FCC Certification Test Report

BEIJING INHAND NETWORKS TECHNOLOGY CO., LTD.

INDUSTRIAL CELLULAR ROUTER

MODEL: IR915L, IR9X5L, IR9X2L

FCC ID: 2AANYIR9

REPORT# **15WB0608010F Rev 0**
Dec.03, 2015

Prepared for:

Beijing Inhand Networks Technology Co., Ltd.
101, West Wing, 11th Floor, No.101, Lize central Park Wangjing,
Chaoyang District, Beijing, 100102, P.R.China

Prepared By:

Washington International Technology Limited

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For the

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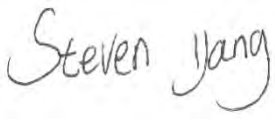
Prepared by:

Henry guo

Reviewed by:



Steven yang

Abstract

This report has been prepared on behalf of Beijing Inhand Networks Technology Co., Ltd. to support the attached Application for Equipment Authorization. The test report and application are submitted for a Spread Spectrum Transceiver under Part 15.247 of the FCC Rules and Regulations. This Federal Communication Commission (FCC) Certification Test Report documents the test configuration and test results for a Beijing Inhand Networks Technology Co., Ltd. Industrial Cellular Router.

Testing was performed on an 966 Chamber of CCIC-SET Electronic Testing Building, Shahe Road, Xili Town, ShenZhen, 518055, China. CCIC-SET has been accepted by the FCC, the FCC Registration Number is 406086.

The Industrial Cellular Router is an IEEE 802.11b/802.11g/802.11n compliant device and complies with the limits for a Direct Sequence Spread Spectrum Transmitter device under Part 15.247 of the FCC Rules and Regulations.

Revision History	Reason	Date
Rev 0	Initial Release	**Dec.03, 2015**

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1 Introduction

1.1 Compliance Statement

After the modifications listed in Section 2.5 were installed:

The Beijing Inhand Networks Technology Co., Ltd. Industrial Cellular Router complies with the limits for a Spread Spectrum Transceiver device under Part 15.247 of the FCC Rules and Regulations.

1.2 Test Scope Summary

Tests for radiated and conducted emissions were performed. All measurements were performed according to the 2013 version of ANSI C63.10

Test Specification	Specific Description	Result	Modifications (Y/N)	Test Location
CFR47 Part 15.207	Conducted Emissions – AC Power Ports	N/A	No	N/A
CFR47 Part 15.209	Radiated Emissions	Complied	No	CCIC-SET
CFR47 Part 15.247	RF Power Output	Complied	No	CCIC-SET
CFR47 Part 15.247(d)	Spurious Emissions at Antenna Terminals	Complied	No	CCIC-SET
CFR47 Part 15.247(d)	Radiated Spurious Emissions	Complied	No	CCIC-SET
CFR47 Part 15.247	Occupied Bandwidth	Complied	No	CCIC-SET
CFR47 Part 15.247	Band Edge Measurement(Conducted)	Complied	No	CCIC-SET
CFR47 Part 15.247	Band Edge Measurement(Radiated)	Complied	No	CCIC-SET
NOTE: The EUT is also considered as a kind of other class A digital device it has been verified to comply with the requirements of FCC Part 15B Class A(Verification) the test report has been issued by WashingtonTechnology International Limited				

1.3 Contract Information

Customer: Beijing Inhand Networks Technology Co., Ltd.

101,West Wing, 11th Floor, No.101, Lize central Park
Wangjing, Chaoyang District, Beijing, 100102,
P.R.ChinaHaidian District,Beijing

1.4 Test and Support Personnel

Zhu Qi CCIC-SET Electronic Testing Building,

Shahe Road, Xili Town, ShenZhen, 518055, China.

1.5 Abbreviations

A	**A**mpere
ac	**a**lternating **c**urrent
AM	Amplitude Modulation
Amps	**Amp**eres
b/s	**b**its per **s**econd
BW	**B**and**W**idth
CE	**C**onducted **E**mission
cm	**C**enti**m**eter
CW	**C**ontinuous **W**ave
dB	**decibel**
dc	**d**irect **c**urrent
EMI	**E**lectro**m**agnetic **I**nterference
EUT	**E**quipment **U**nder **T**est
FM	**F**requency **M**odulation
G	**g**iga - prefix for 10^9 multiplier
Hz	**H**ertz
IF	**I**ntermediate **F**requency
k	**k**ilo - prefix for 10^3 multiplier
LISN	**L**ine **I**mpedance **S**tabilization **N**etwork
M	**M**ega - prefix for 10^6 multiplier
m	**M**eter
µ	**m**icro - prefix for 10^{-6} multiplier
NB	**N**arrow**b**and
QP	**Q**uasi-**P**eak
RE	**R**adiated **E**missions
RF	**R**adio **F**requency
rms	**r**oot-**m**ean-**s**quare
SN	**S**erial **N**umber
S/A	**S**pectrum **A**nalyzer
V	**V**olt

2 Equipment Under Test

2.1 EUT Identification

The results obtained relate only to the item(s) tested.

Table 1: Overview of Industrial Cellular Router, Equipment Under Test

ITEM	DESCRIPTION
Manufacturer:	**Beijing Inhand Networks Technology Co., Ltd.**
FCC ID Number	**2AANYIR9**
EUT Name:	**INDUSTRIAL CELLULAR ROUTER**
Test Model:	**IR915L, IR9X5L, IR9X2L，see the model description**
FCC Rule Parts:	**§15.247**
Frequency Range:	**IEEE 802.11b/g/n(HT20) : 2412 – 2462MHz** **IEEE 802.11n(HT40): 2422 – 2452 MHz**
Maximum Output Power:	**IEEE 802.11b: 19.11dBm** **IEEE 802.11g: 19.66dBm** **IEEE 802.11n HT20: 19.79dBm** **IEEE 802.11n HT40: 19.13dBm**
Modulation:	**Direct Sequence Spread Spectrum**
Necessary Bandwidth:	**N/A**
Keying:	**Automatic**
Type of Information:	**IEEE 802.11b: DSSS(CCK,DQPSK,DBPSK)** **IEEE 802.11g: OFDM(64QAM, 16QAM, QPSK, BPSK)** **IEEE 802.11n HT20, HT40: OFDM (64QAM, 16QAM, QPSK,BPSK)**
Number of Channels:	**IEEE 802.11b/g/n(HT20) : 11** **IEEE 802.11n(HT40): 7**
Antenna Type	**sucker antenna see the PCB Photo**
Frequency Tolerance:	**N/A**
Emission Type(s):	**N/A**
Interface Cables:	**None**
Power Source & Voltage:	**12-48V**

2.2 EUT Description

The Industrial Cellular Router is a network Router for household users. By connecting it to IP network through Ethernet interface or Wifi, it can stream videos over the network to TV display panel via RSS 485 cable connection.

Product Name: Industrial Cellular Router

Model No. : IR915L, IR9X5L, IR9X2L

Tested Model No.: IR915L

EUT Rated Voltage: 12-48V

I/O Ports: Front Side: (1) RJ-45 Port*6; (2) SMA connection Port*5;

Declaration letter

Beijing InHand Networks Technology Co., Ltd

Dear Sir,

For our business issue and marketing requirement, we would like to list different models numbers on the CE/FCC certificates and reports, as following:

Model No.: IR915L

IR905L IR925L IR935L IR945L IR955L IR965L IR975L IR985L IR995L

IR902L IR922L IR922L IR932L IR942L IR952L IR962L IR972L IR982L IR992L

The twenty models are the same in these: appearance, PCB layout, and basic software function;The differences are as follows:

1. IR9X5L have five Ethernet ports; IR9X2L have two Ethernet ports.
2. IR9X2L&IR9X5L,X=0,1,2,3,4,5,6,7,8,9; X means different software functions

Thank you!

Signature: Biao Wang

Printed name/title:Wangbiao/ EMC engineer

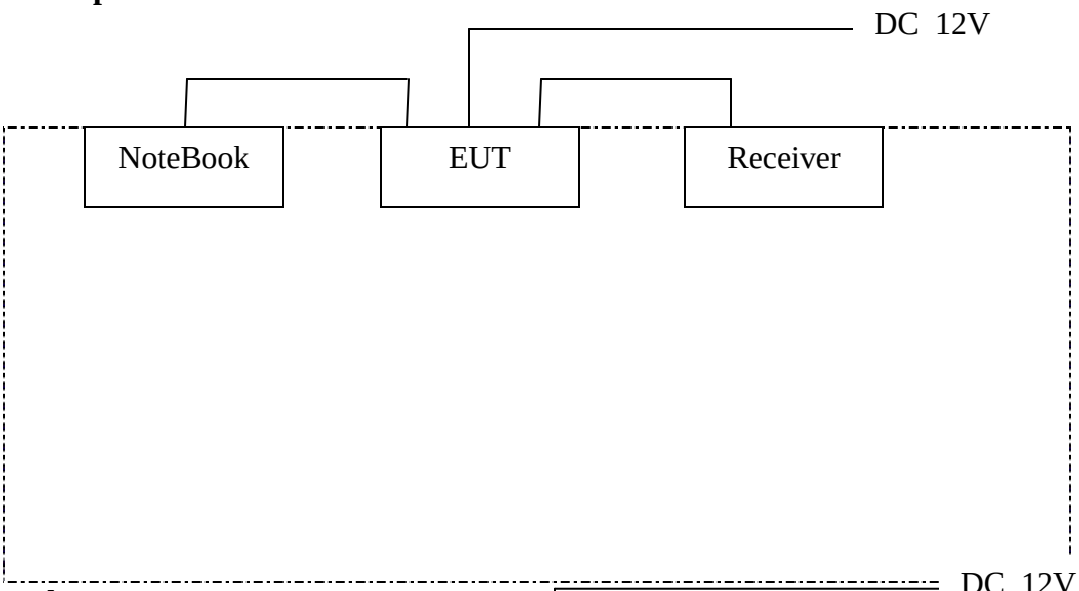
Address:101, West Wing, 11th Floor, No.101, Lize central Park, Wangjing, Chaoyang District, Beijing, 100102, P.R.China

2.3 Test Configuration

The Beijing Inhand Networks Technology Co., Ltd. Industrial Cellular Router, Equipment Under Test (EUT), was operated by 12-48VDC power supply.

The EUT was configured with DC power supply, an antenna, a support NB with RSS485 cable. The EUT firmware/software was set up to control power, bit rate, and channel selection.

RF test setup



Radiated test setup:

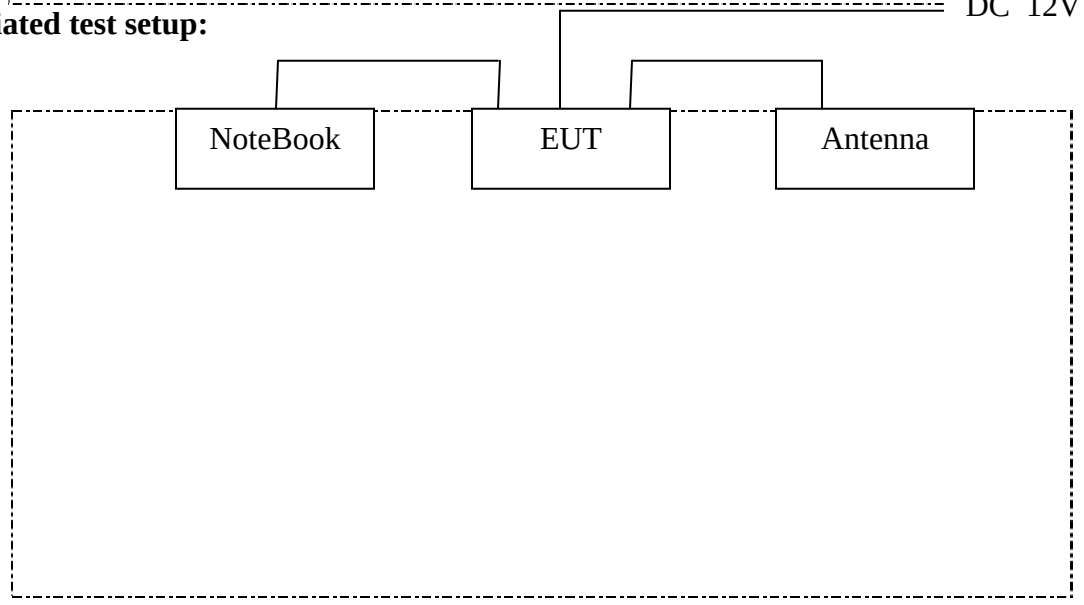


Figure 1: Test Configuration

2.4 Equipment Configuration

The EUT was set up as outlined in Radiated Emission Test Configuration photo. The EUT was comprised of the following equipment. (All Modules, PCBs, etc. listed were considered as part of the EUT, as tested.)

Table 2: Equipment Configuration

Name / Description	Model Number	Part Number	Serial Number	Revision
Industrial Cellular Router	IR915L	FS28-W-S-GPS	RF9151506267242	/

2.5 Interface Cables

Table 3: Interface Cables

Port Identification	Connector Type	Cable Length	Shielded (Y/N)	Termination Point
antenna cable	SMA	2.5m	N	N/A
antenna cable	SMA	1.9m	N	N/A

2.6 Support Equipment

The following support equipment was used during testing:

No.	Support Equipment	Model/Part Number	Serial Number
1	Lenovo Note Book	Thinkpad Edge E431	N/A

2.7 EUT Modifications

No modifications were performed in order to meet the test requirements:

2.8 Testing Algorithm

The IR915L Industrial Cellular Router was operated using and drivers.

2.9 Test Location

All measurements herein were performed at CCIC-SET Electronic Testing Building, Shahe Road, Xili Town, ShenZhen, 518055, China. CCIC-SET has been accepted by the FCC, the FCC Registration Number is 406086**.**

2.10 Measurements

2.10.1 Measurement Method

All measurements were performed according to the 2013 version of ANSI C63.10 for testing compliance of a wide variety of unlicensed wireless devices

2.11 Measurement Uncertainty

All results reported herein relate only to the equipment tested. The basis for uncertainty calculation uses ANSI/NCSL Z540-2-1997 with a type B evaluation of the standard uncertainty. Elements contributing to the standard uncertainty are combined using the method described in Equation 1 to arrive at the total standard uncertainty. The standard uncertainty is multiplied by the coverage factor to determine the expanded uncertainty which is generally accepted for use in commercial, industrial, and regulatory applications and when health and safety are concerned (see Equation 2). A coverage factor was selected to yield a 95% confidence in the uncertainty estimation.

Equation 1: Standard Uncertainty

$$u_c = \pm\sqrt{\frac{a^2}{div_a{}^2} + \frac{b^2}{div_b{}^2} + \frac{c^2}{div_c{}^2} + ...}$$

where u_c = standard uncertainty

a, b, c,.. = individual uncertainty elements

$div_{a,\ b,\ c}$ = the individual uncertainty element divisor based on the probability distribution

divisor = 1.732 for rectangular distribution

divisor = 2 for normal distribution

divisor = 1.414 for trapezoid distribution

Equation 2: Expanded Uncertainty

$$U = ku_c$$

where U = expanded uncertainty

k = coverage factor

k ≤ 2 for 95% coverage (ANSI/NCSL Z540-2 Annex G)

u_c = standard uncertainty

The measurement uncertainty complies with the maximum allowed uncertainty from CISPR 16-4-2. Measurement uncertainty is not used to adjust the measurements to

determine compliance. The expanded uncertainty values for the various scopes in the WLL accreditation are provided in Table 3 below.

Table 4: Expanded Uncertainty List

Scope	Standard(s)	Expanded Uncertainty
Conducted Emissions	CISPR11, CISPR22, CISPR14, FCC Part 15	1.69 dB
Radiated Emissions 30MHz-1GHz	CISPR11, CISPR22, CISPR14, FCC Part 15	4.55 dB
Radiated Emissions 1GHz-26.5GHz Horizontal	CISPR11, CISPR22, CISPR14, FCC Part 15	4.63dB
Radiated Emissions 1GHz-26.5GHz Vertical	CISPR11, CISPR22, CISPR14, FCC Part 15	4.73dB

3 Test Equipment

Table 5 shows a list of the test equipment used for measurements along with the calibration information.

Table 5: Test Equipment List

Item	Instrument	Manufacturer	Type No./Serial No	Last Cal.	calibration interval
1	EMI Test Receiver	R&S	ESIB26	Jun. 2. 2015	1 Year
2	Full-Anechoic Chamber	Albatross	12.8m*6.8m*6.4m	Jan. 5. 2015	1Year
3	Bilog Antenna	Schwarzbeck	VULB 9163	Jun. 2. 2015	1 Year
4	Double ridge horn antenna	R&S	HF960	Jun. 2. 2015	1 Year
5	Ultra-wideband antenna	R&S	HL562	Jun. 2. 2015	1 Year
6	Test Antenna – Horn (18-25GHz)	ETS	UG-596A/U	Jun. 2. 2015	1 Year
7	Amplifier 20M~3GHz	R&S	PAP-0203H	Jun. 2. 2015	1 Year
8	Amplifier 1G~18GHz	R&S	MITEQ AFS42-00101800	Jun. 2. 2015	1 Year
9	Amplifier 18G~40GHz	R&S	JS42-18002600-28-5A	Jun. 2. 2015	1 Year
10	Spectrum Analyzer	R&S	FSP40	Jun. 2. 2015	1 Year
11	Cable	SUNHNER	SUCOFLEX	Jun. 2. 2015	1 Year
12	Cable	SUNHNER	SUCOFLEX 104	Jun. 2. 2015	1 Year

4 Test Results

4.1 RF Power Output:

To measure the output power the unit was set to transmit on a low, high and middle channel. The output from the transmitter was connected to an attenuator and then to the input of a detector diode. The output of the detector diode was displayed on an oscilloscope. The trace deflection was recorded and the transmitter was replaced with a signal generator at the same frequency. The output of the signal generator was increased until the trace deflection was the same as it was with the transmitter. The signal from the generator was then connected to a power meter and the level was taken.

4.1.1 Limit (FCC Part 15.247b(3))

For systems using digital modulation in the 2400—2483.5MHz, The Peak output Power shall not exceed 1W(30dBm)

4.1.2 Test Procedure

1, Connected the EUT's antenna port to measure device by 20dB attenuator.

2, For IEEE 802.11b/g and IEEE802.11n HT20 and HT40 mode, use a PK power meter which's bandwidth is 20MHz up to 40MHz and above 6dB bandwidth of signal to measure out each test modes' PK output power.

Note: The cable loss and attenuator loss were offset into measure device as an amplitude offset.

4.1.3 Test Data

The EUT complied with the FCC Part 15.247 RF Power Output requirements.

Table 6 provides the test results for RF Power Output. （all the data attached was use the worst case data rate data）

4.1.4 Areas of Concern

None.

Table 6 RF Power Output

802.11b:

Channel	Frequency (MHz)	Antenna	Output Power(dBm)			
			DSSS Data Rate			
			1 Mbps	2 Mbps	5.5Mbps	11 Mbps
1	2412	1	18.54	18.46	18.51	18.49
		2	18.58	18.52	18.55	18.53
6	2437	1	18.49	18.45	18.44	18.41
		2	18.52	18.49	18.45	18.50
11	2462	1	19.11	19.02	19.08	19.03
		2	19.05	19.01	18.95	18.97

802.11g:

Channel	Frequency (MHz)	Antenna	Output Power(dBm)							
			OFDM Data Rate							
			6 Mbps	9 Mbps	12 Mbps	18 Mbps	24 Mbps	36 Mbps	48 Mbps	54 Mbps
1	2412	1	19.38	19.28	19.35	19.36	19.28	19.31	19.35	19.33
		2	19.36	19.26	19.35	19.24	19.28	19.30	19.33	19.27
6	2437	1	19.46	19.42	19.37	19.40	19.44	19.38	19.41	19.36
		2	19.41	19.34	19.31	19.36	19.32	19.38	19.34	19.28
11	2462	1	19.66	19.49	19.60	19.58	19.64	19.53	19.57	19.55
		2	19.62	19.52	19.49	19.56	19.48	19.53	19.51	19.48

802.11n20:

Channel	Frequency (MHz)	Antenna	Output Power(dBm)							
			OFDM Data Rate							
			MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
1	2412	1	19.12	19.05	19.01	19.03	18.95	19.10	18.93	18.95
		2	19.09	18.92	19.04	18.96	19.06	19.01	18.91	18.97
6	2437	1	19.65	19.58	19.62	19.48	19.55	19.58	19.61	19.57
		2	19.59	19.46	19.53	19.54	19.48	19.53	19.55	19.50
11	2462	1	19.79	19.68	19.65	19.73	19.75	19.70	19.66	19.77
		2	19.73	19.68	19.70	19.66	19.61	19.68	19.60	19.69

802.11n40:

Channel	Frequency (MHz)	Antenna	Output Power(dBm)							
			OFDM Data Rate							
			MCS0	MCS1	MCS2	MCS3	MCS4	MCS5	MCS6	MCS7
3	2422	1	18.29	18.23	18.18	18.25	18.19	18.26	18.21	18.20
		2	18.25	18.16	18.23	18.14	18.17	18.20	18.22	18.18
6	2437	1	18.80	18.67	18.75	18.73	18.65	18.70	18.77	18.69
		2	18.76	18.72	18.68	18.73	18.69	18.61	18.65	18.71
9	2452	1	19.13	19.05	19.04	18.98	19.06	19.10	19.07	19.00
		2	19.18	19.05	19.09	19.11	19.04	19.01	19.10	19.16

Antenna 1+Antenna 2 （MIMO Mode）-Test Data

Frequency		Antenna 1 power (dBm)	Antenna 2 power (dBm)	Antenna 1+2 power (mW)	Limit (mW)	Pass/Fail
IEEE 802.11n HT20	Channel 1 2412MHz	19.12	19.09	162.74	1000	Pass
	Channel 6 2437 MHz	19.65	19.59	183.25	1000	Pass
	Channel 11 2462 MHz	19.79	19.73	189.25	1000	Pass
IEEE 802.11n HT40	Channel 1 2412MHz	18.29	18.25	162.74	1000	Pass
	Channel 6 2437 MHz	18.80	18.76	183.25	1000	Pass
	Channel 11 2462 MHz	19.13	19.18	189.25	1000	Pass

Note1: According exploratory test, EUT will have maximum output power as above bolded data rate, so those data rate were used for all test.

2. In MIMO, Ant1+Ant2 Directional gain = GANT + 10 log(N) dBi = 2 + 10 log(2) = 5dBi, so the Power limit is 30dBm (1000mW);

4.2 RF Power Spectral Density

The output from the transmitter was connected to an attenuator and then to the input of the RF Spectrum Analyzer. The analyzer offset was adjusted to compensate for the attenuator and other losses in the system.

4.2.1 Limit

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8dBm in any 3kHz band during any time interval of continuous transmission.

4.2.2 Test Procedure

The transmitter output was connected to a spectrum analyzer. Power density was measured by spectrum analyzer with 100kHz RBW and 300kHz VBW, sweep time=2.5s.

4.2.3 Test Data

The EUT complied with the FCC Part 15.247 RF Power Spectral Density requirements.

Table 7 provides the test results for RF Power Spectral Density. (all the data attached was use the worst case data rate data)

4.2.4 Areas of Concern

None.

Table 7 RF Power Spectral Density

Antenna 1-Test Data

Frequency		Worst case data rate	Cable loss (dB)	Att (dB)	Result (dBm)	Limit (dBm)	Pass /Fail
IEEE 802.11b	Channel 1: 2412 MHz	1Mbps	2.0	20	0.20	8	Pass
	Channel 6: 2437 MHz	1Mbps	2.0	20	1.00	8	Pass
	Channel11:2462 MHz	1Mbps	2.0	20	1.96	8	Pass
IEEE 802.11g	Channel 1: 2412 MHz	6 Mbps	2.0	20	-0.09	8	Pass
	Channel 6: 2432 MHz	6 Mbps	2.0	20	1.57	8	Pass
	Channel11:2462 MHz	6 Mbps	2.0	20	1.83	8	Pass
IEEE 802.11n HT 20	Channel 1: 2412 MHz	MCS 0	2.0	20	0.06	8	Pass
	Channel 6: 2432 MHz	MCS 0	2.0	20	1.04	8	Pass
	Channel11:2462 MHz	MCS 0	2.0	20	1.30	8	Pass
IEEE 802.11n HT 40	Channel 3 2422MHz	MCS 0	2.0	20	-3.19	8	Pass
	Channel 6 2437 MHz	MCS 0	2.0	20	-2.49	8	Pass
	Channel 9 2452 MHz	MCS 0	2.0	20	-2.19	8	Pass

Antenna 2-Test Data

Frequency		Worst case data rate	Cable loss (dB)	Att (dB)	Result (dBm)	Limit (dBm)	Pass /Fail
IEEE 802.11b	Channel 1: 2412 MHz	1Mbps	2.0	20	0.22	8	Pass
	Channel 6: 2437 MHz	1Mbps	2.0	20	1.04	8	Pass
	Channel11:2462 MHz	1Mbps	2.0	20	1.93	8	Pass
IEEE 802.11g	Channel 1: 2412 MHz	6 Mbps	2.0	20	0.02	8	Pass
	Channel 6: 2432 MHz	6 Mbps	2.0	20	1.41	8	Pass
	Channel11:2462 MHz	6 Mbps	2.0	20	1.61	8	Pass
IEEE 802.11n HT 20	Channel 1: 2412 MHz	MCS 0	2.0	20	0.11	8	Pass
	Channel 6: 2432 MHz	MCS 0	2.0	20	0.96	8	Pass
	Channel11:2462 MHz	MCS 0	2.0	20	1.26	8	Pass
IEEE 802.11n HT 40	Channel 3 2422MHz	MCS 0	2.0	20	-3.15	8	Pass
	Channel 6 2437 MHz	MCS 0	2.0	20	-2.54	8	Pass
	Channel 9 2452 MHz	MCS 0	2.0	20	-2.33	8	Pass

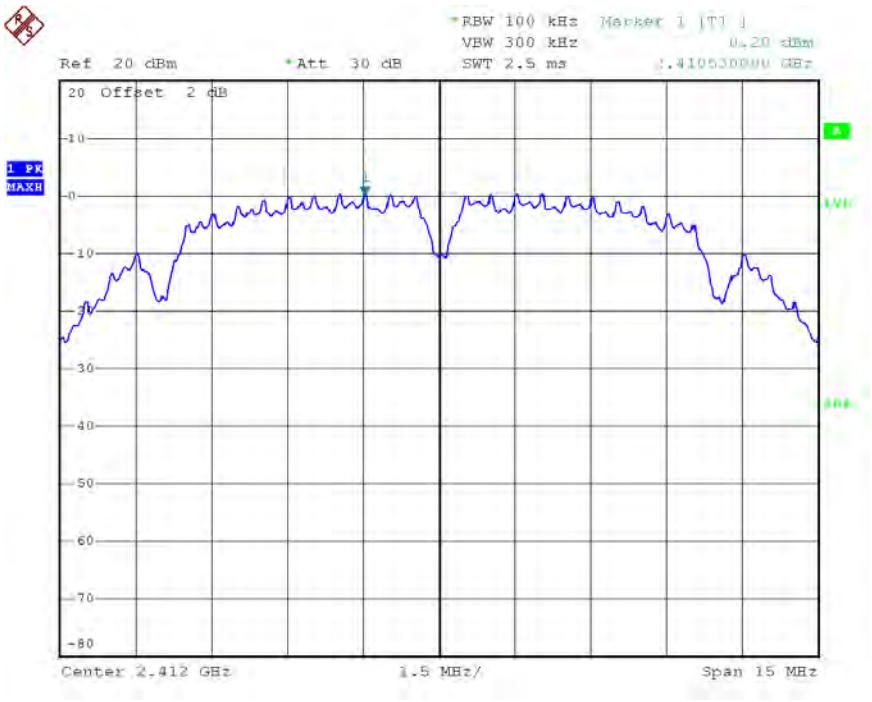
Antenna 1+Antenna 2 （MIMO Mode）-Test Data

Frequency		Antenna 1 power (dBm)	Antenna 2 power (dBm)	Antenna 1+2 power (mW)	Limit (dBm)	Limit (mW)	Pass/Fail
IEEE 802.11n HT20	Channel 1 2412MHz	0.06	0.11	2.04	8	6.3	Pass
	Channel 6 2437 MHz	1.04	0.96	2.51	8	6.3	Pass
	Channel 11 2462 MHz	1.30	1.26	2.68	8	6.3	Pass
IEEE 802.11n HT40	Channel 1 2412MHz	-3.19	-3.15	0.96	8	6.3	Pass
	Channel 6 2437 MHz	-2.49	-2.54	1.12	8	6.3	Pass
	Channel 11 2462 MHz	-2.19	-2.33	1.18	8	6.3	Pass

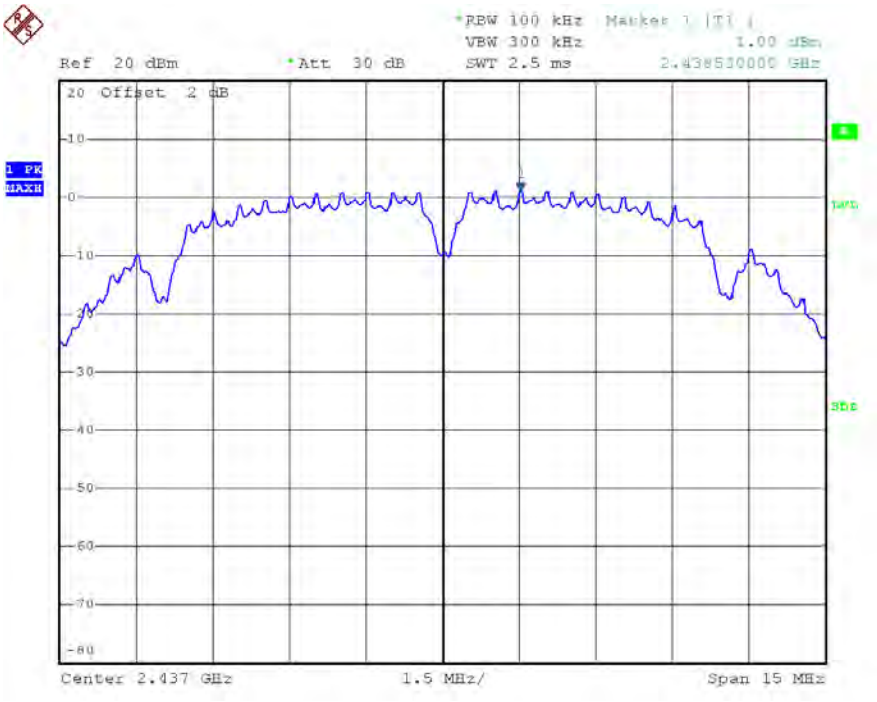
Antenna 1-Test Data

Test Mode: IEEE 802.11b TX

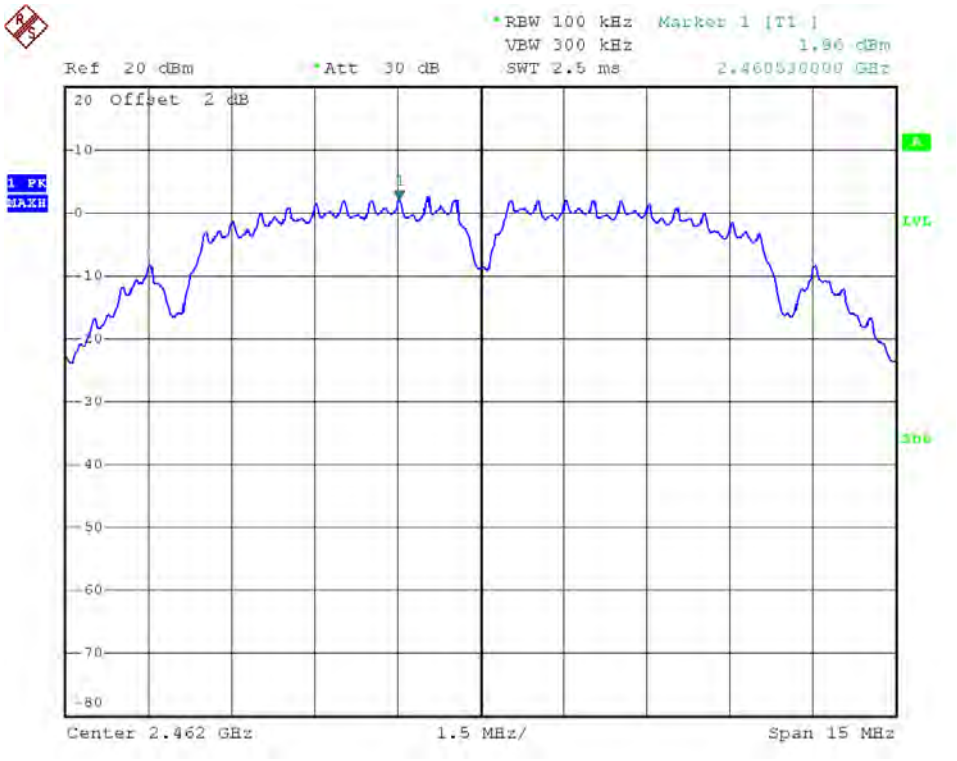
Test CH1: 2412MHz



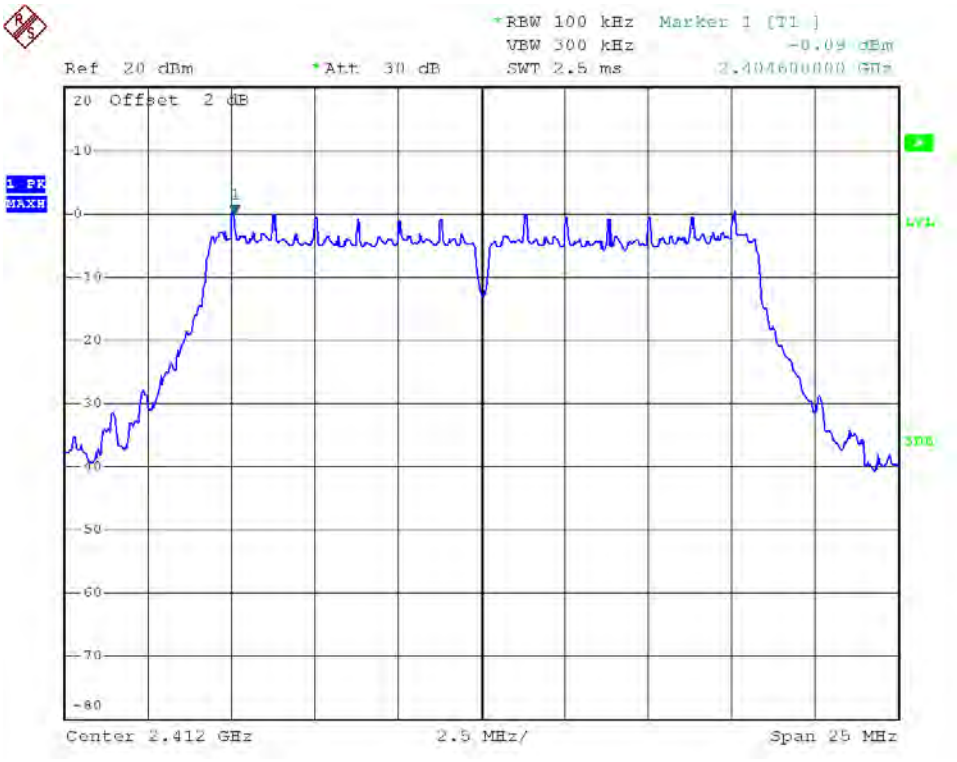
Test CH6: 2437MHz



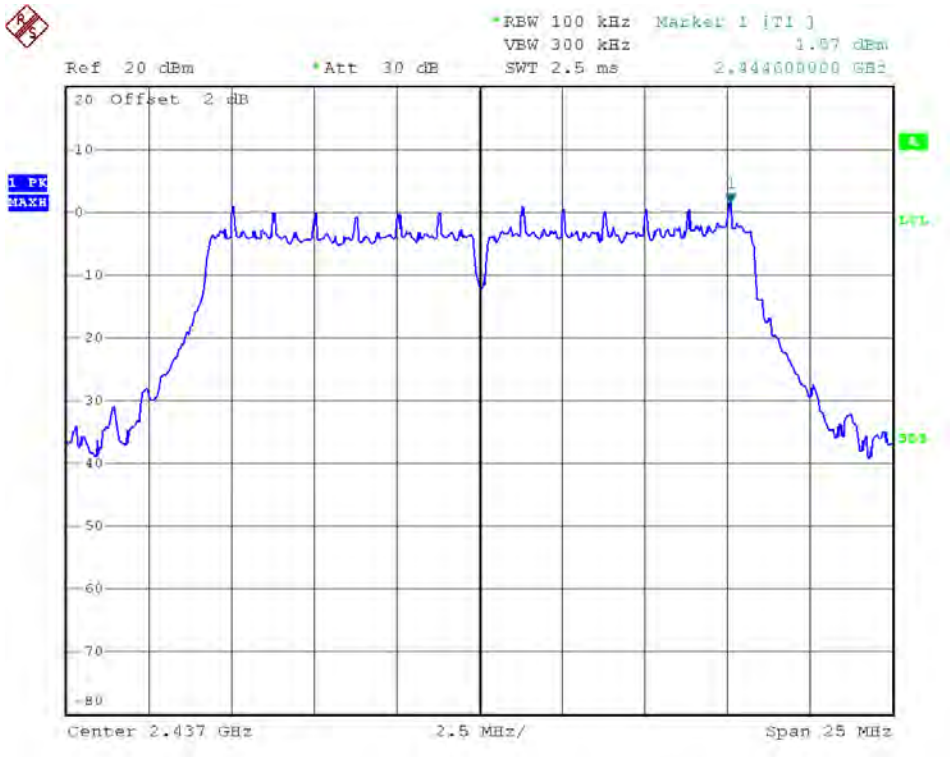
Test CH11: 2462MHz



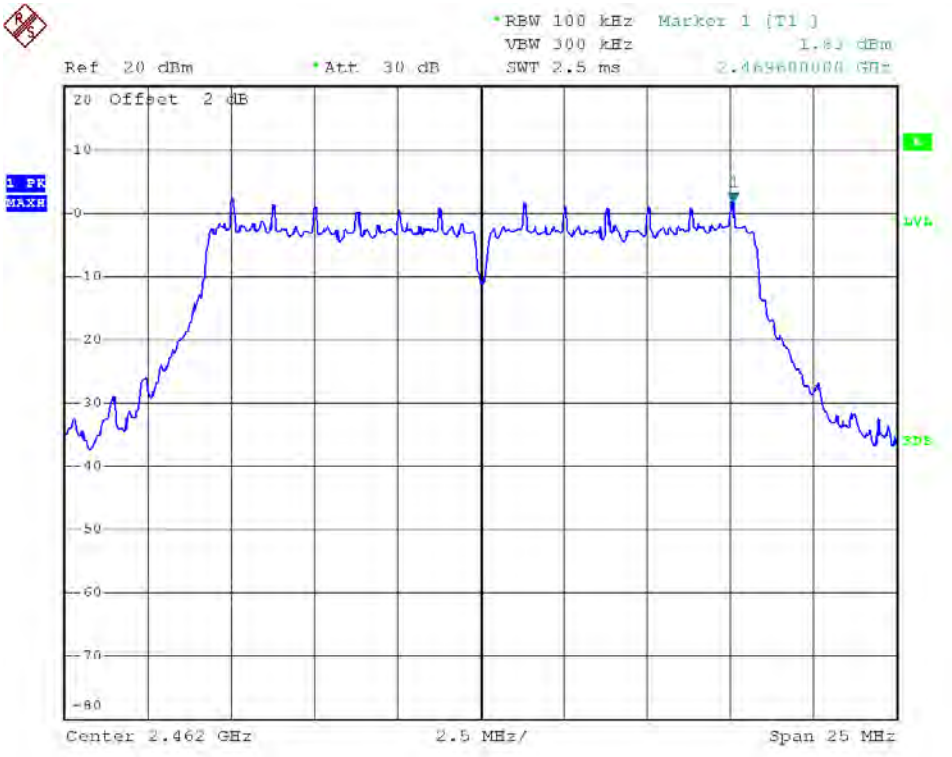
Test Mode: IEEE 802.11g TX Test CH1: 2412MHz



Test CH6: 2437MHz

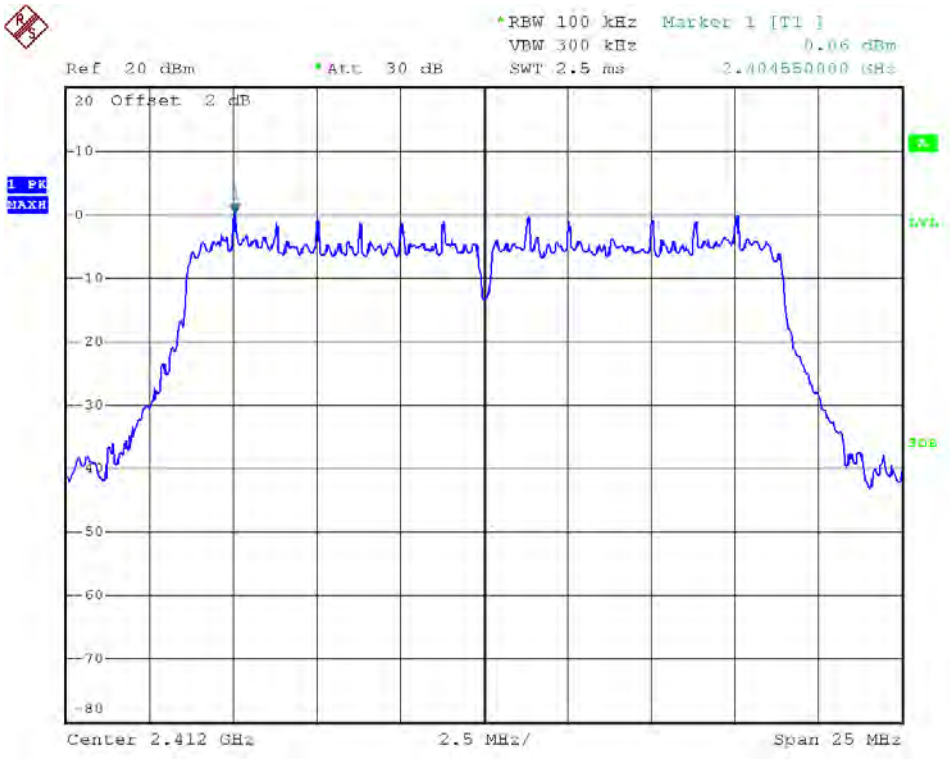


Test CH11: 2462MHz

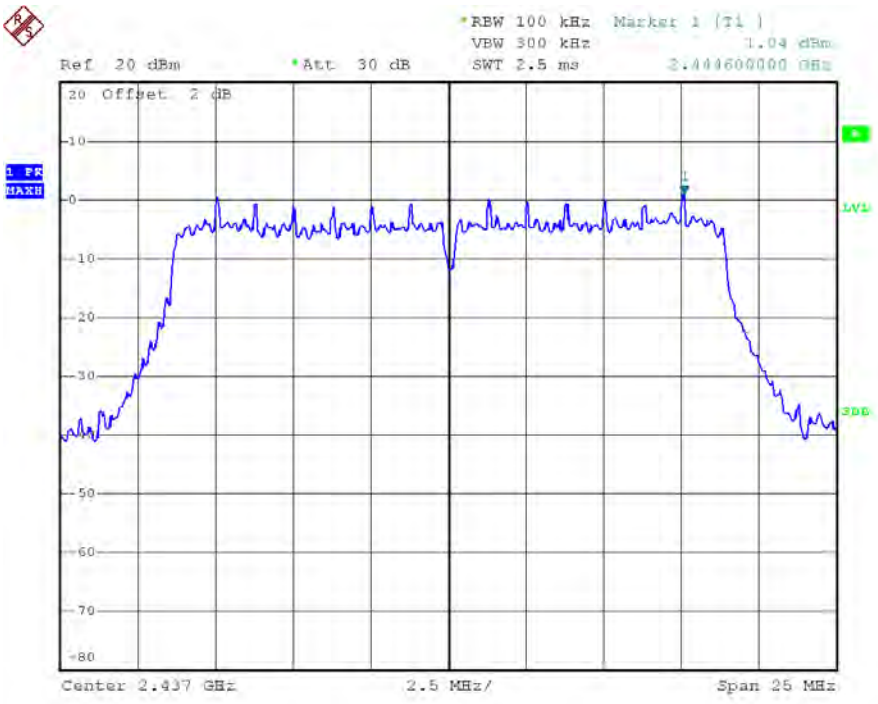


Test Mode: IEEE 802.11n HT20 TX

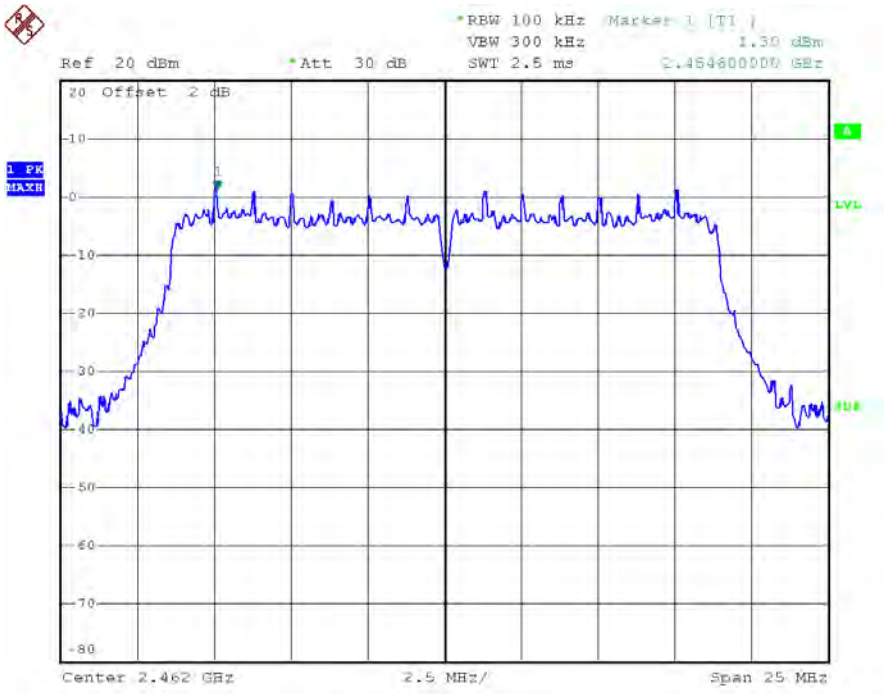
Test CH1: 2412MHz



Test CH6: 2437MHz

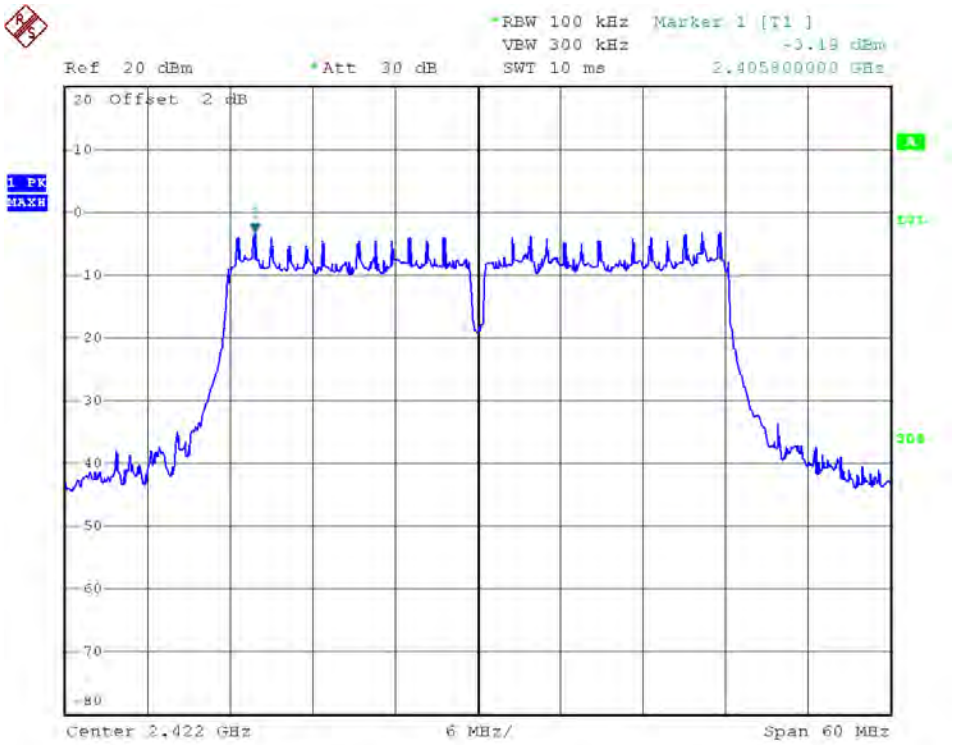


Test CH11: 2462MHz

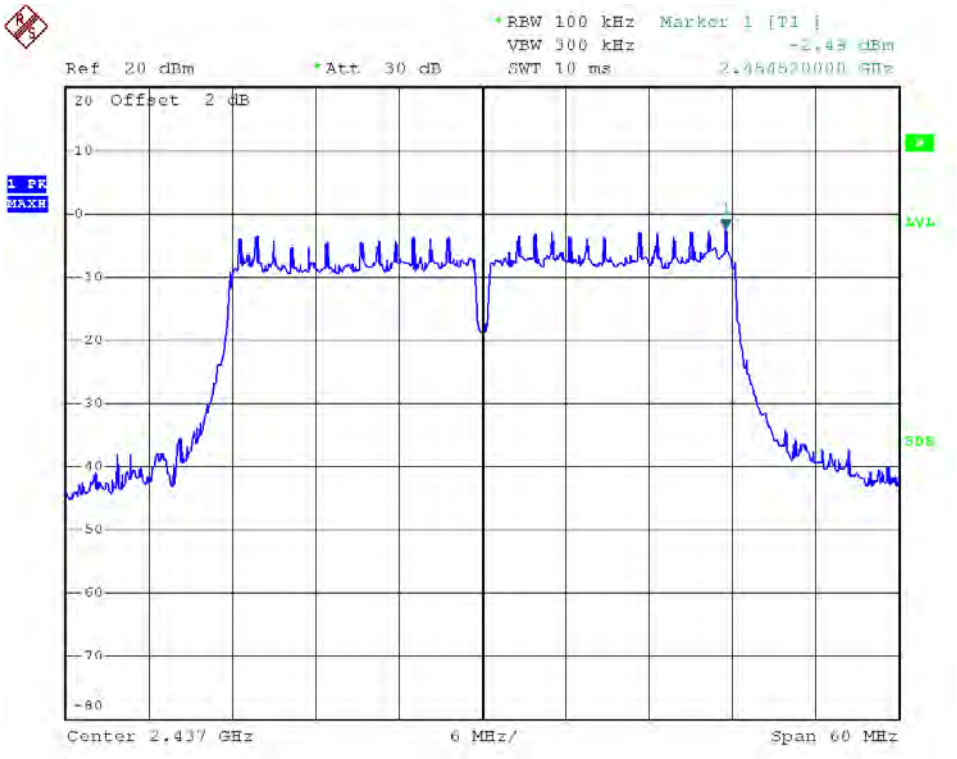


Test Mode: IEEE 802.11n HT40 TX

Test CH3: 2422MHz



Test CH6: 2437MHz



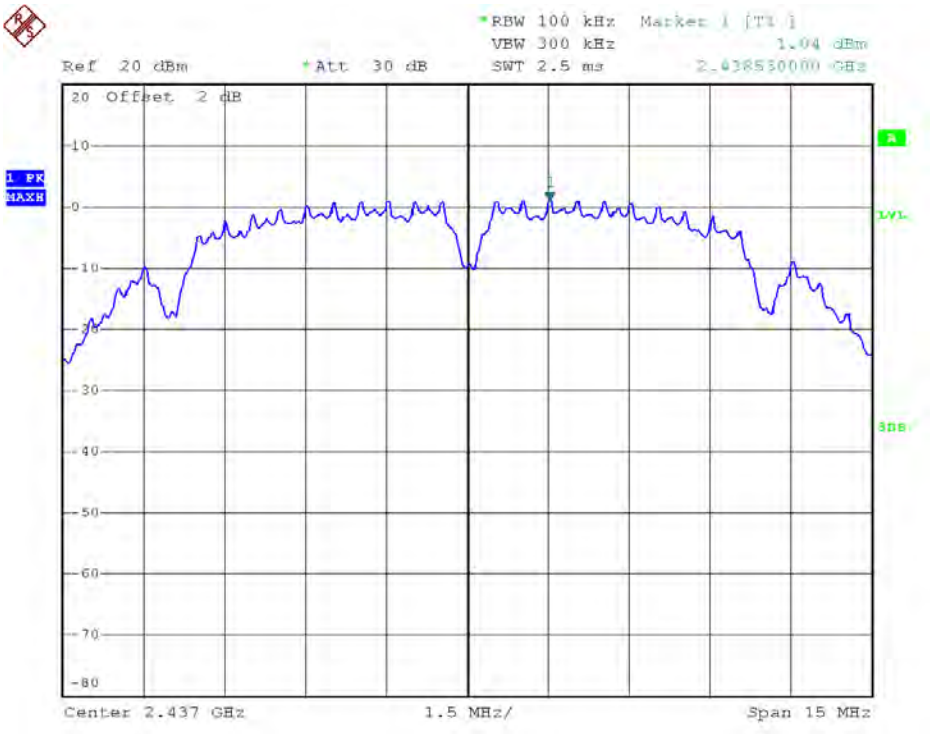
Test CH9: 2452MHz

Antenna 2-Test Data

Test Mode: IEEE 802.11b TX

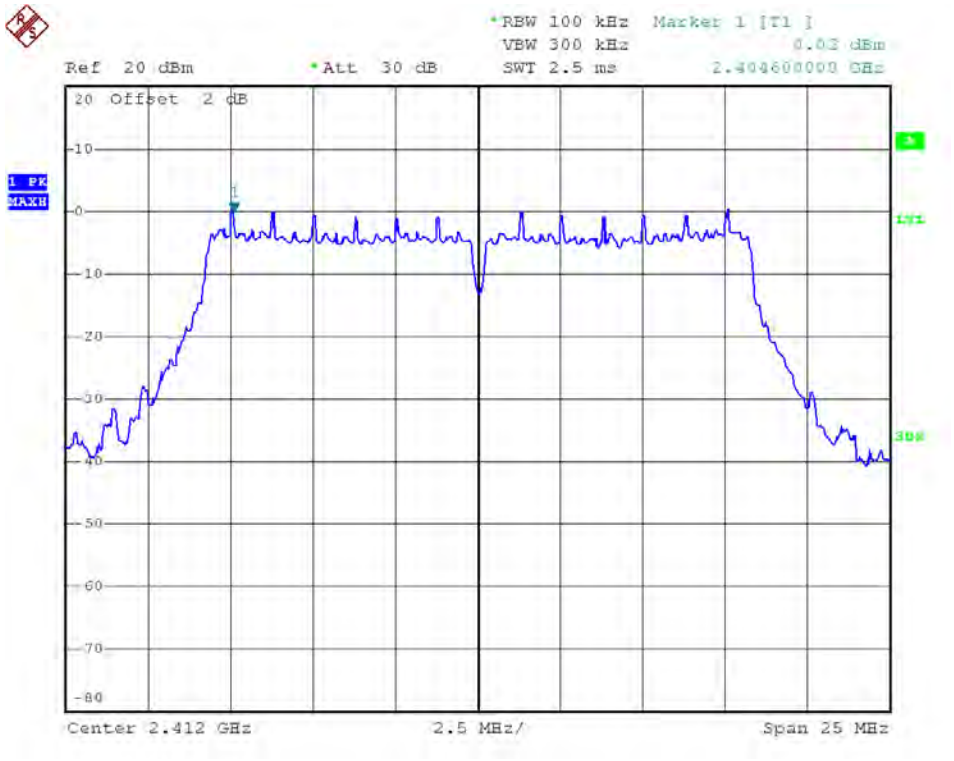
Test CH1: 2412MHz

Test CH6: 2437MHz

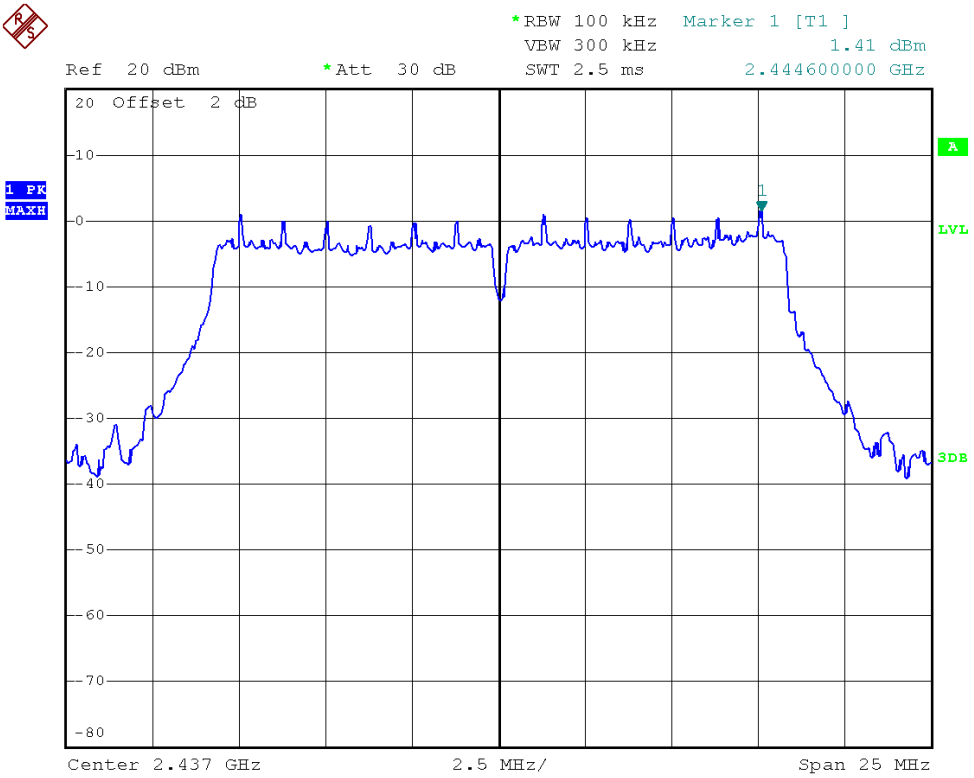


Test CH11: 2462MHz

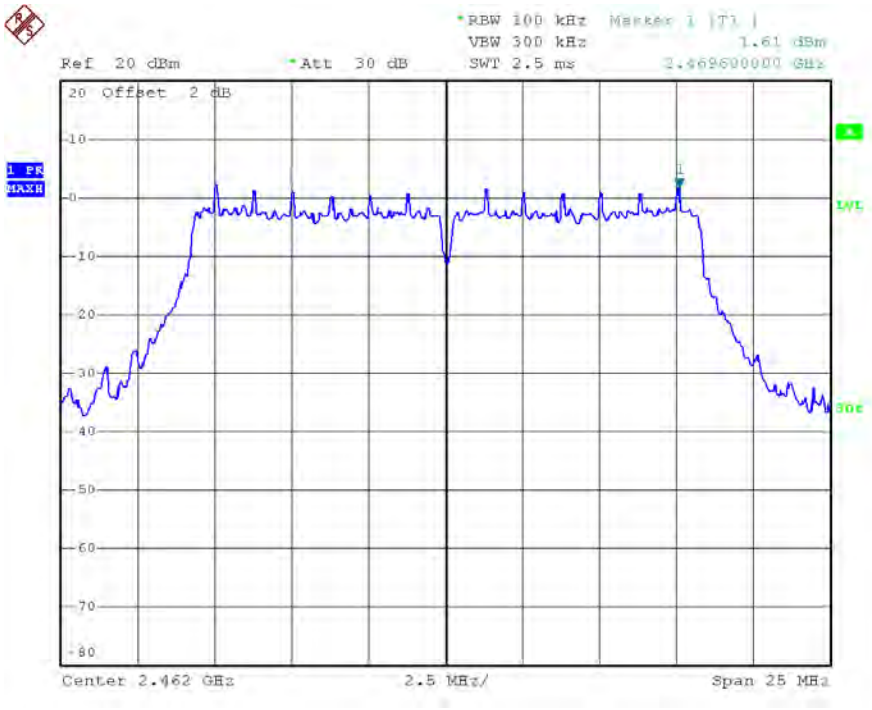
Test Mode: IEEE 802.11g TX Test CH1: 2412MHz



Test CH6: 2437MHz

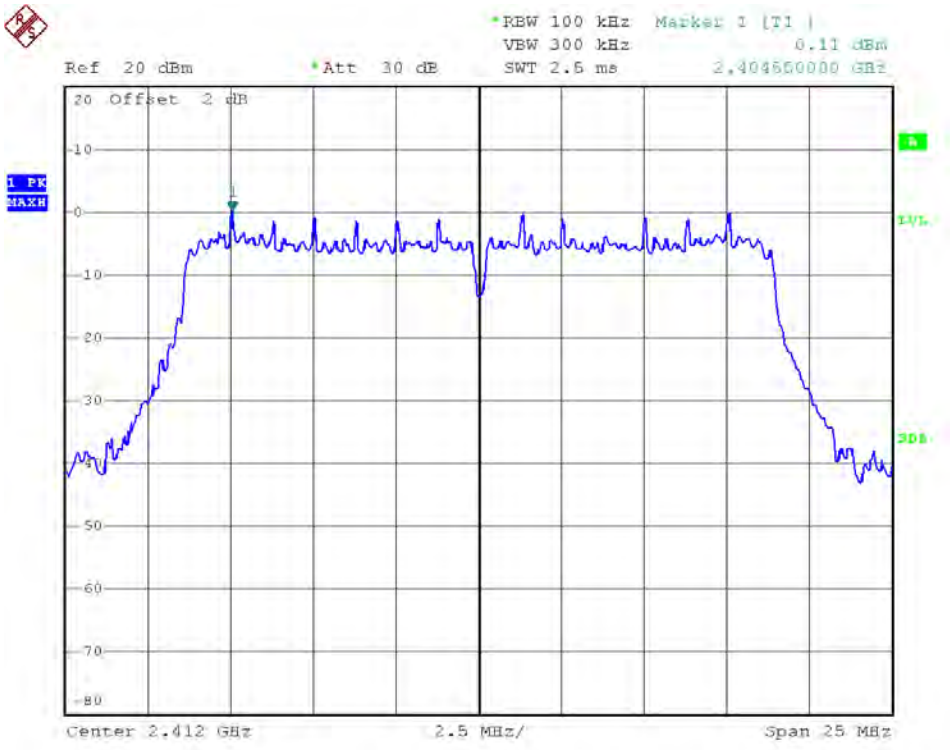


Test CH11: 2462MHz

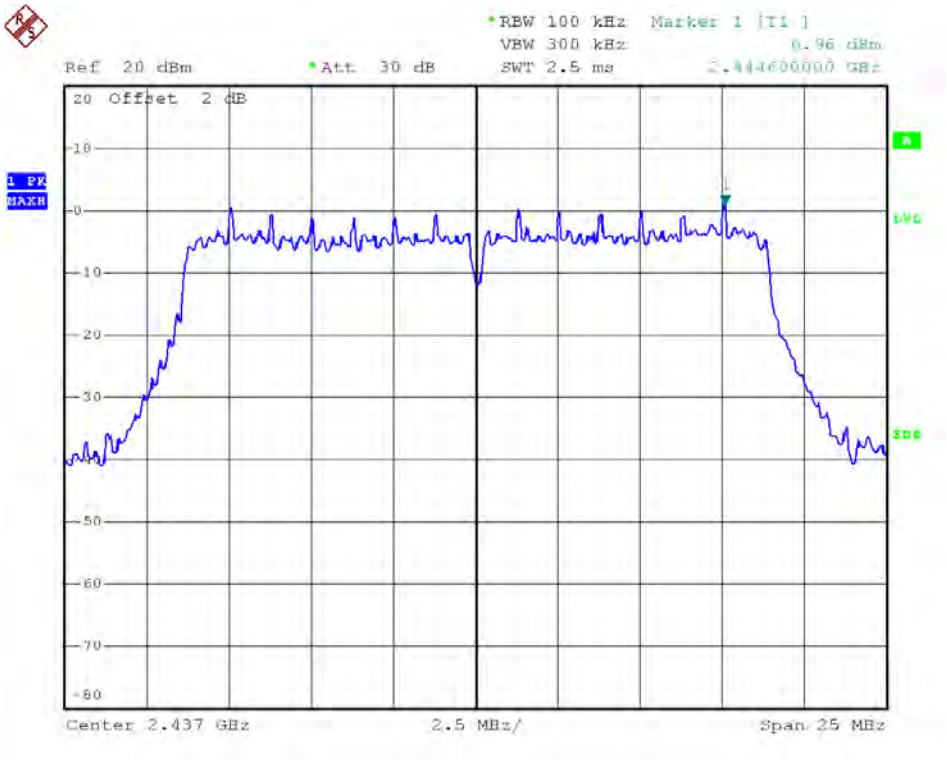


Test Mode: IEEE 802.11n HT20 TX

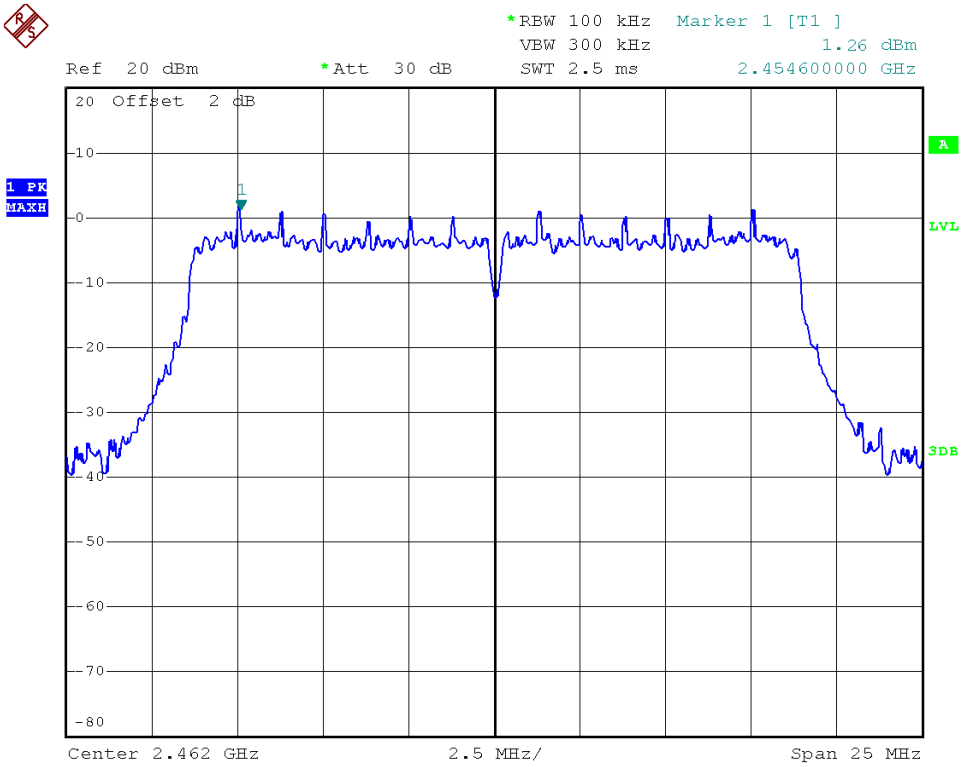
Test CH1: 2412MHz



Test CH6: 2437MHz

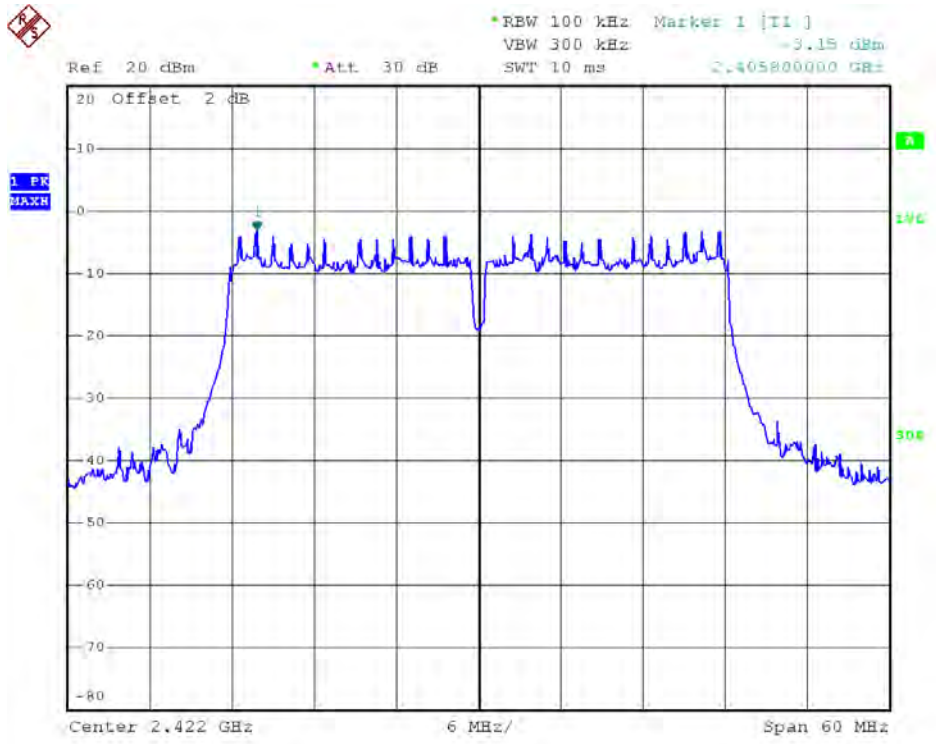


Test CH11: 2462MHz

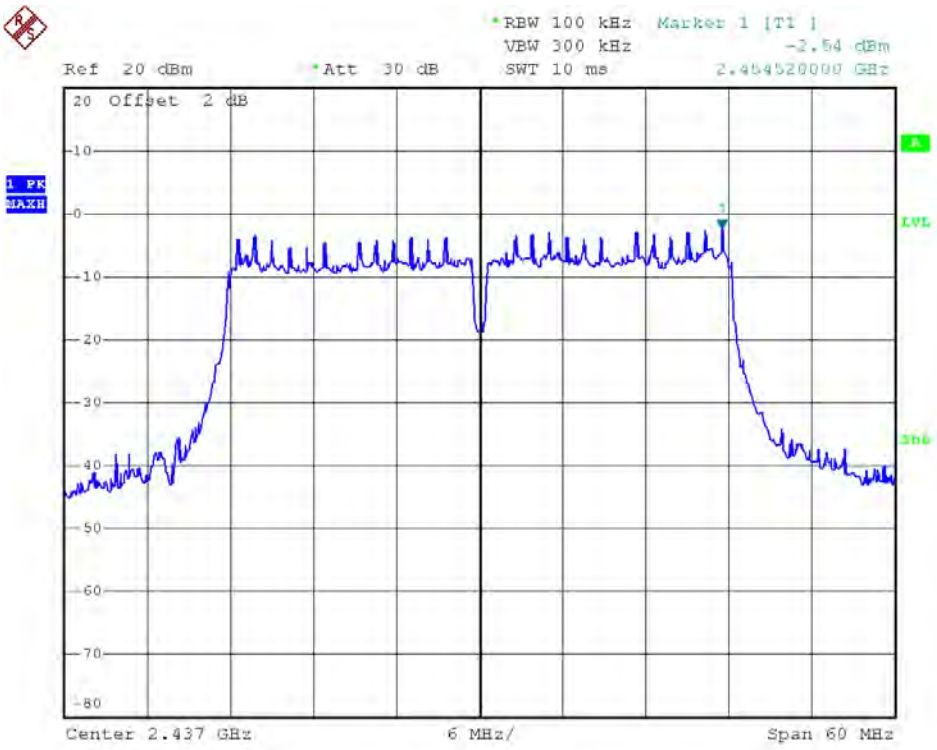


Test Mode: IEEE 802.11n HT40 TX

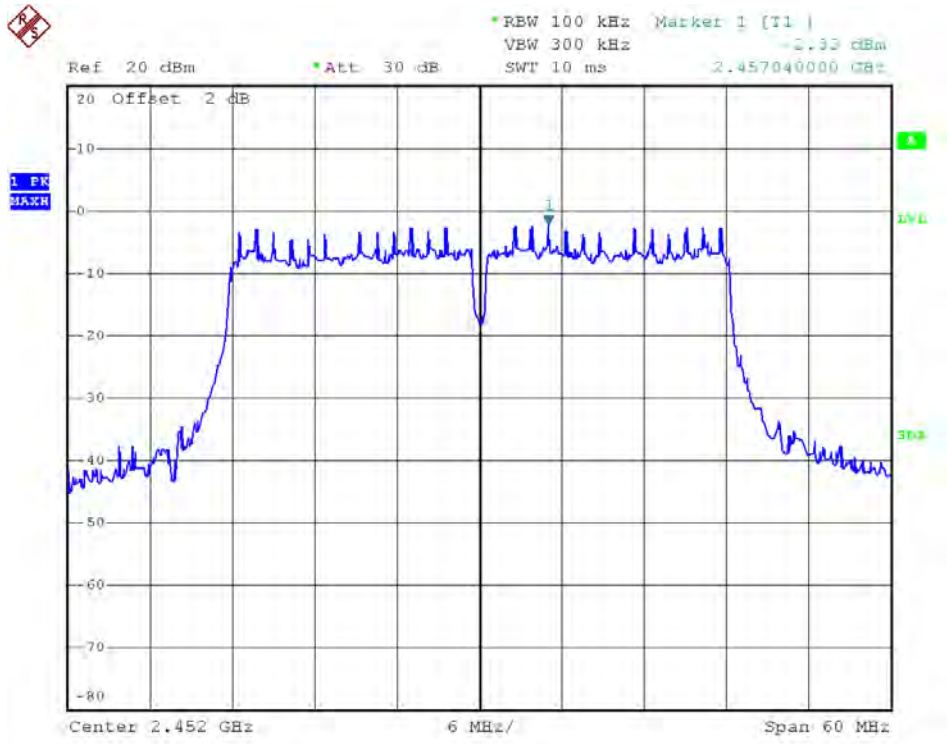
Test CH3: 2422MHz



Test CH6: 2437MHz



Test CH9: 2452MHz



4.3 Occupied Bandwidth

Occupied bandwidth was performed by coupling the output of the EUT to the input of a spectrum analyzer.

4.3.1 Limit

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

4.3.2 Test Procedure

The transmitter output was connected to a spectrum analyzer, The bandwidth of the

fundamental frequency was measured by spectrum analyzer with 100kHz RBW and 100 kHz VBW. The 6dB bandwidth is defined as the total spectrum the power of which is higher than peak power minus 6dB.

4.3.3 Test Data

The EUT complied with the FCC Part 15.247 Occupied bandwidth requirements.

Table 8 provides the test results for Occupied bandwidth.（all the data attached was use the worst case data rate as in table 6）

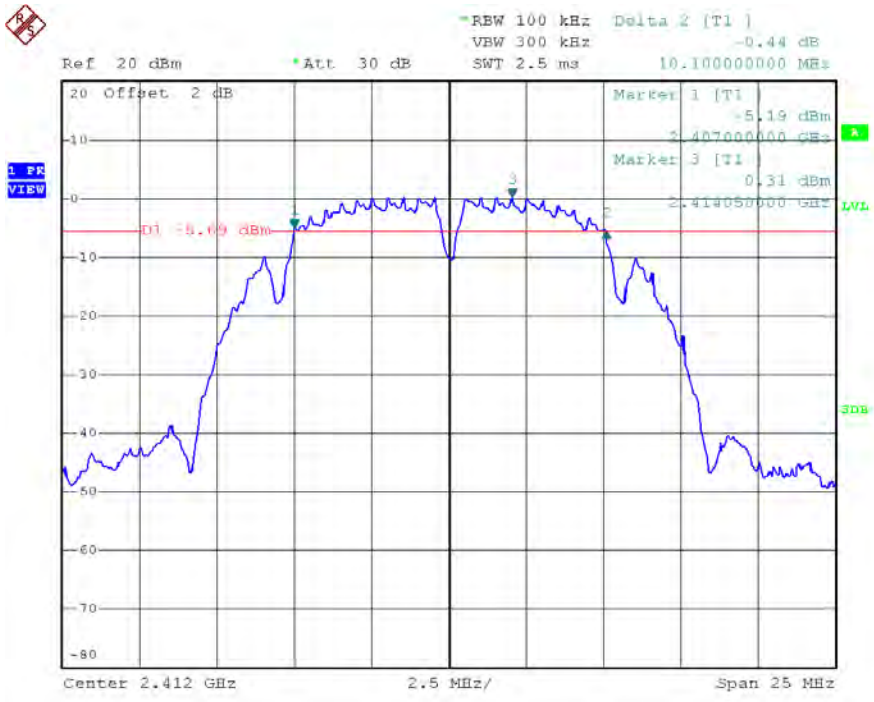
4.3.4 Areas of Concern

None.

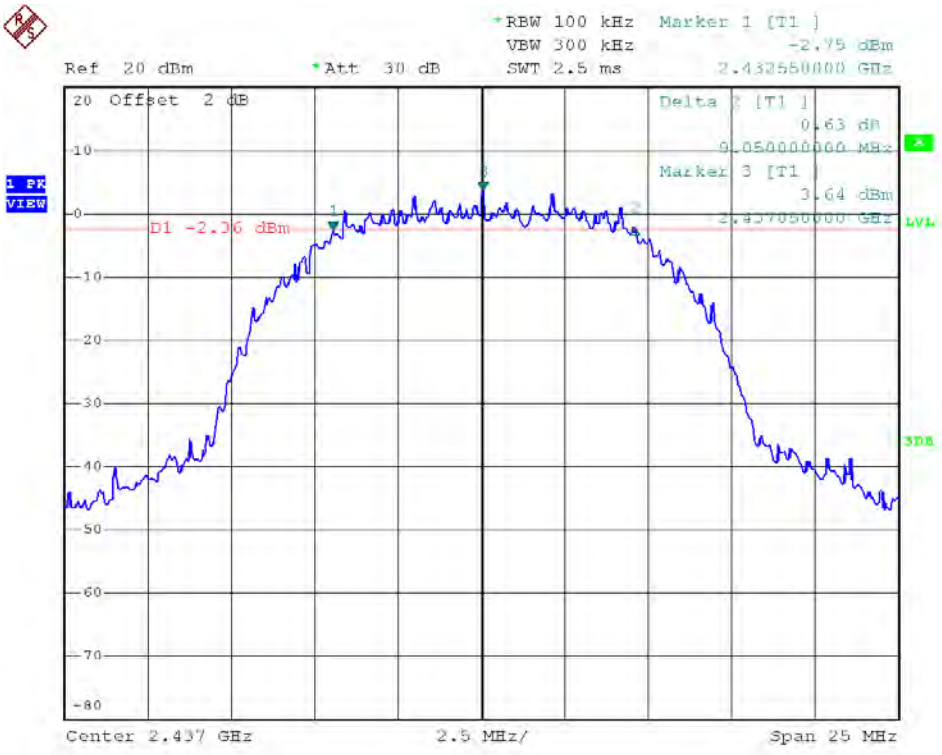
Antenna 1-Test Data

Test Mode: IEEE 802.11b TX

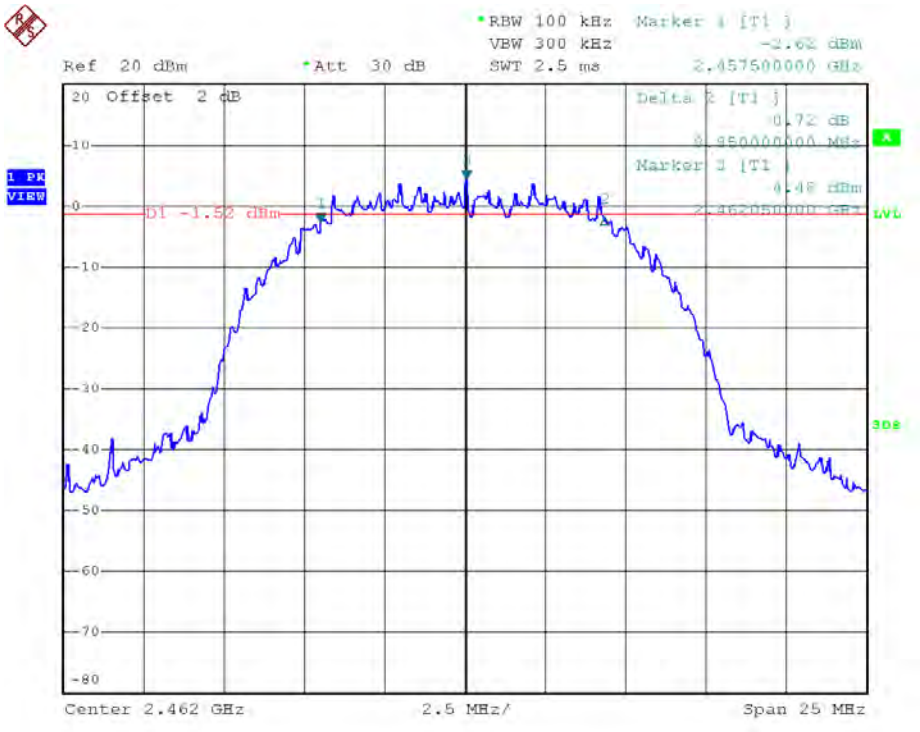
Test CH1: 2412MHz



Test CH6: 2437MHz

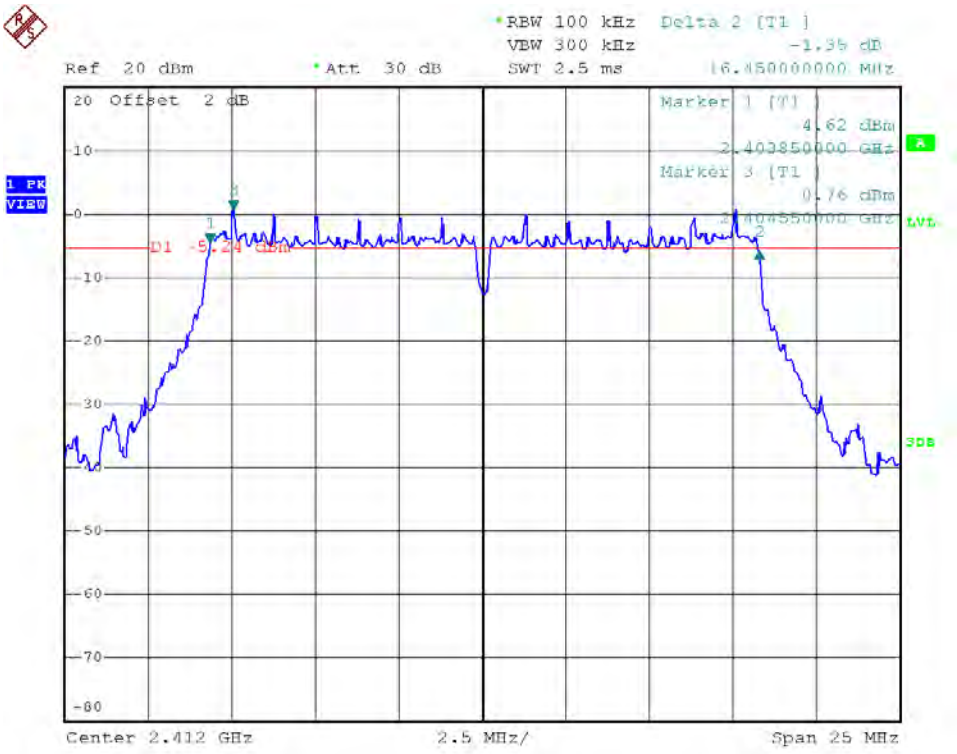


Test CH11: 2462MHz

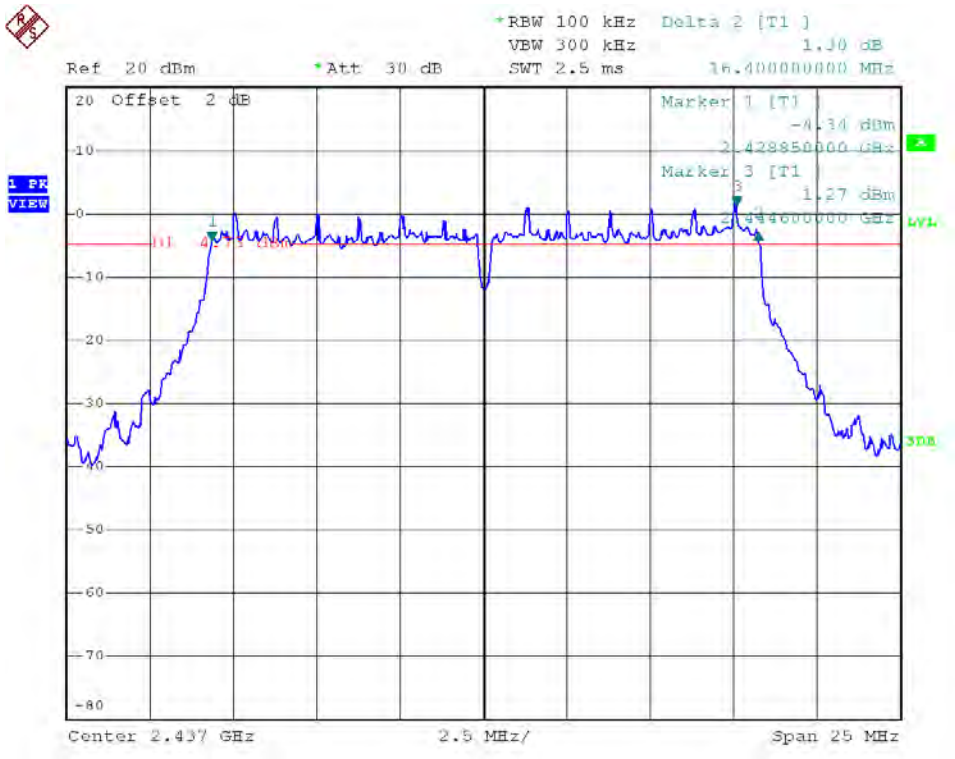


Test Mode: IEEE 802.11g TX

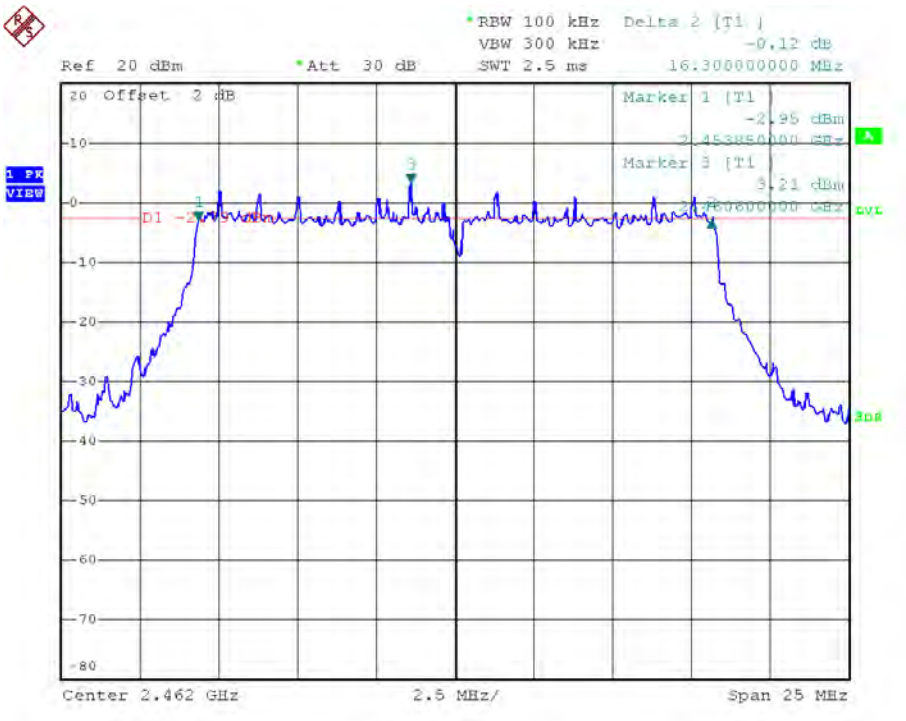
Test CH1: 2412MHz



Test CH6: 2437MHz

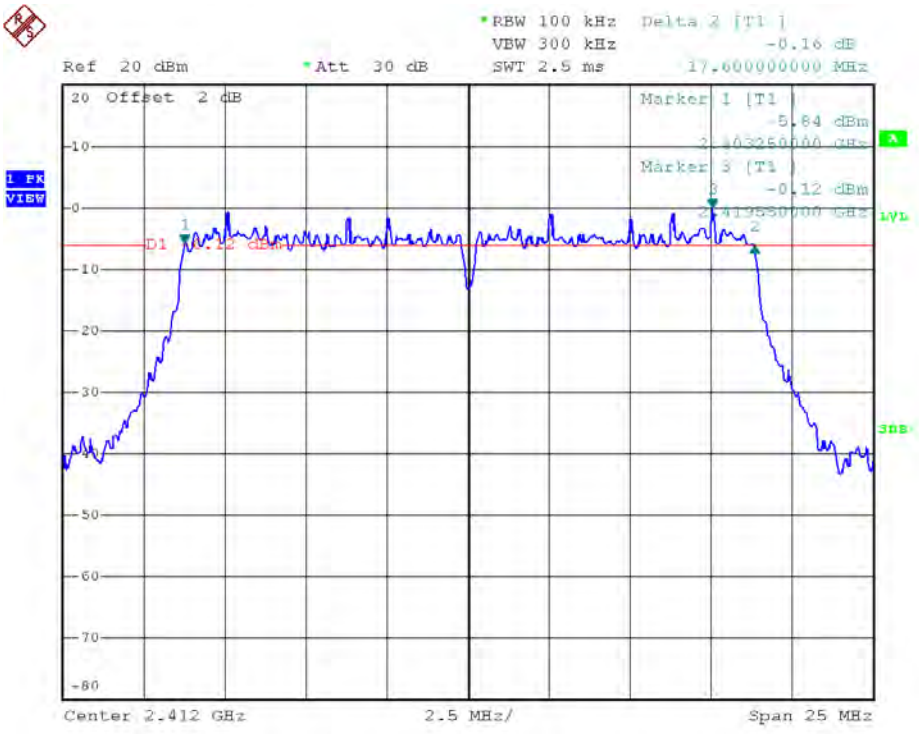


Test CH11: 2462MHz

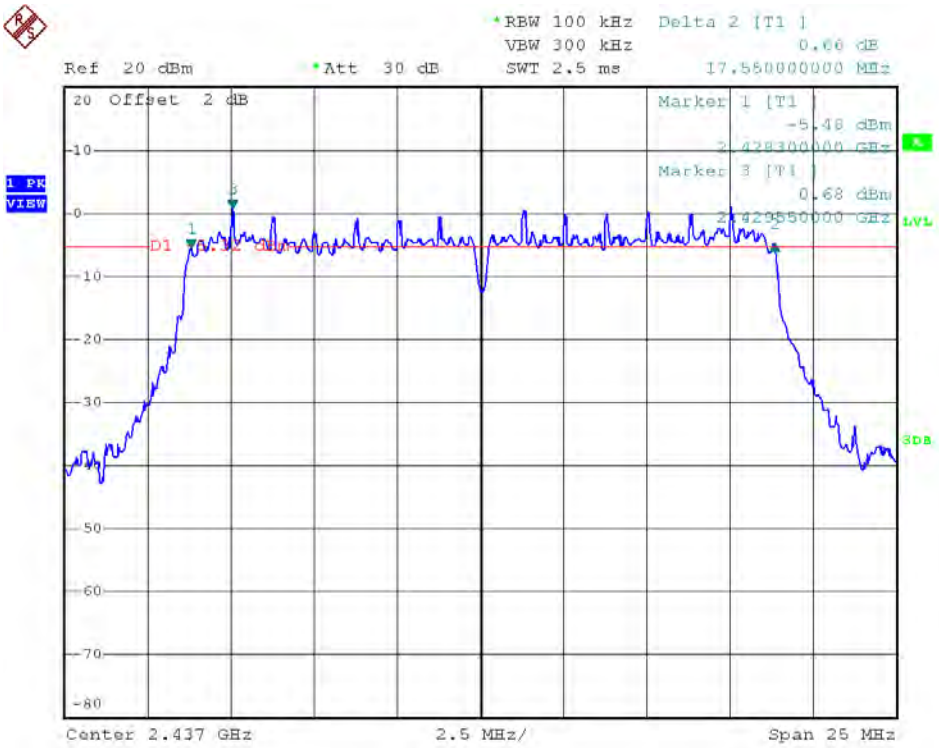


Test Mode: IEEE 802.11n HT20 TX Test

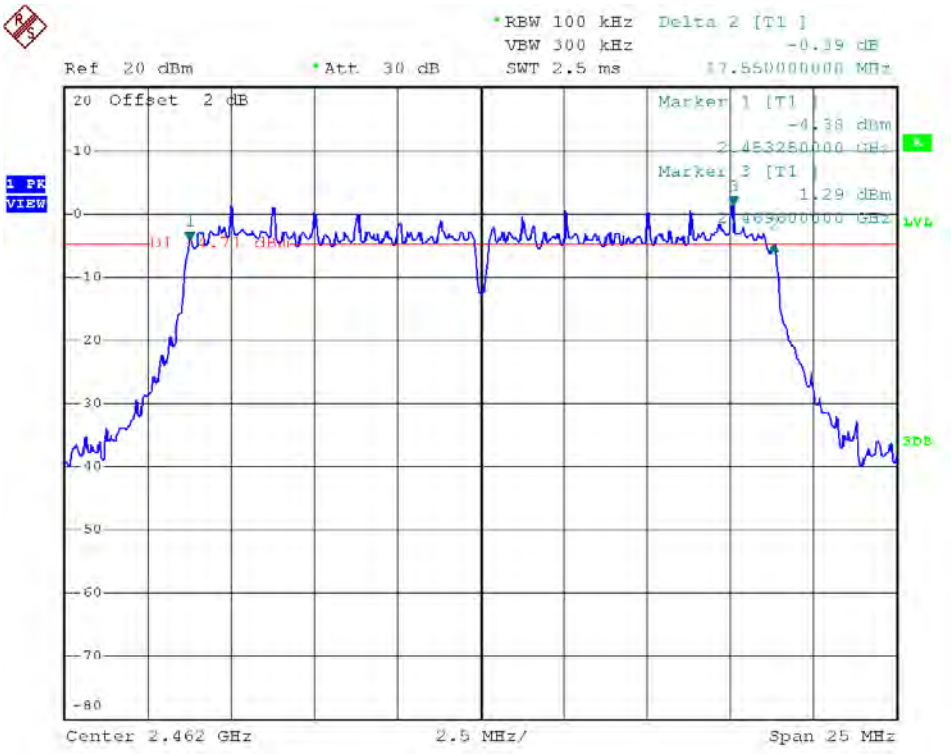
CH1: 2412MHz



Test CH6: 2437MHz

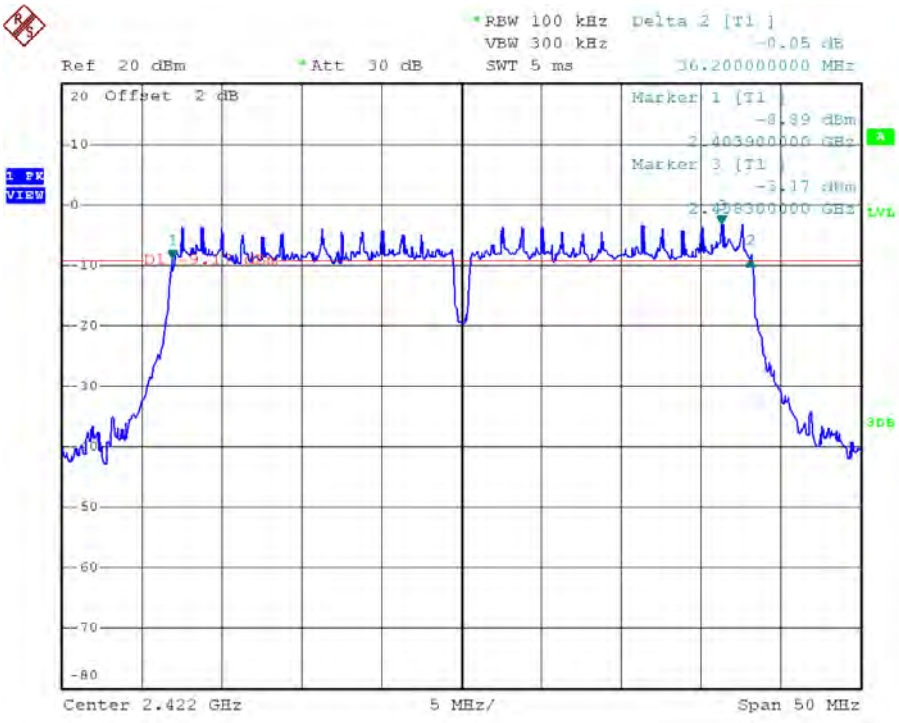


Test CH11: 2462MHz

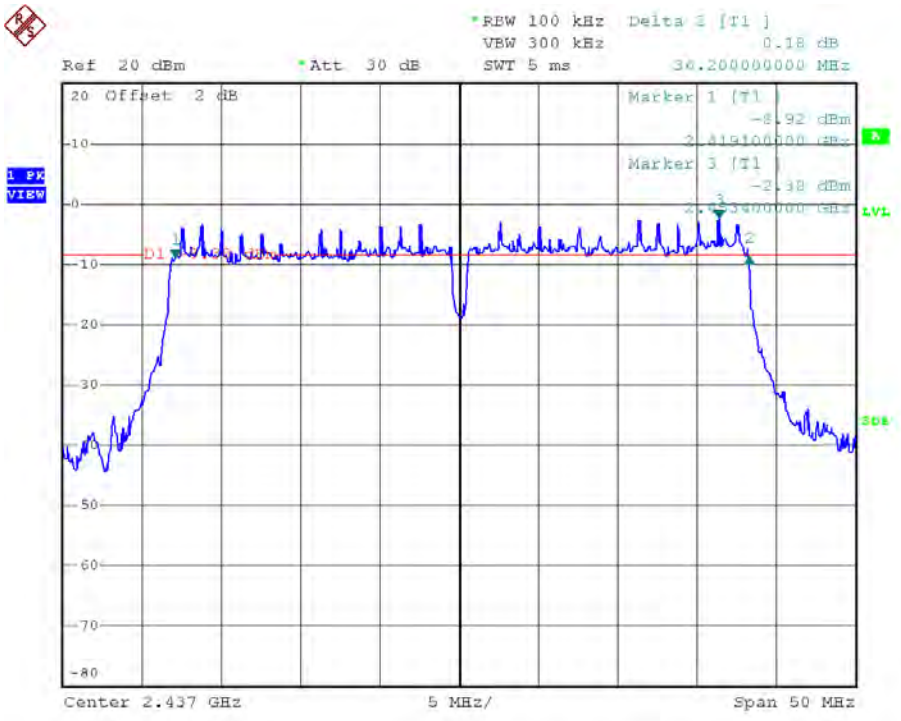


Test Mode: IEEE 802.11n HT40 TX

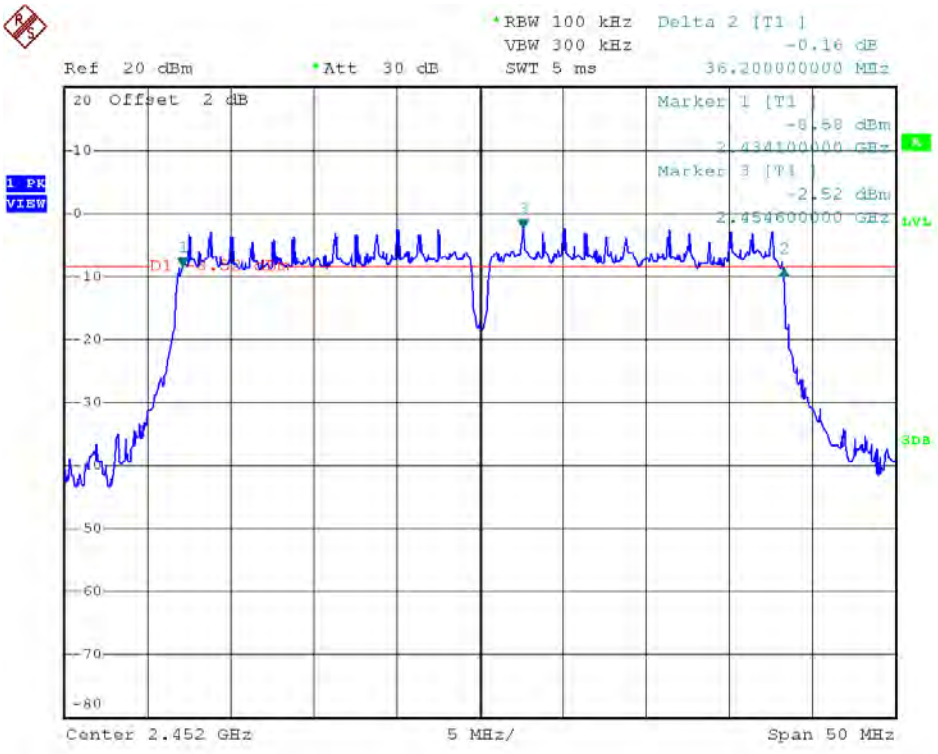
Test CH3: 2422MHz



Test CH6: 2437MHz



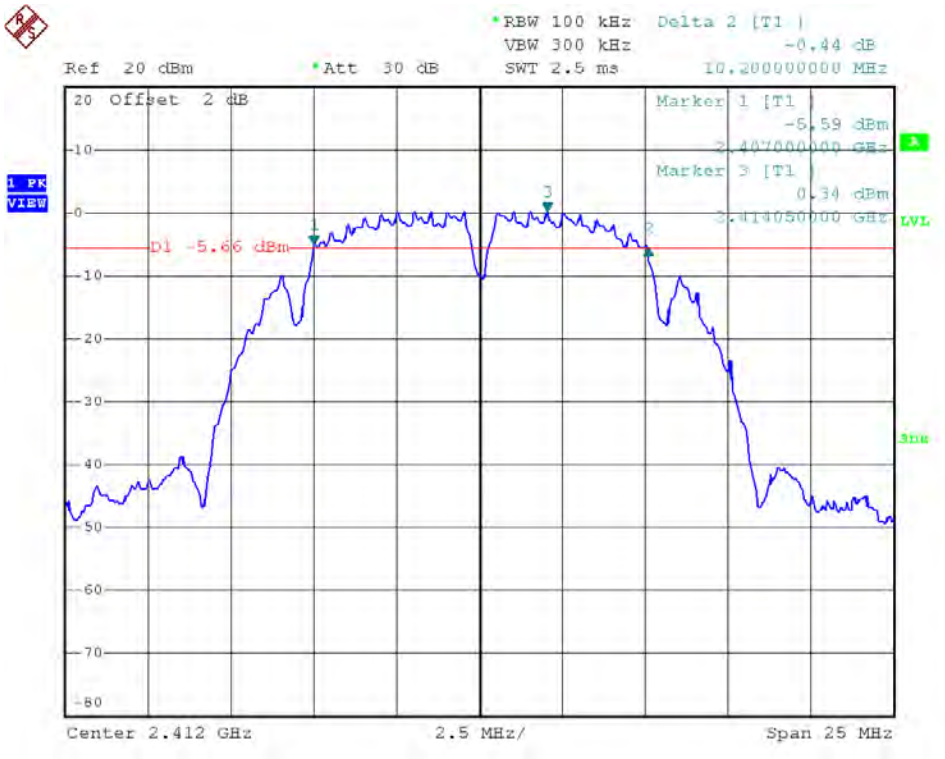
Test CH9: 2452MHz



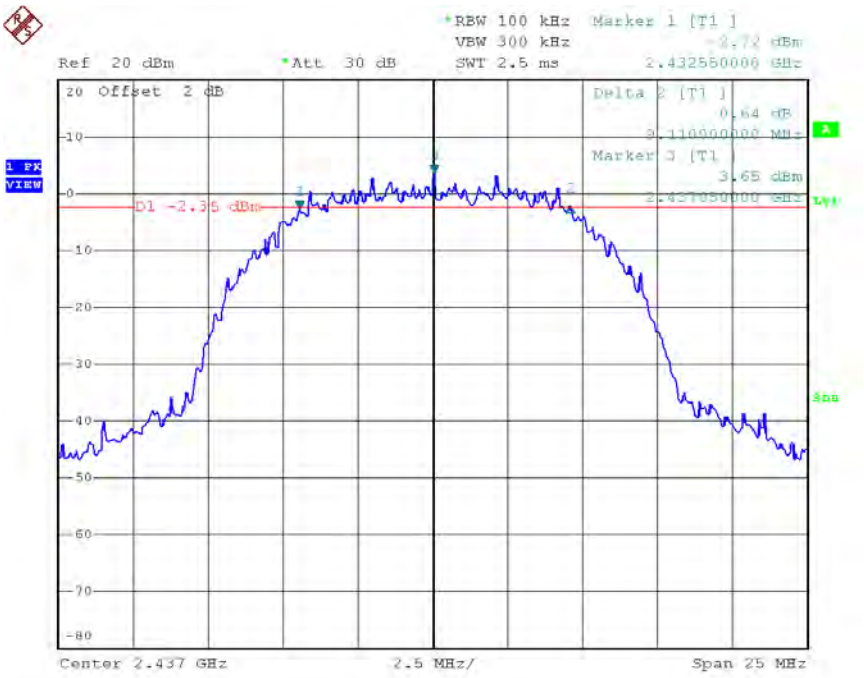
Antenna 2-Test Data

Test Mode: IEEE 802.11b TX

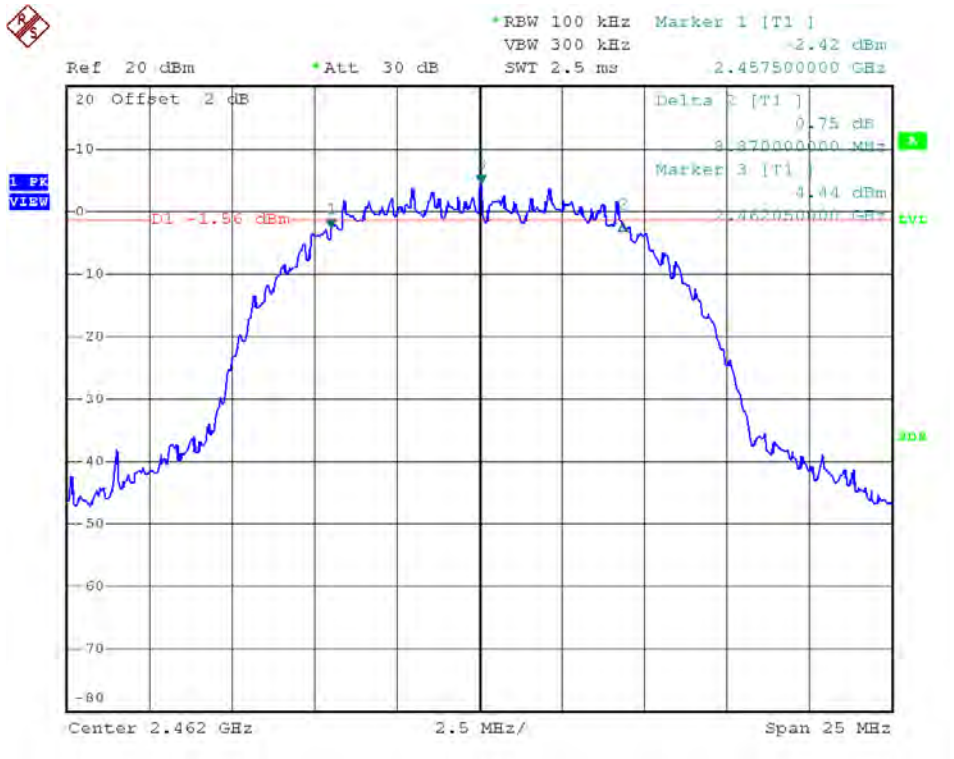
Test CH1: 2412MHz



Test CH6: 2437MHz

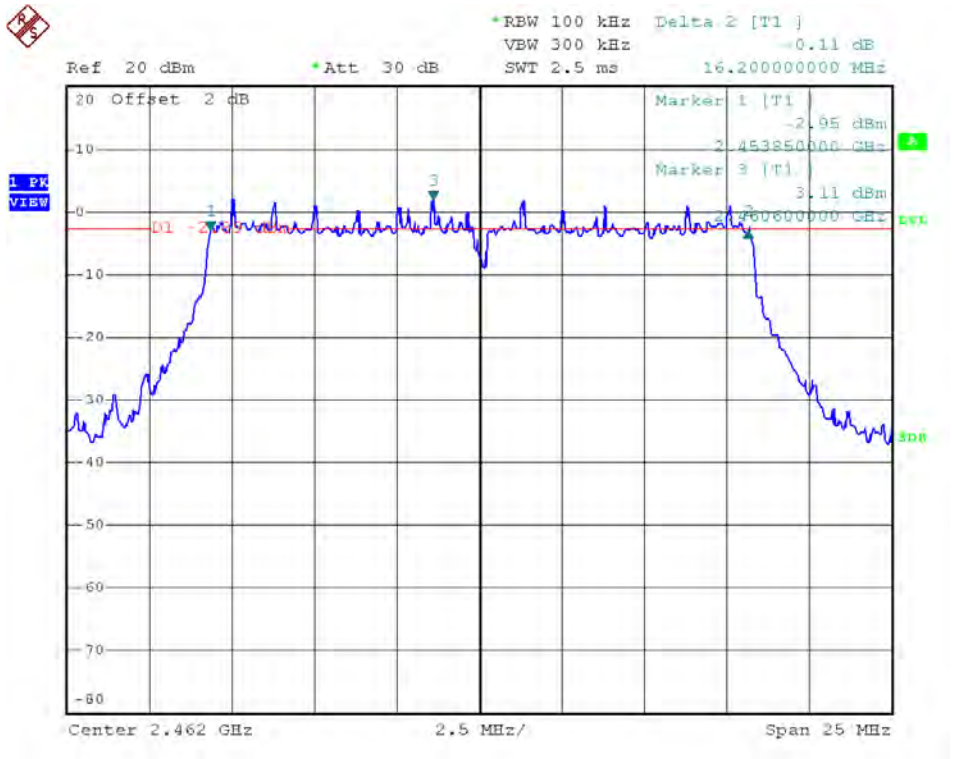


Test CH11: 2462MHz

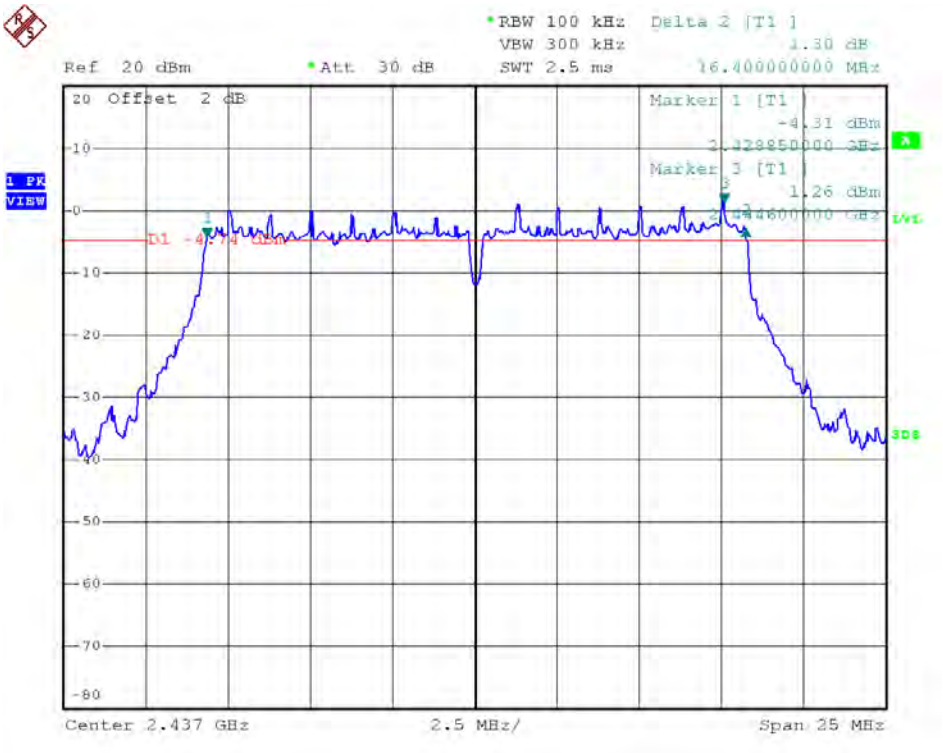


Test Mode: IEEE 802.11g TX

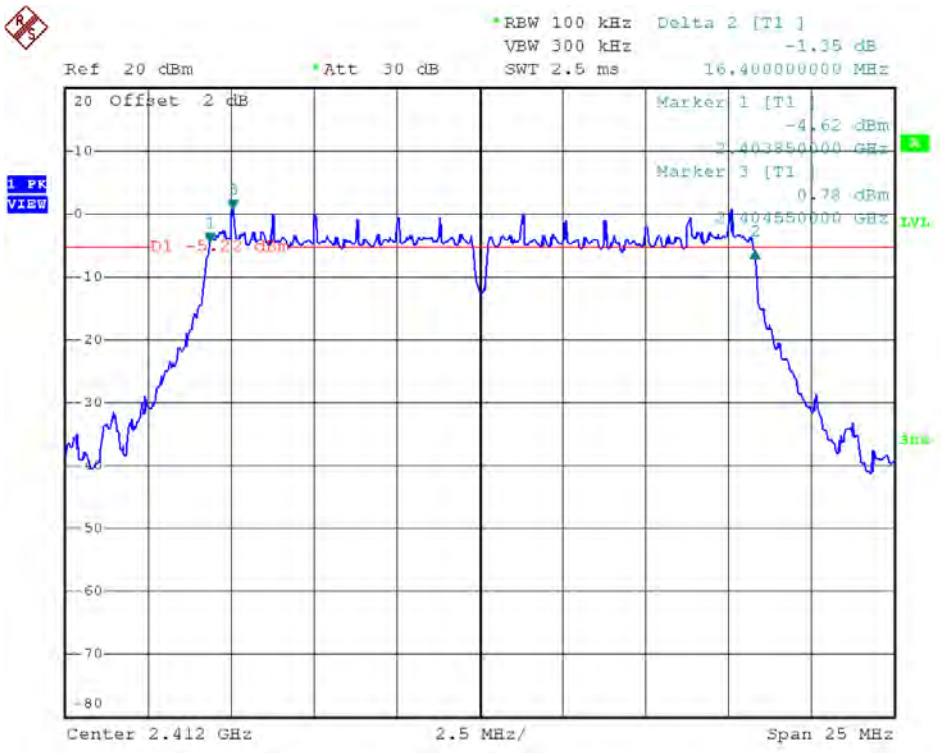
Test CH1: 2412MHz



Test CH6: 2437MHz

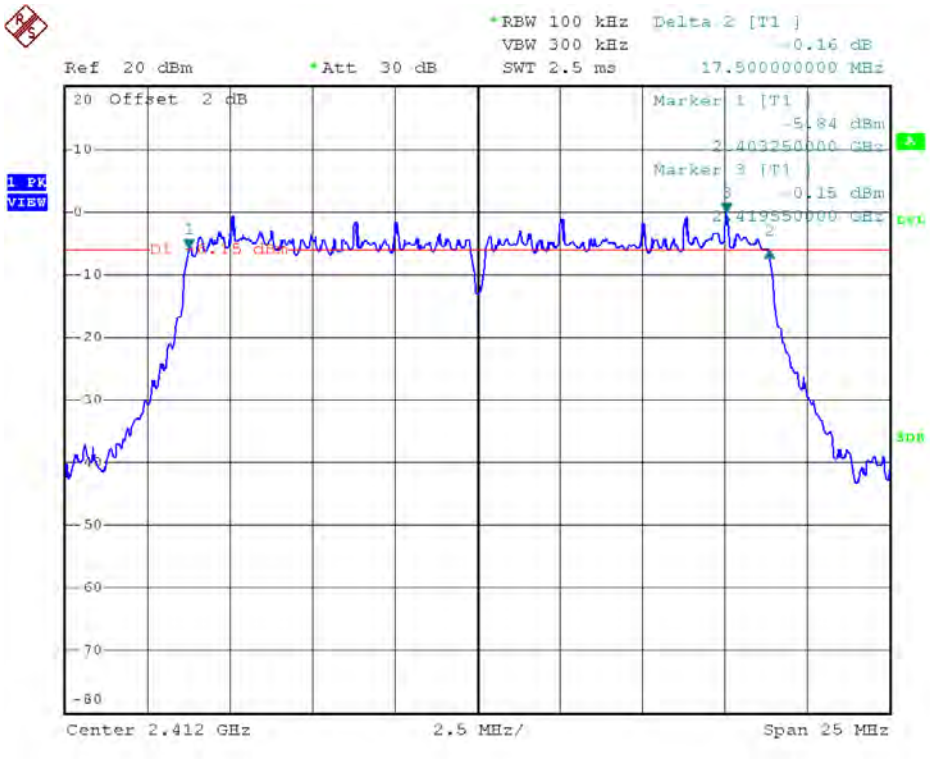


Test CH11: 2462MHz

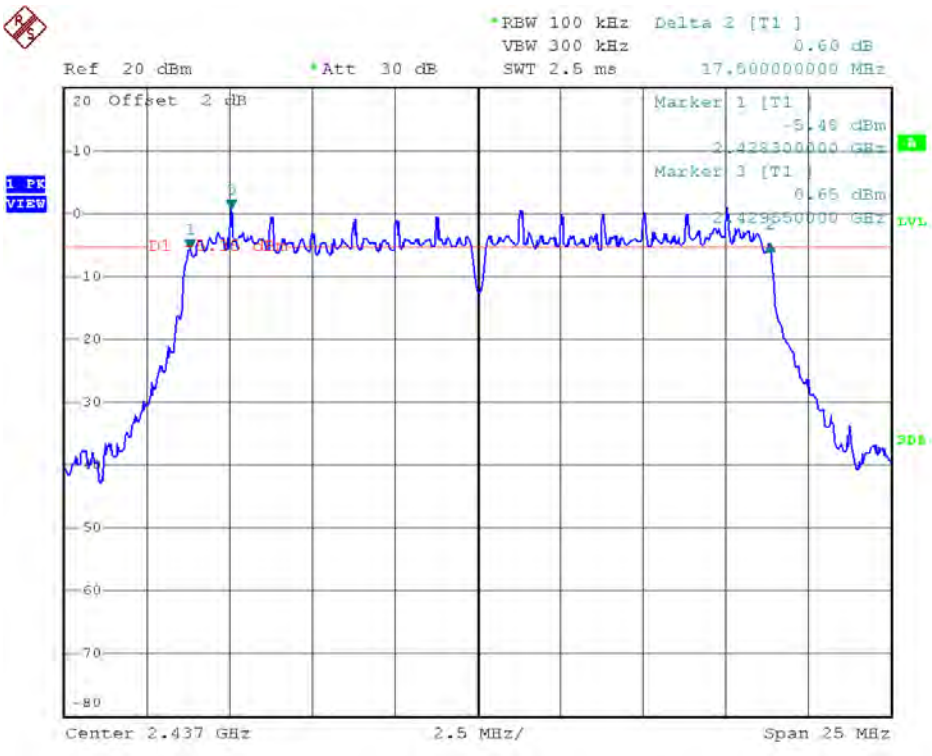


Test Mode: IEEE 802.11n HT20 TX Test

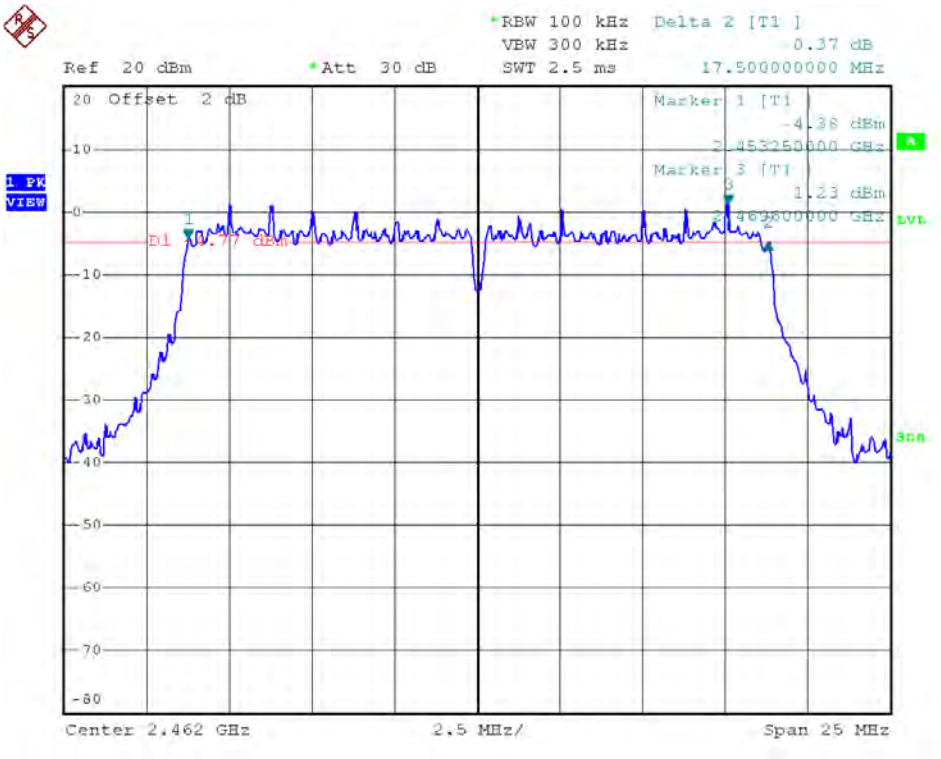
CH1: 2412MHz



Test CH6: 2437MHz

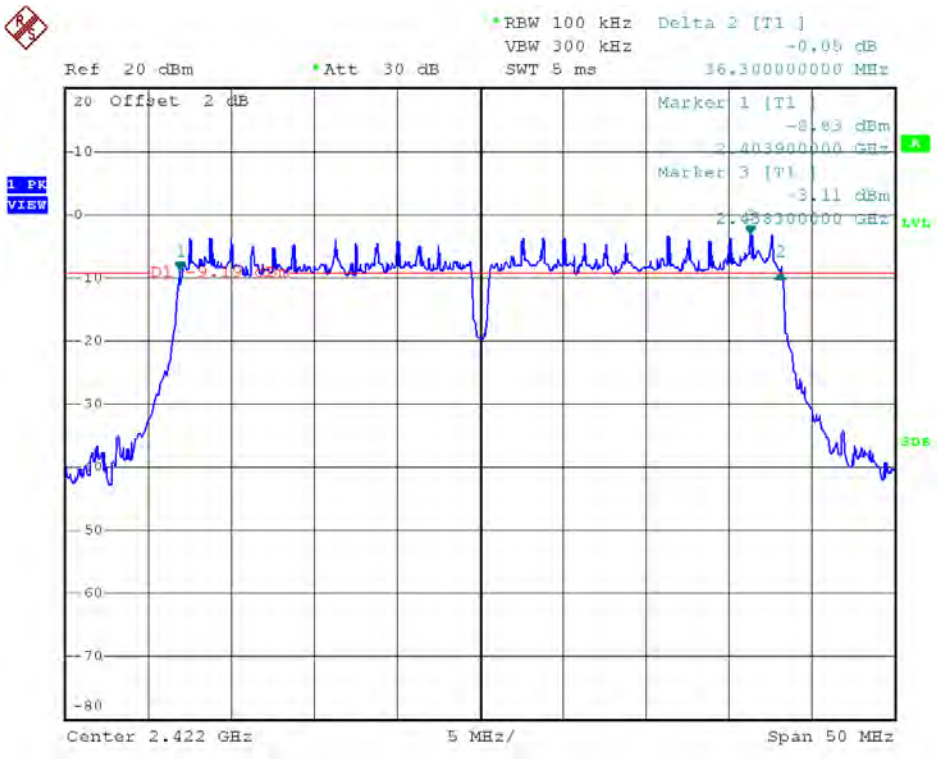


Test CH11: 2462MHz

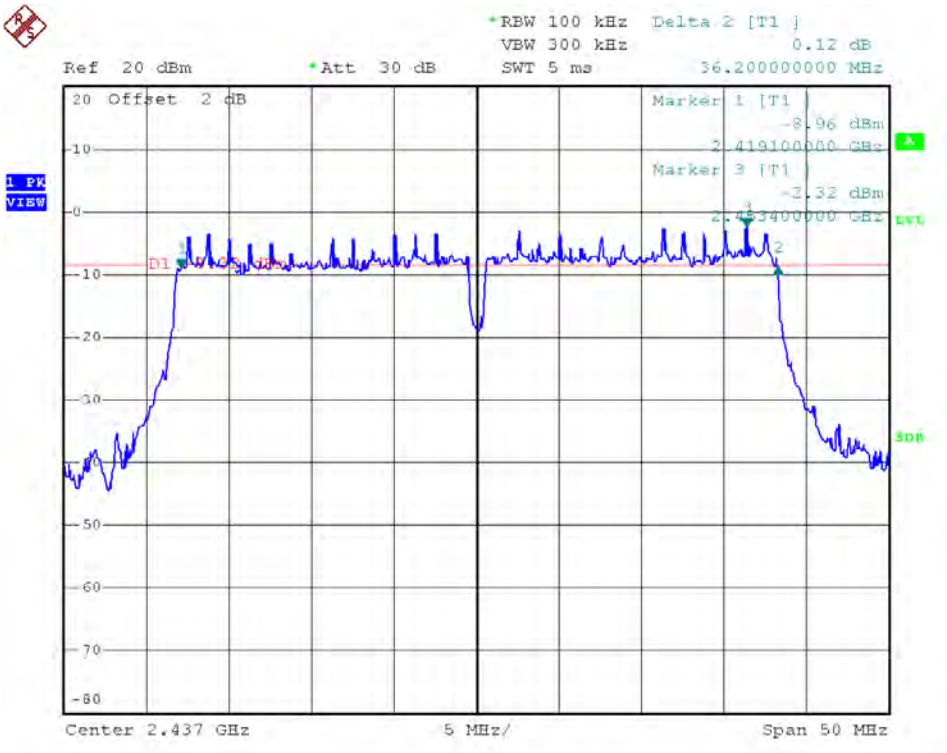


Test Mode: IEEE 802.11n HT40 TX

Test CH3: 2422MHz



Test CH6: 2437MHz



Test CH9: 2452MHz

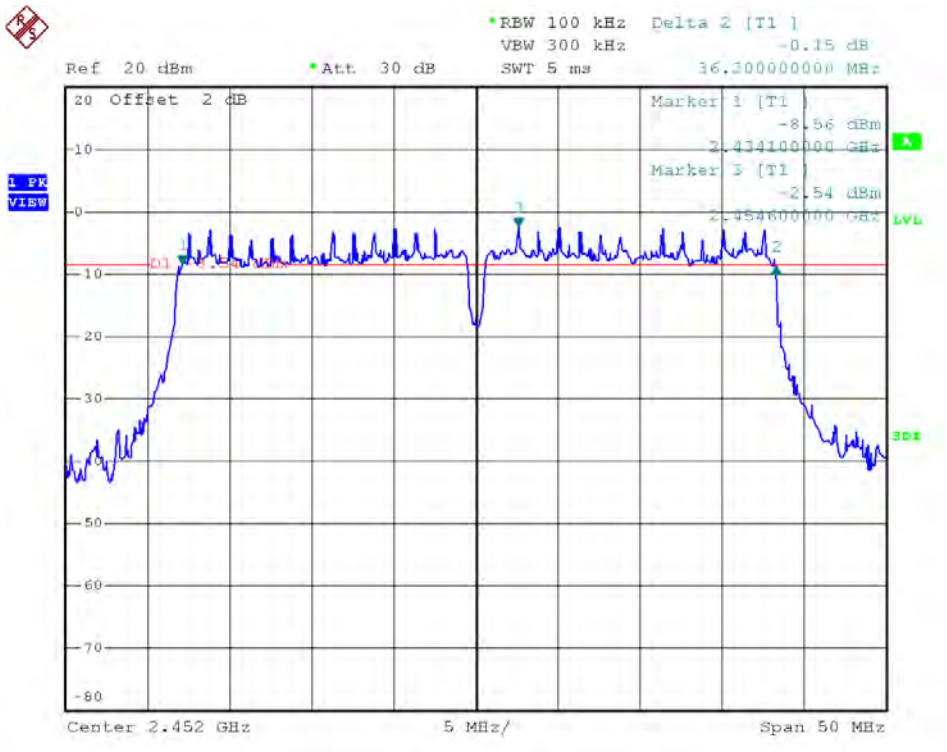


Table 8 Occupied Bandwidth Results

Antenna 1-Test Data

Frequency		Bandwidth	Limit	Pass/Fail
IEEE 802.11b	Channel 1: 2412 MHz	10.10MHz	> 500 kHz	Pass
	Channel 6: 2432 MHz	9.05MHz	> 500 kHz	Pass
	Channel 11: 2462 MHz	9.85MHz	> 500 kHz	Pass
IEEE 802.11g	Channel 1: 2412 MHz	16.45MHz	> 500 kHz	Pass
	Channel 6: 2432 MHz	16.40MHz	> 500 kHz	Pass
	Channel 11: 2462 MHz	16.30MHz	> 500 kHz	Pass
IEEE 802.11n HT20	Channel 1: 2412 MHz	17.60MHz	> 500 kHz	Pass
	Channel 6: 2432 MHz	17.55 MHz	> 500 kHz	Pass
	Channel 11: 2462 MHz	17.55 MHz	> 500 kHz	Pass
IEEE 802.11n HT40	Channel 3: 2422 MHz	36.20MHz	> 500 kHz	Pass
	Channel 6: 2437 MHz	36.20MHz	> 500 kHz	Pass
	Channel 9: 2452 MHz	36.20MHz	> 500 kHz	Pass

Antenna 2-Test Data

Frequency		Bandwidth	Limit	Pass/Fail
IEEE 802.11b	Channel 1: 2412 MHz	10.20MHz	> 500 kHz	Pass
	Channel 6: 2432 MHz	9.11MHz	> 500 kHz	Pass
	Channel 11: 2462 MHz	8.87MHz	> 500 kHz	Pass
IEEE 802.11g	Channel 1: 2412 MHz	16.2MHz	> 500 kHz	Pass
	Channel 6: 2432 MHz	16.4MHz	> 500 kHz	Pass
	Channel 11: 2462 MHz	16.4MHz	> 500 kHz	Pass
IEEE 802.11n HT20	Channel 1: 2412 MHz	17.5MHz	> 500 kHz	Pass
	Channel 6: 2432 MHz	17.5MHz	> 500 kHz	Pass
	Channel 11: 2462 MHz	17.5MHz	> 500 kHz	Pass
IEEE 802.11n HT40	Channel 3: 2422 MHz	36.3MHz	> 500 kHz	Pass
	Channel 6: 2437 MHz	36.2MHz	> 500 kHz	Pass
	Channel 9: 2452 MHz	36.2MHz	> 500 kHz	Pass

4.4 Conducted spurious emission (FCC Part §15.247(d)

4.4.1 Limit

In any 100kHz bandwidth outside the frequency bands in which the spread spectrum intentional radiator in 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.

4.4.2 Test Procedure

The transmitter output was connected to a spectrum analyzer, The resolution bandwidth is set to 100 kHz, The video bandwidth is set to 300 kHz and measure all the emissions detected.

See the plots of conducted emissions plots below.

4.4.3 Test Data

The EUT complied with the FCC Part 15.247 Spurious Emissions at Antenna Terminals requirements.

Table 9 provides the test results for Spurious Emissions at Antenna Terminals.（all the data attached was use the worst case data rate as in table 6）

4.4.4 Areas of Concern

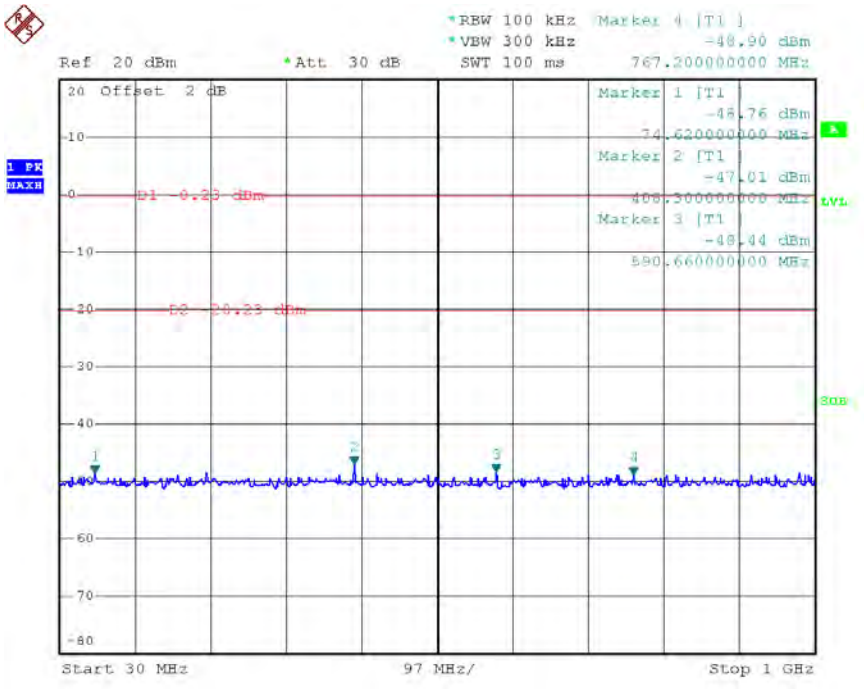
None.

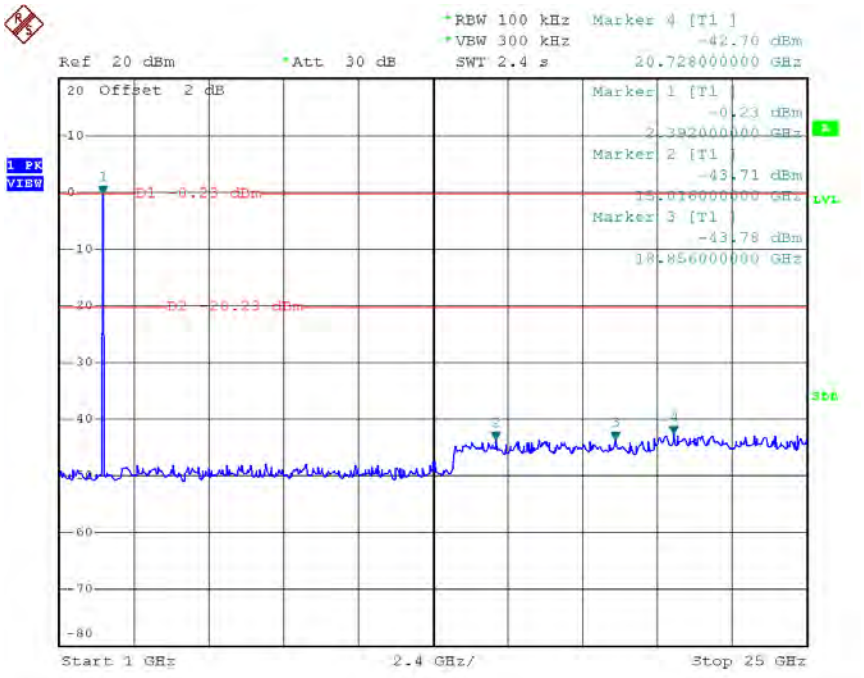
Table 9: Spurious Emissions at Antenna Terminals Results

Antenna 1 Test Data:

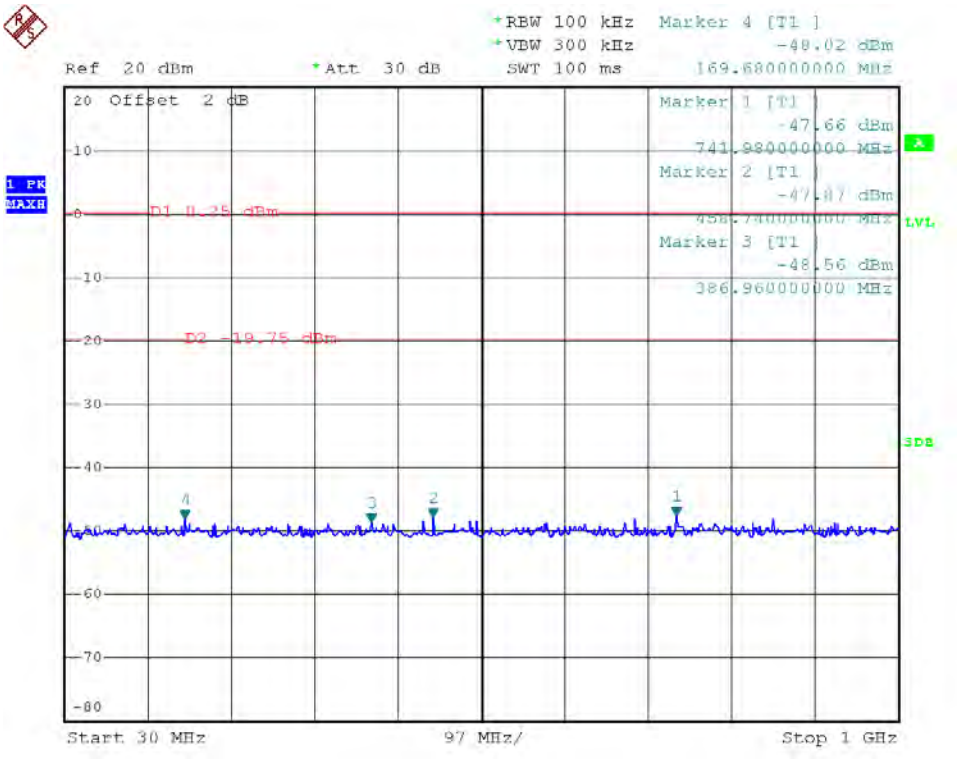
Test Mode: IEEE 802.11b TX

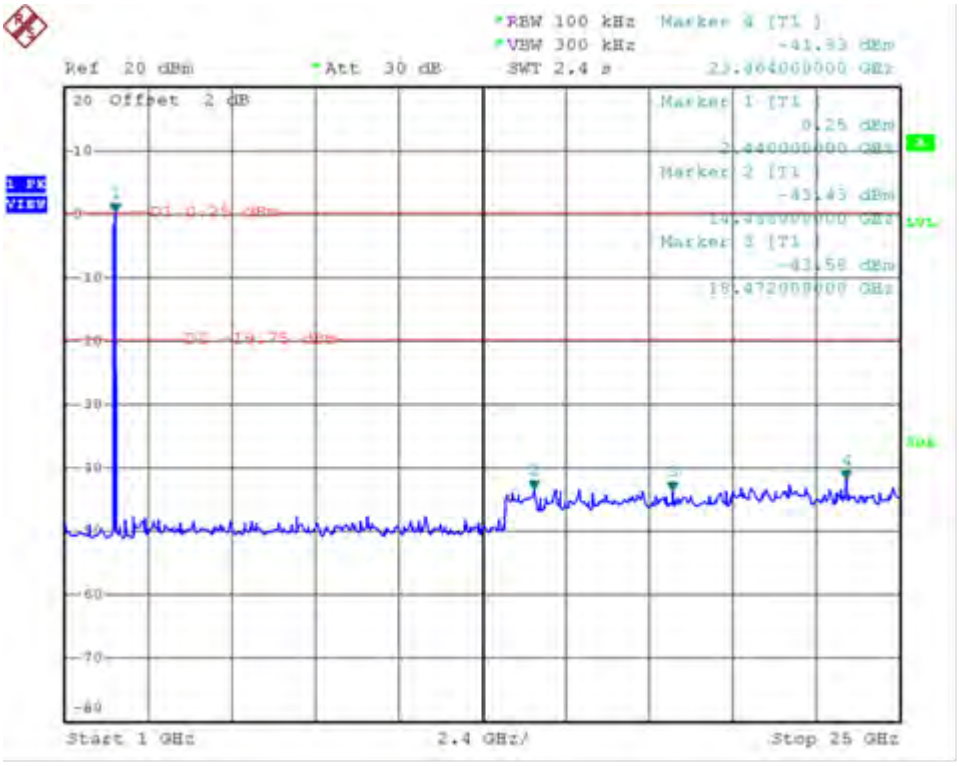
Test CH1: 2412MHz



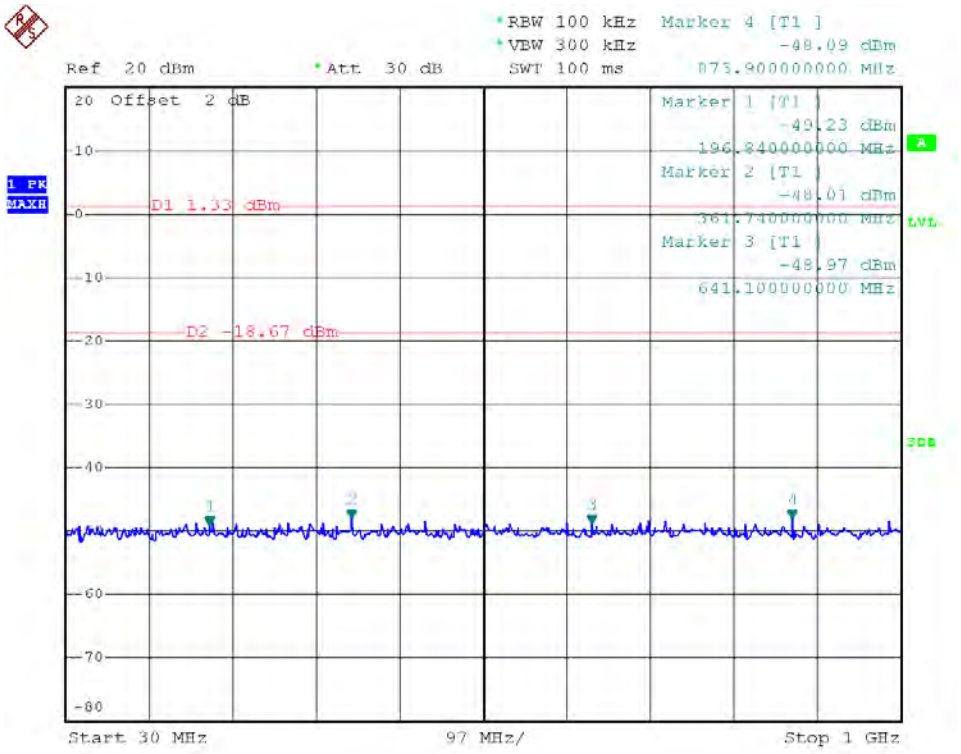


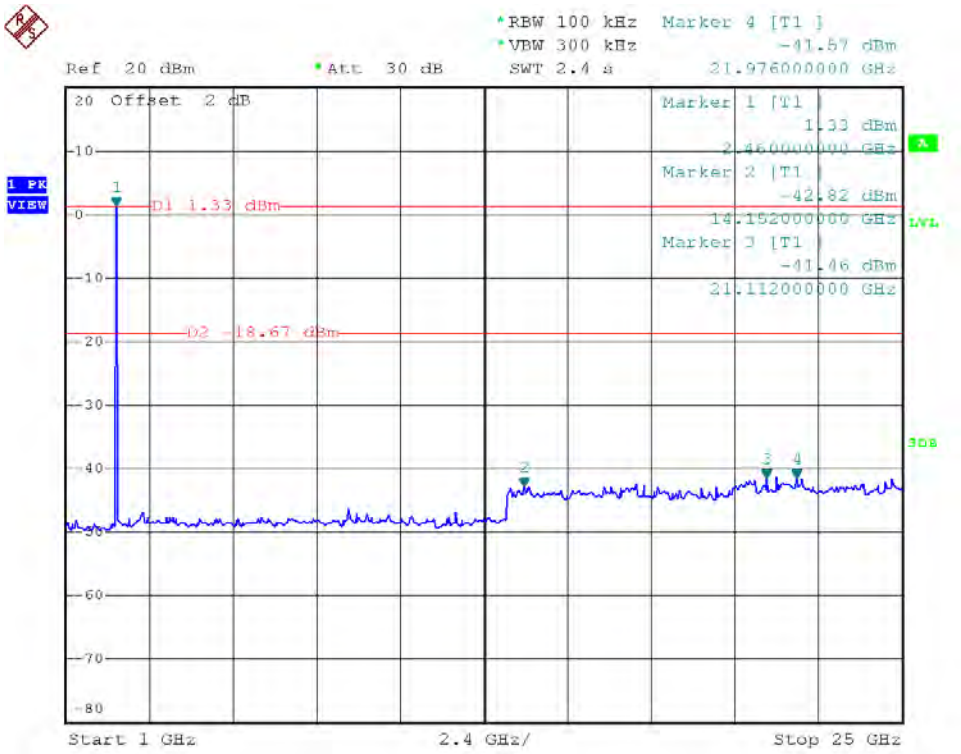
Test CH6: 2437MHz



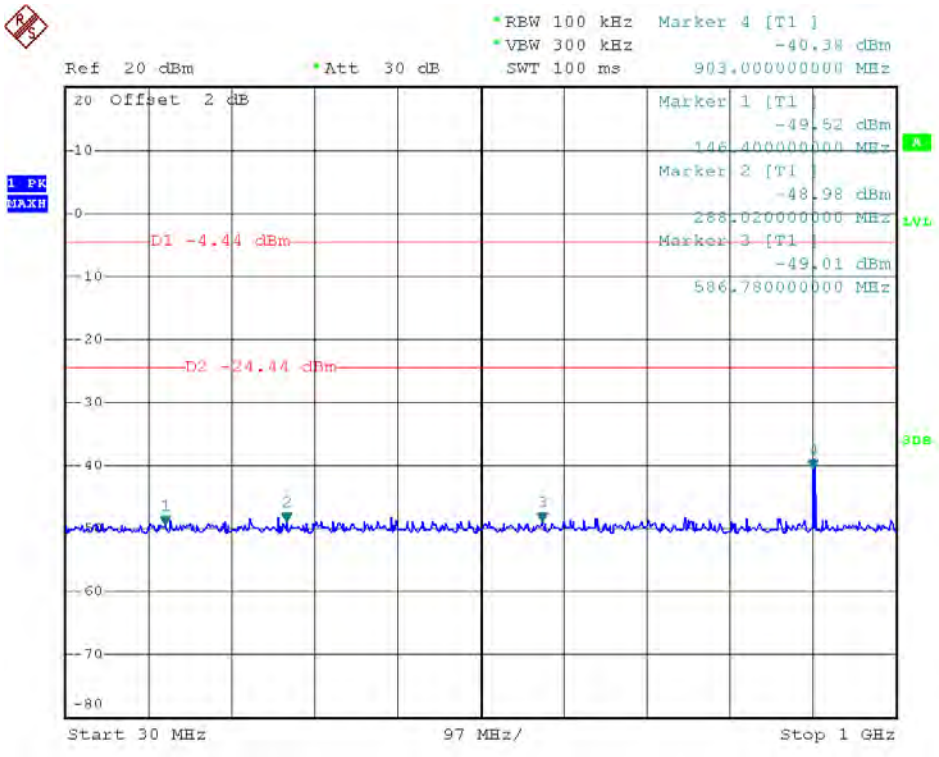


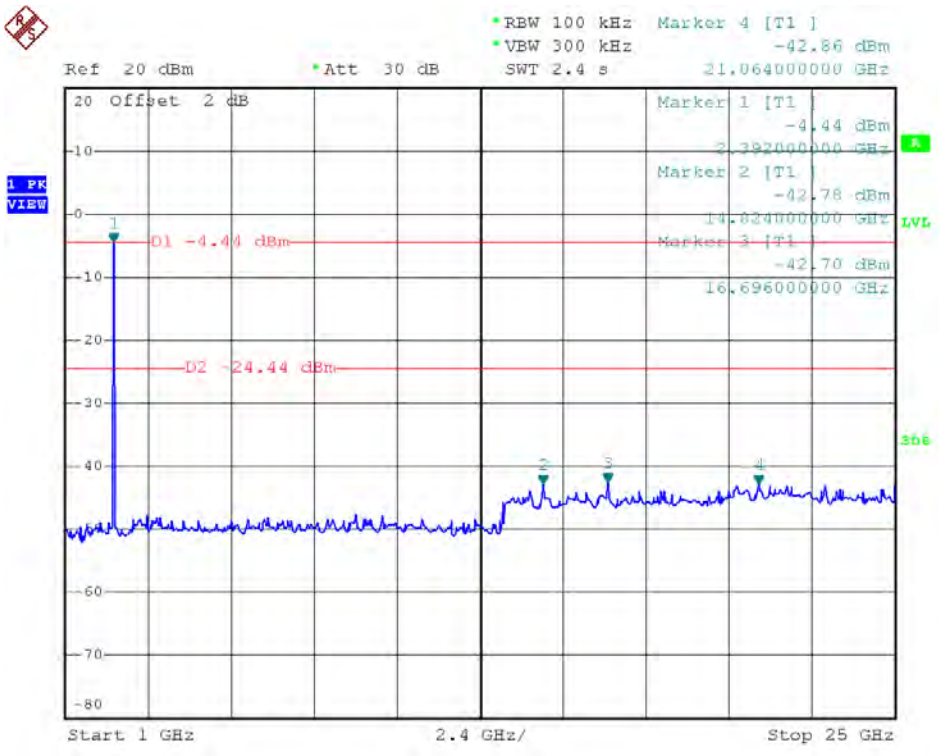
Test CH11: 2462MHz



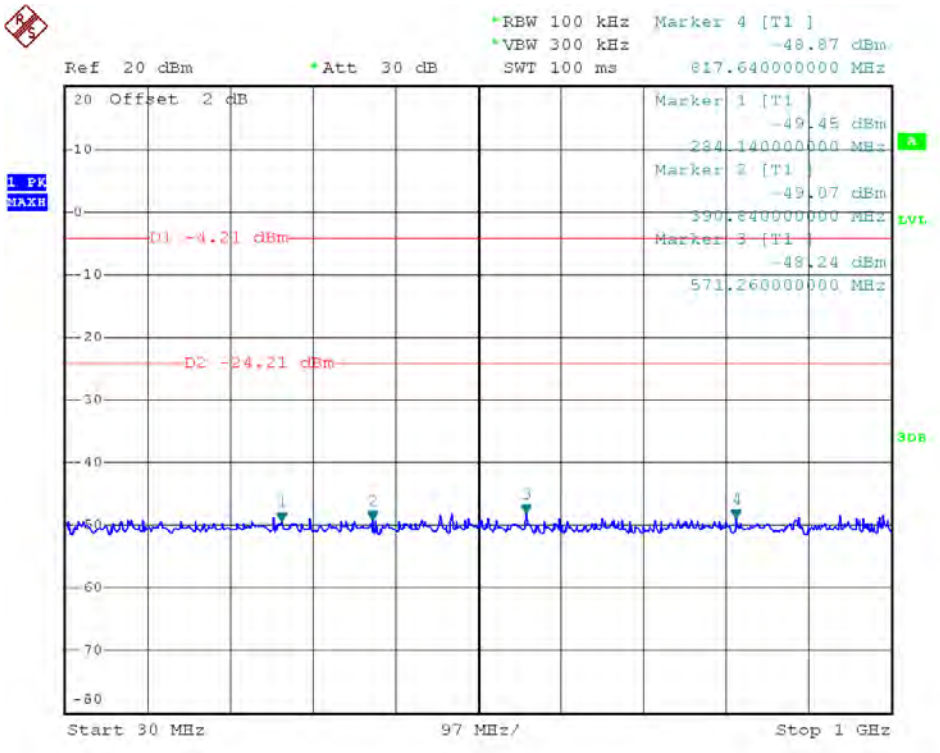


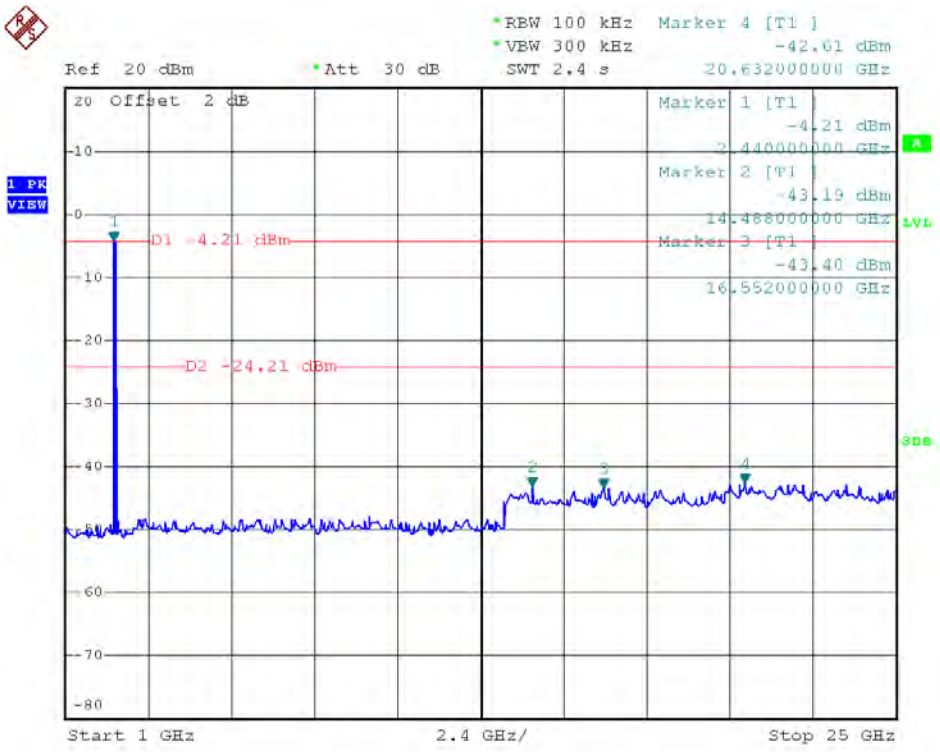
Test Mode: IEEE 802.11g TX Test CH1: 2412MHz



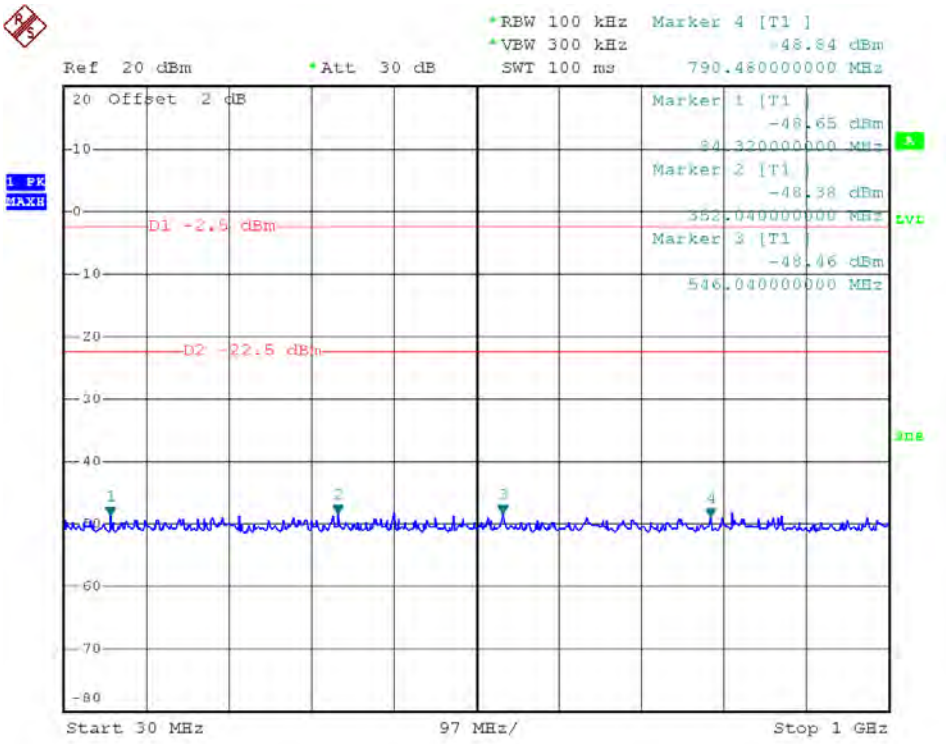


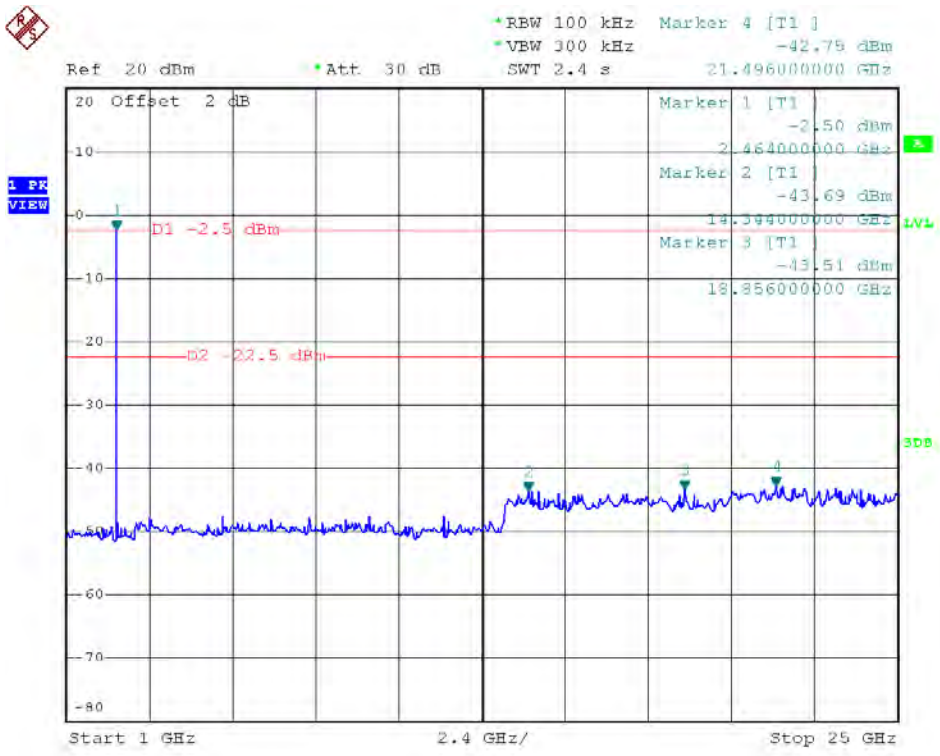
Test CH6: 2437MHz





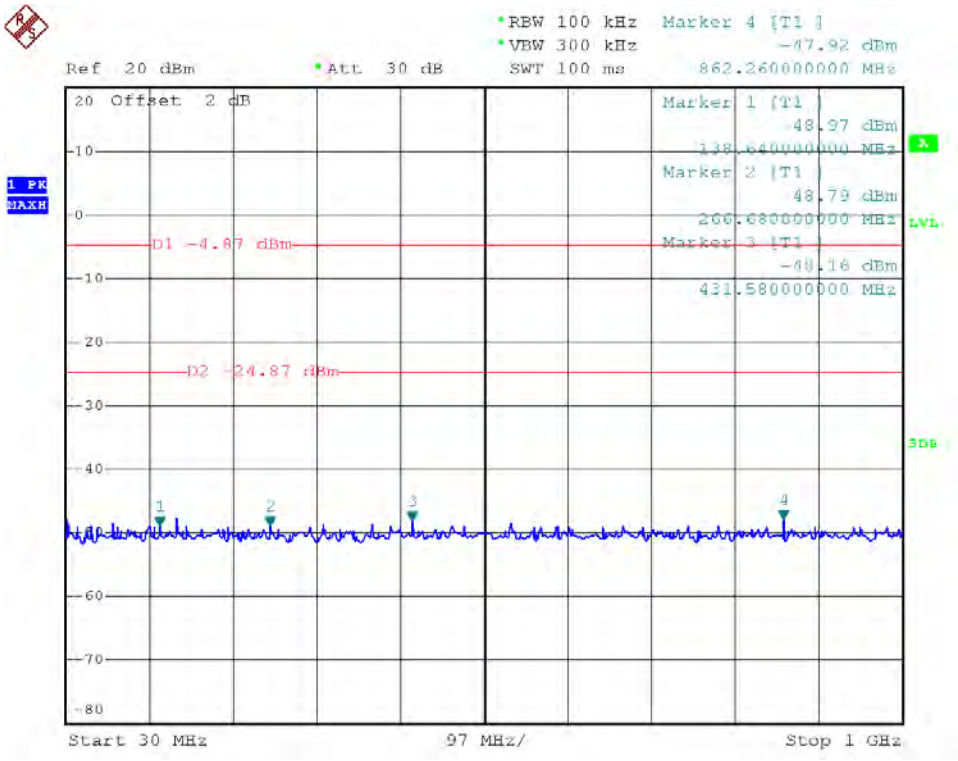
Test CH11: 2462MHz

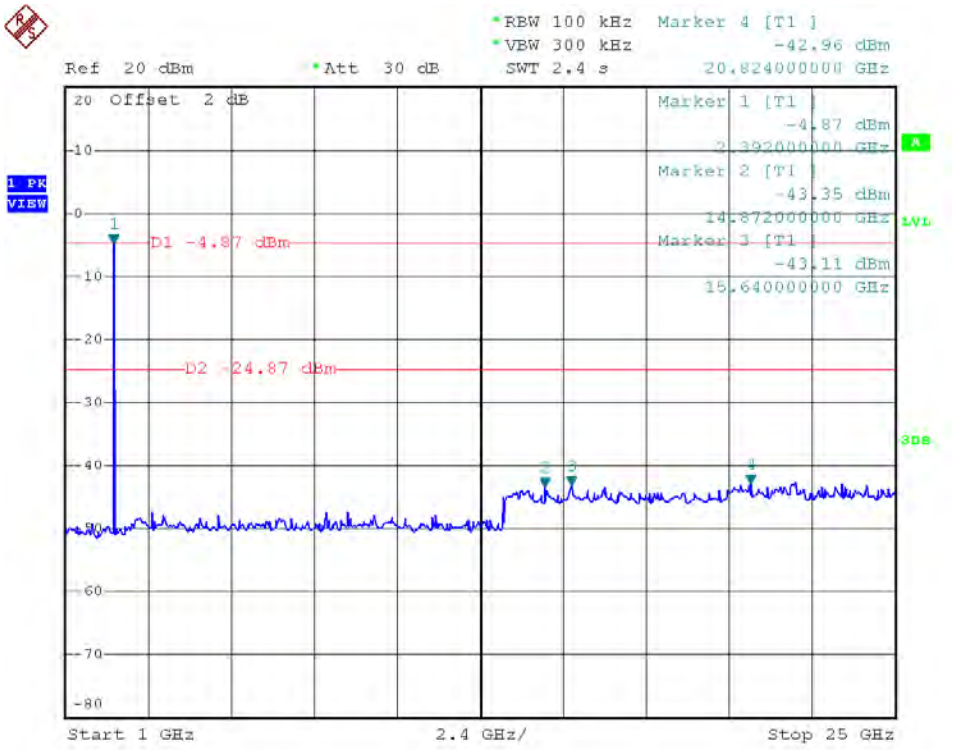




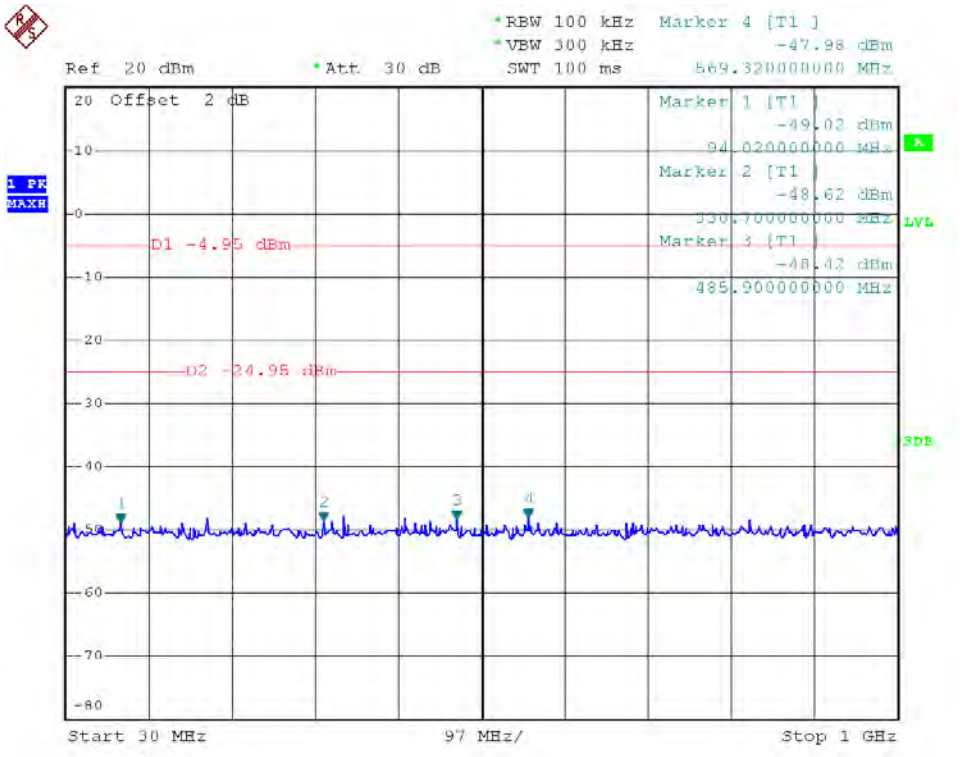
Test Mode: IEEE 802.11n HT20 TX

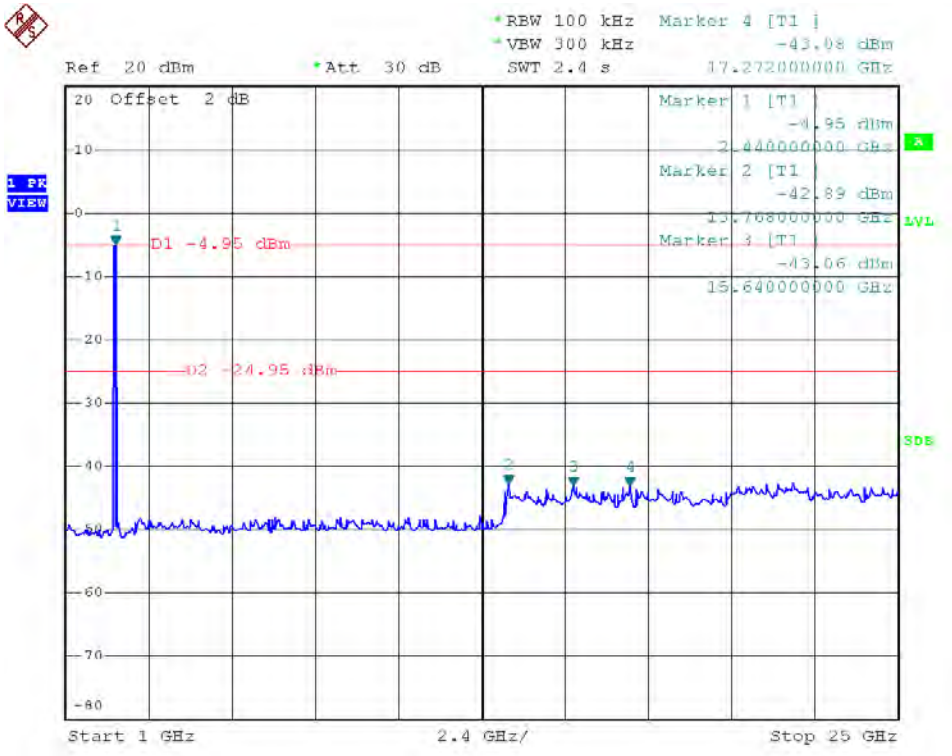
Test CH1: 2412MHz



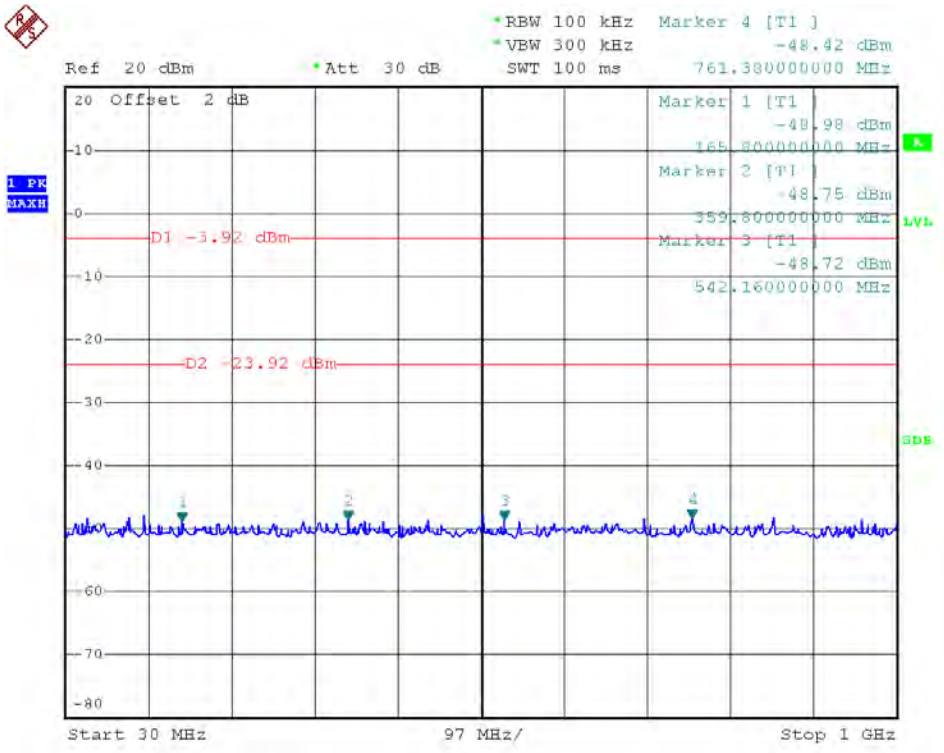


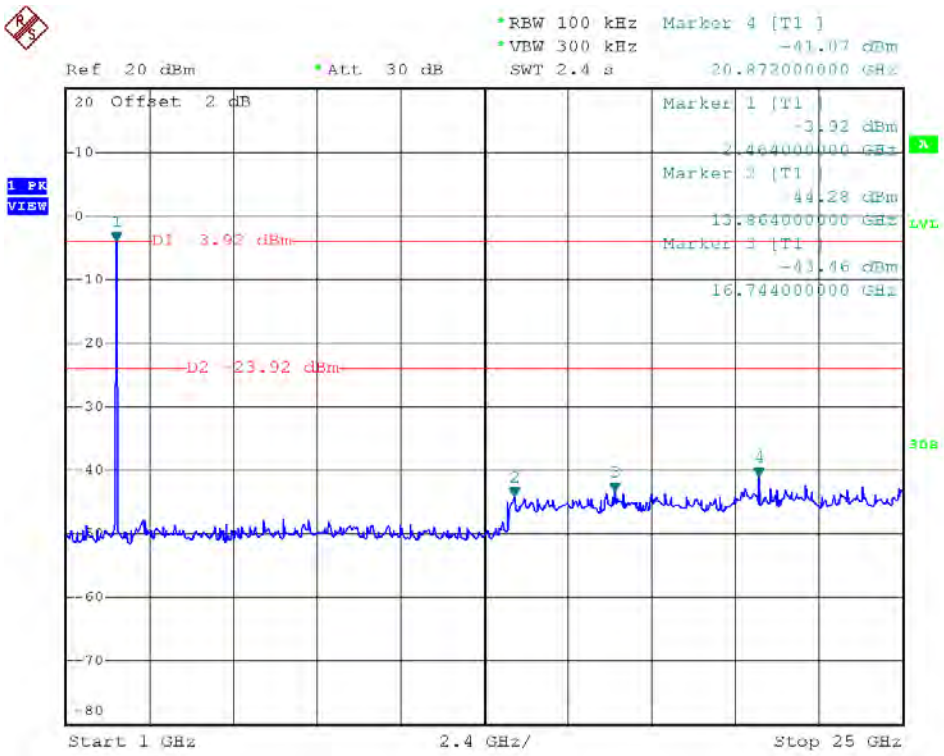
Test CH6: 2437MHz





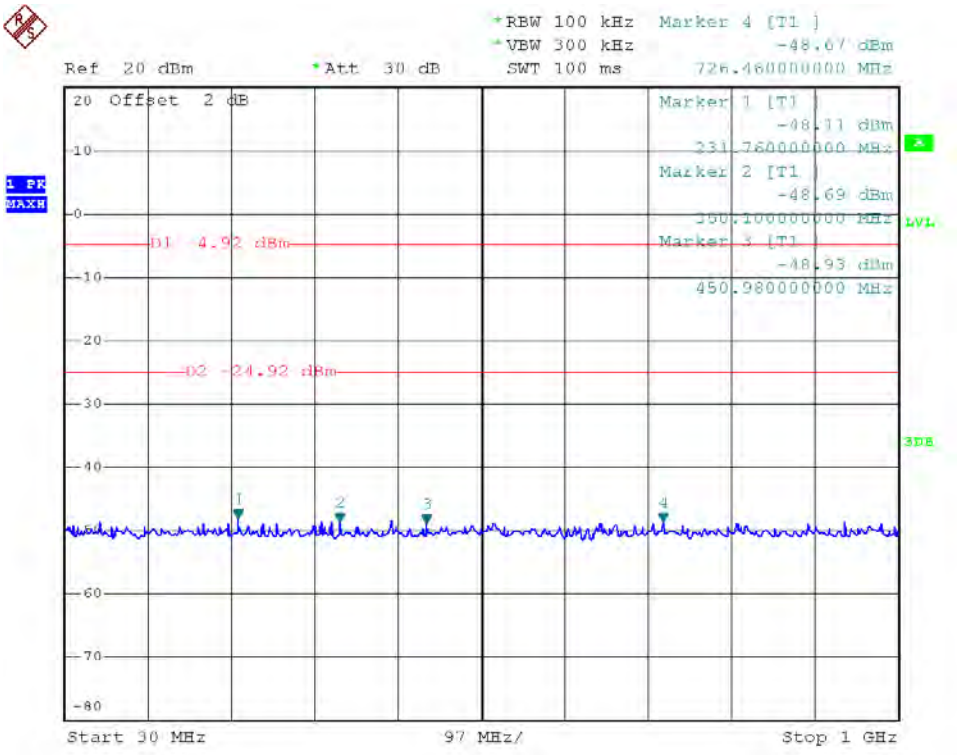
Test CH11: 2462MHz

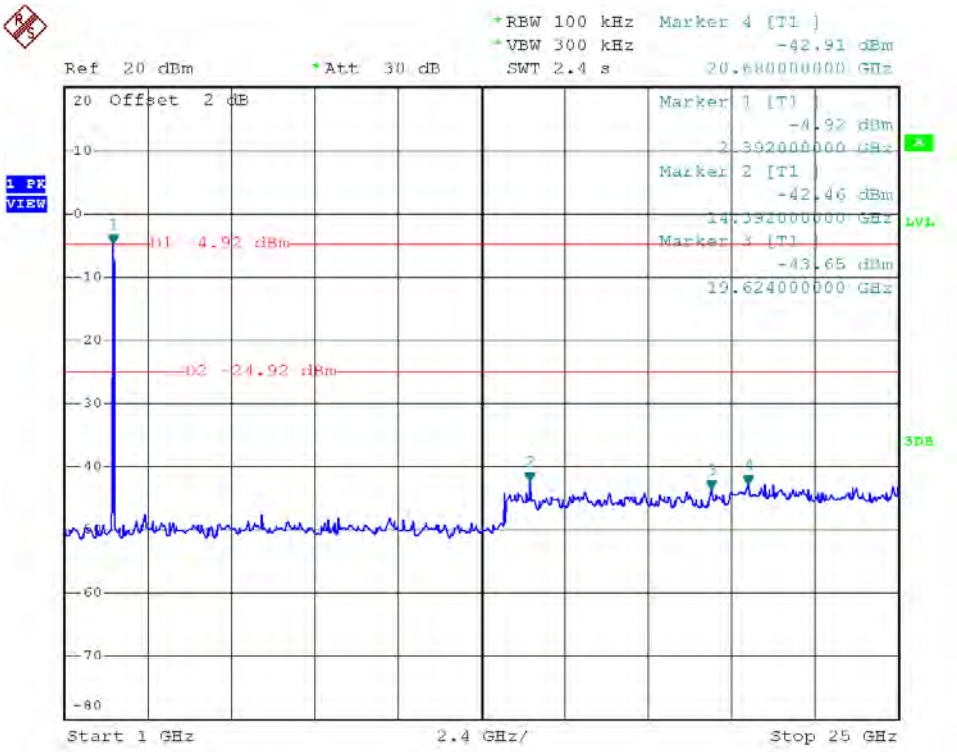




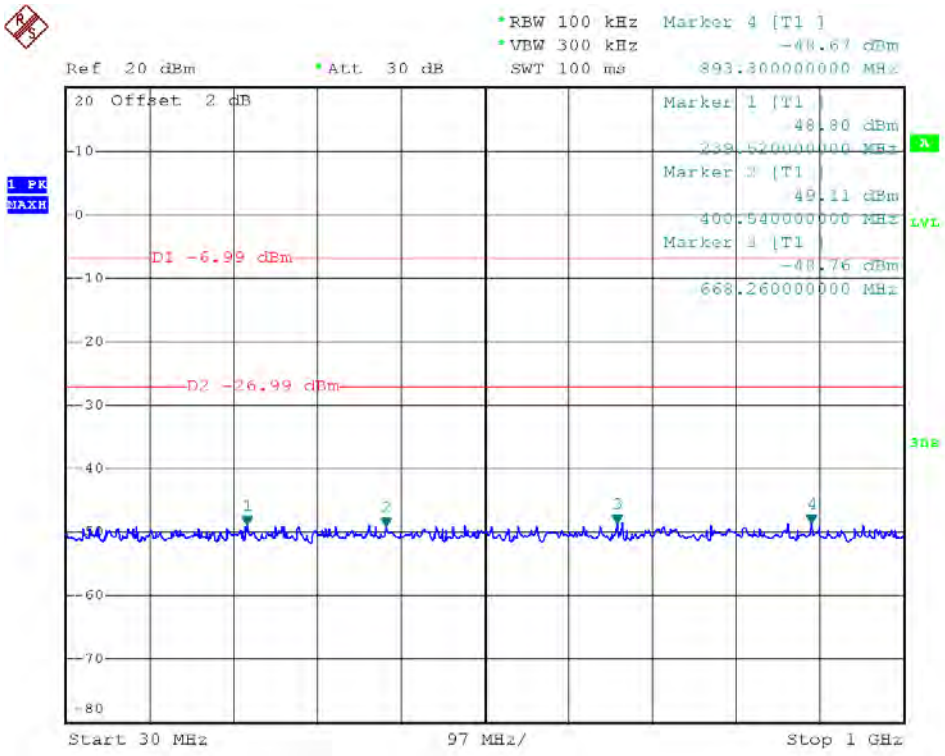
Test Mode: IEEE 802.11n HT 40TX

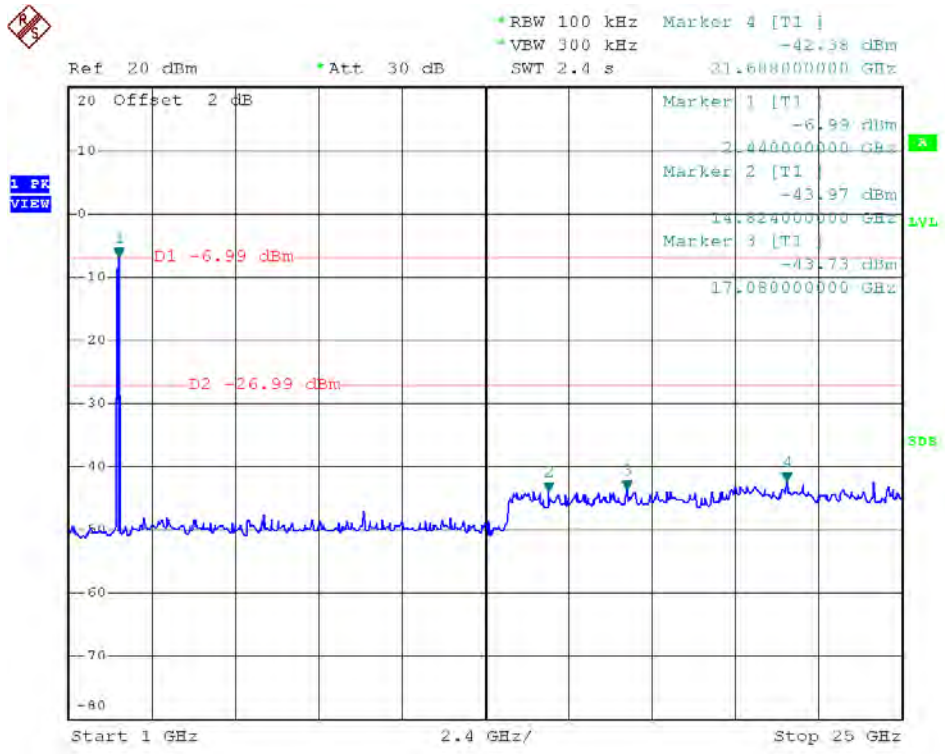
Test CH3: 2422 MHz



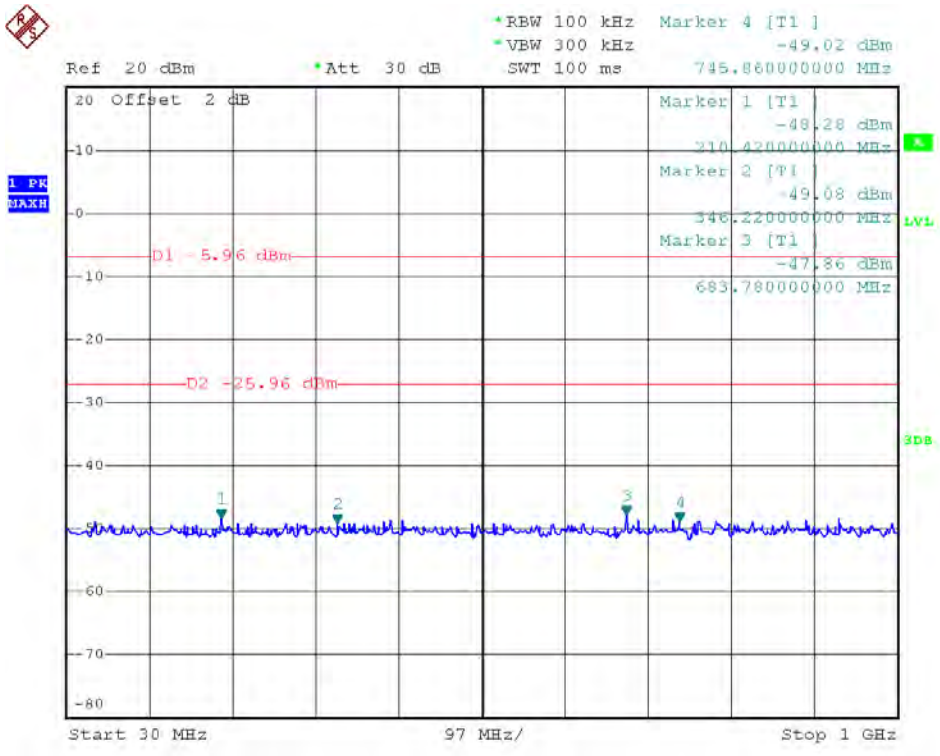


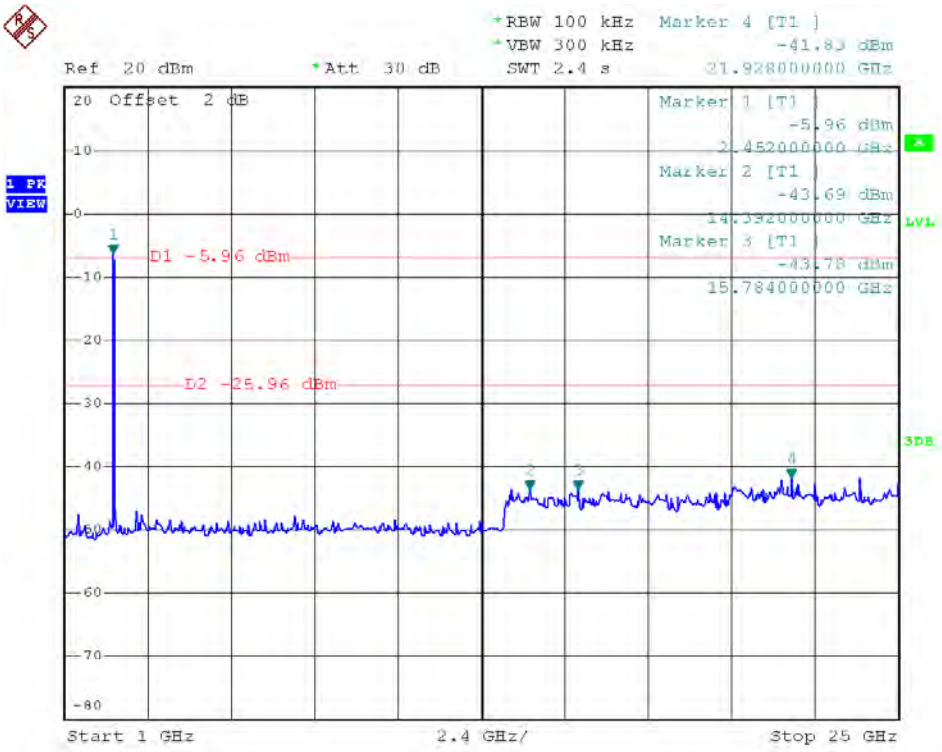
Test CH6: 2437 MHz





Test CH9: 2452 MHz

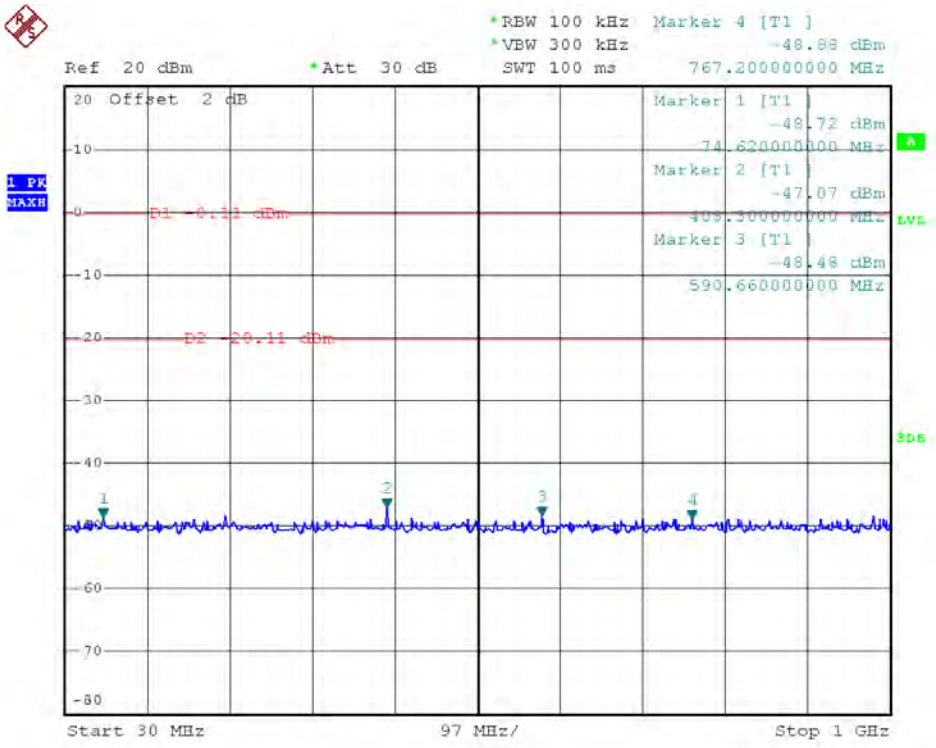


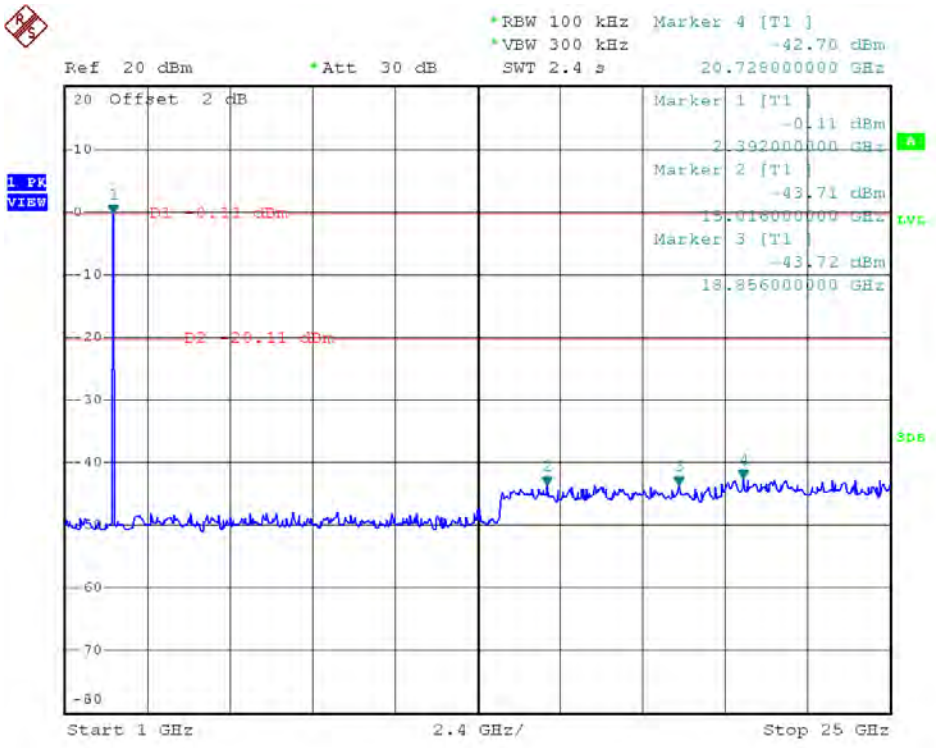


Antenna 2 Test Data:

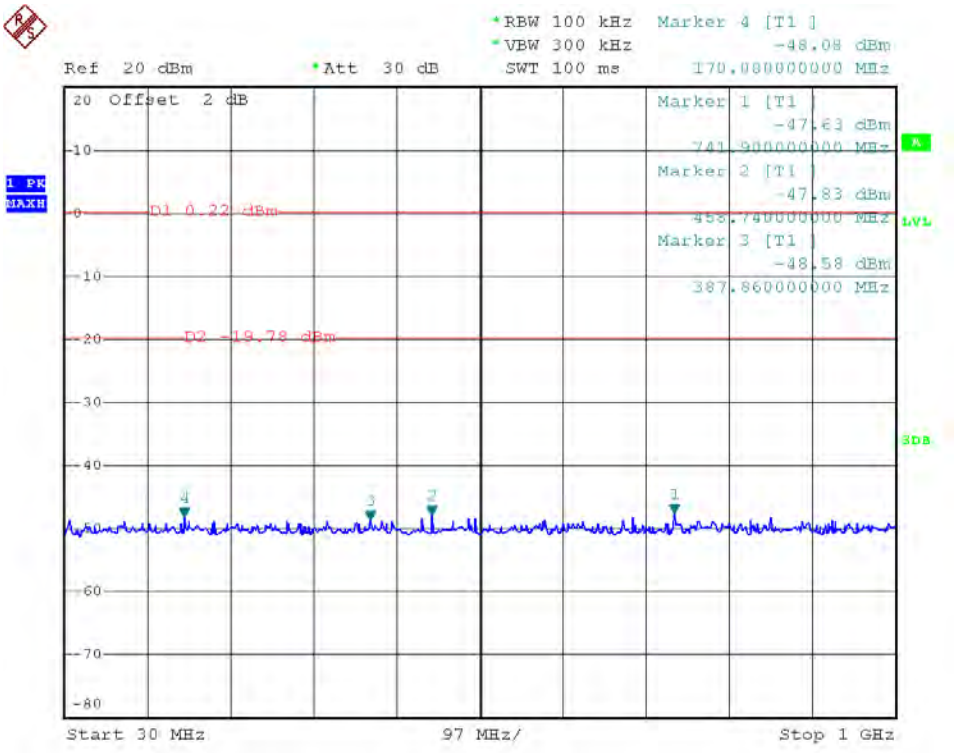
Test Mode: IEEE 802.11b TX

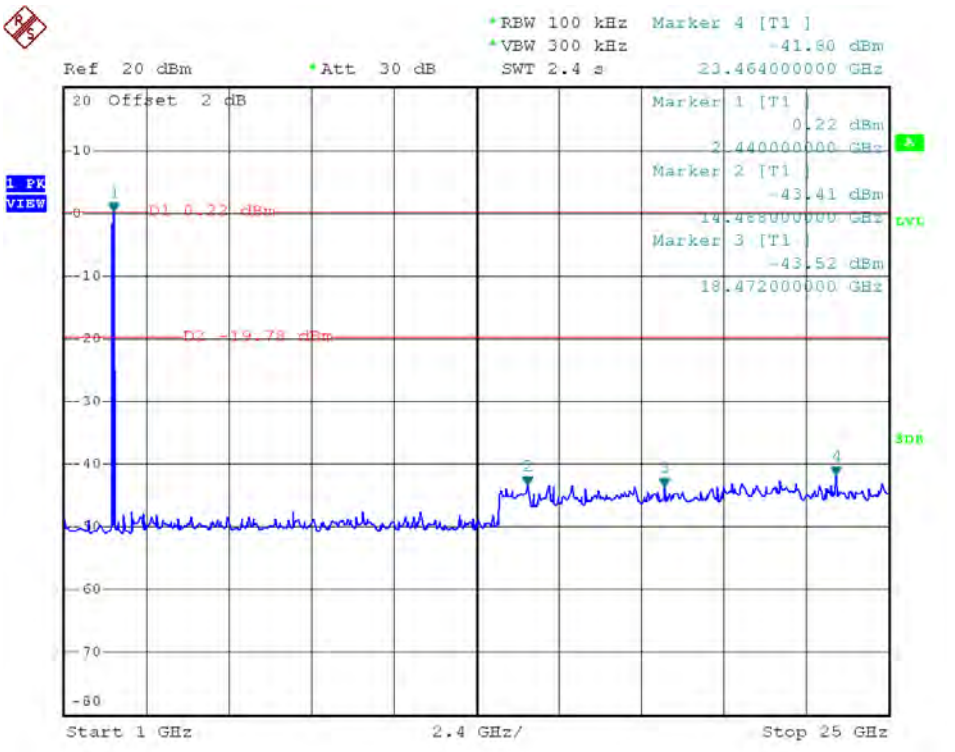
Test CH1: 2412MHz



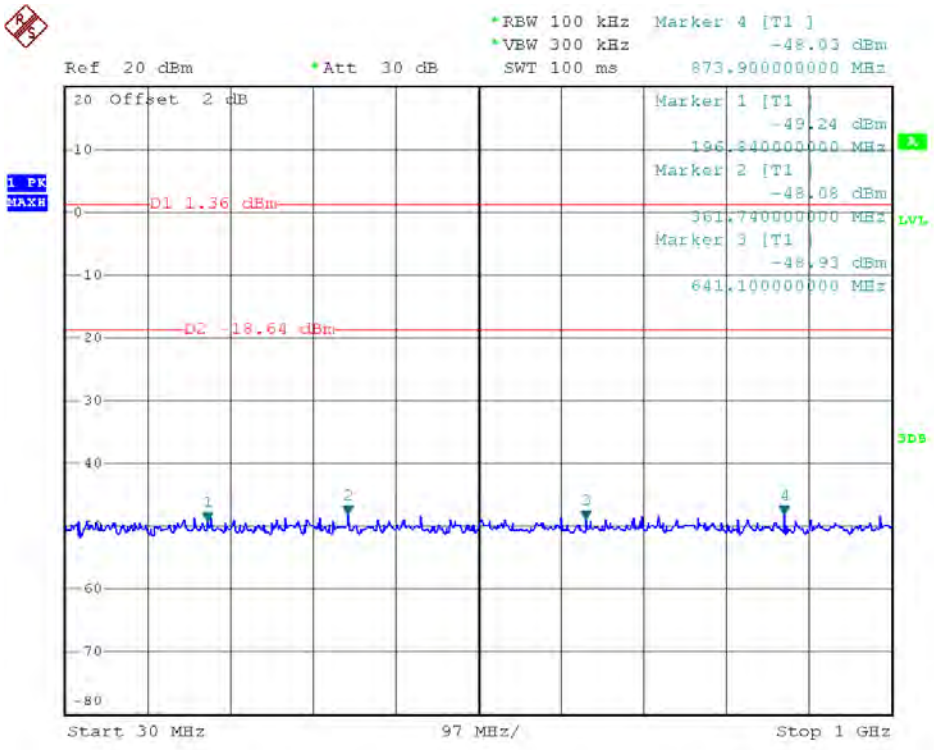


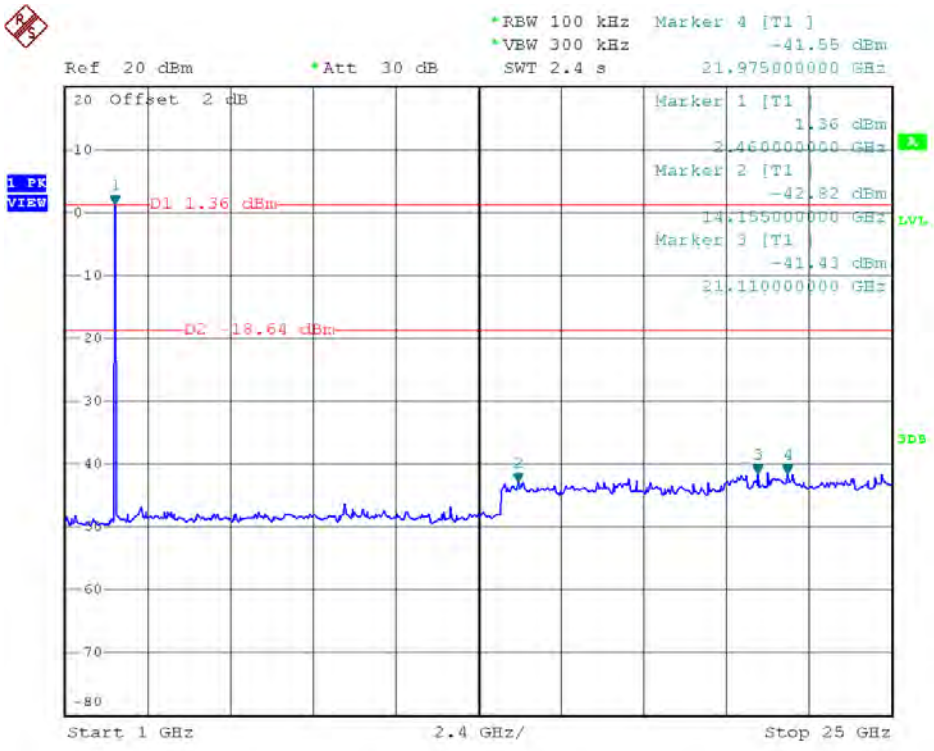
Test CH6: 2437MHz



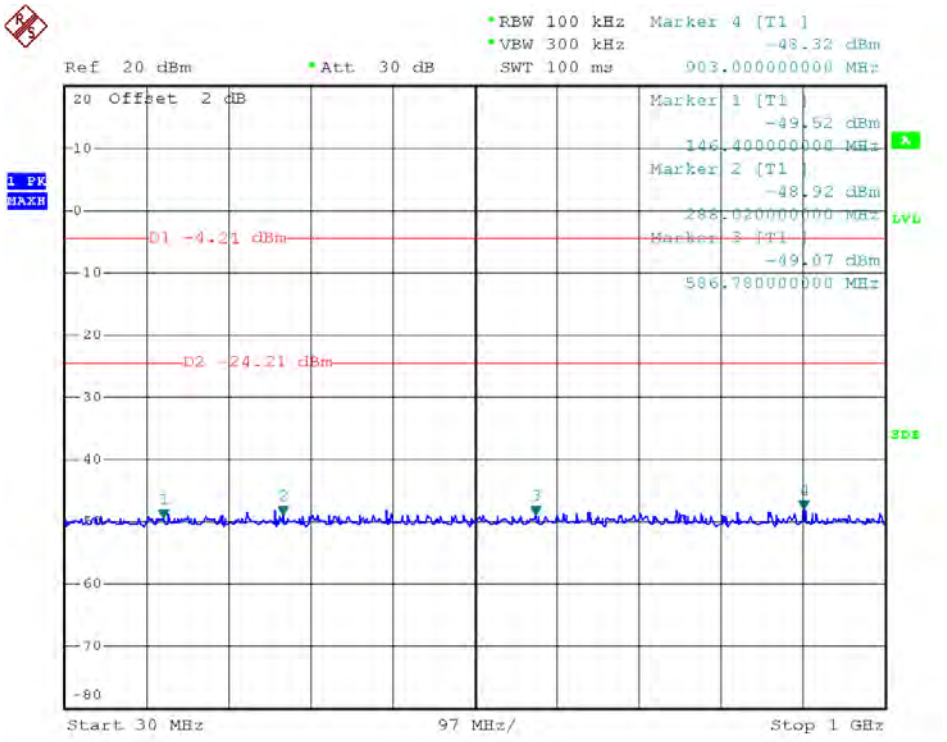


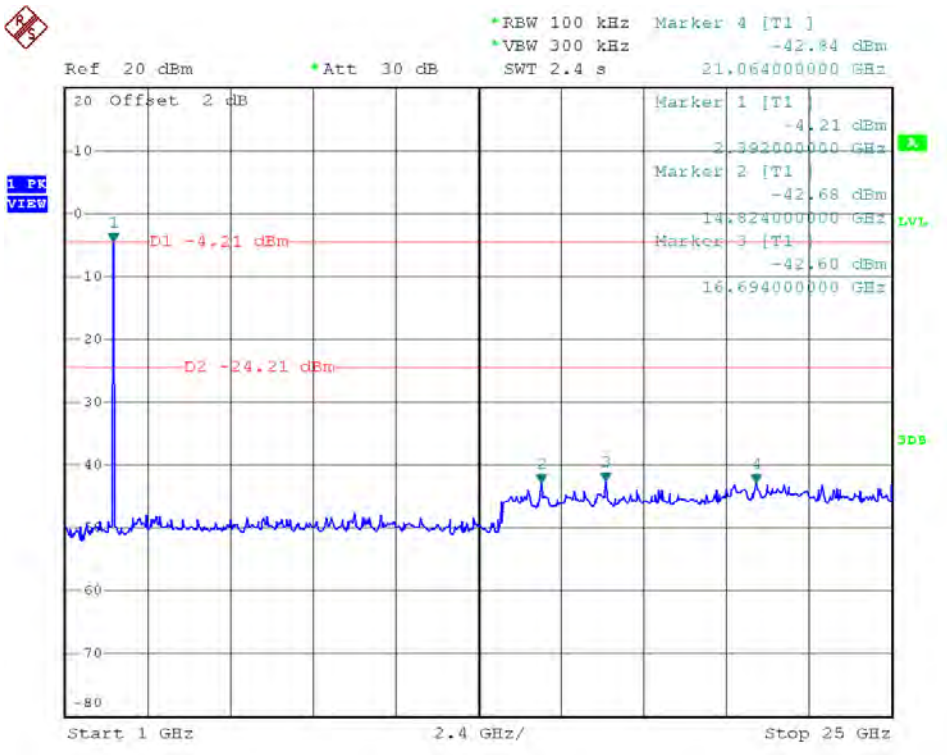
Test CH11: 2462MHz



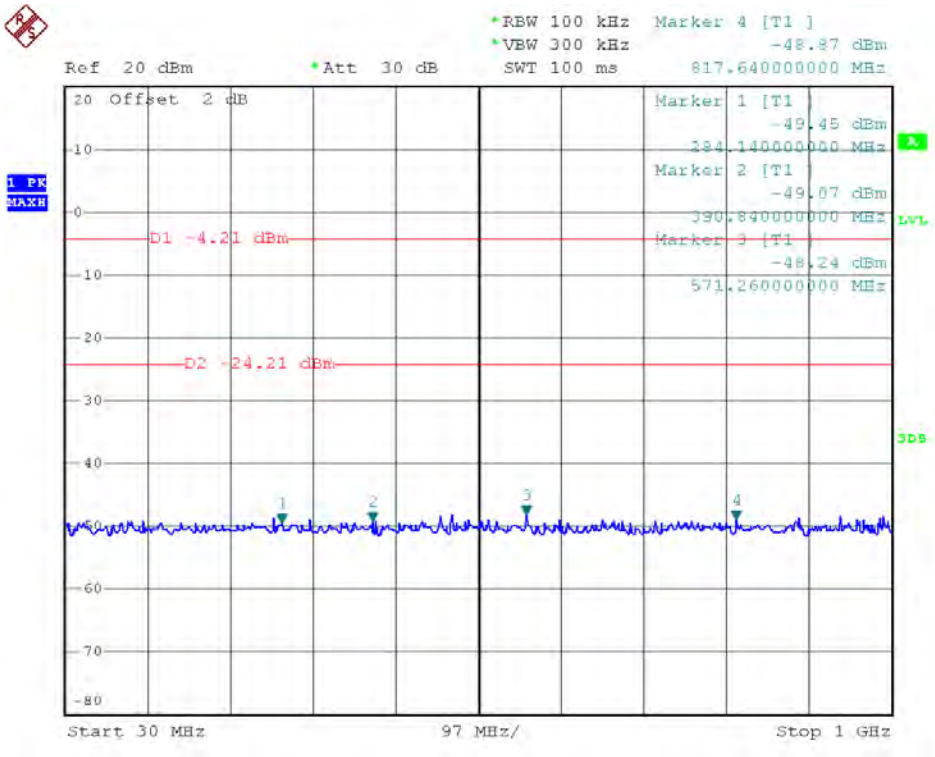


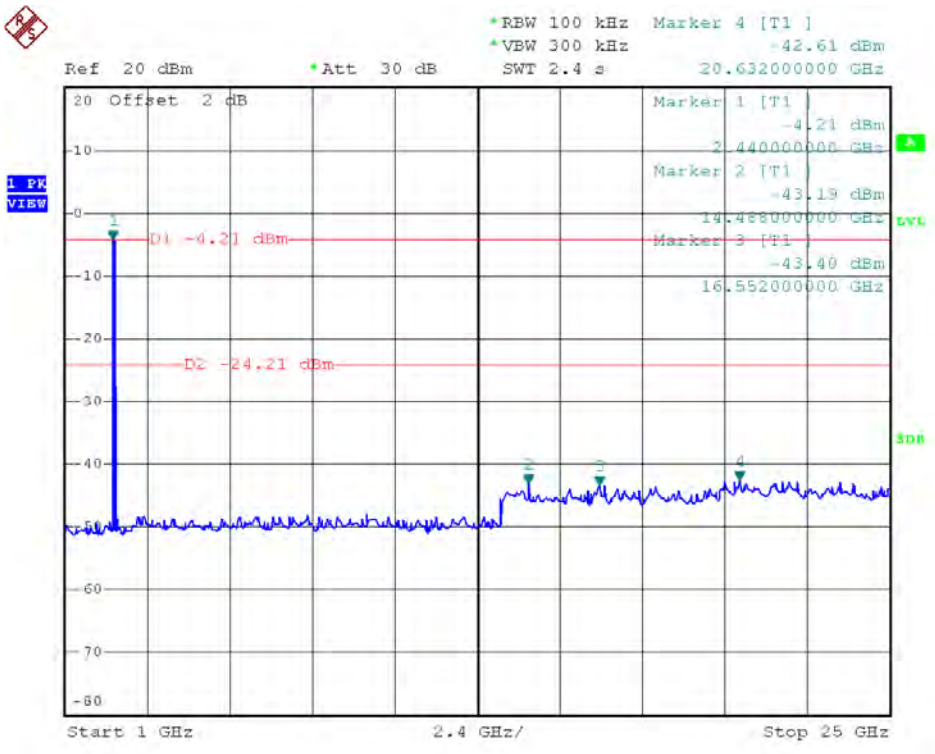
Test Mode: IEEE 802.11g TX Test CH1: 2412MHz



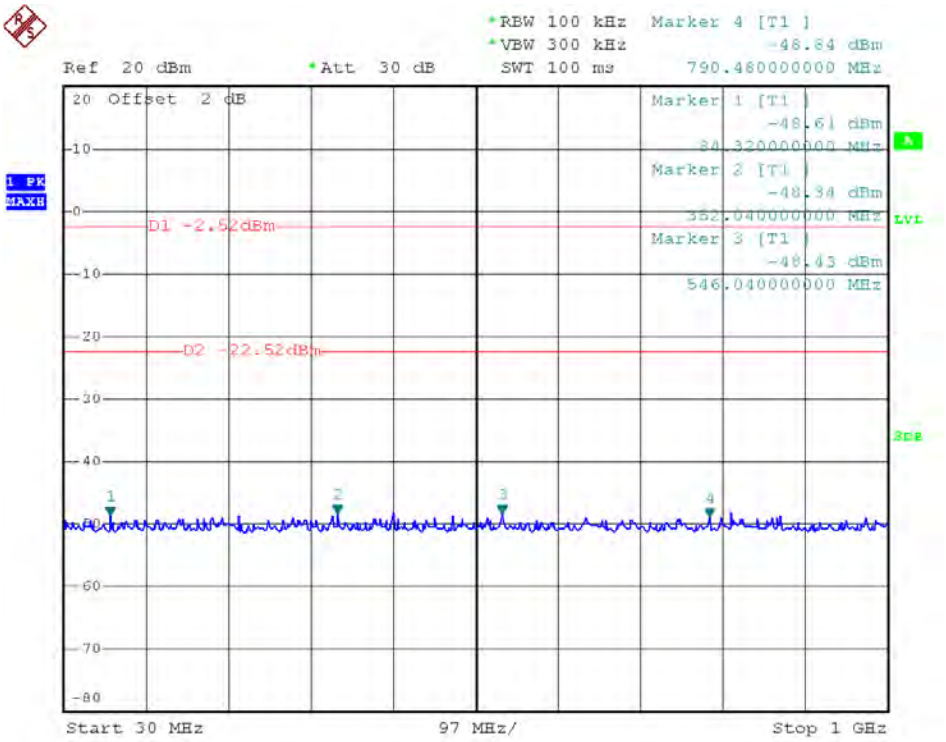


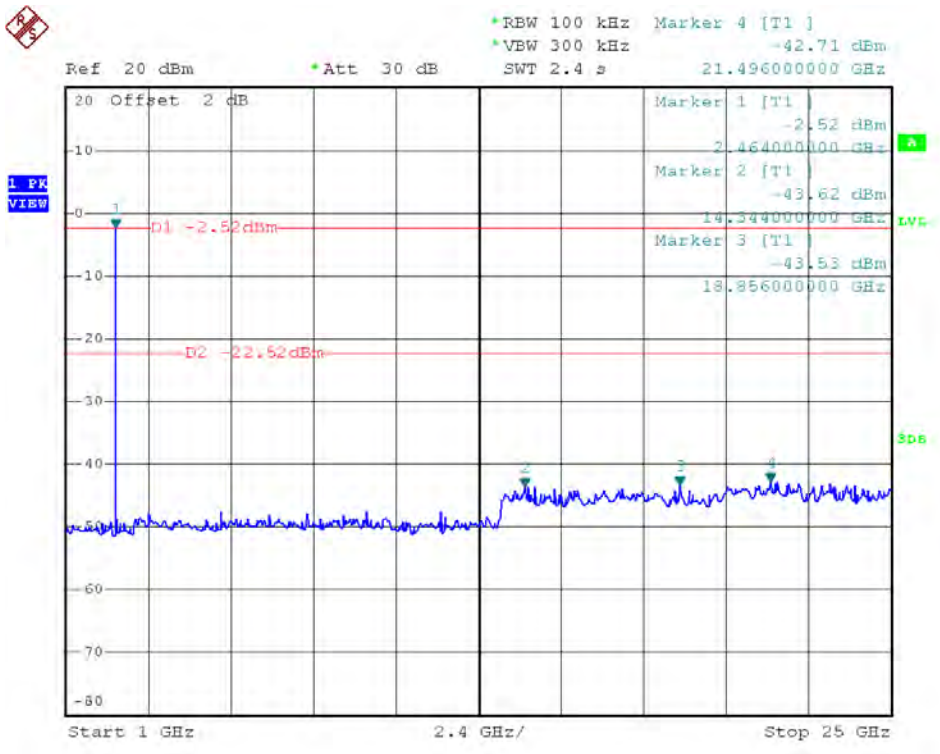
Test CH6: 2437MHz





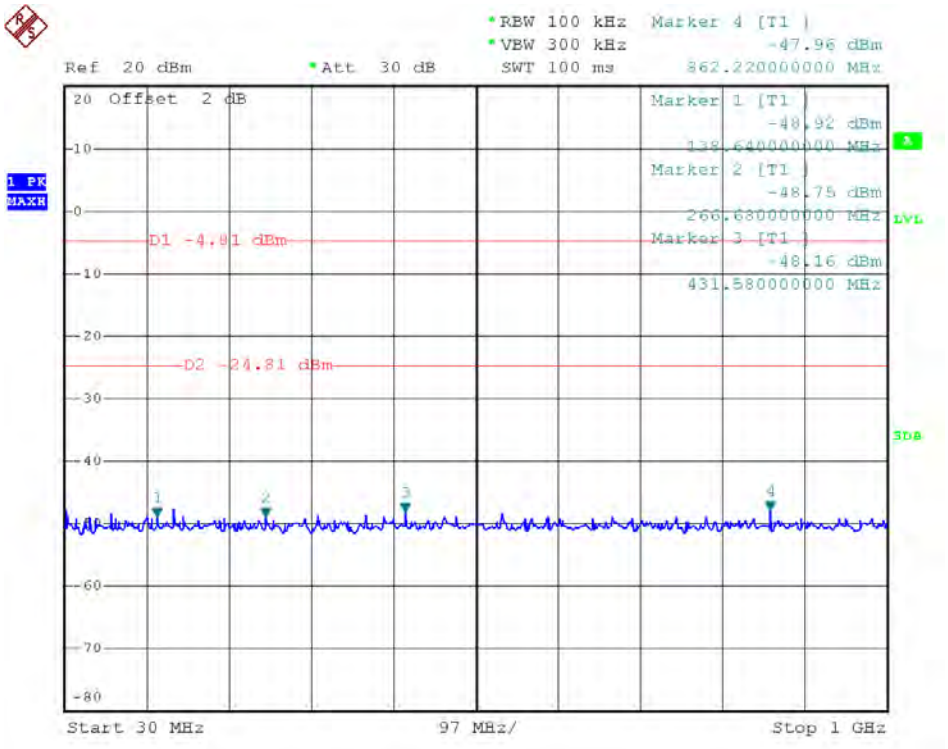
Test CH11: 2462MHz

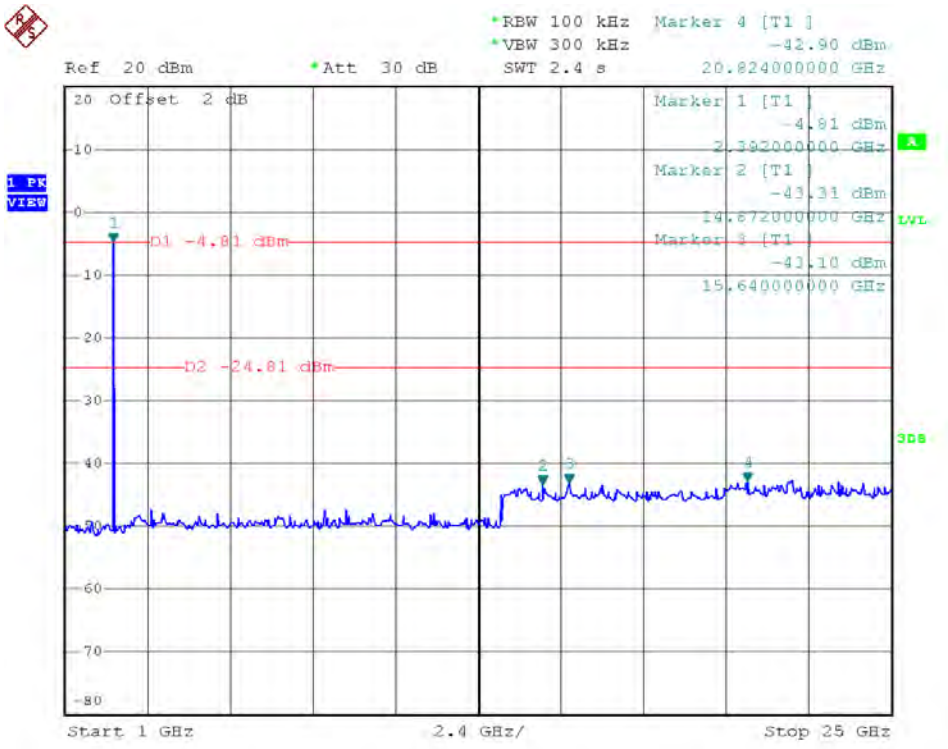




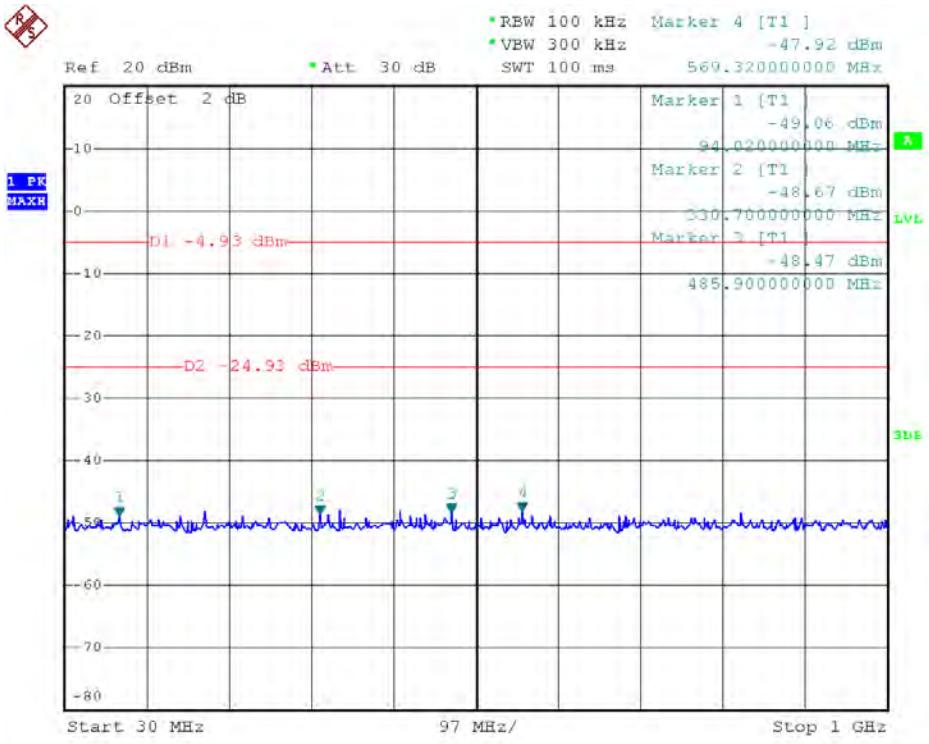
Test Mode: IEEE 802.11n HT20 TX

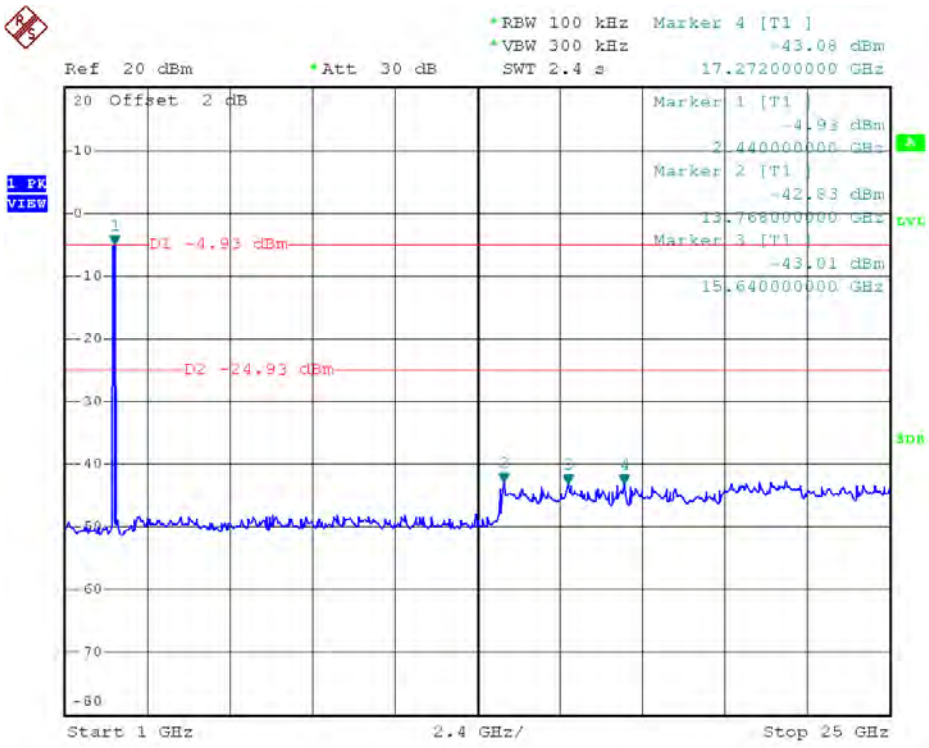
Test CH1: 2412MHz



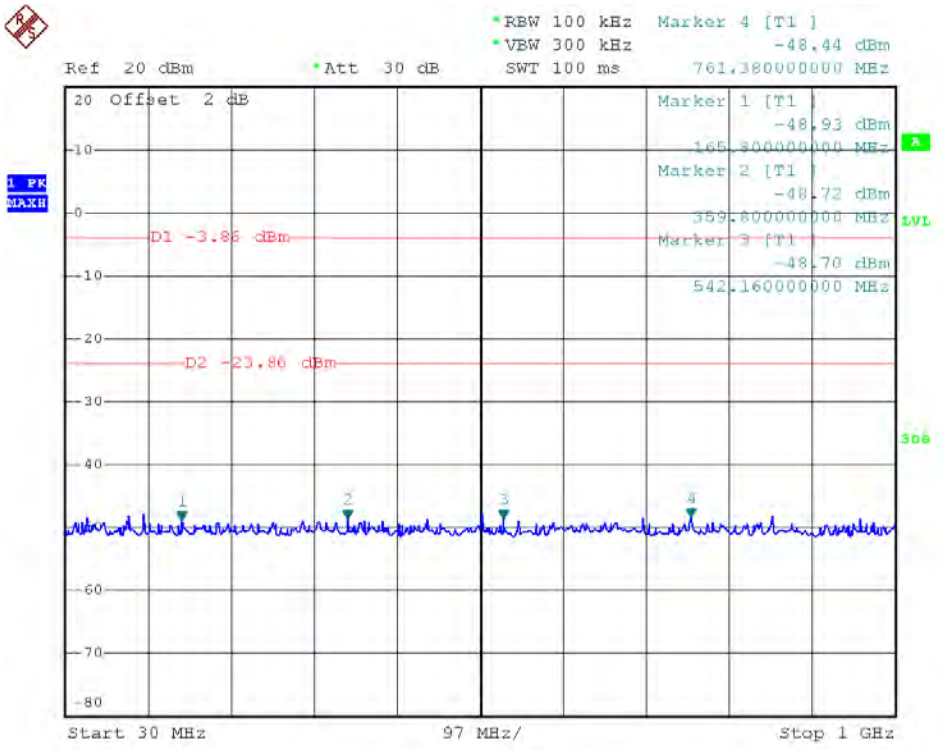


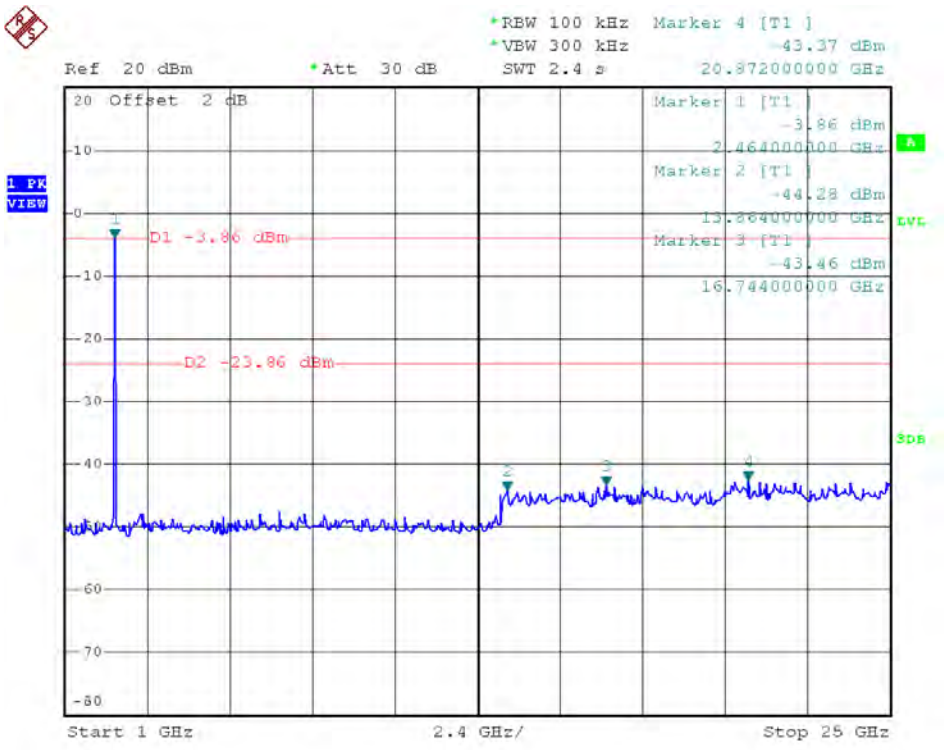
Test CH6: 2437MHz





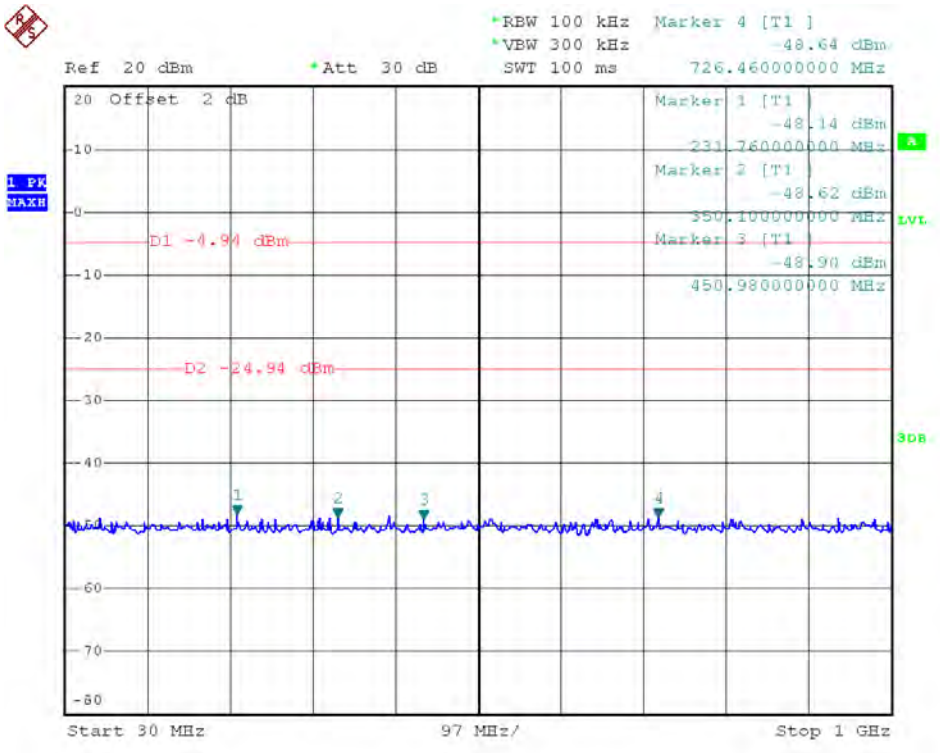
Test CH11: 2462MHz

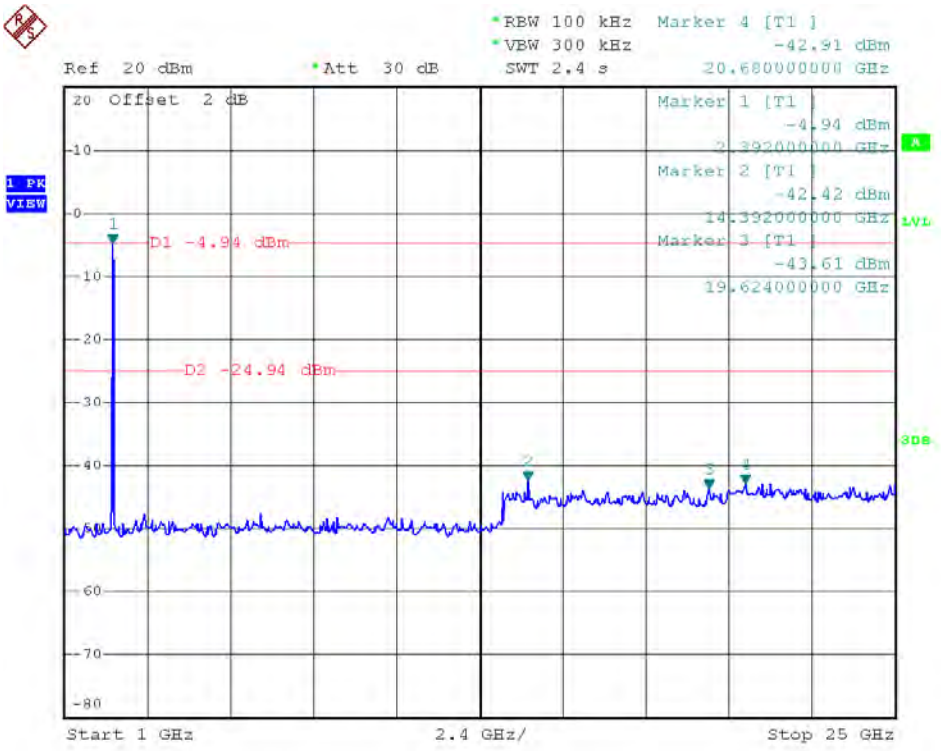




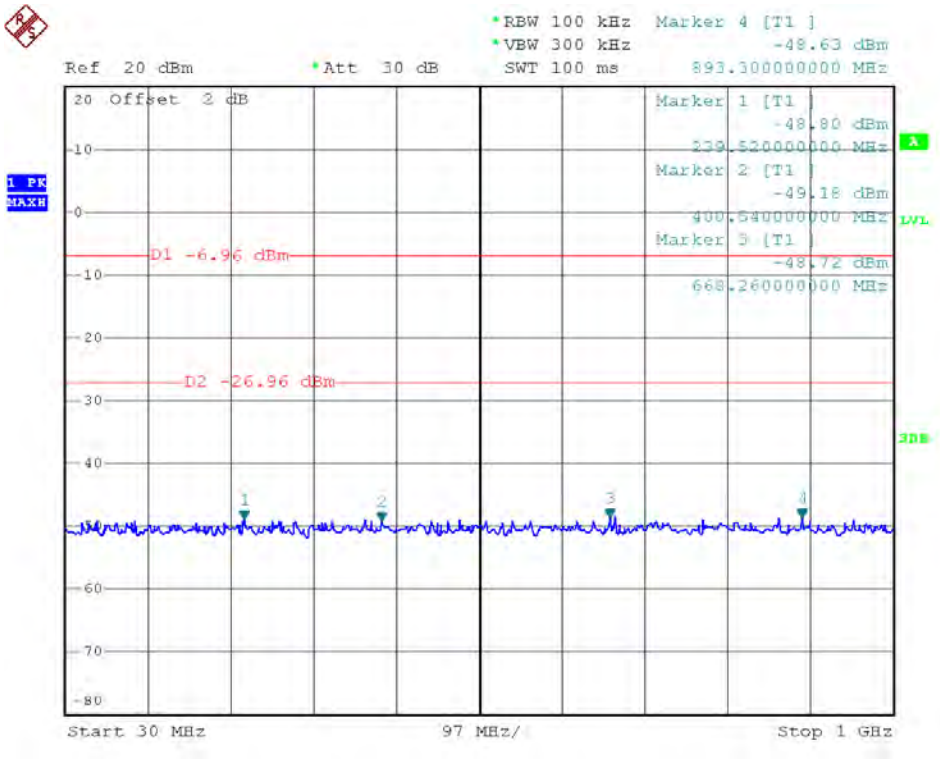
Test Mode: IEEE 802.11n HT 40TX

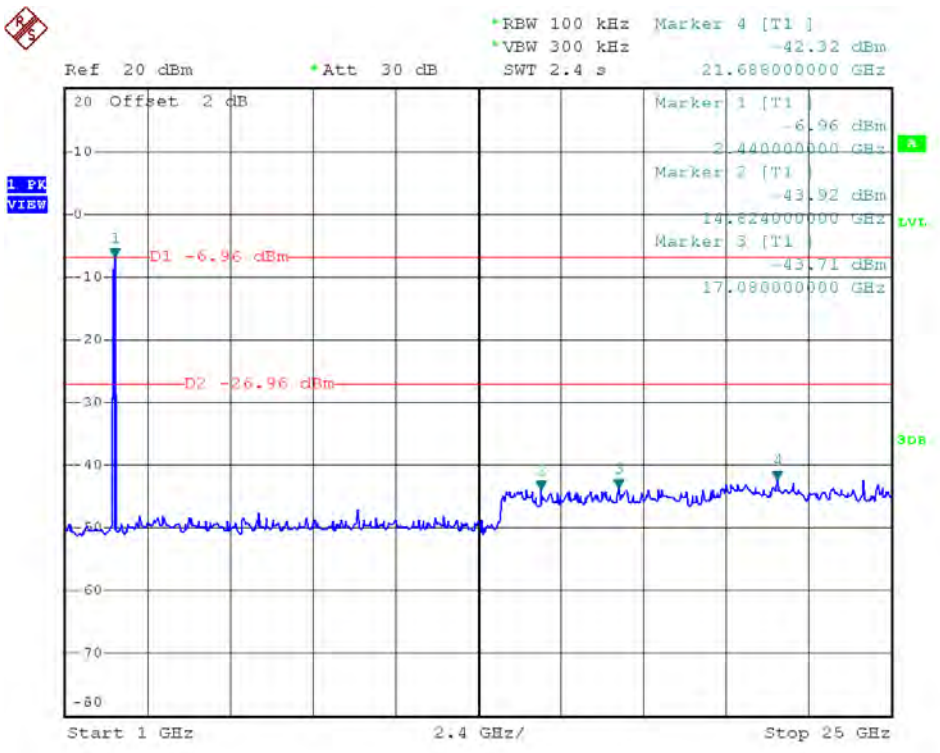
Test CH3: 2422 MHz



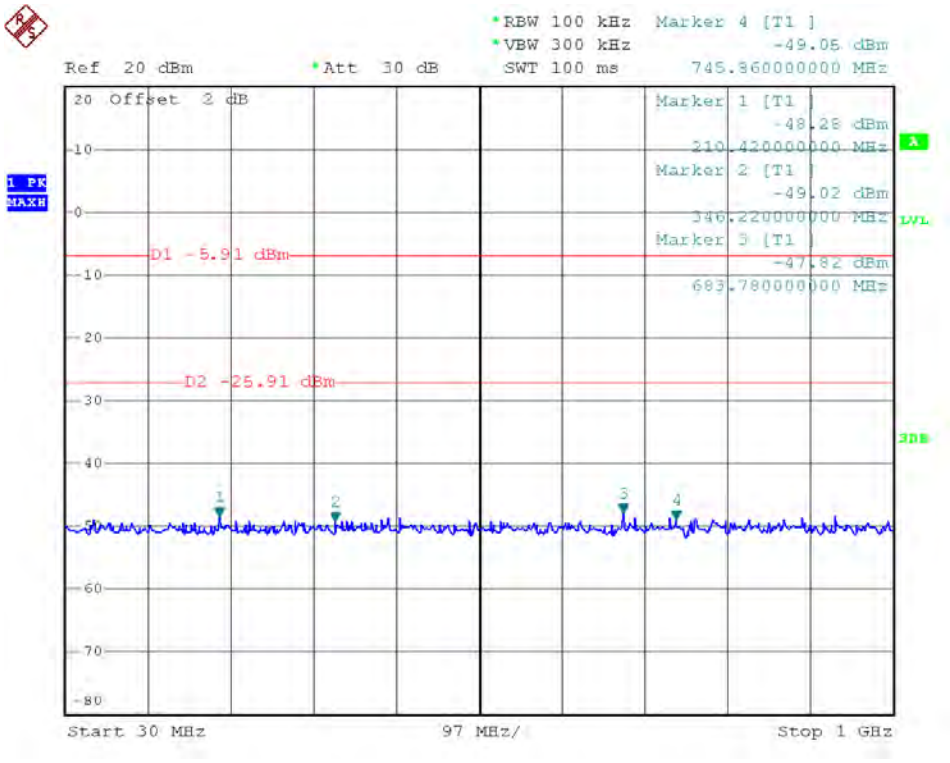


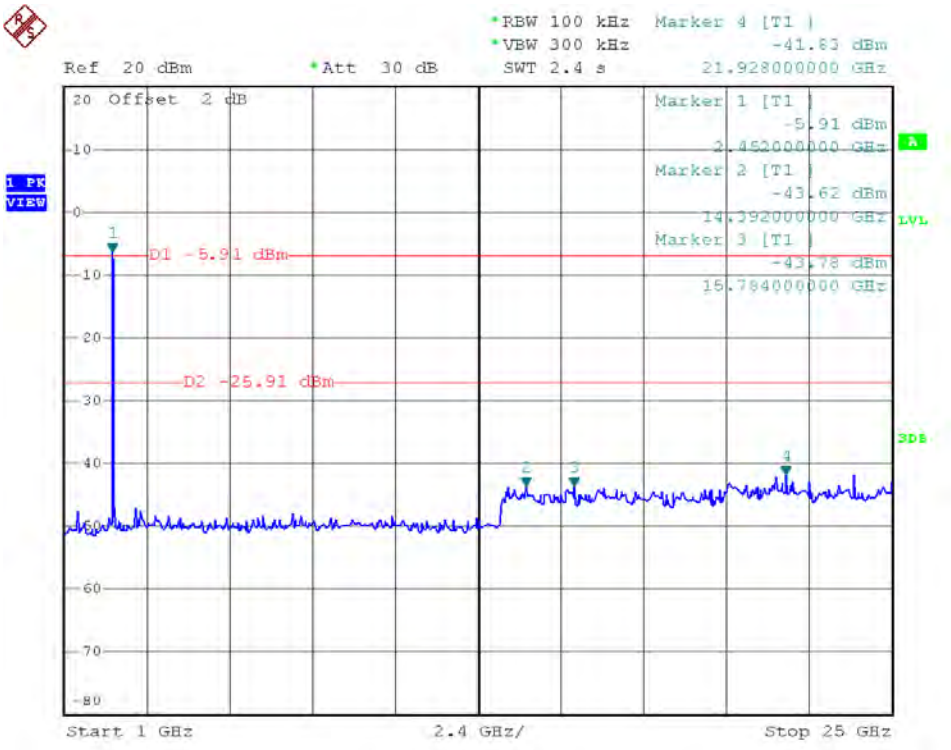
Test CH6: 2437 MHz





Test CH9: 2452 MHz





4.5 Radiated Spurious Emissions: (FCC Part §15.247(d))

4.5.1 Limits

Radiated emissions that fall in the restricted bands must comply with the general emissions limits in 15.209(a).

The emissions were measured using the following resolution bandwidths:

Frequency Range	Resolution Bandwidth	Video Bandwidth
30MHz-1000 MHz	120kHz	>30 kHz
>1000 MHz	1 MHz	<30 Hz

Harmonic and Spurious emissions that were identified as coming from the EUT were checked in Peak and in Average Mode. The high frequency, which started from 18 to26.5GHz,was pre-scan and the test result which was 20dB lower than the limit was not reported.

Peak measurements and average measurements are made. All emissions were determined to have a peak-to-average ratio of less than 20dB.

4.5.2 Test Procedure

The EUT was placed on motorized turntable for radiated testing on a 3-meter open field test site. The emissions from the EUT were measured continuously at every azimuth by rotating the turntable. Receiving antennas were mounted on an antenna mast to determine the height of maximum emissions. The height of the antenna was varied between 1 and 4 meters. The peripherals were placed on the table in accordance with ANSI C63.10-2013. Cables were varied in position to produce maximum emissions. Both the horizontal and vertical field components were measured.

4.5.3 Test Data

The EUT complied with the FCC Part 15.247 Radiated Spurious Emissions requirements.

Table 10 and Table 11 provide the test results for Radiated Spurious Emissions.（all the data attached was use the worst case data rate as in table 6）

4.5.4 Areas of Concern

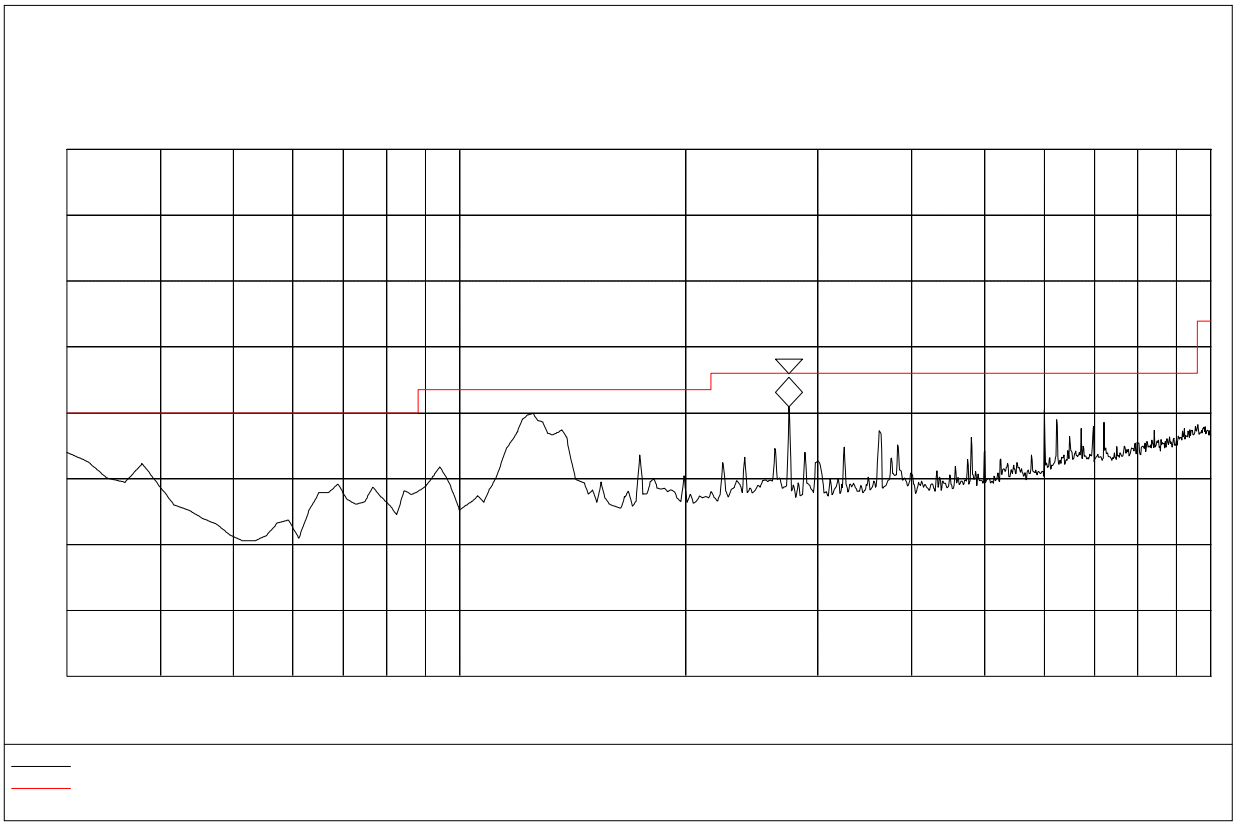
None

Table 10**: Radiated Emission Antenna 1 Test Data Test Data**

Antenna 1 Test Data:

Test Mode: IEEE 802.11bTX

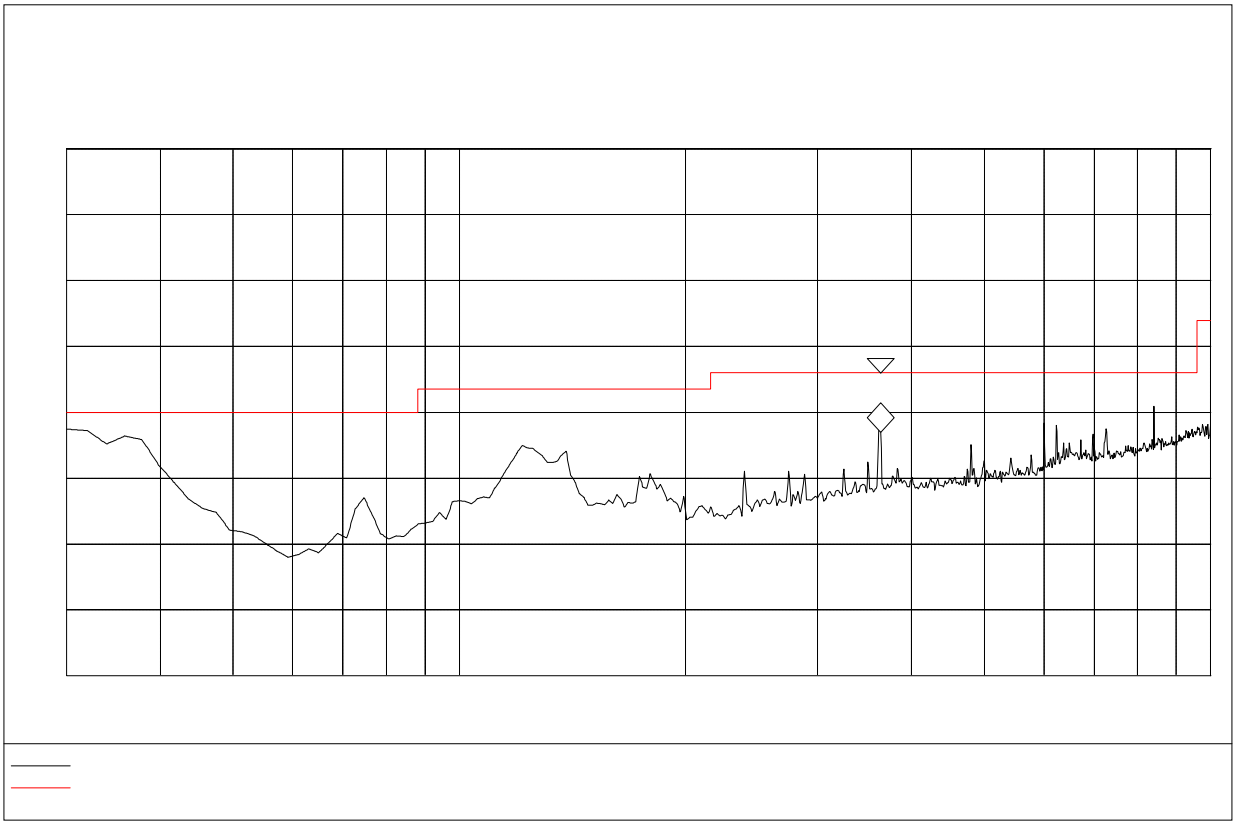
(Horizontal)



MEASUREMENT RESULT: "QuasiPeak"

Frequency	Level	Limit
MHz	dBµV/m	dBµV/m
125.060000	39.92	43.5
274.440000	40.91	46.0

(Vertical)

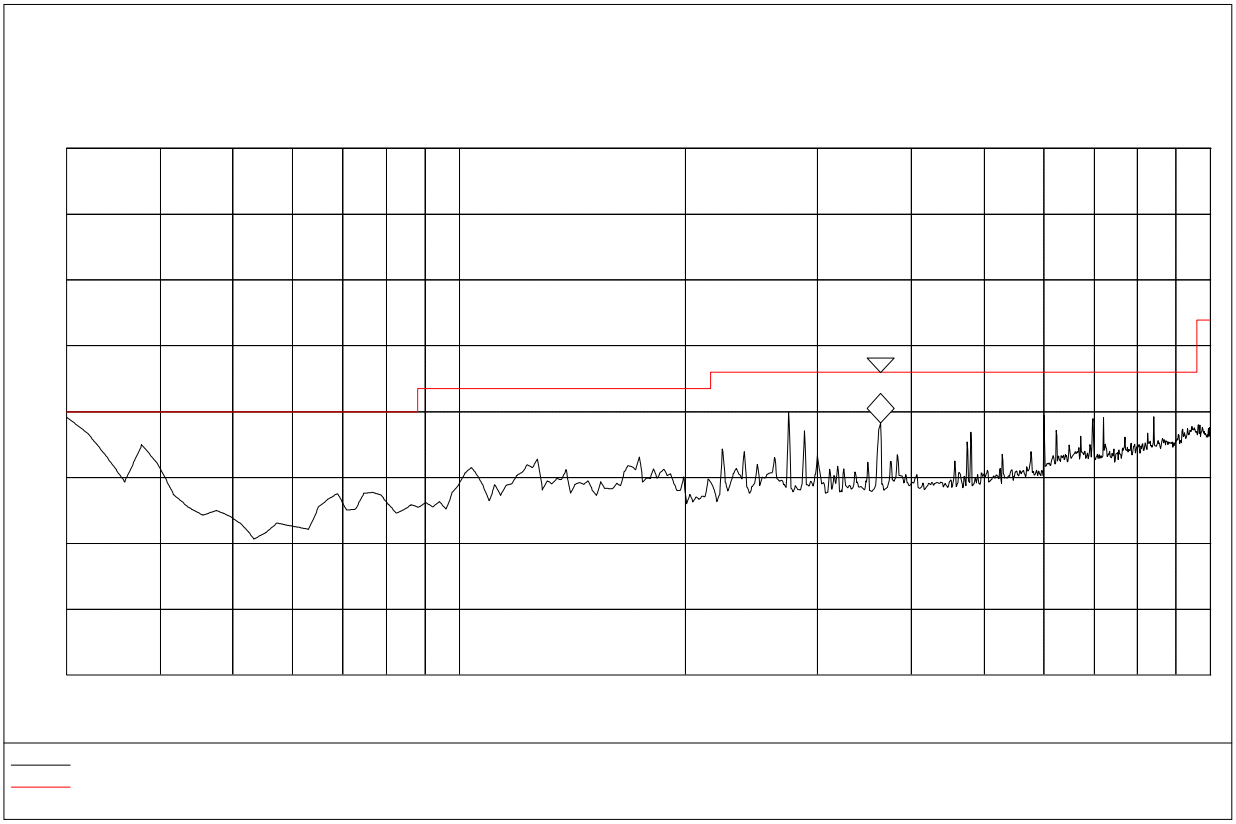


MEASUREMENT RESULT: "QuasiPeak"

Frequency	Level	Limit
MHz	dBµV/m	dBµV/m
121.180000	34.95	43.5
363.680000	36.75	46.0

Test Mode: IEEE 802.11gTX

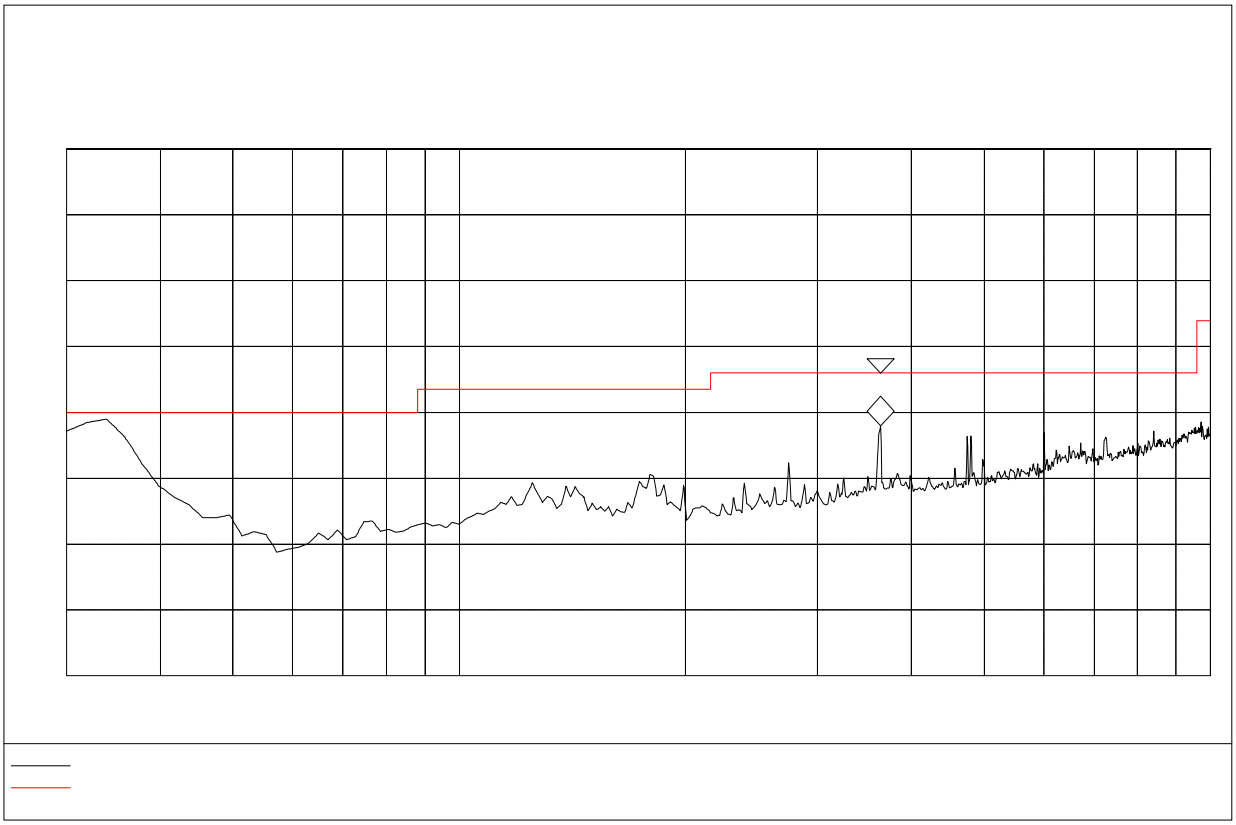
(Horizontal)



MEASUREMENT RESULT: "QuasiPeak"

Frequency	Level	Limit
MHz	dBµV/m	dBµV/m
274.440000	38.16	46.0
363.630000	37.30	46.0

(Vertical)

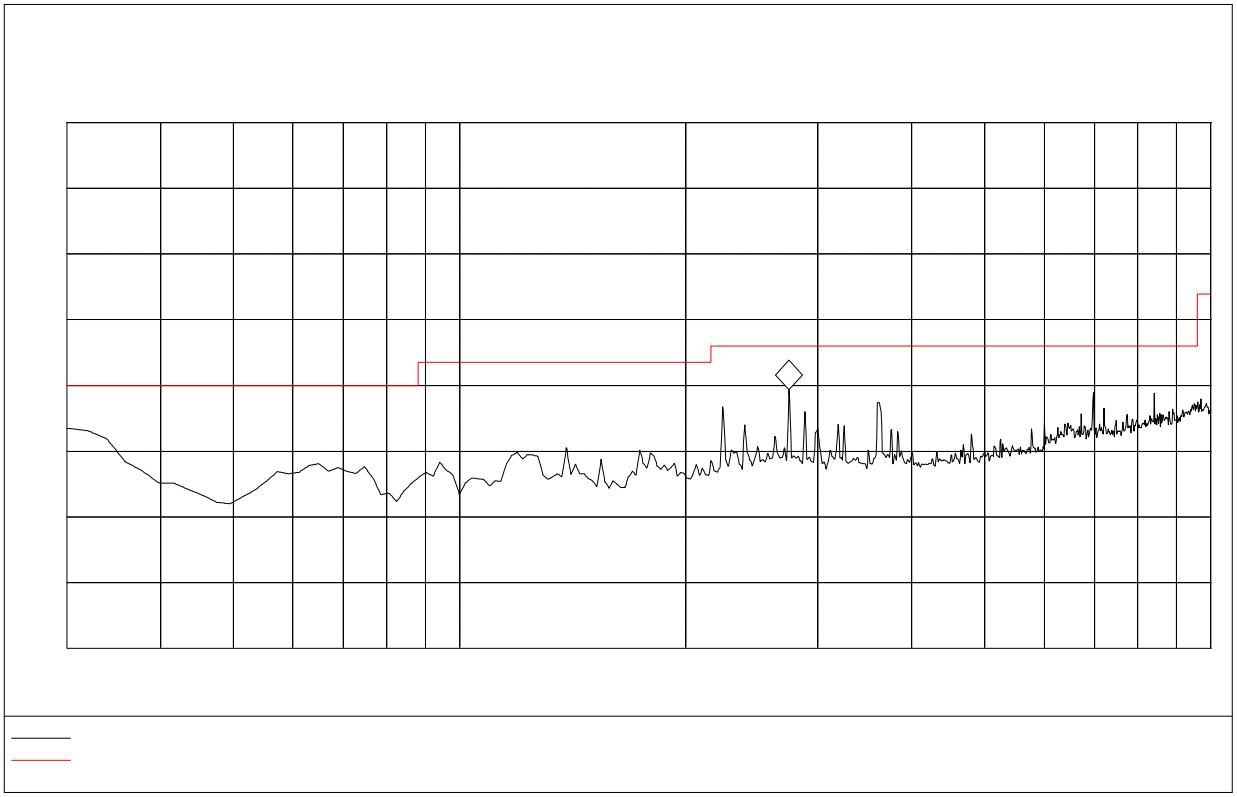


MEASUREMENT RESULT: "QuasiPeak"

Frequency	Level	Limit
MHz	dBµV/m	dBµV/m
33.880000	36.43	40.0
363.680000	35.94	46.0

Test Mode: IEEE 802.11n HT20TX

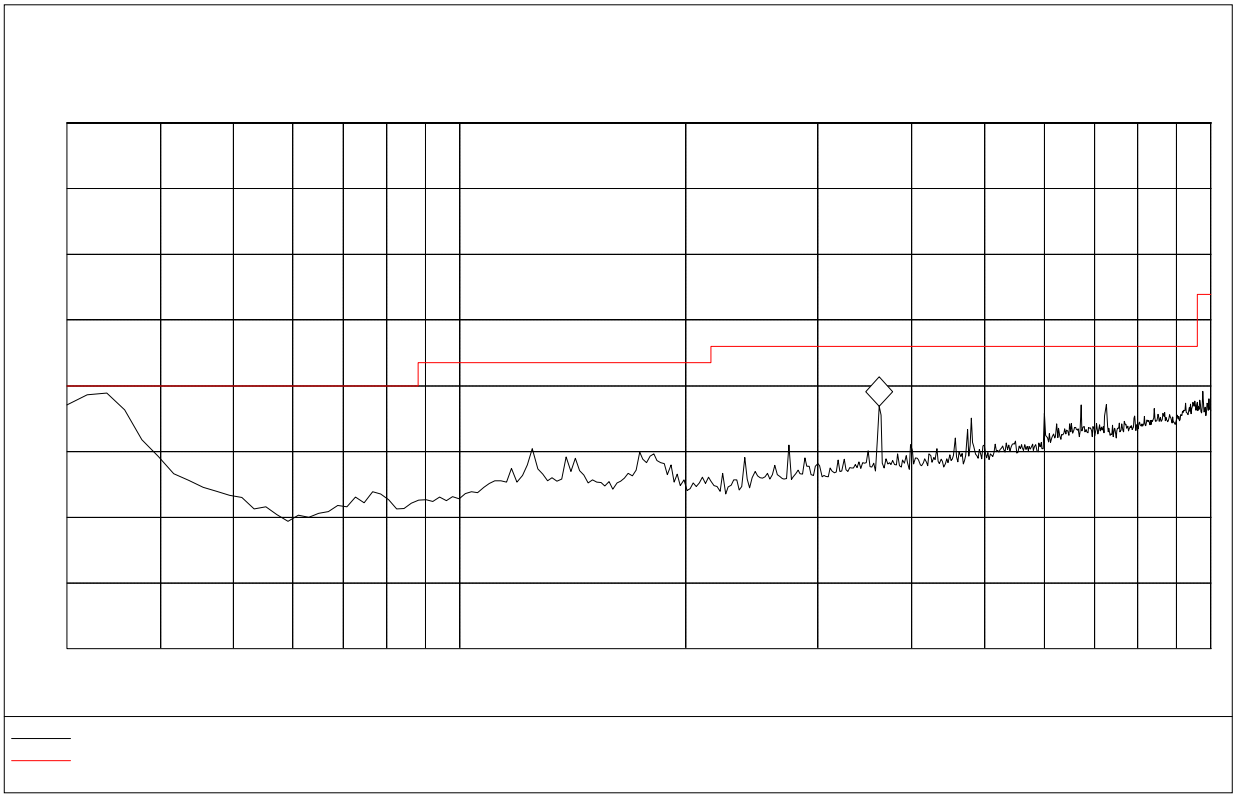
(Horizontal)



MEASUREMENT RESULT: "QuasiPeak"

Frequency	Level	Limit
MHz	dBµV/m	dBµV/m
224.000000	34.72	46.0
274.440000	37.38	46.0

(Vertical)

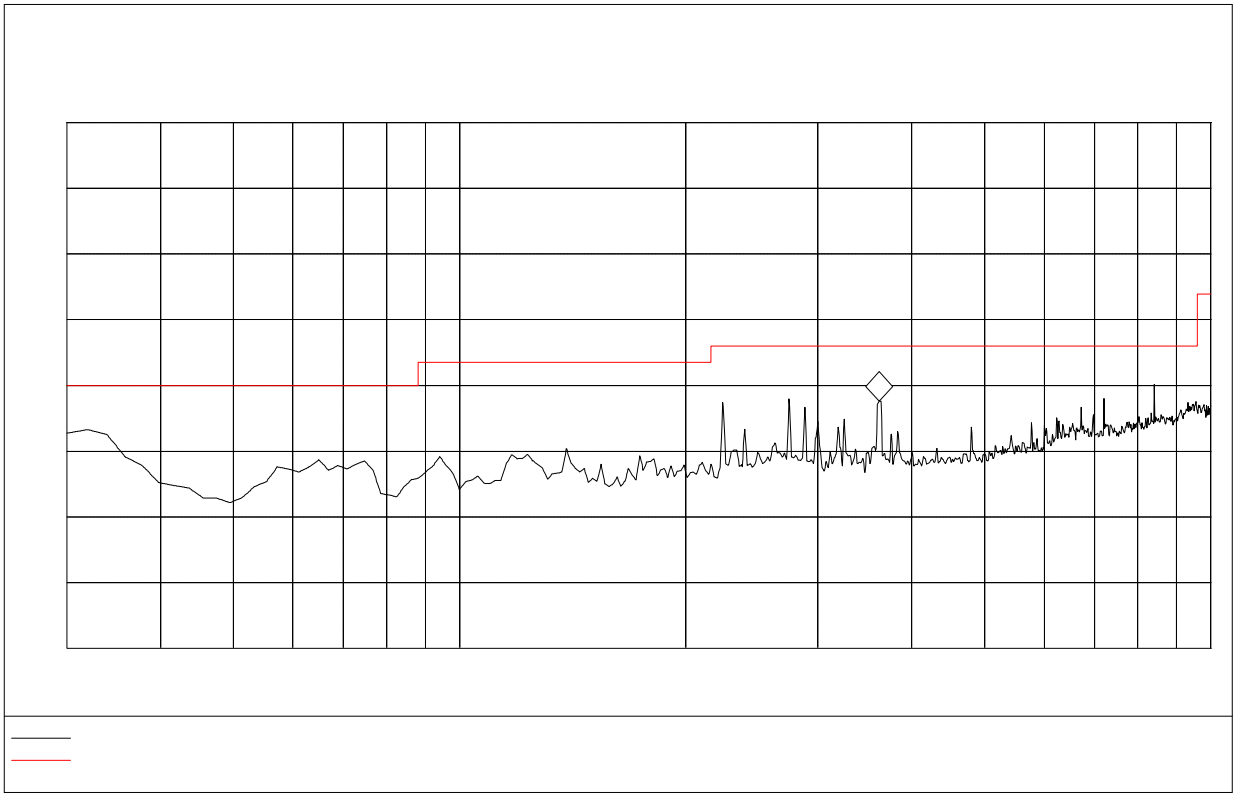


MEASUREMENT RESULT: "QuasiPeak"

Frequency	Level	Limit
MHz	dBµV/m	dBµV/m
33.880000	35.91	40.0
361.740000	34.86	46.0

Test Mode: IEEE 802.11n HT40TX

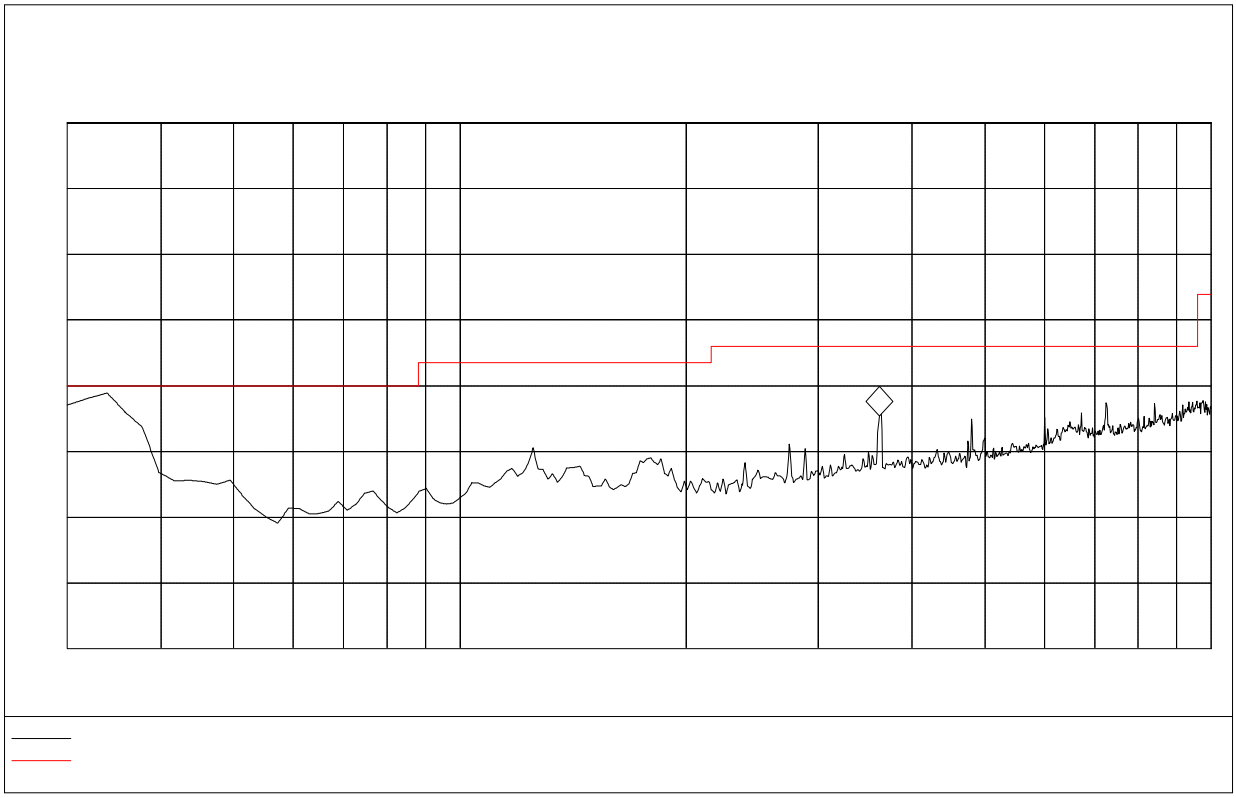
(Horizontal)



MEASUREMENT RESULT: "QuasiPeak"

Frequency	Level	Limit
MHz	dBµV/m	dBµV/m
274.440000	35.98	46.0
361.740000	34.63	46.0

(Vertical)



MEASUREMENT RESULT: "QuasiPeak"

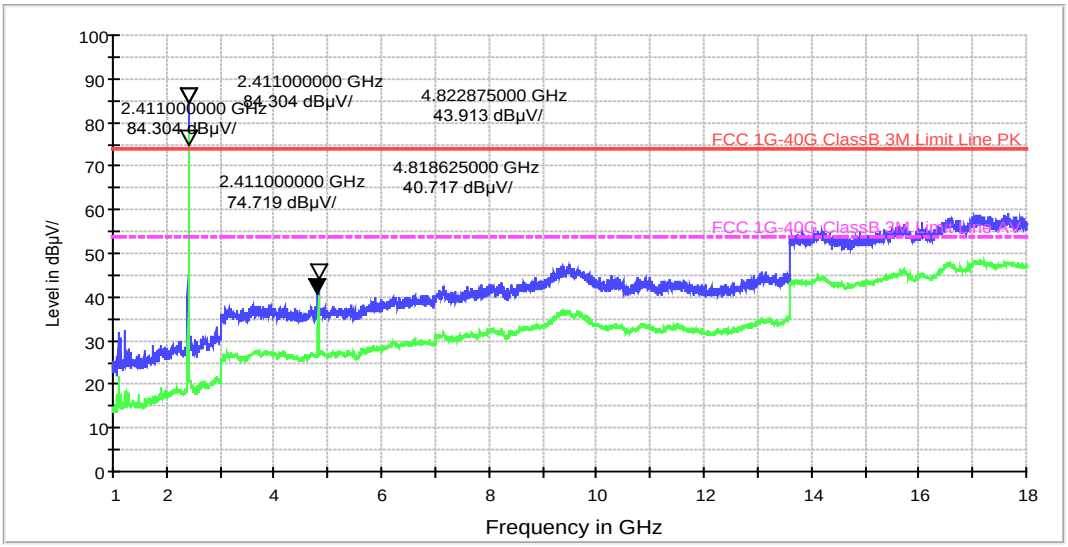
Frequency	Level	Limit
MHz	dBµV/m	dBµV/m
33.880000	35.51	40.0
361.740000	33.44	46.0

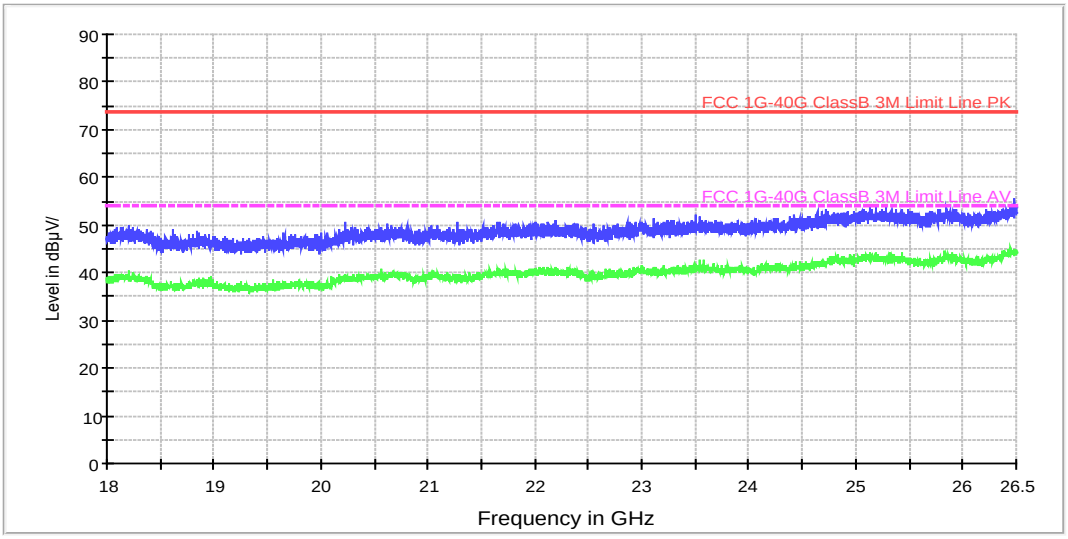
Antenna 1 Test Data:

Test Mode: IEEE 802.11b

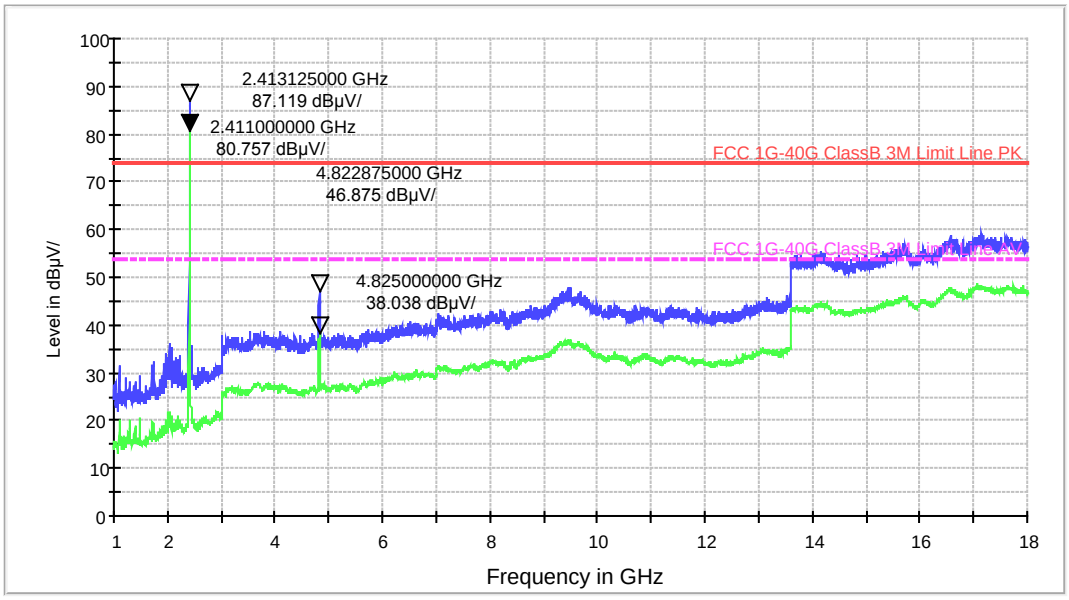
Channel 1 2412MHz

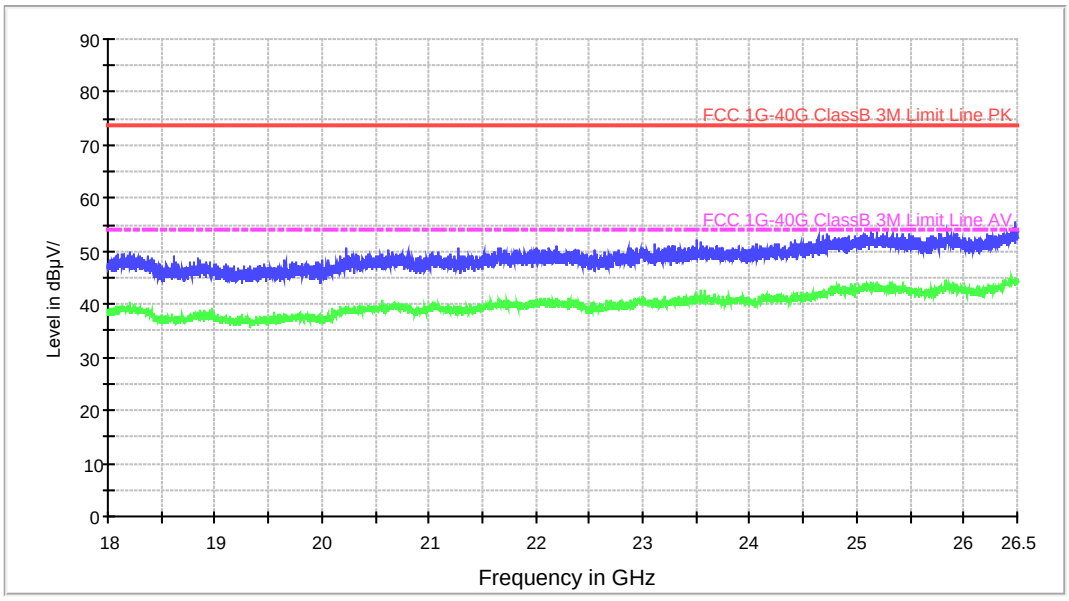
(Horizontal)





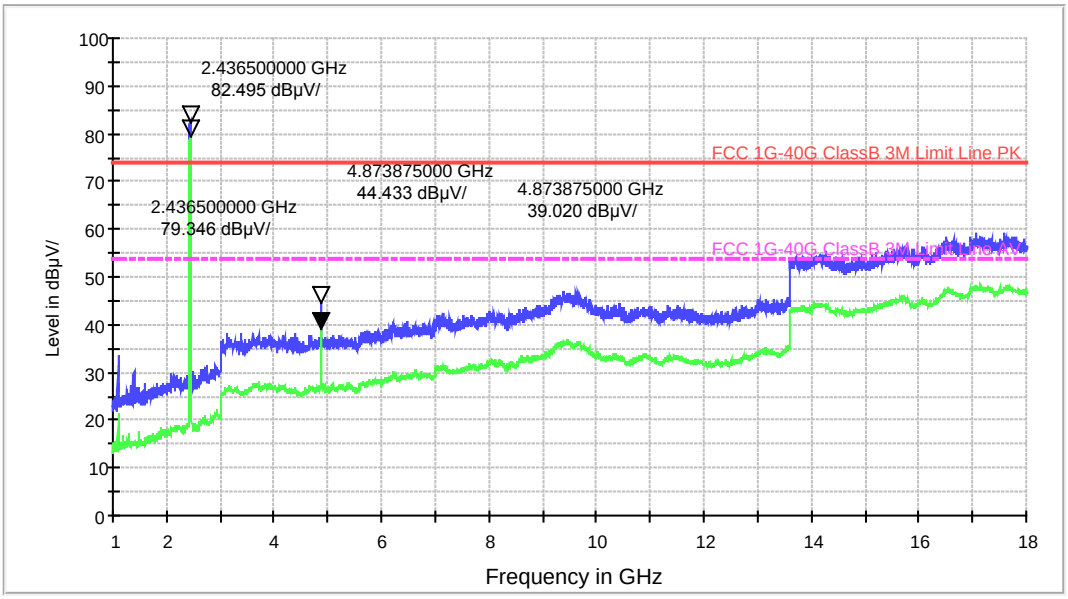
(Vertical)

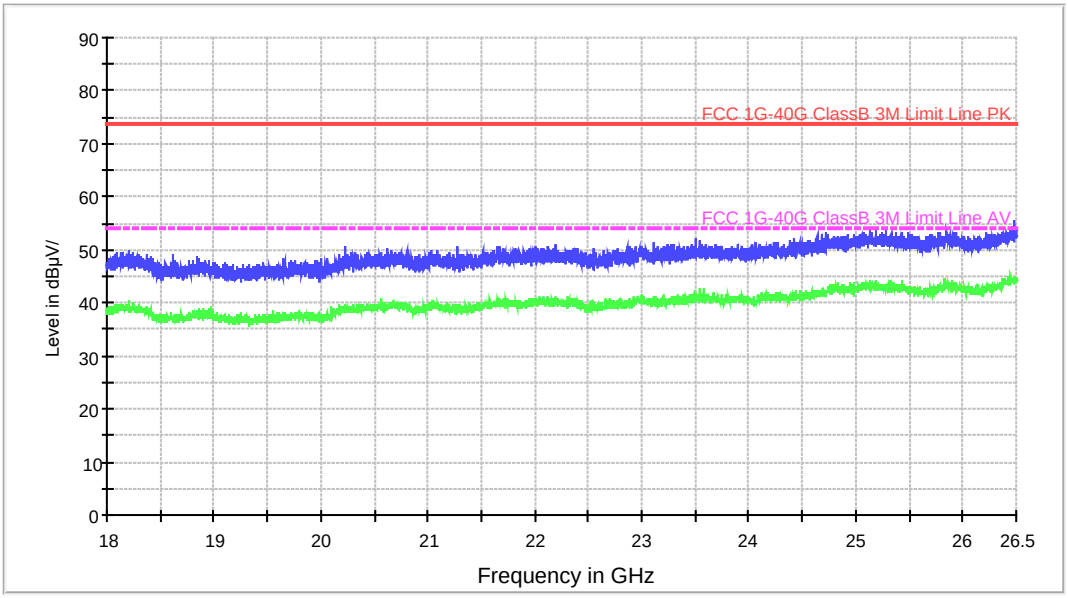




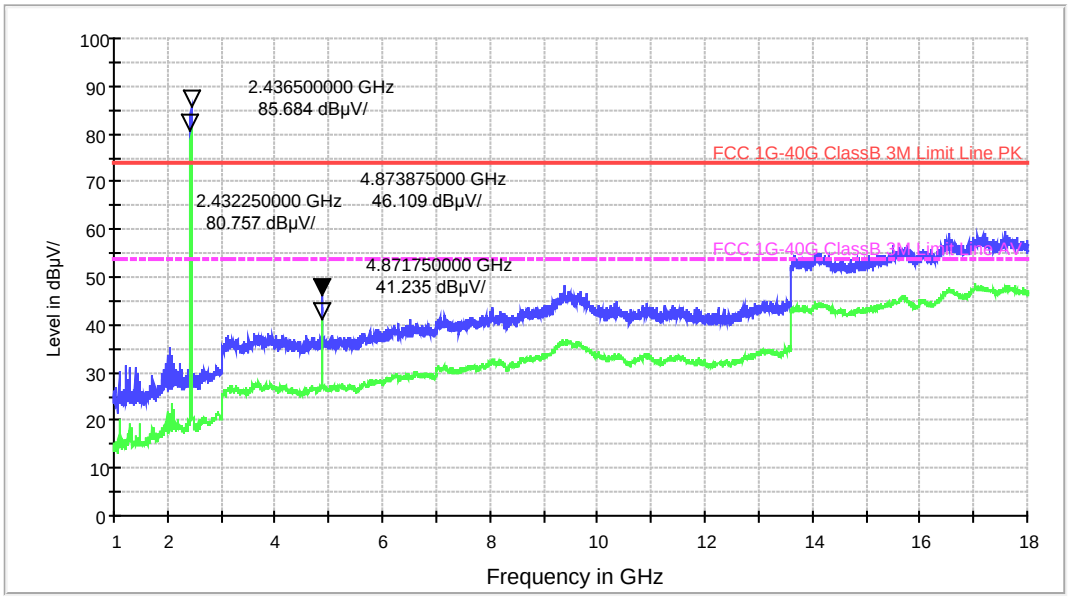
Channel 6 2437MHz

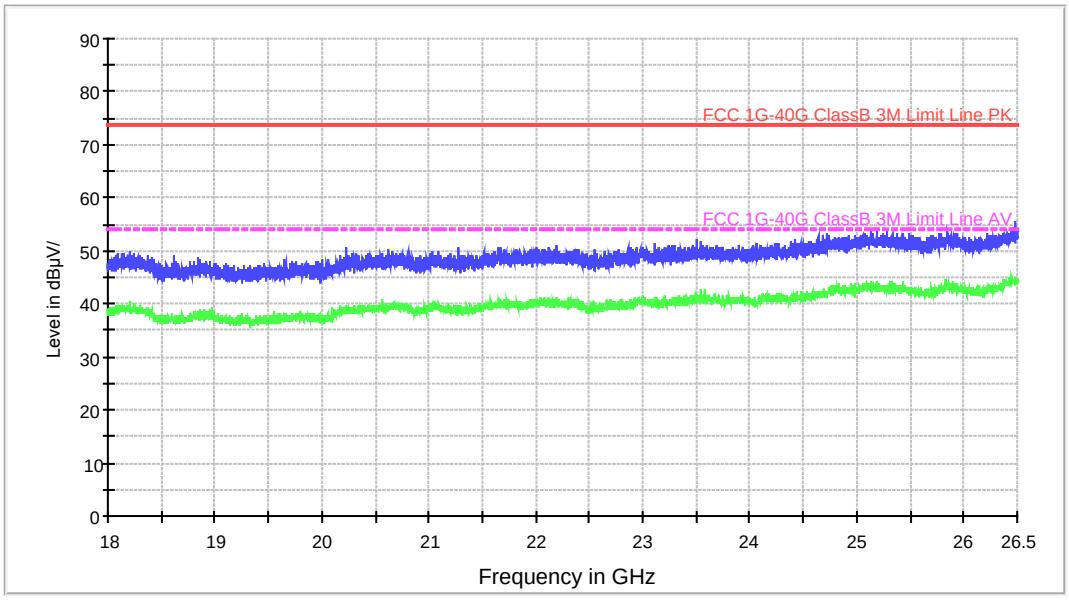
(Horizontal)





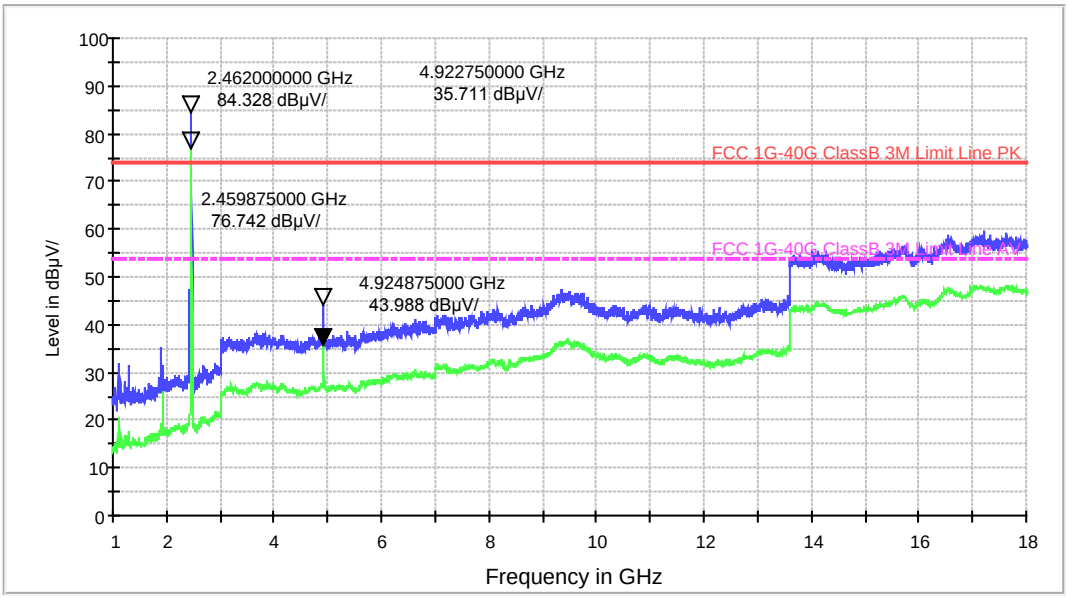
(Vertical)

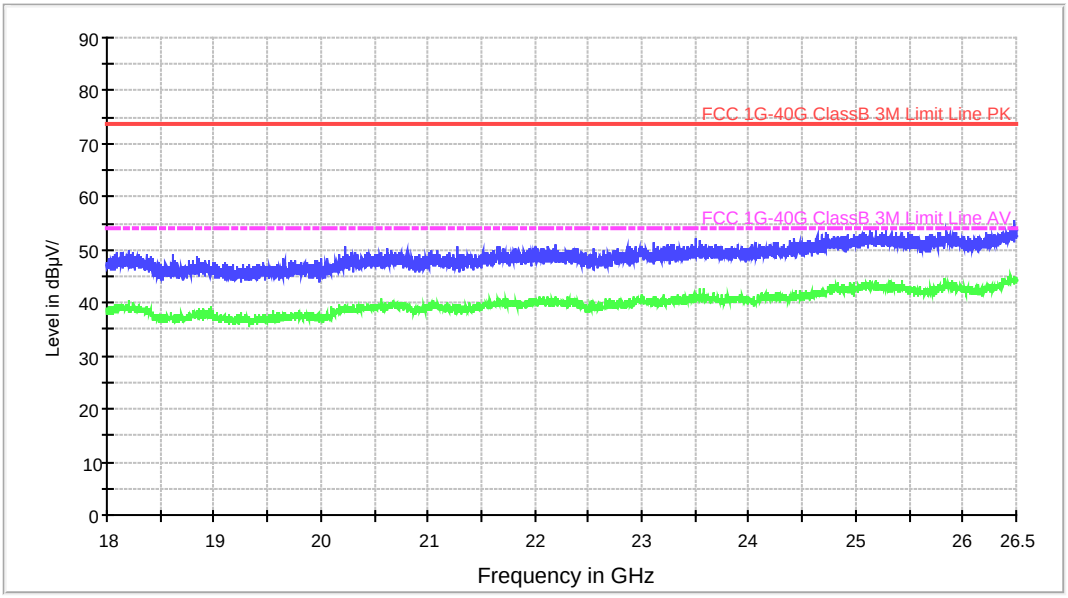




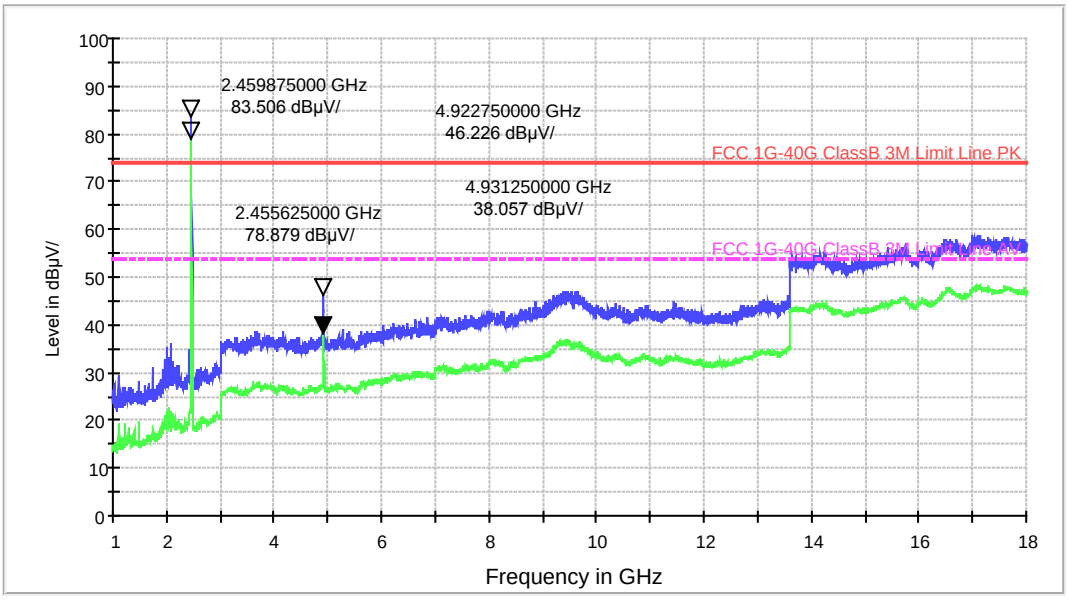
Channel 11 2462MHz

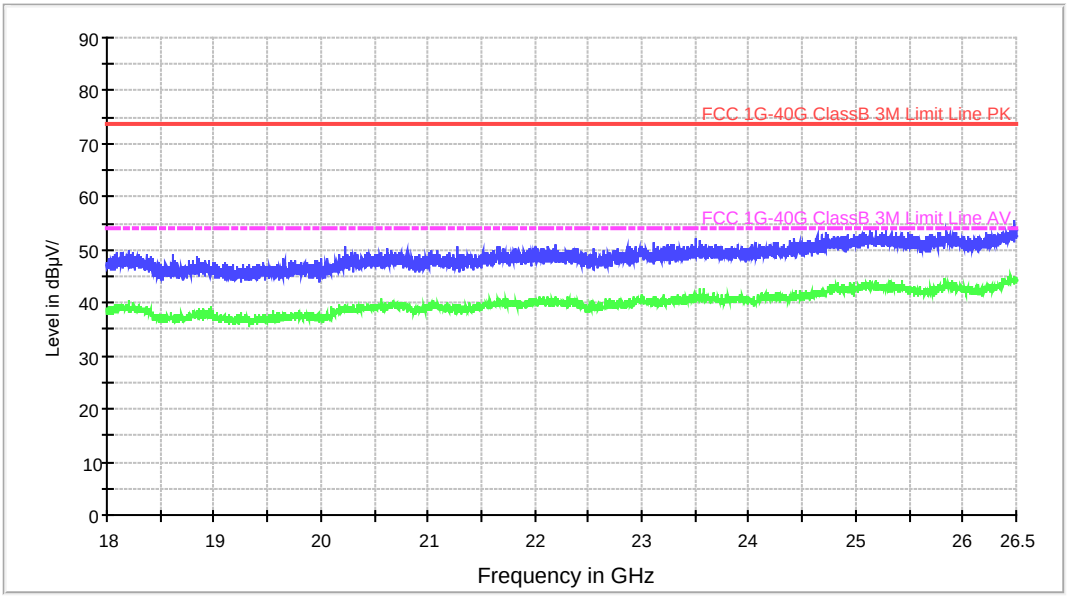
(Horizontal)





(Vertical)

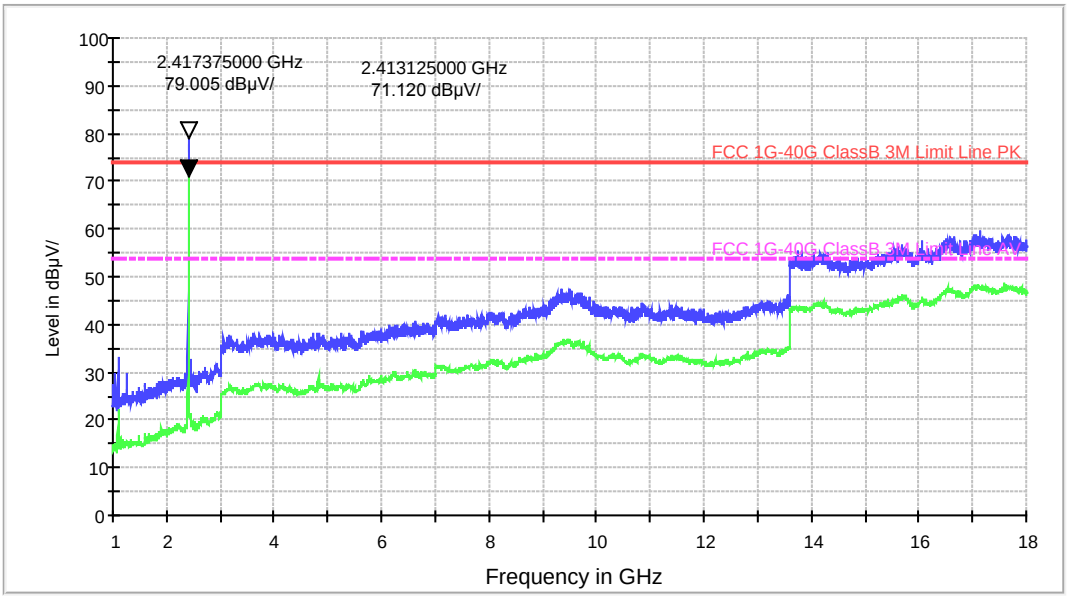


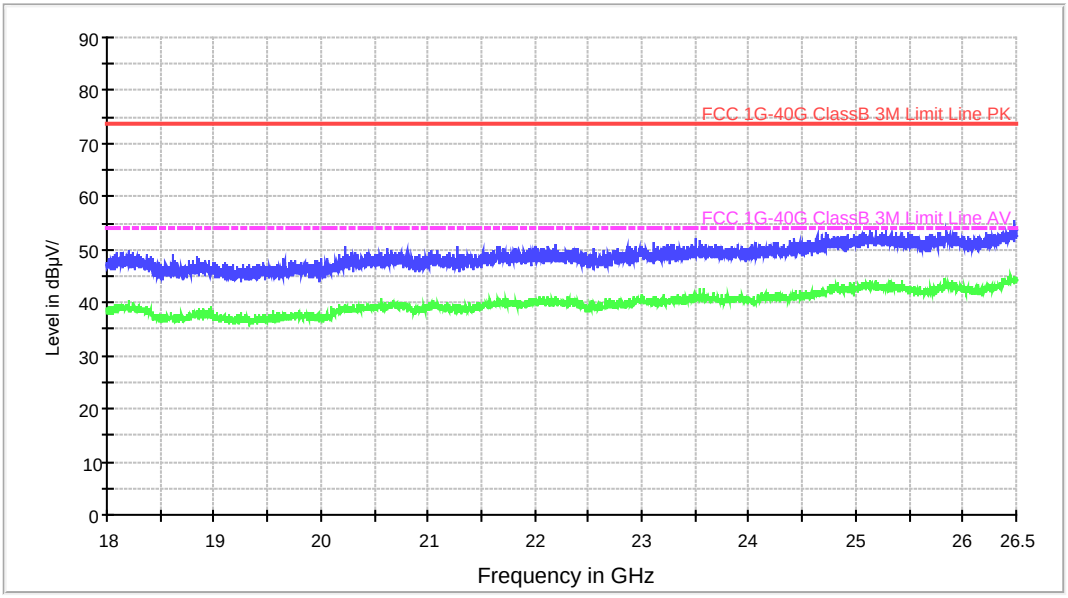


Test Mode: IEEE 802.11g TX

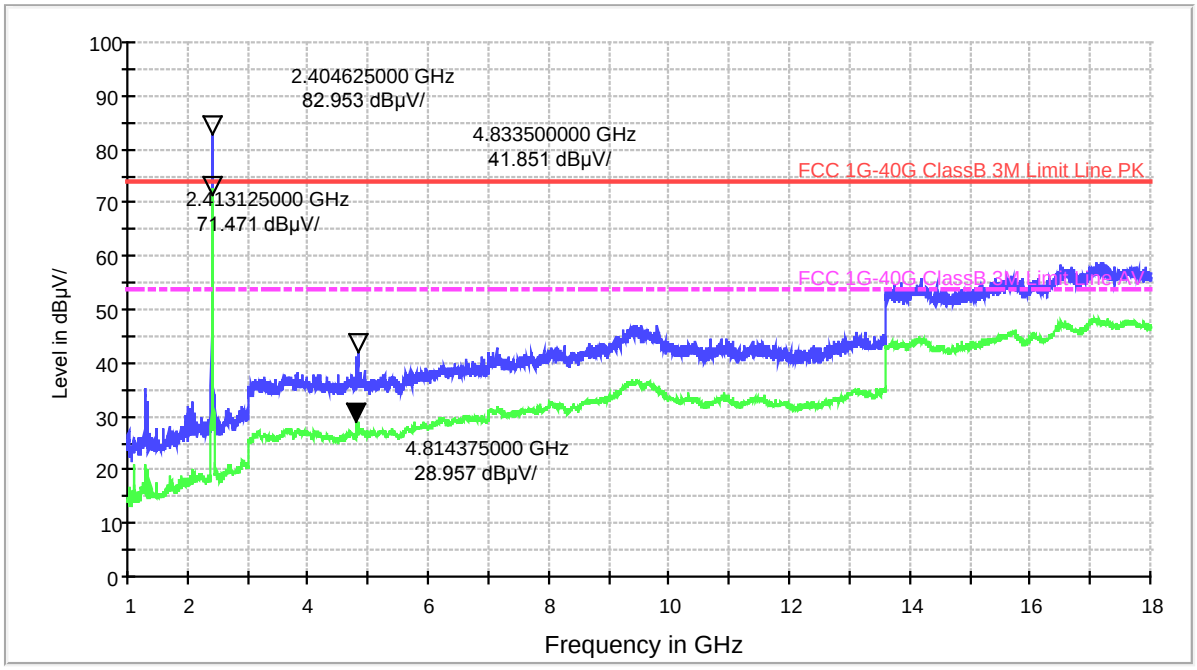
Channel 1 2412MHz

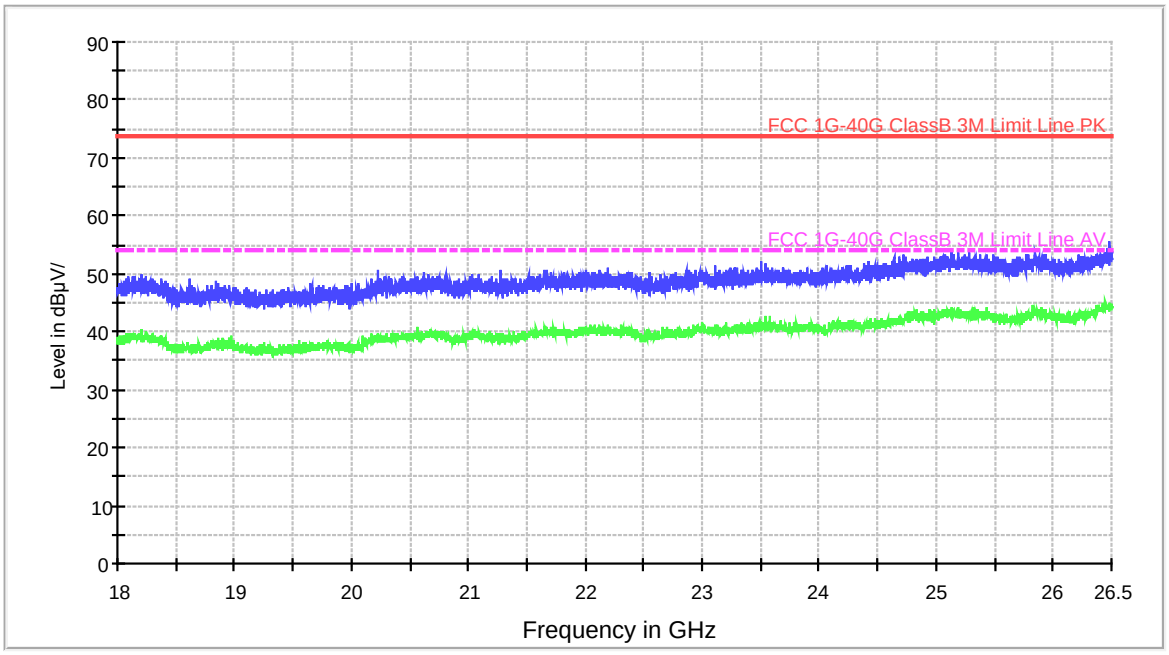
(Horizontal)





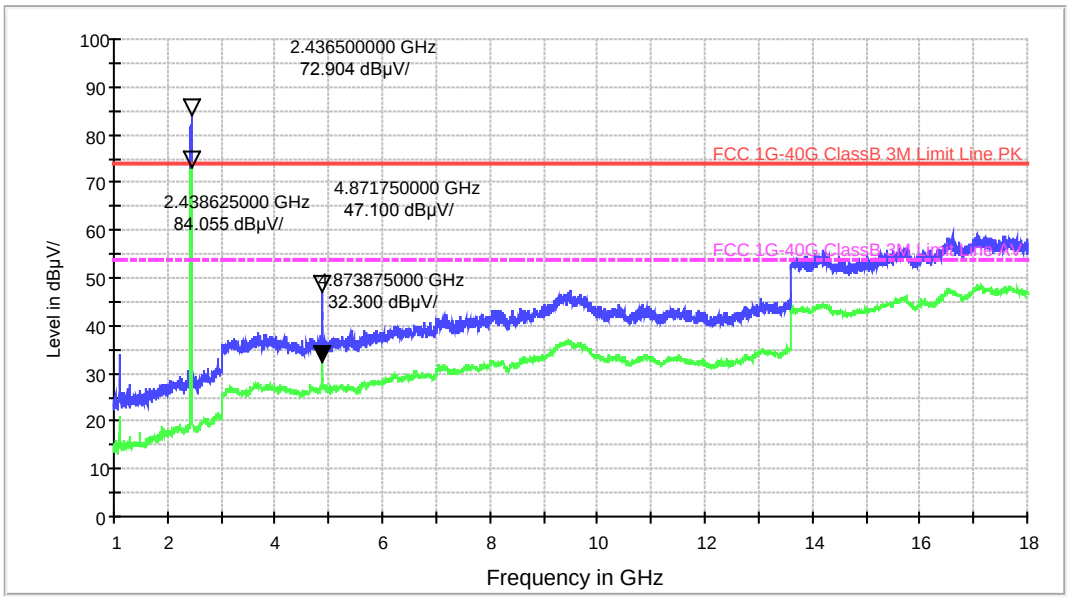
(Vertical)

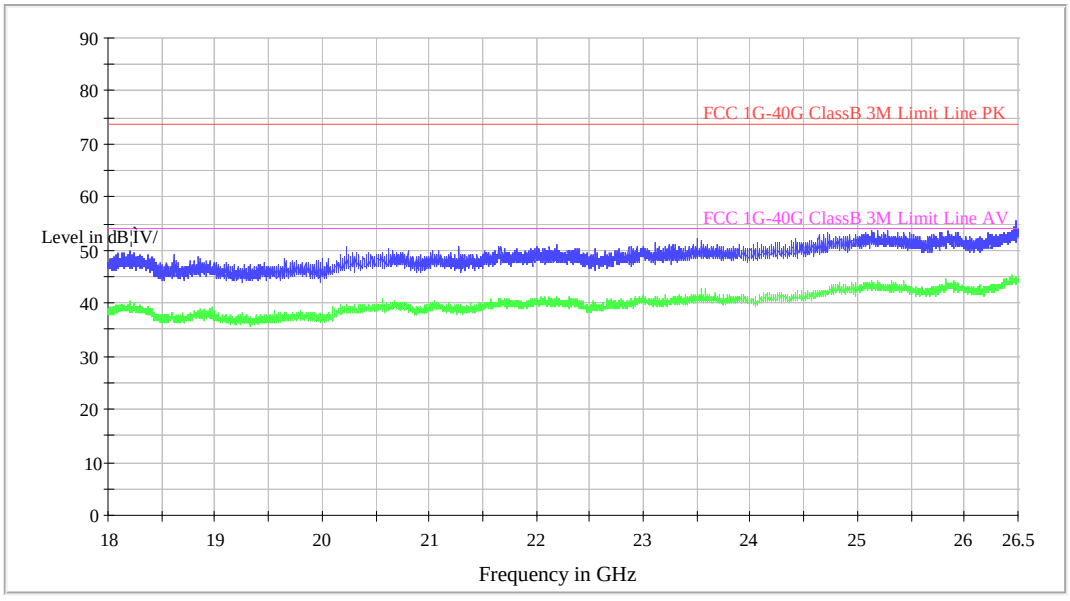




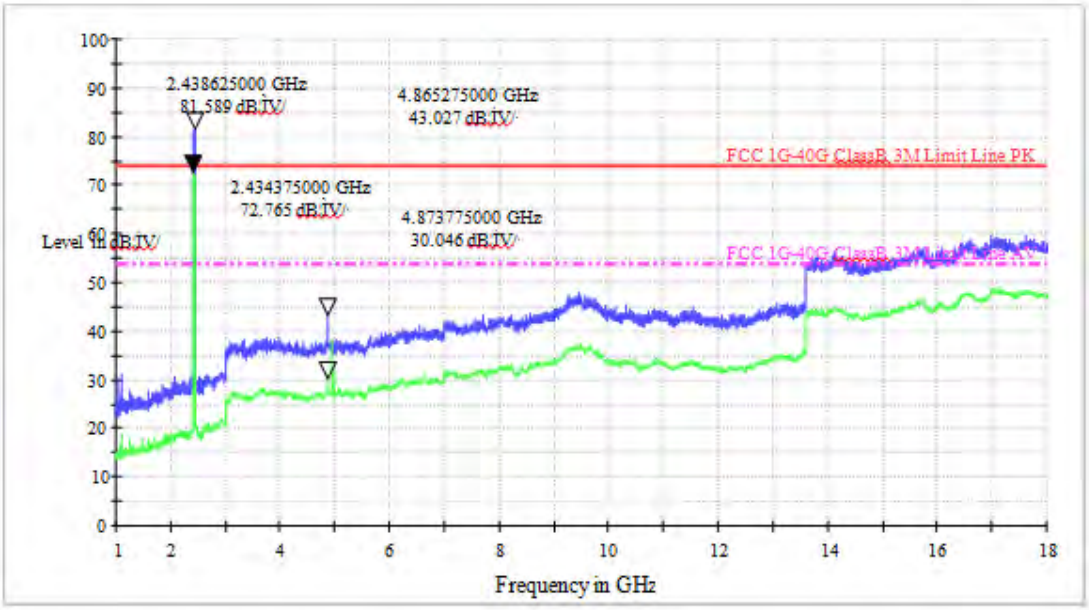
Channel 6 2437MHz

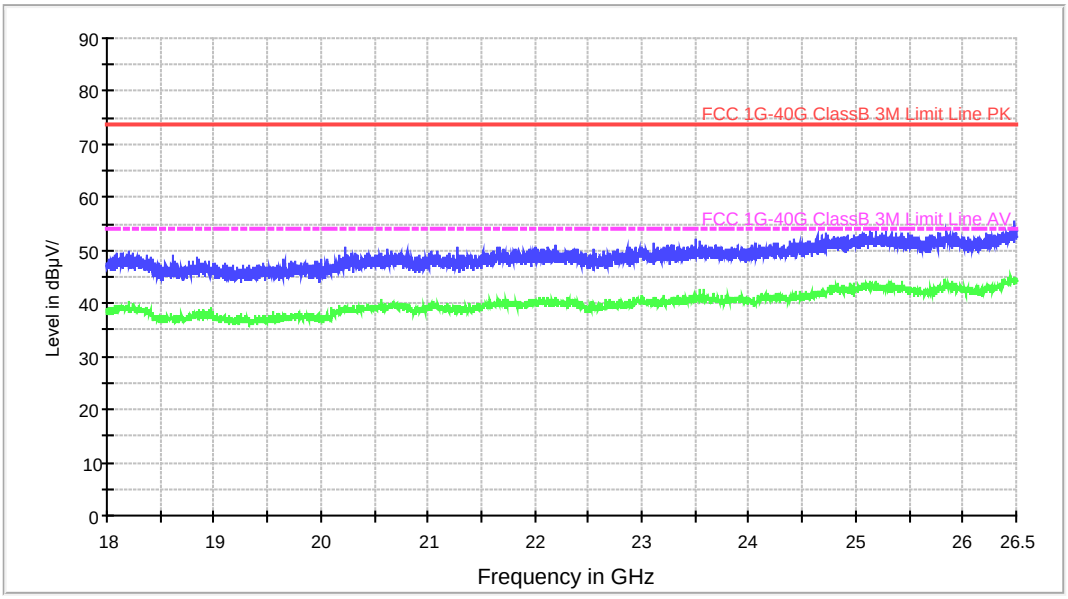
(Horizontal)





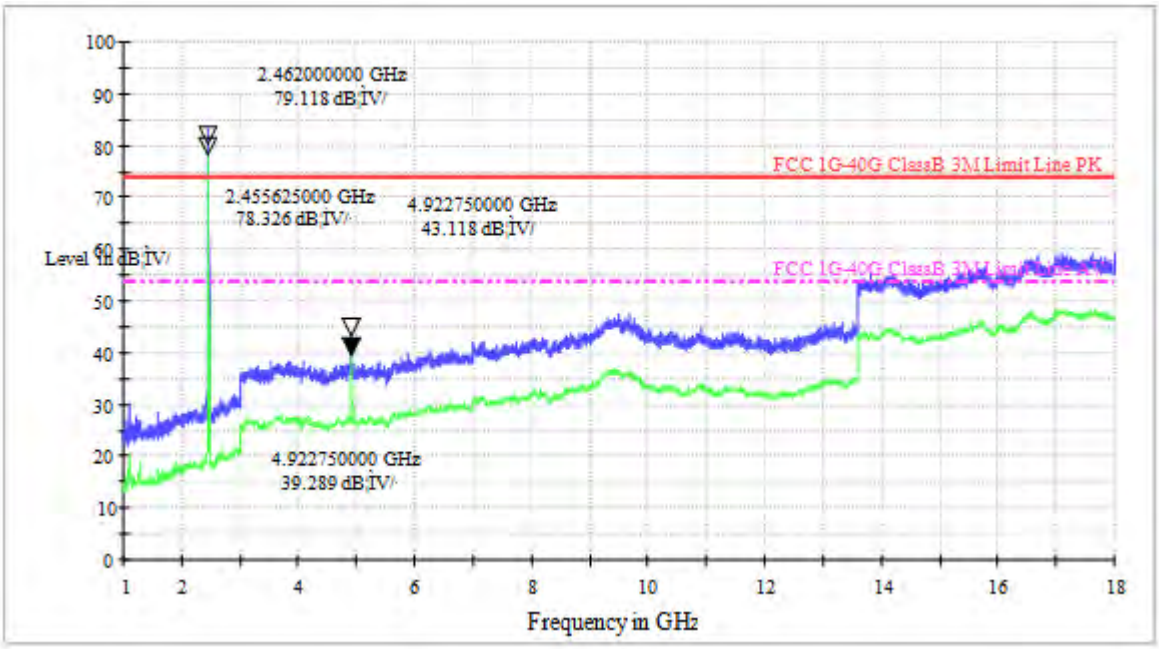
(Vertical)

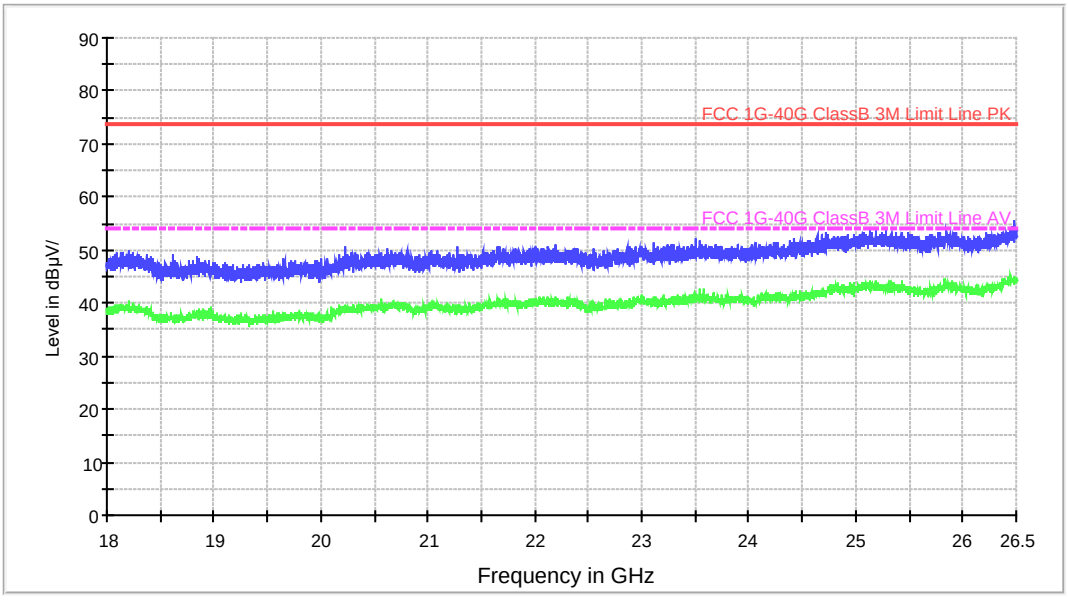




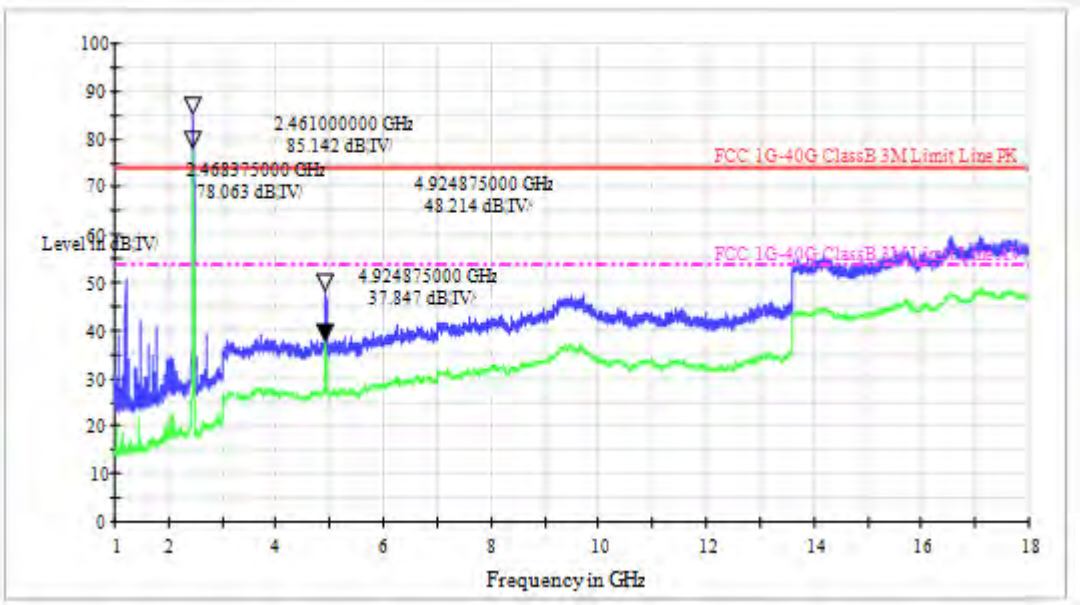
Channel 11 2462MHz

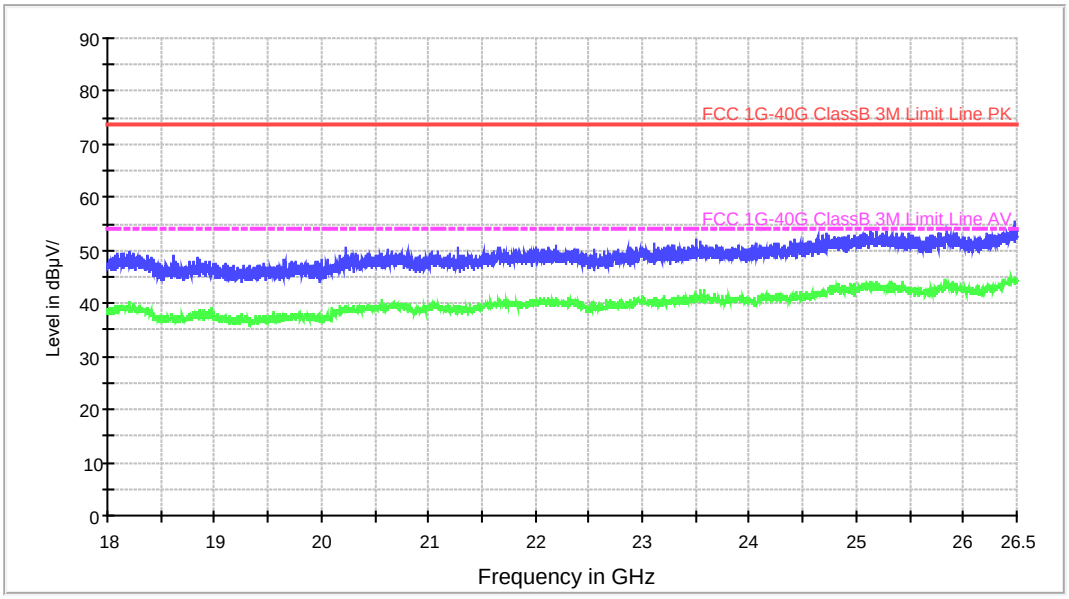
(Horizontal)





(Vertical)

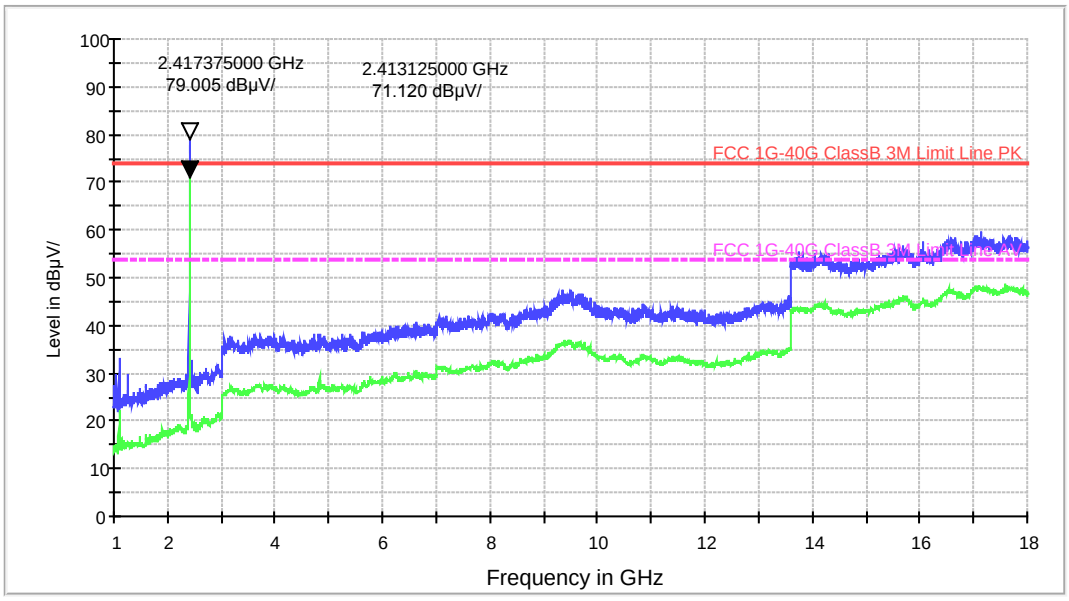


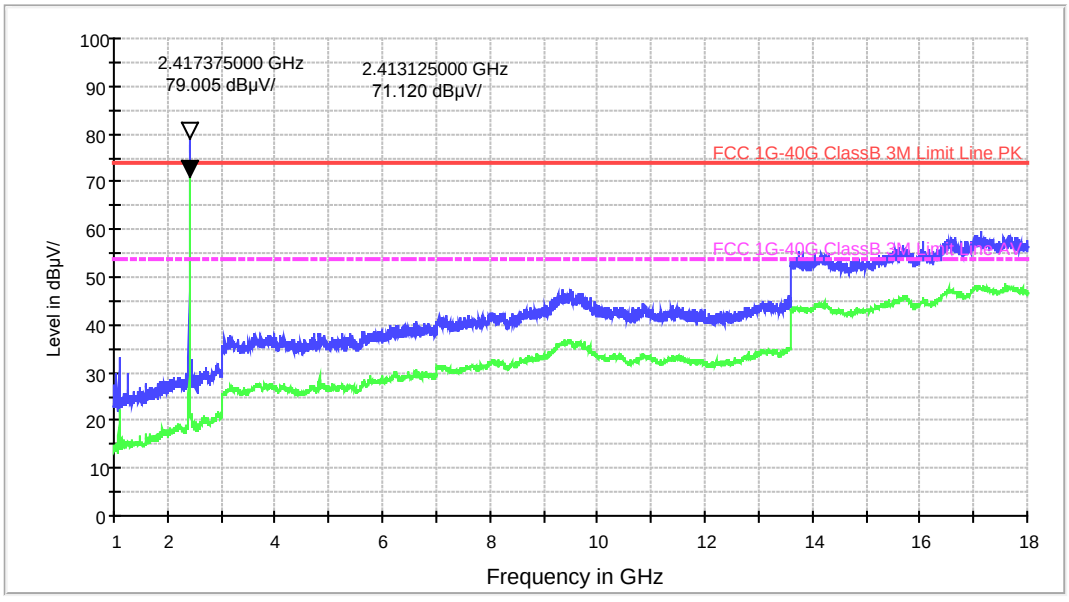


Test Mode: IEEE 802.11n HT20TX

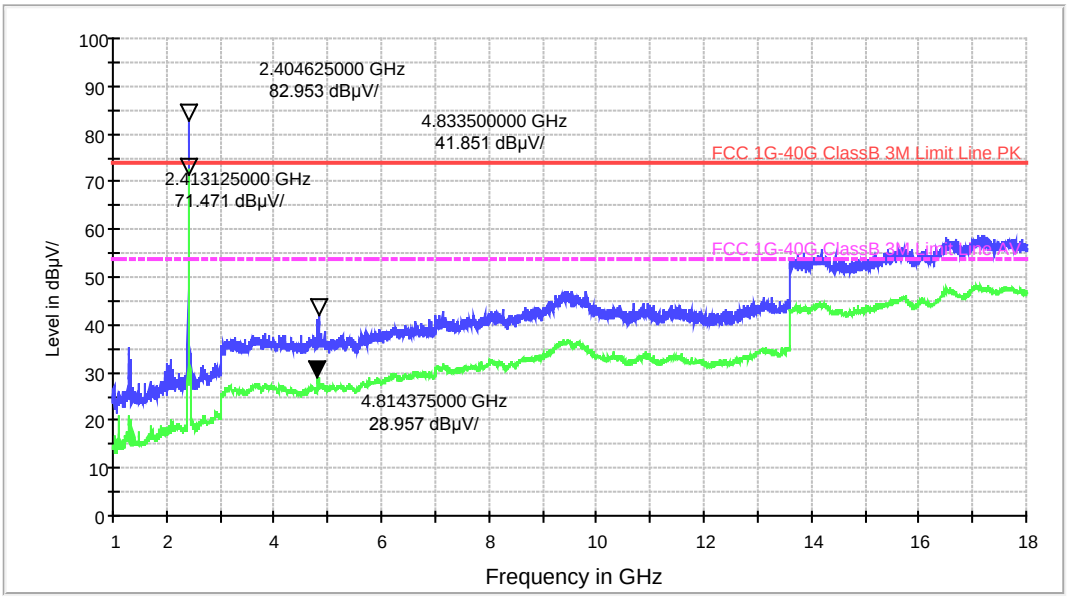
Channel 1 2412MHz

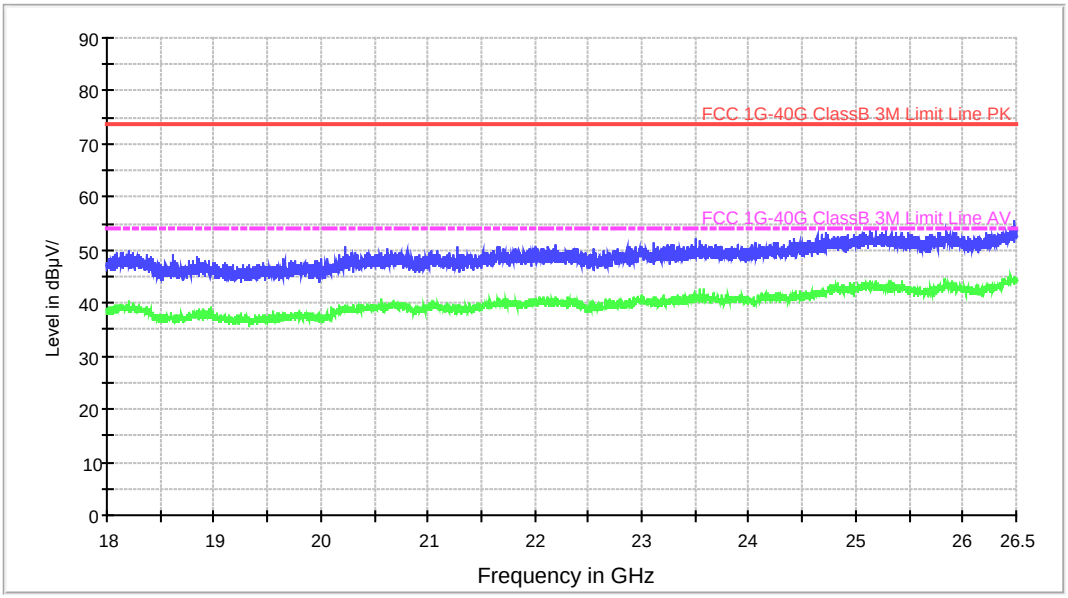
(Horizontal)





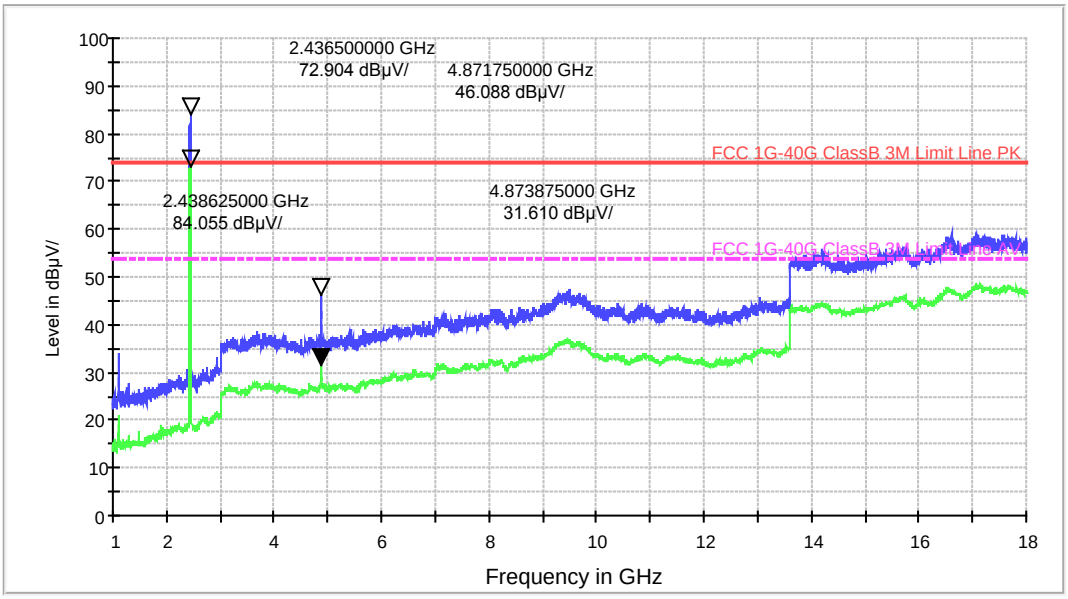
(Vertical)

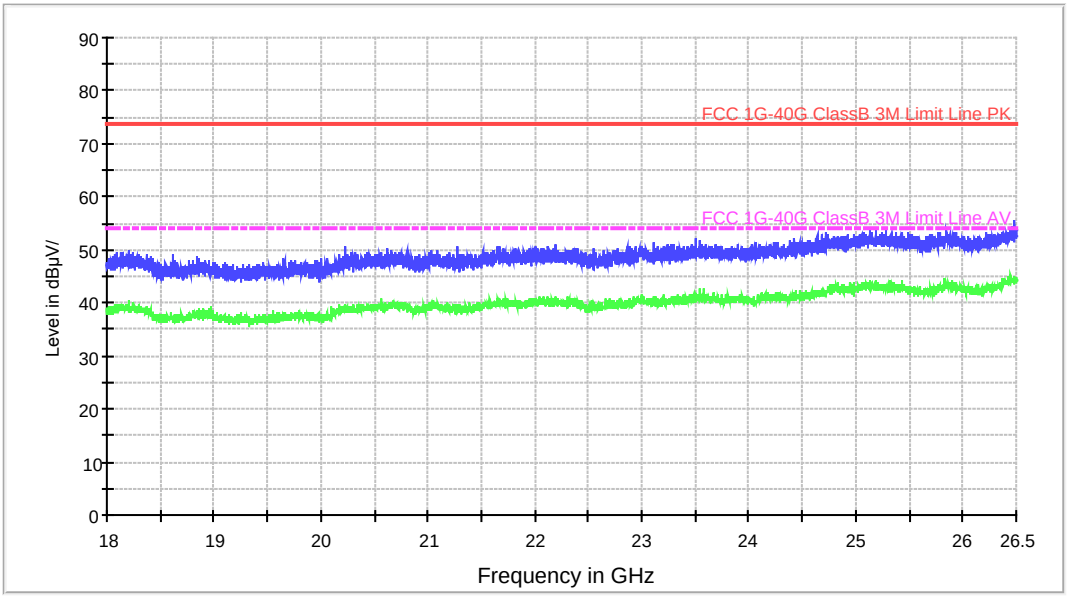




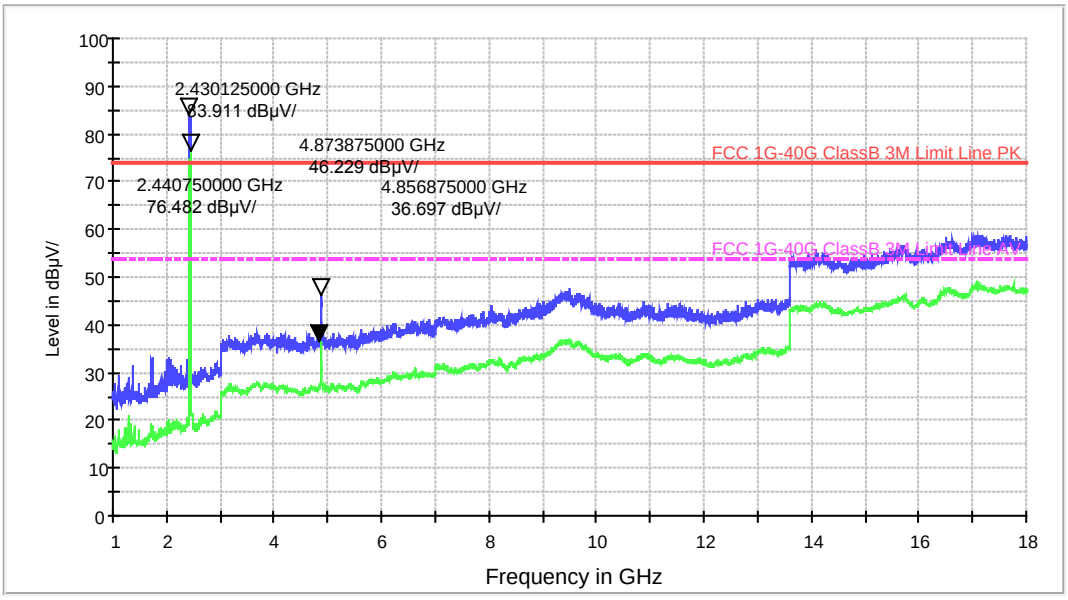
Channel 6 2437MHz

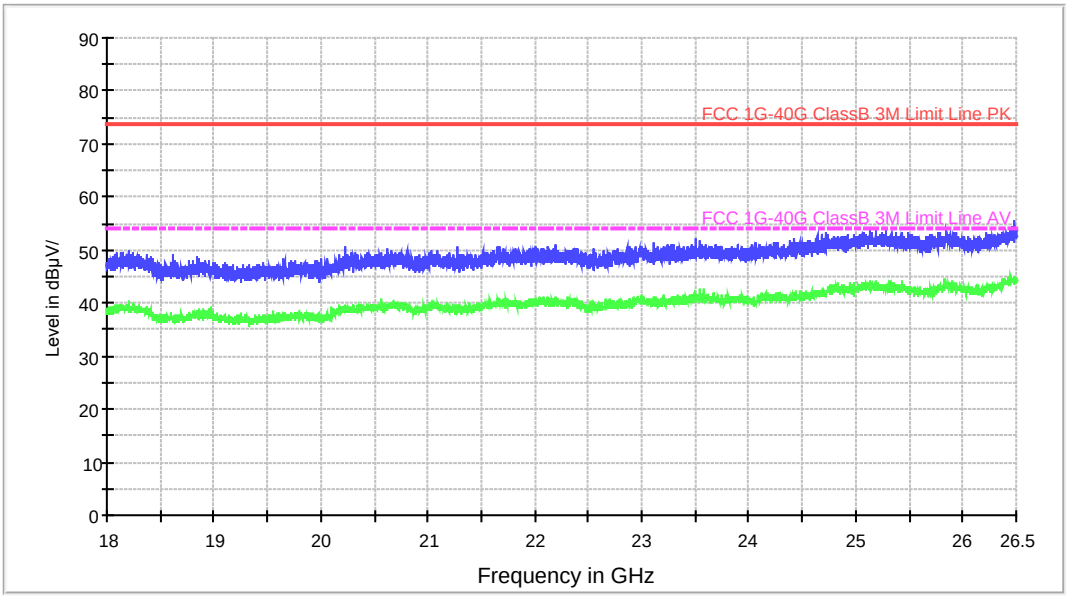
(Horizontal)





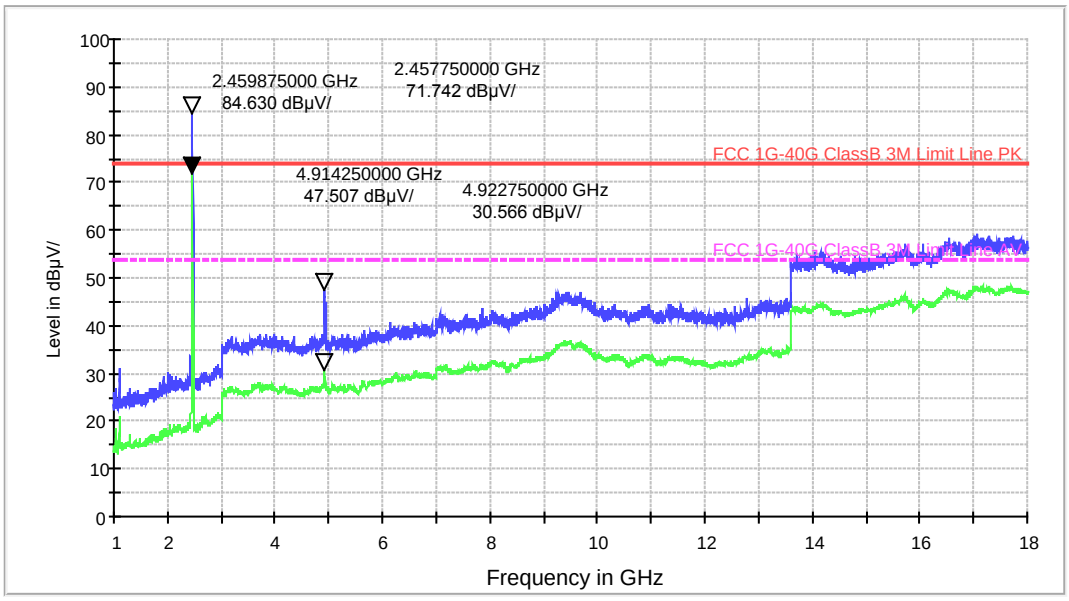
(Vertical)

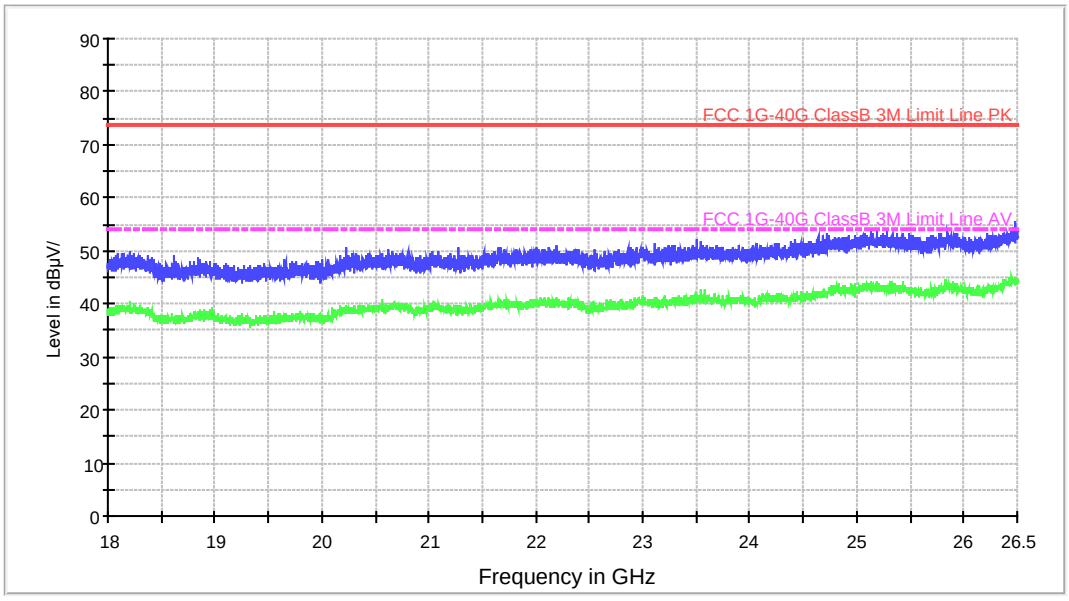




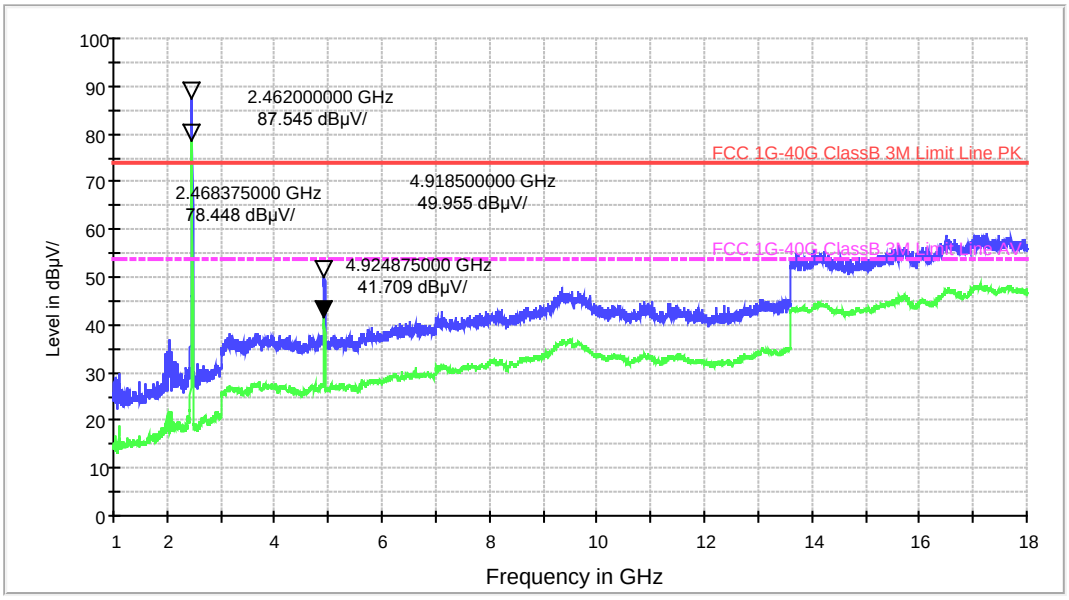
Channel 11 2462MHz

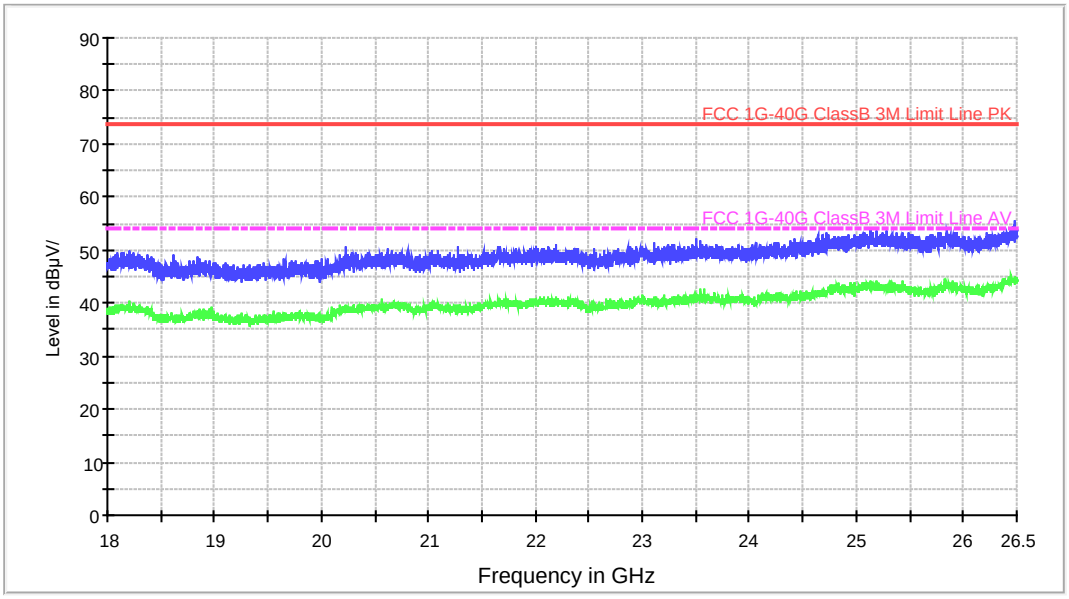
(Horizontal)





(Vertical)

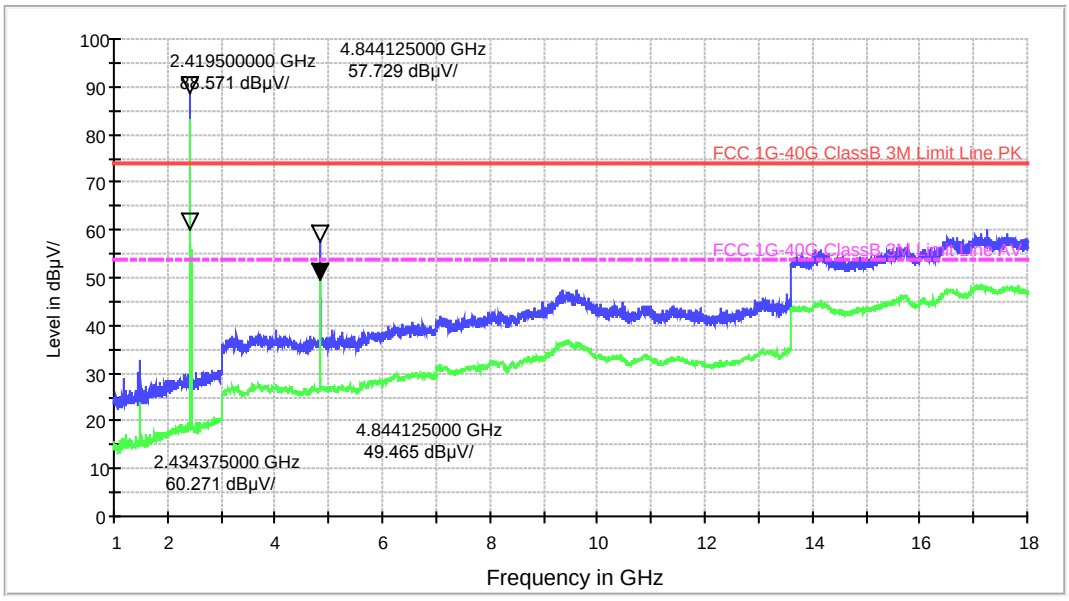


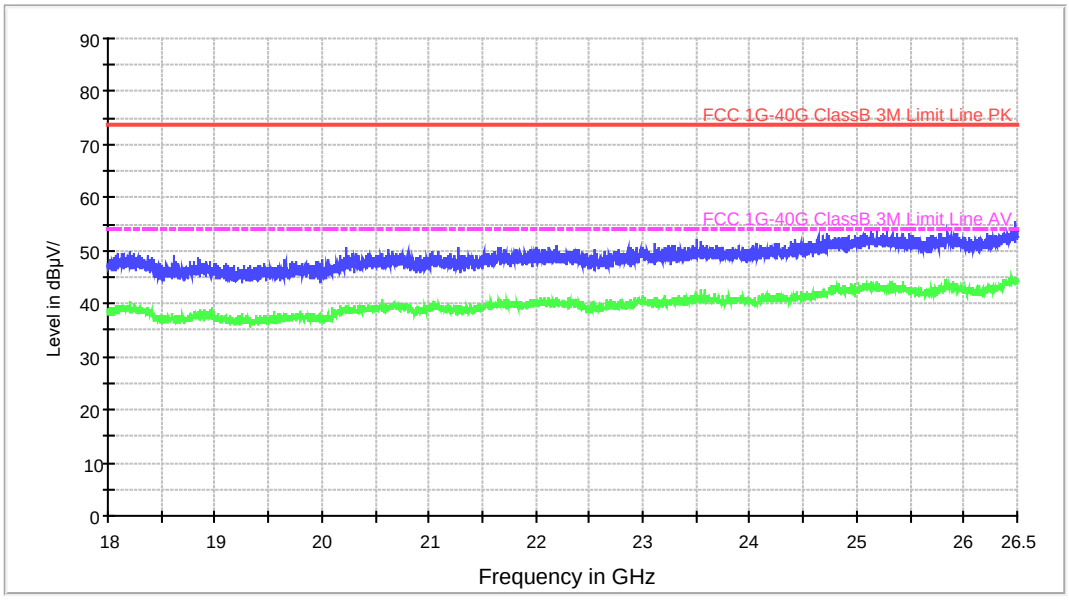


Test Mode: IEEE 802.11n HT40TX

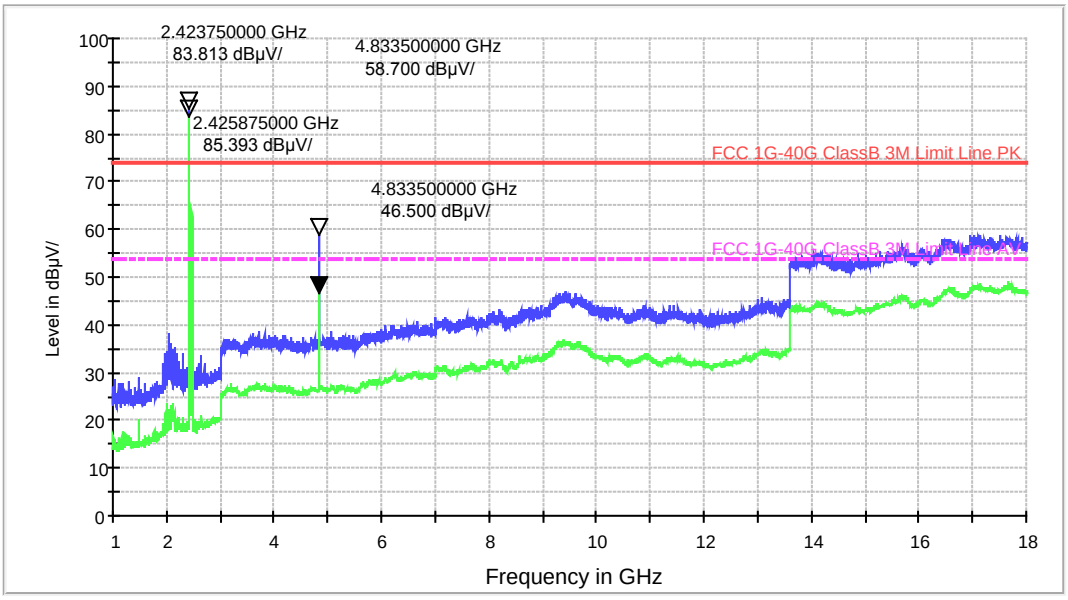
Channel 3 2422MHz

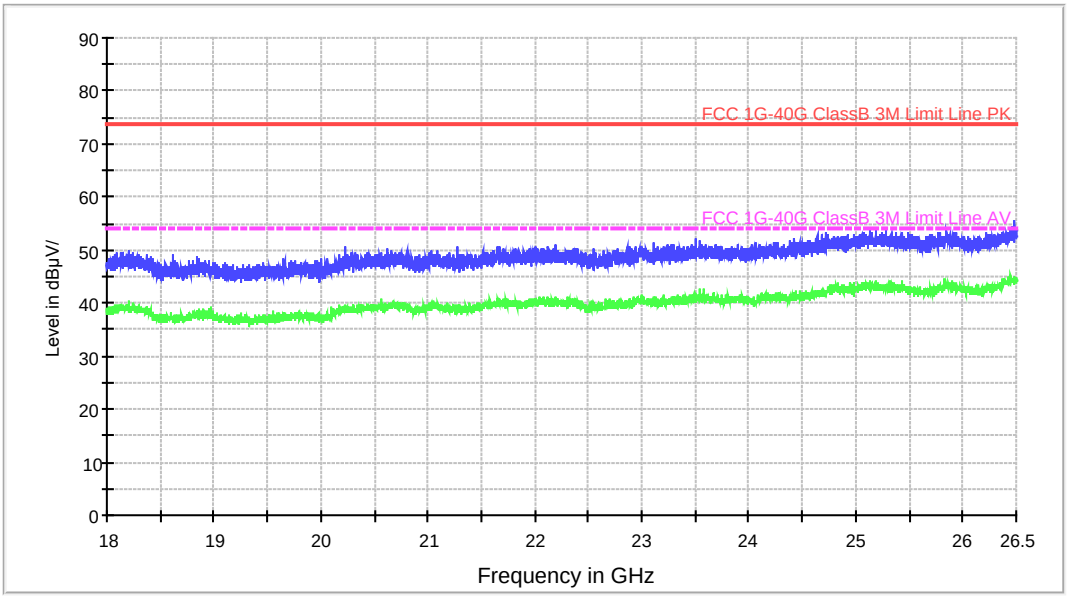
(Horizontal)





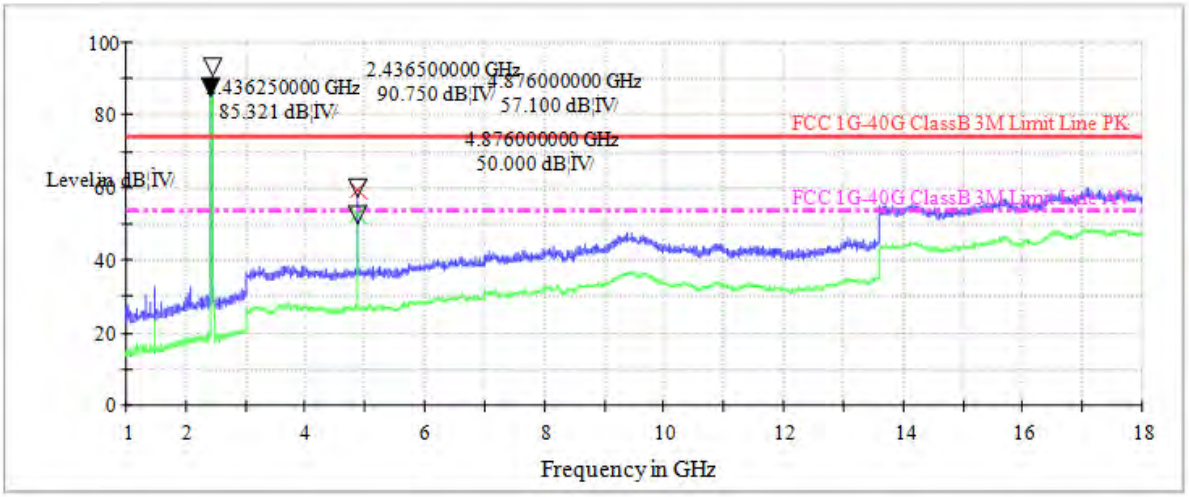
(Vertical)

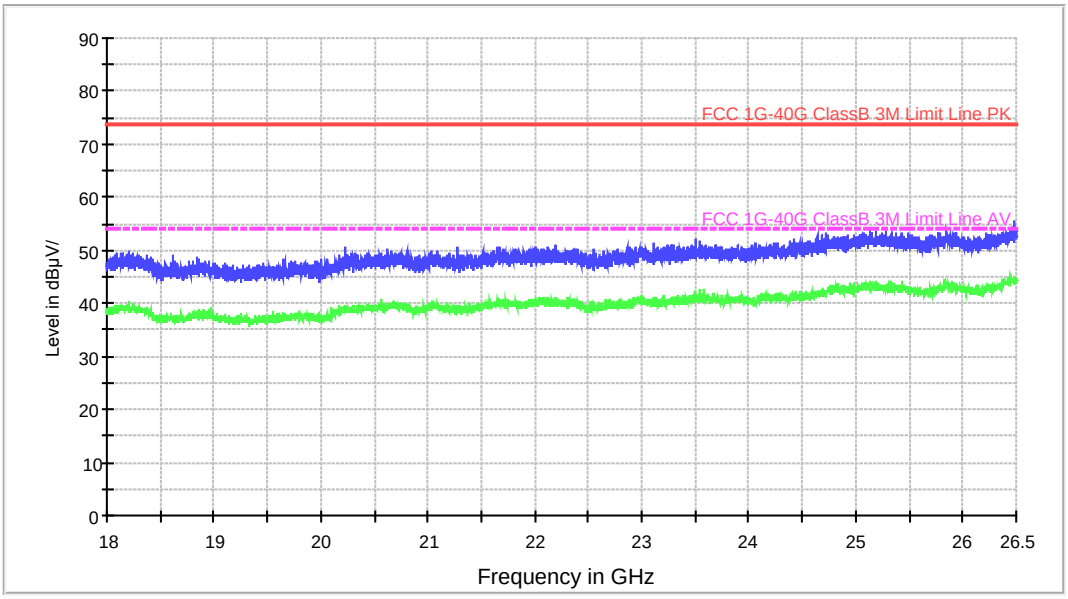




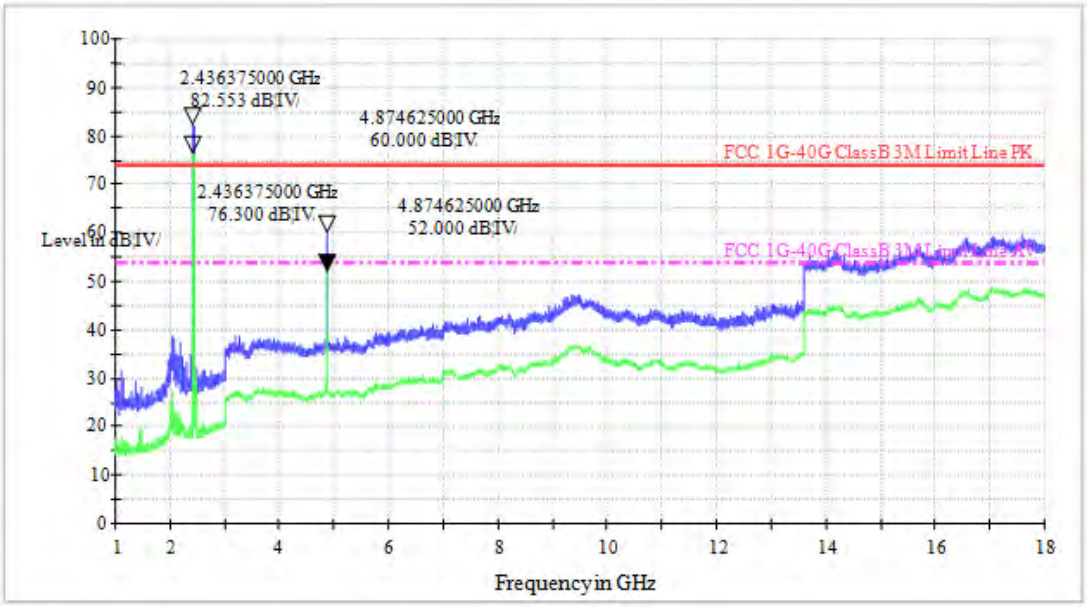
Channel 6 2437MHz

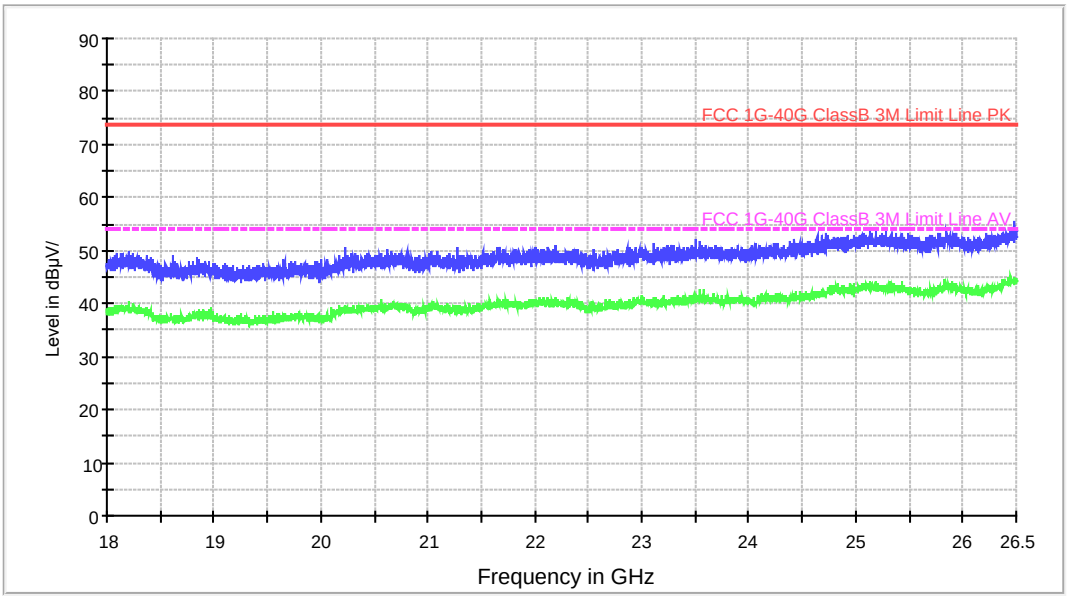
(Horizontal)





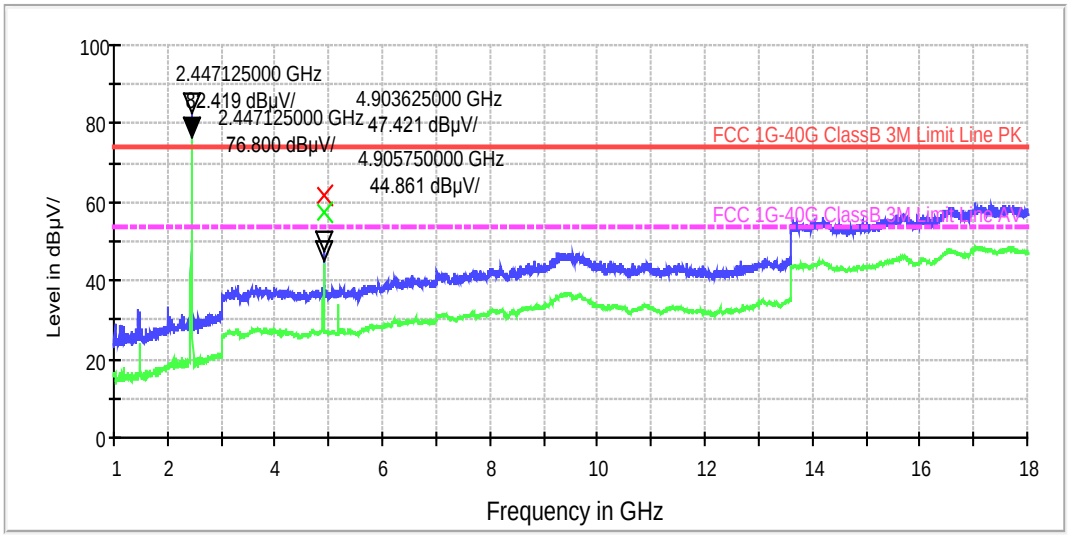
(Vertical)

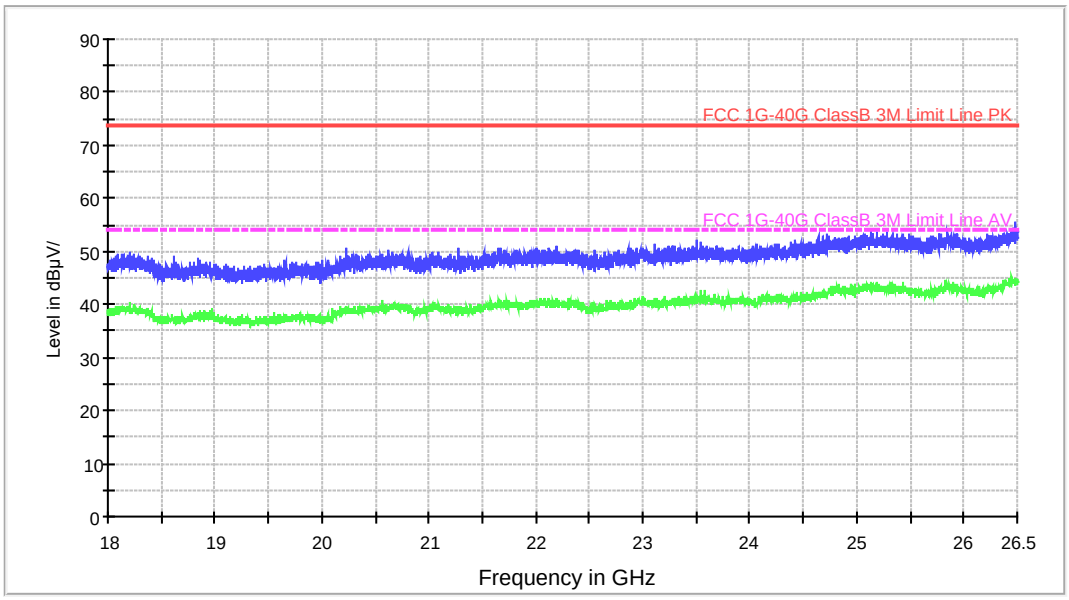




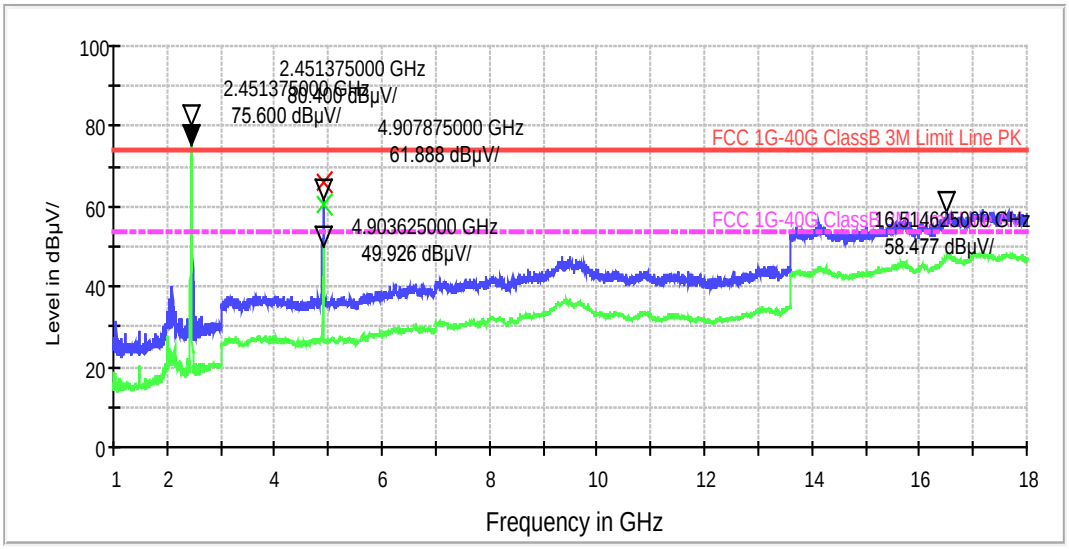
Channel 9 2452MHz

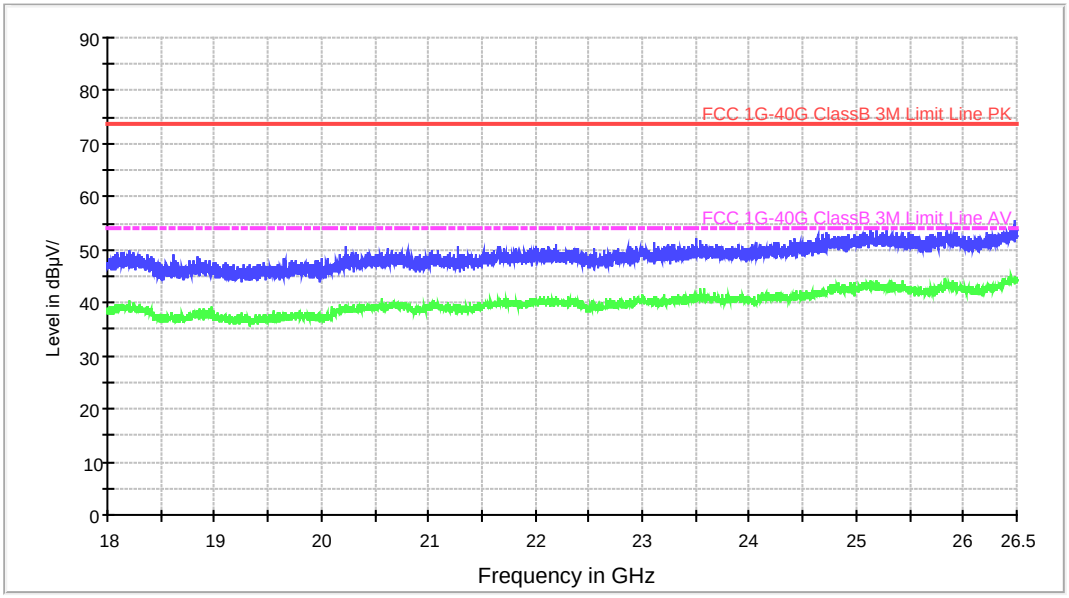
(Horizontal)





(Vertical)





Remark:

The red line means the PK limit.

The purple line means the AV limit.

The blue line means the PK scan data.

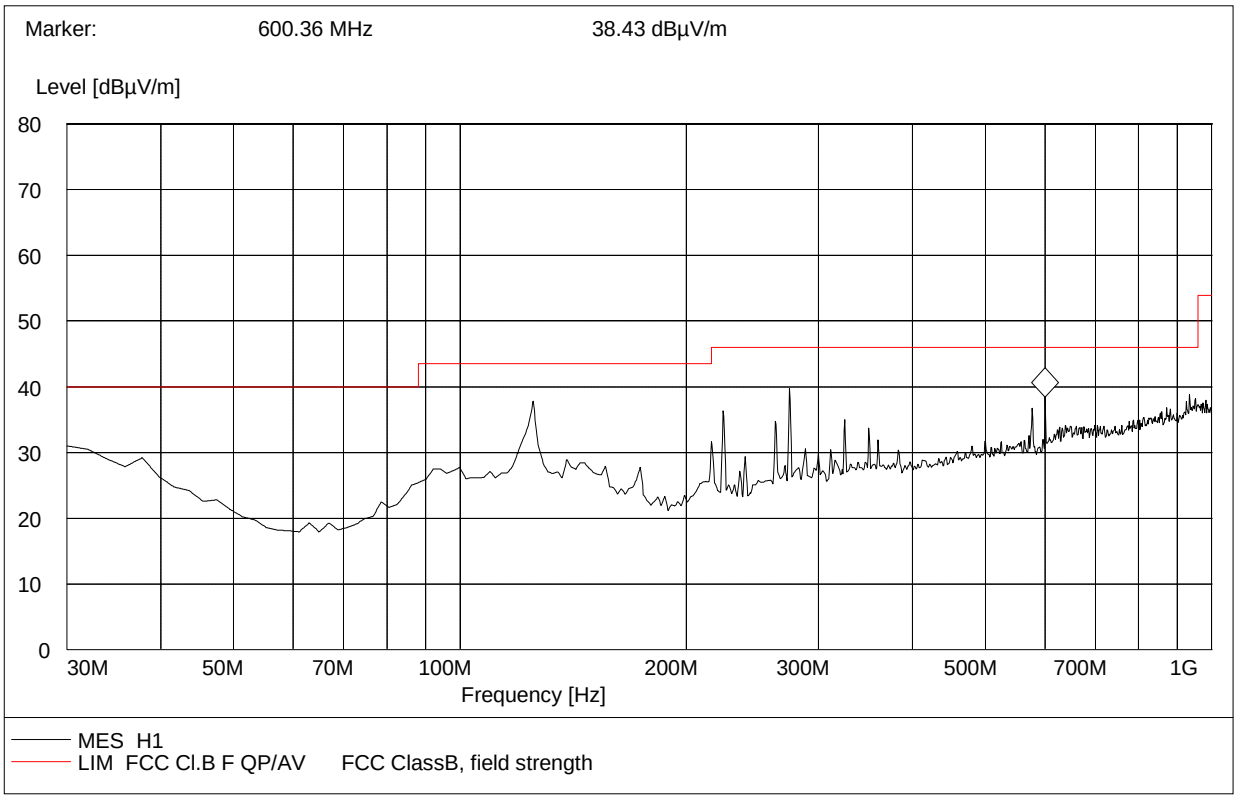
The green line means the AV scan data.

Table 11 Radiated Emission Antenna 2 Test Data Test Data

Antenna 2 Test Data:

Test Mode: IEEE 802.11bTX

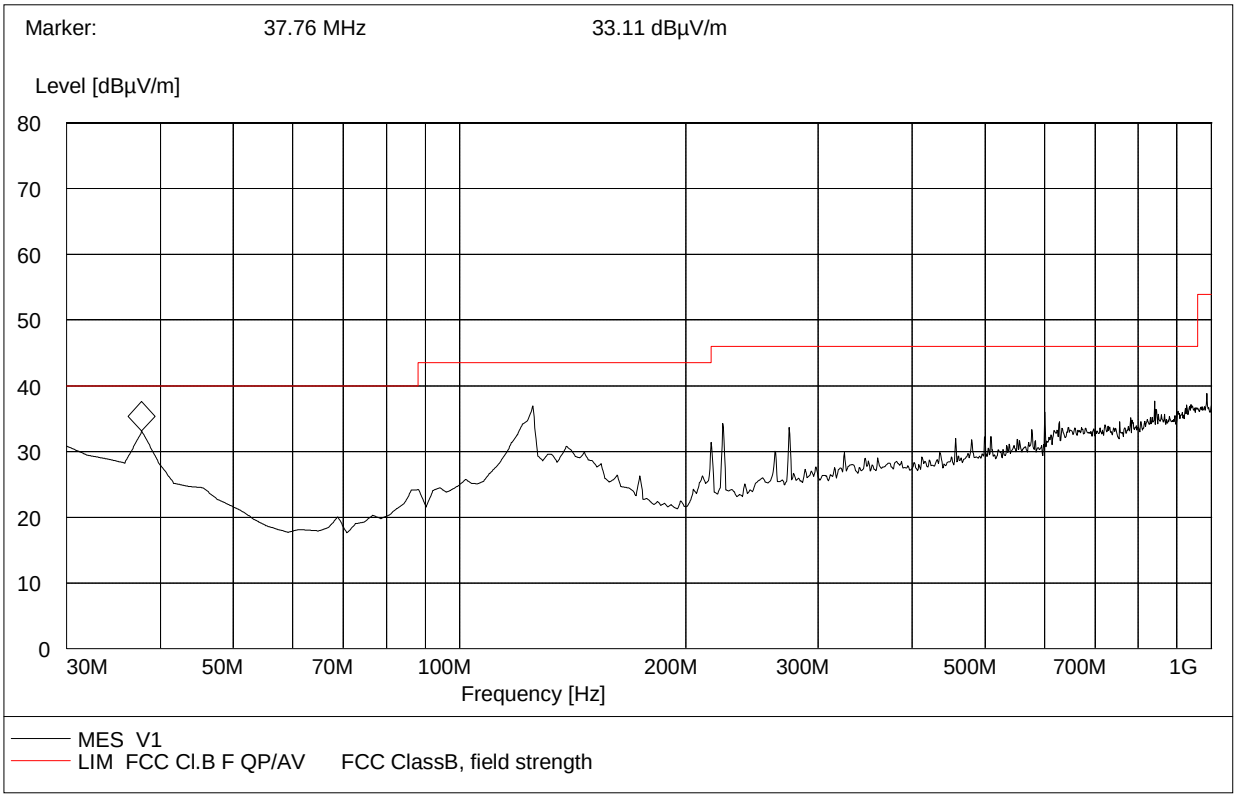
(Horizontal)



MEASUREMENT RESULT: "QuasiPeak"

Frequency MHz	Level dBµV/m	Limit dBµV/m
125.390000	35.04	43.9
274.190000	37.09	46.0
600.180000	36.14	46.0

(Vertical)

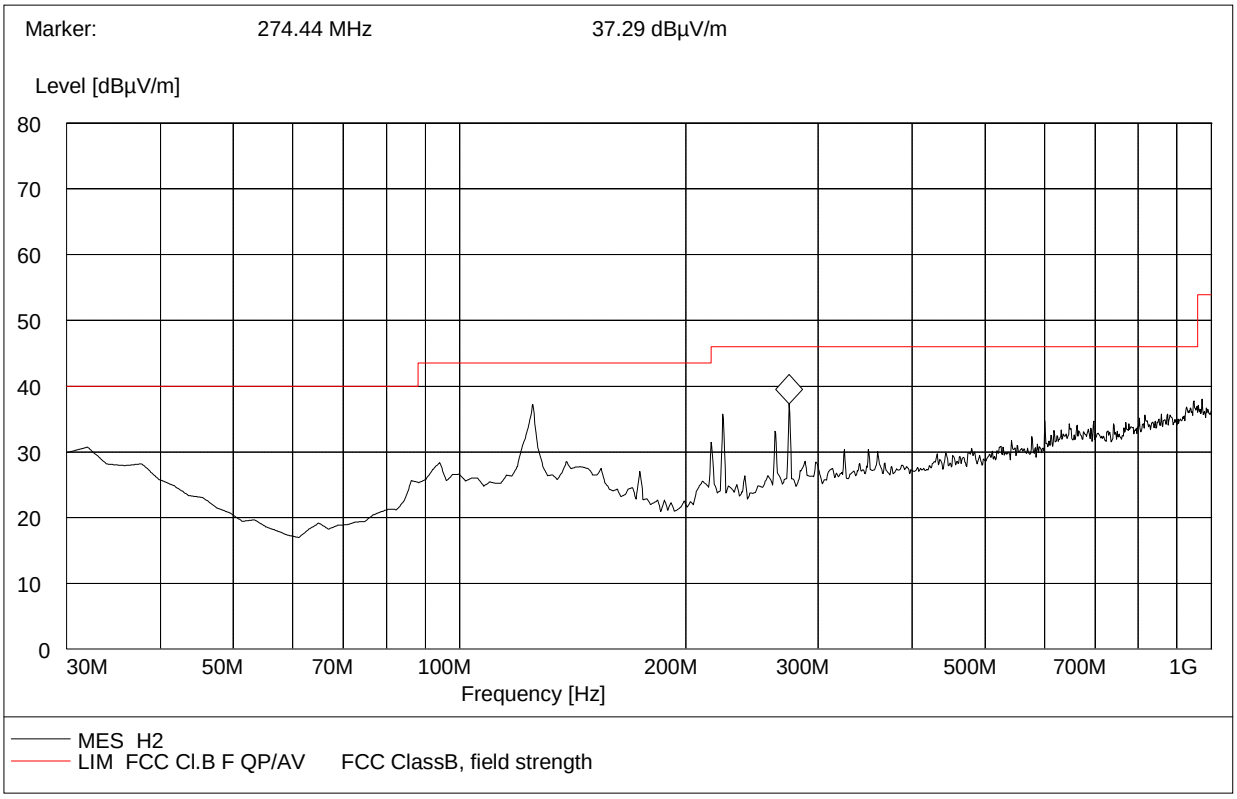


MEASUREMENT RESULT: "QuasiPeak"

Frequency MHz	Level dBµV/m	Limit dBµV/m
125.390000	34.14	43.9
224.360000	32.18	46.0
600.180000	34.14	46.0

Test Mode: IEEE 802.11gTX

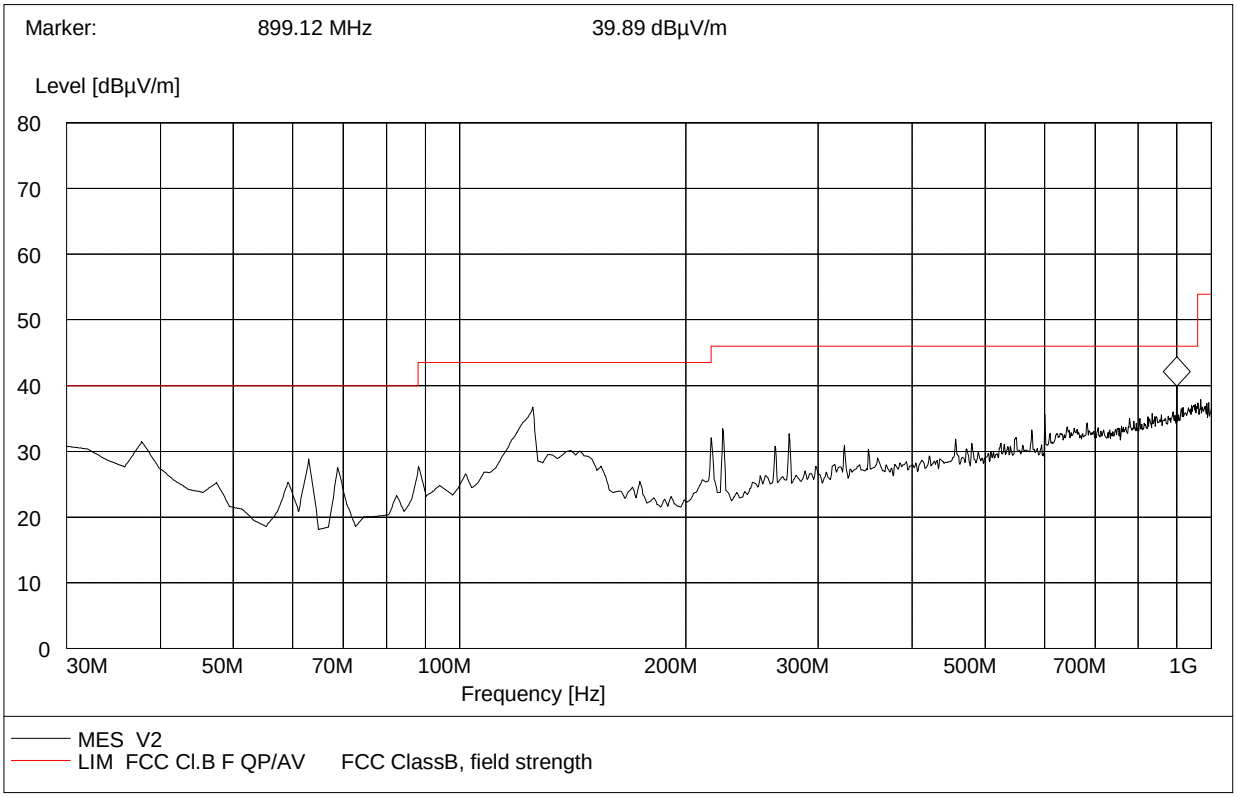
(Horizontal)



MEASUREMENT RESULT: "QuasiPeak"

Frequency MHz	Level dBµV/m	Limit dBµV/m
125.390000	35.03	43.5
224.390000	34.25	46.0

(Vertical)

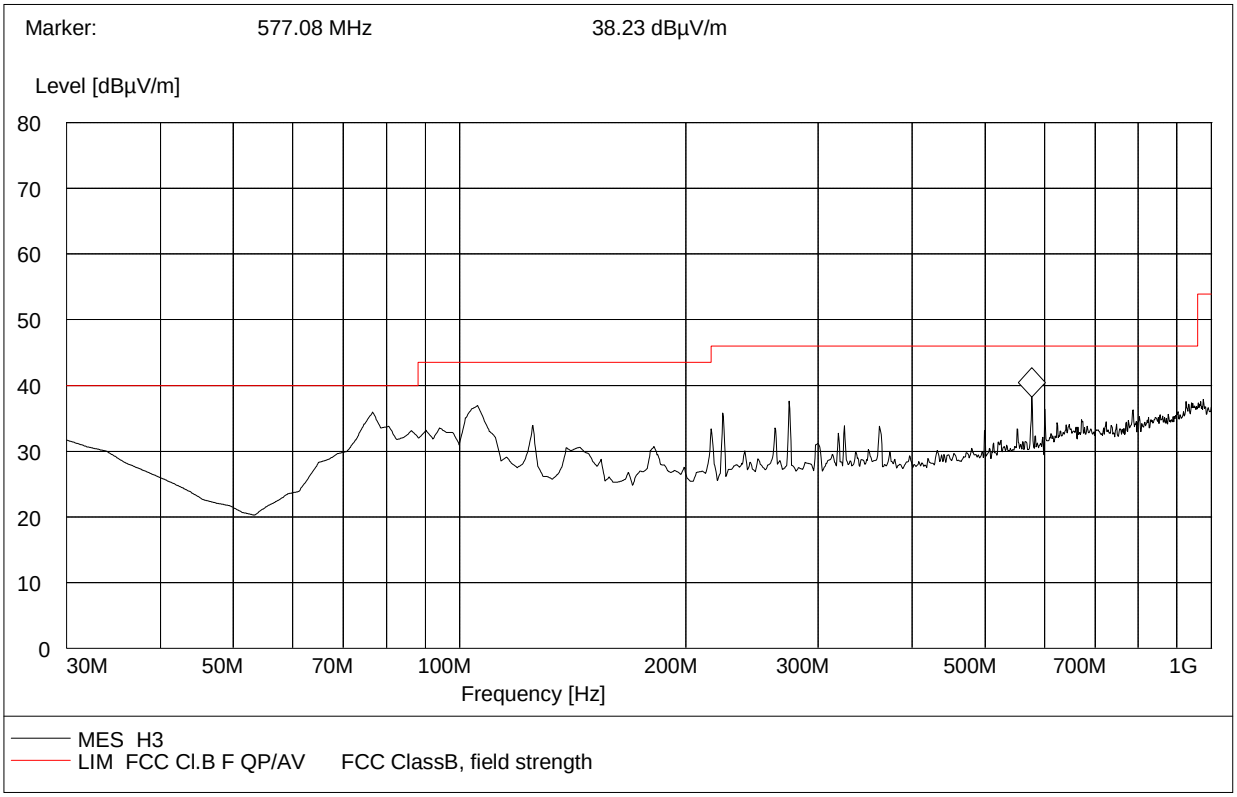


MEASUREMENT RESULT: "QuasiPeak"

Frequency	Level	Limit
MHz	dBµV/m	dBµV/m
37.190000	30.05	40.0
125.390000	34.12	43.5
889.070000	37.28	46.0

Test Mode: IEEE 802.11n HT20TX

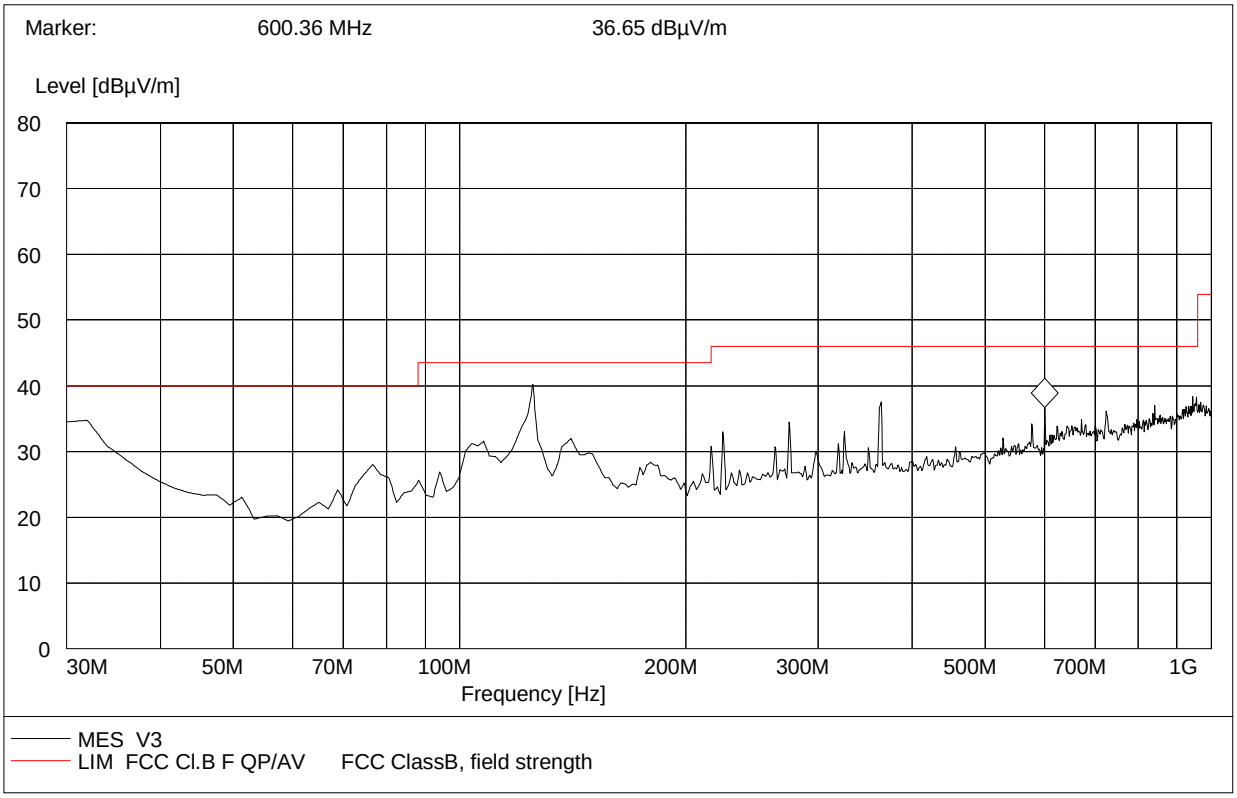
(Horizontal)



MEASUREMENT RESULT: "QuasiPeak"

Frequency	Level	Limit
MHz	dBµV/m	dBµV/m
105.360000	34.09	43.5
76.390000	33.16	40.0

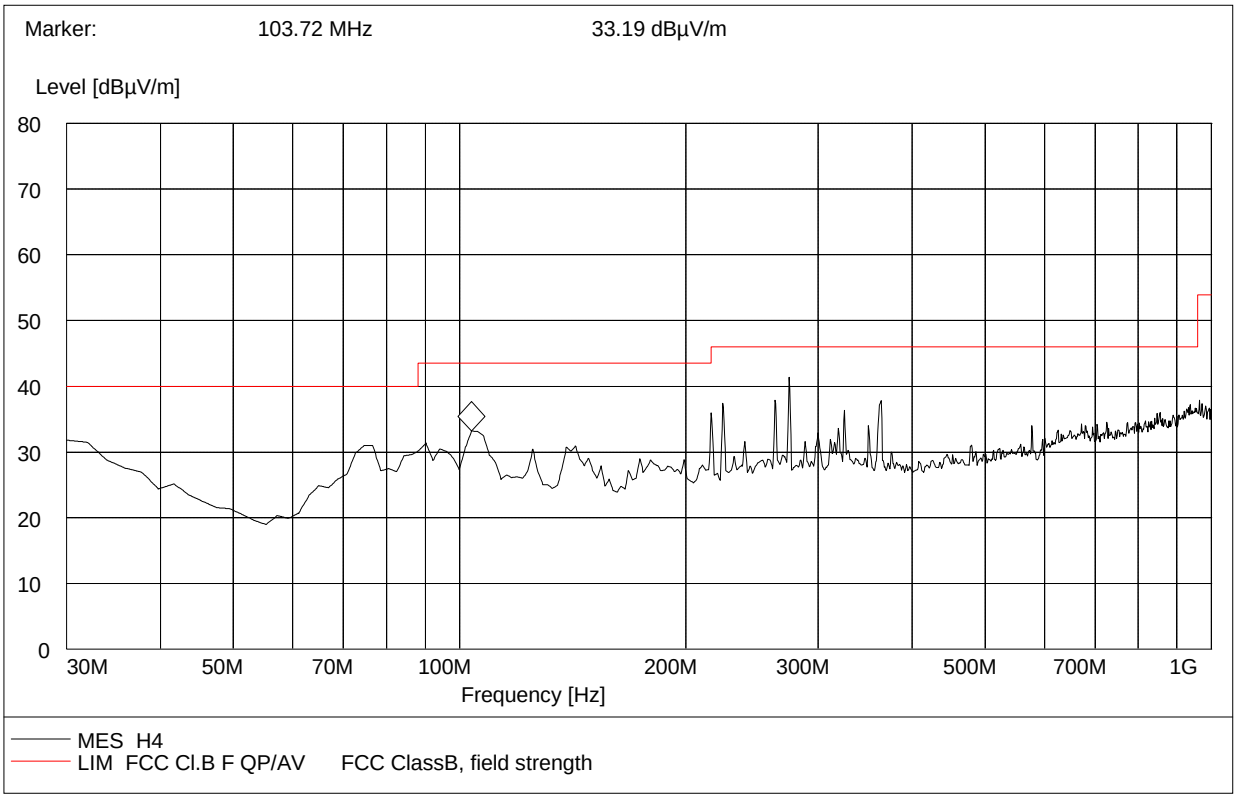
(Vertical)



MEASUREMENT RESULT: "QuasiPeak"

Frequency	Level	Limit
MHz	dBµV/m	dBµV/m
125.360000	37.24	43.5
363.280000	35.07	46.0

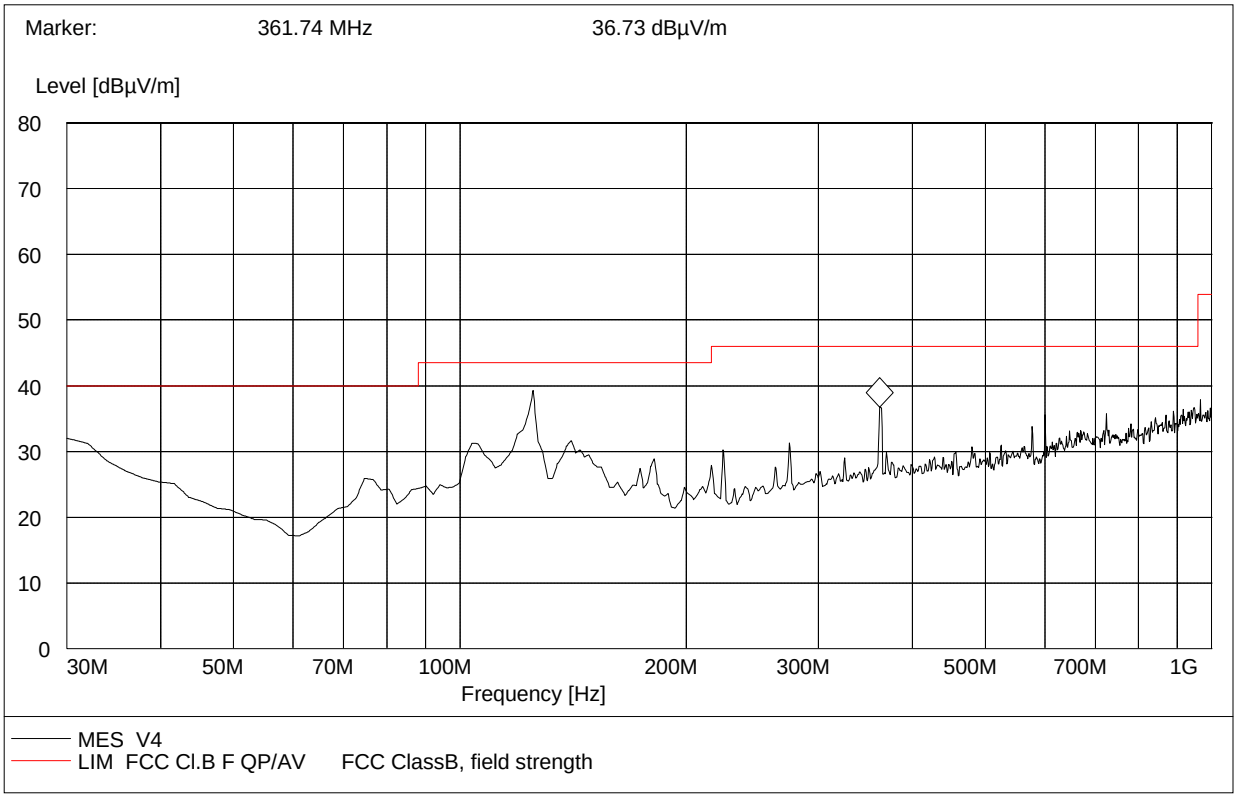
Test Mode: IEEE 802.11n HT40TX
(Horizontal)



MEASUREMENT RESULT: "QuasiPeak"

Frequency	Level	Limit
MHz	dBµV/m	dBµV/m
274.370000	40.21	46.0
224.350000	35.07	46.0

(Vertical)



MEASUREMENT RESULT: "QuasiPeak"

Frequency	Level	Limit
MHz	dBµV/m	dBµV/m
125.360000	37.01	43.5
361.320000	34.67	46.0

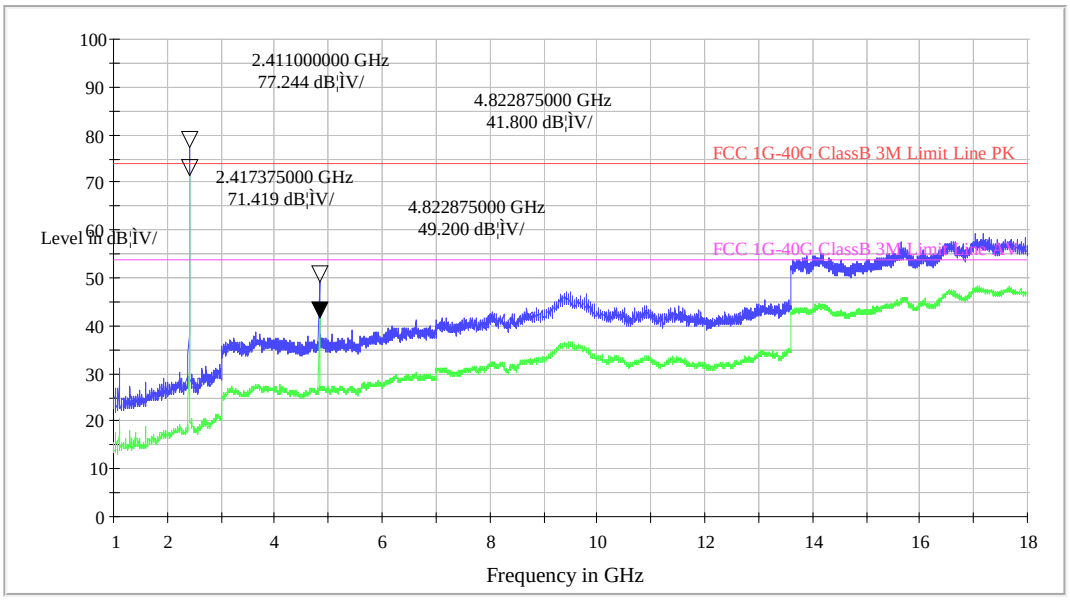
Radiated Emission Test Data (Above 1GHz)

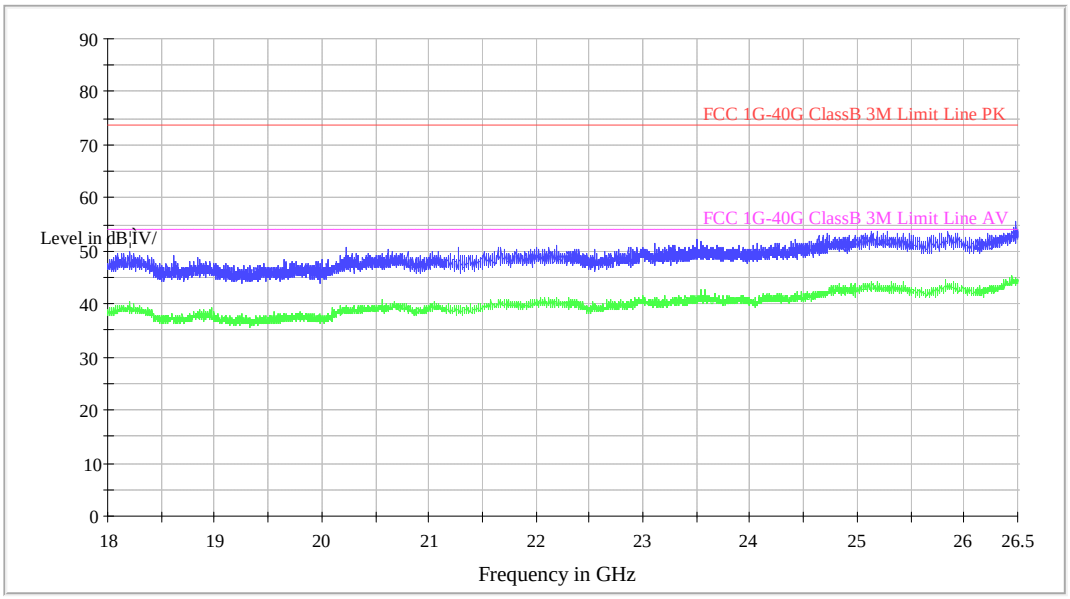
Antenna 2 Test Data

Test Mode: IEEE 802.11b

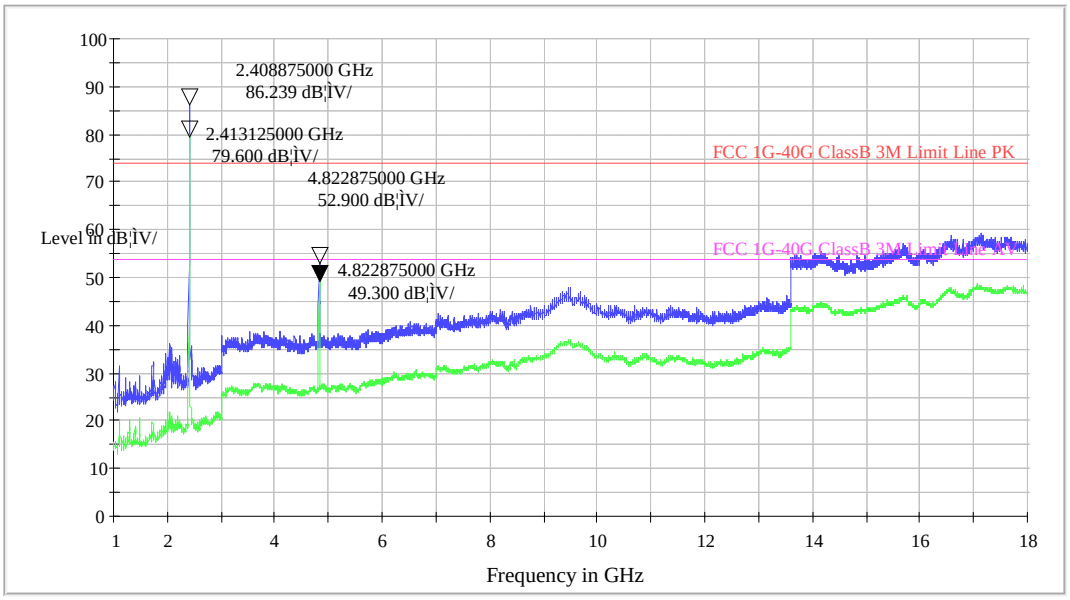
Channel 1 2412MHz

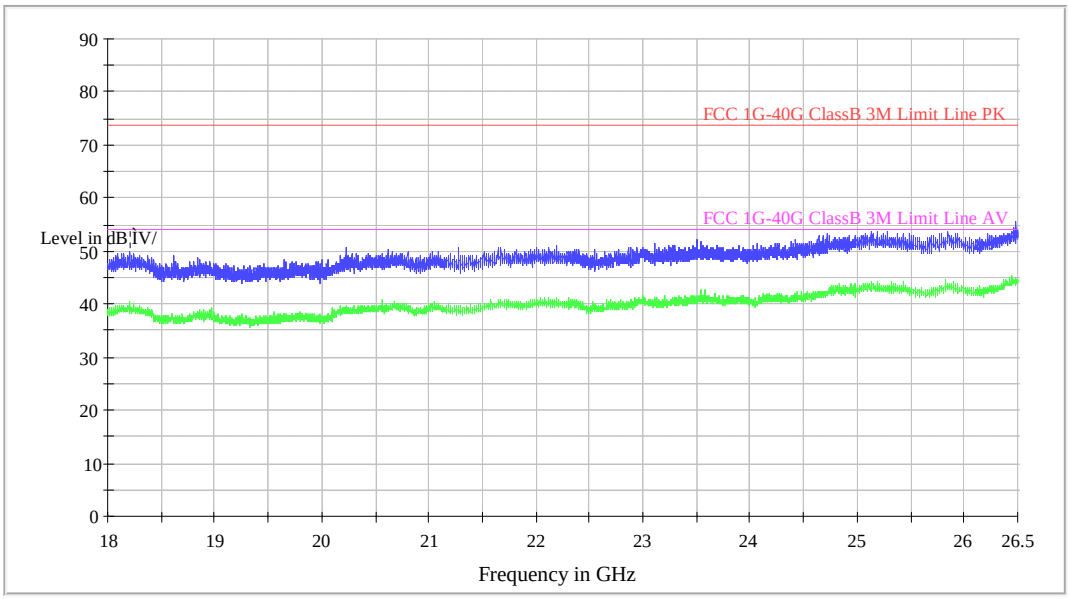
(Horizontal)





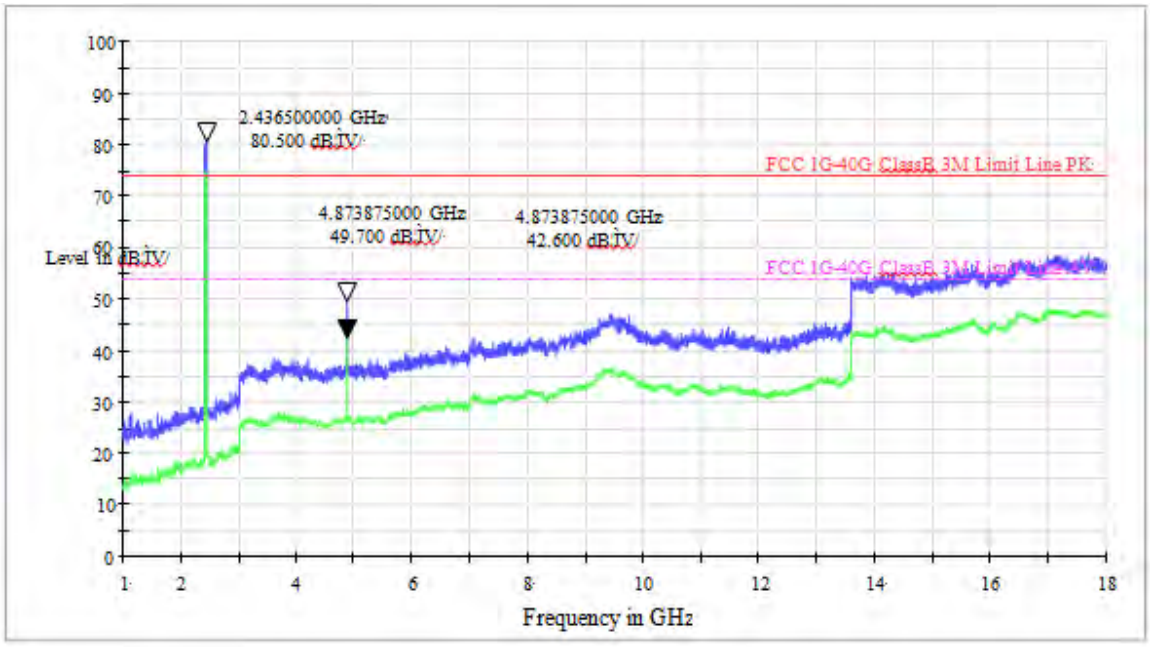
(Vertical)

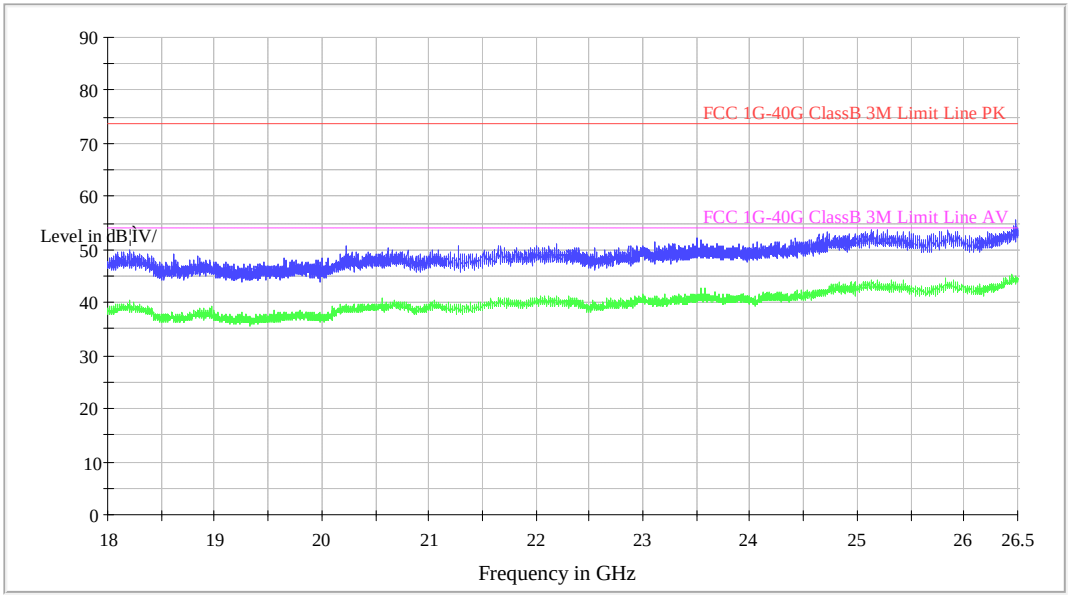




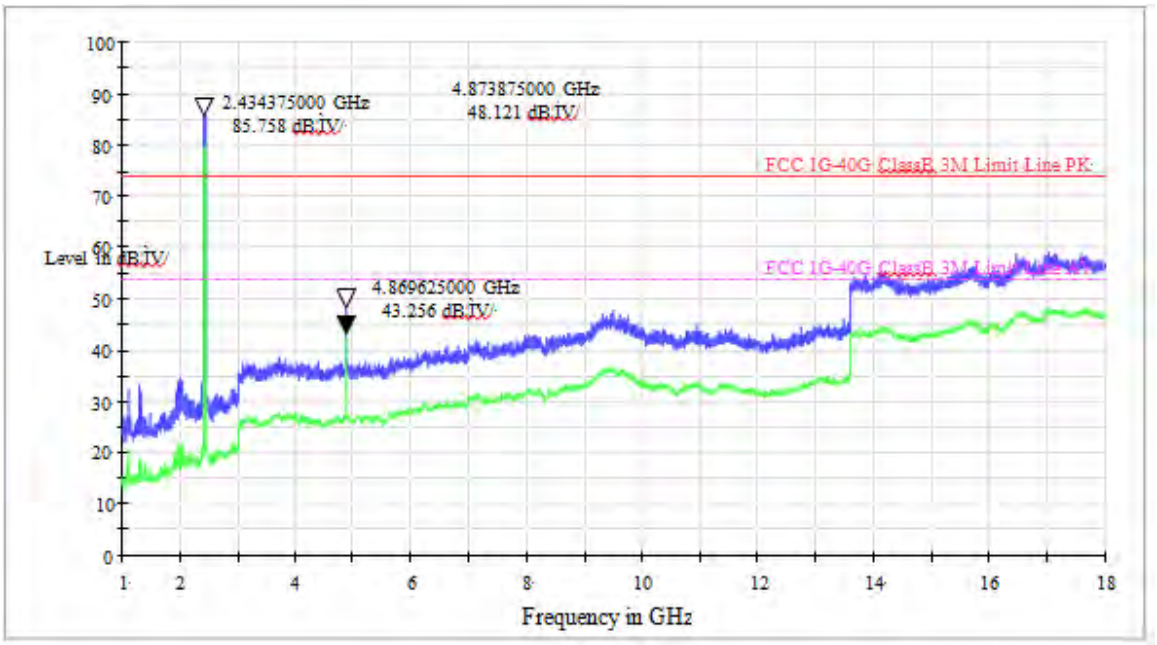
Channel 6 2437MHz

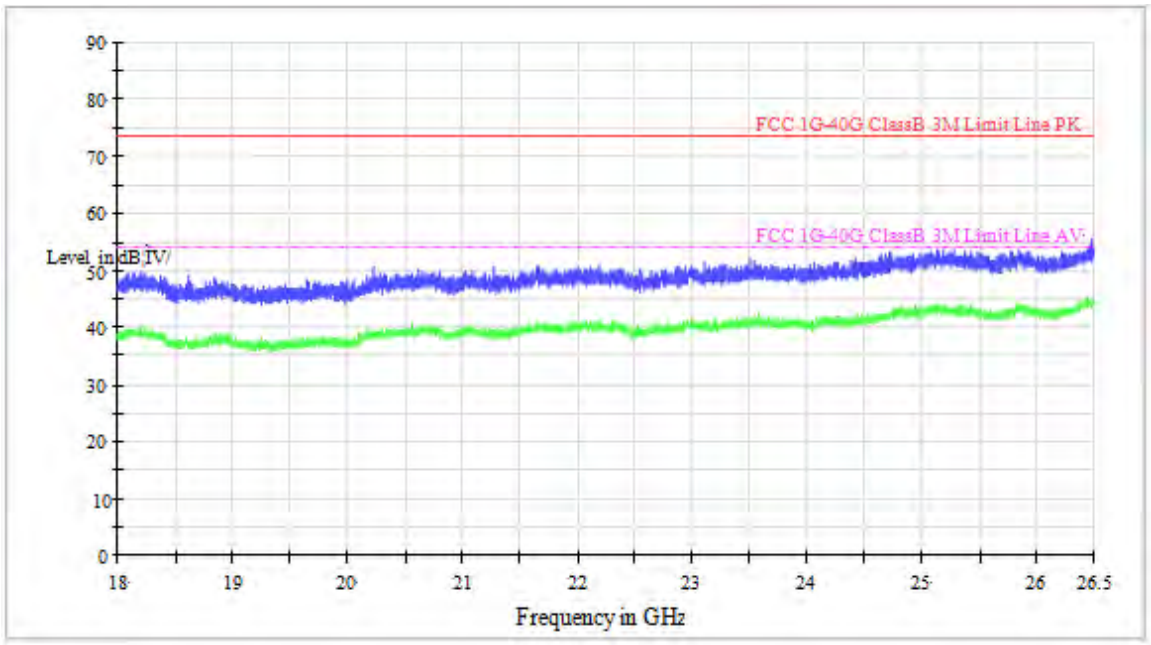
(Horizontal)





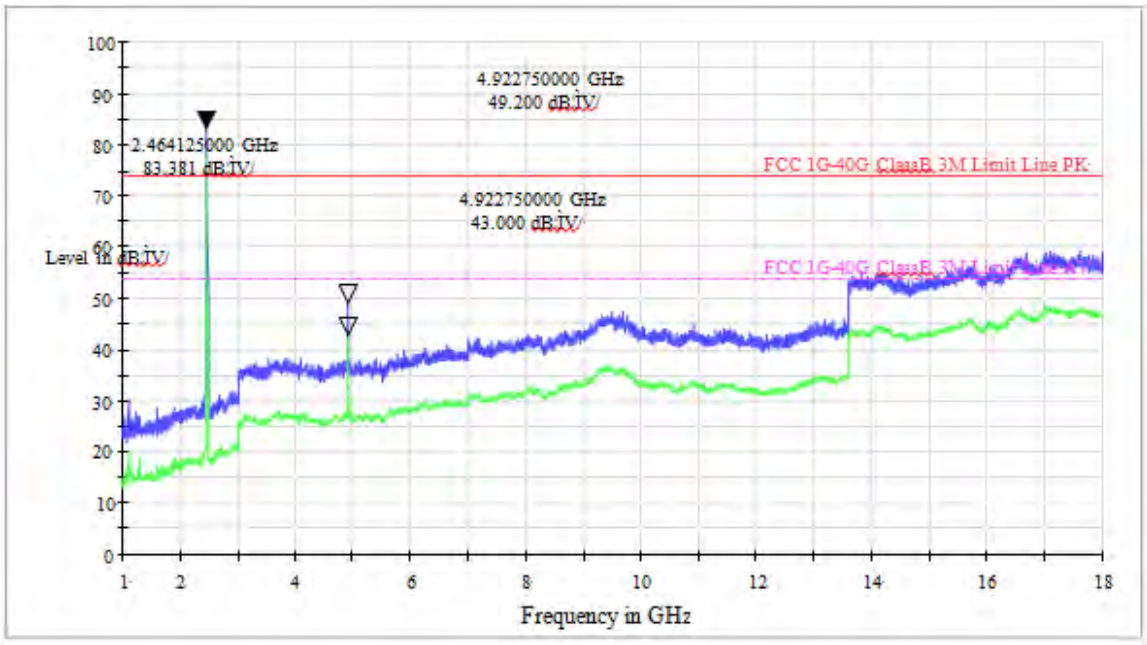
(Vertical)

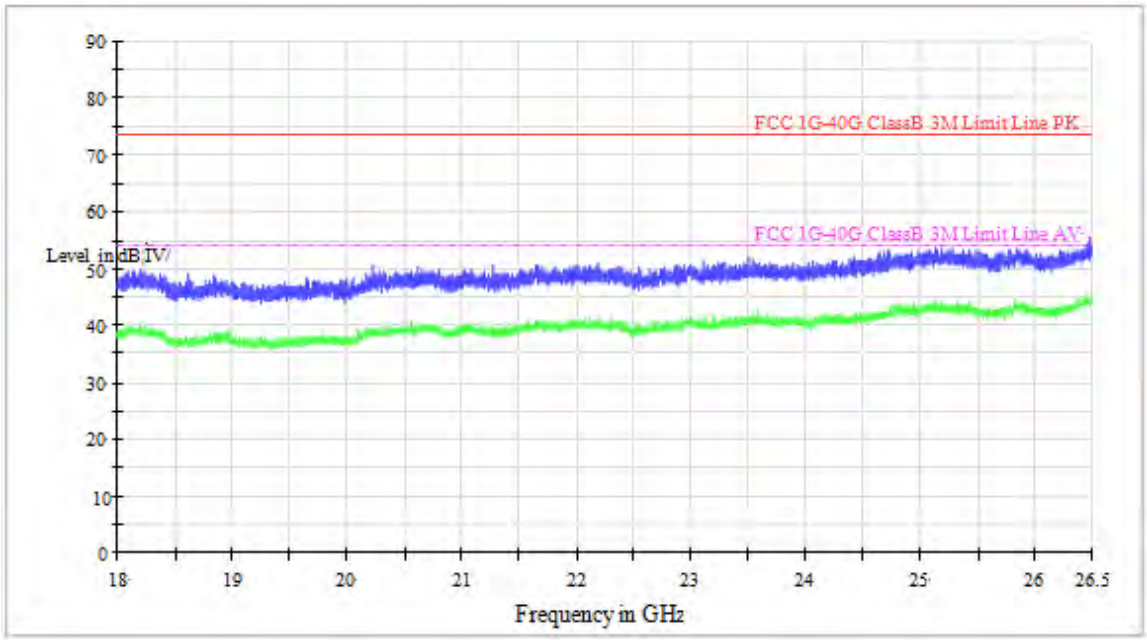




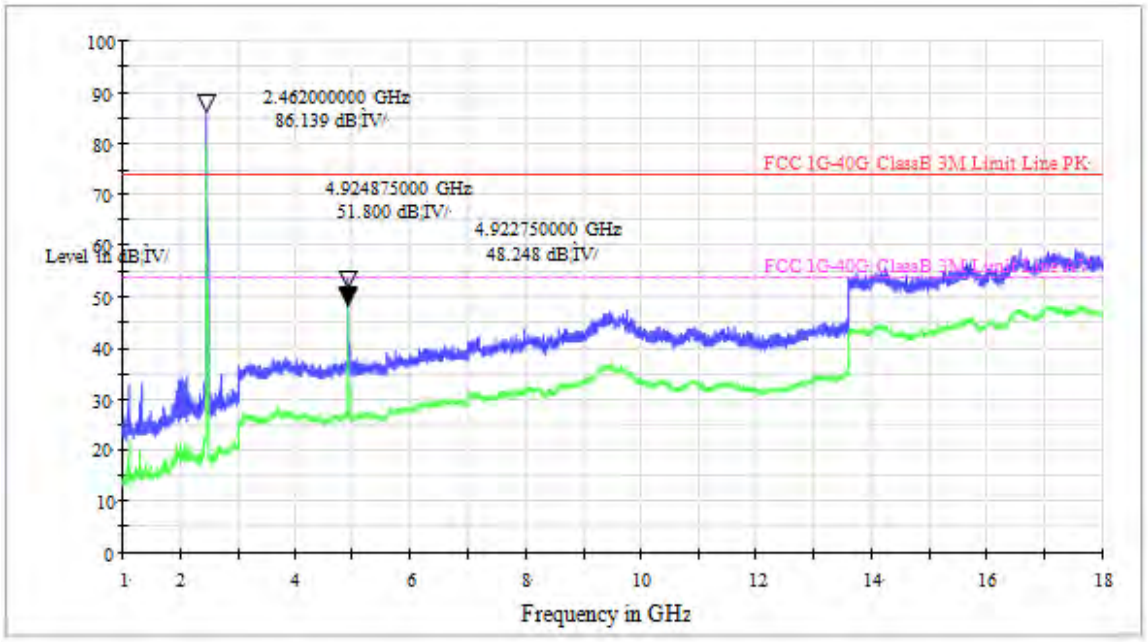
Channel 11 2462MHz

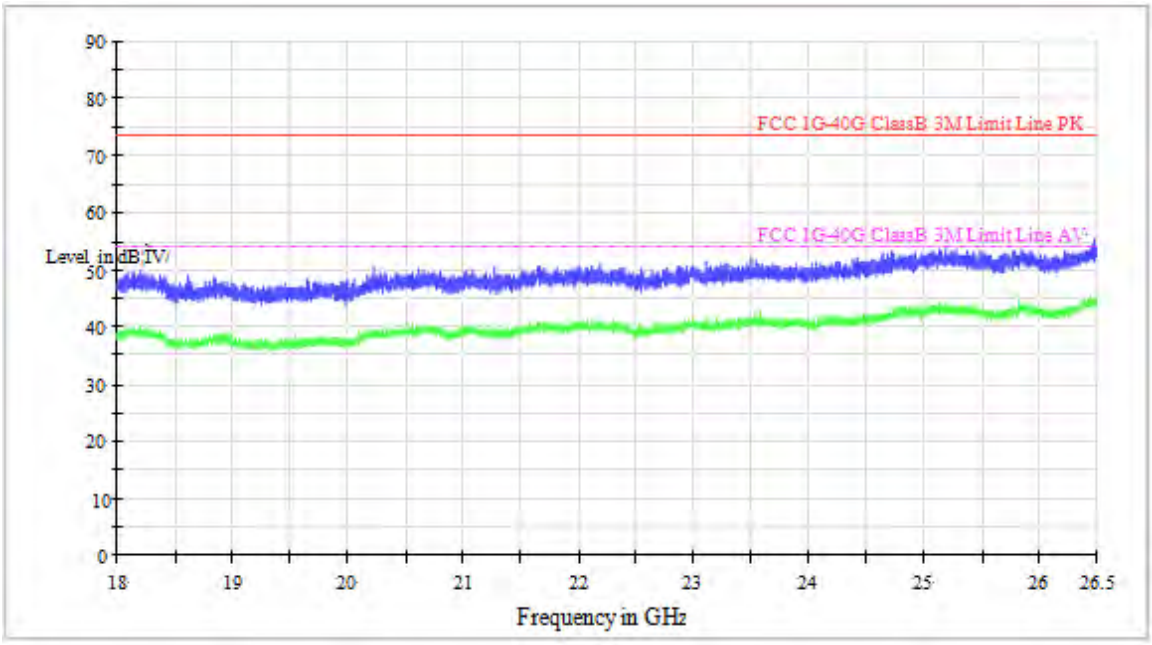
(Horizontal)





(Vertical)

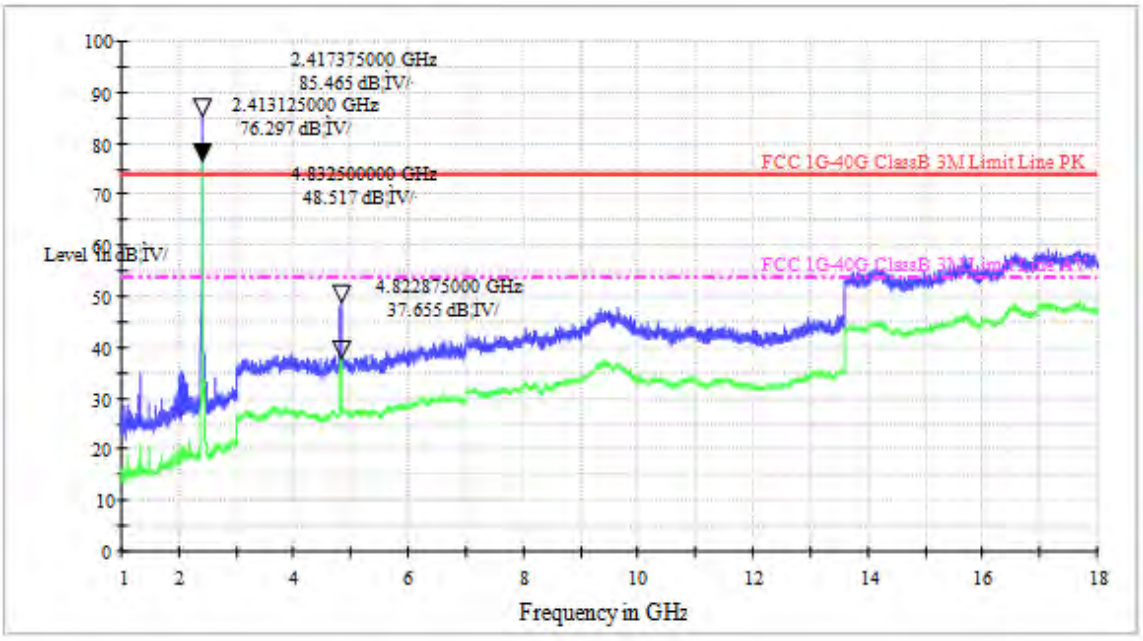


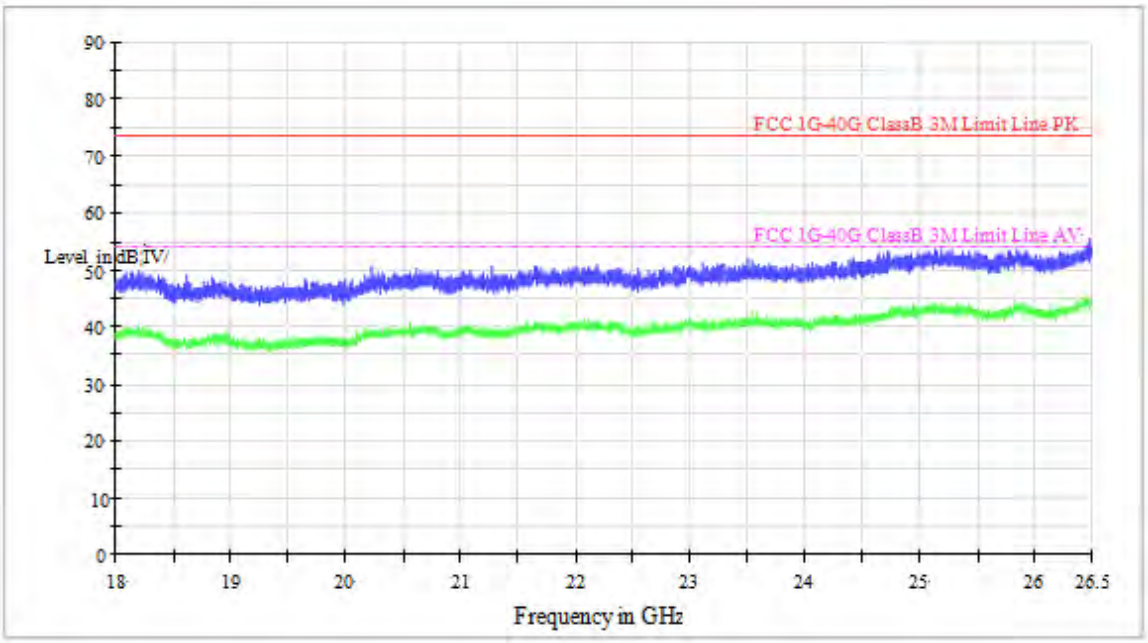


Test Mode: IEEE 802.11g TX

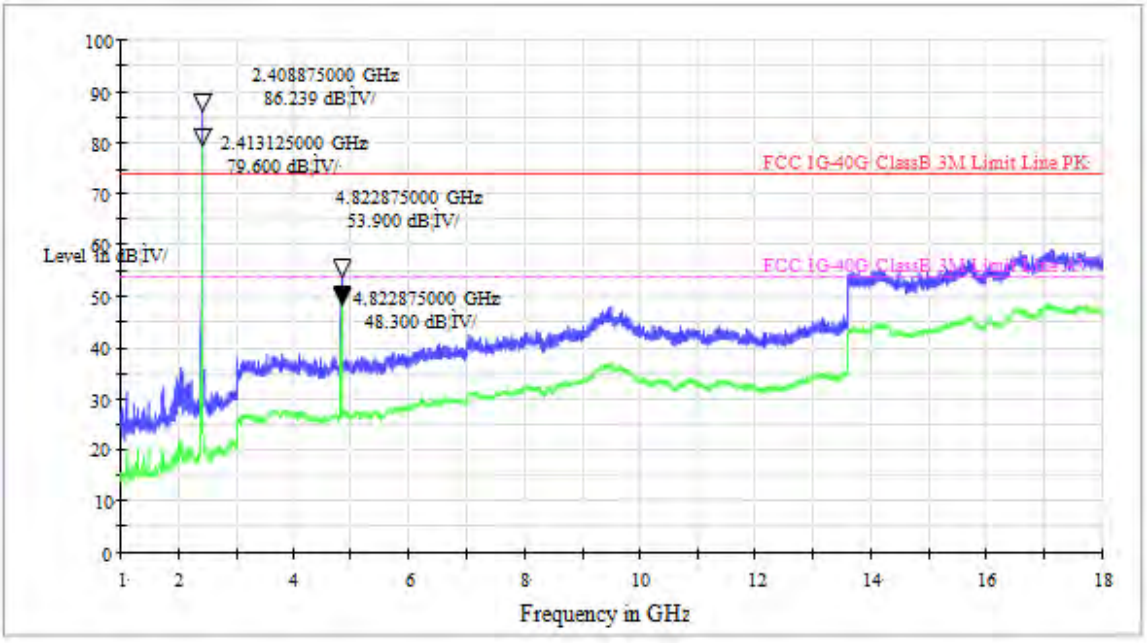
Channel 1 2412MHz

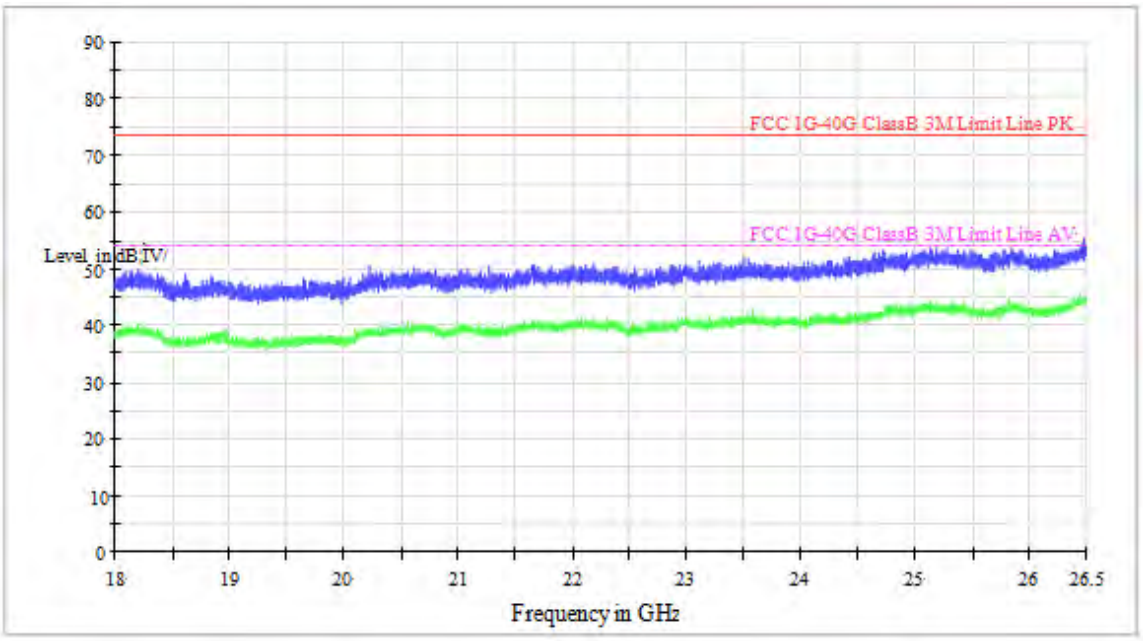
(Horizontal)





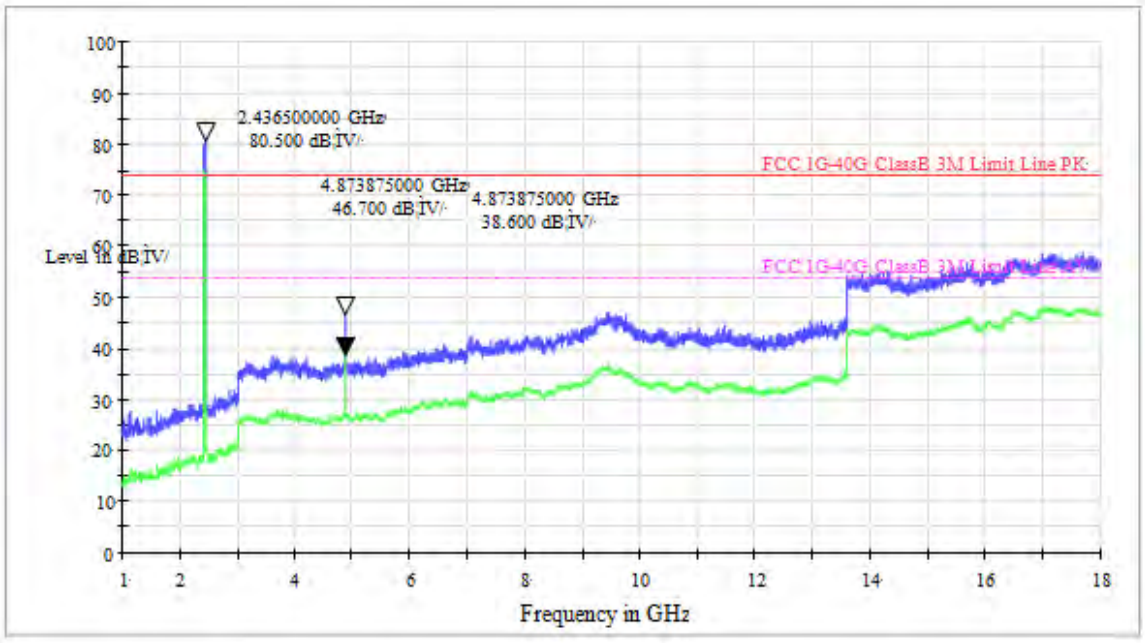
(Vertical)

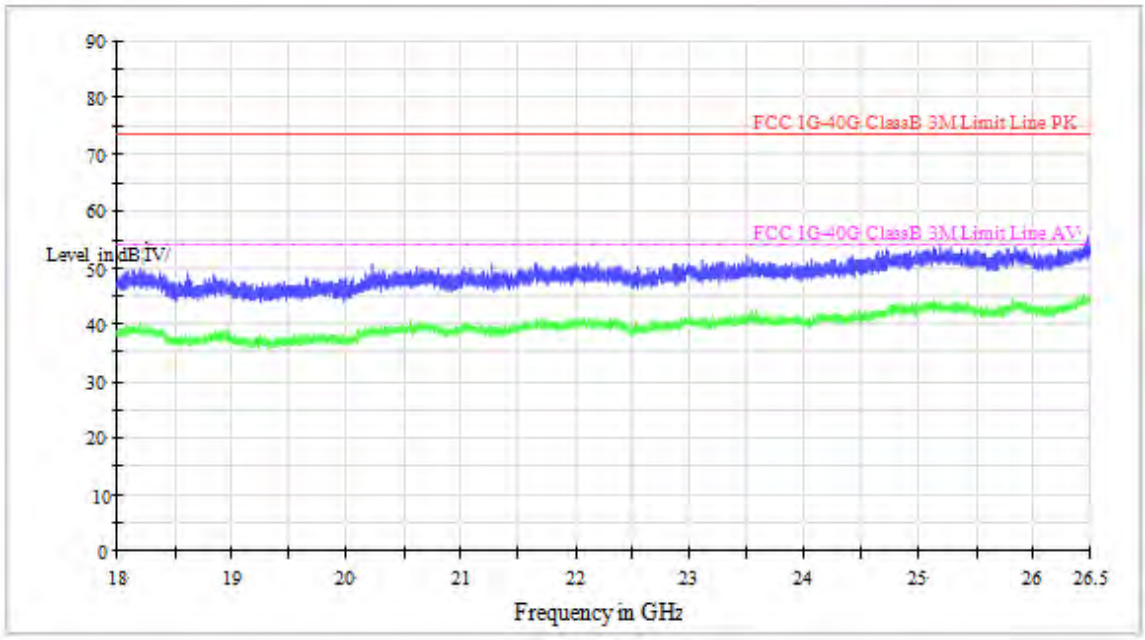




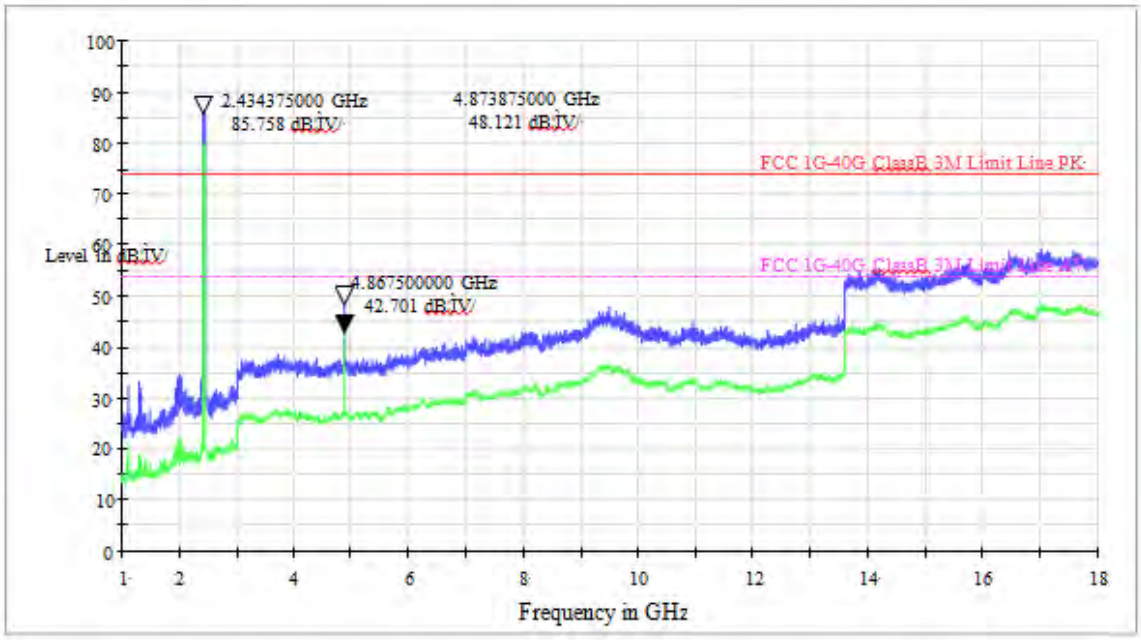
Channel 6 2437MHz

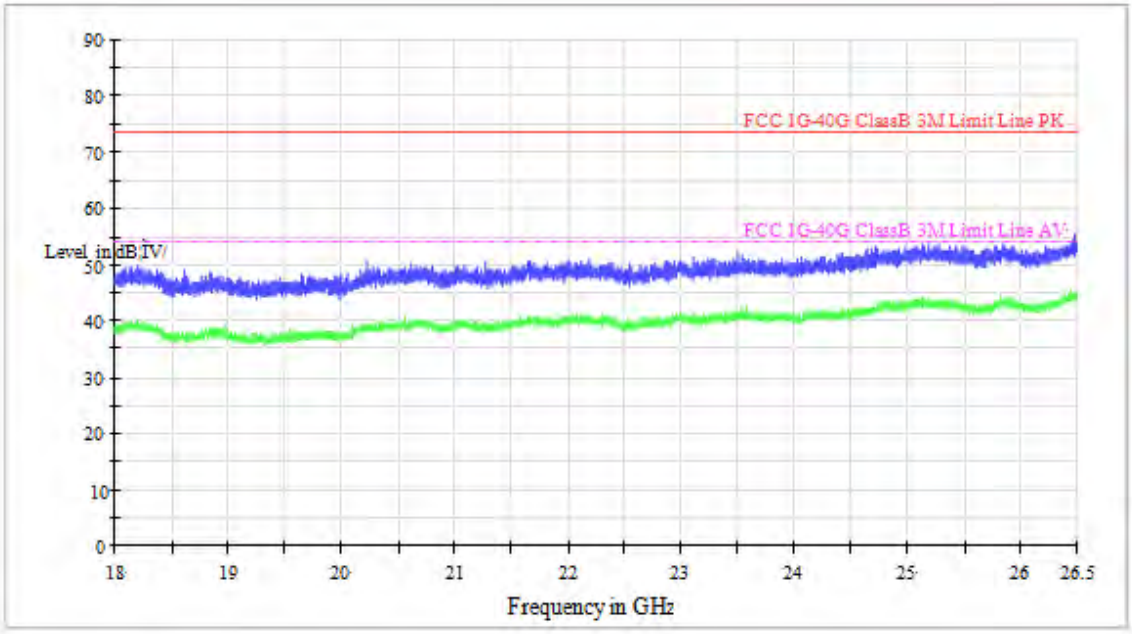
(Horizontal)





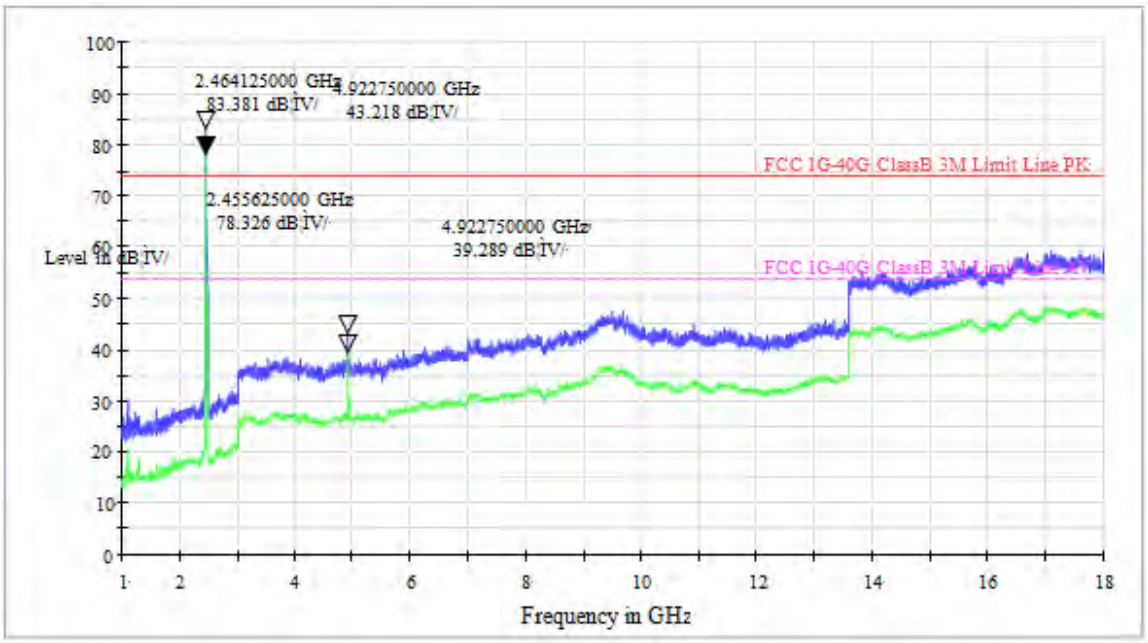
(Vertical)

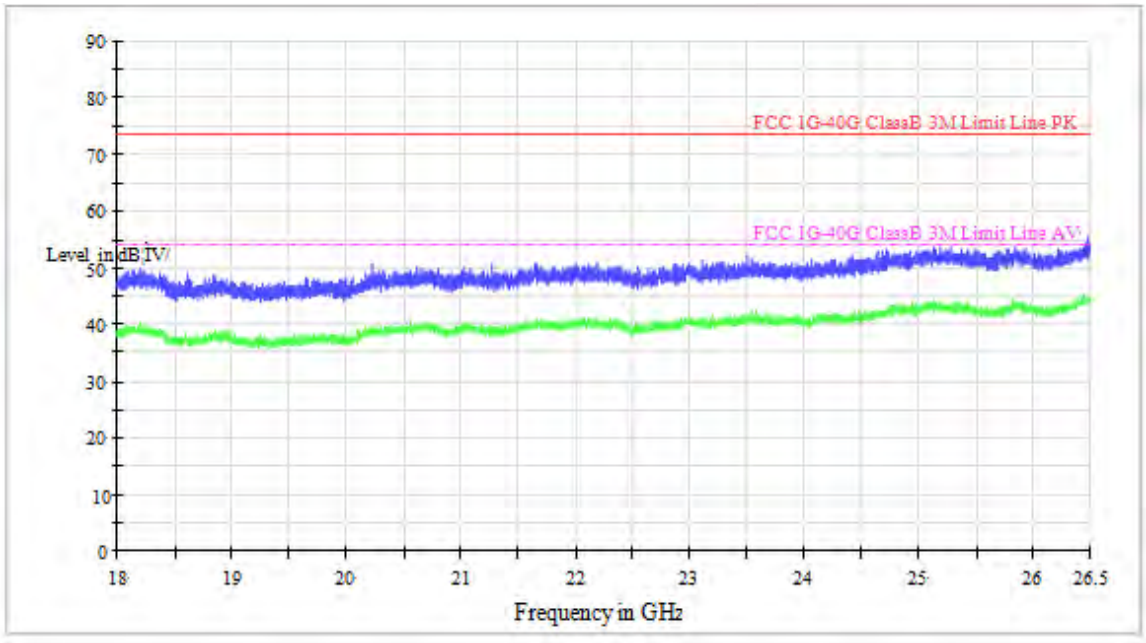




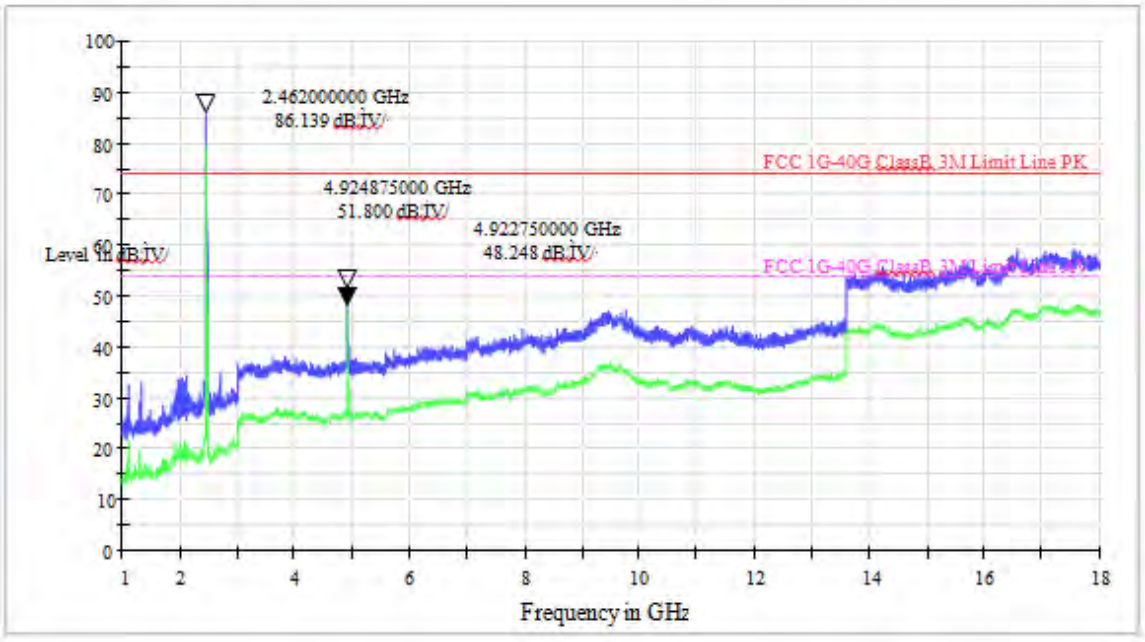
Channel 11 2462MHz

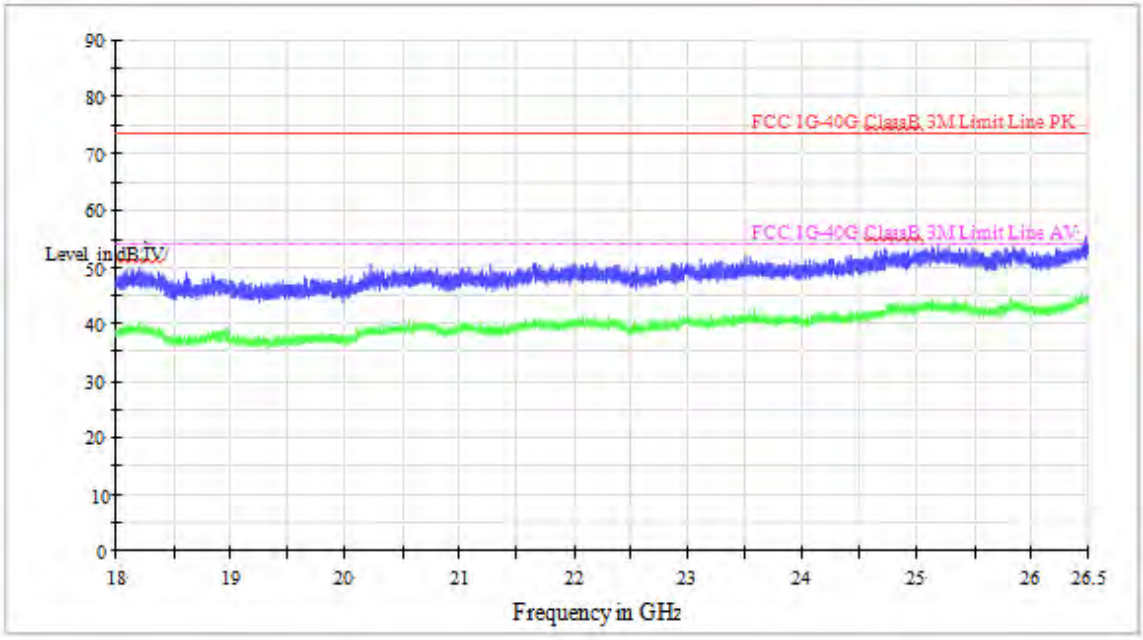
(Horizontal)





(Vertical)

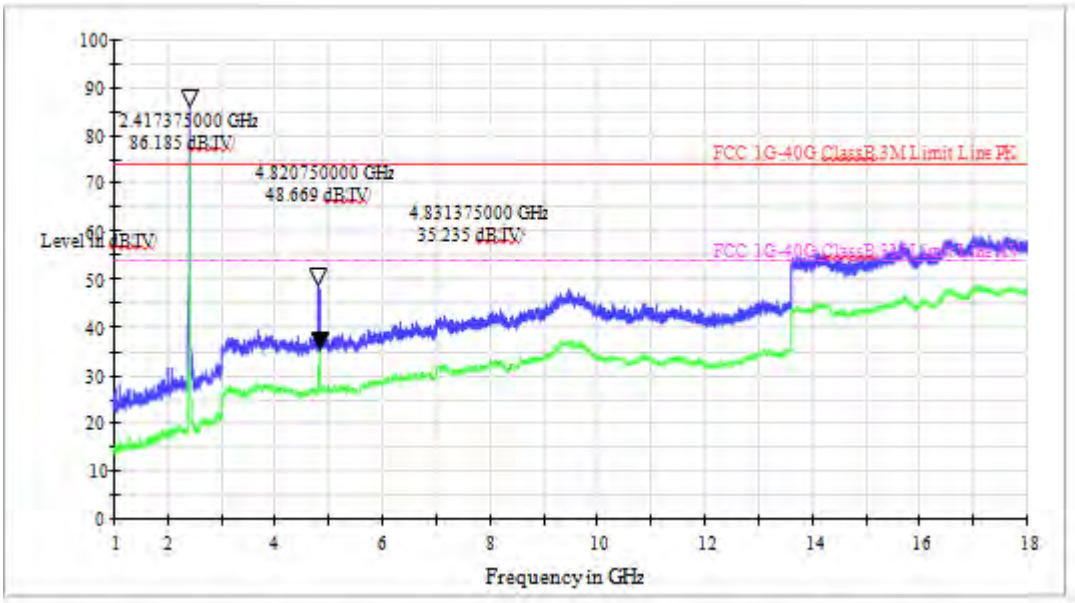


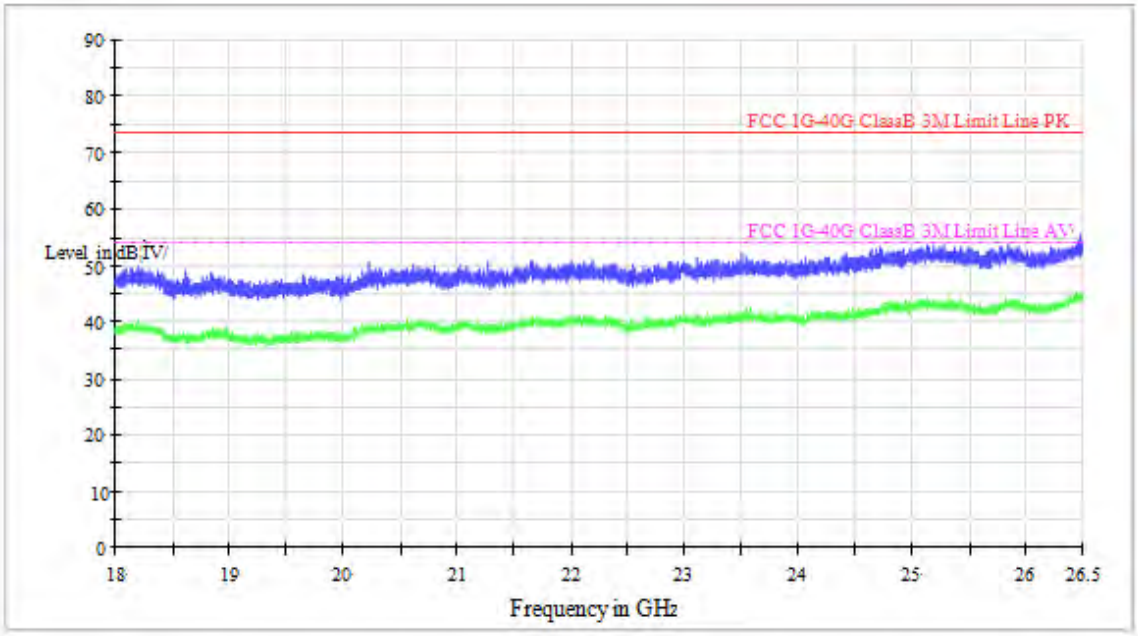


Test Mode: IEEE 802.11n HT20TX

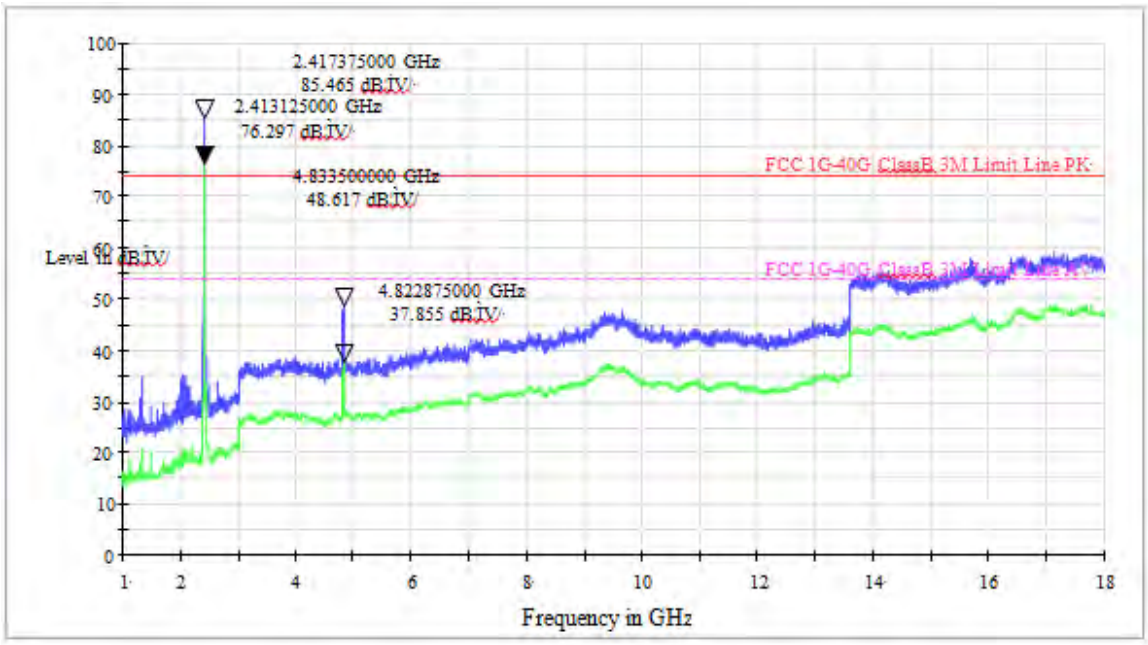
Channel 1 2412MHz

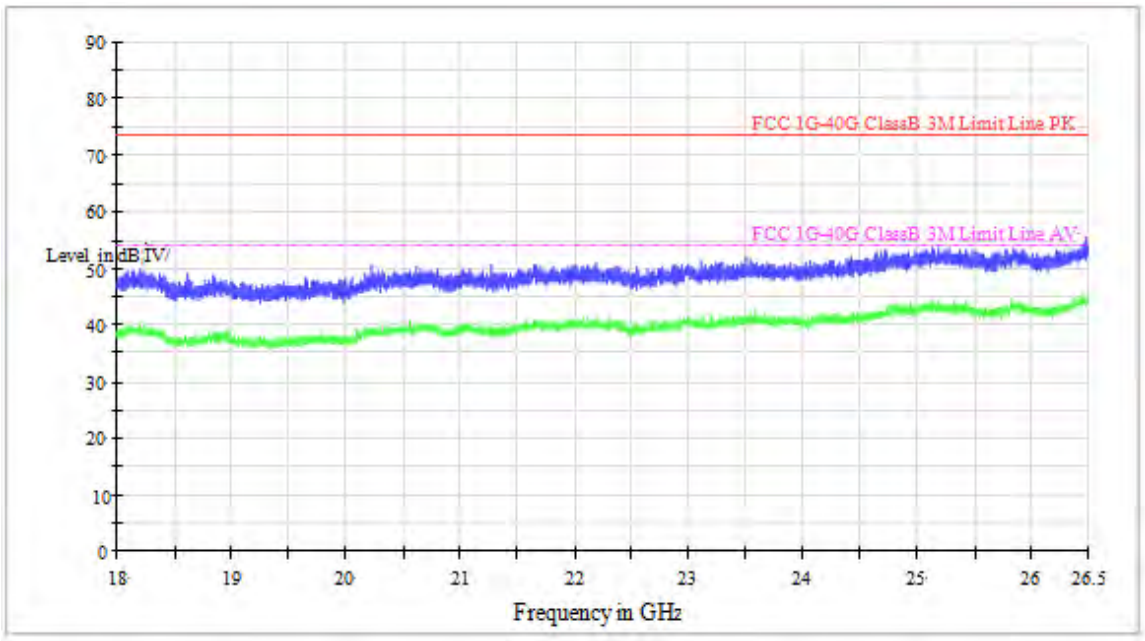
(Horizontal)





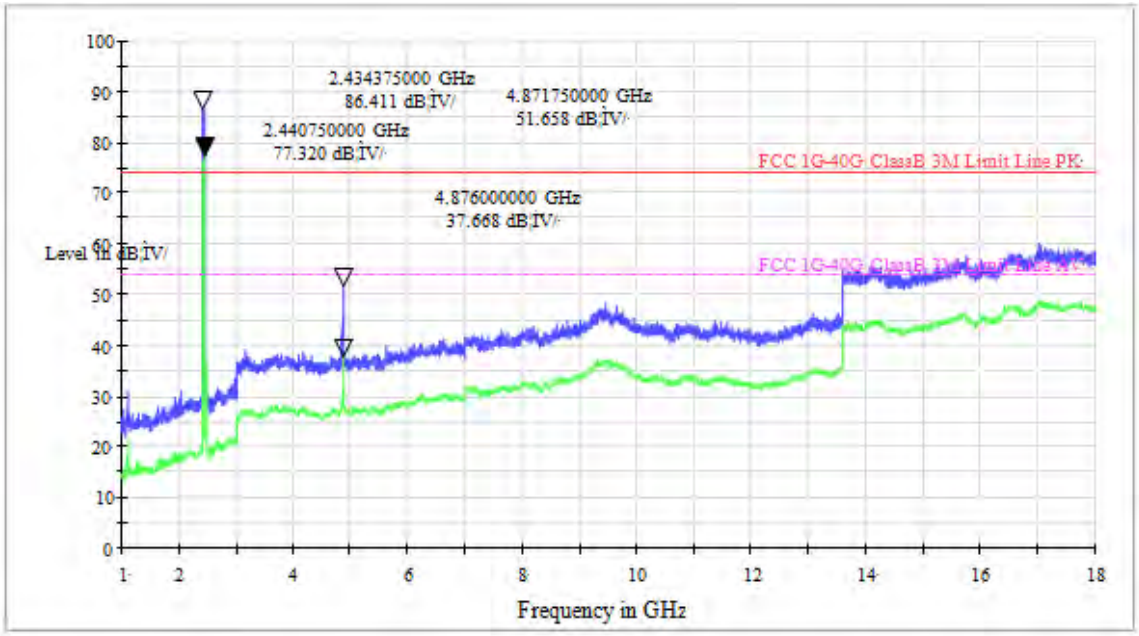
(Vertical)

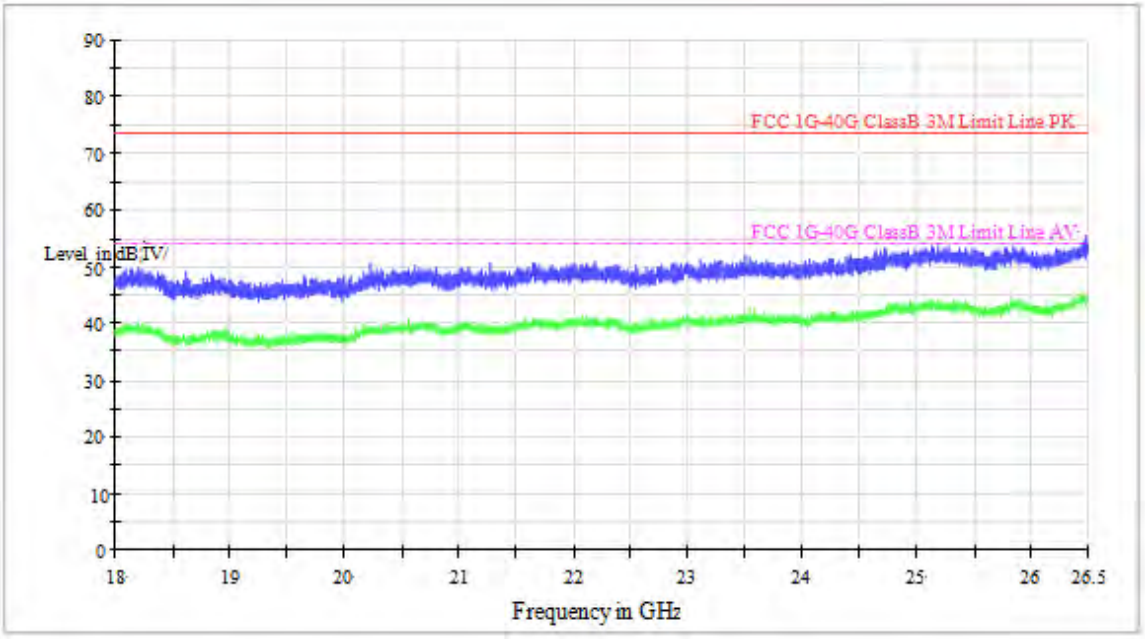




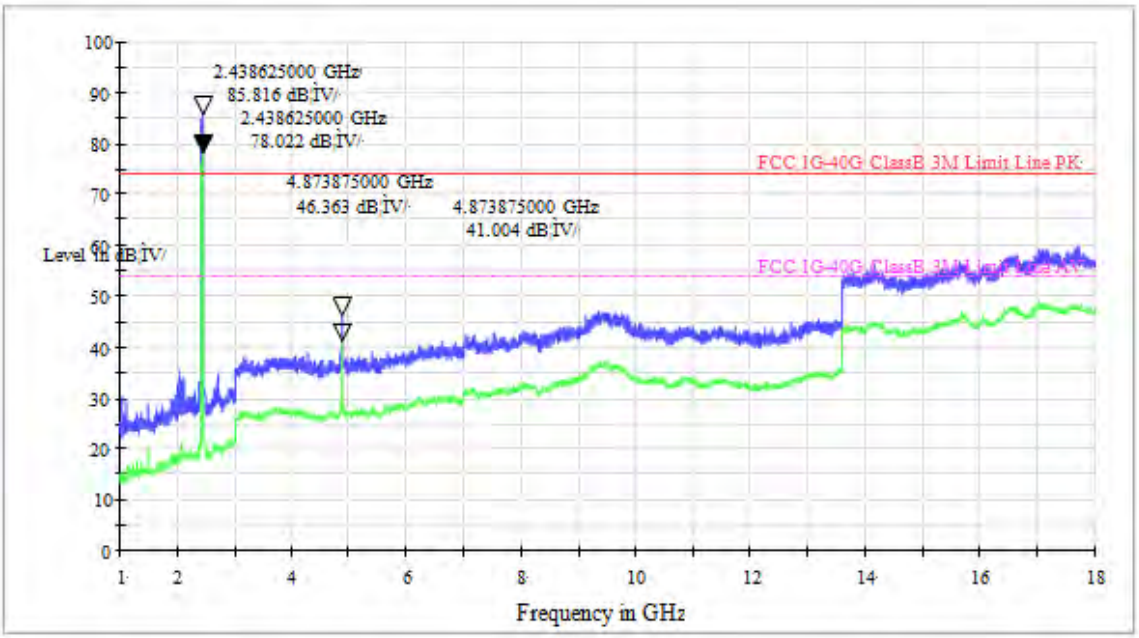
Channel 6 2437MHz

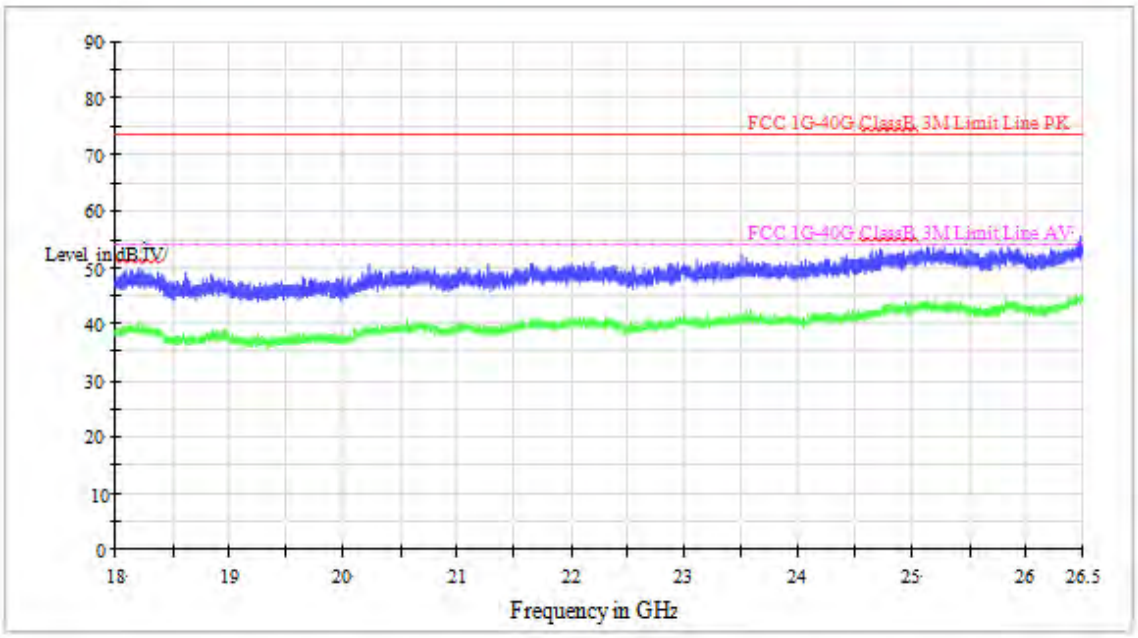
(Horizontal)





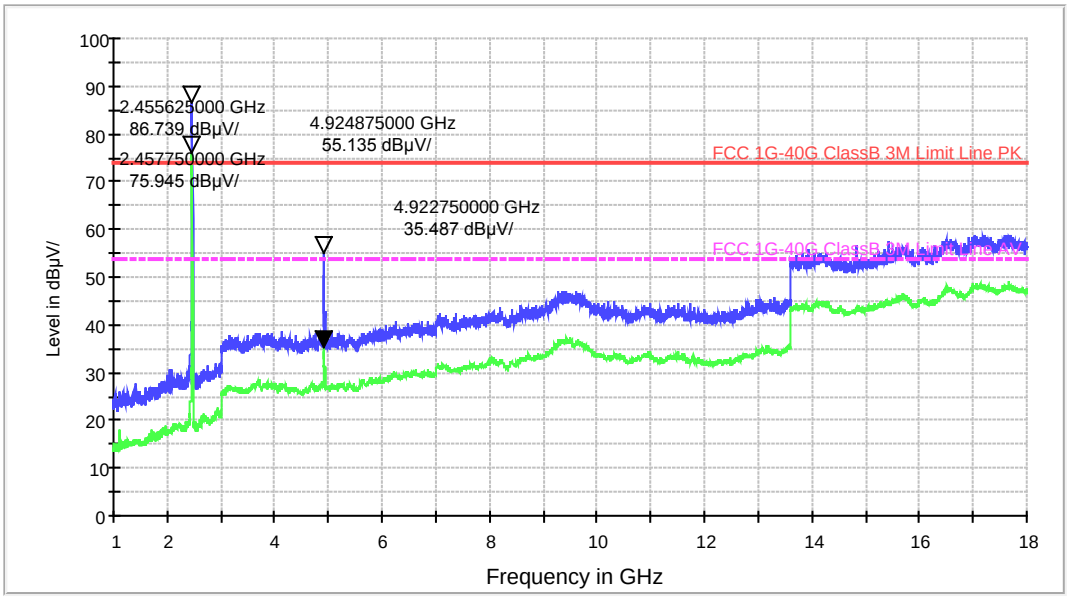
(Vertical)

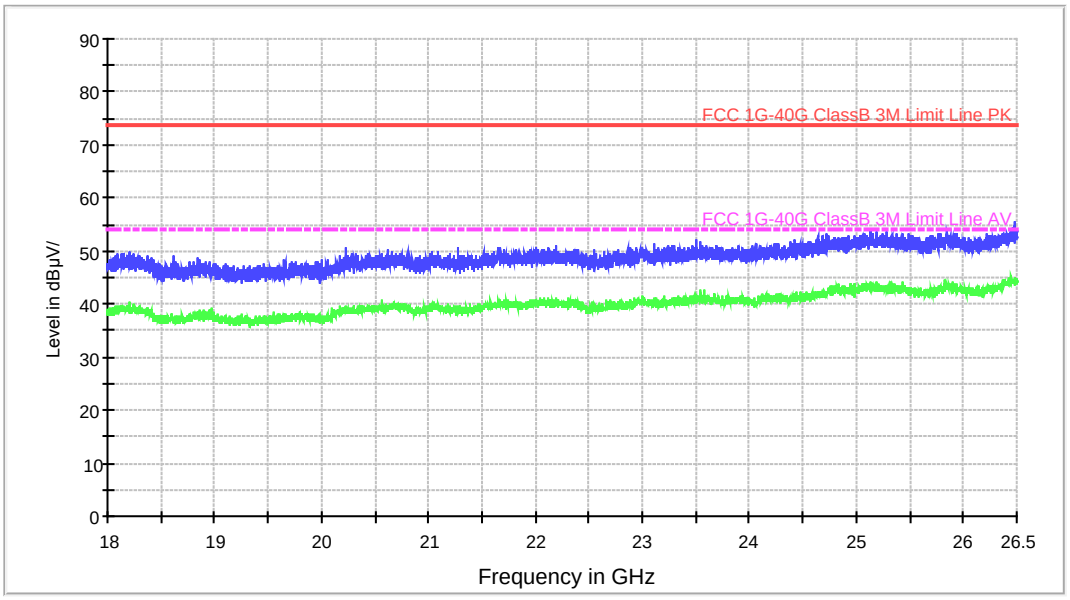




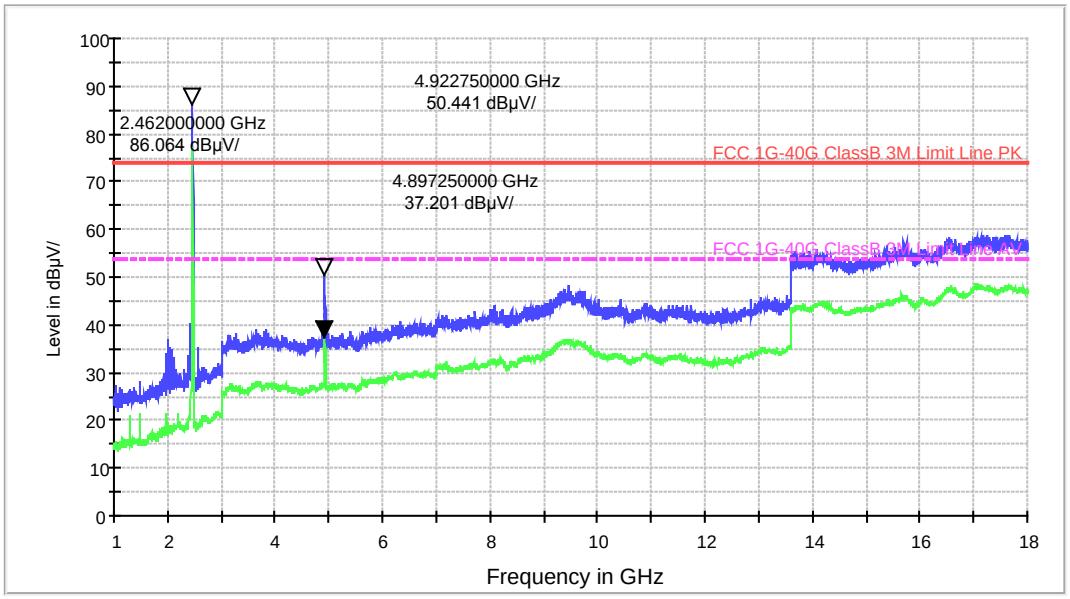
Channel 11 2462MHz

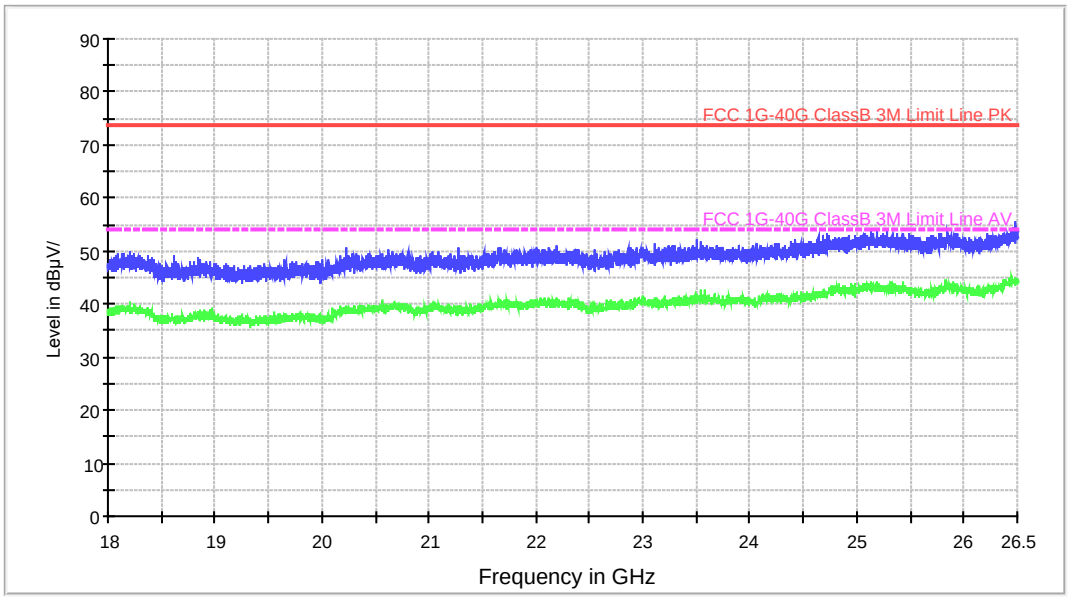
(Horizontal)





(Vertical)

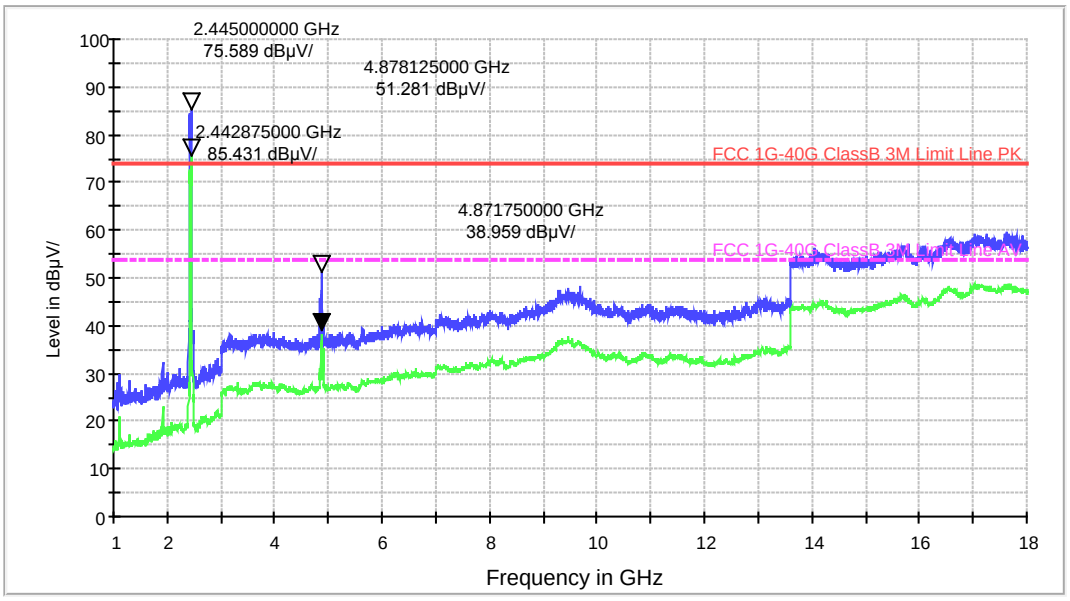


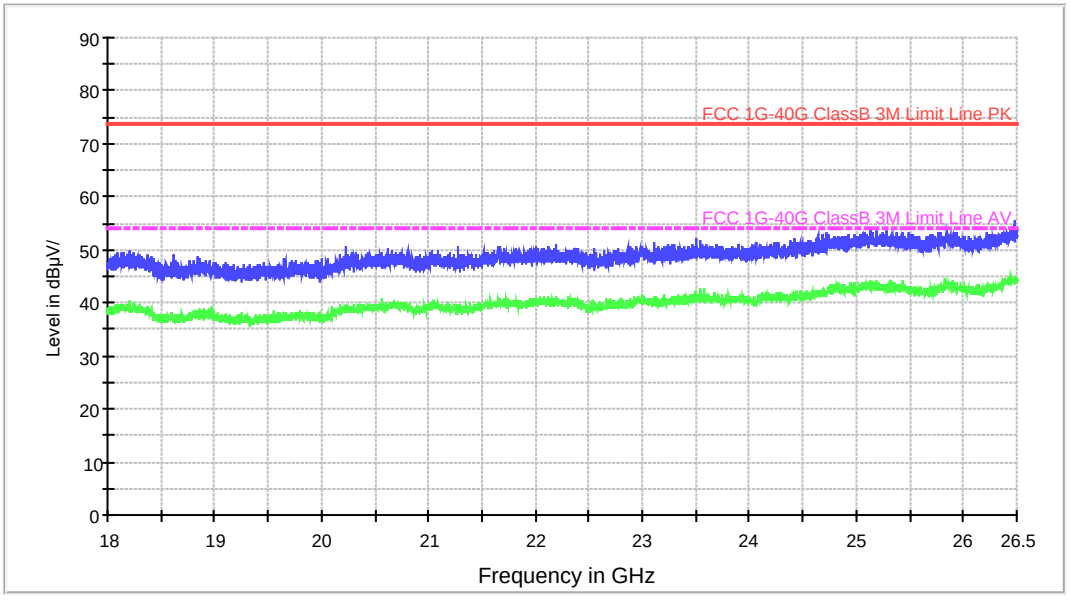


Test Mode: IEEE 802.11n HT40TX

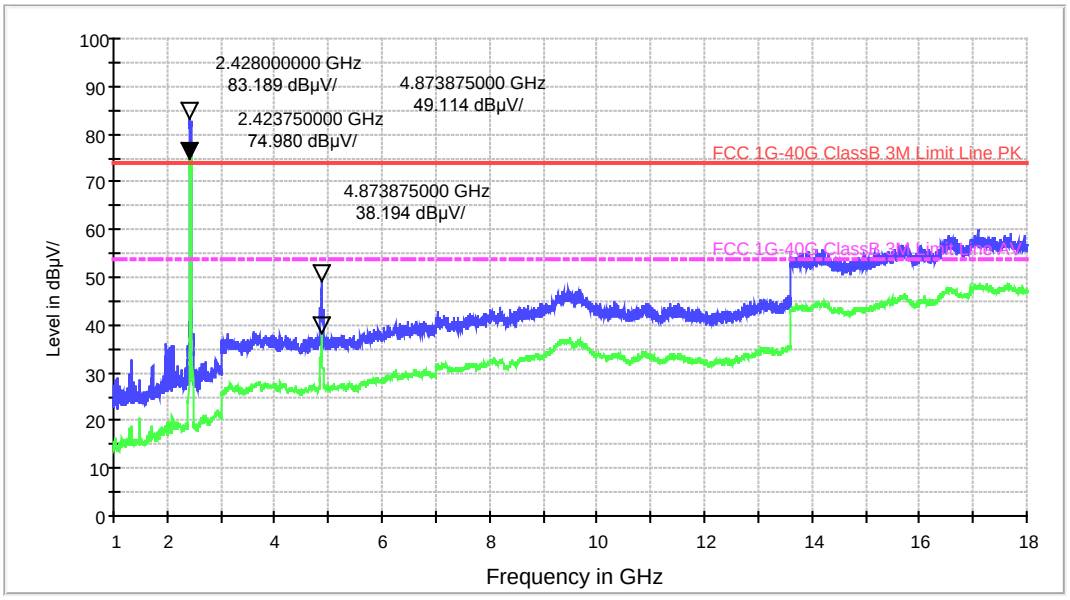
Channel 3 2422MHz

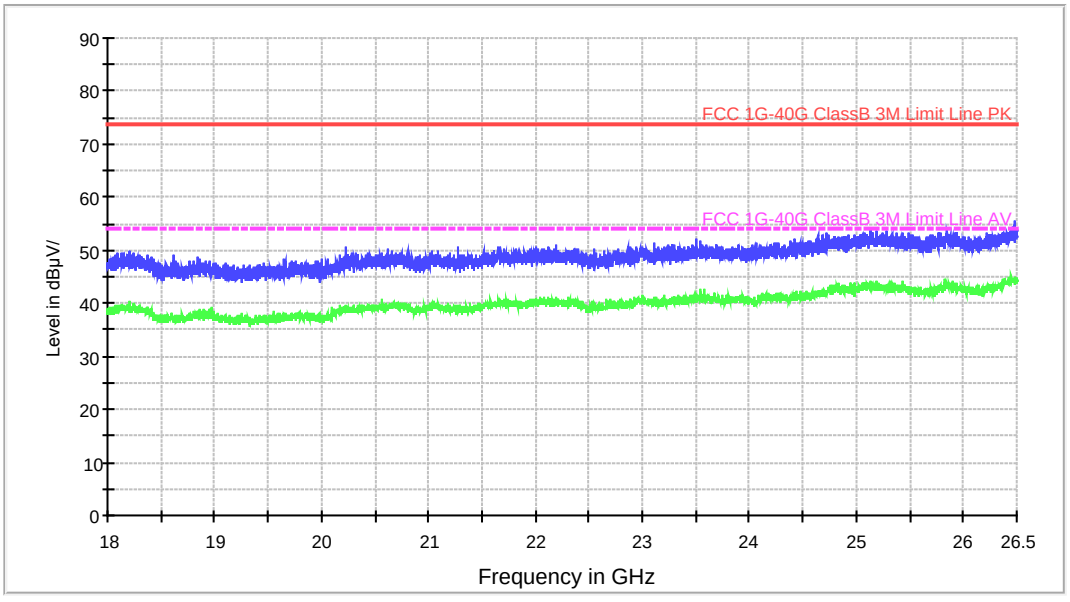
(Horizontal)





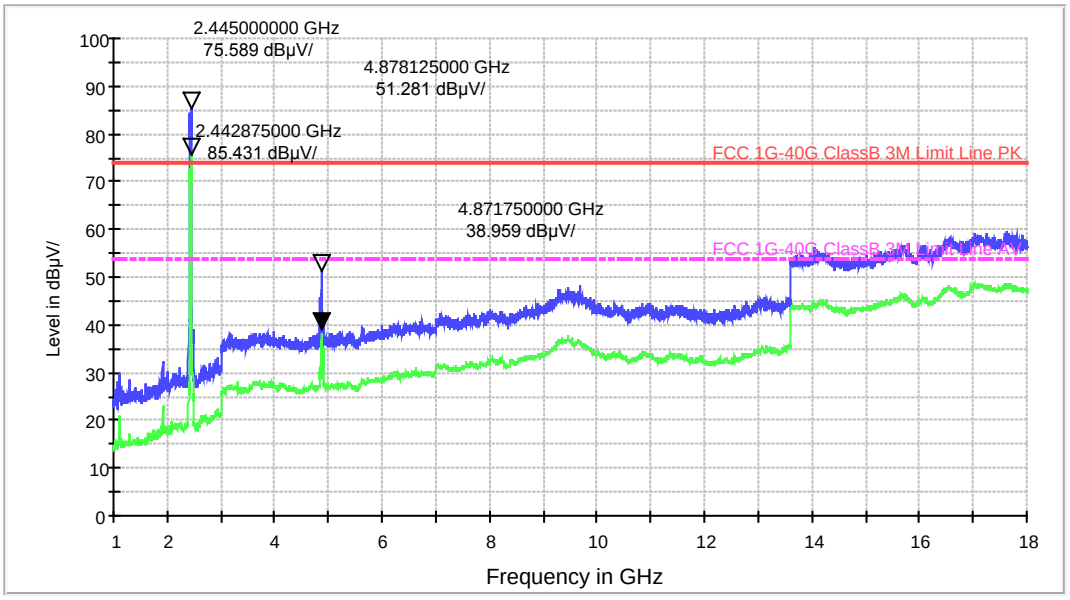
(Vertical)

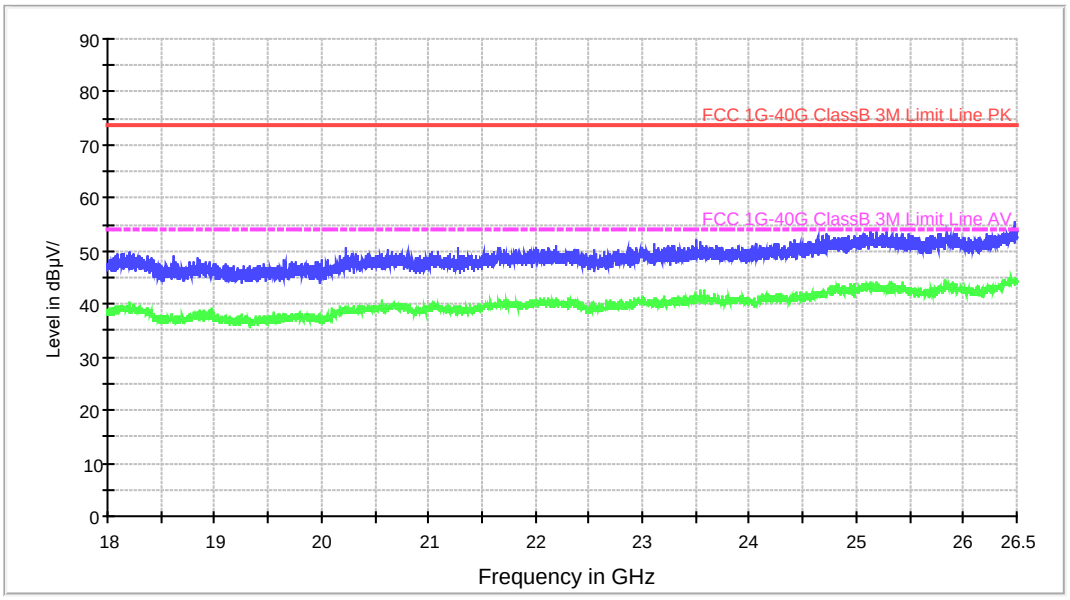




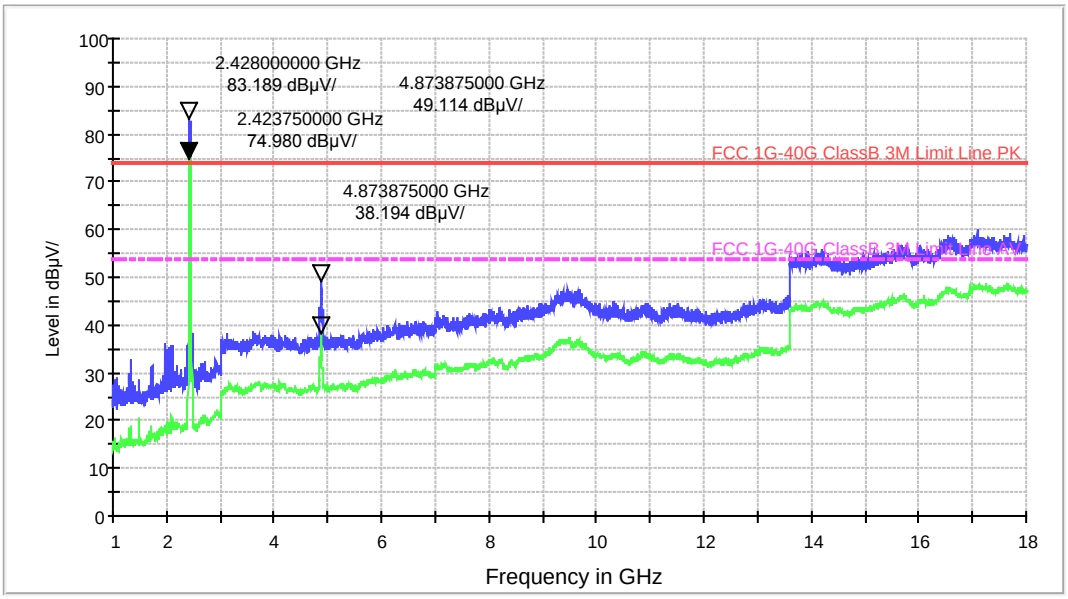
Channel 6 2437MHz

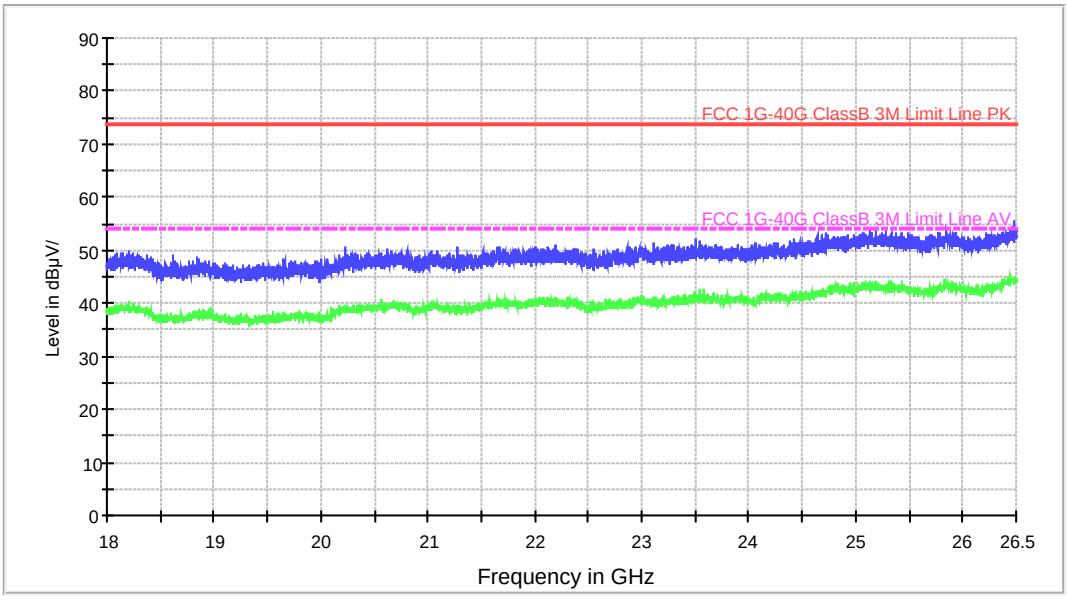
(Horizontal)





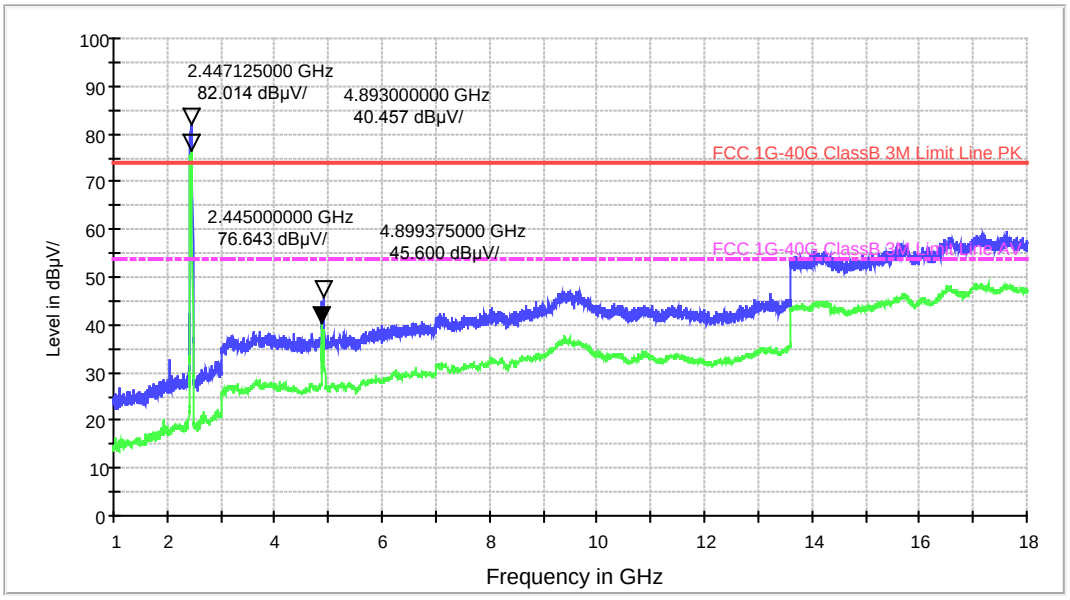
(Vertical)

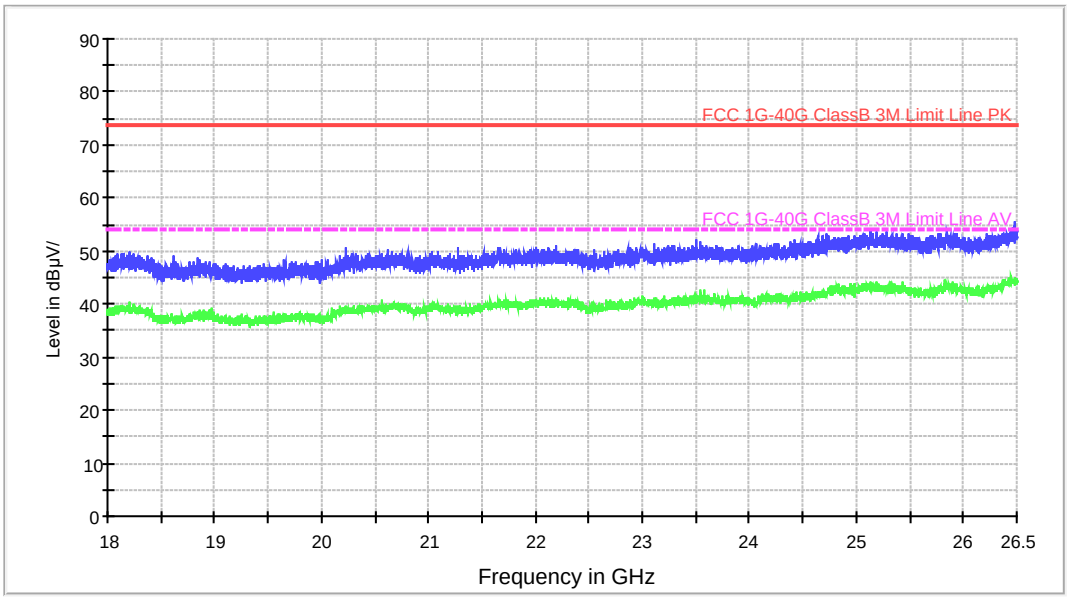




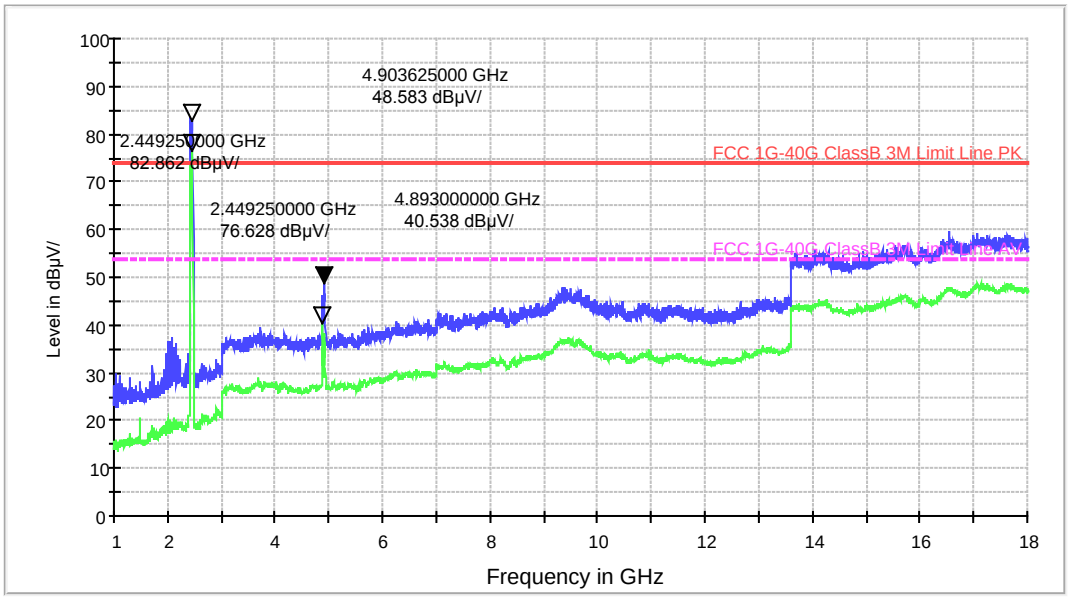
Channel 9 2452MHz

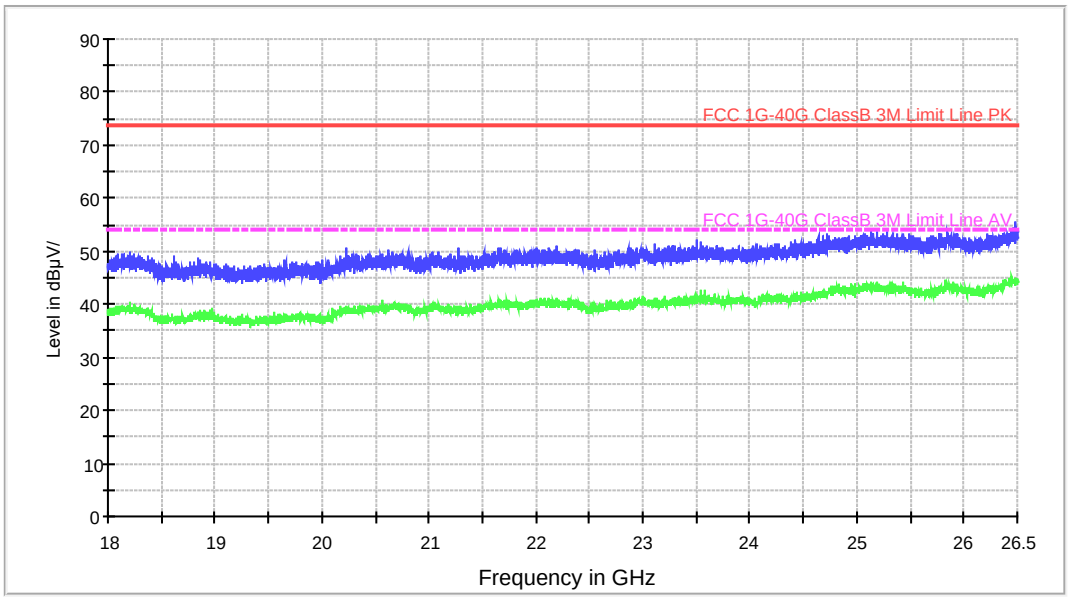
(Horizontal)





(Vertical)





Remark:

The red line means the PK limit.

The purple line means the AV limit.

The blue line means the PK scan data.

The green line means the AV scan data.

4.6 Band Edge Measurements (Conducted)

4.6.1 Limits

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. 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).

4.6.2 Test Procedure

1. The transmitter output (antenna port) was connected to the test receiver.
2. Set s the test receiver's RBW and VBW to applicable value with Peak in Max Hold.
3. Record the fundamental emission and emissions out of the bandedge.
4. Determine band-edge compliance as required.

4.6.3 Test Data

The EUT complied with the FCC Part 15.247 Conducted band edge emissions requirements.

Table 12 provides the test results for Conducted band edge emissions. （all the data attached was use the worst case data rate as in table 6）

4.6.4 Areas of Concern

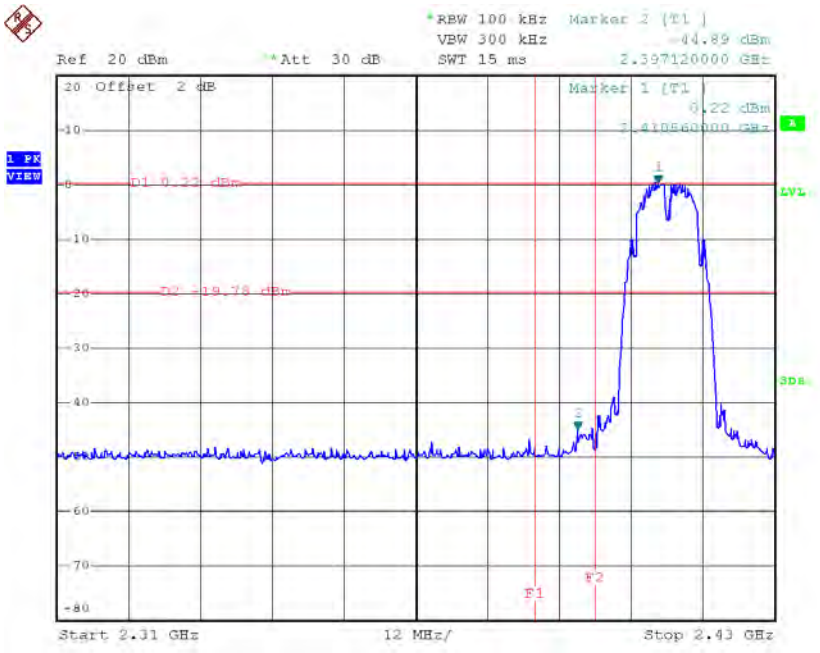
None.

Table 12 Band Edge Measurements (Conducted)

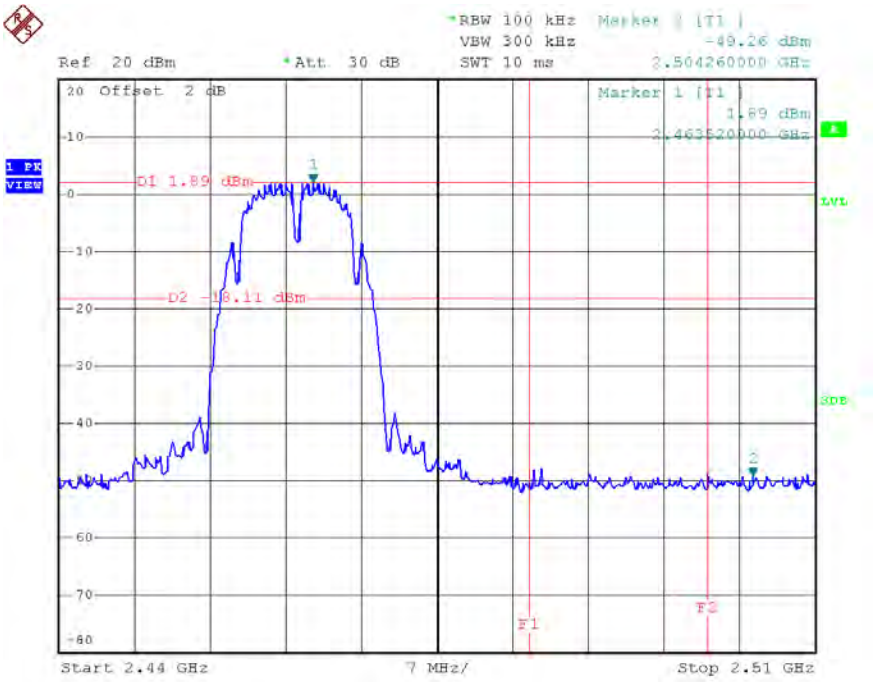
Antenna 1 Test Data

Test Mode: IEEE 802.11b TX

Test CH1: 2412MHz

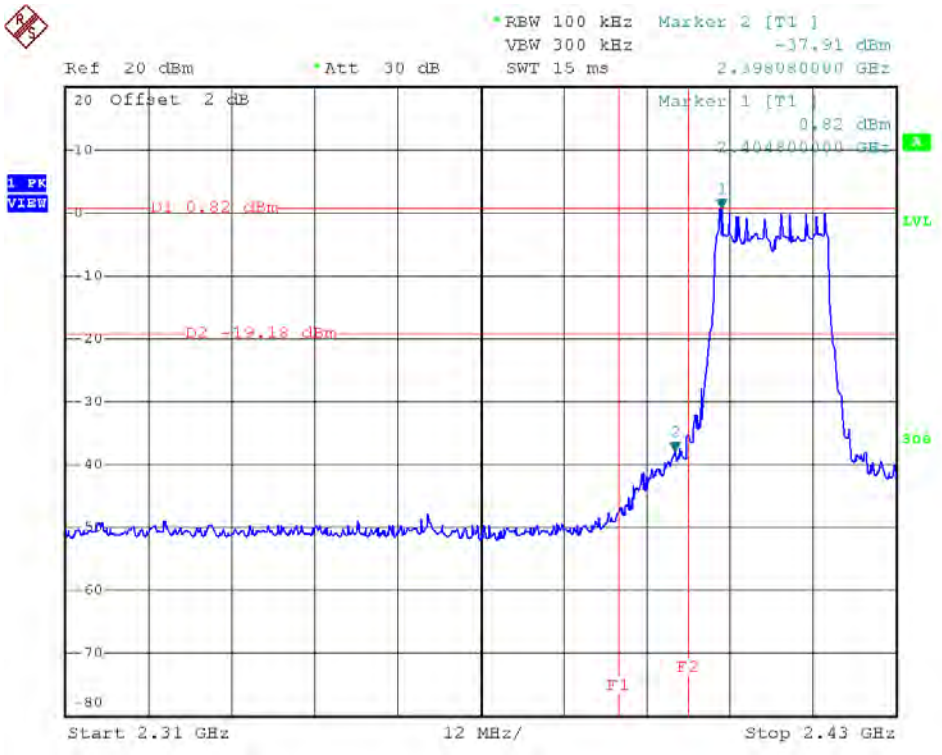


Test CH11: 2462MHz

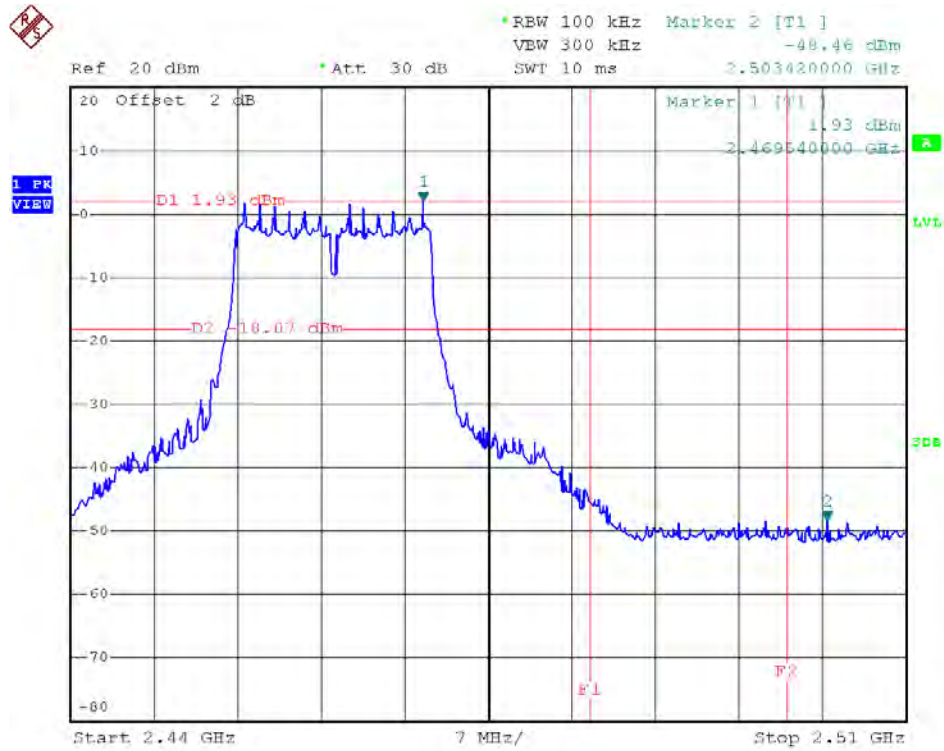


Test Mode: IEEE 802.11g TX

Test CH1: 2412MHz

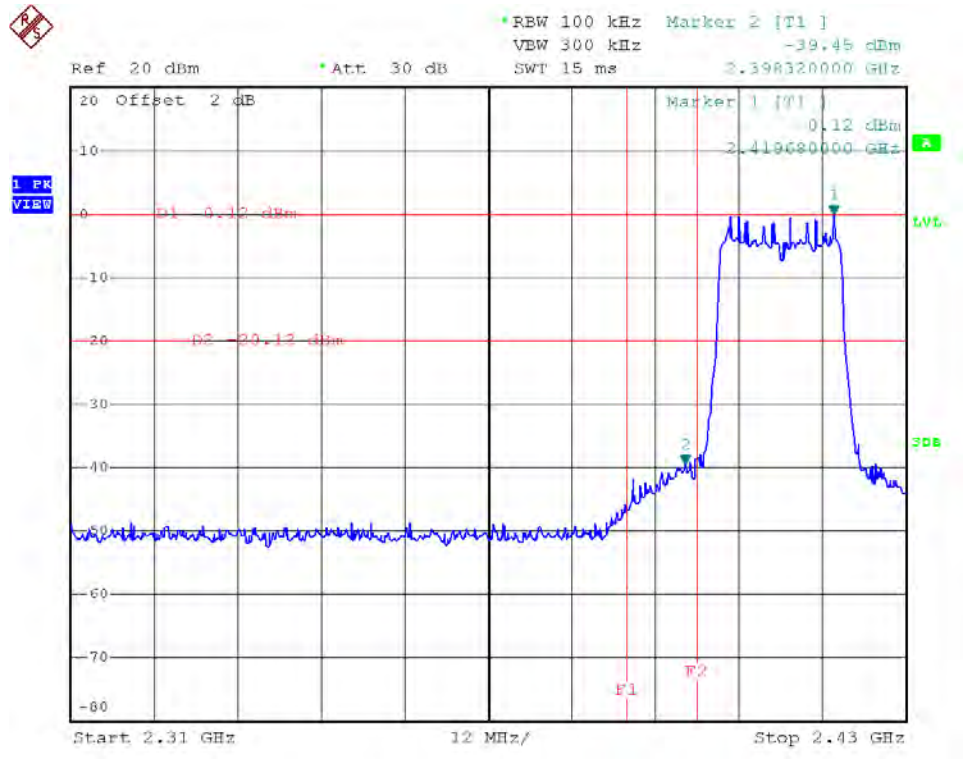


Test CH11: 2462MHz

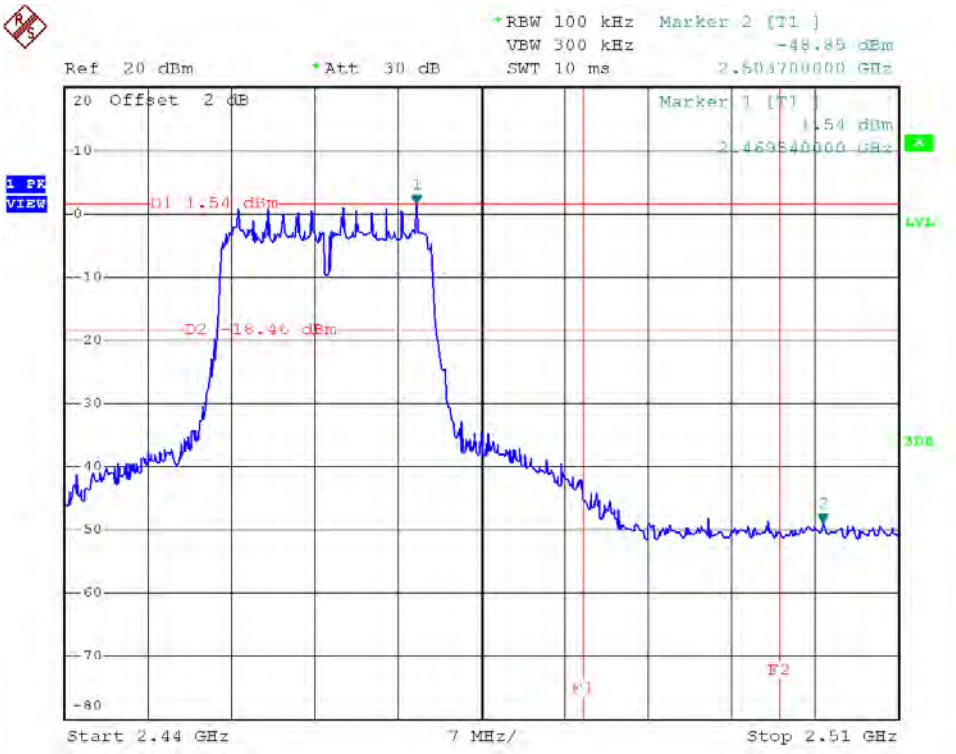


Test Mode: IEEE 802.11n HT20 TX

Test CH1: 2412MHz

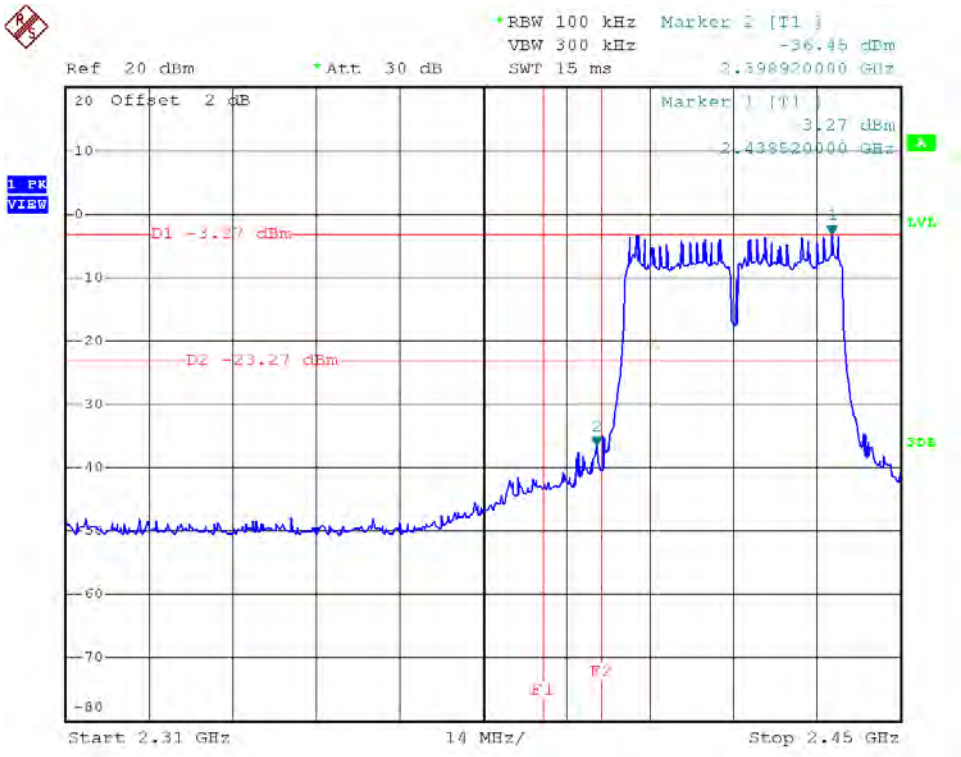


Test CH11: 2462MHz

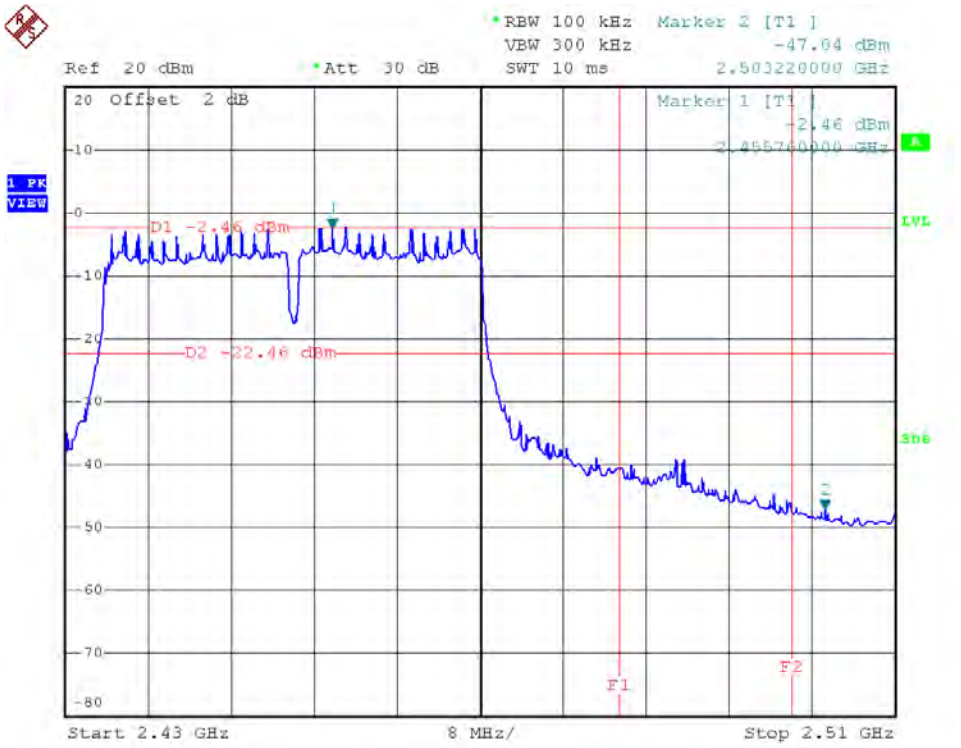


Test Mode: IEEE 802.11n HT40 TX

Test CH3: 2422MHz



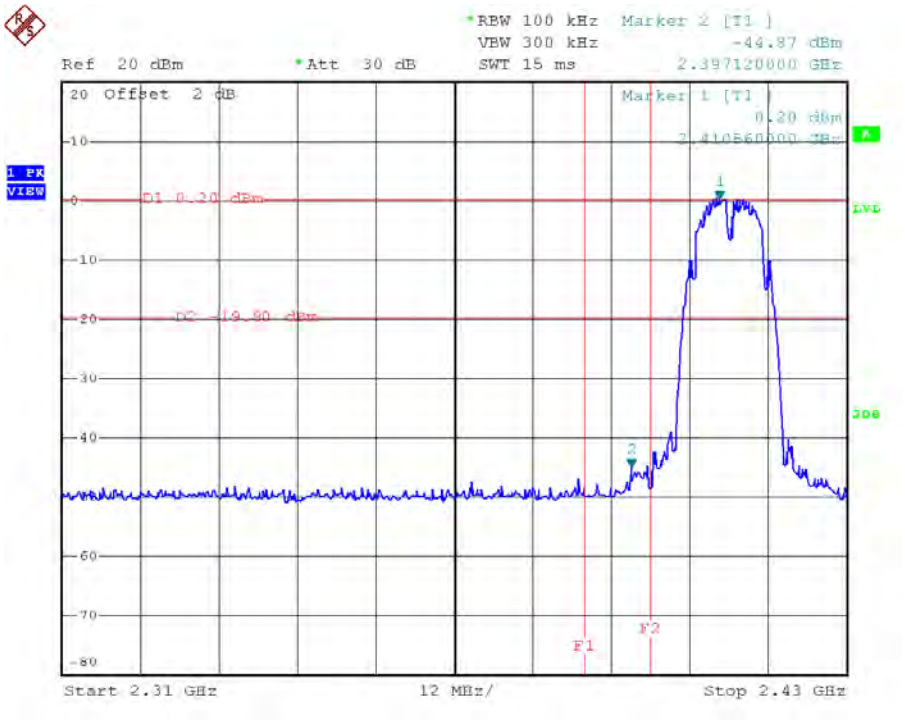
Test CH9: 2452MHz



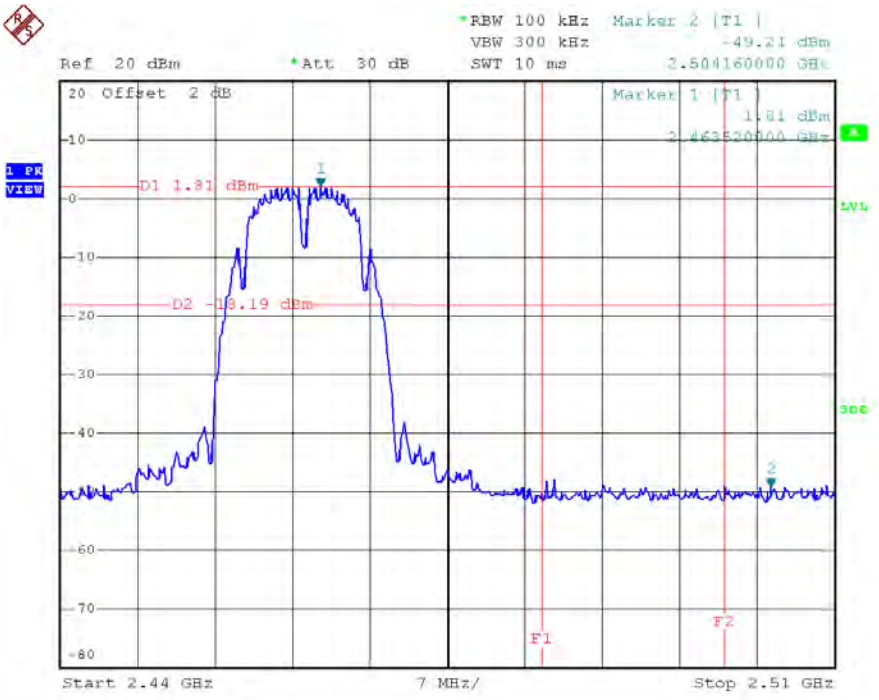
Antenna 2 Test Data

Test Mode: IEEE 802.11b TX

Test CH1: 2412MHz

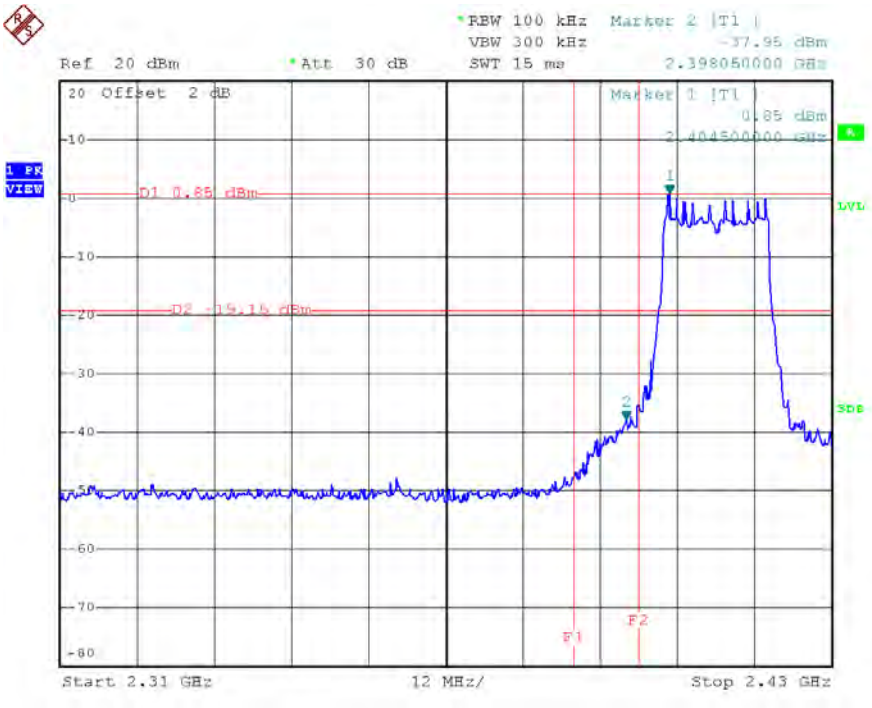


Test CH11: 2462MHz

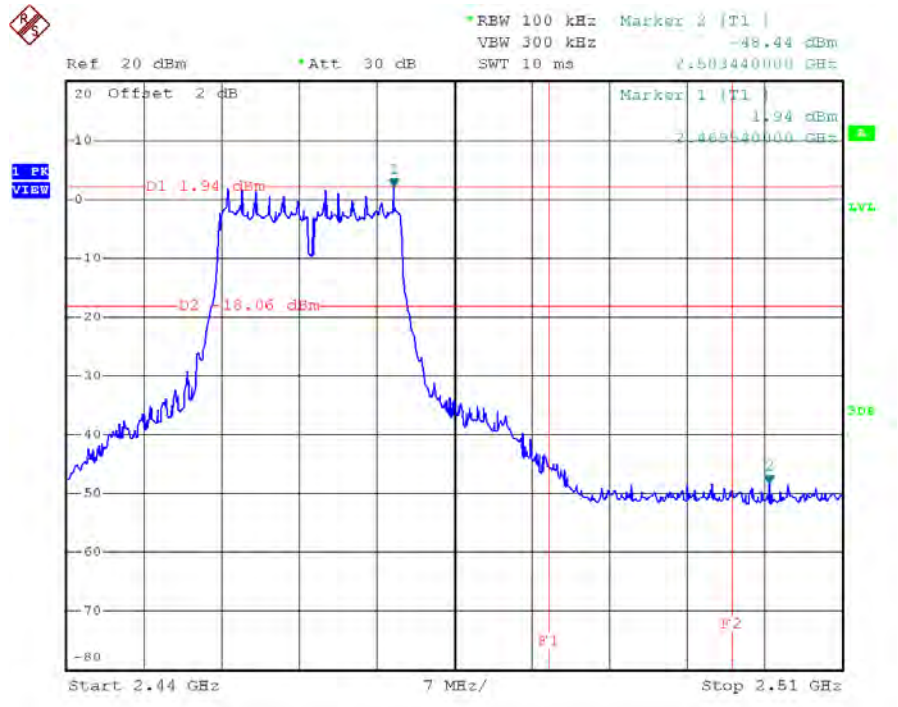


Test Mode: IEEE 802.11g TX

Test CH1: 2412MHz

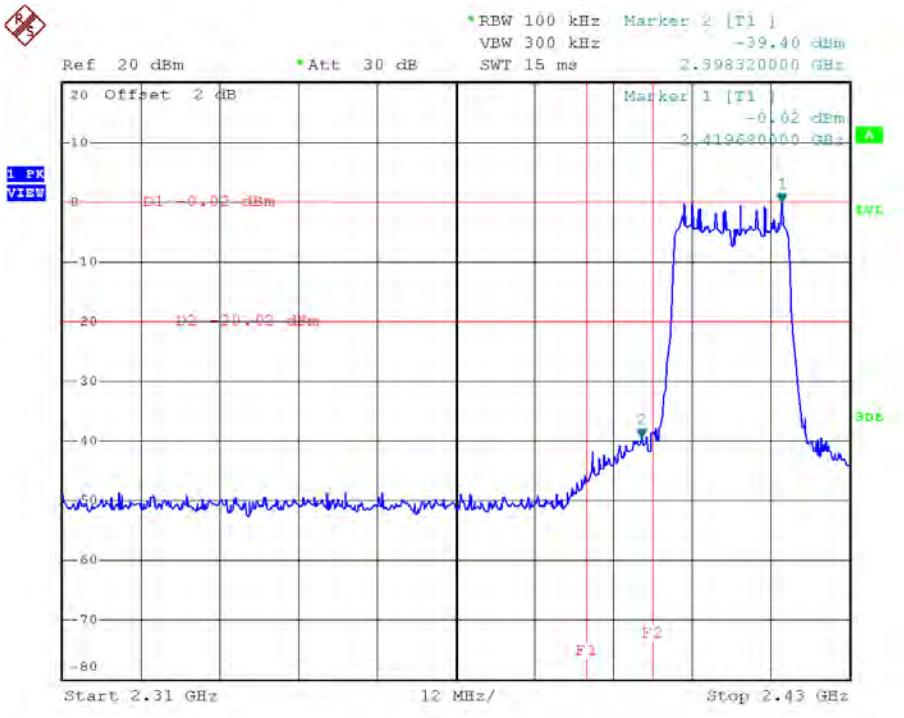


Test CH11: 2462MHz

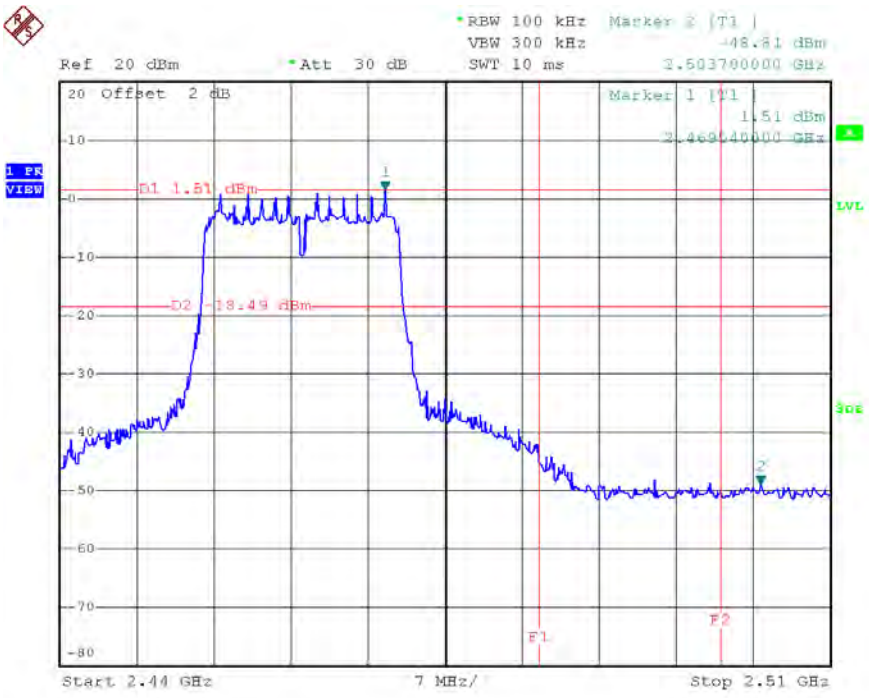


Test Mode: IEEE 802.11n HT20 TX

Test CH1: 2412MHz

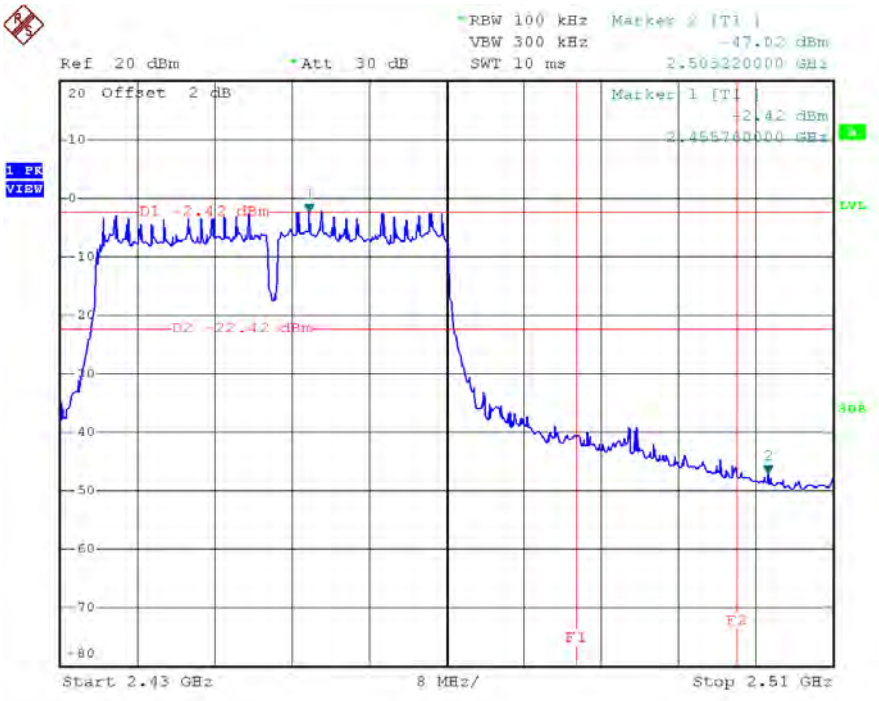


Test CH11: 2462MHz

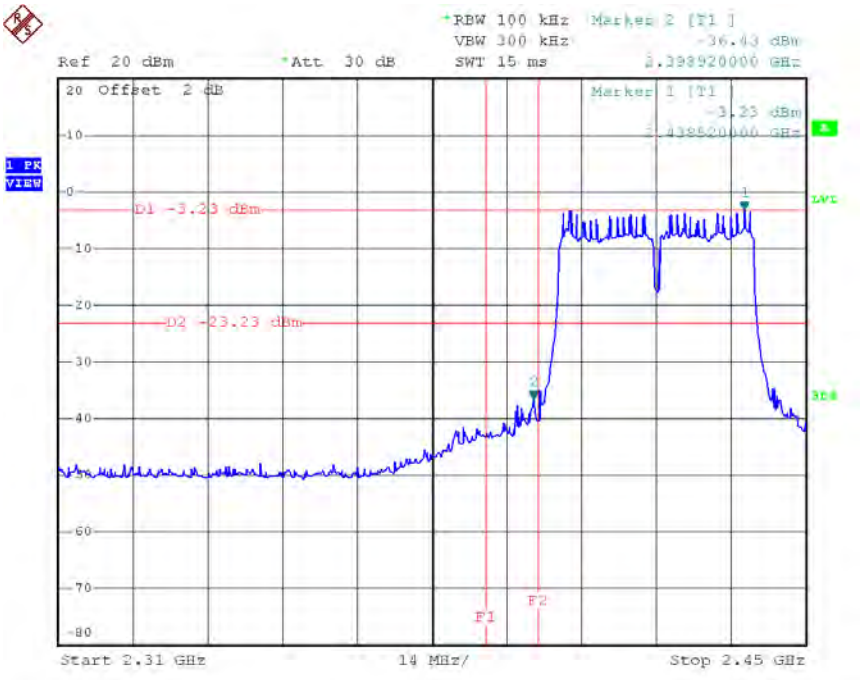


Test Mode: IEEE 802.11n HT40 TX

Test CH3: 2422MHz



Test CH9: 2452MHz



4.7 Band Edge Measurements (Radiated)

Radiated band edge measurements at 2390MHz and 2483MHz were made with the unit transmitting in the low end of the channel range and the high end closest to the restricted bands respectively. The emissions were made on the 966 Semi-Chamber. Use (resolution bandwidth (RBW) = 1 MHz, video bandwidth (VBW) = 1 MHz for peak levels and RBW = 1 MHz and VBW = 10 Hz for average levels). Table 11 shows the band edge emissions.

4.7.1 Limits

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. 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).

4.7.2 Test Procedure

1. Use radiated spurious emission test procedure described in 4.5.2 clause. The transmitter output (antenna port) was connected to the test receiver.

2. Set the PK and AV limit line.

3. Record the fundamental emission and emissions out of the bandedge.

4. Determine band-edge compliance as required.

4.7.3 Test Data

The EUT complied with the FCC Part 15.247 Radiated band edge emissions requirements.

Table 13 provides the test results for Radiated band edge emissions. （all the data attached was use the worst case data rate as in table 6）

4.7.4 Areas of Concern

None.

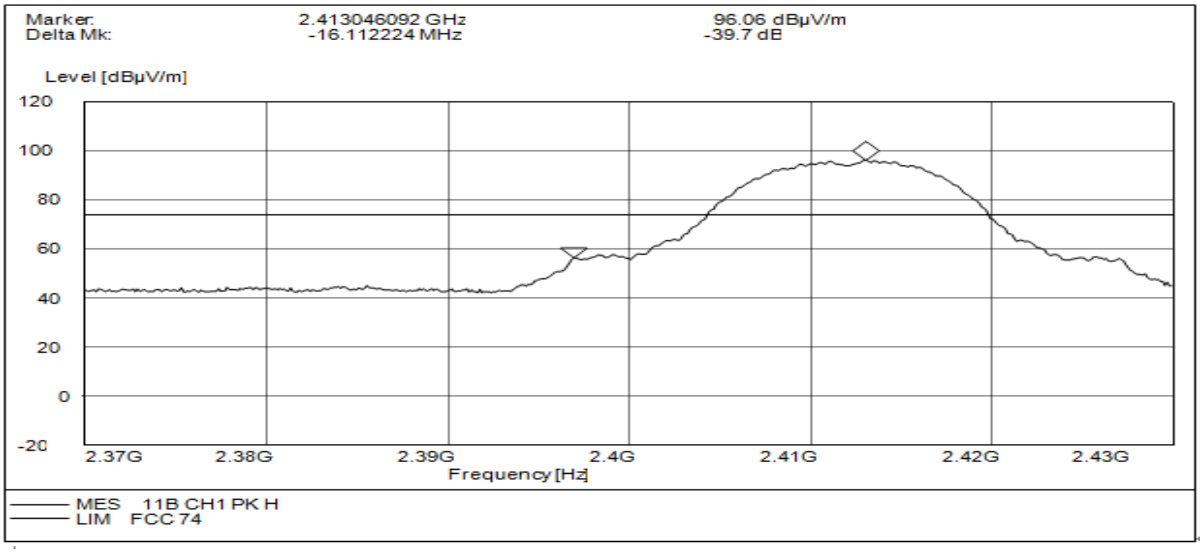
Table 13 Band Edge Measurements (Radiated)

Antenna 1 Test Data:

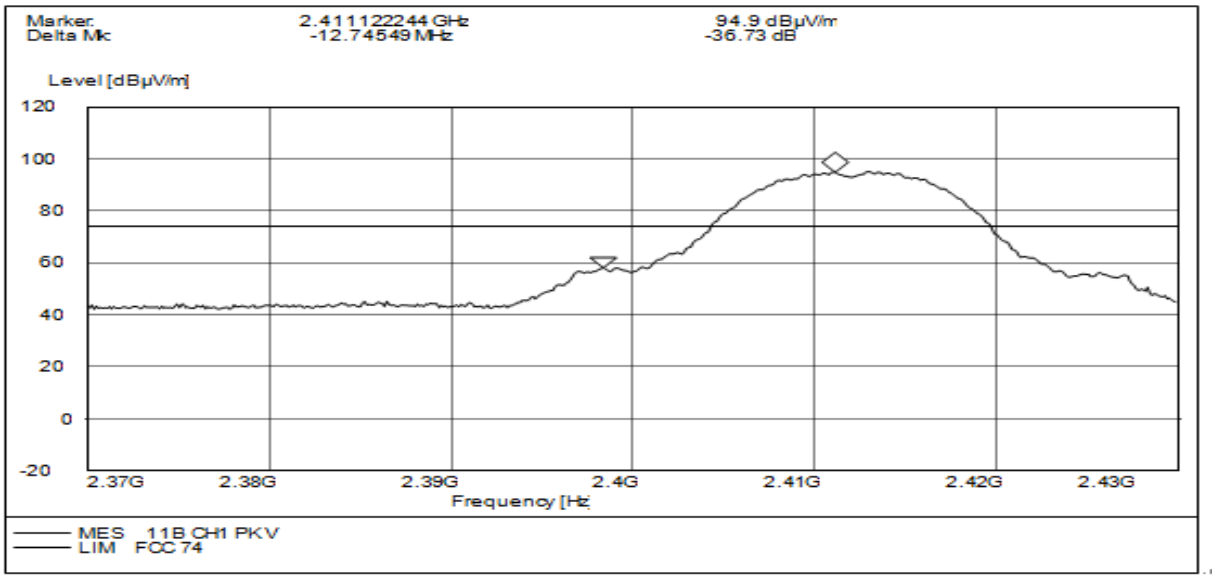
Test Mode: IEEE 802.11b TX Test

CH1: 2412MHz

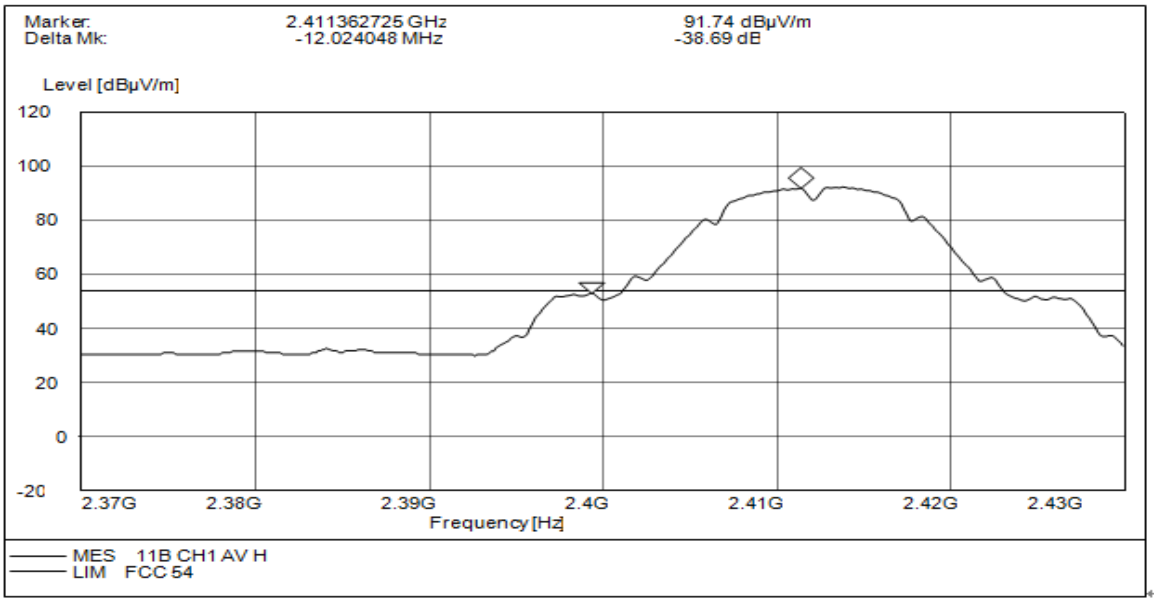
PK (Horizontal)



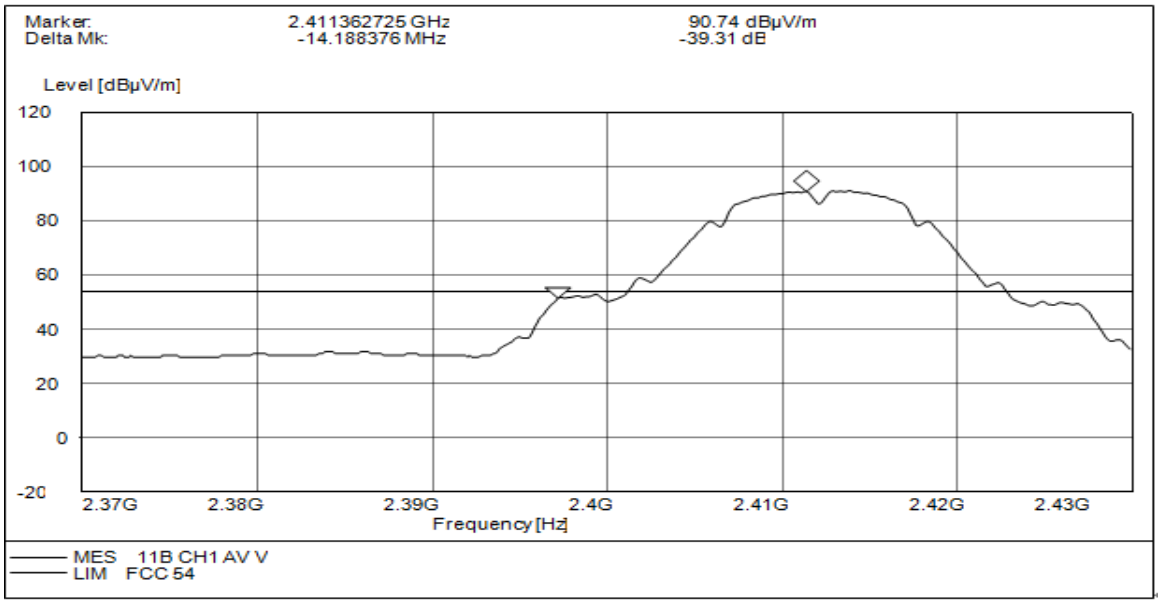
PK (Vertical)



AV (Horizontal)

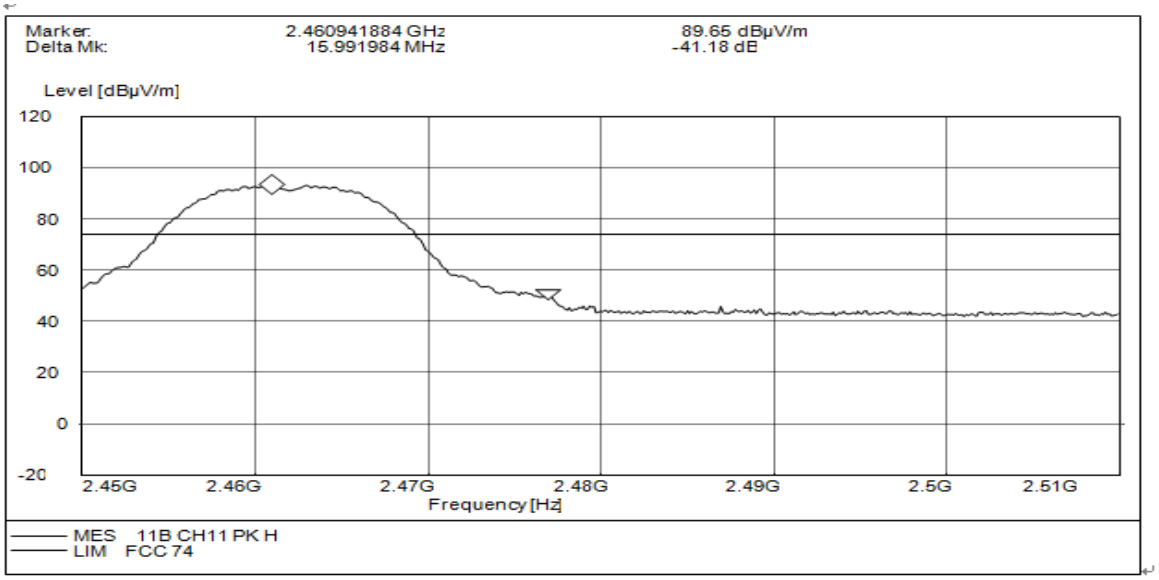


AV (Vertical)

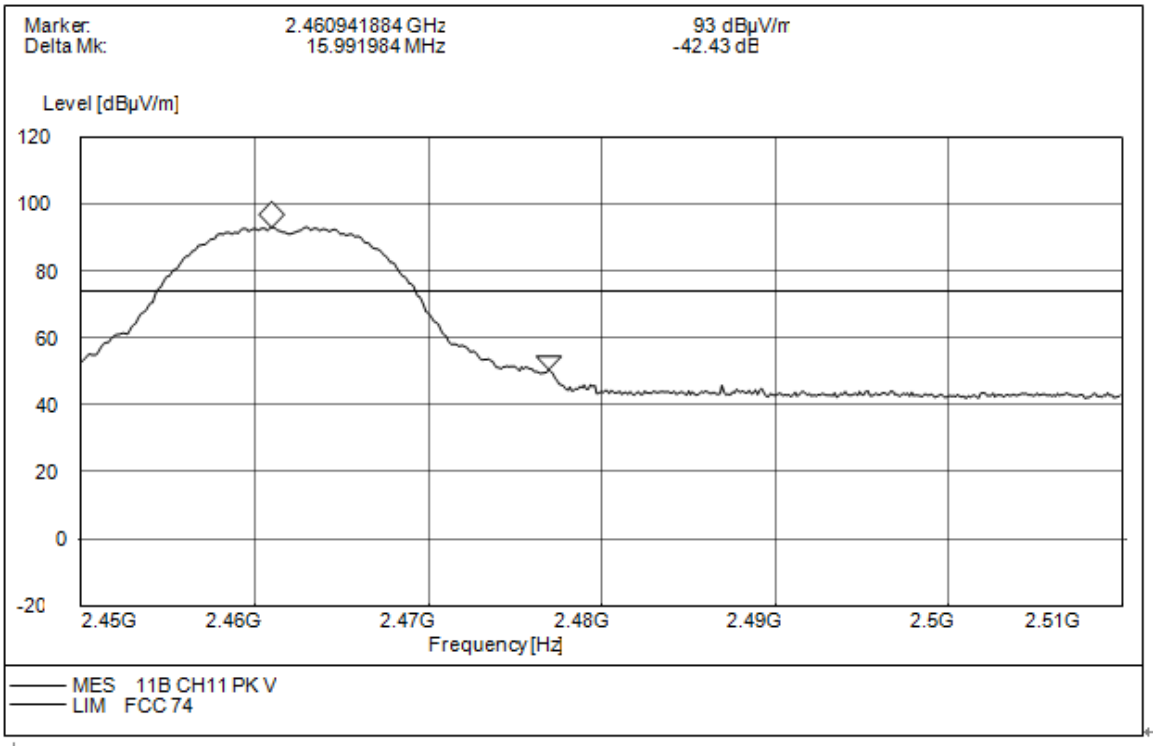


Test CH11: 2462MHz

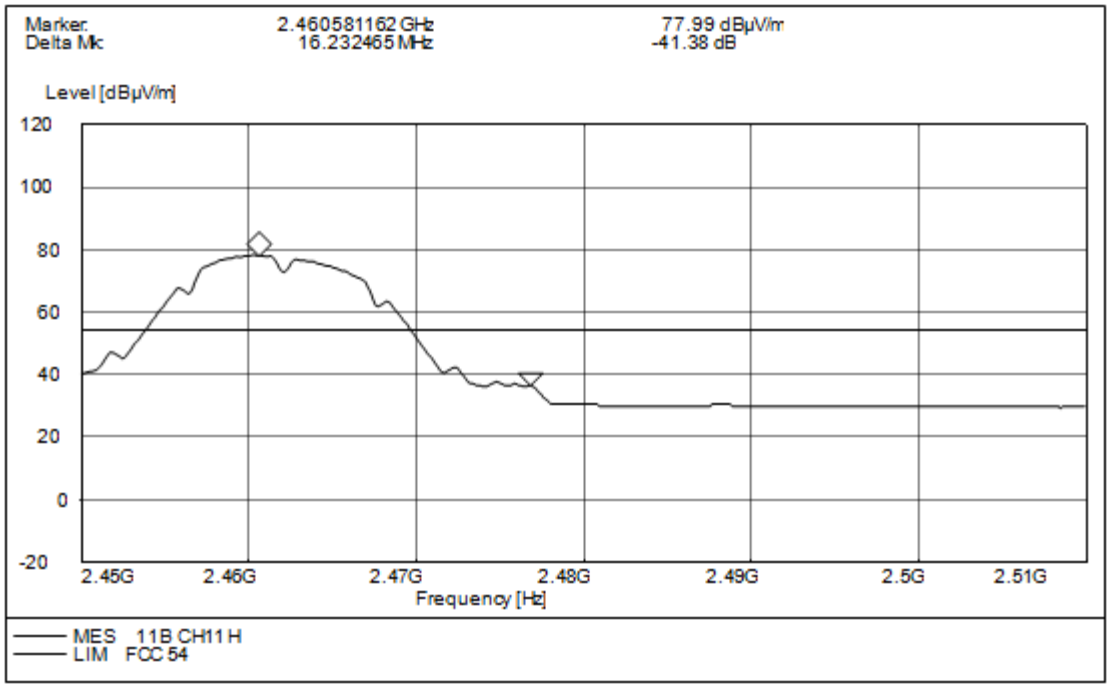
PK (Horizontal)



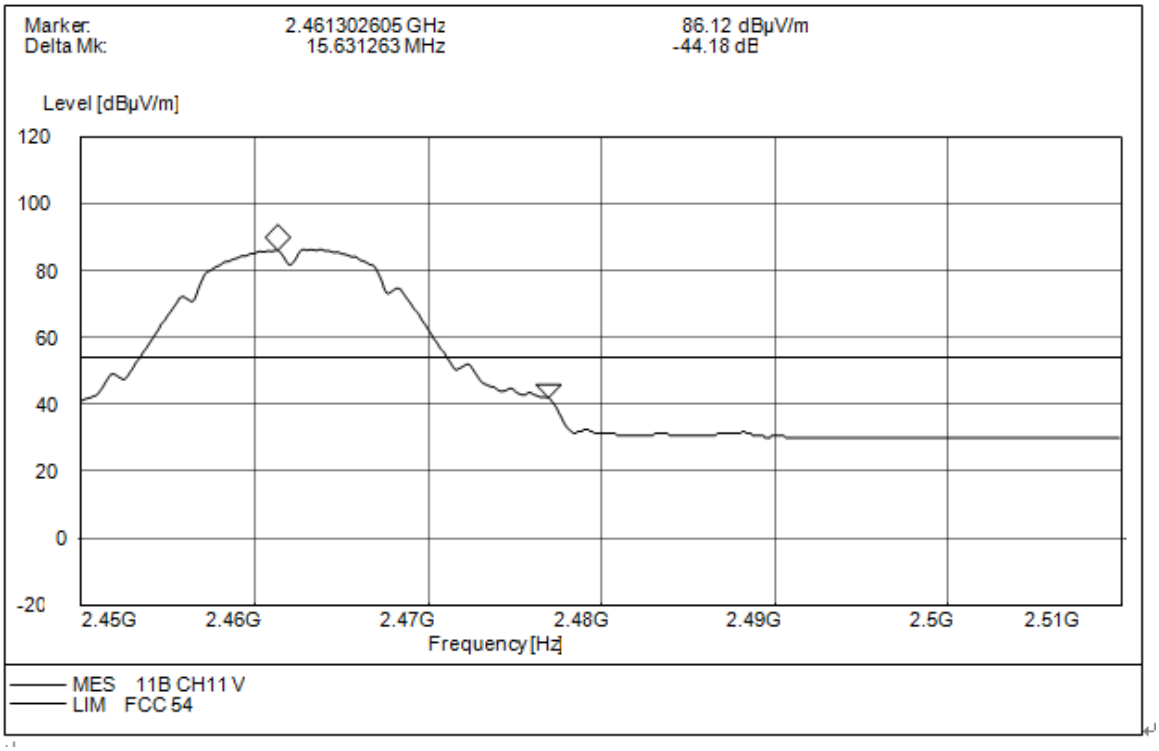
PK (Vertical)



AV (Horizontal)

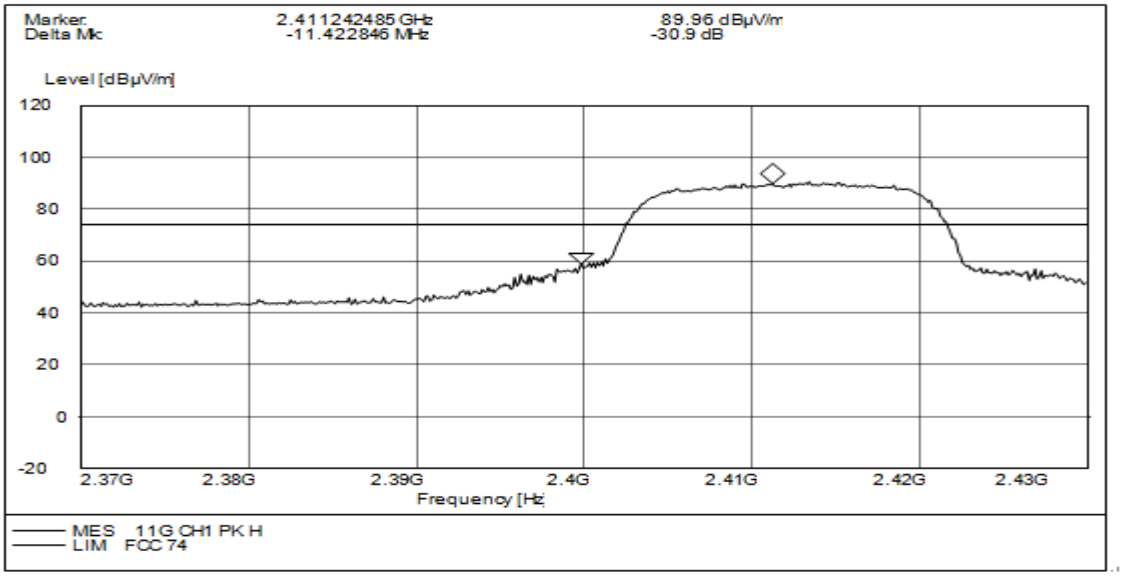


AV (Vertical)

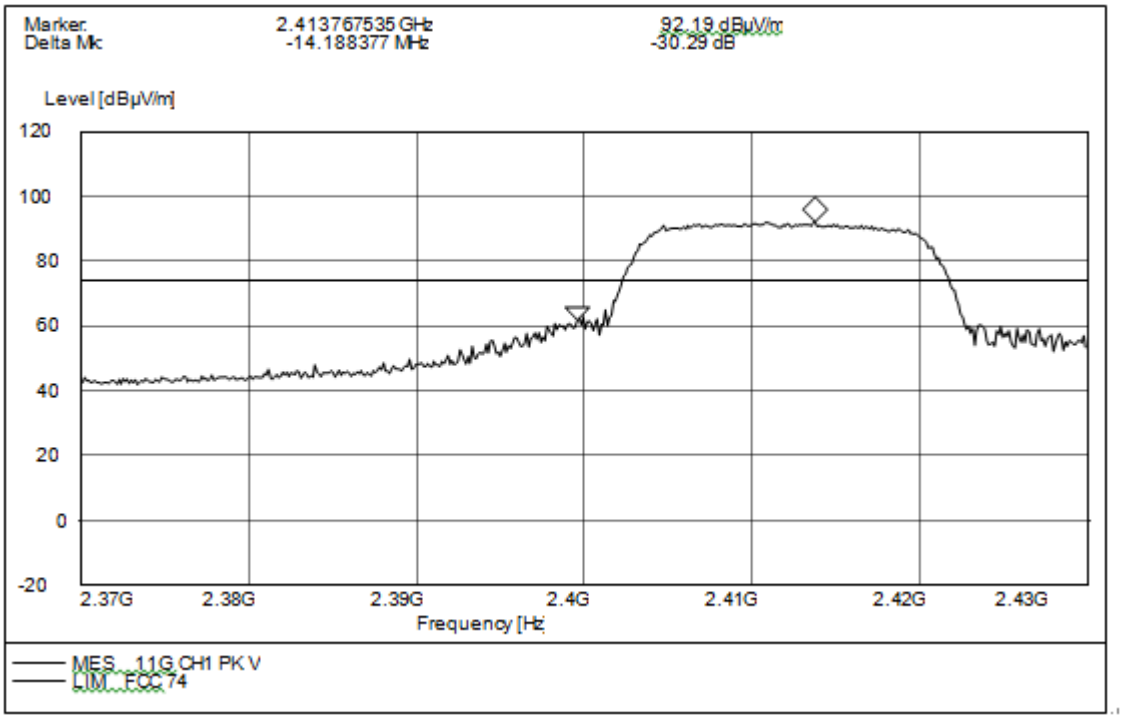


Test Mode: IEEE 802.11g TX Test CH1: 2412MHz

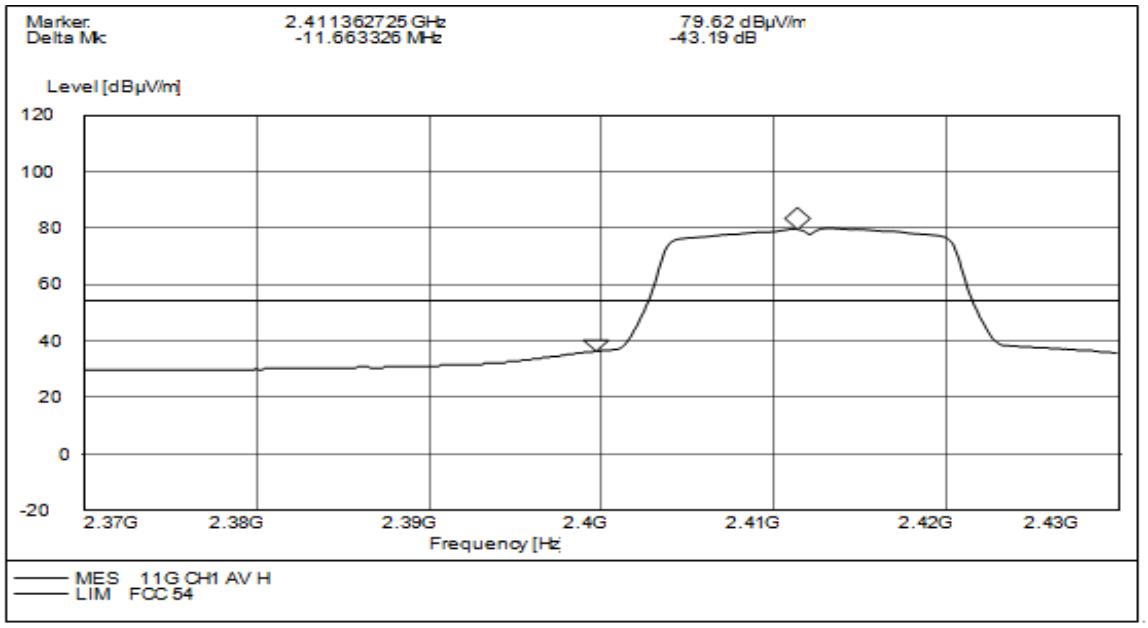
PK (Horizontal



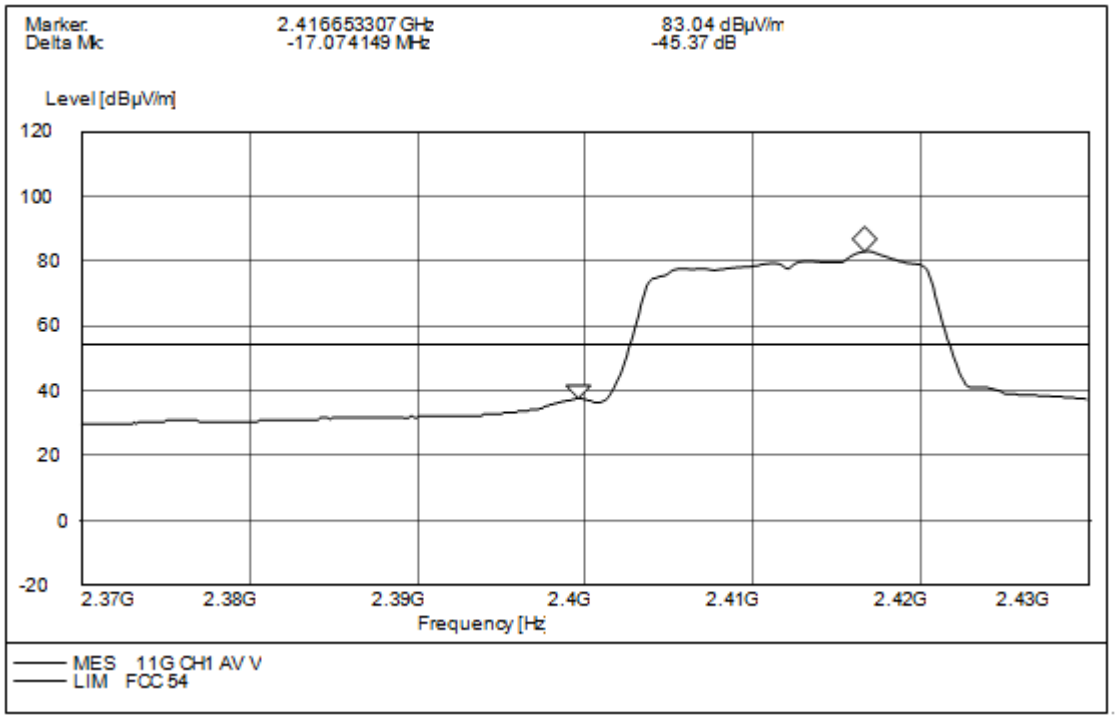
PK (Vertical)



AV (Horizontal)

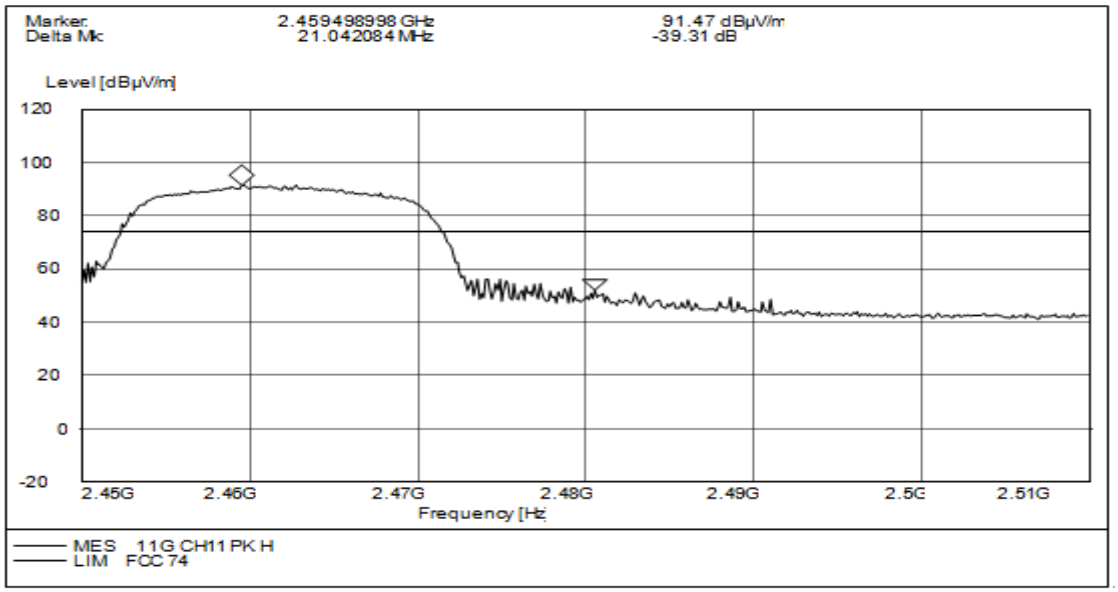


AV (Vertical)

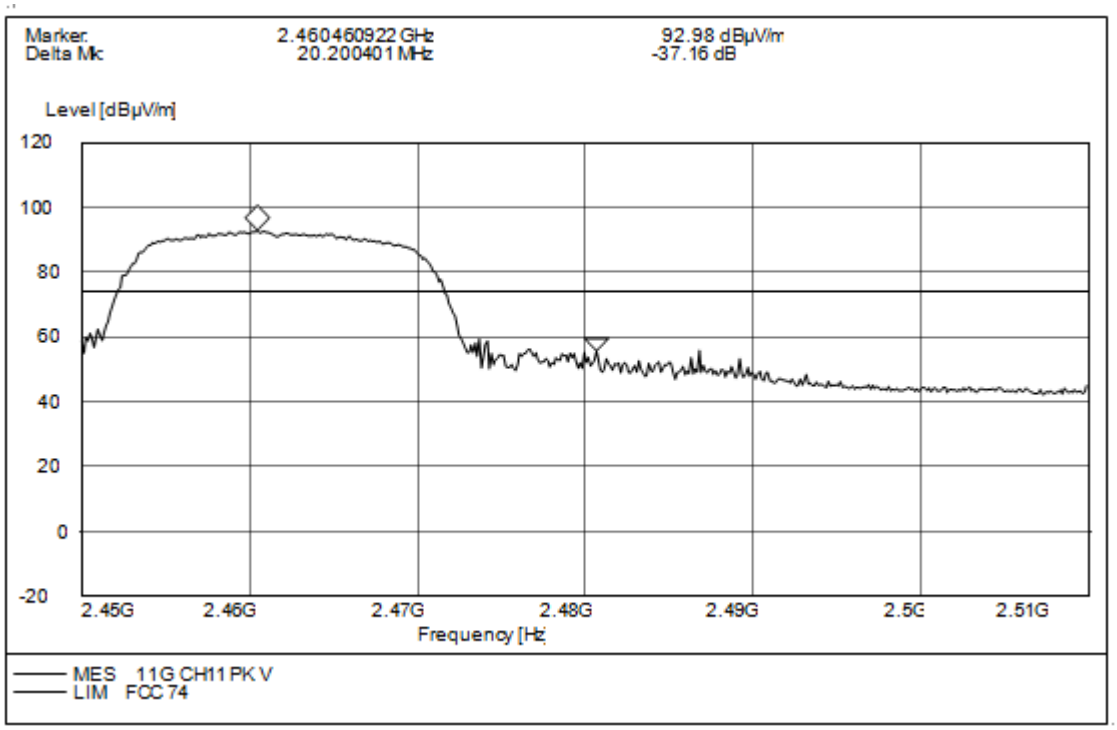


Test CH11: 2462MHz

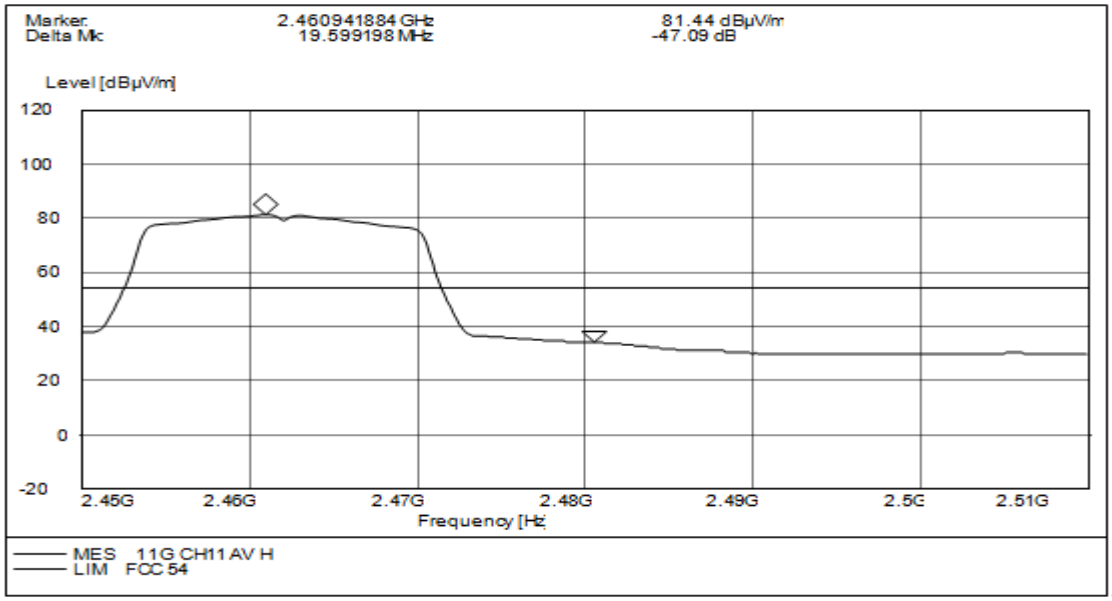
PK (Horizontal)



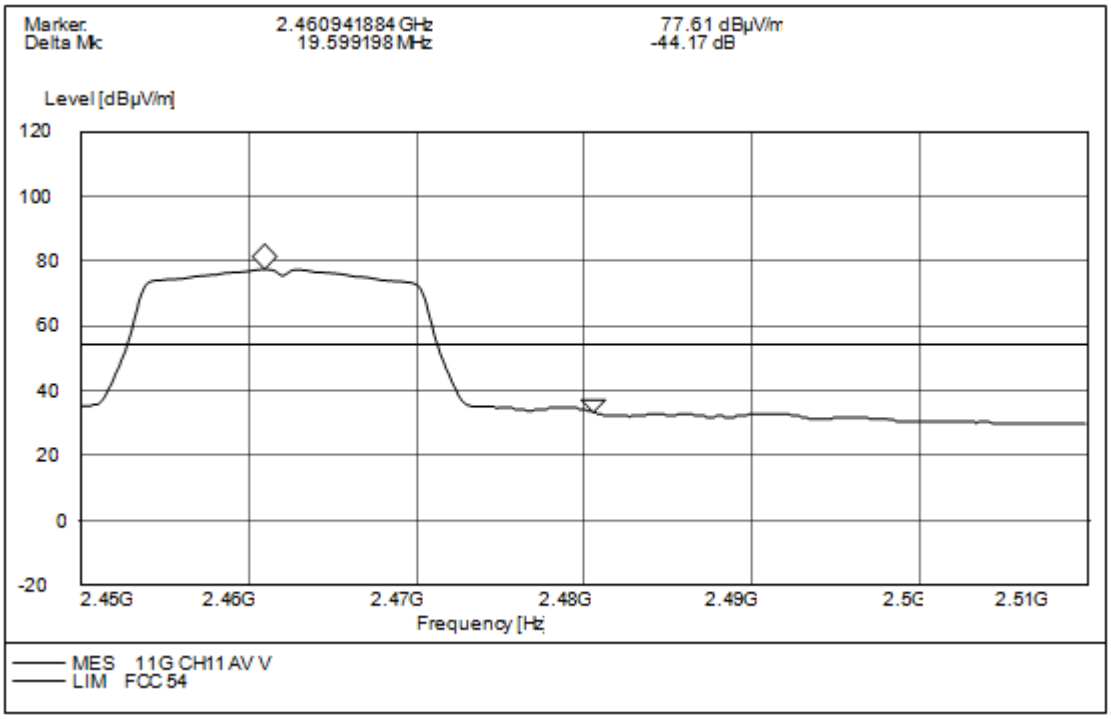
PK (Vertical)



AV (Horizontal)

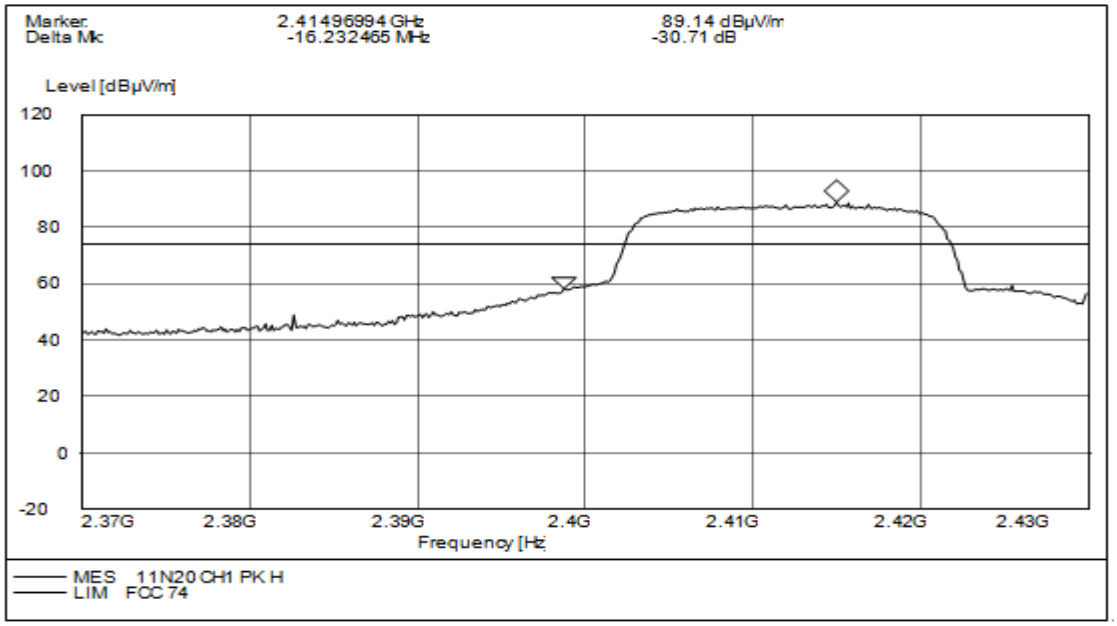


AV (Vertical)

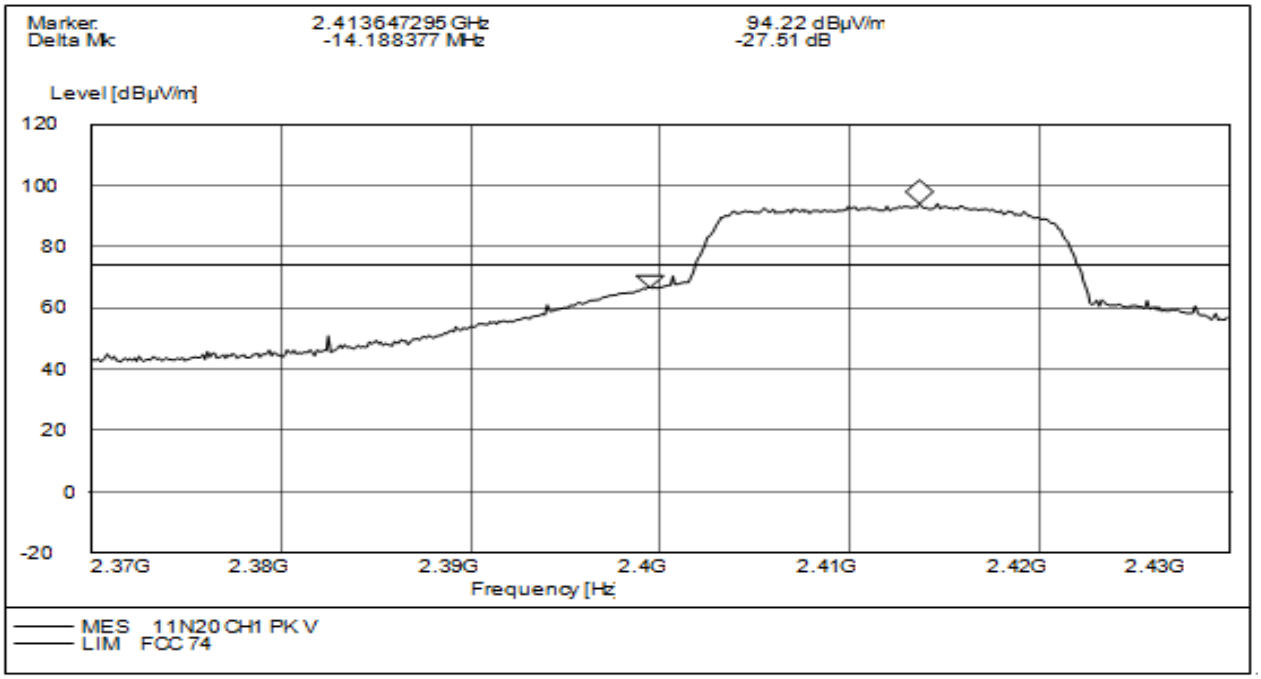


Test Mode: IEEE 802.11n HT20 TX Test CH1: 2412MHz

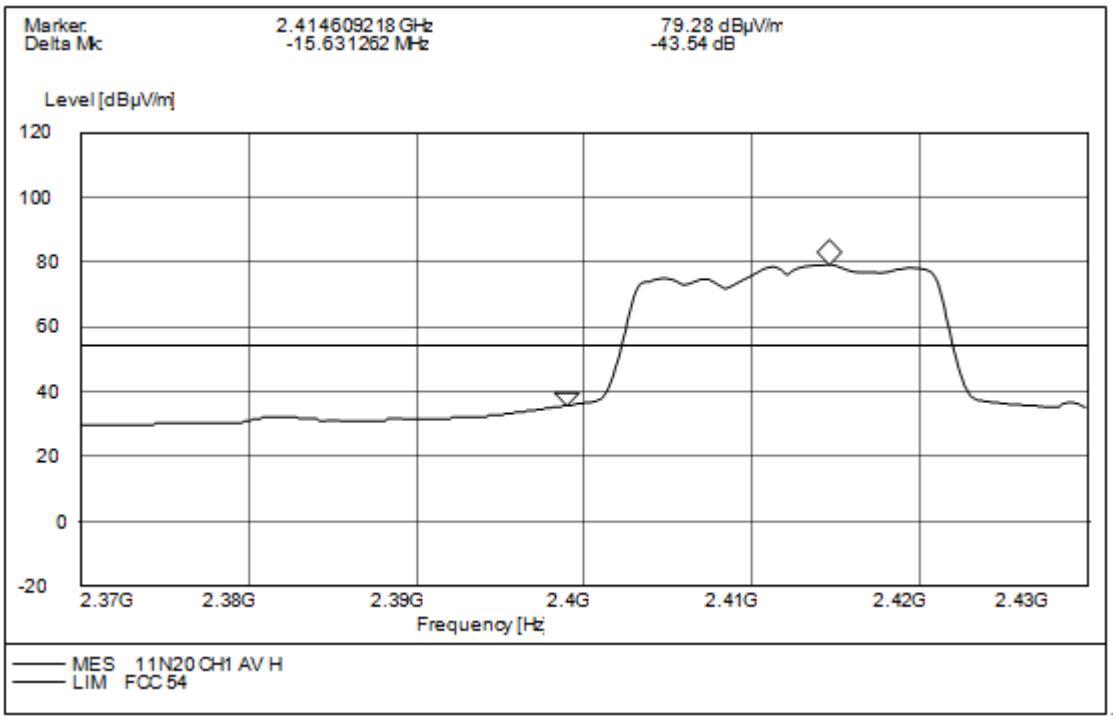
PK (Horizontal)



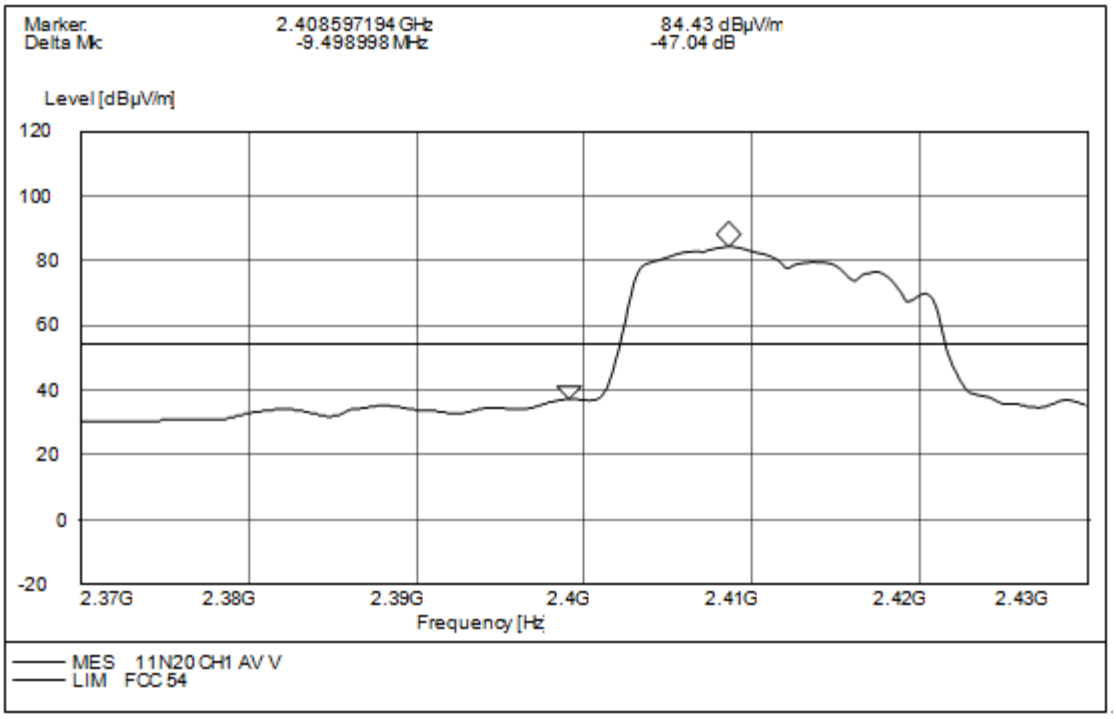
PK (Vertical)



AV (Horizontal)

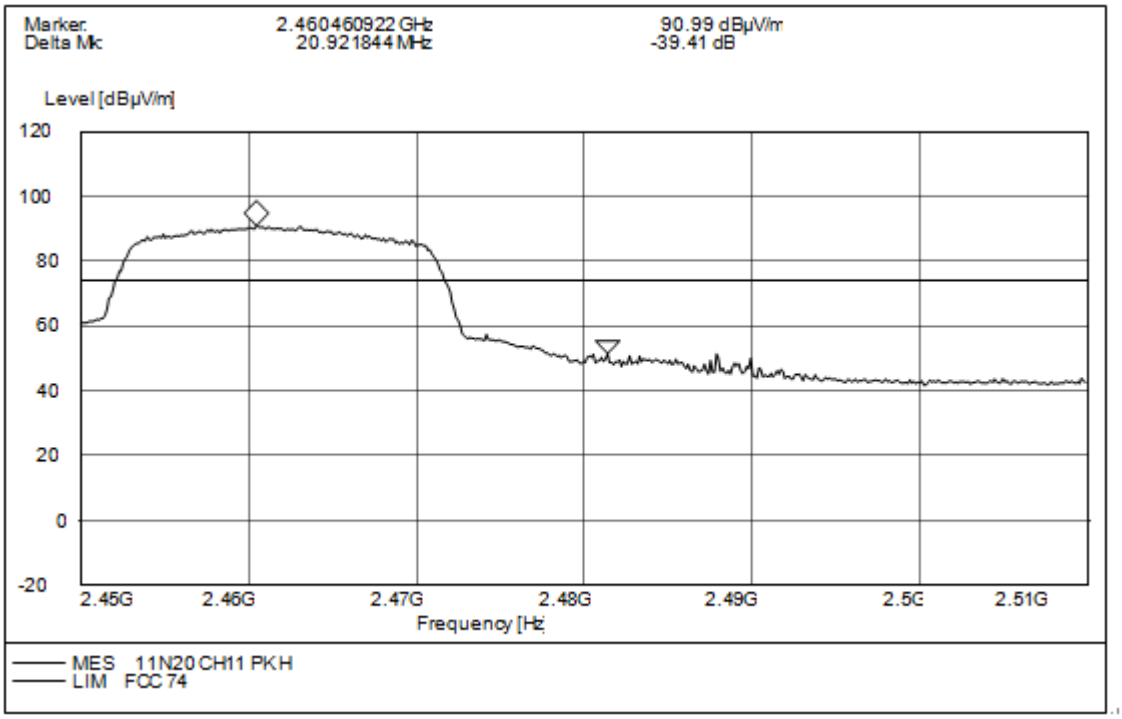


AV (Vertical)

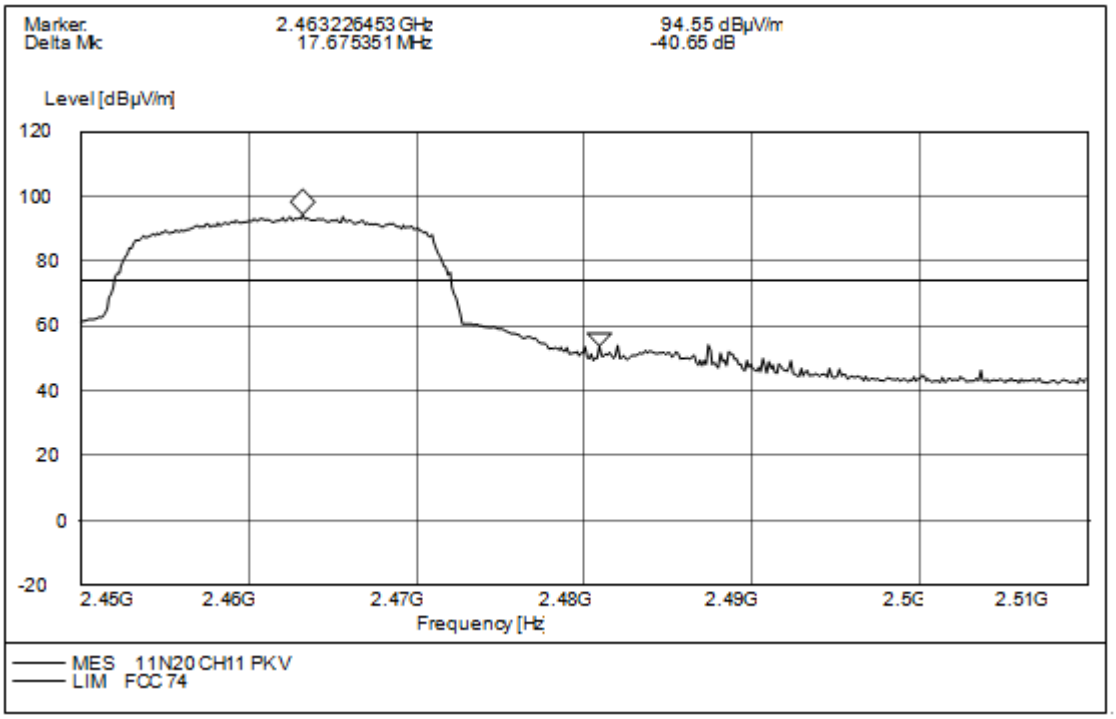


Test Mode: IEEE 802.11n HT20 TX Test CH11: 2462MHz

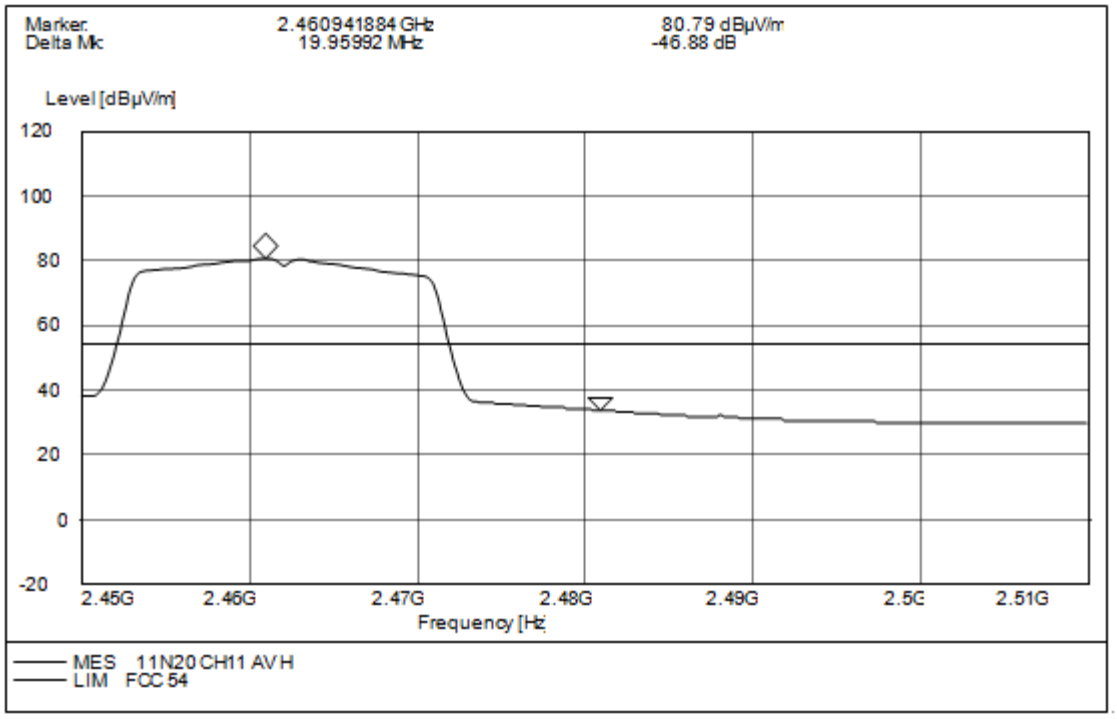
PK (Horizontal)



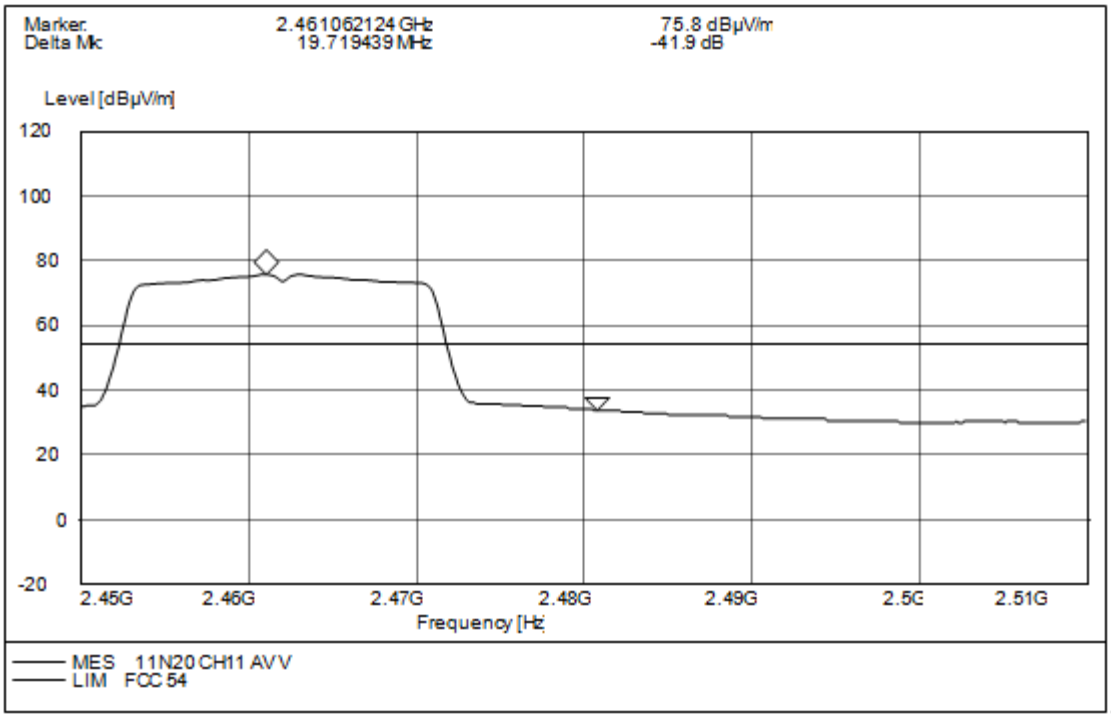
PK (Vertical)



AV (Horizontal)

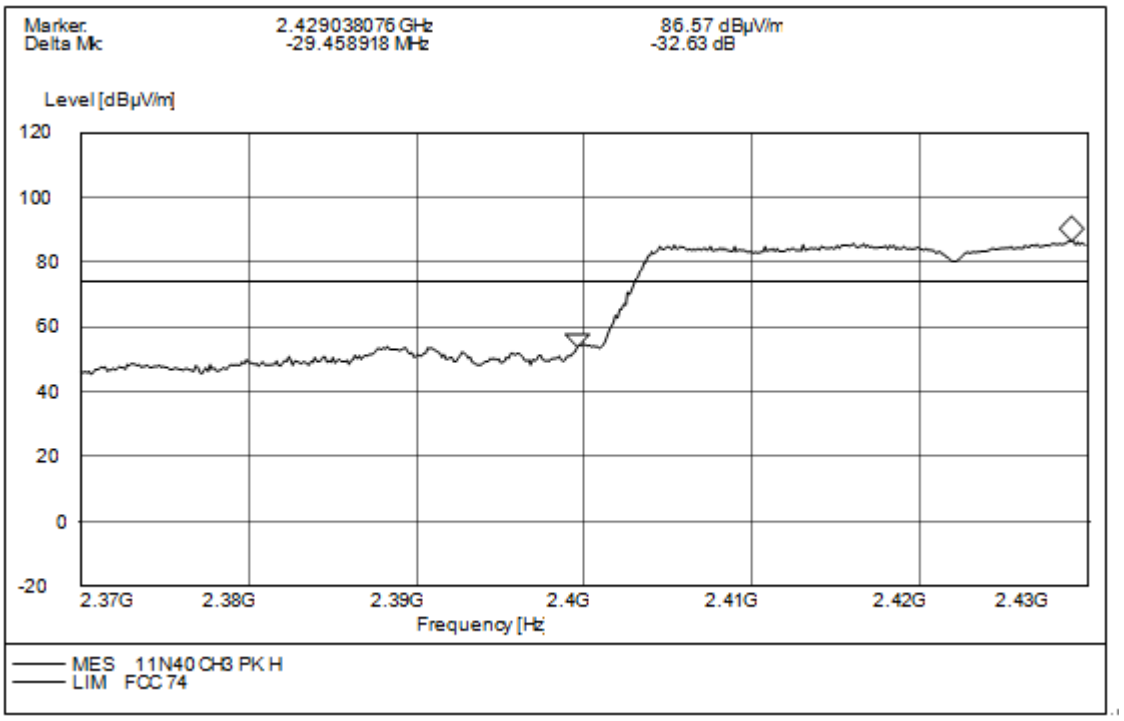


AV (Vertical)

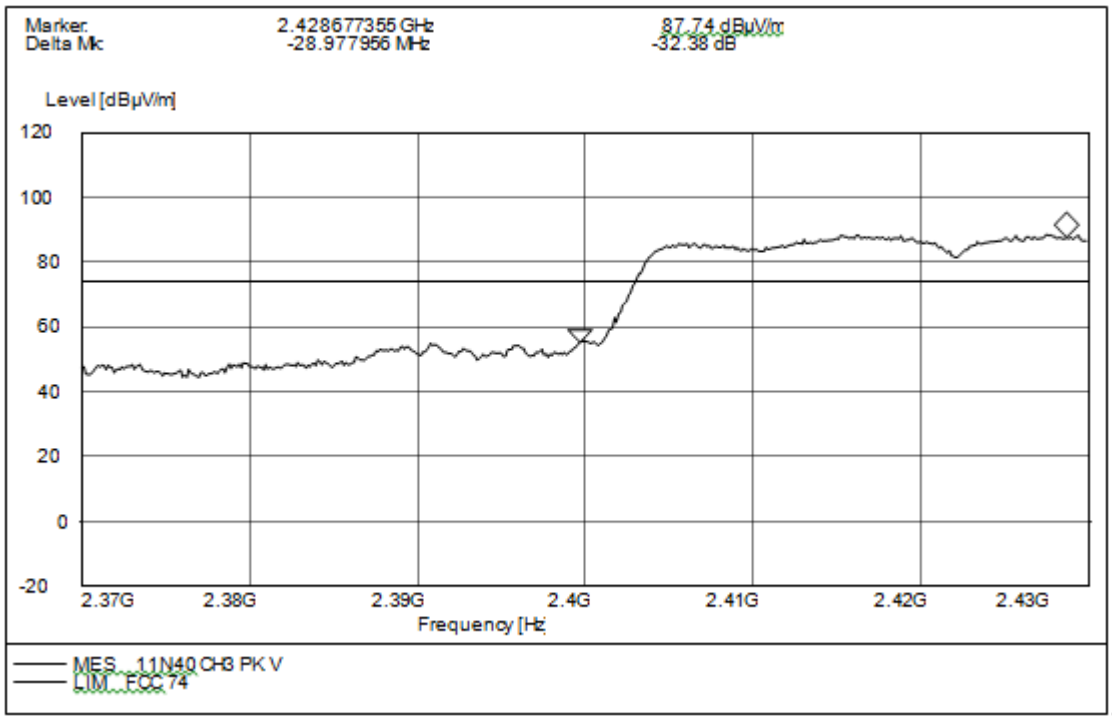


Test Mode: IEEE 802.11n HT40 TX Test CH3: 2422MHz

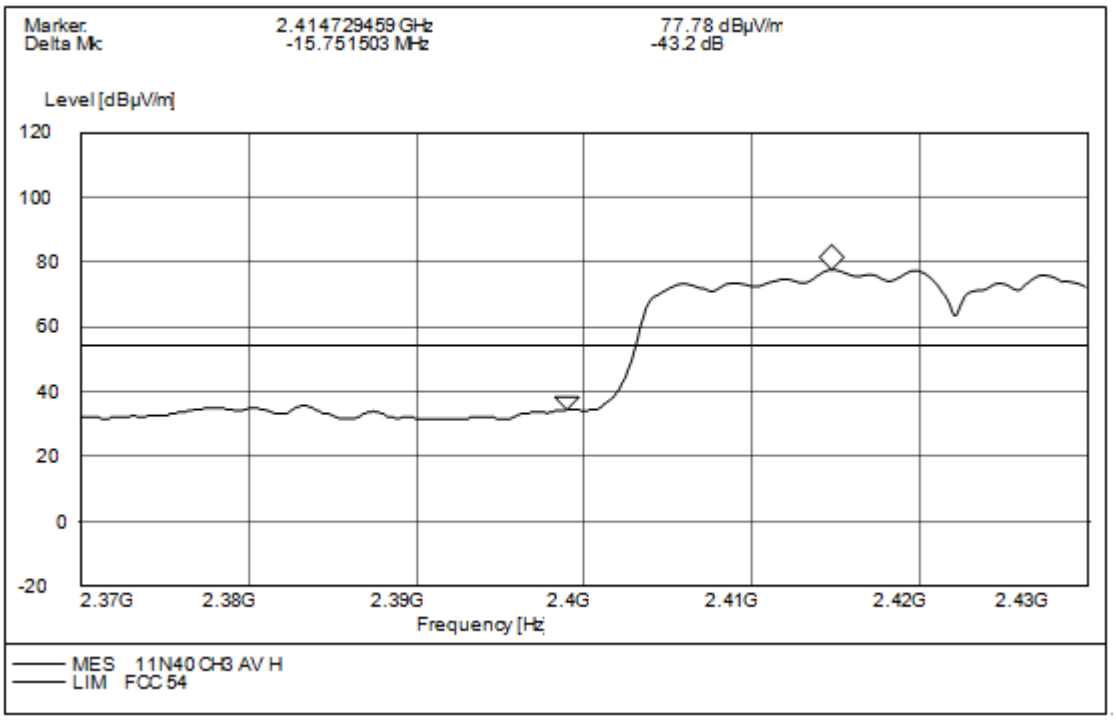
PK (Horizontal)



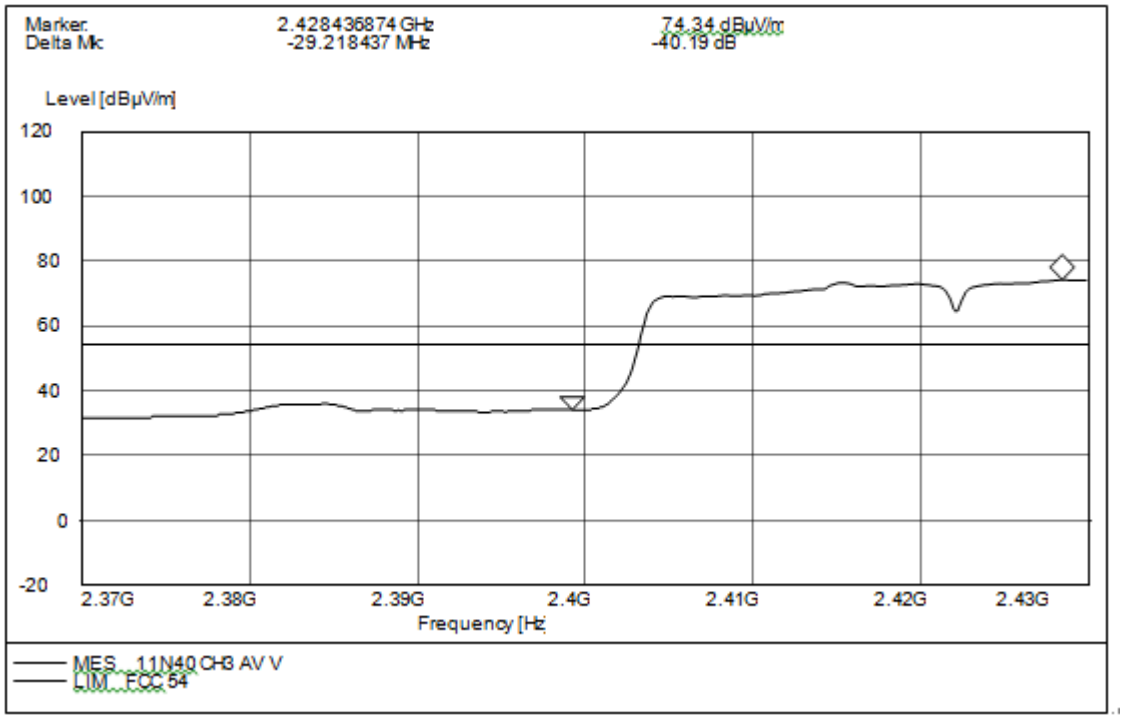
PK (Vertical)



AV (Horizontal)

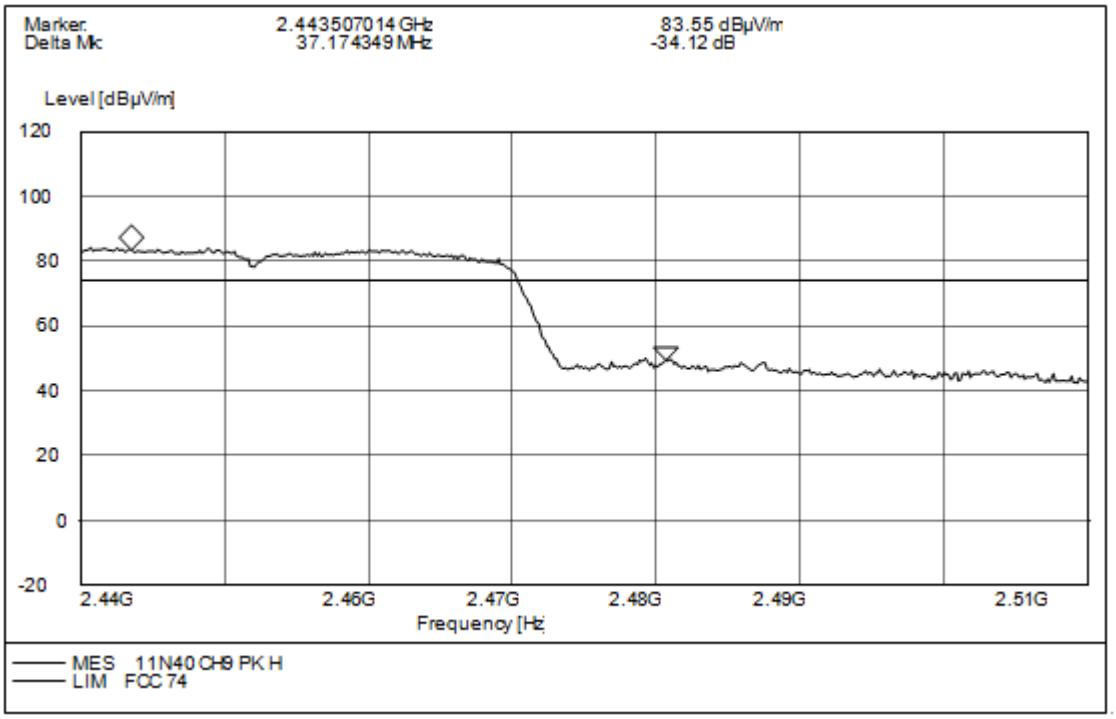


AV (Vertical)

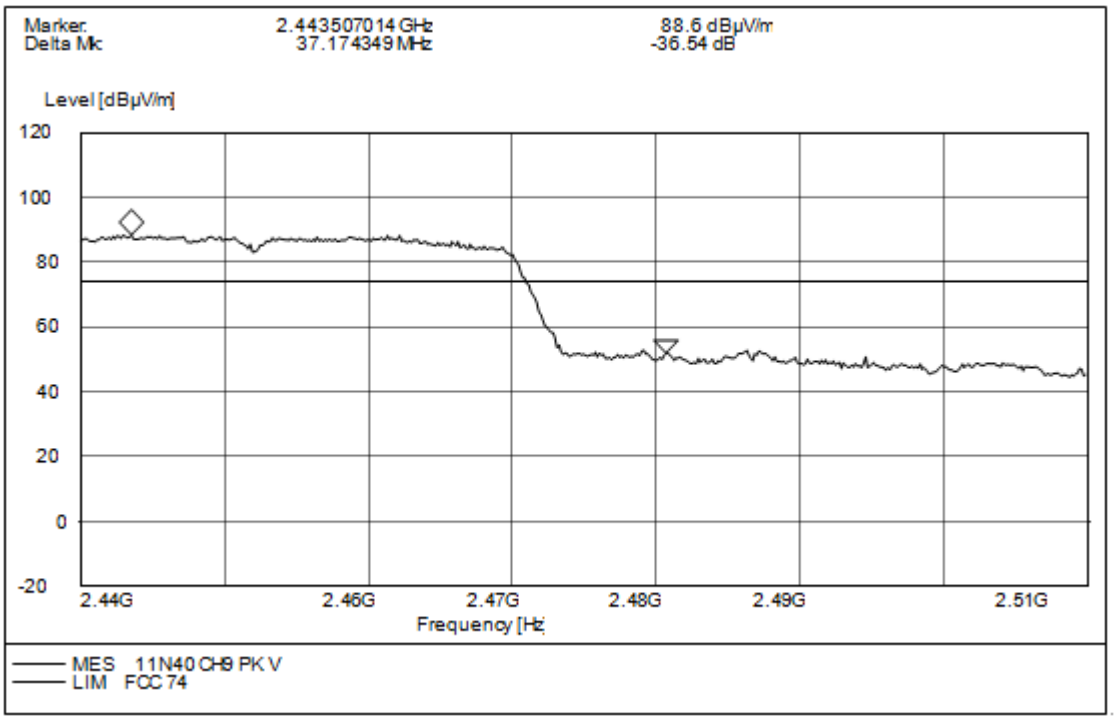


Test Mode: IEEE 802.11n HT40 TX Test CH9: 2452MHz

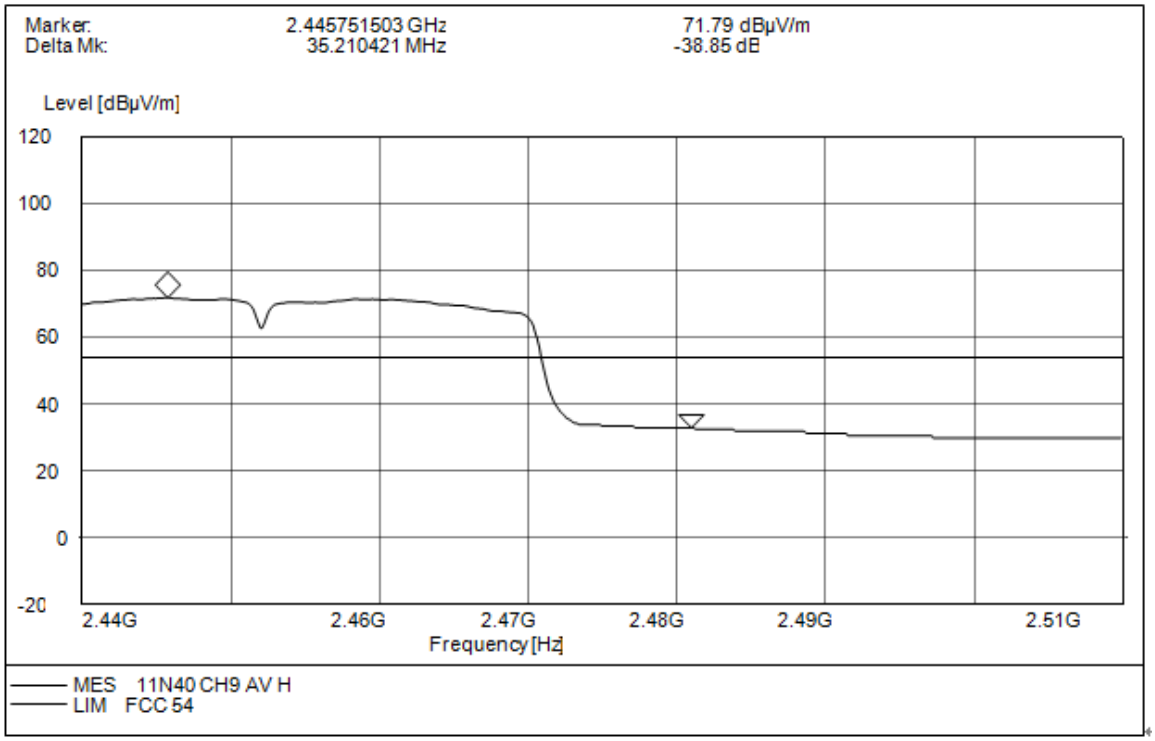
PK (Horizontal)



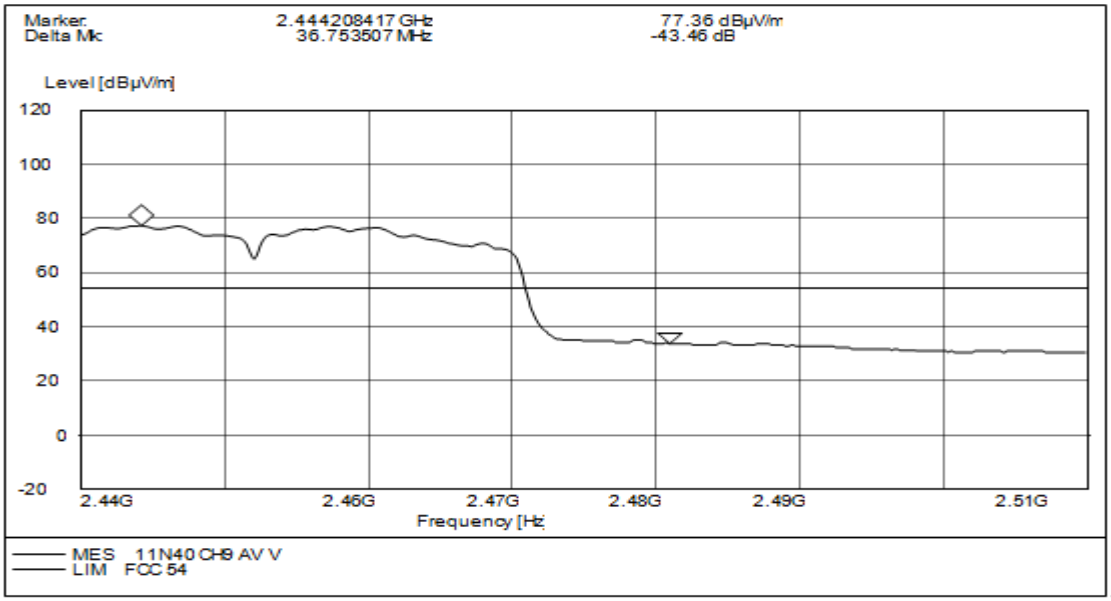
PK (Vertical)



AV (Horizontal)



AV (Vertical)

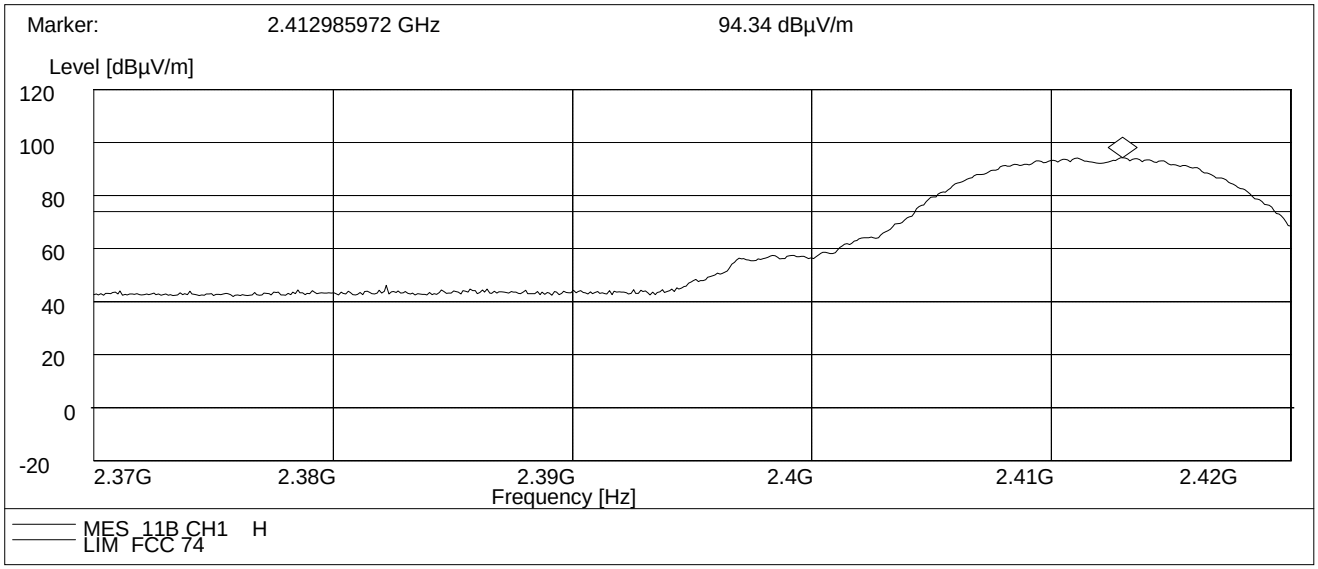


Antenna 2 Test Data:

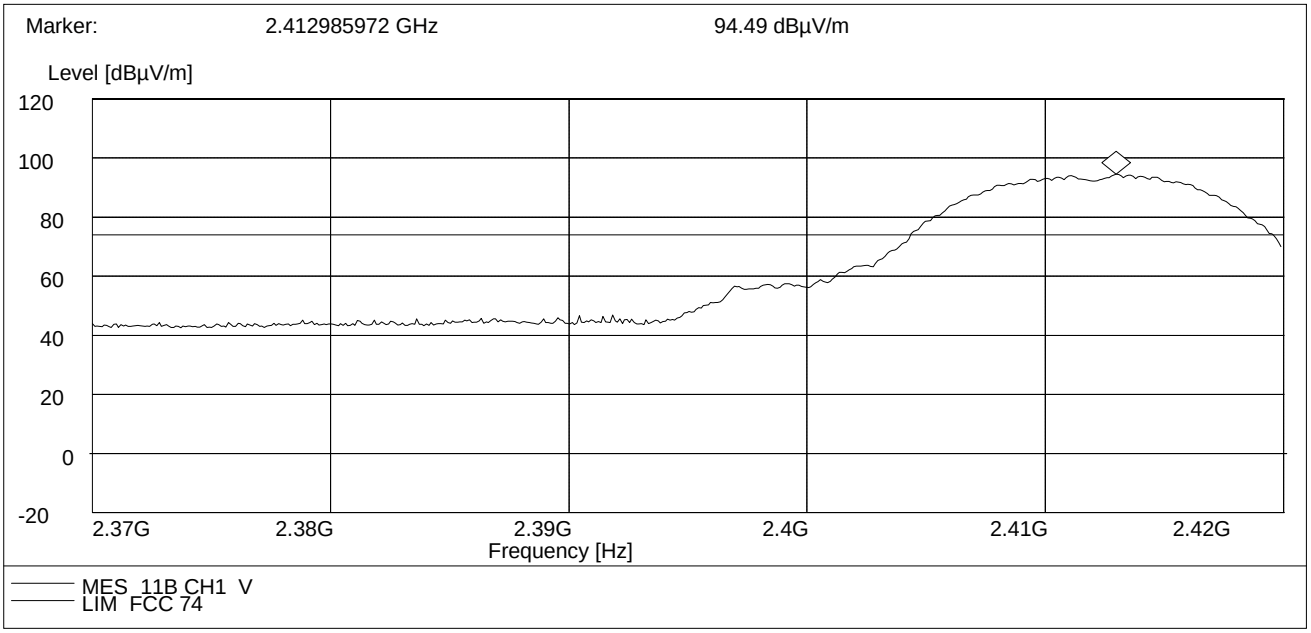
Test Mode: IEEE 802.11b TX Test

CH1: 2412MHz

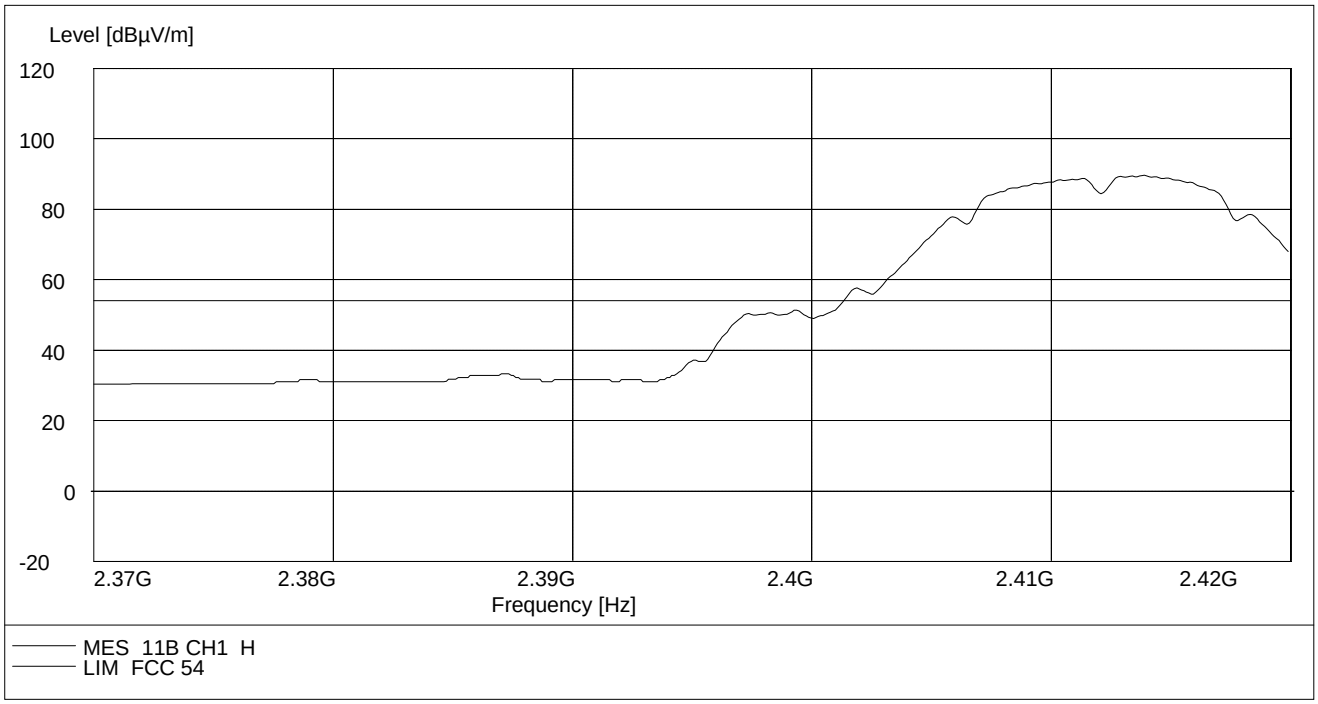
PK (Horizontal)



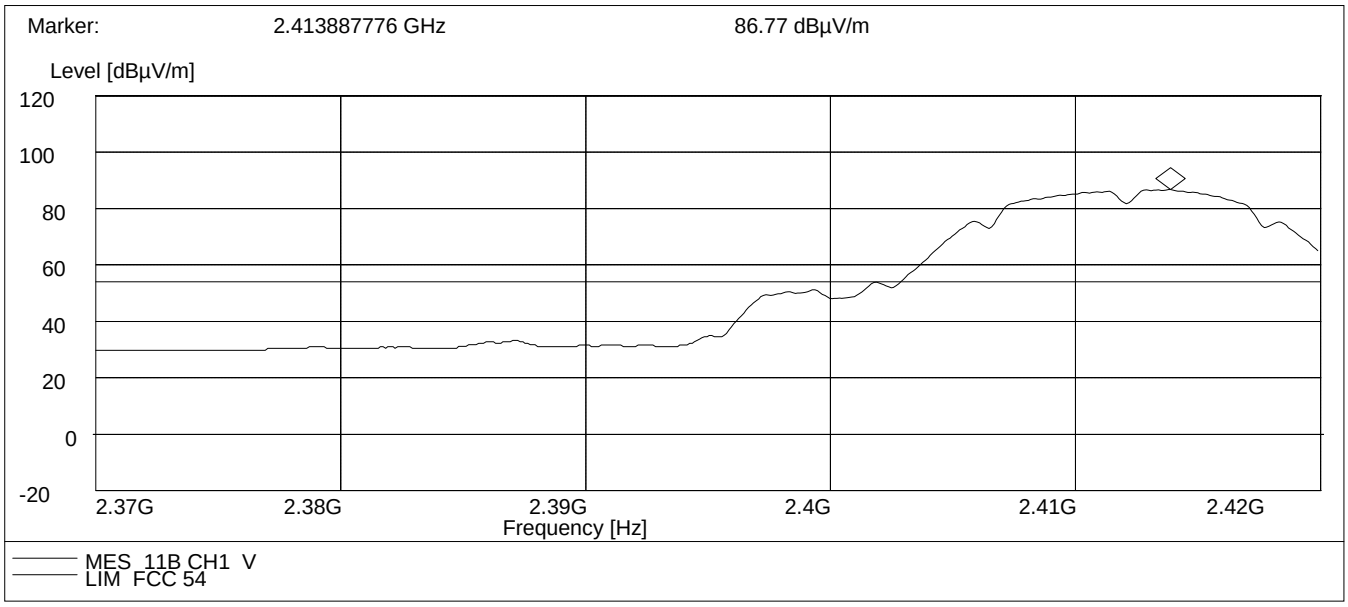
PK (Vertical)



AV (Horizontal)

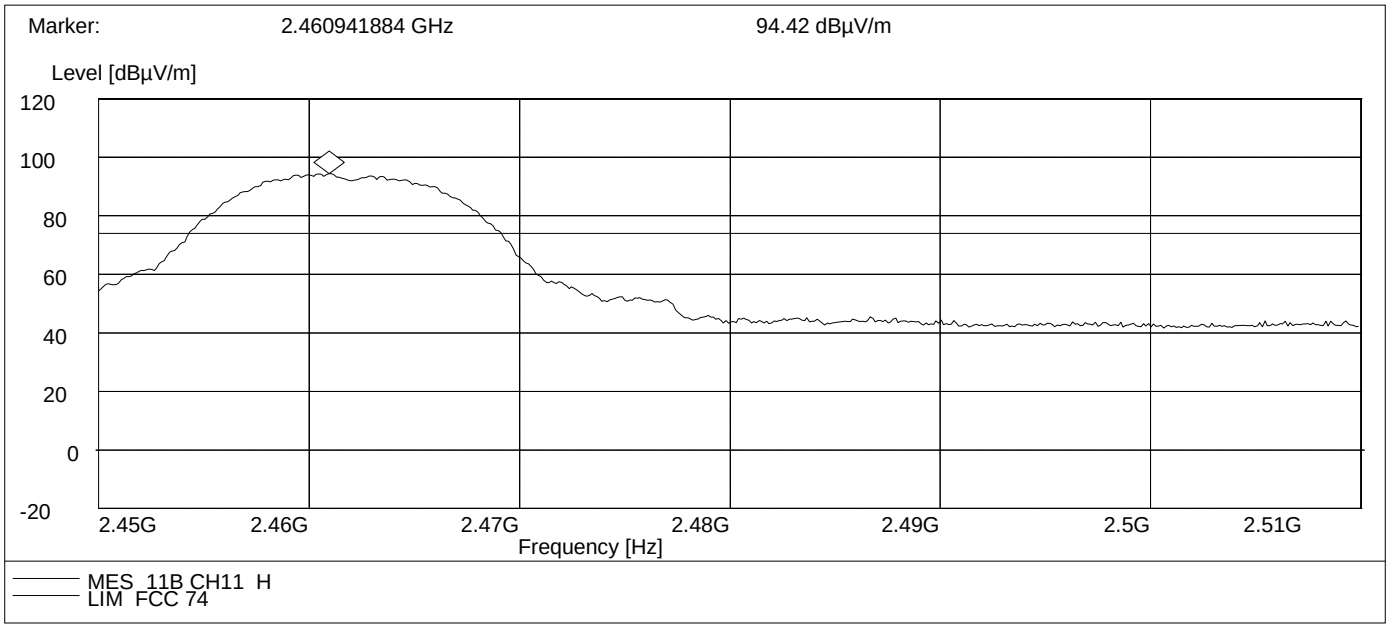


AV (Vertical)

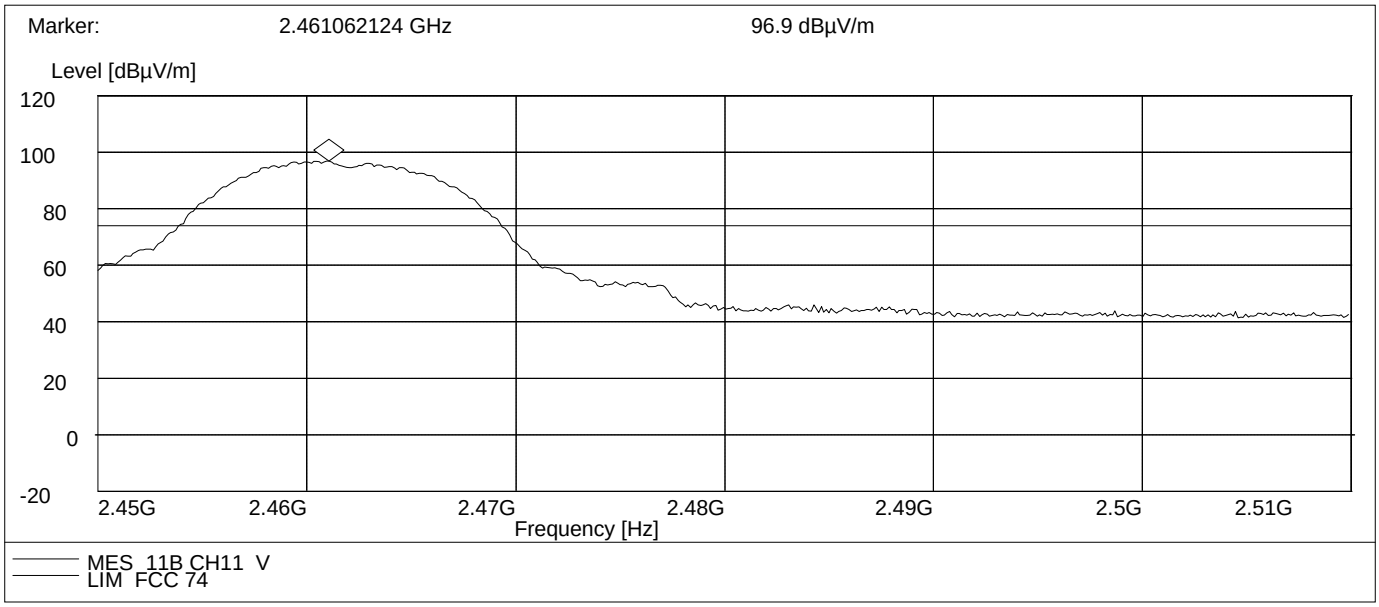


Test CH11: 2462MHz

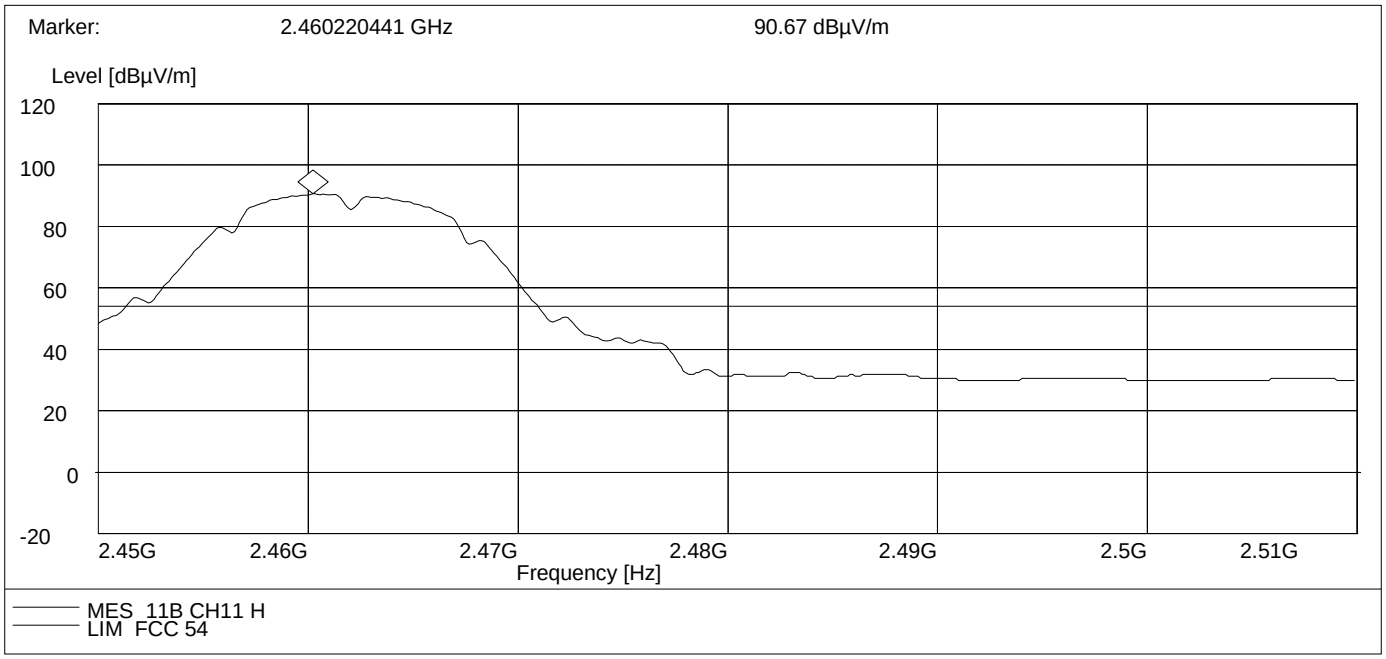
PK (Horizontal)



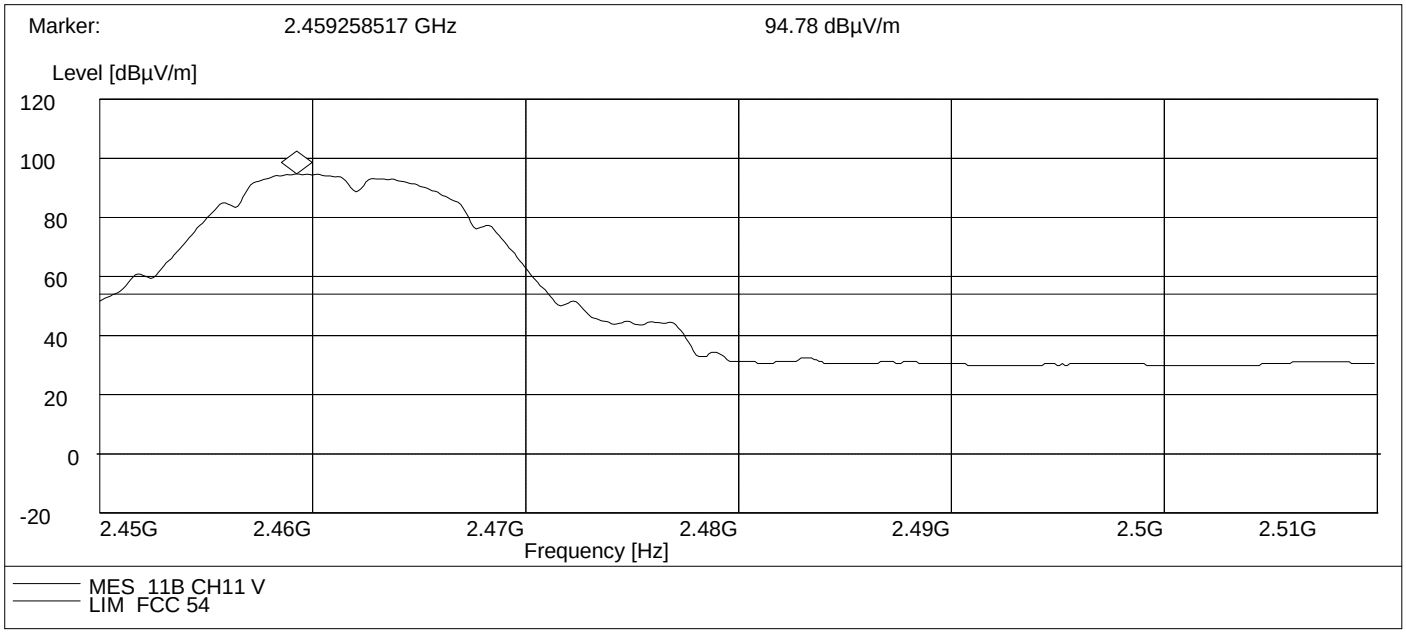
PK (Vertical)



AV (Horizontal)

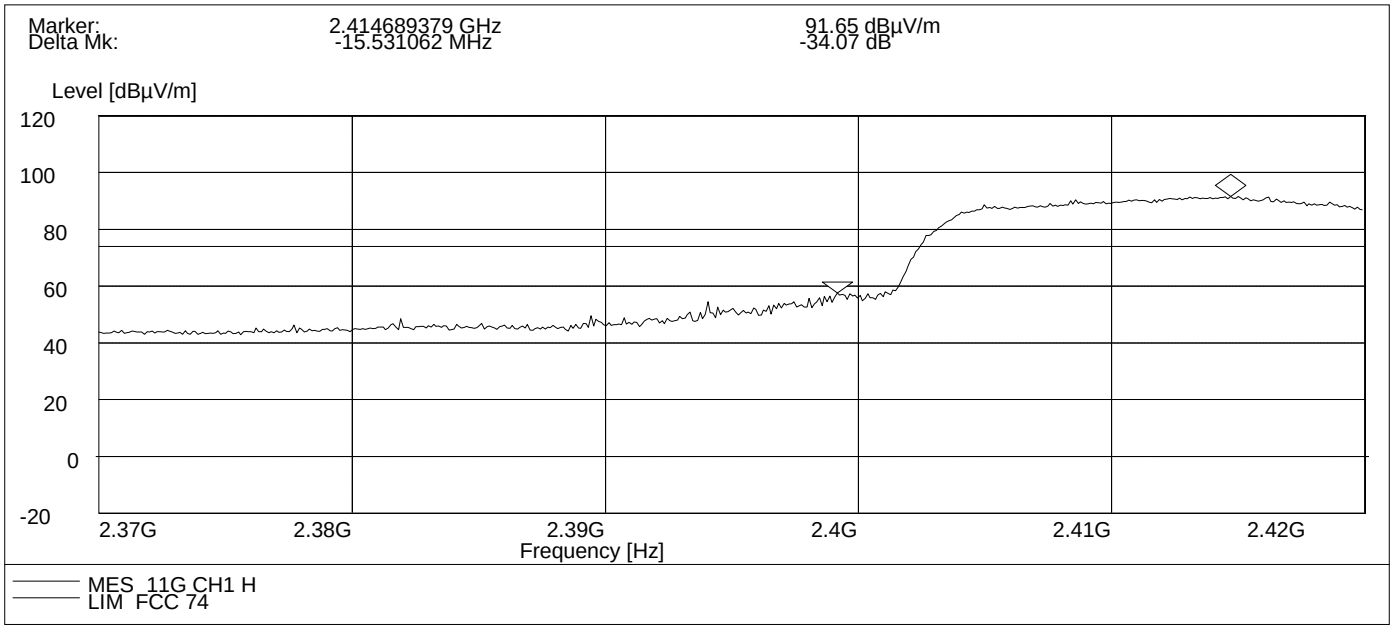


AV (Vertical)

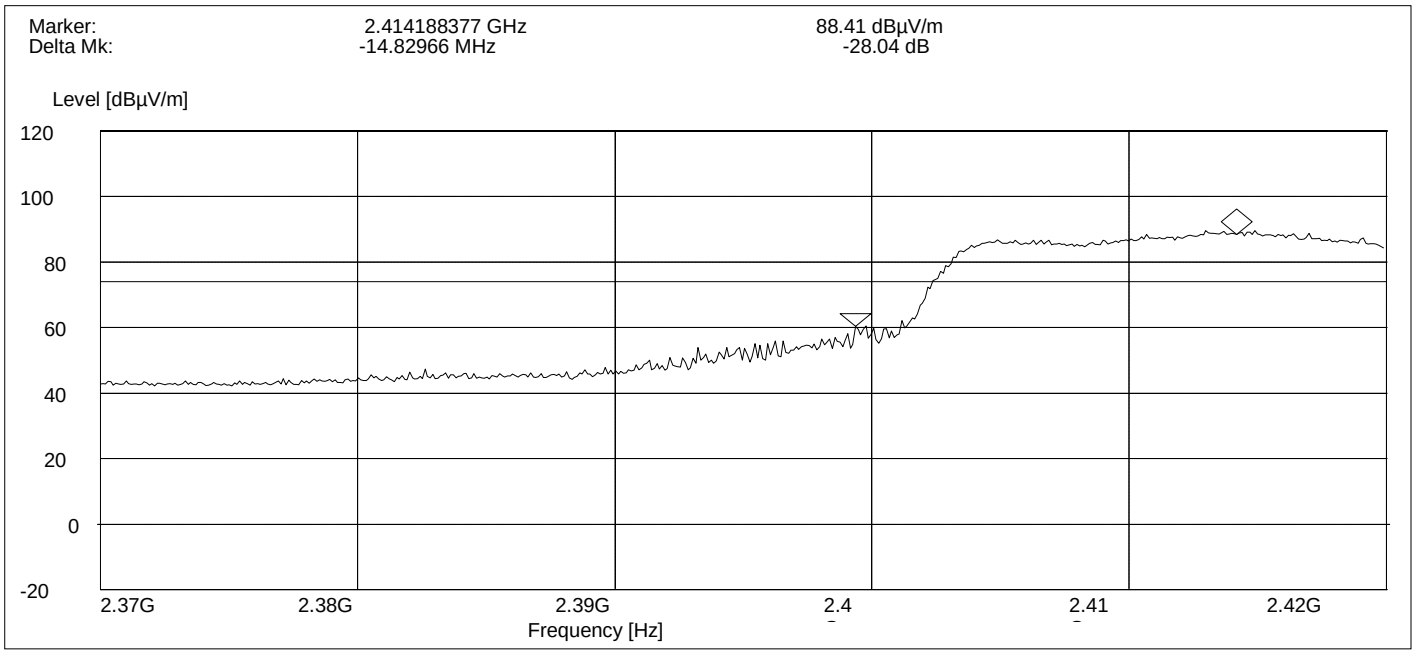


Test Mode: IEEE 802.11g TX Test CH1: 2412MHz

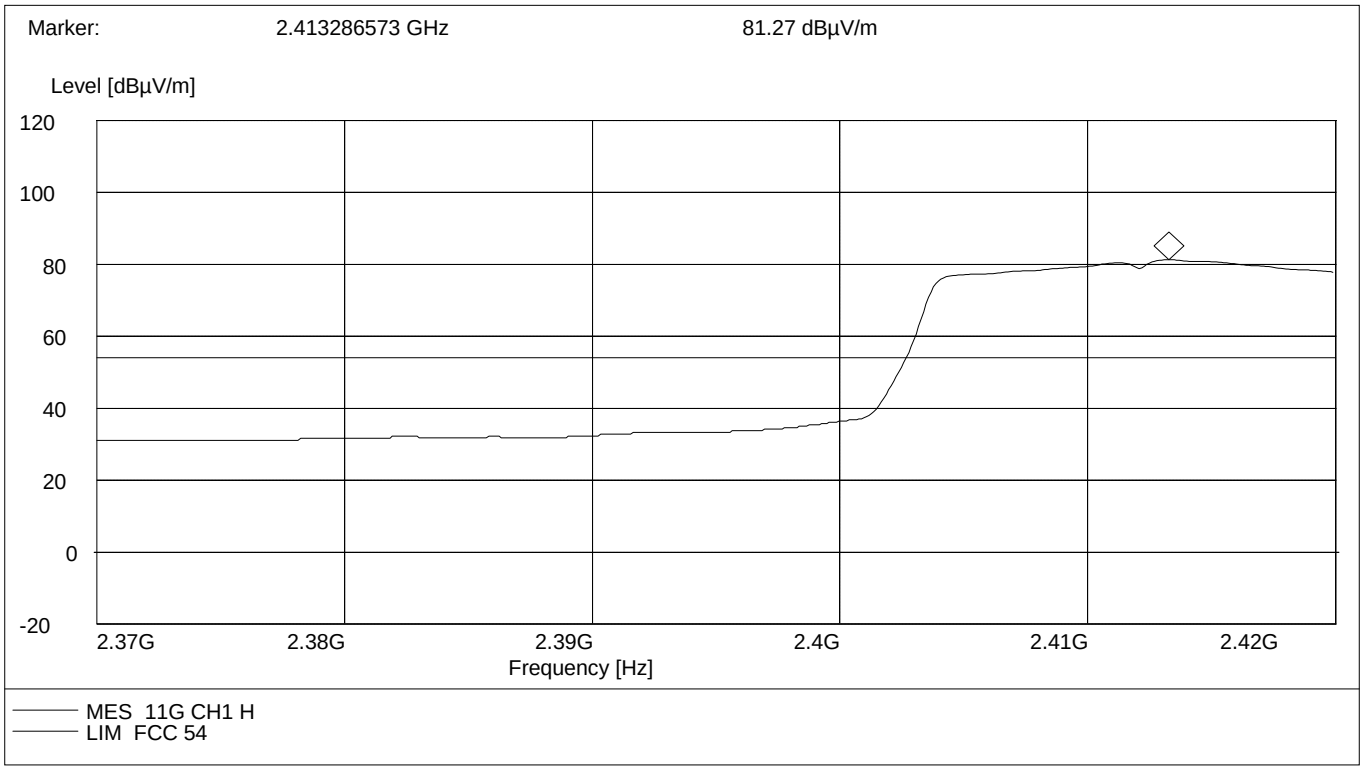
PK (Horizontal)



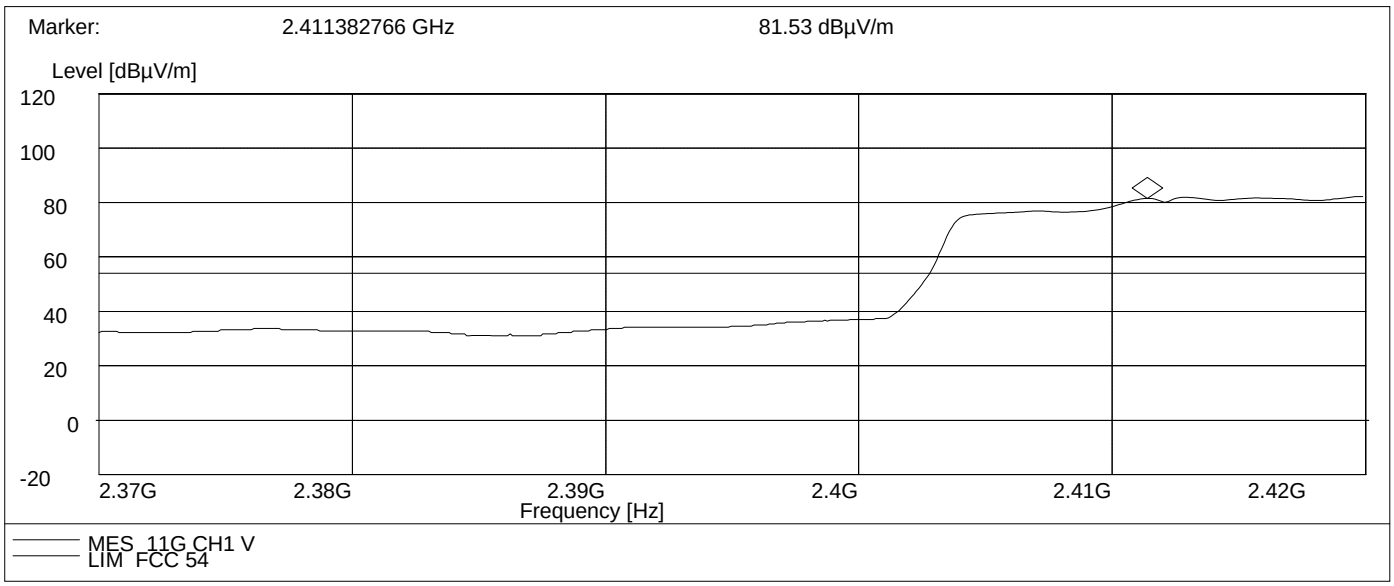
PK (Vertical)



AV (Horizontal)\

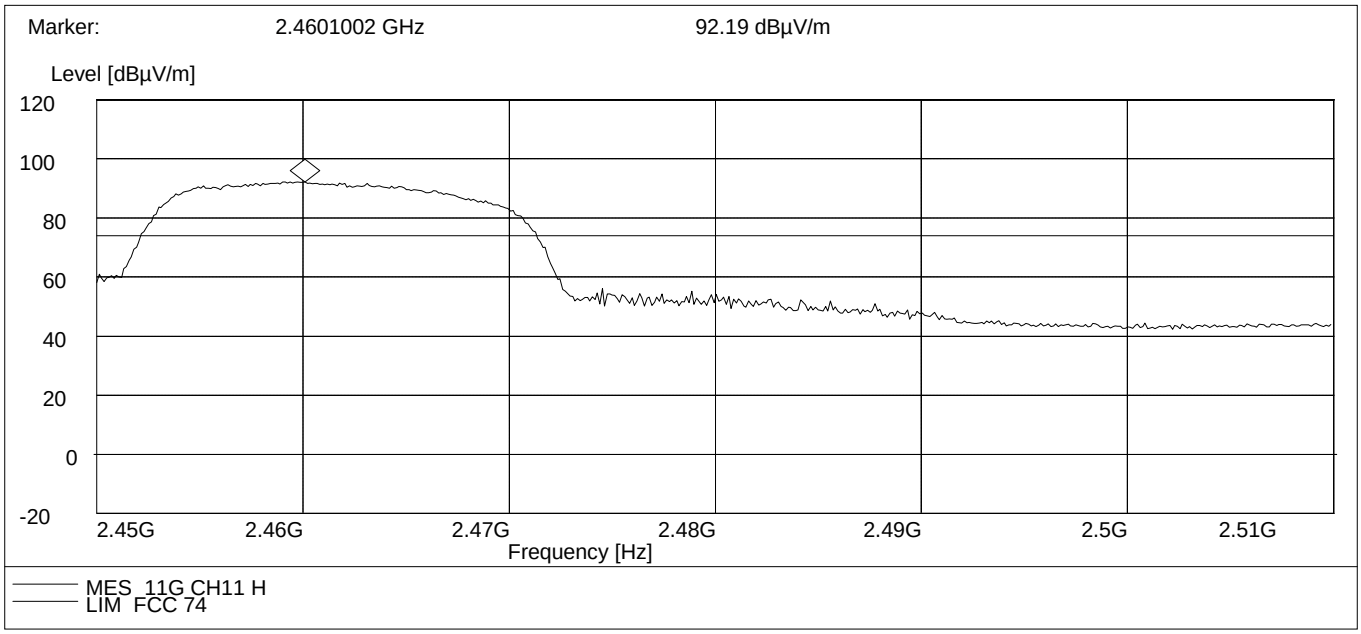


AV (Vertical)

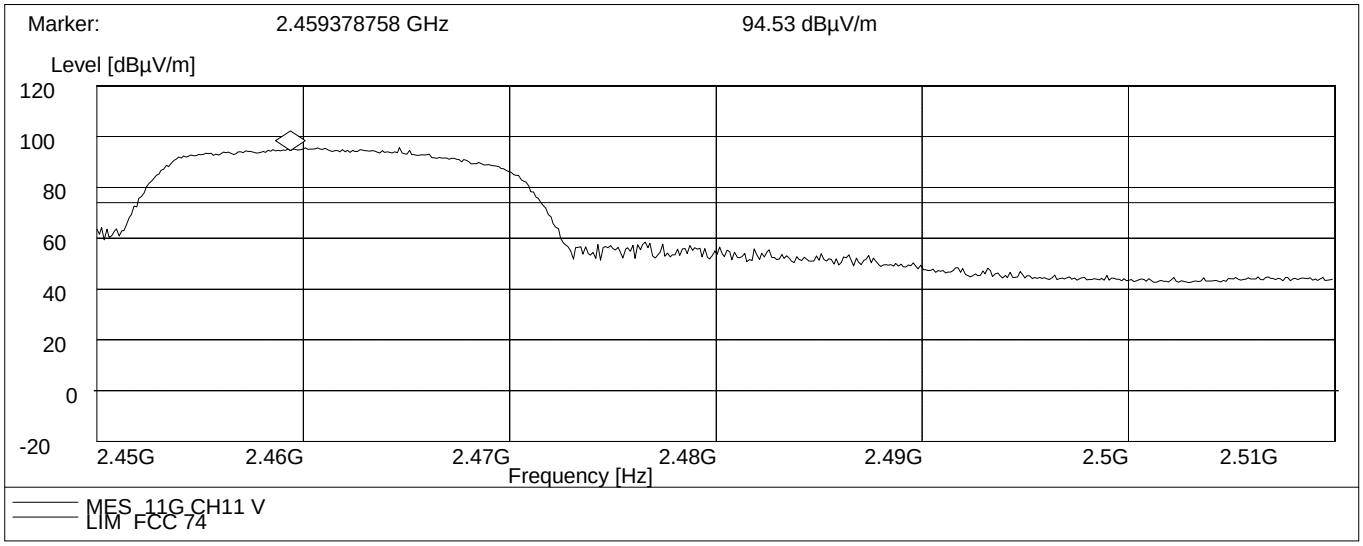


Test CH11: 2462MHz

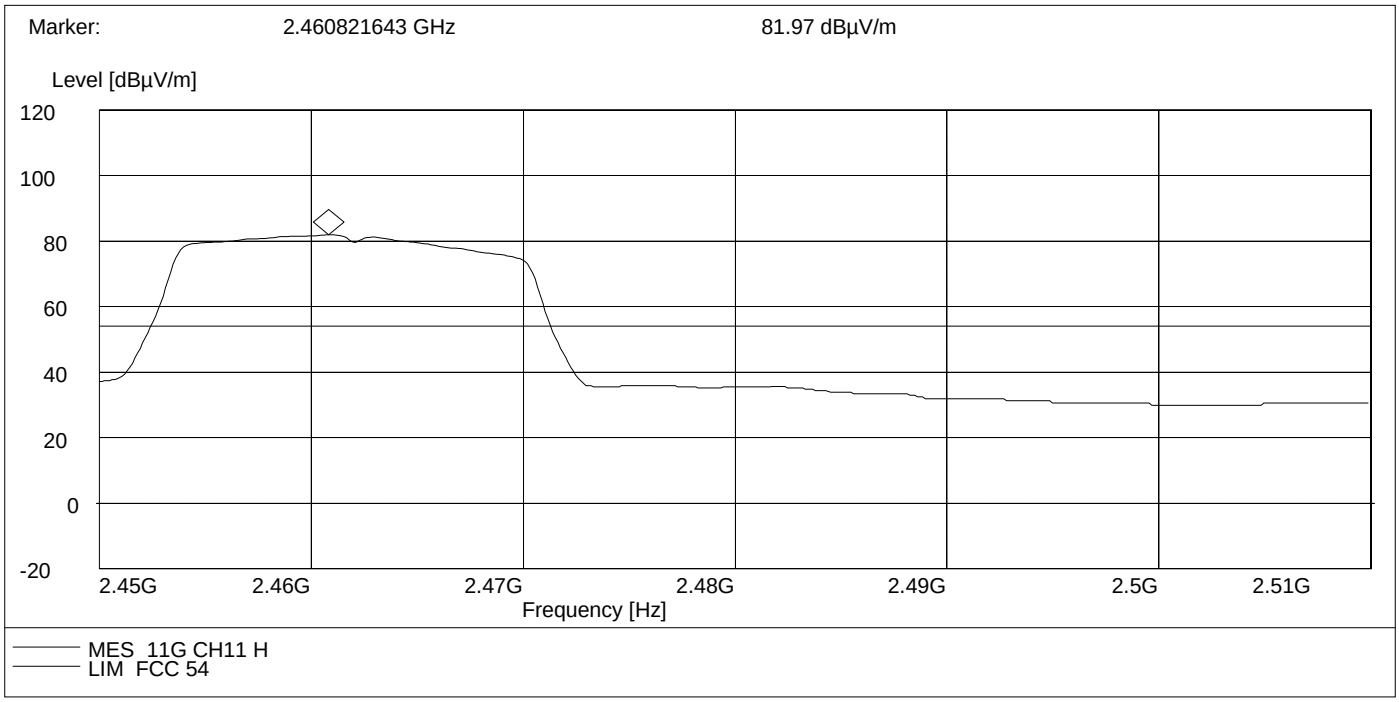
PK (Horizontal)



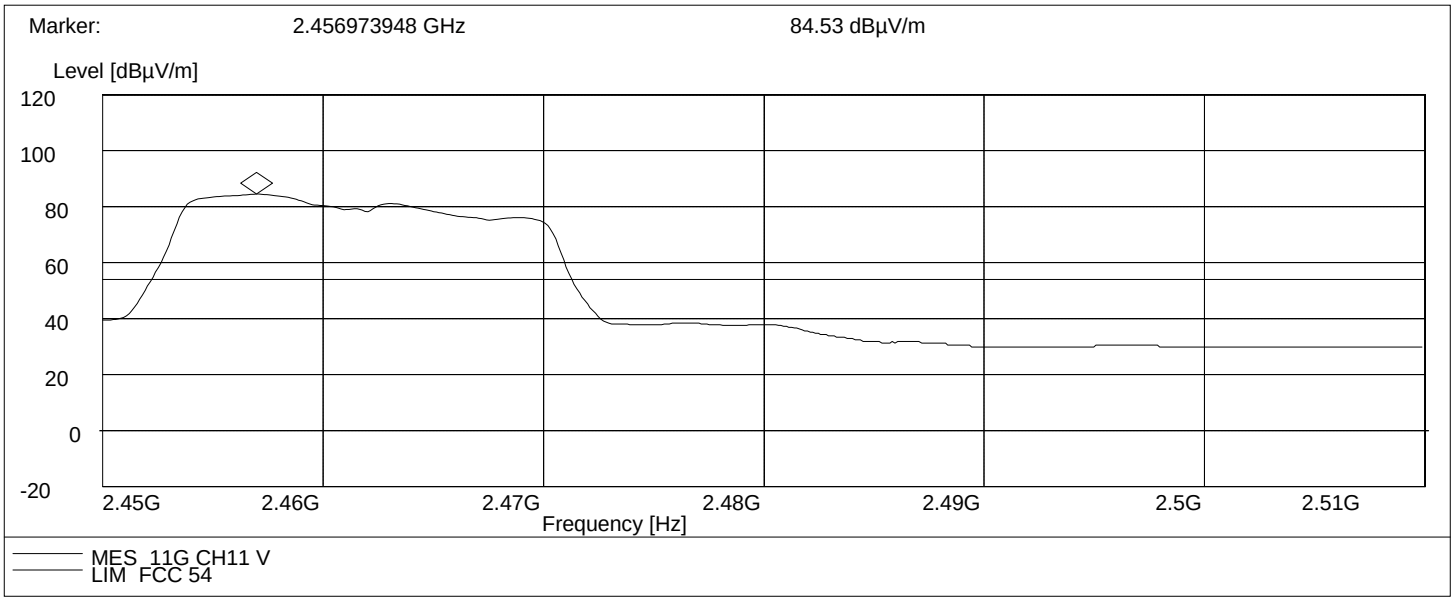
PK (Vertical)



AV (Horizontal)

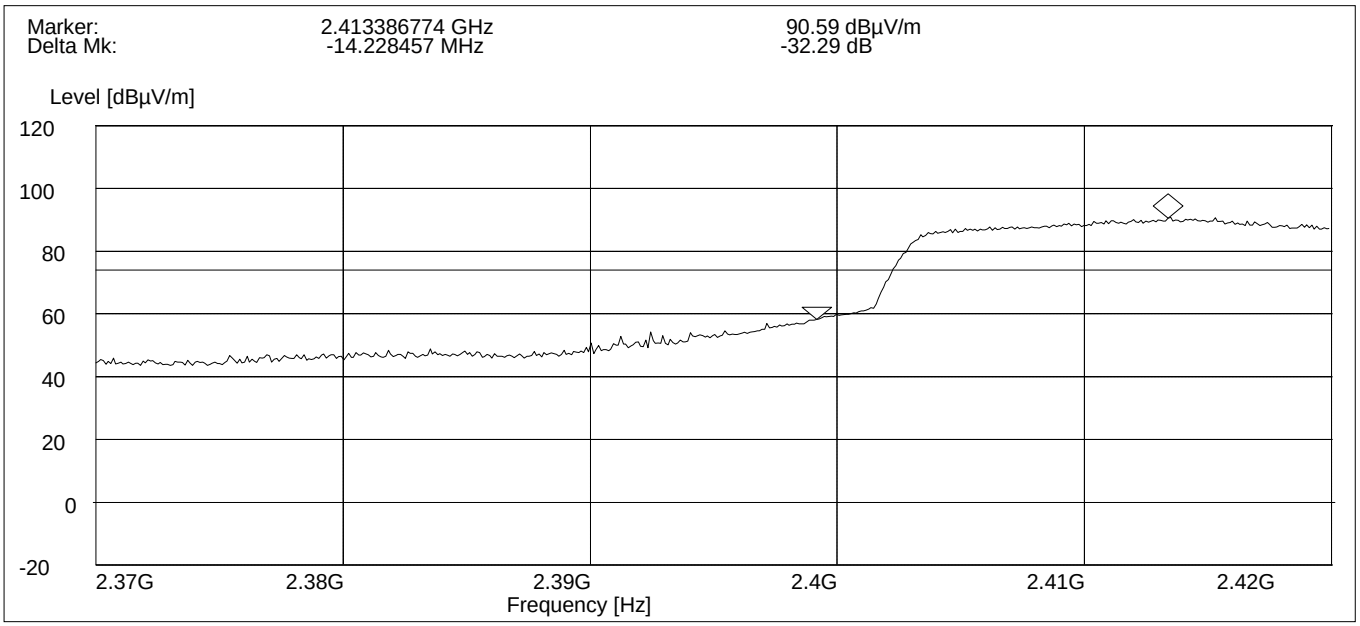


AV (Vertical)

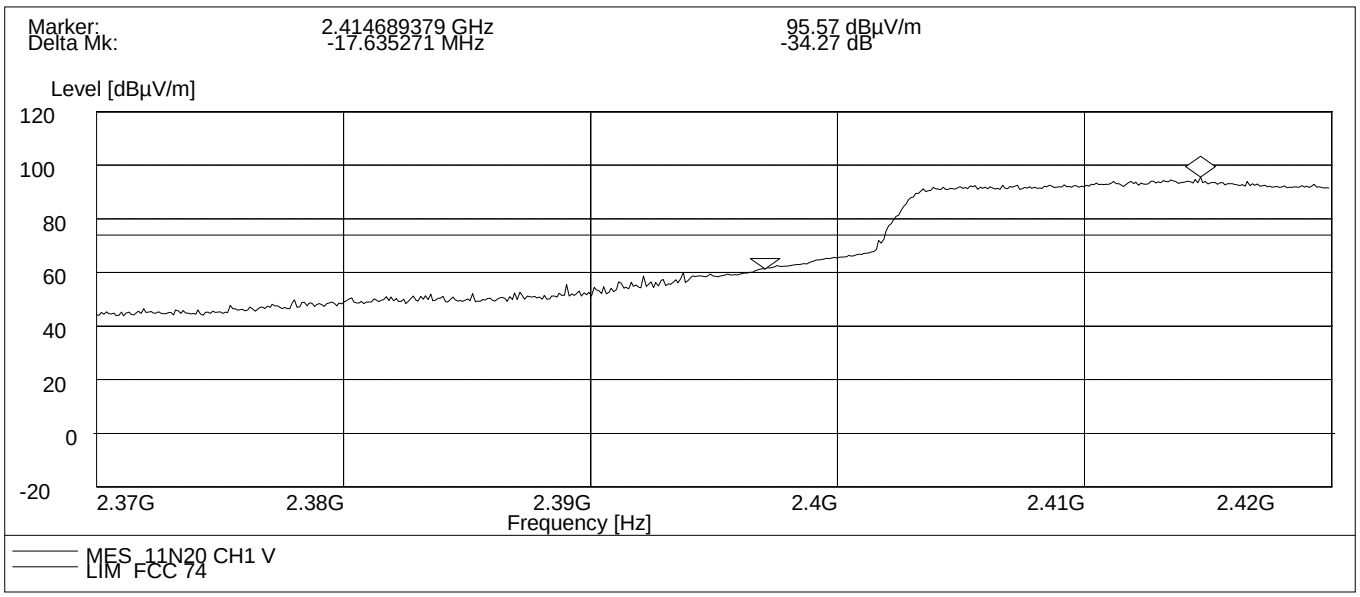


Test Mode: IEEE 802.11n HT20 TX Test CH1: 2412MHz

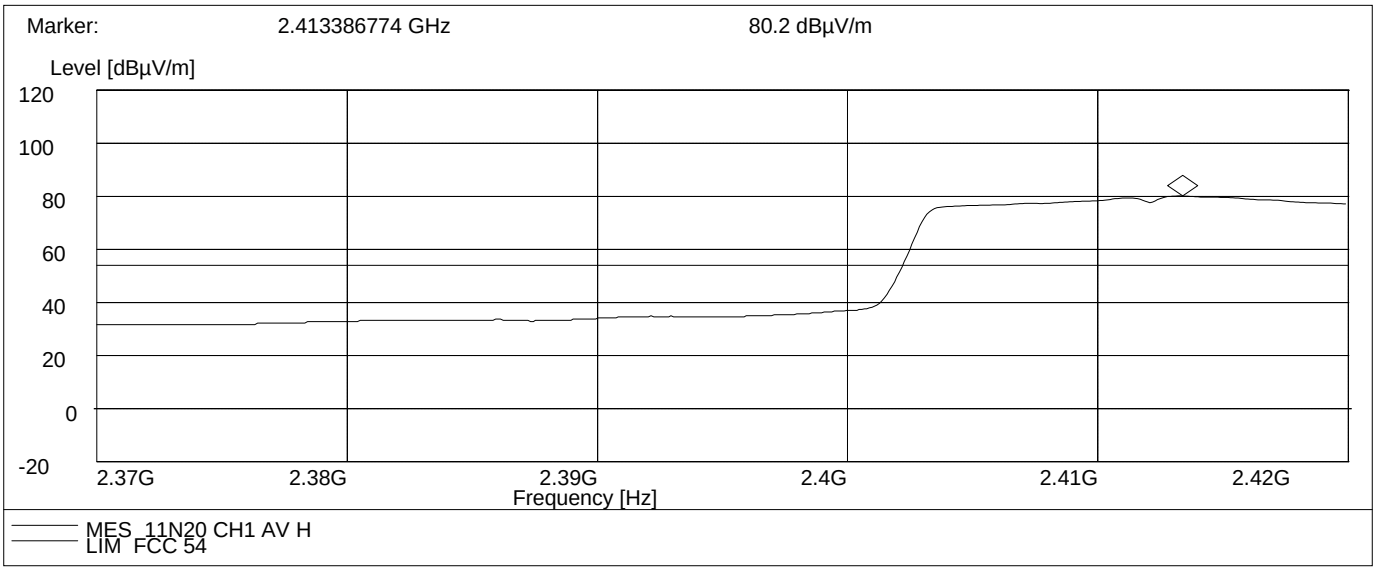
PK (Horizontal)



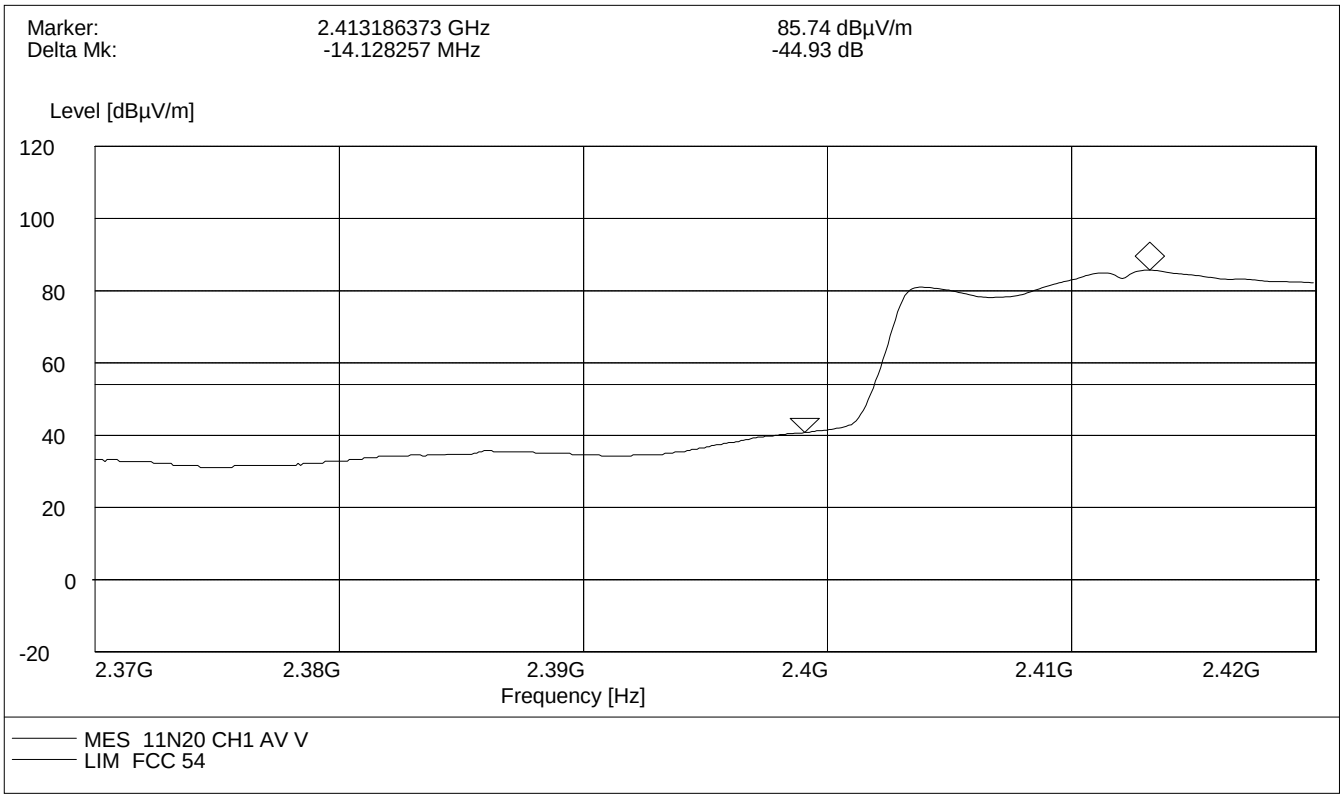
PK (Vertical)



AV (Horizontal)

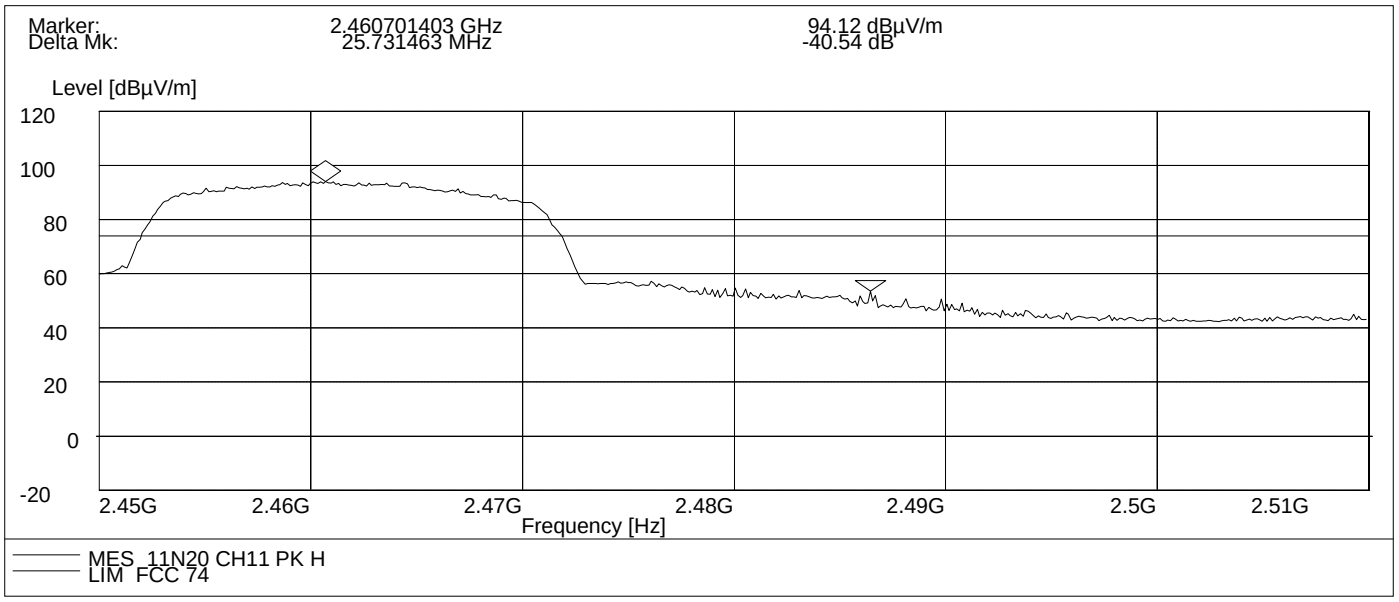


AV (Vertical)

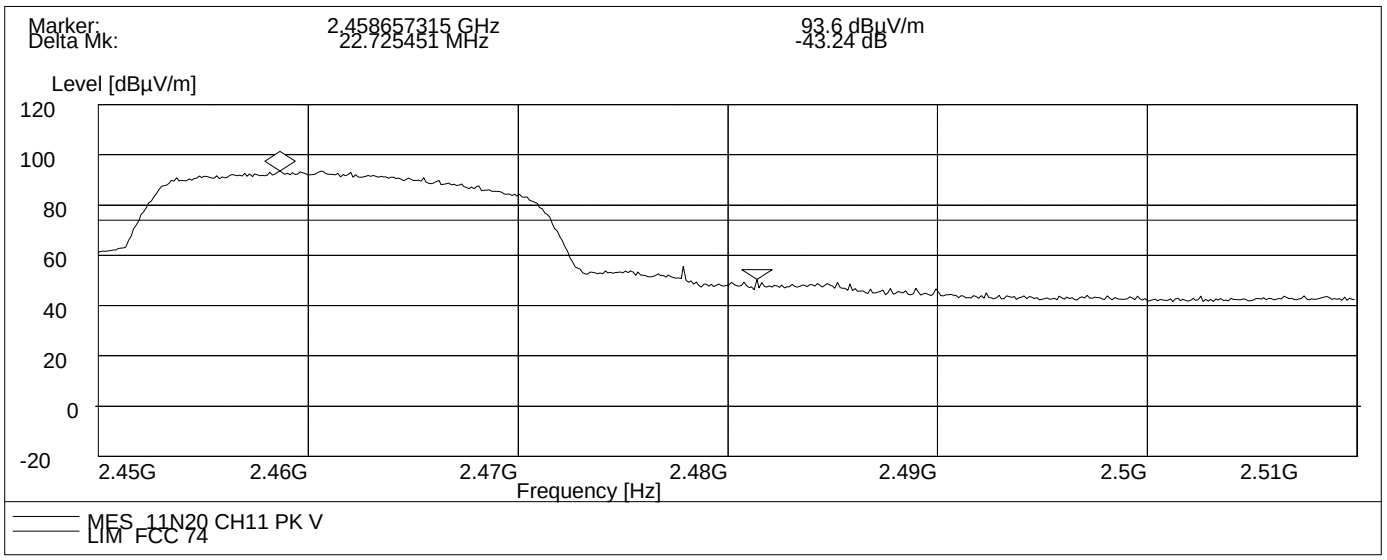


Test Mode: IEEE 802.11n HT20 TX Test CH11: 2462MHz

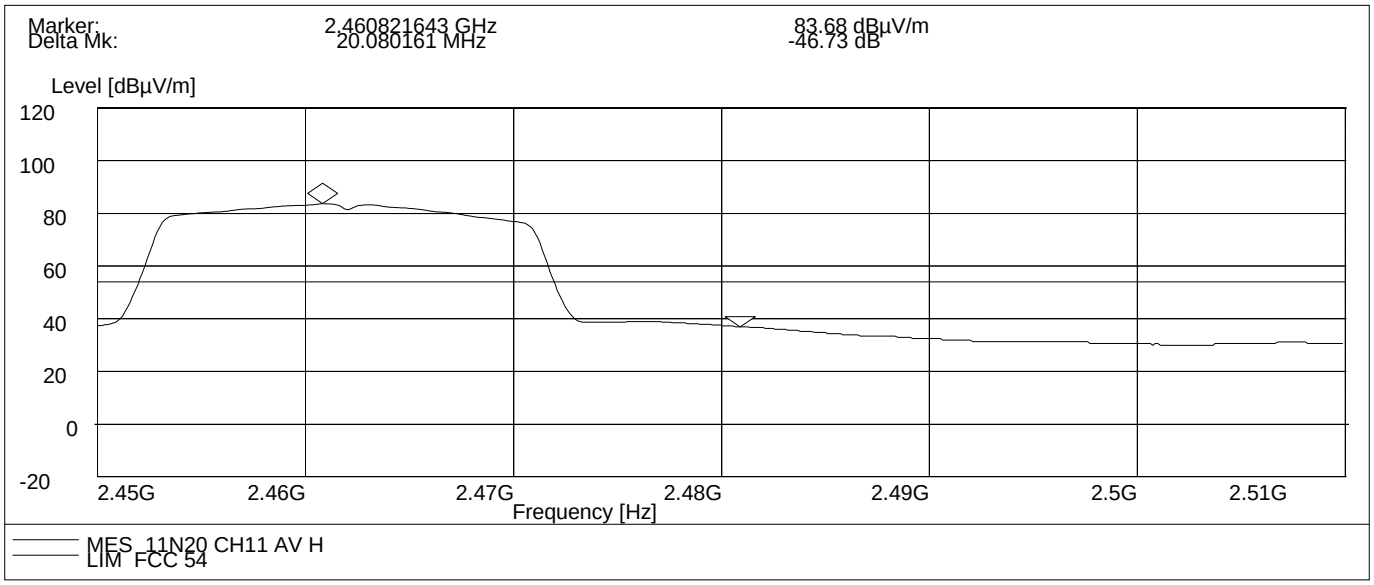
PK (Horizontal)



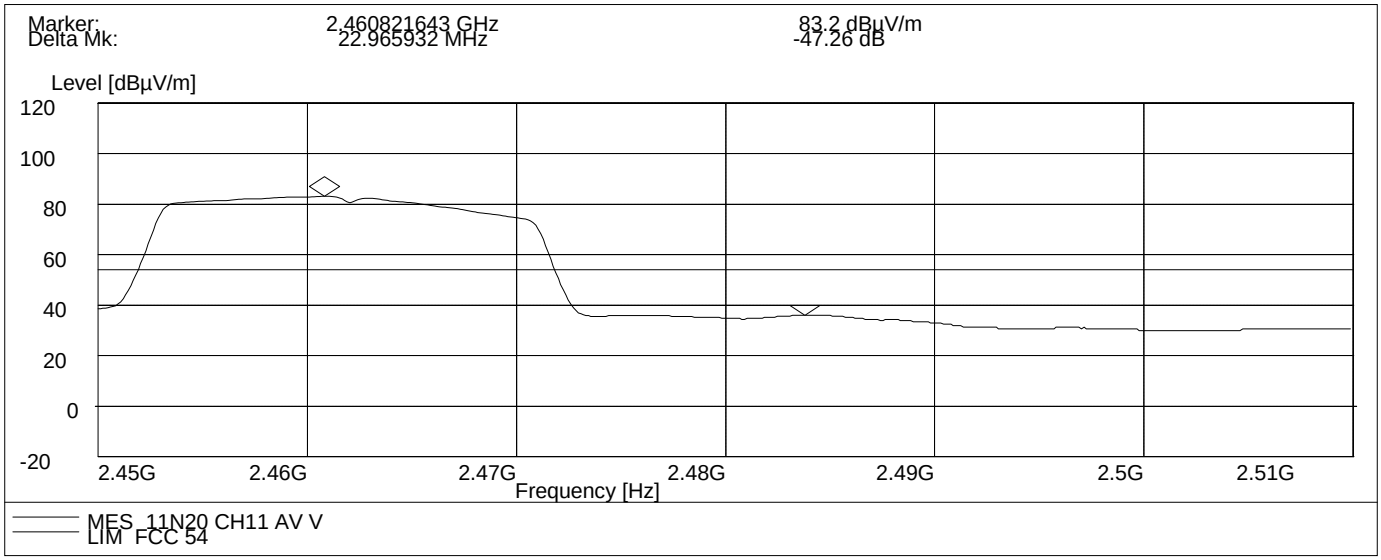
PK (Vertical)



AV (Horizontal)

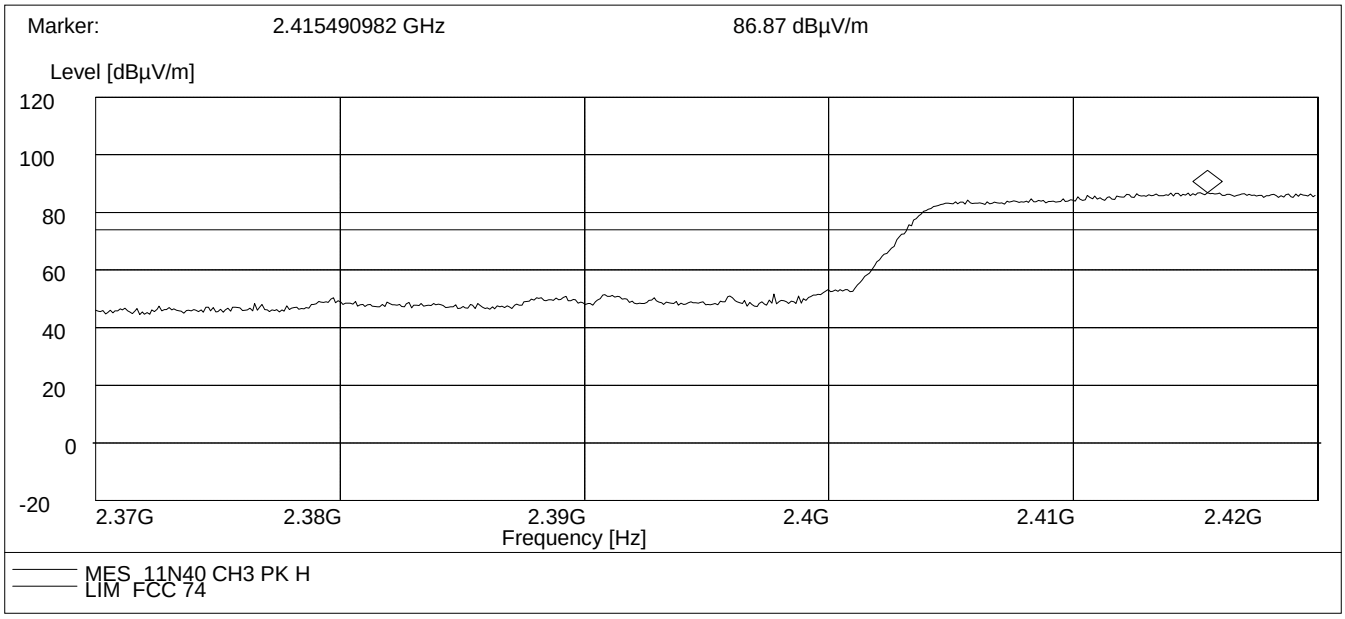


AV (Vertical)

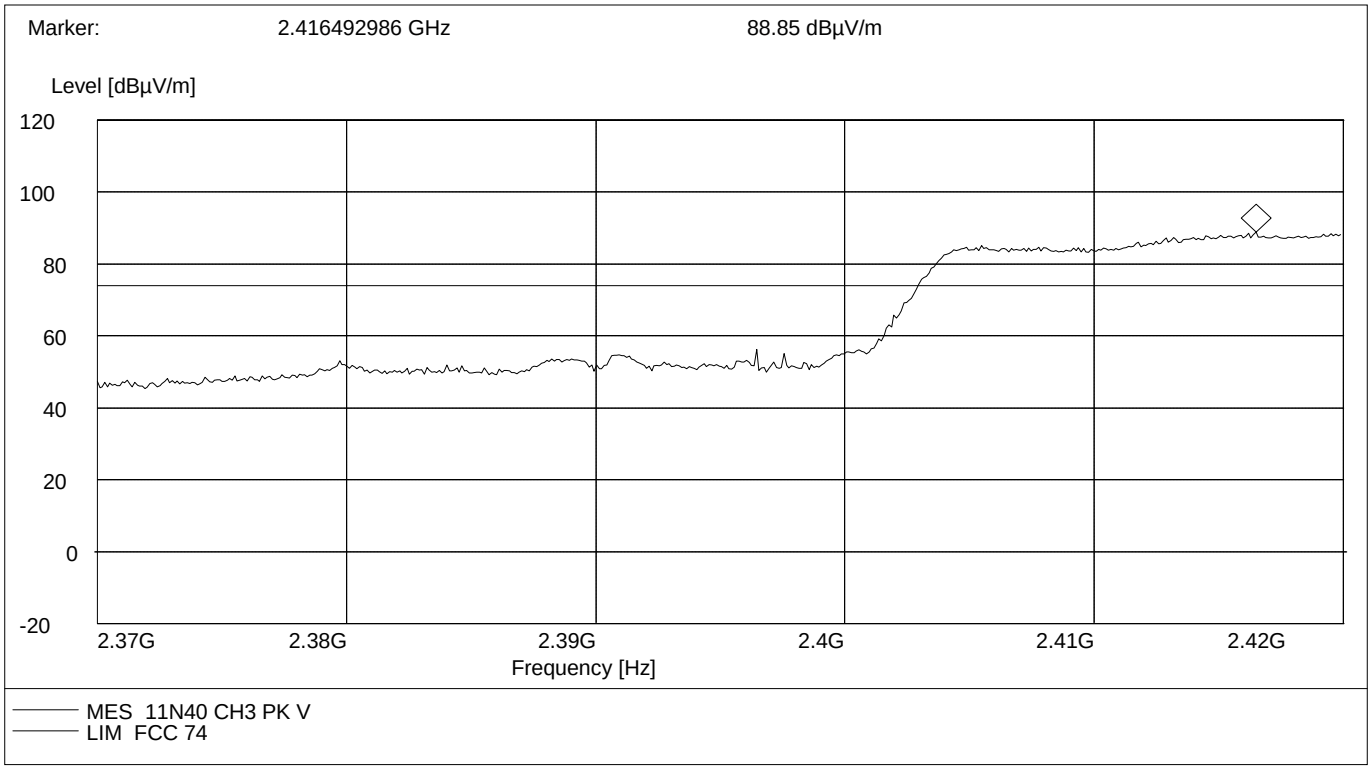


Test Mode: IEEE 802.11n HT40 TX Test CH3: 2422MHz

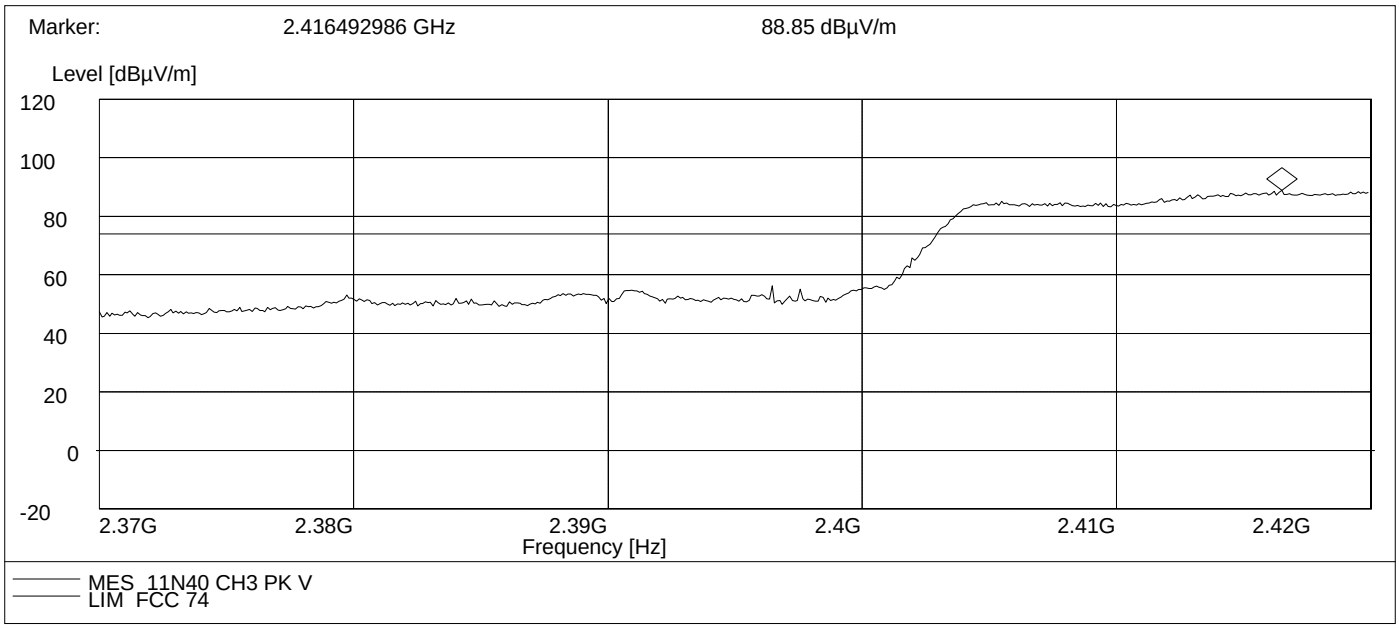
PK (Horizontal)



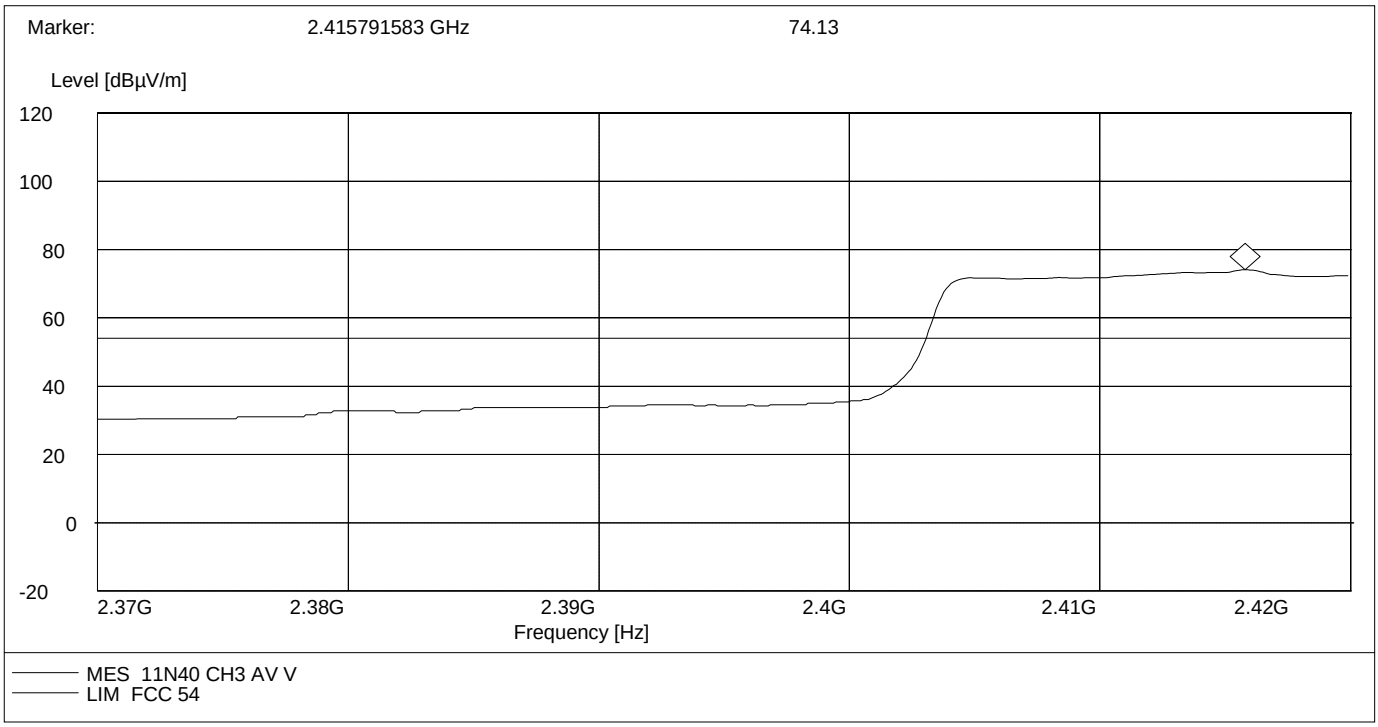
PK (Vertical)



AV (Horizontal)

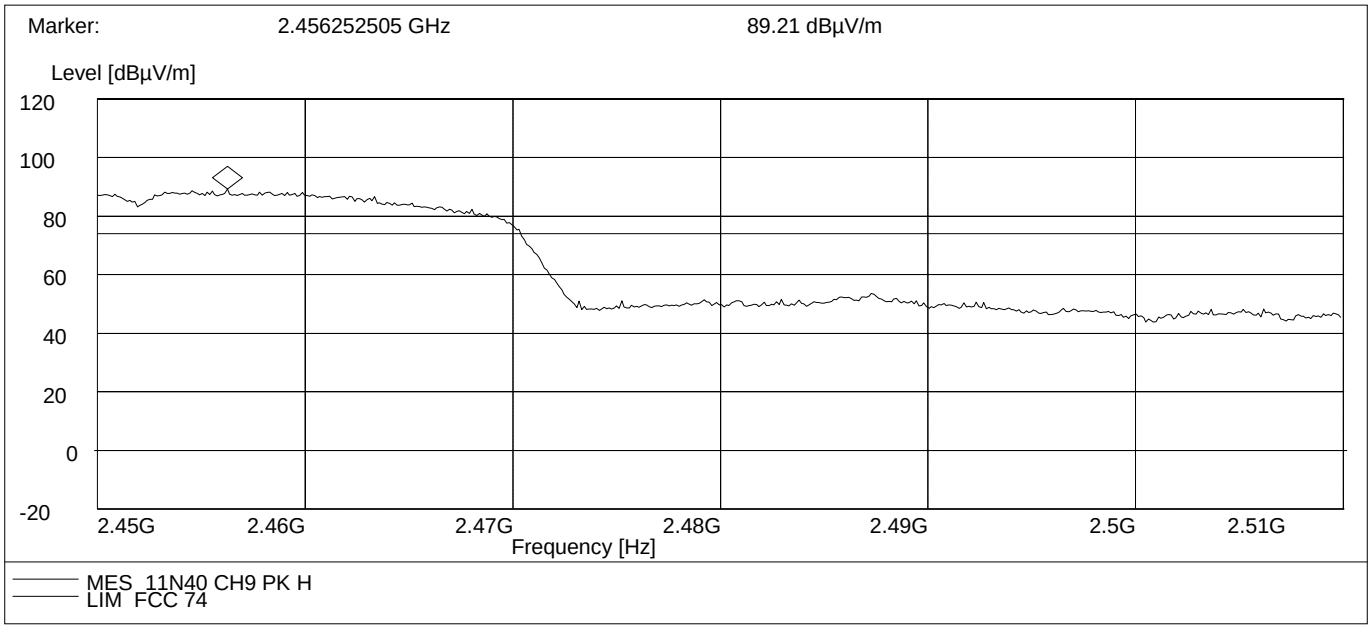


AV (Vertical)

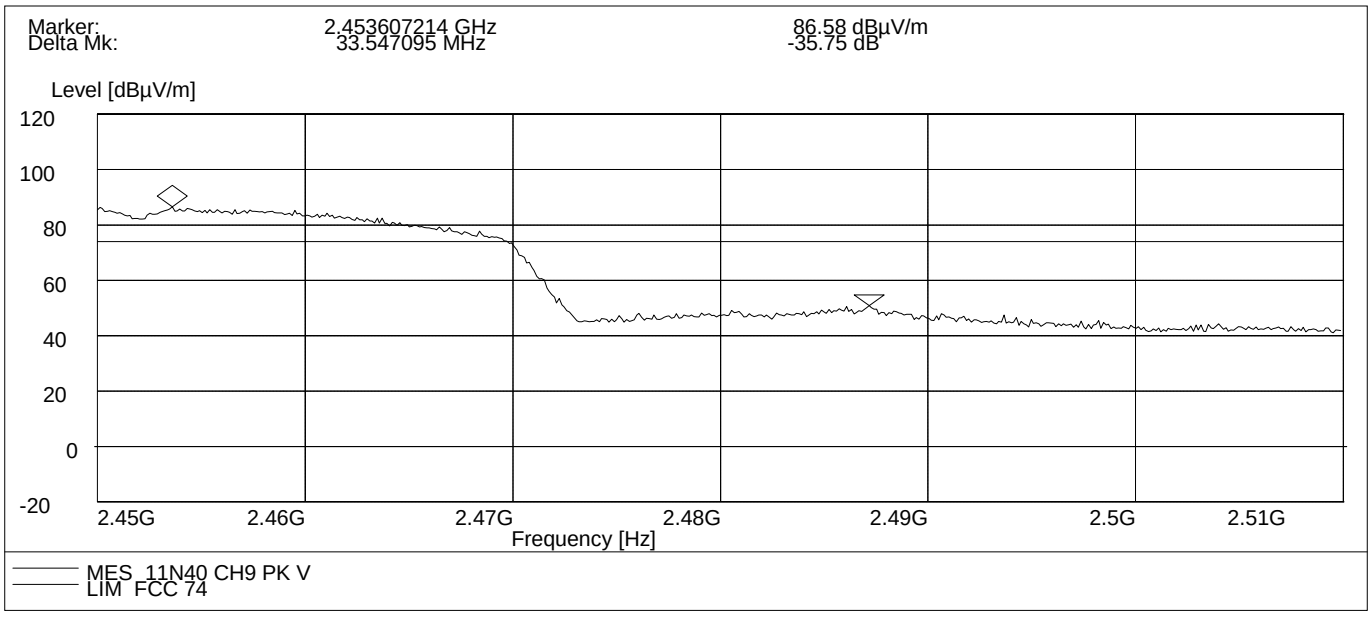


Test Mode: IEEE 802.11n HT40 TX Test CH9: 2452MHz

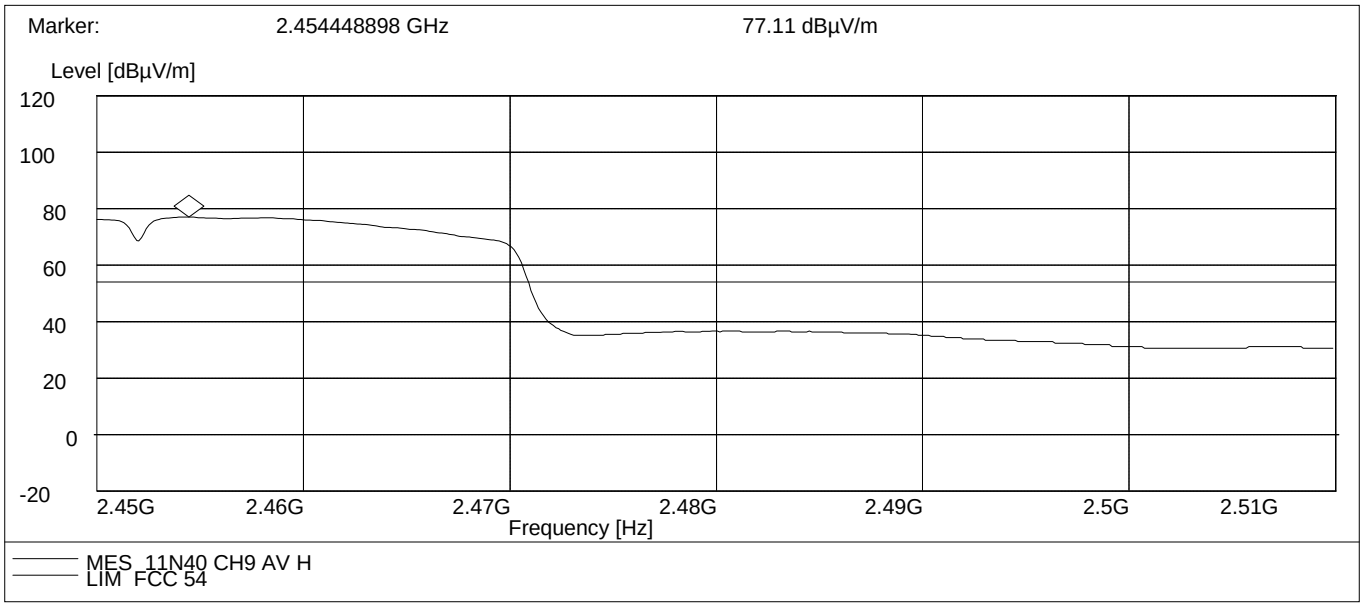
PK (Horizontal)



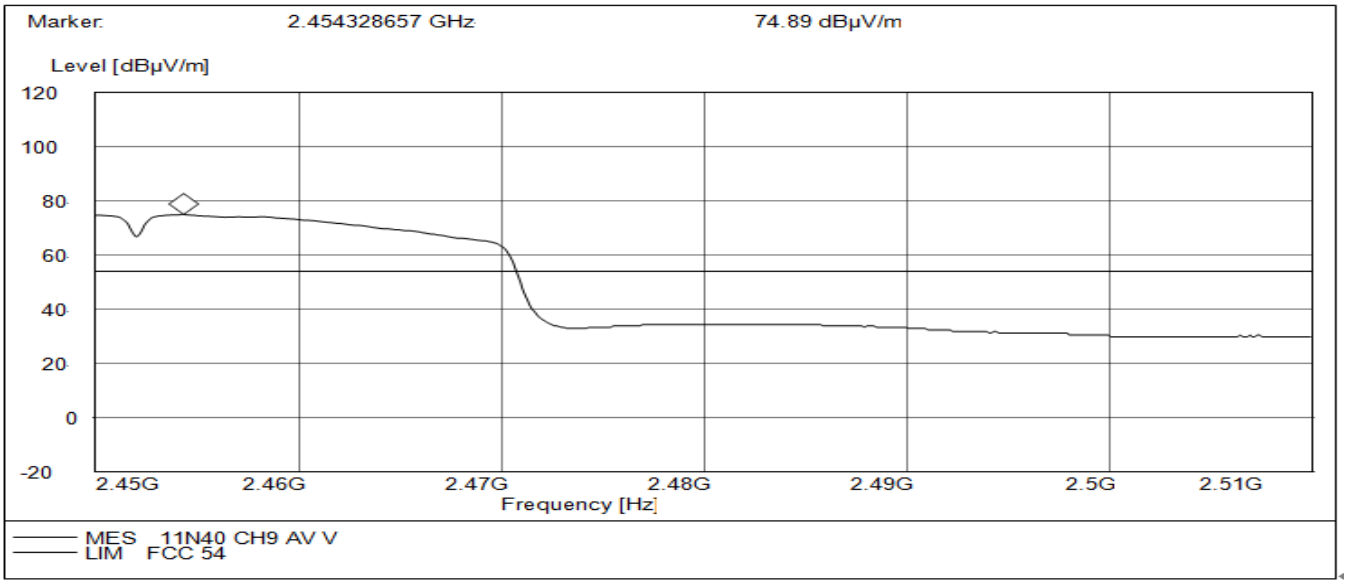
PK (Vertical)



AV (Horizontal)



AV (Vertical)



END Of TEST REPORT