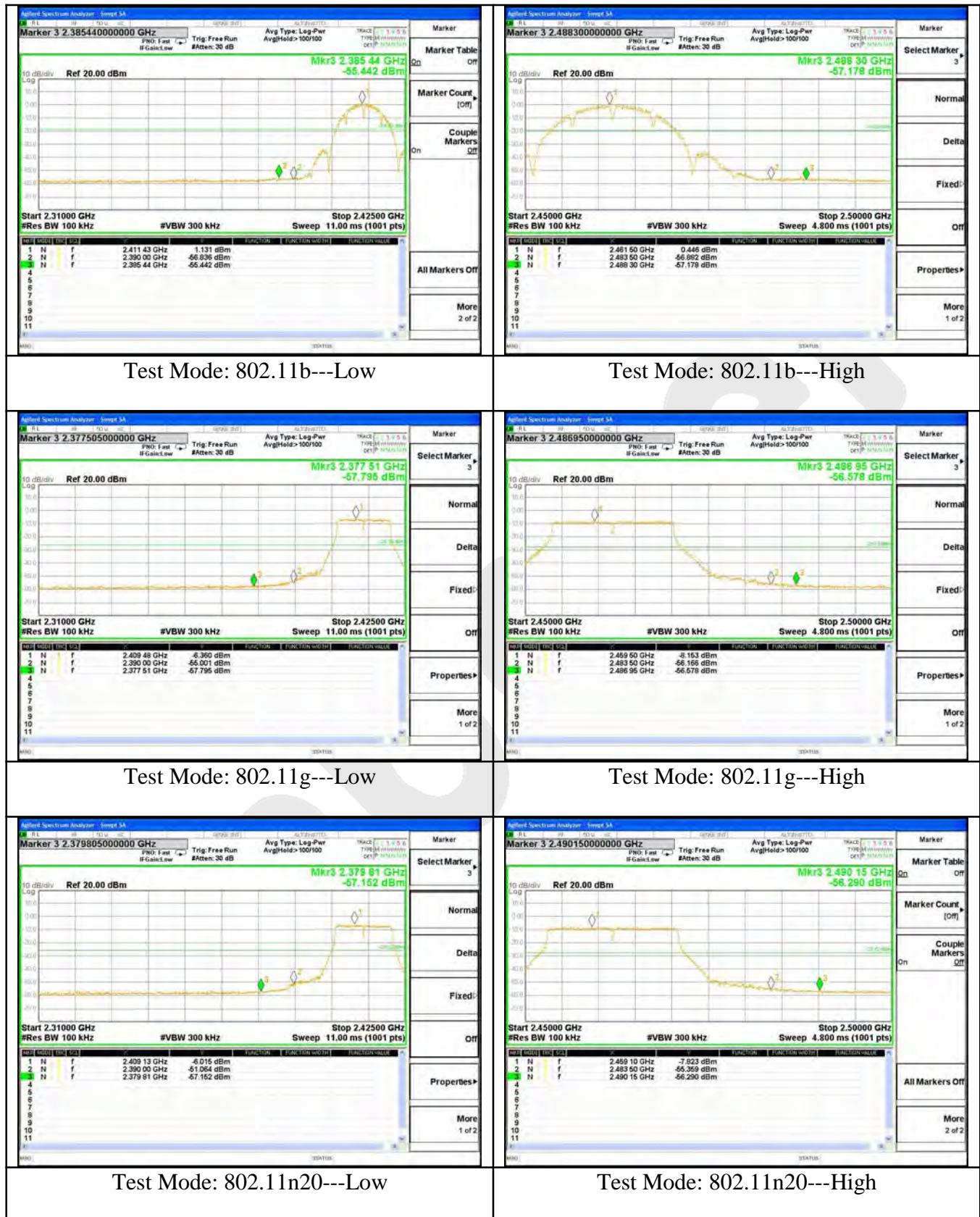
d. Test Results

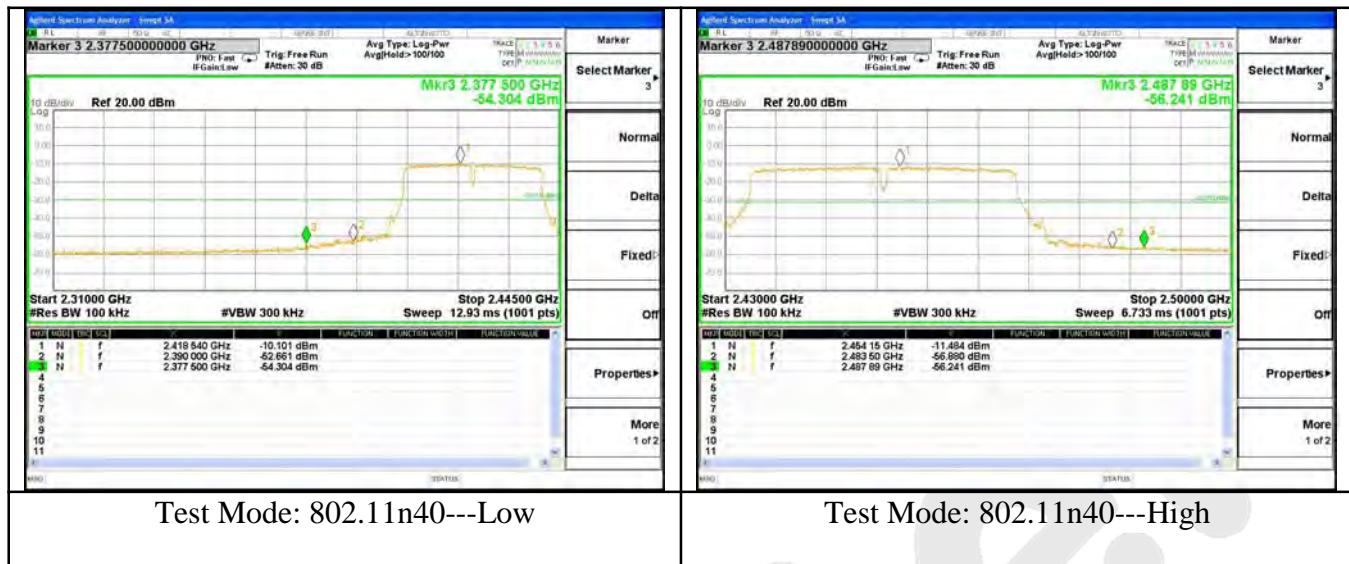
Pass.

e. Test Plots

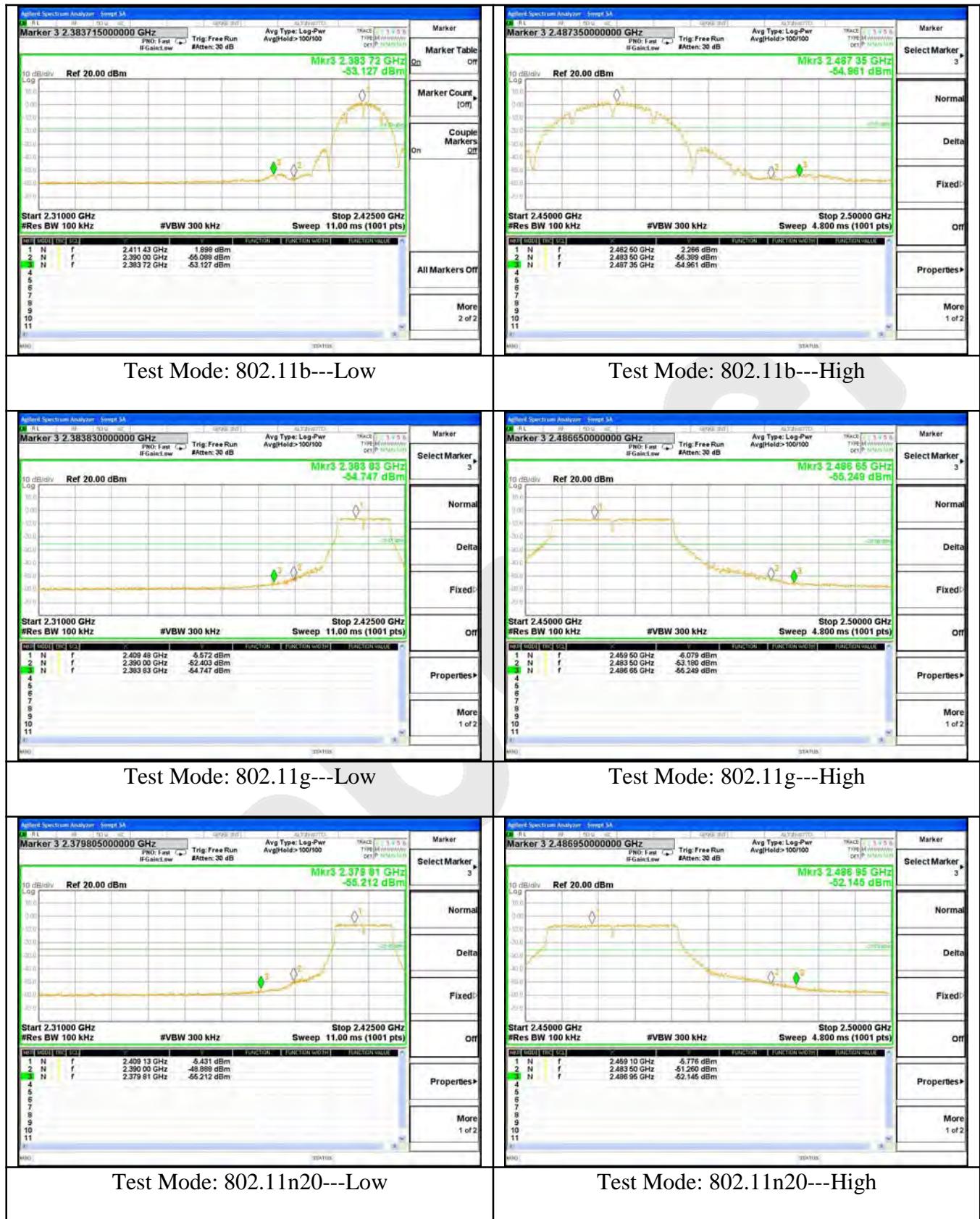
See the following page.

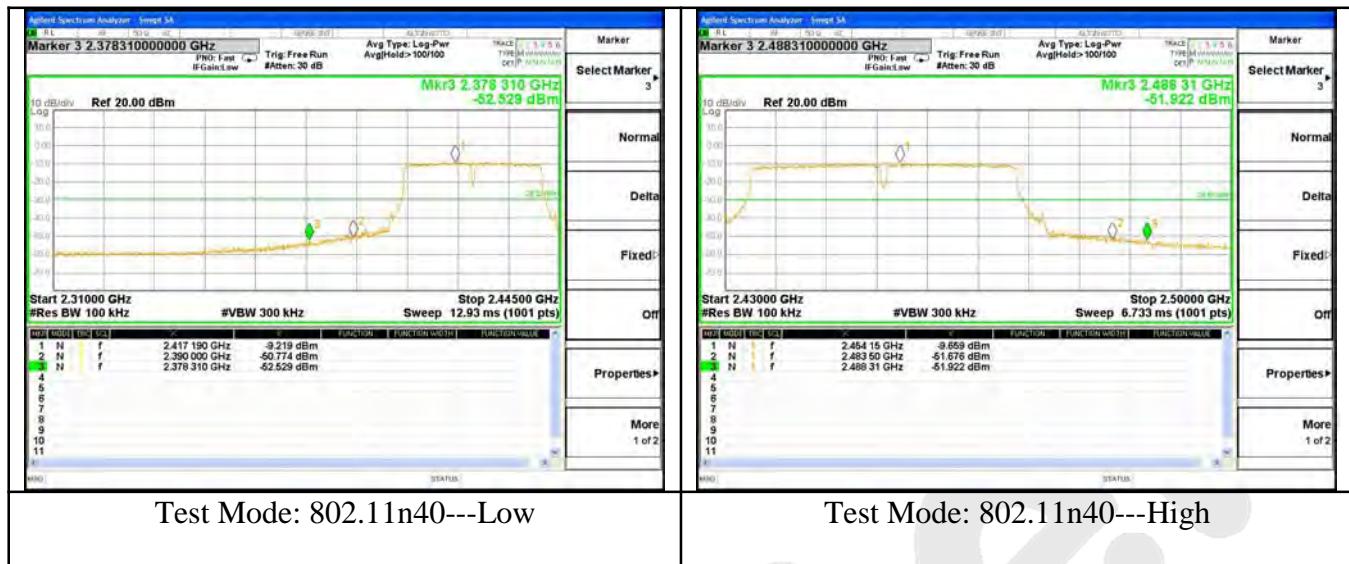
ANT A





ANT B



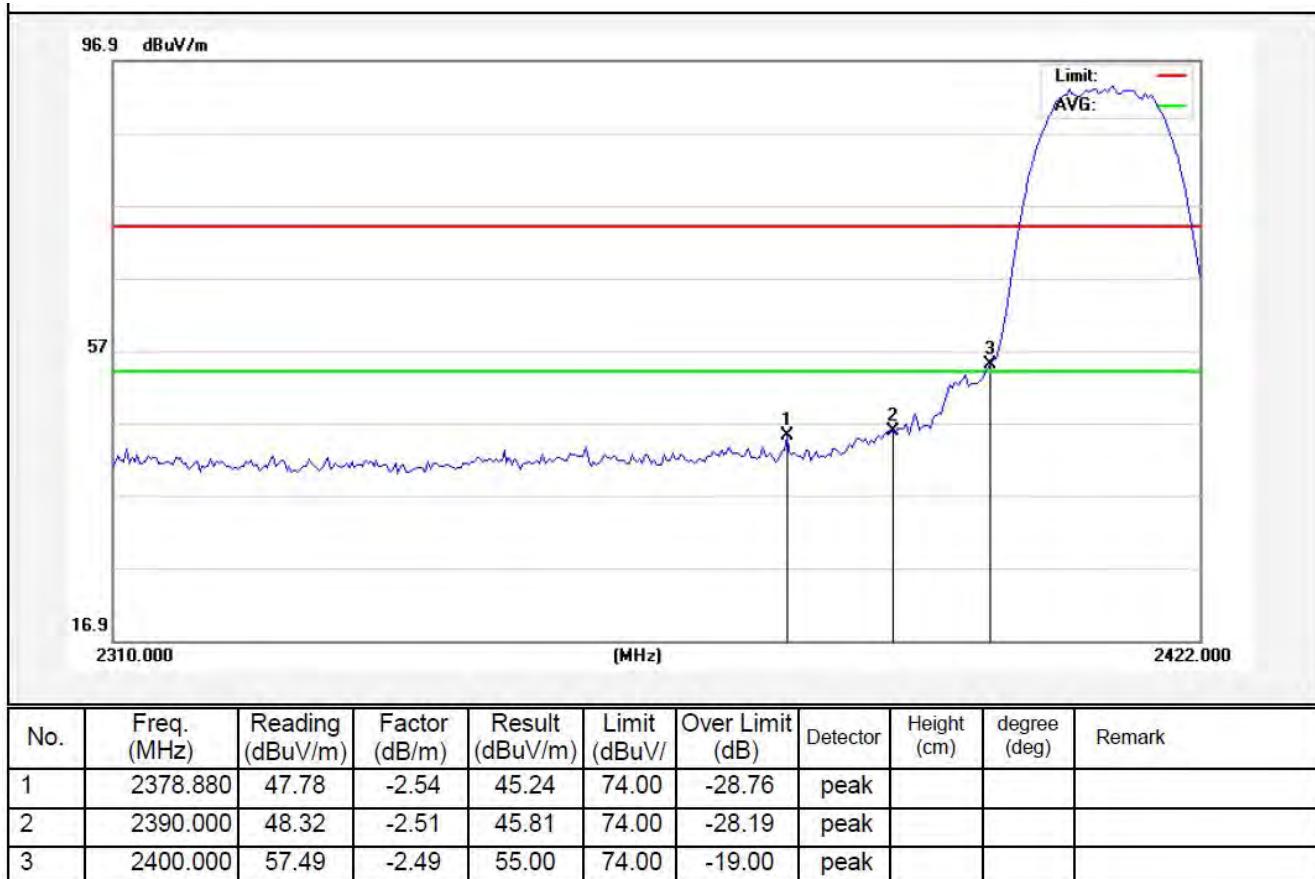


ANT A

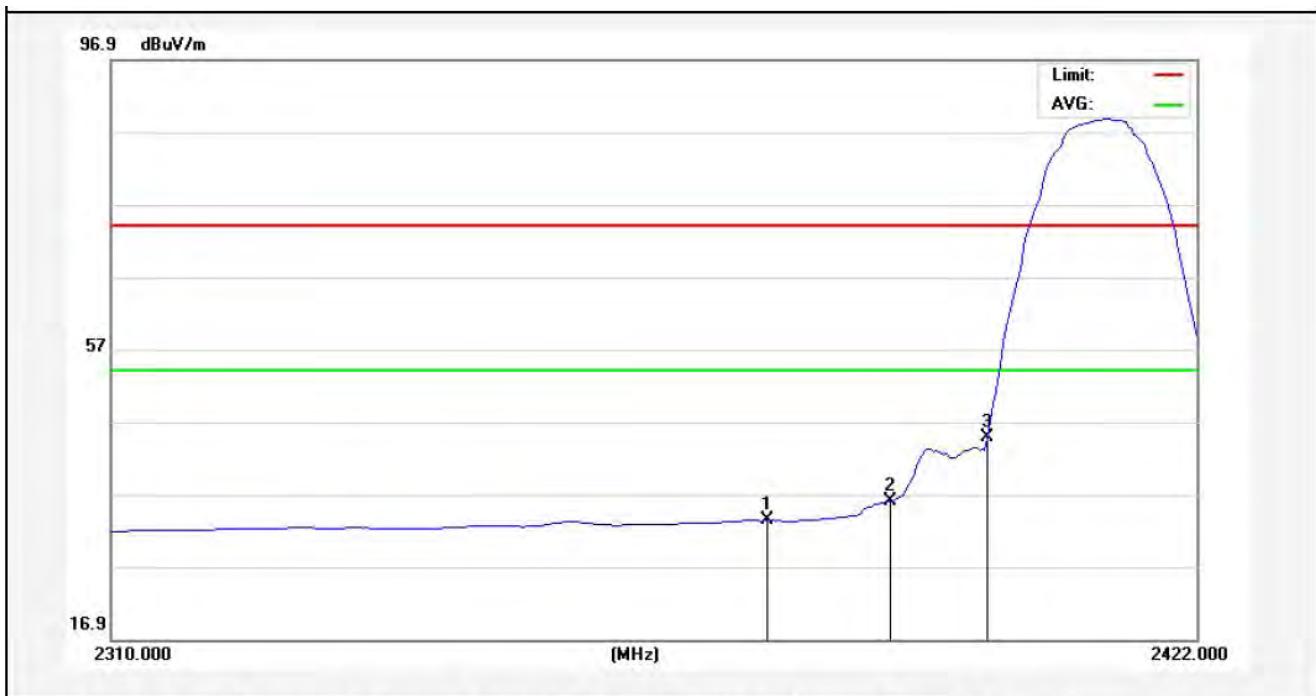
Test Mode: 802.11b

2412MHz

Horizontal-PEAK:



Horizontal-AV:

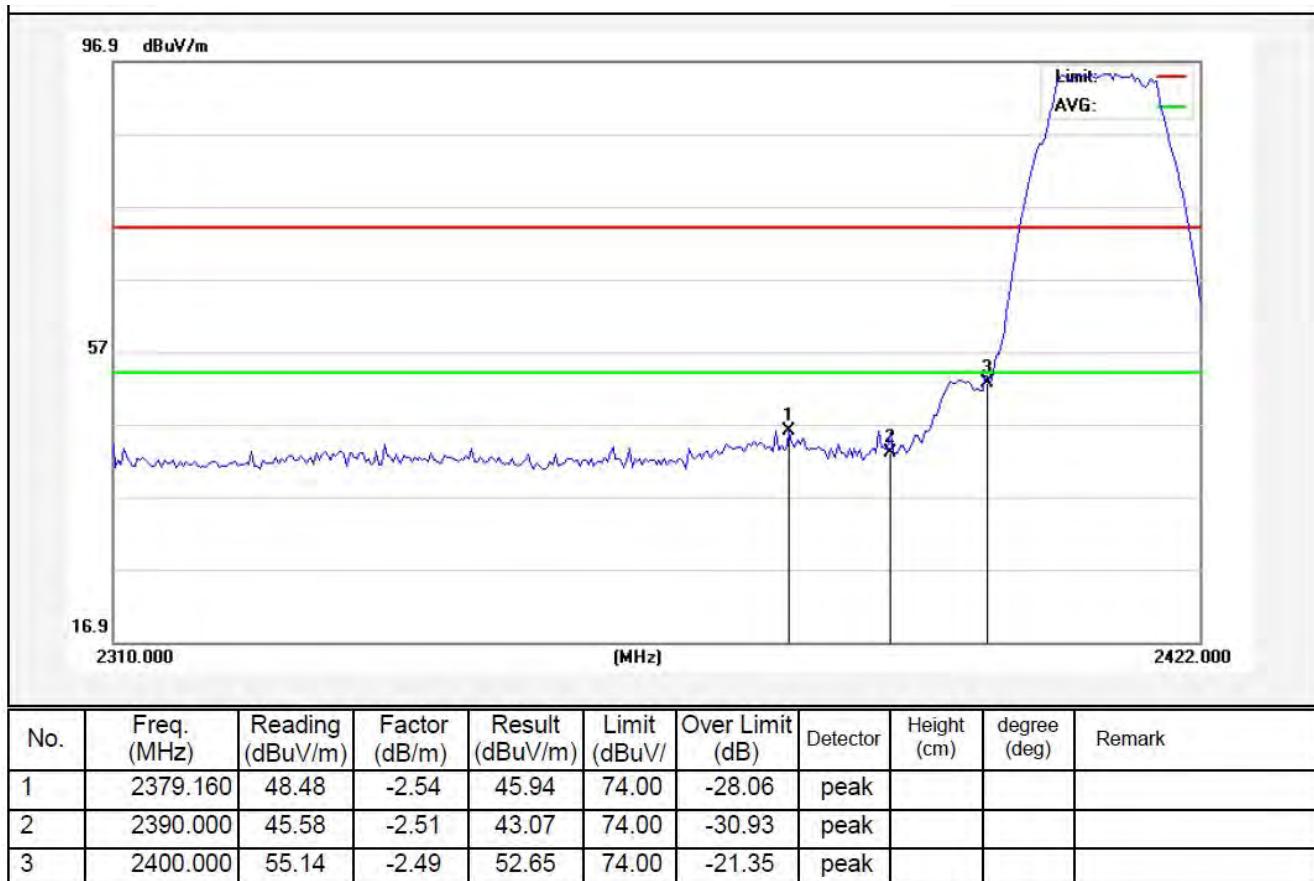


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	2377.200	35.88	-2.54	33.34	54.00	-20.66	AVG			
2	2390.000	38.52	-2.51	36.01	54.00	-17.99	AVG			
3	2400.000	47.27	-2.49	44.78	54.00	-9.22	AVG			

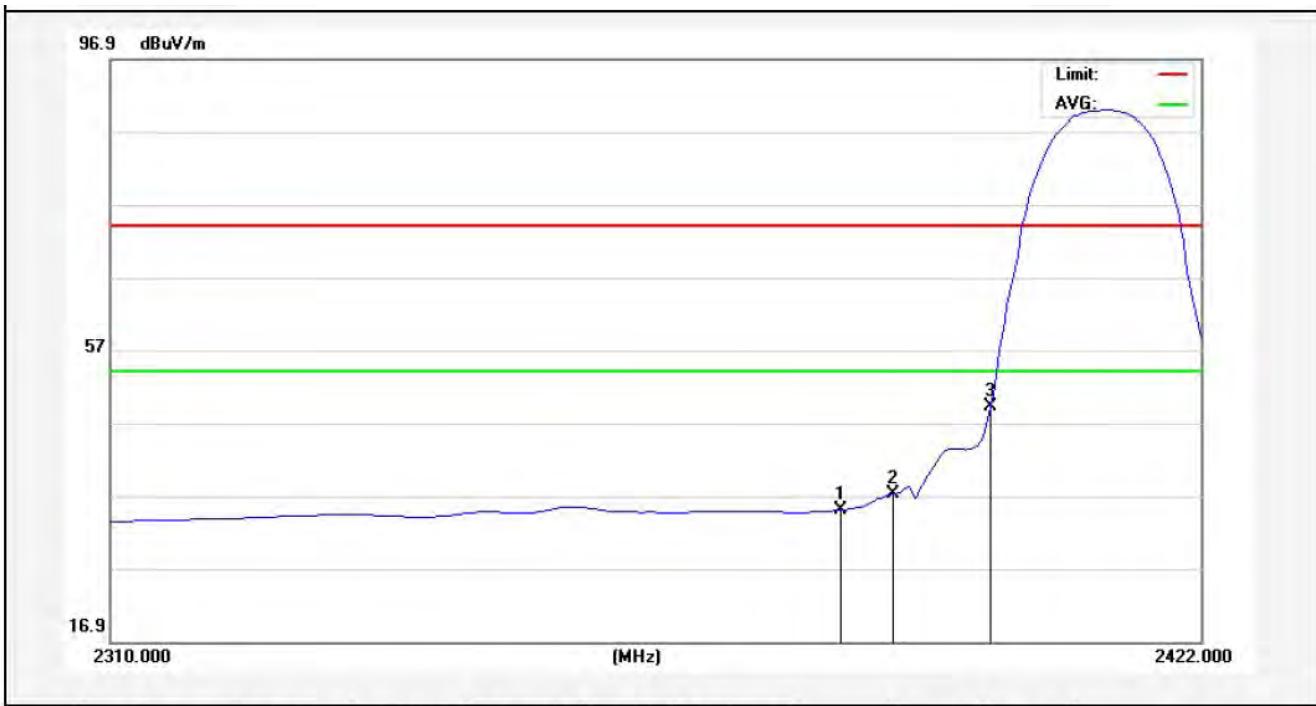
Test Mode: 802.11b

2412MHz

Vertical-PEAK:



Vertical-AV:

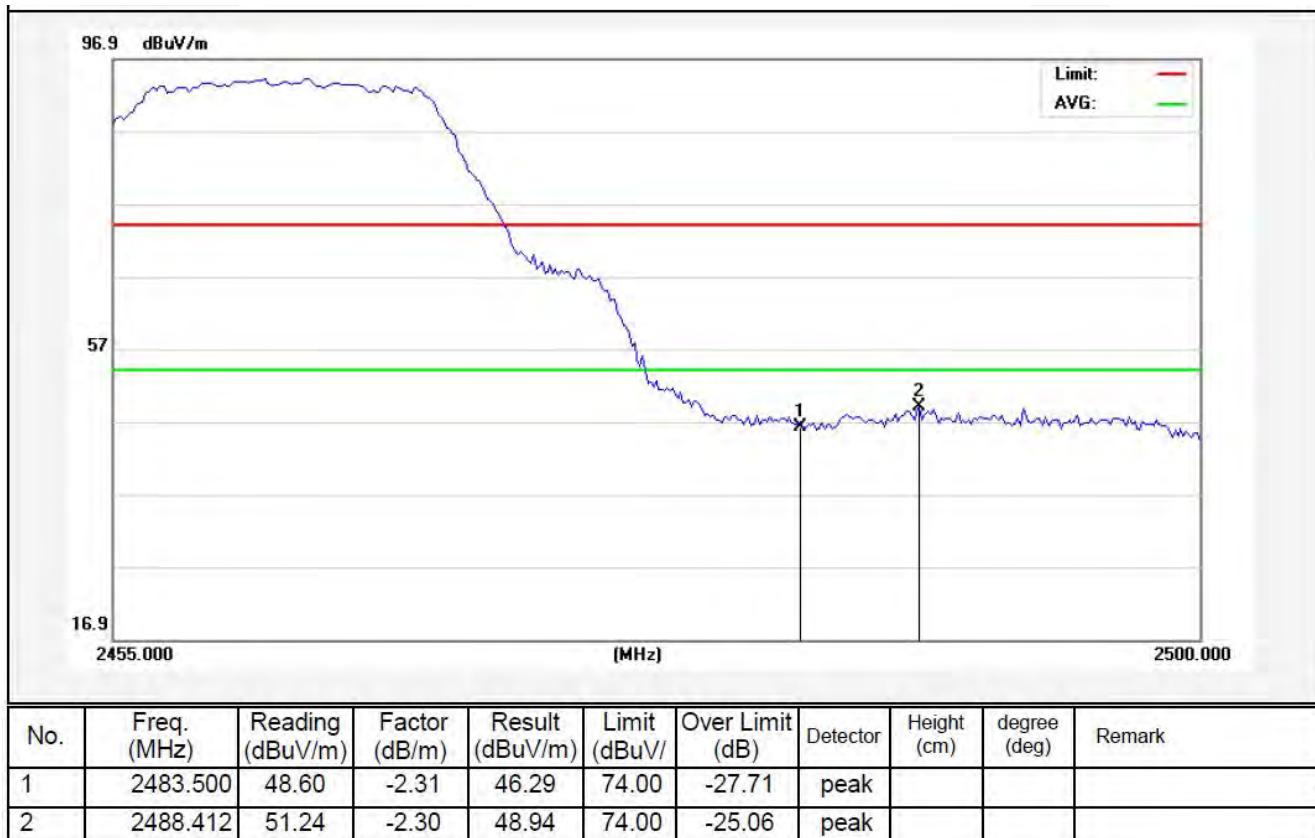


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	2384.200	37.51	-2.53	34.98	54.00	-19.02	AVG			
2	2390.000	39.67	-2.51	37.16	54.00	-16.84	AVG			
3	2400.000	51.61	-2.49	49.12	54.00	-4.88	AVG			

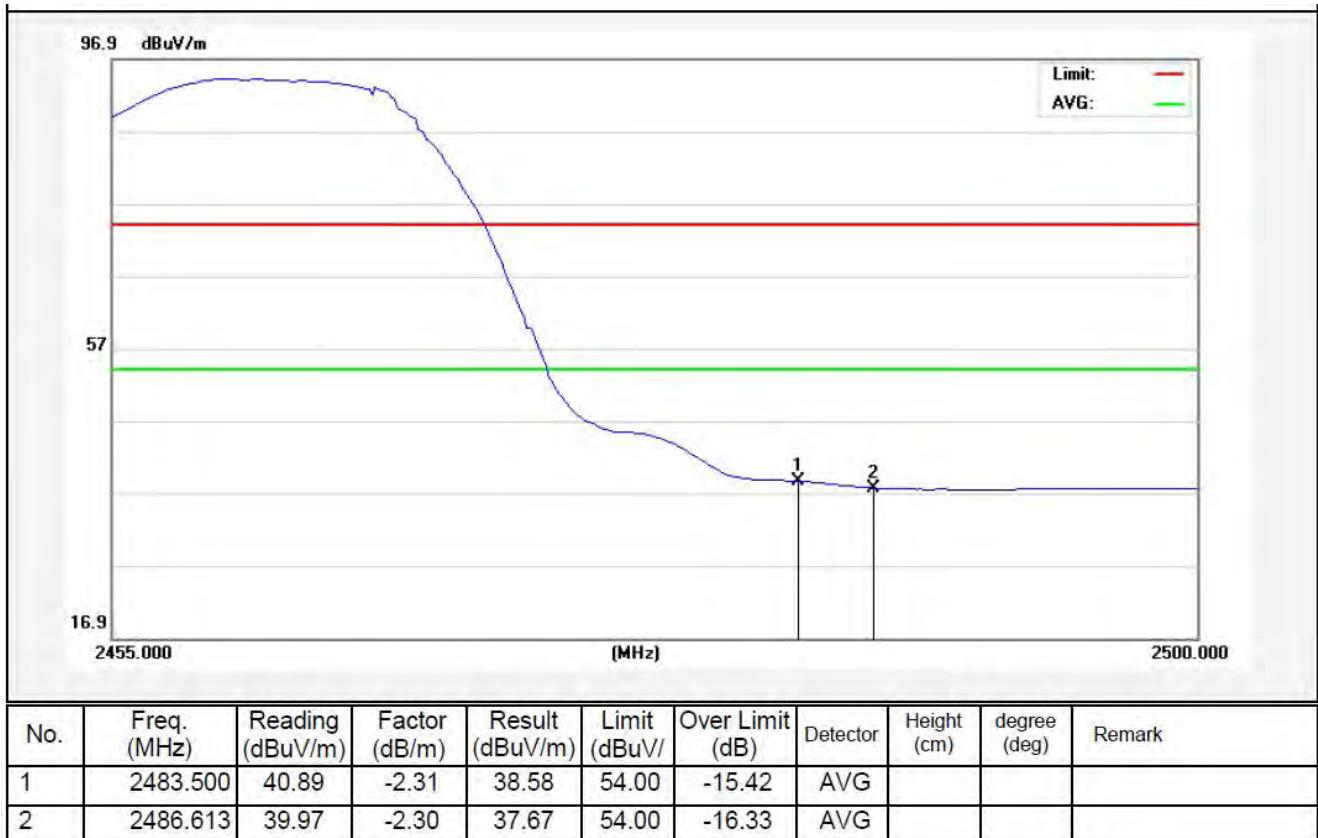
Test Mode: 802.11b

2462MHz

Horizontal-PEAK:



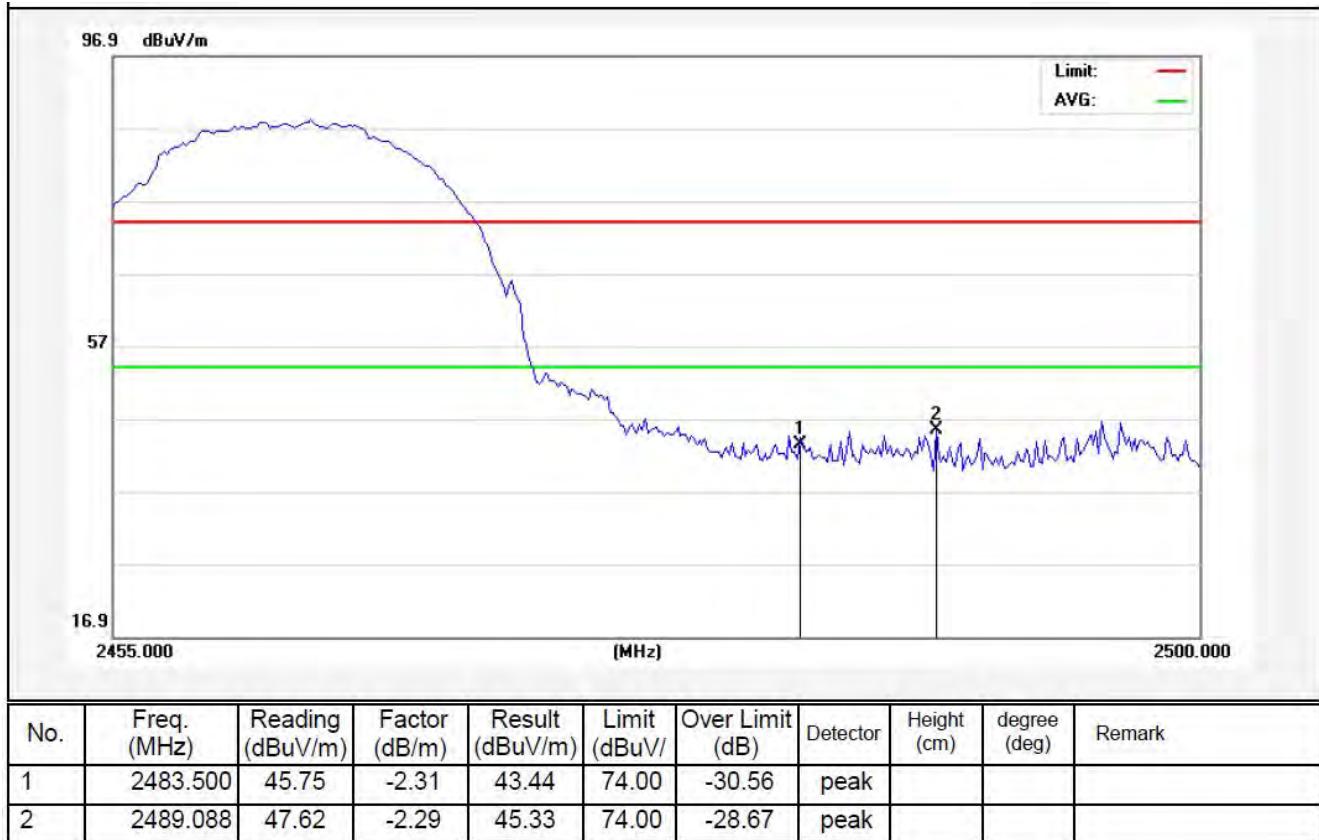
Horizontal-AV:



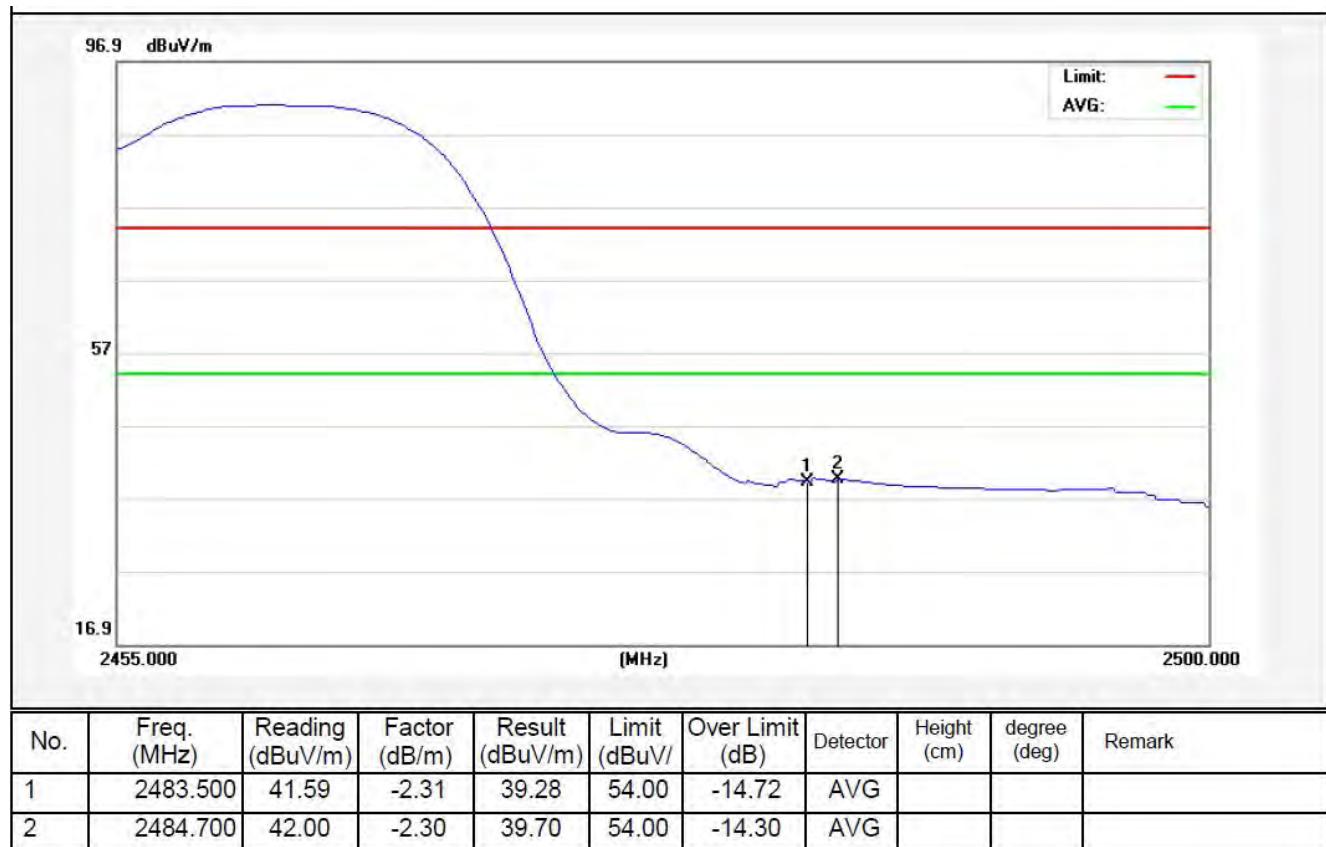
Test Mode: 802.11b

2462MHz

Vertical-PEAK:



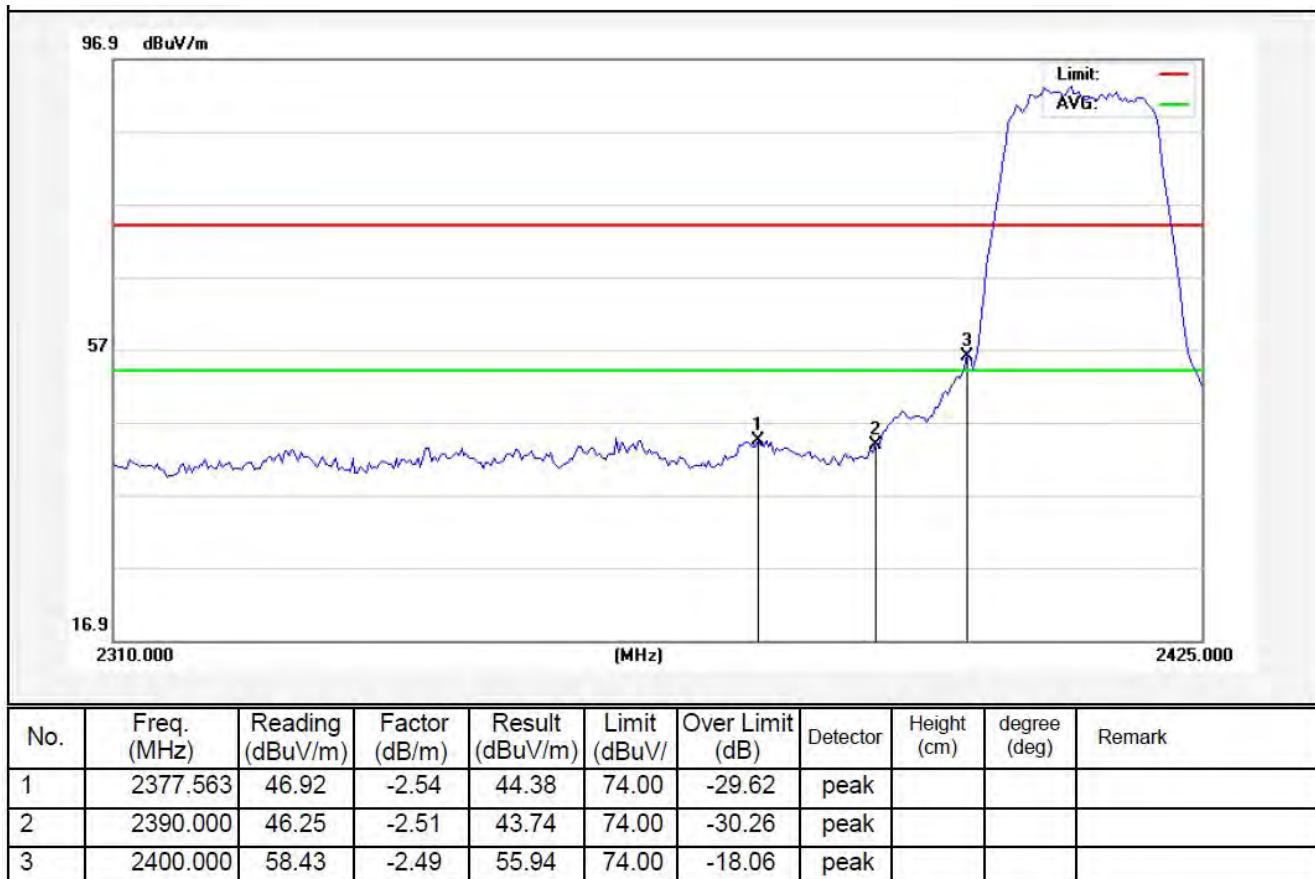
Vertical-AV:



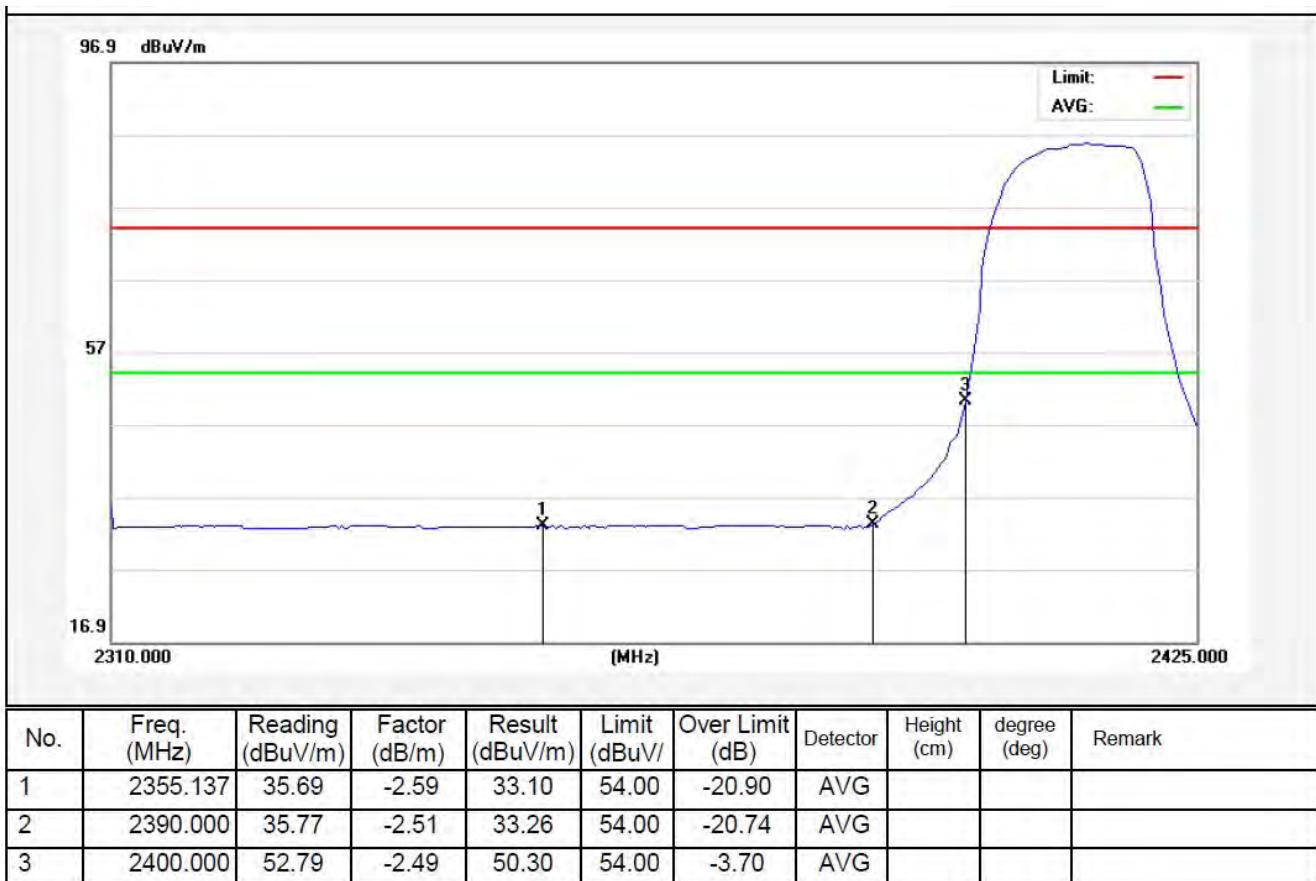
Test Mode: 802.11g

2412MHz

Horizontal-PEAK:



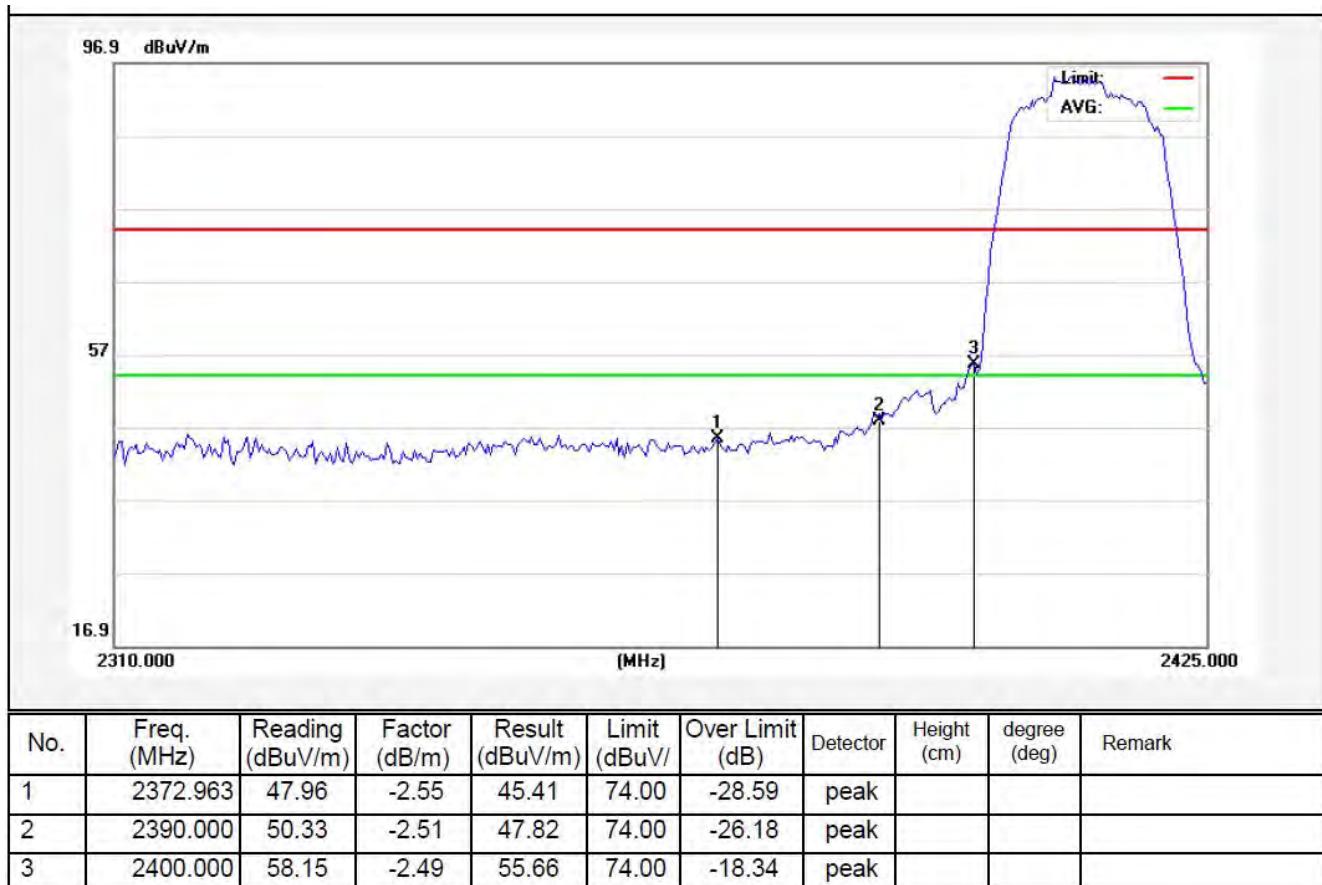
Horizontal-AV:



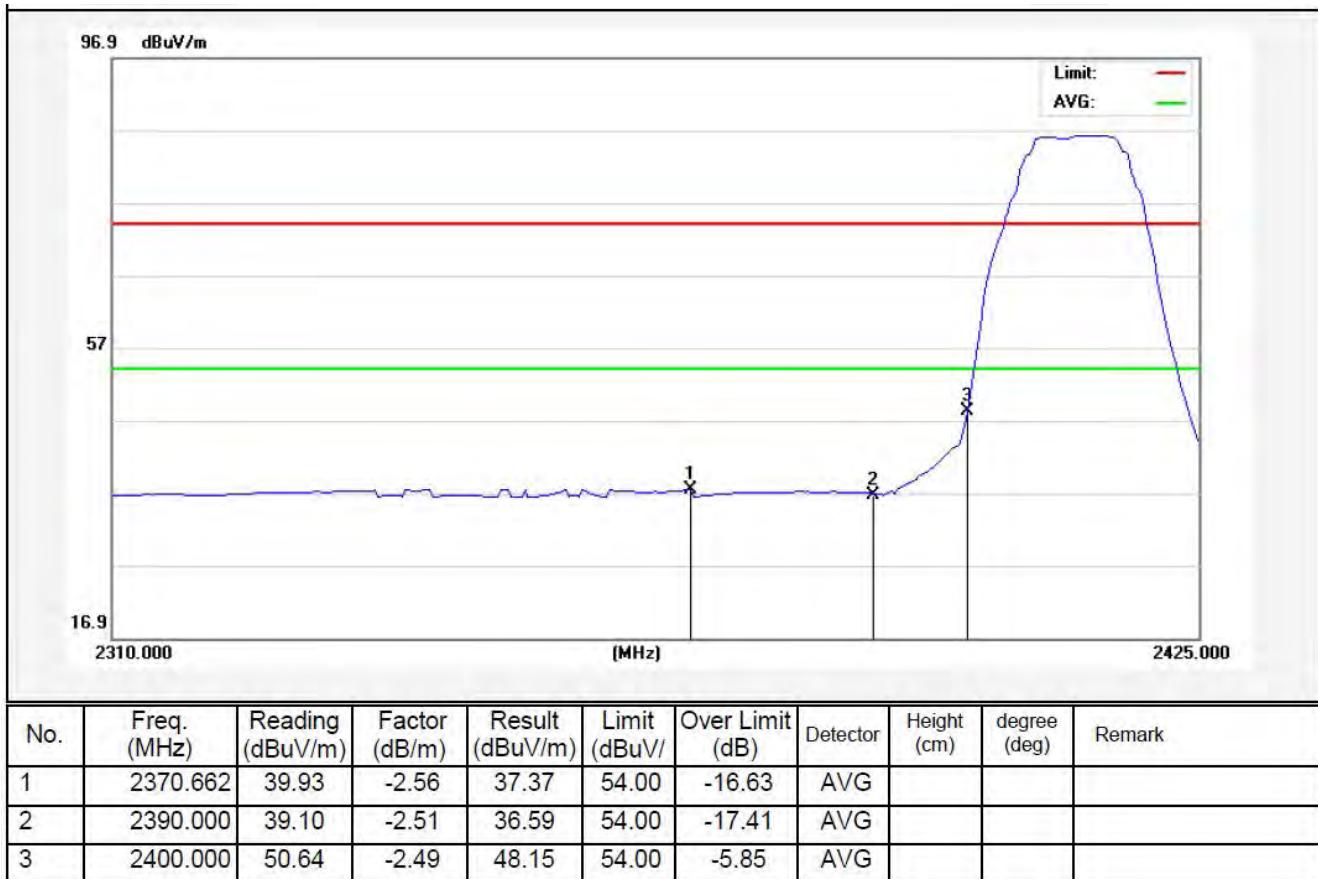
Test Mode: 802.11g

2412MHz

Vertical-PEAK:



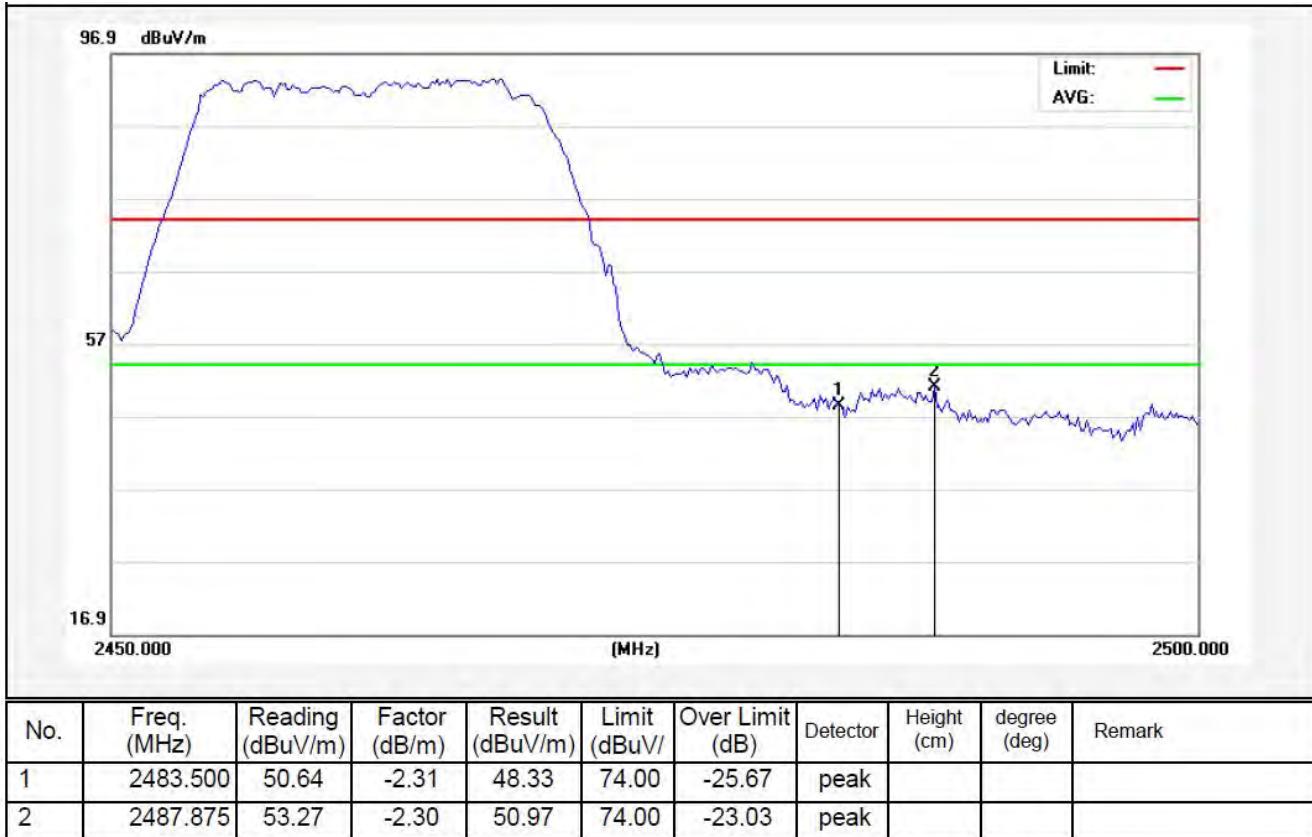
Vertical-AV:



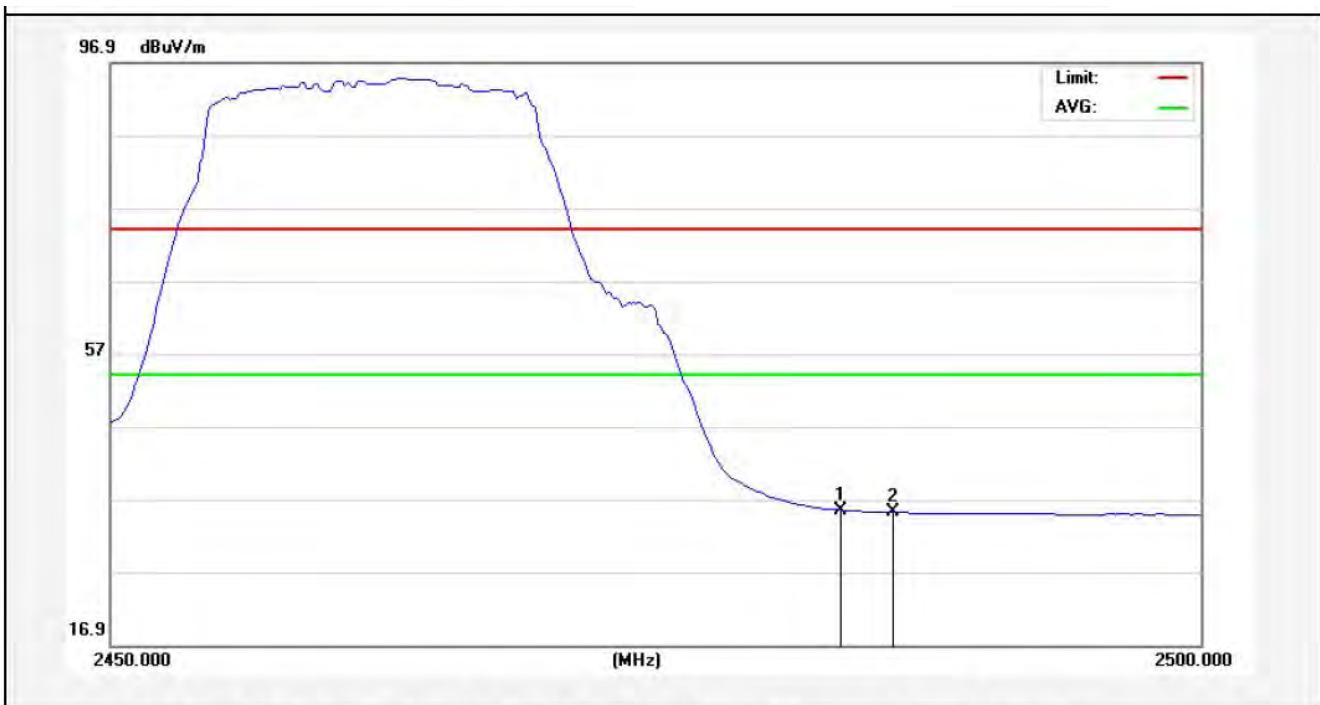
Test Mode: 802.11g

2462MHz

Horizontal-PEAK:



Horizontal-AV:

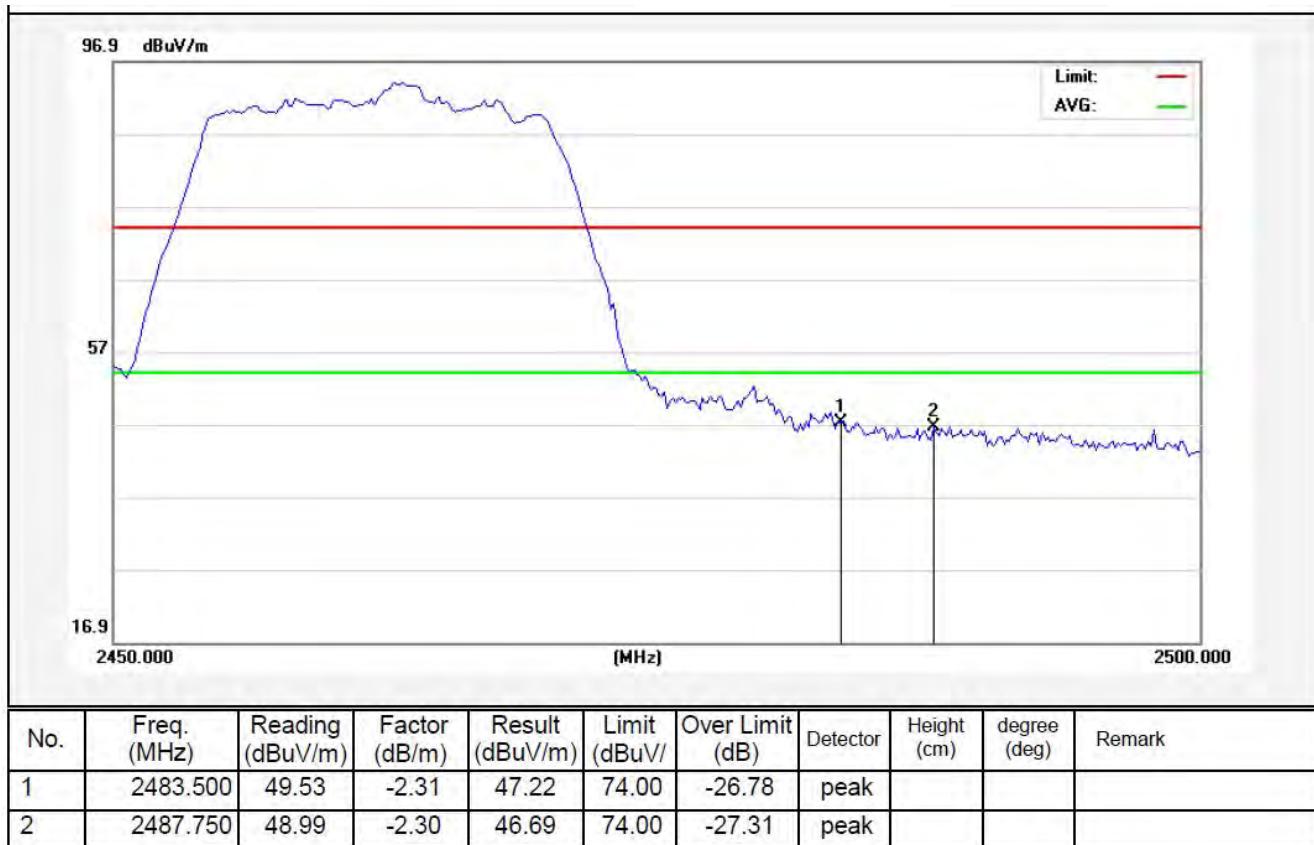


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	2483.500	37.79	-2.31	35.48	54.00	-18.52	AVG			
2	2485.875	37.45	-2.30	35.15	54.00	-18.85	AVG			

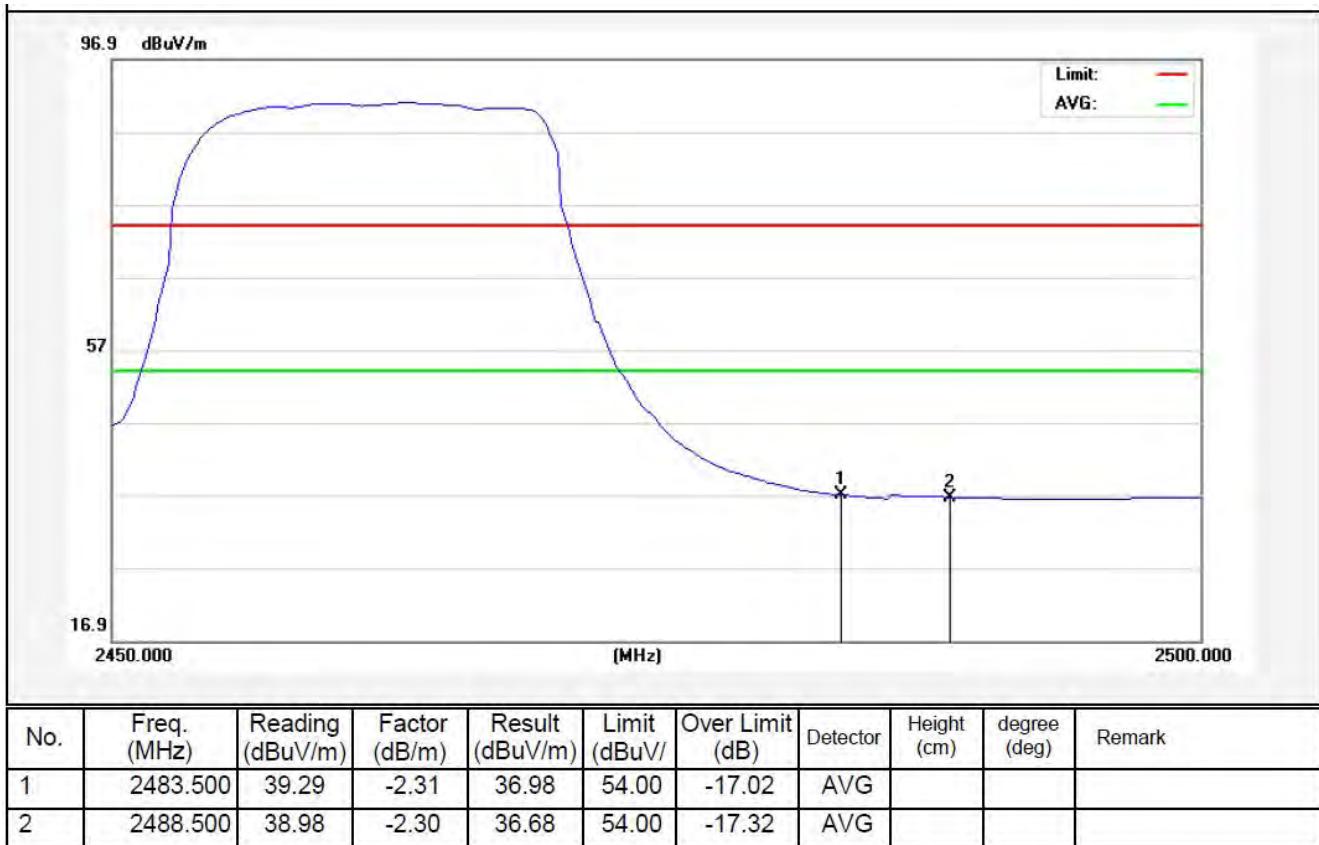
Test Mode: 802.11g

2462MHz

Vertical-PEAK:



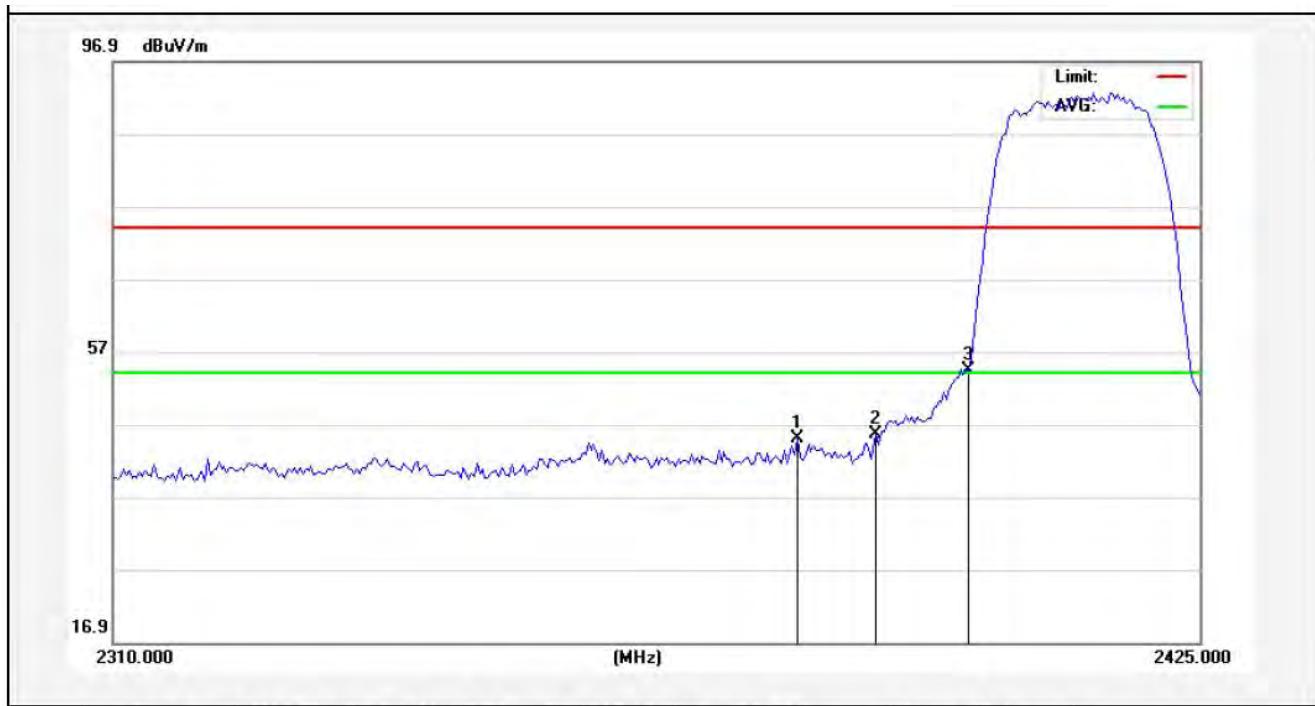
Vertical-AV:



Test Mode: 802.11n (HT20)

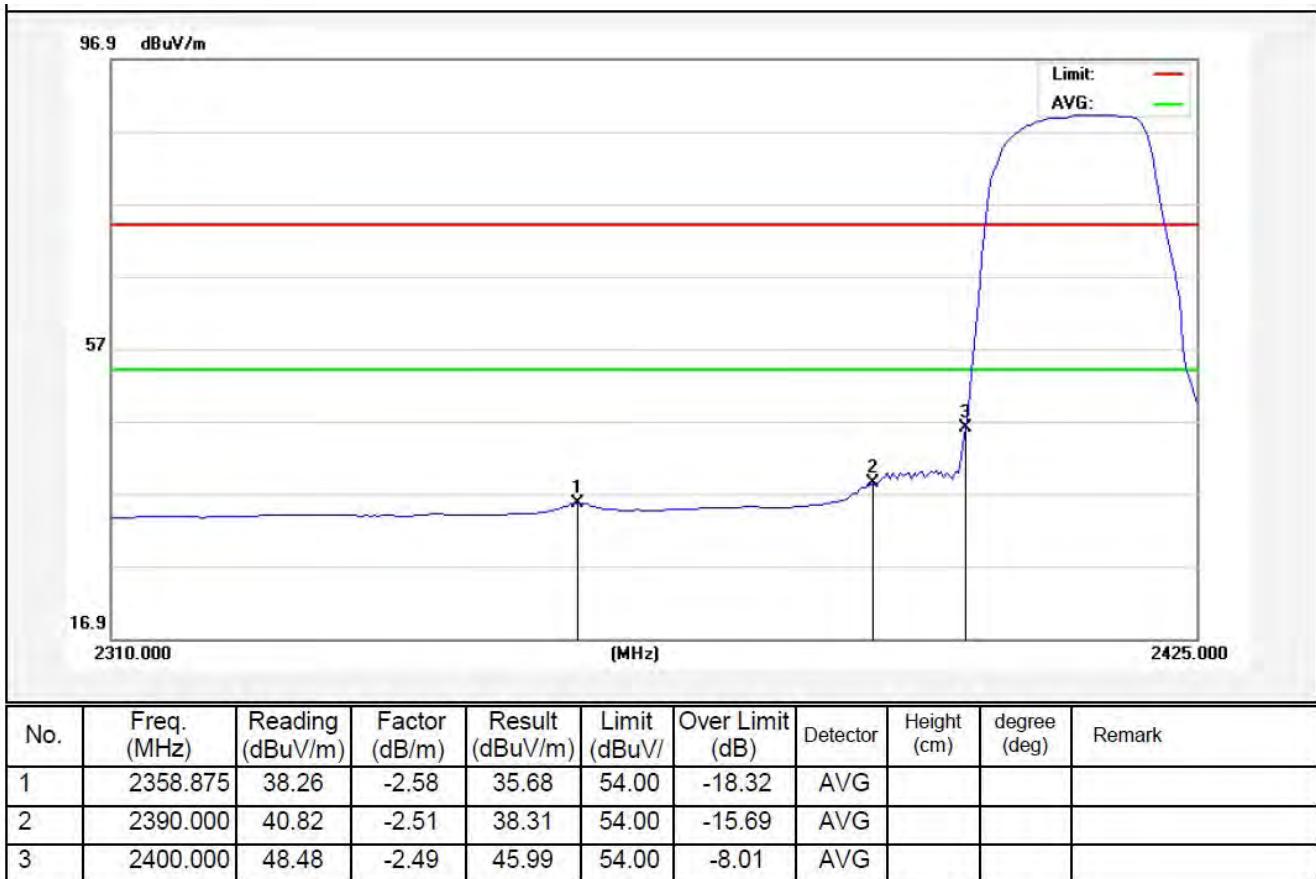
2412MHz

Horizontal-PEAK:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	2381.875	47.54	-2.53	45.01	74.00	-28.99	peak			
2	2390.000	48.20	-2.51	45.69	74.00	-28.31	peak			
3	2400.000	56.81	-2.49	54.32	74.00	-19.68	peak			

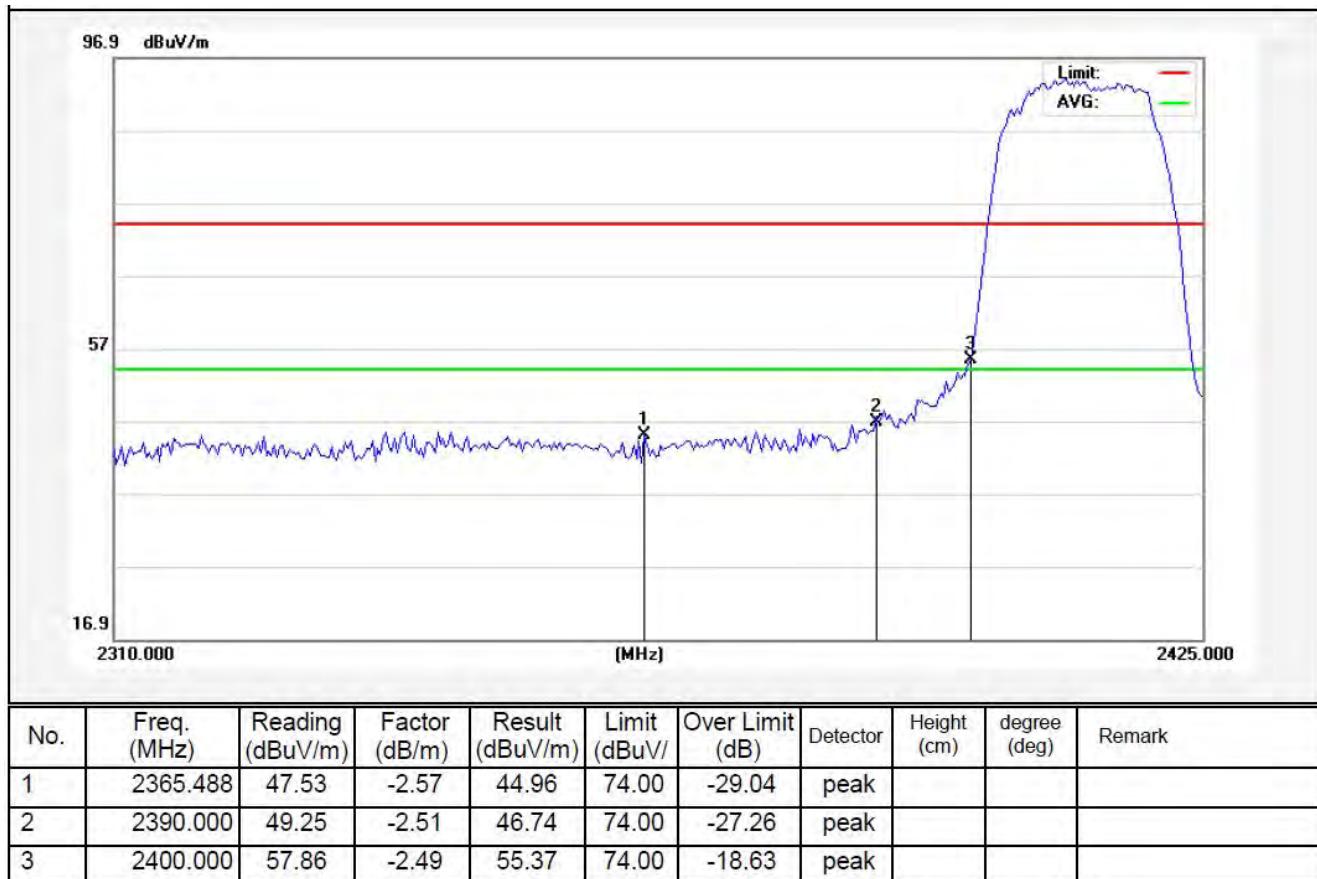
Horizontal-AV:



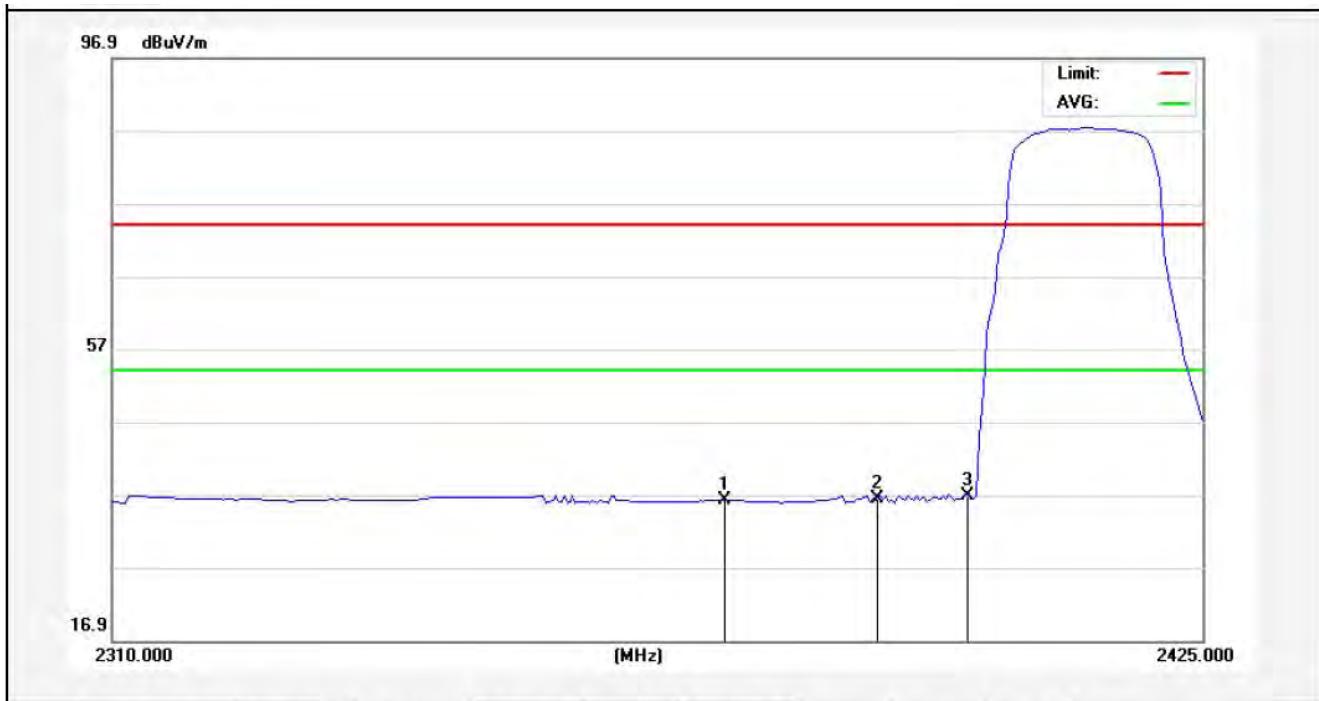
Test Mode: 802.11n (HT20)

2412MHz

Vertical-PEAK:



Vertical-AV:

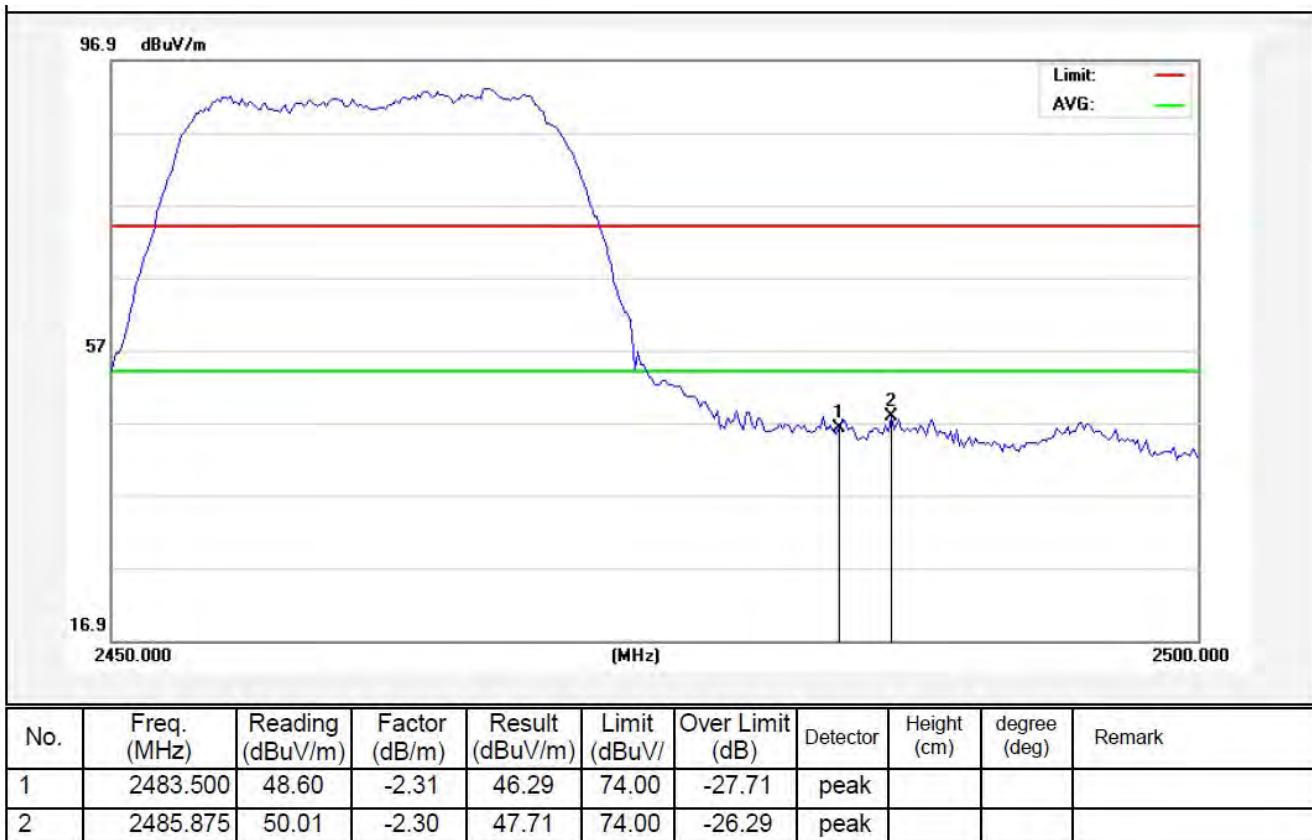


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	2374.113	38.70	-2.55	36.15	54.00	-17.85	AVG			
2	2390.000	39.01	-2.51	36.50	54.00	-17.50	AVG			
3	2400.000	39.25	-2.49	36.76	54.00	-17.24	AVG			

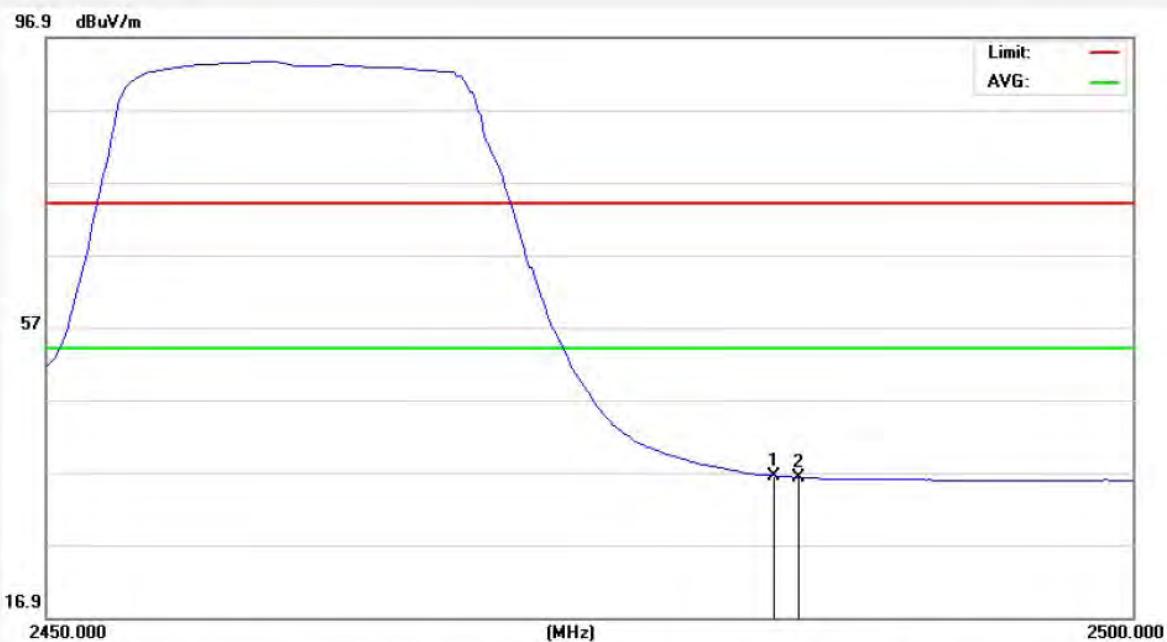
Test Mode: 802.11n (HT20)

2462MHz

Horizontal-PEAK:



Horizontal-AV:

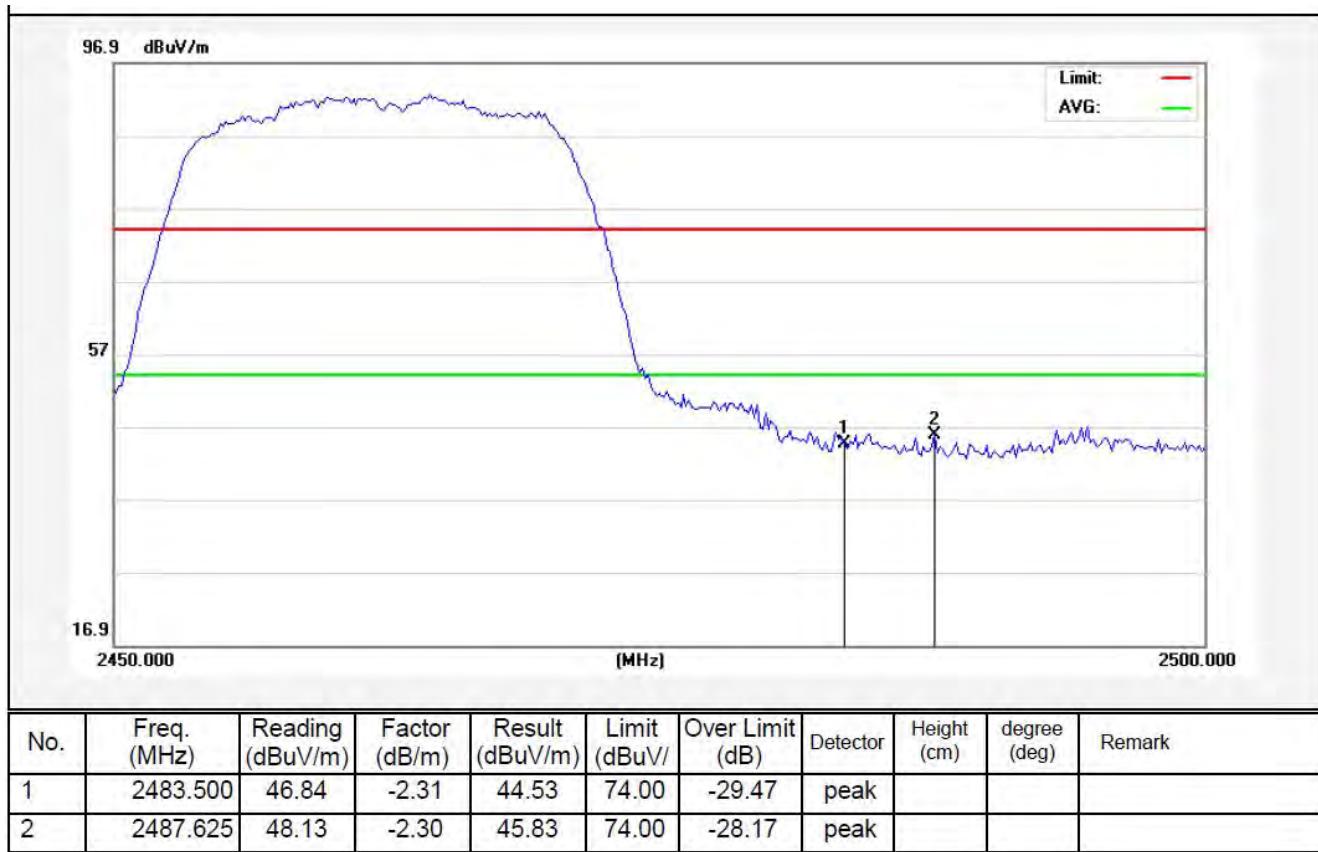


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	2483.500	38.81	-2.31	36.50	54.00	-17.50	AVG			
2	2484.625	38.55	-2.30	36.25	54.00	-17.75	AVG			

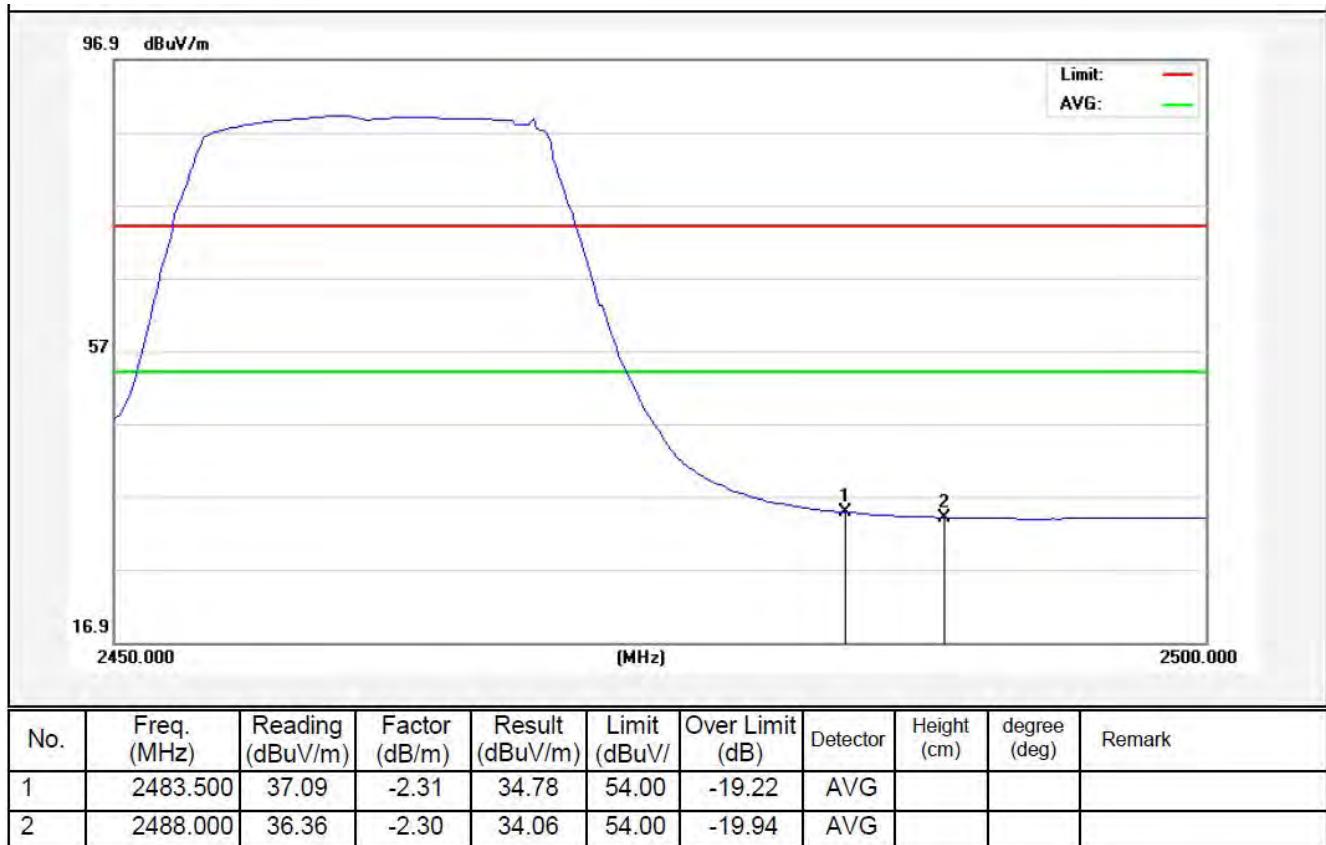
Test Mode: 802.11n (HT20)

2462MHz

Vertical-PEAK:



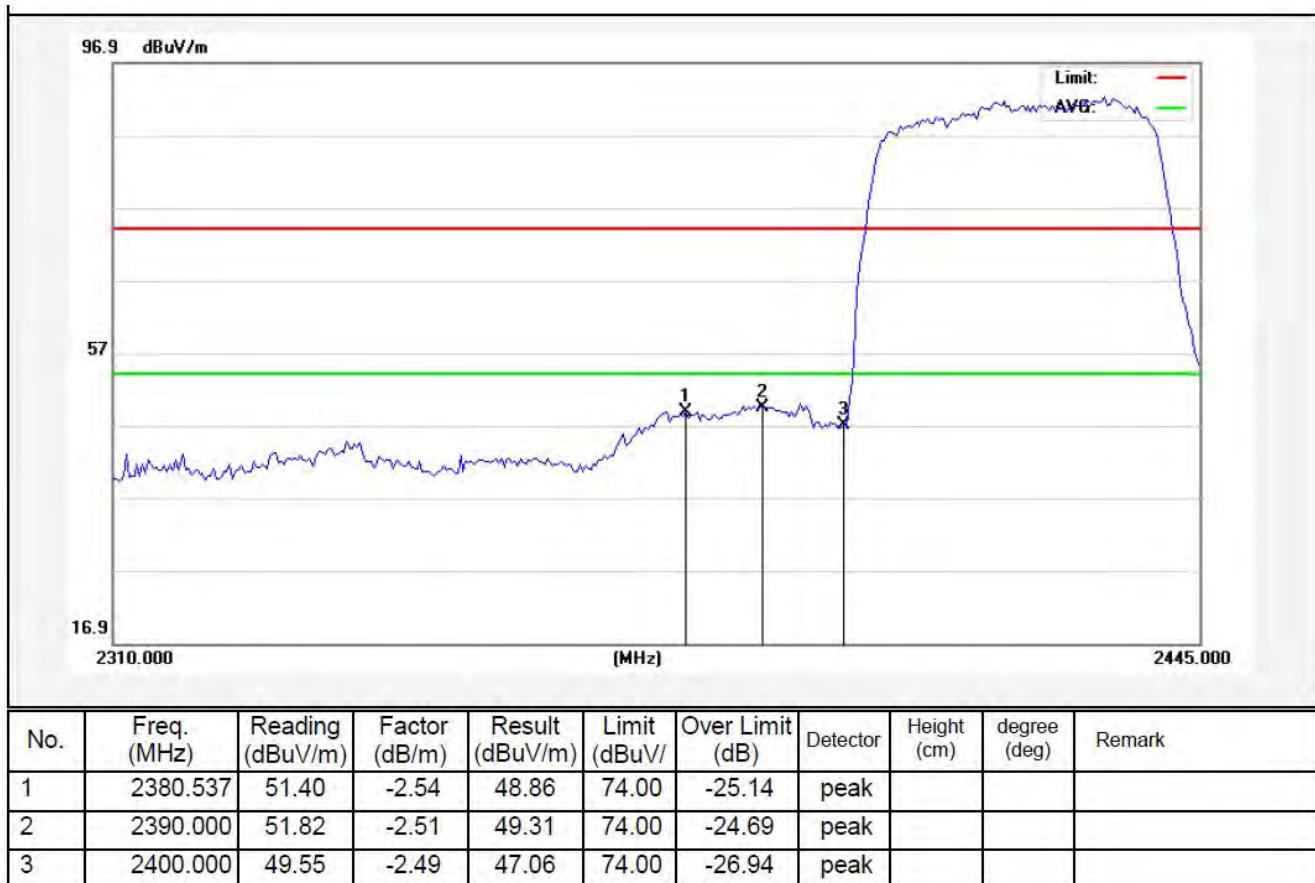
Vertical-AV:



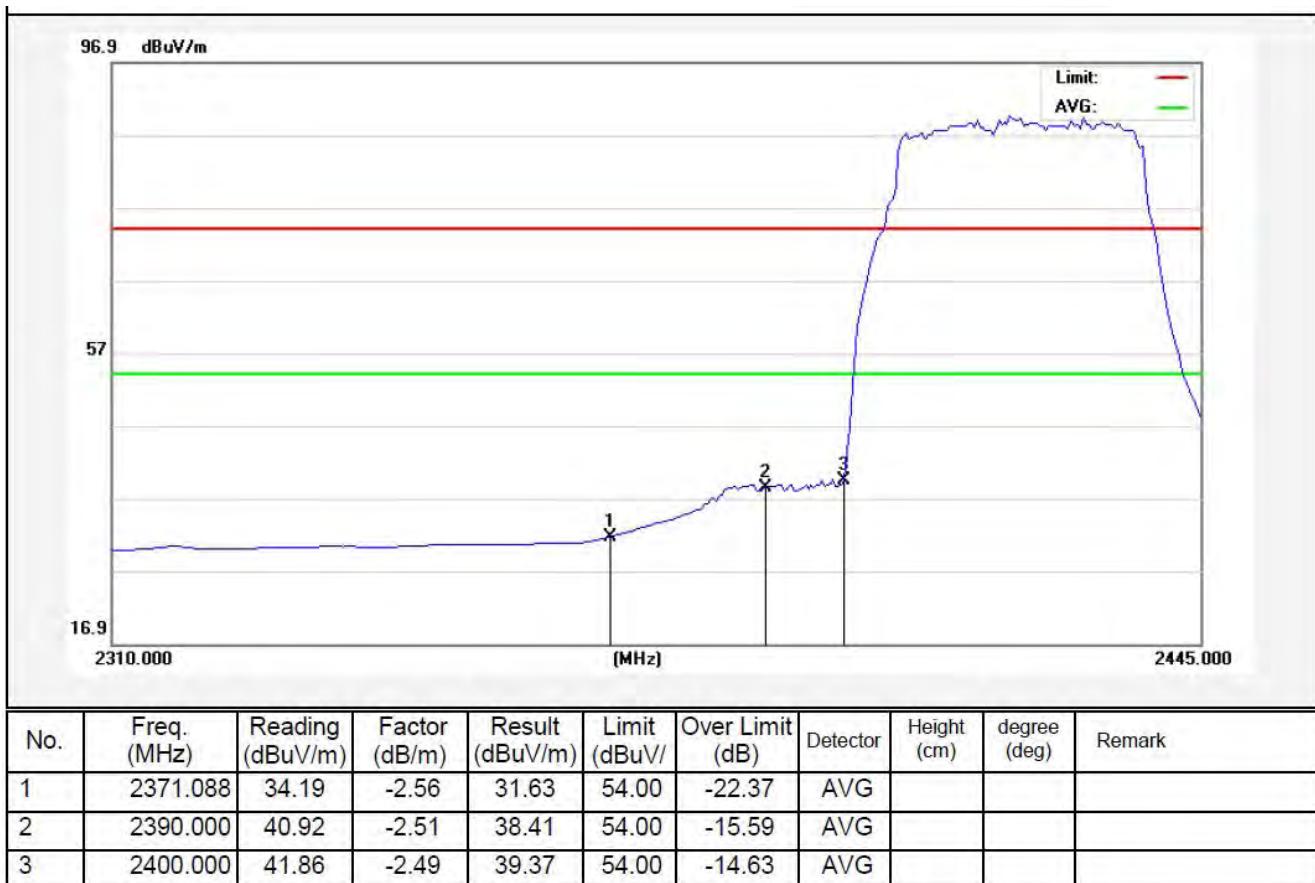
Test Mode: 802.11n (HT40)

2422MHz

Horizontal-PEAK:



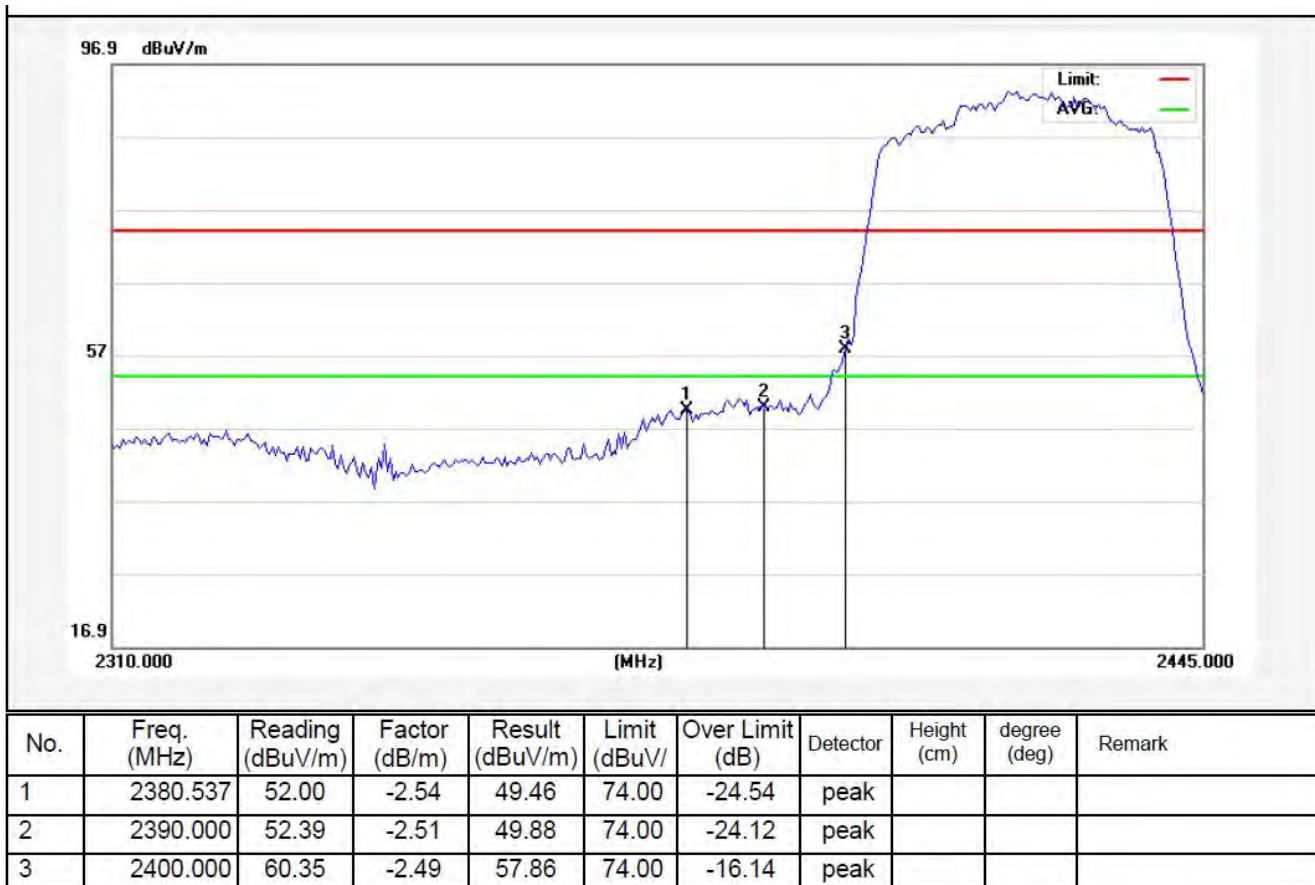
Horizontal-AV:



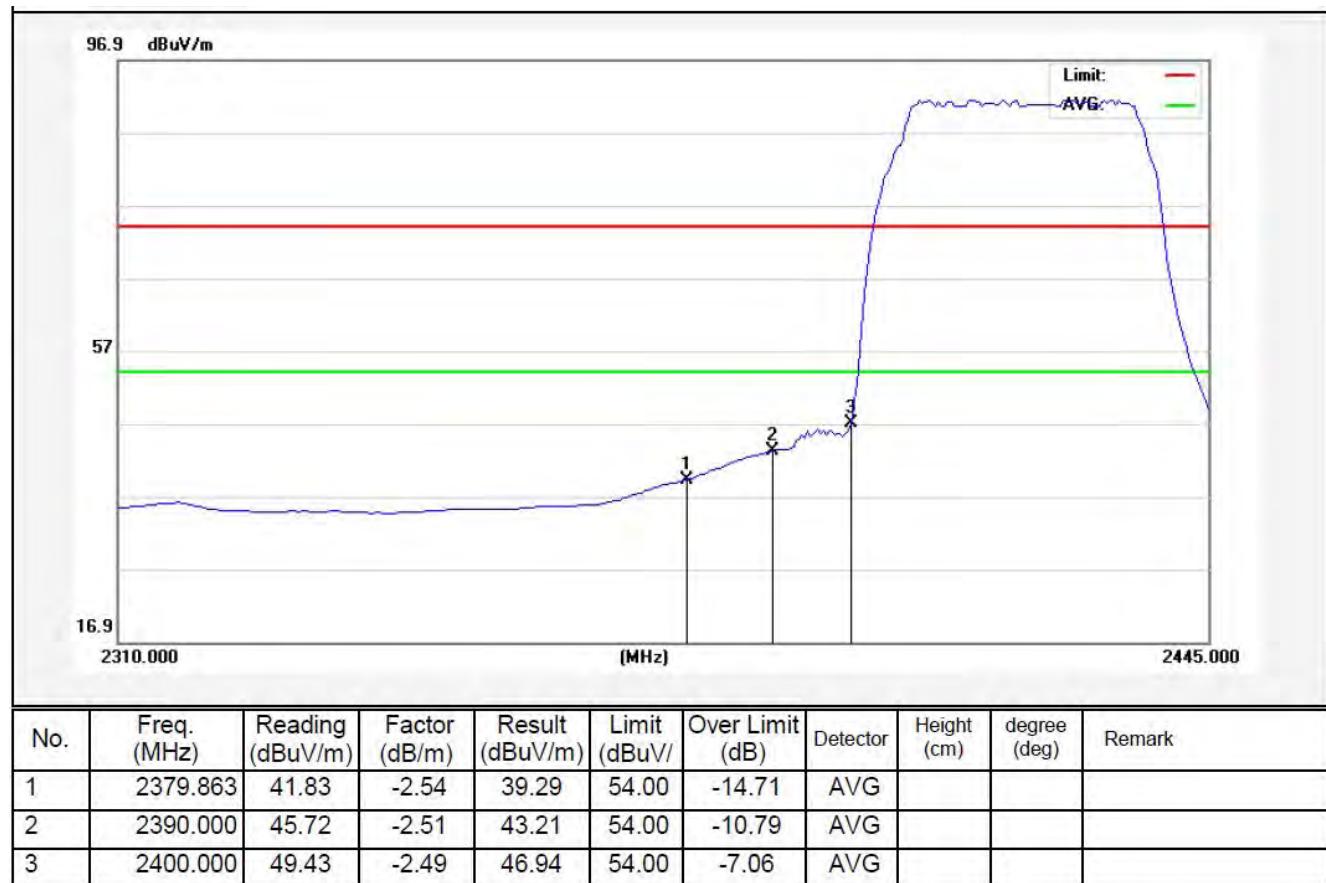
Test Mode: 802.11n (HT40)

2422MHz

Vertical-PEAK:



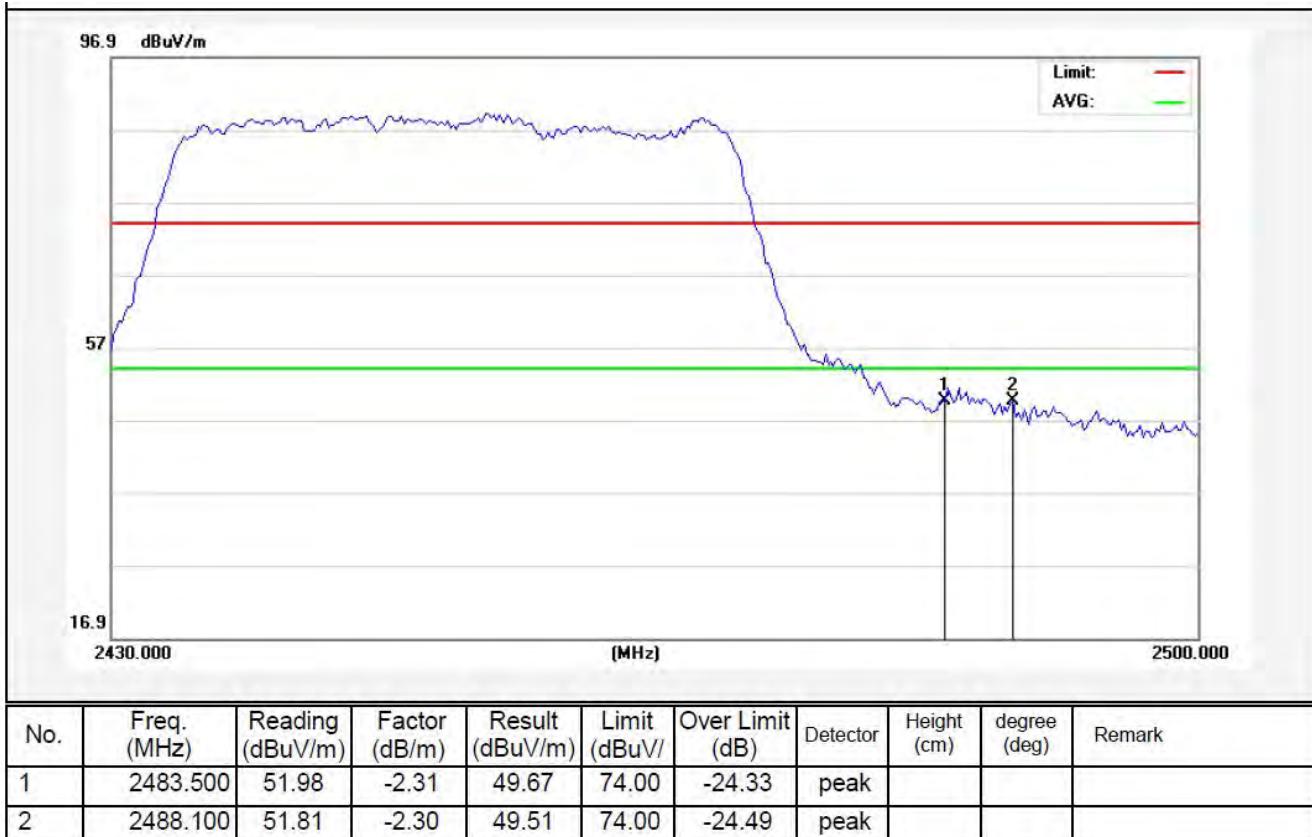
Vertical-AV:



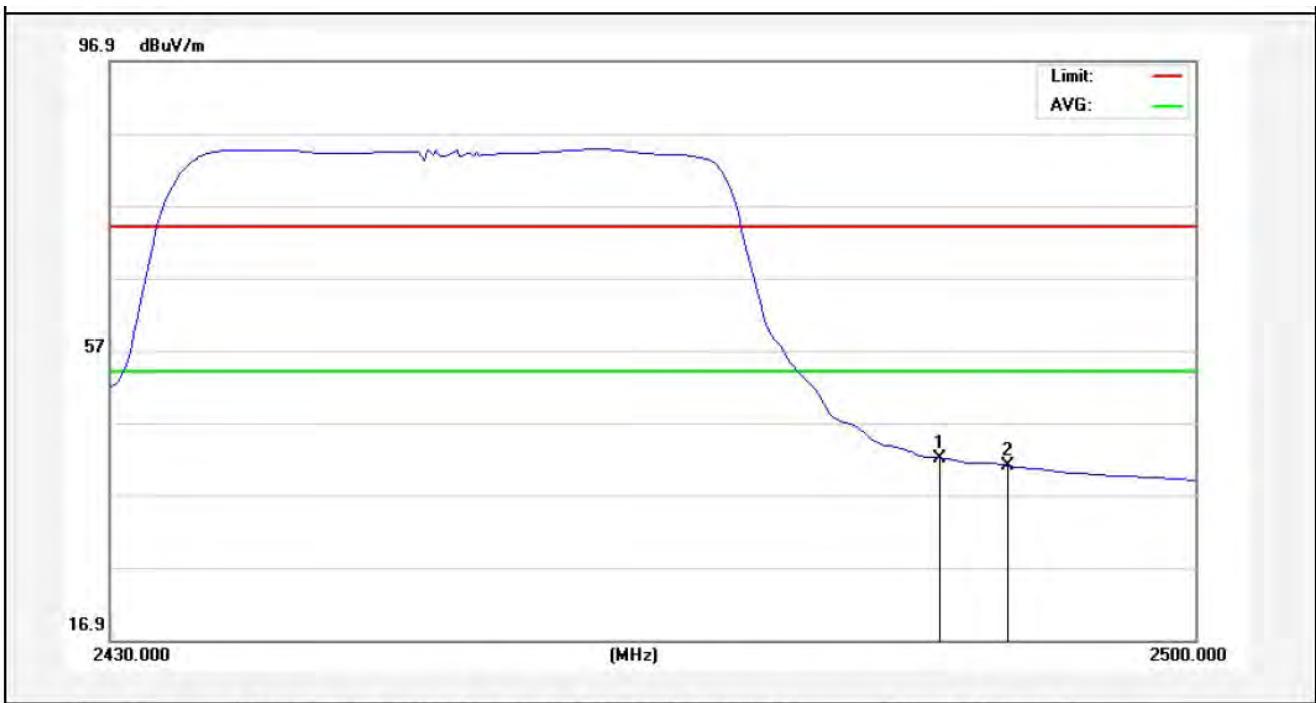
Test Mode: 802.11n (HT40)

2452MHz

Horizontal-PEAK:



Horizontal-AV:

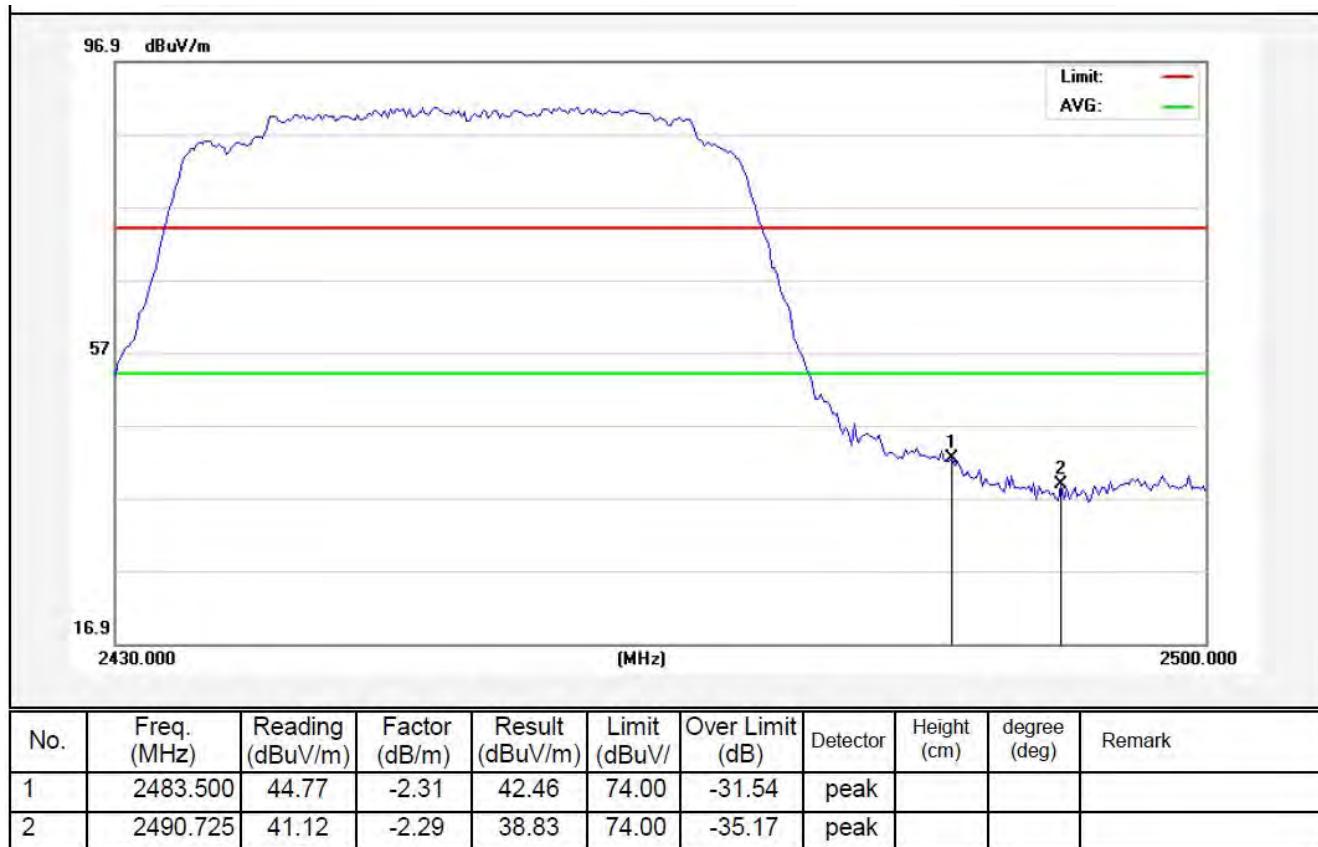


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	2483.500	44.40	-2.31	42.09	54.00	-11.91	AVG			
2	2487.925	43.32	-2.30	41.02	54.00	-12.98	AVG			

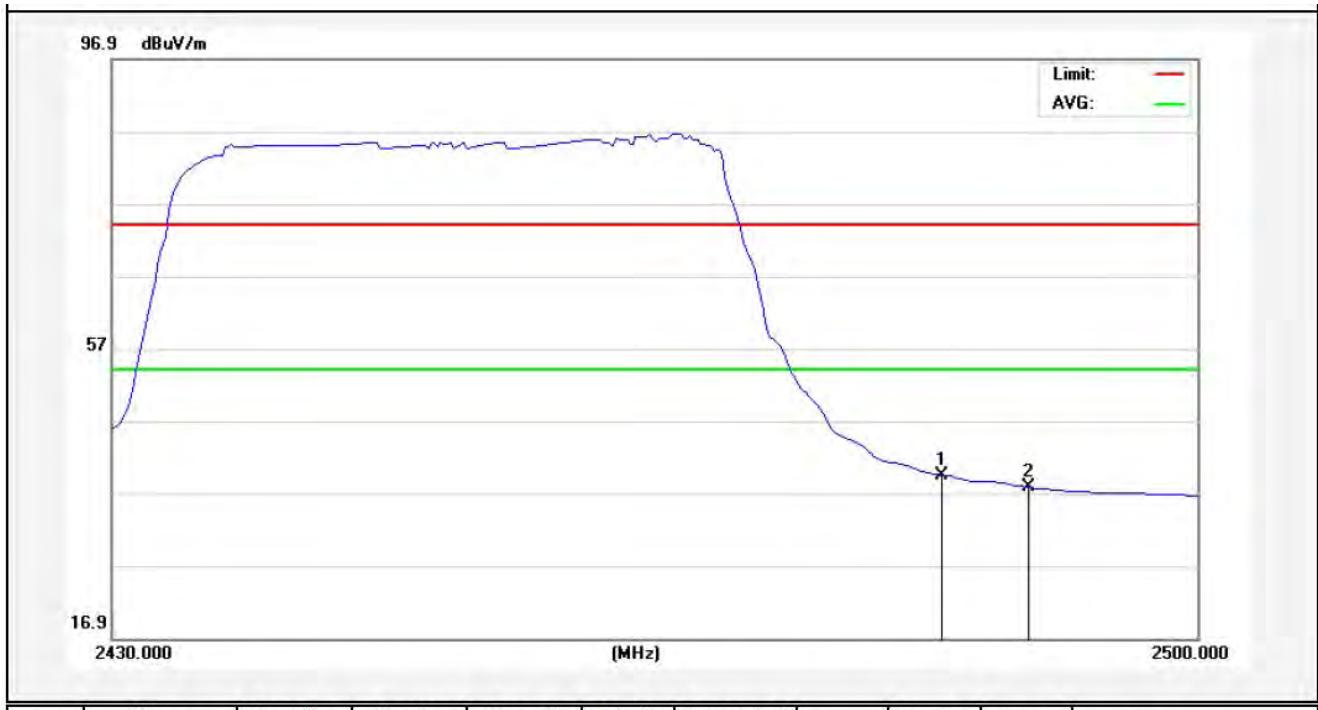
Test Mode: 802.11n (HT40)

2452MHz

Vertical-PEAK:



Vertical-AV:



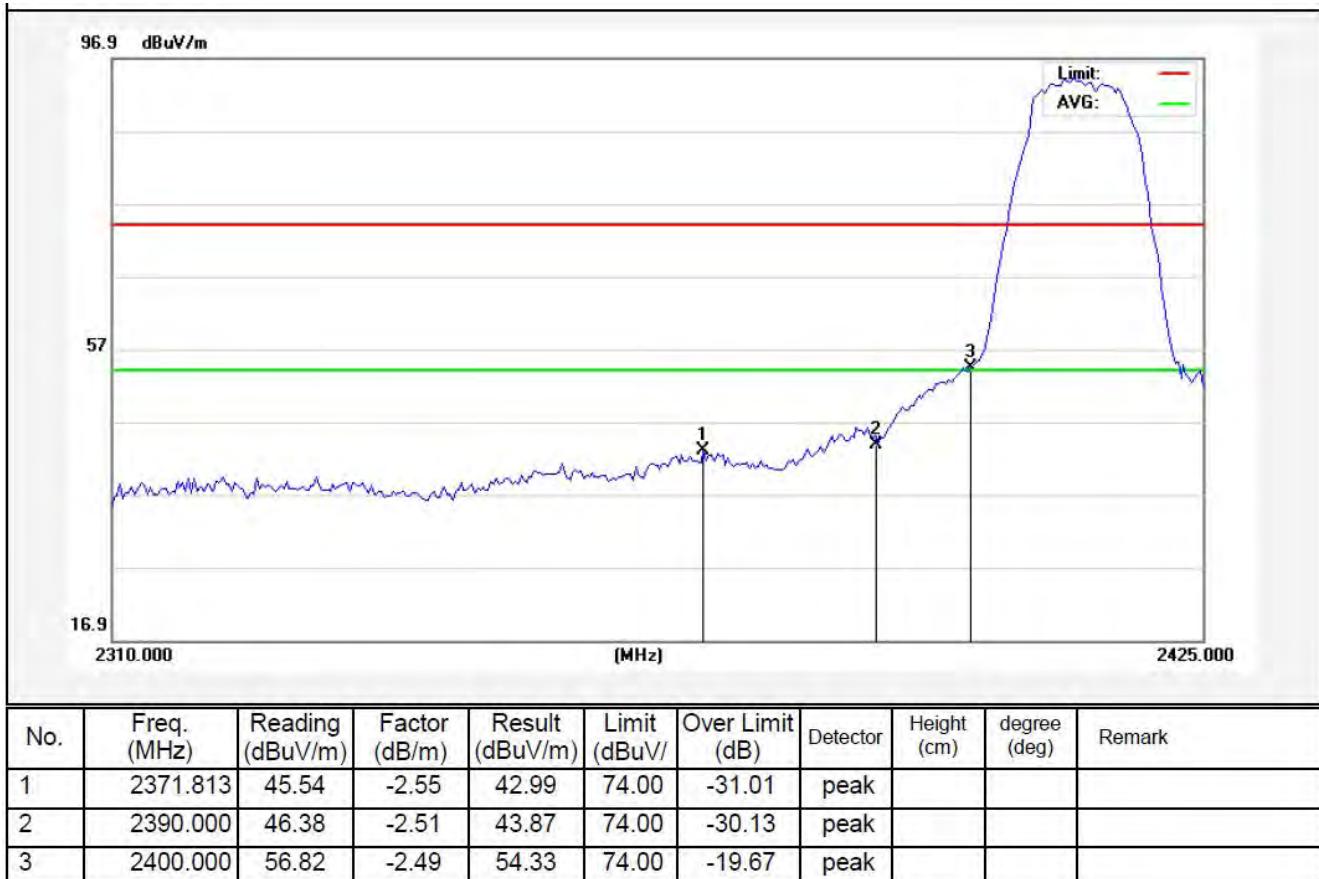
No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	2483.500	41.74	-2.31	39.43	54.00	-14.57	AVG			
2	2489.150	40.08	-2.29	37.79	54.00	-16.21	AVG			

ANT B

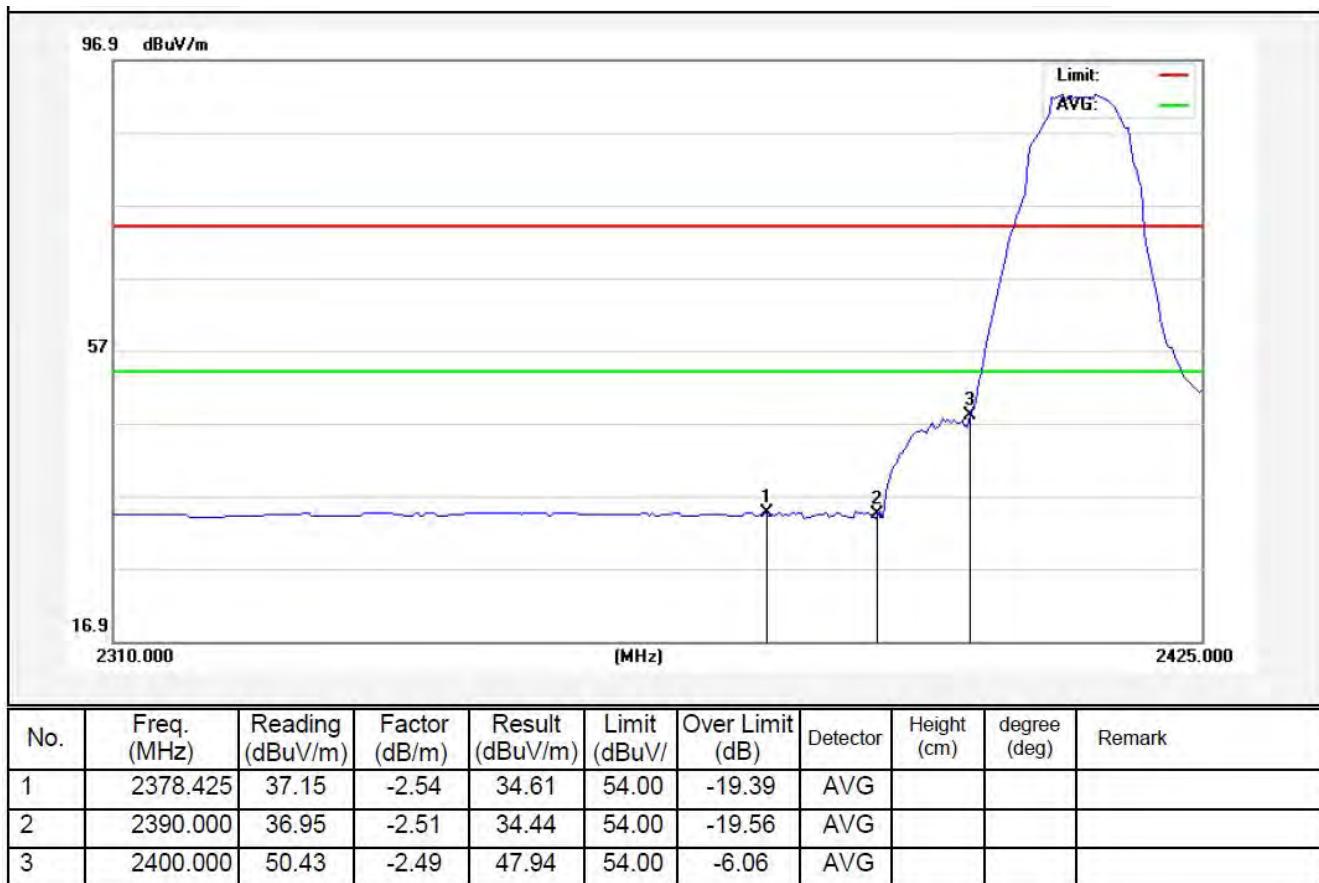
Test Mode: 802.11b

2412MHz

Horizontal-PEAK:



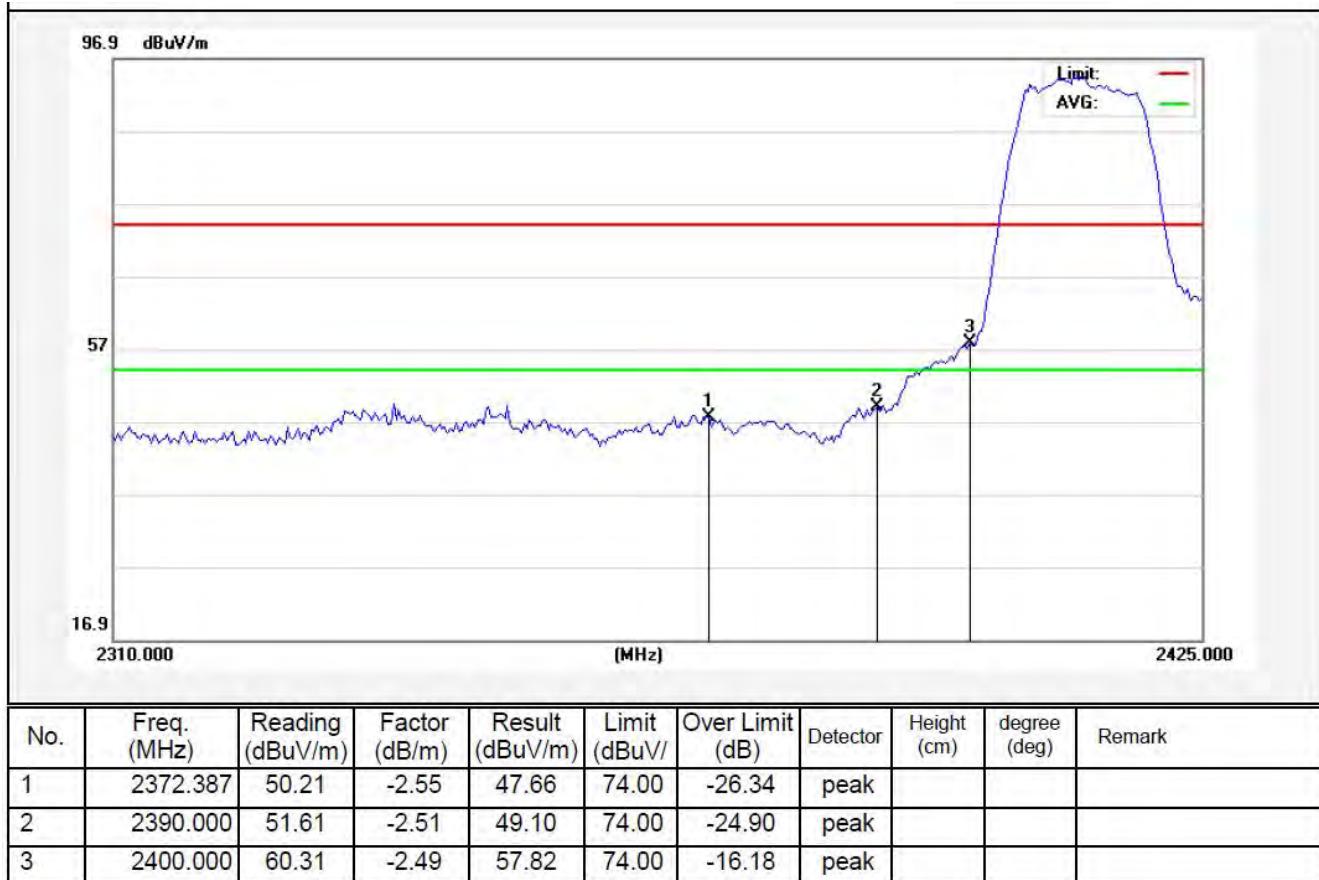
Horizontal-AV:



Test Mode: 802.11b

2412MHz

Vertical-PEAK:



No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	2372.387	50.21	-2.55	47.66	74.00	-26.34	peak			
2	2390.000	51.61	-2.51	49.10	74.00	-24.90	peak			
3	2400.000	60.31	-2.49	57.82	74.00	-16.18	peak			

Vertical-AV:

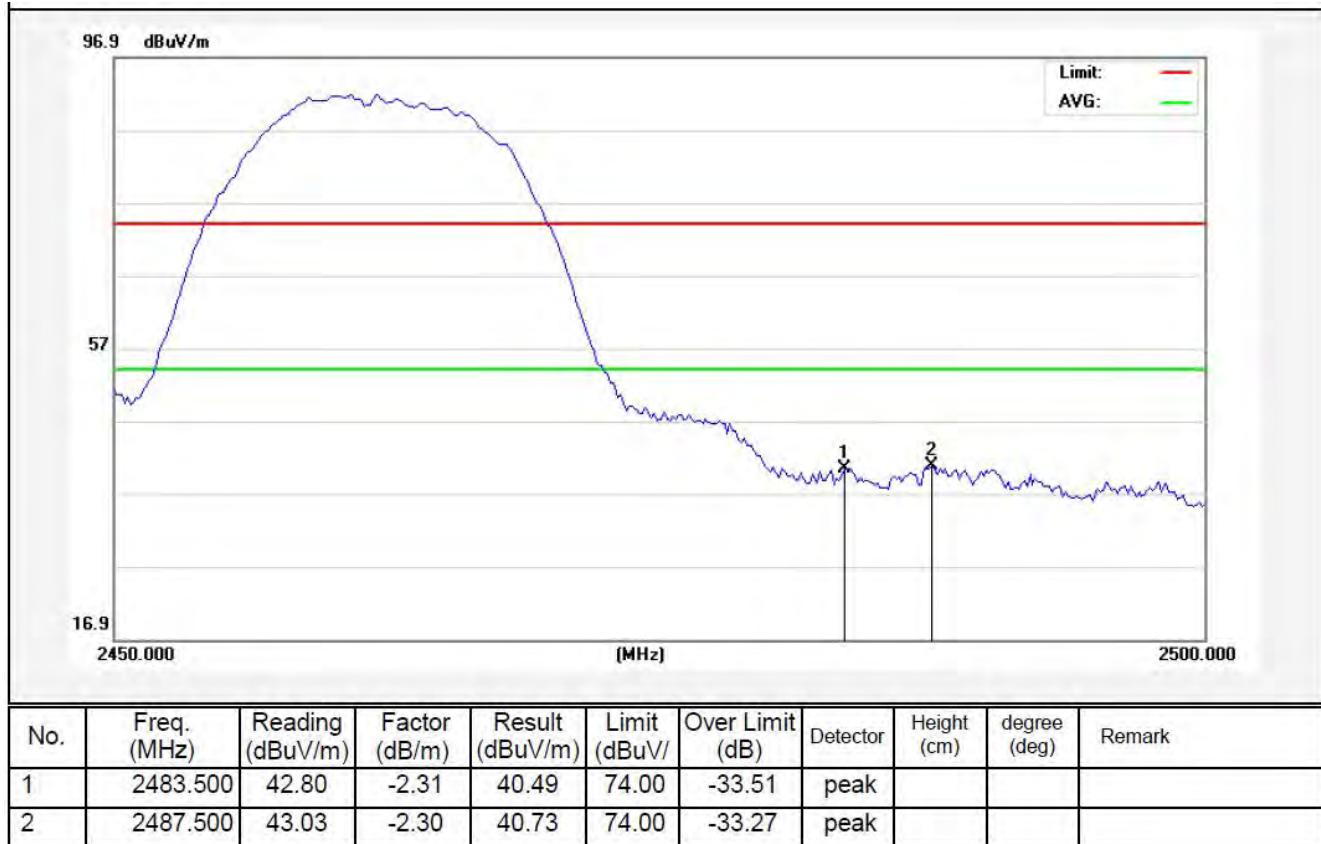


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	2381.012	39.15	-2.53	36.62	54.00	-17.38	AVG			
2	2390.000	43.14	-2.51	40.63	54.00	-13.37	AVG			
3	2400.000	50.96	-2.49	48.47	54.00	-5.53	AVG			

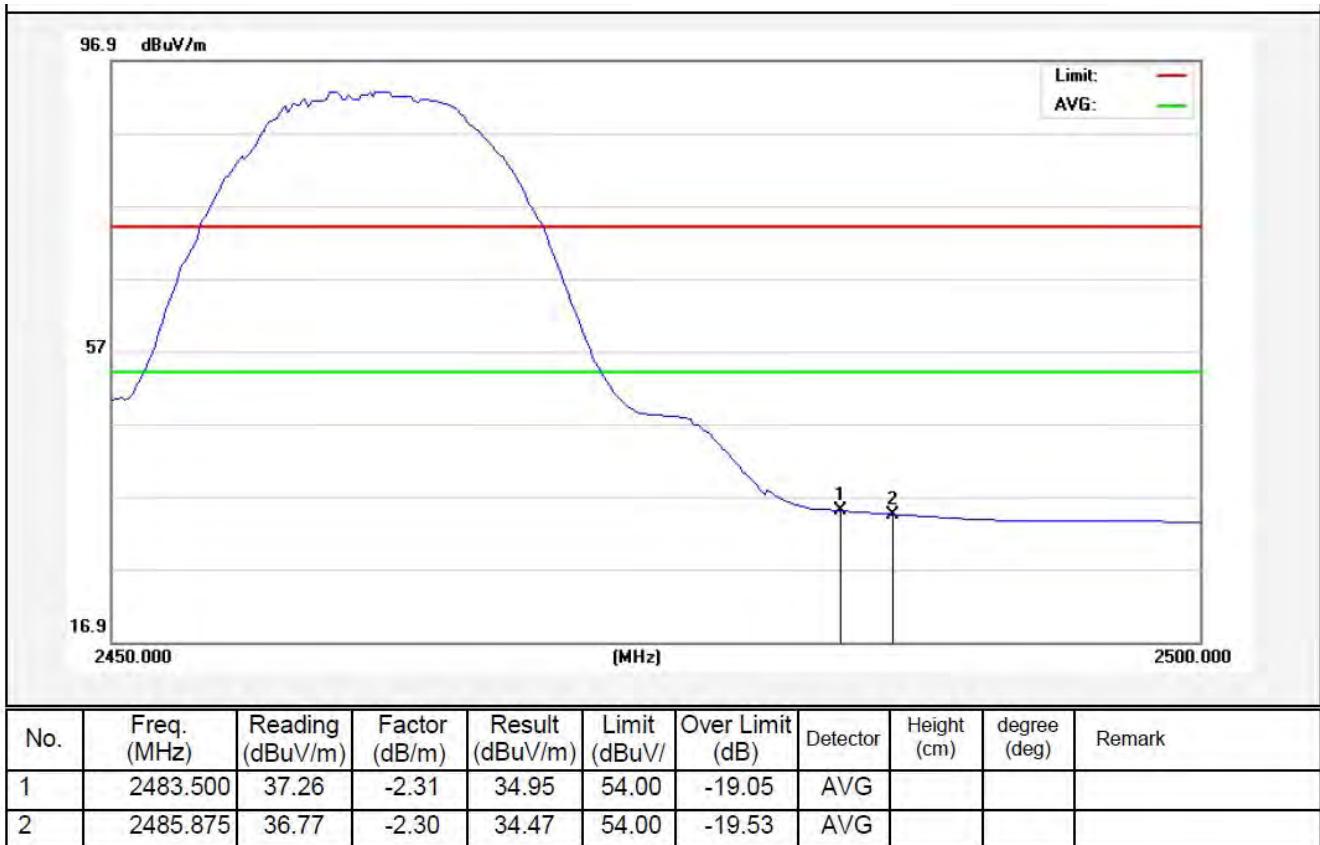
Test Mode: 802.11b

2462MHz

Horizontal-PEAK:



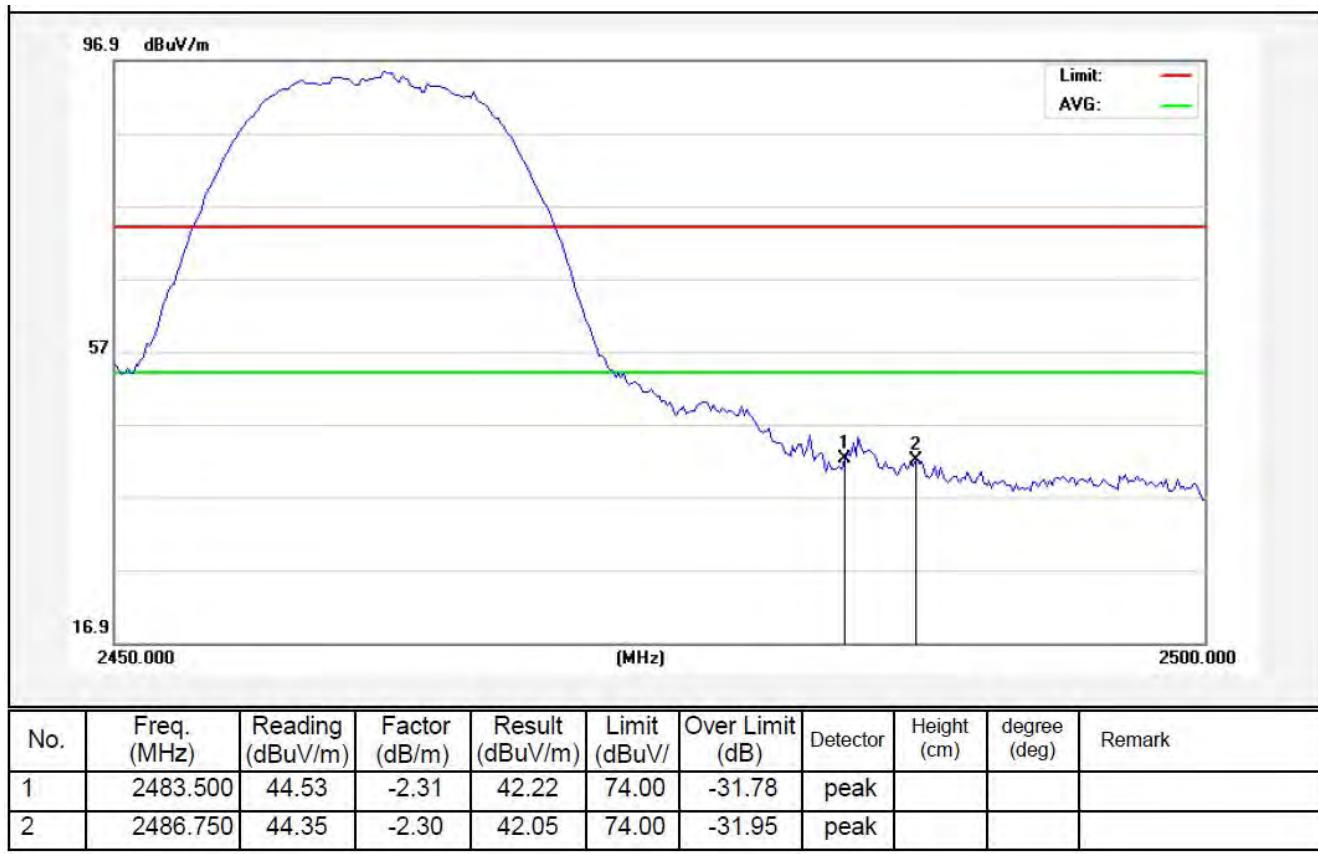
Horizontal-AV:



Test Mode: 802.11b

2462MHz

Vertical-PEAK:



Vertical-AV:

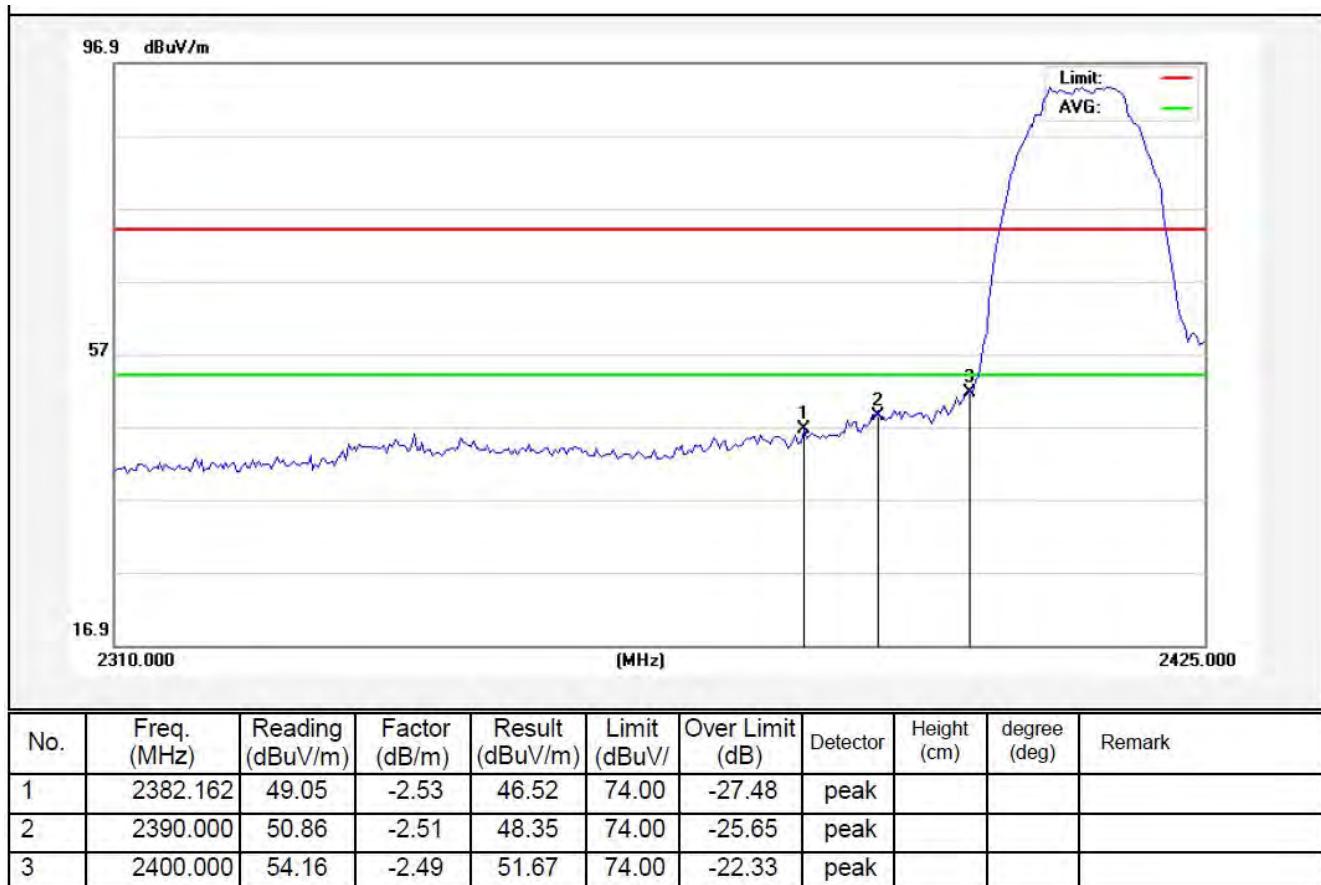


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	2483.500	36.58	-2.31	34.27	54.00	-19.73	AVG			
2	2487.125	36.39	-2.30	34.09	54.00	-19.91	AVG			

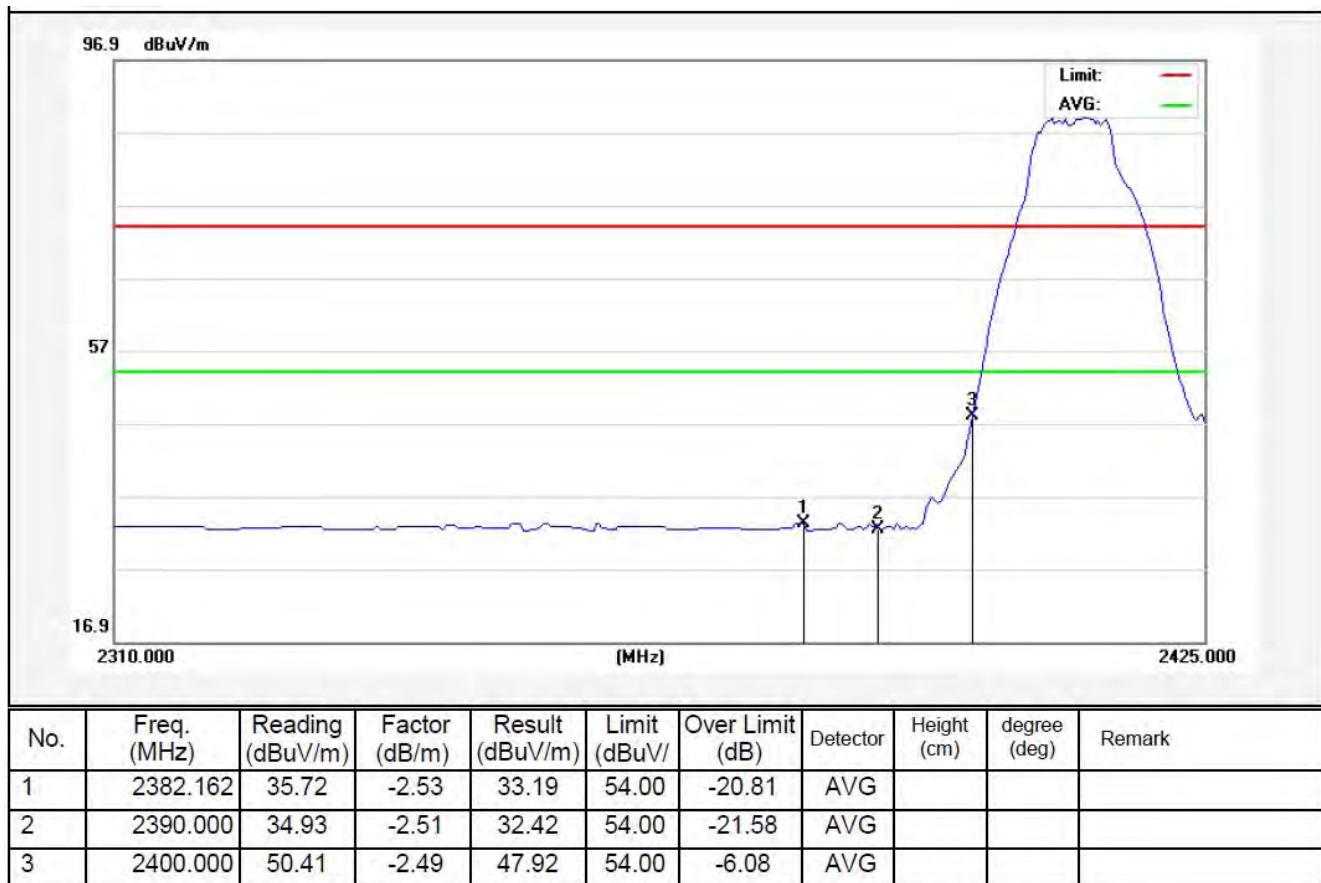
Test Mode: 802.11g

2412MHz

Horizontal-PEAK:



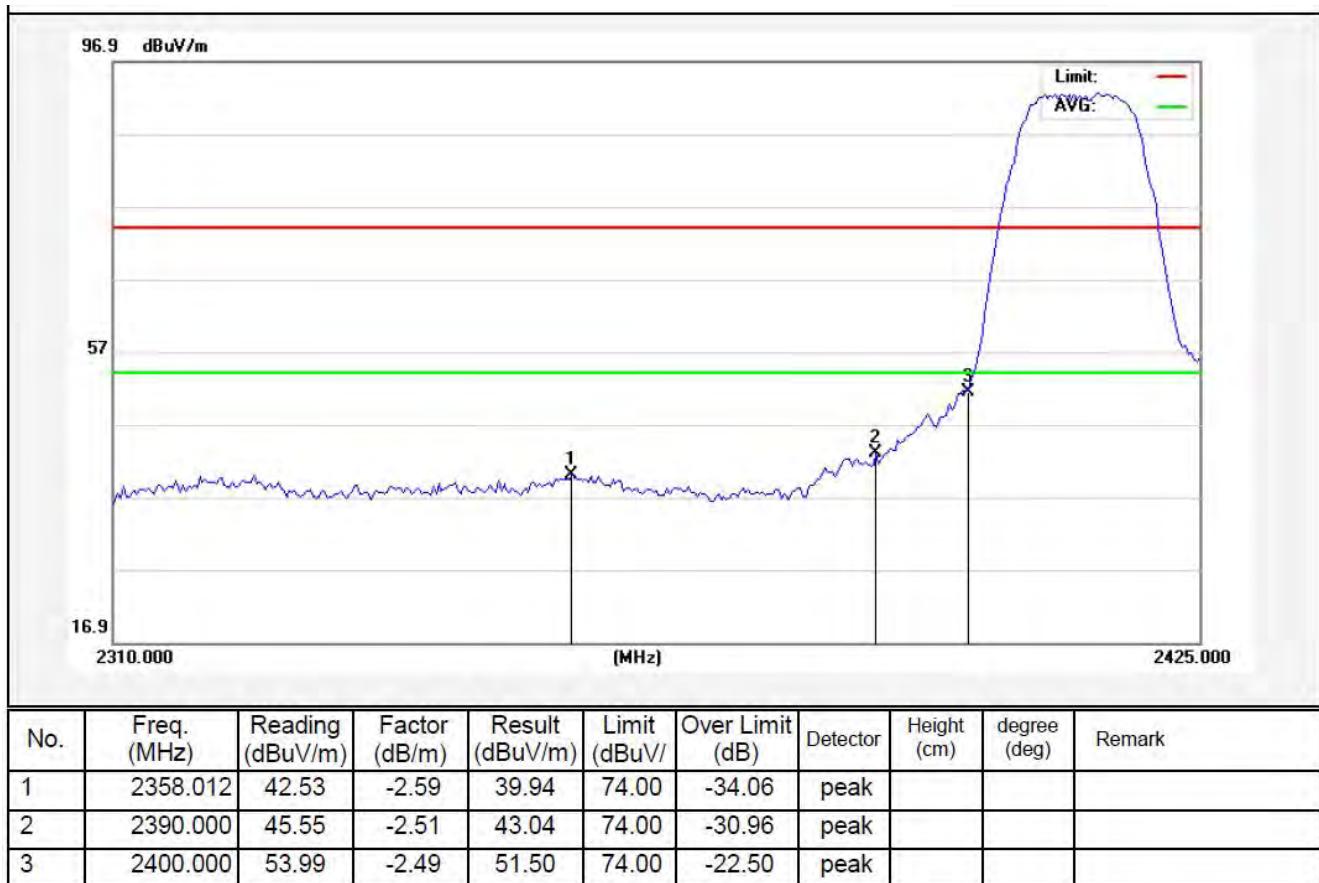
Horizontal-AV:



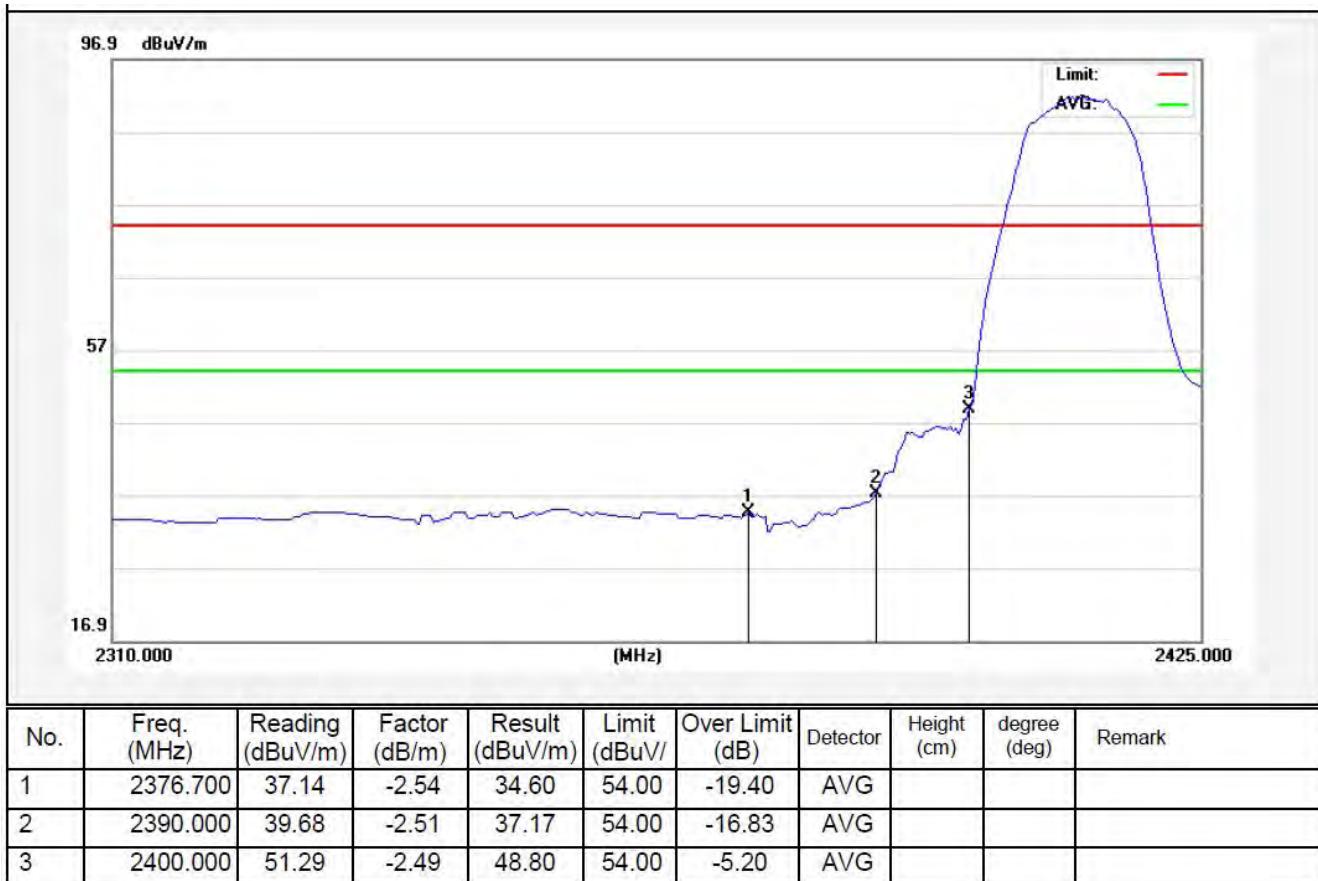
Test Mode: 802.11g

2412MHz

Vertical-PEAK:



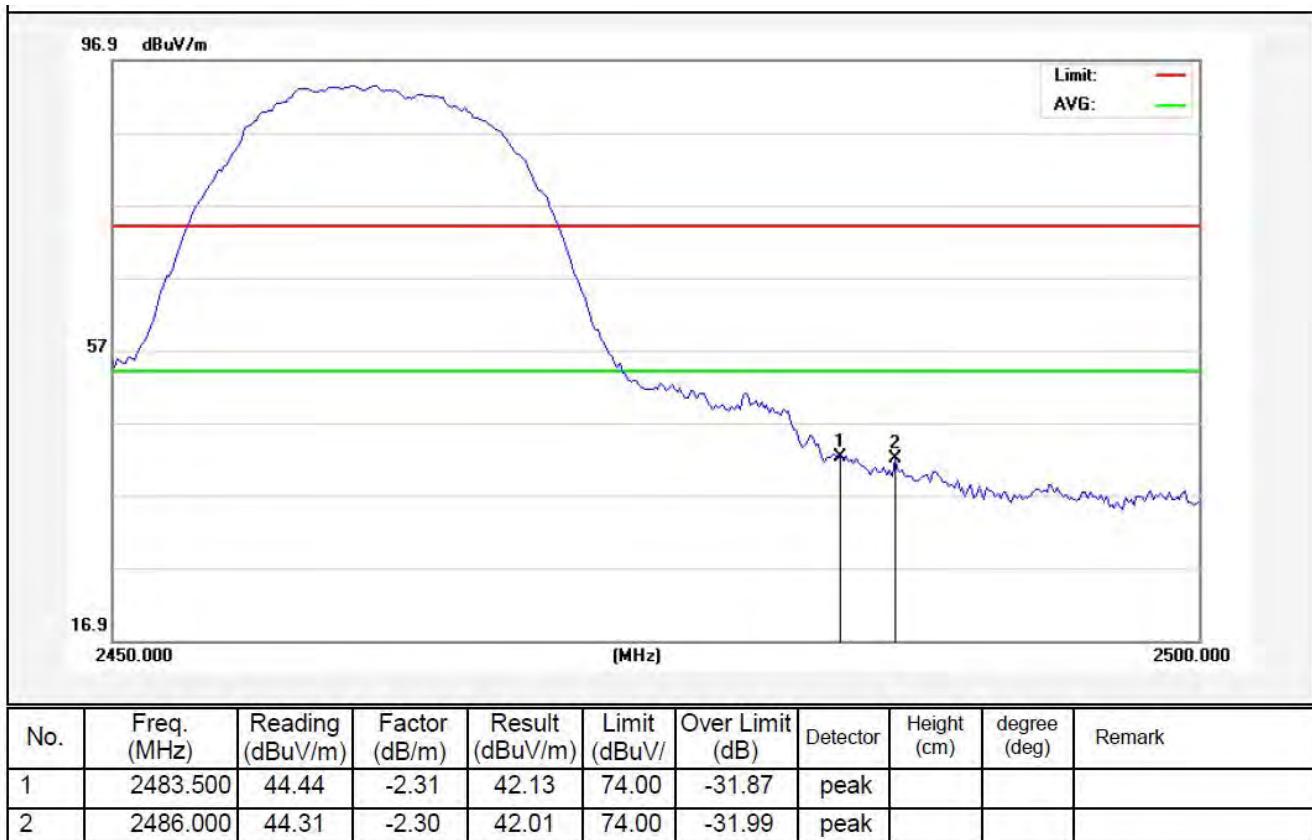
Vertical-AV:



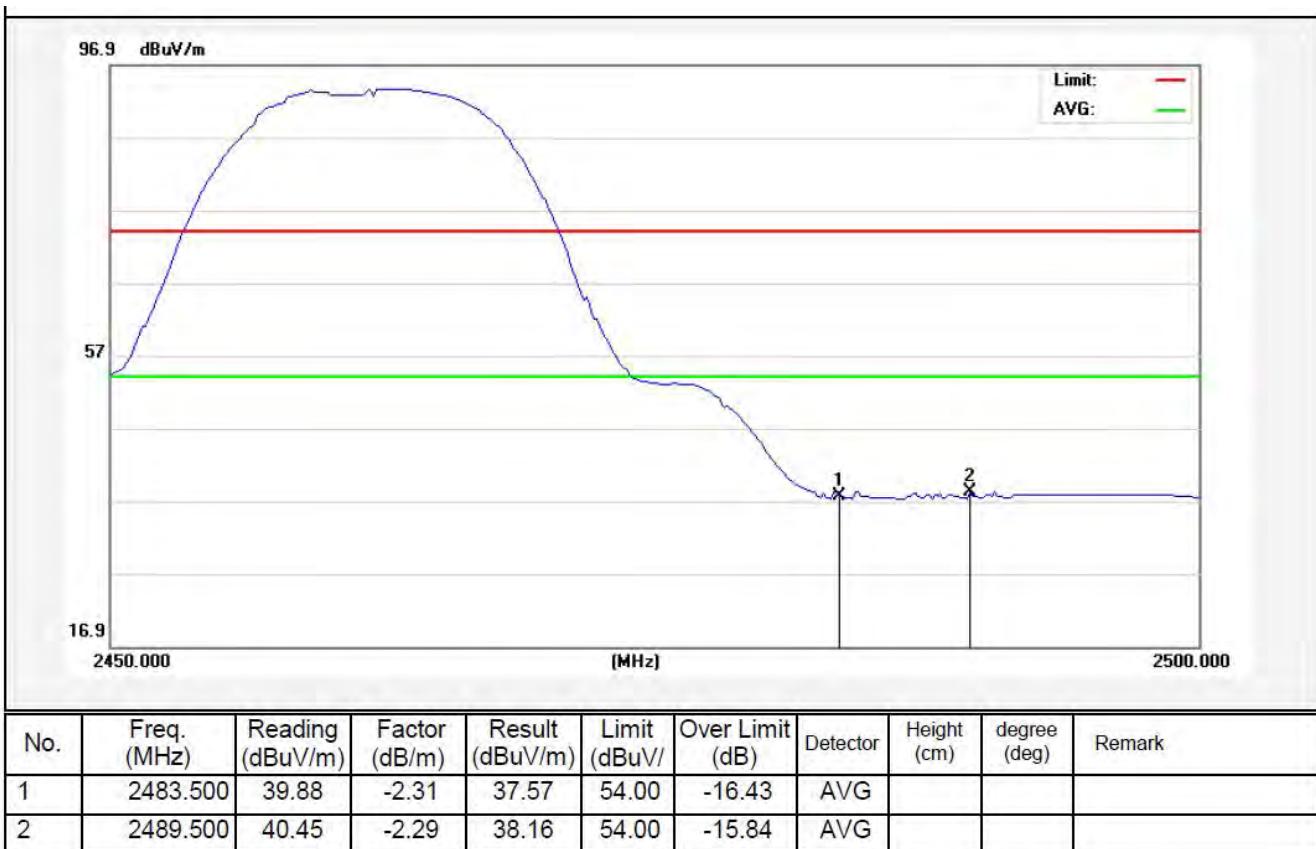
Test Mode: 802.11g

2462MHz

Horizontal-PEAK:



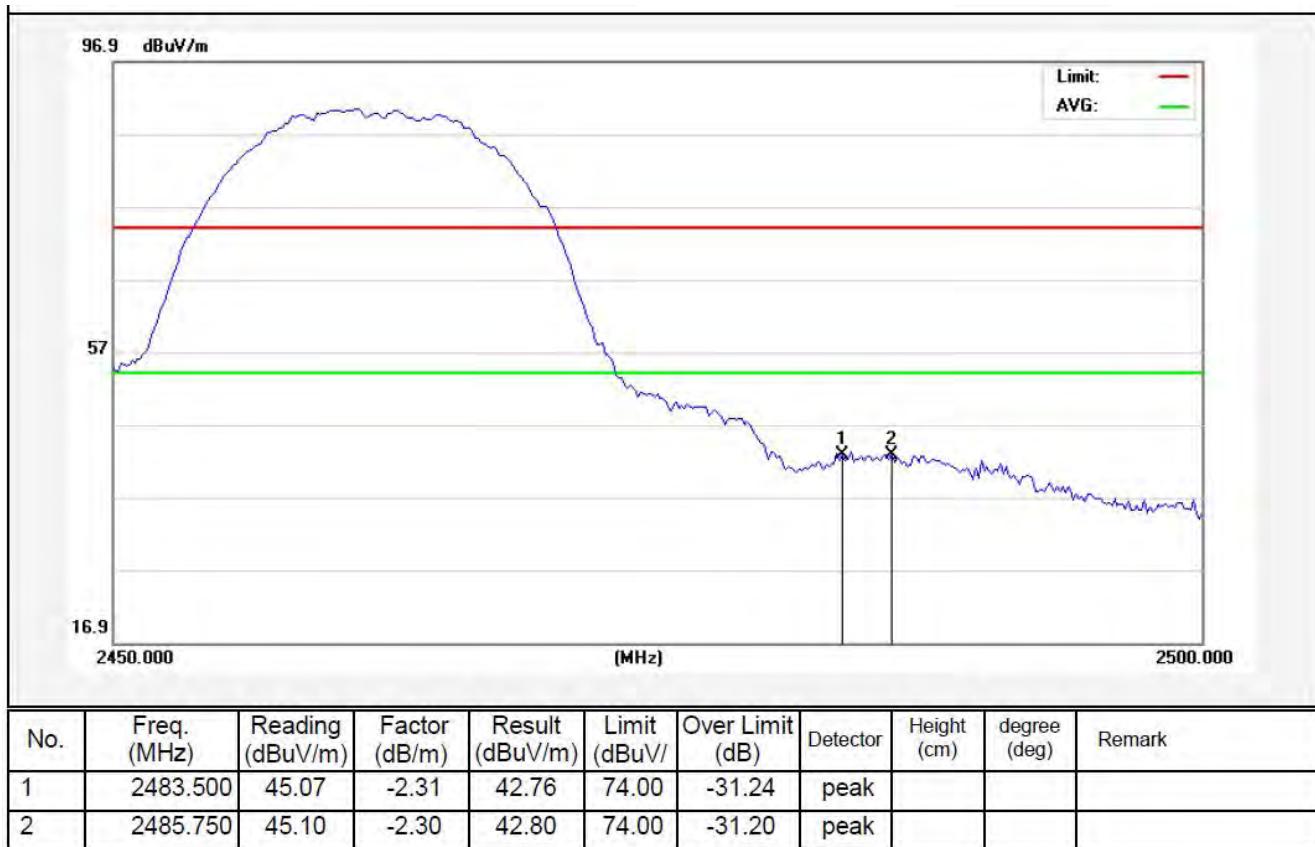
Horizontal-AV:



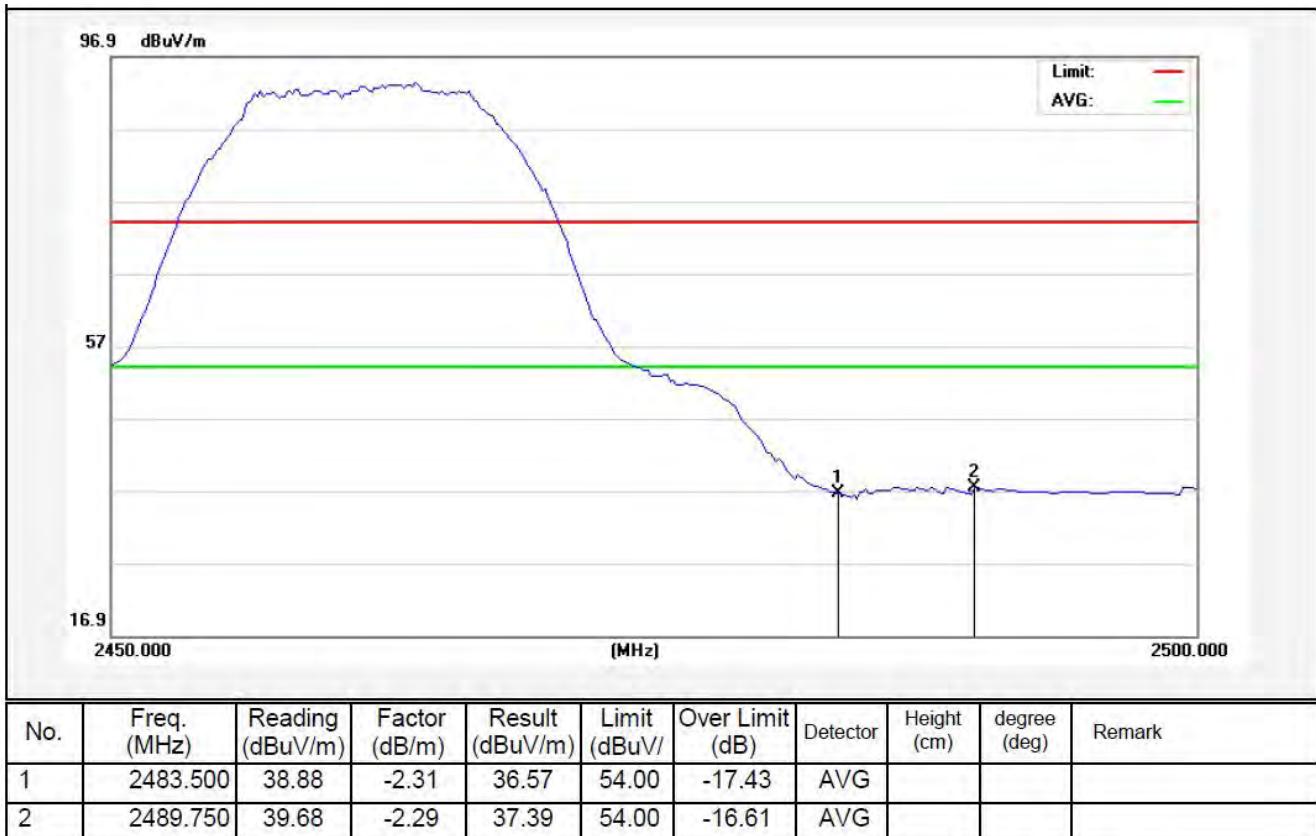
Test Mode: 802.11g

2462MHz

Vertical-PEAK:



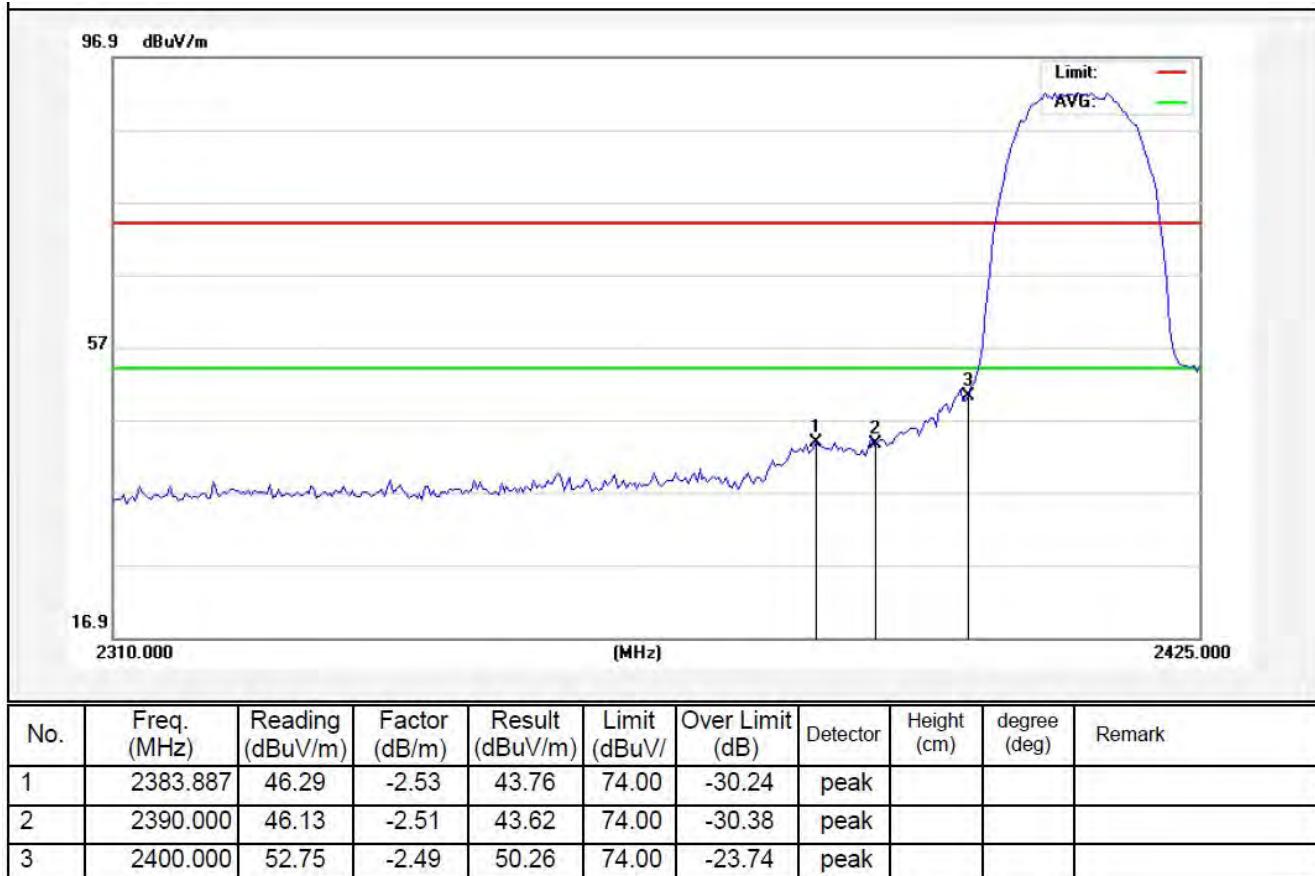
Vertical-AV:



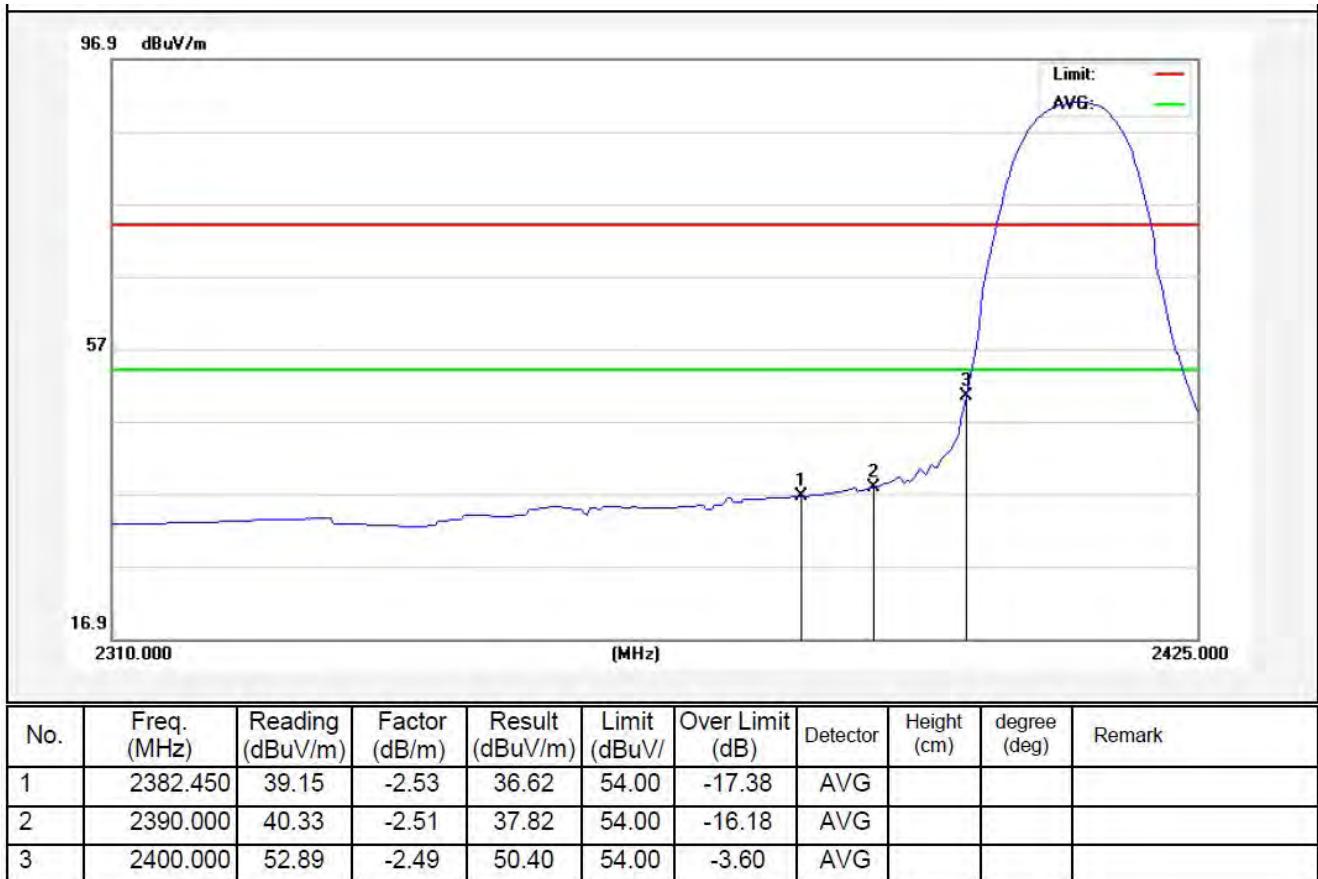
Test Mode: 802.11n (HT20)

2412MHz

Horizontal-PEAK:



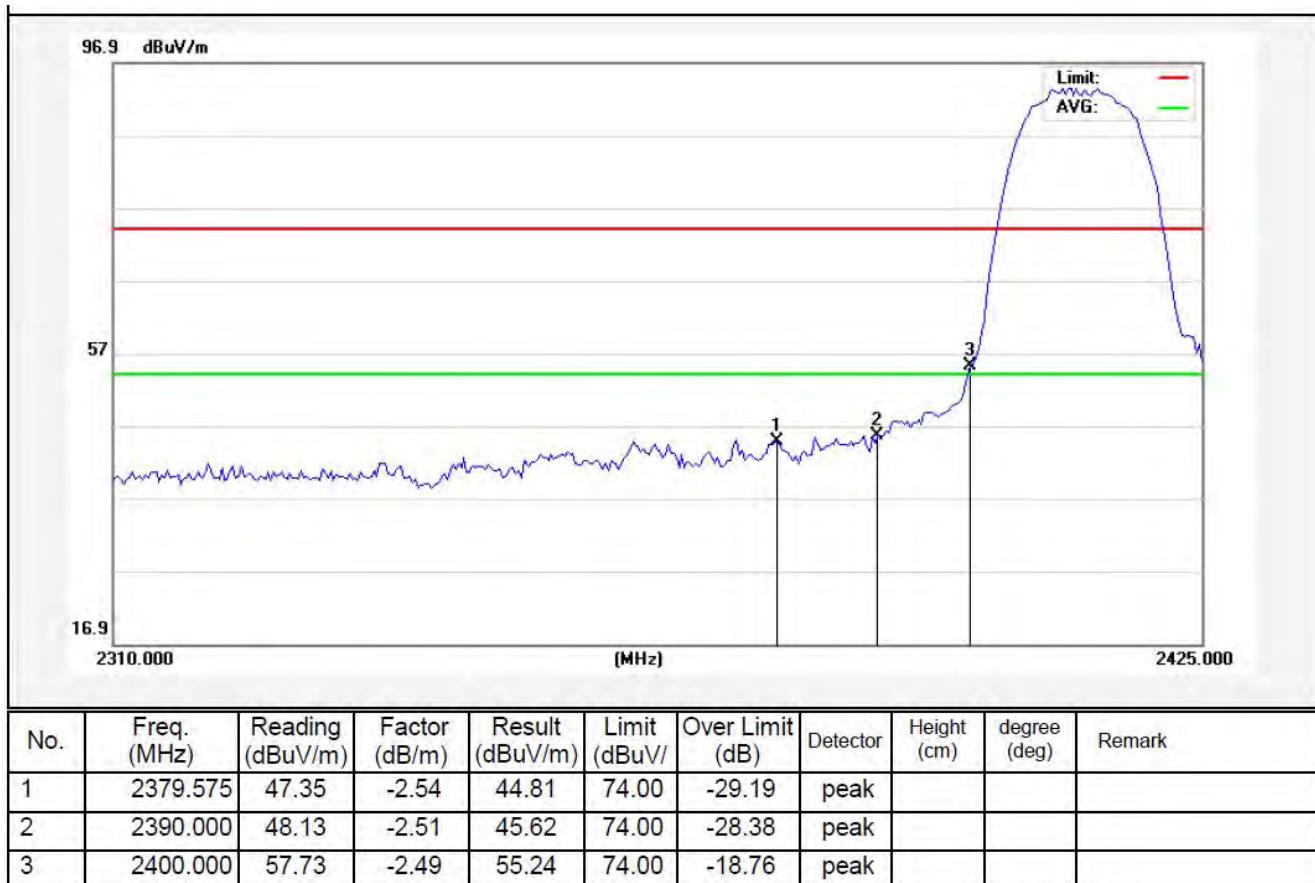
Horizontal-AV:



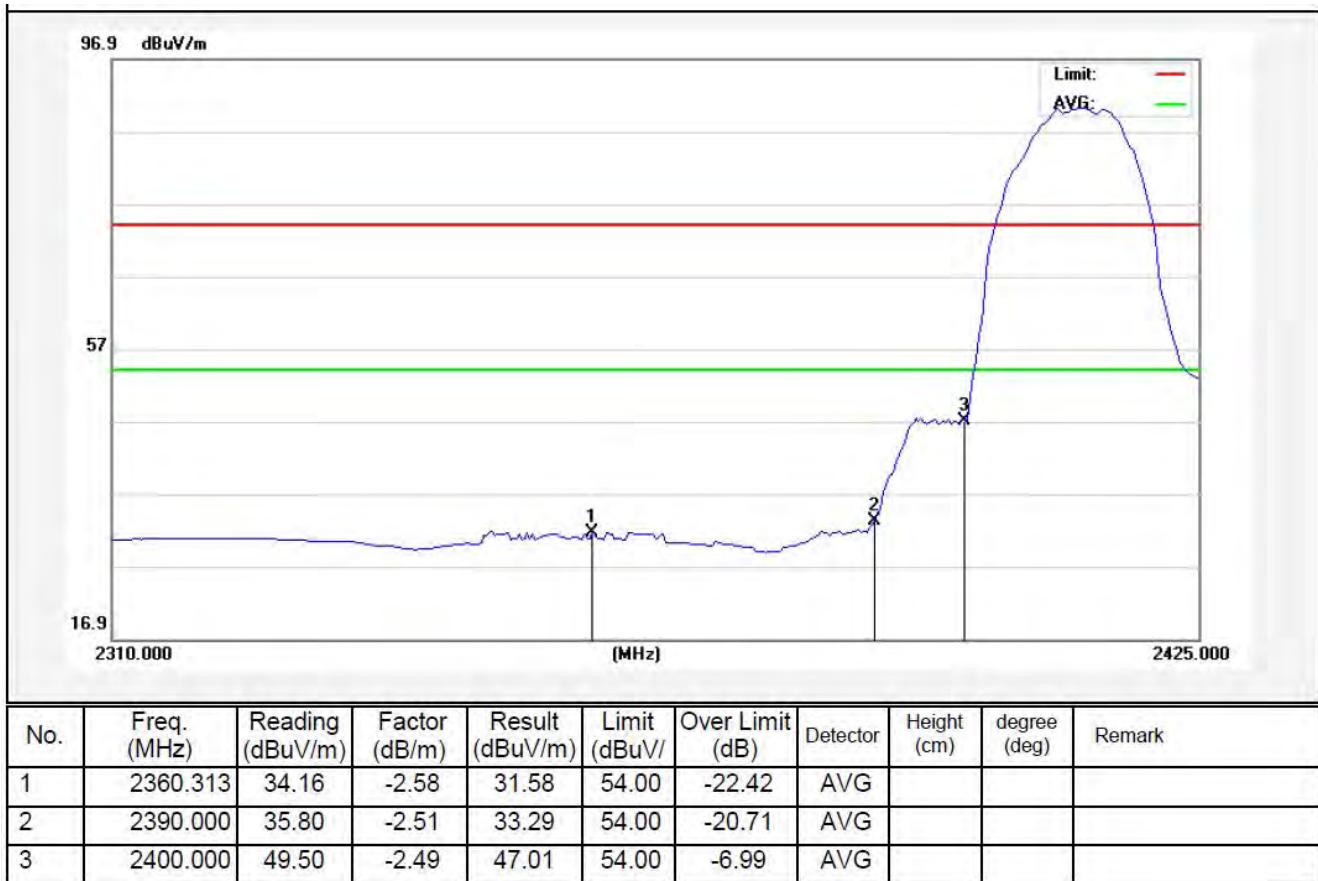
Test Mode: 802.11n (HT20)

2412MHz

Vertical-PEAK:



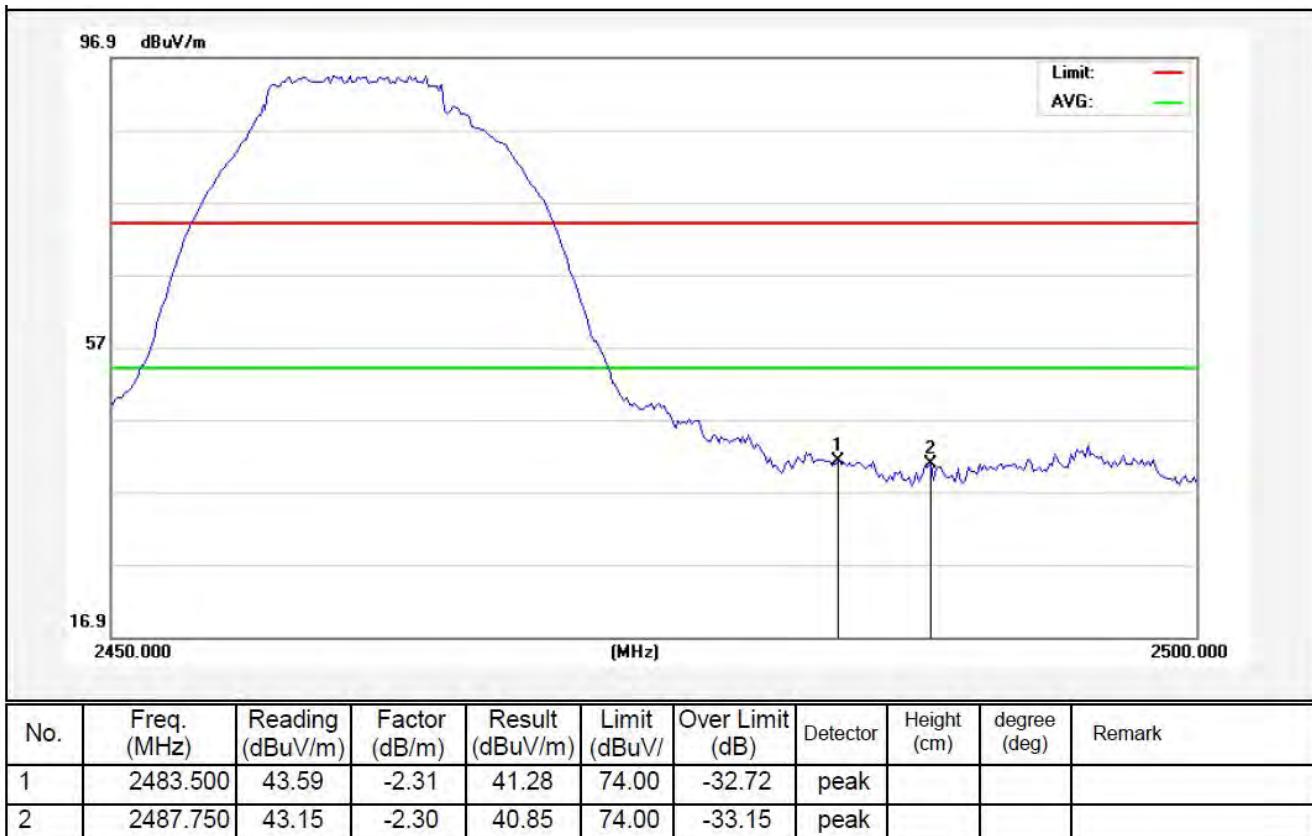
Vertical-AV:



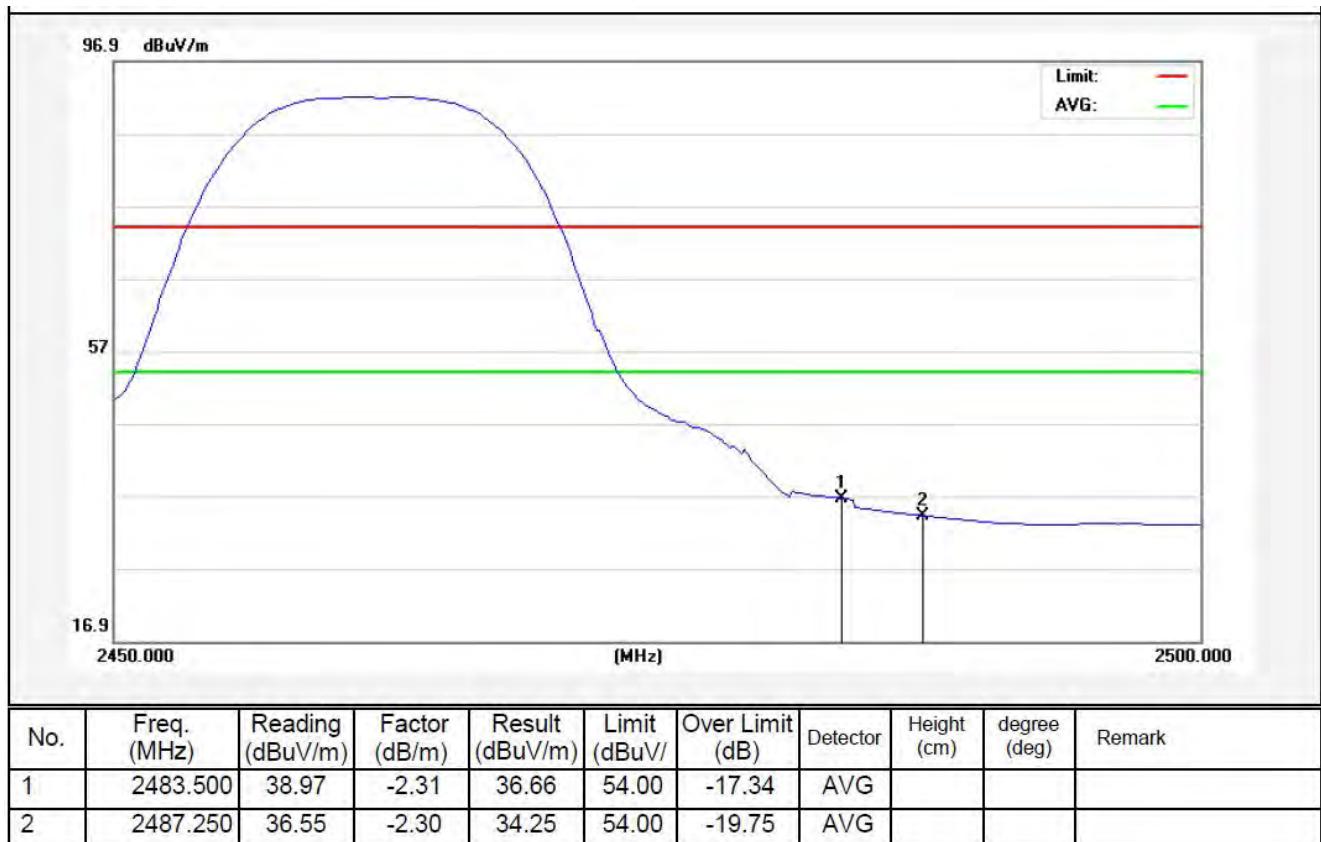
Test Mode: 802.11n (HT20)

2462MHz

Horizontal-PEAK:



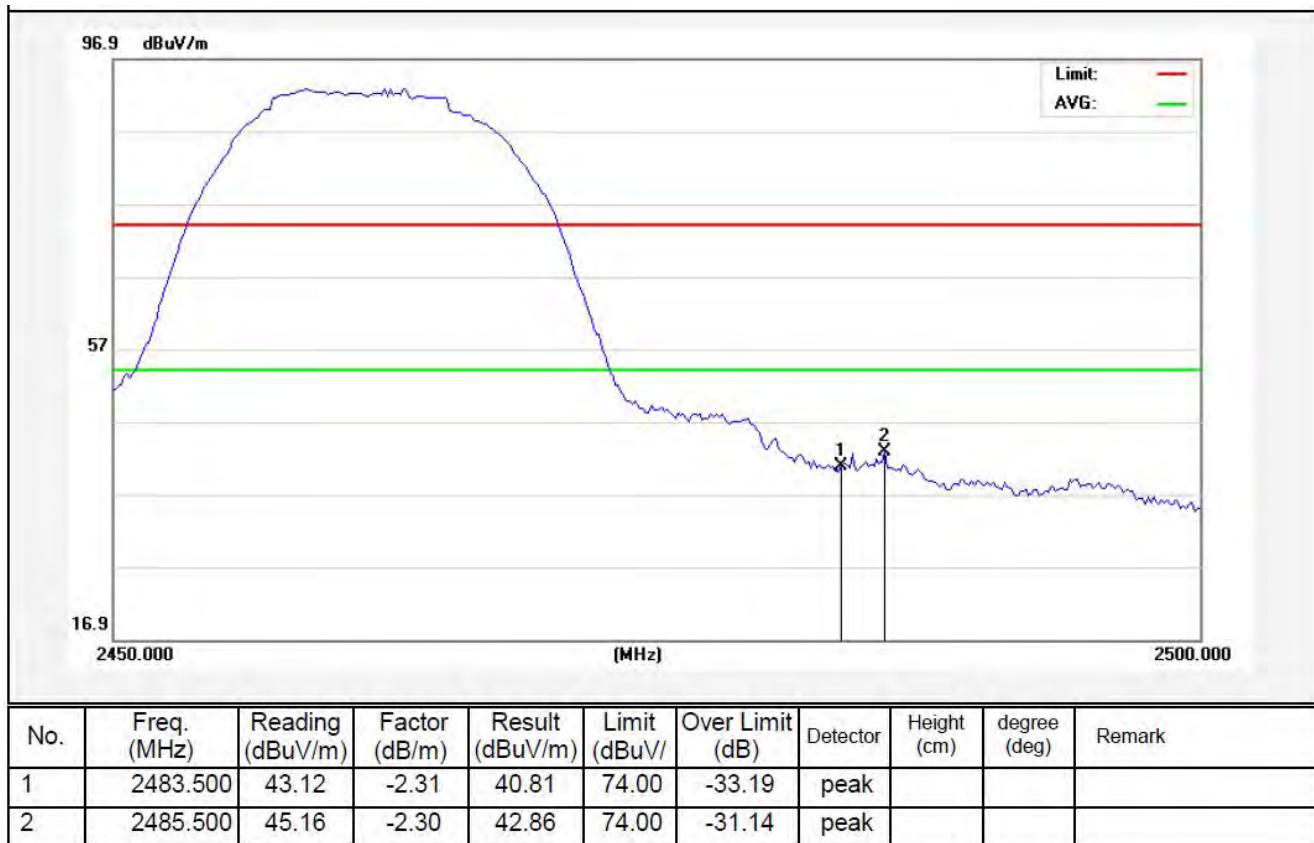
Horizontal-AV:



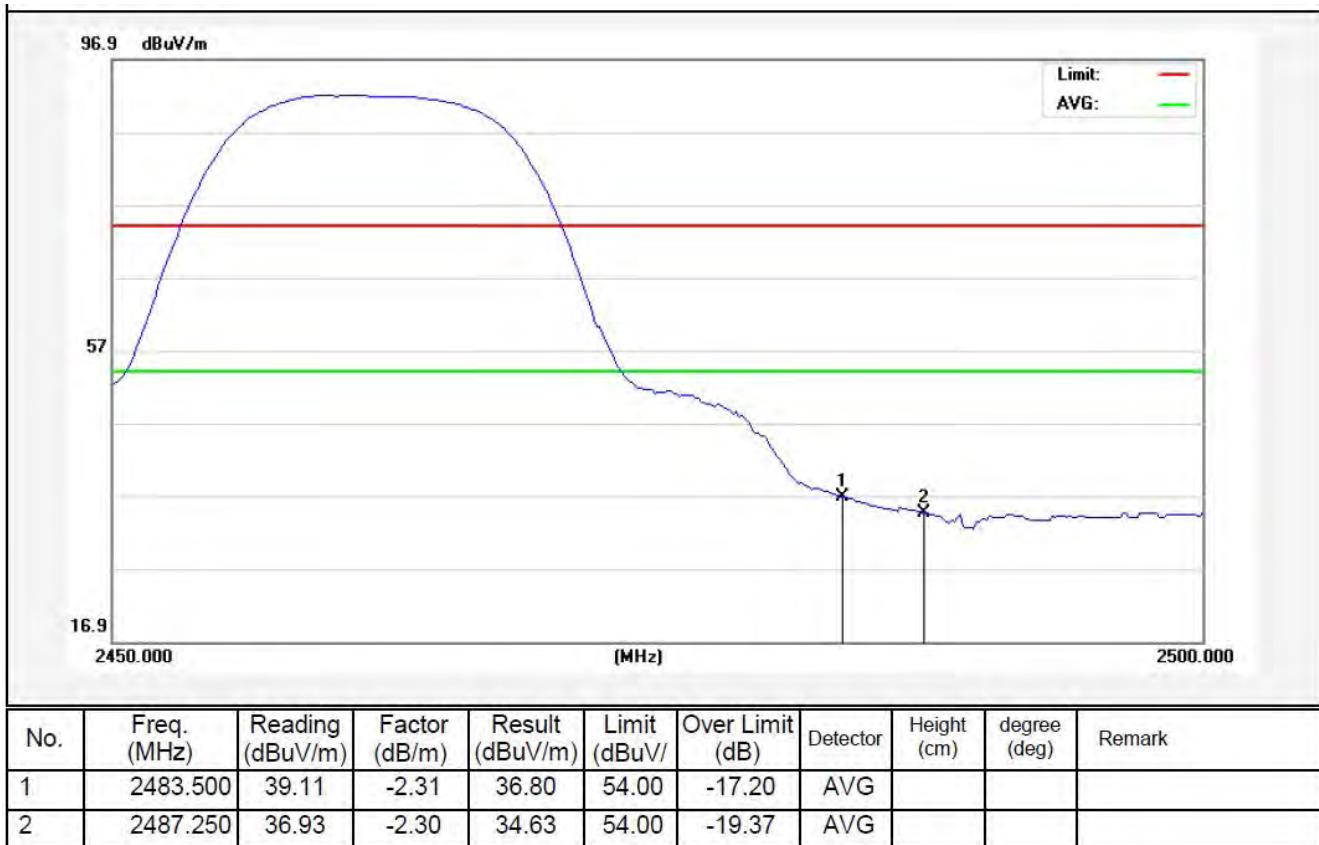
Test Mode: 802.11n (HT20)

2462MHz

Vertical-PEAK:



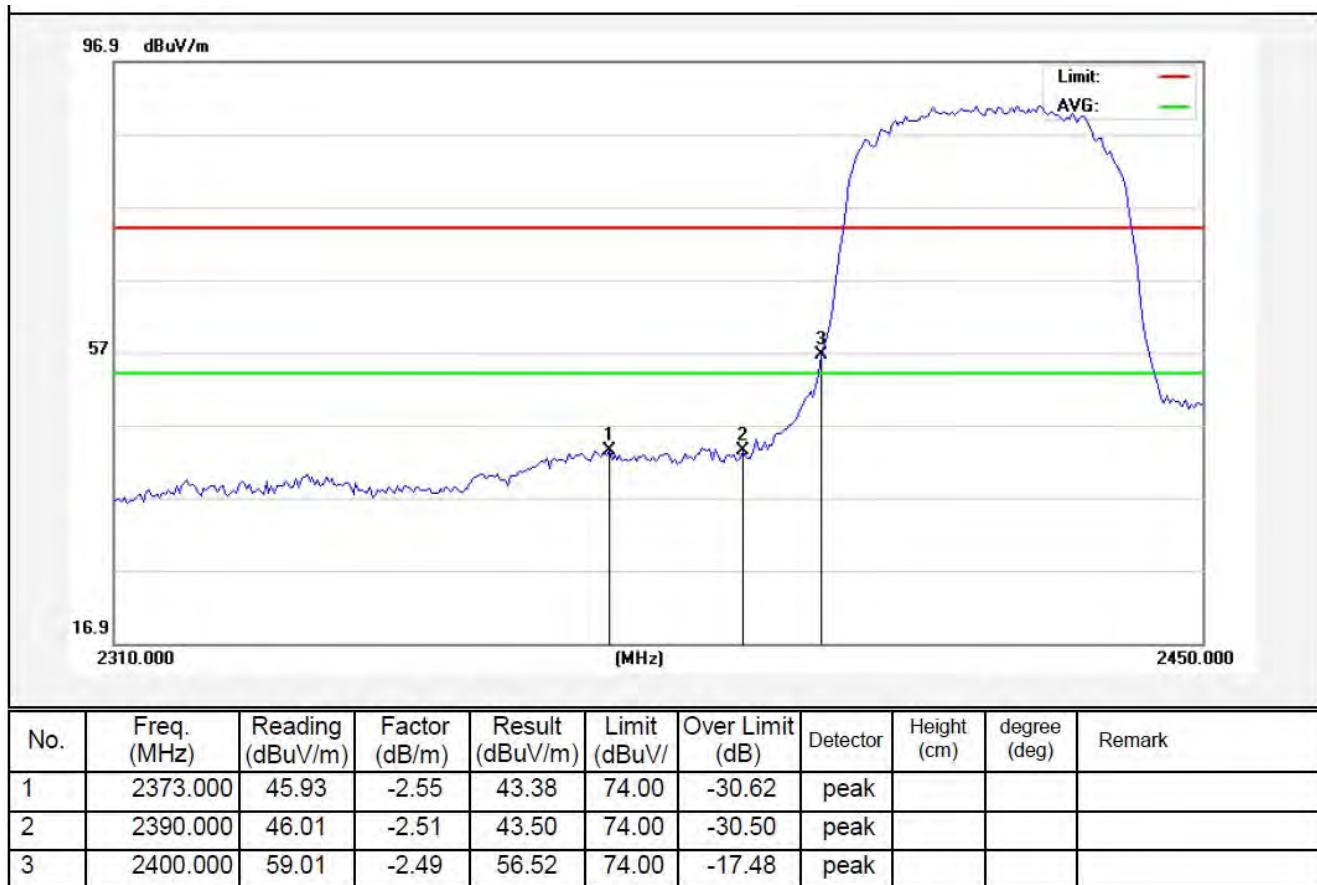
Vertical-AV:



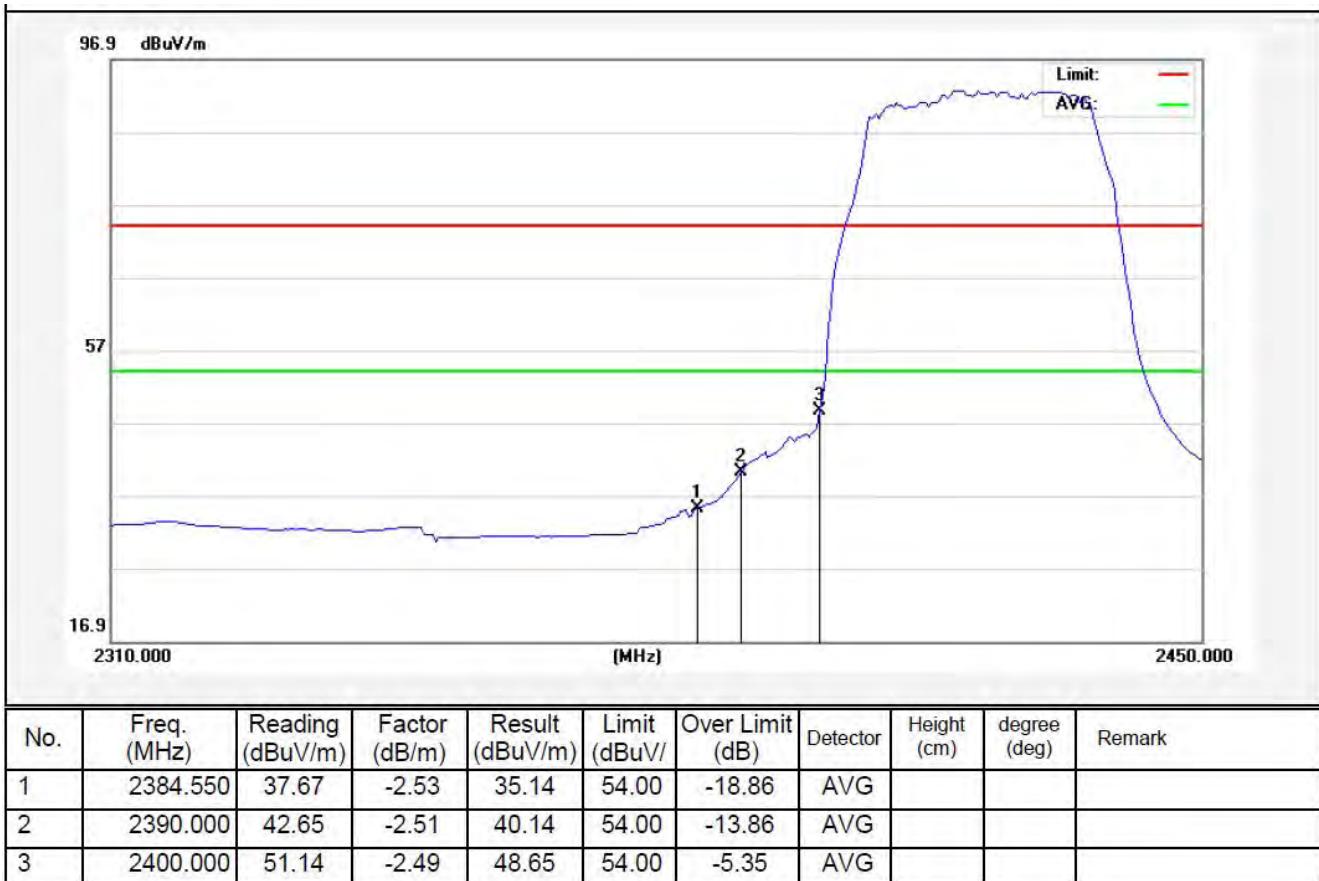
Test Mode: 802.11n (HT40)

2422MHz

Horizontal-PEAK:



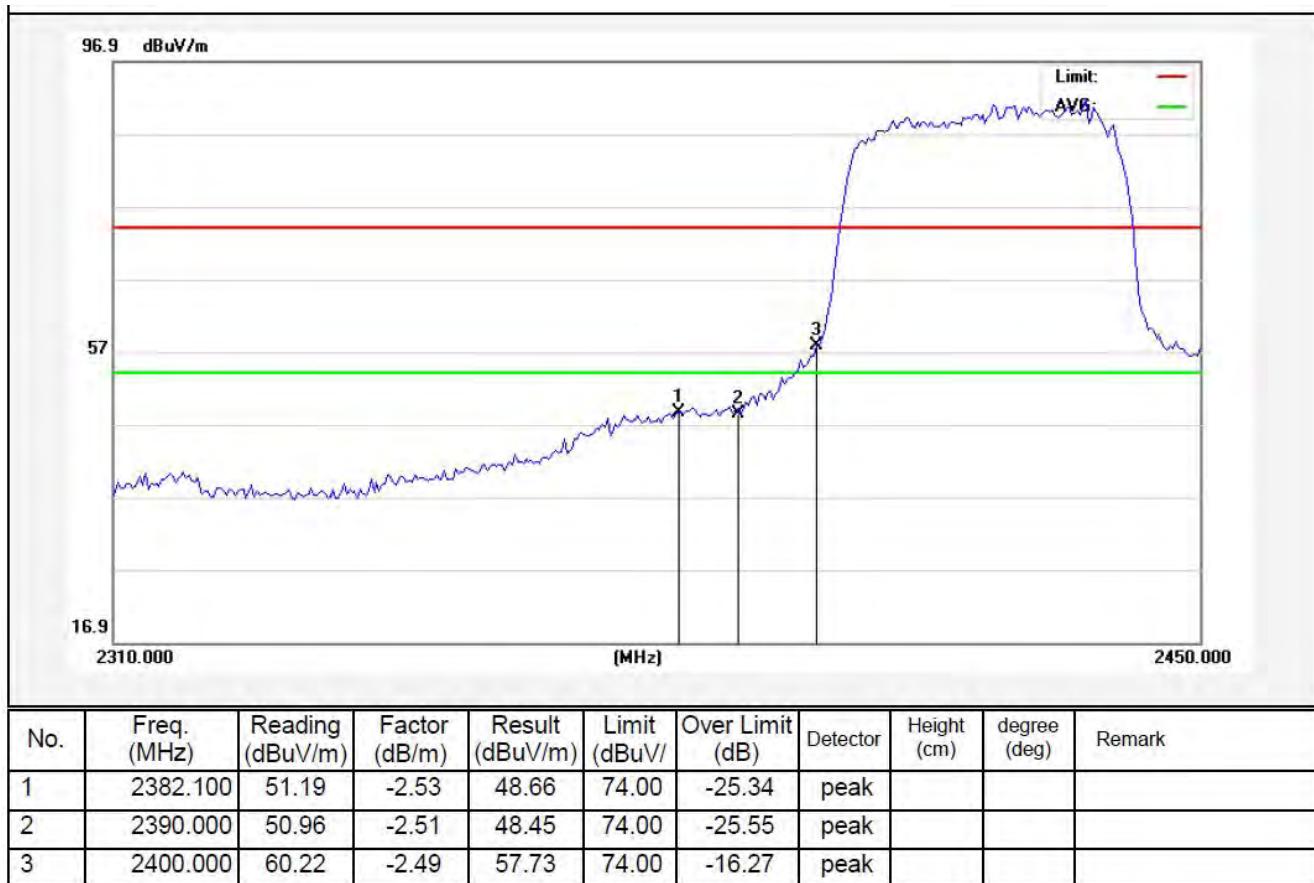
Horizontal-AV:



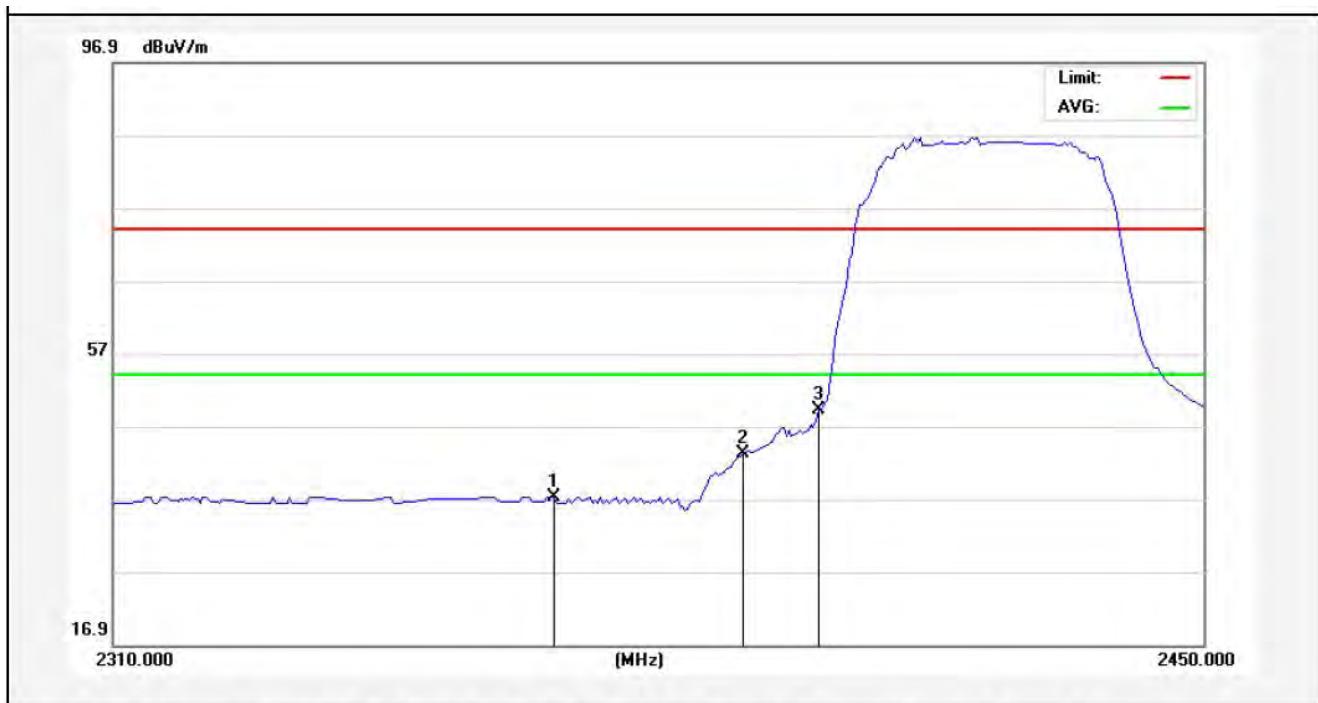
Test Mode: 802.11n (HT40)

2422MHz

Vertical-PEAK:



Vertical-AV:

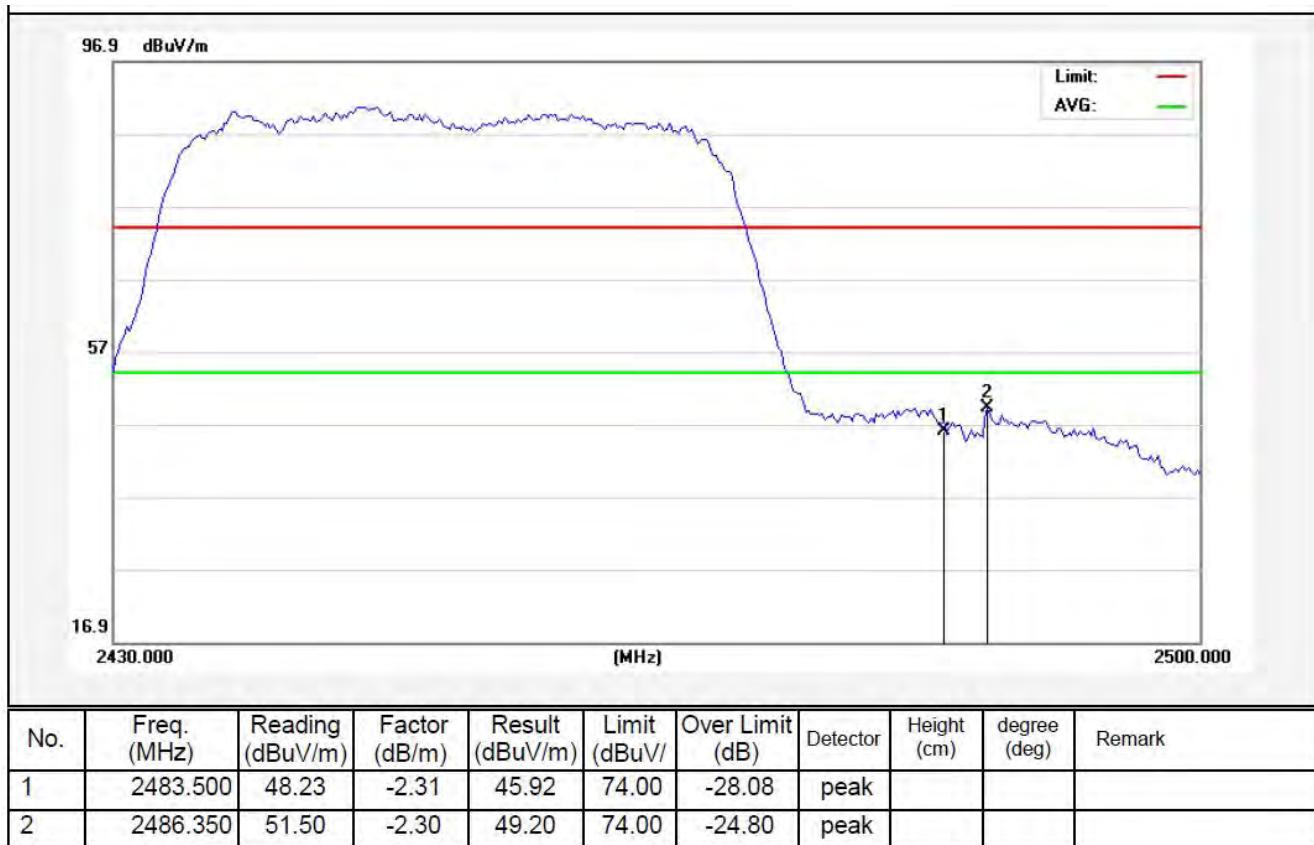


No.	Freq. (MHz)	Reading (dBuV/m)	Factor (dB/m)	Result (dBuV/m)	Limit (dBuV/m)	Over Limit (dB)	Detector	Height (cm)	degree (deg)	Remark
1	2366.000	39.87	-2.57	37.30	54.00	-16.70	Avg			
2	2390.000	45.64	-2.51	43.13	54.00	-10.87	Avg			
3	2400.000	51.66	-2.49	49.17	54.00	-4.83	Avg			

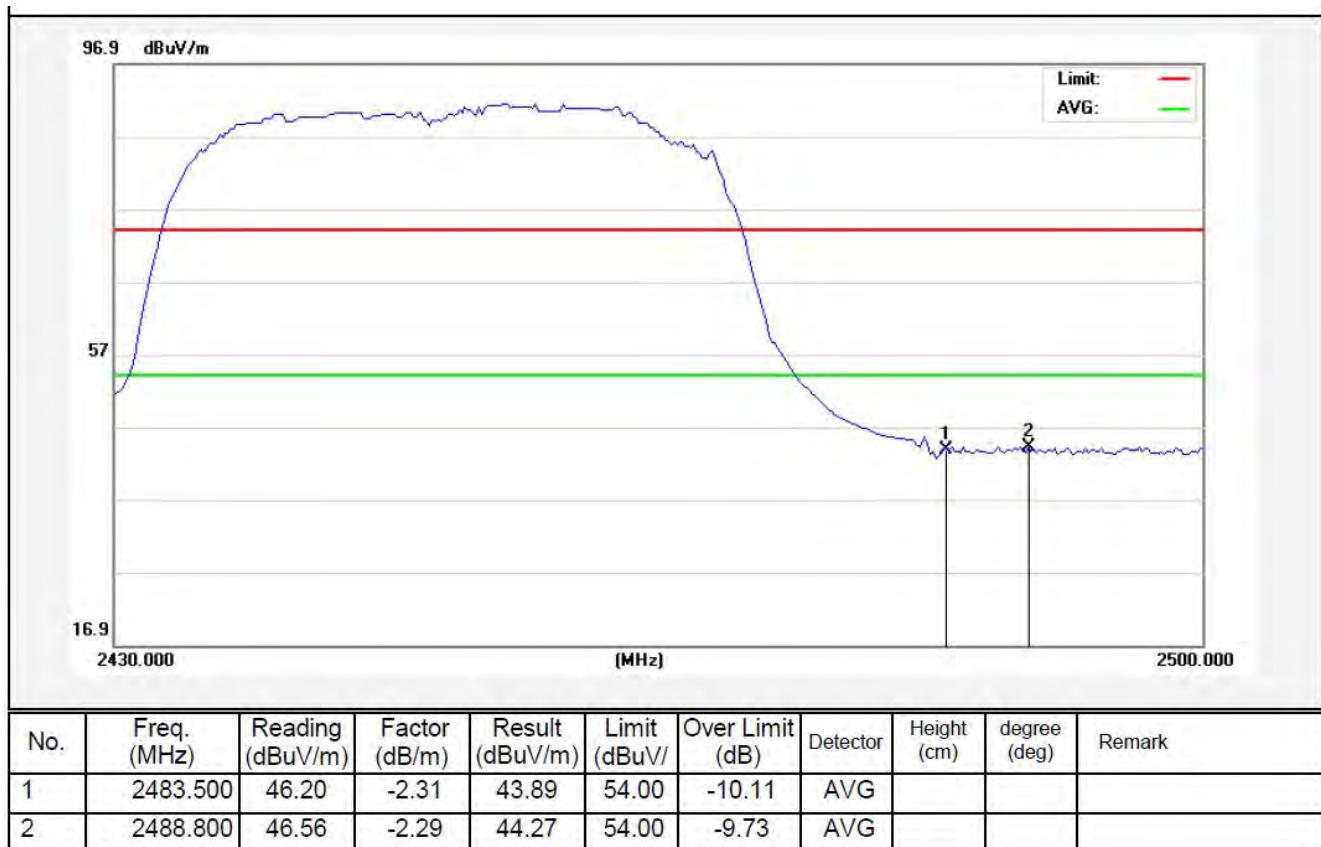
Test Mode: 802.11n (HT40)

2452MHz

Horizontal-PEAK:



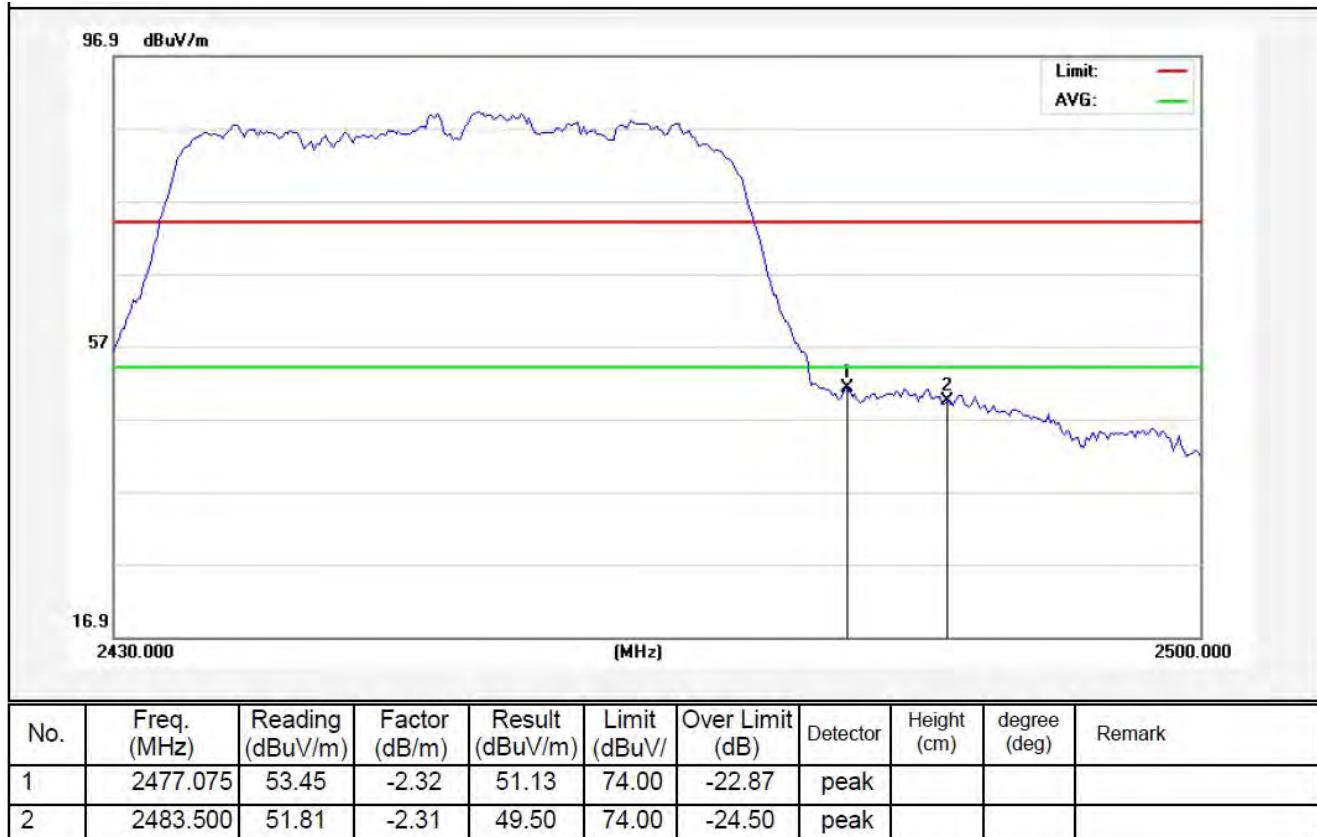
Horizontal-AV:



Test Mode: 802.11n (HT40)

2452MHz

Vertical-PEAK:



Vertical-AV:

