TEST REPORT

Application No.:	FYCR2211000442AT
Applicant:	TomTom International BV
Address of Applicant:	De Ruijterkade 154 1011 AC Amsterdam, The Netherlands
Manufacturer:	TomTom International BV
Address of Manufacturer:	De Ruijterkade 154 1011 AC Amsterdam, The Netherlands
Factory:	Hunan Zhonglongtong Technology Co., Ltd
Address of Factory:	Floor 3, Building 1, Xiangjiang Kunpeng Industrial Park, No. 67, Ziyuan Road, Shixue Street, Yuelu District, Changsha City, Hunan Province, China
Equipment Under Test (EUT):	
EUT Name:	WiFi/BT Module
Model No.:	AW869A
Trade Mark:	TomTom
FCC ID:	S4LFF51
Standard(s) :	47 CFR Part 15, Subpart C 15.247
Date of Receipt:	2022-11-07
Date of Test:	2022-11-24 to 2022-12-14
Date of Issue:	2022-12-19
Test Result:	**Pass***

* In the configuration tested, the EUT complied with the standards specified above.

Winkey Wang
EMC Technical Manager

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Revision Record				
Version	***Chapter***	***Date***	***Modifier***	***Remark***
01		*2022-12-20*		*Original*

Authorized for issue by:				
		Tree Zhan		
		Tree Zhan/Project Engineer		
		Winkey Wang		
		Winkey Wang/Reviewer		

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2 Test Summary

Radio Spectrum Technical Requirement				
Item	**Standard**	**Method**	**Requirement**	**Result**
Antenna Requirement	47 CFR Part 15, Subpart C 15.247	N/A	47 CFR Part 15, Subpart C 15.203 & 15.247(b)(4)	Pass

Radio Spectrum Matter Part				
Item	**Standard**	**Method**	**Requirement**	**Result**
Conducted Peak Output Power	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 11.9.2	47 CFR Part 15, Subpart C 15.247(b)(3)	Pass
Minimum 6dB Bandwidth		ANSI C63.10 (2013) Section 11.8.1	47 CFR Part 15, Subpart C 15.247a(2)	Pass
Power Spectrum Density		ANSI C63.10 (2013) Section 11.10.2	47 CFR Part 15, Subpart C 15.247(e)	Pass
Conducted Band Edges Measurement		ANSI C63.10 (2013) Section 11.13.3.2	47 CFR Part 15, Subpart C 15.247(d)	Pass
Conducted Spurious Emissions		ANSI C63.10 (2013) Section 11.11	47 CFR Part 15, Subpart C 15.247(d)	Pass
Radiated Emissions which fall in the restricted bands		ANSI C63.10 (2013) Section 6.10.5	47 CFR Part 15, Subpart C 15.205 & 15.209	Pass
Radiated Spurious Emissions Below 1GHz		ANSI C63.10 (2013) Section 6.4,6.5	47 CFR Part 15, Subpart C 15.205 & 15.209	Pass
Radiated Spurious Emissions Above 1GHz		ANSI C63.10 (2013) Section 6.6	47 CFR Part 15, Subpart C 15.205 & 15.209	Pass

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4 General Information

4.1 Details of E.U.T.

Power supply:	DC5V(Adapter or host equipment)
Operation Frequency:	802.11b/g/n(HT20): 2412MHz to 2462MHz;802.11n(HT40): 2422MHz to 2452MHz
Modulation Type:	802.11b: DSSS (CCK, DQPSK, DBPSK);802.11g/n: OFDM (64QAM, 16QAM, QPSK, BPSK)
Number of Channels:	802.11b/g/n(HT20):11;802.11n(HT40):7
Channel Spacing:	5MHz
Antenna Type:	FPC
Antenna Gain:	0.29dBi

Remark: The information in this section is provided by the applicant or manufacturer, CCS is not liable to the accuracy, suitability, reliability or/and integrity of the information.

4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
--	--	--	--
The EUT has been tested as an independent unit.			

4.3 Measurement Uncertainty

Test Item	Measurement Uncertainty
Conducted Peak Output Power	± 0.8dB
Minimum 6dB Bandwidth	± 0.3%
Power Spectrum Density	± 0.4dB
Conducted Band Edges Measurement	± 2.7dB
Conducted Spurious Emissions	± 2.7dB
Radiated Emissions which fall in the restricted bands	± 4.4dB (Above 1GHz)
Radiated Spurious Emissions Below 1GHz	± 3.1dB (Below 1GHz)
Radiated Spurious Emissions Above 1GHz	± 4.4dB (Above 1GHz)

Remark:
The U_{lab} (lab Uncertainty) is less than $U_{cispr/ETSI}$ (CISPR/ETSI Uncertainty), so the test results
– compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit;
– non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.

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4.4 Test Location

All tests were performed at:

Compliance Certification Services（Kunshan）Inc. Shenzhen branch.

Fuyong lab. Xinlong TechnoPark,Fengtang Road, Fuyong Subdistrict, Bao'an, Shenzhen, China

Tel: +86 755 8866 3988 Fax: +86 755 2671 0594

No tests were sub-contracted.

4.5 Test Facility

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

• A2LA (Certificate No. 6606.01)

Compliance Certification Services（Kunshan）Inc. Shenzhen branch is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 6606.01.

• FCC –Designation Number: CN1322

Compliance Certification Services（Kunshan）Inc. Shenzhen branch has been recognized as an accredited testing laboratory.

Designation Number: CN1322. Test Firm Registration Number: 718073

• Innovation, Science and Economic Development Canada

Compliance Certification Services（Kunshan）Inc. Shenzhen branch has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0129.

IC#: 28189.

4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None

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5 Equipment List

Conducted Peak Output Power					
Equipment	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal Date**	**Cal Due Date**
MXA Signal Analyzer	KEYSIGHT	N9020A	SEM004-25	2022/5/30	2023/5/29
Power Sensor	Erika Fiedler	U2021XA	SEM009-15	2022/7/12	2023/7/11
Power Sensor	Erika Fiedler	U2021XA	SEM009-16	2022/7/12	2023/7/11
Programmable DC Source	Chroma	62024P-80-60	SEM011-09	2022/7/12	2023/7/11
Attenuator	Huber+Suhner	6620_SMA-50-1	SEM021-09	2022/7/12	2023/7/11
Measurement Software	TST PASS	TST PASS V2.0	N/A	N/A	N/A

Minimum 6dB Bandwidth					
Equipment	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal Date**	**Cal Due Date**
MXA Signal Analyzer	KEYSIGHT	N9020A	SEM004-25	2022/5/30	2023/5/29
Attenuator	Huber+Suhner	6620_SMA-50-1	SEM021-09	2022/7/12	2023/7/11
Measurement Software	TST PASS	TST PASS V2.0	N/A	N/A	N/A

Power Spectrum Density					
Equipment	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal Date**	**Cal Due Date**
MXA Signal Analyzer	KEYSIGHT	N9020A	SEM004-25	2022/5/30	2023/5/29
Attenuator	Huber+Suhner	6620_SMA-50-1	SEM021-09	2022/7/12	2023/7/11
Measurement Software	TST PASS	TST PASS V2.0	N/A	N/A	N/A

Conducted Band Edges Measurement					
Equipment	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal Date**	**Cal Due Date**
MXA Signal Analyzer	KEYSIGHT	N9020A	SEM004-25	2022/5/30	2023/5/29
Attenuator	Huber+Suhner	6620_SMA-50-1	SEM021-09	2022/7/12	2023/7/11
Measurement Software	TST PASS	TST PASS V2.0	N/A	N/A	N/A

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Conducted Spurious Emissions					
Equipment	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal Date**	**Cal Due Date**
MXA Signal Analyzer	KEYSIGHT	N9020A	SEM004-25	2022/5/30	2023/5/29
Attenuator	Huber+Suhner	6620_SMA-50-1	SEM021-09	2022/7/12	2023/7/11
Measurement Software	TST PASS	TST PASS V2.0	N/A	N/A	N/A

Radiated Emissions which fall in the restricted bands					
Equipment	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal Date**	**Cal Due Date**
3m Anechoic Chamber	CRT	N/A	SEM001-13	2021/7/13	2024/7/12
Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	SEM003-15	2021/7/11	2024/7/10
Broad-Band Horn Antenna	Schwarzbeck	BBHA 9120D	SEM003-32	2021/9/26	2024/9/25
MXA Signal Analyzer	KEYSIGHT	N9020A	SEM004-23	2022/4/24	2023/4/23
Pre-amplifier	Compliance Directions Systems Inc.	PAP-2640-50	SEM005-08	2022/7/12	2023/7/11
Pre-amplifier	Rohde & Schwarz	CH14-H052	SEM005-17	2022/7/12	2023/7/11
Coaxial Cable	CCS	N/A	SEM035-02	2022/5/16	2023/5/15
Coaxial Cable	CCS	N/A	SEM035-03	2022/5/16	2023/5/15
Pre-amplifier	TST PASS	LNA04080G30	SEM005-27	2022/4/15	2023/4/14
Pre-amplifier	TST PASS	LNA10180G45	SEM005-28	2022/4/15	2023/4/14
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A

Radiated Spurious Emissions Below 1GHz					
Equipment	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal Date**	**Cal Due Date**
3m Anechoic Chamber	CRT	N/A	SEM001-13	2021/7/13	2024/7/12
Trilog-Broadband Antenna	Schwarzbeck	VULB9168	SEM003-33	2021/9/25	2024/9/24
MXE EMI receiver	Agilent	N9038A	SEM004-05	2022/7/12	2023/7/11
Pre-amplifier	HP	8447D	SEM005-02	2022/7/12	2023/7/11
Coaxial Cable	CCS	N/A	SEM035-01	2022/5/16	2023/5/15
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A

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Radiated Spurious Emissions Above 1GHz					
Equipment	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal Date**	**Cal Due Date**
3m Anechoic Chamber	CRT	N/A	SEM001-13	2021/7/13	2024/7/12
Broad-Band Horn Antenna	Schwarzbeck	BBHA 9120D	SEM003-32	2021/9/26	2024/9/25
MXA Signal Analyzer	KEYSIGHT	N9020A	SEM004-23	2022/4/24	2023/4/23
Coaxial Cable	CCS	N/A	SEM035-03	2022/5/16	2023/5/15
Pre-amplifier	TST PASS	LNA04080G30	SEM005-27	2022/4/15	2023/4/14
Pre-amplifier	TST PASS	LNA10180G45	SEM005-28	2022/4/15	2023/4/14
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A

General used equipment					
Equipment	**Manufacturer**	**Model No.**	**Inventory No.**	**Cal Date**	**Cal Due Date**
Humidity/ Temperature Indicator	Mingle	TH607	SEM002-22	2022-07-12	2023-07-11
Humidity/ Temperature Indicator	Mingle	TH607	SEM002-23	2022-07-12	2023-07-11
Barometer	DUMAI	DYM3	SEM002-24	2022-07-12	2023-07-11

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6 Radio Spectrum Technical Requirement

6.1 Antenna Requirement

6.1.1 Test Requirement:

47 CFR Part 15, Subpart C 15.203 & 15.247(b)(4)

6.1.2 Conclusion

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, 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.

15.247(b) (4) requirement:

The conducted output power limit specified in paragraph (b) of this section is based on the use of antennas with directional gains that do not exceed 6 dBi. Except as shown in paragraph (c) of this section, if transmitting antennas of directional gain greater than 6 dBi are used, the conducted output power from the intentional radiator shall be reduced below the stated values in paragraphs (b)(1), (b)(2), and (b)(3) of this section, as appropriate, by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

EUT Antenna:

The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antenna is 0.29dBi.

Antenna location: Refer to internal photo.

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7 Radio Spectrum Matter Test Results

7.1 Conducted Peak Output Power

Test Requirement 47 CFR Part 15, Subpart C 15.247(b)(3)
Test Method: ANSI C63.10 (2013) Section 11.9.2

Limit:

Frequency range(MHz)	Output power of the intentional radiator(watt)
902-928	1 for ≥50 hopping channels
	0.25 for 25≤ hopping channels <50
	1 for digital modulation
2400-2483.5	1 for ≥75 non-overlapping hopping channels
	0.125 for all other frequency hopping systems
	1 for digital modulation
5725-5850	1 for frequency hopping systems and digital modulation

7.1.1 E.U.T. Operation

Operating Environment:
Temperature: 25.0 °C Humidity: 40.6 % RH Atmospheric Pressure: 1020 mbar

7.1.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	05	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40), final test modes are considering the modulation and worse data rates. Only the data of worst case is recorded in the report.

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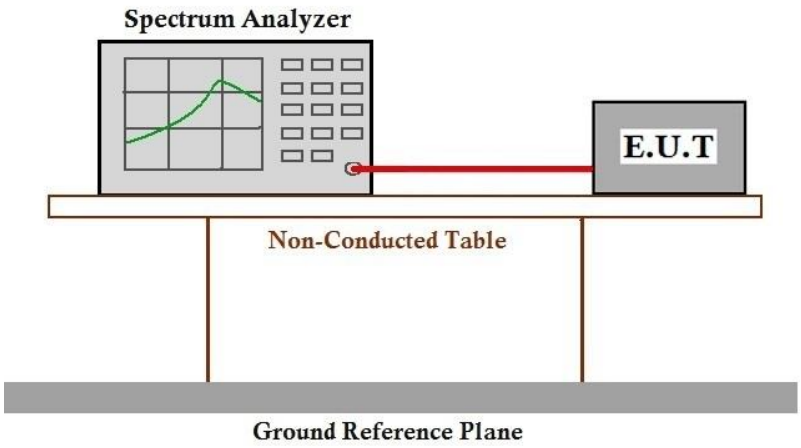
7.1.3 Test Setup Diagram



7.1.4 Measurement Procedure and Data

Note: Since the verify power the same operating range bandwidth and smaller power can be covered by the higher power.

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7.2 Minimum 6dB Bandwidth

Test Requirement 47 CFR Part 15, Subpart C 15.247a(2)

Test Method: ANSI C63.10 (2013) Section 11.8.1

Limit:

≥500 kHz

7.2.1 E.U.T. Operation

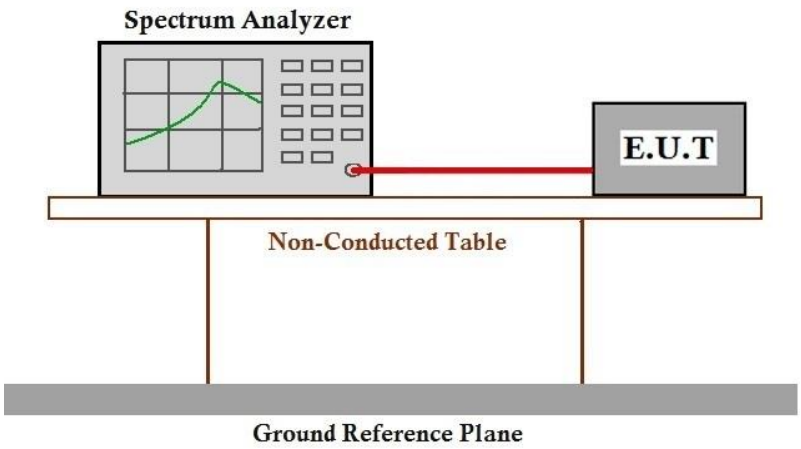
Operating Environment:

Temperature: 25.0 °C Humidity: 40.6 % RH Atmospheric Pressure: 1020 mbar

7.2.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	05	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40), final test modes are considering the modulation and worse data rates. Only the data of worst case is recorded in the report.

7.2.3 Test Setup Diagram



7.2.4 Measurement Procedure and Data

Please Refer to Appendix for Details

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7.3 Power Spectrum Density

Test Requirement 47 CFR Part 15, Subpart C 15.247(e)
Test Method: ANSI C63.10 (2013) Section 11.10.2

Limit:
≤8dBm in any 3 kHz band during any time interval of continuous transmission

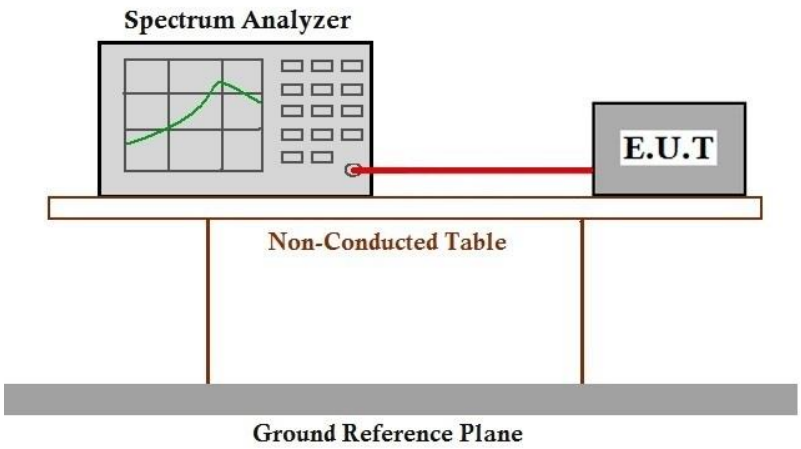
7.3.1 E.U.T. Operation

Operating Environment:
Temperature: 25.0 °C Humidity: 40.6 % RH Atmospheric Pressure: 1020 mbar

7.3.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	05	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40), final test modes are considering the modulation and worse data rates. Only the data of worst case is recorded in the report.

7.3.3 Test Setup Diagram



7.3.4 Measurement Procedure and Data

Please Refer to Appendix for Details

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7.4 Conducted Band Edges Measurement

Test Requirement 47 CFR Part 15, Subpart C 15.247(d)

Test Method: ANSI C63.10 (2013) Section 11.13.3.2

Limit:

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) (see §15.205(c).

7.4.1 E.U.T. Operation

Operating Environment:

Temperature: 25.0 °C Humidity: 40.6 % RH Atmospheric Pressure: 1020 mbar

7.4.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	05	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40), final test modes are considering the modulation and worse data rates. Only the data of worst case is recorded in the report.

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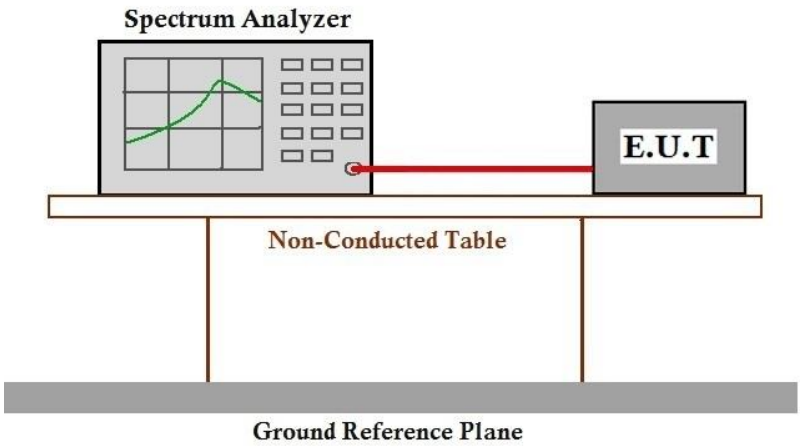
7.4.3 Test Setup Diagram



7.4.4 Measurement Procedure and Data

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7.5 Conducted Spurious Emissions

Test Requirement 47 CFR Part 15, Subpart C 15.247(d)

Test Method: ANSI C63.10 (2013) Section 11.11

Limit:

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) (see §15.205(c).

7.5.1 E.U.T. Operation

Operating Environment:

Temperature: 25.0 °C Humidity: 40.6 % RH Atmospheric Pressure: 1020 mbar

7.5.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	05	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40), final test modes are considering the modulation and worse data rates. Only the data of worst case is recorded in the report.

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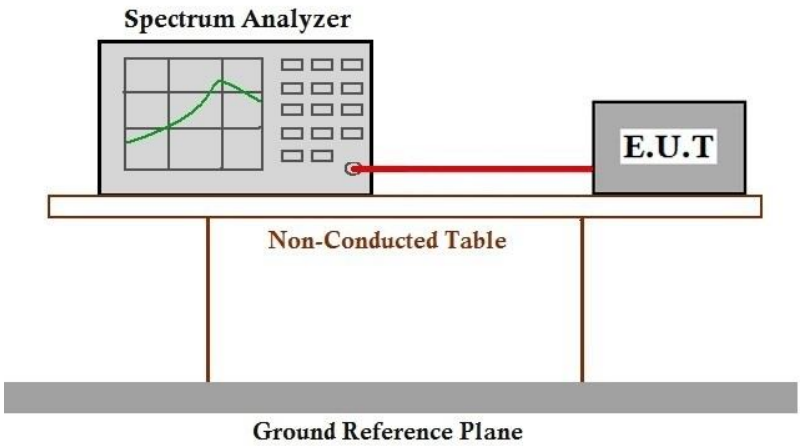
7.5.3 Test Setup Diagram



7.5.4 Measurement Procedure and Data

Please Refer to Appendix for Details

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7.6 Radiated Emissions which fall in the restricted bands

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.209
Test Method: ANSI C63.10 (2013) Section 6.10.5
Measurement Distance: 3m

Limit:

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
Above 960	500	3
Remark: The emission limits shown in the above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90kHz, 110-490kHz and above 1000 MHz. Radiated emission limits in these three bands are based on measurements employing an average detector, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation.		

7.6.1 E.U.T. Operation

Operating Environment:
Temperature: 23.2 °C Humidity: 50.9 % RH Atmospheric Pressure: 1020 mbar

7.6.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	05	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40), final test modes are considering the modulation and worse data rates. Only the data of worst case is recorded in the report.

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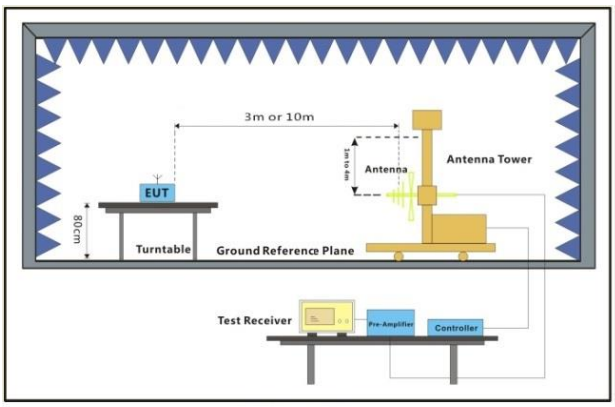
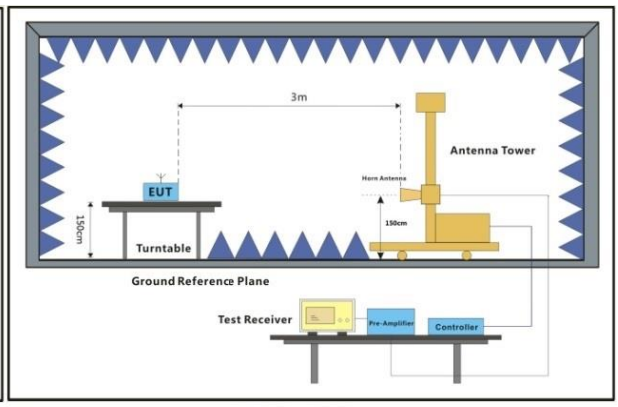
7.6.3 Test Setup Diagram



30MHz-1GHz



Above 1GHz

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7.6.4 Measurement Procedure and Data

a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

c. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

d. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

e. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

f. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

g. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak, quasi-peak or average method as specified and then reported in a data sheet.

h. Test the EUT in the lowest channel, the middle channel, the Highest channel.

i. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.

j. Repeat above procedures until all frequencies measured was complete.

Remark 1: Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

Remark 2: For frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.

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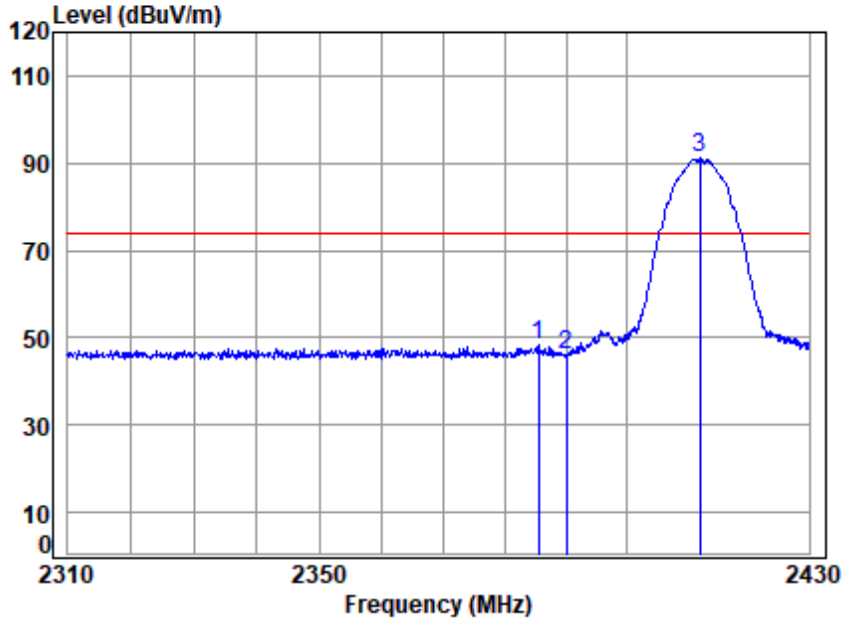
Test Mode: 05; Polarity: Horizontal; Modulation:802.11b; Bandwidth:20MHz; Channel:Low



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00442AT
Mode : 2412 Band edge
Note : 2.4G WIFI 11B

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2385.494	5.05	27.15	32.50	48.47	48.17	74.00	-25.83	peak
2	2390.000	5.05	27.16	32.50	46.51	46.22	74.00	-27.78	peak
3	2412.000	5.07	27.21	32.50	91.32	91.10	74.00	17.10	peak

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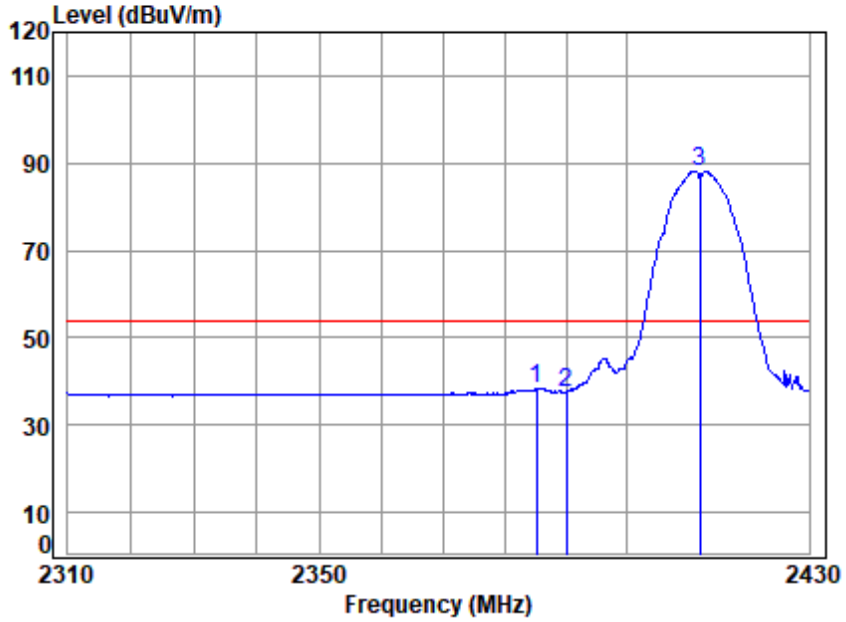
Test Mode: 05; Polarity: Horizontal; Modulation:802.11b; Bandwidth:20MHz; Channel:Low



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00442AT
Mode : 2412 Band edge
Note : 2.4G WIFI 11B

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2385.252	5.05	27.15	32.50	38.81	38.51	54.00	-15.49	Average
2	2390.000	5.05	27.16	32.50	37.69	37.40	54.00	-16.60	Average
3	2412.000	5.07	27.21	32.50	88.51	88.29	54.00	34.29	Average

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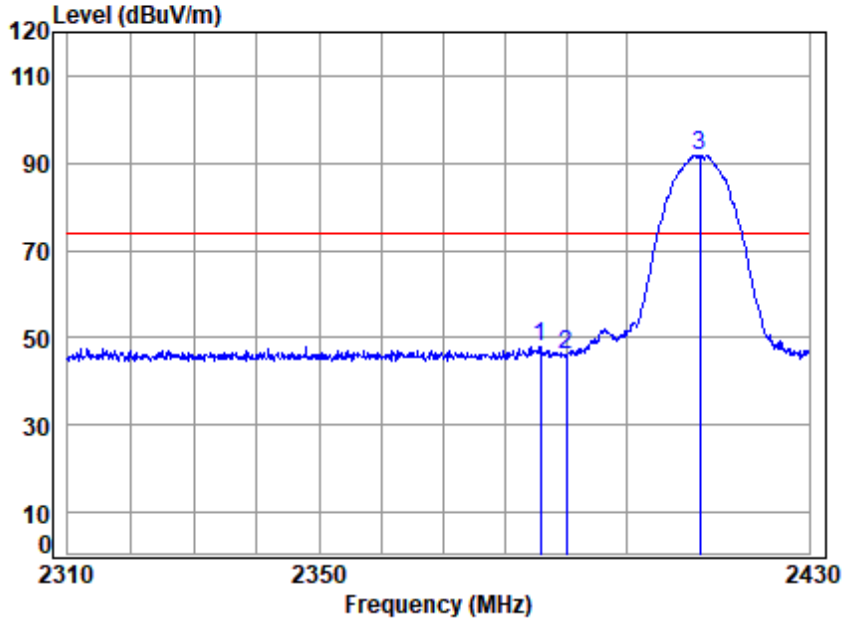
Test Mode: 05; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:Low



Site : chamber
Condition: 3m VERTICAL
Job No : 00442AT
Mode : 2412 Band edge
Note : 2.4G WIFI 11B

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2385.857	5.05	27.15	32.50	48.42	48.12	74.00	-25.88	Peak
2	2390.000	5.05	27.16	32.50	46.20	45.91	74.00	-28.09	Peak
3	2412.000	5.07	27.21	32.50	92.12	91.90	74.00	17.90	Peak

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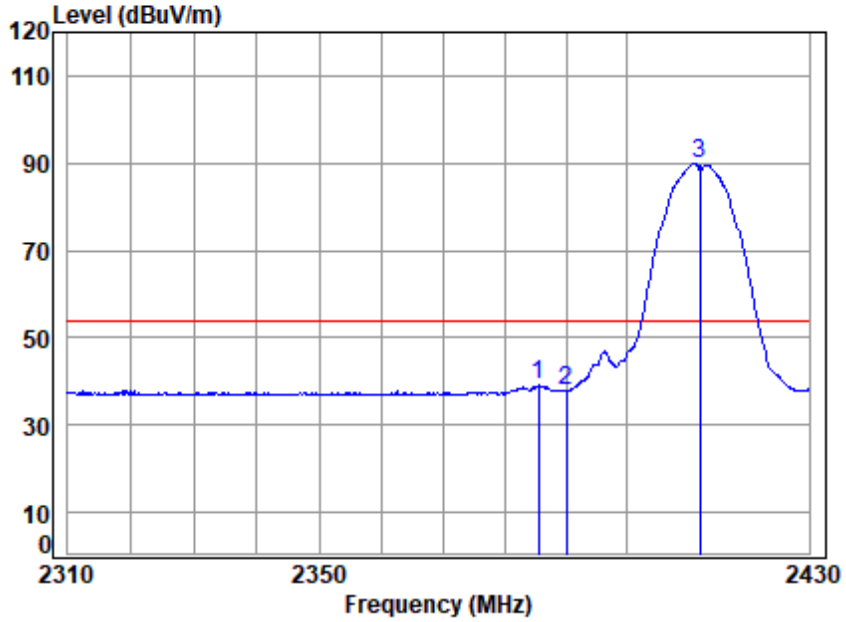
Test Mode: 05; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:Low



Site : chamber
Condition: 3m VERTICAL
Job No : 00442AT
Mode : 2412 Band edge
Note : 2.4G WIFI 11B

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2385.494	5.05	27.15	32.50	39.34	39.04	54.00	-14.96	Average
2	2390.000	5.05	27.16	32.50	38.02	37.73	54.00	-16.27	Average
3	2412.000	5.07	27.21	32.50	90.12	89.90	54.00	35.90	Average

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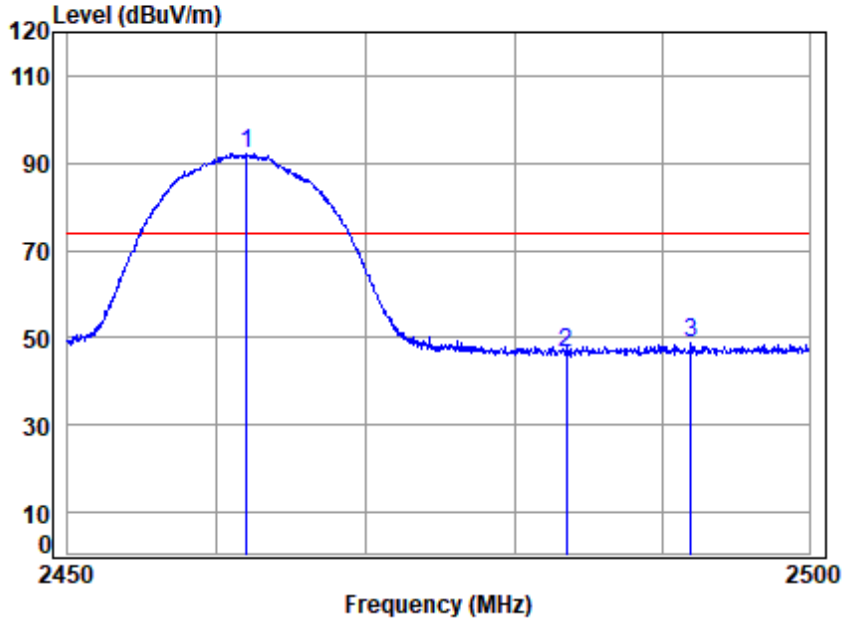
Test Mode: 05; Polarity: Horizontal; Modulation:802.11b; Bandwidth:20MHz; Channel:High



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00442AT
Mode : 2462 Band edge
Note : 2.4G WIFI 11B

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2462.000	5.10	27.32	32.50	92.21	92.13	74.00	18.13	peak
2	2483.500	5.12	27.36	32.50	46.41	46.39	74.00	-27.61	peak
3	2491.982	5.12	27.38	32.50	48.76	48.76	74.00	-25.24	peak

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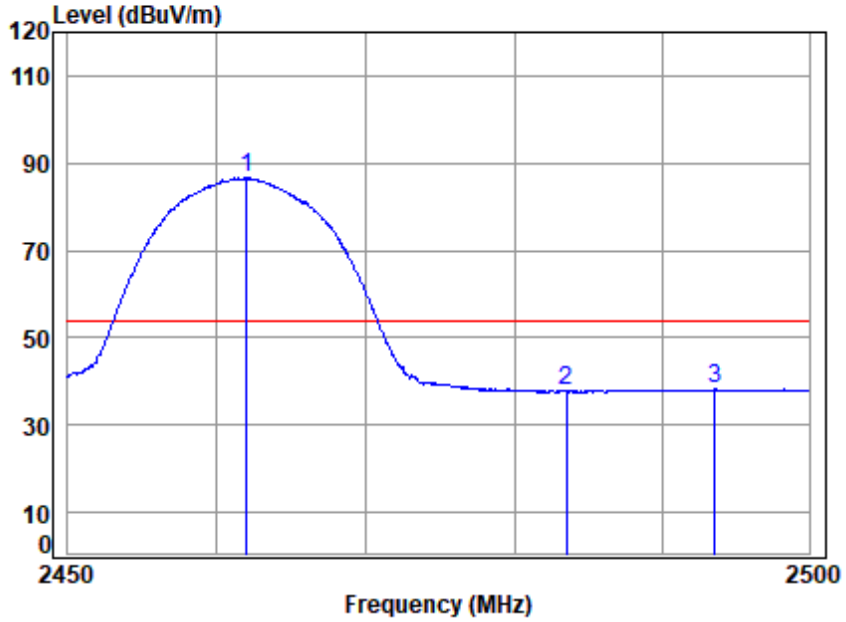
Test Mode: 05; Polarity: Horizontal; Modulation:802.11b; Bandwidth:20MHz; Channel:High



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00442AT
Mode : 2462 Band edge
Note : 2.4G WIFI 11B

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2462.000	5.10	27.32	32.50	86.60	86.52	54.00	32.52	Average
2	2483.500	5.12	27.36	32.50	37.67	37.65	54.00	-16.35	Average
3	2493.594	5.13	27.39	32.50	38.37	38.39	54.00	-15.61	Average

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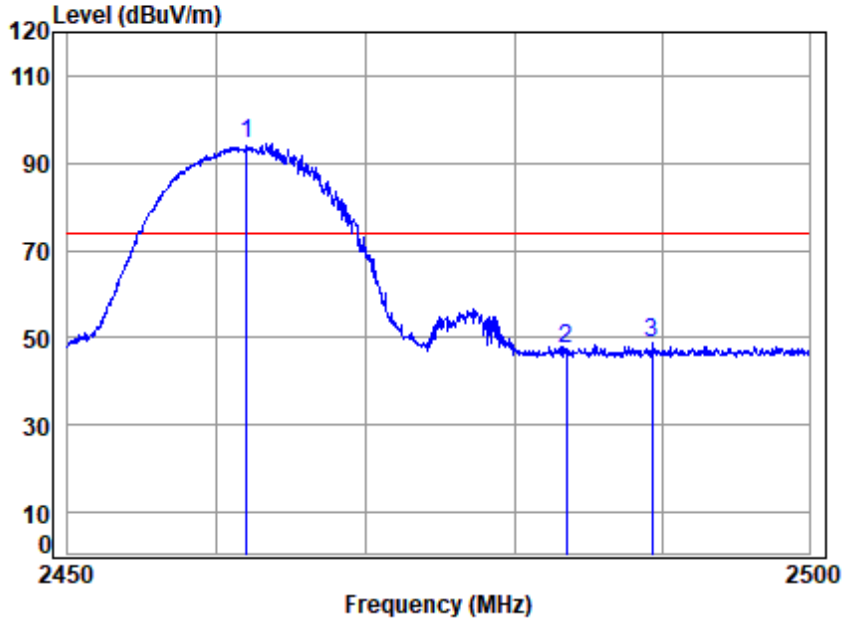
Test Mode: 05; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:High



Site : chamber
Condition: 3m VERTICAL
Job No : 00442AT
Mode : 2462 Band edge
Note : 2.4G WIFI 11B

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2462.000	5.10	27.32	32.50	94.57	94.49	74.00	20.49	Peak
2	2483.500	5.12	27.36	32.50	47.35	47.33	74.00	-26.67	Peak
3	2489.315	5.12	27.38	32.50	48.60	48.60	74.00	-25.40	Peak

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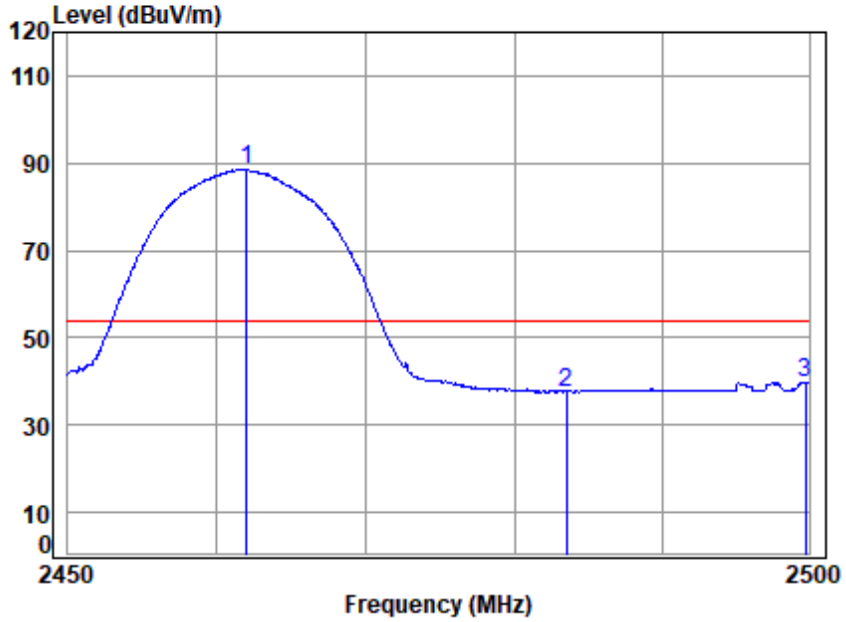
Test Mode: 05; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:High



Site : chamber
Condition: 3m VERTICAL
Job No : 00442AT
Mode : 2462 Band edge
Note : 2.4G WIFI 11B

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2462.000	5.10	27.32	32.50	88.63	88.55	54.00	34.55	Average
2	2483.500	5.12	27.36	32.50	37.64	37.62	54.00	-16.38	Average
3	2499.748	5.13	27.40	32.50	39.85	39.88	54.00	-14.12	Average

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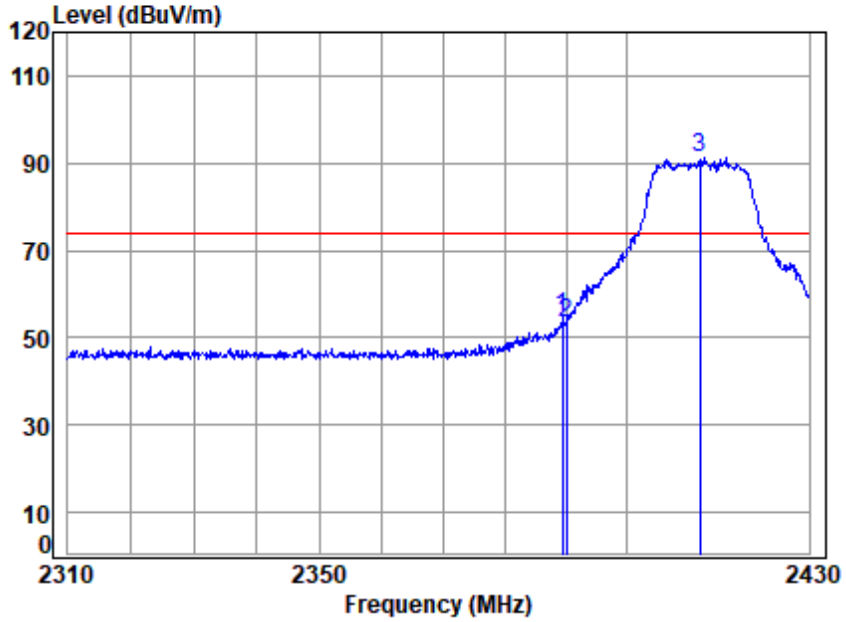
Test Mode: 05; Polarity: Horizontal; Modulation:802.11g; Bandwidth:20MHz; Channel:Low



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00442AT
Mode : 2412 Band edge
Note : 2.4G WIFI 11G

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2389.363	5.05	27.16	32.50	55.02	54.73	74.00	-19.27	peak
2	2390.000	5.05	27.16	32.50	53.88	53.59	74.00	-20.41	peak
3	2412.000	5.07	27.21	32.50	91.41	91.19	74.00	17.19	peak

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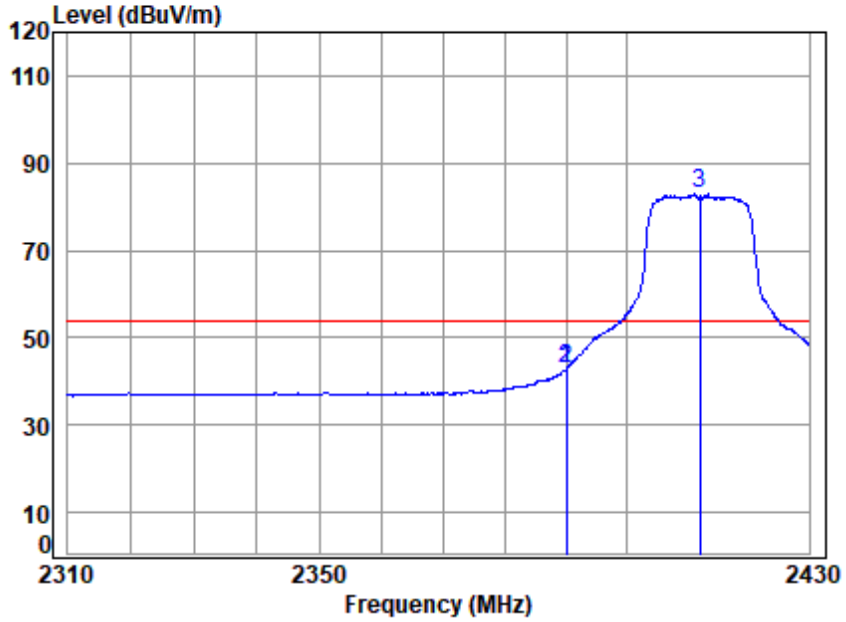
Test Mode: 05; Polarity: Horizontal; Modulation:802.11g; Bandwidth:20MHz; Channel:Low



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00442AT
Mode : 2412 Band edge
Note : 2.4G WIFI 11G

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2389.968	5.05	27.16	32.50	43.30	43.01	54.00	-10.99	Average
2	2390.000	5.05	27.16	32.50	43.30	43.01	54.00	-10.99	Average
3	2412.000	5.07	27.21	32.50	83.07	82.85	54.00	28.85	Average

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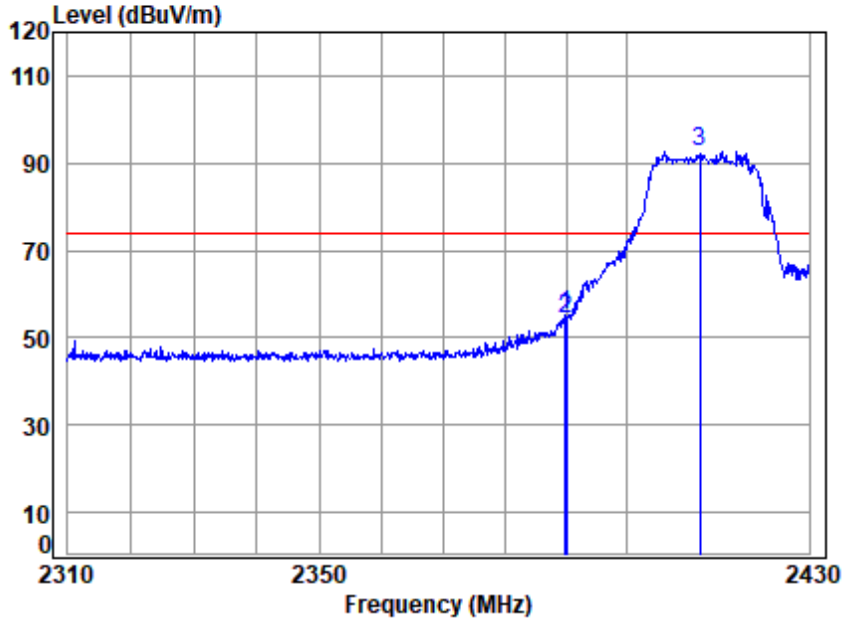
Test Mode: 05; Polarity: Vertical; Modulation:802.11g; Bandwidth:20MHz; Channel:Low



Site : chamber
Condition: 3m VERTICAL
Job No : 00442AT
Mode : 2412 Band edge
Note : 2.4G WIFI 11G

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2389.847	5.05	27.16	32.50	55.28	54.99	74.00	-19.01	Peak
2	2390.000	5.05	27.16	32.50	54.57	54.28	74.00	-19.72	Peak
3	2412.000	5.07	27.21	32.50	92.77	92.55	74.00	18.55	Peak

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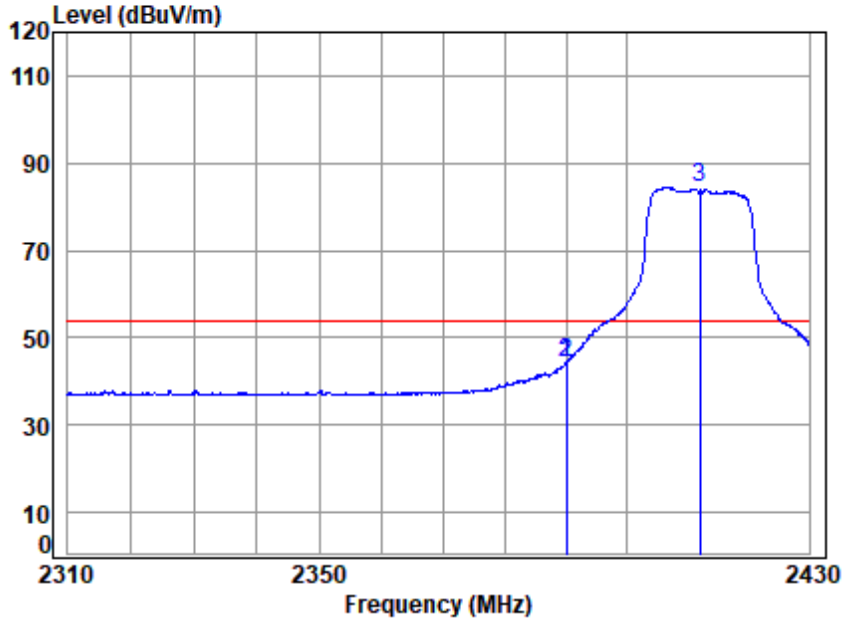
Test Mode: 05; Polarity: Vertical; Modulation:802.11g; Bandwidth:20MHz; Channel:Low



Site : chamber
Condition: 3m VERTICAL
Job No : 00442AT
Mode : 2412 Band edge
Note : 2.4G WIFI 11G

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2389.968	5.05	27.16	32.50	44.66	44.37	54.00	-9.63	Average
2	2390.000	5.05	27.16	32.50	44.66	44.37	54.00	-9.63	Average
3	2412.000	5.07	27.21	32.50	84.72	84.50	54.00	30.50	Average

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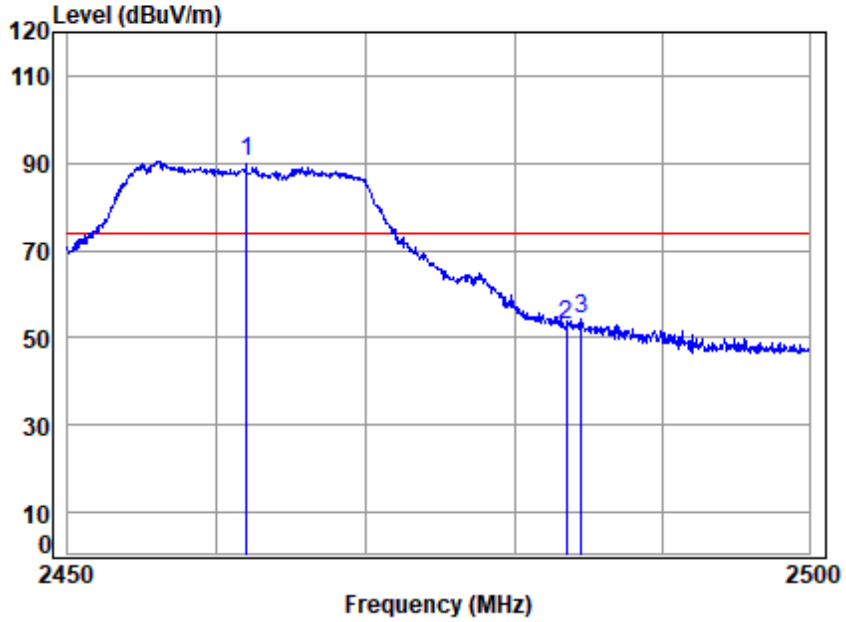
Test Mode: 05; Polarity: Horizontal; Modulation:802.11g; Bandwidth:20MHz; Channel:High



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00442AT
Mode : 2462 Band edge
Note : 2.4G WIFI 11G

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2462.000	5.10	27.32	32.50	90.60	90.52	74.00	16.52	peak
2	2483.500	5.12	27.36	32.50	52.74	52.72	74.00	-21.28	peak
3	2484.542	5.12	27.37	32.50	54.45	54.44	74.00	-19.56	peak

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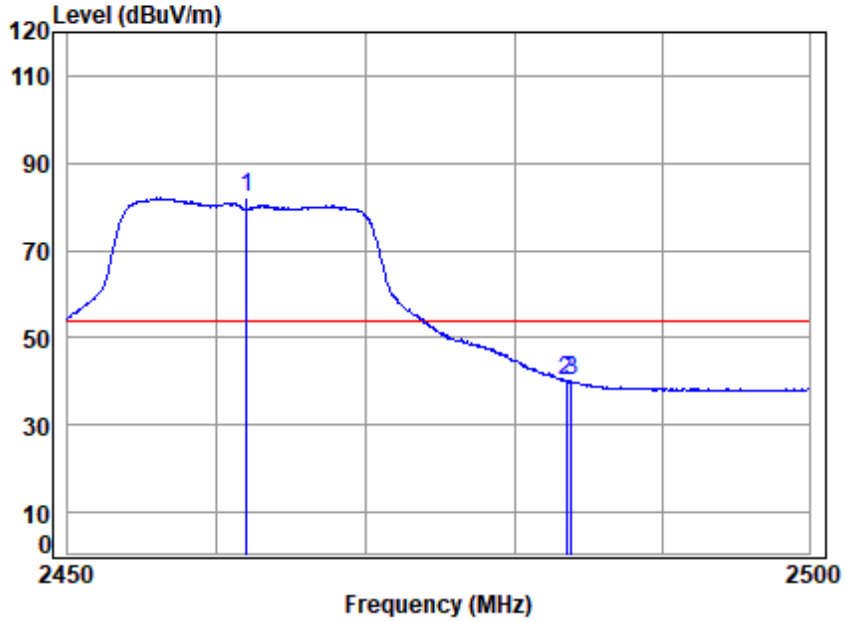
Test Mode: 05; Polarity: Horizontal; Modulation:802.11g; Bandwidth:20MHz; Channel:High



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00442AT
Mode : 2462 Band edge
Note : 2.4G WIFI 11G

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2462.000	5.10	27.32	32.50	82.01	81.93	54.00	27.93	Average
2	2483.500	5.12	27.36	32.50	40.33	40.31	54.00	-13.69	Average
3	2483.890	5.12	27.37	32.50	40.12	40.11	54.00	-13.89	Average

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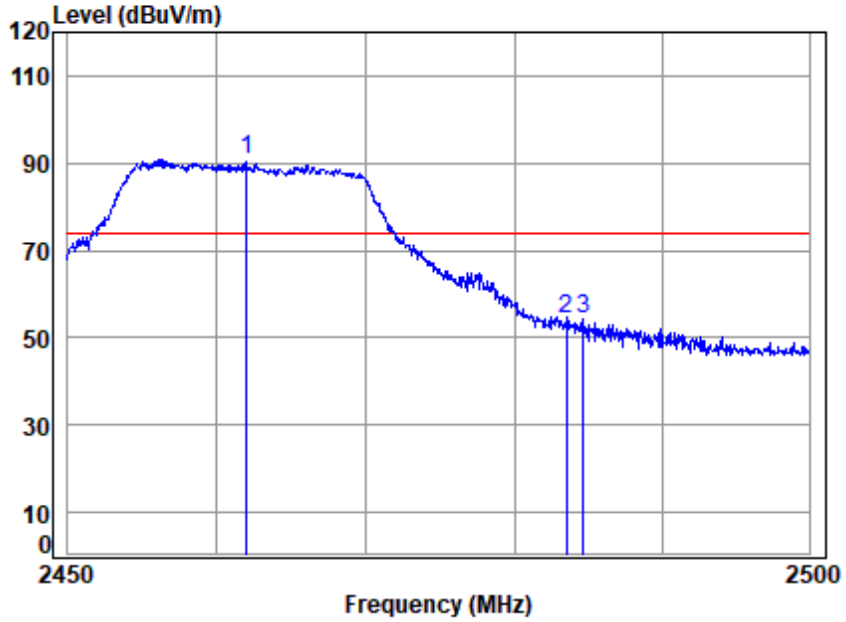
Test Mode: 05; Polarity: Vertical; Modulation:802.11g; Bandwidth:20MHz; Channel:High



Site : chamber
Condition: 3m VERTICAL
Job No : 00442AT
Mode : 2462 Band edge
Note : 2.4G WIFI 11G

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2462.000	5.10	27.32	32.50	90.97	90.89	74.00	16.89	Peak
2	2483.500	5.12	27.36	32.50	54.25	54.23	74.00	-19.77	Peak
3	2484.643	5.12	27.37	32.50	54.12	54.11	74.00	-19.89	Peak

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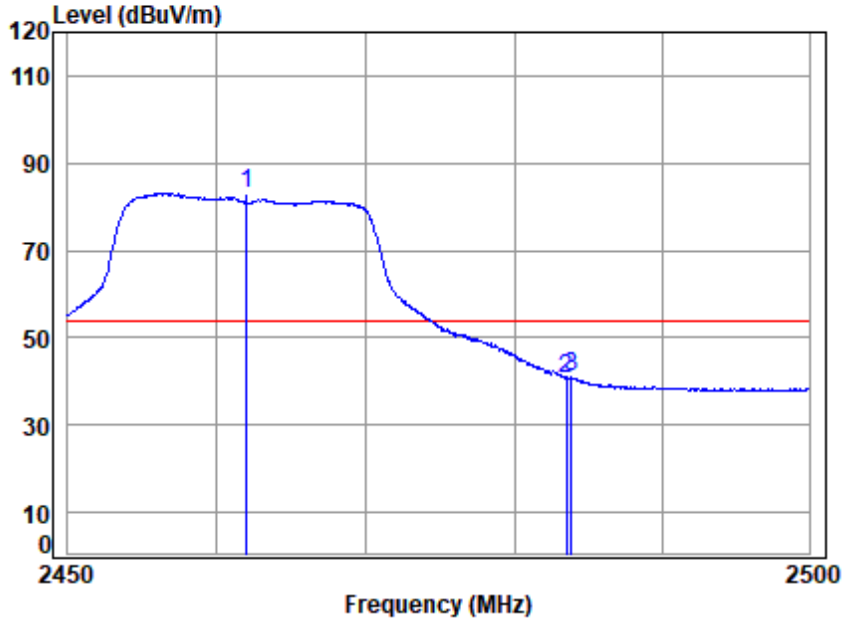
Test Mode: 05; Polarity: Vertical; Modulation:802.11g; Bandwidth:20MHz; Channel:High



Site : chamber
Condition: 3m VERTICAL
Job No : 00442AT
Mode : 2462 Band edge
Note : 2.4G WIFI 11G

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2462.000	5.10	27.32	32.50	83.16	83.08	54.00	29.08	Average
2	2483.500	5.12	27.36	32.50	40.68	40.66	54.00	-13.34	Average
3	2483.840	5.12	27.37	32.50	41.11	41.10	54.00	-12.90	Average

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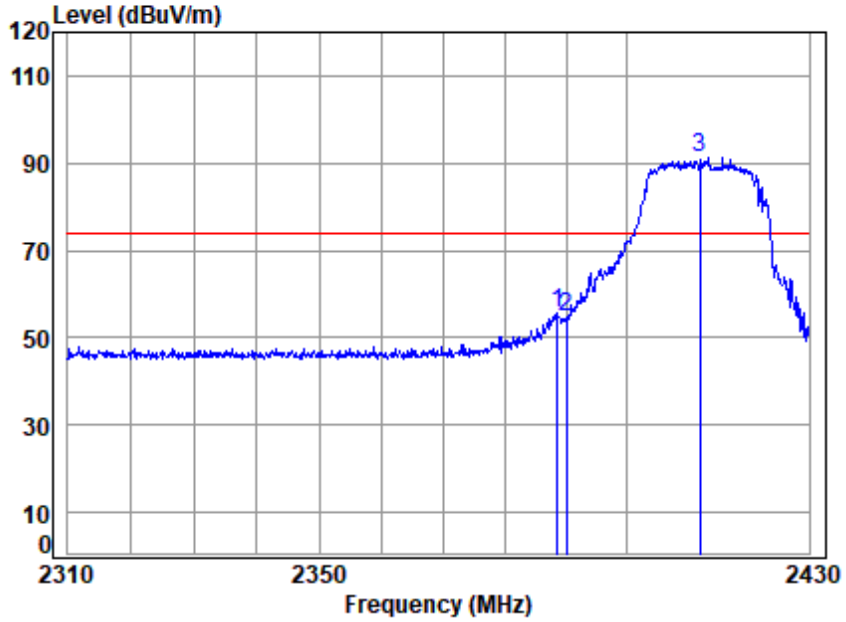
Test Mode: 05; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:Low



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00442AT
Mode : 2412 Band edge
Note : 2.4G WIFI 11N20

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2388.516	5.05	27.15	32.50	56.13	55.83	74.00	-18.17	peak
2	2390.000	5.05	27.16	32.50	54.96	54.67	74.00	-19.33	peak
3	2412.000	5.07	27.21	32.50	91.52	91.30	74.00	17.30	peak

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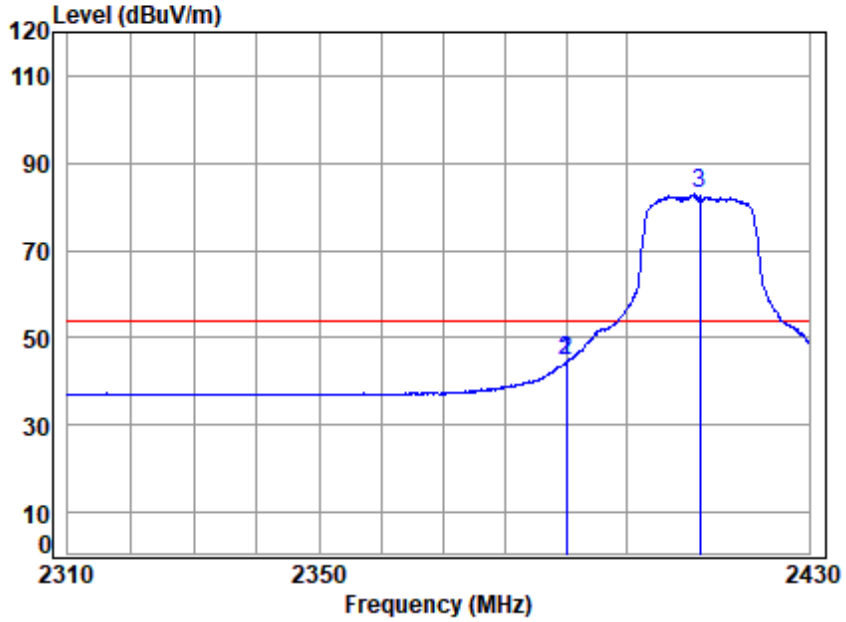
Test Mode: 05; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:Low



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00442AT
Mode : 2412 Band edge
Note : 2.4G WIFI 11N20

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2389.968	5.05	27.16	32.50	44.83	44.54	54.00	-9.46	Average
2	2390.000	5.05	27.16	32.50	44.83	44.54	54.00	-9.46	Average
3	2412.000	5.07	27.21	32.50	83.08	82.86	54.00	28.86	Average

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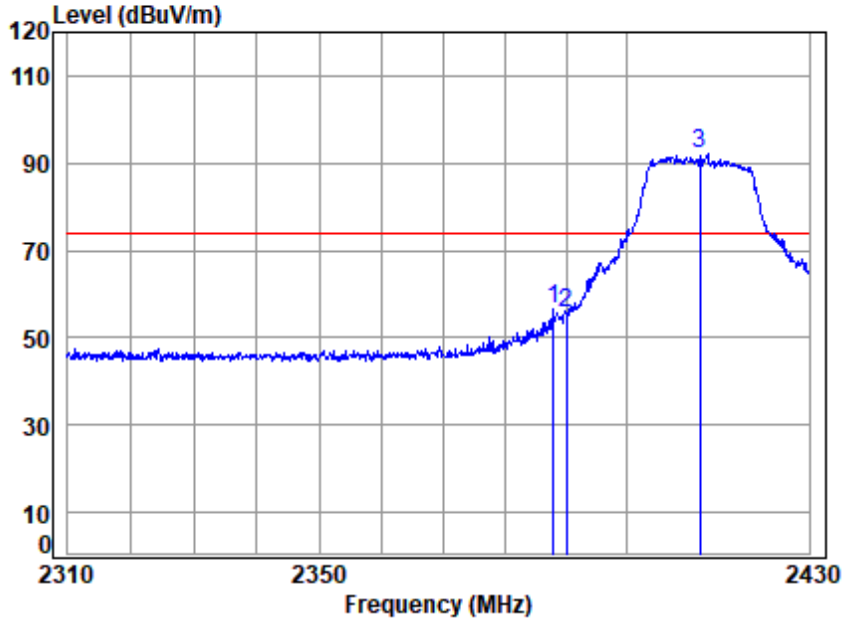
Test Mode: 05; Polarity: Vertical; Modulation:802.11n; Bandwidth:20MHz; Channel:Low



Site : chamber
Condition: 3m VERTICAL
Job No : 00442AT
Mode : 2412 Band edge
Note : 2.4G WIFI 11N20

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2387.912	5.05	27.15	32.50	56.90	56.60	74.00	-17.40	Peak
2	2390.000	5.05	27.16	32.50	56.03	55.74	74.00	-18.26	Peak
3	2412.000	5.07	27.21	32.50	92.33	92.11	74.00	18.11	Peak

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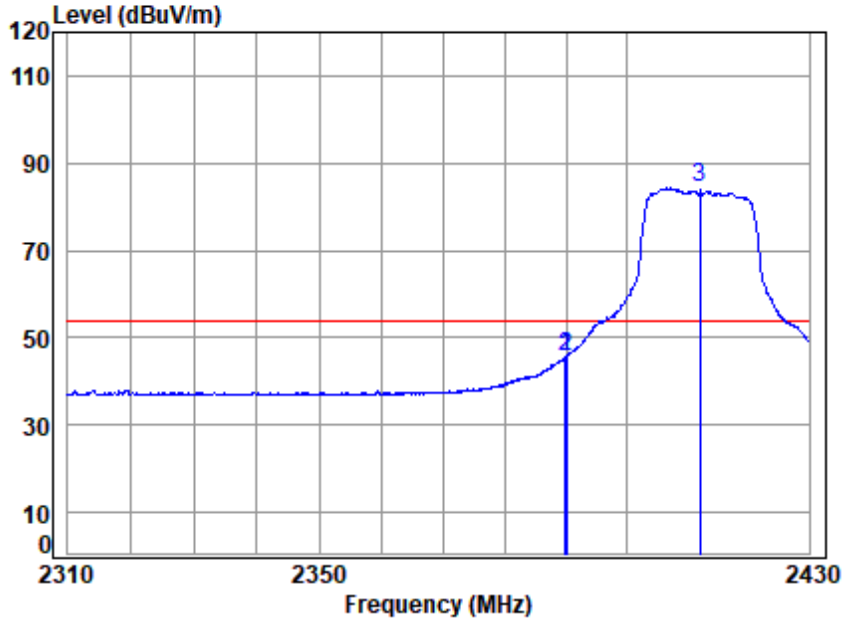
Test Mode: 05; Polarity: Vertical; Modulation:802.11n; Bandwidth:20MHz; Channel:Low



Site : chamber
Condition: 3m VERTICAL
Job No : 00442AT
Mode : 2412 Band edge
Note : 2.4G WIFI 11N20

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2389.847	5.05	27.16	32.50	45.78	45.49	54.00	-8.51	Average
2	2390.000	5.05	27.16	32.50	45.74	45.45	54.00	-8.55	Average
3	2412.000	5.07	27.21	32.50	84.46	84.24	54.00	30.24	Average

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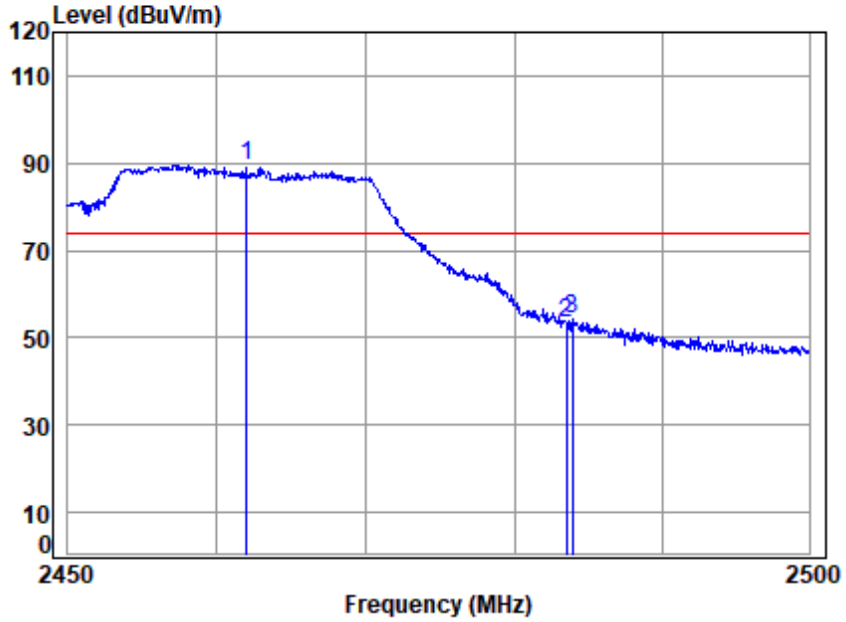
Test Mode: 05; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:High



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00442AT
Mode : 2462 Band edge
Note : 2.4G WIFI 11N20

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2462.000	5.10	27.32	32.50	89.71	89.63	74.00	15.63	peak
2	2483.500	5.12	27.36	32.50	53.62	53.60	74.00	-20.40	peak
3	2483.940	5.12	27.37	32.50	54.11	54.10	74.00	-19.90	peak

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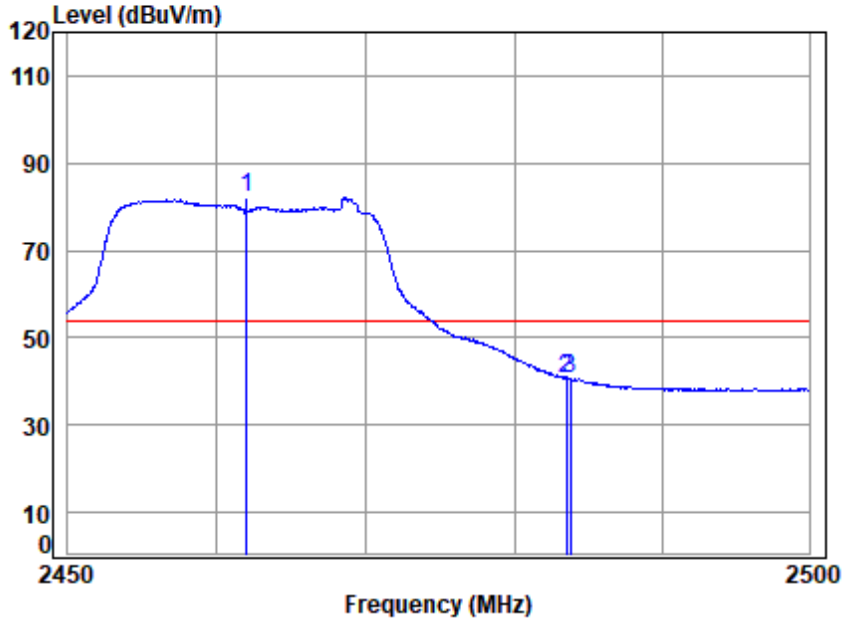
Test Mode: 05; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:High



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00442AT
Mode : 2462 Band edge
Note : 2.4G WIFI 11N20

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2462.000	5.10	27.32	32.50	82.31	82.23	54.00	28.23	Average
2	2483.500	5.12	27.36	32.50	40.77	40.75	54.00	-13.25	Average
3	2483.790	5.12	27.37	32.50	40.79	40.78	54.00	-13.22	Average

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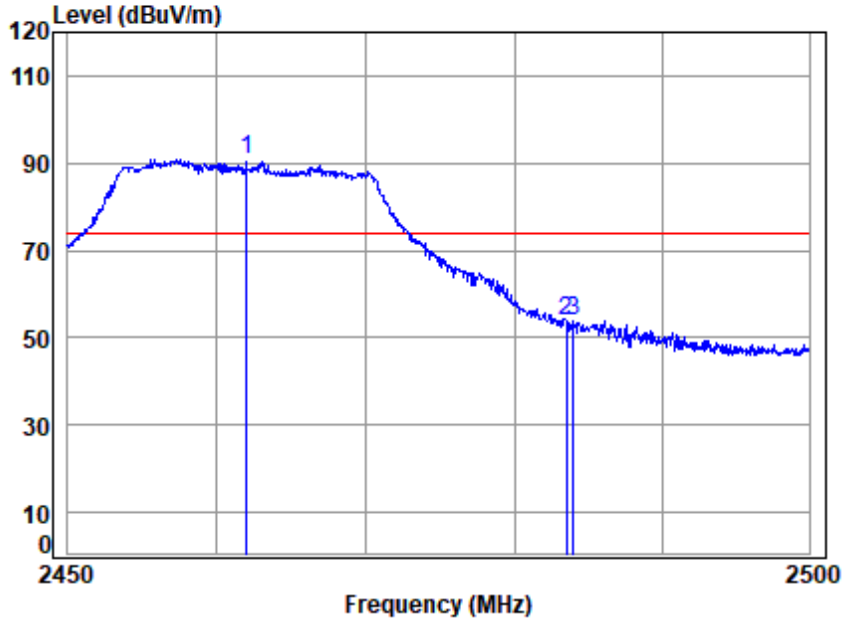
Test Mode: 05; Polarity: Vertical; Modulation:802.11n; Bandwidth:20MHz; Channel:High



Site : chamber
Condition: 3m VERTICAL
Job No : 00442AT
Mode : 2462 Band edge
Note : 2.4G WIFI 11N20

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2462.000	5.10	27.32	32.50	91.03	90.95	74.00	16.95	Peak
2	2483.500	5.12	27.36	32.50	53.94	53.92	74.00	-20.08	Peak
3	2483.990	5.12	27.37	32.50	53.94	53.93	74.00	-20.07	Peak

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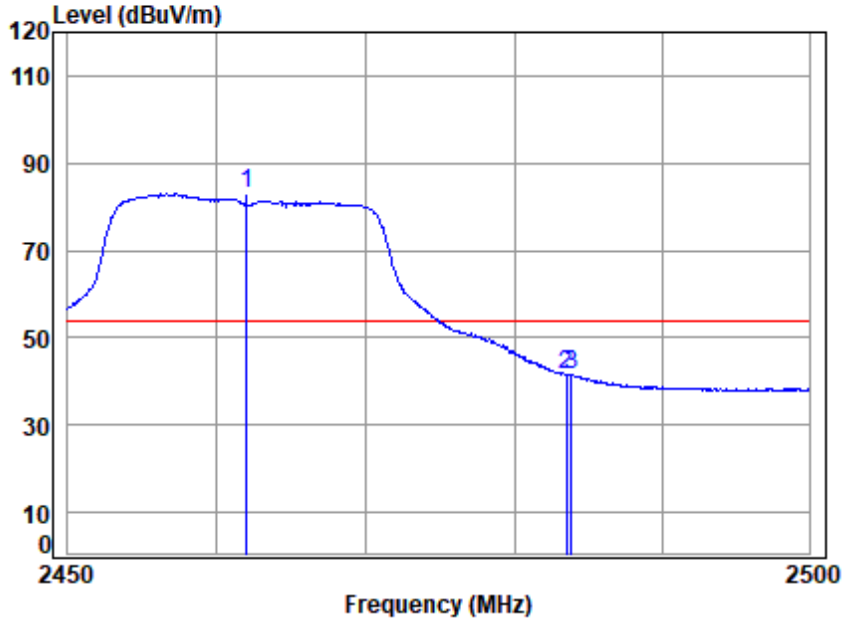

Site : chamber
Condition: 3m VERTICAL
Job No : 00442AT
Mode : 2462 Band edge
Note : 2.4G WIFI 11N20

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2462.000	5.10	27.32	32.50	83.18	83.10	54.00	29.10	Average
2	2483.500	5.12	27.36	32.50	41.63	41.61	54.00	-12.39	Average
3	2483.840	5.12	27.37	32.50	41.61	41.60	54.00	-12.40	Average

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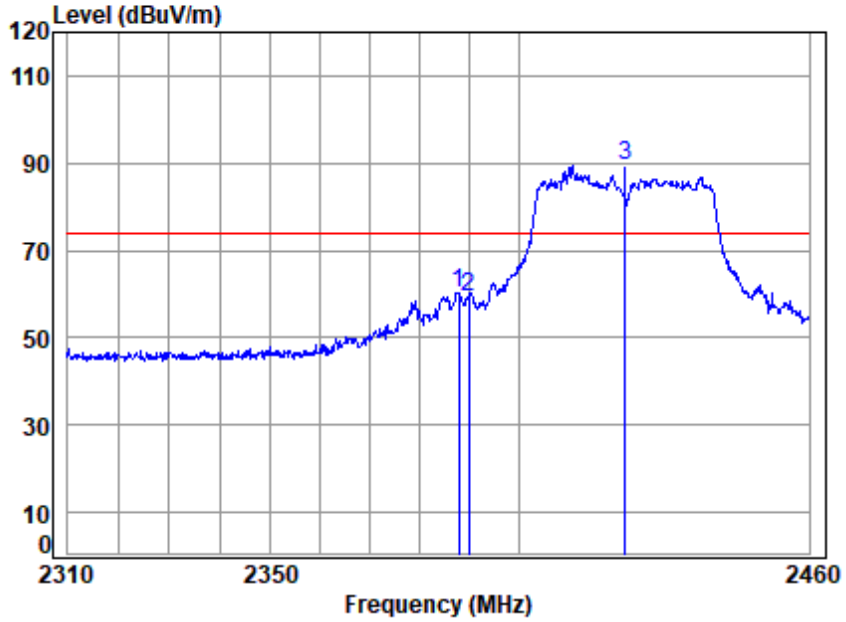
Test Mode: 05; Polarity: Horizontal; Modulation:802.11n; Bandwidth:40MHz; Channel:Low



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00442AT
Mode : 2422 Band edge
Note : 2.4G WIFI 11N40

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2388.023	5.05	27.15	32.50	60.67	60.37	74.00	-13.63	peak
2	2390.000	5.05	27.16	32.50	59.67	59.38	74.00	-14.62	peak
3	2422.000	5.08	27.23	32.50	89.44	89.25	74.00	15.25	peak

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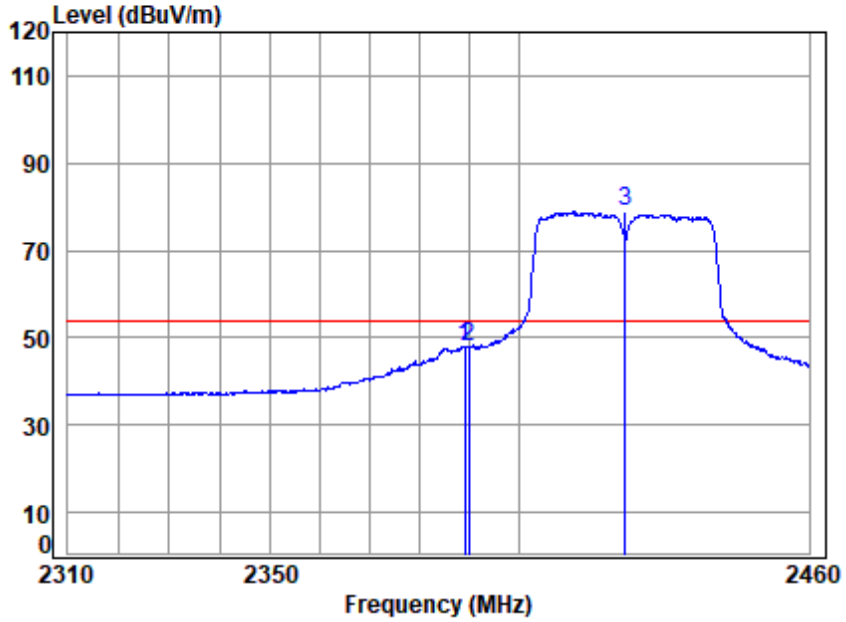
Test Mode: 05; Polarity: Horizontal; Modulation:802.11n; Bandwidth:40MHz; Channel:Low



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00442AT
Mode : 2422 Band edge
Note : 2.4G WIFI 11N40

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2389.226	5.05	27.16	32.50	48.41	48.12	54.00	-5.88	Average
2	2390.000	5.05	27.16	32.50	48.15	47.86	54.00	-6.14	Average
3	2422.000	5.08	27.23	32.50	78.99	78.80	54.00	24.80	Average

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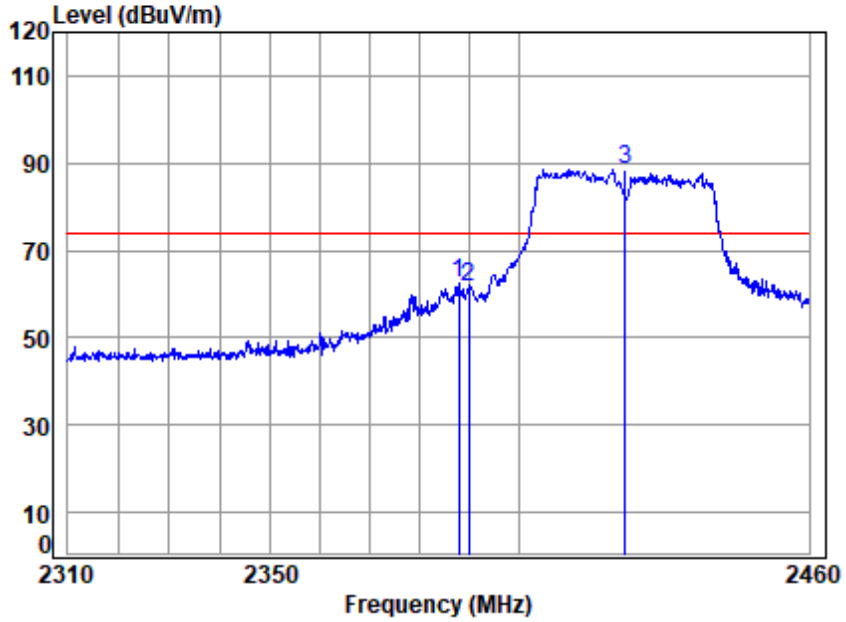
Test Mode: 05; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:Low



Site : chamber
Condition: 3m VERTICAL
Job No : 00442AT
Mode : 2422 Band edge
Note : 2.4G WIFI 11N40

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2388.023	5.05	27.15	32.50	62.64	62.34	74.00	-11.66	Peak
2	2390.000	5.05	27.16	32.50	61.96	61.67	74.00	-12.33	Peak
3	2422.000	5.08	27.23	32.50	88.69	88.50	74.00	14.50	Peak

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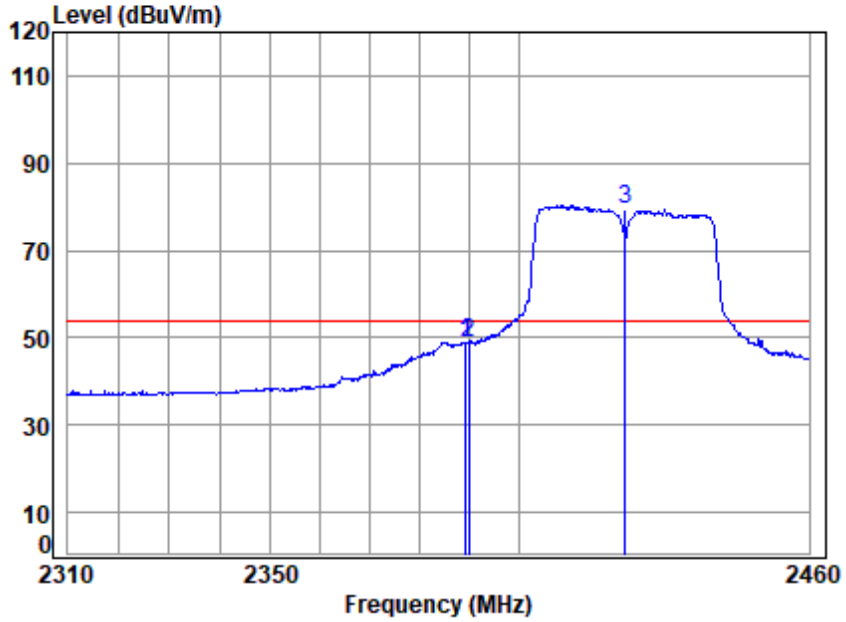
Test Mode: 05; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:Low



Site : chamber
Condition: 3m VERTICAL
Job No : 00442AT
Mode : 2422 Band edge
Note : 2.4G WIFI 11N40

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2389.376	5.05	27.16	32.50	49.31	49.02	54.00	-4.98	Average
2	2390.000	5.05	27.16	32.50	49.08	48.79	54.00	-5.21	Average
3	2422.000	5.08	27.23	32.50	79.54	79.35	54.00	25.35	Average

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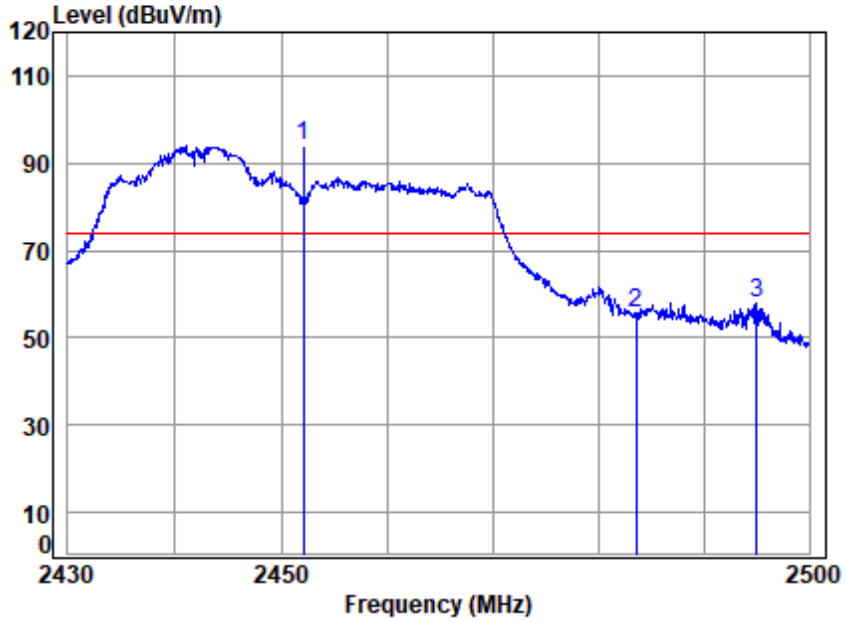
Test Mode: 05; Polarity: Horizontal; Modulation:802.11n; Bandwidth:40MHz; Channel:High



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00442AT
Mode : 2452 Band edge
Note : 2.4G WIFI 11N40

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2452.000	5.10	27.30	32.50	93.93	93.83	74.00	19.83	peak
2	2483.500	5.12	27.36	32.50	55.65	55.63	74.00	-18.37	peak
3	2494.964	5.13	27.39	32.50	57.86	57.88	74.00	-16.12	peak

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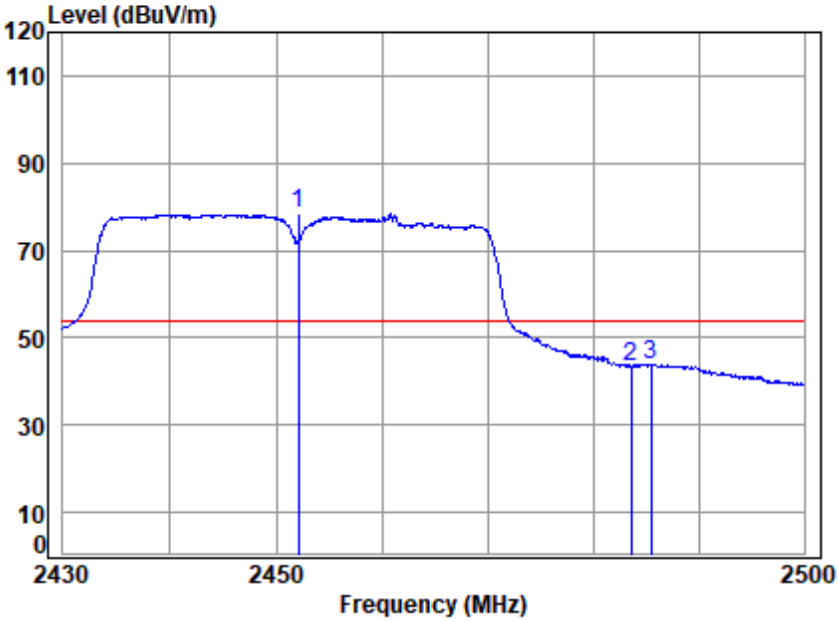
Test Mode: 05; Polarity: Horizontal; Modulation:802.11n; Bandwidth:40MHz; Channel:High



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00442AT
Mode : 2452 Band edge
Note : 2.4G WIFI 11N40

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2452.000	5.10	27.30	32.50	78.56	78.46	54.00	24.46	Average
2	2483.500	5.12	27.36	32.50	43.54	43.52	54.00	-10.48	Average
3	2485.346	5.12	27.37	32.50	43.98	43.97	54.00	-10.03	Average

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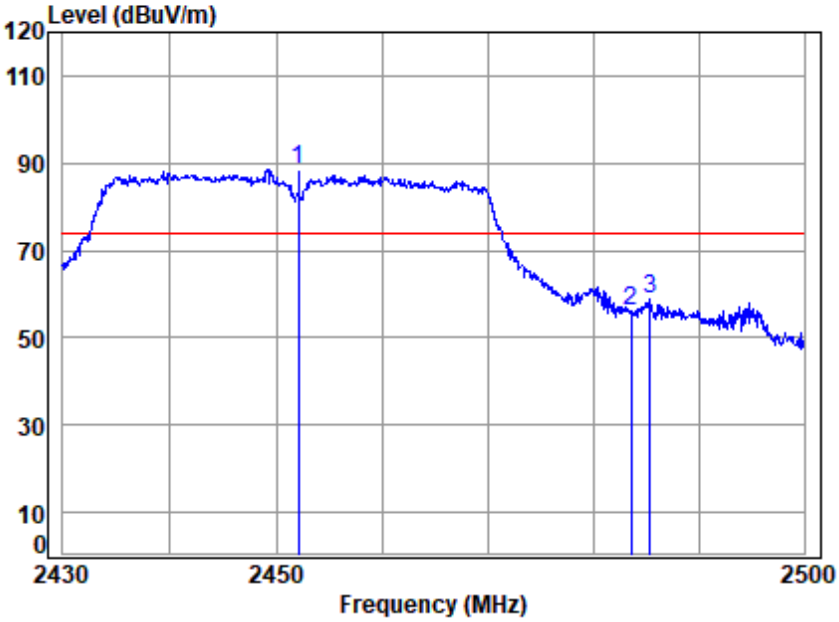
Test Mode: 05; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:High



Site : chamber
Condition: 3m VERTICAL
Job No : 00442AT
Mode : 2452 Band edge
Note : 2.4G WIFI 11N40

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2452.000	5.10	27.30	32.50	88.64	88.54	74.00	14.54	Peak
2	2483.500	5.12	27.36	32.50	55.94	55.92	74.00	-18.08	Peak
3	2485.276	5.12	27.37	32.50	58.76	58.75	74.00	-15.25	Peak

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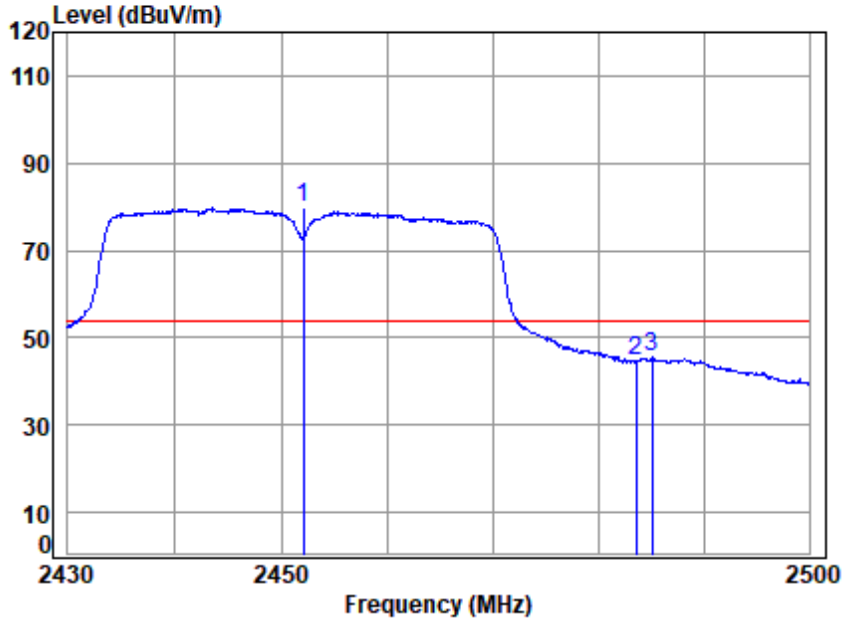
Test Mode: 05; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:High



Site : chamber
Condition: 3m VERTICAL
Job No : 00442AT
Mode : 2452 Band edge
Note : 2.4G WIFI 11N40

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	2452.000	5.10	27.30	32.50	79.73	79.63	54.00	25.63	Average
2	2483.500	5.12	27.36	32.50	44.62	44.60	54.00	-9.40	Average
3	2484.993	5.12	27.37	32.50	45.51	45.50	54.00	-8.50	Average

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7.7 Radiated Spurious Emissions Below 1GHz

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.209
Test Method: ANSI C63.10 (2013) Section 6.4,6.5
Measurement Distance: 3m

Limit:

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
0.009-0.490	2400/F(kHz)	300
0.490-1.705	24000/F(kHz)	30
1.705-30.0	30	30
30-88	100	3
88-216	150	3
216-960	200	3
960-1000	500	3

7.7.1 E.U.T. Operation

Operating Environment:
Temperature: 23.2 °C Humidity: 52.1 % RH Atmospheric Pressure: 1020 mbar

7.7.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	05	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40), final test modes are considering the modulation and worse data rates. Only the data of worst case is recorded in the report.

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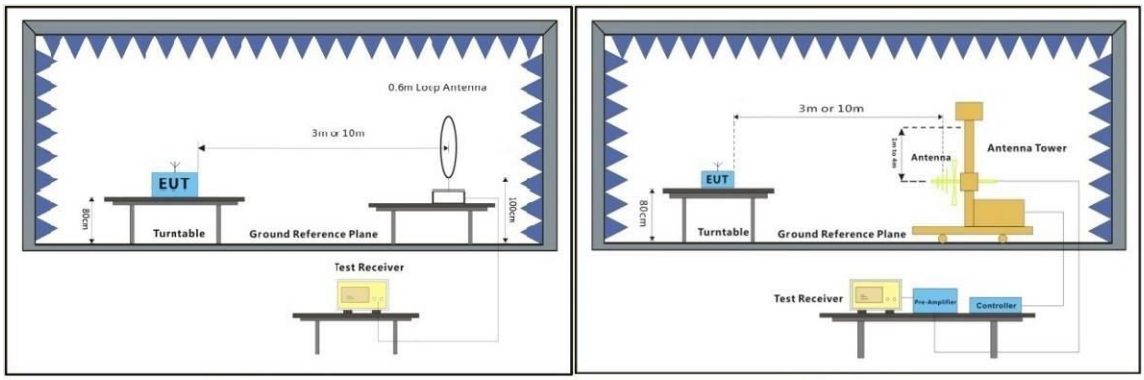
7.7.3 Test Setup Diagram



Below 30MHz 30MHz-1GHz

7.7.4 Measurement Procedure and Data

a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 or 10 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using quasi-peak method as specified and then reported in a data sheet.

g. Test the EUT in the lowest channel, the middle channel, the Highest channel.

h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.

i. Repeat above procedures until all frequencies measured was complete.

Remark:

1. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

2. Scan from 9kHz to 30MHz, the disturbance below 30MHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.

3. The disturbance below 1GHz was very low and the harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.

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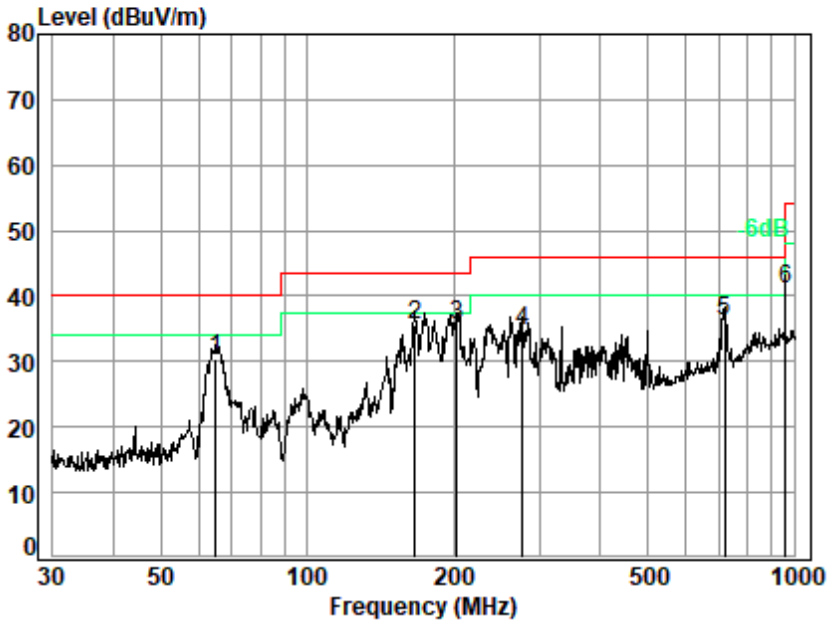
Test Mode: 05; Polarity: Horizontal



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00422AT
Mode : 05

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	64.887	0.26	16.56	25.89	39.59	30.52	40.00	-9.48	QP
2	166.651	0.79	17.00	25.51	43.45	35.73	43.50	-7.77	QP
3	202.810	0.70	15.22	25.47	45.00	35.45	43.50	-8.05	QP
4	277.094	0.94	17.62	25.41	41.53	34.68	46.00	-11.32	QP
5	719.200	1.78	25.93	24.49	32.99	36.21	46.00	-9.79	QP
6	958.794	2.31	29.34	24.04	33.46	41.07	46.00	-4.93	QP

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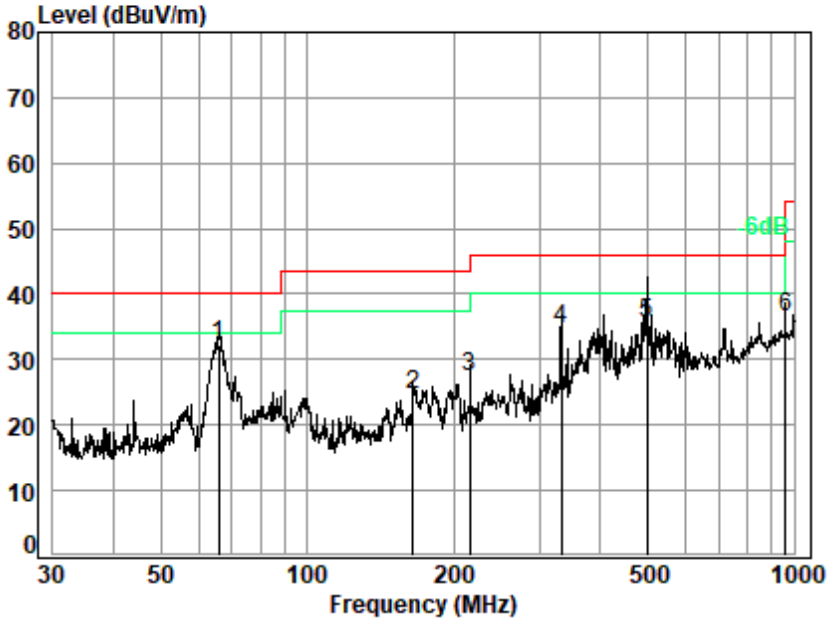
Test Mode: 05; Polarity: Vertical



Site : chamber
Condition: 3m VERTICAL
Job No : 00422AT
Mode : 05

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	65.803	0.27	16.49	25.88	41.23	32.11	40.00	-7.89	QP
2	164.908	0.80	17.05	25.51	32.19	24.53	43.50	-18.97	QP
3	216.024	0.75	15.72	25.46	36.33	27.34	46.00	-18.66	QP
4	332.519	1.35	19.58	25.42	39.17	34.68	46.00	-11.32	QP
5	497.677	1.39	22.74	25.50	36.88	35.51	46.00	-10.49	QP
6	958.794	2.31	29.34	24.04	28.92	36.53	46.00	-9.47	QP

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7.8 Radiated Spurious Emissions Above 1GHz

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.209
Test Method: ANSI C63.10 (2013) Section 6.6
Measurement Distance: 3m

Limit:

Frequency(MHz)	Field strength(microvolts/meter)	Measurement distance(meters)
Above 1000	500	3

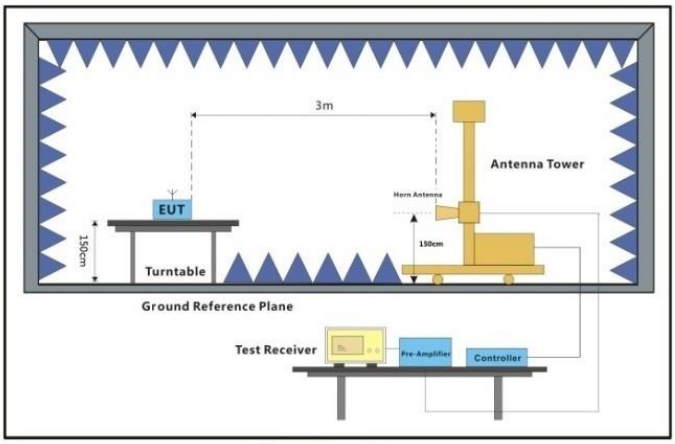
7.8.1 E.U.T. Operation

Operating Environment:
Temperature: 23.2 °C Humidity: 58.6 % RH Atmospheric Pressure: 1020 mbar

7.8.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	05	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and found the data rate @ 1Mbps is the worst case of IEEE 802.11b; data rate @ 6Mbps is the worst case of IEEE 802.11g; data rate @ 6.5Mbps is the worst case of IEEE 802.11n(HT20); data rate @ 13.5Mbps is the worst case of IEEE 802.11n(HT40), final test modes are considering the modulation and worse data rates. Only the data of worst case is recorded in the report.

7.8.3 Test Setup Diagram



Above 1GHz

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7.8.4 Measurement Procedure and Data

a. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.

b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.

c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.

d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.

e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.

f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak or average method as specified and then reported in a data sheet.

g. Test the EUT in the lowest channel, the middle channel, the Highest channel.

h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.

i. Repeat above procedures until all frequencies measured was complete.

Remark:

1. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor

2. Scan from 1GHz to 25GHz, the disturbance above 18GHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.

3. As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.

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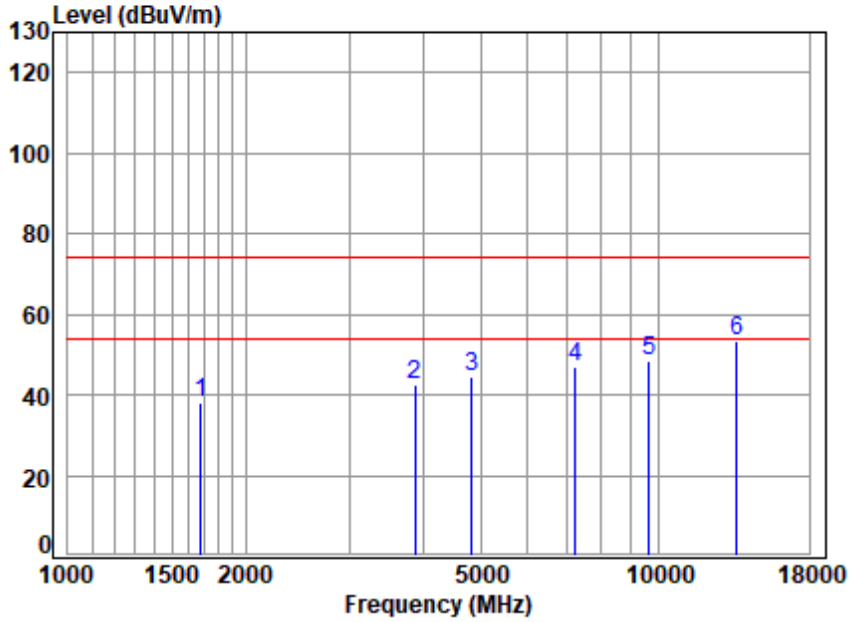
Test Mode: 05; Polarity: Horizontal; Modulation:802.11b; Bandwidth:20MHz; Channel:Low



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00442AT
Mode : 2412 TX RSE
Note : 2.4G WIFI 11B

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1677.621	4.15	24.96	52.95	61.88	38.04	74.00	-35.96	peak
2	3879.027	7.38	29.32	52.83	58.53	42.40	74.00	-31.60	peak
3	4824.000	8.02	30.99	53.05	58.42	44.38	74.00	-29.62	peak
4	7236.000	8.31	36.09	53.52	56.31	47.19	74.00	-26.81	peak
5	9648.000	11.38	37.62	53.54	53.09	48.55	74.00	-25.45	peak
6	13599.130	11.97	40.79	53.96	54.68	53.48	74.00	-20.52	Peak

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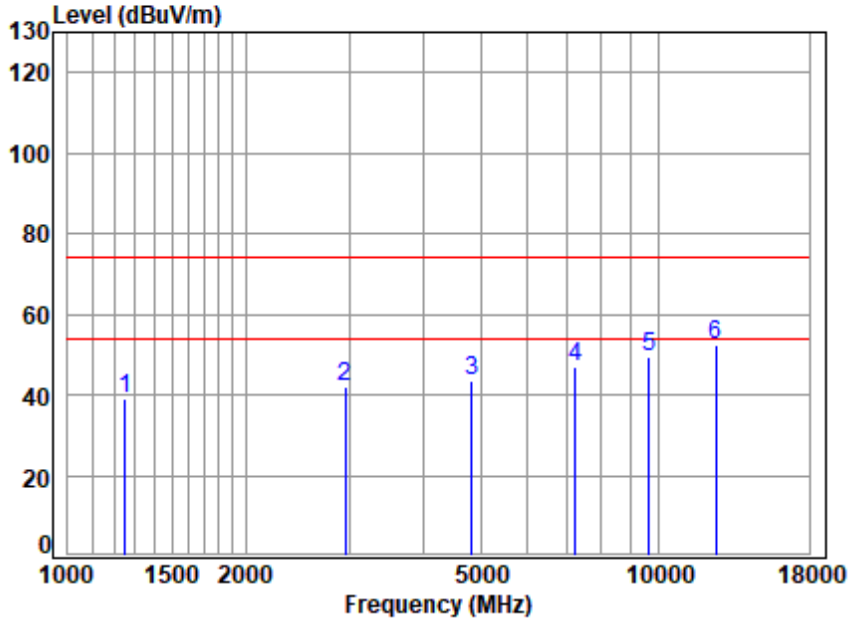
Test Mode: 05; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:Low



Site : chamber
Condition: 3m VERTICAL
Job No : 00442AT
Mode : 2412 TX RSE
Note : 2.4G WIFI 11B

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1249.269	3.26	24.27	52.69	64.05	38.89	74.00	-35.11	peak
2	2956.155	5.67	28.50	53.10	60.86	41.93	74.00	-32.07	Peak
3	4824.000	8.02	30.99	53.05	57.57	43.53	74.00	-30.47	peak
4	7236.000	8.31	36.09	53.52	55.93	46.81	74.00	-27.19	peak
5	9648.000	11.38	37.62	53.54	53.82	49.28	74.00	-24.72	peak
6	12505.710	12.45	39.75	54.10	54.23	52.33	74.00	-21.67	Peak

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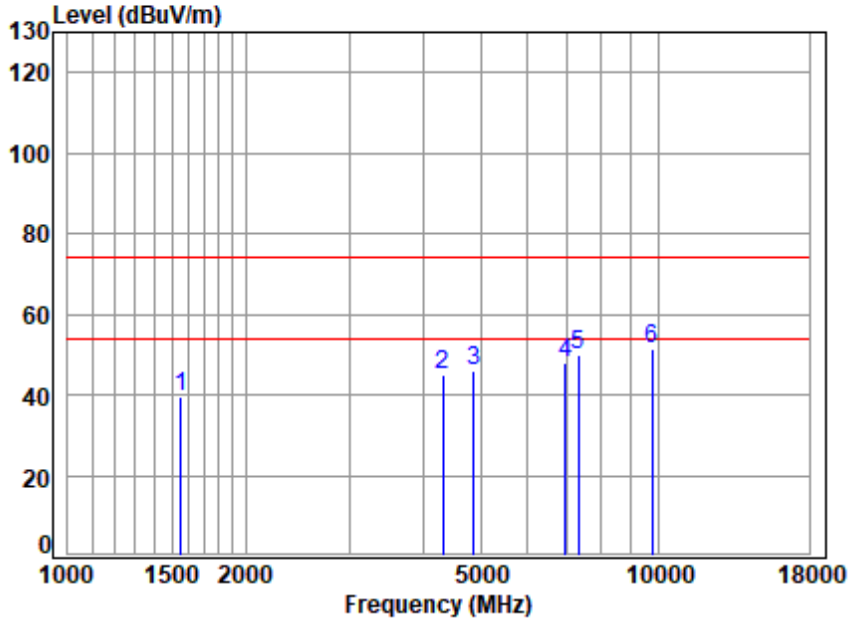
Test Mode: 05; Polarity: Horizontal; Modulation:802.11b; Bandwidth:20MHz; Channel:middle



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00442AT
Mode : 2437 TX RSE
Note : 2.4G WIFI 11B

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1551.677	3.89	24.66	52.88	63.92	39.59	74.00	-34.41	peak
2	4316.859	7.48	29.95	52.90	60.22	44.75	74.00	-29.25	peak
3	4874.000	8.10	31.11	53.07	59.84	45.98	74.00	-28.02	peak
4	6954.852	8.15	35.70	53.47	57.50	47.88	74.00	-26.12	peak
5	7311.000	8.34	36.18	53.53	58.73	49.72	74.00	-24.28	peak
6	9748.000	11.30	37.84	53.44	55.54	51.24	74.00	-22.76	peak

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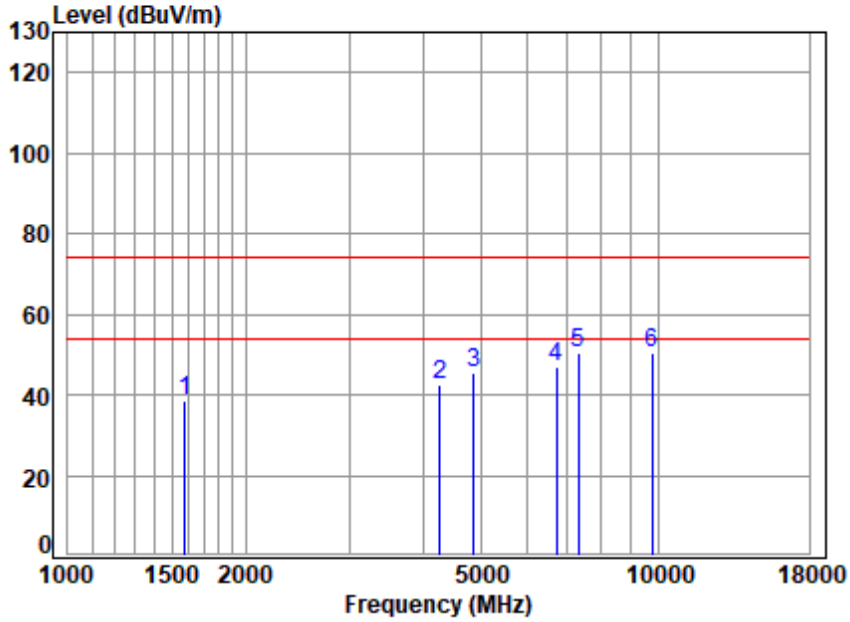
Test Mode: 05; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:middle



Site : chamber
Condition: 3m VERTICAL
Job No : 00442AT
Mode : 2437 TX RSE
Note : 2.4G WIFI 11B

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1578.822	3.94	24.74	52.90	62.96	38.74	74.00	-35.26	peak
2	4267.237	7.48	29.88	52.89	58.06	42.53	74.00	-31.47	peak
3	4874.000	8.10	31.11	53.07	59.54	45.68	74.00	-28.32	peak
4	6717.762	7.92	35.13	53.31	57.43	47.17	74.00	-26.83	peak
5	7311.000	8.34	36.18	53.53	59.22	50.21	74.00	-23.79	peak
6	9748.000	11.30	37.84	53.44	54.72	50.42	74.00	-23.58	peak

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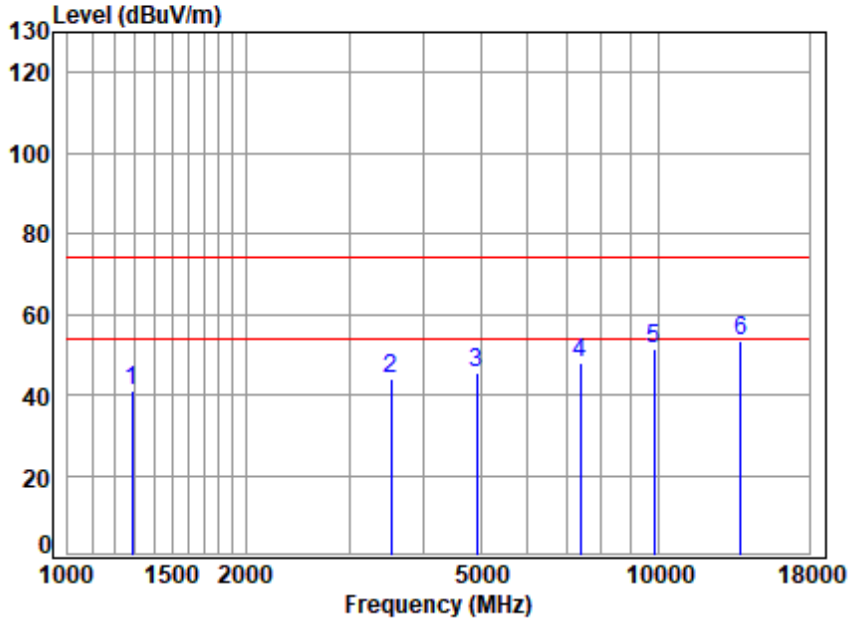
Test Mode: 05; Polarity: Horizontal; Modulation:802.11b; Bandwidth:20MHz; Channel:High



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00442AT
Mode : 2462 TX RSE
Note : 2.4G WIFI 11B

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1285.904	3.34	24.26	52.72	65.95	40.83	74.00	-33.17	Peak
2	3526.134	7.02	28.74	52.93	61.27	44.10	74.00	-29.90	Peak
3	4924.000	8.18	31.23	53.08	58.90	45.23	74.00	-28.77	peak
4	7386.000	8.38	36.27	53.54	56.94	48.05	74.00	-25.95	peak
5	9848.000	11.23	38.07	53.35	55.53	51.48	74.00	-22.52	peak
6	13797.090	11.72	41.15	53.88	54.55	53.54	74.00	-20.46	Peak

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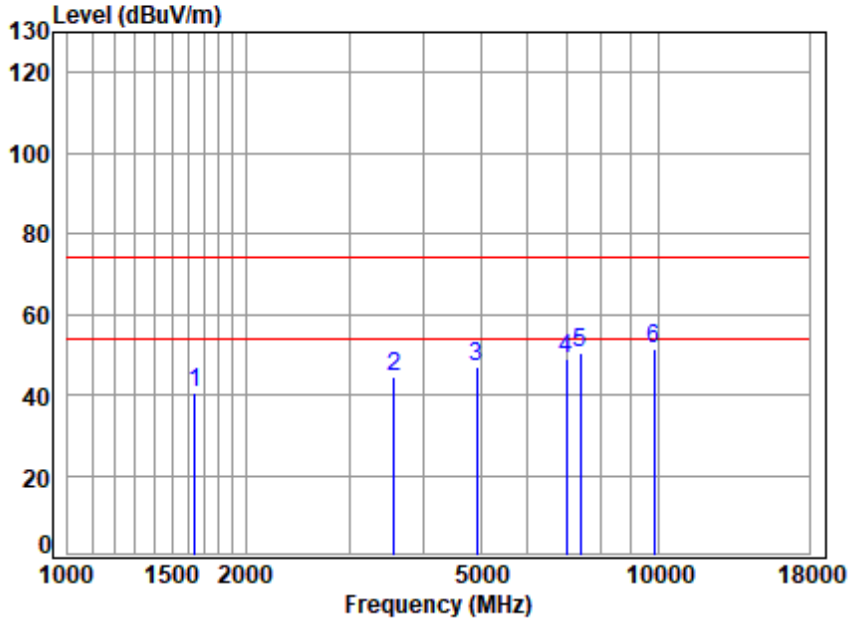
Test Mode: 05; Polarity: Vertical; Modulation:802.11b; Bandwidth:20MHz; Channel:High



Site : chamber
Condition: 3m VERTICAL
Job No : 00442AT
Mode : 2462 TX RSE
Note : 2.4G WIFI 11B

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1639.274	4.07	24.88	52.93	64.41	40.43	74.00	-33.57	peak
2	3567.138	7.06	28.81	52.92	61.58	44.53	74.00	-29.47	peak
3	4924.000	8.18	31.23	53.08	60.57	46.90	74.00	-27.10	peak
4	6995.172	8.19	35.79	53.50	58.27	48.75	74.00	-25.25	peak
5	7386.000	8.38	36.27	53.54	59.15	50.26	74.00	-23.74	peak
6	9848.000	11.23	38.07	53.35	55.67	51.62	74.00	-22.38	peak

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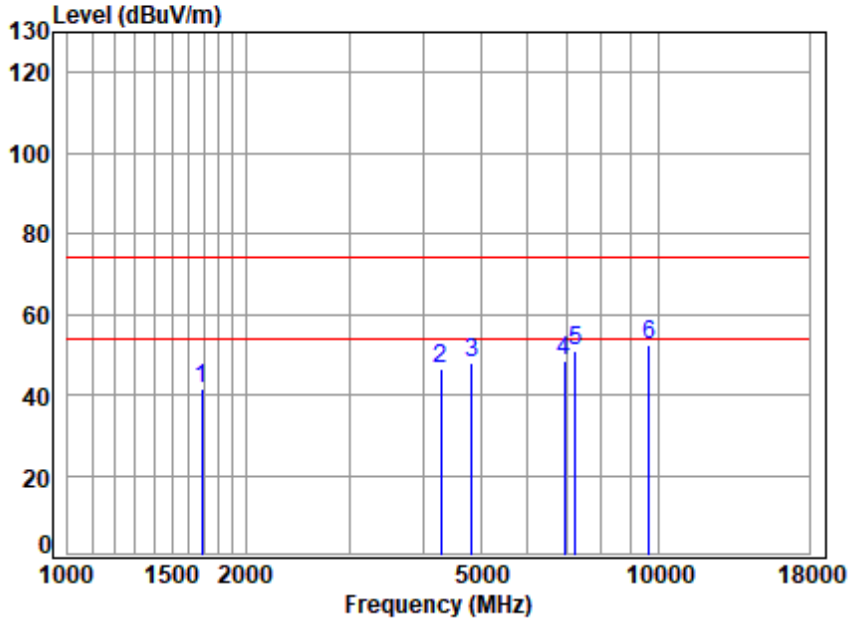
Test Mode: 05; Polarity: Horizontal; Modulation:802.11g; Bandwidth:20MHz; Channel:Low



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00442AT
Mode : 2412 TX RSE
Note : 2.4G WIFI 11G

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1687.347	4.17	24.98	52.95	65.12	41.32	74.00	-32.68	peak
2	4291.977	7.48	29.92	52.89	62.15	46.66	74.00	-27.34	peak
3	4824.000	8.02	30.99	53.05	62.17	48.13	74.00	-25.87	peak
4	6934.778	8.13	35.65	53.46	58.36	48.68	74.00	-25.32	peak
5	7236.000	8.31	36.09	53.52	60.00	50.88	74.00	-23.12	peak
6	9648.000	11.38	37.62	53.54	56.74	52.20	74.00	-21.80	peak

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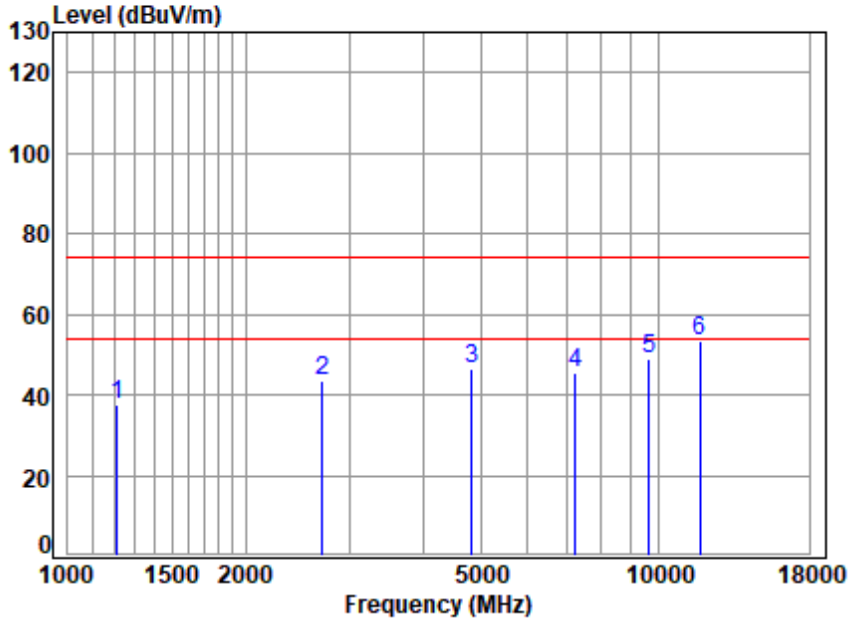
Test Mode: 05; Polarity: Vertical; Modulation:802.11g; Bandwidth:20MHz; Channel:Low



Site : chamber
Condition: 3m VERTICAL
Job No : 00442AT
Mode : 2412 TX RSE
Note : 2.4G WIFI 11G

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1213.677	3.18	24.29	52.67	62.99	37.79	74.00	-36.21	Peak
2	2694.998	5.37	27.89	53.10	63.53	43.69	74.00	-30.31	Peak
3	4824.000	8.02	30.99	53.05	60.54	46.50	74.00	-27.50	peak
4	7236.000	8.31	36.09	53.52	54.46	45.34	74.00	-28.66	peak
5	9648.000	11.38	37.62	53.54	53.62	49.08	74.00	-24.92	peak
6	11769.210	11.60	39.76	53.91	55.92	53.37	74.00	-20.63	Peak

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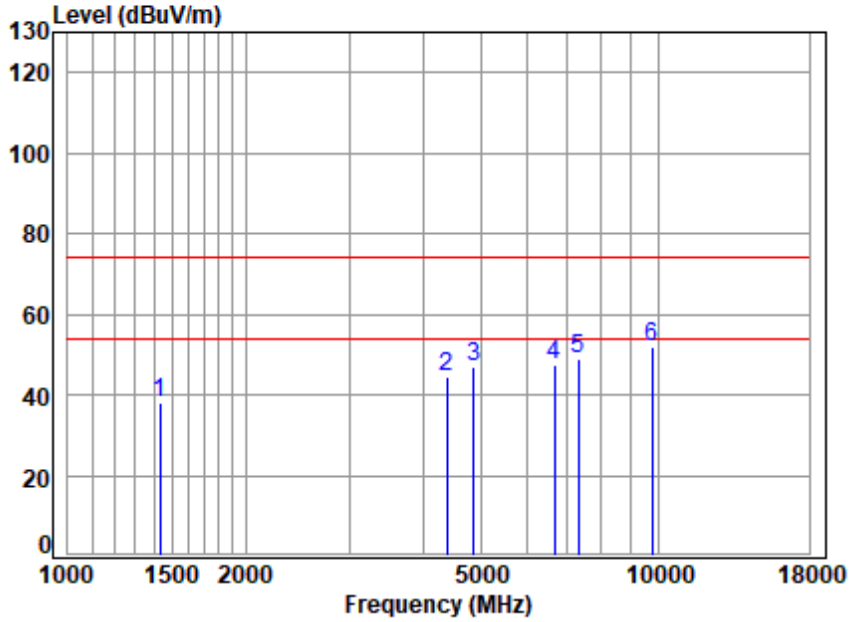
Test Mode: 05; Polarity: Horizontal; Modulation:802.11g; Bandwidth:20MHz; Channel:middle



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00442AT
Mode : 2437 TX RSE
Note : 2.4G WIFI 11G

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1435.189	3.65	24.31	52.81	62.95	38.10	74.00	-35.90	peak
2	4392.376	7.47	30.06	52.93	59.80	44.40	74.00	-29.60	peak
3	4874.000	8.10	31.11	53.07	60.98	47.12	74.00	-26.88	peak
4	6679.040	7.88	35.04	53.29	57.63	47.26	74.00	-26.74	peak
5	7311.000	8.34	36.18	53.53	57.79	48.78	74.00	-25.22	peak
6	9748.000	11.30	37.84	53.44	56.41	52.11	74.00	-21.89	peak

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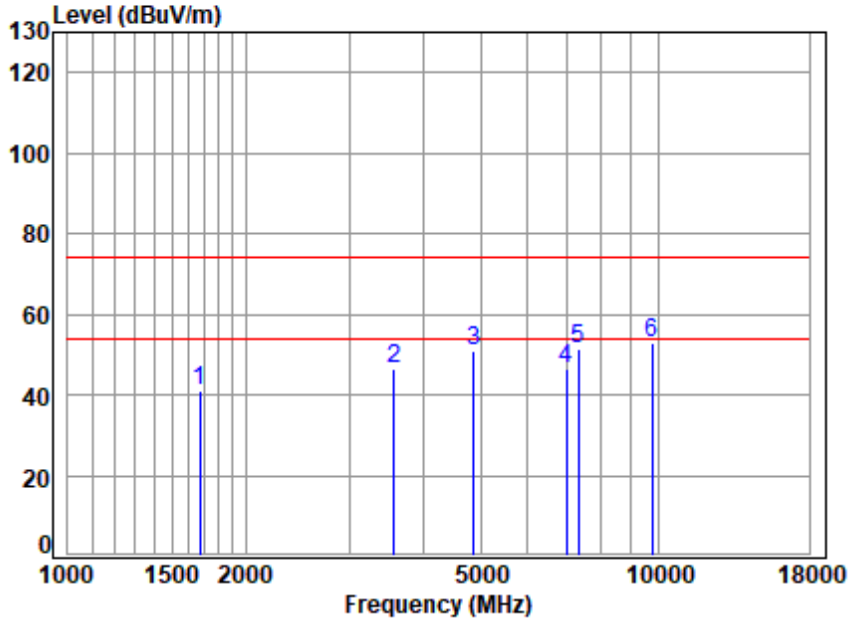
Test Mode: 05; Polarity: Vertical; Modulation:802.11g; Bandwidth:20MHz; Channel:middle



Site : chamber
Condition: 3m VERTICAL
Job No : 00442AT
Mode : 2437 TX RSE
Note : 2.4G WIFI 11G

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1672.779	4.14	24.95	52.95	64.90	41.04	74.00	-32.96	peak
2	3567.138	7.06	28.81	52.92	63.43	46.38	74.00	-27.62	peak
3	4874.000	8.10	31.11	53.07	64.93	51.07	74.00	-22.93	peak
4	6995.172	8.19	35.79	53.50	56.18	46.66	74.00	-27.34	peak
5	7311.000	8.34	36.18	53.53	60.59	51.58	74.00	-22.42	peak
6	9748.000	11.30	37.84	53.44	57.10	52.80	74.00	-21.20	peak

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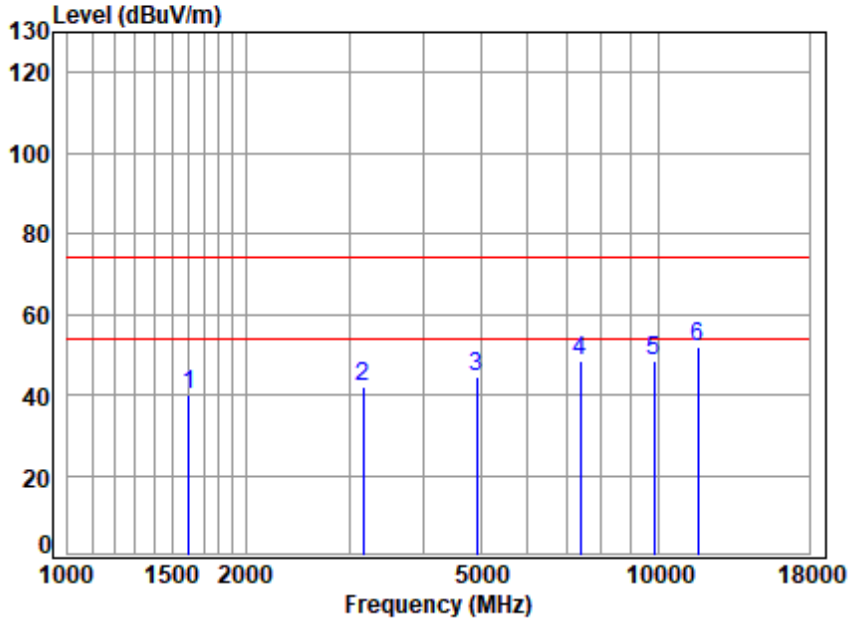
Test Mode: 05; Polarity: Horizontal; Modulation:802.11g; Bandwidth:20MHz; Channel:High



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00442AT
Mode : 2462 TX RSE
Note : 2.4G WIFI 11G

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1601.804	3.99	24.80	52.91	64.05	39.93	74.00	-34.07	peak
2	3168.500	6.17	28.64	53.04	60.32	42.09	74.00	-31.91	Peak
3	4924.000	8.18	31.23	53.08	57.95	44.28	74.00	-29.72	peak
4	7386.000	8.38	36.27	53.54	57.49	48.60	74.00	-25.40	peak
5	9848.000	11.23	38.07	53.35	52.56	48.51	74.00	-25.49	peak
6	11667.600	11.60	39.74	53.87	54.31	51.78	74.00	-22.22	Peak

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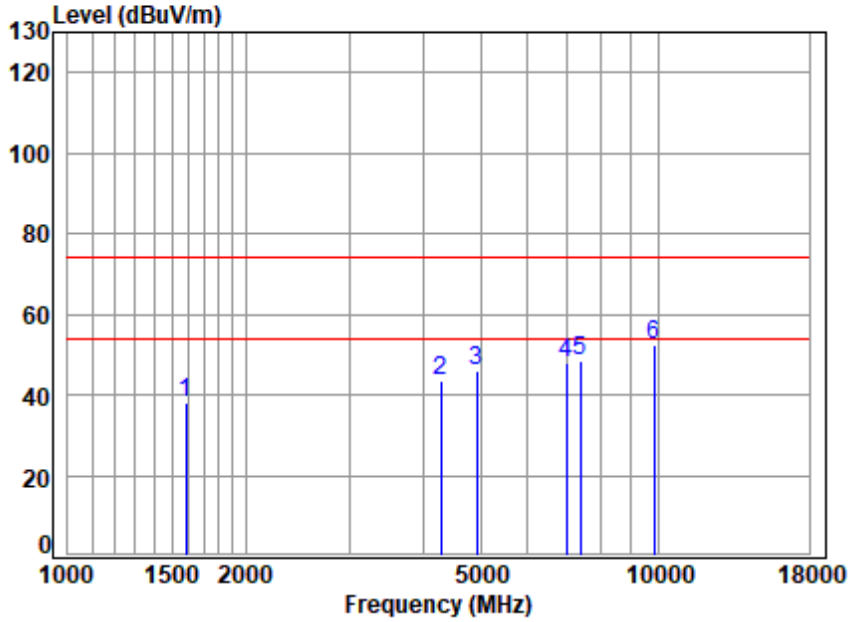
Test Mode: 05; Polarity: Vertical; Modulation:802.11g; Bandwidth:20MHz; Channel:High



Site : chamber
Condition: 3m VERTICAL
Job No : 00442AT
Mode : 2462 TX RSE
Note : 2.4G WIFI 11G

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1583.392	3.95	24.75	52.90	62.36	38.16	74.00	-35.84	peak
2	4291.977	7.48	29.92	52.89	59.10	43.61	74.00	-30.39	peak
3	4924.000	8.18	31.23	53.08	59.67	46.00	74.00	-28.00	peak
4	6974.982	8.17	35.74	53.48	57.33	47.76	74.00	-26.24	peak
5	7386.000	8.38	36.27	53.54	57.50	48.61	74.00	-25.39	peak
6	9848.000	11.23	38.07	53.35	56.30	52.25	74.00	-21.75	peak

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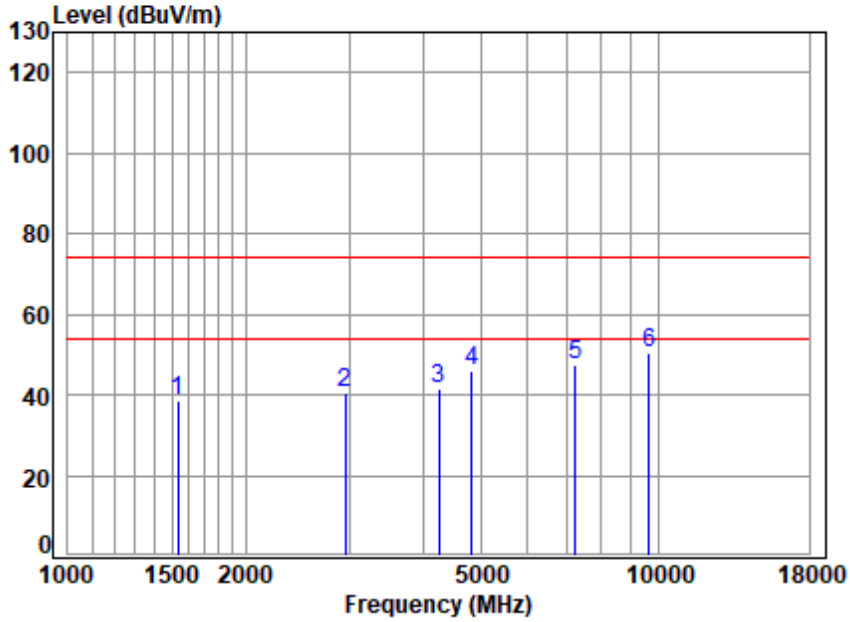
Test Mode: 05; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:Low



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00442AT
Mode : 2412 TX RSE
Note : 2.4G WIFI 11N20

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1533.841	3.85	24.61	52.87	62.79	38.38	74.00	-35.62	peak
2	2956.155	5.67	28.50	53.10	59.38	40.45	74.00	-33.55	Peak
3	4254.921	7.48	29.87	52.88	57.22	41.69	74.00	-32.31	peak
4	4824.000	8.02	30.99	53.05	60.10	46.06	74.00	-27.94	peak
5	7236.000	8.31	36.09	53.52	56.41	47.29	74.00	-26.71	peak
6	9648.000	11.38	37.62	53.54	54.85	50.31	74.00	-23.69	peak

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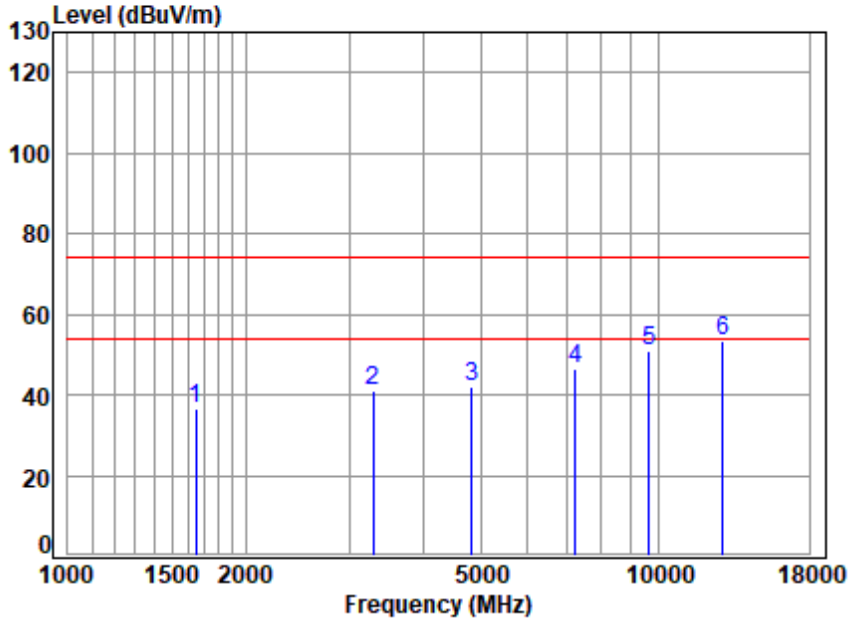
Test Mode: 05; Polarity: Vertical; Modulation:802.11n; Bandwidth:20MHz; Channel:Low



Site : chamber
Condition: 3m VERTICAL
Job No : 00442AT
Mode : 2412 TX RSE
Note : 2.4G WIFI 11N20

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1648.778	4.09	24.90	52.93	60.50	36.56	74.00	-37.44	peak
2	3289.821	6.48	28.66	53.00	58.67	40.81	74.00	-33.19	Peak
3	4824.000	8.02	30.99	53.05	56.27	42.23	74.00	-31.77	peak
4	7236.000	8.31	36.09	53.52	55.74	46.62	74.00	-27.38	peak
5	9648.000	11.38	37.62	53.54	55.42	50.88	74.00	-23.12	peak
6	12835.290	12.48	39.72	54.17	55.41	53.44	74.00	-20.56	Peak

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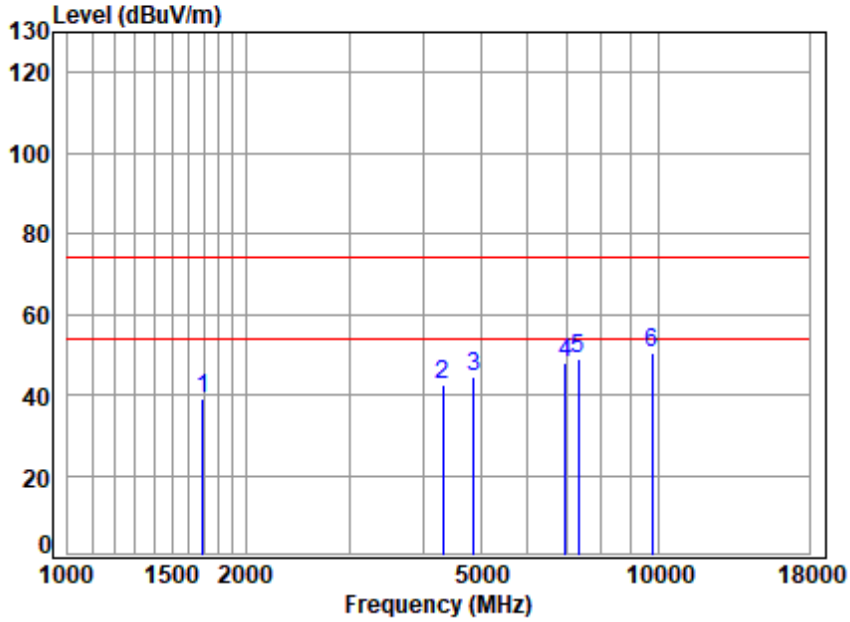
Test Mode: 05; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:middle



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00442AT
Mode : 2437 TX RSE
Note : 2.4G WIFI 11N20

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1692.231	4.18	24.99	52.96	62.74	38.95	74.00	-35.05	peak
2	4316.859	7.48	29.95	52.90	58.07	42.60	74.00	-31.40	peak
3	4874.000	8.10	31.11	53.07	58.28	44.42	74.00	-29.58	peak
4	6954.852	8.15	35.70	53.47	57.70	48.08	74.00	-25.92	peak
5	7311.000	8.34	36.18	53.53	58.15	49.14	74.00	-24.86	peak
6	9748.000	11.30	37.84	53.44	54.49	50.19	74.00	-23.81	peak

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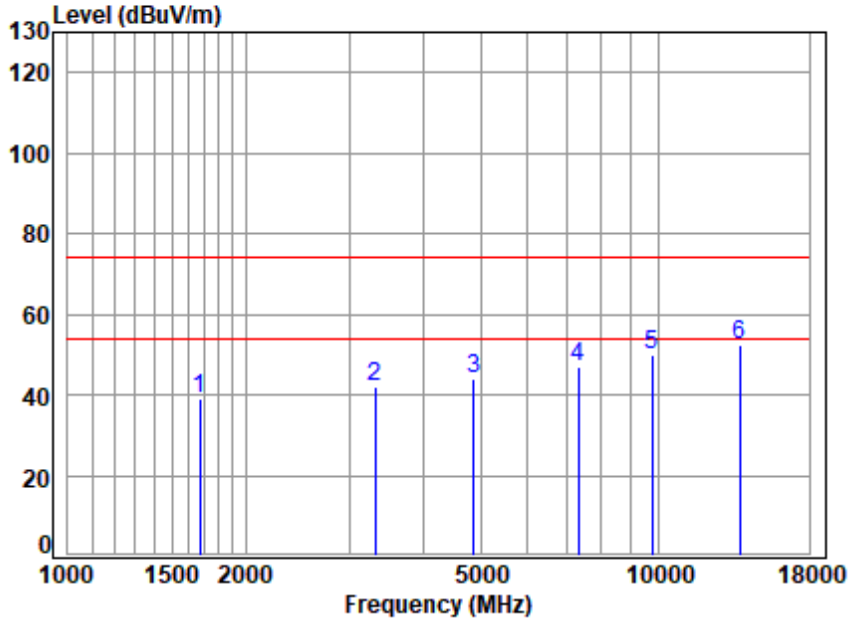
Test Mode: 05; Polarity: Vertical; Modulation:802.11n; Bandwidth:20MHz; Channel:middle



Site : chamber
Condition: 3m VERTICAL
Job No : 00442AT
Mode : 2437 TX RSE
Note : 2.4G WIFI 11N20

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1672.779	4.14	24.95	52.95	62.69	38.83	74.00	-35.17	peak
2	3318.471	6.55	28.67	52.99	59.84	42.07	74.00	-31.93	Peak
3	4874.000	8.10	31.11	53.07	58.04	44.18	74.00	-29.82	peak
4	7311.000	8.34	36.18	53.53	55.87	46.86	74.00	-27.14	peak
5	9748.000	11.30	37.84	53.44	54.34	50.04	74.00	-23.96	peak
6	13717.560	11.82	41.00	53.91	53.42	52.33	74.00	-21.67	Peak

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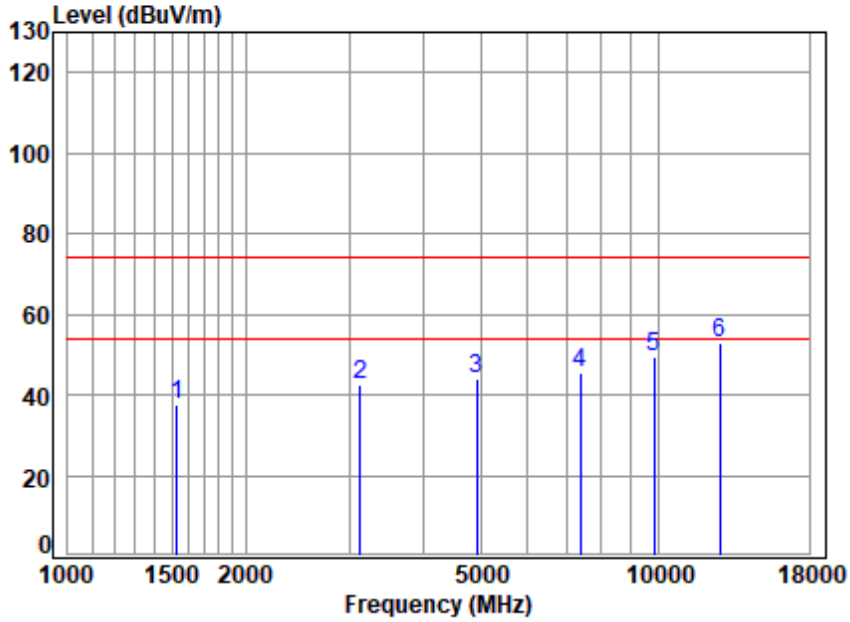
Test Mode: 05; Polarity: Horizontal; Modulation:802.11n; Bandwidth:20MHz; Channel:High



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00442AT
Mode : 2462 TX RSE
Note : 2.4G WIFI 11N20

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1529.414	3.84	24.60	52.87	62.11	37.68	74.00	-36.32	Peak
2	3132.079	6.07	28.63	53.06	60.70	42.34	74.00	-31.66	Peak
3	4924.000	8.18	31.23	53.08	57.87	44.20	74.00	-29.80	peak
4	7386.000	8.38	36.27	53.54	54.29	45.40	74.00	-28.60	peak
5	9848.000	11.23	38.07	53.35	53.28	49.23	74.00	-24.77	peak
6	12724.470	12.47	39.73	54.15	55.03	53.08	74.00	-20.92	Peak

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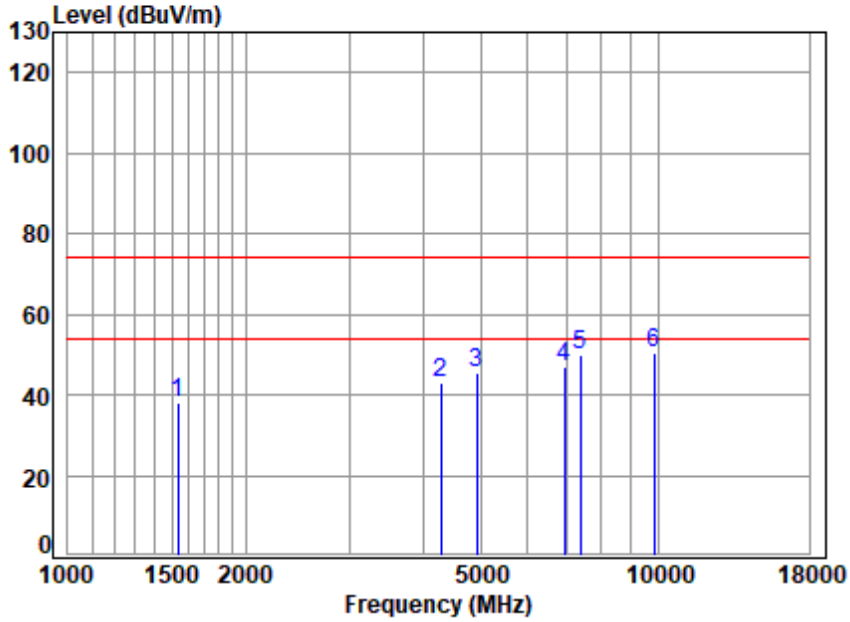
Test Mode: 05; Polarity: Vertical; Modulation:802.11n; Bandwidth:20MHz; Channel:High



Site : chamber
Condition: 3m VERTICAL
Job No : 00442AT
Mode : 2462 TX RSE
Note : 2.4G WIFI 11N20

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1538.281	3.86	24.62	52.87	62.48	38.09	74.00	-35.91	peak
2	4291.977	7.48	29.92	52.89	58.49	43.00	74.00	-31.00	peak
3	4924.000	8.18	31.23	53.08	59.16	45.49	74.00	-28.51	peak
4	6934.778	8.13	35.65	53.46	56.52	46.84	74.00	-27.16	peak
5	7386.000	8.38	36.27	53.54	58.65	49.76	74.00	-24.24	peak
6	9848.000	11.23	38.07	53.35	54.50	50.45	74.00	-23.55	peak

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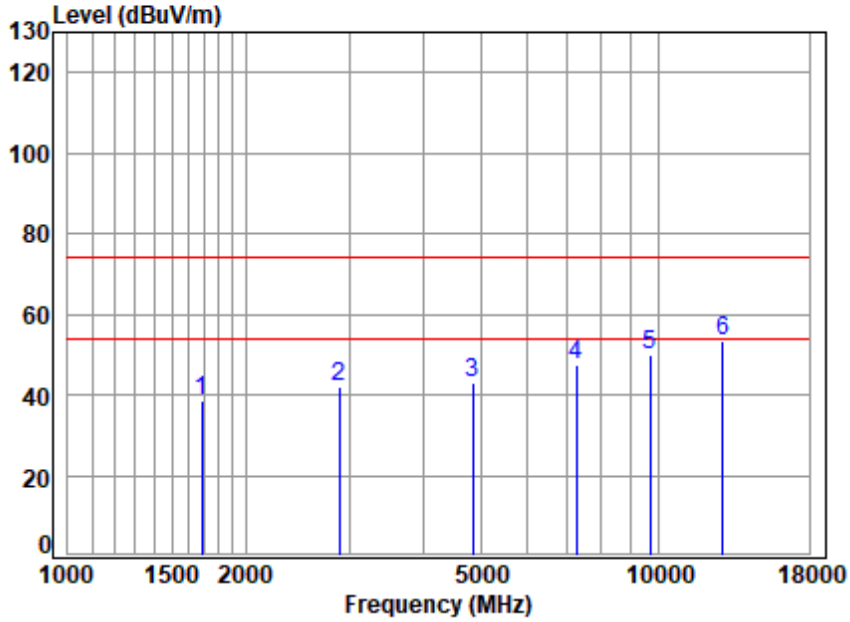
Test Mode: 05; Polarity: Horizontal; Modulation:802.11n; Bandwidth:40MHz; Channel:Low



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00442AT
Mode : 2422 TX RSE
Note : 2.4G WIFI 11N40

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1687.347	4.17	24.98	52.95	62.50	38.70	74.00	-35.30	peak
2	2880.247	5.59	28.33	53.10	61.00	41.82	74.00	-32.18	Peak
3	4844.000	8.05	31.04	53.06	56.98	43.01	74.00	-30.99	peak
4	7266.000	8.32	36.12	53.53	56.59	47.50	74.00	-26.50	peak
5	9688.000	11.35	37.71	53.50	54.12	49.68	74.00	-24.32	peak
6	12872.440	12.48	39.71	54.18	55.40	53.41	74.00	-20.59	Peak

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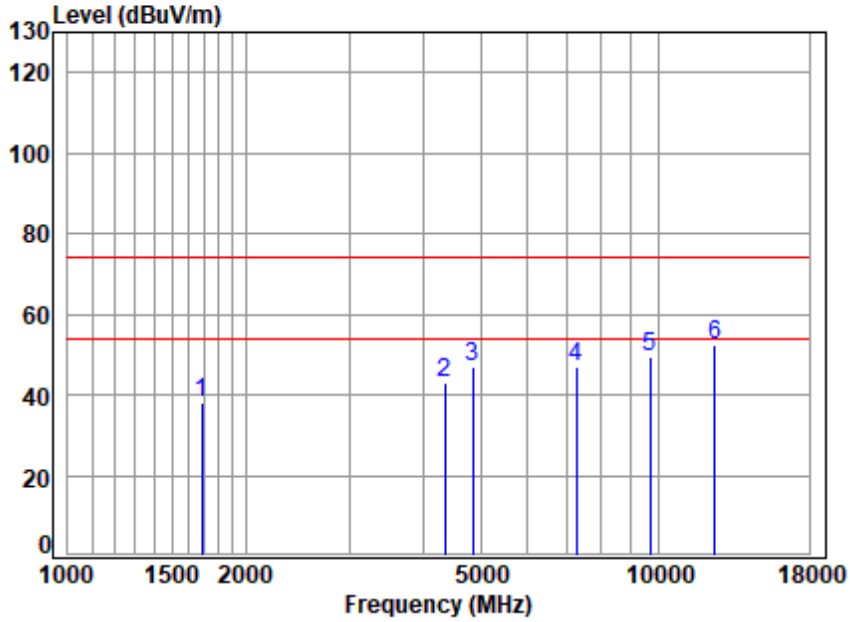
Test Mode: 05; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:Low



Site : chamber
Condition: 3m VERTICAL
Job No : 00442AT
Mode : 2422 TX RSE
Note : 2.4G WIFI 11N40

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1687.347	4.17	24.98	52.95	61.85	38.05	74.00	-35.95	peak
2	4354.454	7.48	30.00	52.91	58.55	43.12	74.00	-30.88	peak
3	4844.000	8.05	31.04	53.06	60.99	47.02	74.00	-26.98	peak
4	7266.000	8.32	36.12	53.53	55.91	46.82	74.00	-27.18	peak
5	9688.000	11.35	37.71	53.50	53.82	49.38	74.00	-24.62	peak
6	12469.610	12.40	39.75	54.10	54.46	52.51	74.00	-21.49	Peak

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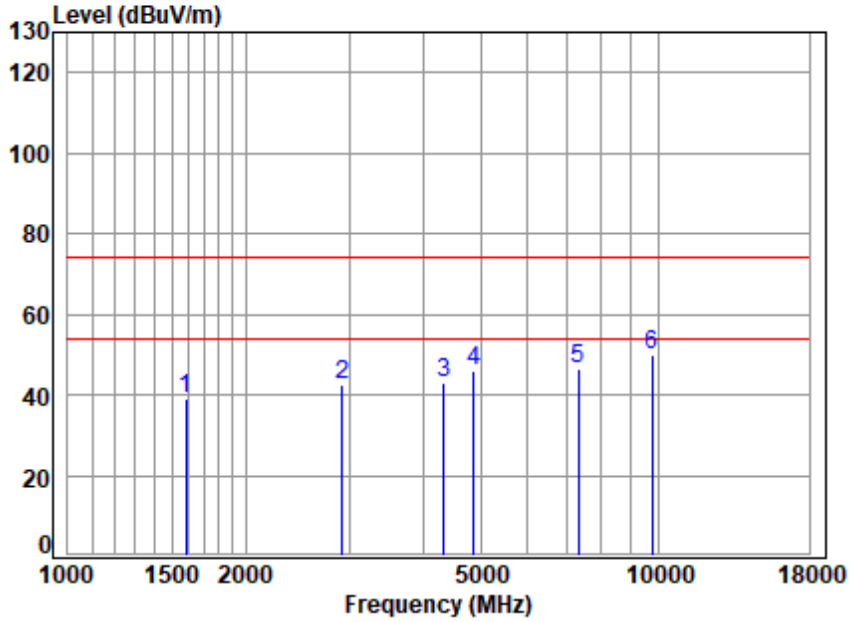
Test Mode: 05; Polarity: Horizontal; Modulation:802.11n; Bandwidth:40MHz; Channel:middle



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00442AT
Mode : 2437 TX RSE
Note : 2.4G WIFI 11N40

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1587.975	3.96	24.77	52.90	63.44	39.27	74.00	-34.73	peak
2	2922.174	5.63	28.43	53.10	61.65	42.61	74.00	-31.39	Peak
3	4329.354	7.48	29.97	52.91	58.28	42.82	74.00	-31.18	peak
4	4874.000	8.10	31.11	53.07	59.87	46.01	74.00	-27.99	peak
5	7311.000	8.34	36.18	53.53	55.68	46.67	74.00	-27.33	peak
6	9748.000	11.30	37.84	53.44	54.44	50.14	74.00	-23.86	peak

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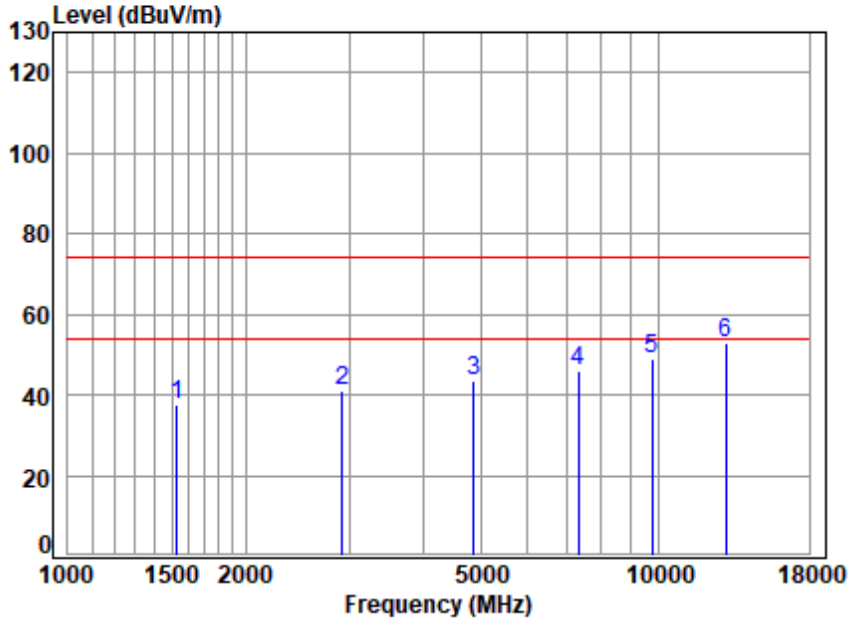
Test Mode: 05; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:middle



Site : chamber
Condition: 3m VERTICAL
Job No : 00442AT
Mode : 2437 TX RSE
Note : 2.4G WIFI 11N40

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1529.414	3.84	24.60	52.87	62.02	37.59	74.00	-36.41	peak
2	2913.740	5.63	28.41	53.10	60.14	41.08	74.00	-32.92	Peak
3	4874.000	8.10	31.11	53.07	57.39	43.53	74.00	-30.47	peak
4	7311.000	8.34	36.18	53.53	55.19	46.18	74.00	-27.82	peak
5	9748.000	11.30	37.84	53.44	53.04	48.74	74.00	-25.26	peak
6	12984.540	12.49	39.70	54.20	54.76	52.75	74.00	-21.25	Peak

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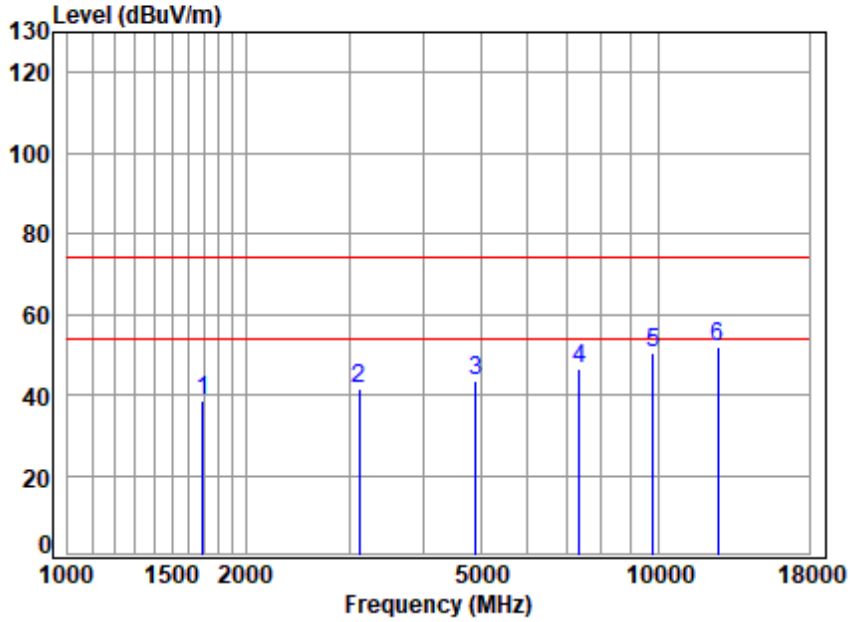
Test Mode: 05; Polarity: Horizontal; Modulation:802.11n; Bandwidth:40MHz; Channel:High



Site : chamber
Condition: 3m HORIZONTAL
Job No : 00442AT
Mode : 2452 TX RSE
Note : 2.4G WIFI 11N40

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1692.231	4.18	24.99	52.96	62.32	38.53	74.00	-35.47	peak
2	3114.025	6.03	28.62	53.06	59.98	41.57	74.00	-32.43	Peak
3	4904.000	8.15	31.18	53.07	57.02	43.28	74.00	-30.72	peak
4	7356.000	8.36	36.23	53.54	55.63	46.68	74.00	-27.32	peak
5	9808.000	11.26	37.98	53.38	54.54	50.40	74.00	-23.60	peak
6	12614.610	12.46	39.74	54.12	53.62	51.70	74.00	-22.30	Peak

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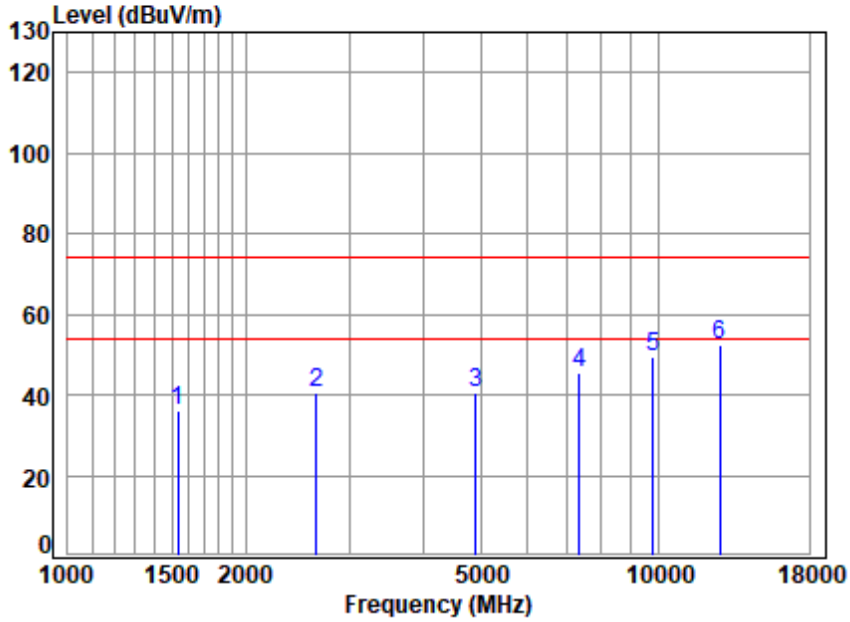
Test Mode: 05; Polarity: Vertical; Modulation:802.11n; Bandwidth:40MHz; Channel:High



Site : chamber
Condition: 3m VERTICAL
Job No : 00442AT
Mode : 2452 TX RSE
Note : 2.4G WIFI 11N40

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1533.841	3.85	24.61	52.87	60.52	36.11	74.00	-37.89	Peak
2	2633.397	5.30	27.74	53.10	60.73	40.67	74.00	-33.33	Peak
3	4904.000	8.15	31.18	53.07	54.47	40.73	74.00	-33.27	peak
4	7356.000	8.36	36.23	53.54	54.53	45.58	74.00	-28.42	peak
5	9808.000	11.26	37.98	53.38	53.65	49.51	74.00	-24.49	peak
6	12687.750	12.47	39.73	54.14	54.47	52.53	74.00	-21.47	Peak

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8 Test Setup Photo

Refer to Appendix - Test Setup Photo for FYCR2211000442AT

9 EUT Constructional Details (EUT Photos)

Refer to Appendix – External and Internal Photos for FYCR2211000442AT

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10 Appendix

1. Duty Cycle

1.1 Ant1

1.1.1 Test Result

Ant1									
Mode	TX Type	Frequency (MHz)	RU	RU Pos	T_on (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	Max. DC Variation (%)
802.11b	SISO	2412	/	/	12.227	12.397	98.63	0.06	0.86
		2437	/	/	12.227	12.353	98.98	0.04	0.67
		2462	/	/	12.223	12.370	98.81	0.05	0.67
802.11g	SISO	2412	/	/	2.033	2.181	93.21	0.31	4.85
		2437	/	/	2.033	2.213	91.87	0.37	3.09
		2462	/	/	2.038	2.209	92.26	0.35	5.63
802.11n (HT20)	SISO	2412	/	/	1.893	2.126	89.04	0.50	4.77
		2437	/	/	1.893	2.060	91.89	0.37	3.78
		2462	/	/	1.892	2.068	91.49	0.39	3.71
802.11n (HT40)	SISO	2422	/	/	0.933	1.100	84.82	0.72	10.09
		2437	/	/	0.932	1.166	79.93	0.97	9.70
		2452	/	/	0.932	1.064	87.59	0.58	8.13
802.11ax (HEW20)	SISO	2412	RU242	Left	1.455	1.689	86.15	0.65	2.38
		2437	RU242	Left	1.455	1.614	90.15	0.45	5.91
		2462	RU242	Left	1.462	1.631	89.64	0.48	7.53
802.11ax (HEW40)	SISO	2422	RU484	Left	0.748	0.964	77.59	1.10	7.99
		2437	RU484	Left	0.748	0.964	77.59	1.10	8.00
		2452	RU484	Left	0.748	0.924	80.95	0.92	10.72

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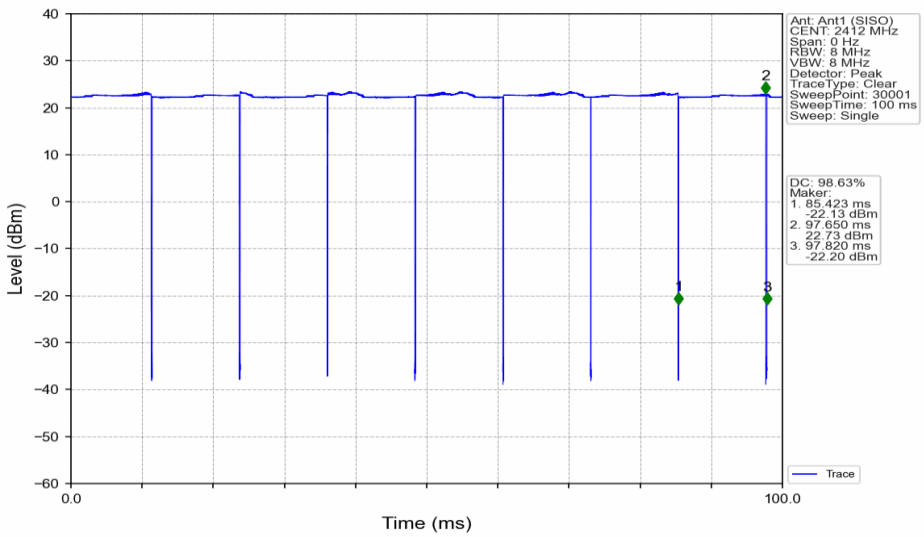
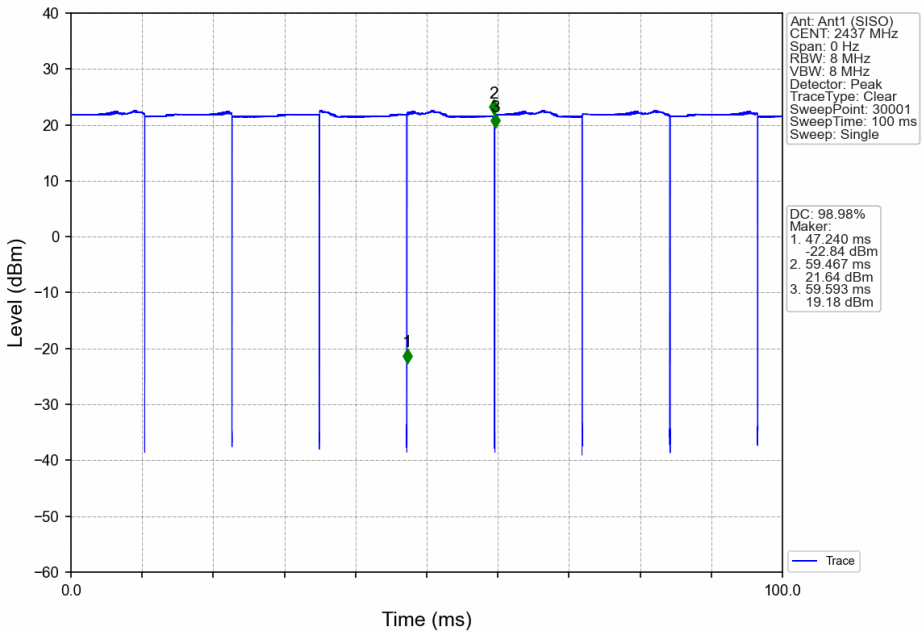
1.1.2 Test Graph

802.11b_LCH_2412MHz_Ant1 (SISO)_NTNV



802.11b_MCH_2437MHz_Ant1 (SISO)_NTNV



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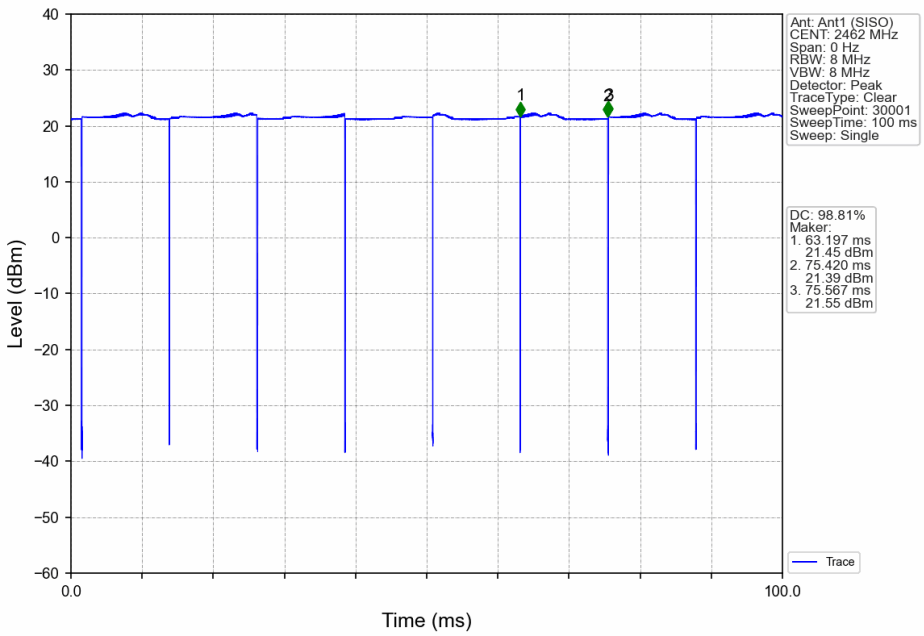
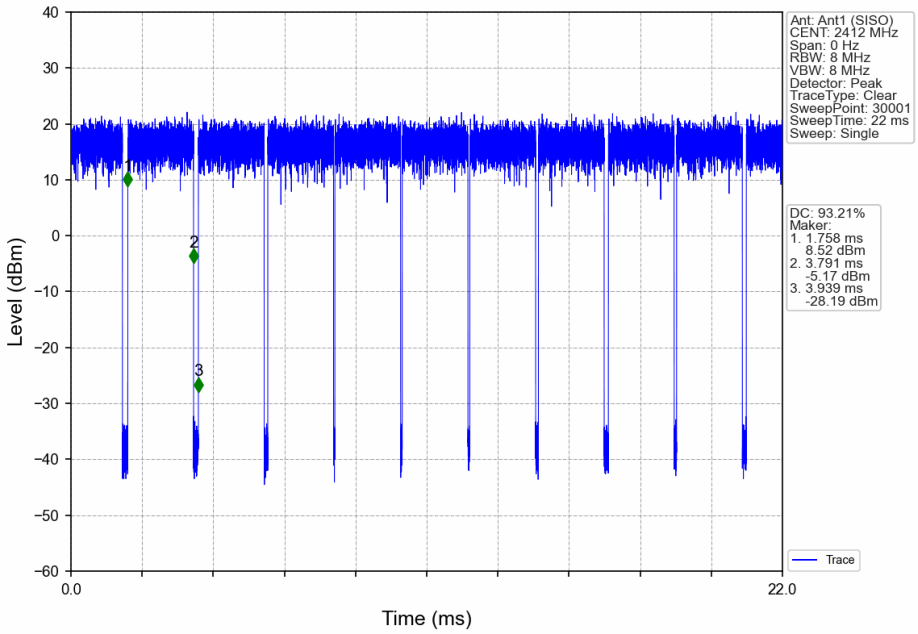
802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV



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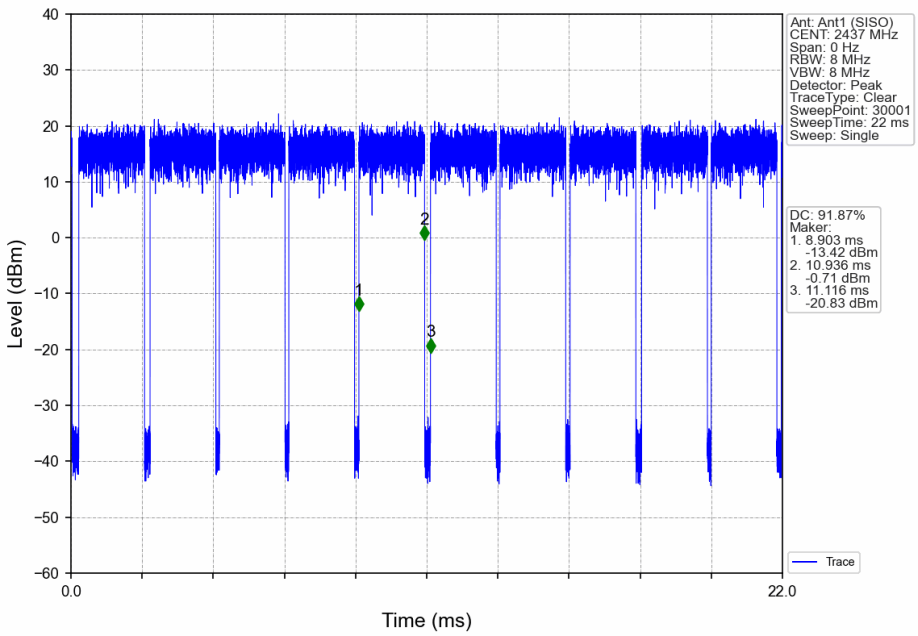
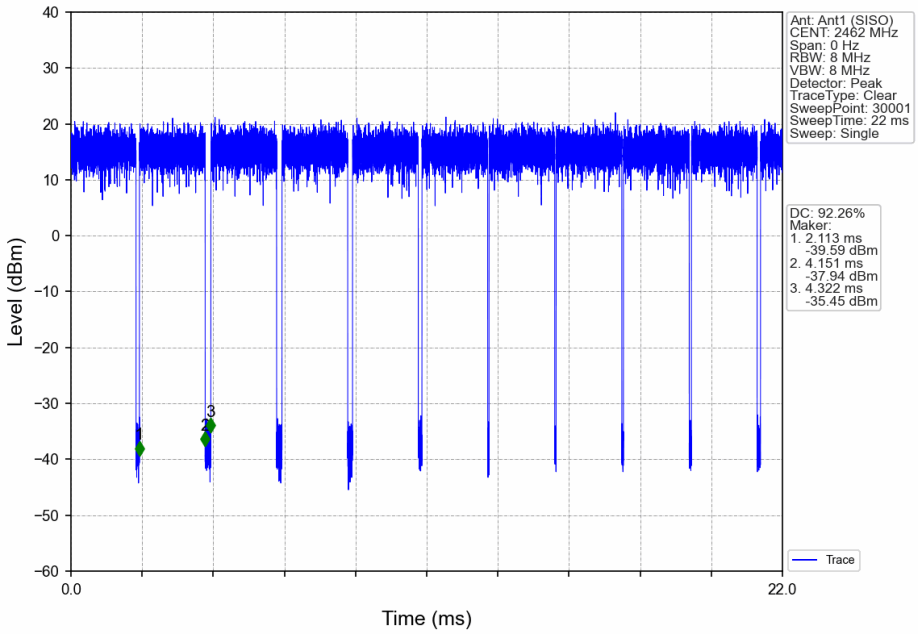
802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



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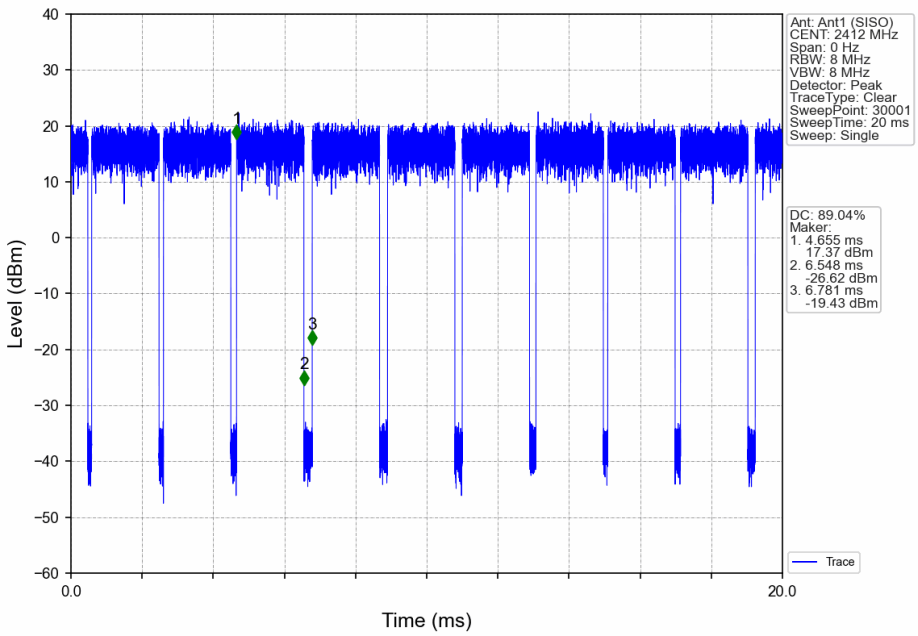
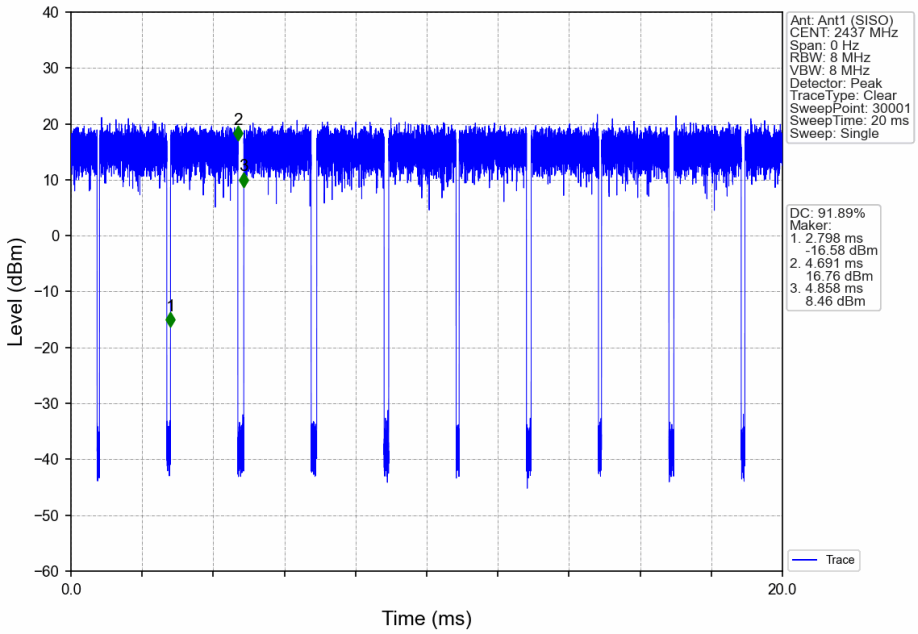
802.11n(HT20)_LCH_2412MHz_Ant1 (SISO)_NTNV



802.11n(HT20)_MCH_2437MHz_Ant1 (SISO)_NTNV



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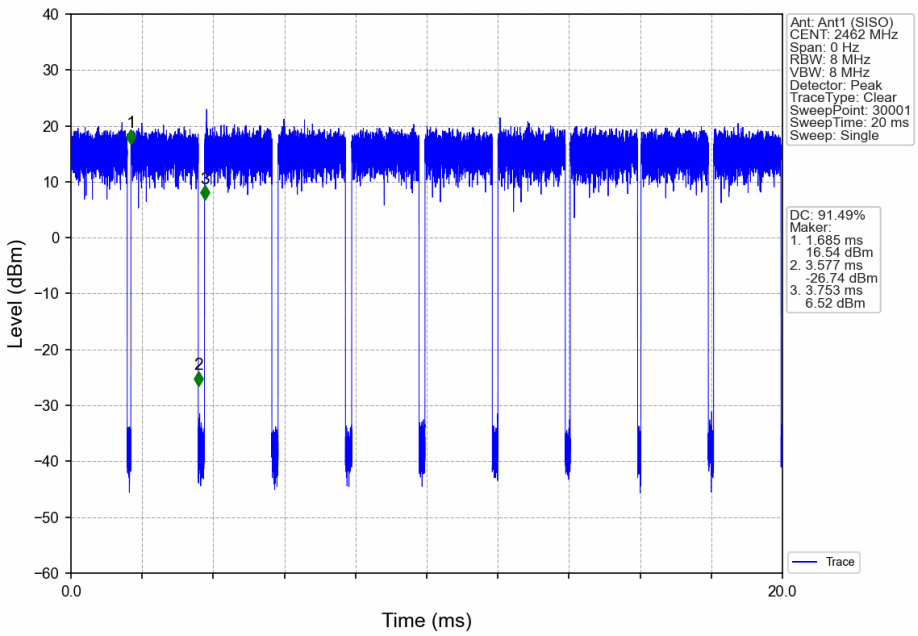
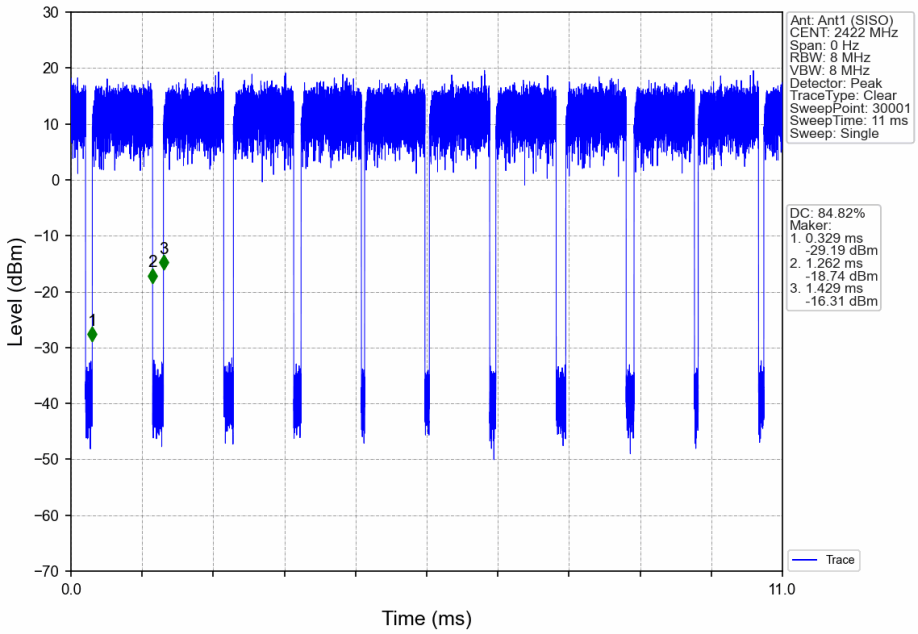
802.11n(HT20)_HCH_2462MHz_Ant1 (SISO)_NTNV



802.11n(HT40)_LCH_2422MHz_Ant1 (SISO)_NTNV



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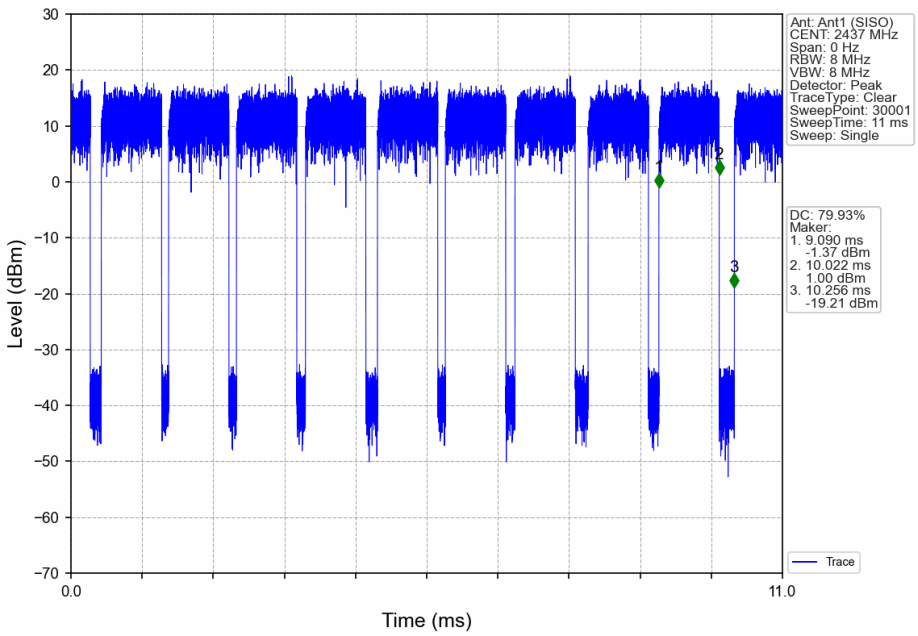
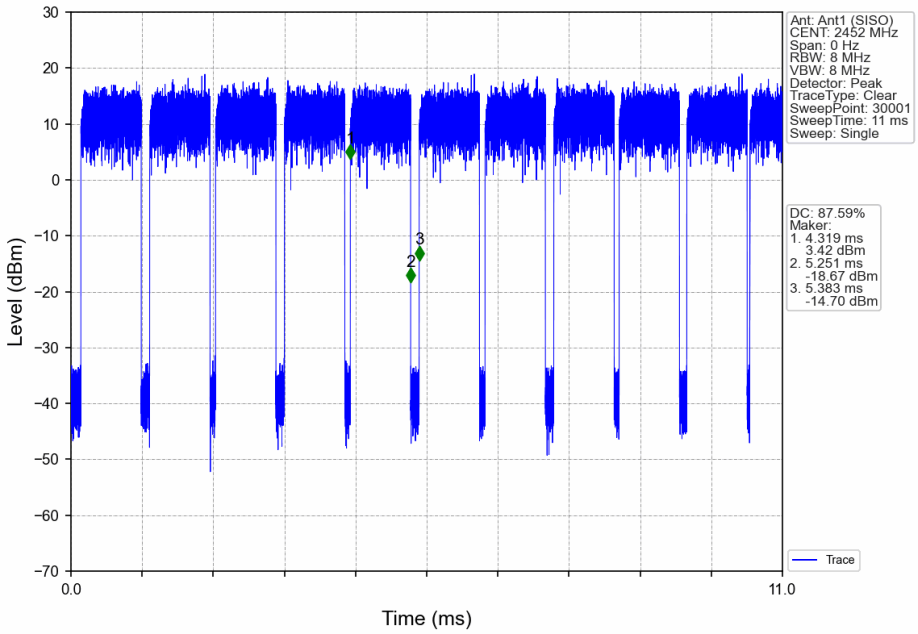
802.11n(HT40)_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11n(HT40)_HCH_2452MHz_Ant1 (SISO)_NTNV



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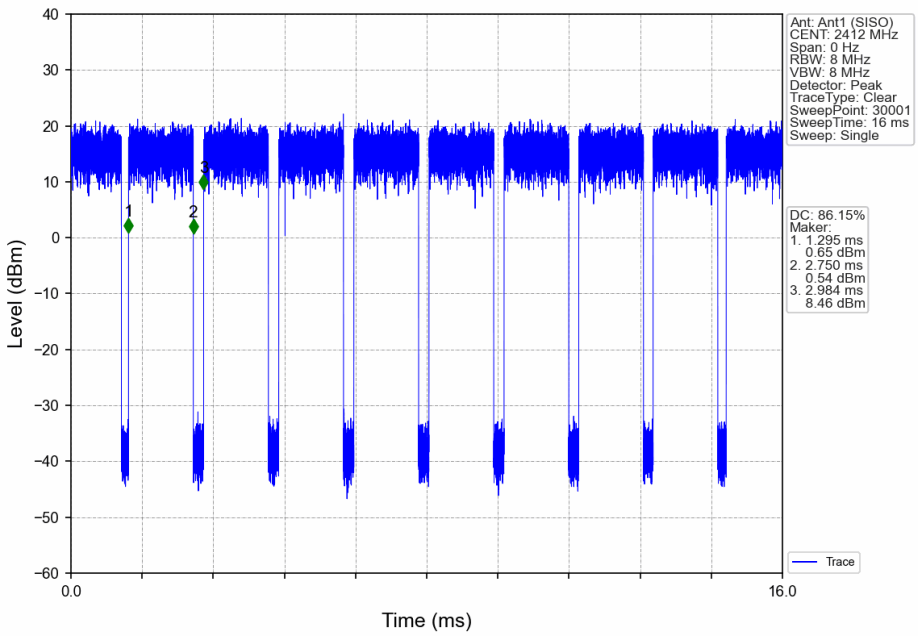
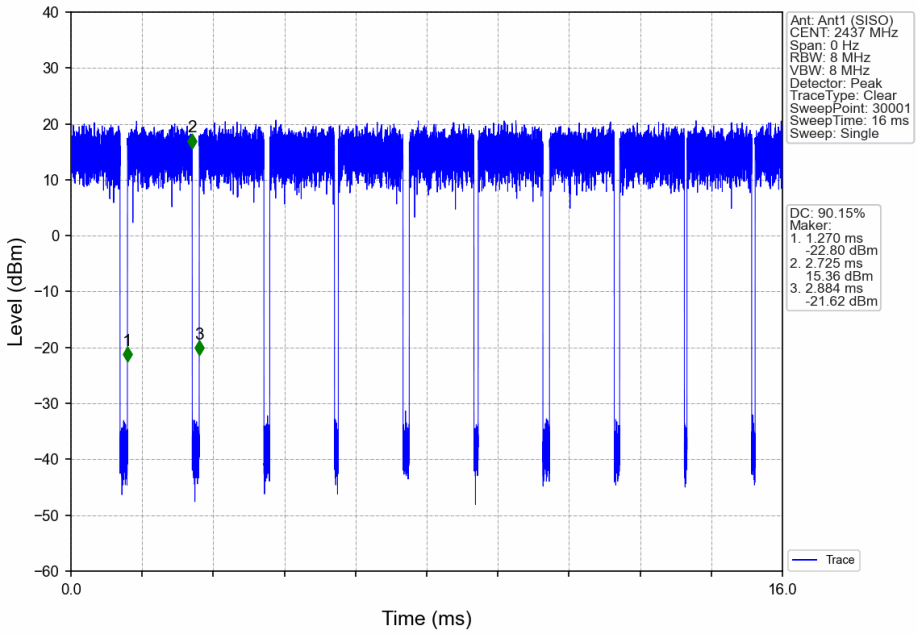
802.11ax(HEW20)_LCH_2412MHz_RU242_Left_Ant1 (SISO)_NTNV



802.11ax(HEW20)_MCH_2437MHz_RU242_Left_Ant1 (SISO)_NTNV



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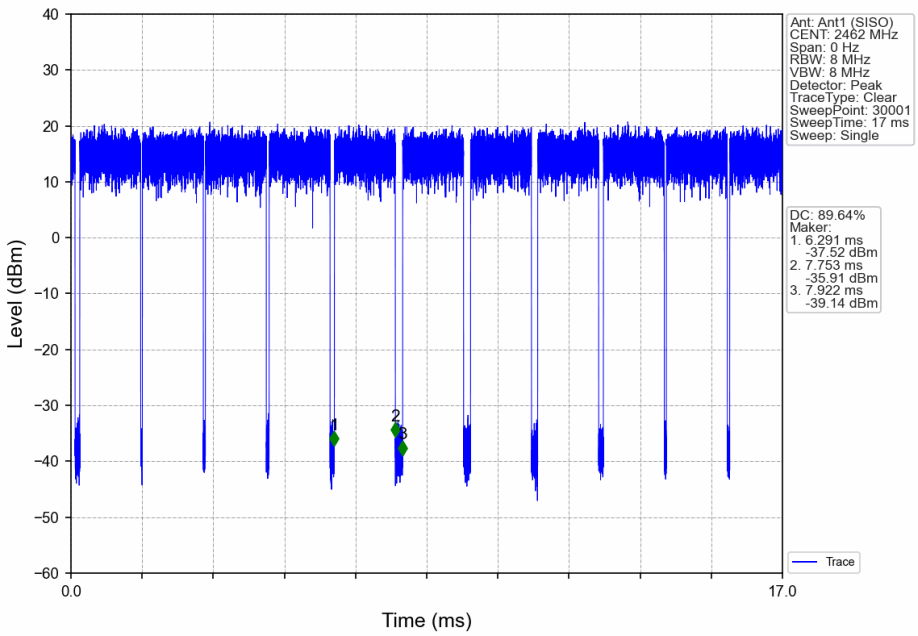
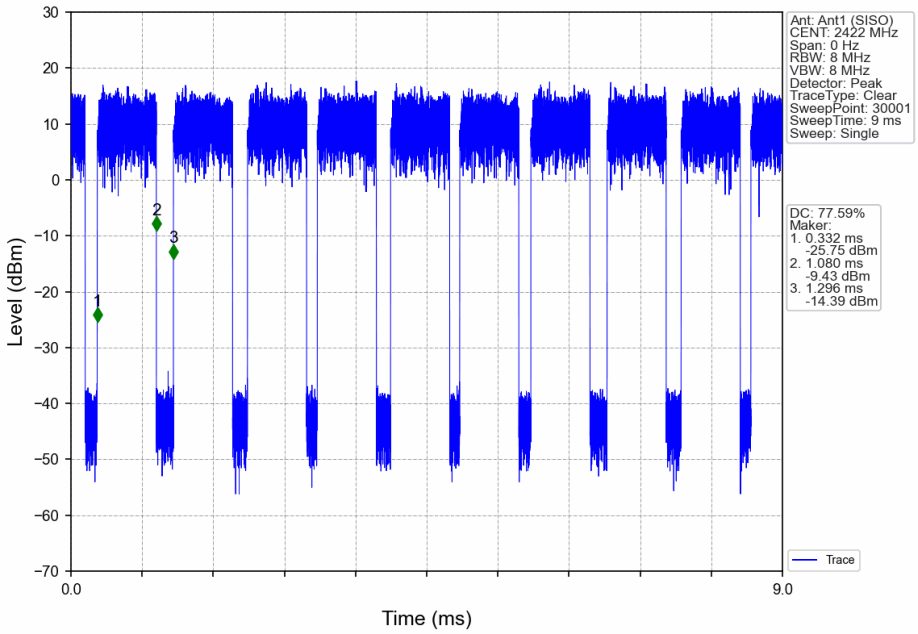
802.11ax(HEW20)_HCH_2462MHz_RU242_Left_Ant1 (SISO)_NTNV



802.11ax(HEW40)_LCH_2422MHz_RU484_Left_Ant1 (SISO)_NTNV



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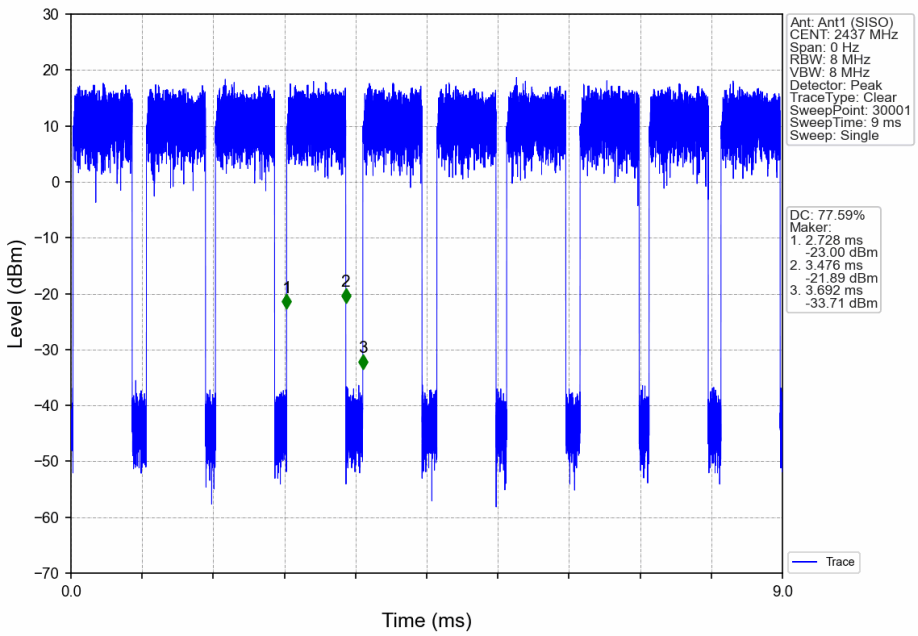
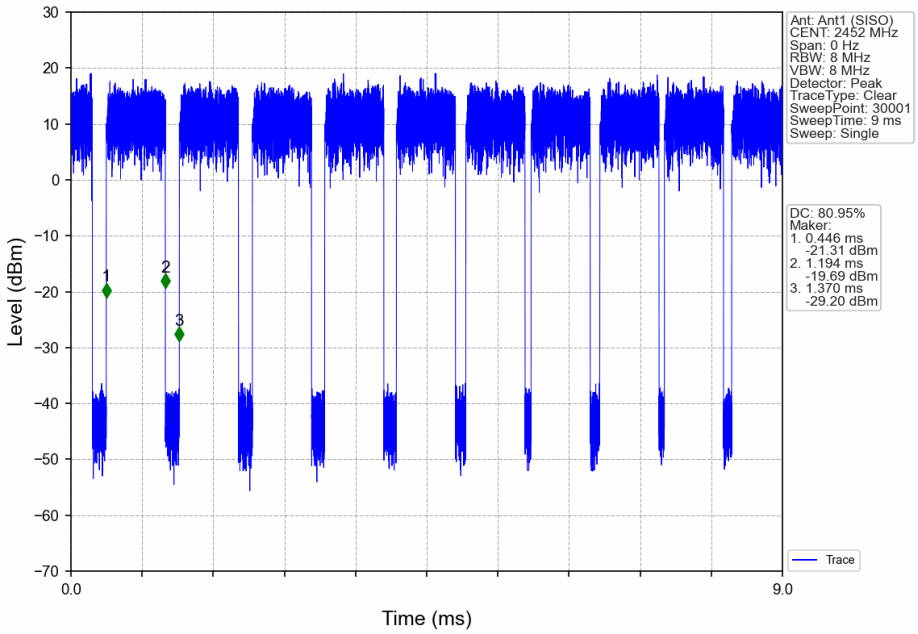
802.11ax(HEW40)_MCH_2437MHz_RU484_Left_Ant1 (SISO)_NTNV



802.11ax(HEW40)_HCH_2452MHz_RU484_Left_Ant1 (SISO)_NTNV



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2. Bandwidth

2.1 OBW

2.1.1 Test Result

Mode	TX Type	Frequency (MHz)	RU	RU Pos	ANT	99% Occupied Bandwidth (MHz) Result	Verdict
802.11b	SISO	2412	/	/	1	12.339	Pass
		2437	/	/	1	12.303	Pass
		2462	/	/	1	12.303	Pass
802.11g	SISO	2412	/	/	1	16.716	Pass
		2437	/	/	1	16.682	Pass
		2462	/	/	1	16.692	Pass
802.11n (HT20)	SISO	2412	/	/	1	17.680	Pass
		2437	/	/	1	17.701	Pass
		2462	/	/	1	17.675	Pass
802.11n (HT40)	SISO	2422	/	/	1	36.655	Pass
		2437	/	/	1	36.618	Pass
		2452	/	/	1	36.601	Pass
802.11ax (HEW20)	SISO	2412	RU242	Left	1	18.581	Pass
		2437	RU242	Left	1	18.573	Pass
		2462	RU242	Left	1	18.600	Pass
802.11ax (HEW40)	SISO	2422	RU484	Left	1	37.536	Pass
		2437	RU484	Left	1	37.562	Pass
		2452	RU484	Left	1	37.581	Pass

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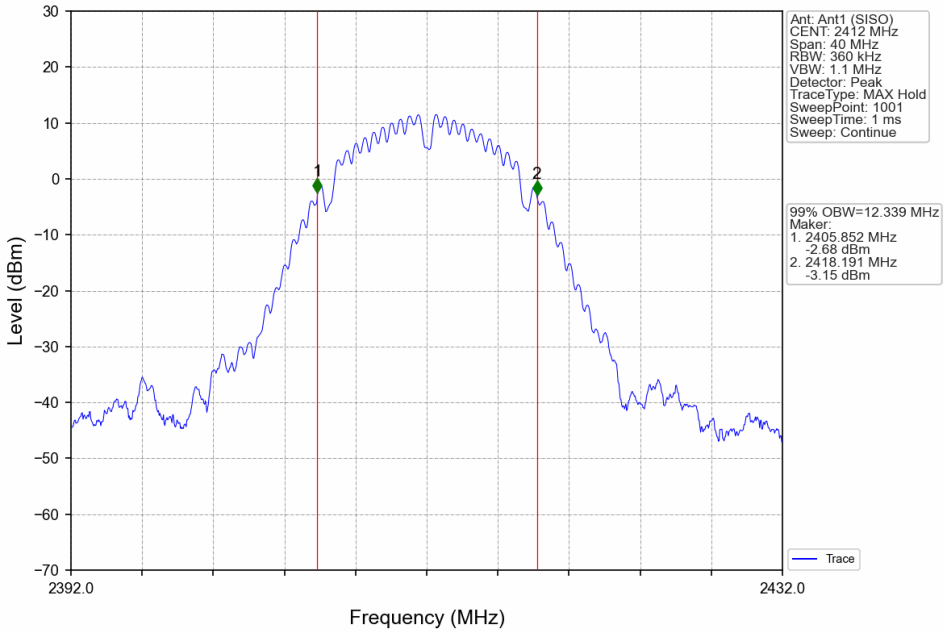
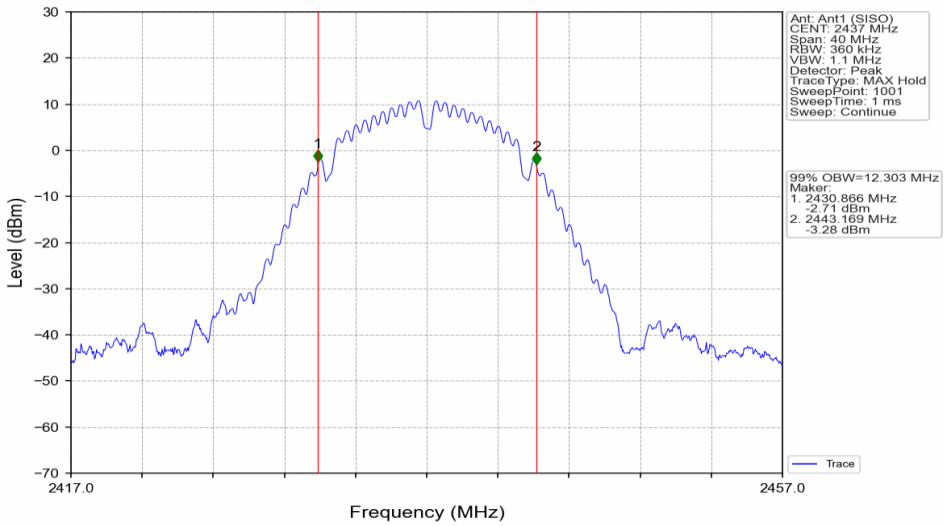
2.1.2 Test Graph

802.11b_LCH_2412MHz_Ant1 (SISO)_NTNV



802.11b_MCH_2437MHz_Ant1 (SISO)_NTNV



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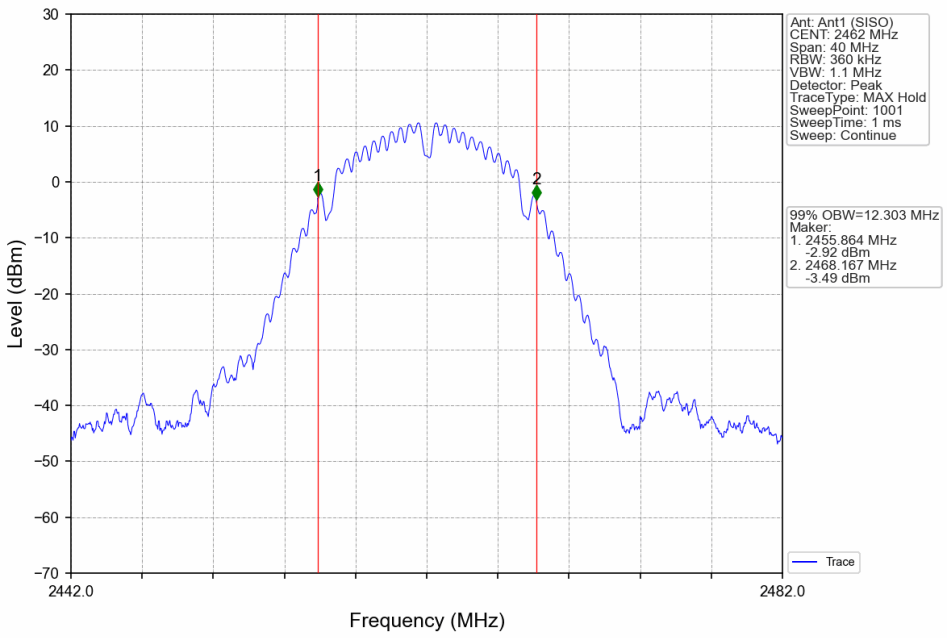

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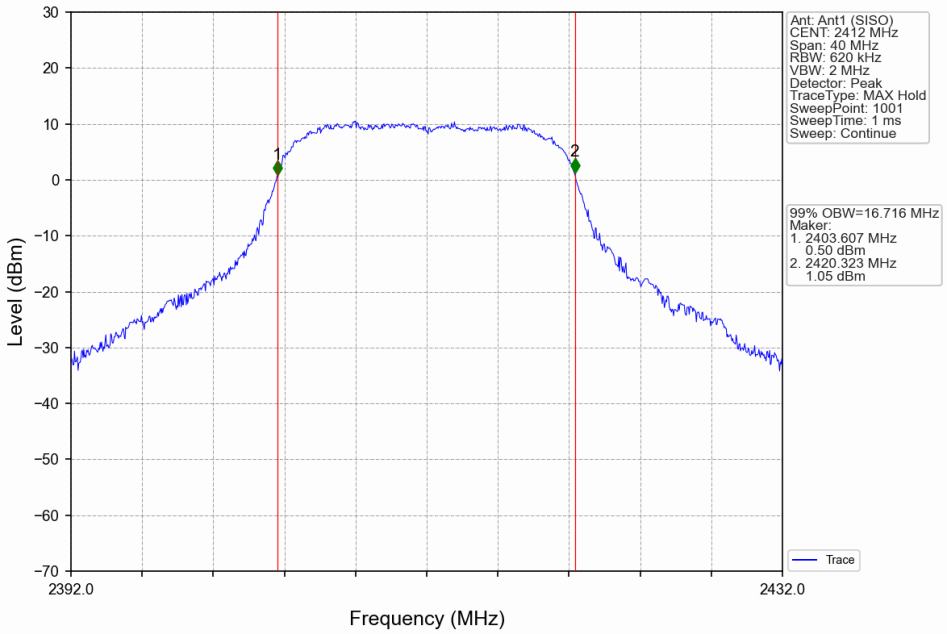

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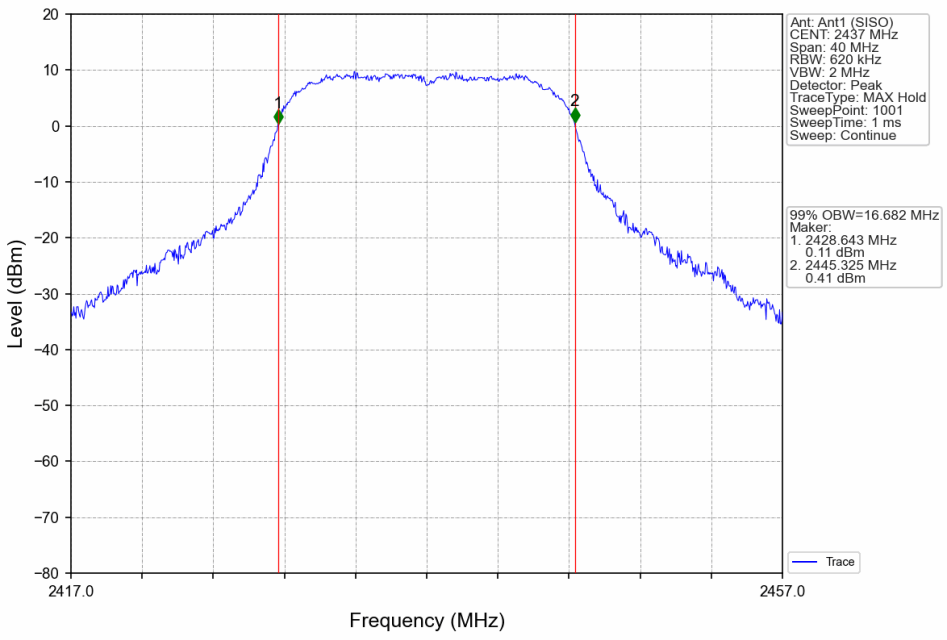
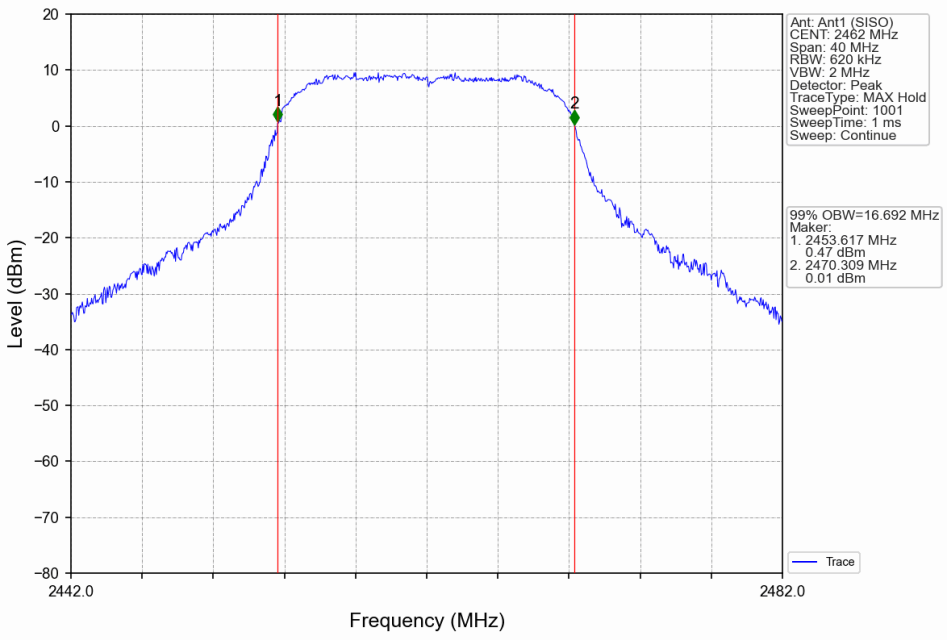
802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



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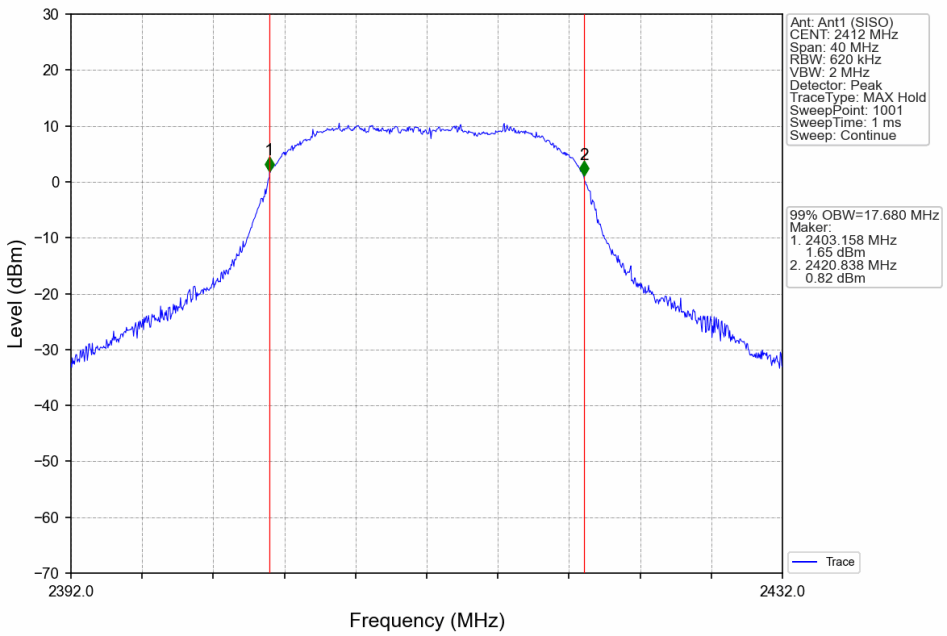
802.11n(HT20)_LCH_2412MHz_Ant1 (SISO)_NTNV



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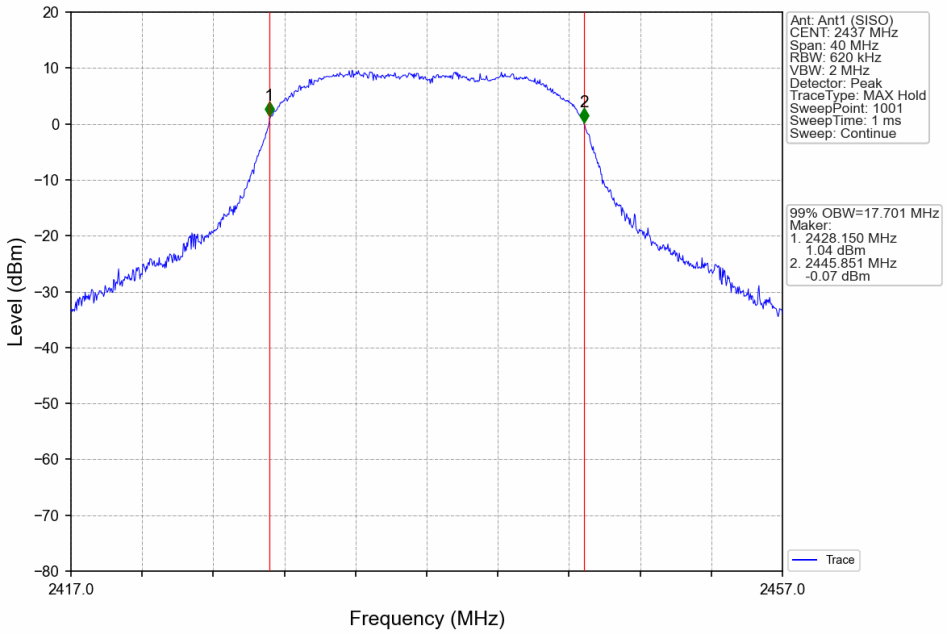

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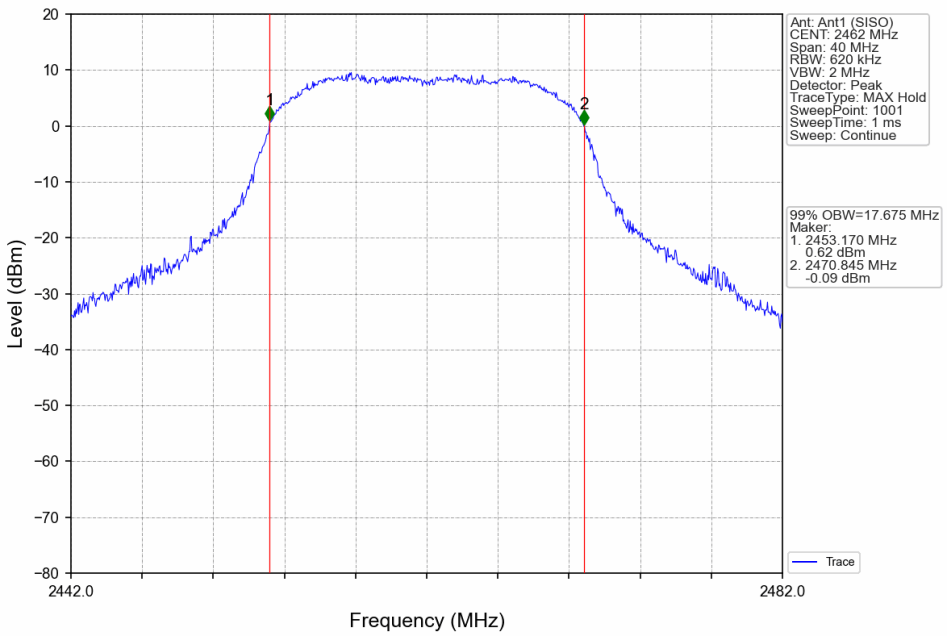
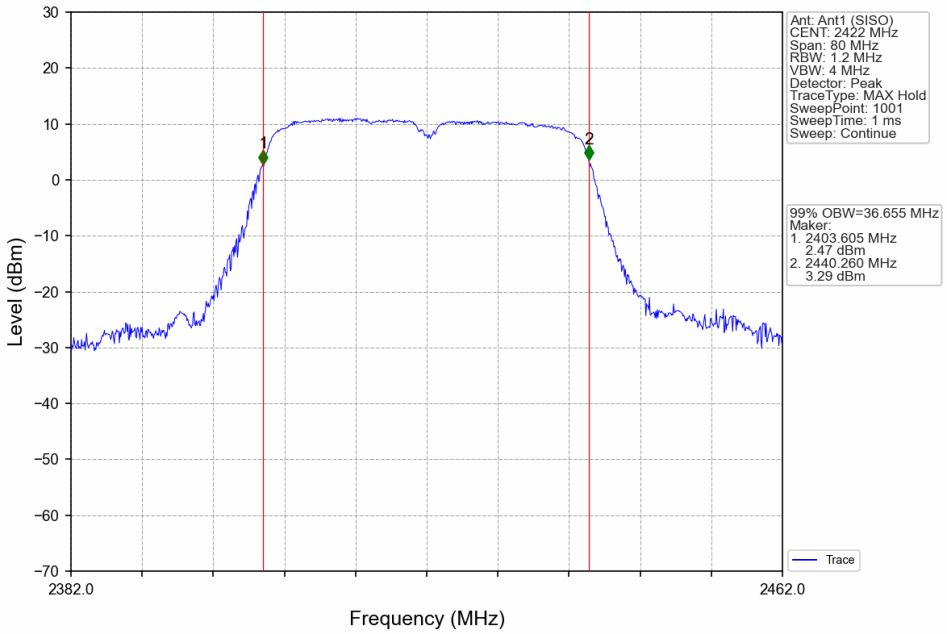
802.11n(HT20)_HCH_2462MHz_Ant1 (SISO)_NTNV



802.11n(HT40)_LCH_2422MHz_Ant1 (SISO)_NTNV



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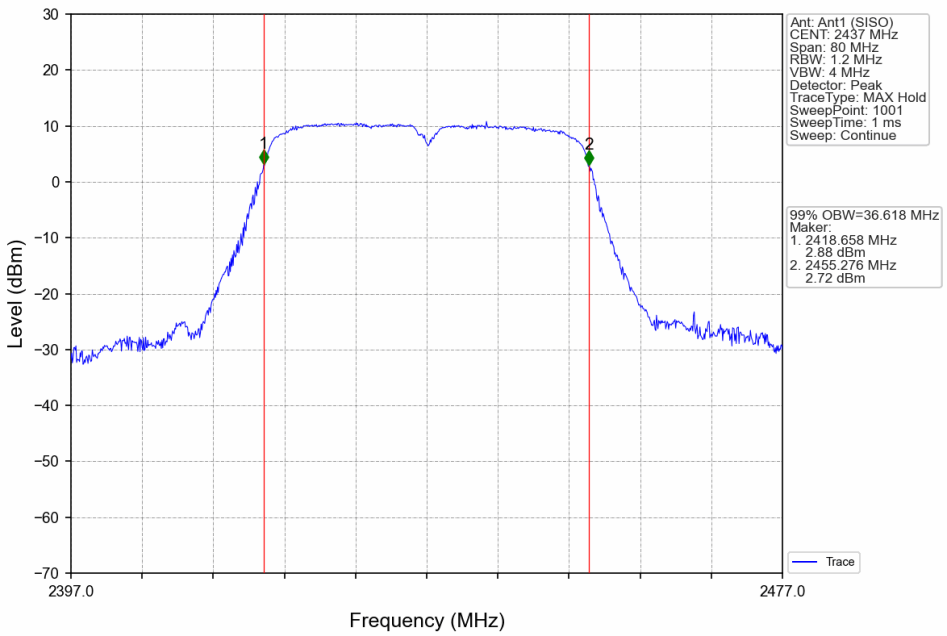
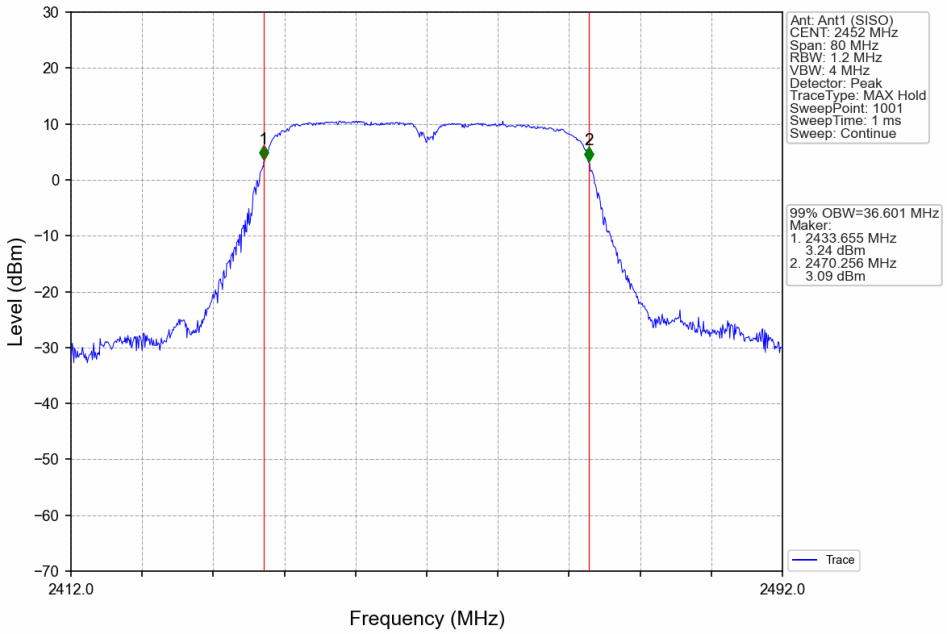
802.11n(HT40)_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11n(HT40)_HCH_2452MHz_Ant1 (SISO)_NTNV



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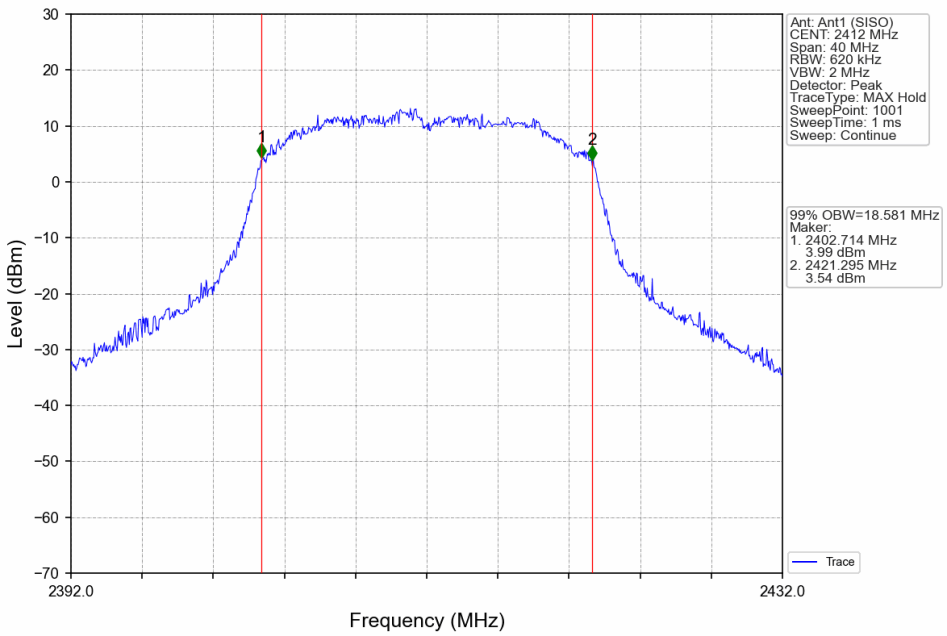
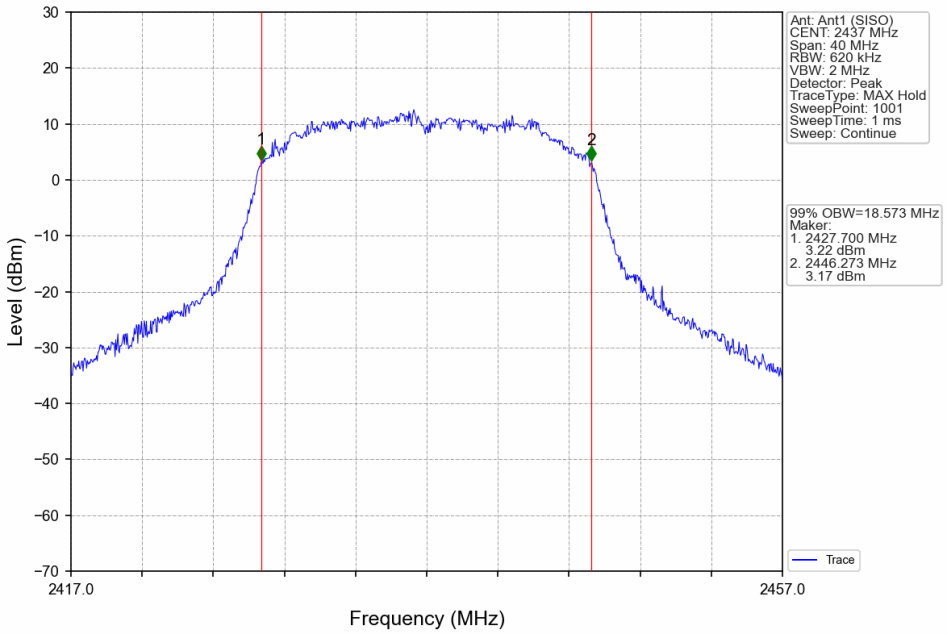
802.11ax(HEW20)_LCH_2412MHz_RU242_Left_Ant1 (SISO)_NTNV



802.11ax(HEW20)_MCH_2437MHz_RU242_Left_Ant1 (SISO)_NTNV



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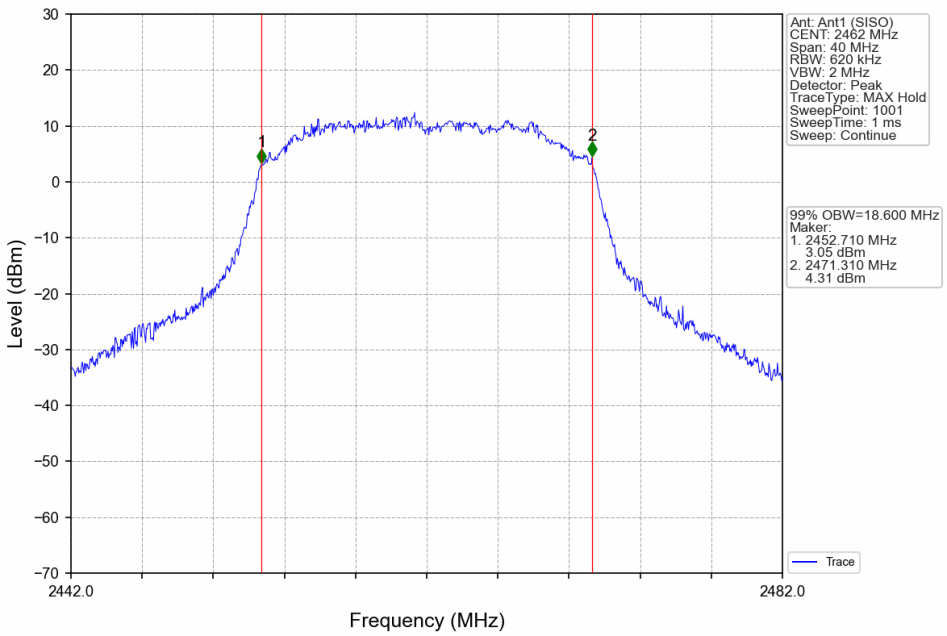
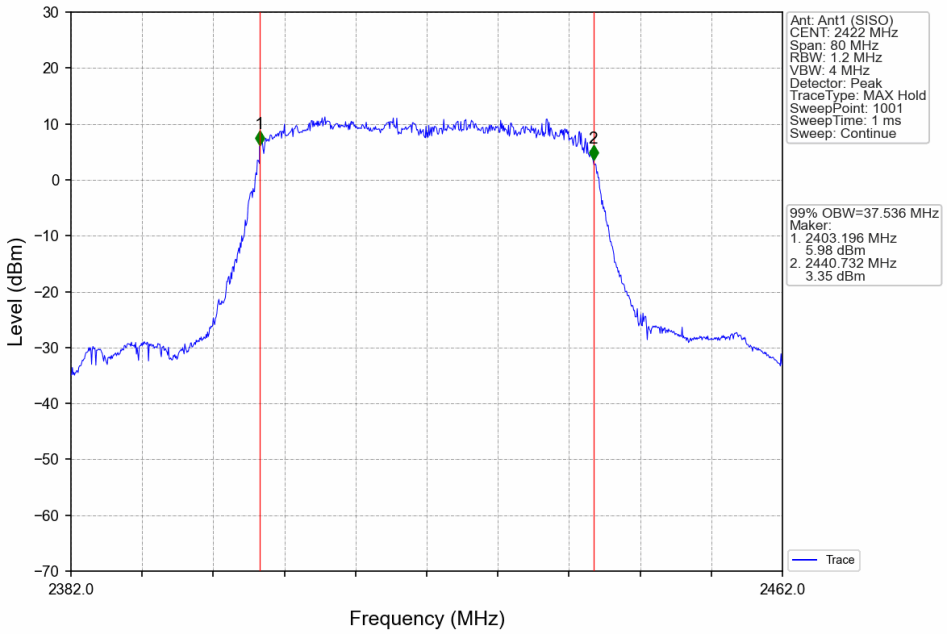
802.11ax(HEW20)_HCH_2462MHz_RU242_Left_Ant1 (SISO)_NTNV



802.11ax(HEW40)_LCH_2422MHz_RU484_Left_Ant1 (SISO)_NTNV



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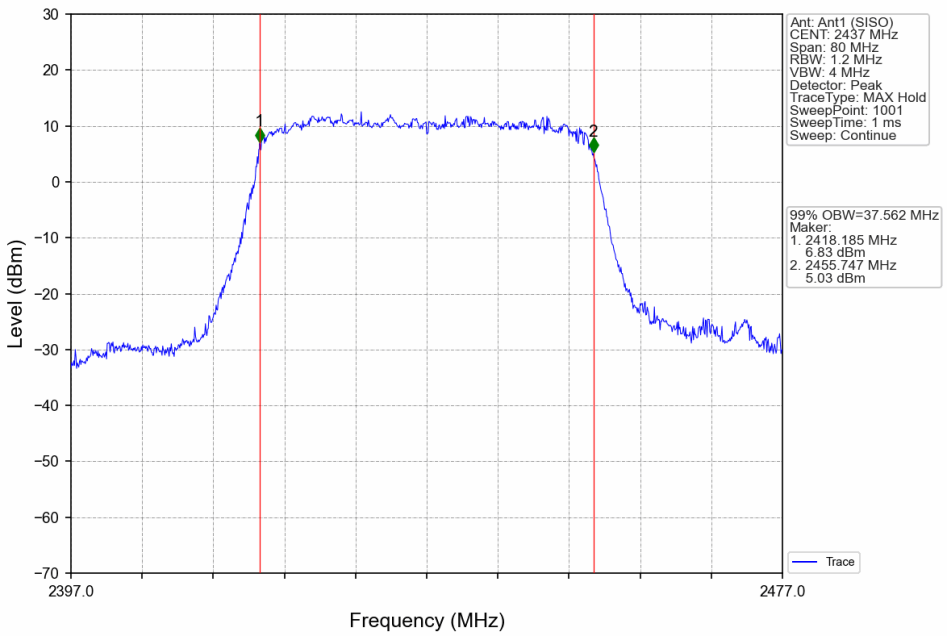
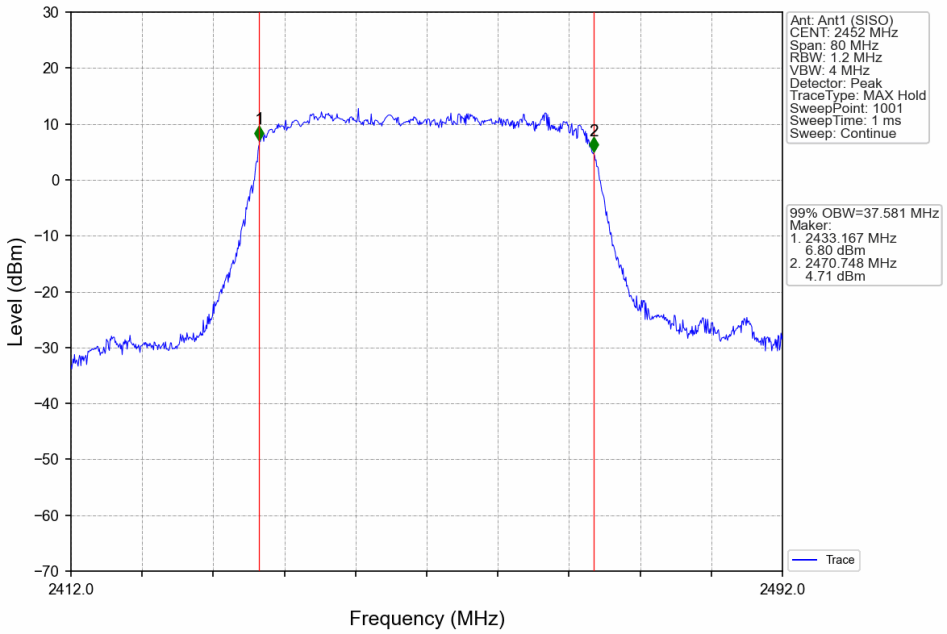
802.11ax(HEW40)_MCH_2437MHz_RU484_Left_Ant1 (SISO)_NTNV



802.11ax(HEW40)_HCH_2452MHz_RU484_Left_Ant1 (SISO)_NTNV



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2.2 6dB BW

2.2.1 Test Result

Mode	TX Type	Frequency (MHz)	RU	RU Pos	ANT	6dB Bandwidth (MHz)		Verdict
						Result	Limit	
802.11b	SISO	2412	/	/	1	8.056	>=0.5	Pass
		2437	/	/	1	8.066	>=0.5	Pass
		2462	/	/	1	8.091	>=0.5	Pass
802.11g	SISO	2412	/	/	1	15.154	>=0.5	Pass
		2437	/	/	1	15.128	>=0.5	Pass
		2462	/	/	1	15.143	>=0.5	Pass
802.11n (HT20)	SISO	2412	/	/	1	15.151	>=0.5	Pass
		2437	/	/	1	15.143	>=0.5	Pass
		2462	/	/	1	15.094	>=0.5	Pass
802.11n (HT40)	SISO	2422	/	/	1	35.168	>=0.5	Pass
		2437	/	/	1	35.122	>=0.5	Pass
		2452	/	/	1	35.167	>=0.5	Pass
802.11ax (HEW20)	SISO	2412	RU242	Left	1	15.169	>=0.5	Pass
		2437	RU242	Left	1	15.159	>=0.5	Pass
		2462	RU242	Left	1	15.165	>=0.5	Pass
802.11ax (HEW40)	SISO	2422	RU484	Left	1	35.703	>=0.5	Pass
		2437	RU484	Left	1	35.586	>=0.5	Pass
		2452	RU484	Left	1	35.613	>=0.5	Pass

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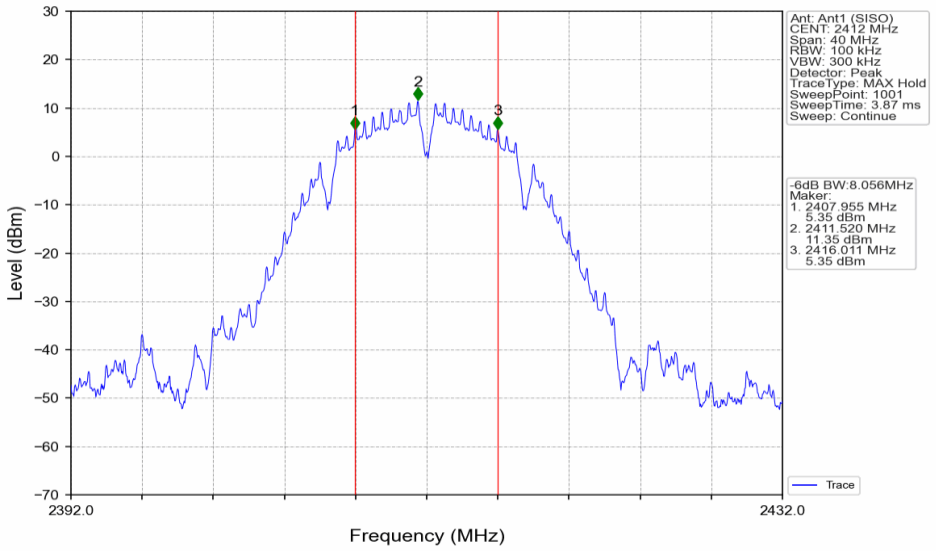
2.2.2 Test Graph

802.11b_LCH_2412MHz_Ant1 (SISO)_NTNV



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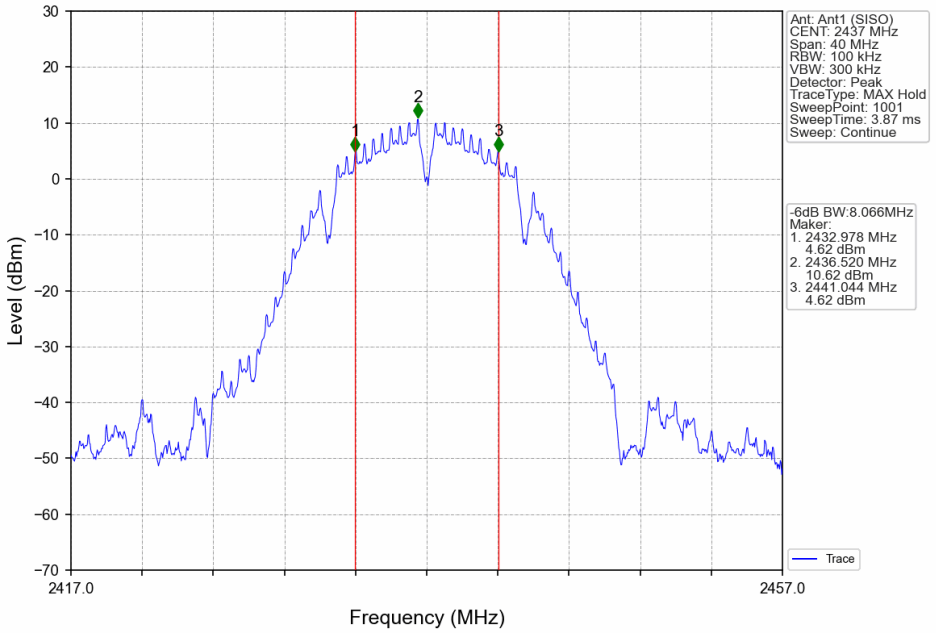

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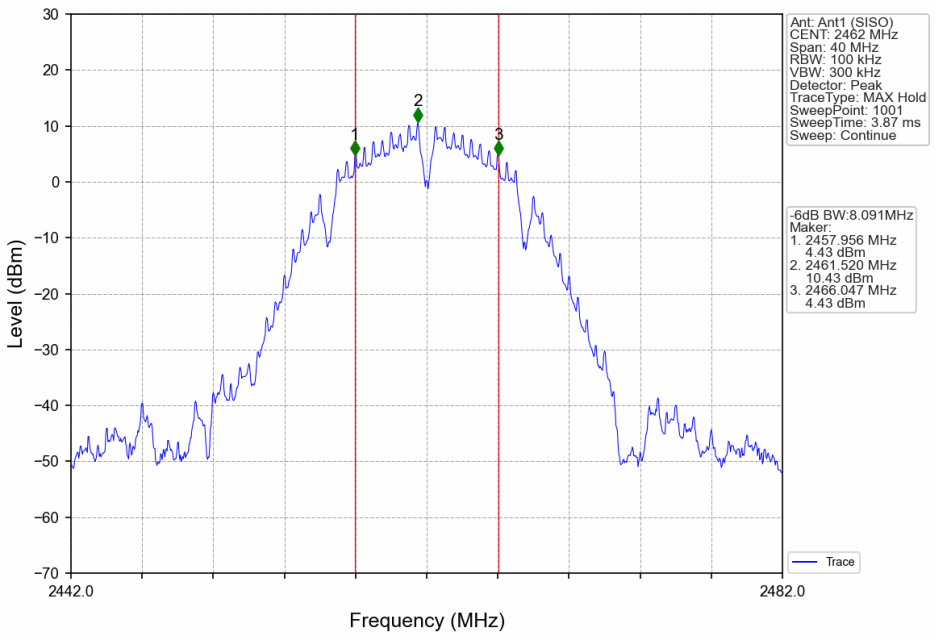

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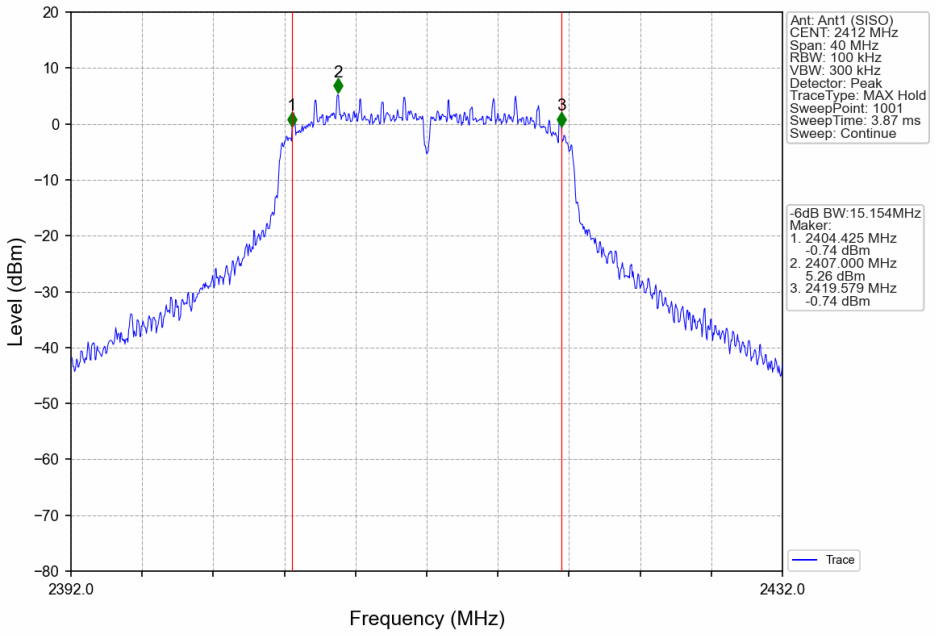

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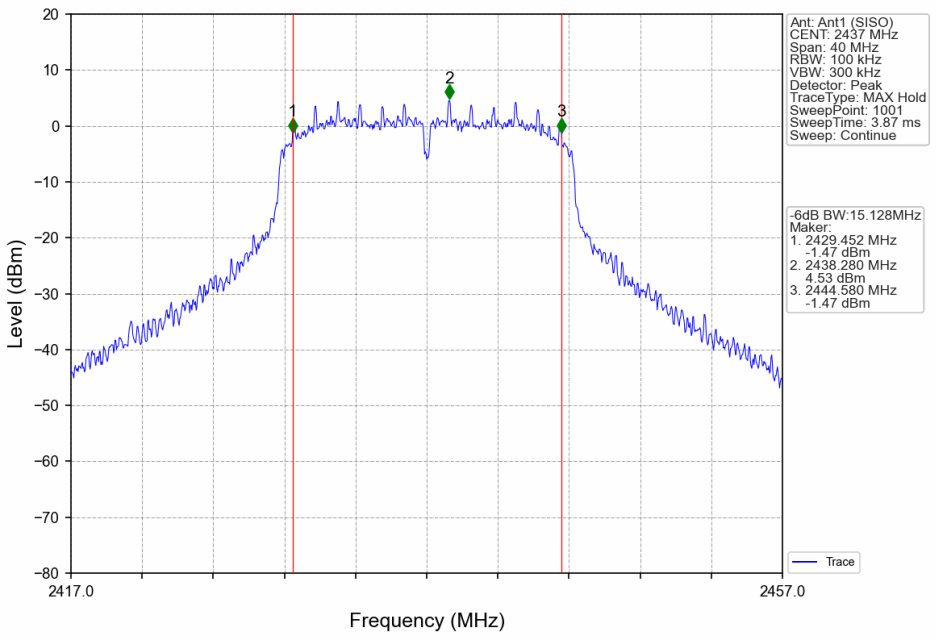
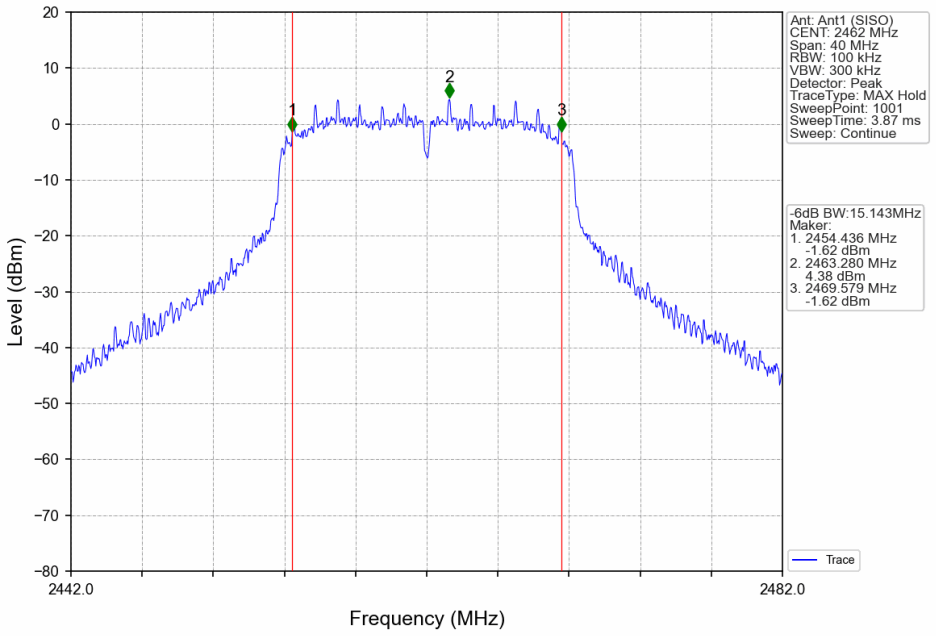
802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



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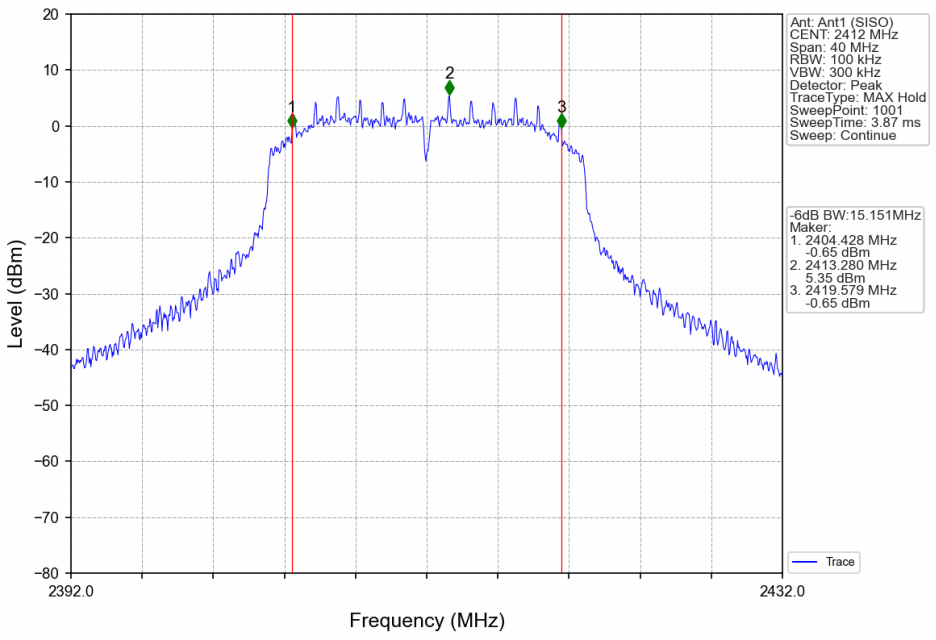
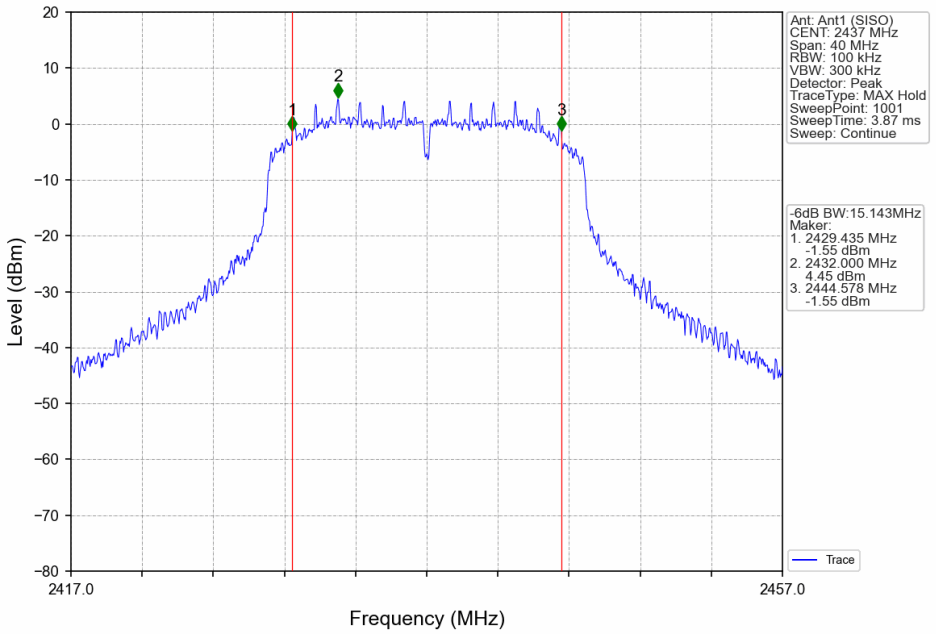
802.11n(HT20)_LCH_2412MHz_Ant1 (SISO)_NTNV



802.11n(HT20)_MCH_2437MHz_Ant1 (SISO)_NTNV



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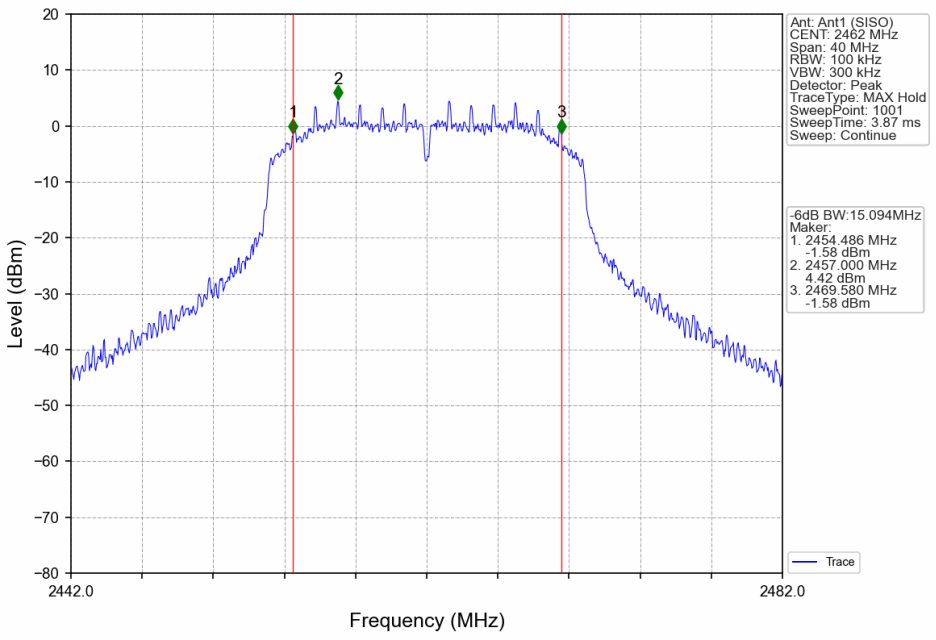
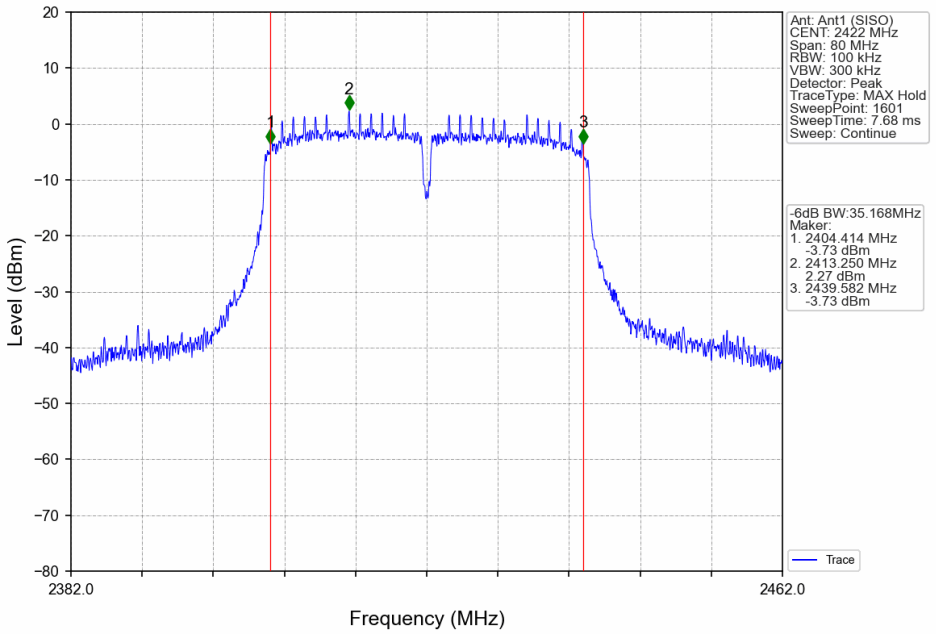
802.11n(HT20)_HCH_2462MHz_Ant1 (SISO)_NTNV



802.11n(HT40)_LCH_2422MHz_Ant1 (SISO)_NTNV



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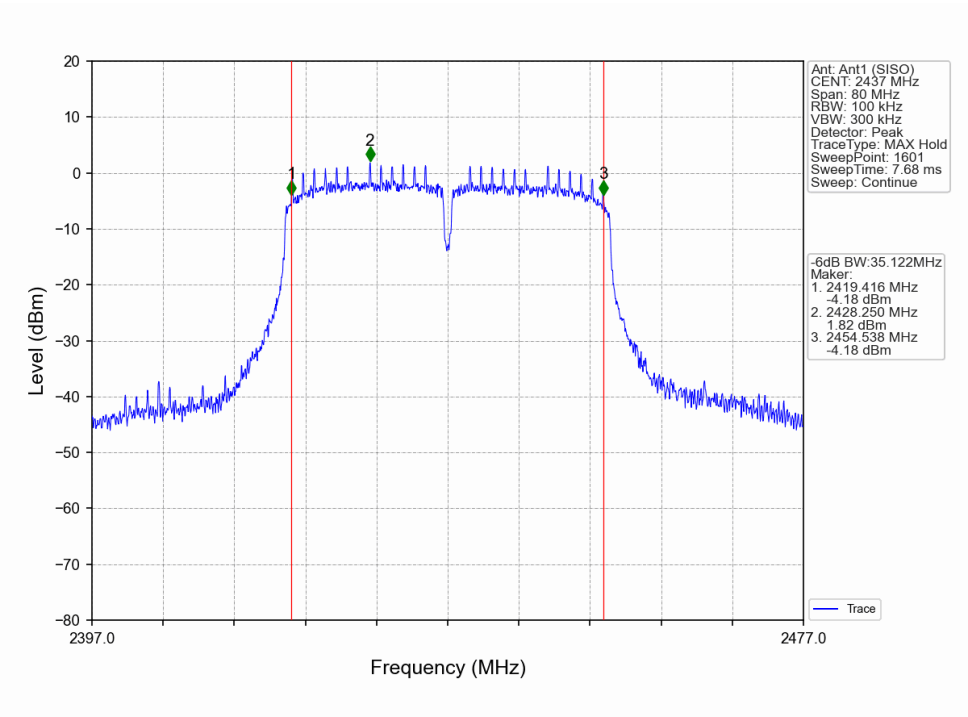
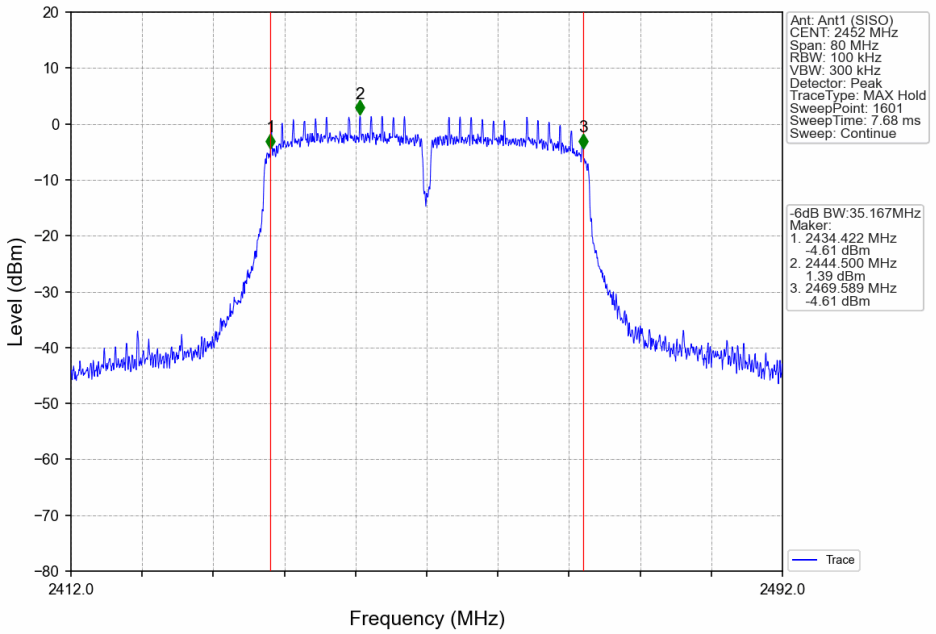
802.11n(HT40)_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11n(HT40)_HCH_2452MHz_Ant1 (SISO)_NTNV



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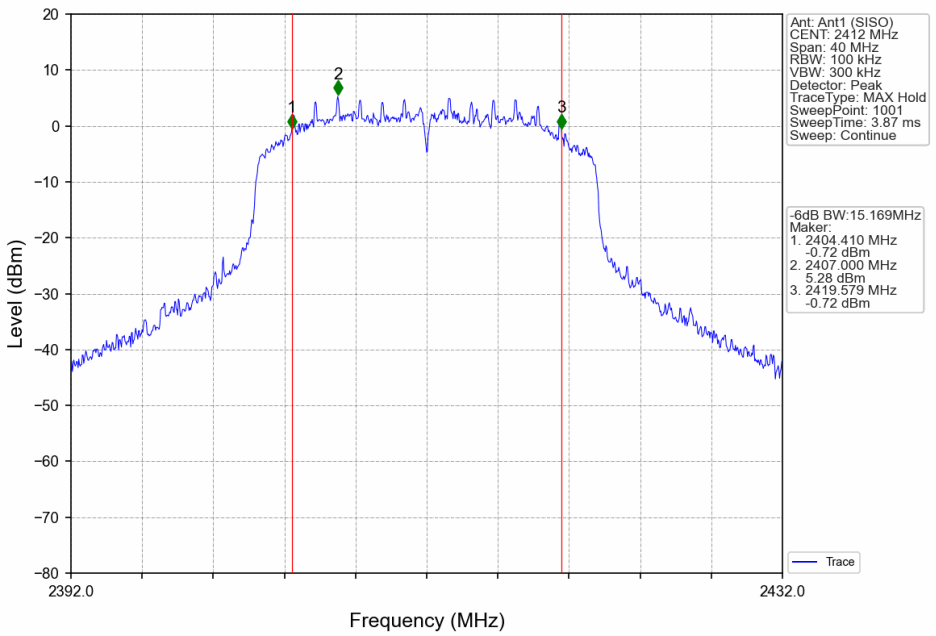
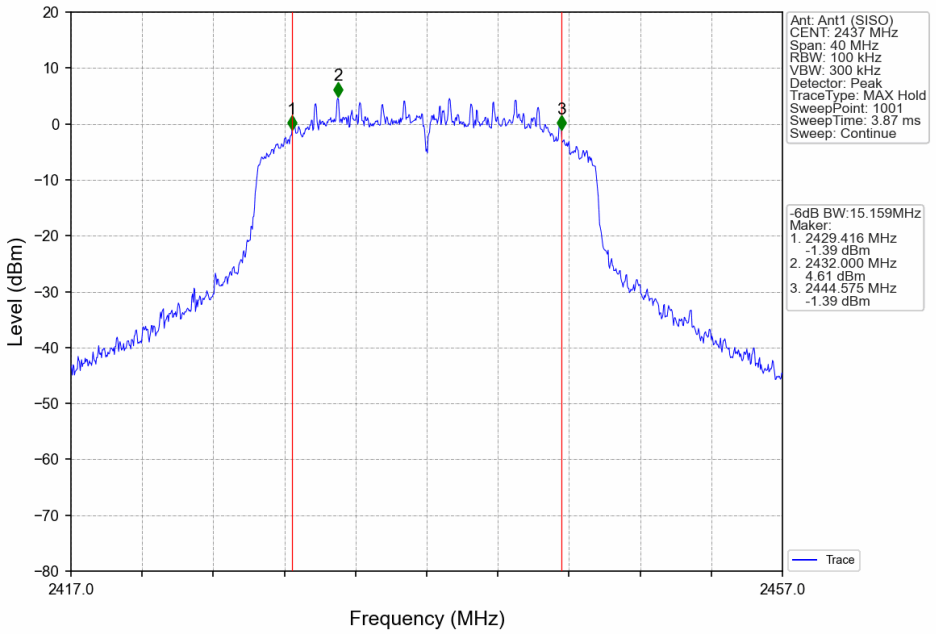
802.11ax(HEW20)_LCH_2412MHz_RU242_Left_Ant1 (SISO)_NTNV



802.11ax(HEW20)_MCH_2437MHz_RU242_Left_Ant1 (SISO)_NTNV



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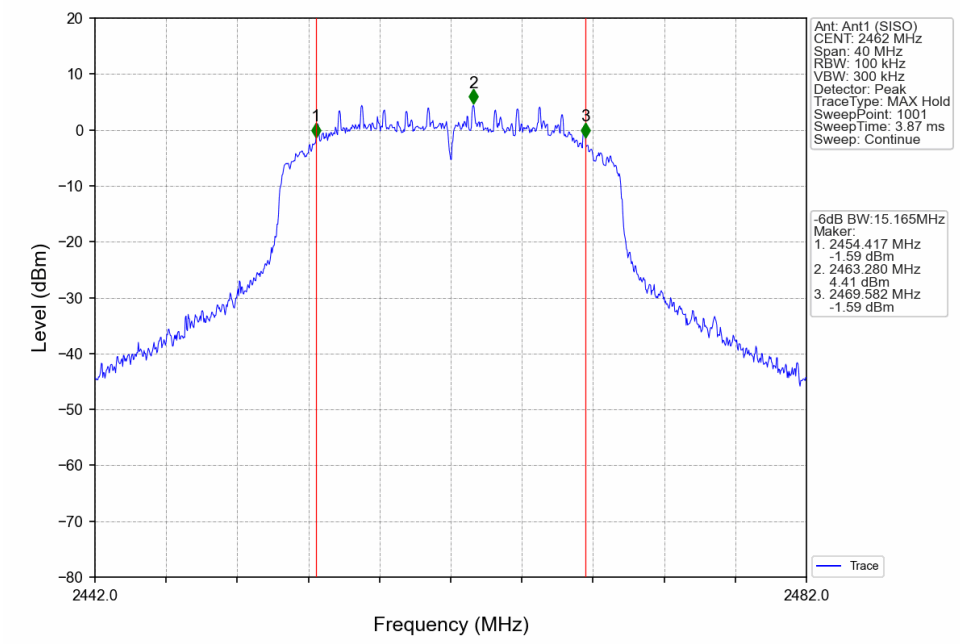
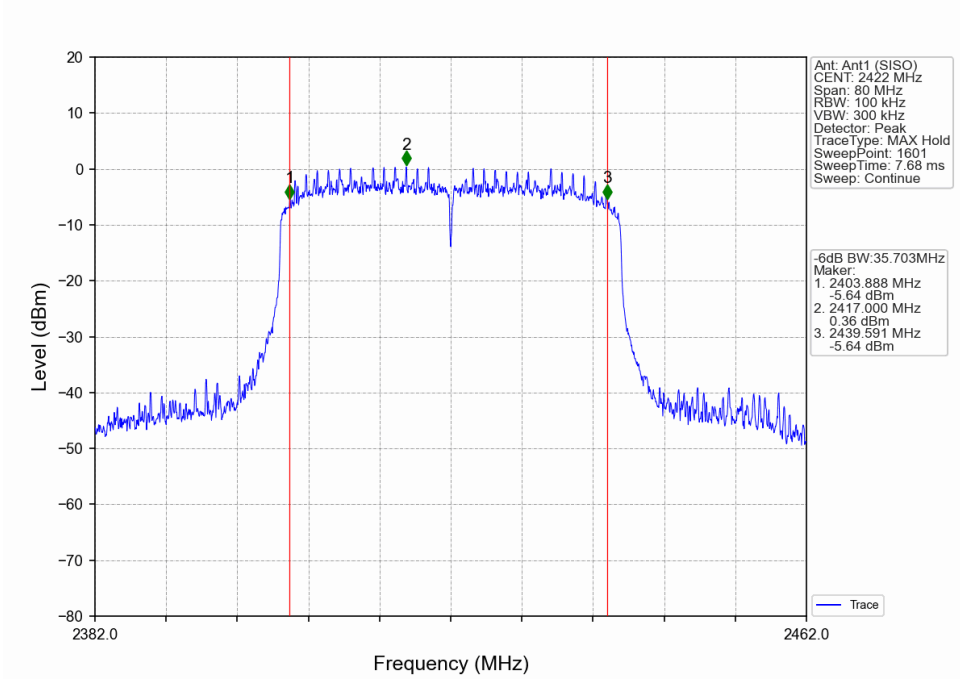
802.11ax(HEW20)_HCH_2462MHz_RU242_Left_Ant1 (SISO)_NTNV



802.11ax(HEW40)_LCH_2422MHz_RU484_Left_Ant1 (SISO)_NTNV



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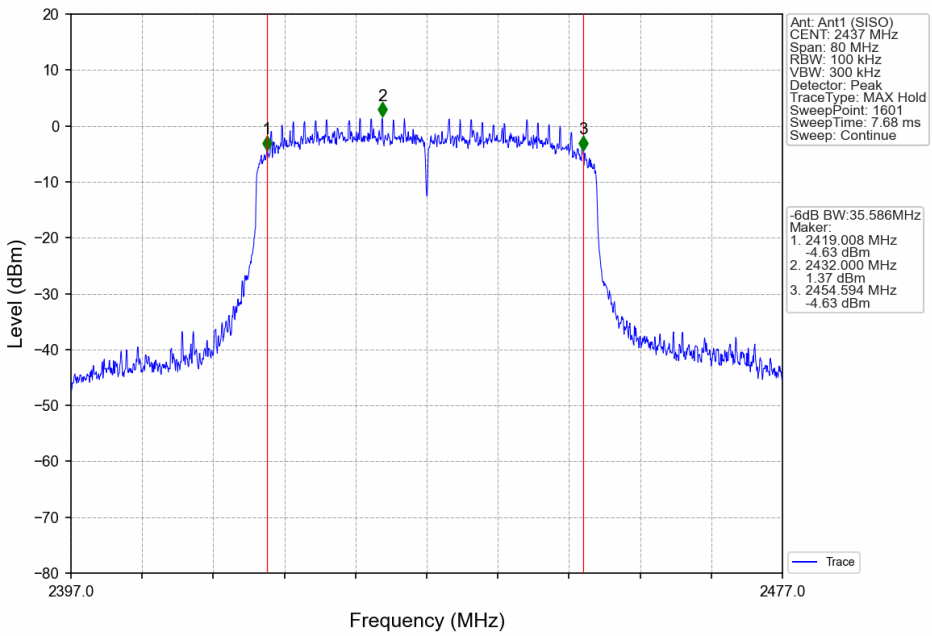
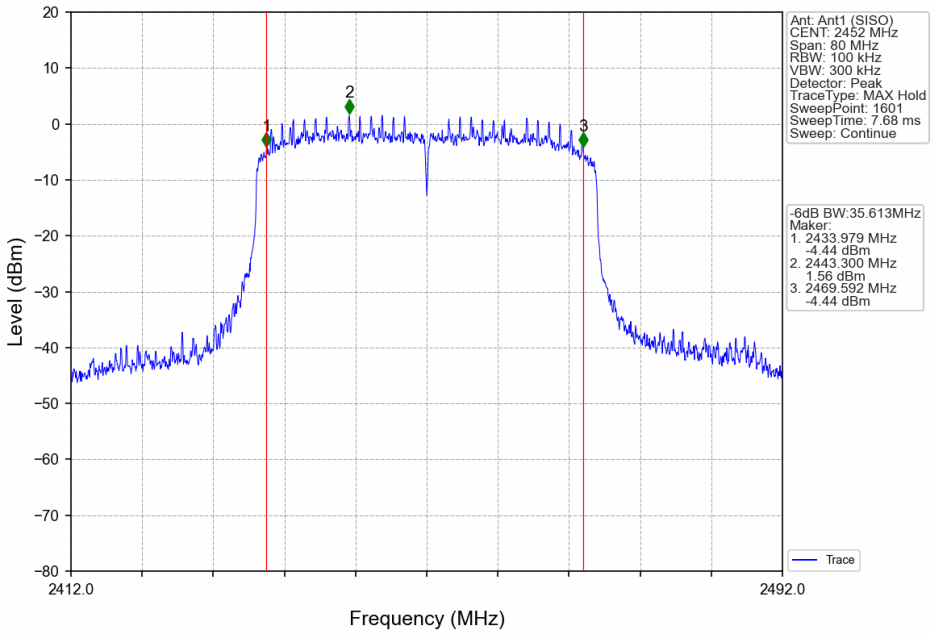
802.11ax(HEW40)_MCH_2437MHz_RU484_Left_Ant1 (SISO)_NTNV



802.11ax(HEW40)_HCH_2452MHz_RU484_Left_Ant1 (SISO)_NTNV



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3. Maximum Conducted Output Power

3.1 Power

3.1.1 Test Result

Mode	TX Type	Frequency (MHz)	RU	RU Pos	Maximum Average Conducted Output Power (dBm)		Verdict
					ANT1	Limit	
802.11b	SISO	2412	/	/	18.73	<=30	Pass
		2437	/	/	17.97	<=30	Pass
		2462	/	/	17.81	<=30	Pass
802.11g	SISO	2412	/	/	15.51	<=30	Pass
		2437	/	/	14.79	<=30	Pass
		2462	/	/	14.60	<=30	Pass
802.11n (HT20)	SISO	2412	/	/	15.37	<=30	Pass
		2437	/	/	14.65	<=30	Pass
		2462	/	/	14.50	<=30	Pass
802.11n (HT40)	SISO	2422	/	/	15.83	<=30	Pass
		2437	/	/	15.38	<=30	Pass
		2452	/	/	15.38	<=30	Pass
802.11ax (HEW20)	SISO	2412	RU242	Left	15.18	<=30	Pass
		2437	RU242	Left	14.46	<=30	Pass
		2462	RU242	Left	14.29	<=30	Pass
802.11ax (HEW40)	SISO	2422	RU484	Left	14.22	<=30	Pass
		2437	RU484	Left	15.27	<=30	Pass
		2452	RU484	Left	15.35	<=30	Pass
Note1: Antenna Gain: Ant1: 0.29dBi;							

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4. Maximum Power Spectral Density

4.1 PSD

4.1.1 Test Result

Mode	TX Type	Frequency (MHz)	RU	RU Pos	Maximum PSD (dBm/3kHz)		Verdict
					ANT1	Limit	
802.11b	SISO	2412	/	/	-0.77	<=8	Pass
		2437	/	/	-3.87	<=8	Pass
		2462	/	/	-3.36	<=8	Pass
802.11g	SISO	2412	/	/	-9.89	<=8	Pass
		2437	/	/	-9.44	<=8	Pass
		2462	/	/	-10.96	<=8	Pass
802.11n (HT20)	SISO	2412	/	/	-9.81	<=8	Pass
		2437	/	/	-10.82	<=8	Pass
		2462	/	/	-10.90	<=8	Pass
802.11n (HT40)	SISO	2422	/	/	-10.81	<=8	Pass
		2437	/	/	-13.29	<=8	Pass
		2452	/	/	-11.94	<=8	Pass
802.11ax (HEW20)	SISO	2412	RU242	Left	-9.93	<=8	Pass
		2437	RU242	Left	-10.74	<=8	Pass
		2462	RU242	Left	-10.61	<=8	Pass
802.11ax (HEW40)	SISO	2422	RU484	Left	-14.82	<=8	Pass
		2437	RU484	Left	-13.43	<=8	Pass
		2452	RU484	Left	-14.52	<=8	Pass
Note1: Antenna Gain: Ant1: 0.29dBi;							

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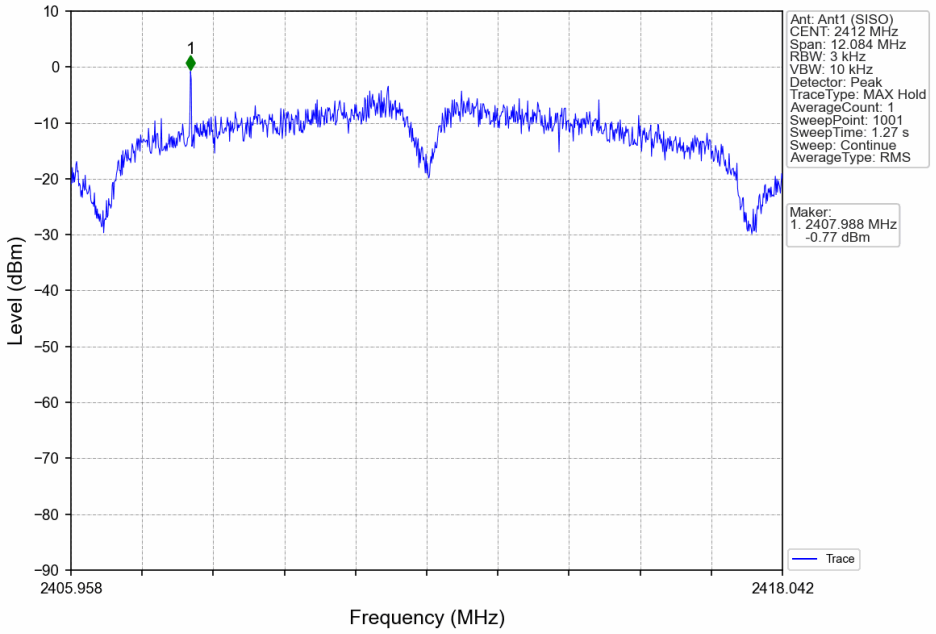
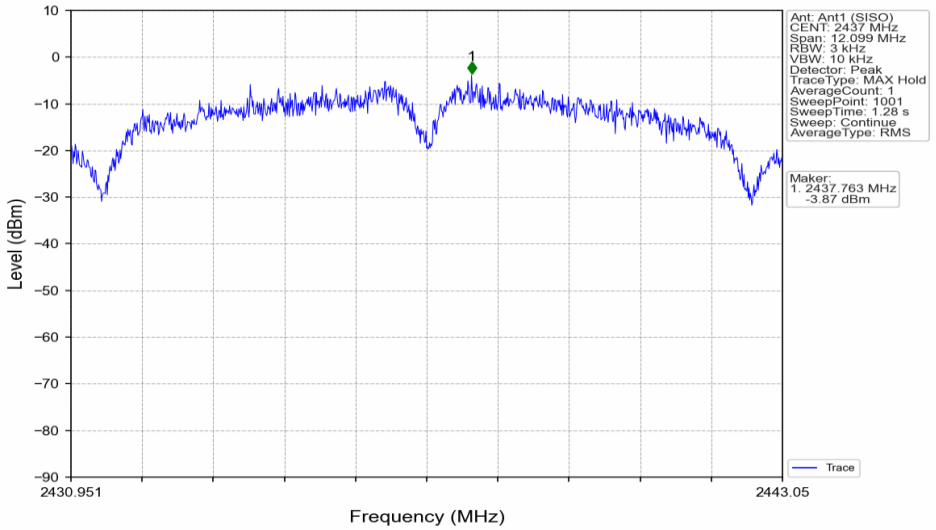
4.1.2 Test Graph

802.11b_LCH_2412MHz_Ant1 (SISO)_NTNV



802.11b_MCH_2437MHz_Ant1 (SISO)_NTNV



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