



# **FCC TEST REPORT**

**FCC ID: 2AKU5ZG10**

On Behalf of

**Wuhan Guide Sensmart Tech Co., Ltd**

**Nighthunter**

**Model No.: C35**

Prepared for : Wuhan Guide Sensmart Tech Co., Ltd  
Address : 4#3th-6th floor, NO.6 Huanglong Hill South Road, East Lake  
Development Zone, Wuhan, China

Prepared By : Shenzhen Alpha Product Testing Co., Ltd.  
Address : Building i, No.2, Lixin Road, Fuyong Street, Bao'an District, 518103,  
Shenzhen, Guangdong, China

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# TEST REPORT DECLARATION

Applicant : Wuhan Guide Sensmart Tech Co., Ltd  
 Address : 4#3th-6th floor, NO.6 Huanglong Hill South Road, East Lake Development Zone, Wuhan, China  
 Manufacturer : Wuhan Guide Sensmart Tech Co., Ltd  
 Address : 4#3th-6th floor, NO.6 Huanglong Hill South Road, East Lake Development Zone, Wuhan, China  
 EUT Description : Nighthunter  
 (A) Model No. : C35  
 (B) Trademark : STEINER

Measurement Standard Used:

**FCC Rules and Regulations Part 15 Subpart C Section 15.247  
ANSI C63.10:2013**

The device described above is tested by Shenzhen Alpha Product Testing Co., Ltd. to determine the maximum emission levels emanating from the device. The maximum emission levels are compared to the FCC Part 15 Subpart C limits both conducted and radiated emissions. The test results are contained in this test report and Shenzhen Alpha Product Testing Co., Ltd. is assumed of full responsibility for the accuracy and completeness of these tests.

After the test, our opinion is that EUT compliance with the requirement of the above standards.

This report applies to above tested sample only. This report shall not be reproduced in parts without written approval of Shenzhen Alpha Product Testing Co., Ltd.

Tested by (name + signature).....: Lucas Pang  
Project Engineer

Approved by (name + signature).....: Simple Guan  
Project Manager

Date of issue.....: September 2, 2021



**Revision History**

Revision	Issue Date	Revisions	Revised By
V0	September 2, 2021	Initial released Issue	Lucas Pang

# 1. SUMMARY OF STANDARDS AND RESULTS

## 1.1. Description of Standards and Results

The EUT have been tested according to the applicable standards as referenced below:

Test Item	Standards Paragraph	Result
Conducted Emission	FCC Part 15: 15.207 ANSI C63.10 :2013	P
6dB Bandwidth	FCC PART 15:15.247(a)(2) ANSI C63.10 :2013	P
Output Power	FCC Part 15: 15.247(b)(3) ANSI C63.10 :2013	P
Radiated Spurious Emission	FCC Part 15: 15.209 FCC Part 15: 15.247(d) ANSI C63.10 :2013	P
Conducted Spurious & Band Edge Emission	FCC Part 15: 15.247(d) ANSI C63.10 :2013	P
Power Spectral Density	FCC PART 15:15.247(e) ANSI C63.10 :2013	P
Radiated Band Edge Emission	FCC Part 15: 15.247(d) ANSI C63.10 :2013	P
Antenna Requirement	FCC Part 15: 15.203	P
Note:	1. P is an abbreviation for Pass. 2. F is an abbreviation for Fail. 3. N/A is an abbreviation for Not Applicable.	

## 2. GENERAL INFORMATION

### 2.1. Description of Device (EUT)

Kind of Equipment	: Nighthunter
Model Number	: C35
Trademark	: STEINER
Test Voltage	: DC 3.6V by battery, DC 5V from USB
RF Technology	: 2.4G WIFI
Operation frequency	: 2412MHz-2462MHz for IEEE 802.11 b, g, n/HT20
Channel No.	: 802.11b/802.11g /802.11n(HT20): 11 IEEE 802.11b: DSSS(CCK,DQPSK,DBPSK)
Modulation type	: IEEE 802.11g: OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE 802.11n :OFDM(64QAM, 16QAM, QPSK, BPSK)
Antenna Type	: Internal antenna, Maximum Gain is 3dBi.
Software Version	: V1.1.41
Hardware version/FVIN	: V1.0
Length	: 180mm
Width	: 90mm
Height	: 60mm
Weight	: 0.75kg(No adapters included)

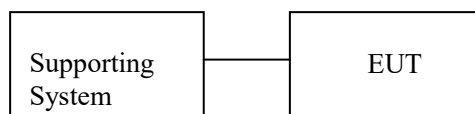
### 2.2. Accessories of Device (EUT)

N/A

### 2.3. Tested Supporting System Details

No.	Description	Manufacturer	Model	Serial Number	Certification or SDOC
1	Power adapter	DISHENGHUI ELECTRONICS	DBS151Q	N/A	N/A
2	Notebook	Thinkpad	E490	N/A	N/A

## 2.4. Block Diagram of connection between EUT and simulators



## 2.5. Test Mode Description

Duty cycle :100%Keeping TX			
Mode	data rate (Mbps)(see Note)	Channel	Frequency (MHz)
IEEE 802.11b	1	Low :CH1	2412
	1	Middle: CH6	2437
	1	High: CH11	2462
IEEE 802.11g	6	Low :CH1	2412
	6	Middle: CH6	2437
	6	High: CH11	2462
IEEE 802.11n/HT20	6.5	Low :CH1	2412
	6.5	Middle: CH6	2437
	6.5	High: CH11	2462
IEEE 802.11n/HT40	13	Low :CH3	/
	13	Middle: CH6	/
	13	High: CH9	/

Note: According exploratory test, EUT will have maximum output power in those data rate. So those data rate were used for all test.

### Software (Used for test) from client

Mode	Special software is used. The software provided by client to enable the EUT under transmission condition continuously at specific channel frequencies individually.
Power level setup in software	
Test Software Name	IPO 4.1
Test Software Version	V4.1
Soft Set	TX level is set as defaults value.

### Channel list:

For IEEE 802.11b, g, n/HT20					
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
CH1	2412	CH5	2432	CH9	2452
CH2	2417	CH6	2437	CH10	2457
CH3	2422	CH7	2442	CH11	2462
CH4	2427	CH8	2447		



## 2.6. Test Conditions

Items	Required	Actual
Temperature range:	15-35°C	24°C
Humidity range:	25-75%	56%
Pressure range:	86-106kPa	98kPa

## 2.7. Test Facility

Shenzhen Alpha Product Testing Co., Ltd  
Building i, No.2, Lixin Road, Fuyong Street, Bao'an District, 518103,  
Shenzhen, Guangdong, China

June 21, 2018 File on Federal Communication Commission  
Registration Number: 293961  
Designation Number: CN1236

July15, 2019 Certificated by IC  
Registration Number: CN0085

## 2.8.Measurement Uncertainty

(95% confidence levels, k=2)

Item	Uncertainty
Uncertainty for Power point Conducted Emissions Test	2.74dB
Uncertainty for Radiation Emission test in 3m chamber (below 30MHz)	2.13 dB(Polarize: V)
	2.57dB(Polarize: H)
Uncertainty for Radiation Emission test in 3m chamber (30MHz to 1GHz)	3.77dB(Polarize: V)
	3.80dB(Polarize: H)
Uncertainty for Radiation Emission test in 3m chamber (1GHz to 25GHz)	4.16dB(Polarize: H)
	4.13dB(Polarize: V)
Uncertainty for radio frequency	$5.4 \times 10^{-8}$
Uncertainty for conducted RF Power	0.37dB
Uncertainty for temperature	0.2°C
Uncertainty for humidity	1%
Uncertainty for DC and low frequency voltages	0.06%

## 2.9. Test Equipment List

Equipment	Manufacture	Model No.	Serial No.	Last cal.	Cal Interval
9*6*6 anechoic chamber	CHENYU	9*6*6	N/A	2019.09.06	3Year
Spectrum analyzer	ROHDE&SCHWARZ	FSV40-N	102137	2020.09.02	1Year
Spectrum analyzer	Agilent	N9020A	MY499100060	2020.09.02	1Year
Receiver	ROHDE&SCHWARZ	ESR	1316.3003K03-10208 2-Wa	2020.09.02	1Year
Receiver	R&S	ESCI	101165	2020.09.02	1Year
Bilog Antenna	Schwarzbeck	VULB 9168	VULB9168-438	2020.04.12	2Year
Horn Antenna	SCHWARZBECK	BBHA 9120 D	BBHA 9120 D(1201)	2020.04.12	2Year
Active Loop Antenna	SCHWARZBECK	FMZB 1519B	00059	2019.09.07	2Year
Cable	Resenberger	N/A	No.1	2020.09.02	1Year
Cable	Resenberger	N/A	No.2	2020.09.02	1Year
Cable	Resenberger	N/A	No.3	2020.09.02	1Year
Pre-amplifier	HP	HP8347A	2834A00455	2020.09.02	1Year
Pre-amplifier	Agilent	8449B	3008A02664	2020.09.02	1Year
L.I.S.N.#1	Schwarzbeck	NSLK8126	8126466	2020.09.02	1Year
L.I.S.N.#2	ROHDE&SCHWARZ	ENV216	101043	2020.09.02	1 Year
20db Attenuator	ICPROBING	IATS1	82347	2020.09.02	1 Year
Horn Antenna	SCHWARZBECK	BBHA9170	00946	2019.09.07	2 Year
Preamplifier	SKET	LNPA_1840-50	SK2018101801	2020.09.02	1 Year
Power Meter	Agilent	E9300A	MY41496625	2020.09.02	1 Year
Temp. & Humid. Chamber	Weihuang	WHTH-1000-40-8 80	100631	2020.09.02	1 Year
Switching Mode Power Supply	JUNKE	JK12010S	20140927-6	2020.09.02	1 Year

### 3. SPURIOUS EMISSION

#### 3.1. Test Limits

All the emissions appearing within 15.205 restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions shall be at least 20dB below the fundamental emissions, or comply with 15.209 limits.

##### 15.205 Restricted frequency band

MHz	MHz	MHz	GHz
0.090 - 0.110	16.42 - 16.423	399.9 - 410	4.5 - 5.15
<sup>1</sup> 0.495 - 0.505	16.69475 - 16.69525	608 - 614	5.35 - 5.46
2.1735 - 2.1905	16.80425 - 16.80475	960 - 1240	7.25 - 7.75
4.125 - 4.128	25.5 - 25.67	1300 - 1427	8.025 - 8.5
4.17725 - 4.17775	37.5 - 38.25	1435 - 1626.5	9.0 - 9.2
4.20725 - 4.20775	73 - 74.6	1645.5 - 1646.5	9.3 - 9.5
6.215 - 6.218	74.8 - 75.2	1660 - 1710	10.6 - 12.7
6.26775 - 6.26825	108 - 121.94	1718.8 - 1722.2	13.25 - 13.4
6.31175 - 6.31225	123 - 138	2200 - 2300	14.47 - 14.5
8.291 - 8.294	149.9 - 150.05	2310 - 2390	15.35 - 16.2
8.362 - 8.366	156.52475 - 156.52525	2483.5 - 2500	17.7 - 21.4
8.37625 - 8.38675	156.7 - 156.9	2690 - 2900	22.01 - 23.12
8.41425 - 8.41475	162.0125 - 167.17	3260 - 3267	23.6 - 24.0
12.29 - 12.293	167.72 - 173.2	3332 - 3339	31.2 - 31.8
12.51975 - 12.52025	240 - 285	3345.8 - 3358	36.43 - 36.5
12.57675 - 12.57725	322 - 335.4	3600 - 4400	( <sup>2</sup> )

##### 15.209 Limit

FREQUENCY MHz	DISTANCE Meters	FIELD STRENGTHS LIMIT	
		$\mu\text{V}/\text{m}$	$\text{dB}(\mu\text{V})/\text{m}$
0.009-0.490	300	2400/F(KHz)	/
0.490-1.705	30	24000/F(KHz)	/
1.705-30	30	30	29.5
30~88	3	100	40.0
88~216	3	150	43.5
216~960	3	200	46.0
960~1000	3	500	54.0
Above 1000	3	74.0 $\text{dB}(\mu\text{V})/\text{m}$ (Peak) 54.0 $\text{dB}(\mu\text{V})/\text{m}$ (Average)	

Note 1: The peak limit is 20 dB higher than the average limit

Note 2: Peak limit applies (AVG limit + 20 dB) as well as RSS-247 Section 5.5

Harmonic emissions limits comply with below 54 dBuV/m at 3m. Other emissions radiated outside of the specified frequency bands, except for harmonics, shall be attenuated by at least 50 dB below the level of the fundamental or comply with the radiated emissions limits specified in section 15.209(a) limit in the table below has to be followed.

### 3.2. Test Procedure

The measuring distance of 3m shall be used for measurements at frequency up to 1GHz and above 1GHz. The EUT was placed on a rotating 0.8 m high above ground for below 1GHz and 1.5m high for above 1GHz testing, the table was rotated 360 degrees to determine the position of the highest radiation

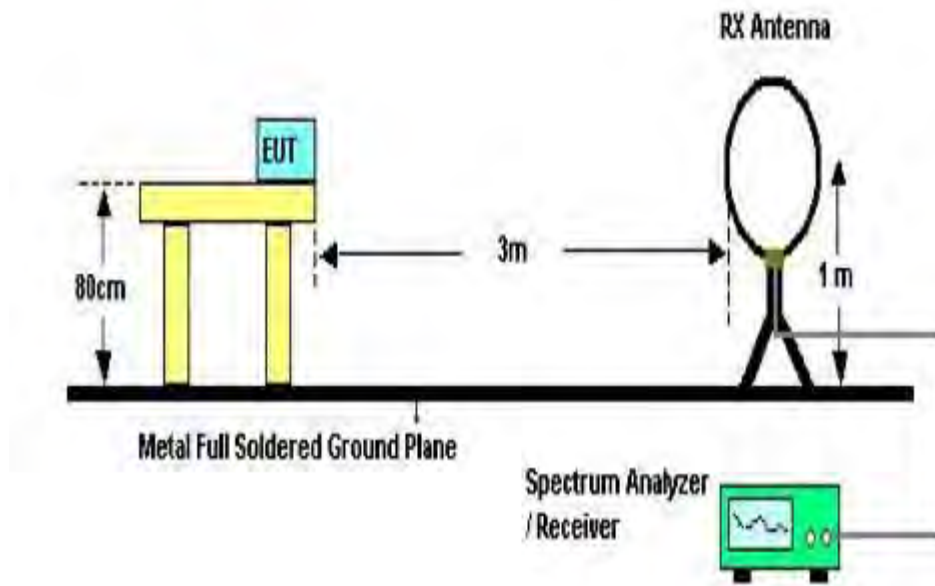
The Test antenna shall vary between 1m and 4m, both Horizontal and Vertical antenna are set of make measurement.

The initial step in collecting radiated emission data is a spectrum analyzer Peak detector mode pre-scanning the measurement frequency range. Significant Peaks are then marked. and then Quasi Peak Detector mode premeasured

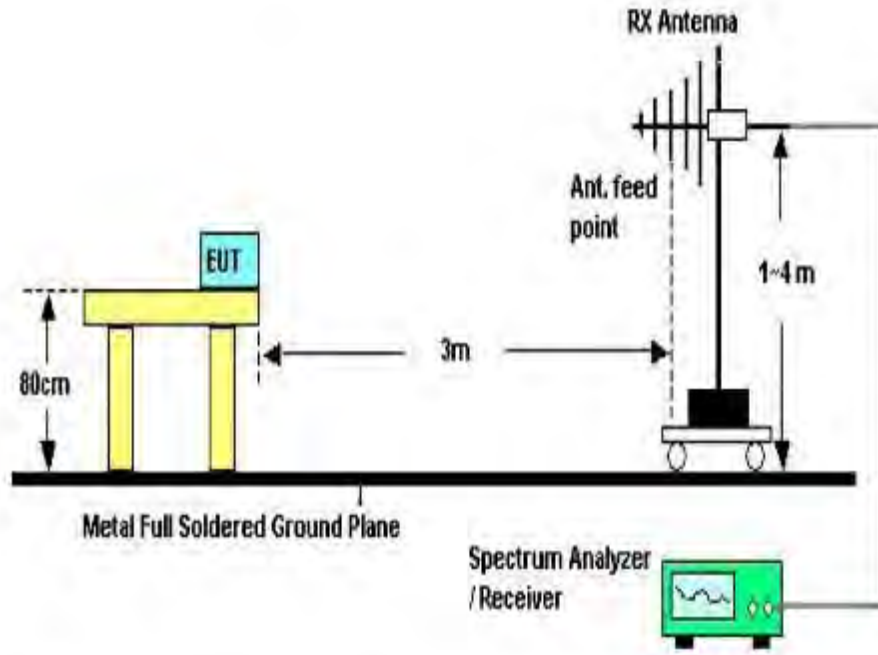
If Peak value comply with QP limit below 1GHz, the EUT deemed to comply with QP limit. But the Peak value and average value both need to comply with applicable limit above 1GHz.

For the actual test configuration, please see the test setup photo.

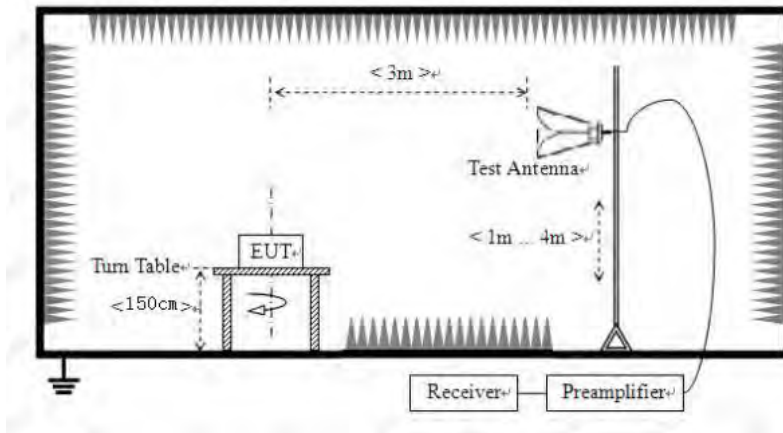
### 3.3. Test Setup



Below 30MHz Test Setup



30MHz-1GHz Test Setup



Above 1GHz Test Setup

### 3.4. Test Results

Test Condition

Continual Transmitting in maximum power.

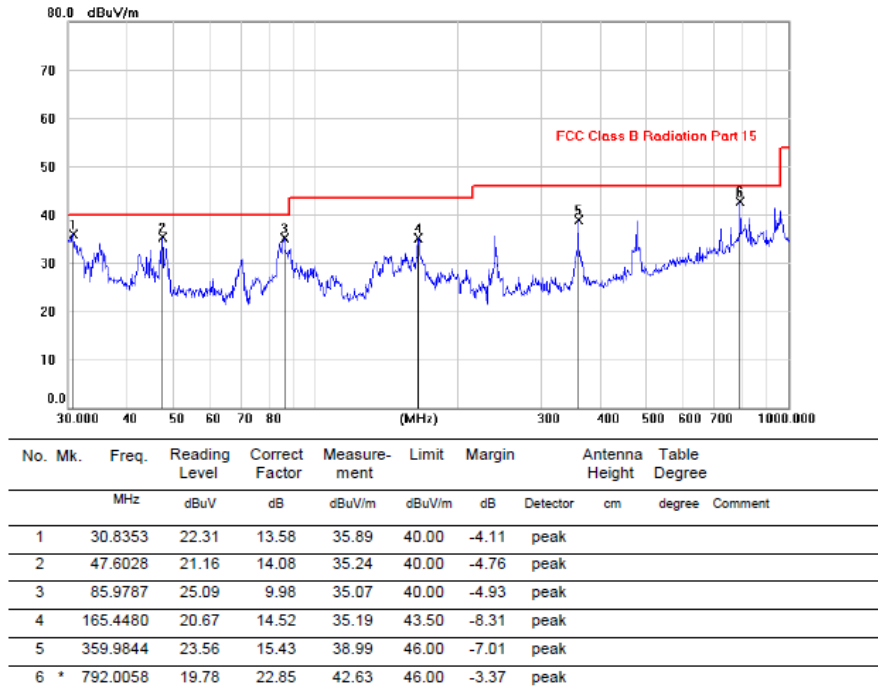
9kHz~150kHz	RBW200Hz	VBW1kHz
150kHz~30MHz	RBW9kHz	VBW 30kHz
30MHz~1GHz	RBW120kHz	VBW 300kHz
Above1GHz	RBW1MHz	VBW 3MHz

Detailed information please see the following page.

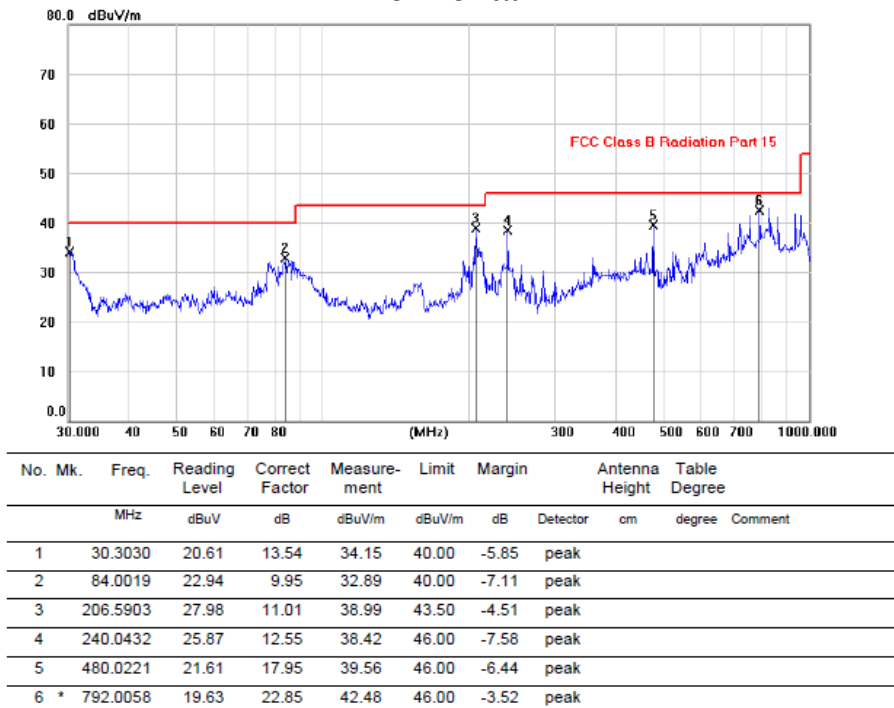
Note:

1. Testing was carried out within frequency range 9 kHz to the tenth harmonics. The measurement results below 30MHz and above 18GHz were greater than 20dB below the limit, so only the radiated spurious emissions from 30MHz to 18GHz were reported
2. Only show the test data of the worst Channel in this report.

Test Mode: IEEE 802.11b TX Low channel  
30-1000MHz  
**Vertical**



**Horizontal**

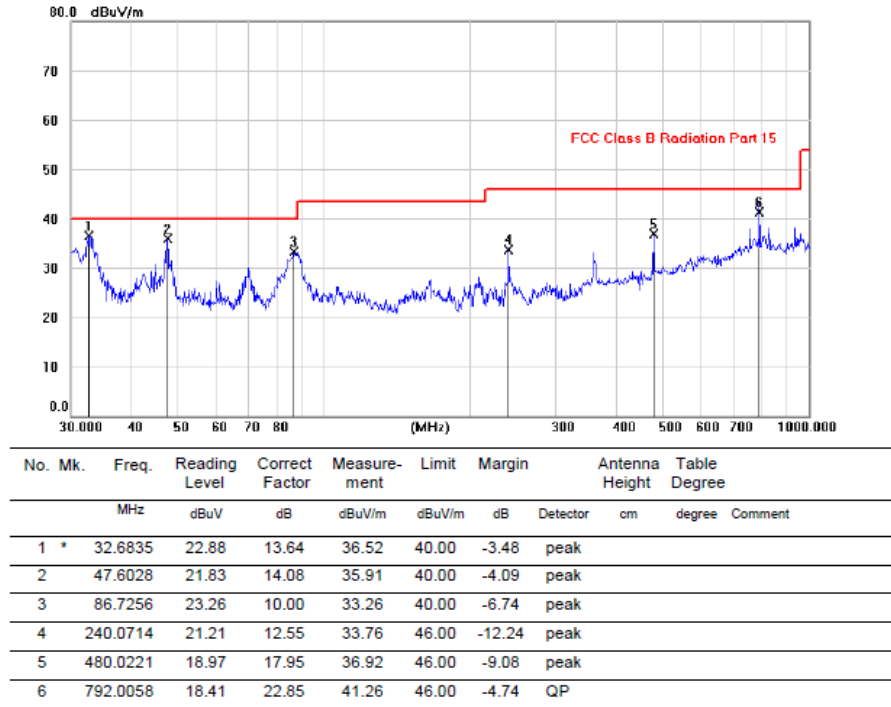


Note:1. \*:Maximum data; x:Over limit; !:over margin.

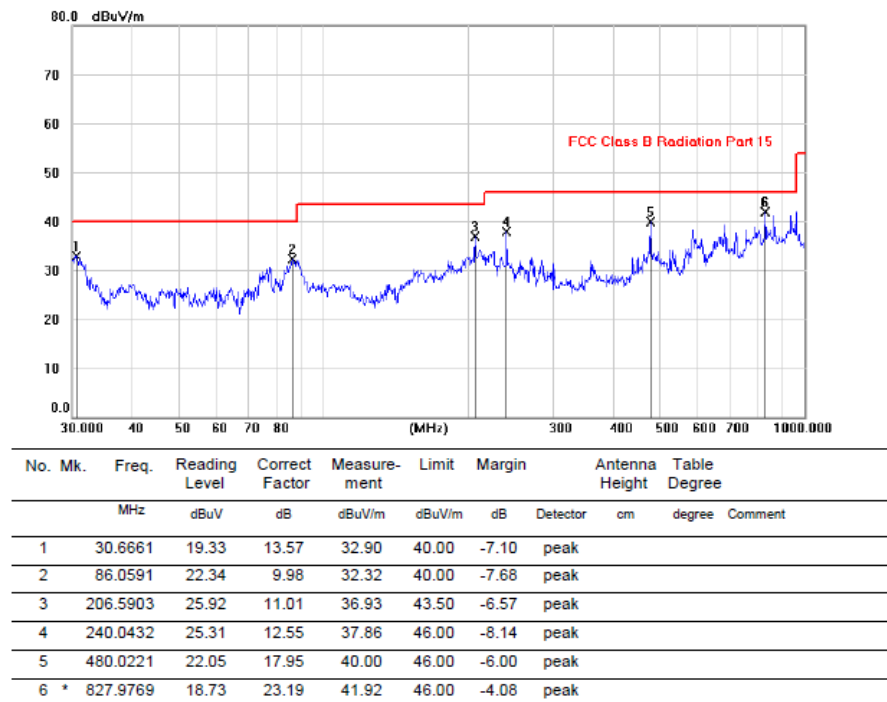
2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.



Test Mode: IEEE 802.11b TX Mid channel  
30-1000MHz  
**Vertical**



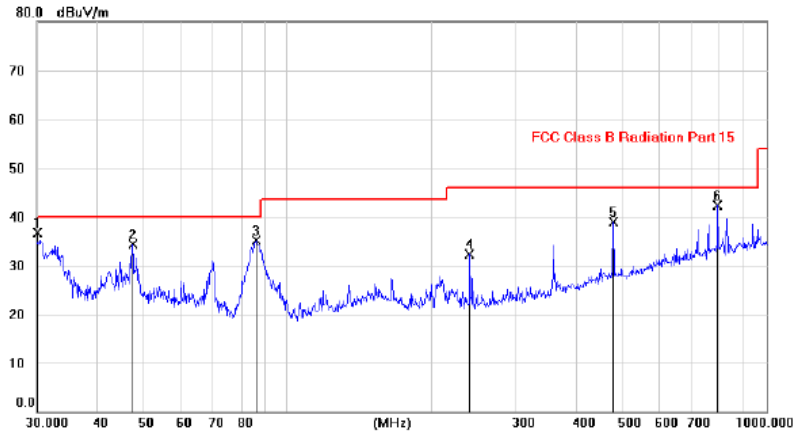
**Horizontal**



Note:1. \*:Maximum data; x:Over limit; !:over margin.

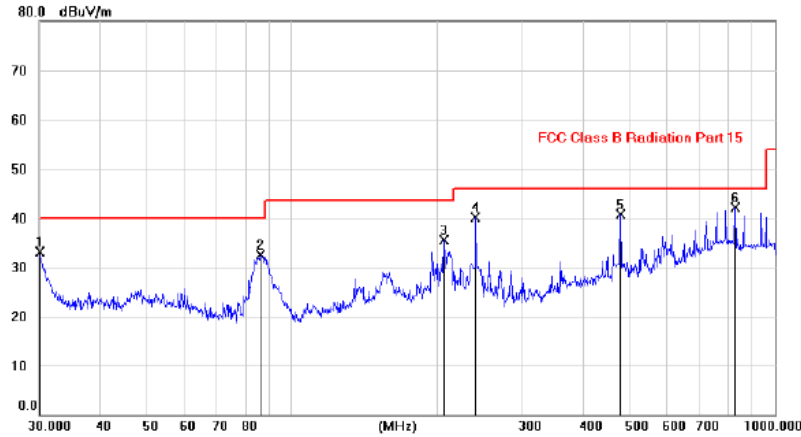
2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

Test Mode: IEEE 802.11b TX High channel  
30-1000MHz  
**Vertical**



No. Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	Antenna Height	Table Degree
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree
1 *	30.0975	23.24	13.53	36.77	40.00	-3.23	peak	
2	47.6028	20.29	14.08	34.37	40.00	-5.63	peak	
3	85.9787	25.22	9.98	35.20	40.00	-4.80	peak	
4	240.0714	19.67	12.55	32.22	46.00	-13.78	peak	
5	480.0221	20.93	17.95	38.88	46.00	-7.12	peak	
6	792.0058	19.41	22.85	42.26	46.00	-3.74	peak	

**Horizontal**

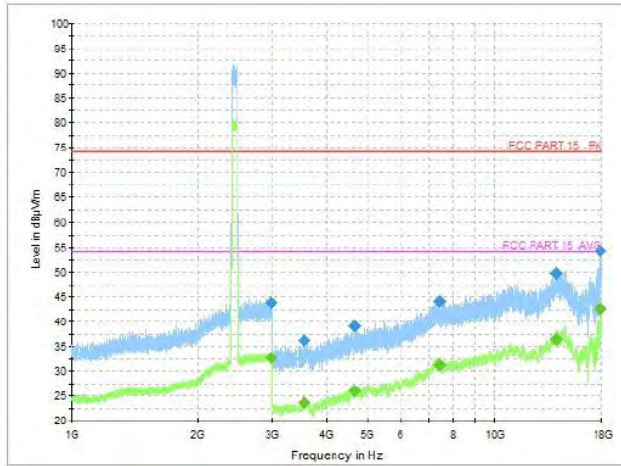


No. Mk.	Freq.	Reading Level	Correct Factor	Measurement	Limit	Margin	Antenna Height	Table Degree
	MHz	dBuV	dB	dBuV/m	dBuV/m	dB	cm	degree
1	30.0350	19.51	13.52	33.03	40.00	-6.97	peak	
2	86.0591	22.51	9.98	32.49	40.00	-7.51	peak	
3	206.5903	24.59	11.01	35.60	43.50	-7.90	peak	
4	240.0432	27.48	12.55	40.03	46.00	-5.97	peak	
5	480.0221	22.72	17.95	40.67	46.00	-5.33	peak	
6 *	827.9769	18.90	23.19	42.09	46.00	-3.91	peak	

Note:1. \*:Maximum data; x:Over limit; !:over margin.

2.Measurement=Reading Level+Correct Factor; Correct Factor=Antenna Factor+Cable Loss.

Test Mode: IEEE 802.11b TX Low channel  
1-18GHz



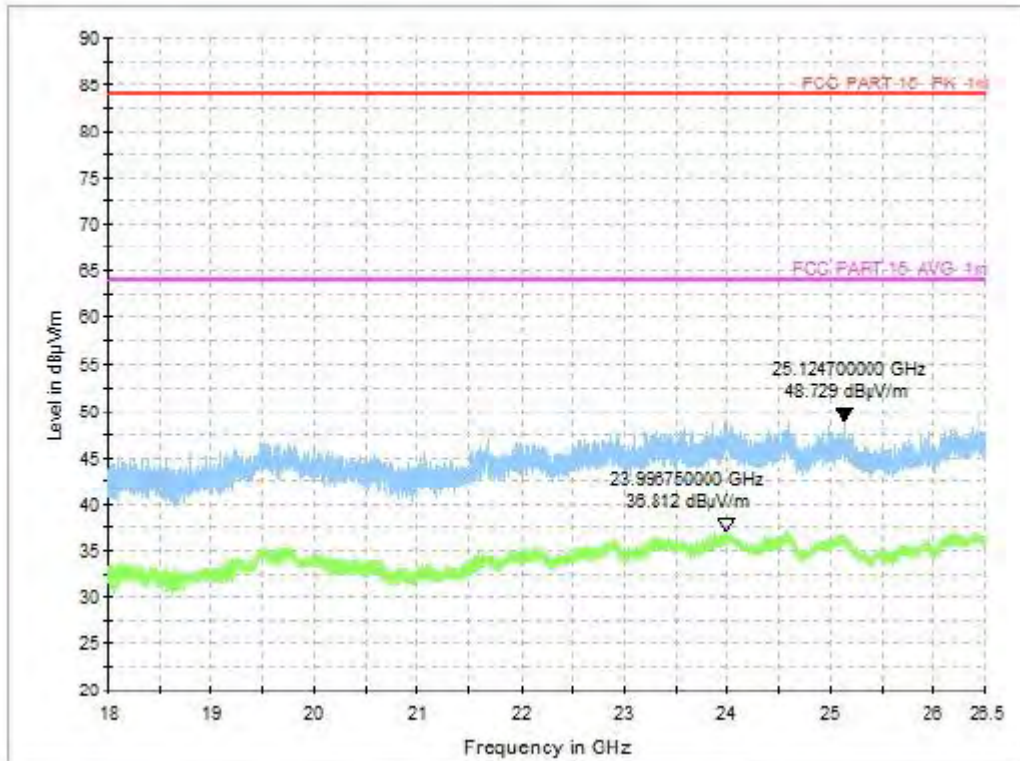
Final Result 1

Frequency (MHz)	MaxPeak-MaxHold (dBµV/m)	Limit (dBµV)	Margin (dB)	Polarization	Corr. (dB)
2981.600000	43.75	74.0	30.25	H	8.95
3551.700000	36.18	74.0	37.82	H	-12.99
4669.200000	39.08	74.0	34.92	V	-9.72
7428.000000	44.10	74.0	29.90	H	-2.35
14021.600000	49.68	74.0	24.32	H	4.98
17942.400000	54.25	74.0	19.75	H	14.56

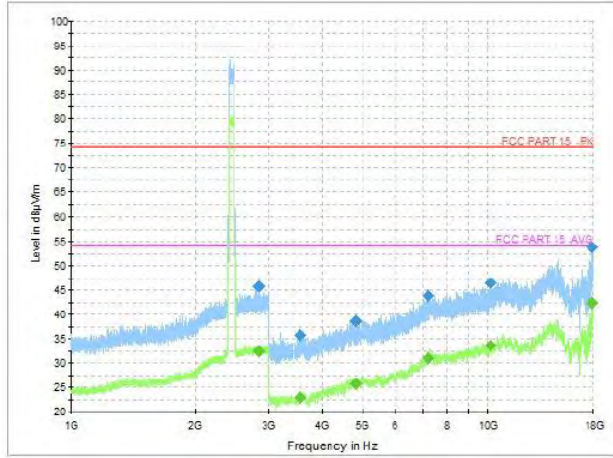
Final Result 2

Frequency (MHz)	Average-MaxHold (dBµV/m)	Limit (dBµV)	Margin (dB)	Polarization	Corr. (dB)
2981.600000	32.60	54.0	21.40	H	8.95
3551.700000	23.53	54.0	30.47	H	-12.99
4669.200000	26.00	54.0	28.00	V	-9.72
7428.000000	31.11	54.0	22.89	H	-2.35
14021.600000	36.45	54.0	17.55	H	4.98
17942.400000	42.57	54.0	11.43	H	14.56

18-26.5GHz



Test Mode: IEEE 802.11b TX Mid channel  
1-18GHz



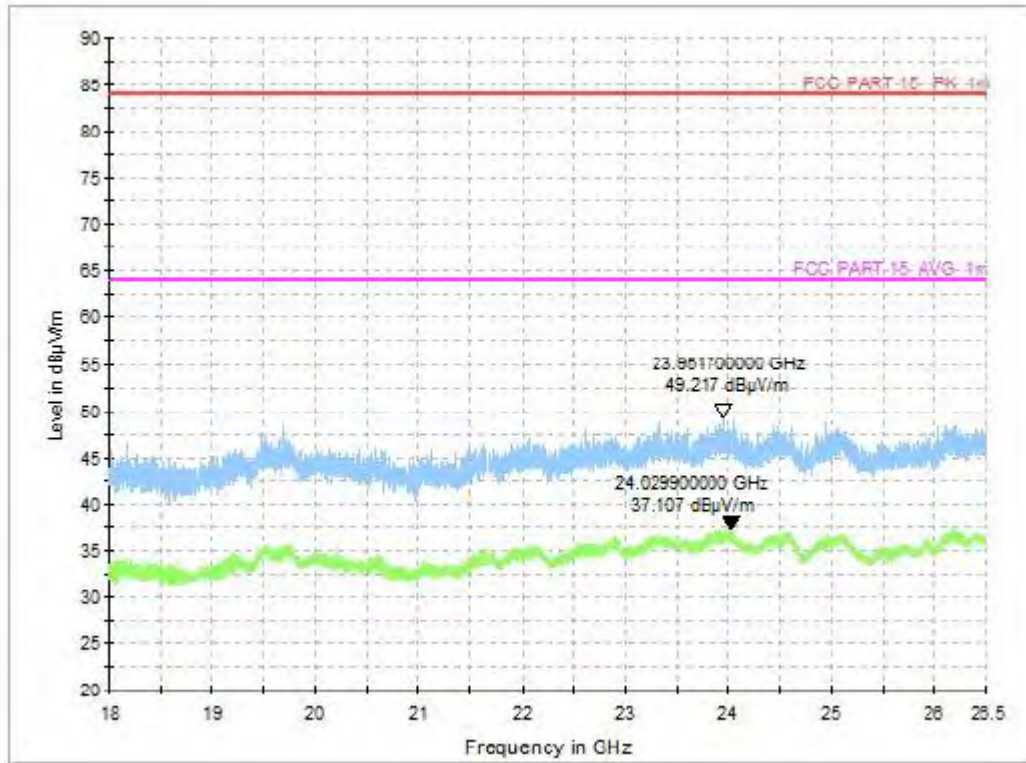
Final Result 1

Frequency (MHz)	MaxPeak-MaxHold (dBµV/m)	Limit (dBµV/)	Margin (dB)	Polarization	Corr. (dB)
2840.800000	45.75	74.0	28.25	H	8.33
3543.000000	35.66	74.0	38.34	V	-13.09
4812.600000	38.46	74.0	35.54	H	-9.40
7216.000000	43.73	74.0	30.27	V	-2.52
10182.400000	46.42	74.0	27.58	V	0.10
17937.200000	53.83	74.0	20.17	H	14.38

Final Result 2

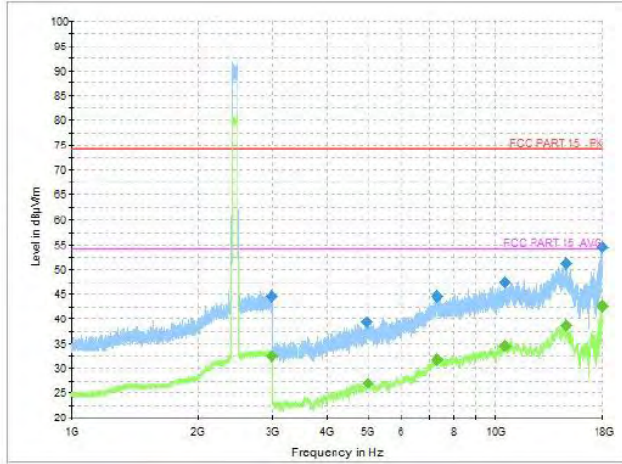
Frequency (MHz)	Average-MaxHold (dBµV/m)	Limit (dBµV/)	Margin (dB)	Polarization	Corr. (dB)
2840.800000	32.36	54.0	21.64	H	8.33
3543.000000	22.87	54.0	31.13	V	-13.09
4812.600000	25.82	54.0	28.18	H	-9.40
7216.000000	30.88	54.0	23.12	V	-2.52
10182.400000	33.53	54.0	20.47	V	0.10
17937.200000	42.27	54.0	11.73	H	14.38

18-26.5GHz





Test Mode: IEEE 802.11b TX Highchannel  
1-18GHz



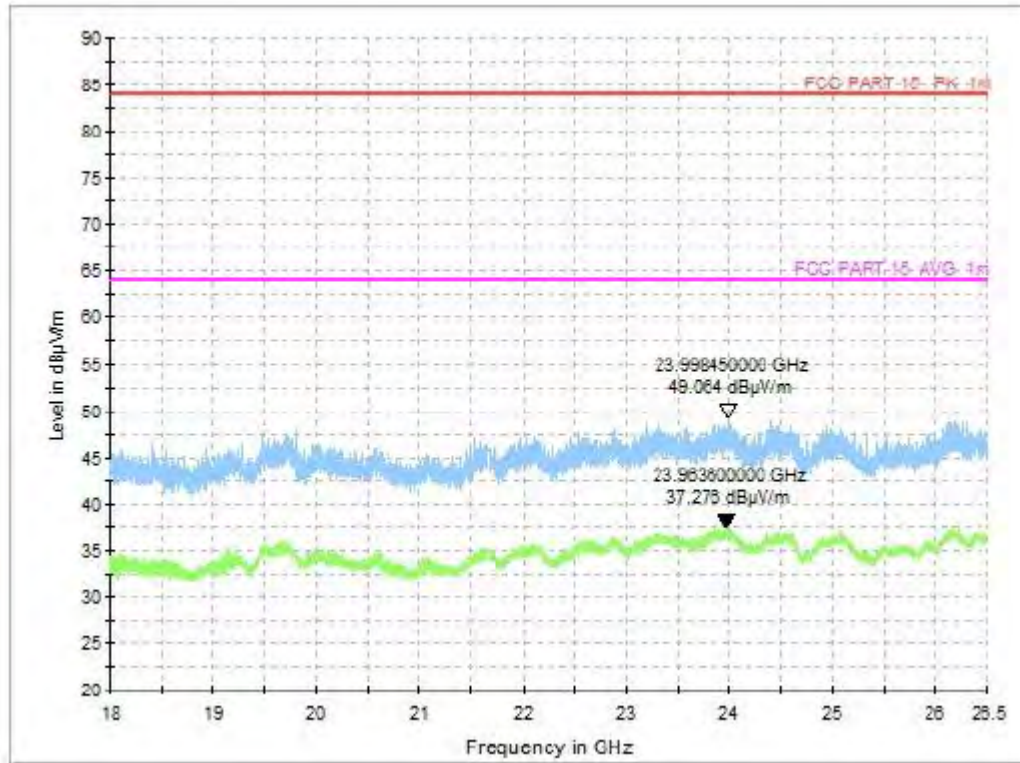
Final Result 1

Frequency (MHz)	MaxPeak-MaxHold (dBµV/m)	Limit (dBµV/)	Margin (dB)	Polarization	Corr. (dB)
2982.400000	44.6	74.0	29.4	V	8.9
4993.800000	39.3	74.0	34.7	H	-8.6
7297.200000	44.6	74.0	29.4	H	-1.6
10598.000000	47.3	74.0	26.7	H	1.5
14794.000000	51.1	74.0	22.9	V	6.5
17954.000000	54.4	74.0	19.6	V	14.7

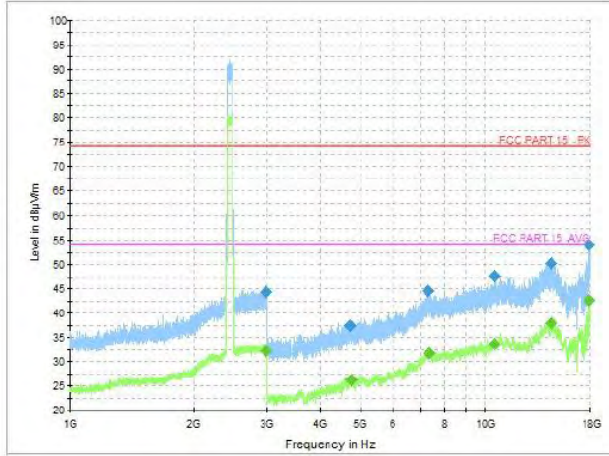
Final Result 2

Frequency (MHz)	Average-MaxHold (dBµV/m)	Limit (dBµV/)	Margin (dB)	Polarization	Corr. (dB)
2982.400000	32.4	54.0	21.6	V	8.9
4995.600000	27.0	54.0	27.0	V	-8.6
7297.200000	31.6	54.0	22.4	H	-1.6
10598.000000	34.6	54.0	19.4	H	1.5
14794.000000	38.5	54.0	15.5	V	6.5
17954.000000	42.7	54.0	11.3	V	14.7

18-26.5GHz



Test Mode: IEEE 802.11g TX Low channel  
1-18GHz



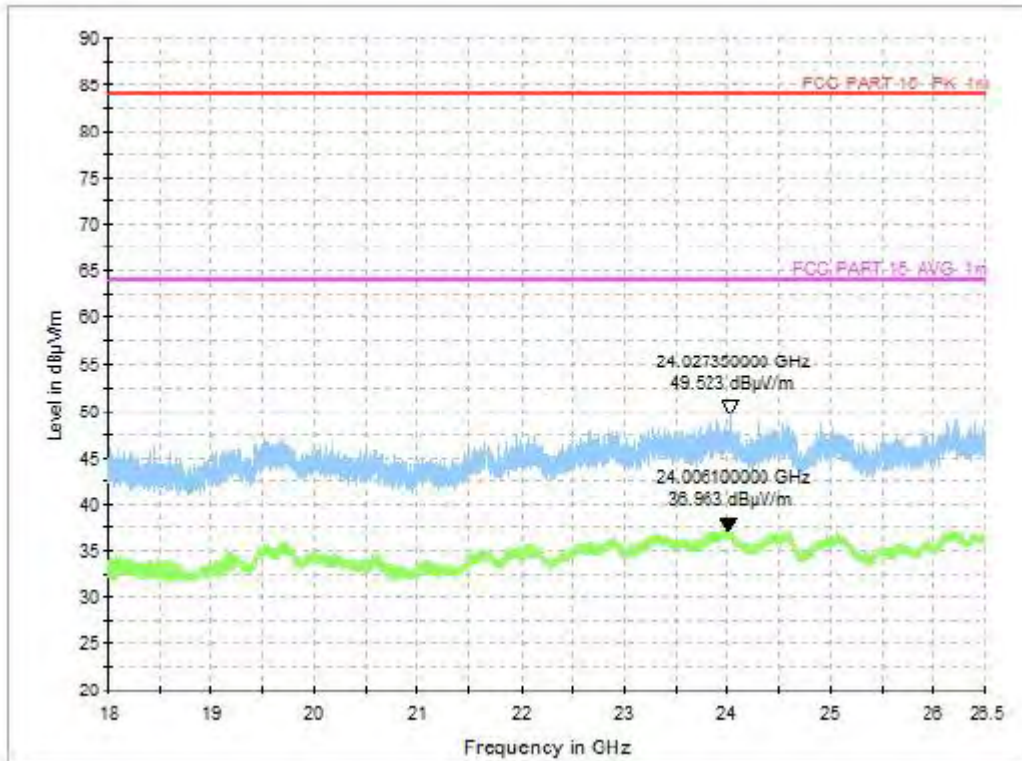
Final Result 1

Frequency (MHz)	MaxPeak-MaxHold (dBµV/m)	Limit (dBµV/)	Margin (dB)	Polarization	Corr. (dB)
2979.200000	44.2	74.0	29.8	H	9.0
4721.100000	37.5	74.0	36.5	V	-9.3
7300.000000	44.6	74.0	29.4	H	-1.5
10615.200000	47.7	74.0	26.3	V	1.4
14449.200000	50.1	74.0	23.9	V	5.9
17939.600000	54.0	74.0	20.0	V	14.5

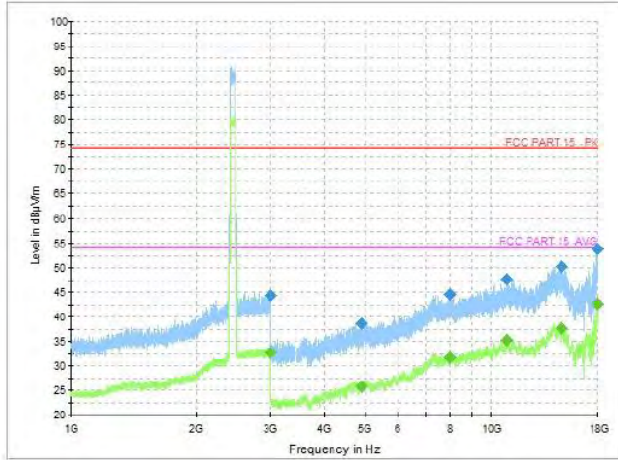
Final Result 2

Frequency (MHz)	Average-MaxHold (dBµV/m)	Limit (dBµV/)	Margin (dB)	Polarization	Corr. (dB)
2979.200000	32.2	54.0	21.8	H	9.0
4749.300000	26.1	54.0	27.9	H	-9.5
7360.800000	31.7	54.0	22.3	V	-2.1
10615.200000	33.5	54.0	20.5	V	1.4
14457.600000	37.8	54.0	16.2	V	5.9
17939.600000	42.7	54.0	11.3	V	14.5

18-26.5GHz



Test Mode: IEEE 802.11g TX Mid channel  
1-18GHz



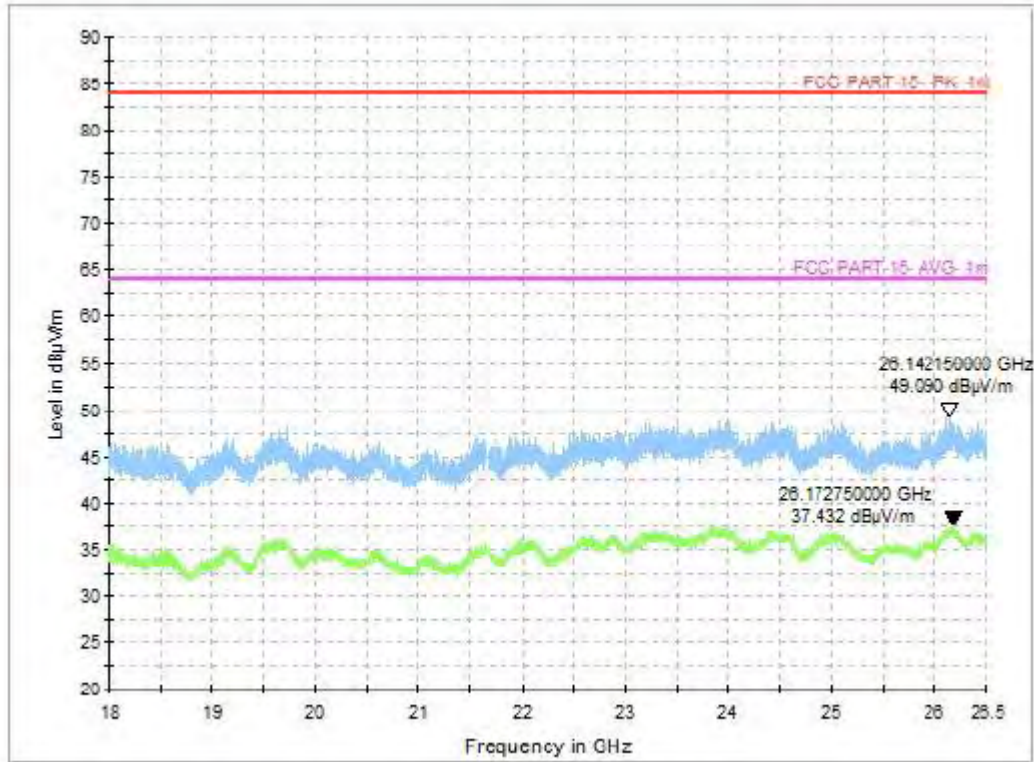
Final Result 1

Frequency (MHz)	MaxPeak-MaxHold (dBµV/m)	Limit (dBµV/)	Margin (dB)	Polarization	Corr. (dB)
2996.800000	44.2	74.0	29.8	V	8.8
4928.700000	38.6	74.0	35.4	V	-9.2
7972.400000	44.6	74.0	29.4	H	-2.2
10942.000000	47.6	74.0	26.4	V	1.6
14786.800000	50.3	74.0	23.7	H	6.4
17951.200000	53.8	74.0	20.2	H	14.8

Final Result 2

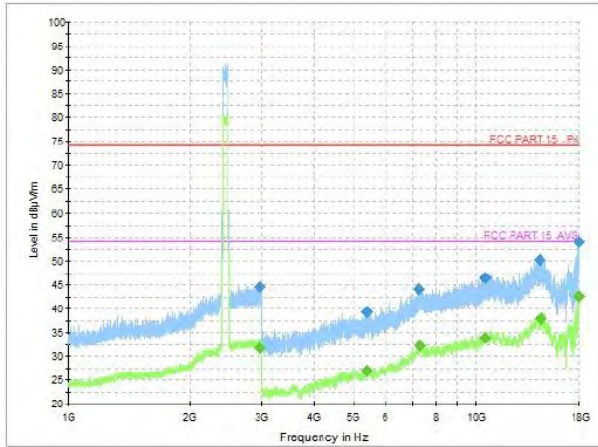
Frequency (MHz)	Average-MaxHold (dBµV/m)	Limit (dBµV/)	Margin (dB)	Polarization	Corr. (dB)
2996.800000	32.7	54.0	21.3	V	8.8
4928.700000	25.8	54.0	28.2	V	-9.2
7972.400000	31.6	54.0	22.4	H	-2.2
10942.000000	35.3	54.0	18.7	V	1.6
14802.800000	37.7	54.0	16.3	H	6.5
17951.200000	42.7	54.0	11.3	H	14.8

18-26.5GHz





Test Mode: IEEE 802.11g TX High channel  
1-18GHz



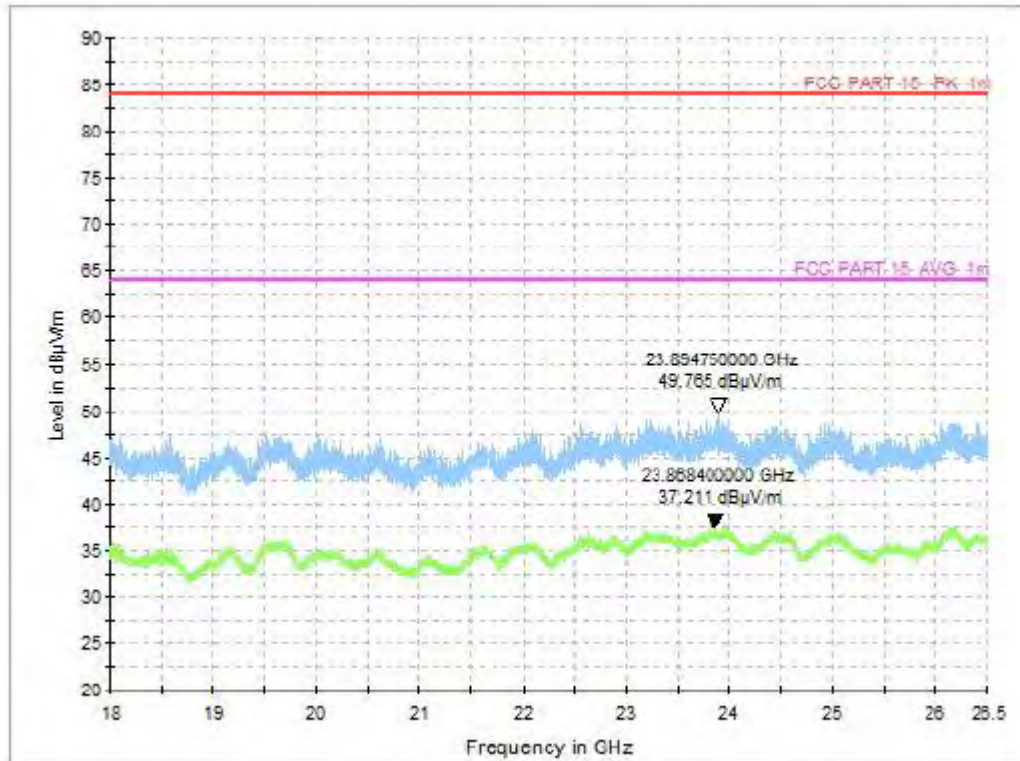
Final Result 1

Frequency (MHz)	MaxPeak-MaxHold (dBµV/m)	Limit (dBµV/)	Margin (dB)	Polarization	Corr. (dB)
2970.000000	44.6	74.0	29.4	H	9.0
5413.800000	39.3	74.0	34.7	V	-8.2
7236.800000	44.1	74.0	29.9	V	-2.4
10612.800000	46.5	74.0	27.5	H	1.4
14424.000000	50.3	74.0	23.7	V	5.6
17956.400000	54.2	74.0	19.8	H	14.7

Final Result 2

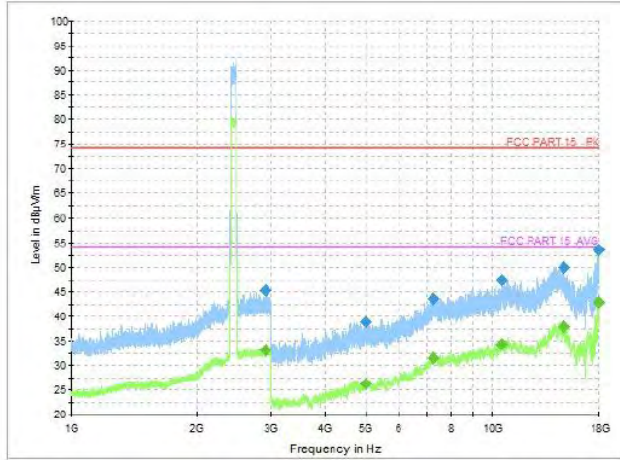
Frequency (MHz)	Average-MaxHold (dBµV/m)	Limit (dBµV/)	Margin (dB)	Polarization	Corr. (dB)
2970.000000	31.8	54.0	22.2	H	9.0
5413.800000	26.8	54.0	27.2	V	-8.2
7301.200000	32.1	54.0	21.9	H	-1.5
10617.200000	33.9	54.0	20.1	V	1.3
14454.000000	37.8	54.0	16.2	V	5.9
17956.400000	42.6	54.0	11.4	H	14.7

18-26.5GHz





Test Mode: IEEE 802.11n20 TX Low channel  
1-18GHz



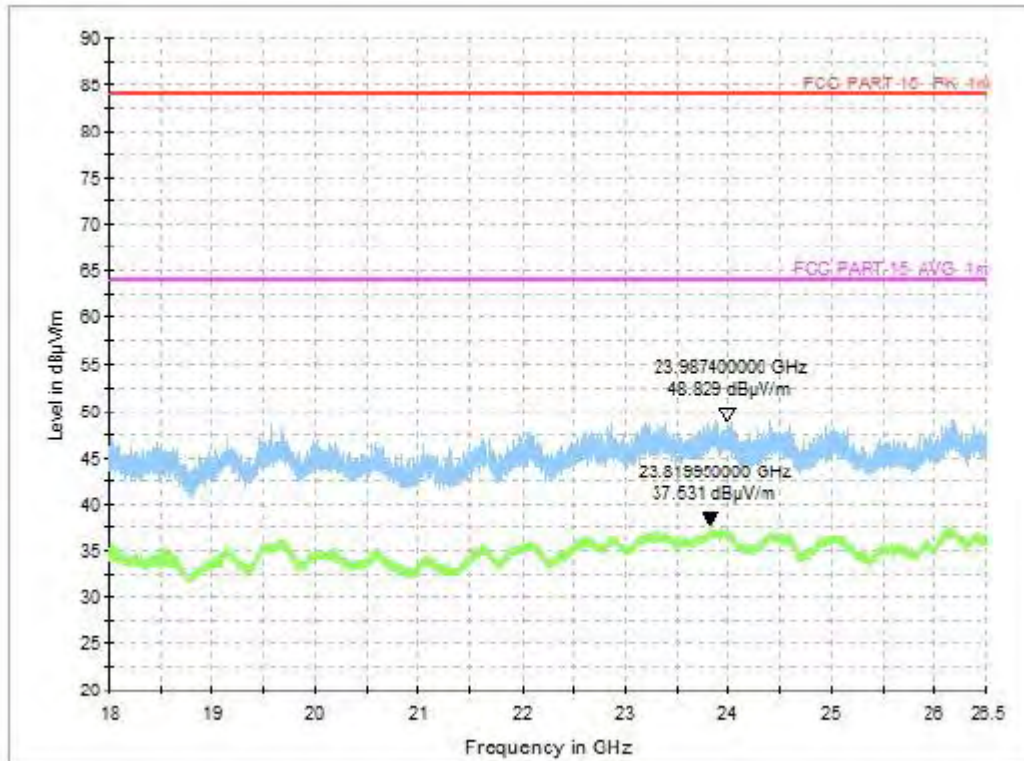
Final Result 1

Frequency (MHz)	MaxPeak-MaxHold (dBµV/m)	Limit (dBµV/)	Margin (dB)	Polarization	Corr. (dB)
2910.800000	45.1	74.0	28.9	H	8.7
5010.300000	38.8	74.0	35.2	V	-8.7
7250.400000	43.7	74.0	30.3	H	-2.3
10588.800000	47.3	74.0	26.7	H	1.4
14862.400000	49.9	74.0	24.1	H	6.0
17949.600000	53.7	74.0	20.3	V	14.8

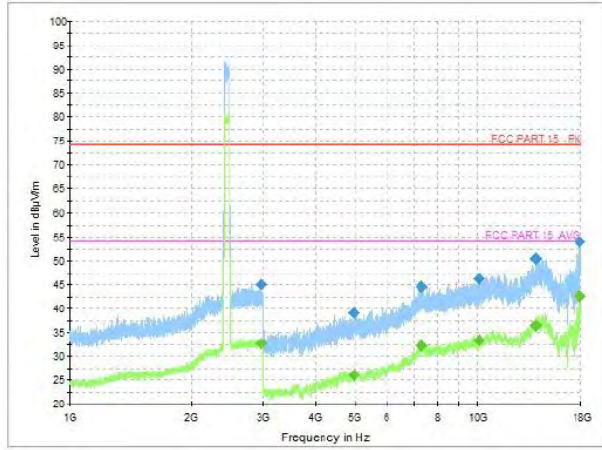
Final Result 2

Frequency (MHz)	Average-MaxHold (dBµV/m)	Limit (dBµV/)	Margin (dB)	Polarization	Corr. (dB)
2910.800000	33.0	54.0	21.0	H	8.7
5010.300000	26.2	54.0	27.8	V	-8.7
7250.400000	31.4	54.0	22.6	H	-2.3
10588.800000	34.3	54.0	19.7	H	1.4
14862.400000	38.0	54.0	16.0	H	6.0
17949.600000	42.8	54.0	11.2	V	14.8

18-26.5GHz



Test Mode: IEEE 802.11n20 TX Mid channel  
1-18GHz



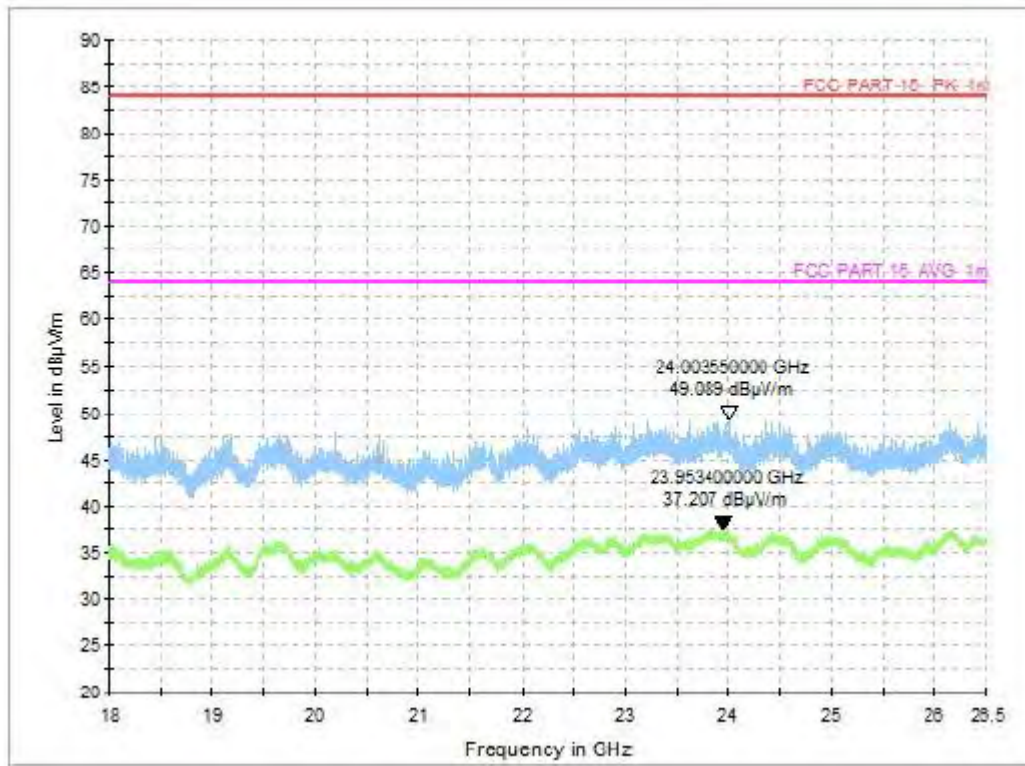
Final Result 1

Frequency (MHz)	MaxPeak-MaxHold (dBµV/m)	Limit (dBµV)	Margin (dB)	Polarization	Corr. (dB)
2970.000000	45.0	74.0	29.0	H	9.0
4983.300000	39.1	74.0	34.9	V	-8.7
7295.600000	44.5	74.0	29.5	H	-1.6
10140.400000	46.1	74.0	27.9	V	0.1
13898.800000	50.4	74.0	23.6	V	4.9
17940.400000	54.0	74.0	20.0	V	14.5

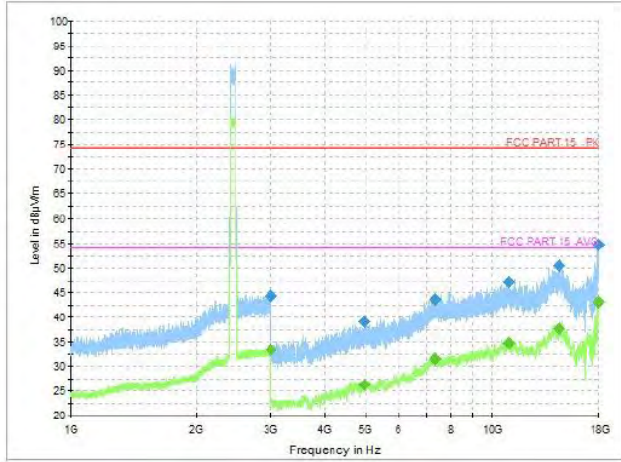
Final Result 2

Frequency (MHz)	Average-MaxHold (dBµV/m)	Limit (dBµV)	Margin (dB)	Polarization	Corr. (dB)
2970.000000	32.7	54.0	21.3	H	9.0
4983.300000	26.0	54.0	28.0	V	-8.7
7295.600000	32.1	54.0	21.9	H	-1.6
10140.400000	33.4	54.0	20.6	V	0.1
13898.800000	36.4	54.0	17.6	V	4.9
17940.400000	42.6	54.0	11.4	V	14.5

18-26.5GHz



Test Mode: IEEE 802.11n20 TX High channel  
1-18GHz



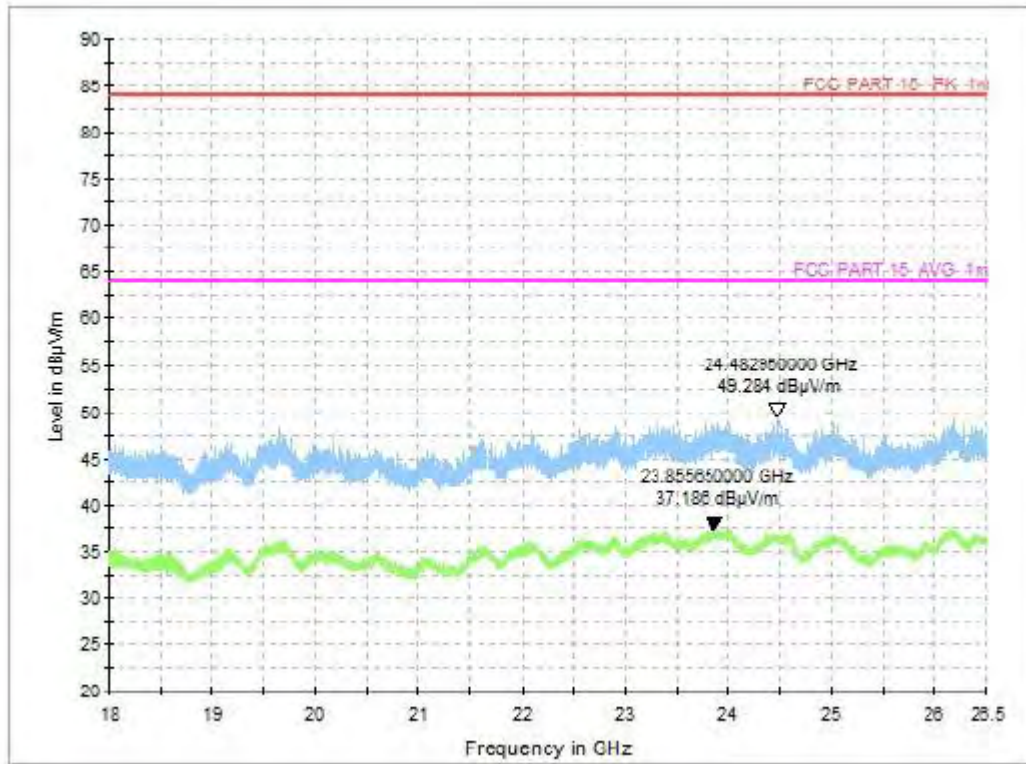
Final Result 1

Frequency (MHz)	MaxPeak-MaxHold (dBµV/m)	Limit (dBµV/)	Margin (dB)	Polarization	Corr. (dB)
2995.200000	44.3	74.0	29.7	V	8.9
4982.400000	39.1	74.0	34.9	V	-8.8
7347.600000	43.5	74.0	30.5	H	-2.0
10977.600000	47.2	74.0	26.8	V	1.6
14444.800000	50.4	74.0	23.6	H	5.8
17953.600000	54.7	74.0	19.3	V	14.7

Final Result 2

Frequency (MHz)	Average-MaxHold (dBµV/m)	Limit (dBµV/)	Margin (dB)	Polarization	Corr. (dB)
2995.200000	33.5	54.0	20.5	V	8.9
4982.400000	26.3	54.0	27.7	V	-8.8
7347.600000	31.5	54.0	22.5	H	-2.0
10977.600000	34.8	54.0	19.2	V	1.6
14444.800000	37.7	54.0	16.3	H	5.8
17953.600000	43.0	54.0	11.0	V	14.7

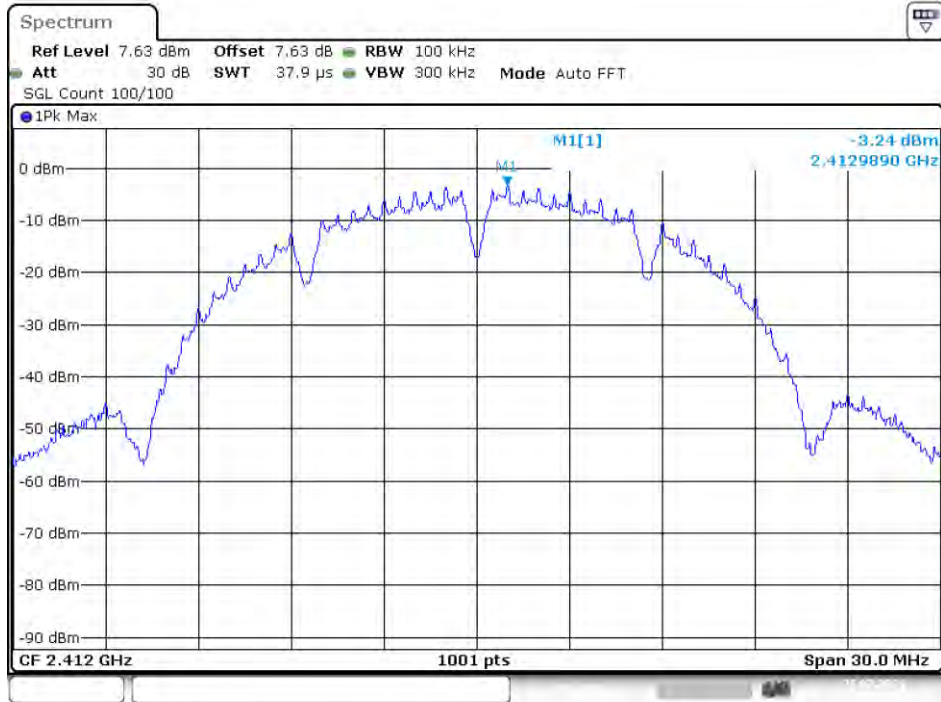
18-26.5GHz



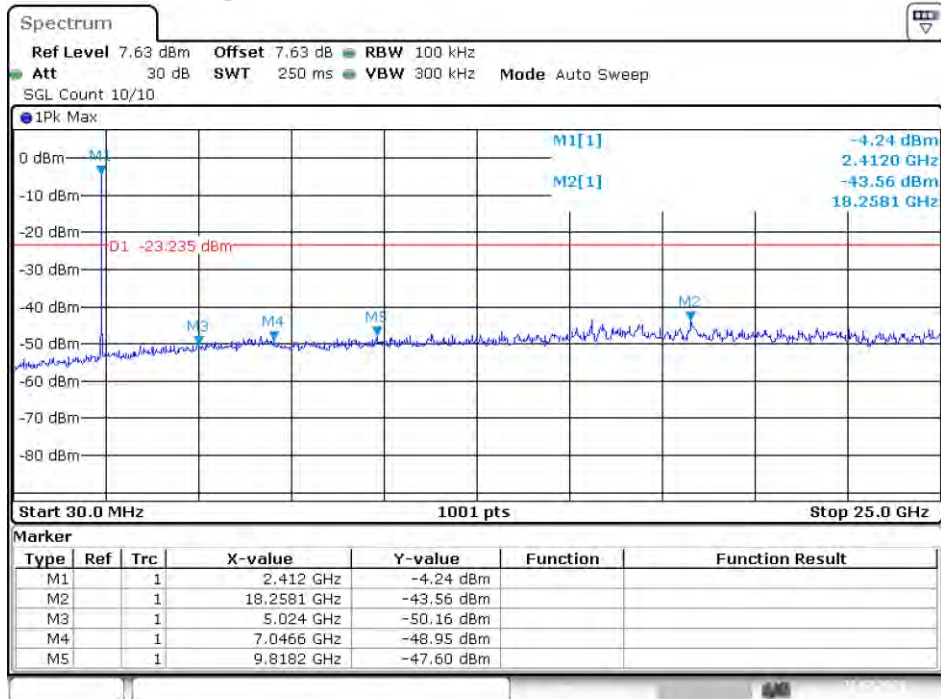


Conducted RF Spurious Emission

Tx. Spurious NVNT 802.11b 2412MHz Ant1 Ref



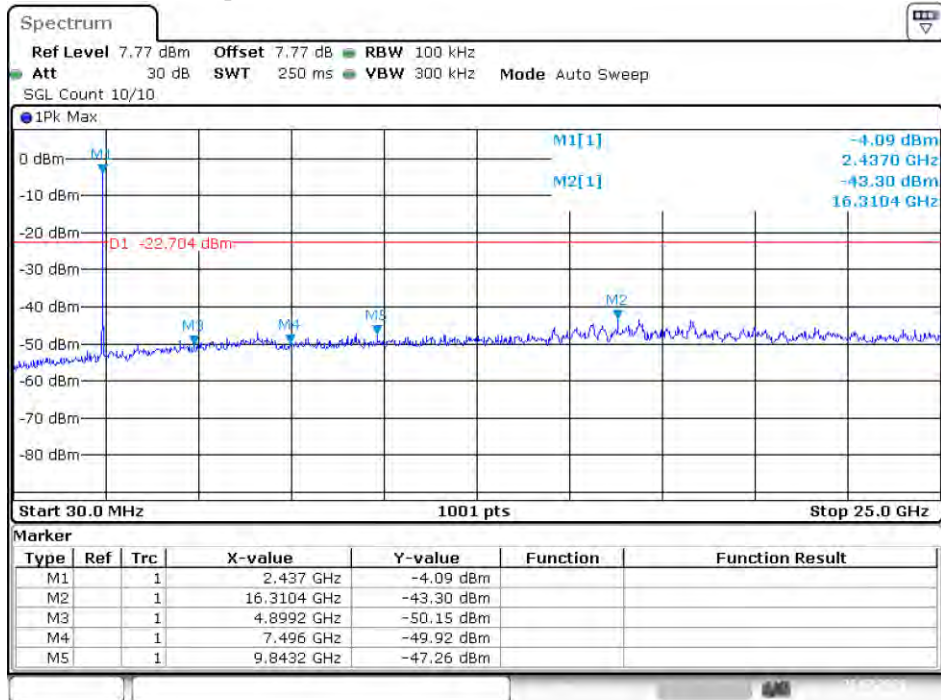
Tx. Spurious NVNT 802.11b 2412MHz Ant1 Emission



Tx. Spurious NVNT 802.11b 2437MHz Ant1 Ref



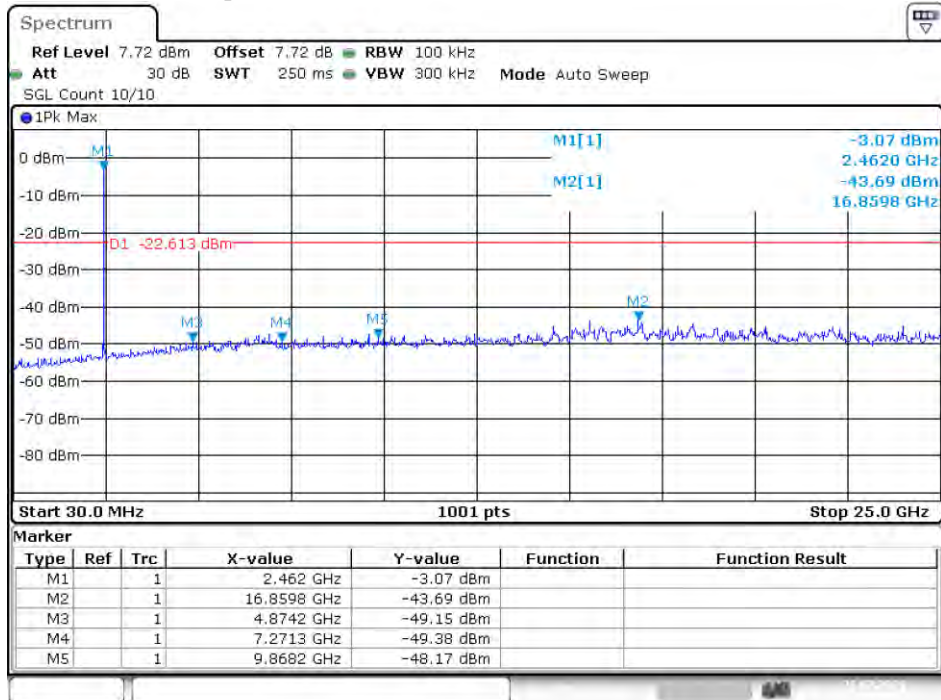
Tx. Spurious NVNT 802.11b 2437MHz Ant1 Emission



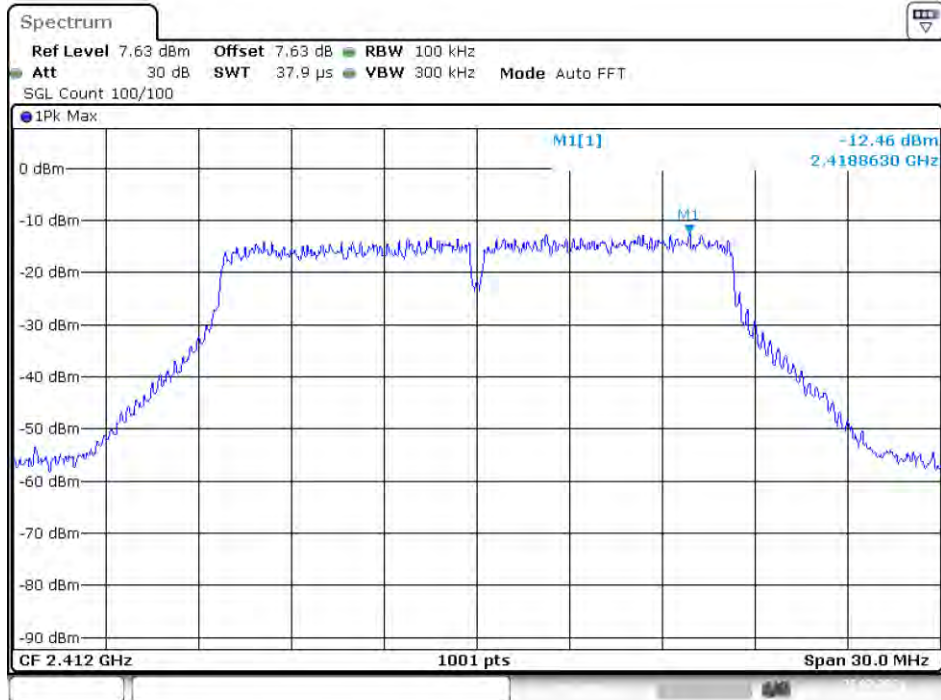
Tx. Spurious NVNT 802.11b 2462MHz Ant1 Ref



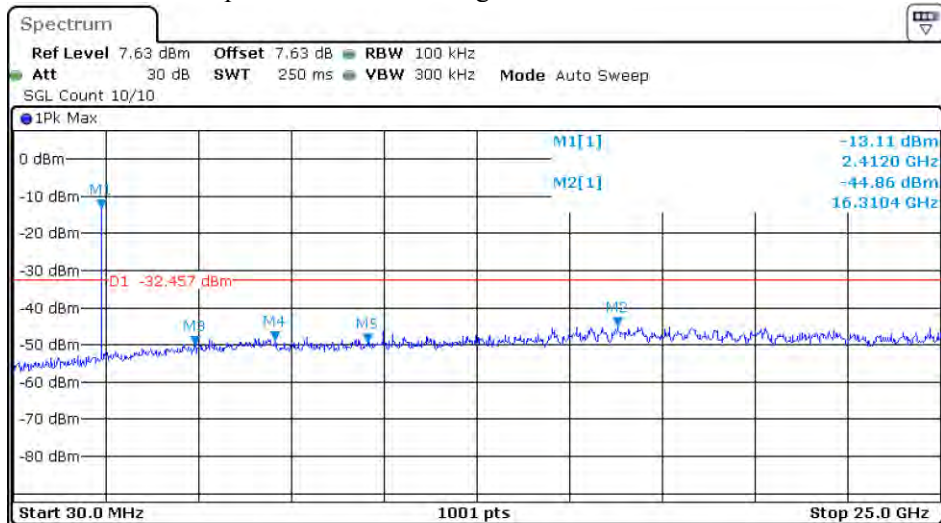
Tx. Spurious NVNT 802.11b 2462MHz Ant1 Emission



Tx. Spurious NVNT 802.11g 2412MHz Ant1 Ref



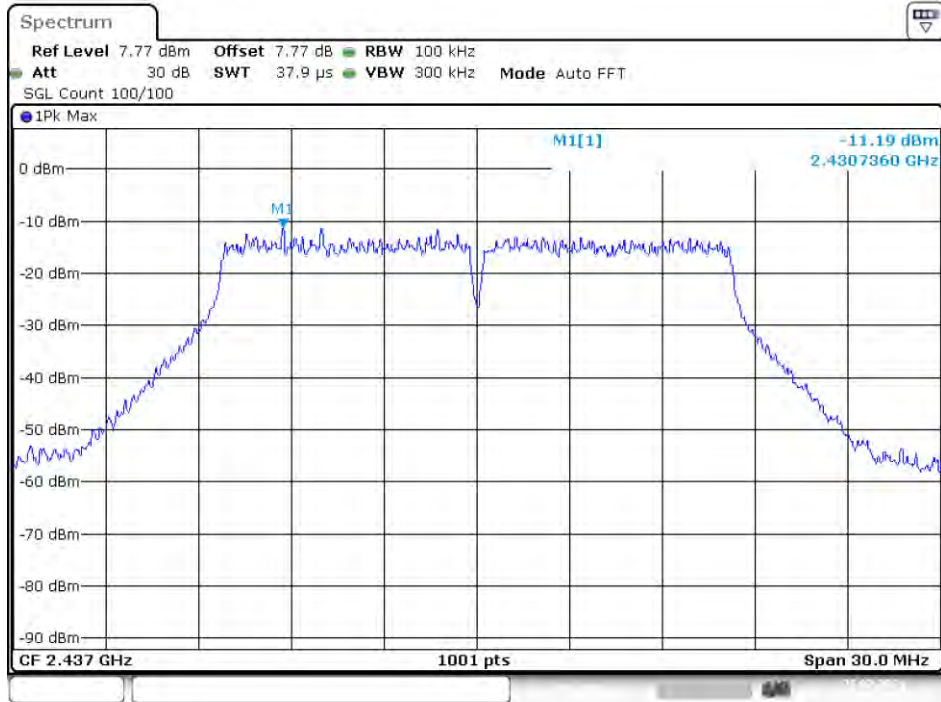
Tx. Spurious NVNT 802.11g 2412MHz Ant1 Emission



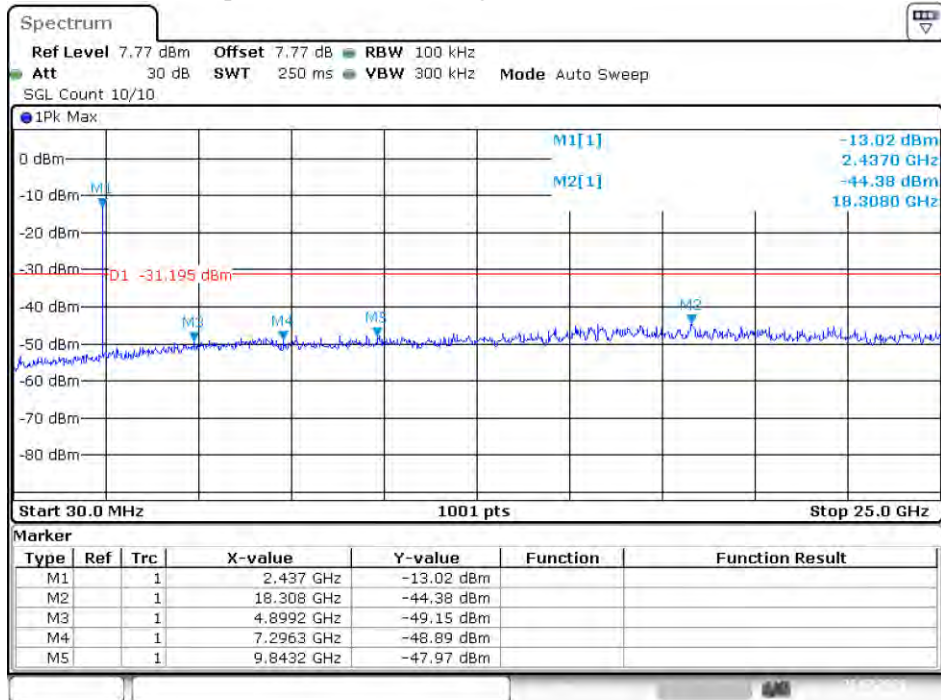
Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1	1	1	2.412 GHz	-13.11 dBm		
M2	1	1	16.3104 GHz	-44.86 dBm		
M3	1	1	4.9241 GHz	-49.88 dBm		
M4	1	1	7.0715 GHz	-48.85 dBm		
M5	1	1	9.5935 GHz	-49.29 dBm		



Tx. Spurious NVNT 802.11g 2437MHz Ant1 Ref

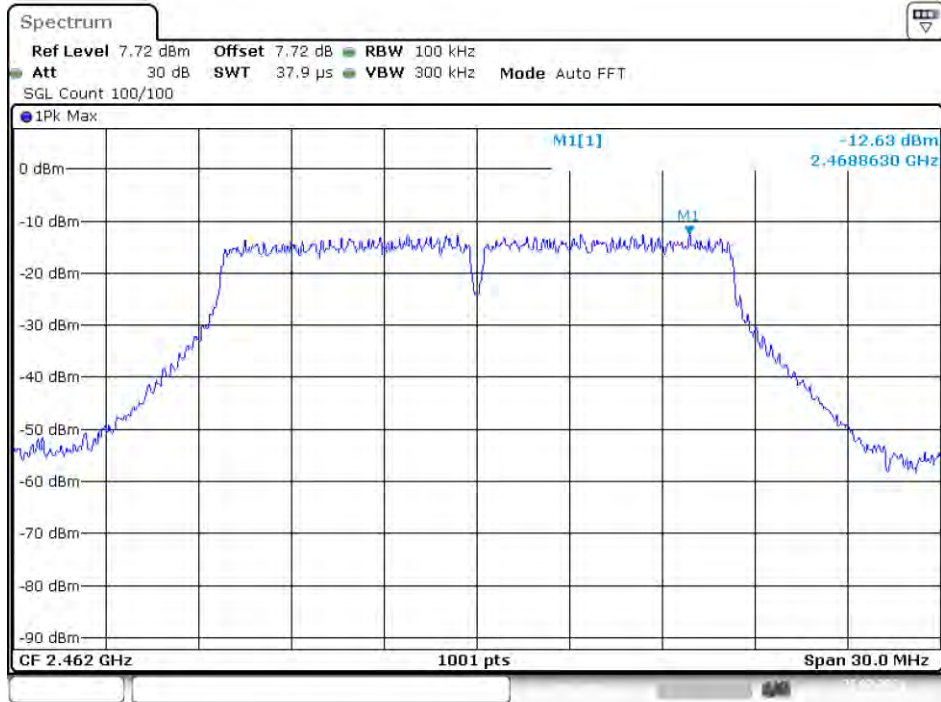


Tx. Spurious NVNT 802.11g 2437MHz Ant1 Emission

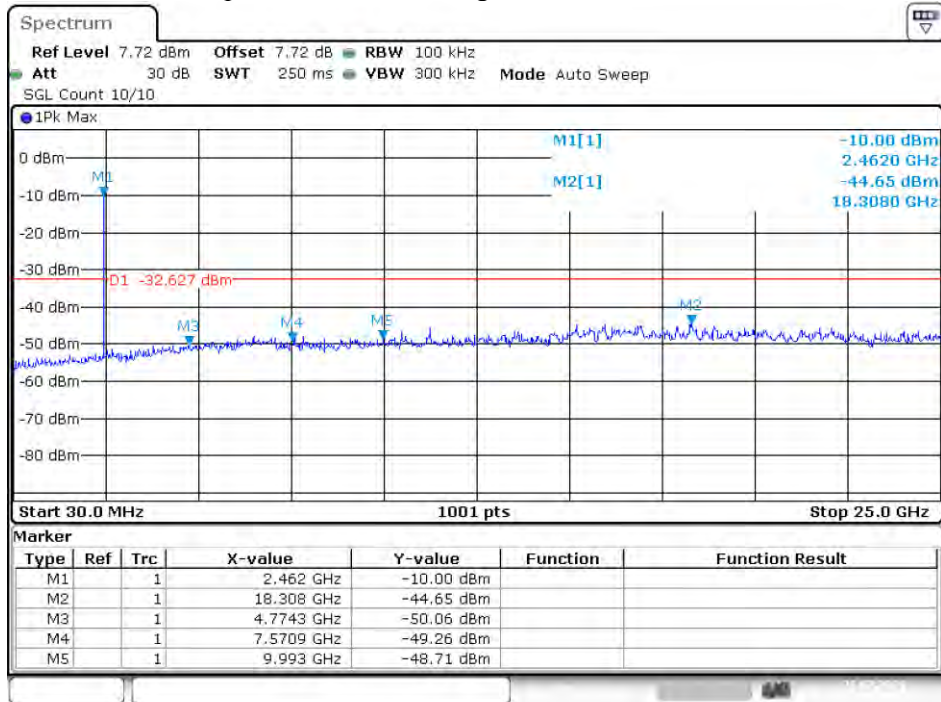




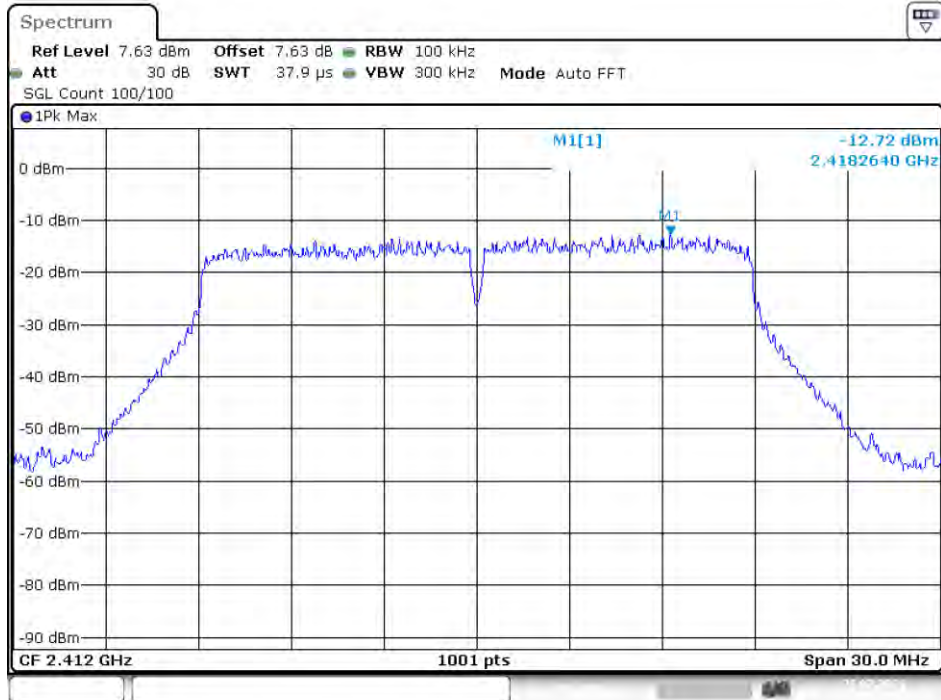
Tx. Spurious NVNT 802.11g 2462MHz Ant1 Ref



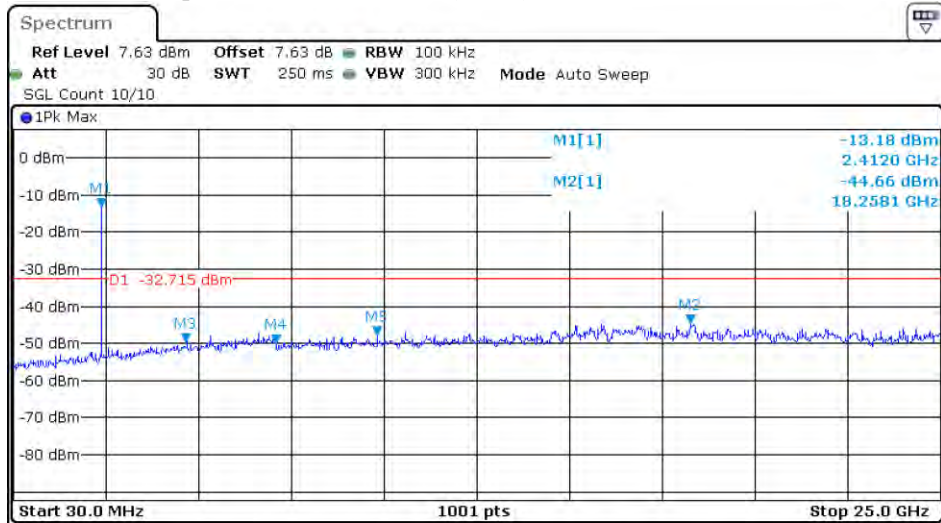
Tx. Spurious NVNT 802.11g 2462MHz Ant1 Emission



Tx. Spurious NVNT 802.11n(HT20) 2412MHz Ant1 Ref

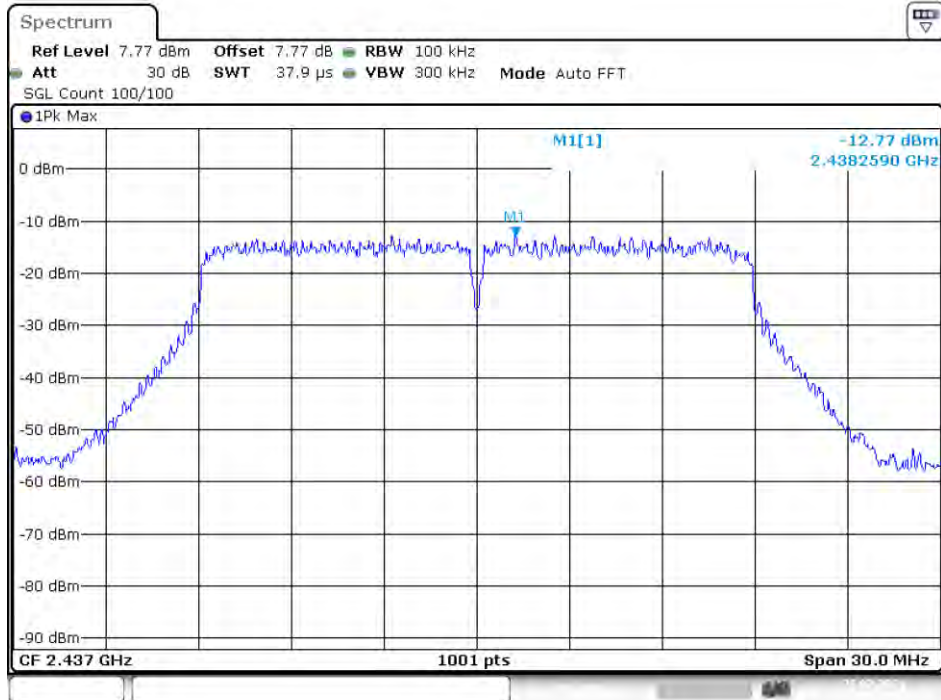


Tx. Spurious NVNT 802.11n(HT20) 2412MHz Ant1 Emission

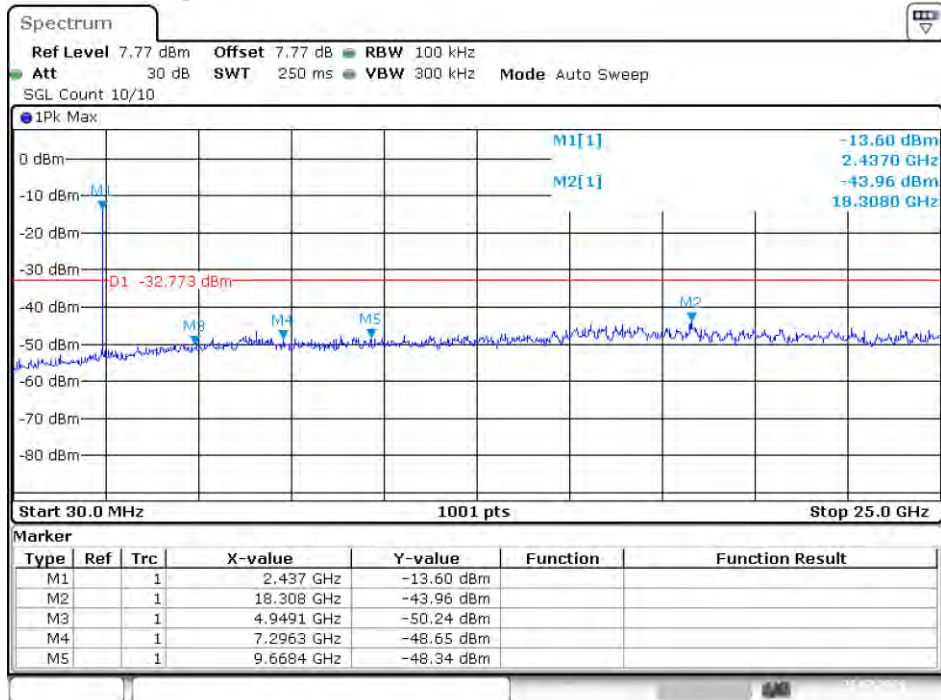


Type	Ref	Trc	X-value	Y-value	Function	Function Result
M1	1	1	2.412 GHz	-13.18 dBm		
M2	1	1	18.2581 GHz	-44.66 dBm		
M3	1	1	4.6994 GHz	-49.81 dBm		
M4	1	1	7.1215 GHz	-49.81 dBm		
M5	1	1	9.8432 GHz	-47.70 dBm		

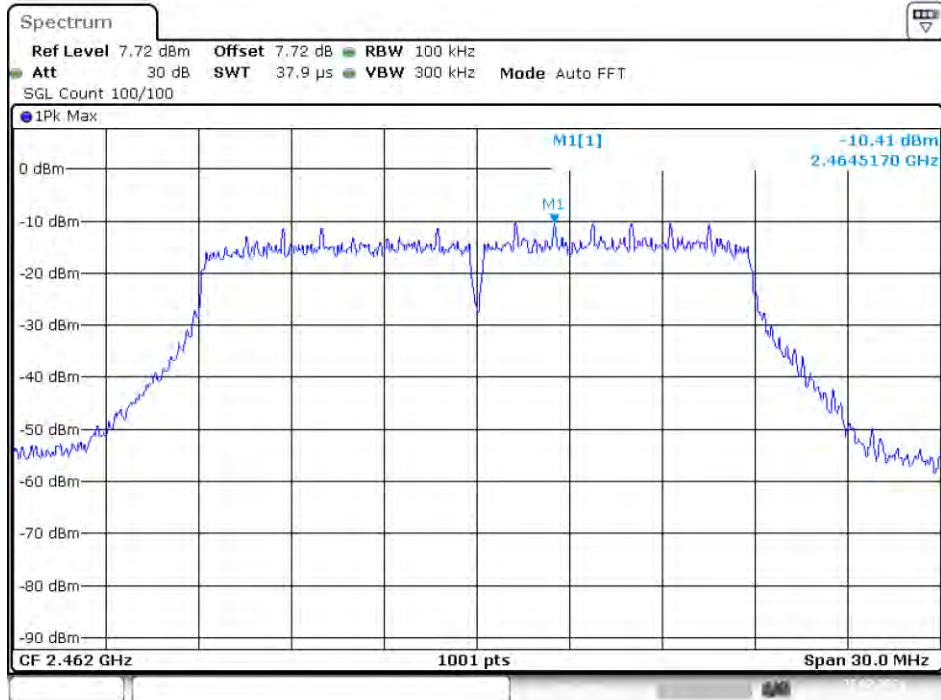
Tx. Spurious NVNT 802.11n(HT20) 2437MHz Ant1 Ref



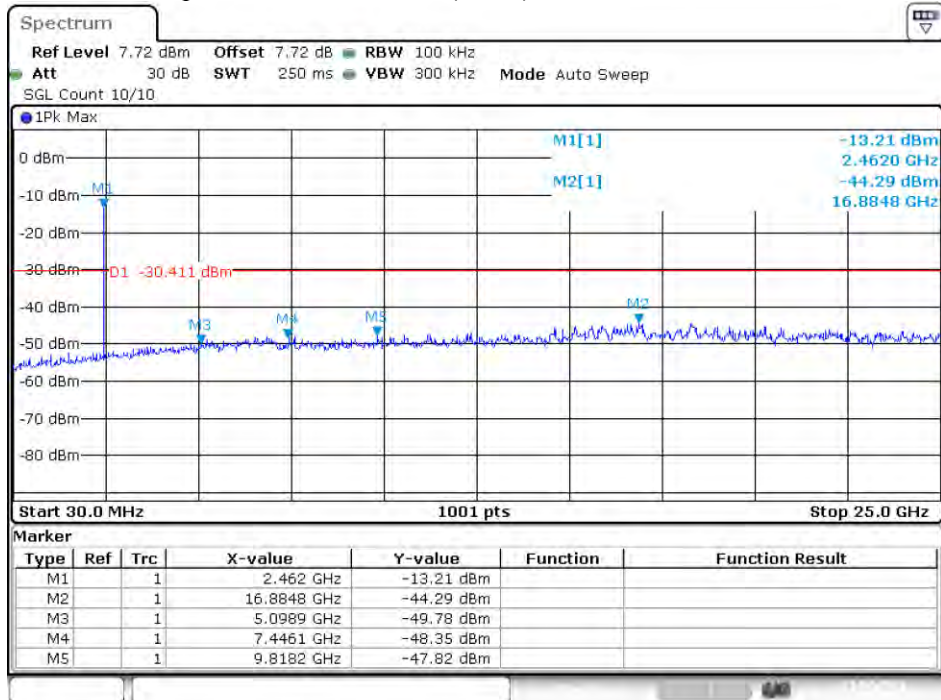
Tx. Spurious NVNT 802.11n(HT20) 2437MHz Ant1 Emission



Tx. Spurious NVNT 802.11n(HT20) 2462MHz Ant1 Ref



Tx. Spurious NVNT 802.11n(HT20) 2462MHz Ant1 Emission



## 4. POWER LINE CONDUCTED EMISSION

### 4.1. Test Limits

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

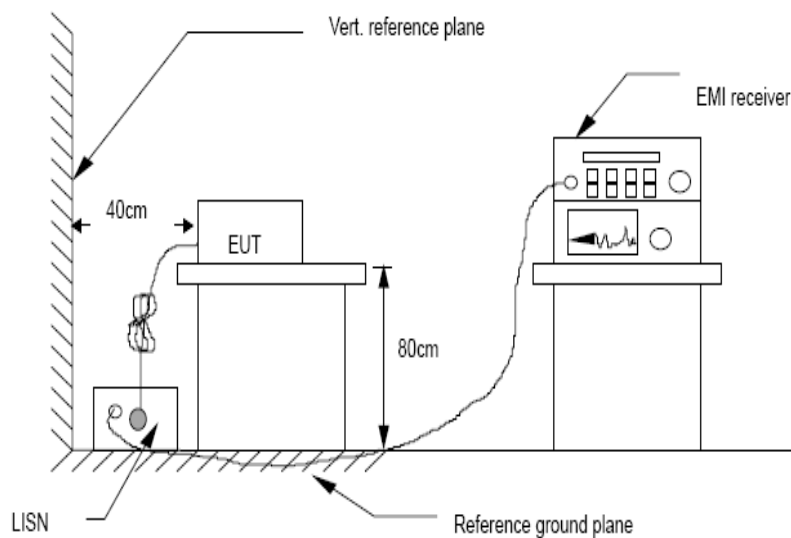
- Notes: 1. \*Decreasing linearly with logarithm of frequency.  
 2. The lower limit shall apply at the transition frequencies.  
 3. The limit decreases in line with the logarithm of the frequency in the rang of 0.15 to 0.50 MHz.

### 4.2. Test Procedure

The EUT is put on the plane 0.8m high above the ground by insulating support and is connected to the power mains through a line impedance stabilization network (L.I.S.N.). This provides a 50ohm coupling impedance for the EUT system. Please refer the block diagram of the test setup and photographs. Both sides of AC lines are checked to find out the maximum conducted emission. In order to find the maximum emission levels, the relative positions of equipment and all of the interface cables shall be changed according to ANSI C63.10:2013 on Conducted Emission Measurement.

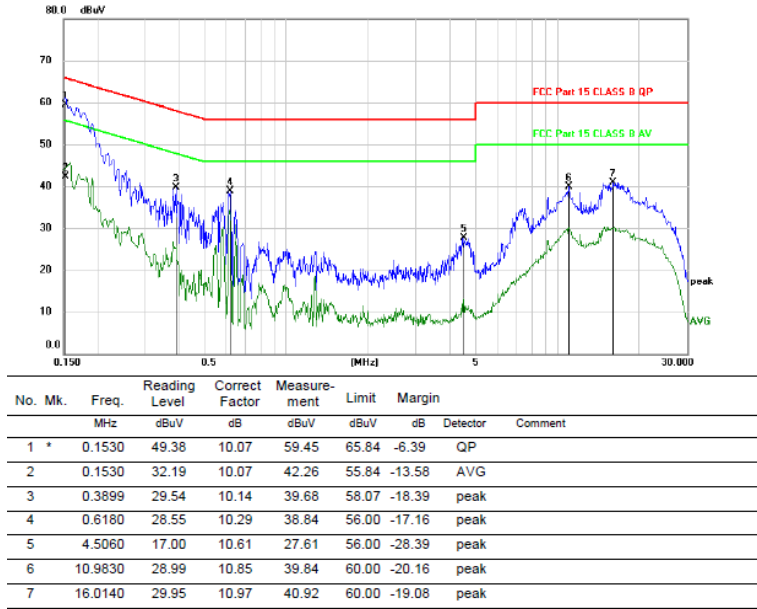
The bandwidth of test receiver is set at 9 kHz.

### 4.3. Test Setup

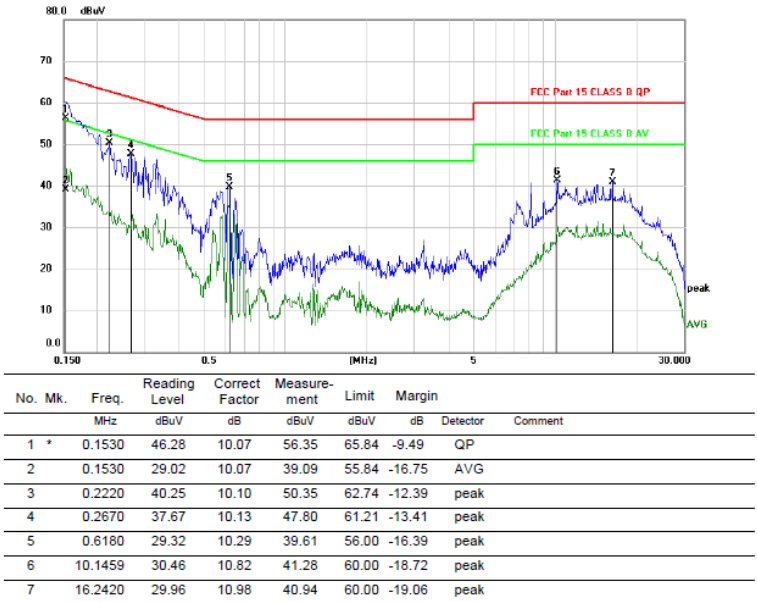


### 4.4. Test Results

<b>Temperature</b>	24°C	<b>Humidity</b>	56%
<b>Pol</b>	Line	<b>Testmode</b>	WIFI operation(powered by adapter)
<b>TestVoltage</b>	AC120V/60Hz		



<b>Temperature</b>	24°C	<b>Humidity</b>	56%
<b>Pol</b>	Neutral	<b>Testmode</b>	WIFI operation(powered by adapter)
<b>TestVoltage</b>	AC120V/60Hz		



\*:Maximum data x:Over limit !:over margin

Note: Measurement=Reading Level+Correc Factor. Factor=(LISN or ISN or PLC or Current Probe)Factor+Cable



## 5. CONDUCTED MAXIMUM OUTPUT POWER

### 5.1. Test limits

FCC PART 15: 15.247.Regulation 15.247(b) The limit of Maximum Peak Output Power Measurement is 1 W(30dBm)

### 5.2. Test Procedure

Details see the KDB558074 D01 Meas Guidancev05r02

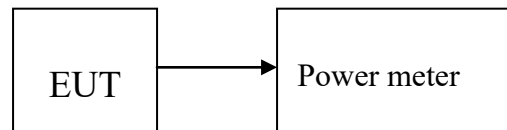
5.2.1 Place the EUT on the table and set it in transmitting mode.

5.2.2 Connected the EUT's antenna port to peak power meter by 20dB attenuator.

5.2.3 Measure out each mode and each bands peak output power of EUT.

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

### 5.3. Test Setup



### 5.4. Test Results

Mode	Frequency (MHz)	Antenna	PK Output power(dBm)	Limit (dBm)	Verdict
802.11b	2412	Ant 1	6.626	30	Pass
802.11b	2437	Ant 1	<b>6.841</b>	30	Pass
802.11b	2462	Ant 1	6.49	30	Pass
802.11g	2412	Ant 1	6.455	30	Pass
802.11g	2437	Ant 1	6.638	30	Pass
802.11g	2462	Ant 1	6.762	30	Pass
802.11n(HT20)	2412	Ant 1	6.455	30	Pass
802.11n(HT20)	2437	Ant 1	6.524	30	Pass
802.11n(HT20)	2462	Ant 1	6.613	30	Pass

## 6. PEAK POWER SPECTRAL DENSITY

### 6.1. Test limits

6.1.1 Please refer FCC PART 15: 15.247.

6.1.2 For direct sequence systems, the peak 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.

6.1.3 The direct sequence operating of the hybrid system, with the frequency hopping operation turned off, shall comply with the power density requirements of paragraph (d) of this section.

### 6.2. Test Procedure

Details see the KDB558074 D01 Meas Guidancev05r02

6.2.1 Place the EUT on the table and set it in transmitting mode.

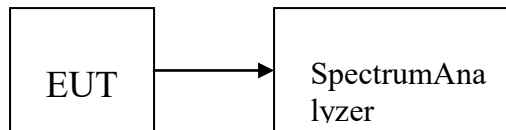
6.2.2 Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to the spectrum analyzer.

6.2.3 Set the spectrum analyzer as  $RBW = 3\text{kHz}$ (Set the RBW to:  $3\text{ kHz} \leq RBW \leq 100\text{ kHz}$ .),  $VBW = 10\text{kHz}$ (Set the  $VBW \geq 3 \times RBW$ ),  $\text{span} \geq 1.5 \times \text{DTS bandwidth}$ ., detail see the test plot.

6.2.4 Record the max reading.

6.2.5 Repeat the above procedure until the measurements for all frequencies are completed.

### 6.3. Test Setup

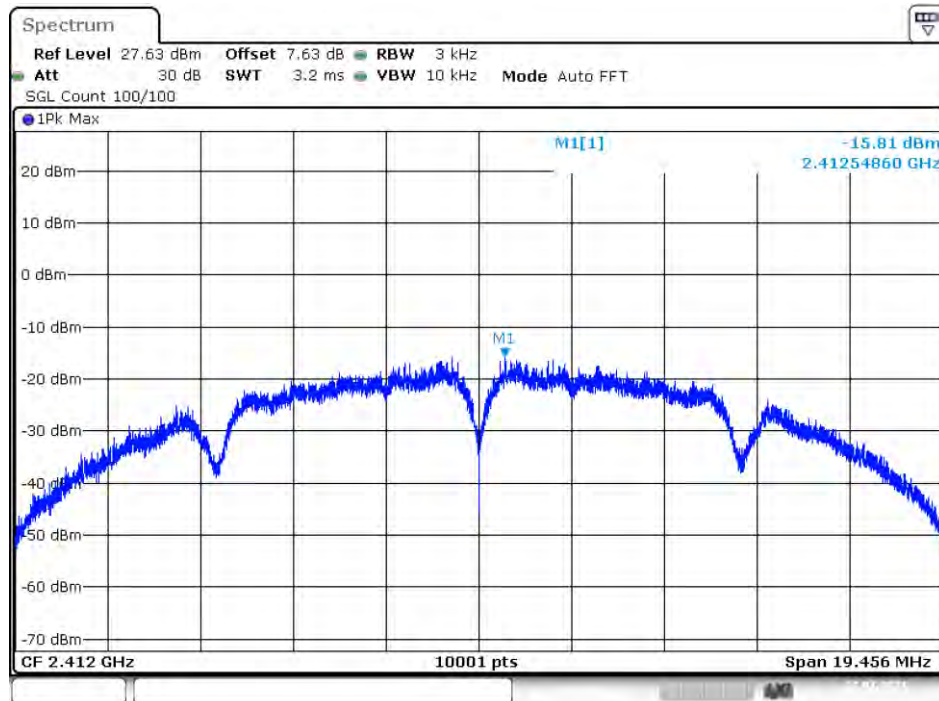




## 6.4. Test Results

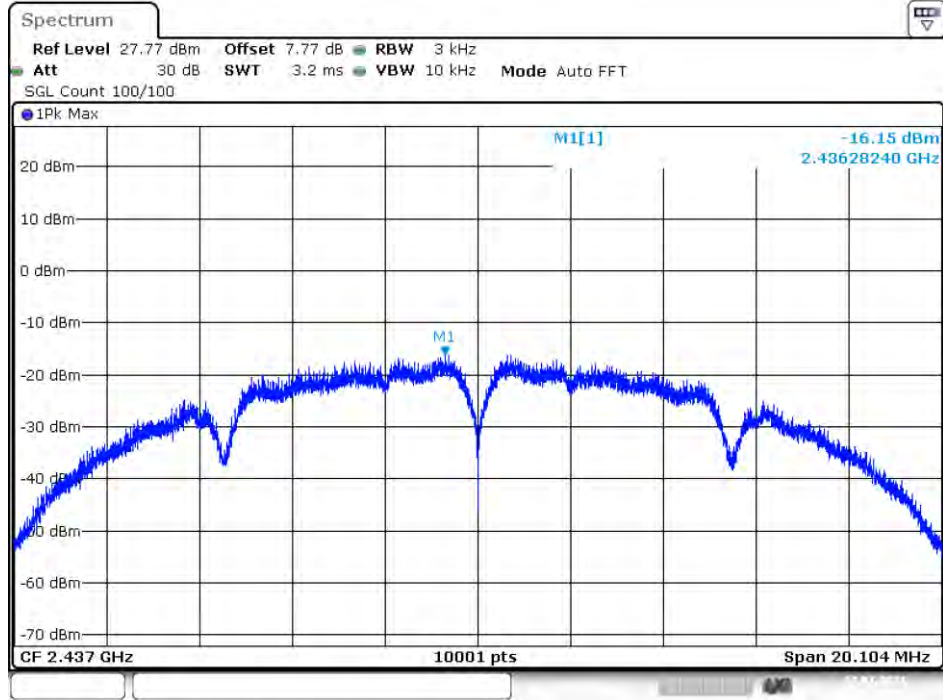
Condition	Mode	Frequency (MHz)	Antenna	Max PSD (dBm/3kHz)	Limit (dBm/3kHz)	Verdict
NVNT	802.11b	2412	Ant 1	-15.812	8	Pass
NVNT	802.11b	2437	Ant 1	-16.153	8	Pass
NVNT	802.11b	2462	Ant 1	-16.252	8	Pass
NVNT	802.11g	2412	Ant 1	-22.492	8	Pass
NVNT	802.11g	2437	Ant 1	-22.376	8	Pass
NVNT	802.11g	2462	Ant 1	-22.145	8	Pass
NVNT	802.11n(HT20)	2412	Ant 1	-23.65	8	Pass
NVNT	802.11n(HT20)	2437	Ant 1	-24.297	8	Pass
NVNT	802.11n(HT20)	2462	Ant 1	-23.413	8	Pass

PSD NVNT 802.11b 2412MHz Ant1



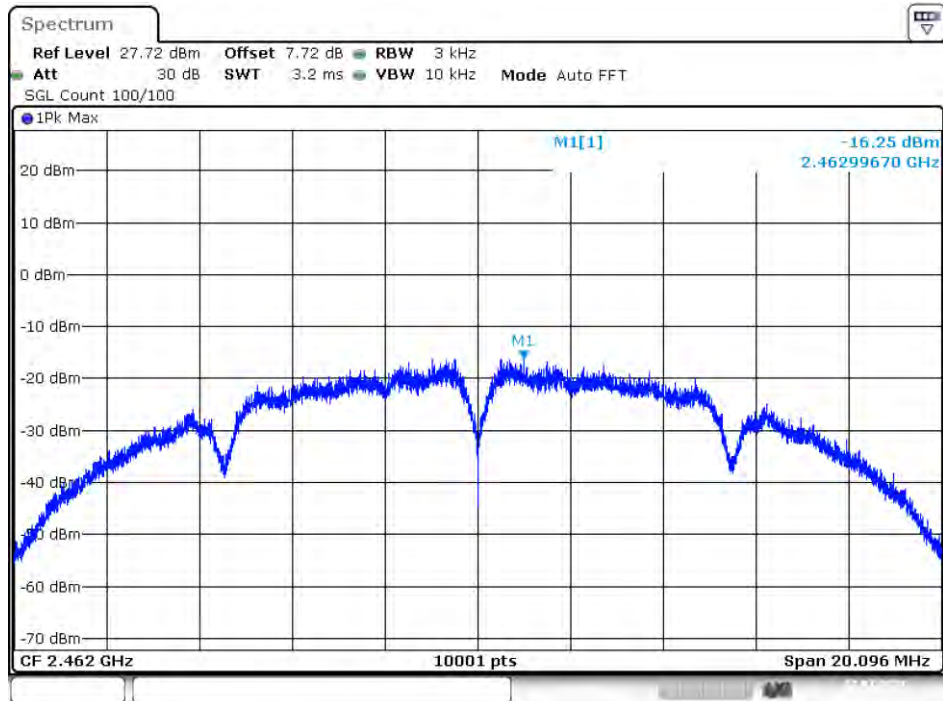
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PSD NVNT 802.11b 2437MHz Ant1



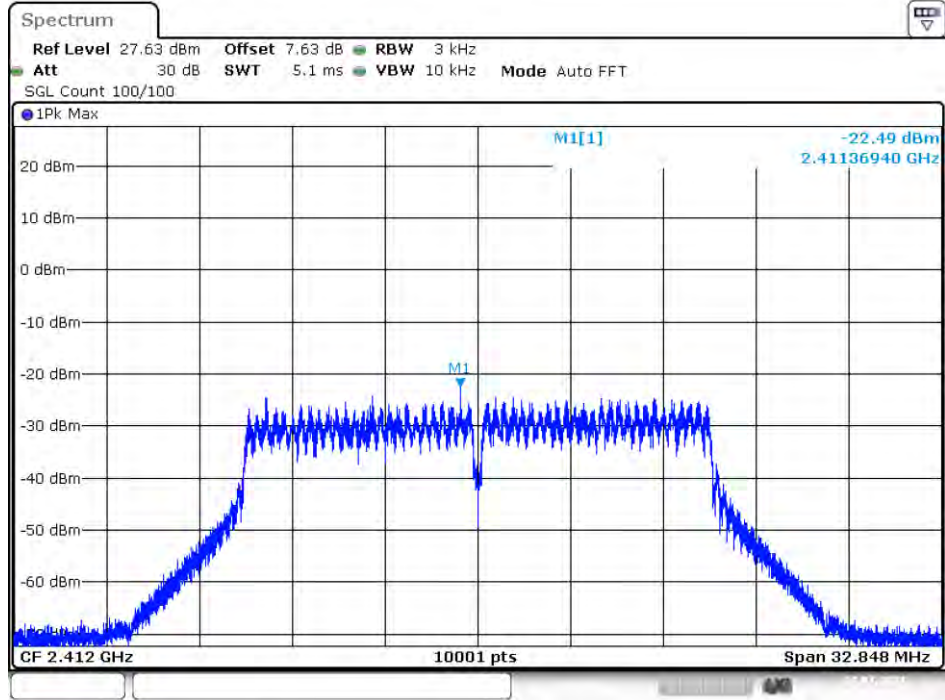
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PSD NVNT 802.11b 2462MHz Ant1



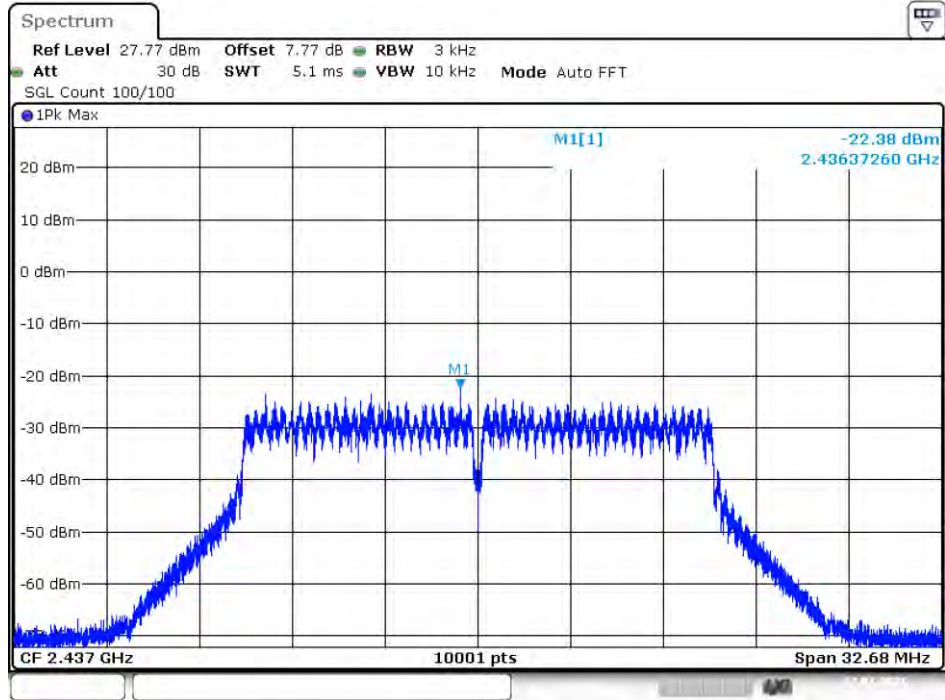
Date: 27.JUL.2021 09:51:37

PSD NVNT 802.11g 2412MHz Ant1



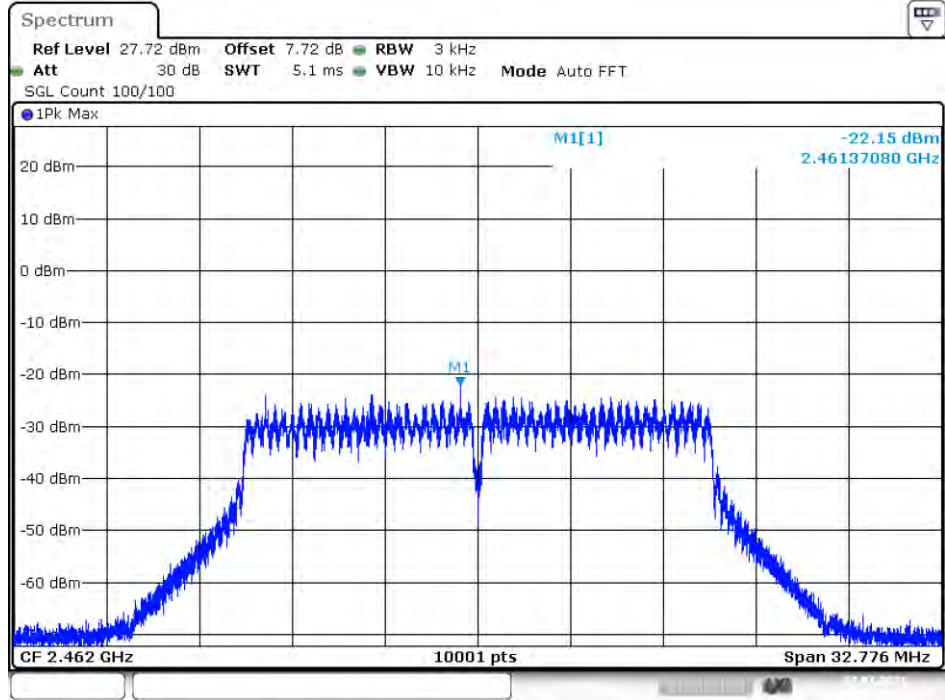
Date: 27.JUL.2021 10:08:22

PSD NVNT 802.11g 2437MHz Ant1



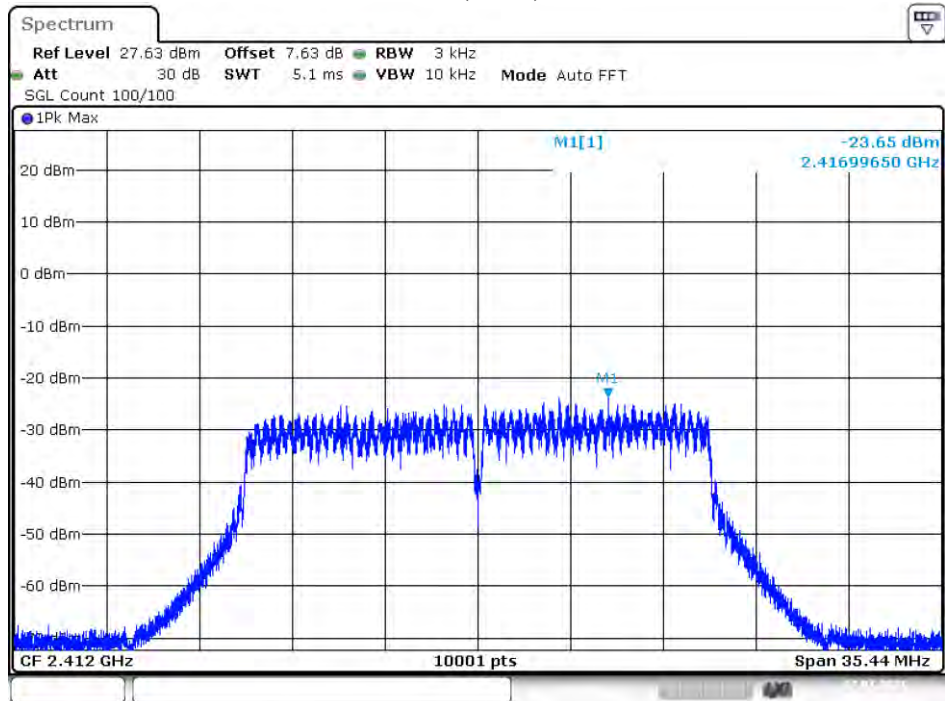
Date: 27.JUL.2021 10:12:45

PSD NVNT 802.11g 2462MHz Ant1



Date: 27.JUL.2021 10:15:52

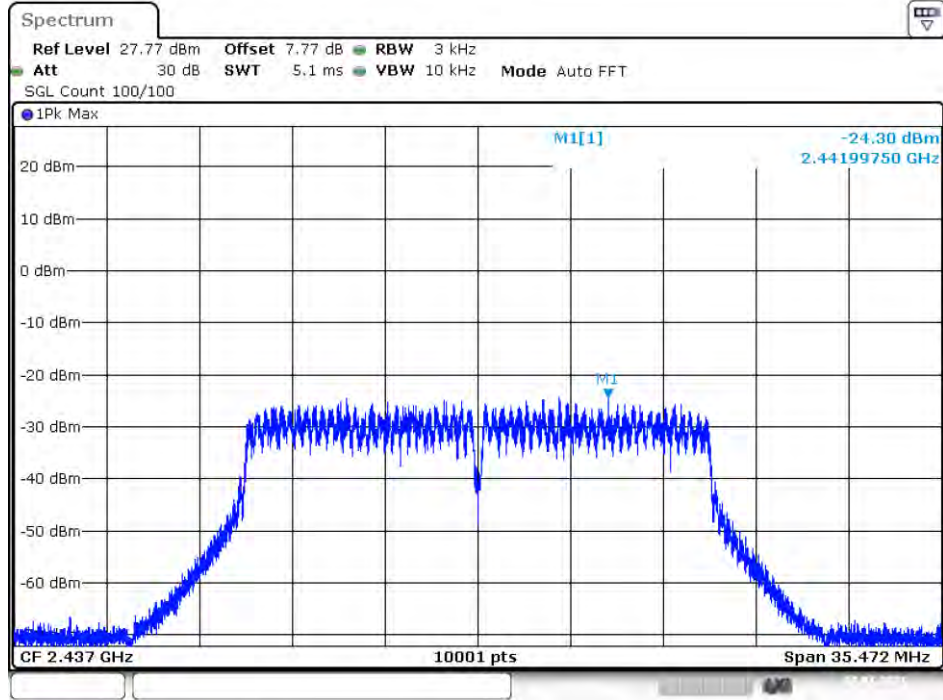
PSD NVNT 802.11n(HT20) 2412MHz Ant1



Date: 27.JUL.2021 10:18:30

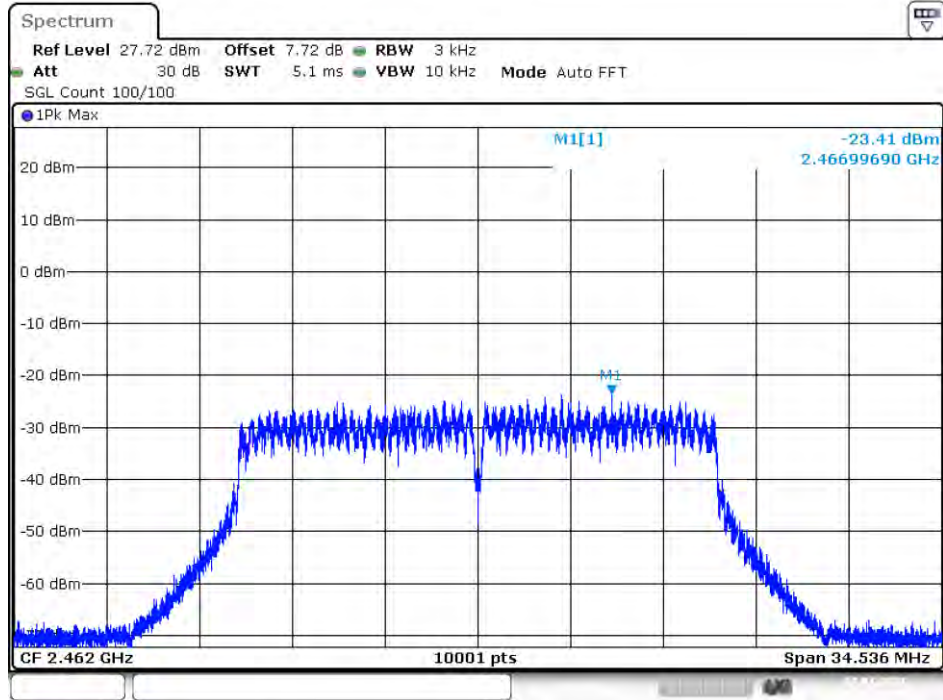


PSD NVNT 802.11n(HT20) 2437MHz Ant1



Date: 27.JUL.2021 10:26:56

PSD NVNT 802.11n(HT20) 2462MHz Ant1



Date: 27.JUL.2021 10:34:04

## 7. BANDWIDTH

### 7.1. Test limits

Please refer FCC PART 15: 15.247

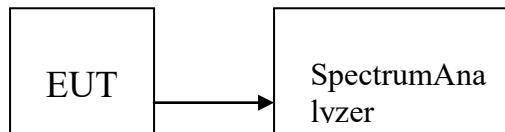
For direct sequence systems, the minimum 6dB bandwidth shall be at least 500kHz.

### 7.2. Test Procedure

Details see the KDB558074 D01 Meas Guidancev05r02

- a) The bandwidth is measured at an amplitude level reduced 6dB from the reference level. The reference level is the level of the highest amplitude signal observed from the transmitter at the fundamental frequency. Once the reference level is established, the equipment is conditioned with typical modulating signal to produce the worst-case (i.e. the widest) bandwidth.
- b) The test receiver set  $RBW = 1-5\%BW$ ,  $VBW \geq 3*RBW$ , Sweep time set auto, detail see the test plot for 99%Bandwidth.
- c) The test receiver set  $RBW = 100kHz$ ,  $VBW \geq 3*RBW = 300kHz$ , Sweep time set auto, detail see the test plot for 6dBBandwidth.

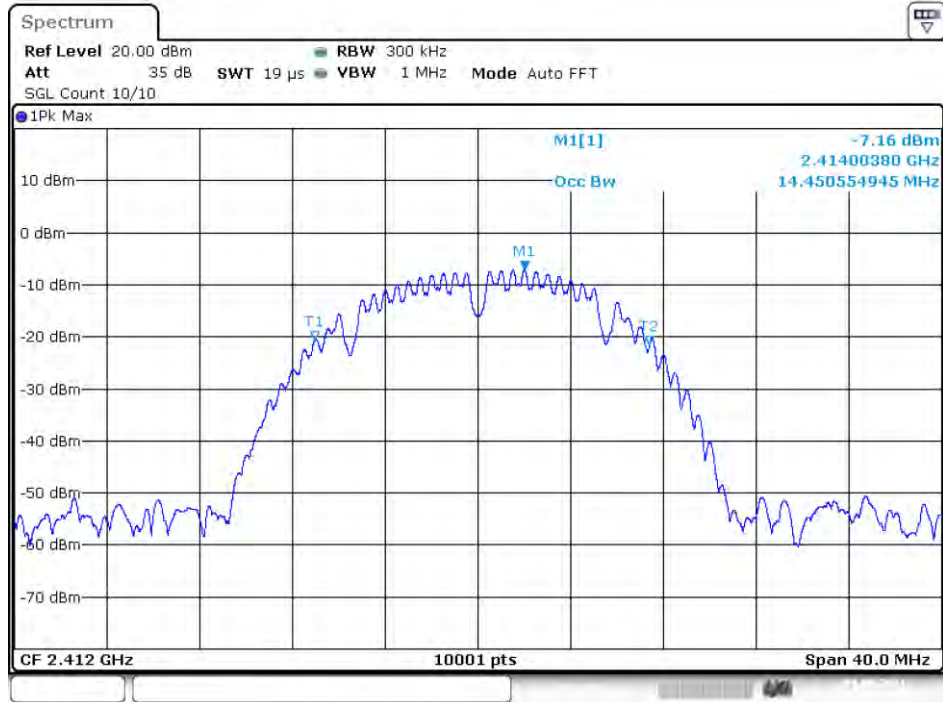
### 7.3. Test Setup



### 7.4. Test Results

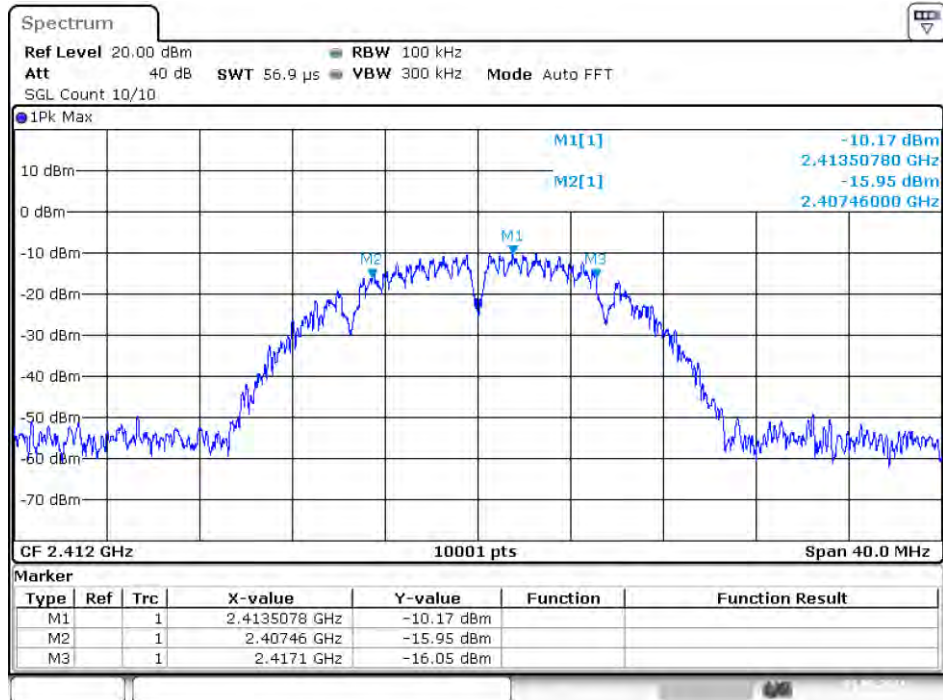
Condition	Mode	Frequency (MHz)	Antenna	99% OBW (MHz)	-6 dB Bandwidth (MHz)	Limit -6 dB Bandwidth (MHz)	Verdict
NVNT	802.11b	2412	Ant 1	14.4506	9.64	0.5	Pass
NVNT	802.11b	2437	Ant 1	14.5825	10.124	0.5	Pass
NVNT	802.11b	2462	Ant 1	14.5065	10.06	0.5	Pass
NVNT	802.11g	2412	Ant 1	16.5423	16.452	0.5	Pass
NVNT	802.11g	2437	Ant 1	16.9143	16.432	0.5	Pass
NVNT	802.11g	2462	Ant 1	16.9343	16.412	0.5	Pass
NVNT	802.11n(HT20)	2412	Ant 1	17.6502	17.584	0.5	Pass
NVNT	802.11n(HT20)	2437	Ant 1	17.7982	17.692	0.5	Pass
NVNT	802.11n(HT20)	2462	Ant 1	17.9102	17.768	0.5	Pass

OBW NVNT 802.11b 2412MHz Ant1



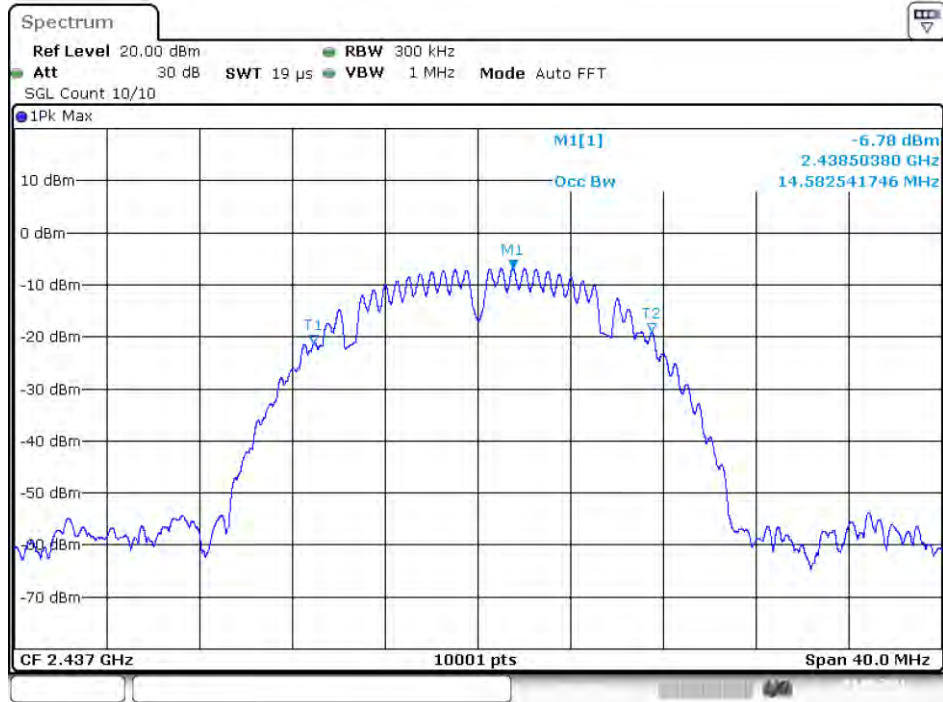
Date: 1.SEP.2021 11:42:39

-6 dB BW NVNT 802.11b 2412MHz Ant1



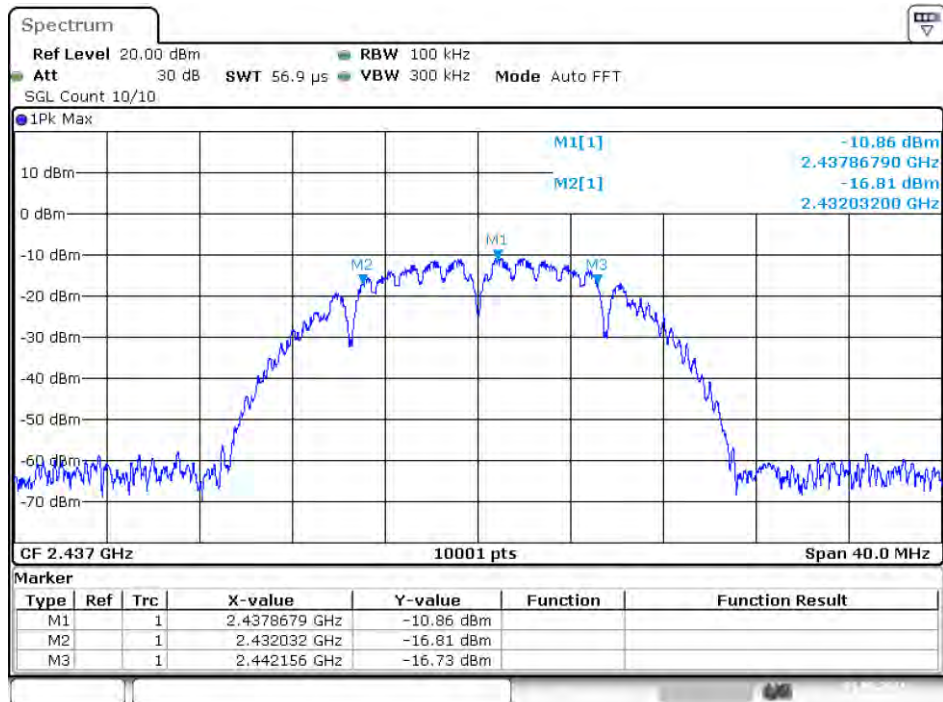
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OBW NVNT 802.11b 2437MHz Ant1



Date: 1.SEP.2021 11:43:01

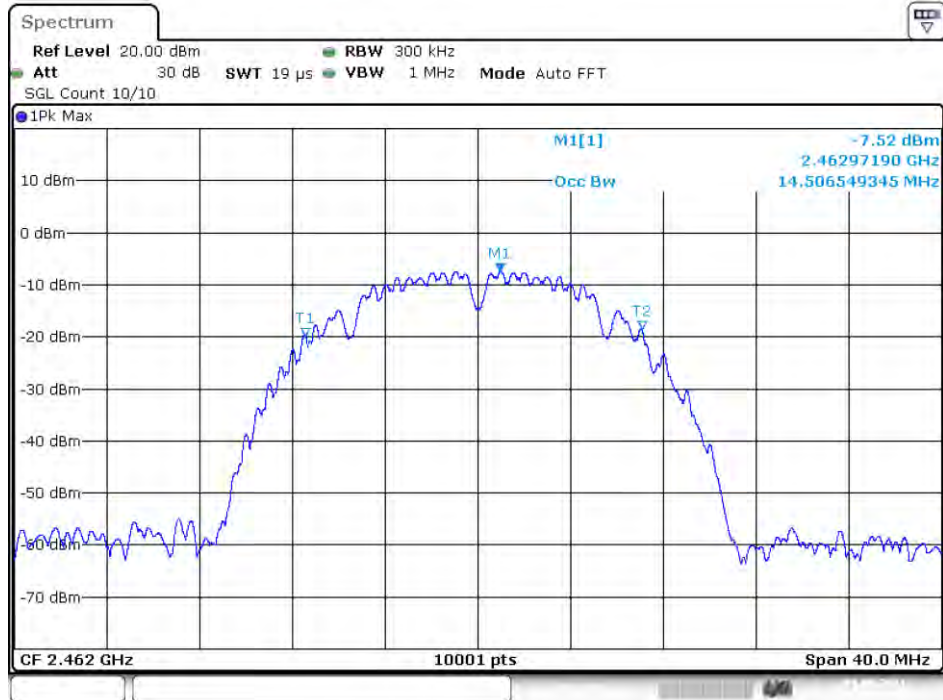
-6 dB BW NVNT 802.11b 2437MHz Ant1



Date: 1.SEP.2021 11:43:03

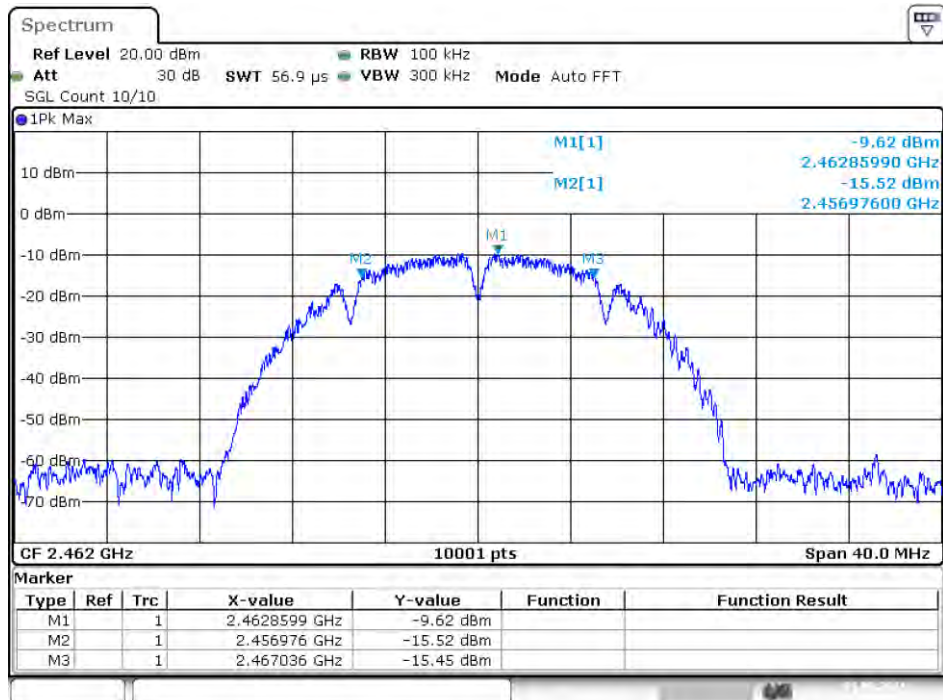


OBW NVNT 802.11b 2462MHz Ant1



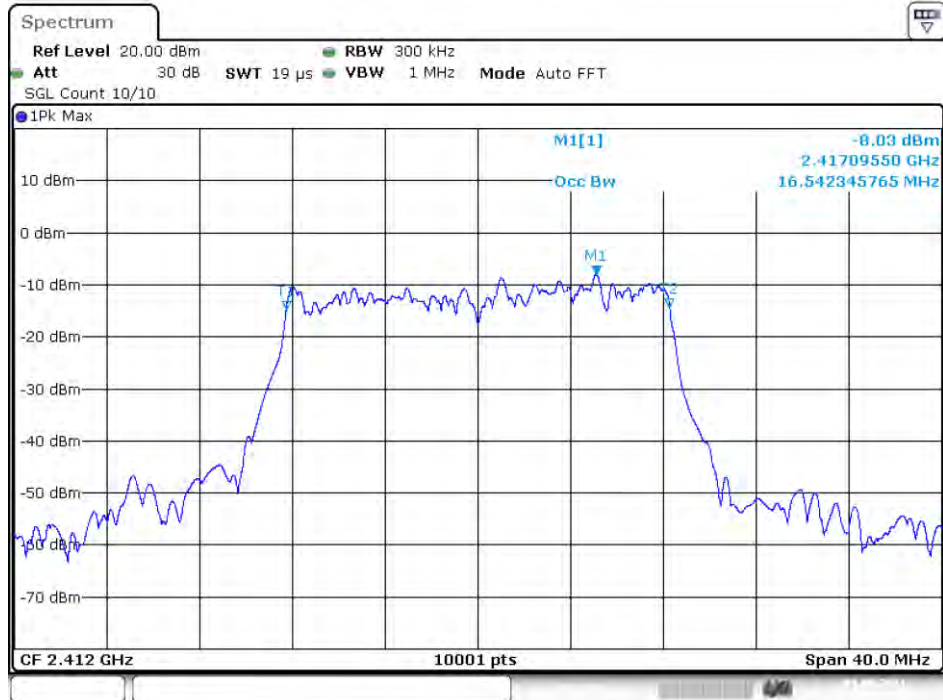
Date: 1.SEP.2021 11:43:21

-6 dB BW NVNT 802.11b 2462MHz Ant1



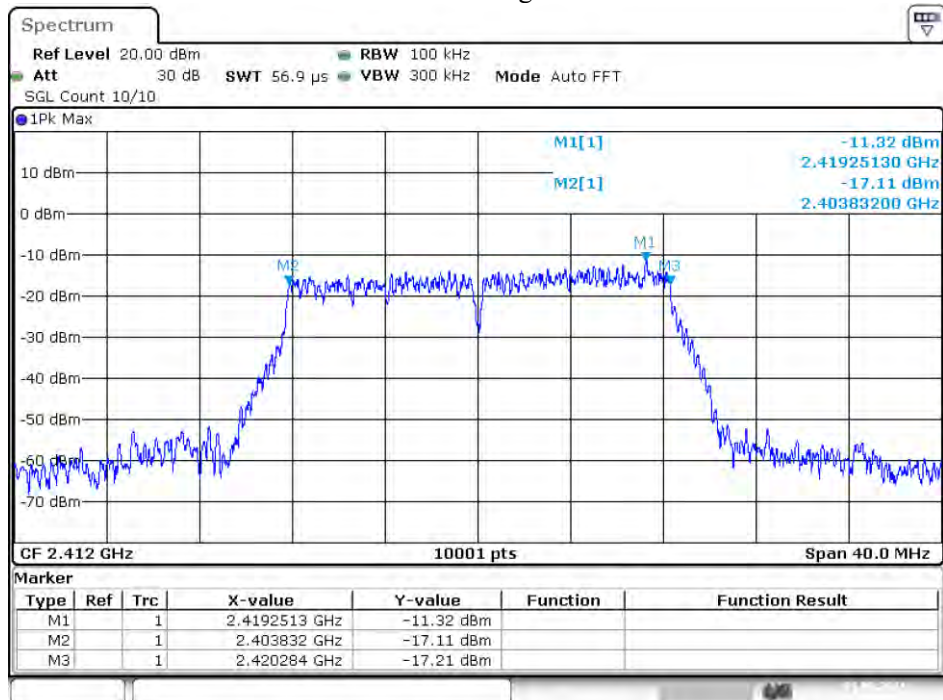
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OBW NVNT 802.11g 2412MHz Ant1



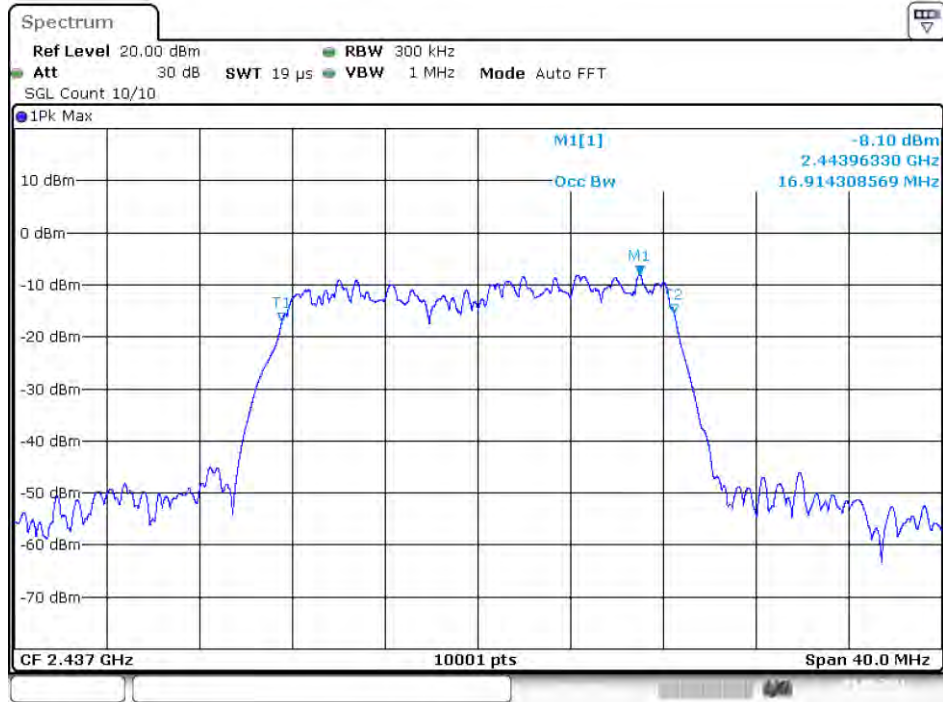
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-6 dB BW NVNT 802.11g 2412MHz Ant1



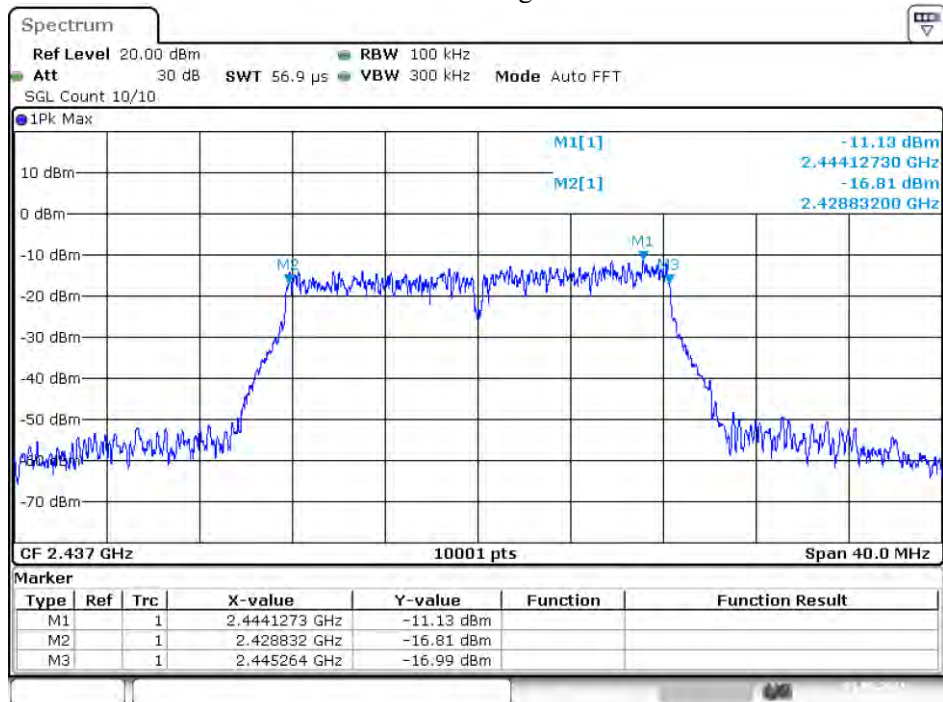
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OBW NVNT 802.11g 2437MHz Ant1



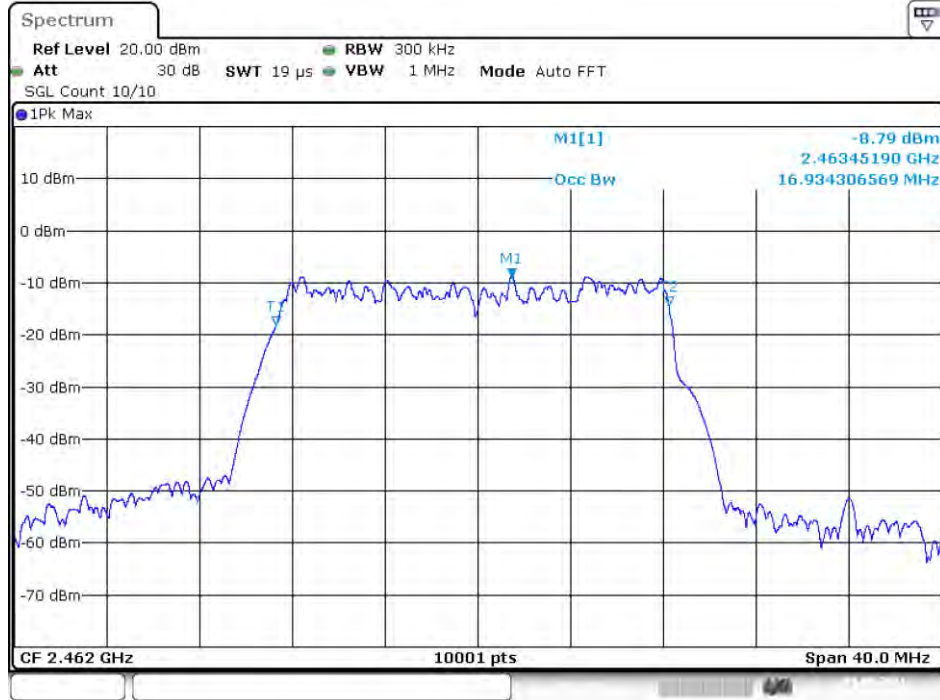
Date: 1.SEP.2021 11:45:20

-6 dB BW NVNT 802.11g 2437MHz Ant1



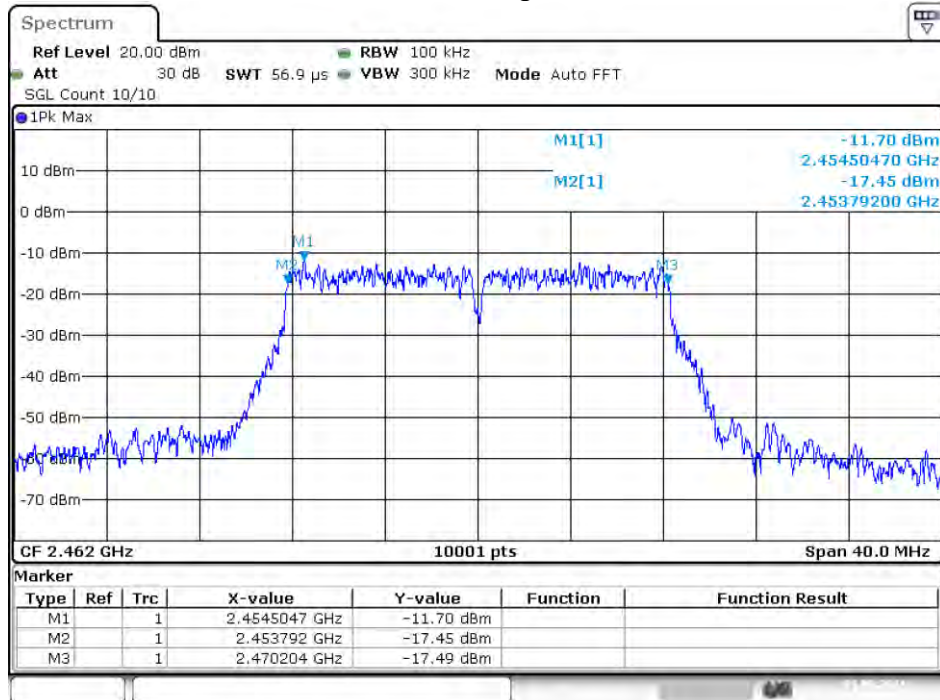
Date: 1.SEP.2021 11:45:22

OBW NVNT 802.11g 2462MHz Ant1



Date: 1.SEP.2021 11:45:44

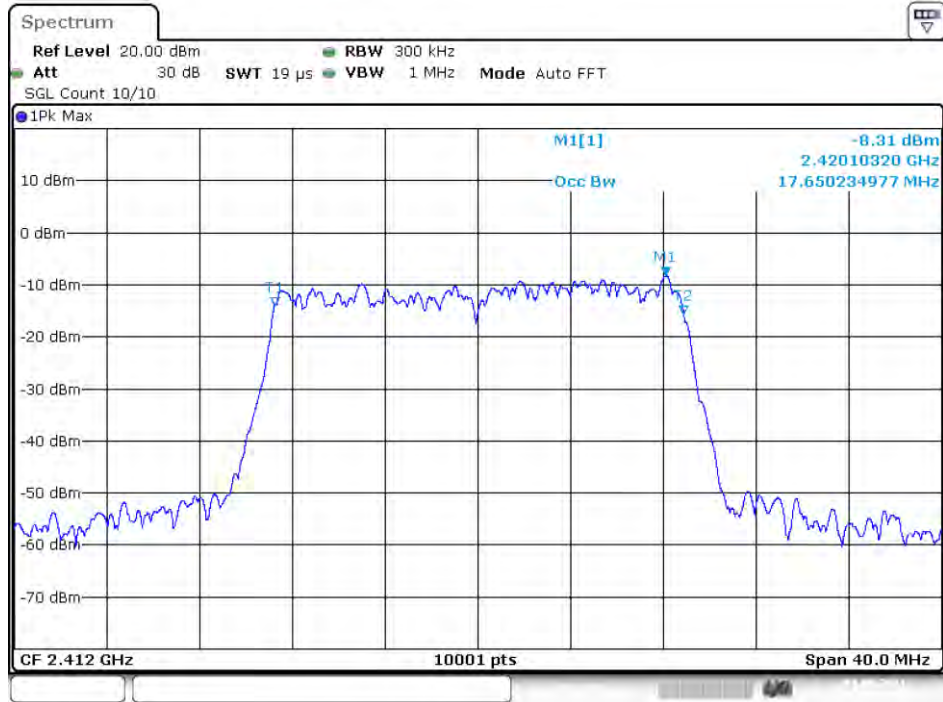
-6 dB BW NVNT 802.11g 2462MHz Ant1



Date: 1.SEP.2021 11:45:47

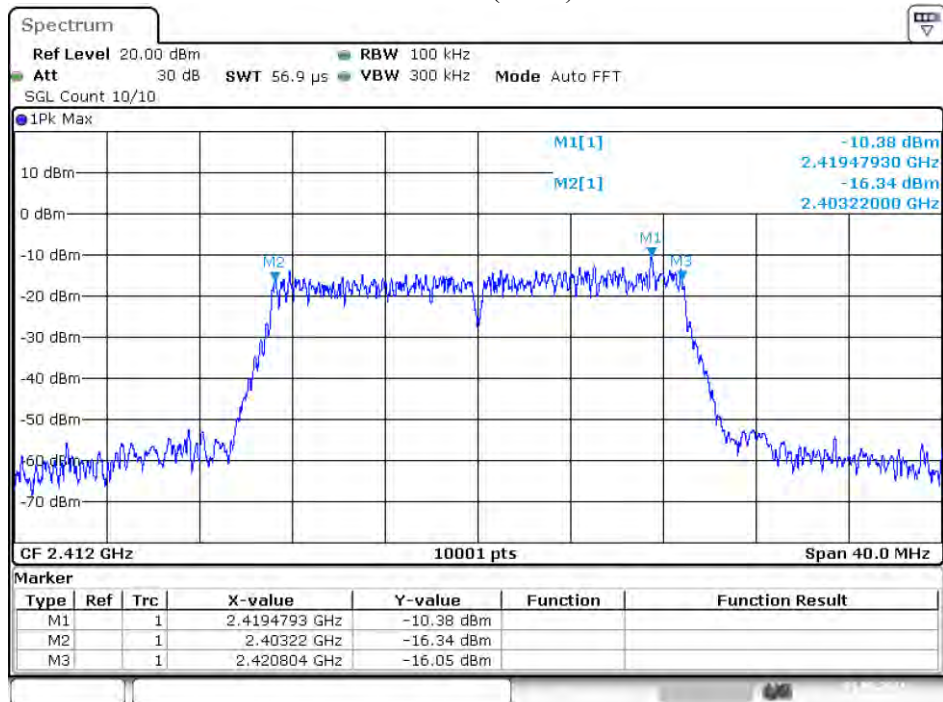


OBW NVNT 802.11n(HT20) 2412MHz Ant1



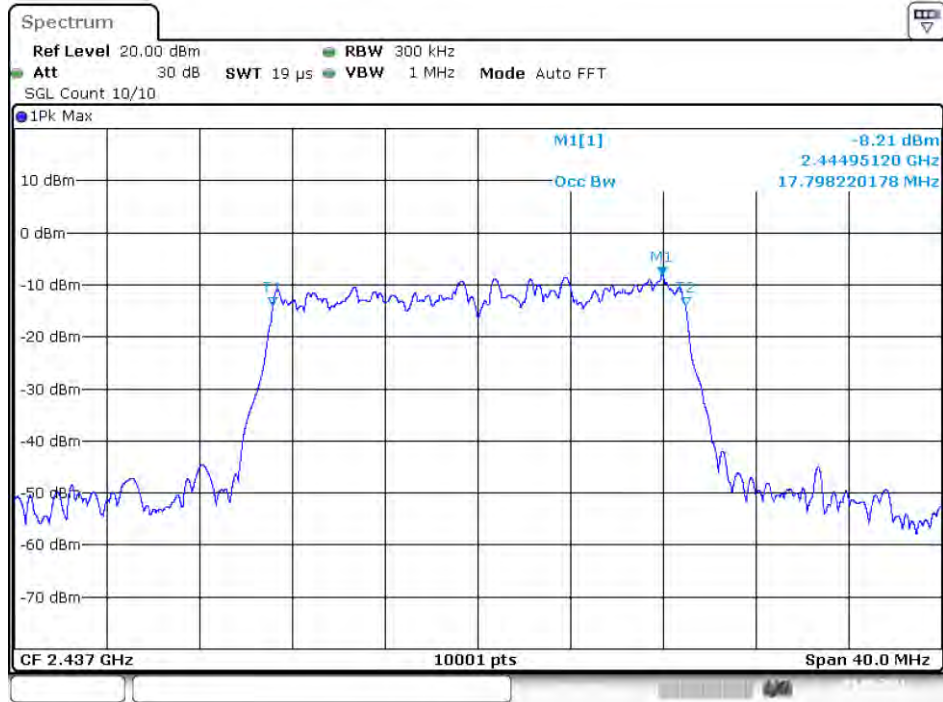
Date: 1.SEP.2021 11:46:11

-6 dB BW NVNT 802.11n(HT20) 2412MHz Ant1



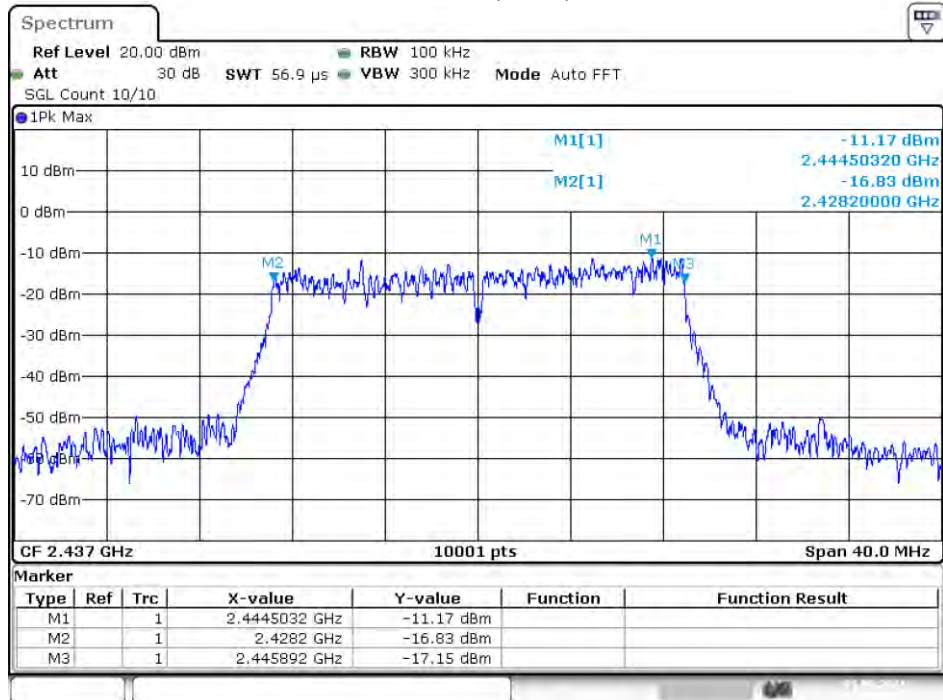
Date: 1.SEP.2021 11:46:13

OBW NVNT 802.11n(HT20) 2437MHz Ant1



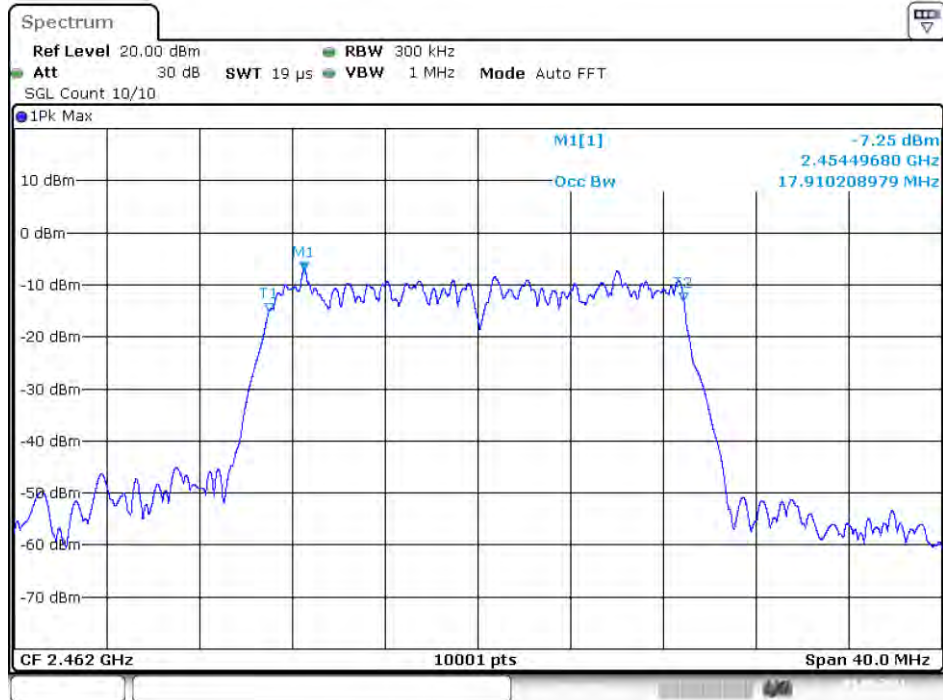
Date: 1.SEP.2021 11:47:04

-6 dB BW NVNT 802.11n(HT20) 2437MHz Ant1



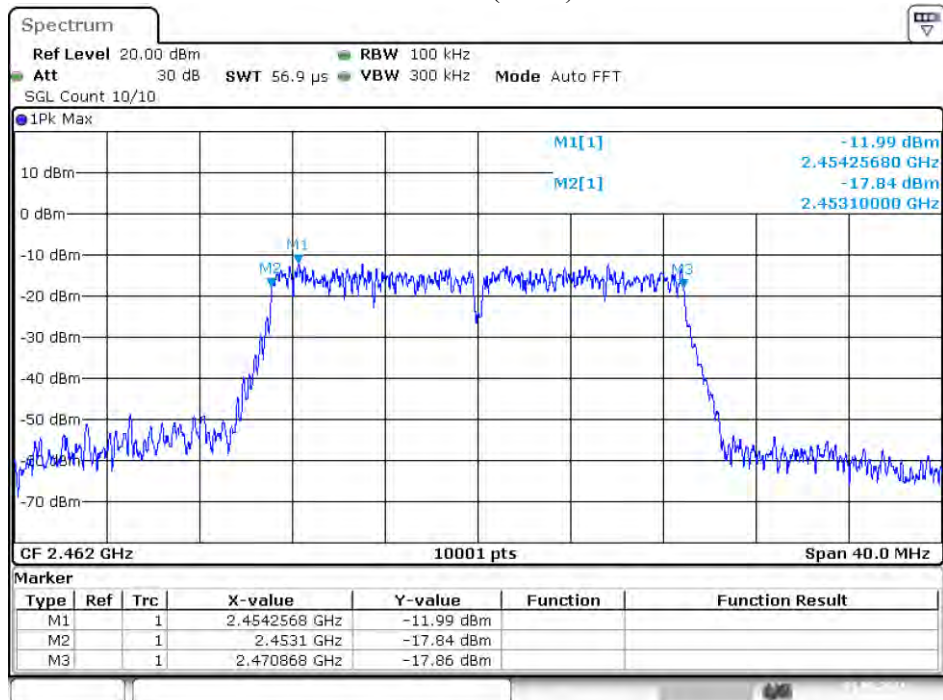
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OBW NVNT 802.11n(HT20) 2462MHz Ant1



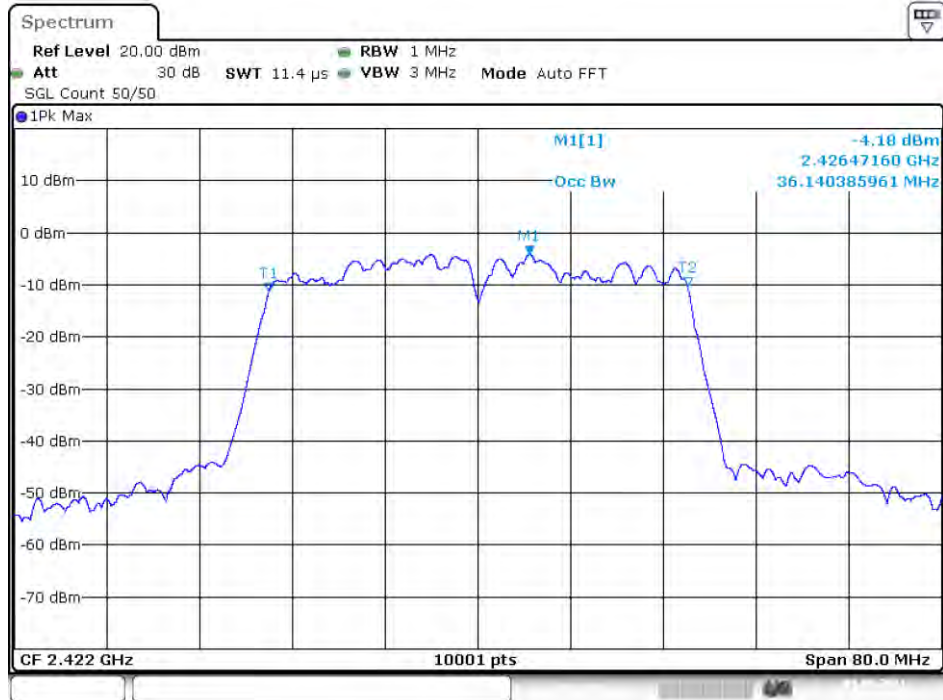
Date: 1.SEP.2021 11:48:53

-6 dB BW NVNT 802.11n(HT20) 2462MHz Ant1



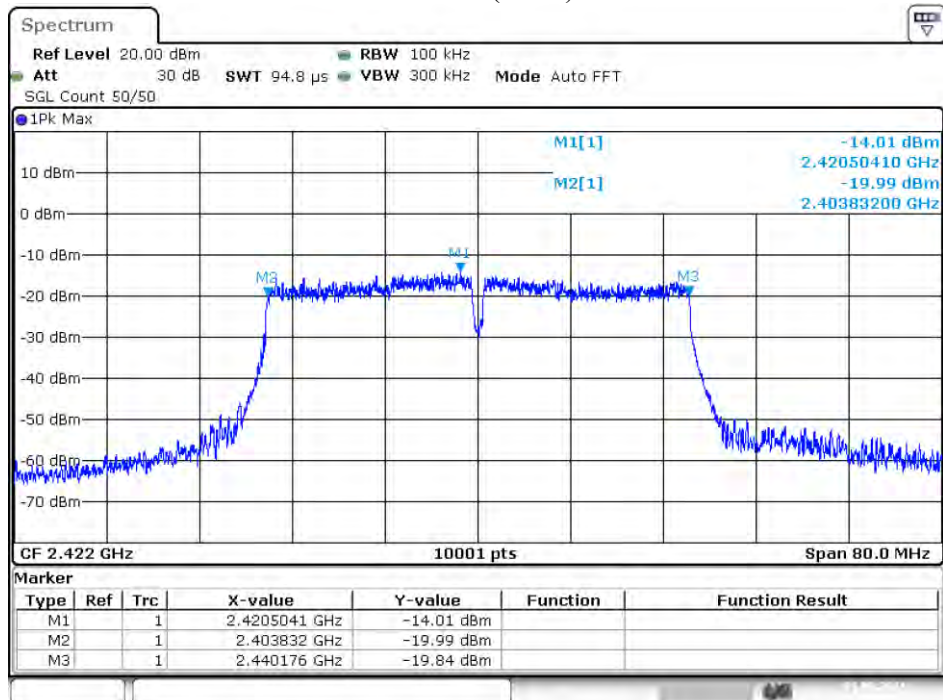
Date: 1.SEP.2021 11:48:56

OBW NVNT 802.11n(HT40) 2422MHz Ant1



Date: 1.SEP.2021 11:49:30

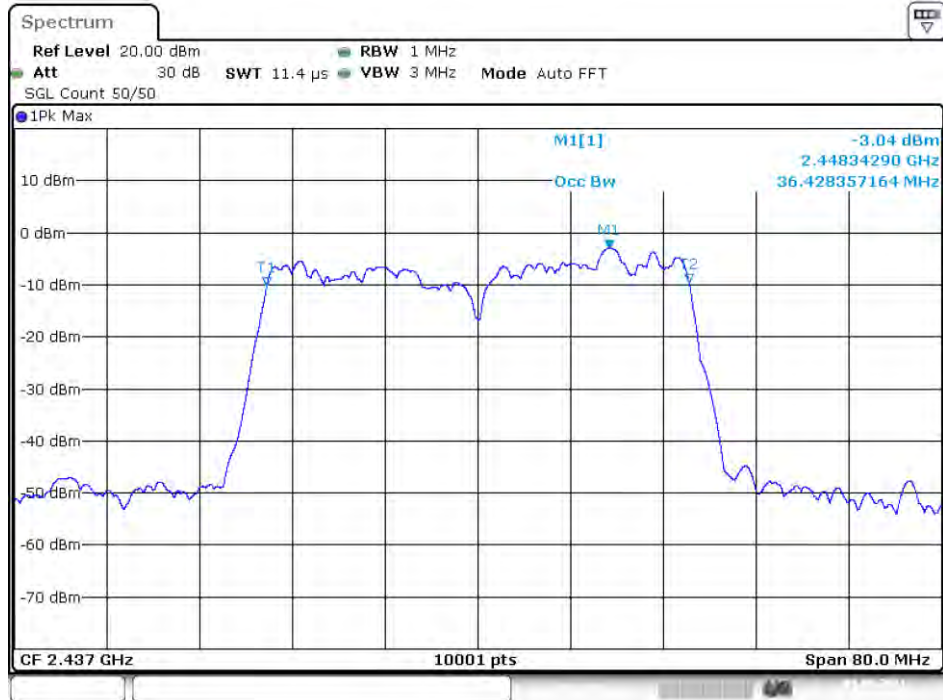
-6 dB BW NVNT 802.11n(HT40) 2422MHz Ant1



Date: 1.SEP.2021 11:49:34

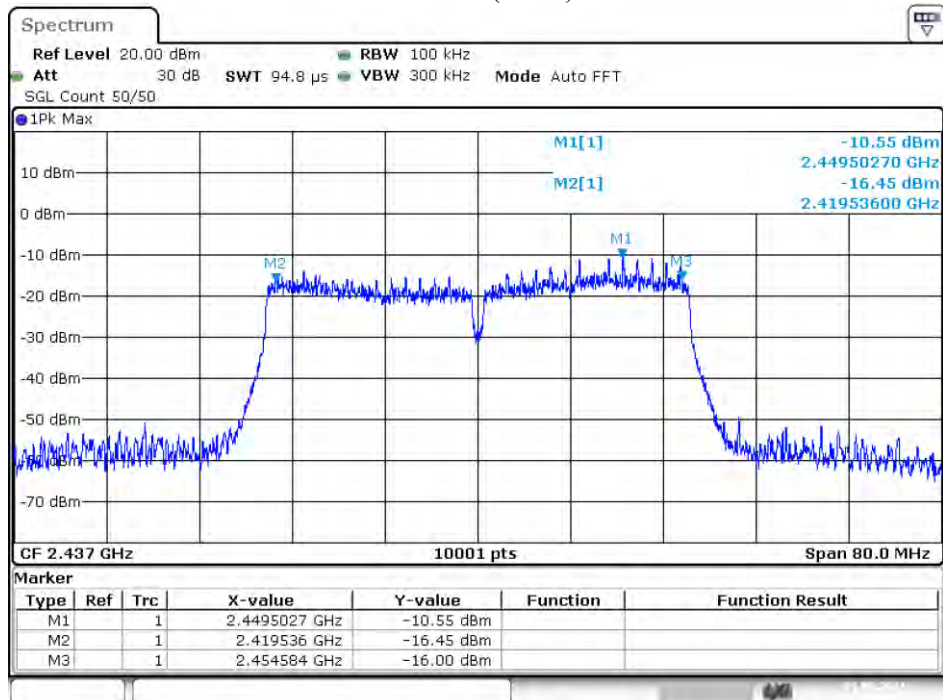


OBW NVNT 802.11n(HT40) 2437MHz Ant1



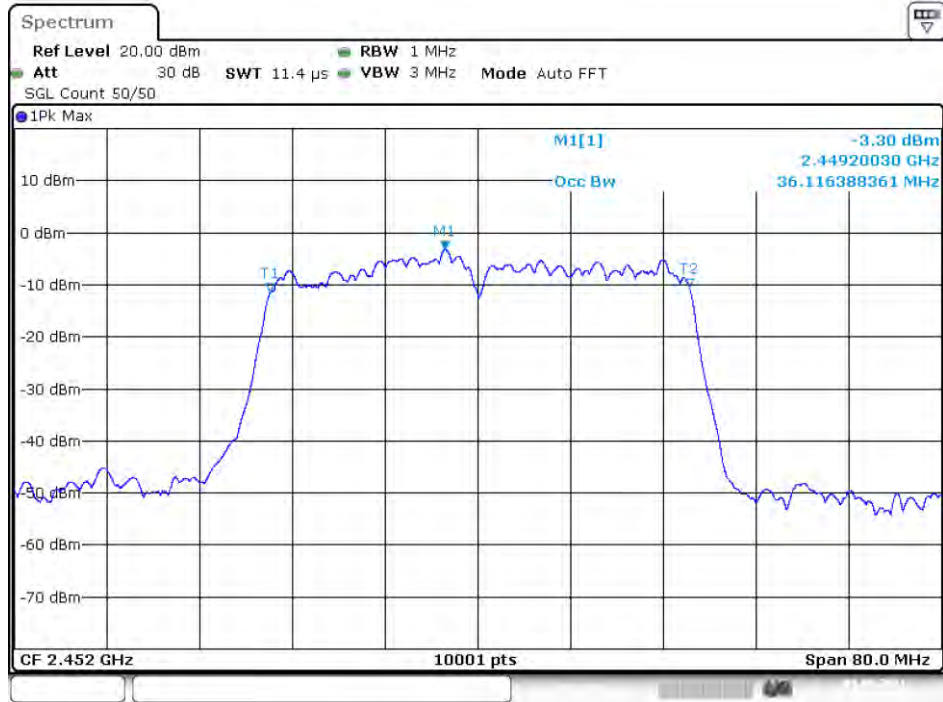
Date: 1.SEP.2021 11:50:36

-6 dB BW NVNT 802.11n(HT40) 2437MHz Ant1



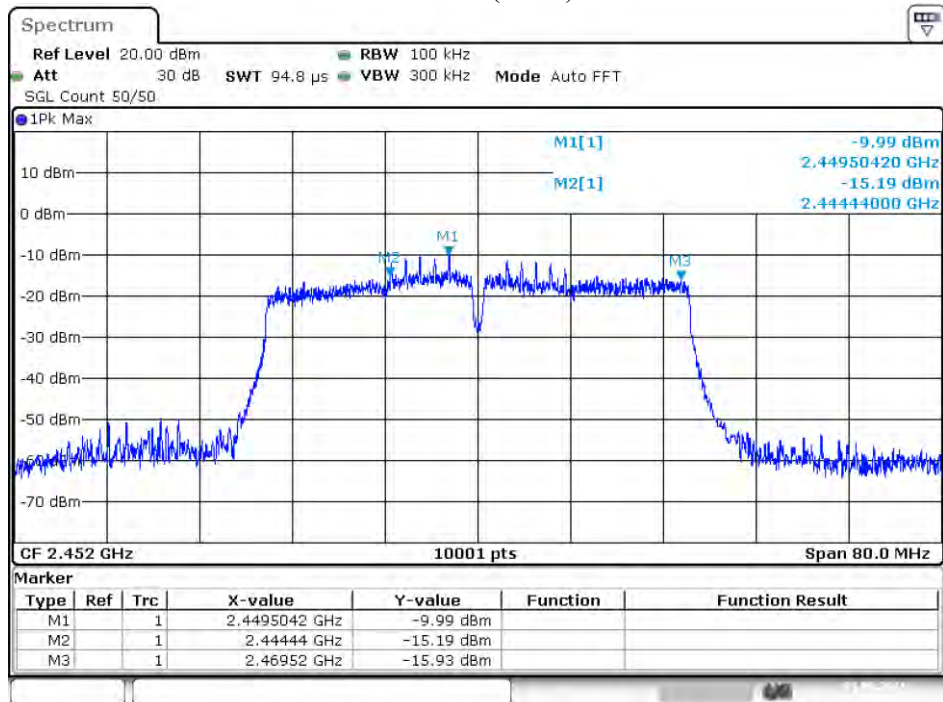
Date: 1.SEP.2021 11:50:40

OBW NVNT 802.11n(HT40) 2452MHz Ant1



Date: 1.SEP.2021 11:51:54

-6 dB BW NVNT 802.11n(HT40) 2452MHz Ant1



Date: 1.SEP.2021 11:51:57

## 8. BAND EDGE CHECK

### 8.1. Test limits

Please refer FCC PART 15: 15.247

All the lower and upper band-edges emissions appearing within 2310MHz to 2390MHz and 2483.5MHz to 2500MHz restricted frequency bands shall not exceed the limits shown in 15.209, all the other emissions outside operation frequency band 2400MHz to 2483.5MHz shall be at least 20dB below the fundamental emissions, or comply with 15.209 limits.

### 8.2. Test Procedure

Details see the KDB558074 D01 Meas Guidancev05r02

8.2.1 Put the EUT on a 1.5m high table, power on the EUT. Emissions were scanned and measured rotating the EUT to 360 degrees, Find the maximum Emission

8.2.2 Check the spurious emissions out of band.

8.2.3 RBW 1MHz, VBW 3MHz, peak detector for peak value, RBW 1MHz , VBW 10Hz , RMS detector for AV value.

### 8.3. Test Setup

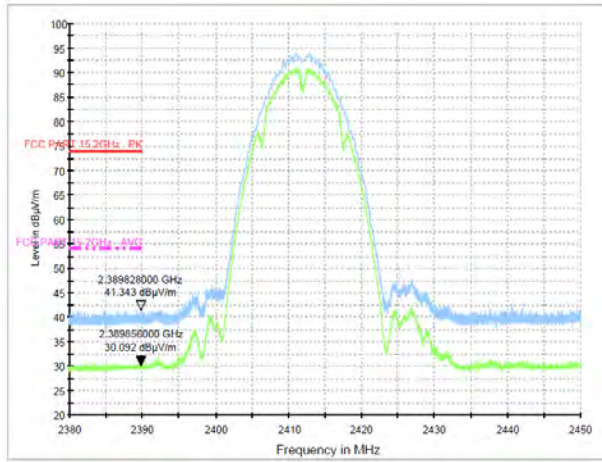
Same as 5.2.2.

### 8.4. Test Results

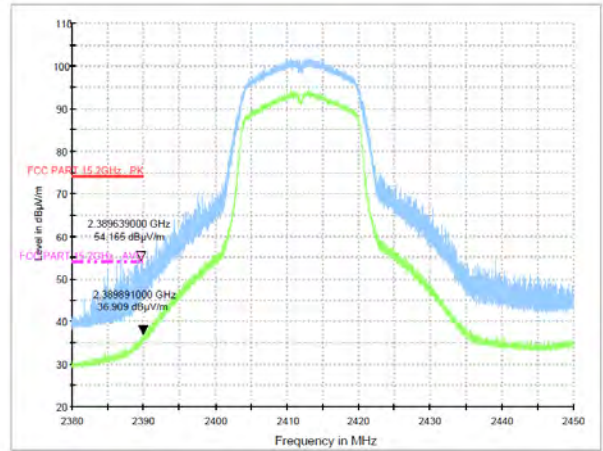
PASS.

Detailed information please see the following page.

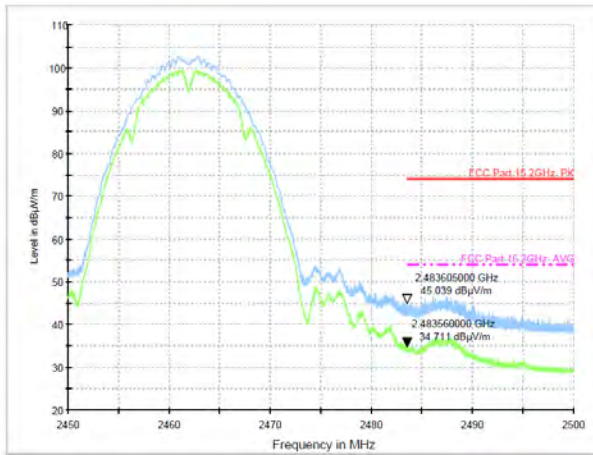
Test Mode: IEEE 802.11b-Low



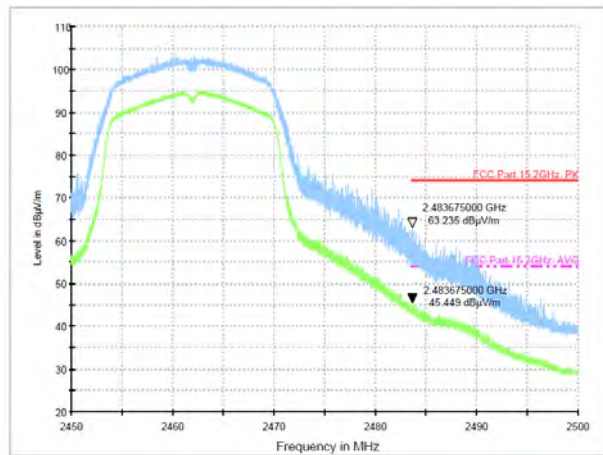
Test Mode: IEEE 802.11g-Low



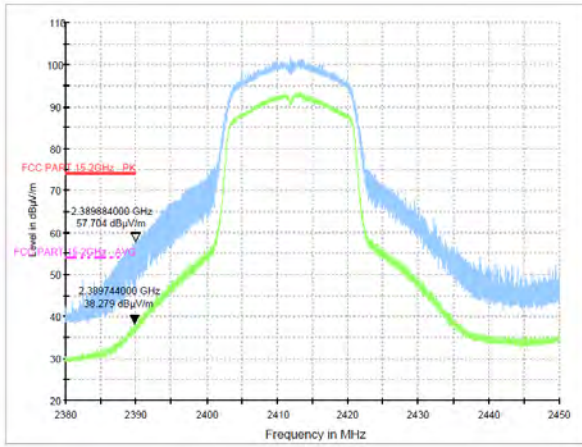
Test Mode: IEEE 802.11b-High



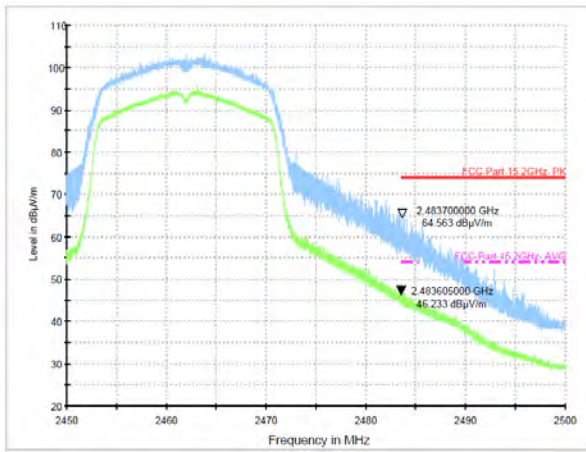
Test Mode: IEEE 802.11g-High



Test Mode: IEEE 802.11n20-Low



Test Mode: IEEE 802.11n20-High



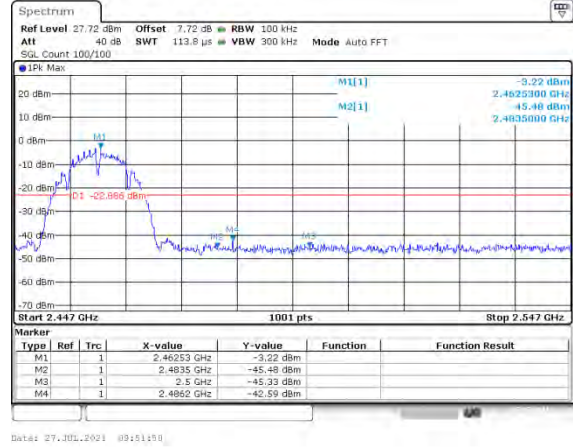


Test mode: 802.11b



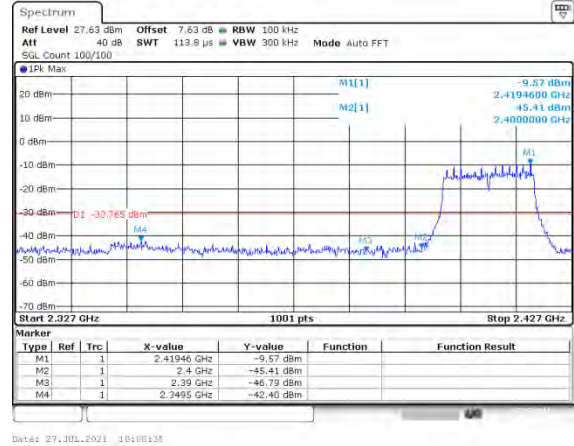
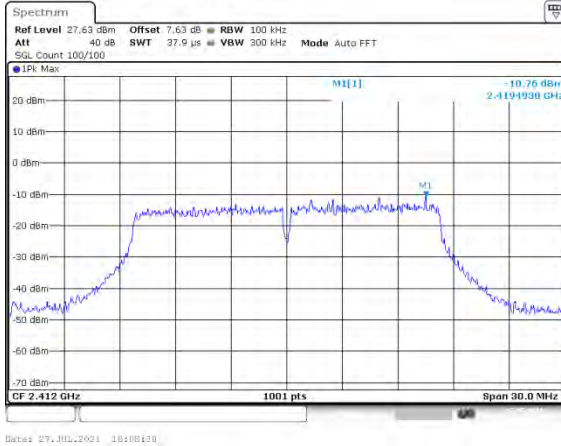
Lowest channel

Test mode: 802.11b



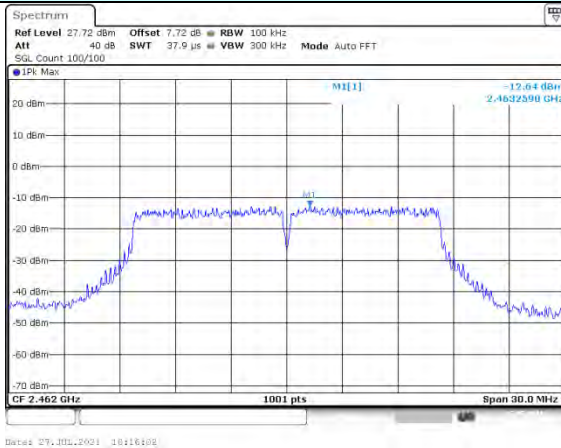
Highest channel

Test mode: 802.11g



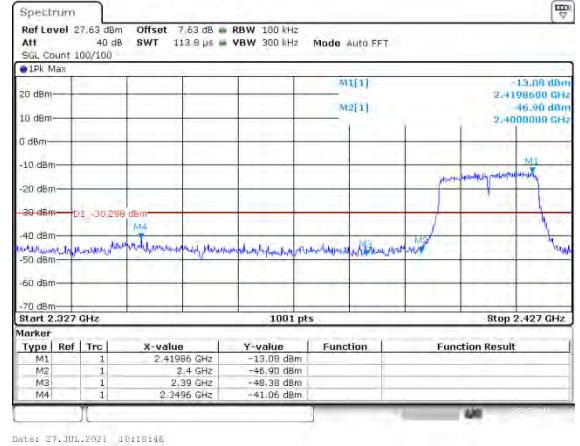
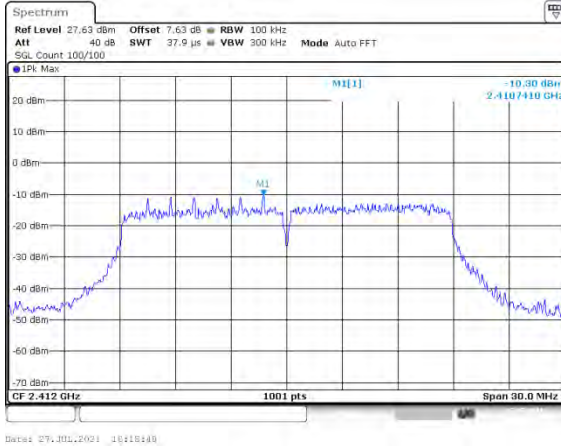
Lowest channel

Test mode: 802.11g



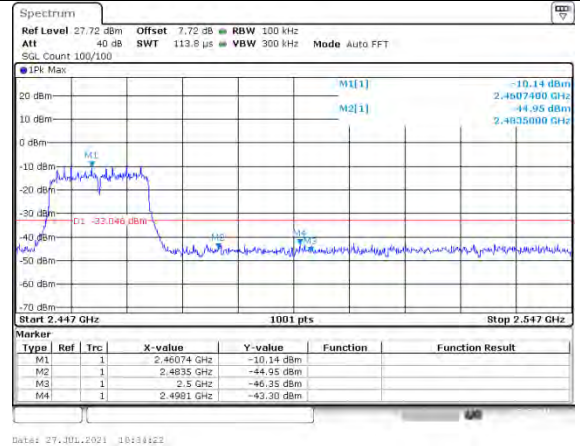
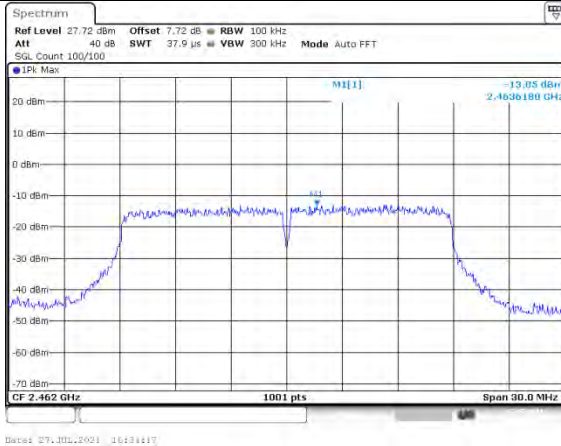
Highest channel

Test mode: 802.11n(HT20)



Lowest channel

Test mode: 802.11n(HT20)



Highest channel



## **9. ANTENNA REQUIREMENT**

### **9.1. Standard Requirement**

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

### **9.2. Antenna Connected Construction**

The antenna connector is unique antenna and no consideration of replacement. Please see EUT photo for details.

### **9.3. Results**

According to the manufacturer declared, the EUT has an Integral antenna, the max. directional gain of antenna is 3dBi, and the antenna connector is designed with permanent attachment and no consideration of replacement. Therefore it complies with the standard requirement.

**-----THE END OF REPORT-----**