

TEST REPORT

Application No.: KSCR2411002399AT
FCC ID: 2AC8UA2431
Applicant: Anhui Huami Information Technology Co., Ltd.
Address of Applicant: 7/F, Building B2, Huami Global Innovation Center, No. 900, Wangjiang West Road, High-tech Zone, Hefei City, China (Anhui) Pilot Free Trade Zone(230088)
Manufacturer: Anhui Huami Information Technology Co., Ltd.
Address of Manufacturer: 7/F, Building B2, Huami Global Innovation Center, No. 900, Wangjiang West Road, High-tech Zone, Hefei City, China (Anhui) Pilot Free Trade Zone(230088)
Equipment Under Test (EUT):
EUT Name: Amazfit V1TAL
Model No.: A2431
Trade Mark: Amazfit
Standard(s) : 47 CFR Part 15, Subpart C 15.247
Date of Receipt: 2024-11-27
Date of Test: 2024-12-17 to 2025-01-08
Date of Issue: 2025-01-09

Test Result:**Pass***

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

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Unless otherwise stated the results shown in this test report refer only to the sample(s) tested and such sample(s) are retained for 30 days only.

Revision Record			
Version	Description	Date	Remark
00	Original	2025-01-09	/

Authorized for issue by:			
Tested By		Damon Zhou	
		Damon_Zhou/Project Engineer	
Approved By		Terry Hou	
		Terry Hou /Reviewer	

2 Test Summary

Radio Spectrum Technical Requirement					
Item	Standard	Method	Requirement	Result	Test Lab
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	N/A

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

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4 General Information

4.1 Details of E.U.T.

Power supply:	Rechargeable Lion Battery model: PL363536 Nominal Voltage: DC 3.87V Rated Capacity: 610mAh Rated Energy: 2.37Wh
Operation Frequency:	802.11b/g/n(HT20): 2412MHz to 2462MHz
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
Channel Spacing:	5MHz
Antenna Type:	IFA Antenna
Antenna Gain:	-4.1dBi (Provided by the manufacturer)

4.2 Power level setting using in test

Channel	11B	11G	11N20
	Ant 1	Ant 1	Ant 1
1	14	14	14
6	14	14	14
11	14	14	14

4.3 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Notebook	Lenovo	/	/
AC Adapter	DVE	/	/

4.4 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	8.4×10^{-8}
2	Timeout	2s
3	Duty Cycle	0.37%
4	Occupied Bandwidth	3%
5	RF Conducted Power	0.6dB
6	RF Power Density	2.9dB
7	Conducted Spurious Emissions	0.75dB
8	RF Radiated Power	5.2dB (Below 1GHz)
		5.9dB (Above 1GHz)
9	Radiated Spurious Emission Test	4.2dB (Below 30MHz)
		4.5dB (30MHz-1GHz)
		5.1dB (1GHz-18GHz)
		5.4dB (Above 18GHz)
10	Temperature Test	1°C
11	Humidity Test	3%
12	Supply Voltages	1.5%
13	Time	3%
Note: The measurement uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of k=2.		

4.5 Test Location

Lab A:

Compliance Certification Services (Kunshan) Inc.

No.10 Weiye Rd, Innovation park, Eco&Tec, Development Zone, Kunshan City, Jiangsu, China.

Tel: +86 512 5735 5888 Fax: +86 512 5737 0818

Lab B:

Radiated Emissions; Radiated Emissions which fall in the restricted bands test at:

SGS-CSTC Standards Technical Services (Suzhou) Co., Ltd.

No.2, Tongsheng Road, Wuzhong District, Suzhou, Jiangsu, China

Tel: +86 512 5735 5888 Fax: +86 512 5737 0818

Note:

1. SGS is not responsible for wrong test results due to incorrect information (e.g., max. internal working frequency, antenna gain, cable loss, etc) is provided by the applicant. (If applicable).
2. SGS is not responsible for the authenticity, integrity and the validity of the conclusion based on results of the data provided by applicant. (If applicable).
3. Sample source: sent by customer.

4.6 Test Facility

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

Lab A:

• **A2LA**

Compliance Certification Services (Kunshan) Inc. is accredited by the American Association for Laboratory Accreditation (A2LA). Certificate No. 2541.01.

• **FCC**

Compliance Certification Services (Kunshan) Inc. has been recognized as an accredited testing laboratory. Designation Number: CN1172.

• **ISED**

Compliance Certification Services (Kunshan) Inc. has been recognized by Innovation, Science and Economic Development Canada (ISED) as an accredited testing laboratory. Company Number: 2324E

• **VCCI**

The 3m and 10m Semi-anechoic chamber and Shielded Room of Compliance Certification Services (Kunshan) Inc. has been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: R-20134, R-11600, C-11707, T-11499, G-10216 respectively.

Lab B:

• **A2LA (Certificate No. 6336.01)**

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 6336.01.

• **Innovation, Science and Economic Development Canada**

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0120.

IC#: 27594.

• **FCC –Designation Number: CN1312**

SGS-CSTC STANDARDS TECHNICAL SERVICES (SUZHOU) CO., LTD. has been recognized as an accredited testing laboratory.

Designation Number: CN1312.

Test Firm Registration Number: 717327

4.7 Deviation from Standards

None

4.8 Abnormalities from Standard Conditions

None

5 Equipment List

Lab:A

Item	Equipment	Manufacturer	Model	Inventory No	Cal Date	Cal. Due Date
Conducted Emission at Mains Terminals						
1	EMI Test Receive	R&S	ESCI	KS301101	01/15/2024	01/14/2025
2	LISN	R&S	ENV216	KS301197	01/15/2024	01/14/2025
3	LISN	Schwarzbeck	NNLK 8129	KS301091	01/15/2024	01/14/2025
4	Pulse Limiter	R&S	ESH3-Z2	KUS1902E001	01/15/2024	01/14/2025
5	CE test Cable	Thermax	/	CZ301102	01/15/2024	01/14/2025
6	Test Software	ESE	E3_V 6.111221a	/	N.C.R	N.C.R
RF Conducted Test						
1	Spectrum Analyzer	Keysight	N9020A	KUS1911E004-2	08/01/2024	07/31/2025
2	Spectrum Analyzer	Keysight	N9020A	KUS2001M001-2	08/01/2024	07/31/2025
3	Spectrum Analyzer	Keysight	N9030B	KSEM021-1	01/15/2024	01/14/2025
4	Signal Generator	R&S	SMBV100B	KSEM032	03/19/2024	03/18/2025
5	Signal Generator	R&S	SMW200A	KSEM020-1	08/02/2024	08/01/2025
6	Signal Generator	Agilent	N5182A	KUS2001M001-1	08/01/2024	07/31/2025
7	Signal Generator	Agilent	E8257C	KS301066	08/06/2024	08/05/2025
8	Radio Communication Test Station	Anritsu	MT8000A	KSEM001-1	08/01/2024	07/31/2025
9	Radio Communication Analyzer	Anritsu	MT8821C	KSEM002-1	03/19/2024	03/18/2025
10	Universal Radio Communication Tester	R&S	CMW500	KUS1911E004-1	08/12/2024	08/11/2025
11	Switcher	TST	FY562	KUS2001M001-4	01/15/2024	01/14/2025
12	Conducted Test Cable	Thermax	RF01-RF04	CZ301111- CZ301120	01/15/2024	01/14/2025
13	Temp. / Humidity Chamber	TERCHY	MHK-120AK	KS301190	08/26/2024	08/25/2025
14	Temperature & Humidity Recorder	Renke Control	RS-WS-N01-6J	KSEM024-5	03/19/2024	03/18/2025
15	Software	BST	TST-PASS	/	NCR	NCR

Lab B:

Item	Equipment	Manufacturer	Model	Inventory No	Cal Date	Cal. Due Date
RF Radiated Test						
1	Semi-Anechoic Chamber	Brilliant-emc	N/A	SUWI-04-02-02	6/3/2023	6/2/2026
2	Temperature and humidity meter	MingGao	TH101B	SUWI-01-01-13	2/8/2024	2/7/2025
3	Signal Analyzer	ROHDE&SCHWARZ	FSW43	SUWI-01-02-04	5/8/2024	5/7/2025
4	Signal Analyzer	KEYSIGHT	N9020A	SUWI-01-02-06	11/20/2024	11/19/2025
5	Test receiver	ROHDE&SCHWARZ	ESR7	SUWI-01-10-01	2/1/2024	1/31/2025
6	Receiving antenna	SCHWRZBECK MESS- ELEKTRONIK	VULB 9168	SUWI-01-11-04	11/24/2024	11/23/2025
7	Receiving antenna	SCHWRZBECK MESS- ELEKTRONIK	BBHA 9120D	SUWI-01-11-05	11/24/2024	11/23/2025
8	Receiving antenna	SCHWRZBECK MESS- ELEKTRONIK	BBHA 9170	SUWI-01-11-03	5/12/2023	5/11/2025
9	Active Loop Antenna	SCHWRZBECK MESS- ELEKTRONIK	FMZB 1519B	SUWI-01-21-01	5/13/2023	5/12/2025
10	Amplifier	Tonscend	TAP9K3G40	SUWI-01-14-01	2/1/2024	1/31/2025
11	Amplifier	Tonscend	TAP01018050	SUWI-01-14-02	2/1/2024	1/31/2025
12	Amplifier	Tonscend	TAP18040048	SUWI-01-14-03	2/1/2024	1/31/2025
13	Measurement Software	Tonscend	JS32-RE	SUWI-02-09-04	NCR	NCR
14	Measurement Software	Tonscend	JS32-RSE	SUWI-02-09-06	NCR	NCR

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 IFA antenna and no consideration of replacement. The best case gain of the antenna is -4.1dBi.

Antenna location: Refer to internal photo.

7 Radio Spectrum Matter Test Results

7.1 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.

7.1.1 E.U.T. Operation

Operating Environment:

Temperature: 25.2 °C

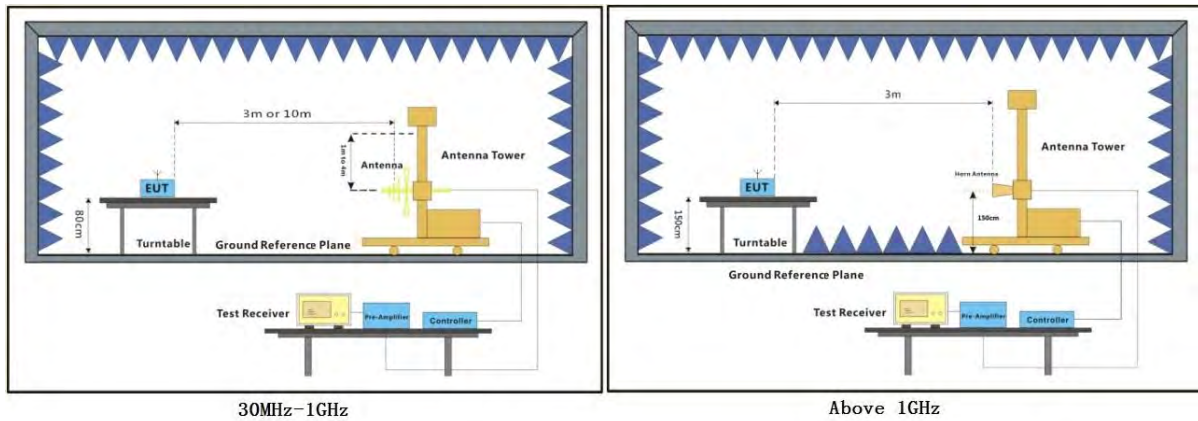
Humidity: 47.7 % RH

Atmospheric Pressure: 1010 mbar

7.1.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	04	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and only the data of worst case is recorded in the report.

7.1.3 Test Setup Diagram



7.1.4 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.

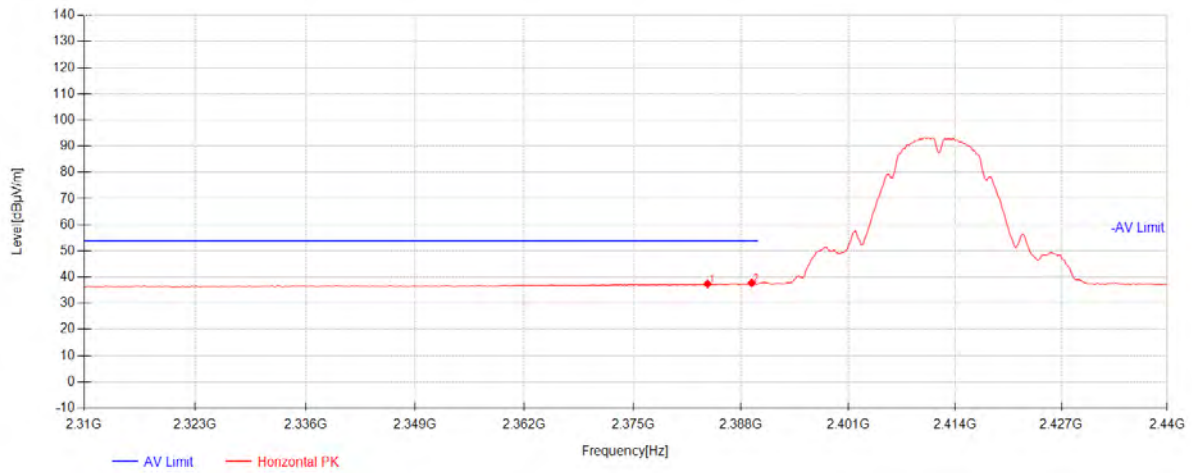
Remark 1: $\text{Level} = \text{Read Level} + \text{Cable Loss} + \text{Antenna Factor} - \text{Preamp Factor}$

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.

Remark 3: The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for Peak detection (PK) and Average detection (AV) at frequency above 1GHz.

Remark 4: For fundamental and harmonic signal measurement, the resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is $\geq 1/T$ (Duty cycle $< 98\%$) or 10Hz (Duty cycle $\geq 98\%$) for Average detection (AV) at frequency above 1GHz.

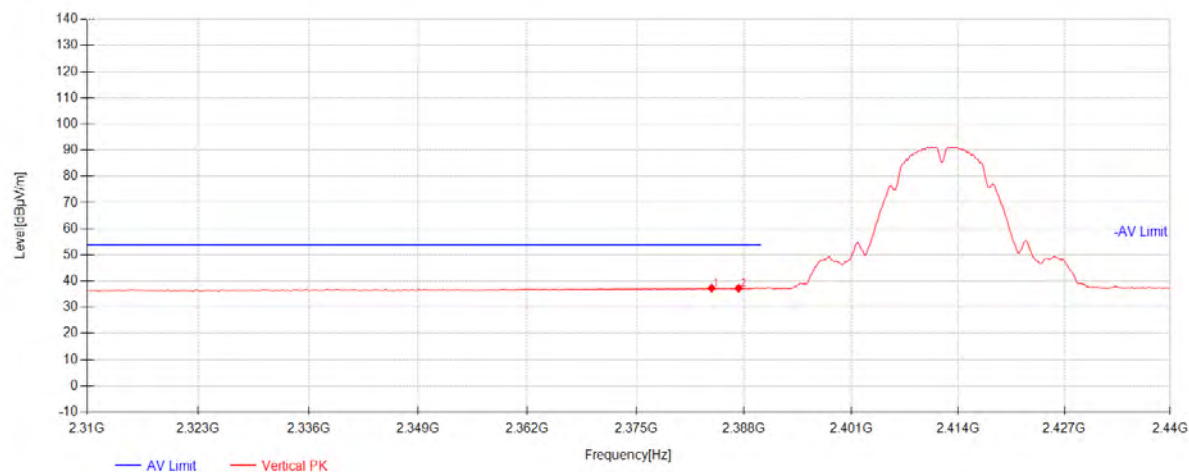
802.11b_Channel 01



Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	2383.97	34.04	26.97	-23.57	37.44	54.00	16.56	Horizontal
2	2389.3	34.38	26.98	-23.57	37.79	54.00	16.21	Horizontal

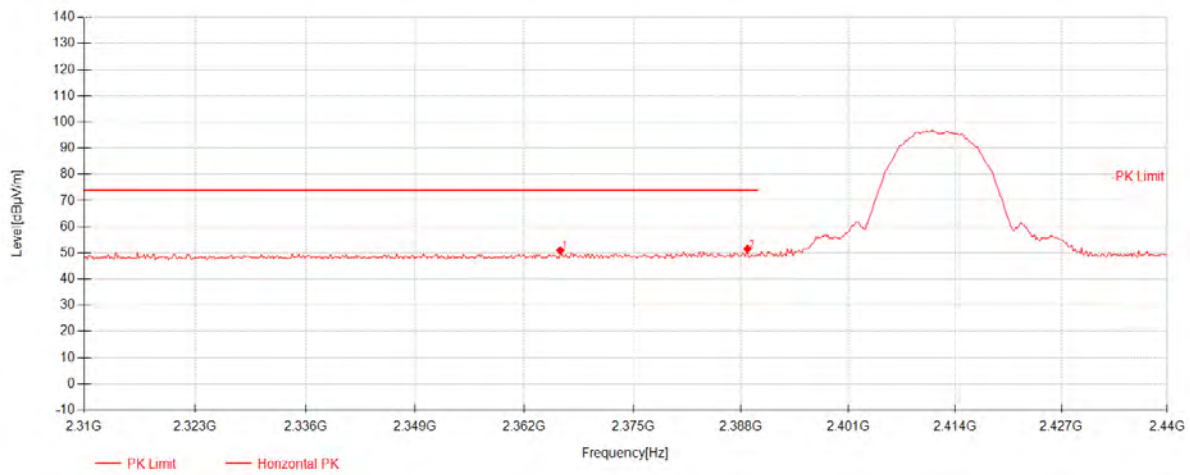


802.11b_Channel 01



Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	2384.1	33.95	26.97	-23.57	37.35	54.00	16.65	Vertical
2	2387.35	33.91	26.97	-23.57	37.31	54.00	16.69	Vertical

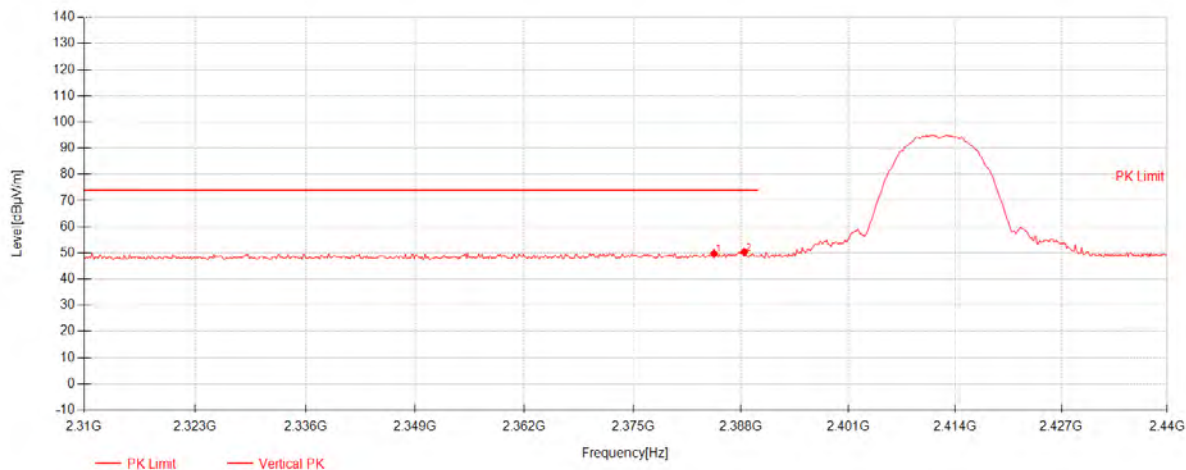
802.11b_Channel 01



Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	2366.29	47.63	26.93	-23.57	50.99	74.00	23.01	Horizontal
2	2388.78	48.15	26.98	-23.57	51.56	74.00	22.44	Horizontal



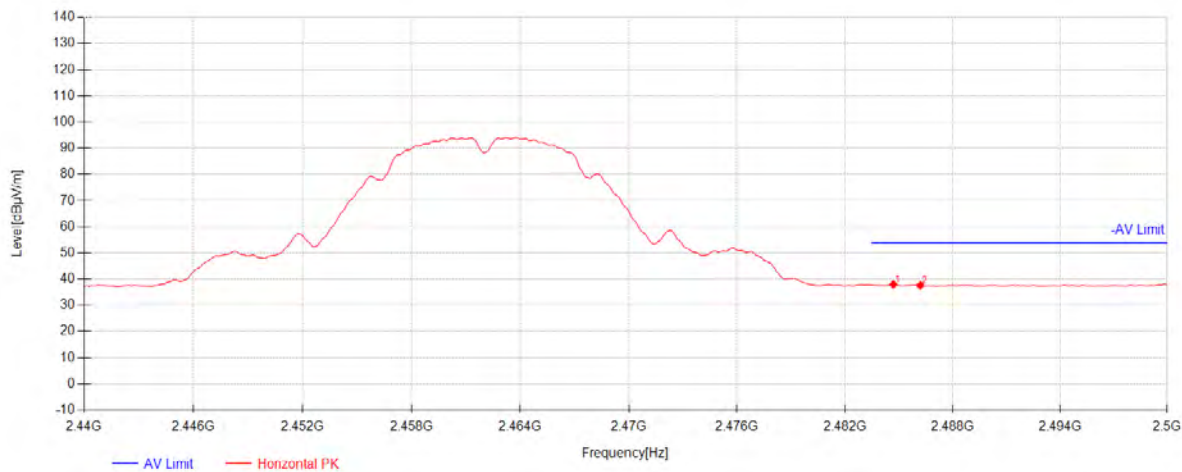
802.11b_Channel 01



Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	2384.75	46.32	26.97	-23.57	49.72	74.00	24.28	Vertical
2	2388.39	46.91	26.98	-23.57	50.32	74.00	23.68	Vertical



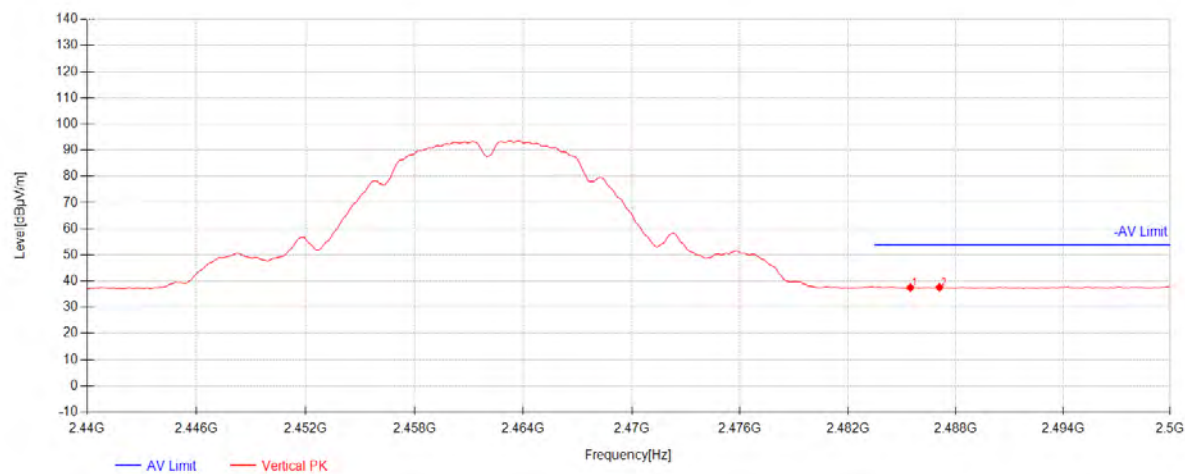
802.11b_Channel 11



Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	2484.7	34.37	27.17	-23.54	37.99	54.00	16.01	Horizontal
2	2486.2	34.00	27.17	-23.54	37.63	54.00	16.37	Horizontal



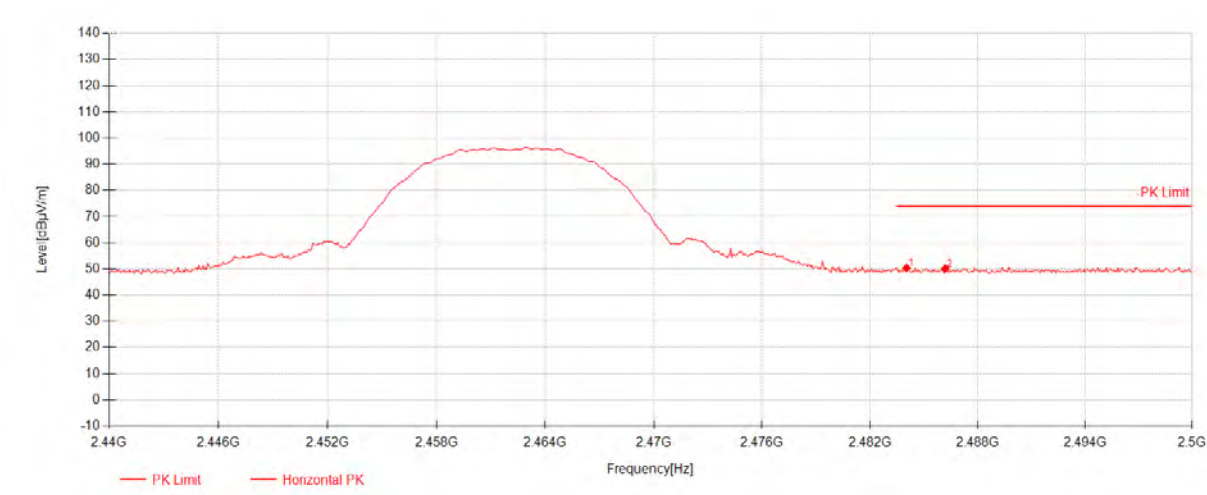
802.11b_Channel 11



Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	2485.48	33.91	27.17	-23.54	37.54	54.00	16.46	Vertical
2	2487.1	34.00	27.17	-23.54	37.63	54.00	16.37	Vertical



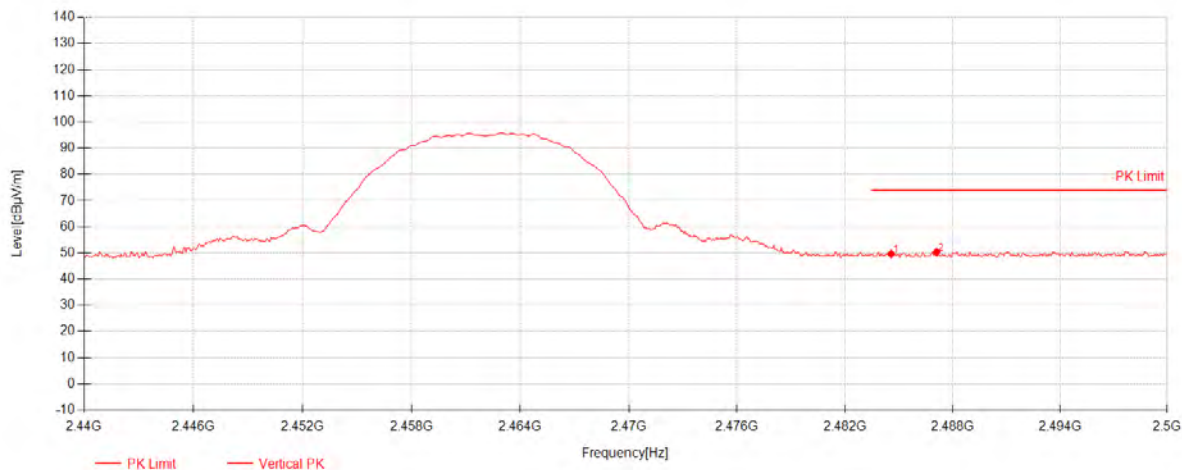
802.11b_Channel 11



Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	2484.04	46.74	27.17	-23.54	50.36	74.00	23.64	Horizontal
2	2486.2	46.49	27.17	-23.54	50.12	74.00	23.88	Horizontal



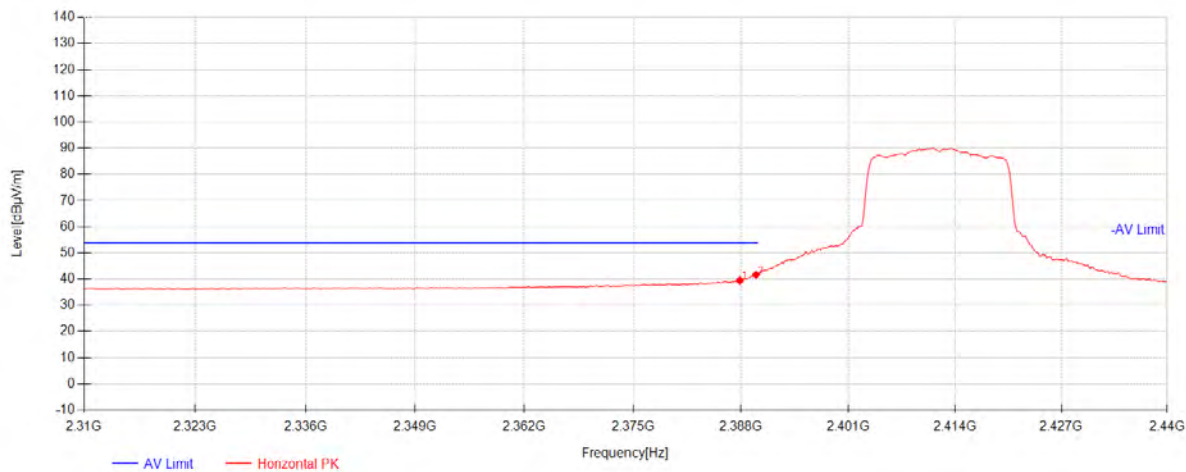
802.11b_Channel 11



Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	2484.58	46.02	27.17	-23.54	49.64	74.00	24.36	Vertical
2	2487.1	46.69	27.17	-23.54	50.32	74.00	23.68	Vertical



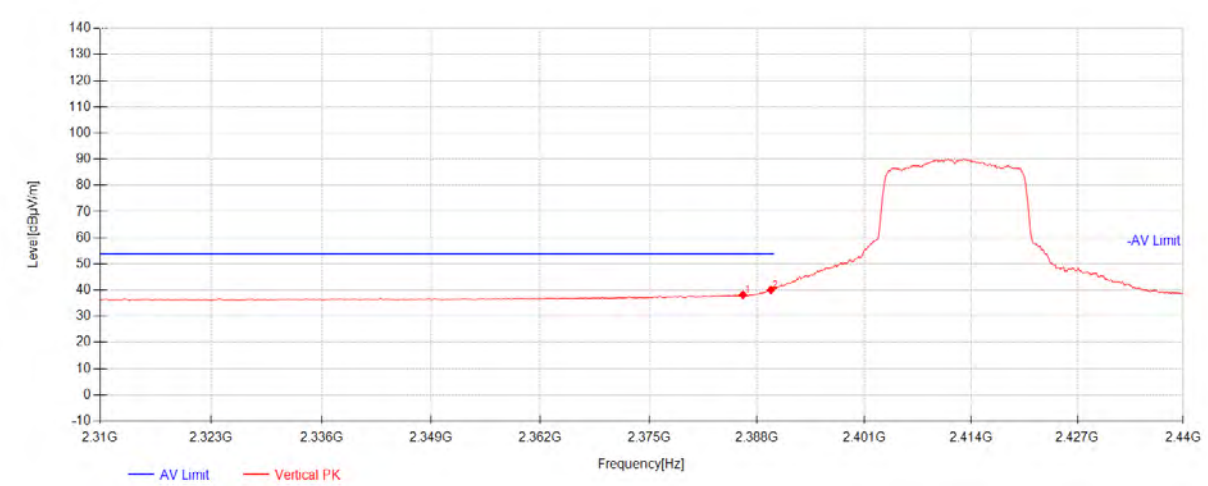
802.11g_Channel 01



Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	2387.87	36.07	26.98	-23.57	39.47	54.00	14.53	Horizontal
2	2389.82	38.25	26.98	-23.57	41.66	54.00	12.34	Horizontal

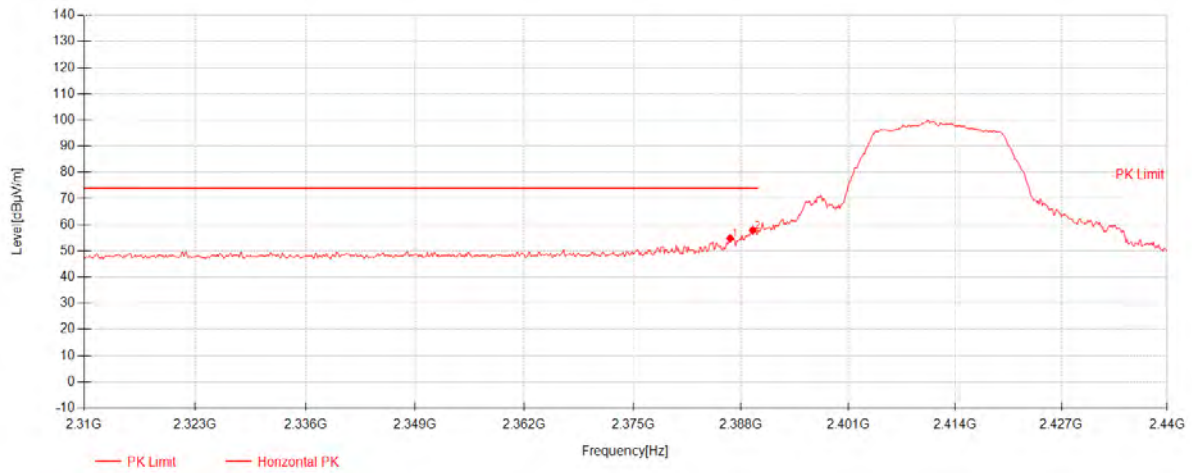


802.11g_Channel 01



Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	2386.31	34.81	26.97	-23.57	38.21	54.00	15.79	Vertical
2	2389.69	36.67	26.98	-23.57	40.08	54.00	13.92	Vertical

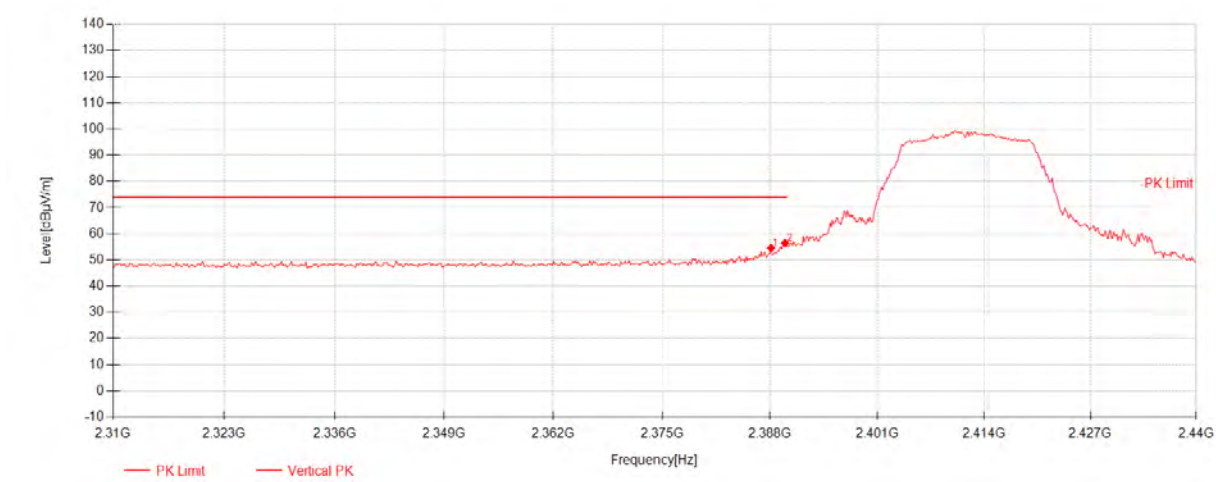
802.11g_Channel 01



Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	2386.7	51.48	26.97	-23.57	54.88	74.00	19.12	Horizontal
2	2389.43	54.53	26.98	-23.57	57.94	74.00	16.06	Horizontal

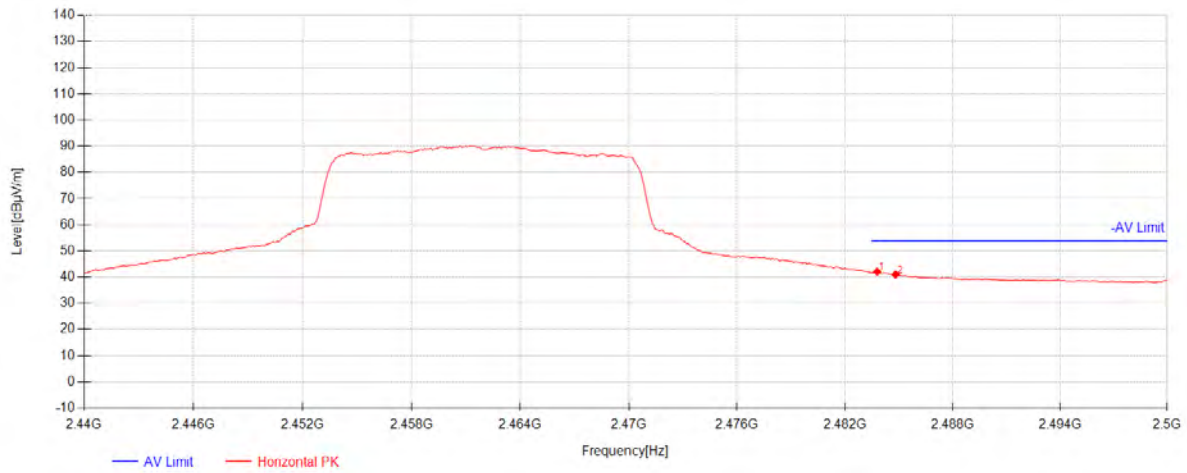


802.11g_Channel 01



Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	2388.13	51.18	26.98	-23.57	54.59	74.00	19.41	Vertical
2	2389.82	53.04	26.98	-23.57	56.45	74.00	17.55	Vertical

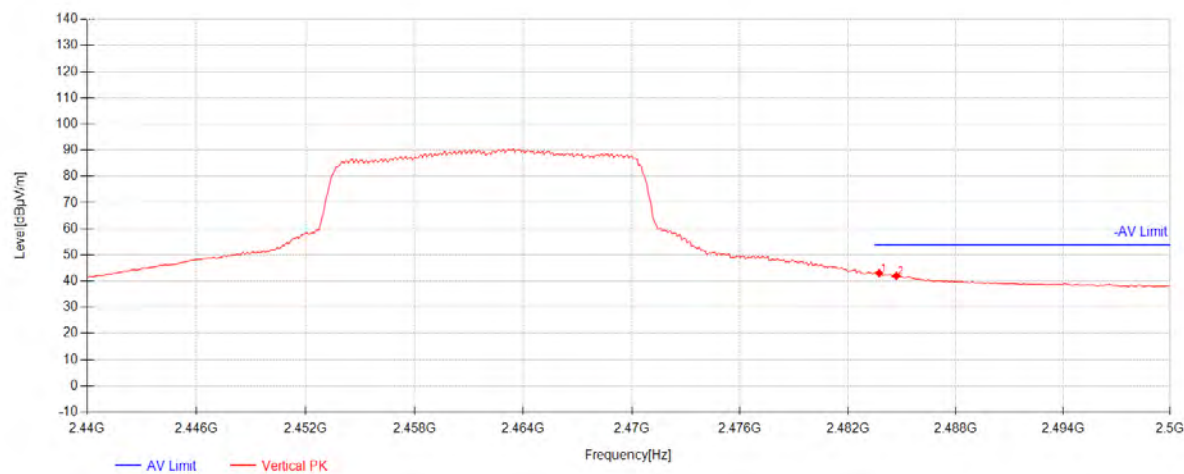
802.11g_Channel 11



Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	2483.8	38.48	27.17	-23.54	42.10	54.00	11.90	Horizontal
2	2484.82	37.36	27.17	-23.54	40.99	54.00	13.01	Horizontal

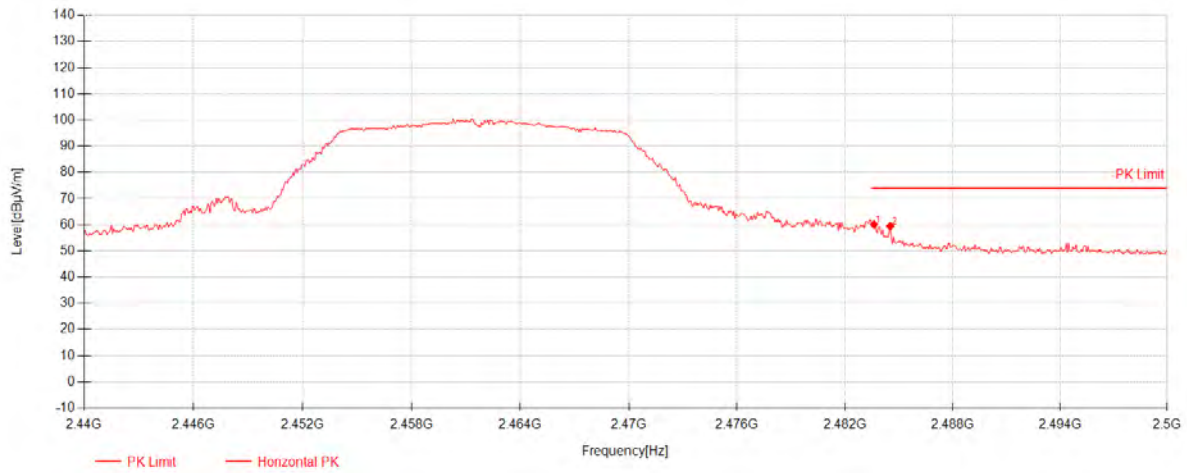


802.11g_Channel 11



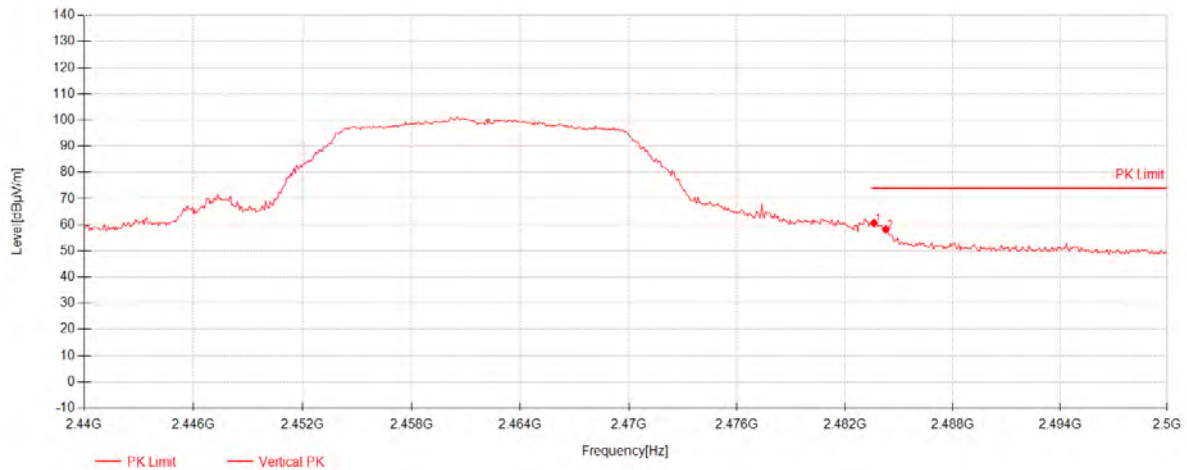
Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	2483.74	39.44	27.17	-23.54	43.06	54.00	10.94	Vertical
2	2484.7	38.40	27.17	-23.54	42.02	54.00	11.98	Vertical

802.11g_Channel 11



Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	2483.62	56.46	27.17	-23.54	60.08	74.00	13.92	Horizontal
2	2484.52	55.80	27.17	-23.54	59.42	74.00	14.58	Horizontal

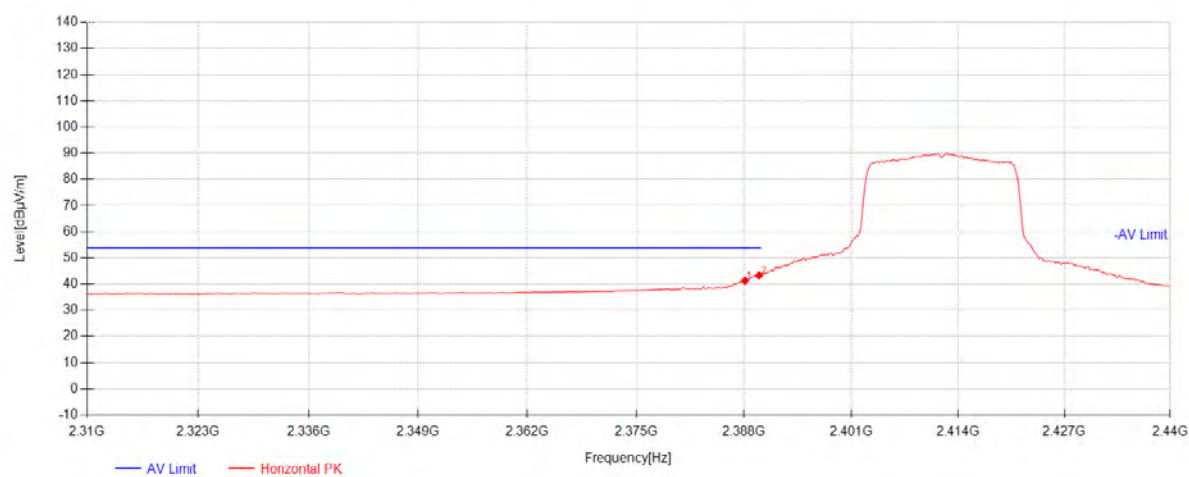
802.11g_Channel 11



Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	2483.62	57.02	27.17	-23.54	60.64	74.00	13.36	Vertical
2	2484.28	54.60	27.17	-23.54	58.22	74.00	15.78	Vertical

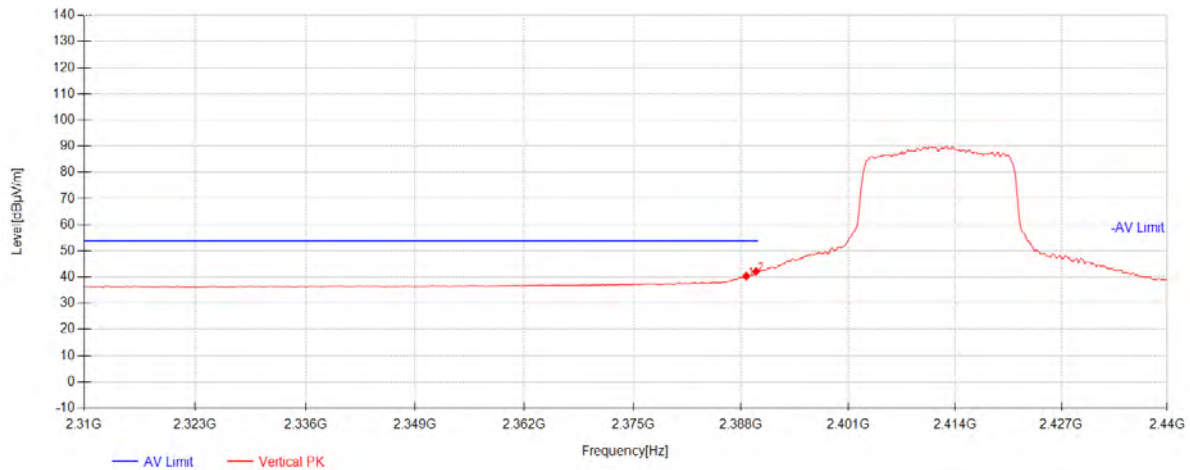


802.11n20_Channel 01



Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	2388.13	37.89	26.98	-23.57	41.30	54.00	12.70	Horizontal
2	2389.82	39.93	26.98	-23.57	43.34	54.00	10.66	Horizontal

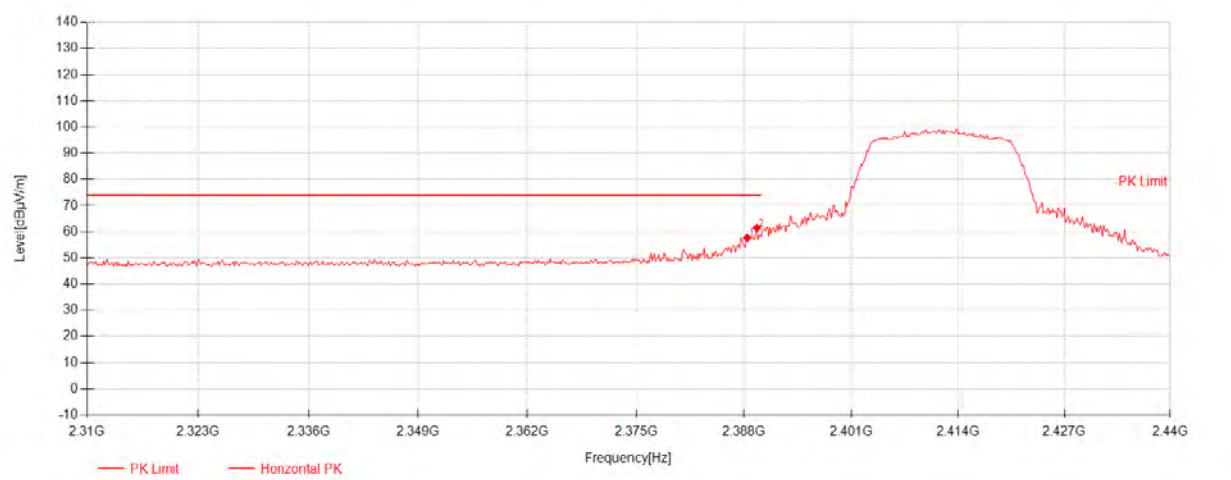
802.11n20_Channel 01



Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	2388.65	36.96	26.98	-23.57	40.37	54.00	13.63	Vertical
2	2389.82	38.79	26.98	-23.57	42.20	54.00	11.80	Vertical

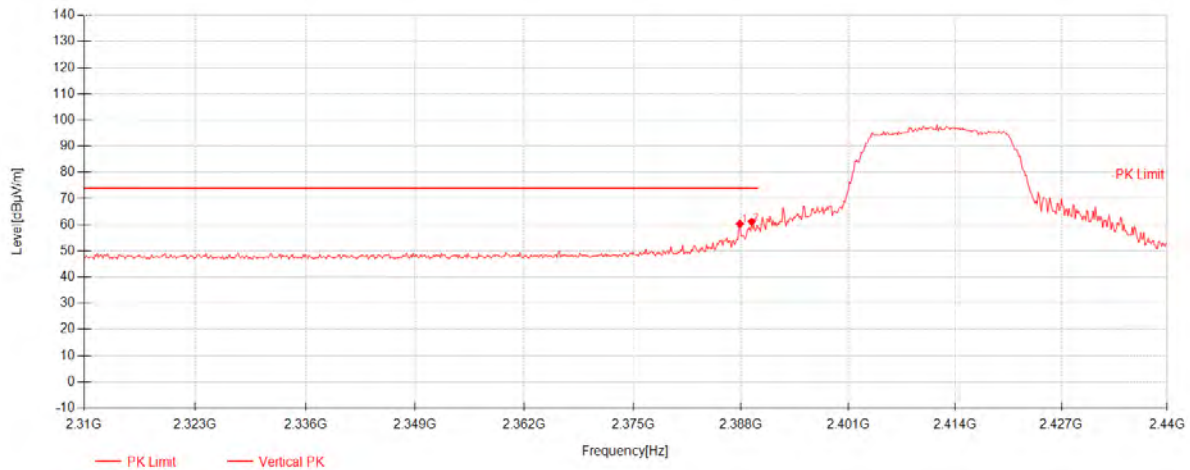


802.11n20_Channel 01



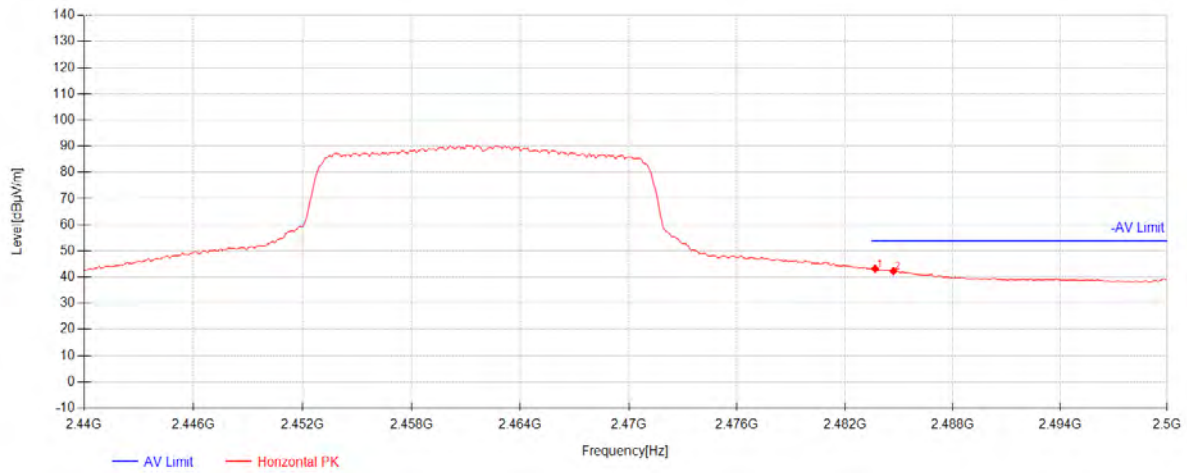
Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	2388.39	54.32	26.98	-23.57	57.73	74.00	16.27	Horizontal
2	2389.56	58.07	26.98	-23.57	61.48	74.00	12.52	Horizontal

802.11n20_Channel 01



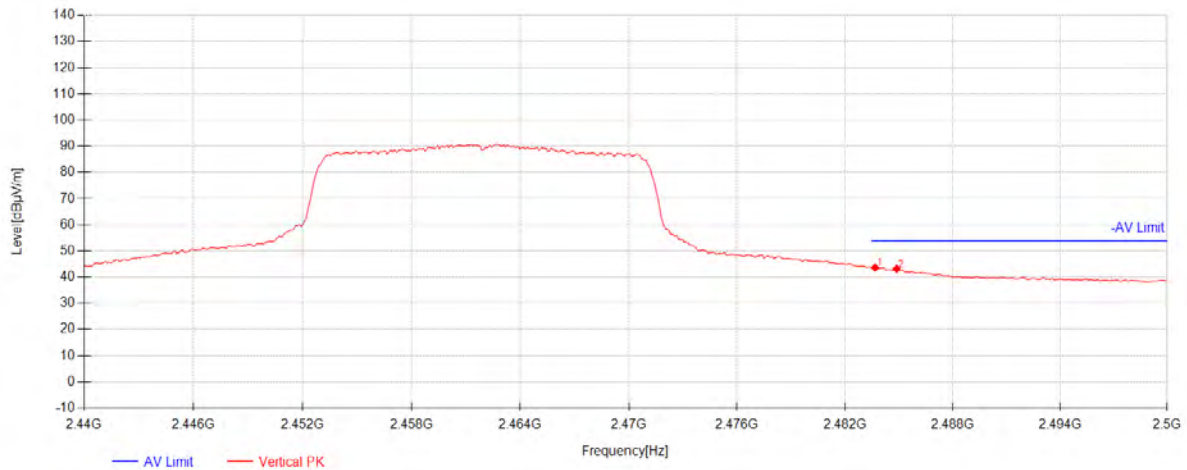
Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	2387.87	56.88	26.98	-23.57	60.28	74.00	13.72	Vertical
2	2389.3	57.75	26.98	-23.57	61.16	74.00	12.84	Vertical

802.11n20_Channel 11



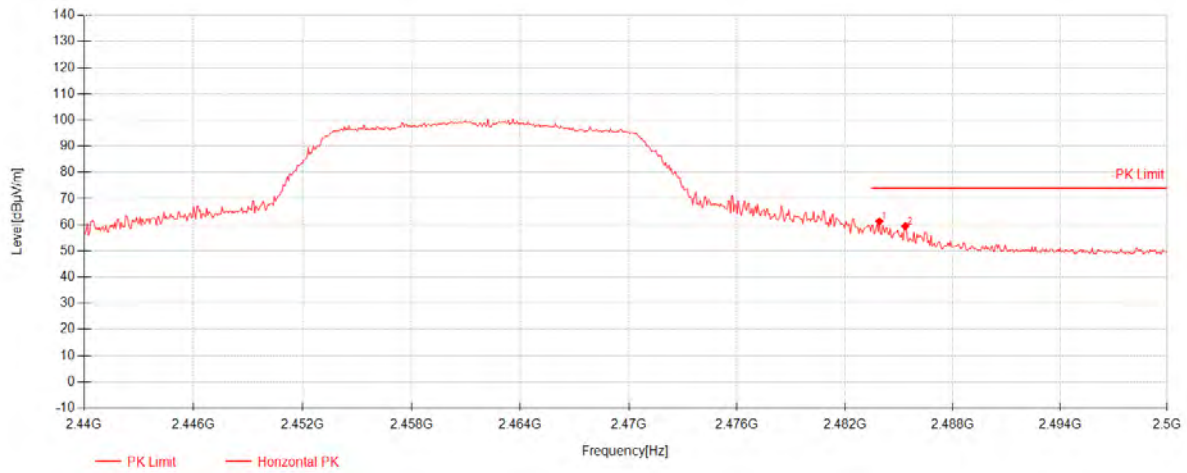
Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	2483.68	39.60	27.17	-23.54	43.22	54.00	10.78	Horizontal
2	2484.7	38.71	27.17	-23.54	42.33	54.00	11.67	Horizontal

802.11n20_Channel 11



Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	2483.68	40.05	27.17	-23.54	43.67	54.00	10.33	Vertical
2	2484.88	39.57	27.17	-23.54	43.20	54.00	10.80	Vertical

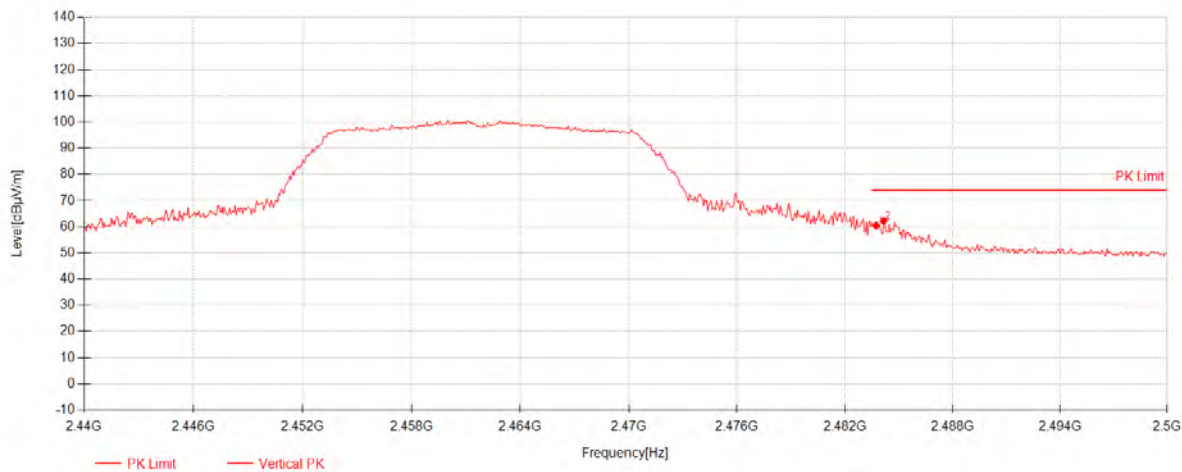
802.11n20_Channel 11



Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	2483.92	57.66	27.17	-23.54	61.28	74.00	12.72	Horizontal
2	2485.36	55.80	27.17	-23.54	59.43	74.00	14.57	Horizontal



802.11n20_Channel 11



Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	2483.74	56.79	27.17	-23.54	60.41	74.00	13.59	Vertical
2	2484.16	58.65	27.17	-23.54	62.27	74.00	11.73	Vertical

7.2 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

7.2.1 E.U.T. Operation

Operating Environment:

Temperature: 24.6 °C

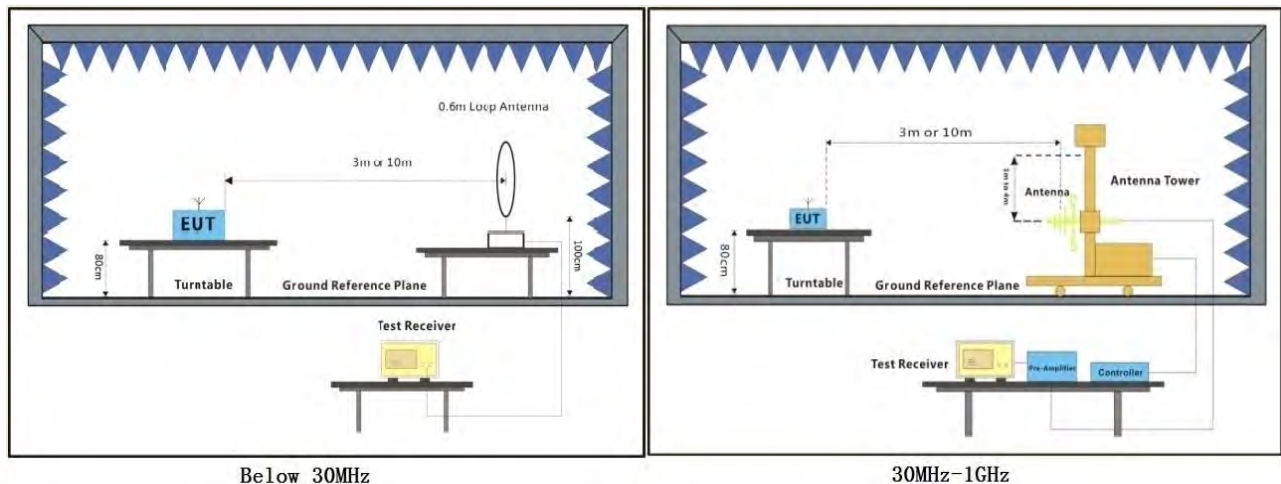
Humidity: 48.1 % RH

Atmospheric Pressure: 1010 mbar

7.2.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	04	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and only the data of worst case is recorded in the report.

7.2.3 Test Setup Diagram



7.2.4 Measurement Procedure and Data

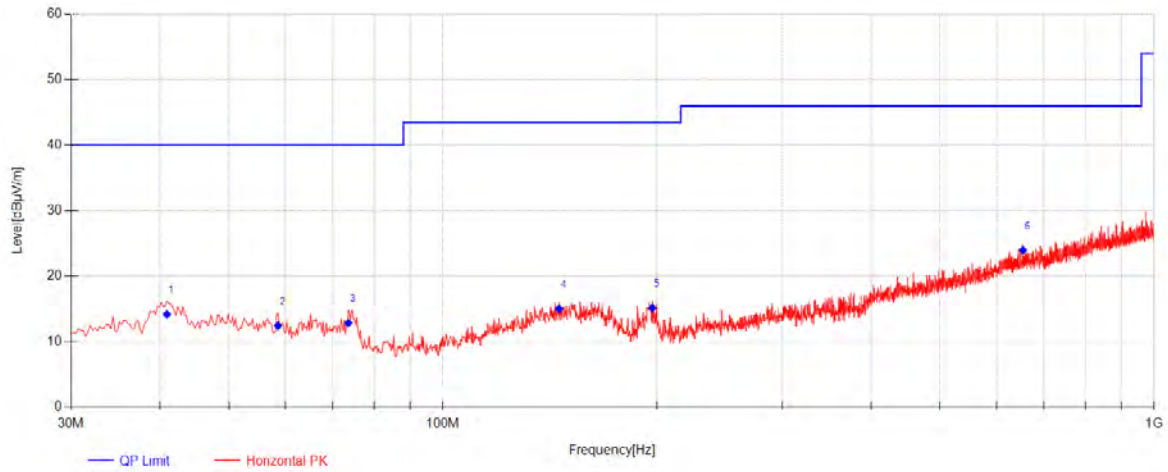
- a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 or 10 meters away from the interference-receiving antenna, 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. $\text{Level} = \text{Read Level} + \text{Cable Loss} + \text{Antenna Factor} - \text{Preamp Factor}$
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.

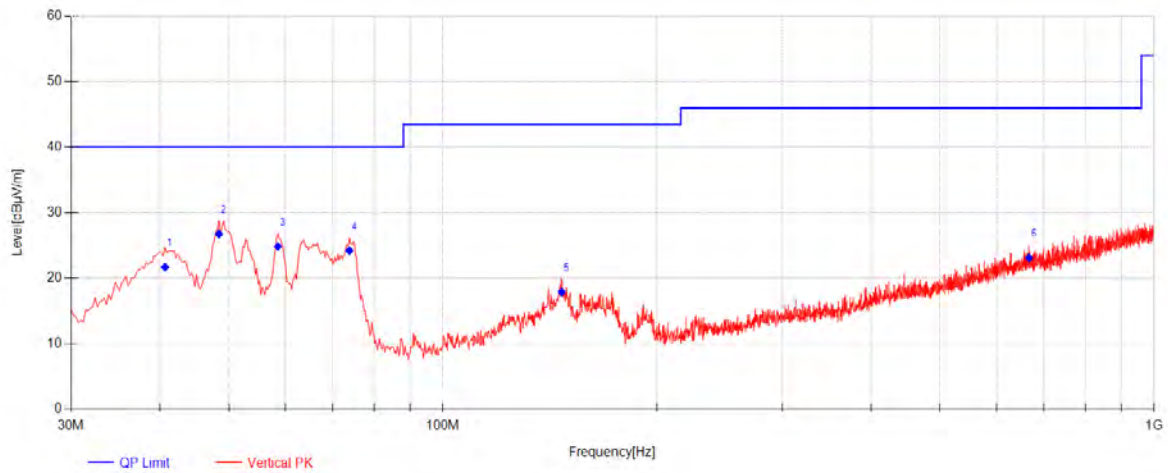


11b_Channel 11

**Final Data List**

NO.	Frequency [MHz]	Reading [dBμV]	Factor [dB]	AF [dB/m]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]	Polarity
1	40.9125	37.61	-42.22	18.80	14.19	40.00	25.81	Horizontal
2	58.615	36.77	-42.01	17.64	12.40	40.00	27.60	Horizontal
3	73.65	38.74	-41.76	15.84	12.82	40.00	27.18	Horizontal
4	145.6725	36.96	-40.85	18.90	15.02	43.50	28.48	Horizontal
5	197.0825	40.56	-40.61	15.21	15.16	43.50	28.34	Horizontal
6	653.9525	36.46	-37.70	25.18	23.94	46.00	22.06	Horizontal

11b_Channel 11



Final Data List								
NO.	Frequency [MHz]	Reading [dBμV]	Factor [dB]	AF [dB/m]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]	Polarity
1	40.67	45.13	-42.22	18.80	21.71	40.00	18.29	Vertical
2	48.43	50.12	-42.16	18.80	26.76	40.00	13.24	Vertical
3	58.615	49.21	-42.01	17.64	24.84	40.00	15.16	Vertical
4	73.8925	50.14	-41.75	15.81	24.20	40.00	15.80	Vertical
5	146.885	39.61	-40.81	19.10	17.90	43.50	25.60	Vertical
6	667.0475	35.50	-37.80	25.40	23.10	46.00	22.90	Vertical

7.3 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

7.3.1 E.U.T. Operation

Operating Environment:

Temperature: 25.2 °C

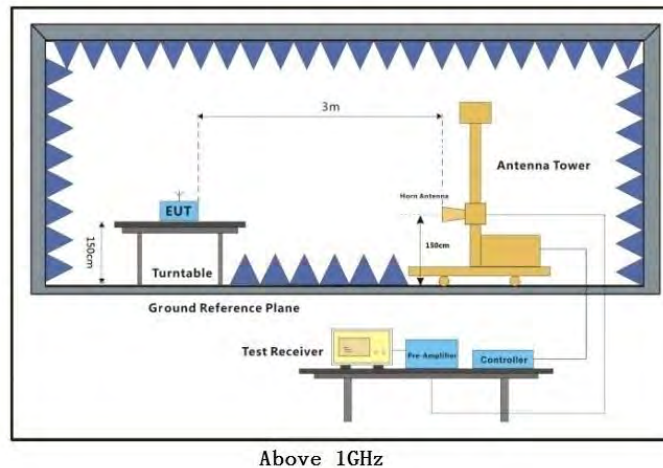
Humidity: 47.7 % RH

Atmospheric Pressure: 1010 mbar

7.3.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	04	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and only the data of worst case is recorded in the report.

7.3.3 Test Setup Diagram



7.3.4 Measurement Procedure and Data

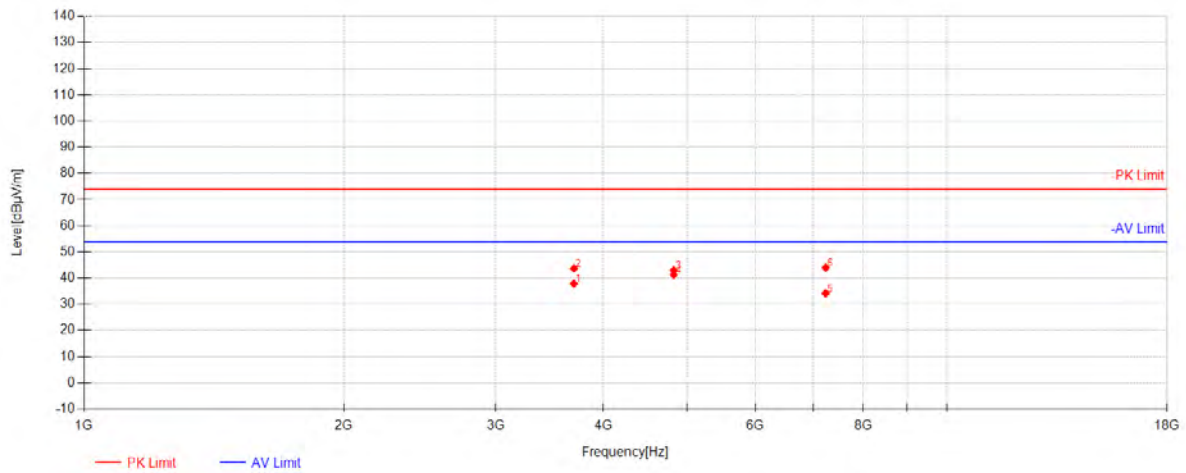
- a. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which 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.
- 4: The resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is 3MHz for Peak detection (PK) and Average detection (AV) at frequency above 1GHz.
- 5:For fundamental and harmonic signal measurement, the resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is $\geq 1/T$ (Duty cycle<98%) or 10Hz (Duty cycle $\geq$ 98%) for Average detection (AV) at frequency above 1GHz.



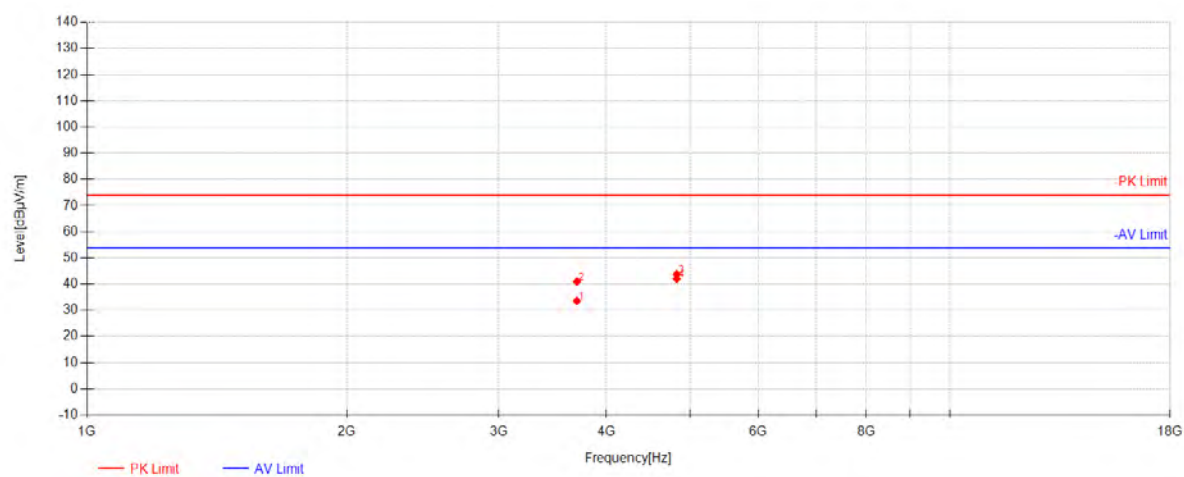
802.11b_Channel 01



Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	3696	54.51	28.91	-45.53	37.90	54.00	16.10	Horizontal
2	3696.75	60.33	28.91	-45.52	43.72	74.00	30.28	Horizontal
3	4824	57.46	31.12	-45.54	43.04	74.00	30.96	Horizontal
4	4824.375	55.74	31.12	-45.54	41.32	54.00	12.68	Horizontal
5	7235.625	42.15	35.66	-43.54	34.27	54.00	19.73	Horizontal
6	7238.25	51.90	35.67	-43.55	44.02	74.00	29.98	Horizontal



802.11b_Channel 01



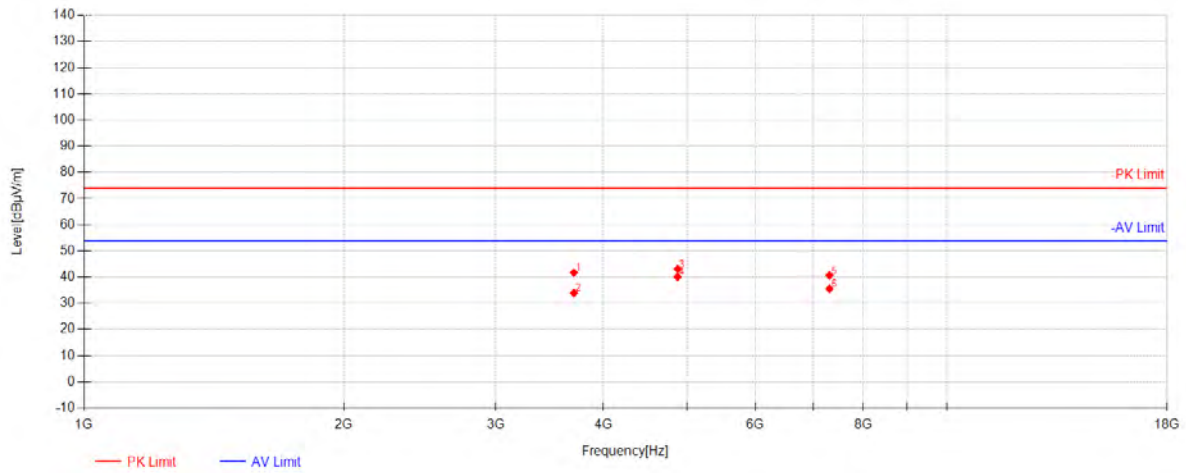
Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	3696	50.25	28.91	-45.53	33.64	54.00	20.36	Vertical
2	3696.75	57.57	28.91	-45.52	40.96	74.00	33.04	Vertical
3	4824	58.24	31.12	-45.54	43.82	74.00	30.18	Vertical
4	4824.375	56.42	31.12	-45.54	42.00	54.00	12.00	Vertical



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802.11b_Channel 06



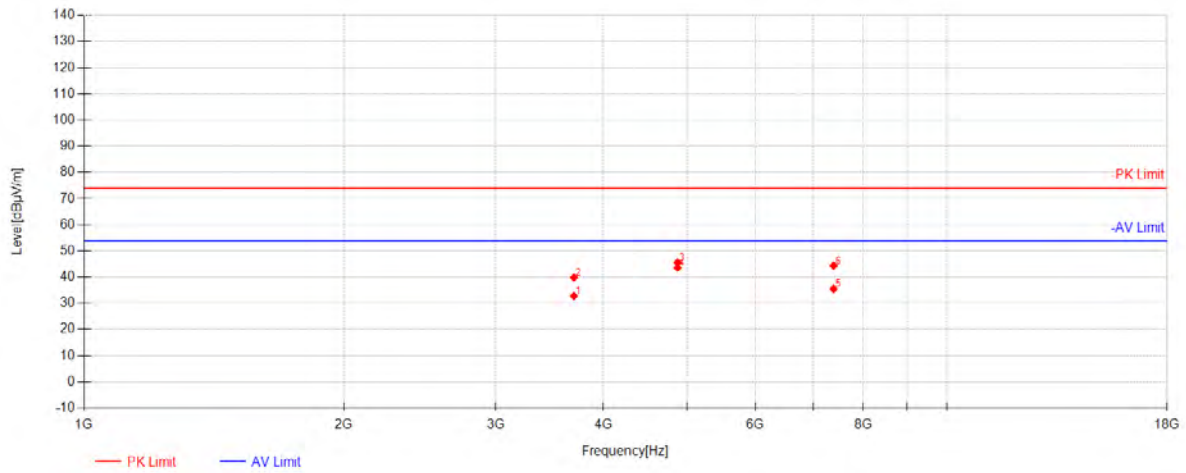
Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	3696	58.33	28.91	-45.53	41.72	74.00	32.28	Horizontal
2	3696.375	50.60	28.91	-45.52	33.99	54.00	20.01	Horizontal
3	4874.25	57.44	31.20	-45.53	43.11	74.00	30.89	Horizontal
4	4874.25	54.43	31.20	-45.53	40.10	54.00	13.90	Horizontal
5	7311.0000	48.46	35.87	-43.71	40.62	74.00	33.38	Horizontal
6	7311.75	43.44	35.87	-43.71	35.60	54.00	18.40	Horizontal



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802.11b_Channel 06



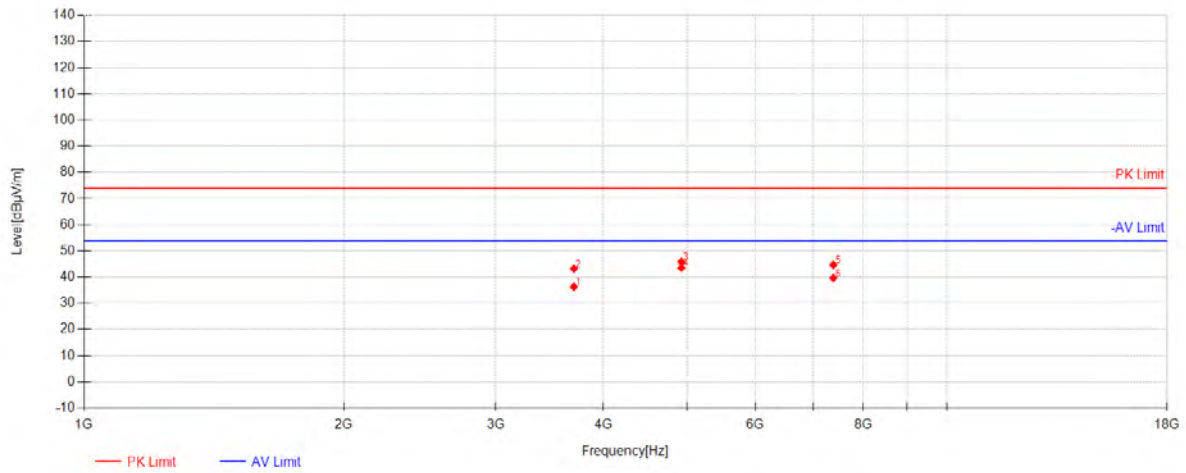
Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	3696	49.41	28.91	-45.53	32.80	54.00	21.20	Vertical
2	3696.75	56.43	28.91	-45.52	39.82	74.00	34.18	Vertical
3	4874.25	59.96	31.20	-45.53	45.63	74.00	28.37	Vertical
4	4874.25	58.00	31.20	-45.53	43.67	54.00	10.33	Vertical
5	7391.625	42.91	36.10	-43.44	35.57	54.00	18.43	Vertical
6	7393.125	51.78	36.10	-43.43	44.45	74.00	29.55	Vertical



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802.11b_Channel 11



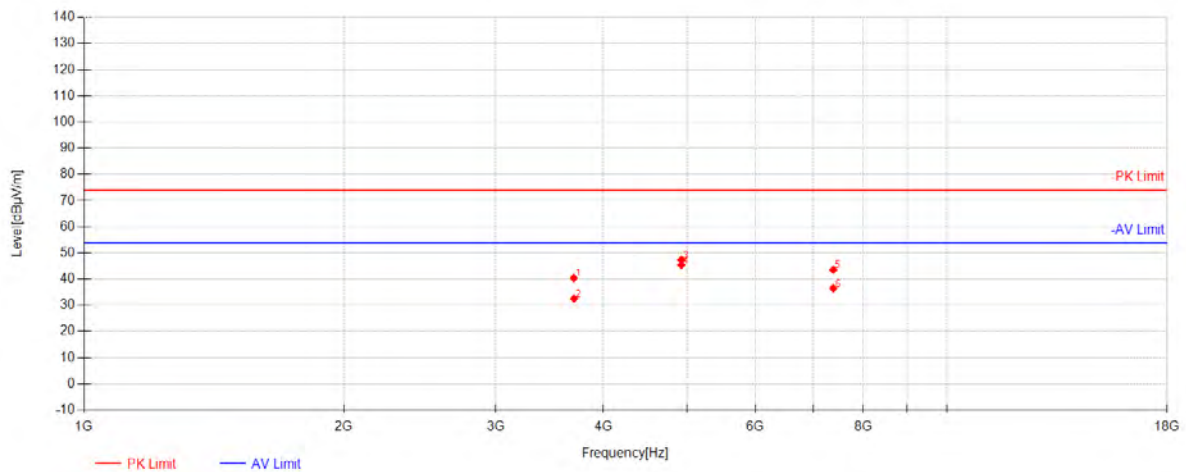
Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	3696	52.98	28.91	-45.53	36.37	54.00	17.63	Horizontal
2	3696.375	59.85	28.91	-45.52	43.24	74.00	30.76	Horizontal
3	4924.125	60.16	31.28	-45.56	45.88	74.00	28.12	Horizontal
4	4924.5	57.87	31.28	-45.56	43.59	54.00	10.41	Horizontal
5	7386.375	52.11	36.08	-43.46	44.74	74.00	29.26	Horizontal
6	7386.375	47.03	36.08	-43.46	39.66	54.00	14.34	Horizontal



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802.11b_Channel 11



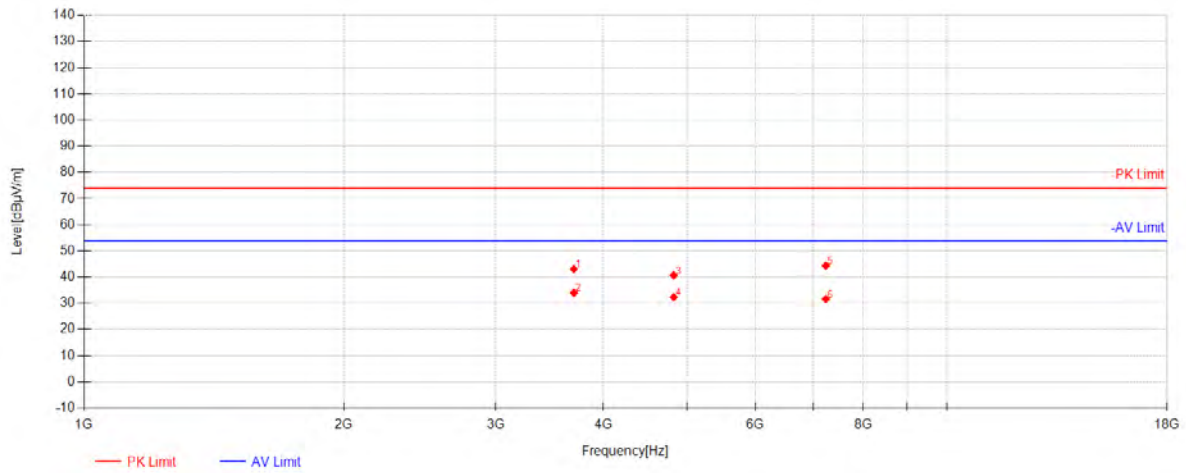
Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	3695.25	57.02	28.91	-45.53	40.40	74.00	33.60	Vertical
2	3697.125	49.16	28.92	-45.52	32.56	54.00	21.44	Vertical
3	4924.125	61.65	31.28	-45.56	47.37	74.00	26.63	Vertical
4	4924.5	59.76	31.28	-45.56	45.48	54.00	8.52	Vertical
5	7385.25	50.98	36.08	-43.46	43.60	74.00	30.40	Vertical
6	7386	43.90	36.08	-43.46	36.52	54.00	17.48	Vertical



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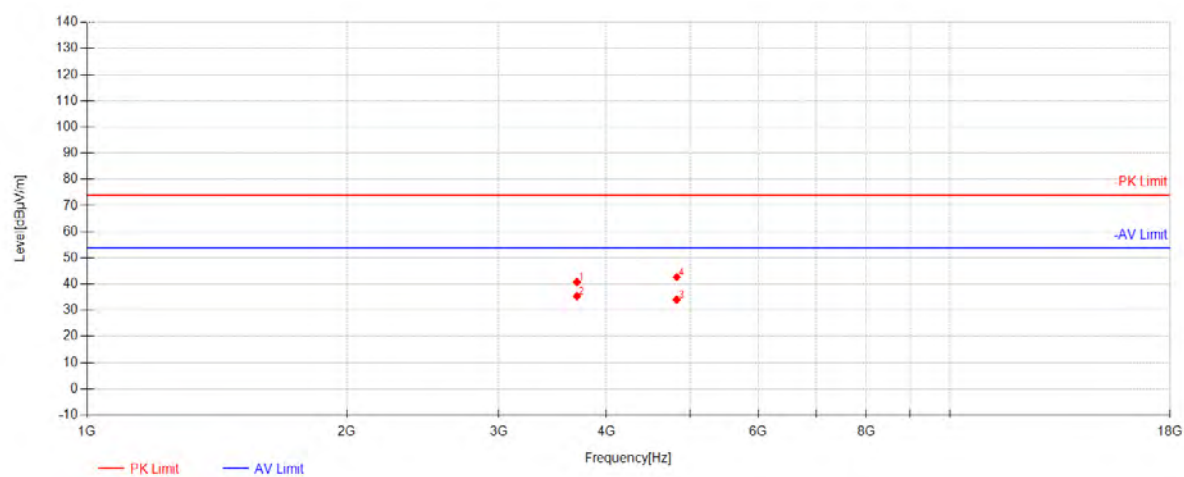
802.11g_Channel 01



Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	3695.25	59.70	28.91	-45.53	43.08	74.00	30.92	Horizontal
2	3696.375	50.67	28.91	-45.52	34.06	54.00	19.94	Horizontal
3	4823.25	55.07	31.12	-45.54	40.65	74.00	33.35	Horizontal
4	4824.375	46.79	31.12	-45.54	32.37	54.00	21.63	Horizontal
5	7240.5	52.31	35.67	-43.55	44.43	74.00	29.57	Horizontal
6	7240.5000	39.53	35.67	-43.55	31.65	54.00	22.35	Horizontal



802.11g_Channel 01



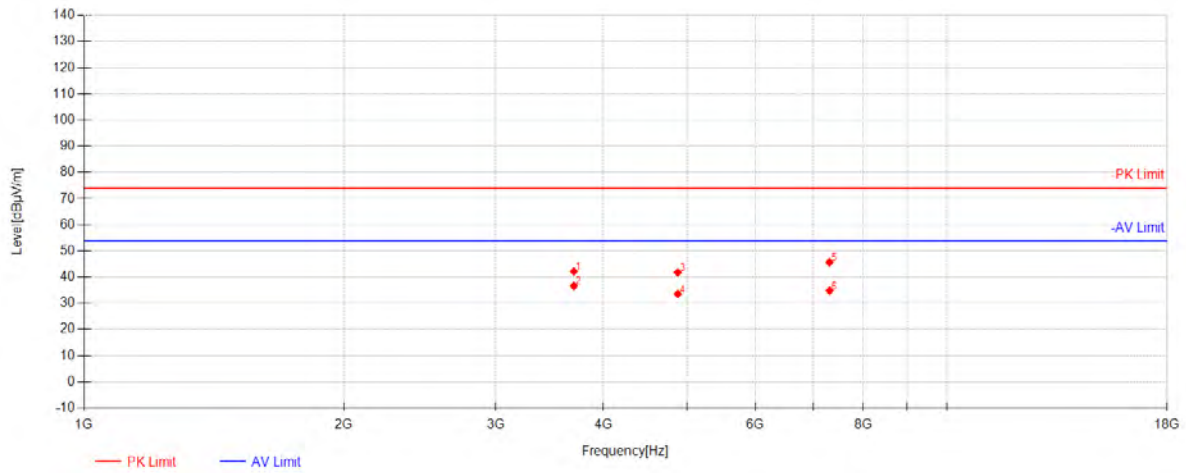
Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	3696.375	57.37	28.91	-45.52	40.76	74.00	33.24	Vertical
2	3696.75	52.06	28.91	-45.52	35.45	54.00	18.55	Vertical
3	4823.625	48.57	31.12	-45.54	34.15	54.00	19.85	Vertical
4	4824.375	57.15	31.12	-45.54	42.73	74.00	31.27	Vertical



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802.11g_Channel 06



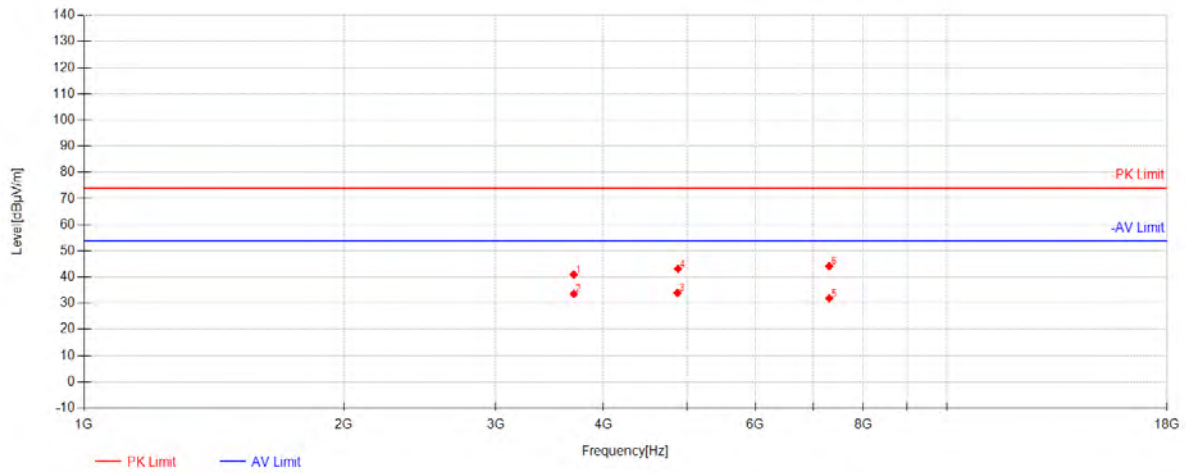
Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	3695.625	58.81	28.91	-45.53	42.20	74.00	31.80	Horizontal
2	3696	53.27	28.91	-45.53	36.66	54.00	17.34	Horizontal
3	4876.5	56.10	31.20	-45.53	41.77	74.00	32.23	Horizontal
4	4876.875	47.97	31.20	-45.53	33.64	54.00	20.36	Horizontal
5	7310.625	53.57	35.87	-43.71	45.73	74.00	28.27	Horizontal
6	7314.375	42.70	35.88	-43.70	34.88	54.00	19.12	Horizontal



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802.11g_Channel 06



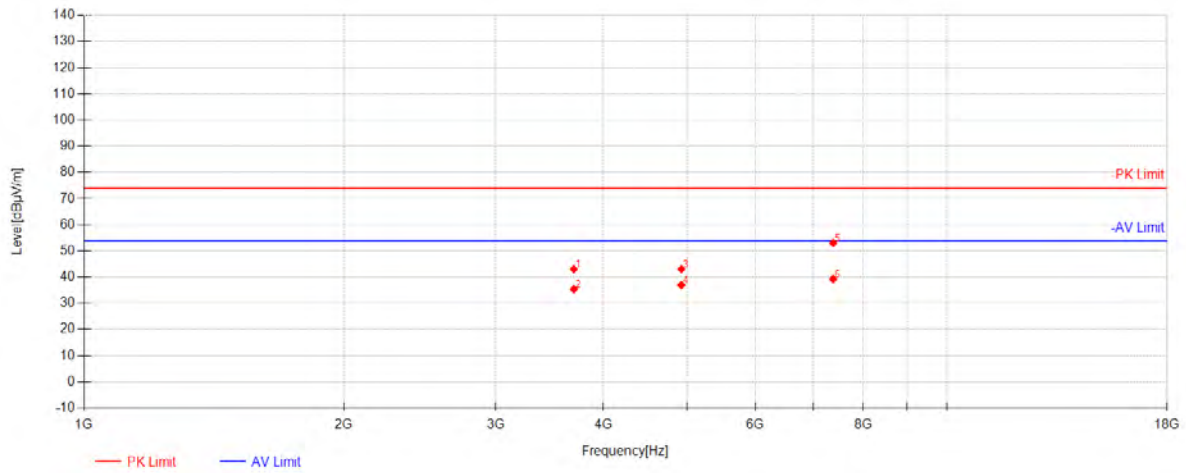
Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	3695.25	57.59	28.91	-45.53	40.97	74.00	33.03	Vertical
2	3696	50.26	28.91	-45.53	33.65	54.00	20.35	Vertical
3	4872.375	48.37	31.20	-45.53	34.03	54.00	19.97	Vertical
4	4879.875	57.51	31.21	-45.53	43.19	74.00	30.81	Vertical
5	7306.0000	39.82	35.86	-43.73	31.95	54.00	22.05	Vertical
6	7306.5	52.11	35.86	-43.73	44.24	74.00	29.76	Vertical



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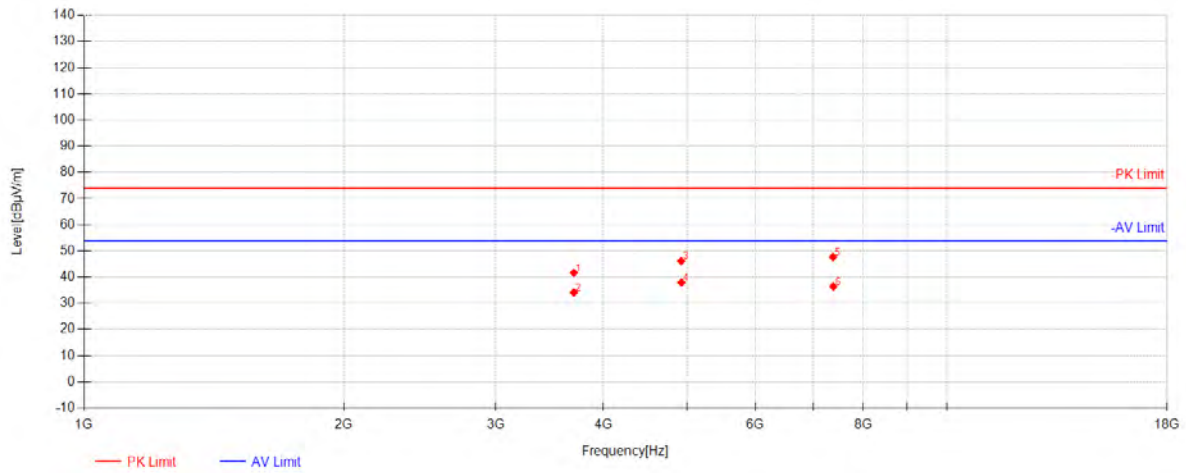
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802.11g_Channel 11



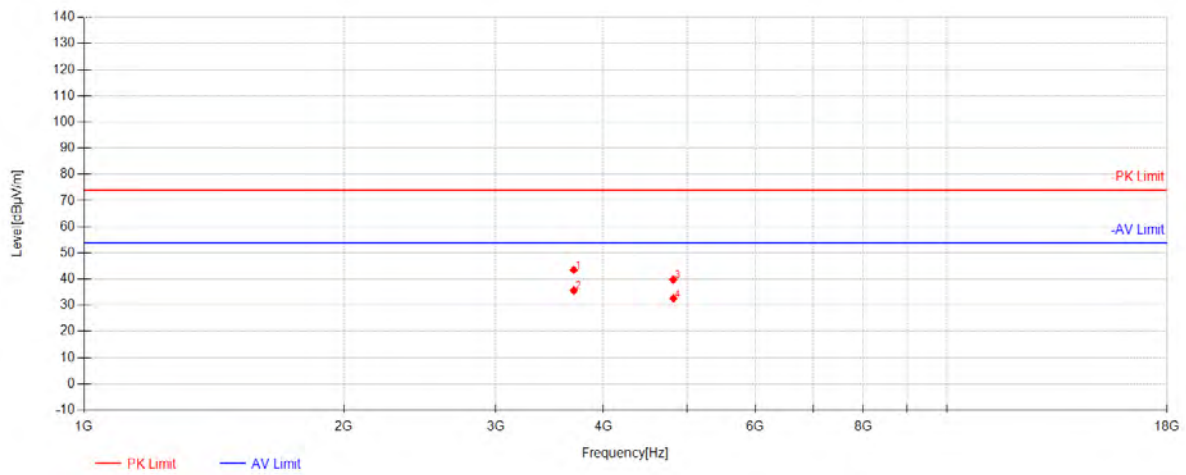
Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	3695.25	59.69	28.91	-45.53	43.07	74.00	30.93	Horizontal
2	3696	52.10	28.91	-45.53	35.49	54.00	18.51	Horizontal
3	4924.125	57.35	31.28	-45.56	43.07	74.00	30.93	Horizontal
4	4924.5	51.27	31.28	-45.56	36.99	54.00	17.01	Horizontal
5	7382.625	60.49	36.07	-43.47	53.09	74.00	20.91	Horizontal
6	7383	46.68	36.07	-43.47	39.28	54.00	14.72	Horizontal

802.11g_Channel 11



Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	3695.625	58.26	28.91	-45.53	41.65	74.00	32.35	Vertical
2	3696	50.83	28.91	-45.53	34.22	54.00	19.78	Vertical
3	4921.5	60.44	31.27	-45.55	46.16	74.00	27.84	Vertical
4	4925.25	52.24	31.28	-45.56	37.96	54.00	16.04	Vertical
5	7379.25	55.12	36.06	-43.48	47.70	74.00	26.30	Vertical
6	7386.375	43.84	36.08	-43.46	36.47	54.00	17.53	Vertical

802.11n20_Channel 01



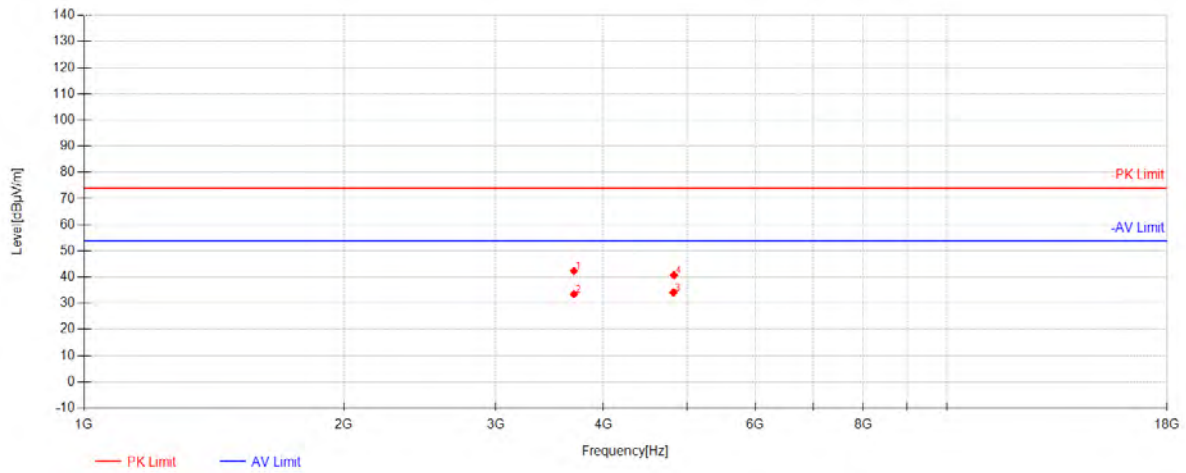
Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	3695.25	60.16	28.91	-45.53	43.54	74.00	30.46	Horizontal
2	3695.625	52.31	28.91	-45.53	35.70	54.00	18.30	Horizontal
3	4818	54.20	31.11	-45.54	39.77	74.00	34.23	Horizontal
4	4821	47.08	31.11	-45.54	32.66	54.00	21.34	Horizontal



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802.11n20_Channel 01



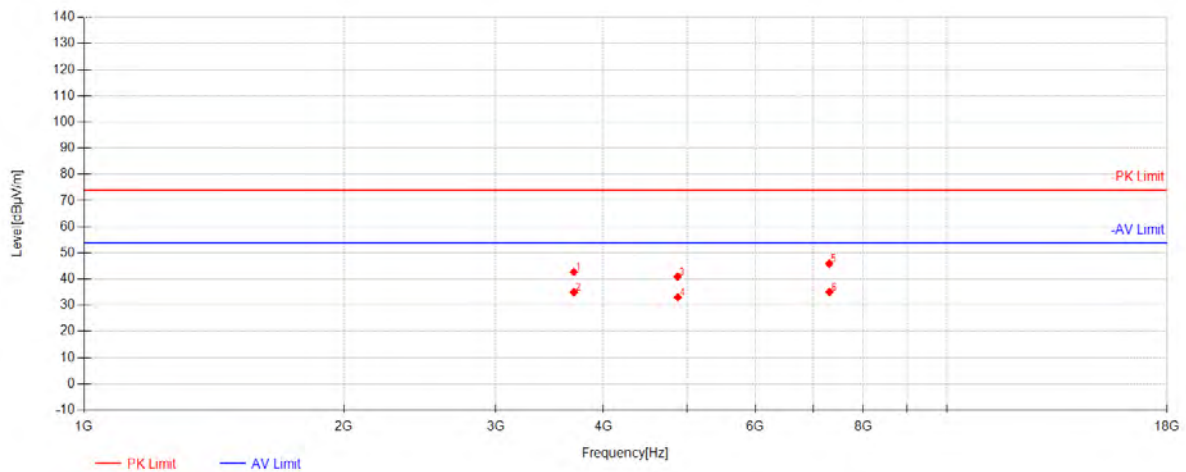
Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	3696.375	58.98	28.91	-45.52	42.37	74.00	31.63	Vertical
2	3696.375	50.17	28.91	-45.52	33.56	54.00	20.44	Vertical
3	4820.25	48.64	31.11	-45.54	34.21	54.00	19.79	Vertical
4	4826.625	55.12	31.12	-45.54	40.71	74.00	33.29	Vertical



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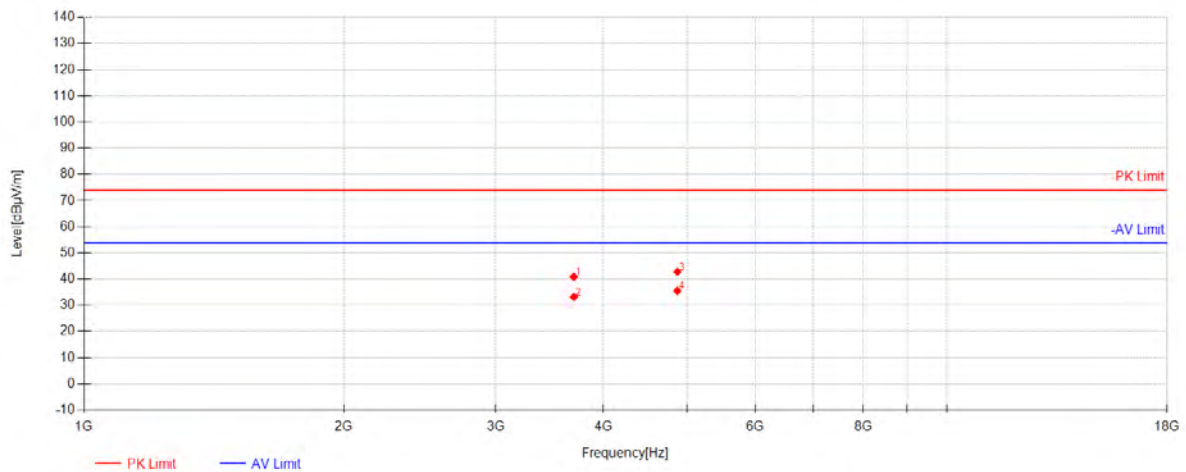
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802.11n20_Channel 06



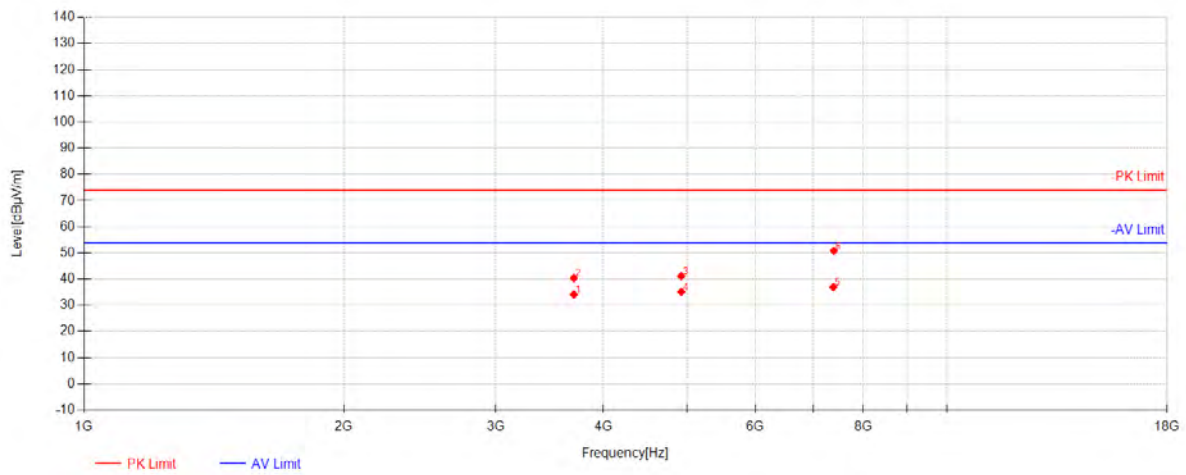
Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	3695.25	59.37	28.91	-45.53	42.75	74.00	31.25	Horizontal
2	3696	51.66	28.91	-45.53	35.05	54.00	18.95	Horizontal
3	4874.25	55.25	31.20	-45.53	40.92	74.00	33.08	Horizontal
4	4877.625	47.41	31.20	-45.53	33.08	54.00	20.92	Horizontal
5	7305.75	53.78	35.86	-43.73	45.91	74.00	28.09	Horizontal
6	7311.375	43.00	35.87	-43.71	35.16	54.00	18.84	Horizontal

802.11n20_Channel 06



Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	3695.625	57.46	28.91	-45.53	40.85	74.00	33.15	Vertical
2	3696	49.85	28.91	-45.53	33.24	54.00	20.76	Vertical
3	4871.25	57.16	31.19	-45.53	42.82	74.00	31.18	Vertical
4	4871.625	49.92	31.19	-45.53	35.58	54.00	18.42	Vertical

802.11n20_Channel 11



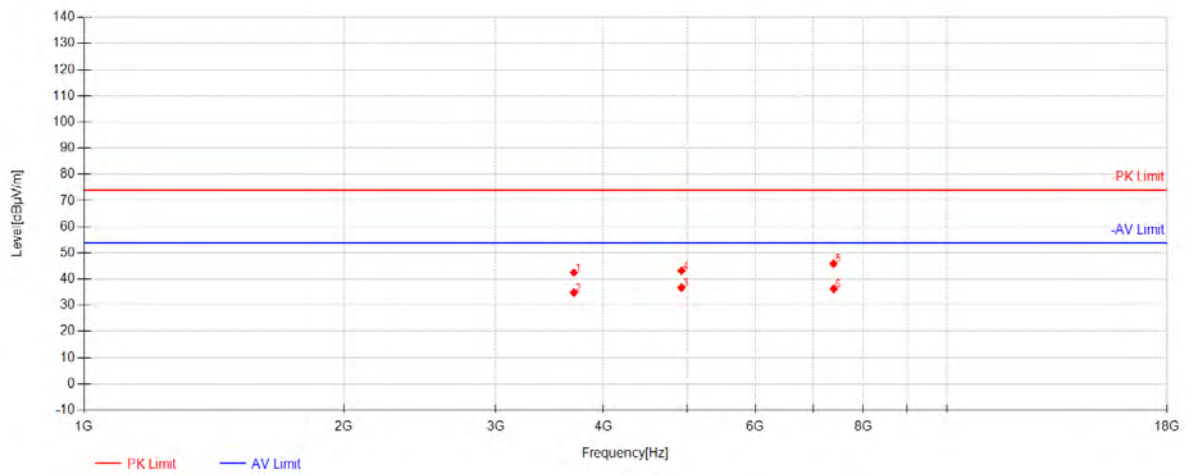
Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	3696	50.82	28.91	-45.53	34.21	54.00	19.79	Horizontal
2	3696.375	56.99	28.91	-45.52	40.38	74.00	33.62	Horizontal
3	4922.25	55.45	31.28	-45.55	41.17	74.00	32.83	Horizontal
4	4923.75	49.48	31.28	-45.56	35.20	54.00	18.80	Horizontal
5	7385.625	44.34	36.08	-43.46	36.96	54.00	17.04	Horizontal
6	7397.625	58.11	36.11	-43.42	50.81	74.00	23.19	Horizontal



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802.11n20_Channel 11



Data List								
NO.	Frequency [MHz]	Reading [dBμV]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	3696	59.13	28.91	-45.53	42.52	74.00	31.48	Vertical
2	3696.375	51.50	28.91	-45.52	34.89	54.00	19.11	Vertical
3	4924.5	51.03	31.28	-45.56	36.75	54.00	17.25	Vertical
4	4925.25	57.50	31.28	-45.56	43.22	74.00	30.78	Vertical
5	7389.75	53.27	36.09	-43.44	45.92	74.00	28.08	Vertical
6	7393.875	43.68	36.10	-43.43	36.35	54.00	17.65	Vertical

7.4 Conducted Average 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 $25 \leq$ 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

7.4.1 E.U.T. Operation

Operating Environment:

Temperature: 25.4 °C

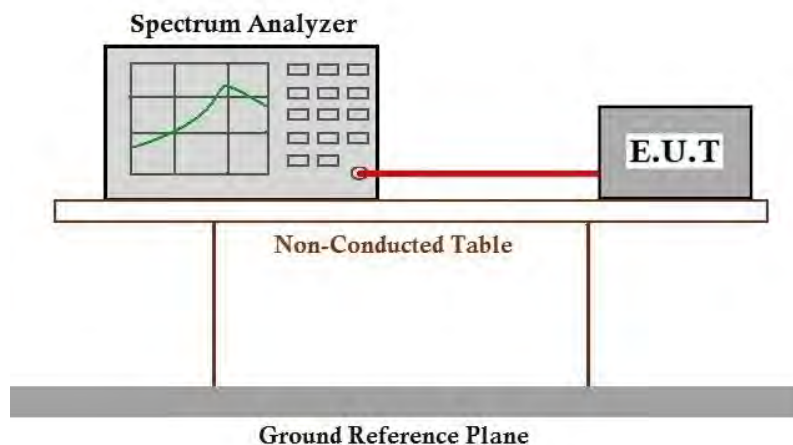
Humidity: 50.6 % RH

Atmospheric Pressure: 1010 mbar

7.4.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	04	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and only the data of worst case is recorded in the report.

7.4.3 Test Setup Diagram





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7.4.4 Measurement Procedure and Data

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

Please Refer to Appendix for Details

7.5 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

7.5.1 E.U.T. Operation

Operating Environment:

Temperature: 25.4 °C

Humidity: 50.6 % RH

Atmospheric Pressure: 1010 mbar

7.5.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	04	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and only the data of worst case is recorded in the report.

7.5.3 Measurement Procedure and Data

Please Refer to Appendix for Details

7.6 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

7.6.1 E.U.T. Operation

Operating Environment:

Temperature: 25.4 °C

Humidity: 50.6 % RH

Atmospheric Pressure: 1010 mbar

7.6.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	04	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and only the data of worst case is recorded in the report.

7.6.3 Measurement Procedure and Data

Please Refer to Appendix for Details

7.7 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)).

7.7.1 E.U.T. Operation

Operating Environment:

Temperature: 25.4 °C

Humidity: 50.6 % RH

Atmospheric Pressure: 1010 mbar

7.7.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	04	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and only the data of worst case is recorded in the report.

7.7.3 Measurement Procedure and Data

Please Refer to Appendix for Details

7.8 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)).

7.8.1 E.U.T. Operation

Operating Environment:

Temperature: 25.4 °C

Humidity: 50.6 % RH

Atmospheric Pressure: 1010 mbar

7.8.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	04	TX mode_Keep the EUT in continuously transmitting mode with all modulation types. All data rates for each modulation type have been tested and only the data of worst case is recorded in the report.

7.8.3 Measurement Procedure and Data

Please Refer to Appendix for Details



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8 Test Setup Photo

Refer to Appendix - Test Setup Photo for KSCR2411002399AT

9 EUT Constructional Details (EUT Photos)

Refer to Appendix_Photographs of EUT Constructional Details for KSCR2411002399AT



10 Appendix

1. Duty Cycle

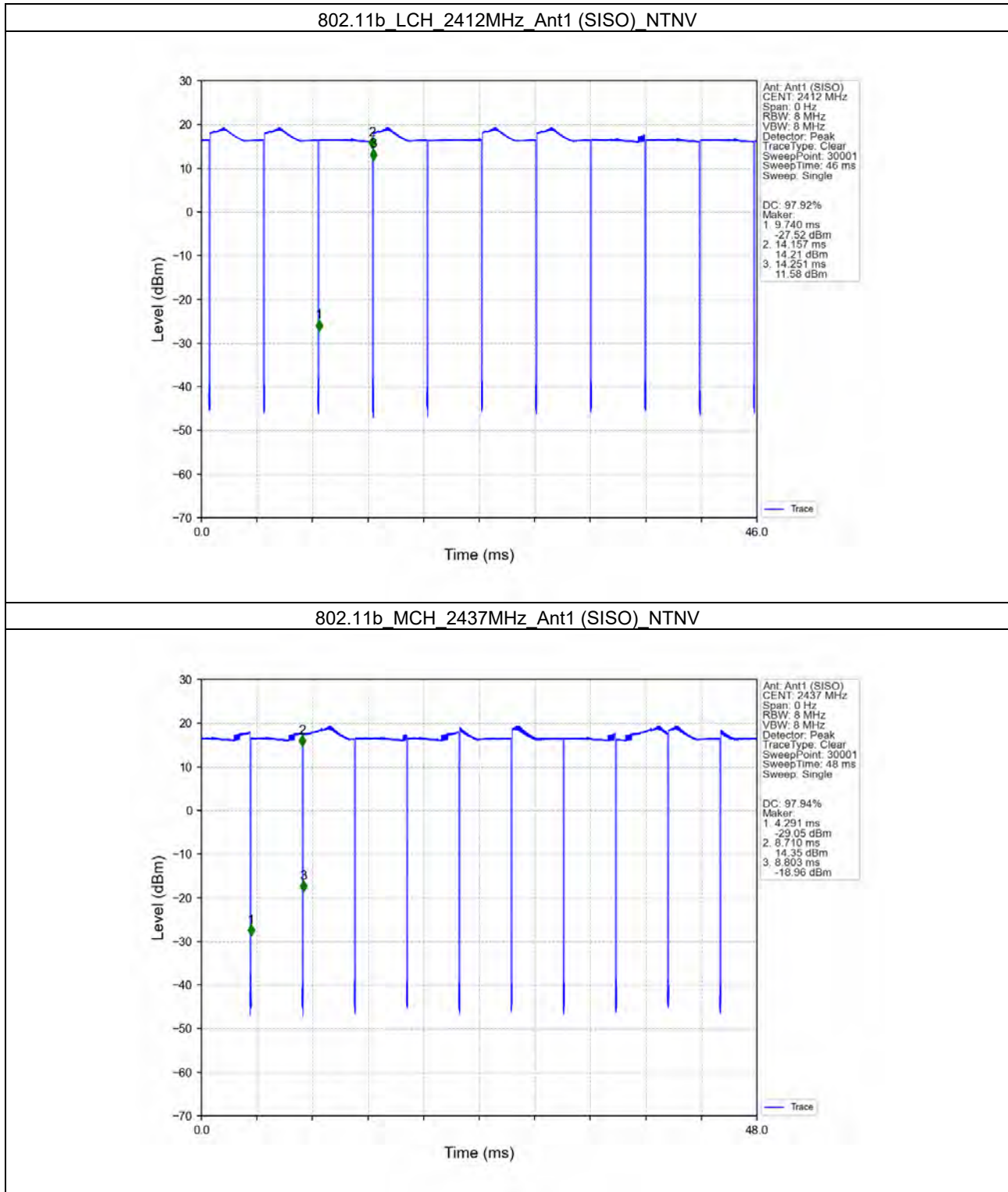
1.1 Test Result

1.1.1 Ant1

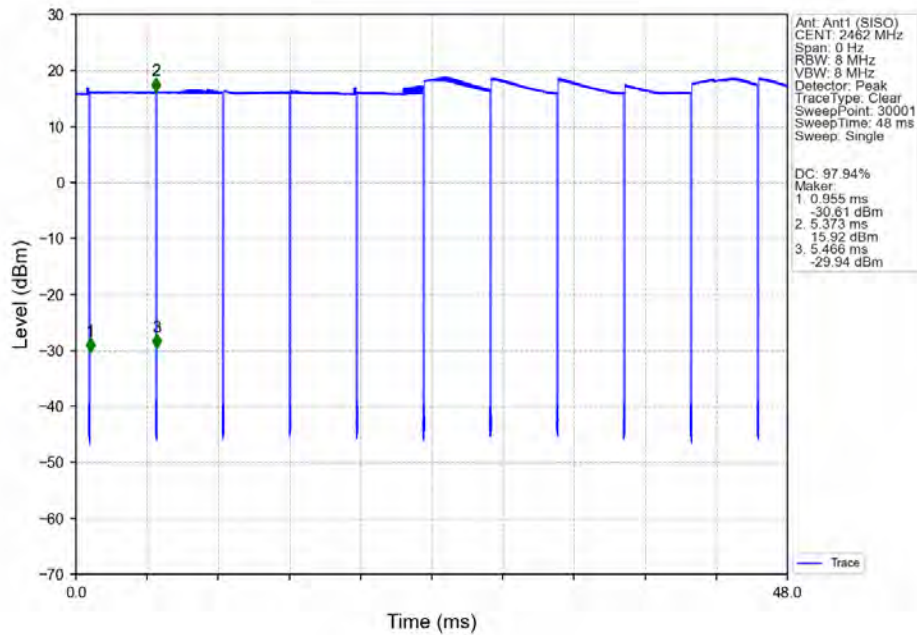
Ant1							
Mode	TX Type	Frequency (MHz)	T_on (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	Max. DC Variation (%)
802.11b	SISO	2412	4.417	4.511	97.92	0.09	0.07
		2437	4.419	4.512	97.94	0.09	0.03
		2462	4.418	4.511	97.94	0.09	0.00
802.11g	SISO	2412	0.729	0.829	87.94	0.56	0.14
		2437	0.730	0.829	88.06	0.55	0.03
		2462	0.730	0.830	87.95	0.56	0.15
802.11n (HT20)	SISO	2412	0.730	0.829	88.06	0.55	0.05
		2437	0.730	0.831	87.85	0.56	0.14
		2462	0.730	0.830	87.95	0.56	0.03

1.2 Test Graph

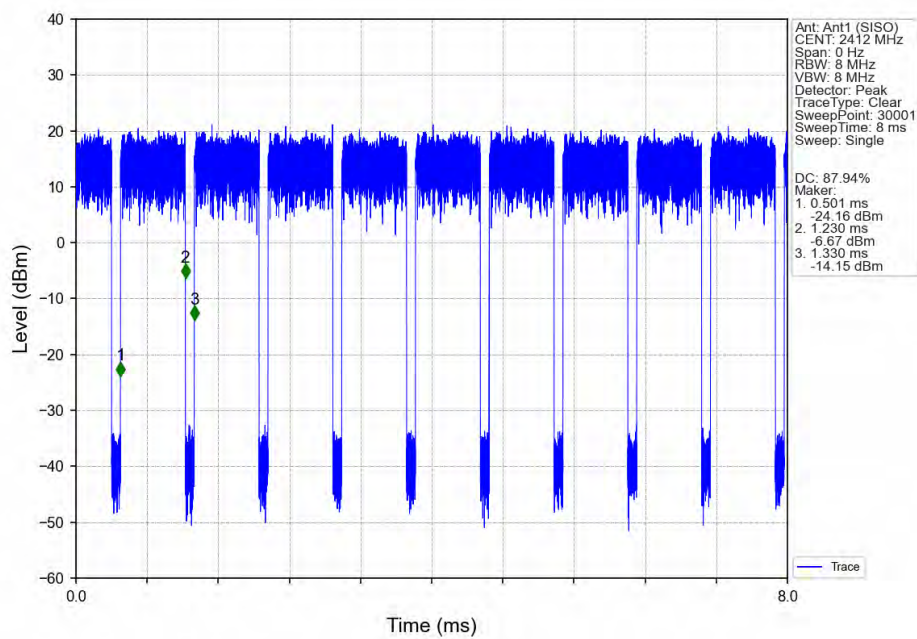
1.2.1 Ant1



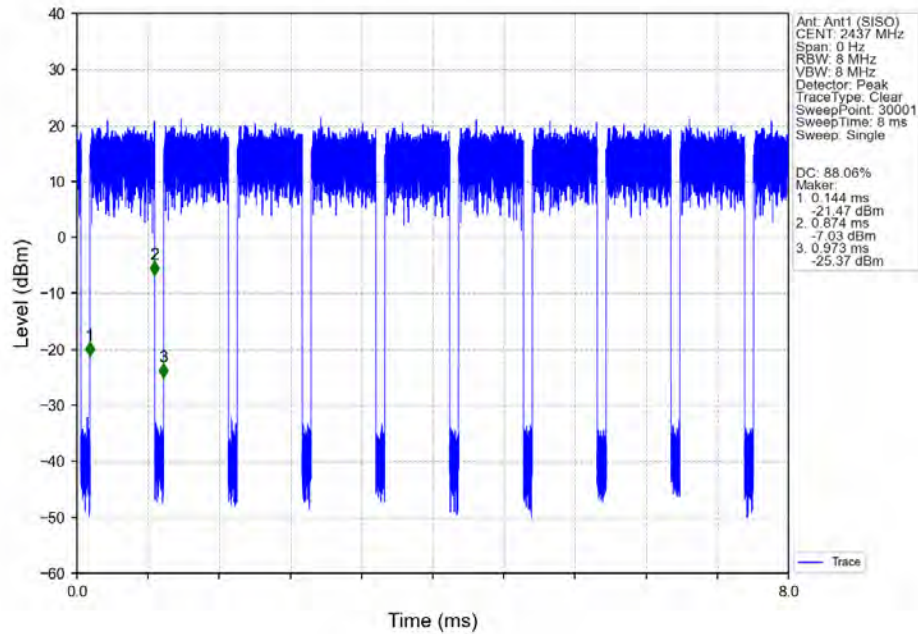
802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



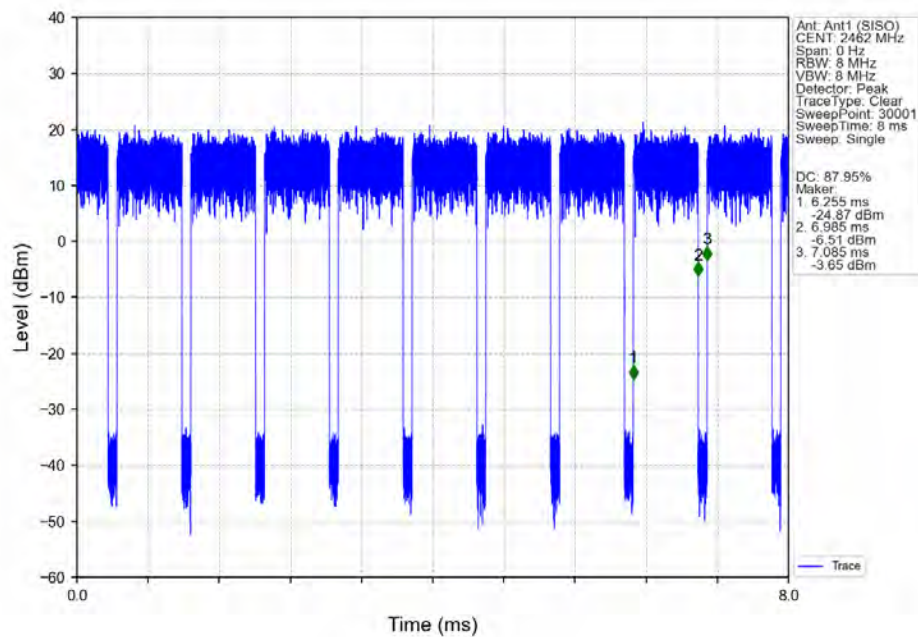
802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV



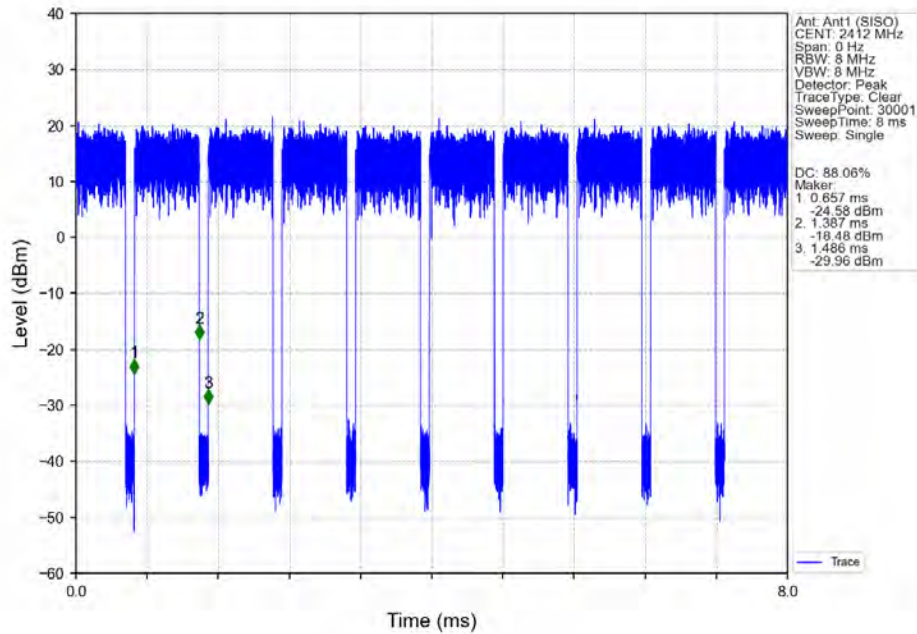
802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



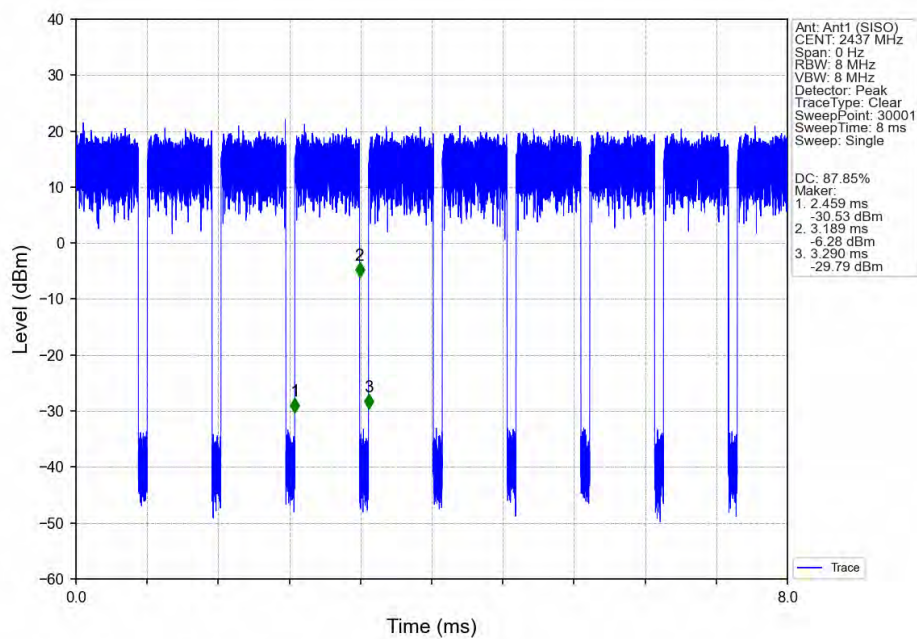
802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



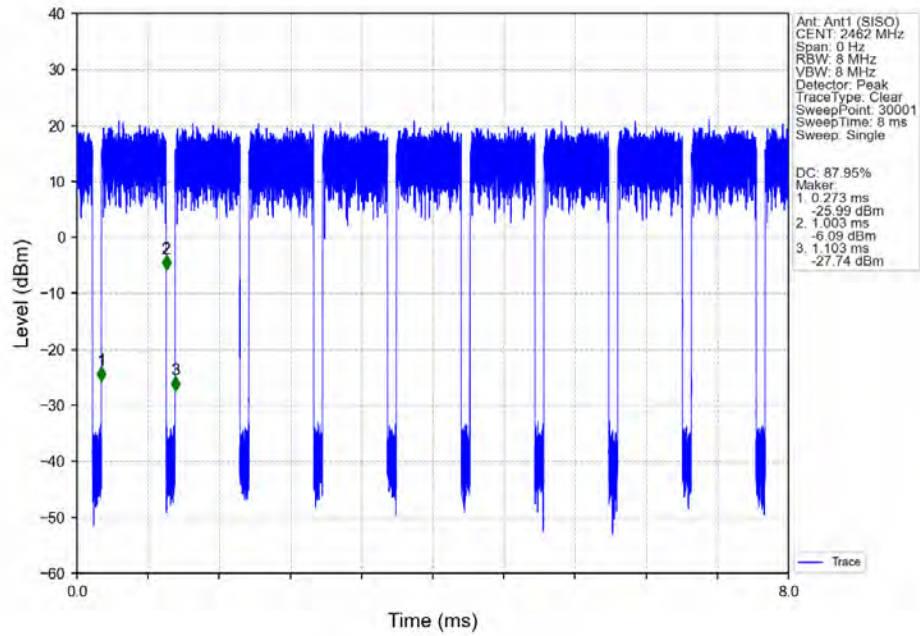
802.11n(HT20)_LCH_2412MHz_Ant1 (SISO)_NTNV



802.11n(HT20)_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11n(HT20) HCH_2462MHz_Ant1 (SISO) NTN





2. Bandwidth

2.1 Test Result

2.1.1 OBW

Mode	TX Type	Frequency (MHz)	ANT	99% Occupied Bandwidth (MHz)		Verdict
				Result	Limit	
802.11b	SISO	2412	1	11.961	/	Pass
		2437	1	11.966	/	Pass
		2462	1	11.975	/	Pass
802.11g	SISO	2412	1	17.987	/	Pass
		2437	1	17.989	/	Pass
		2462	1	17.983	/	Pass
802.11n (HT20)	SISO	2412	1	17.994	/	Pass
		2437	1	17.985	/	Pass
		2462	1	18.003	/	Pass

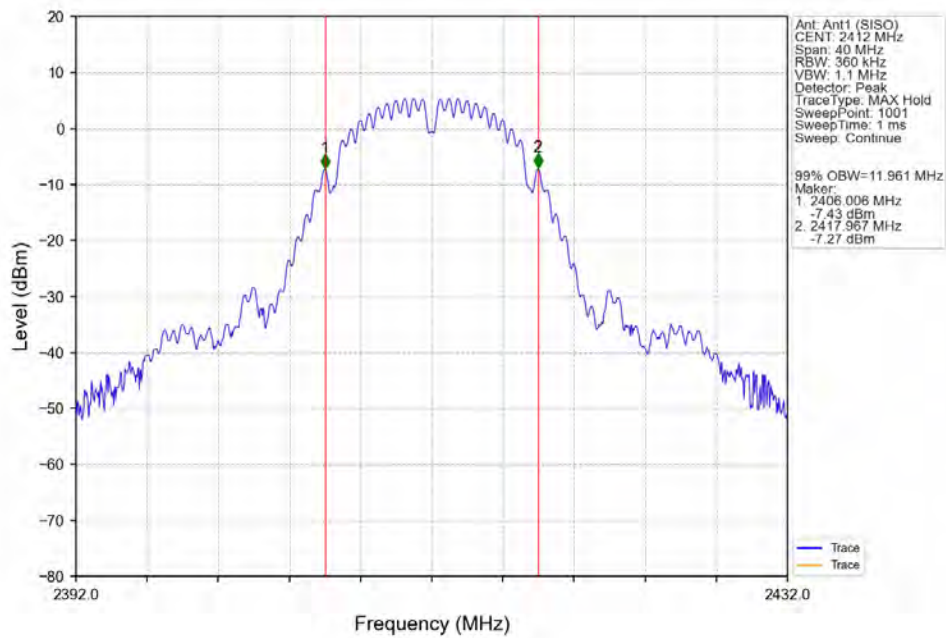
2.1.2 6dB BW

Mode	TX Type	Frequency (MHz)	ANT	6dB Bandwidth (MHz)		Verdict
				Result	Limit	
802.11b	SISO	2412	1	9.063	≥ 0.5	Pass
		2437	1	9.075	≥ 0.5	Pass
		2462	1	9.054	≥ 0.5	Pass
802.11g	SISO	2412	1	16.328	≥ 0.5	Pass
		2437	1	16.330	≥ 0.5	Pass
		2462	1	16.303	≥ 0.5	Pass
802.11n (HT20)	SISO	2412	1	16.323	≥ 0.5	Pass
		2437	1	16.311	≥ 0.5	Pass
		2462	1	16.310	≥ 0.5	Pass

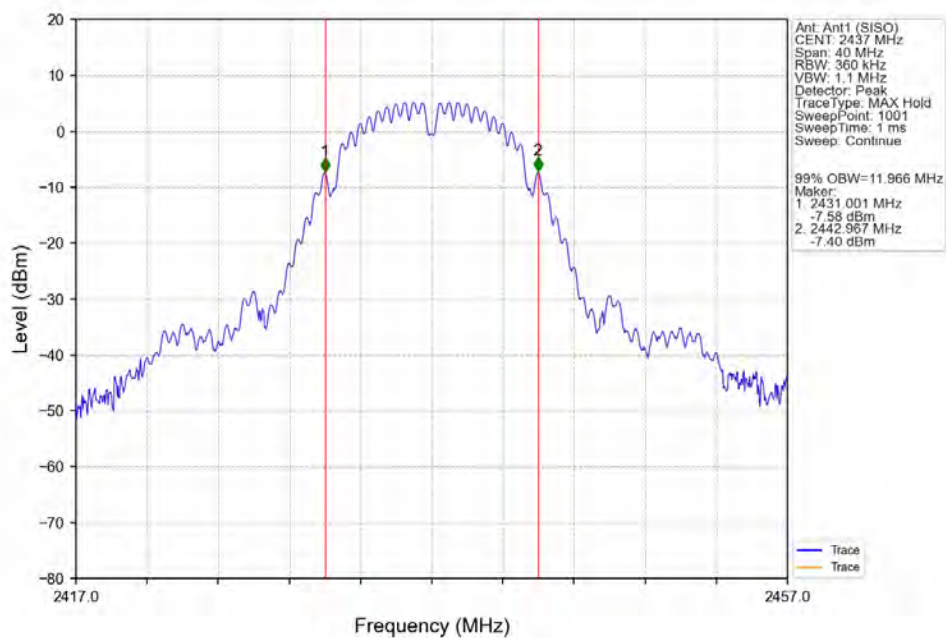
2.2 Test Graph

2.2.1 OBW

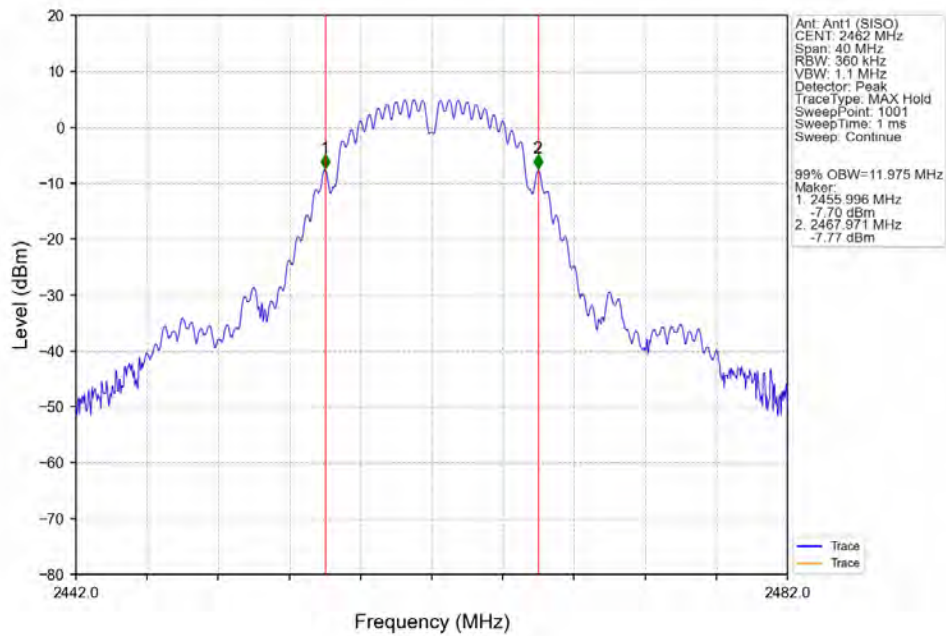
802.11b LCH 2412MHz_Ant1 (SISO)_NTNV



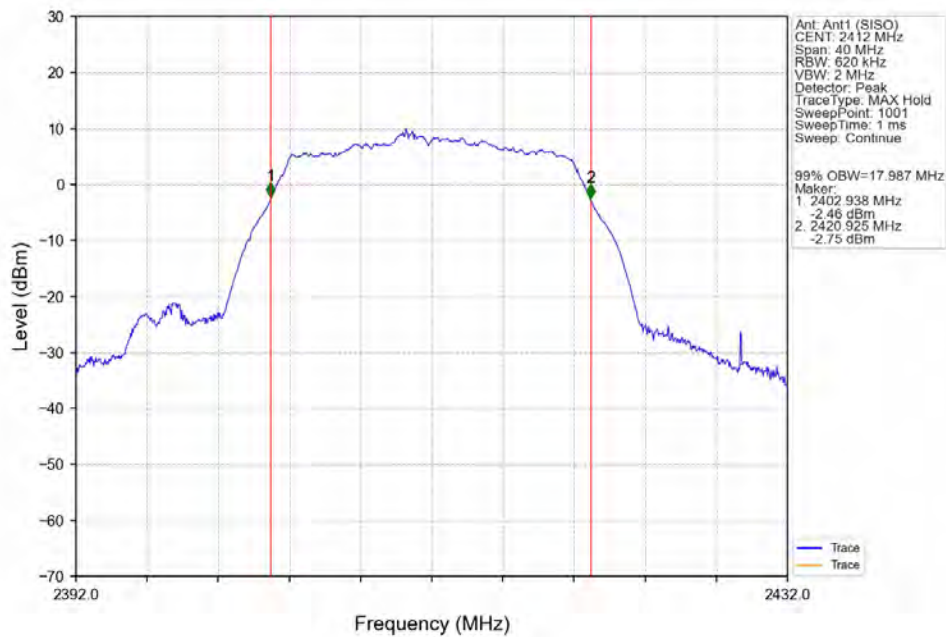
802.11b MCH 2437MHz_Ant1 (SISO)_NTNV



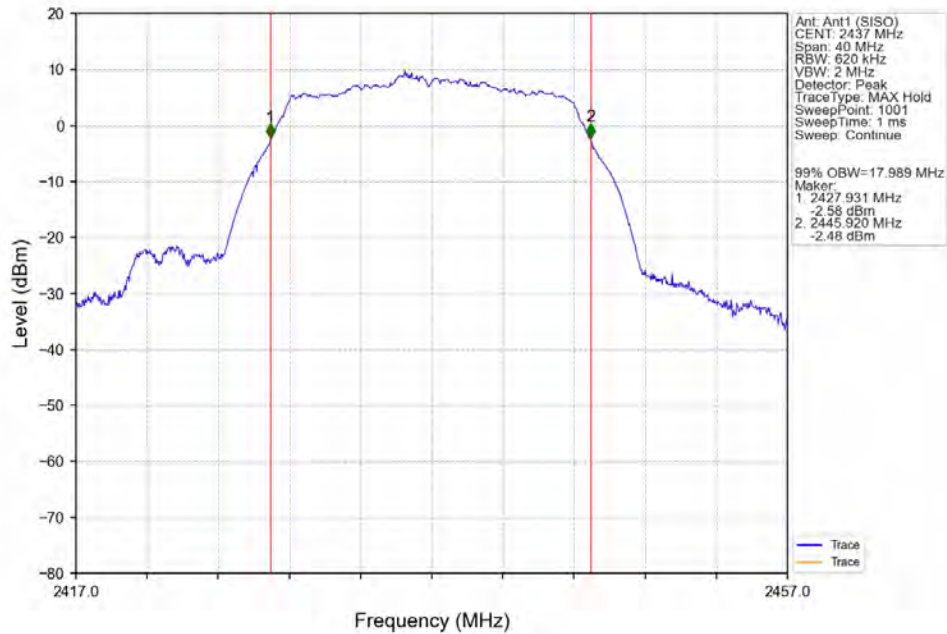
802.11b HCH 2462MHz Ant1 (SISO) NTN



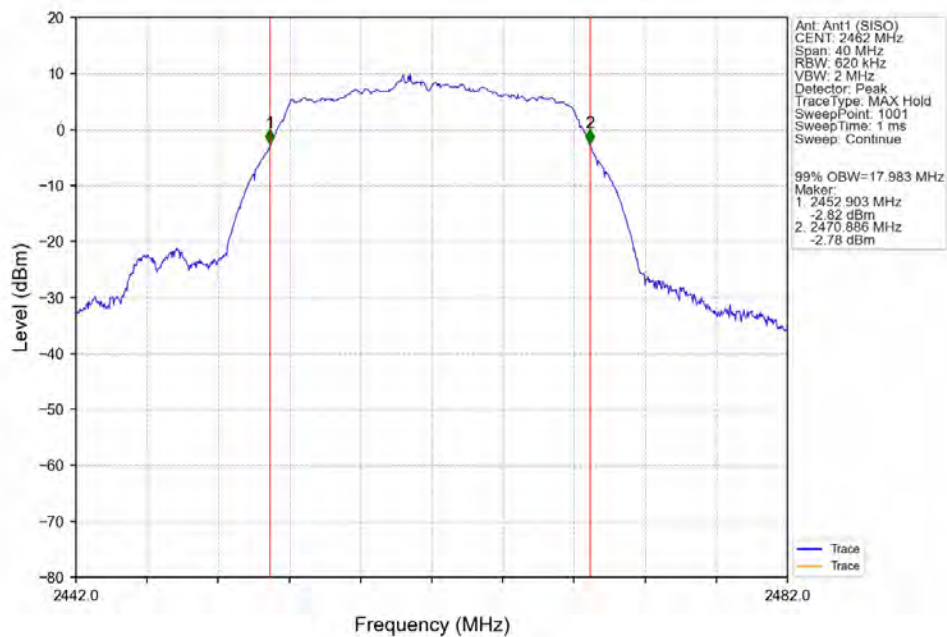
802.11g LCH 2412MHz Ant1 (SISO) NTN



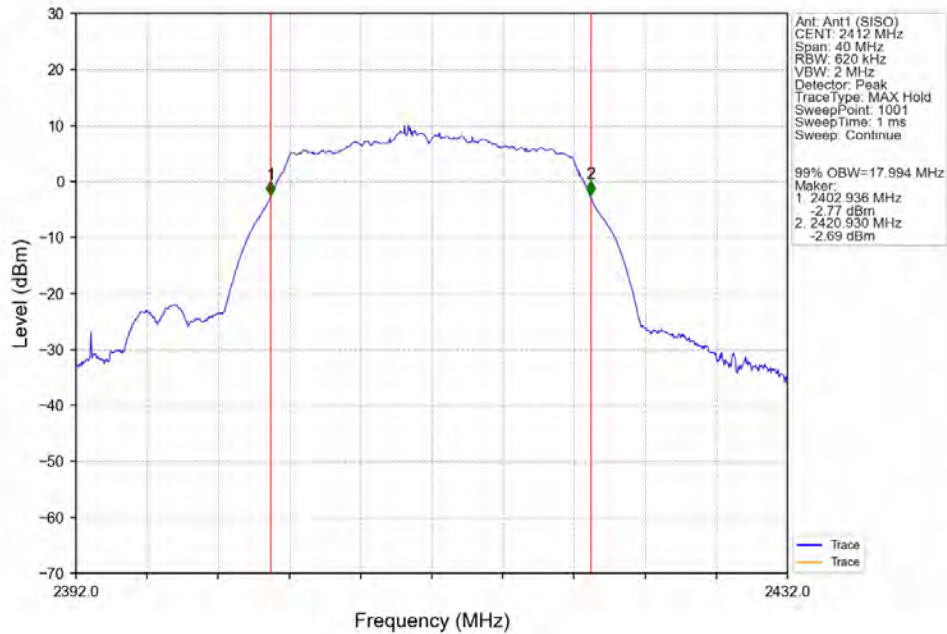
802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



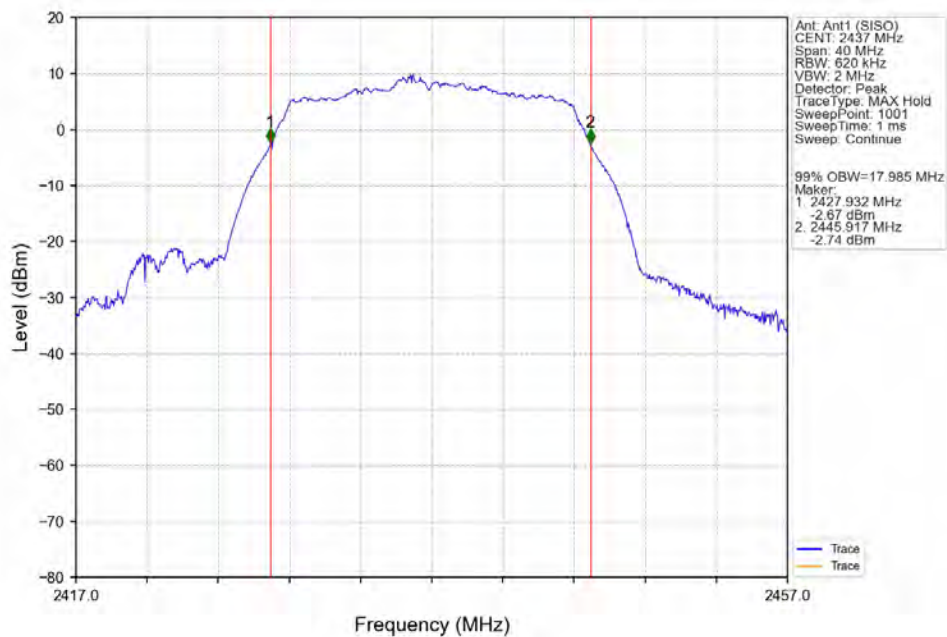
802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



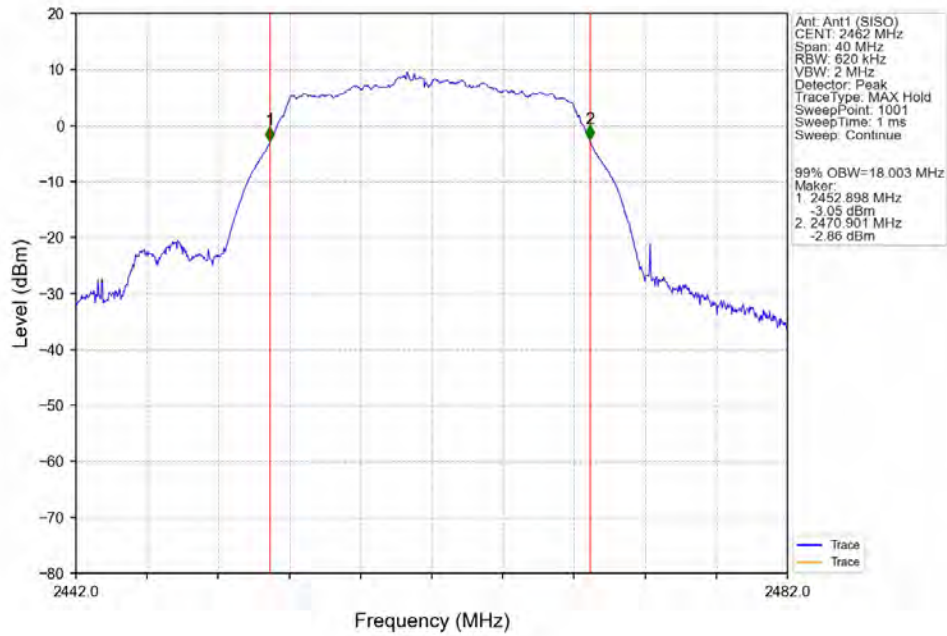
802.11n(HT20) LCH_2412MHz_Ant1 (SISO) NTN



802.11n(HT20) MCH_2437MHz_Ant1 (SISO) NTN

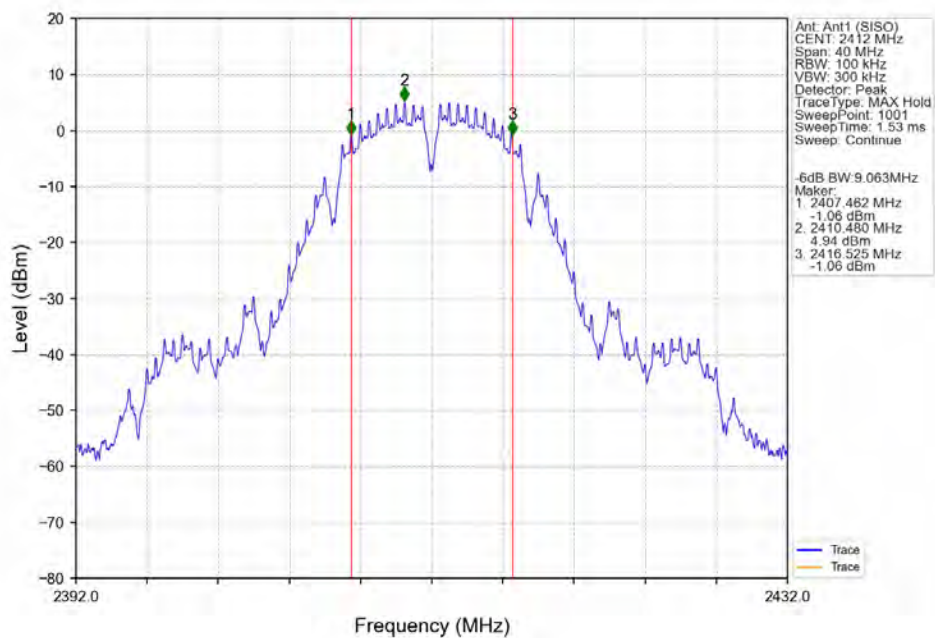


802.11n(HT20) HCH 2462MHz Ant1 (SISO) NTN

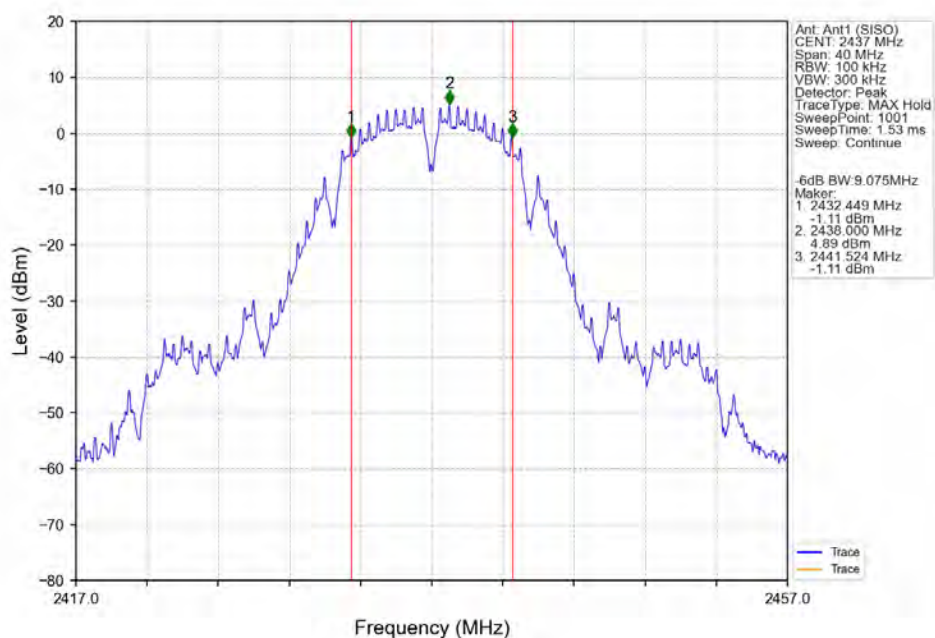


2.2.2 6dB BW

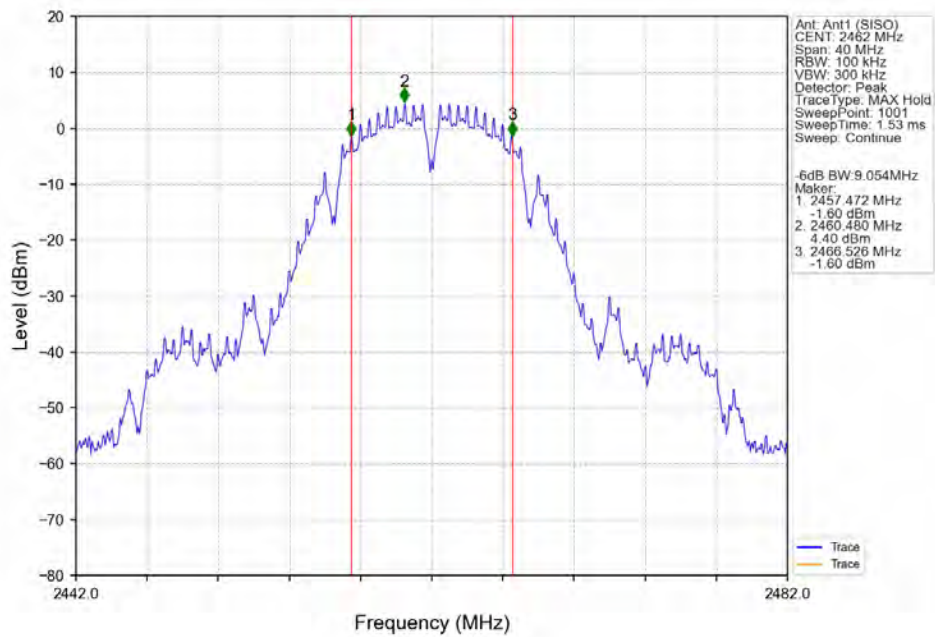
802.11b LCH 2412MHz_Ant1 (SISO)_NTNV



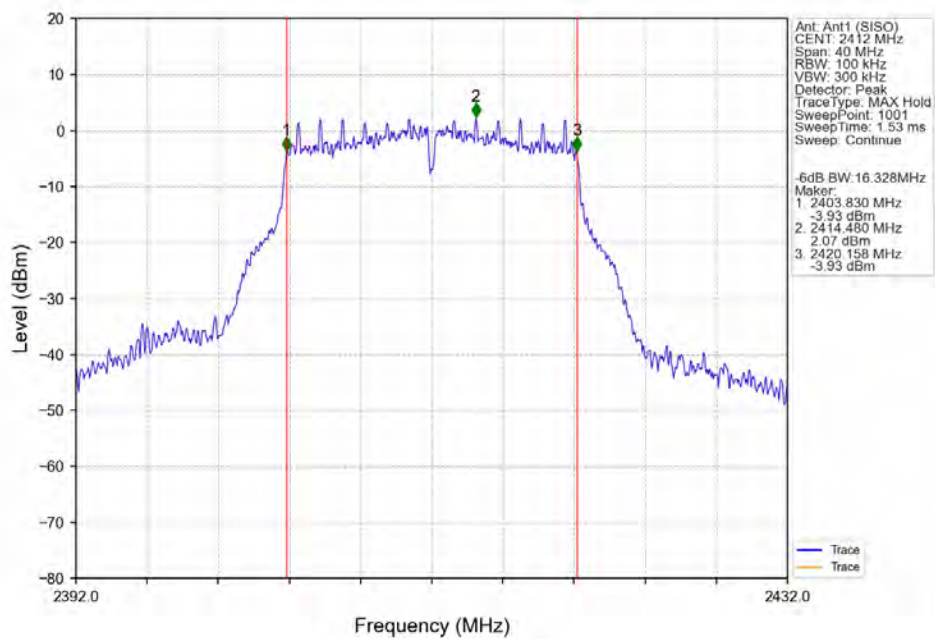
802.11b MCH 2437MHz_Ant1 (SISO)_NTNV



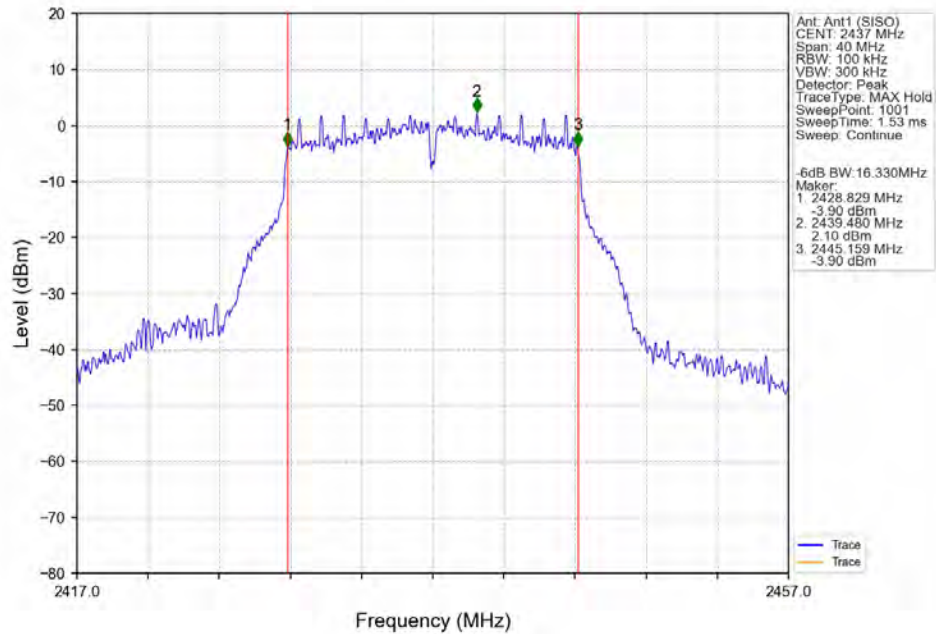
802.11b HCH 2462MHz_Ant1 (SISO)_NTNV



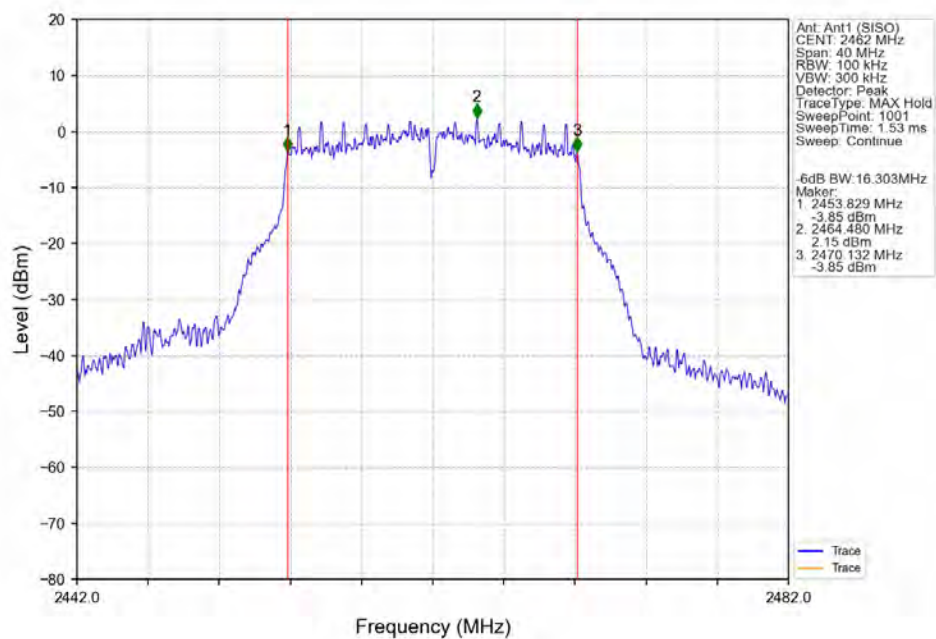
802.11g LCH_2412MHz_Ant1 (SISO) NTN



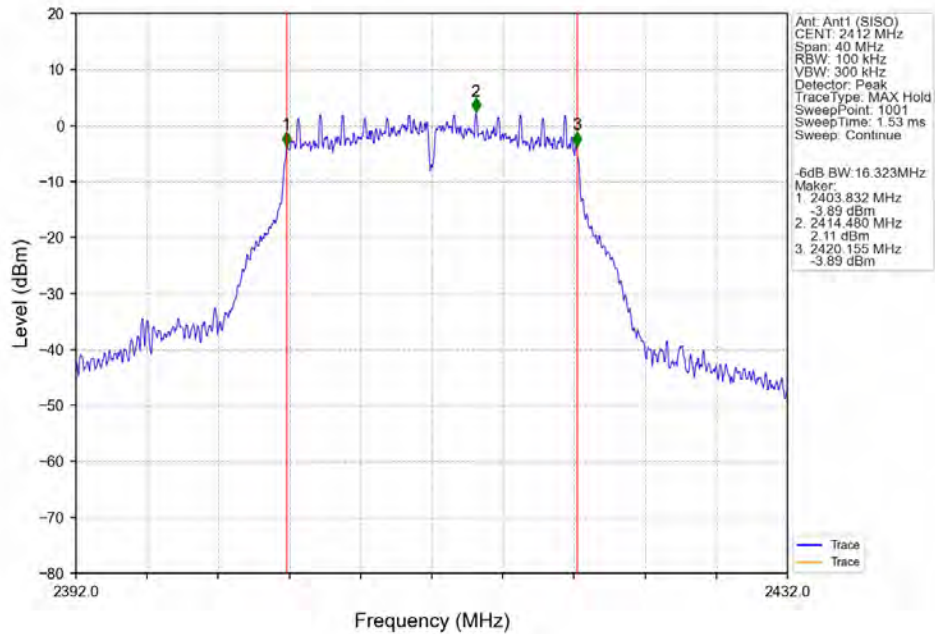
802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



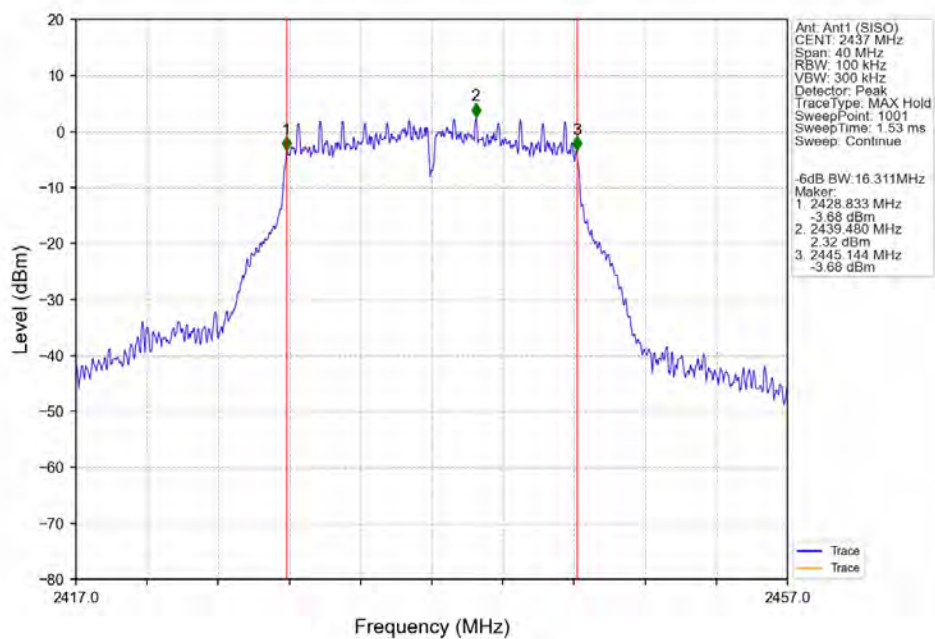
802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



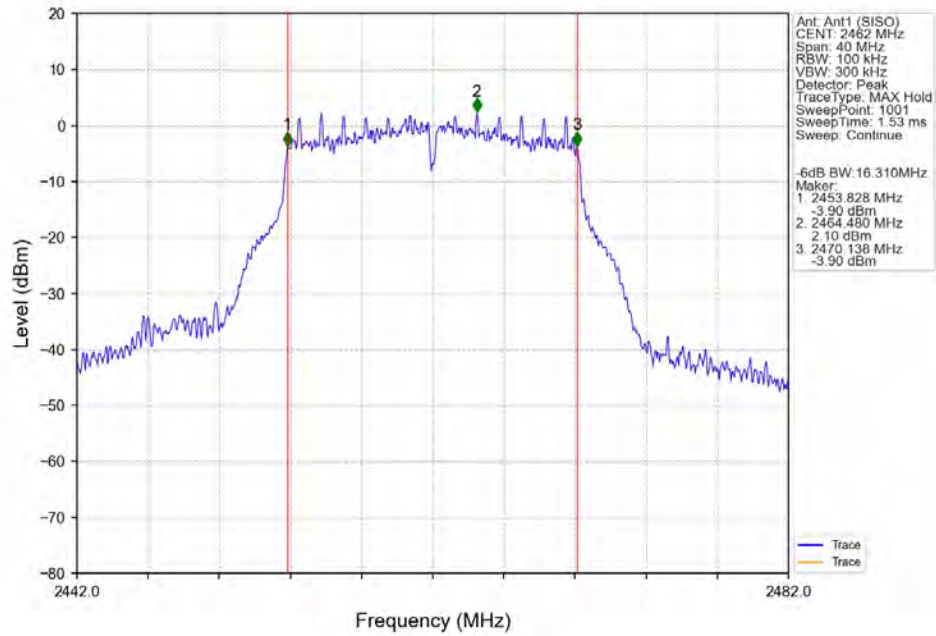
802.11n(HT20) LCH_2412MHz_Ant1 (SISO)_NTNV



802.11n(HT20) MCH_2437MHz_Ant1 (SISO)_NTNV



802.11n(HT20) HCH 2462MHz Ant1 (SISO) NTN





3. Maximum Conducted Output Power

3.1 Test Result

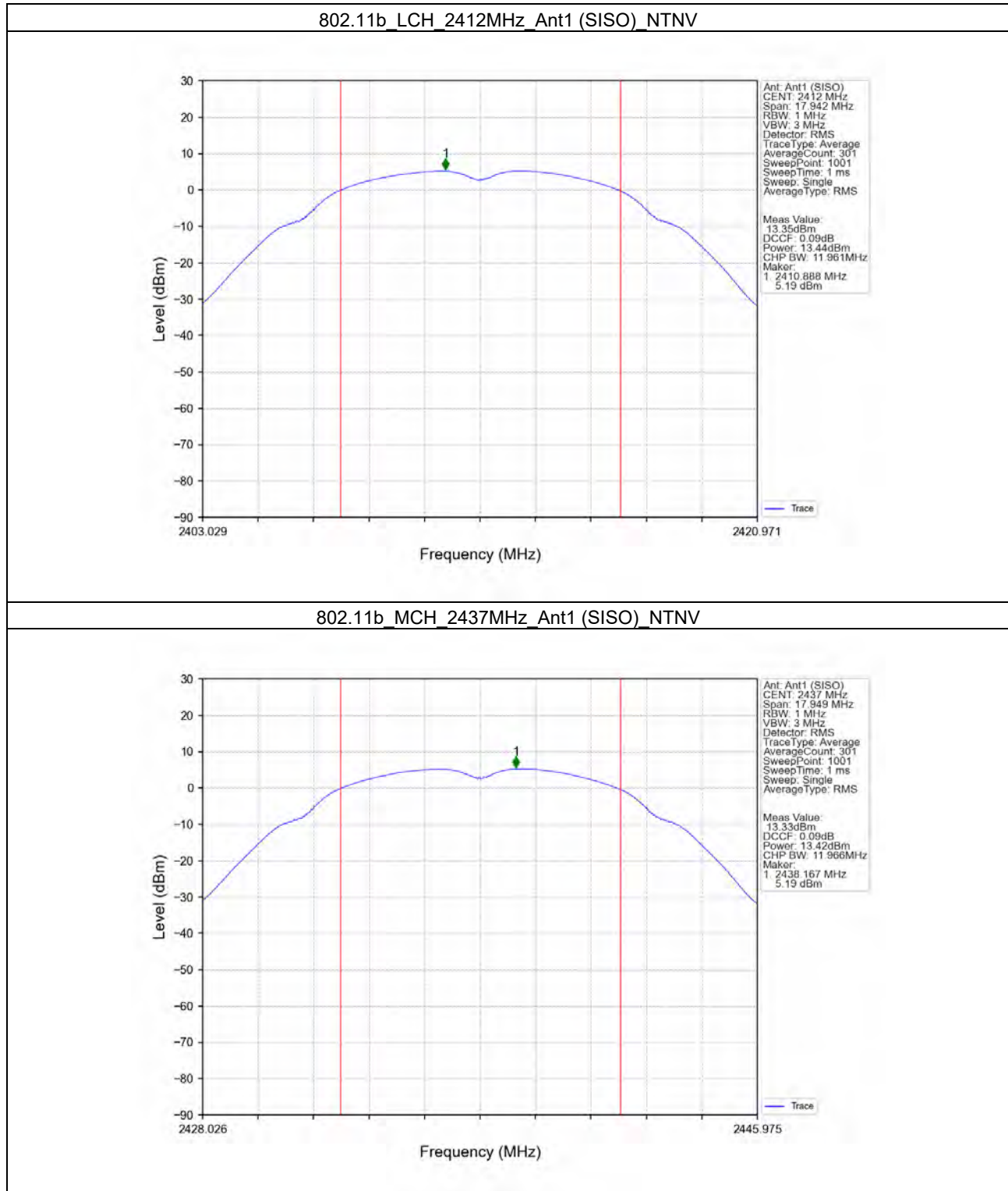
3.1.1 Power

Mode	TX Type	Frequency (MHz)	Maximum Average Conducted Output Power (dBm)		Verdict
			ANT1	Limit	
802.11b	SISO	2412	13.44	≤ 30	Pass
		2437	13.42	≤ 30	Pass
		2462	12.99	≤ 30	Pass
802.11g	SISO	2412	13.74	≤ 30	Pass
		2437	13.74	≤ 30	Pass
		2462	13.66	≤ 30	Pass
802.11n (HT20)	SISO	2412	13.78	≤ 30	Pass
		2437	13.81	≤ 30	Pass
		2462	13.65	≤ 30	Pass

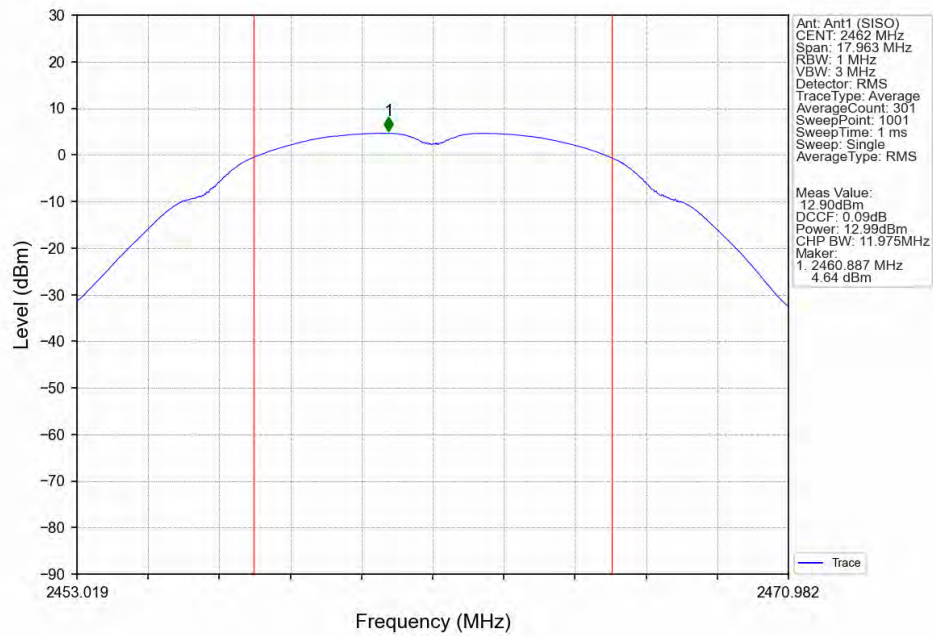
Note1: Antenna Gain: Ant1: -4.10dBi;

3.2 Test Graph

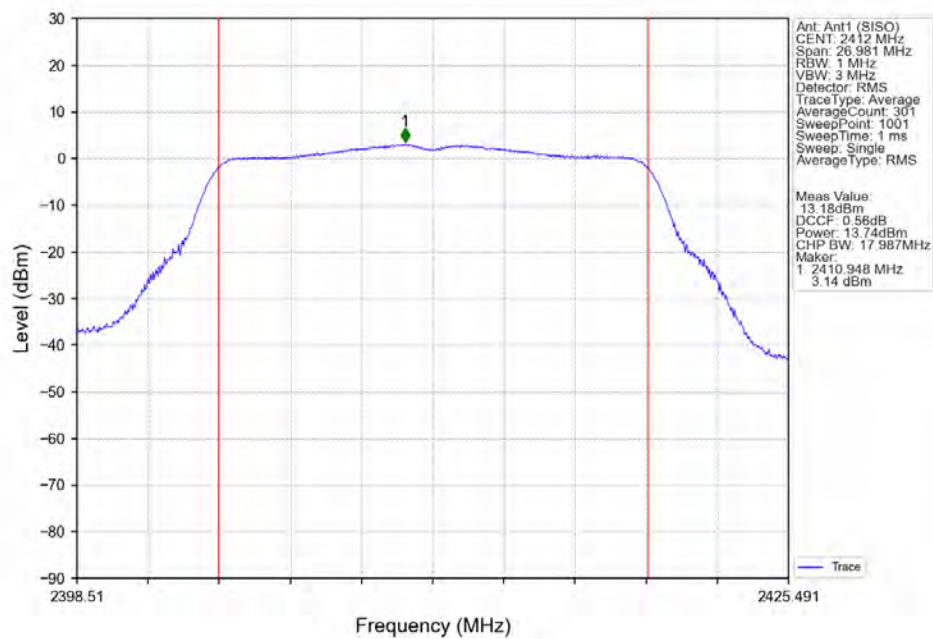
3.2.1 Power



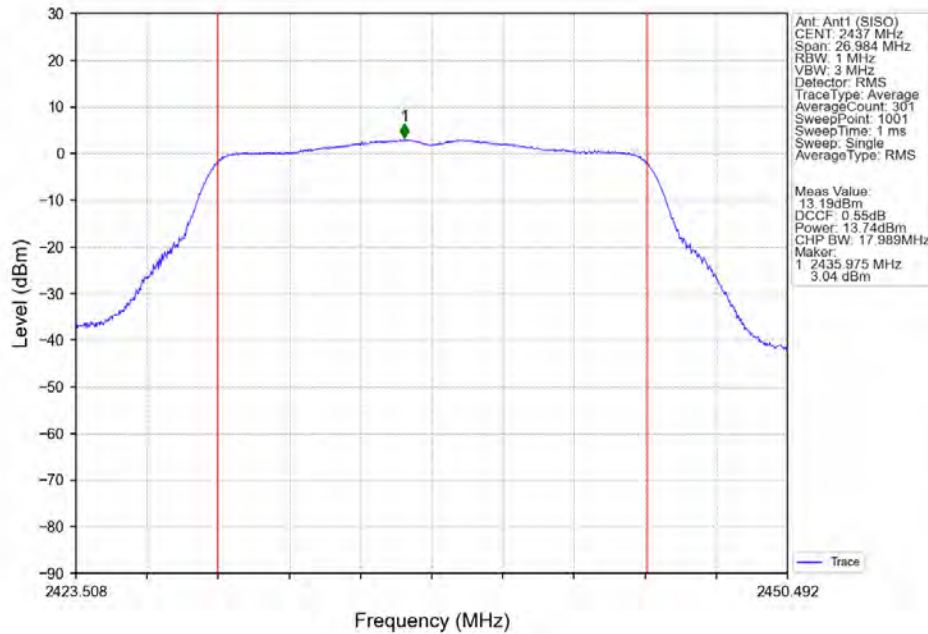
802.11b HCH 2462MHz Ant1 (SISO) NTN



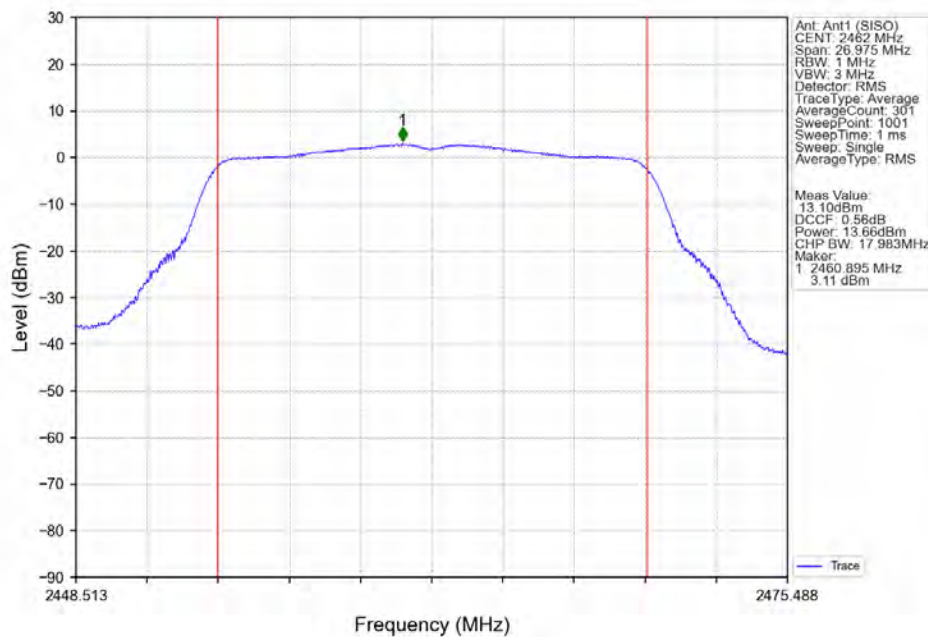
802.11g LCH 2412MHz Ant1 (SISO) NTN



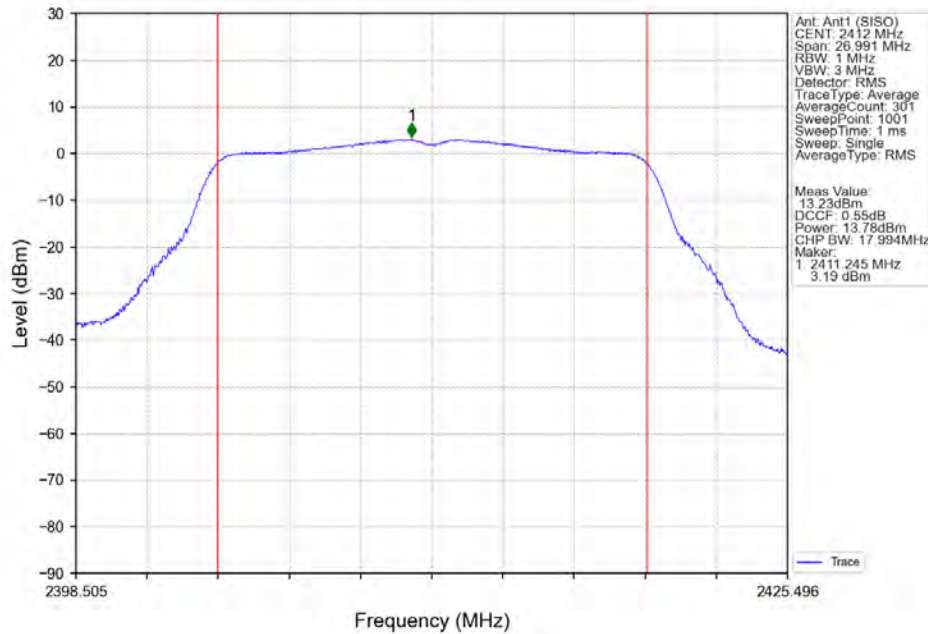
802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



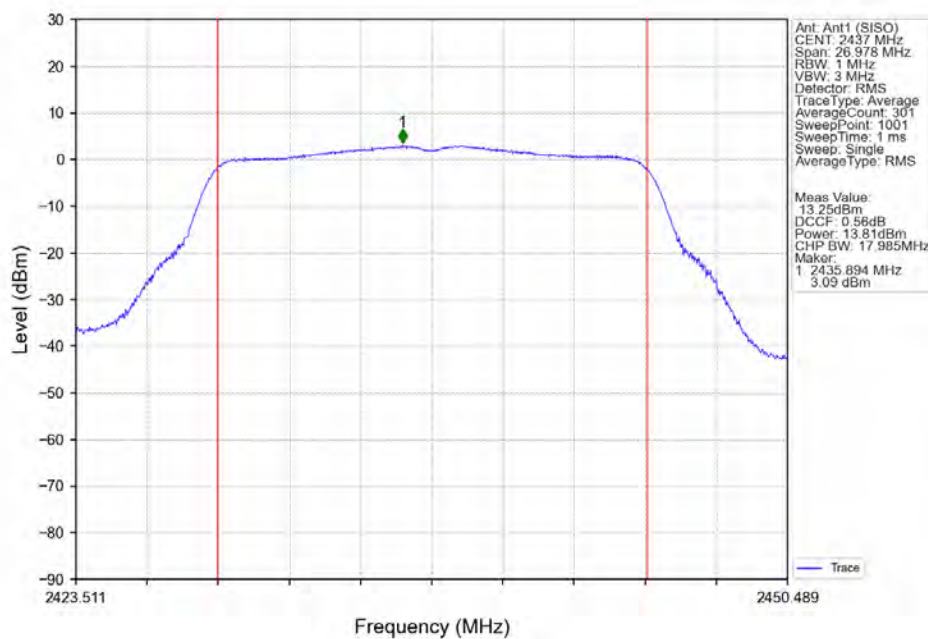
802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



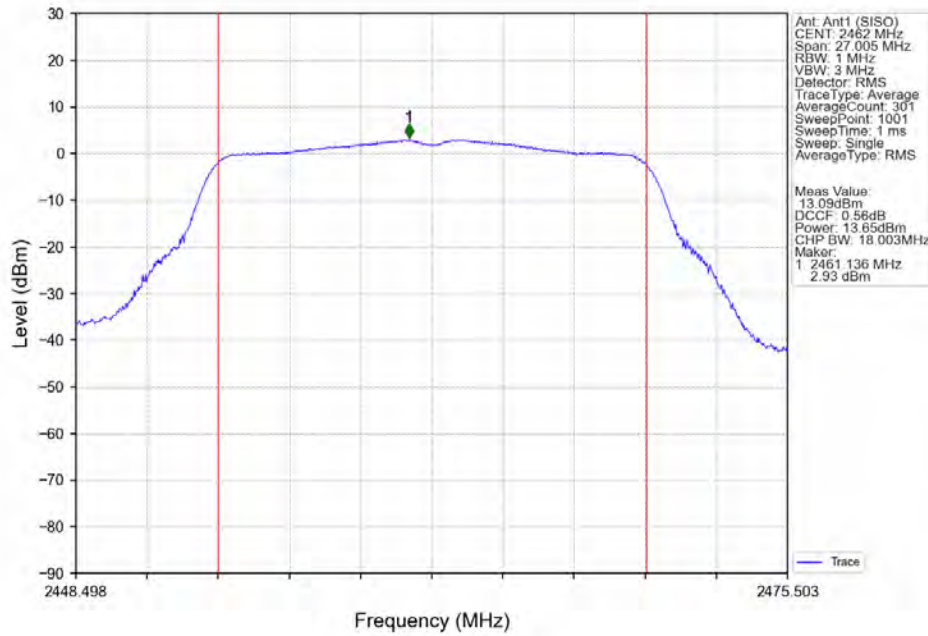
802.11n(HT20)_LCH_2412MHz_Ant1 (SISO)_NTNV



802.11n(HT20)_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11n(HT20) HCH 2462MHz Ant1 (SISO) NTN





4. Maximum Power Spectral Density

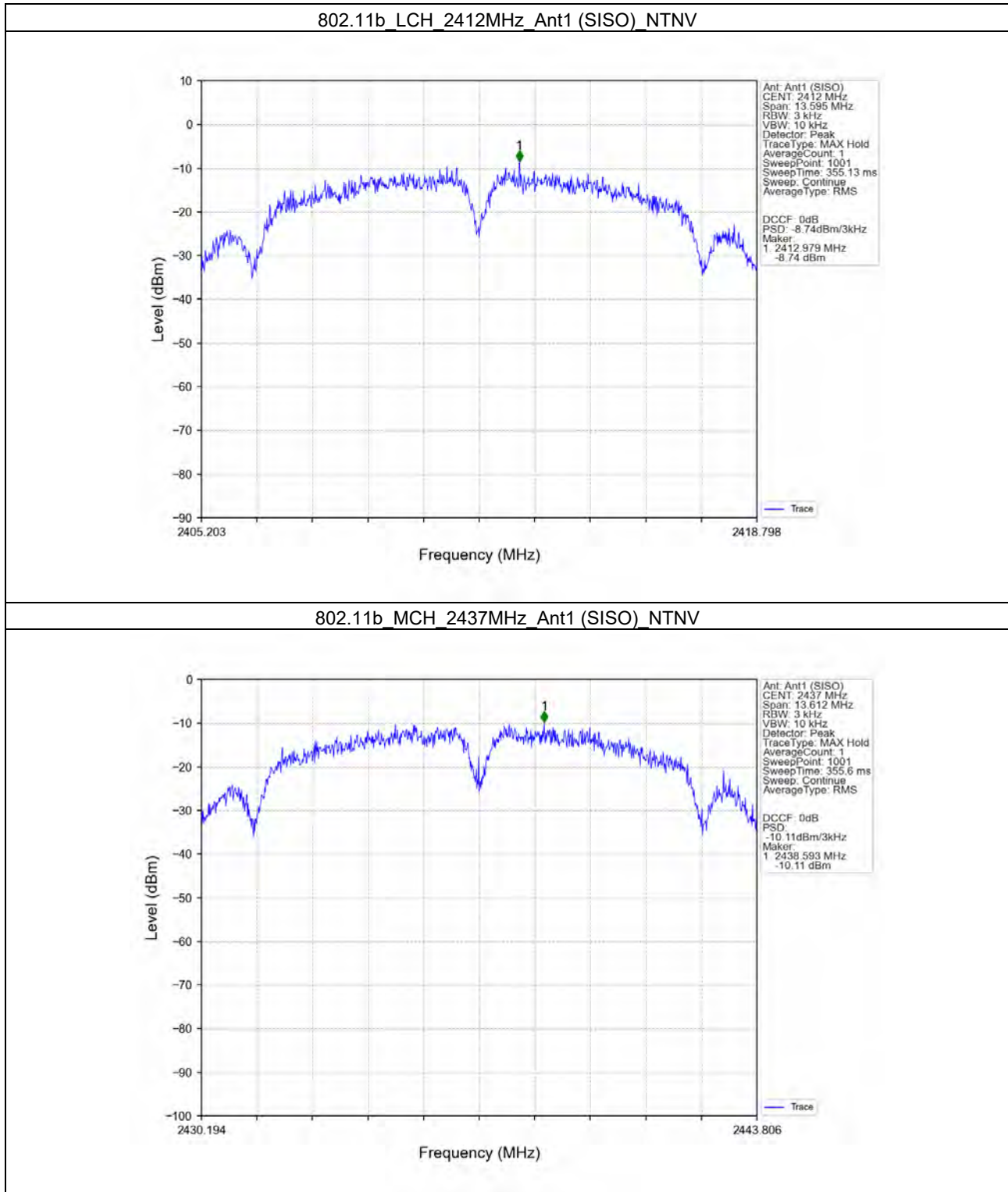
4.1 Test Result

4.1.1 PSD

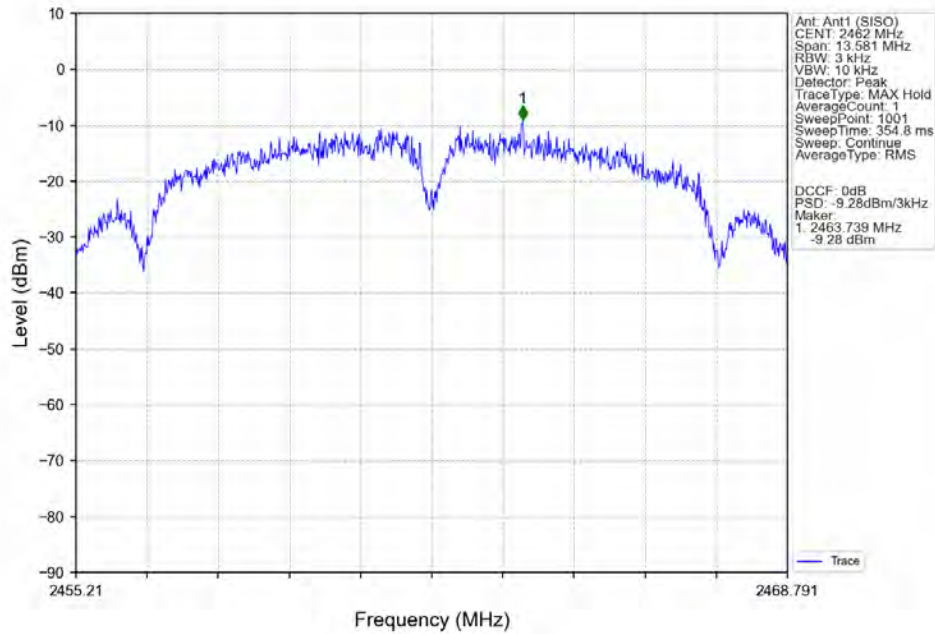
Mode	TX Type	Frequency (MHz)	Maximum PSD (dBm/3kHz)		Verdict
			ANT1	Limit	
802.11b	SISO	2412	-8.74	<=8	Pass
		2437	-10.11	<=8	Pass
		2462	-9.28	<=8	Pass
802.11g	SISO	2412	-12.19	<=8	Pass
		2437	-12.32	<=8	Pass
		2462	-12.39	<=8	Pass
802.11n (HT20)	SISO	2412	-12.20	<=8	Pass
		2437	-11.74	<=8	Pass
		2462	-12.13	<=8	Pass
Note1: Antenna Gain: Ant1: -4.10dBi;					

4.2 Test Graph

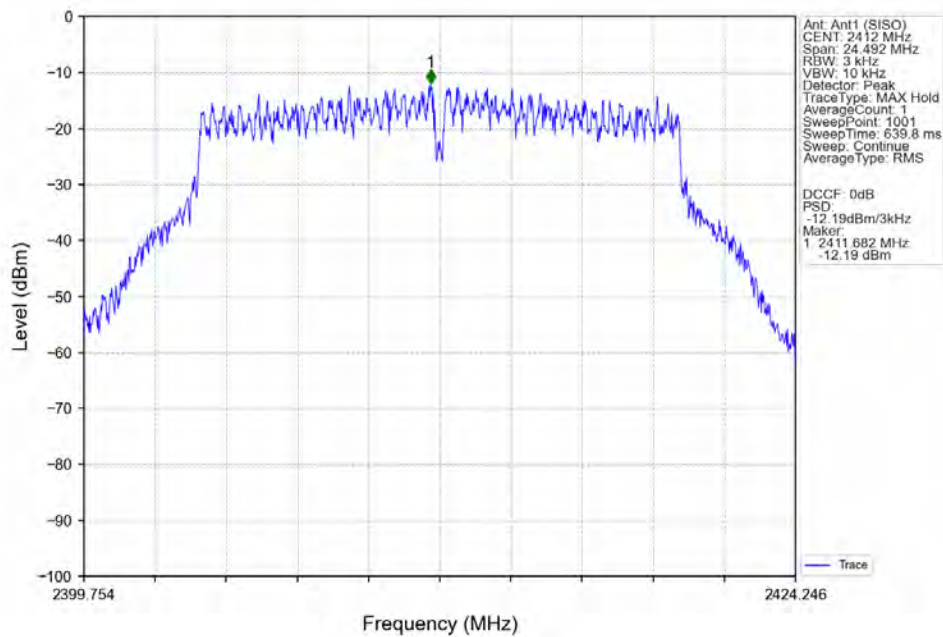
4.2.1 PSD



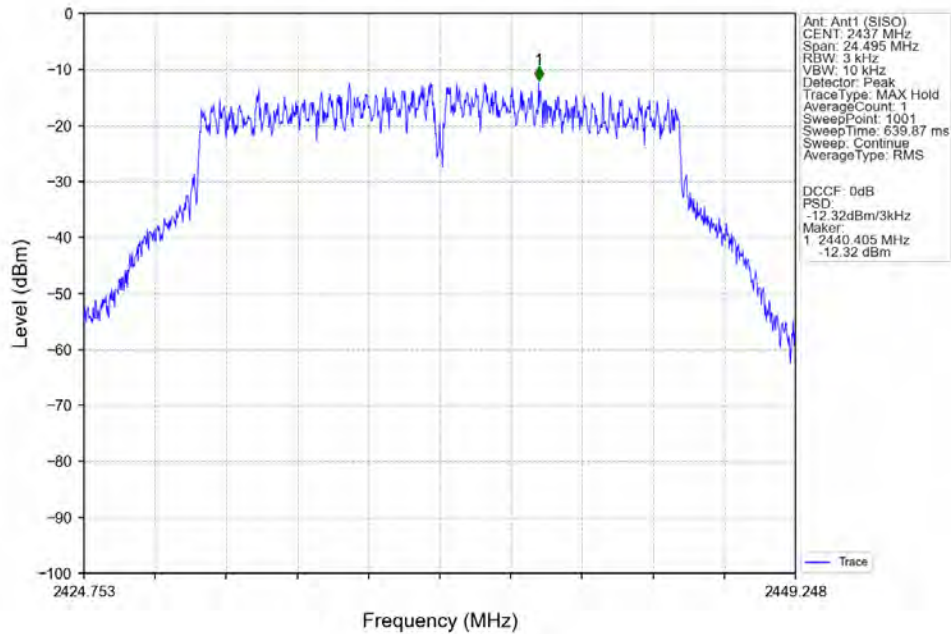
802.11b HCH 2462MHz Ant1 (SISO) NTNV



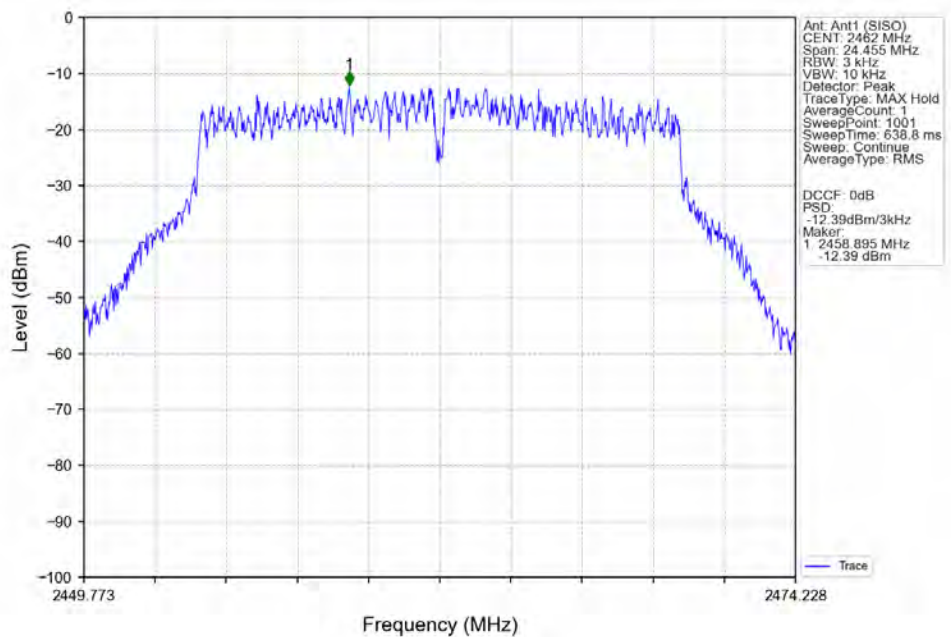
802.11g LCH 2412MHz Ant1 (SISO) NTNV



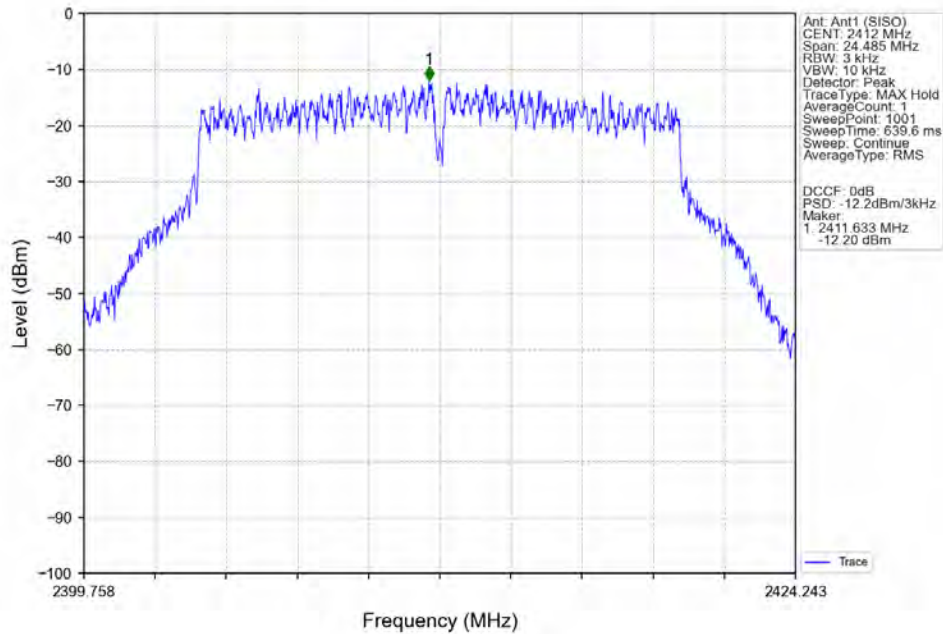
802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



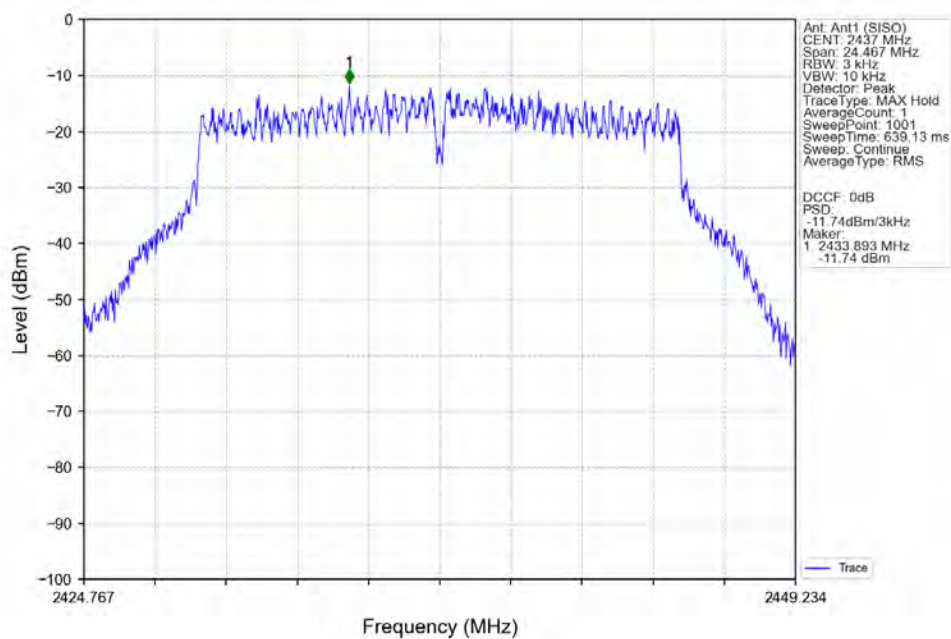
802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



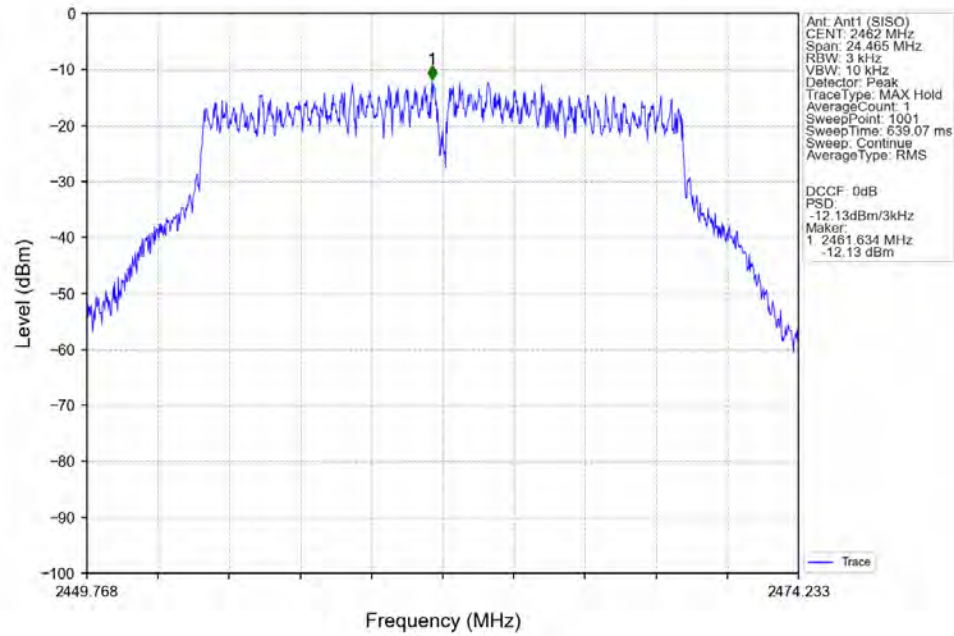
802.11n(HT20)_LCH_2412MHz_Ant1 (SISO)_NTNV



802.11n(HT20)_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11n(HT20)_HCH_2462MHz_Ant1 (SISO)_NTNV



5. Unwanted Emissions In Non-restricted Frequency Bands

5.1 Test Result

5.1.1 Ref

Mode	TX Type	Frequency (MHz)	ANT	Level of Reference (dBm)
802.11b	SISO	2412	1	5.01
		2437	1	4.70
		2462	1	4.56
802.11g	SISO	2412	1	2.07
		2437	1	2.16
		2462	1	2.05
802.11n (HT20)	SISO	2412	1	2.12
		2437	1	2.17
		2462	1	2.04

Note1: Refer to FCC Part 15.247 (d) and ANSI C63.10-2013, the channel contains the maximum PSD level was used to establish the reference level.

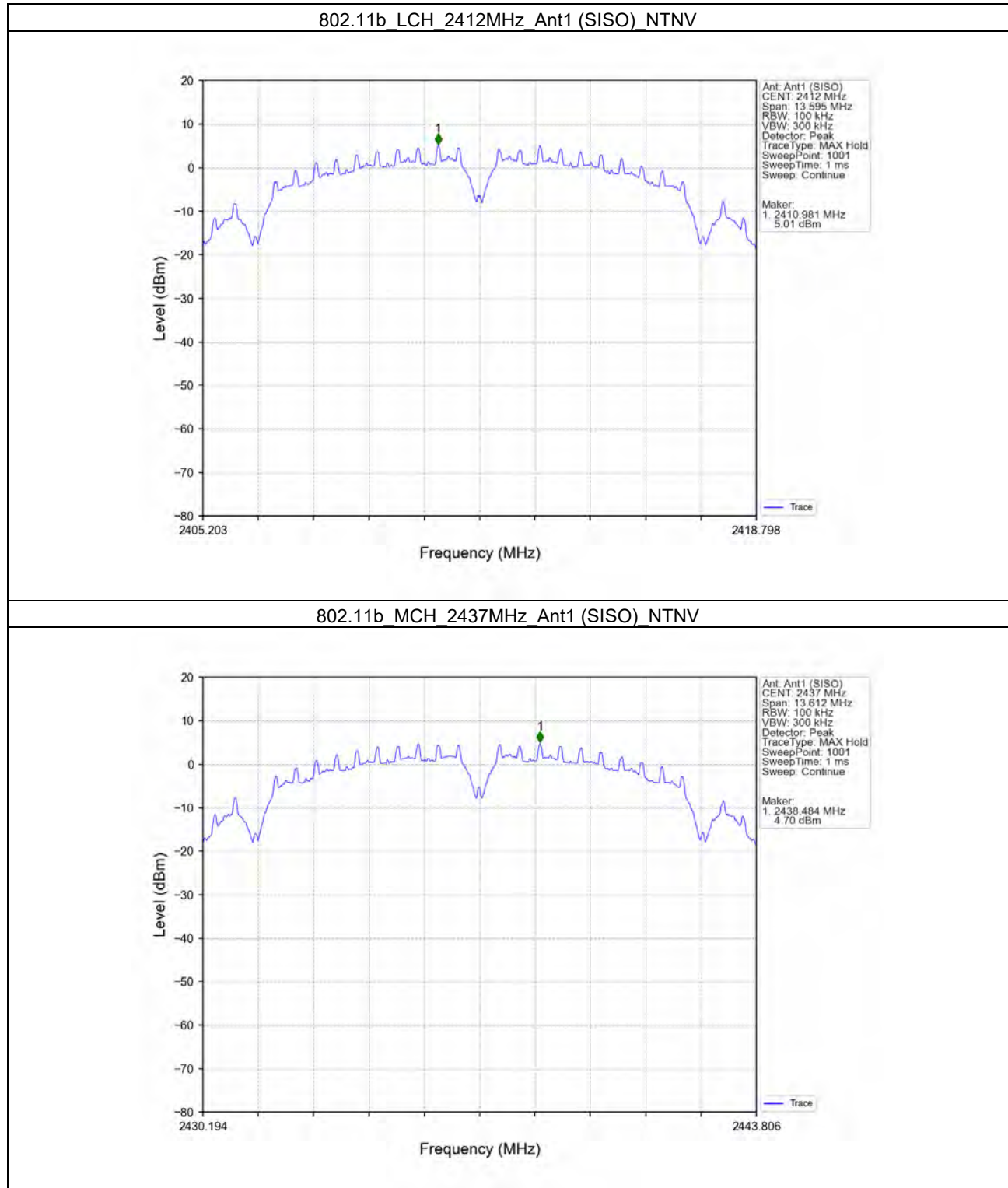
5.1.2 CSE

Mode	TX Type	Frequency (MHz)	ANT	Level of Reference (dBm)	Limit (dBm)	Verdict
802.11b	SISO	2412	1	5.01	-24.99	Pass
		2437	1	5.01	-24.99	Pass
		2462	1	5.01	-24.99	Pass
802.11g	SISO	2412	1	2.16	-27.84	Pass
		2437	1	2.16	-27.84	Pass
		2462	1	2.16	-27.84	Pass
802.11n (HT20)	SISO	2412	1	2.17	-27.83	Pass
		2437	1	2.17	-27.83	Pass
		2462	1	2.17	-27.83	Pass

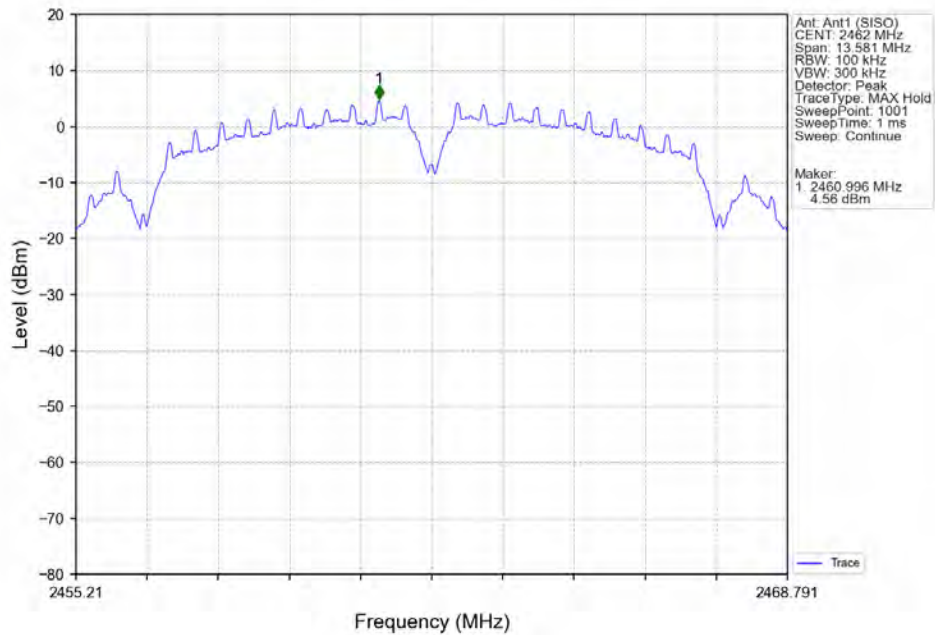
Note1: Refer to FCC Part 15.247 (d) and ANSI C63.10-2013, the channel contains the maximum PSD level was used to establish the reference level.

5.2 Test Graph

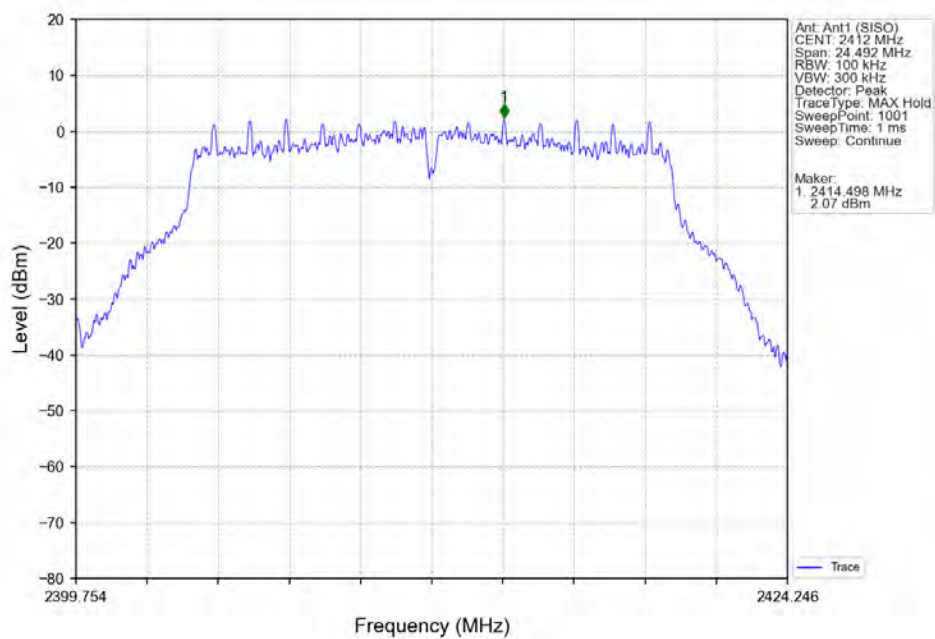
5.2.1 Ref



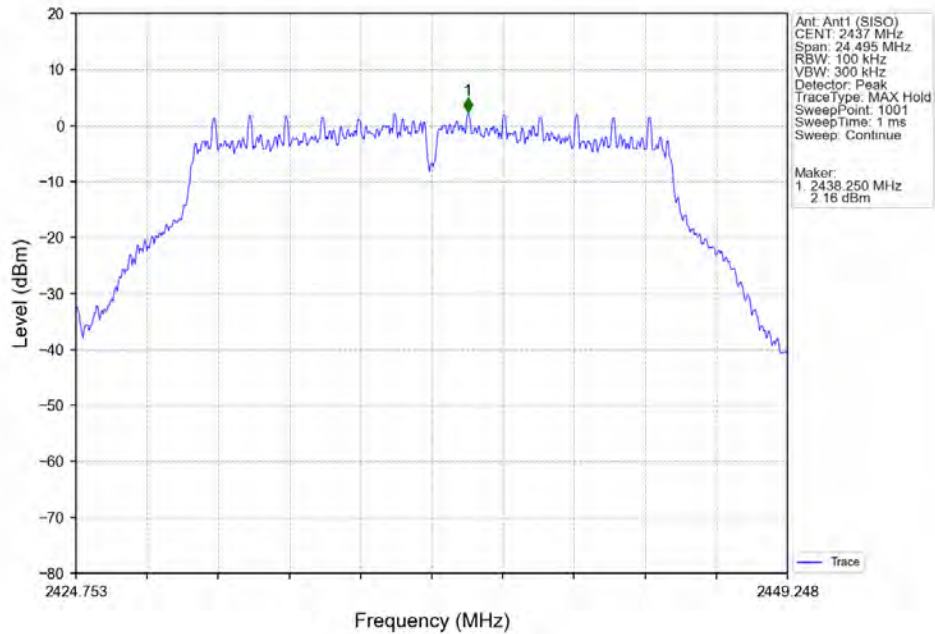
802.11b HCH 2462MHz Ant1 (SISO) NTN



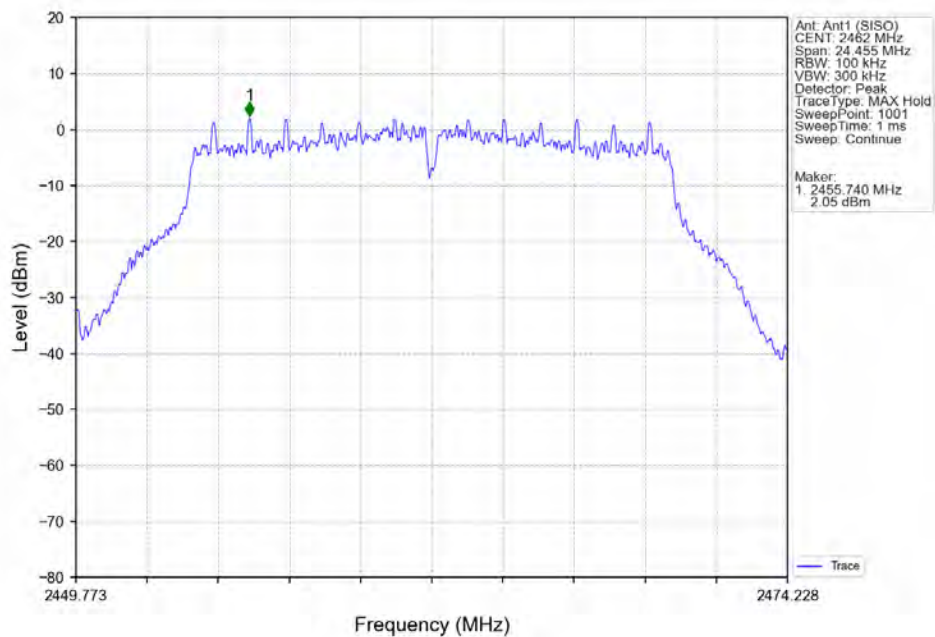
802.11g LCH 2412MHz Ant1 (SISO) NTN



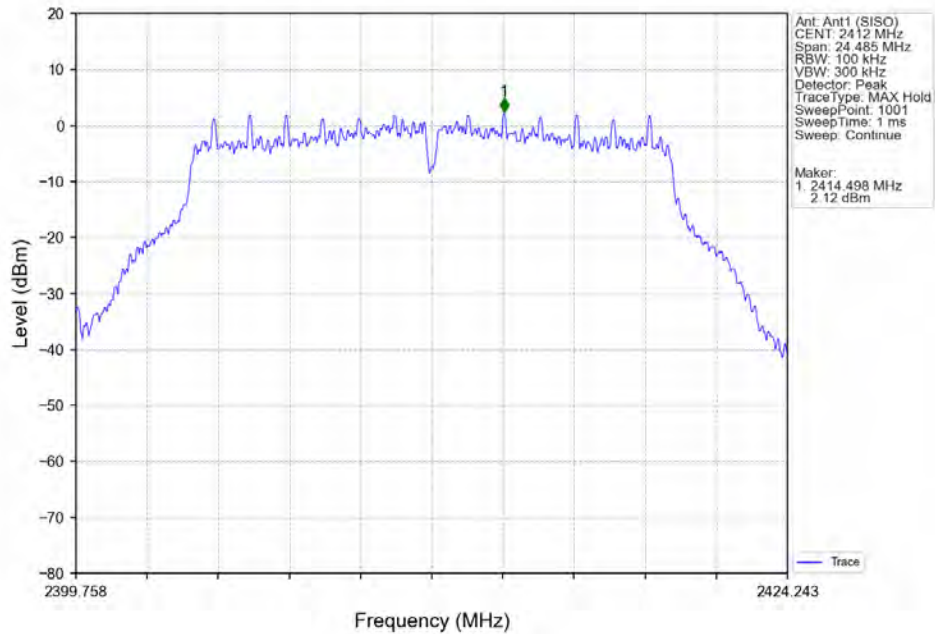
802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



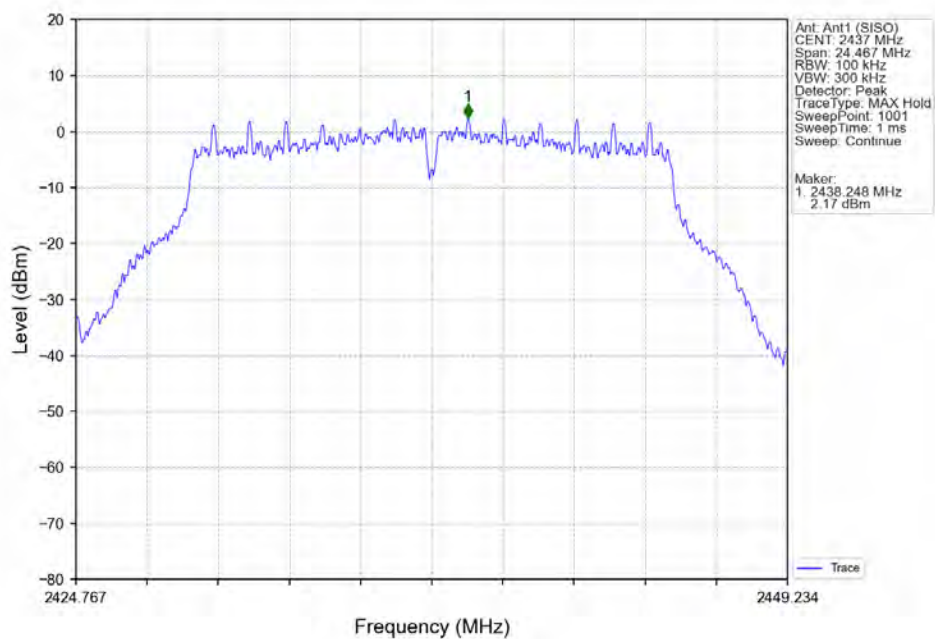
802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



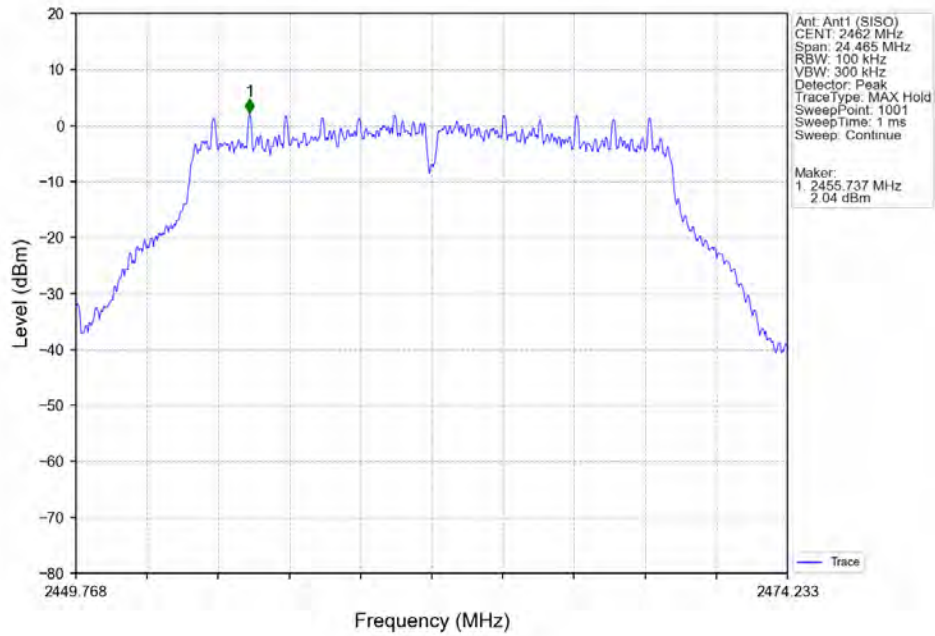
802.11n(HT20) LCH_2412MHz_Ant1 (SISO) NTN



802.11n(HT20) MCH_2437MHz_Ant1 (SISO) NTN

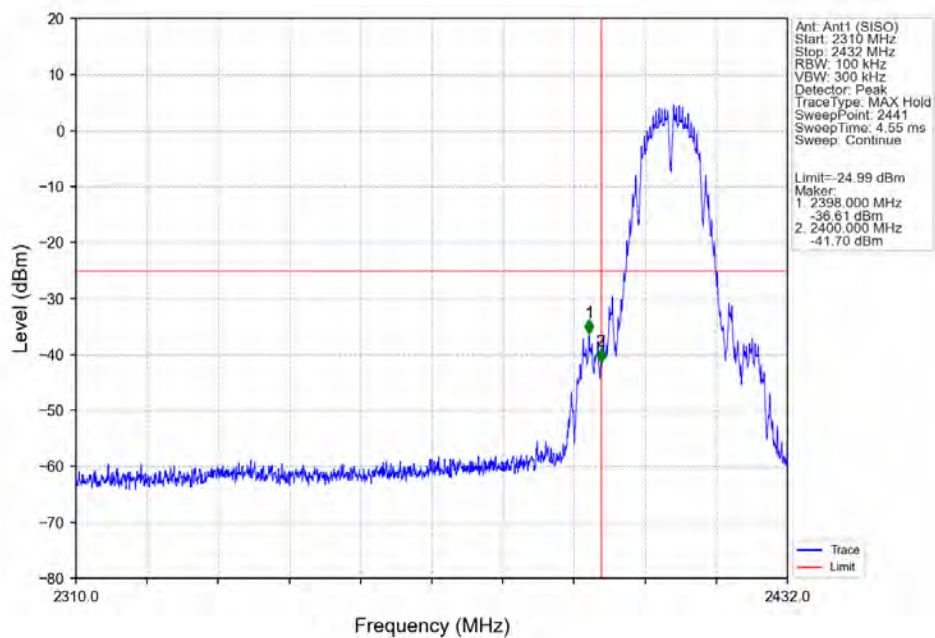


802.11n(HT20)_HCH_2462MHz_Ant1 (SISO)_NTNV

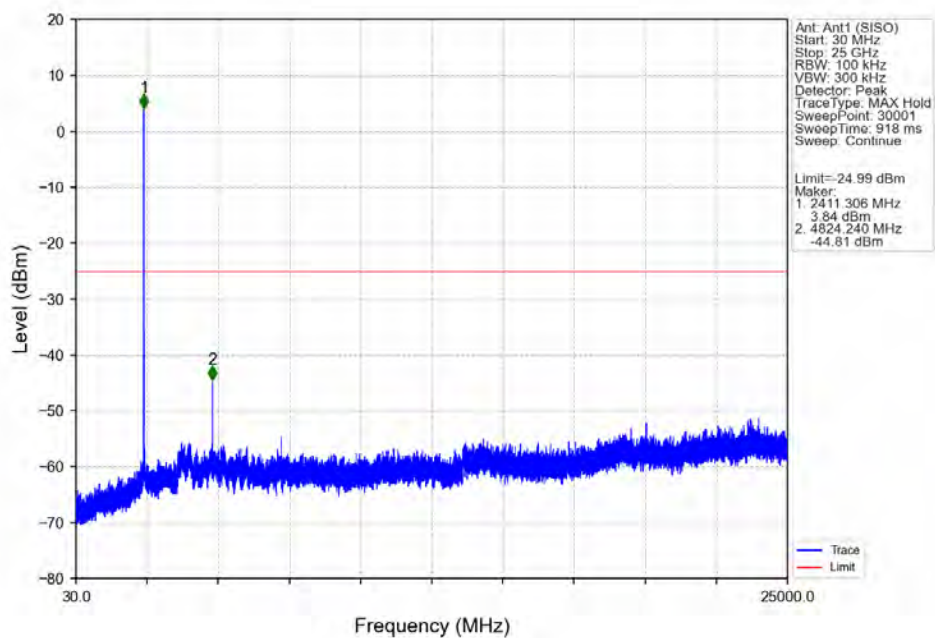


5.2.2 CSE

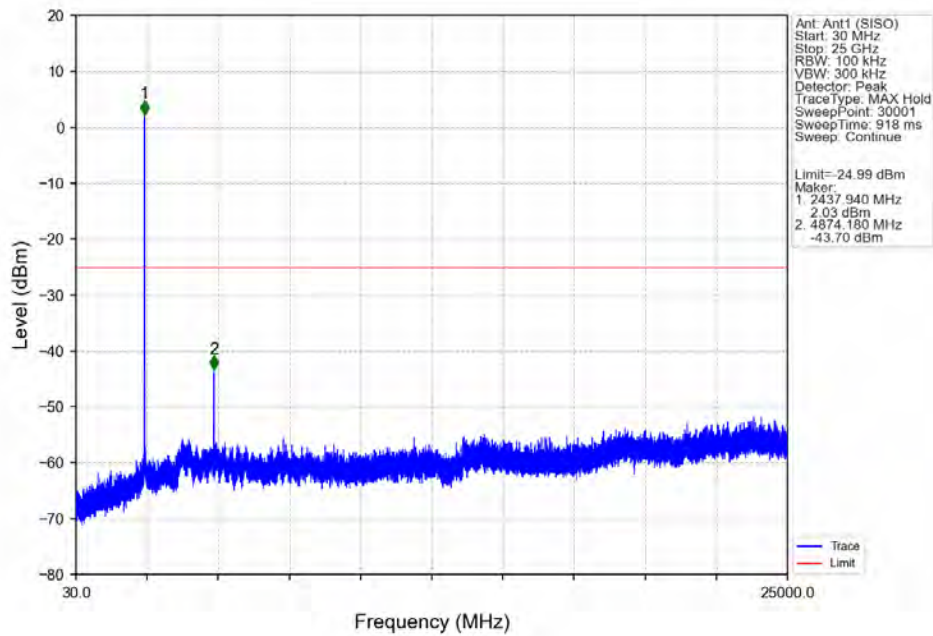
802.11b LCH 2412MHz_Ant1 (SISO)_NTNV



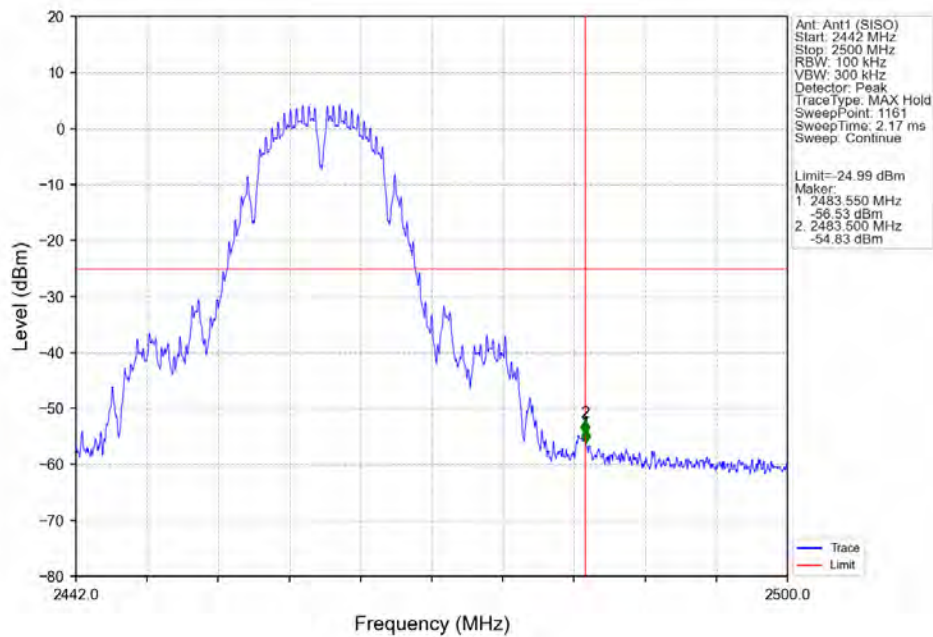
802.11b LCH 2412MHz_Ant1 (SISO)_NTNV



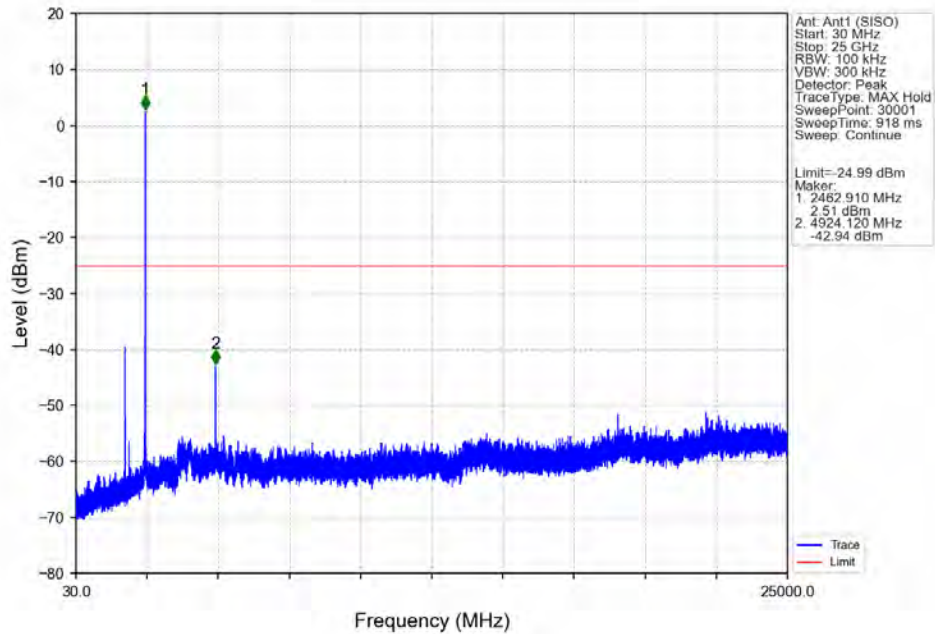
802.11b MCH 2437MHz Ant1 (SISO) NTN



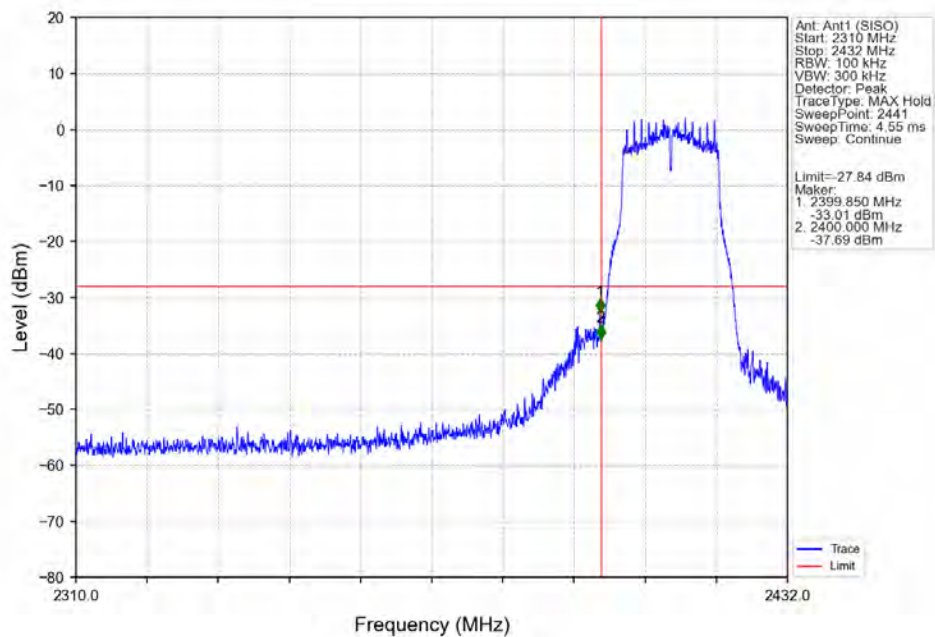
802.11b HCH 2462MHz Ant1 (SISO) NTN



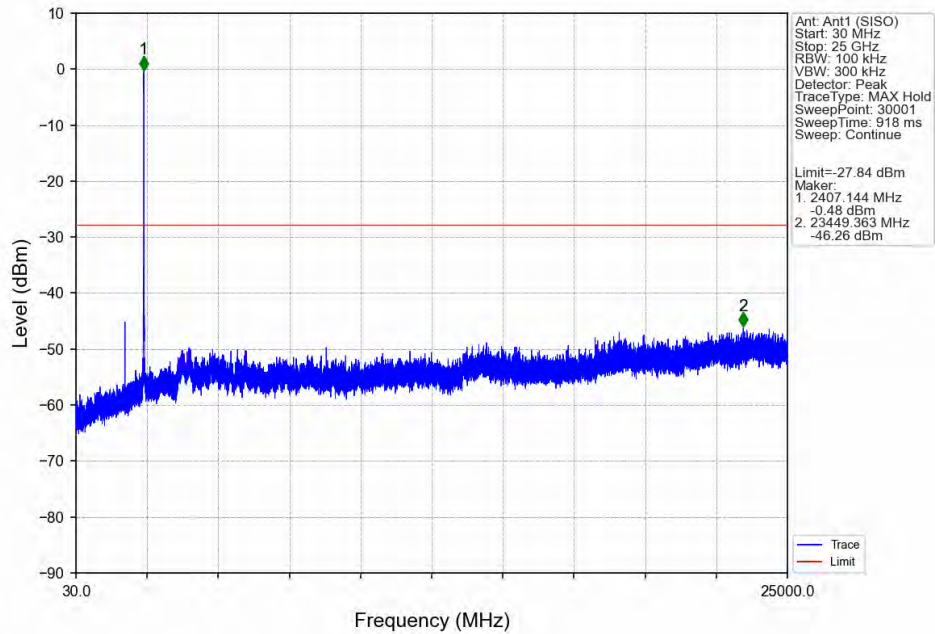
802.11b HCH 2462MHz_Ant1 (SISO)_NTNV



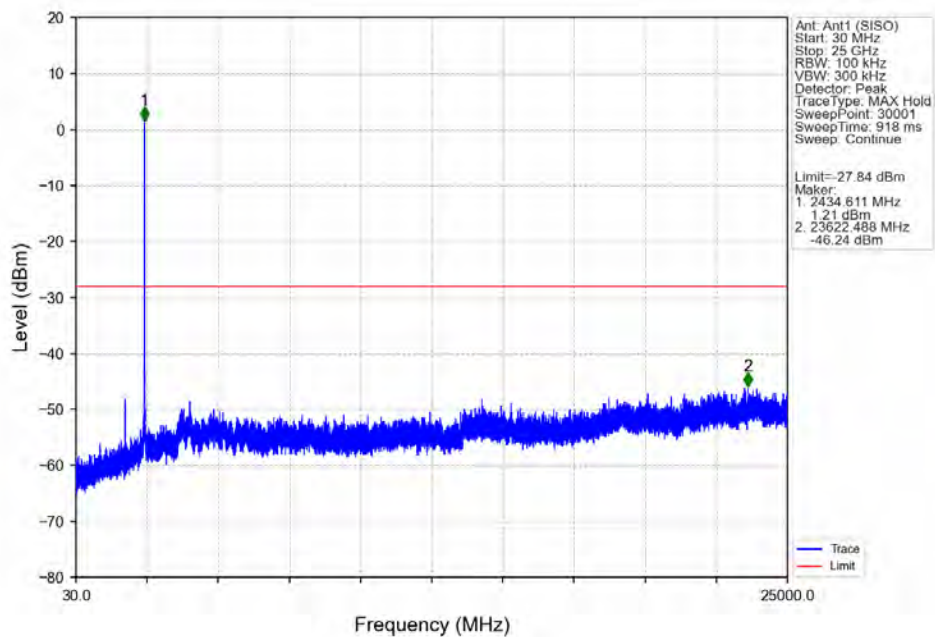
802.11g LCH 2412MHz_Ant1 (SISO)_NTNV



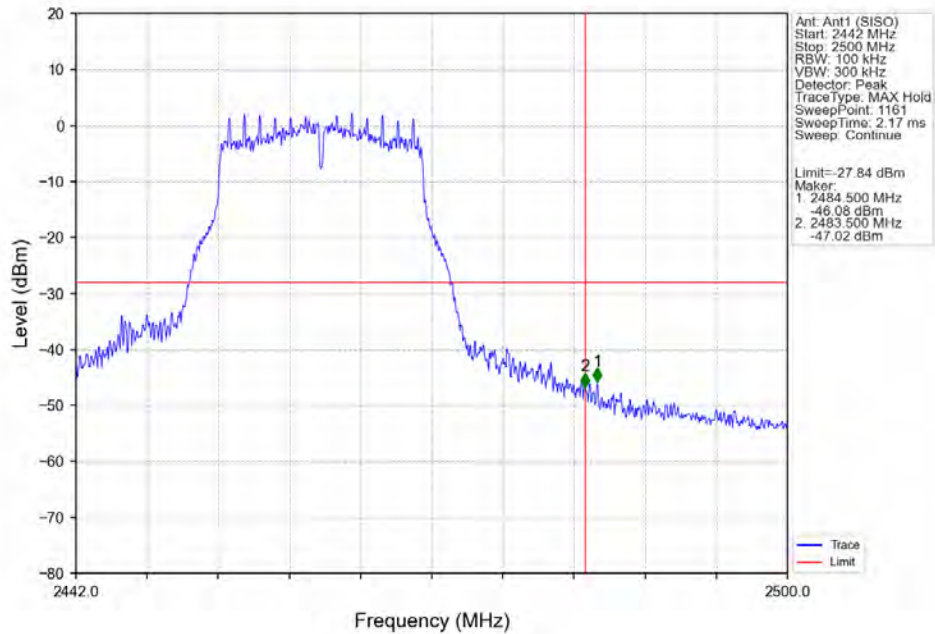
802.11g LCH 2412MHz_Ant1 (SISO) NTN



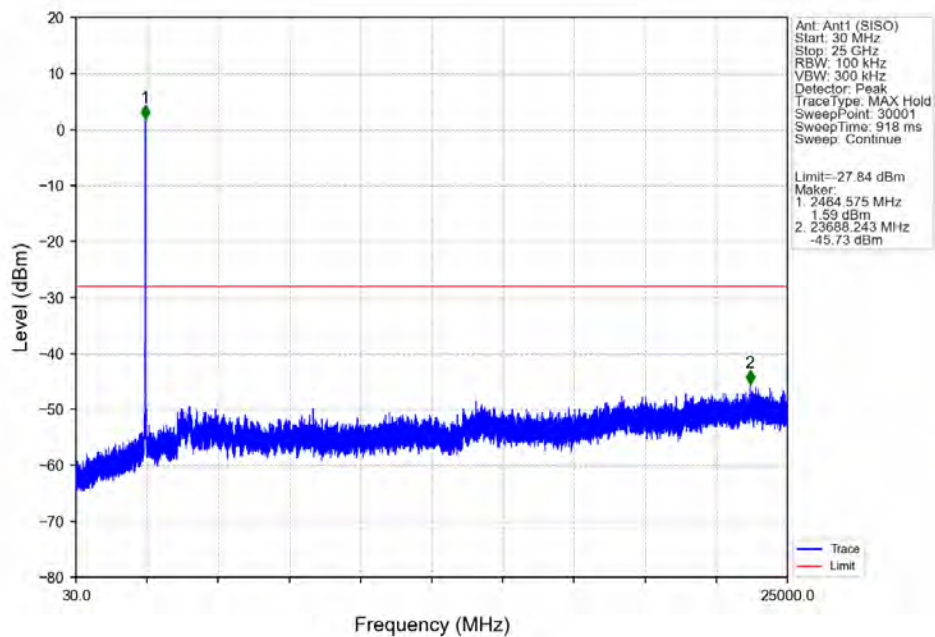
802.11g MCH 2437MHz_Ant1 (SISO) NTN



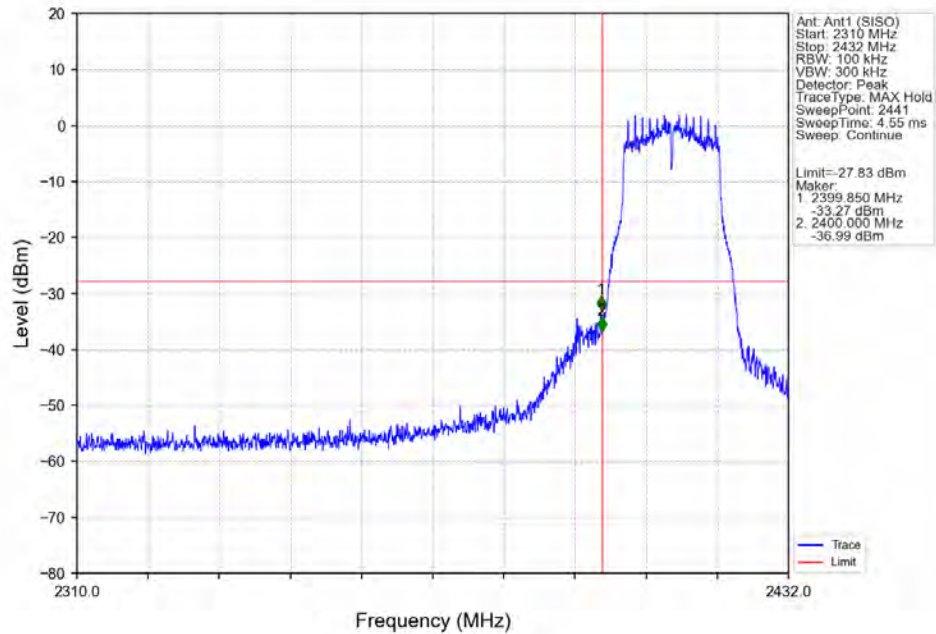
802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



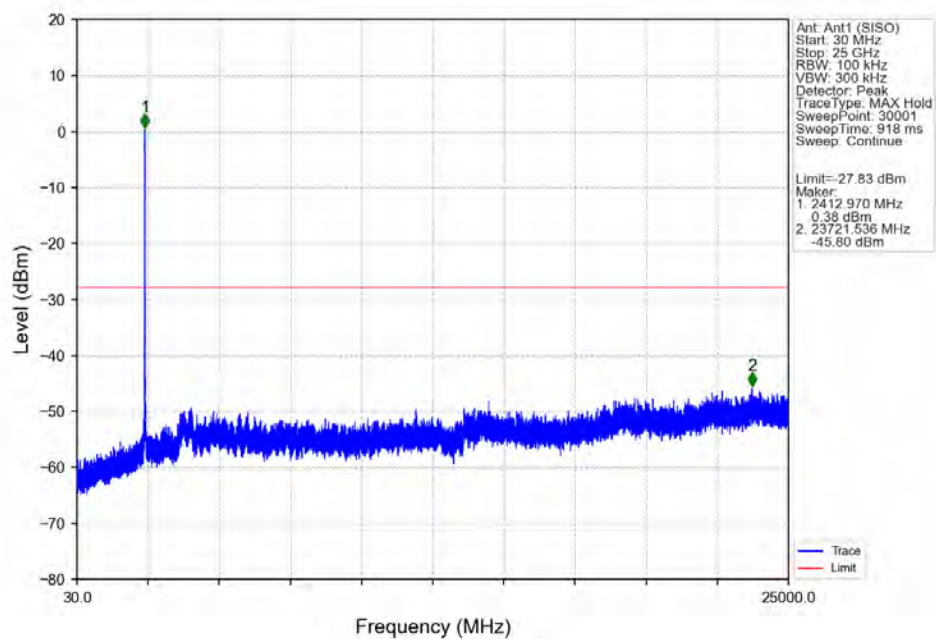
802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



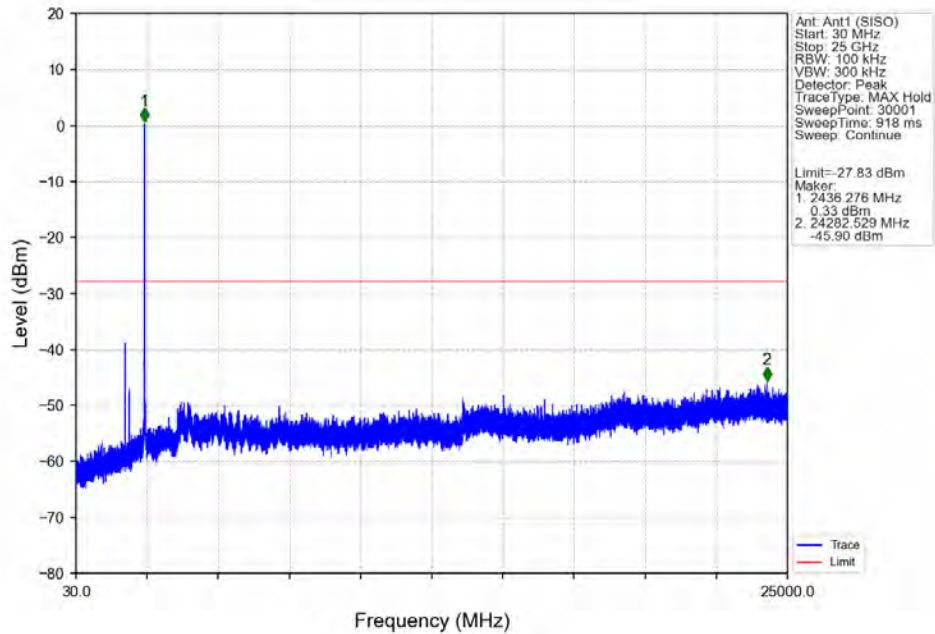
802.11n(HT20) LCH_2412MHz_Ant1 (SISO) NTN



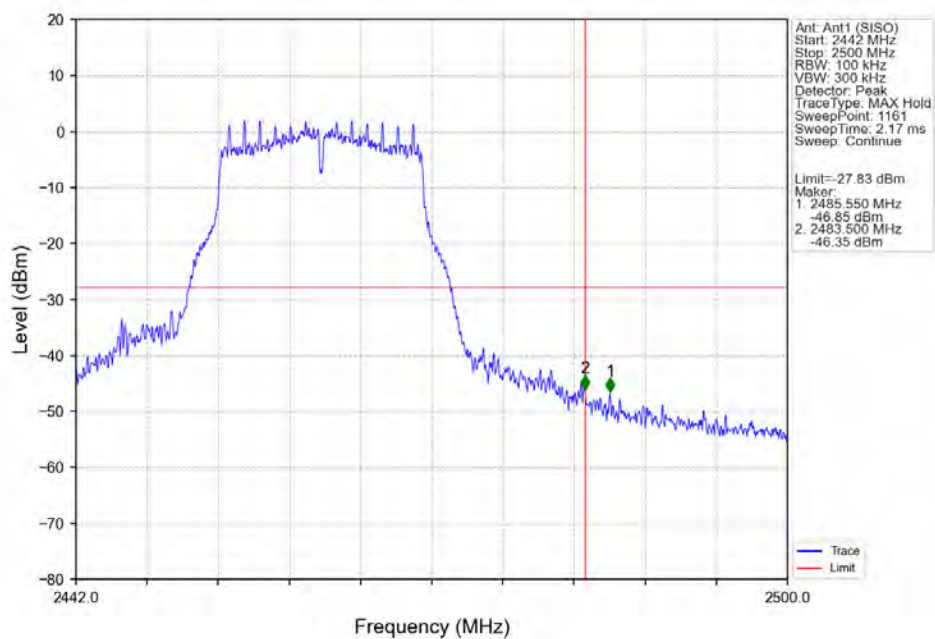
802.11n(HT20) LCH_2412MHz_Ant1 (SISO) NTN



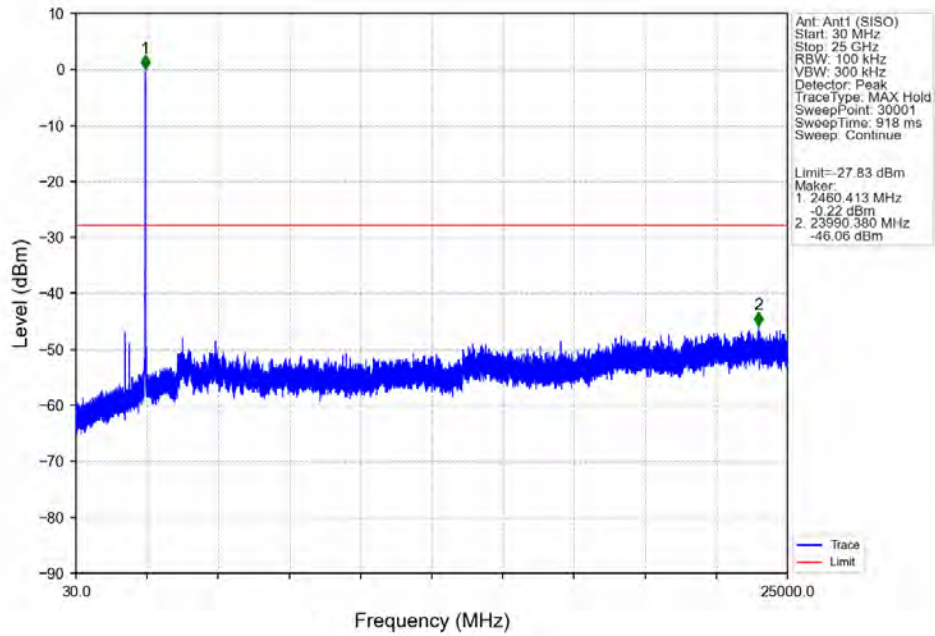
802.11n(HT20)_MCH_2437MHz_Ant1 (SISO)_NTNV



802.11n(HT20)_HCH_2462MHz_Ant1 (SISO)_NTNV



802.11n(HT20) HCH 2462MHz Ant1 (SISO) NTN



- End of the Report -