

Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

Report No.: KSCR240800162403

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TEST REPORT

Application No.: KSCR2408001624AT
FCC ID: 2ASCB-DH043TLB
Name of Testing Laboratory preparing the Report: Compliance Certification Services (Kunshan) Inc.
Address of Testing Laboratory preparing the Report: No.10 Weiye Rd, Innovation park, Eco&Tec, Development Zone, Kunshan City, Jiangsu, China.
Applicant: D2G Group LLC
Address of Applicant: 81 Commerce Drive Fall River, MA 02720 USA
Manufacturer: D2G Group LLC
Address of Manufacturer: 81 Commerce Drive Fall River, MA 02720 USA
Factory: Zhejiang Uniview System Technology Co., Ltd.
Address of Factory: No.1277 Qingfeng South Road (South), Tongxiang Economic Development Zone, Tongxiang City, Jiaxing City, 314500, Zhejiang, China

Equipment Under Test (EUT):
EUT Name: Digital Signage
Model No.: DH043TLB, DH043NLB ♣
 ♣ Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.
Standard(s) : 47 CFR Part 15, Subpart C 15.247
Date of Receipt: 2024-08-23
Date of Test: 2024-09-12 to 2024-10-12
Date of Issue: 2024-10-15

Test Result:	Pass*
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* In the configuration tested, the EUT complied with the standards specified above.

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<i>Revision Record</i>			
<i>Version</i>	<i>Description</i>	<i>Date</i>	<i>Remark</i>
00	Original	2024-10-15	/

Authorized for issue by:			
Tested By		<i>Maker Qi</i>	
		_____ Maker Qi /Project Engineer	
Approved By		<i>Terry Hou</i>	
		_____ Terry Hou /Reviewer	



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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)	Customer Declaration	N/A

Radio Spectrum Matter Part					
Item	Standard	Method	Requirement	Result	Test Lab*
Conducted Emissions at AC Power Line (150kHz-30MHz)	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2013) Section 6.2	47 CFR Part 15, Subpart C 15.207	Pass	B
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	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

Note: There are series models mentioned in this report and they are the identical in electrical and electronic characters. Only the model DH043TLB was tested since their differences were the model number and appearance.

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4 General Information

4.1 Details of E.U.T.

Power supply:	AC 120V/60Hz
Test voltage:	AC 120V/60Hz
Operation Frequency:	802.11b/g/n(HT20)/ax(HE20):2412MHz to 2462MHz; 802.11n(HT40)/ax(HE40):2422MHz to 2452MHz
Modulation Type:	802.11b: DSSS (CCK, DQPSK, DBPSK), 802.11g/n: OFDM (64QAM, 16QAM, QPSK, BPSK), 802.11ax: OFDMA (BPSK, QPSK, 16QAM, 64QAM, 256QAM, 1024-QAM)
Number of Channels:	802.11b/g/n(HT20)/ax(HE20):11;802.11n(HT40)/ax(HE40):7
Channel Spacing:	5MHz
Antenna Type:	Dipole Antenna
Antenna Gain:	3dBi (Provided by the manufacturer)

4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Notebook	LENOVO	K27	EB24537645

4.3 Power level setting using in test

Channel	802.11b	802.11g	802.11n(HT20)	802.11ax(HE20)
	Ant 1	Ant 1	Ant 1	Ant 1
1	11	9	9	9
6	12	11	11	11
11	12	11	11	11
Channel	802.11n(HT40)	802.11ax(HE40)		
	Ant 1	Ant 1		
3	9	9		
6	11	11		
9	11	11		

4.4 Measurement Uncertainty

No.	Item	Measurement Uncertainty
1	Radio Frequency	8.4 x 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:

Conducted Emissions at AC Power Line (150kHz-30MHz); Radiated Emissions; Radiated Emissions which fall in the restricted bands test at:

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

South of No. 6 Plant, No. 1, Runsheng Road, Suzhou Industrial Park, Suzhou Area, China (Jiangsu)

Pilot Free Trade Zone

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.

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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



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5 Equipment List

Lab A:

Item	Equipment	Manufacturer	Model	Inventory No	Cal Date	Cal. Due Date
RF Conducted Test						
1	Spectrum Analyzer	Keysight	N9020A	KUS1911E004-2	08/24/2024	08/23/2025
2	Spectrum Analyzer	Keysight	N9020A	KUS2001M001-2	08/24/2024	08/23/2025
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	08/24/2024	08/23/2025
6	Signal Generator	Agilent	N5182A	KUS2001M001-1	08/24/2024	08/23/2025
7	Radio Communication Test Station	Anritsu	MT8000A	KSEM001-1	08/24/2024	08/23/2025
8	Radio Communication Analyzer	Anritsu	MT8821C	KSEM002-1	03/19/2024	03/18/2025
9	Universal Radio Communication Tester	R&S	CMW500	KUS1911E004-1	08/24/2024	08/23/2025
10	Switcher	TST	FY562	KUS2001M001-4	01/15/2024	01/14/2025
11	AC Power Source	EXTECH	6605	KS301178	N.C.R	N.C.R
12	DC Power Supply	Aglient	E3632A	KS301180	N.C.R	N.C.R
13	Conducted Test Cable	Thermax	RF01-RF04	CZ301111-CZ301120	01/15/2024	01/14/2025
14	Temp. / Humidity Chamber	TERCHY	MHK-120AK	KS301190	08/24/2024	08/23/2025
15	Temperature & Humidity Recorder	Renke Control	RS-WS-N01-6J	KSEM024-5	03/19/2024	03/18/2025
16	Software	BST	TST-PASS	/	NCR	NCR



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Lab B:

Item	Equipment	Manufacturer	Model	Inventory No	Cal Date	Cal. Due Date
Conducted Emission at Mains Terminals						
1	Test receiver	ROHDE&SCHWARZ	ESR7	SUWI-01-10-01	2/1/2024	1/31/2025
2	Temperature and humidity meter	MingGao	TH101B	SUWI-01-01-06	2/8/2024	2/7/2025
3	Artificial network	ROHDE&SCHWARZ	ENV216	SUWI-01-19-03	2/4/2024	2/3/2025
4	Artificial network	ROHDE&SCHWARZ	ENV216	SUWI-01-19-04	2/4/2024	2/3/2025
5	Measurement Software	Tonscend	JS32-CE	SUWI-02-09-05	NCR	NCR
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	11/21/2023	11/20/2024
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	11/25/2023	11/24/2024
7	Receiving antenna	SCHWRZBECK MESS- ELEKTRONIK	BBHA 9120D	SUWI-01-11-05	11/25/2023	11/24/2024
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 Dipole Antenna on the main PCB and no consideration of replacement. The best case gain of the antenna is 3dBi.

Antenna location: Refer to internal photo.

7 Radio Spectrum Matter Test Results

7.1 Conducted Emissions at AC Power Line (150kHz-30MHz)

Test Requirement 47 CFR Part 15, Subpart C 15.207

Test Method: ANSI C63.10 (2013) Section 6.2

Limit:

Frequency of emission(MHz)	Conducted limit(dBµV)	
	Quasi-peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

*Decreases with the logarithm of the frequency.

Detector: Peak for pre-scan (9kHz resolution bandwidth) 0.15M to 30MHz

7.1.1 E.U.T. Operation

Operating Environment:

Temperature: 24.3 °C

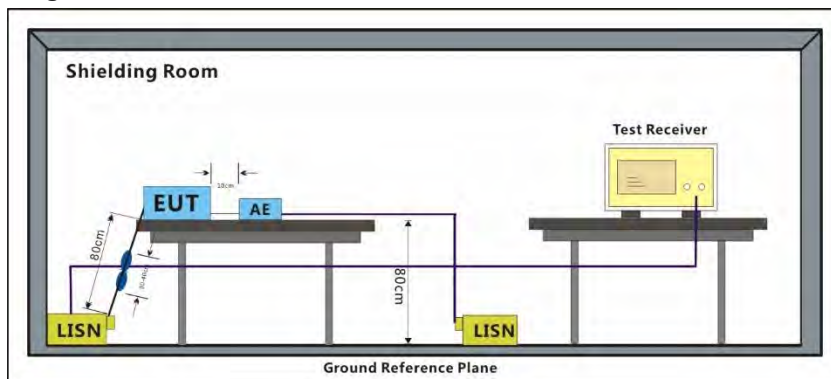
Humidity: 43.2 % RH

Atmospheric Pressure: 1010 mbar

7.1.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	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); data rate @ MCS0 is the worst case of IEEE 802.11ax(HE20); data rate @ MCS0 is the worst case of IEEE 802.11ax(HE40). Only the data of worst case is recorded in the report.

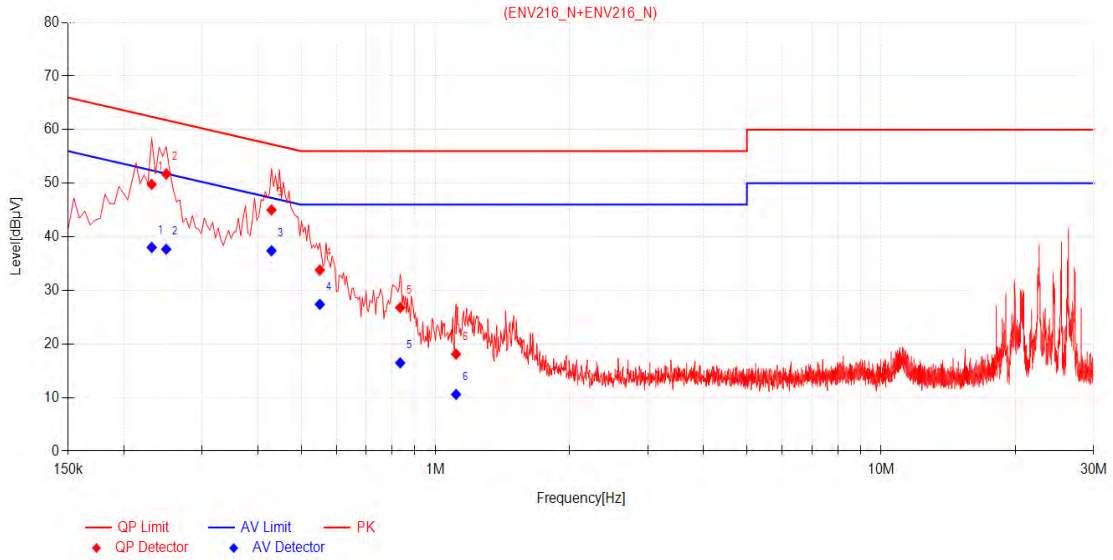
7.1.3 Test Setup Diagram



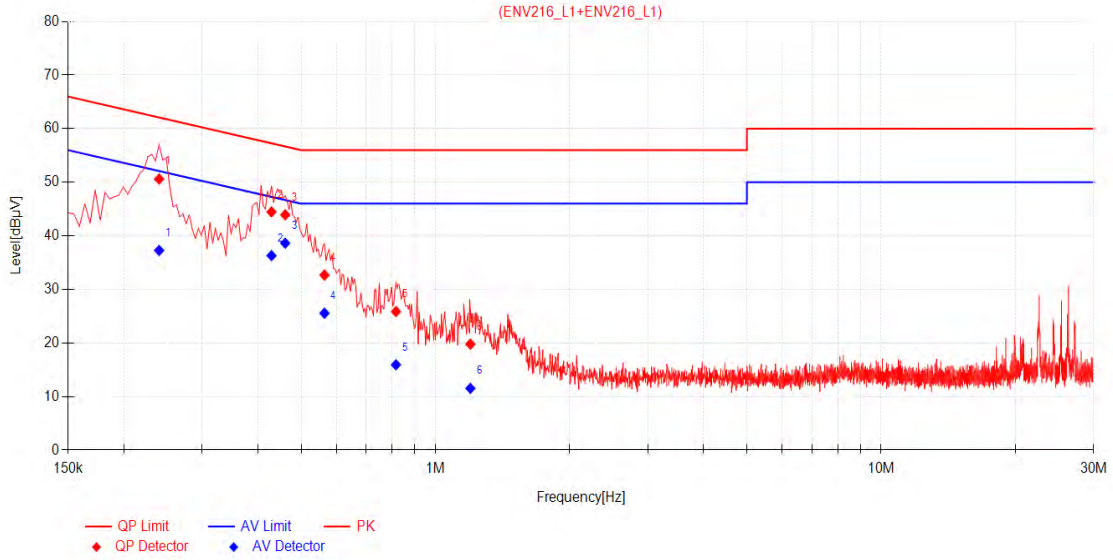
7.1.4 Measurement Procedure and Data

- 1) The mains terminal disturbance voltage test was conducted in a shielded room.
- 2) The EUT was connected to AC power source through a LISN 1 (Line Impedance Stabilization Network) which provides a 50ohm/50μH + 5ohm linear impedance. The power cables of all other units of the EUT were connected to a second LISN 2, which was bonded to the ground reference plane in the same way as the LISN 1 for the unit being measured. A multiple socket outlet strip was used to connect multiple power cables to a single LISN provided the rating of the LISN was not exceeded.
- 3) The tabletop EUT was placed upon a non-metallic table 0.8m above the ground reference plane. And for floor-standing arrangement, the EUT was placed on the horizontal ground reference plane.
- 4) The test was performed with a vertical ground reference plane. The rear of the EUT shall be 0.4 m from the vertical ground reference plane. The vertical ground reference plane was bonded to the horizontal ground reference plane. The LISN 1 was placed 0.8 m from the boundary of the unit under test and bonded to a ground reference plane for LISNs mounted on top of the ground reference plane. This distance was between the closest points of the LISN 1 and the EUT. All other units of the EUT and associated equipment was at least 0.8 m from the LISN 2.
- 5) In order to find the maximum emission, the relative positions of equipment and all of the interface cables must be changed according to ANSI C63.10 on conducted measurement.

Remark: Level=Read Level+ Cable Loss+ LISN Factor



NO.	Frequency [MHz]	Factor [dB]	QP Reading [dBµV]	QP Value [dBµV]	QP Limit [dBµV]	QP Margin [dB]	AV Reading [dBµV]	AV Value [dBµV]	AV Limit [dBµV]	AV Margin [dB]	Verdict
1	0.2310	10.17	39.62	49.79	62.41	12.62	27.85	38.02	52.41	14.39	PASS
2	0.2490	10.16	41.56	51.72	61.79	10.07	27.53	37.69	51.79	14.10	PASS
3	0.4290	10.16	34.86	45.02	57.27	12.25	27.24	37.40	47.27	9.87	PASS
4	0.5505	10.18	23.61	33.79	56.00	22.21	17.21	27.39	46.00	18.61	PASS
5	0.8340	10.15	16.64	26.79	56.00	29.21	6.31	16.46	46.00	29.54	PASS
6	1.1130	10.09	8.01	18.10	56.00	37.90	0.49	10.58	46.00	35.42	PASS



NO.	Frequency [MHz]	Factor [dB]	QP Reading [dBµV]	QP Value [dBµV]	QP Limit [dBµV]	QP Margin [dB]	AV Reading [dBµV]	AV Value [dBµV]	AV Limit [dBµV]	AV Margin [dB]	Verdict
1	0.2400	10.16	40.45	50.61	62.10	11.49	27.11	37.27	52.10	14.83	PASS
2	0.4290	10.17	34.30	44.47	57.27	12.80	26.13	36.30	47.27	10.97	PASS
3	0.4605	10.17	33.75	43.92	56.68	12.76	28.46	38.63	46.68	8.05	PASS
4	0.5640	10.18	22.49	32.67	56.00	23.33	15.38	25.56	46.00	20.44	PASS
5	0.8160	10.15	15.72	25.87	56.00	30.13	5.77	15.92	46.00	30.08	PASS
6	1.1985	10.07	9.71	19.78	56.00	36.22	1.45	11.52	46.00	34.48	PASS

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7.2 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.

7.2.1 E.U.T. Operation

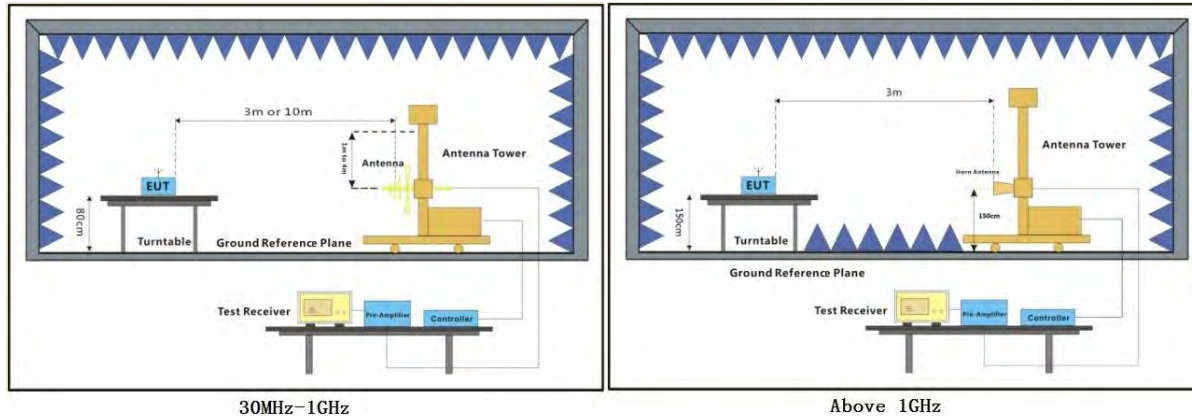
Operating Environment:

Temperature: 23 °C Humidity: 46 % RH Atmospheric Pressure: 1010 mbar

7.2.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	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); data rate @ MCS0 is the worst case of IEEE 802.11ax(HE20); data rate @ MCS0 is the worst case of IEEE 802.11ax(HE40). 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. 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.

Remark 3: Average Measurements Above 1000MHz, VBW = 10 Hz (when duty cycle is no less than 98 percent). $VBW \geq 1/T$, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

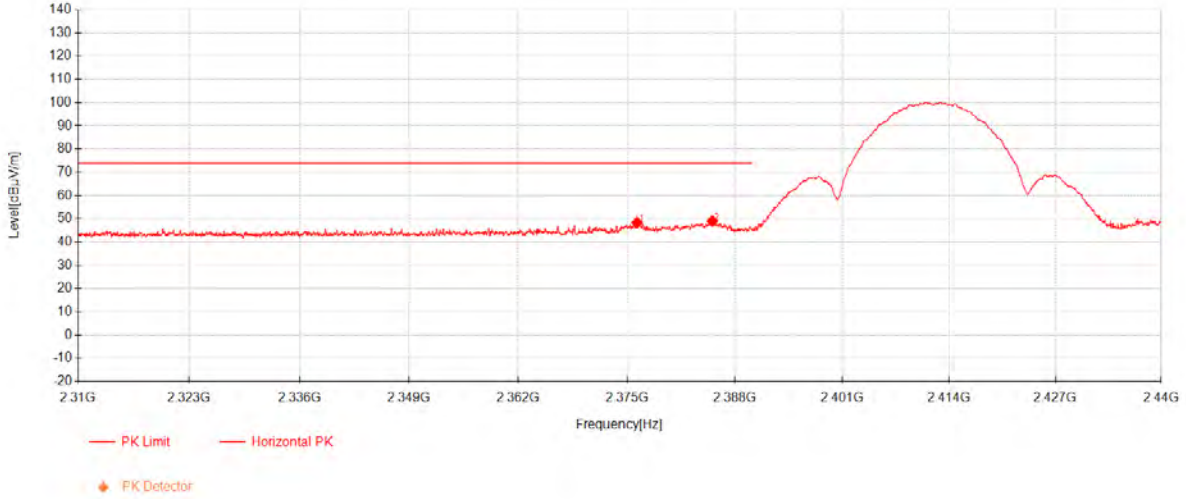
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802.11b_Channel 01



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2376.2025	43.57	27.13	-22.43	48.27	74.00	25.73	Horizontal
2	2385.27	44.25	27.15	-22.41	48.99	74.00	25.01	Horizontal

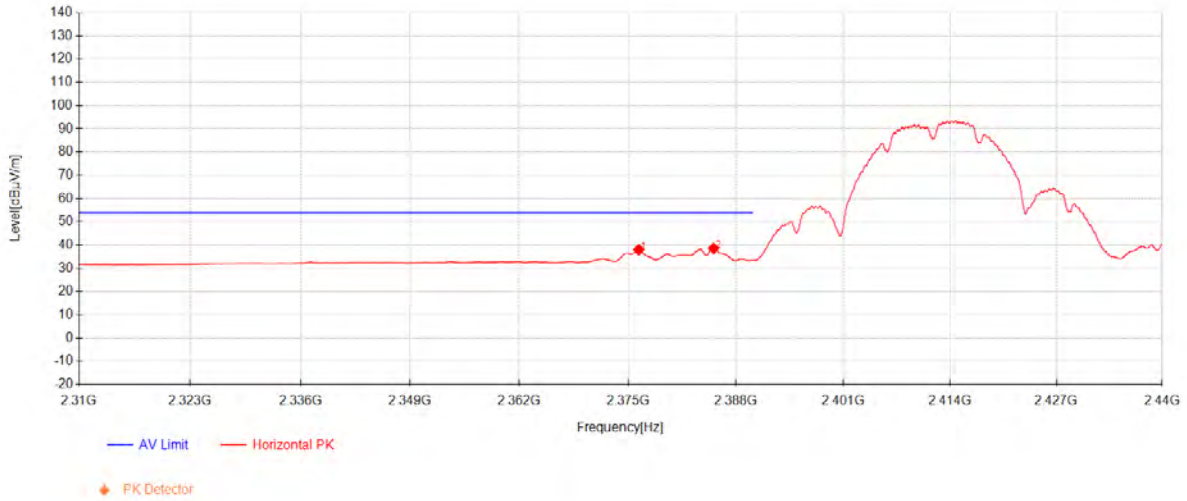
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802.11b_Channel 01



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2376.3	33.28	27.13	-22.43	37.98	54.00	16.02	Horizontal
2	2385.3025	33.80	27.15	-22.41	38.54	54.00	15.46	Horizontal

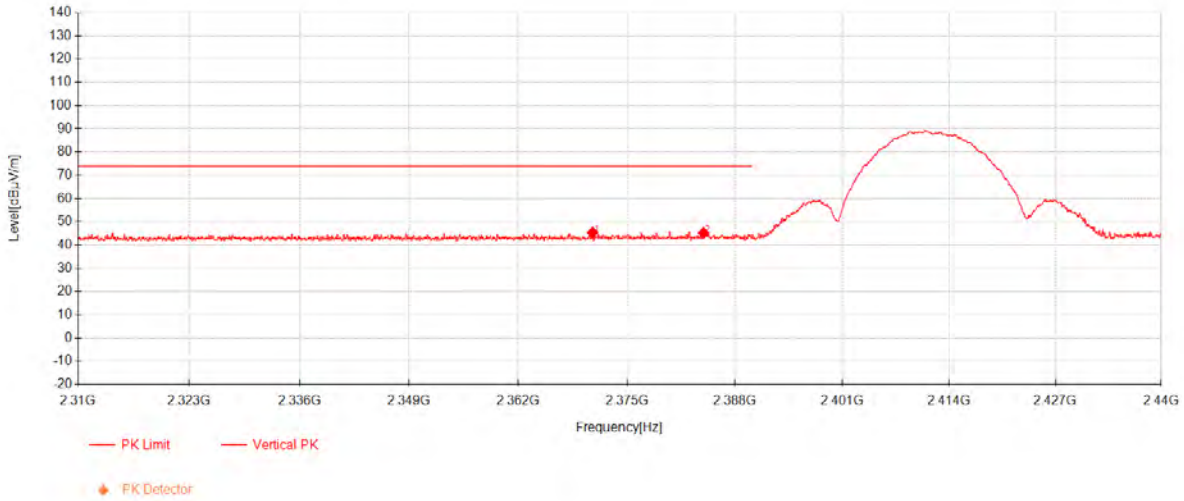
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802.11b_Channel 01



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2370.8725	40.67	27.12	-22.45	45.34	74.00	28.66	Vertical
2	2384.1975	40.47	27.15	-22.41	45.20	74.00	28.80	Vertical

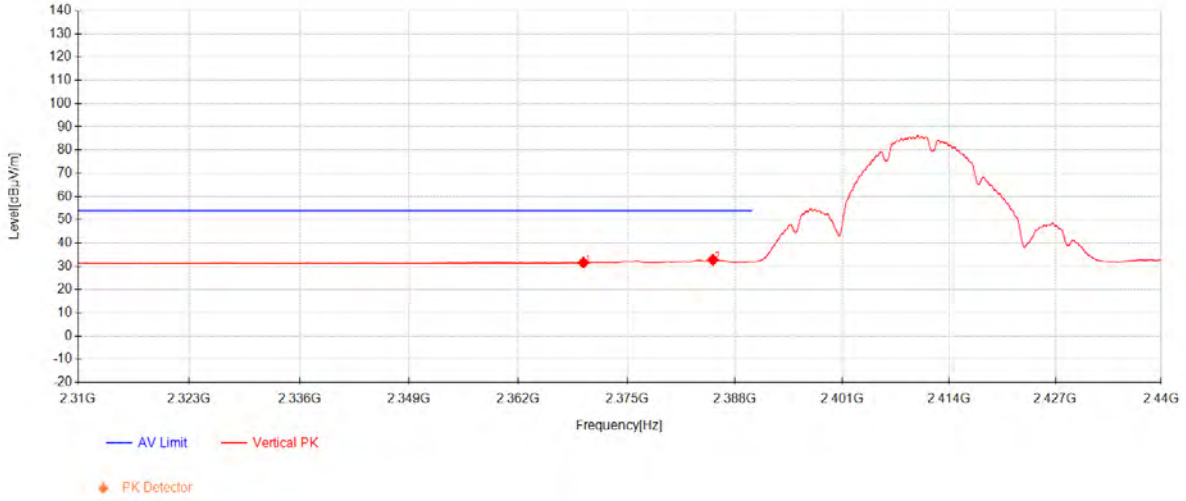
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802.11b_Channel 01



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2369.7675	26.94	27.11	-22.45	31.60	54.00	22.40	Vertical
2	2385.335	28.04	27.15	-22.41	32.78	54.00	21.22	Vertical



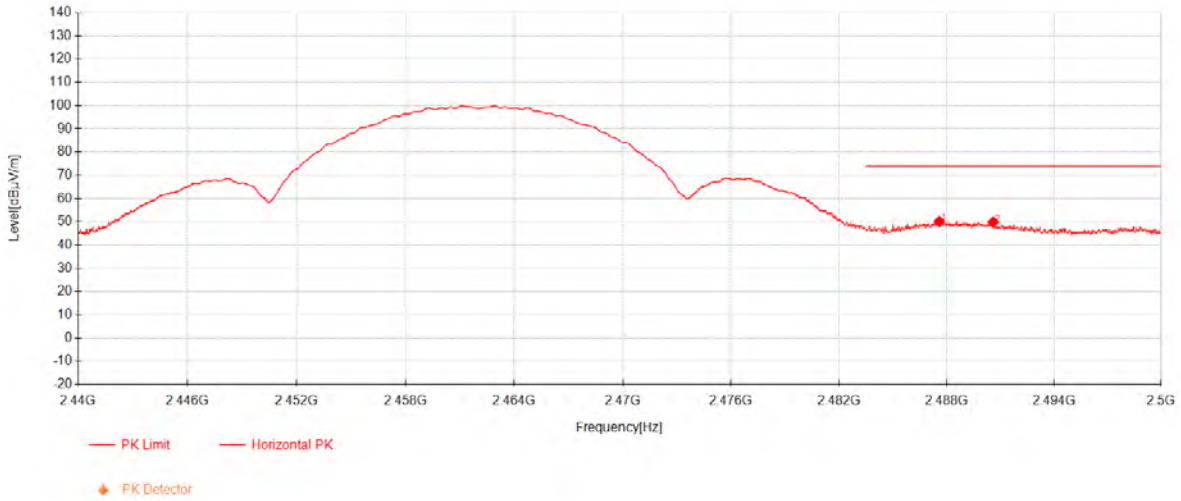
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802.11b_Channel 11



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2487.595	45.01	27.37	-22.29	50.09	74.00	23.91	Horizontal
2	2490.61	44.72	27.38	-22.29	49.81	74.00	24.19	Horizontal

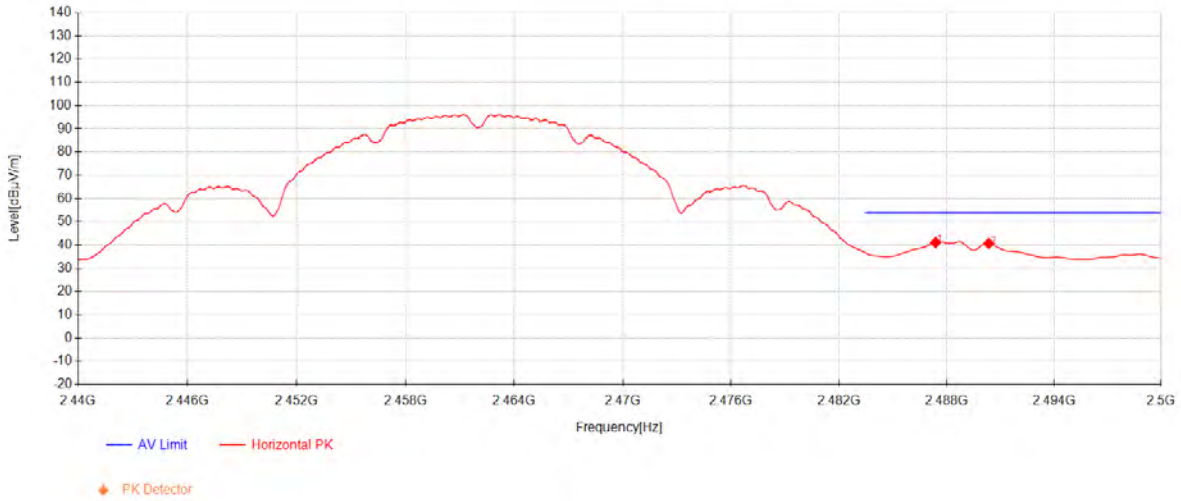
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802.11b_Channel 11



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2487.385	36.02	27.37	-22.29	41.10	54.00	12.90	Horizontal
2	2490.355	35.57	27.38	-22.29	40.66	54.00	13.34	Horizontal



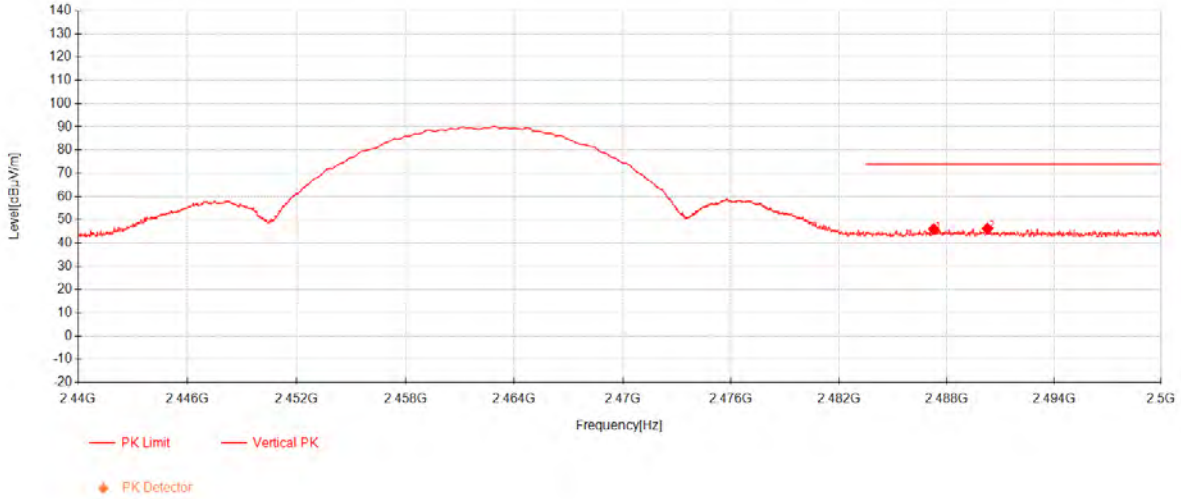
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802.11b_Channel 11



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2487.28	40.87	27.37	-22.29	45.95	74.00	28.05	Vertical
2	2490.28	41.04	27.38	-22.29	46.13	74.00	27.87	Vertical

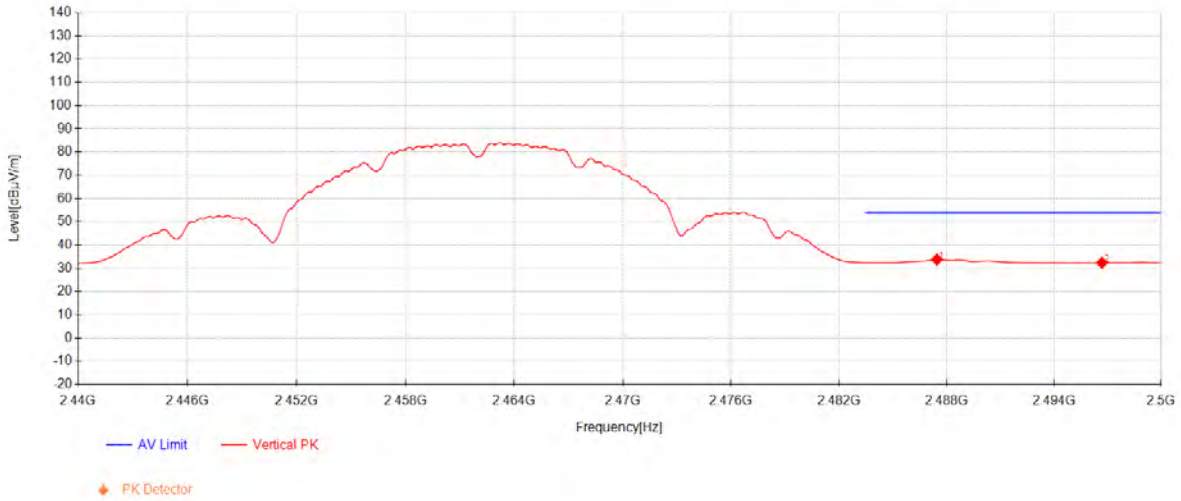
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802.11b_Channel 11



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2487.46	28.70	27.37	-22.29	33.78	54.00	20.22	Vertical
2	2496.685	27.30	27.39	-22.28	32.41	54.00	21.59	Vertical

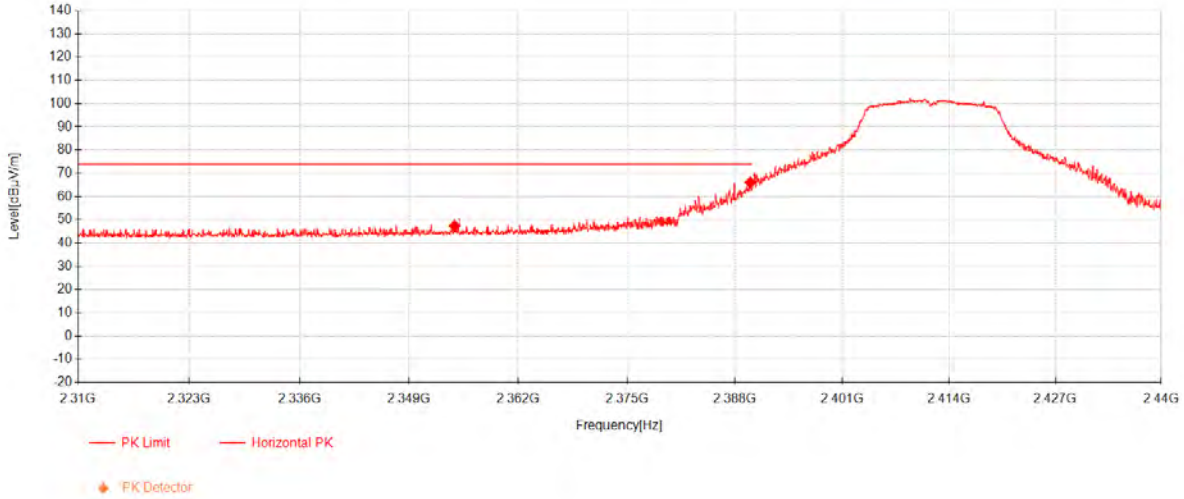
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802.11g_Channel 01



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2354.395	42.73	27.08	-22.49	47.32	74.00	26.68	Horizontal
2	2389.8525	61.30	27.16	-22.40	66.06	74.00	7.94	Horizontal

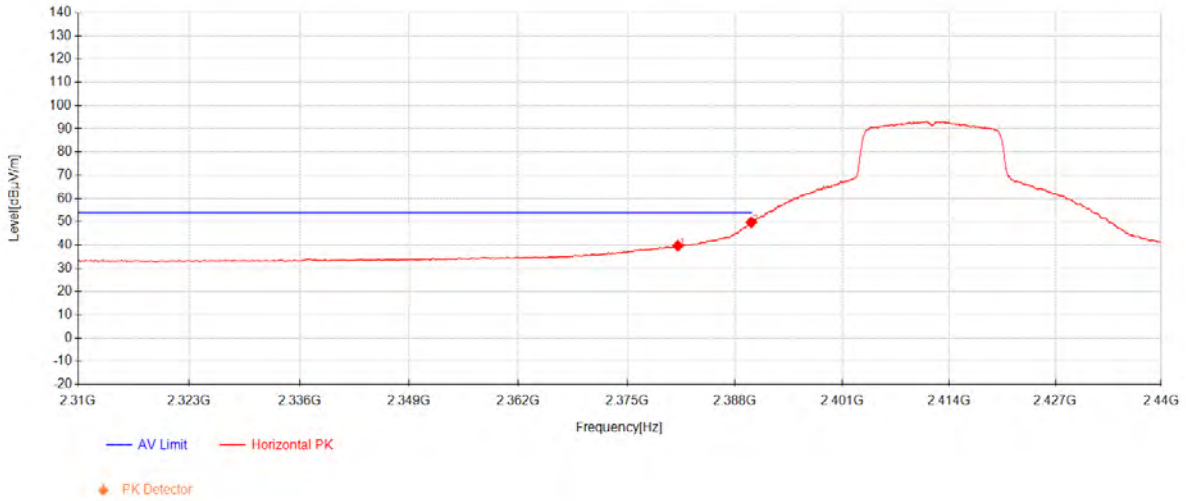
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802.11g_Channel 01



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2381.11	34.96	27.14	-22.42	39.68	54.00	14.32	Horizontal
2	2389.9825	44.98	27.16	-22.40	49.74	54.00	4.26	Horizontal

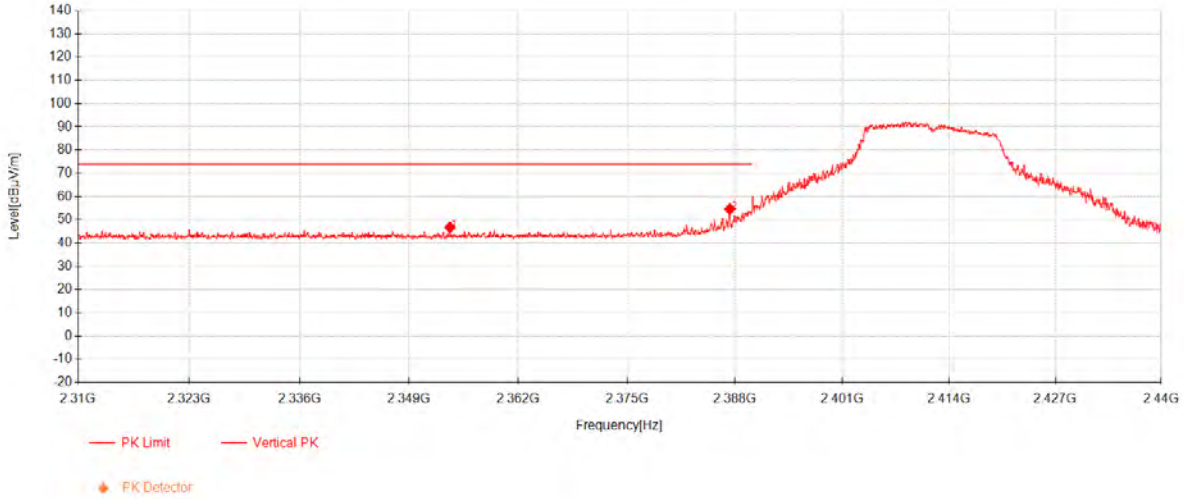
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802.11g_Channel 01



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2353.8425	42.15	27.08	-22.49	46.74	74.00	27.26	Vertical
2	2387.3825	49.89	27.15	-22.40	54.64	74.00	19.36	Vertical

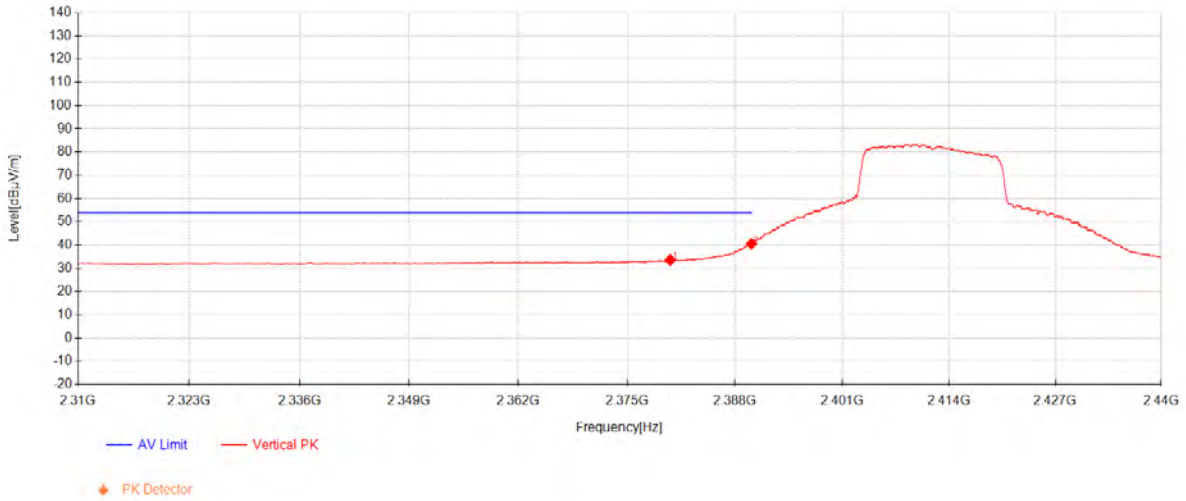
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802.11g_Channel 01



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2380.2	28.90	27.14	-22.42	33.61	54.00	20.39	Vertical
2	2389.9825	35.78	27.16	-22.40	40.54	54.00	13.46	Vertical

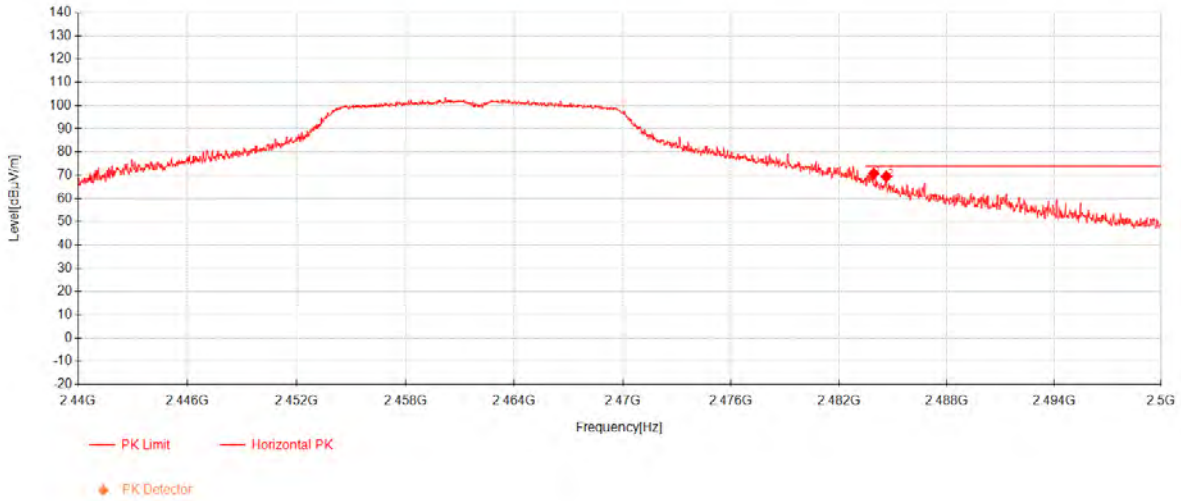
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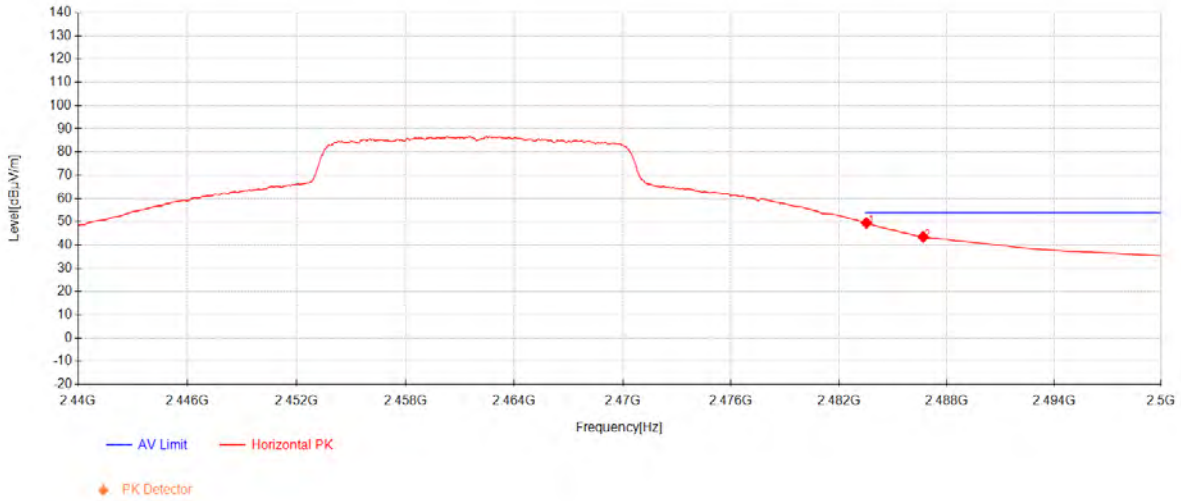
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802.11g_Channel 11



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2483.935	65.58	27.36	-22.29	70.65	74.00	3.35	Horizontal
2	2484.64	64.35	27.37	-22.29	69.42	74.00	4.58	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	2483.53	44.41	27.36	-22.29	49.48	54.00	4.52	Horizontal
2	2486.695	38.45	27.37	-22.29	43.53	54.00	10.47	Horizontal

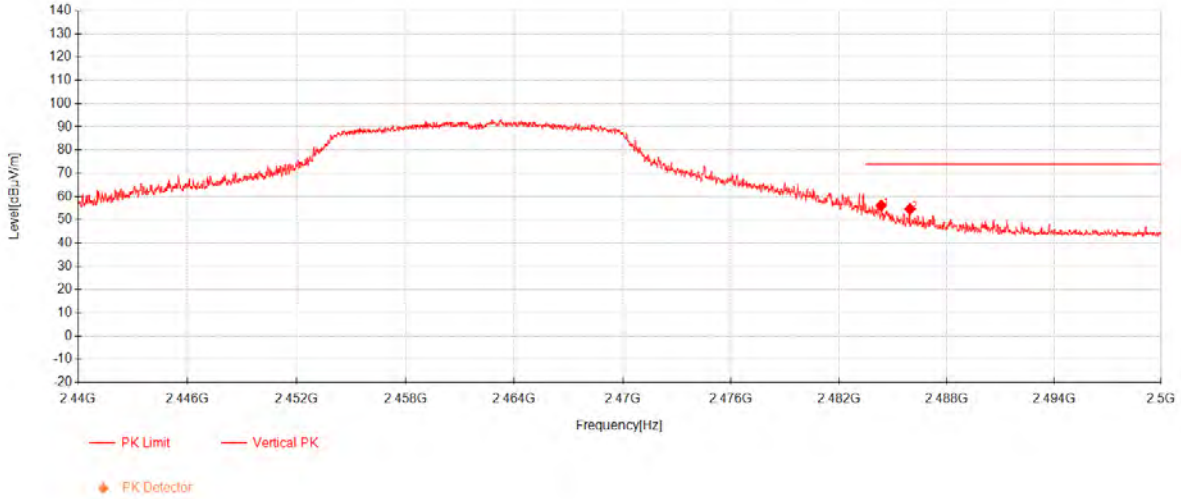
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802.11g_Channel 11



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2484.355	51.09	27.37	-22.29	56.16	74.00	17.84	Vertical
2	2485.96	49.57	27.37	-22.29	54.65	74.00	19.35	Vertical

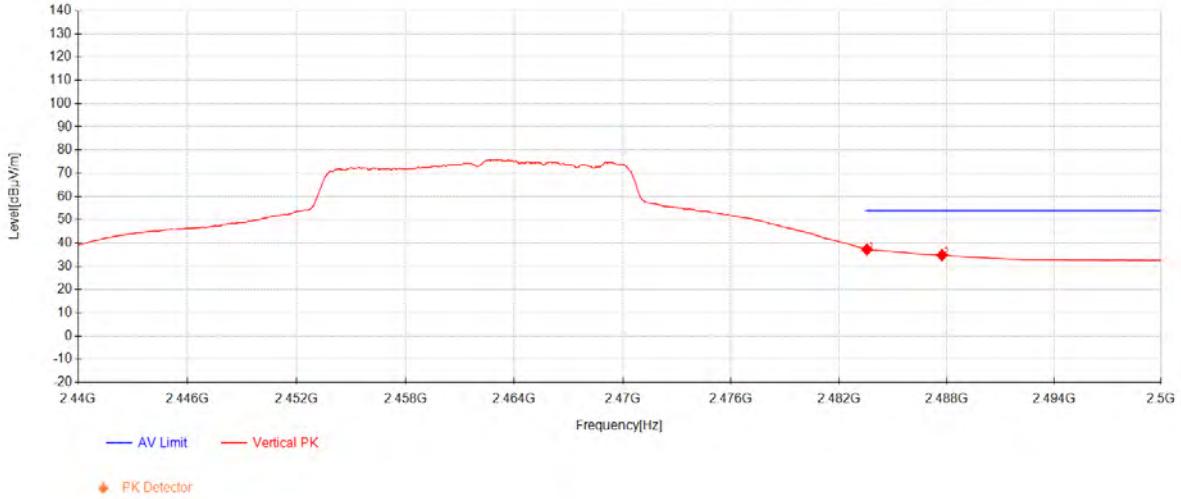
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802.11g_Channel 11



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2483.56	32.10	27.36	-22.29	37.17	54.00	16.83	Vertical
2	2487.745	29.71	27.37	-22.29	34.79	54.00	19.21	Vertical

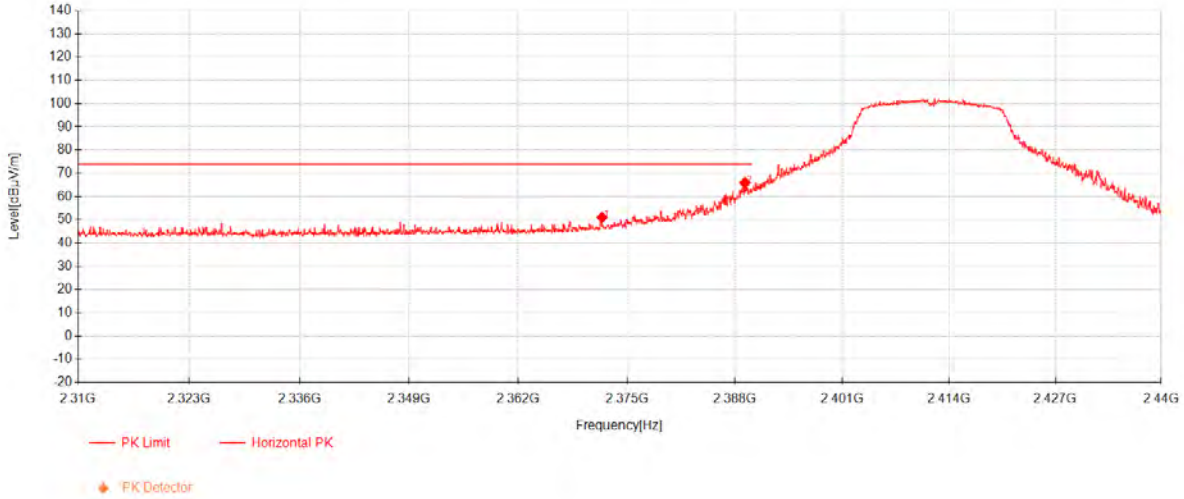
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802.11n20_Channel 01



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2372.01	46.37	27.12	-22.44	51.05	74.00	22.95	Horizontal
2	2389.2025	61.17	27.16	-22.40	65.93	74.00	8.07	Horizontal

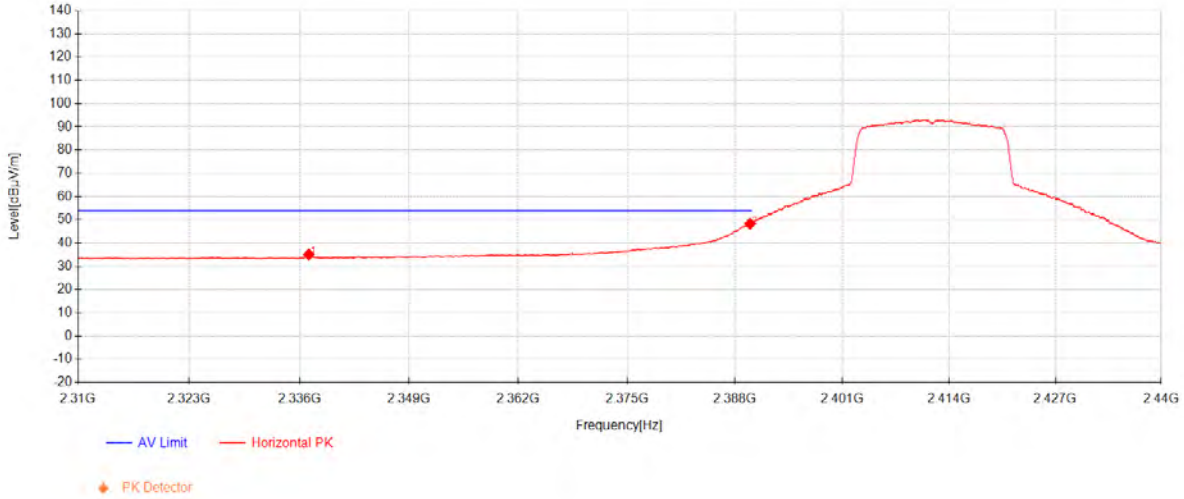
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802.11n20_Channel 01



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2337.105	30.57	27.04	-22.53	35.08	54.00	18.92	Horizontal
2	2389.82	43.48	27.16	-22.40	48.24	54.00	5.76	Horizontal

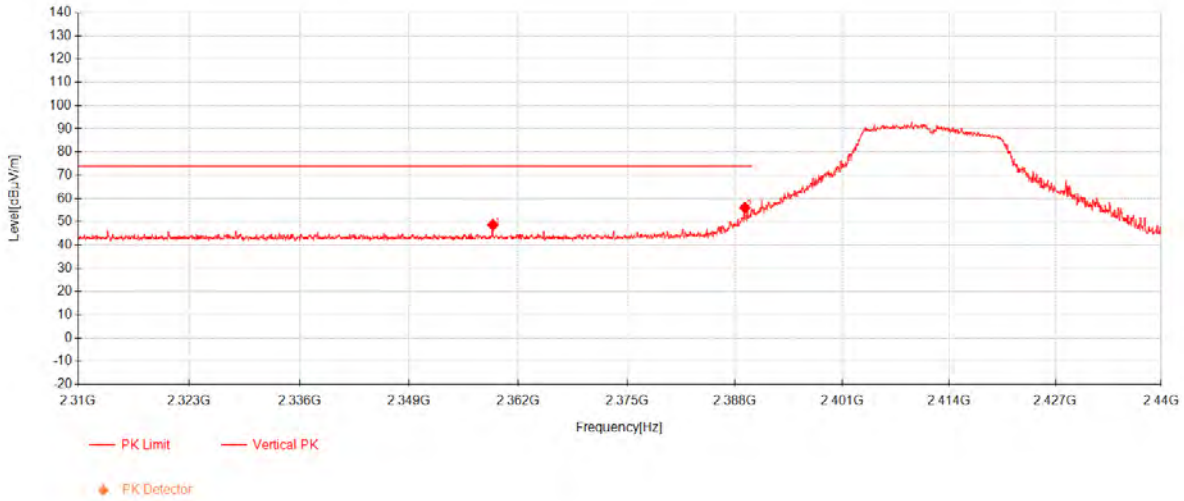
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802.11n20_Channel 01



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2358.945	43.97	27.09	-22.48	48.58	74.00	25.42	Vertical
2	2389.2025	51.31	27.16	-22.40	56.07	74.00	17.93	Vertical

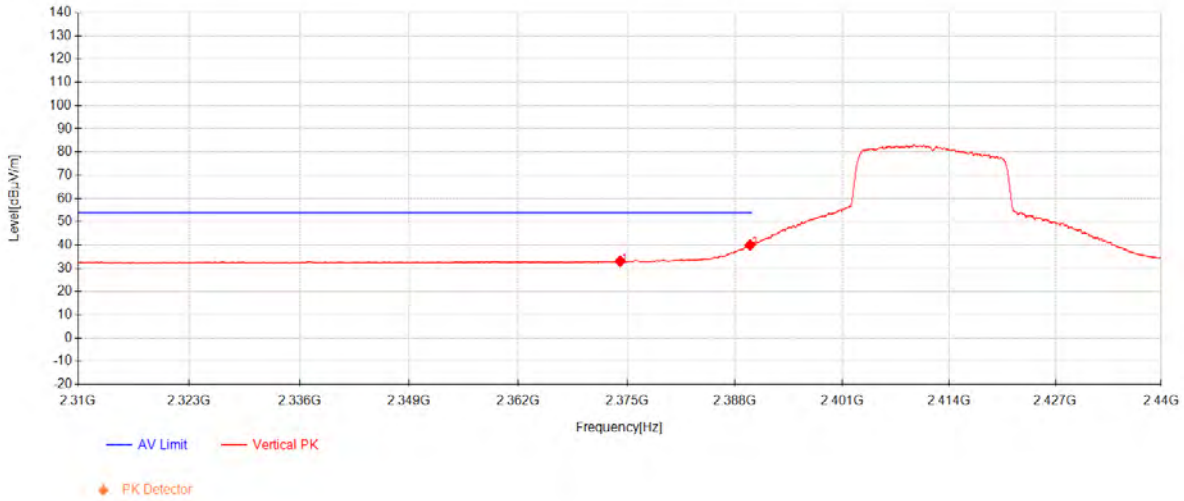
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802.11n20_Channel 01



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2374.1875	28.35	27.12	-22.44	33.04	54.00	20.96	Vertical
2	2389.82	35.26	27.16	-22.40	40.02	54.00	13.98	Vertical

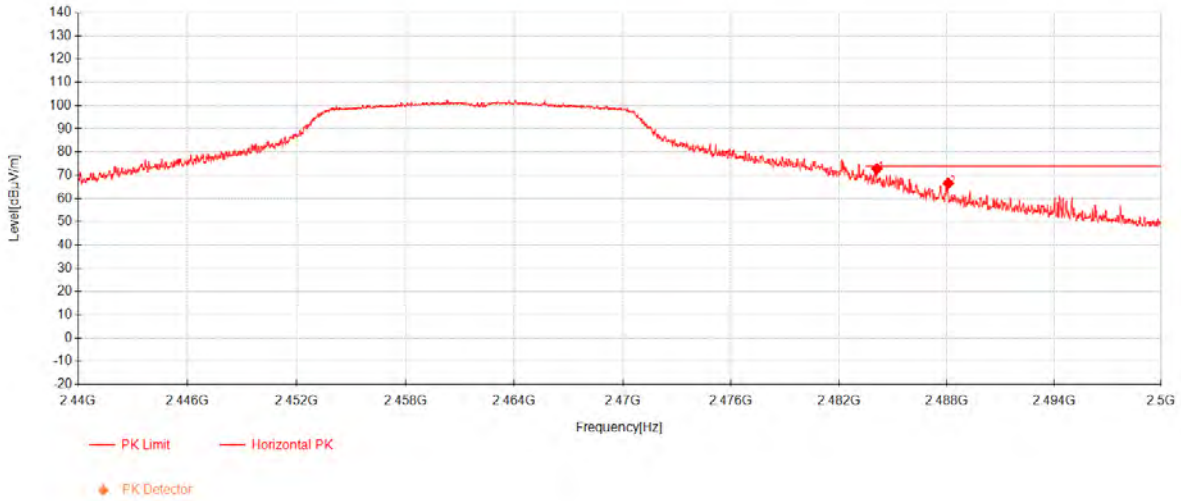
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802.11n20_Channel 11



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2484.115	67.71	27.37	-22.29	72.78	74.00	1.22	Horizontal
2	2488.09	61.46	27.37	-22.29	66.54	74.00	7.46	Horizontal

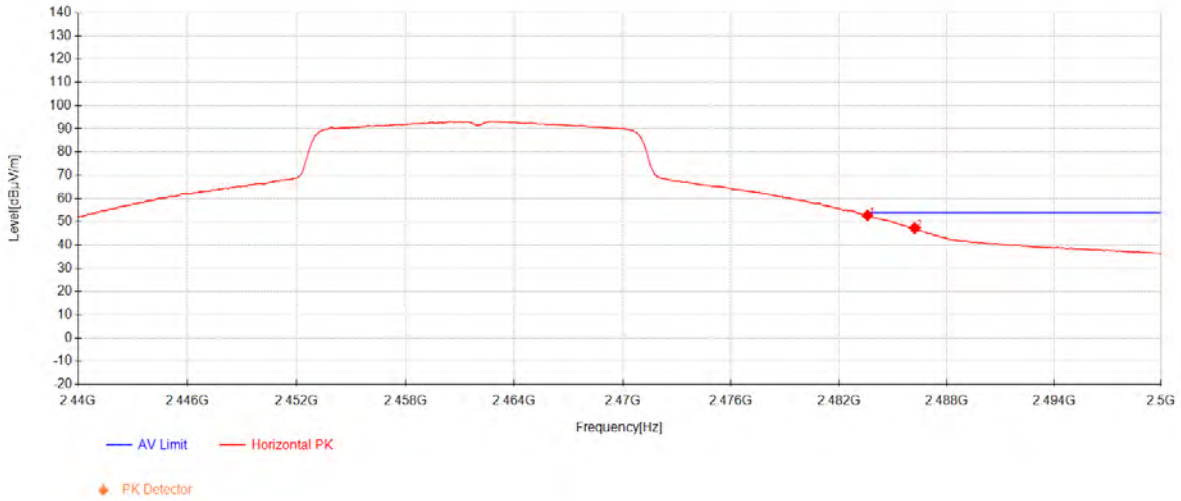
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802.11n20_Channel 11



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2483.59	47.65	27.36	-22.29	52.72	54.00	1.28	Horizontal
2	2486.215	42.20	27.37	-22.29	47.28	54.00	6.72	Horizontal

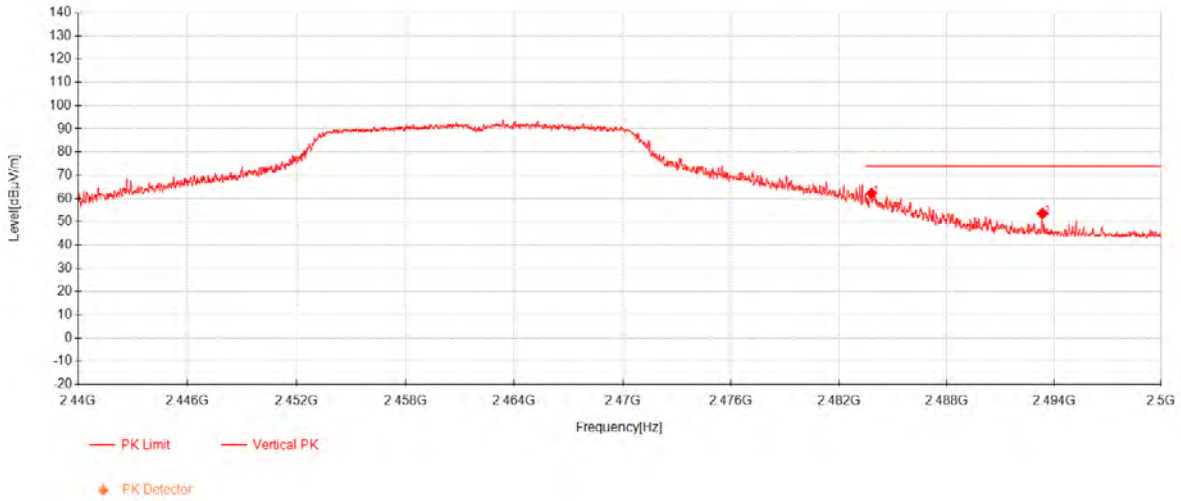
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802.11n20_Channel 11



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2483.815	57.12	27.36	-22.29	62.19	74.00	11.81	Vertical
2	2493.355	48.42	27.39	-22.29	53.52	74.00	20.48	Vertical

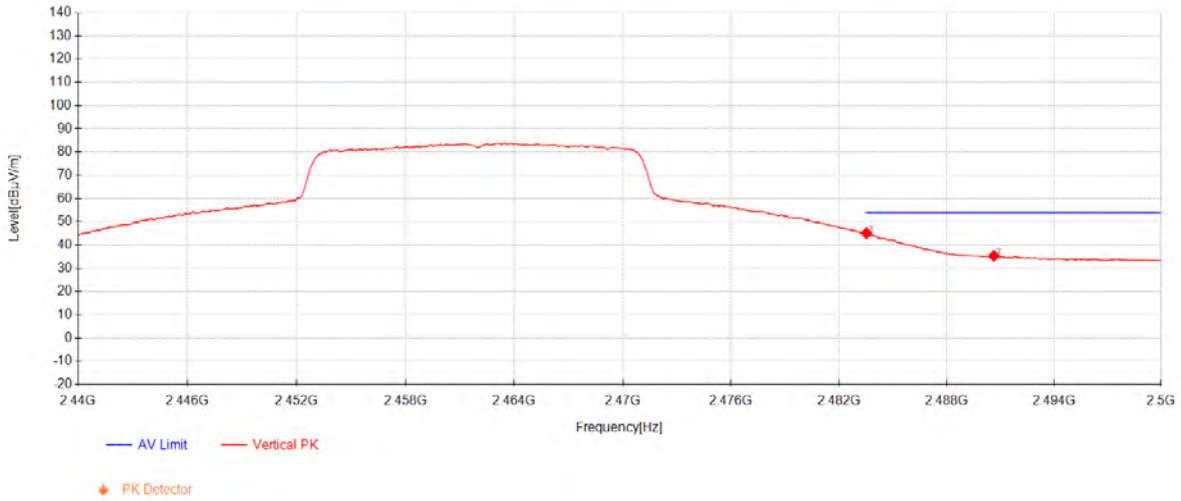
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802.11n20_Channel 11



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2483.53	40.05	27.36	-22.29	45.12	54.00	8.88	Vertical
2	2490.64	30.22	27.38	-22.29	35.31	54.00	18.69	Vertical

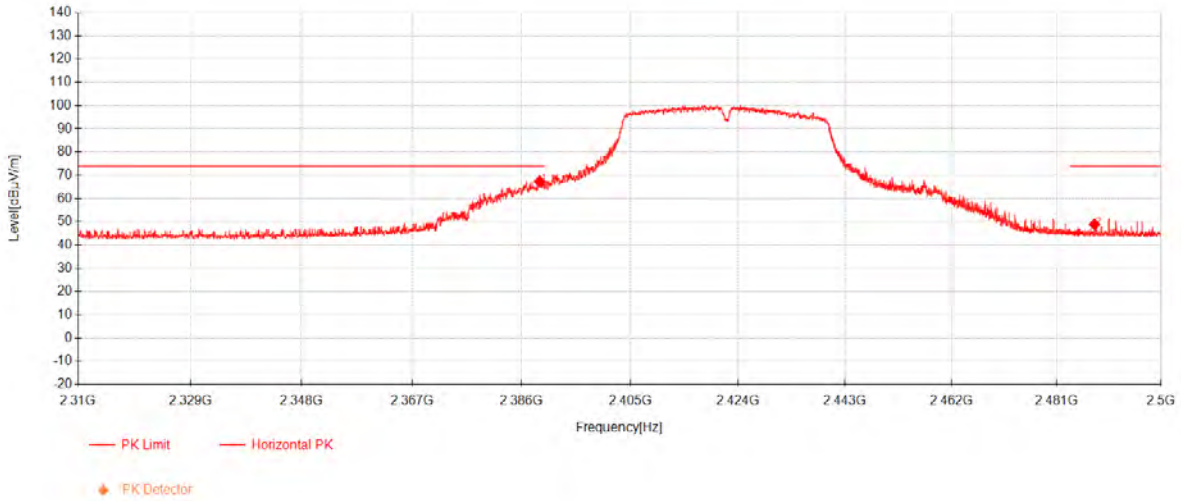
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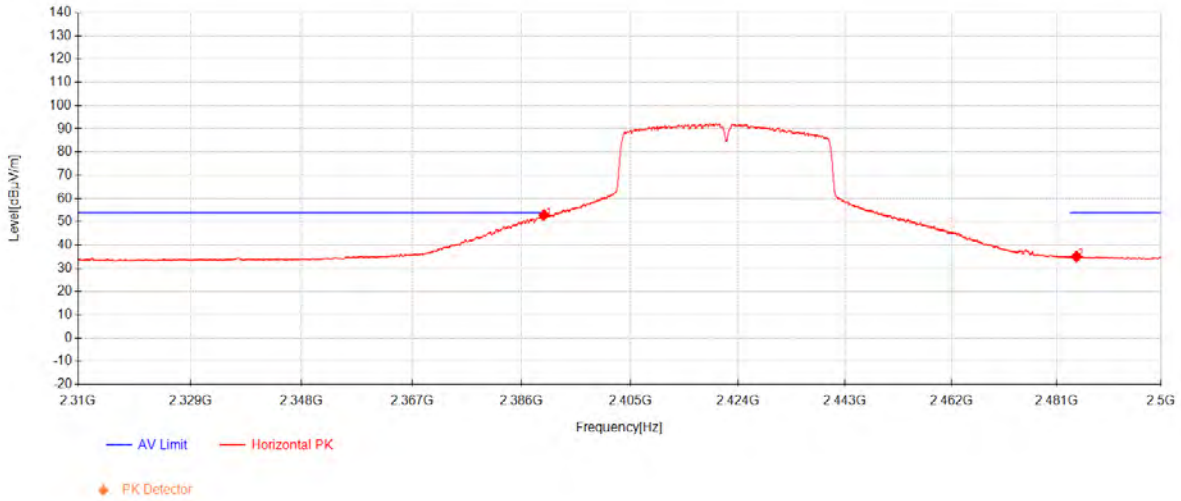
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802.11n40_Channel 03



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2389.1375	62.59	27.16	-22.40	67.35	74.00	6.65	Horizontal
2	2487.88	43.78	27.37	-22.29	48.86	74.00	25.14	Horizontal

802.11n40_Channel 03



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2389.9175	48.16	27.16	-22.40	52.92	54.00	1.08	Horizontal
2	2484.61	29.96	27.37	-22.29	35.03	54.00	18.97	Horizontal

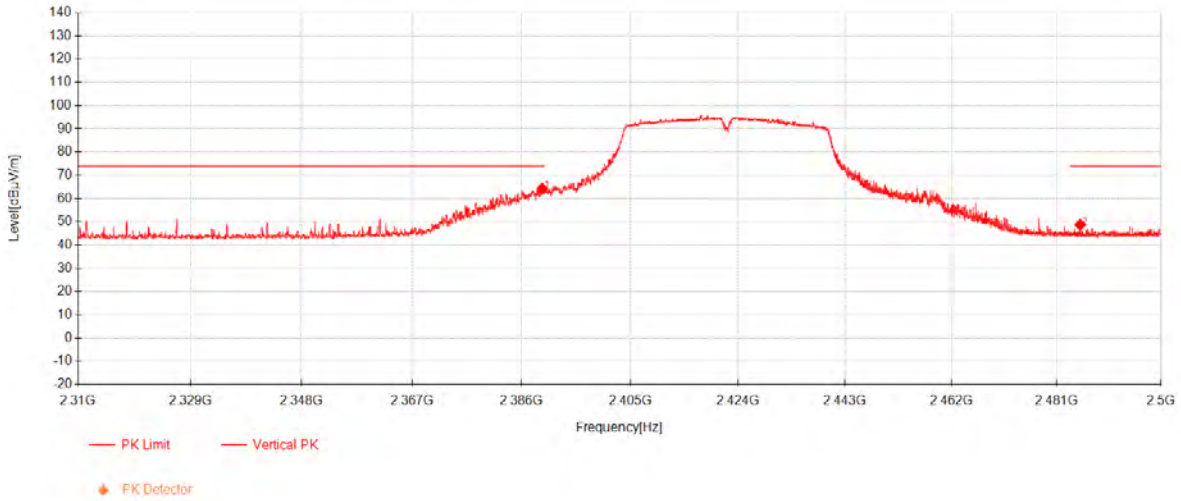
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802.11n40_Channel 03



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2389.5925	59.57	27.16	-22.40	64.33	74.00	9.67	Vertical
2	2485.285	43.55	27.37	-22.29	48.62	74.00	25.38	Vertical

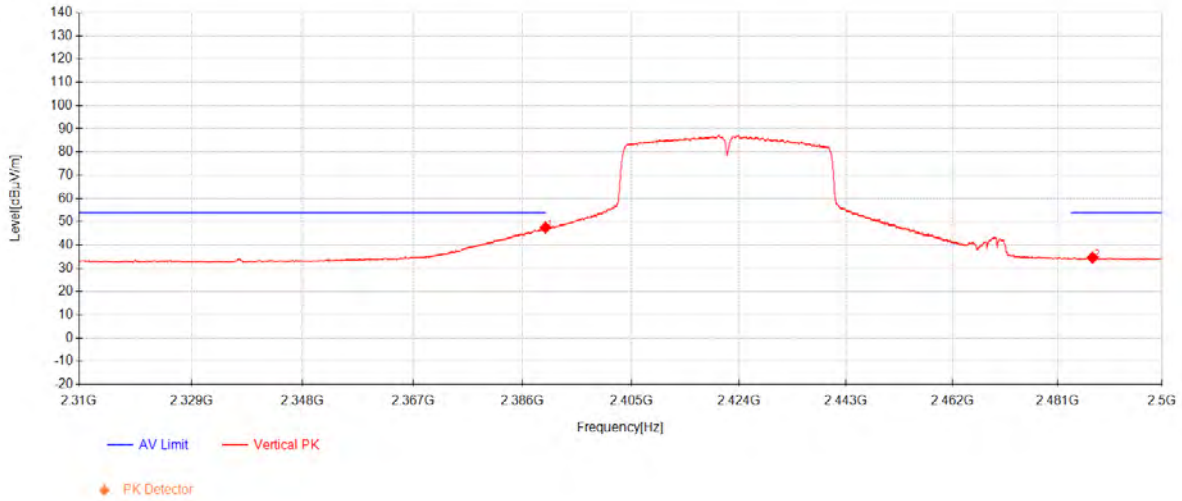
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802.11n40_Channel 03



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2389.9825	42.73	27.16	-22.40	47.49	54.00	6.51	Vertical
2	2487.34	29.49	27.37	-22.29	34.57	54.00	19.43	Vertical

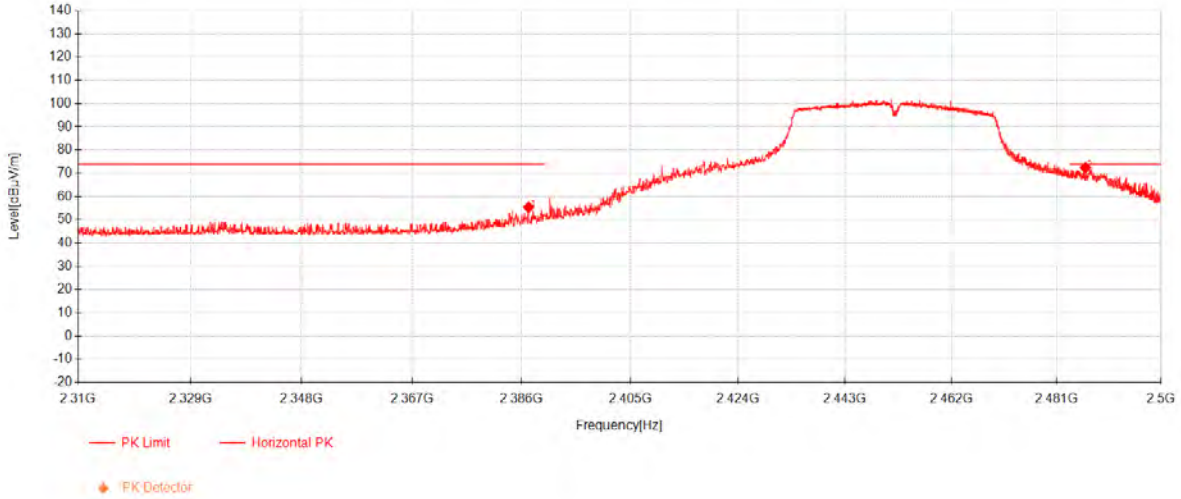
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802.11n40_Channel 09



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2387.22	50.65	27.15	-22.40	55.40	74.00	18.60	Horizontal
2	2486.23	67.22	27.37	-22.29	72.30	74.00	1.70	Horizontal

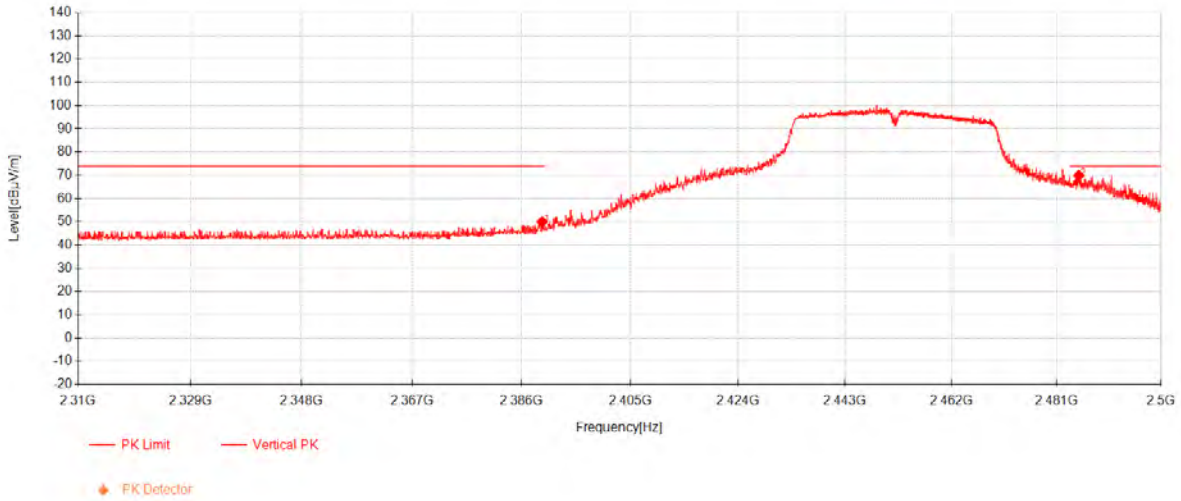
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802.11n40_Channel 09



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2389.5925	45.20	27.16	-22.40	49.96	74.00	24.04	Vertical
2	2485.045	64.80	27.37	-22.29	69.87	74.00	4.13	Vertical

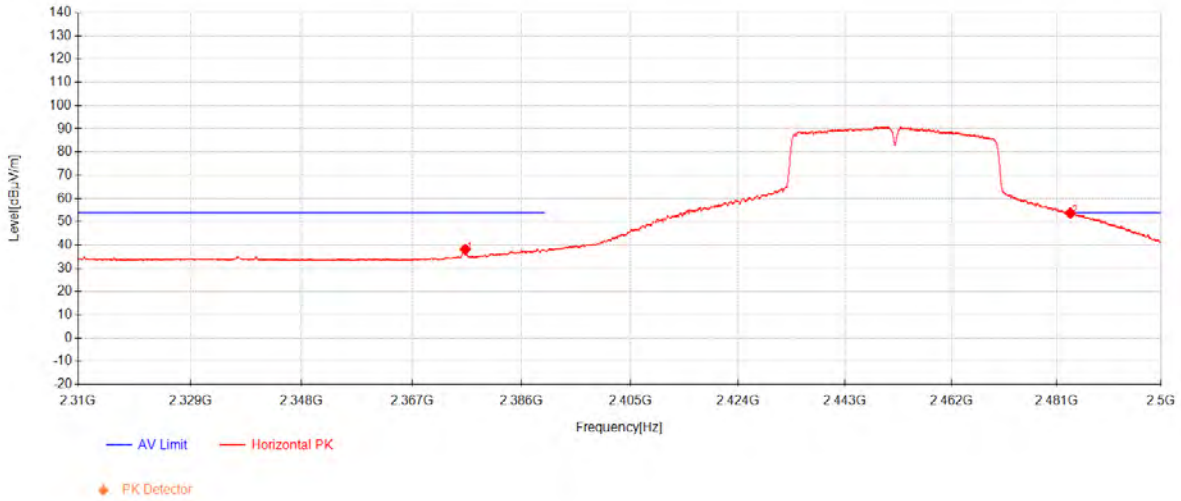
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802.11n40_Channel 09



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2376.2025	33.40	27.13	-22.43	38.10	54.00	15.90	Horizontal
2	2483.5	48.67	27.36	-22.29	53.74	54.00	0.26	Horizontal

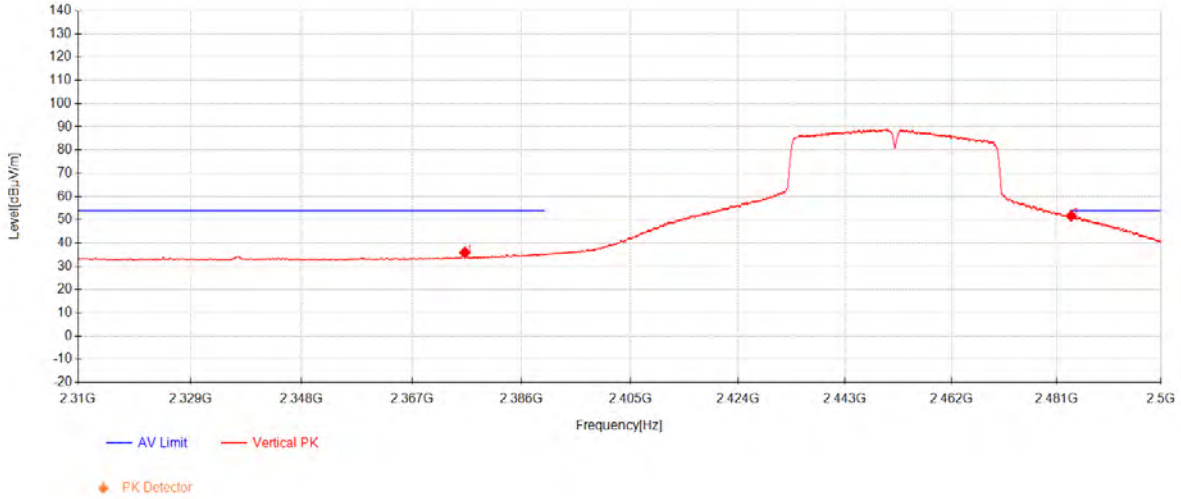
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802.11n40_Channel 09



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2376.1375	31.16	27.13	-22.43	35.86	54.00	18.14	Vertical
2	2483.65	46.55	27.36	-22.29	51.62	54.00	2.38	Vertical

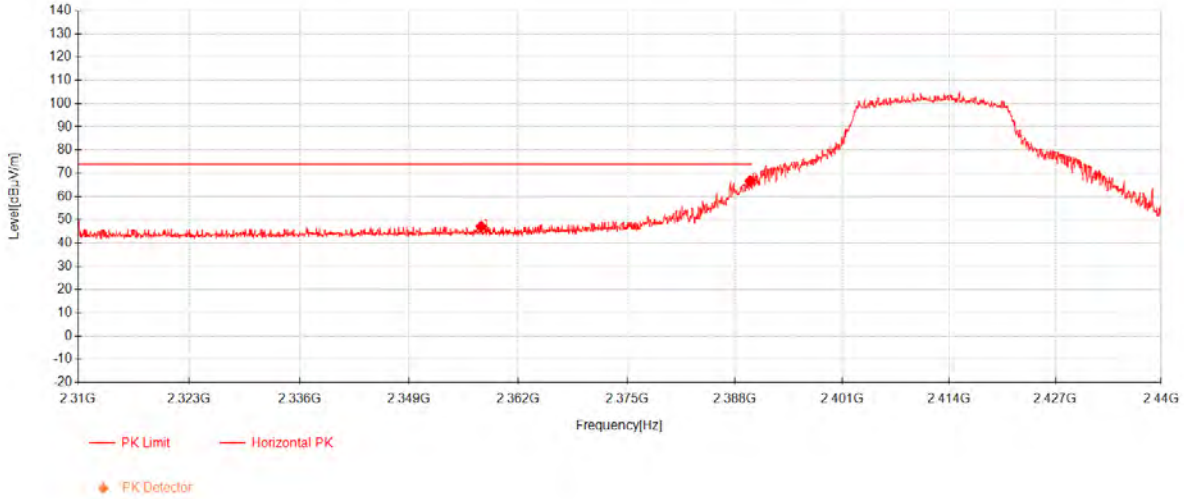
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802.11ax20_Channel 01



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2357.5475	42.43	27.09	-22.48	47.04	74.00	26.96	Horizontal
2	2389.82	61.94	27.16	-22.40	66.70	74.00	7.30	Horizontal

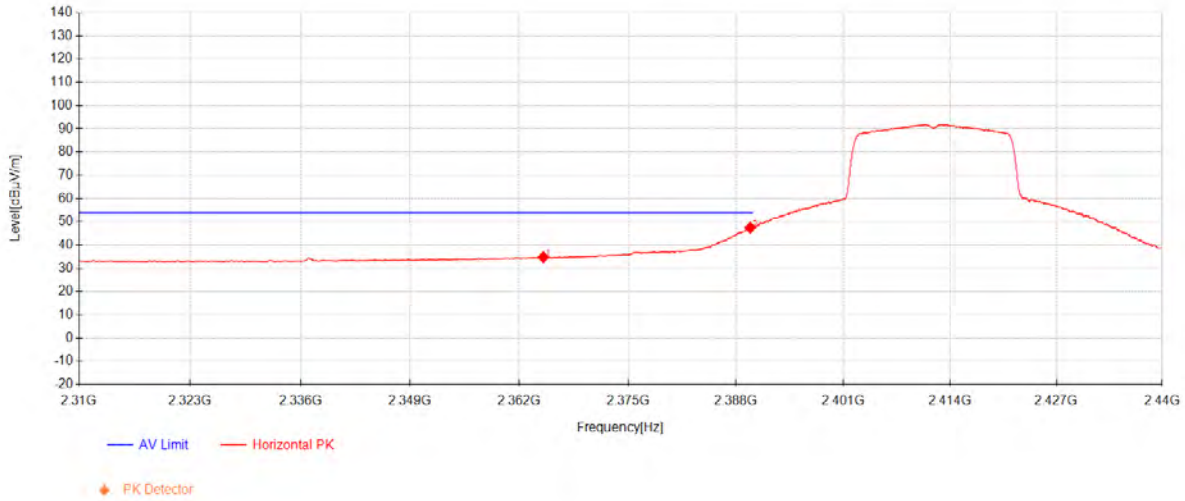
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802.11ax20_Channel 01



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2364.86	30.13	27.10	-22.46	34.77	54.00	19.23	Horizontal
2	2389.7225	42.67	27.16	-22.40	47.43	54.00	6.57	Horizontal

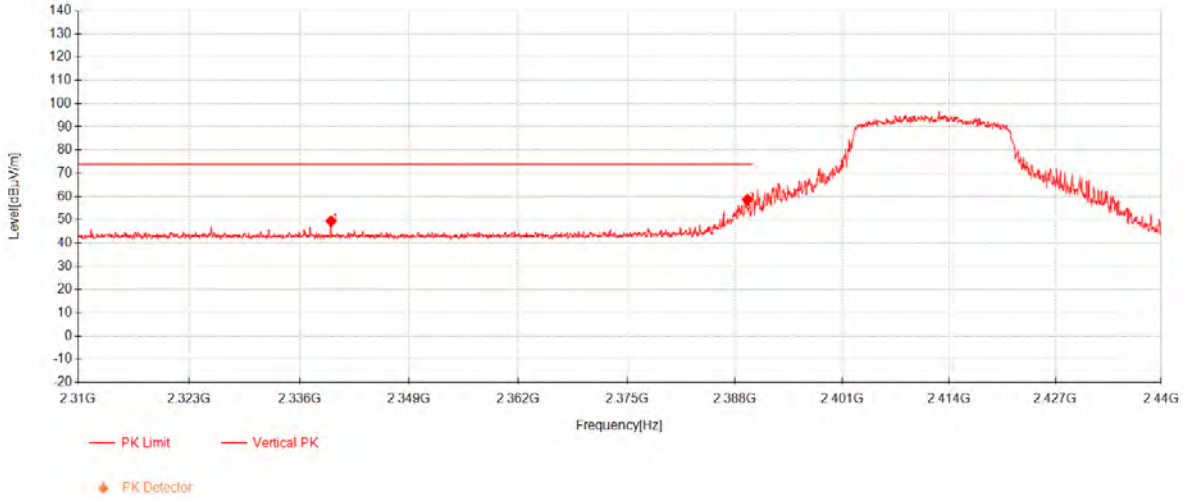
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802.11ax20_Channel 01



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2339.7375	44.85	27.05	-22.53	49.37	74.00	24.63	Vertical
2	2389.495	53.90	27.16	-22.40	58.66	74.00	15.34	Vertical

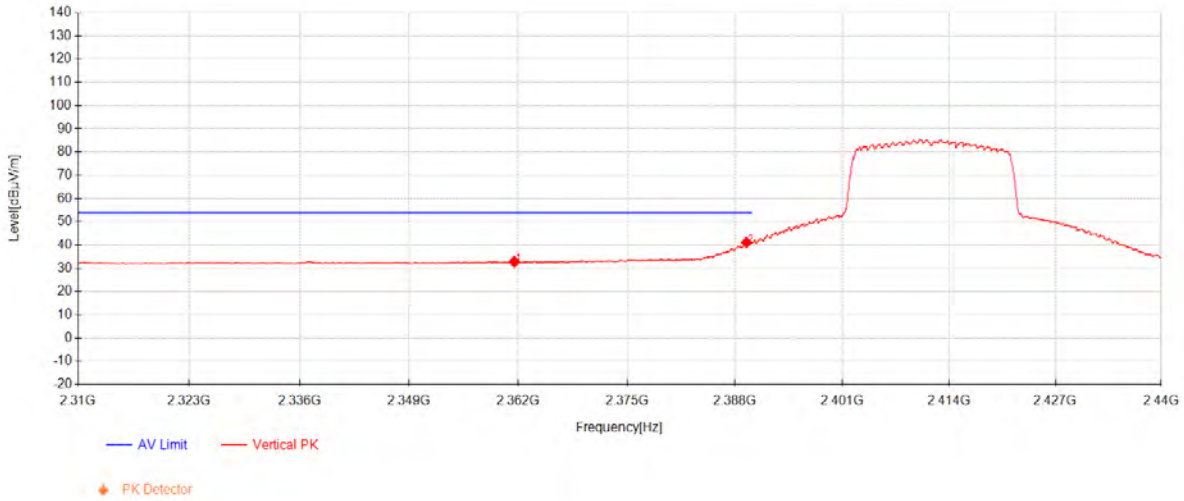
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802.11ax20_Channel 01



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2361.5125	28.21	27.10	-22.47	32.84	54.00	21.16	Vertical
2	2389.3975	36.37	27.16	-22.40	41.13	54.00	12.87	Vertical

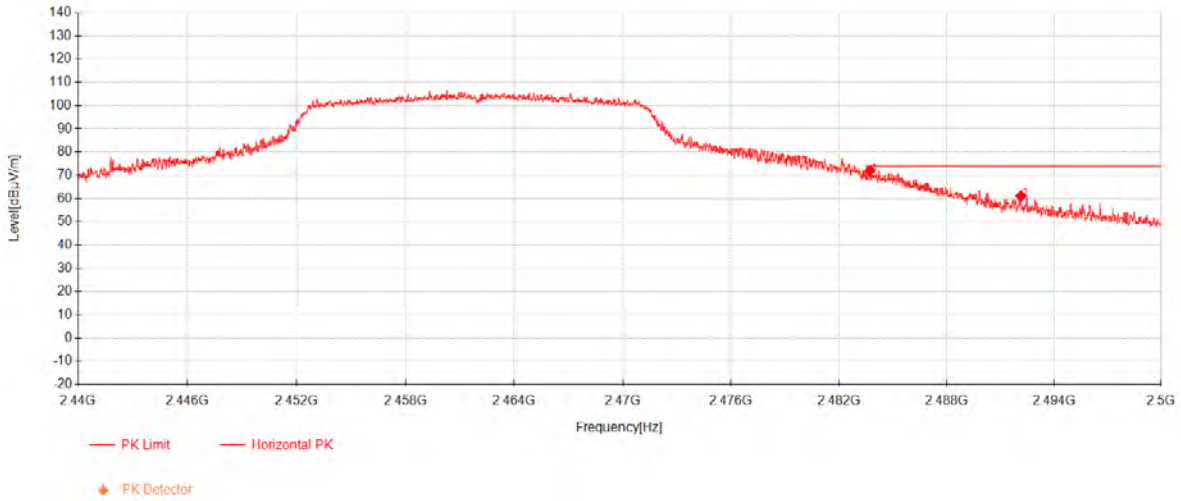
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802.11ax20_Channel 11



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2483.725	66.86	27.36	-22.29	71.93	74.00	2.07	Horizontal
2	2492.155	55.97	27.38	-22.29	61.07	74.00	12.93	Horizontal

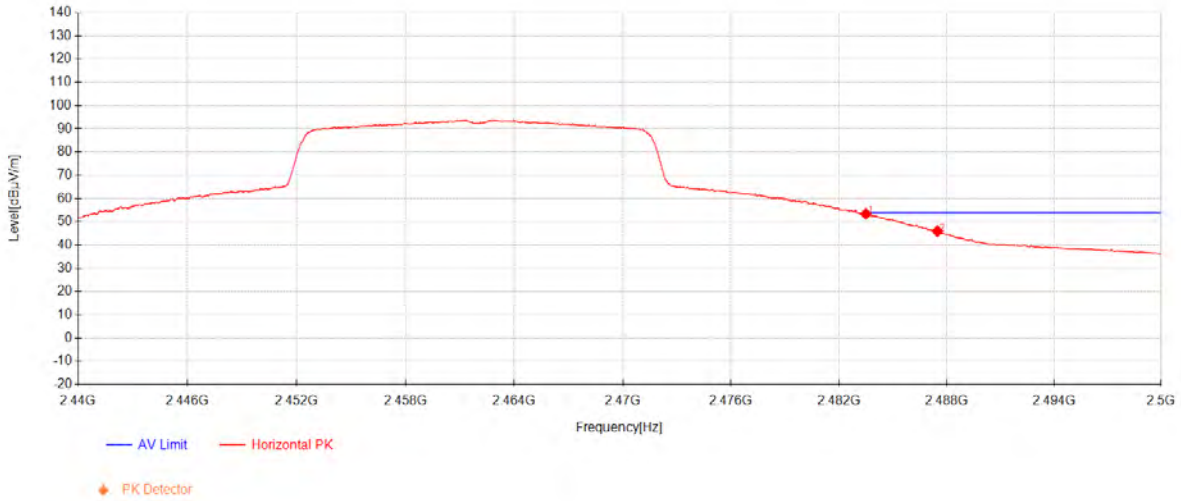
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802.11ax20_Channel 11



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2483.5	48.32	27.36	-22.29	53.39	54.00	0.61	Horizontal
2	2487.49	40.89	27.37	-22.29	45.97	54.00	8.03	Horizontal

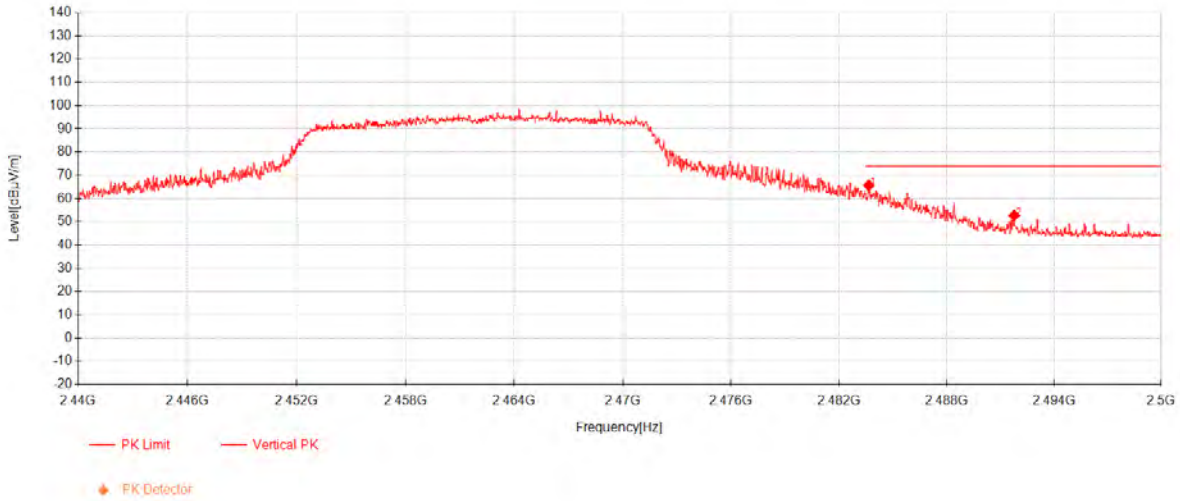
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802.11ax20_Channel 11



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2483.665	60.65	27.36	-22.29	65.72	74.00	8.28	Vertical
2	2491.78	47.63	27.38	-22.29	52.72	74.00	21.28	Vertical

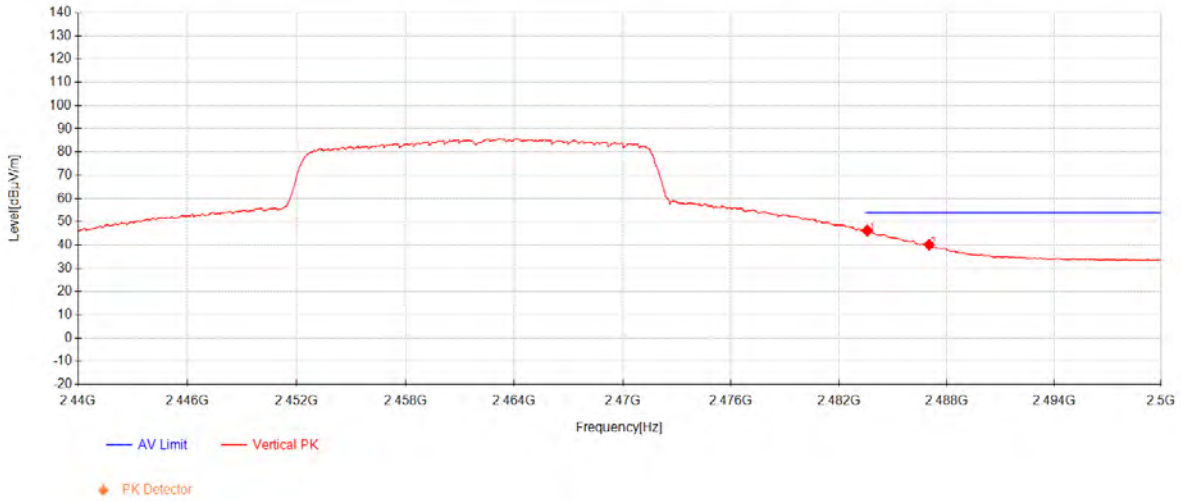
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802.11ax20_Channel 11



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2483.575	41.14	27.36	-22.29	46.21	54.00	7.79	Vertical
2	2487.025	35.04	27.37	-22.29	40.12	54.00	13.88	Vertical

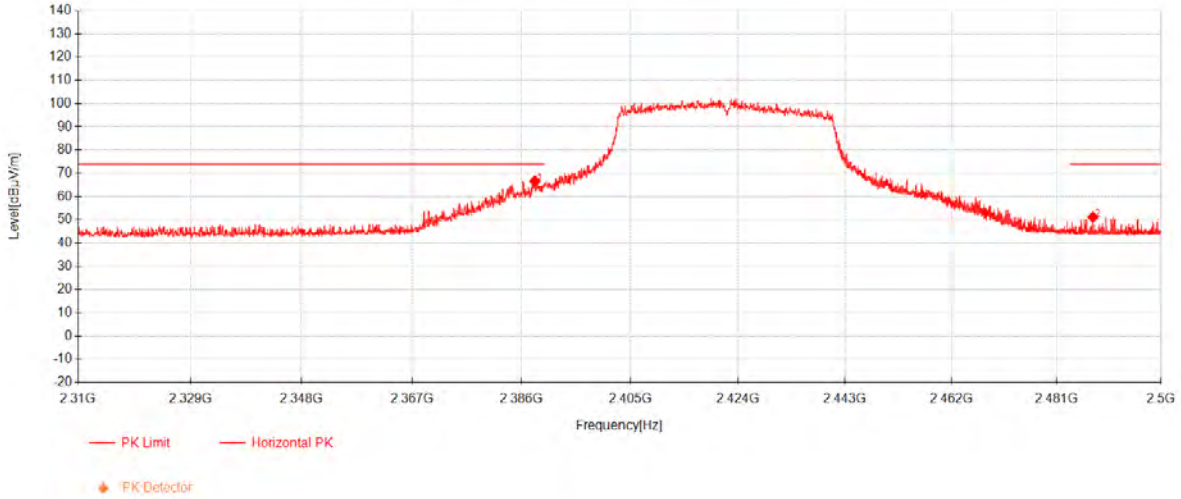
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802.11ax40_Channel 03



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2388.325	61.90	27.15	-22.40	66.65	74.00	7.35	Horizontal
2	2487.595	46.06	27.37	-22.29	51.14	74.00	22.86	Horizontal

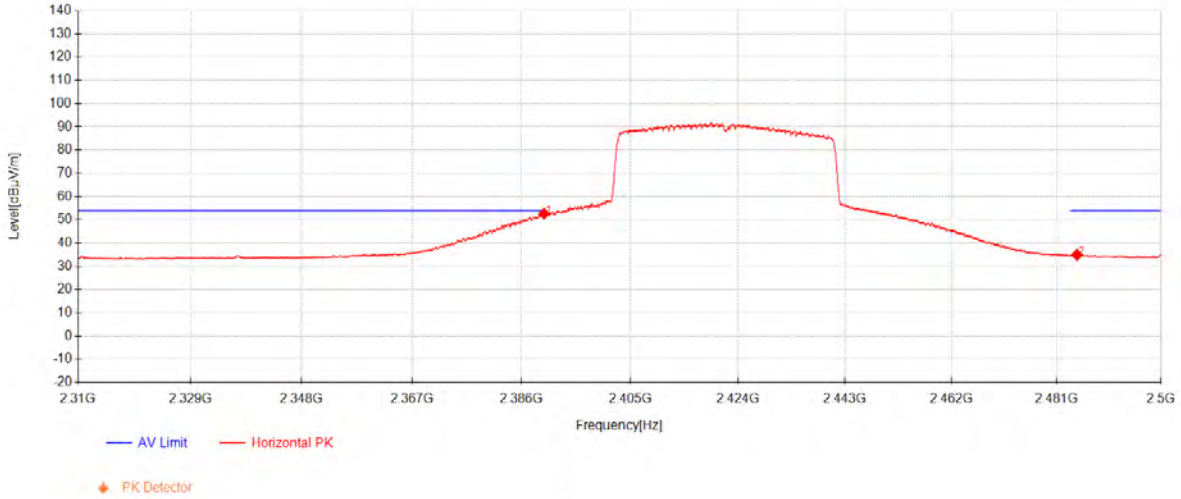
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802.11ax40_Channel 03



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2389.9175	47.84	27.16	-22.40	52.60	54.00	1.40	Horizontal
2	2484.715	29.84	27.37	-22.29	34.91	54.00	19.09	Horizontal

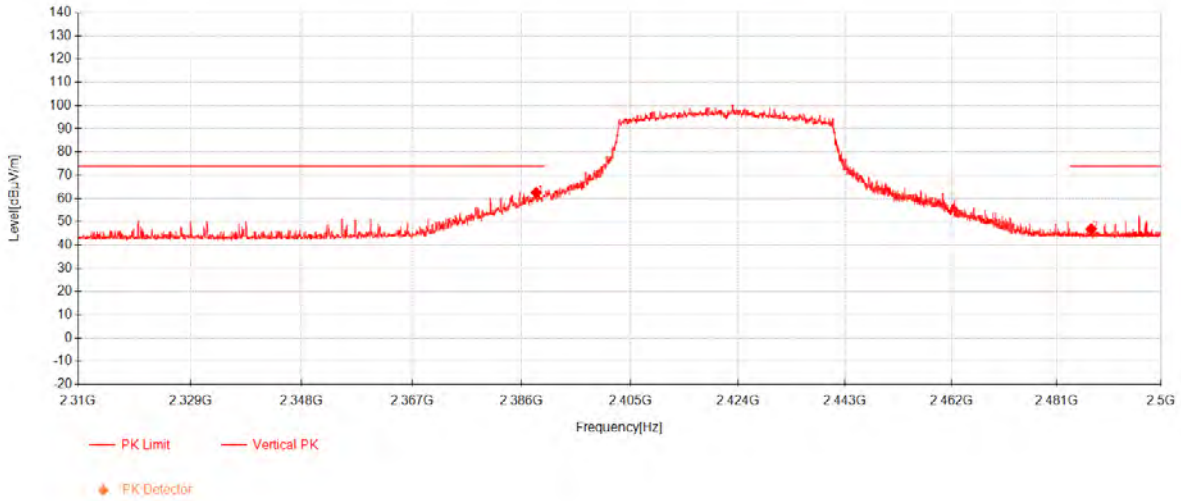
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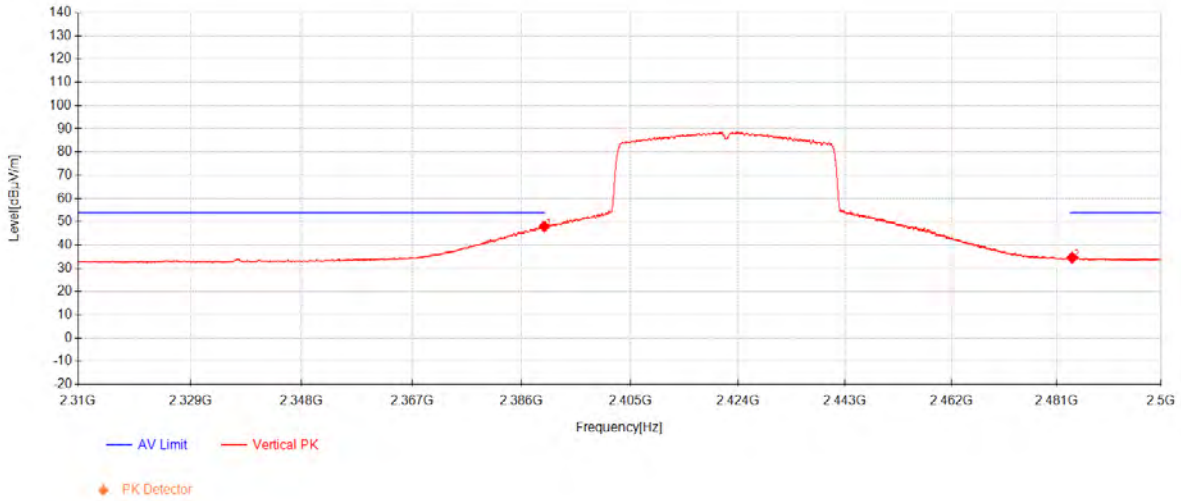
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802.11ax40_Channel 03



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2388.5525	57.77	27.15	-22.40	62.53	74.00	11.47	Vertical
2	2487.28	41.74	27.37	-22.29	46.82	74.00	27.18	Vertical

802.11ax40_Channel 03



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2389.95	43.18	27.16	-22.40	47.94	54.00	6.06	Vertical
2	2483.815	29.51	27.36	-22.29	34.58	54.00	19.42	Vertical

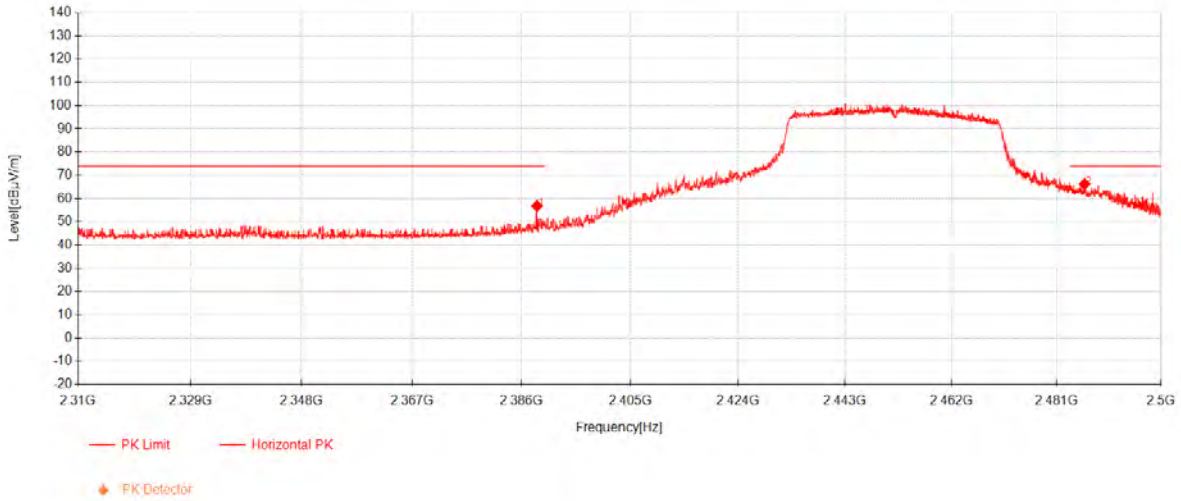
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802.11ax40_Channel 09



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2388.6825	52.03	27.16	-22.40	56.79	74.00	17.21	Horizontal
2	2486.08	61.17	27.37	-22.29	66.25	74.00	7.75	Horizontal

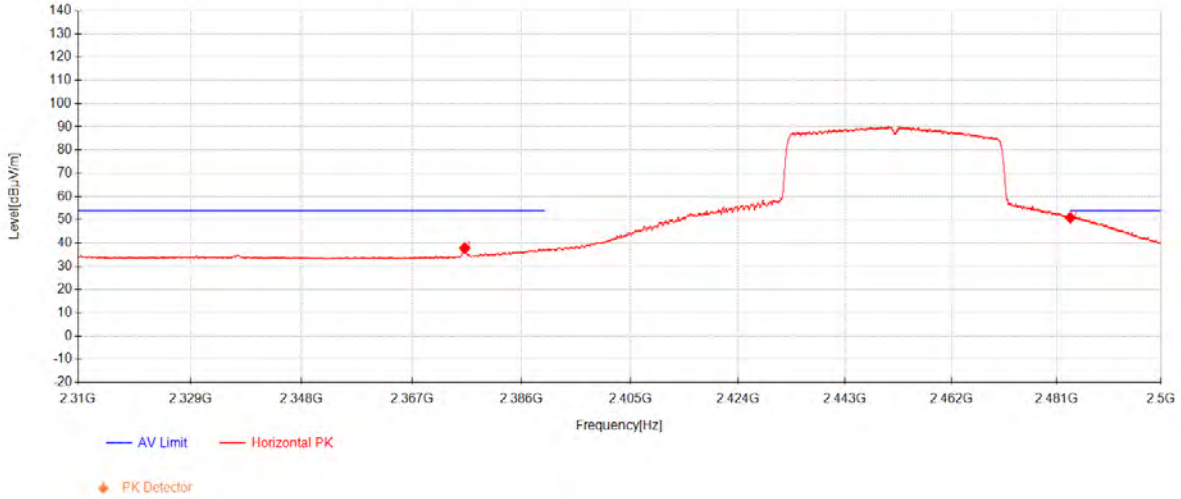
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802.11ax40_Channel 09



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2376.105	33.05	27.13	-22.43	37.75	54.00	16.25	Horizontal
2	2483.5	45.82	27.36	-22.29	50.89	54.00	3.11	Horizontal

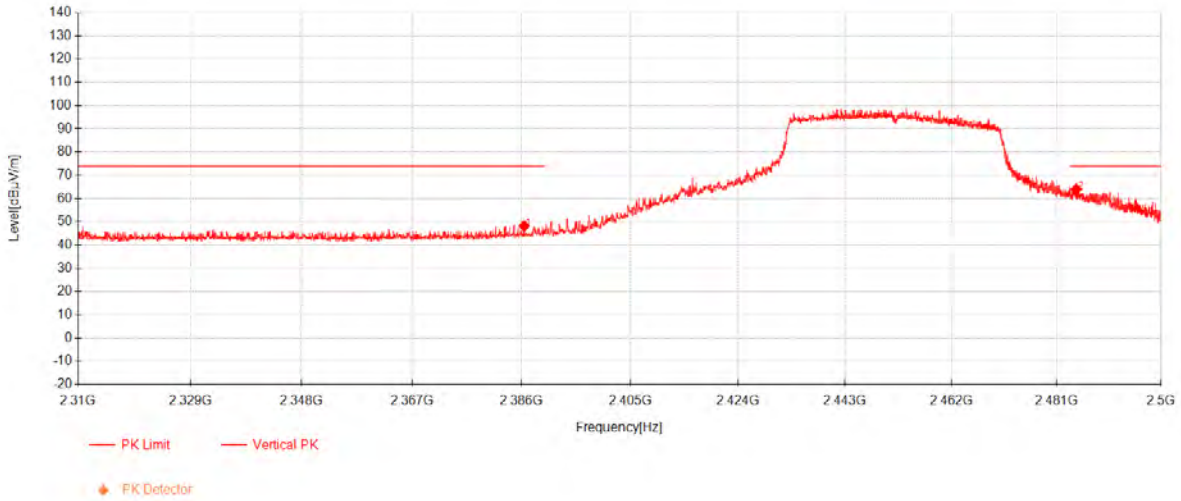
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802.11ax40_Channel 09



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2386.44	43.39	27.15	-22.41	48.13	74.00	25.87	Vertical
2	2484.565	58.96	27.37	-22.29	64.03	74.00	9.97	Vertical

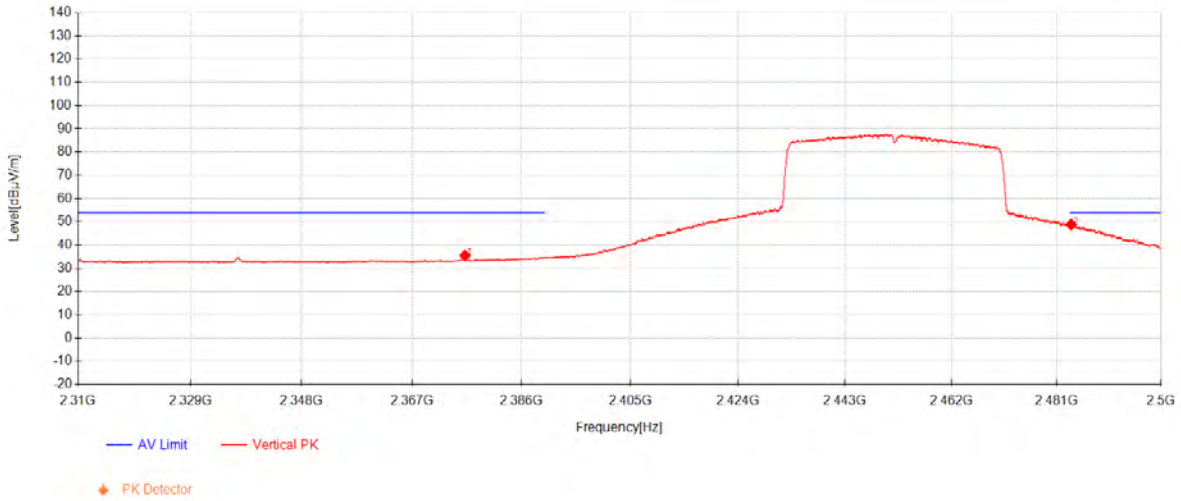
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Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	2376.17	30.76	27.13	-22.43	35.46	54.00	18.54	Vertical
2	2483.65	43.72	27.36	-22.29	48.79	54.00	5.21	Vertical

7.3 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

7.3.1 E.U.T. Operation

Operating Environment:

Temperature: 23 °C

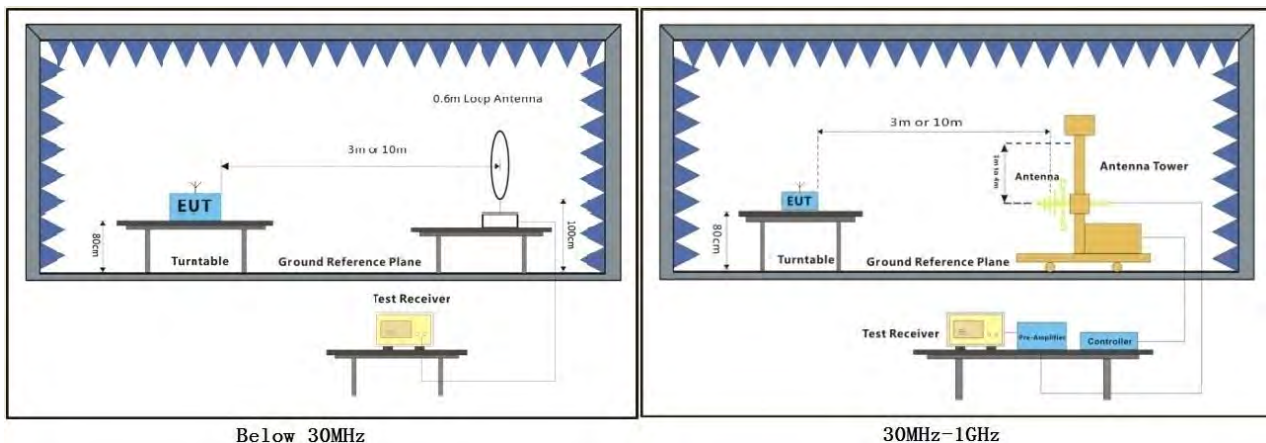
Humidity: 46 % RH

Atmospheric Pressure: 1010 mbar

7.3.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	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); data rate @ MCS0 is the worst case of IEEE 802.11ax(HE20); data rate @ MCS0 is the worst case of IEEE 802.11ax(HE40). 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 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.

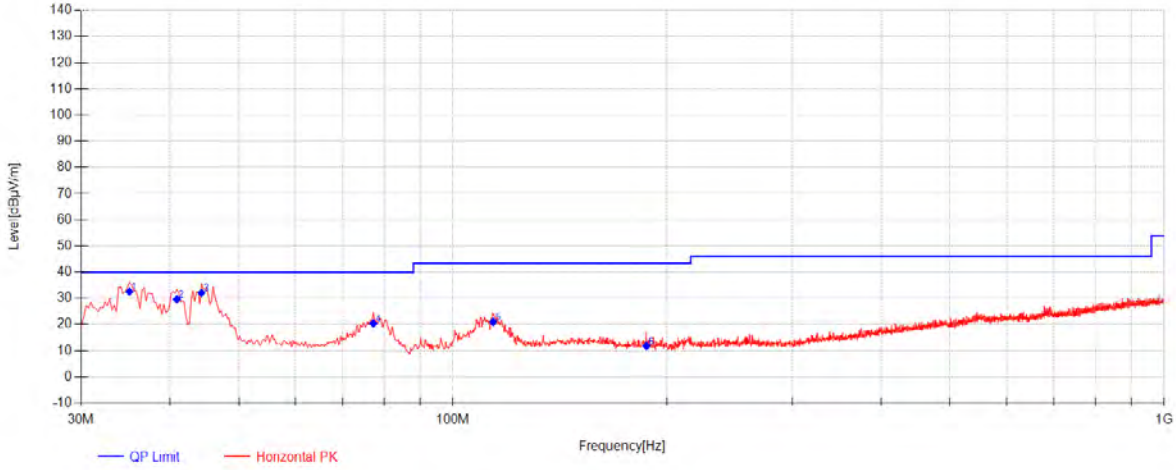
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Final Data List								
NO.	Frequency [MHz]	Reading [dBµV]	Factor [dB]	AF [dB/m]	QP Value [dBµV/m]	QP Limit [dBµV/m]	QP Margin [dB]	Polarity
1	35.0925	56.22	-42.36	18.72	32.58	40.00	7.42	Horizontal
2	40.9125	52.36	-42.33	19.54	29.57	40.00	10.43	Horizontal
3	44.3075	55.14	-42.35	19.30	32.09	40.00	7.91	Horizontal
4	77.2875	46.29	-41.90	15.96	20.35	40.00	19.65	Horizontal
5	113.905	46.03	-41.77	16.67	20.93	43.50	22.57	Horizontal
6	187.14	36.57	-40.97	16.16	11.76	43.50	31.74	Horizontal

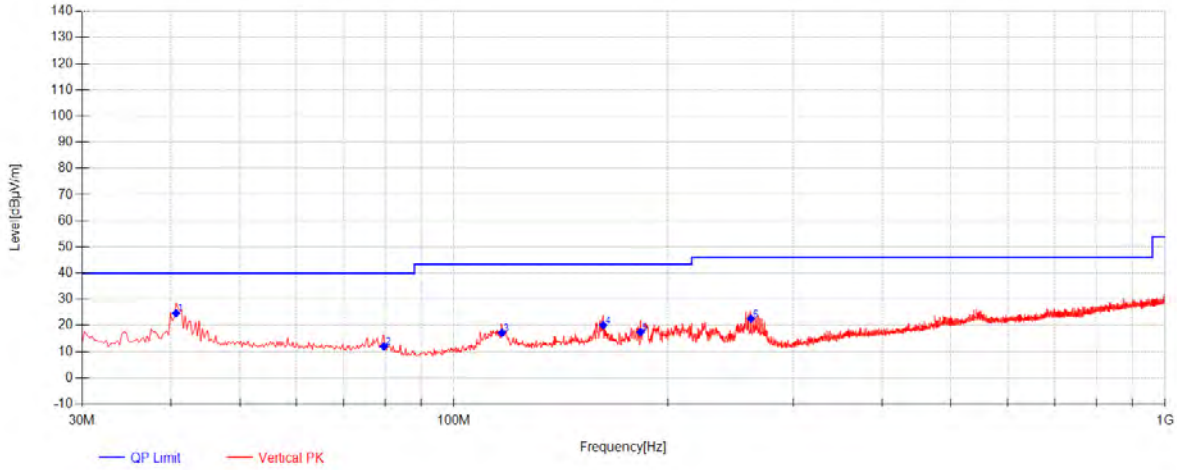
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Final Data List								
NO.	Frequency [MHz]	Reading [dBµV]	Factor [dB]	AF [dB/m]	QP Value [dBµV/m]	QP Limit [dBµV/m]	QP Margin [dB]	Polarity
1	40.67	47.53	-42.32	19.55	24.76	40.00	15.24	Vertical
2	79.7125	38.26	-41.84	15.55	11.97	40.00	28.03	Vertical
3	116.815	42.11	-41.77	16.88	17.22	43.50	26.28	Vertical
4	162.1625	42.59	-40.82	18.31	20.08	43.50	23.42	Vertical
5	183.0175	42.03	-41.00	16.47	17.50	43.50	26.00	Vertical
6	261.5875	45.79	-40.33	17.18	22.64	46.00	23.36	Vertical

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7.4 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

7.4.1 E.U.T. Operation

Operating Environment:

Temperature: 23 °C

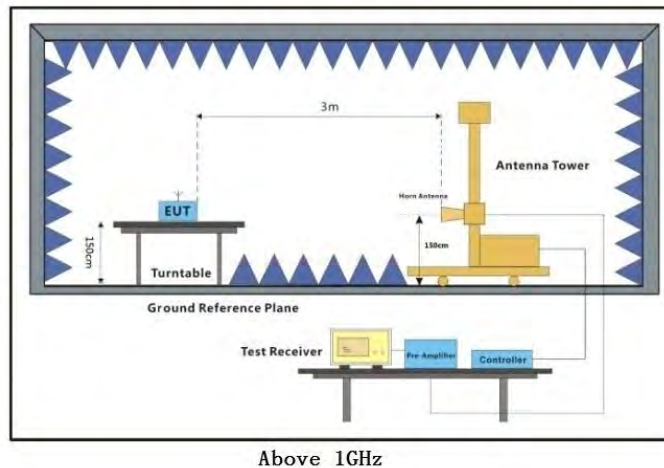
Humidity: 46 % RH

Atmospheric Pressure: 1010 mbar

7.4.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	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); data rate @ MCS0 is the worst case of IEEE 802.11ax(HE20); data rate @ MCS0 is the worst case of IEEE 802.11ax(HE40). Only the data of worst case is recorded in the report.

7.4.3 Test Setup Diagram



7.4.4 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. Average Measurements Above 1000MHz, $VBW = 10 \text{ Hz}$ (when duty cycle is no less than 98 percent). $VBW \geq 1/T$, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.



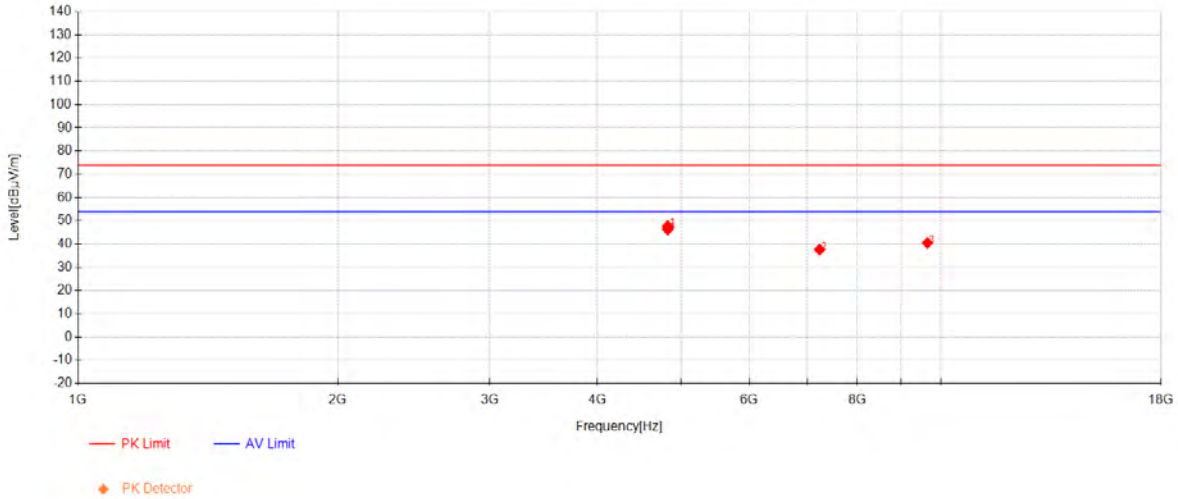
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802.11b_Channel 01



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	4824	56.30	32.81	-41.43	47.68	74.00	26.32	Horizontal
2	7236	39.10	36.28	-37.81	37.58	74.00	36.42	Horizontal
3	9648	35.95	37.79	-33.26	40.48	74.00	33.52	Horizontal
4	4824.5	54.89	32.81	-41.43	46.28	54.00	7.72	Horizontal



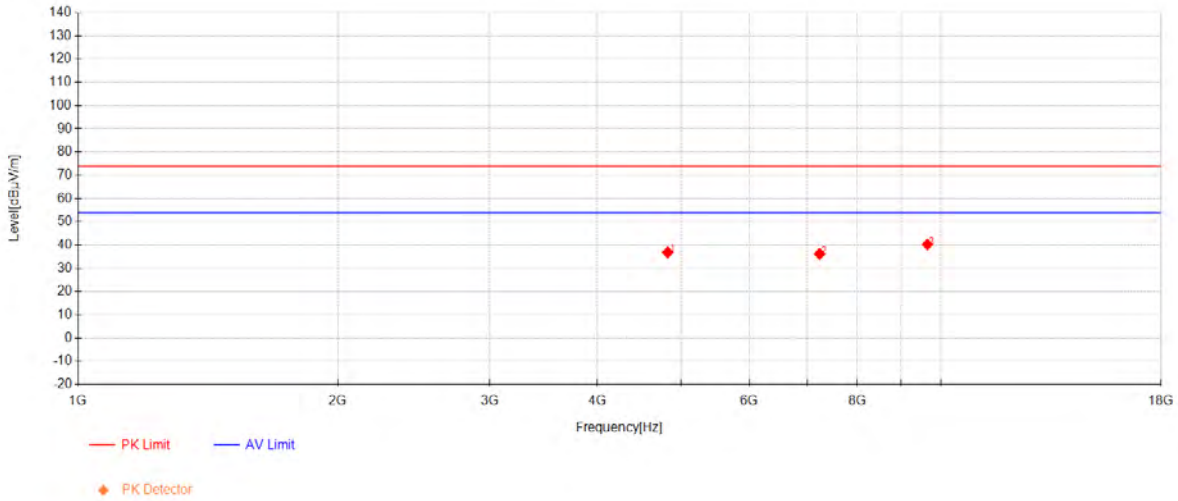
Compliance Certification Services (Kunshan) Inc.

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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	4824	45.42	32.81	-41.43	36.80	74.00	37.20	Vertical
2	7236	37.71	36.28	-37.81	36.19	74.00	37.81	Vertical
3	9648	35.74	37.79	-33.26	40.27	74.00	33.73	Vertical



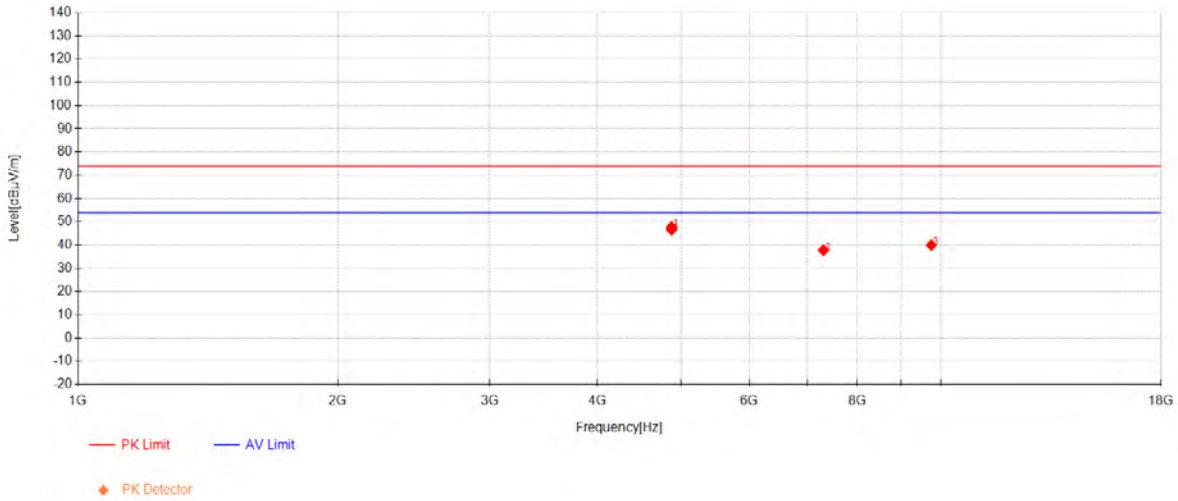
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802.11b_Channel 06



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	4874	56.02	32.92	-41.28	47.66	74.00	26.34	Horizontal
2	7311	38.81	36.37	-37.42	37.76	74.00	36.24	Horizontal
3	9748	35.19	37.82	-33.06	39.96	74.00	34.04	Horizontal
4	4874.5	54.97	32.92	-41.28	46.62	54.00	7.38	Horizontal

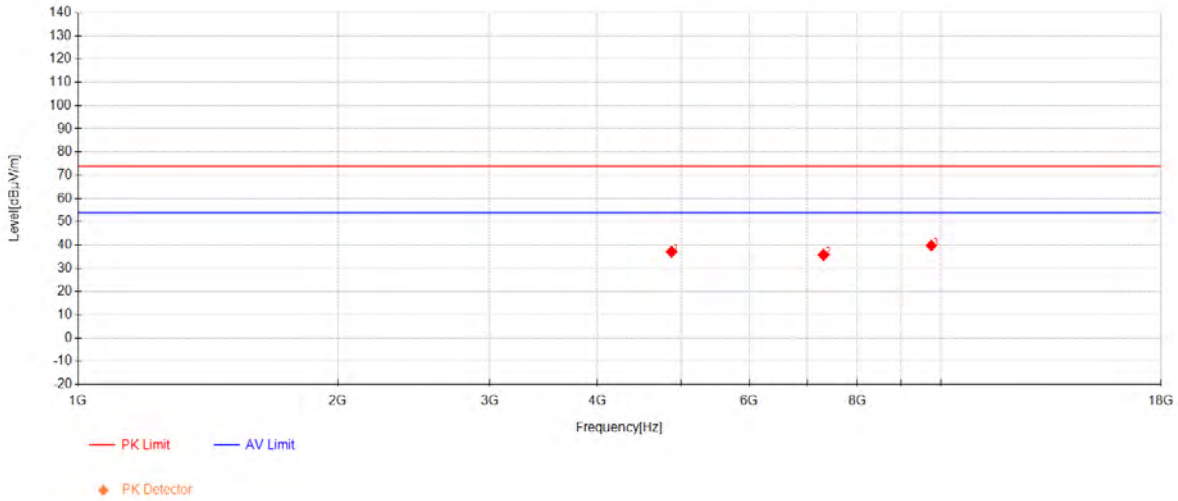
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802.11b_Channel 06



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	4874	45.43	32.92	-41.28	37.07	74.00	36.93	Vertical
2	7311	36.79	36.37	-37.42	35.74	74.00	38.26	Vertical
3	9748	35.01	37.82	-33.06	39.78	74.00	34.22	Vertical



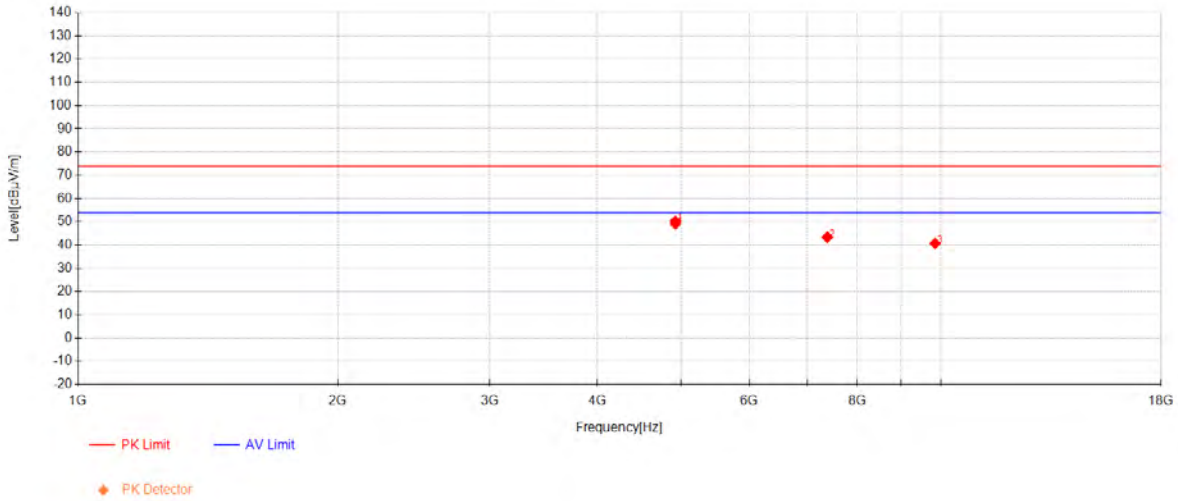
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802.11b_Channel 11



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	4924	58.43	33.03	-41.26	50.20	74.00	23.80	Horizontal
2	7386	44.80	36.46	-37.82	43.45	74.00	30.55	Horizontal
3	9848	35.67	37.85	-32.85	40.67	74.00	33.33	Horizontal
4	4924.5	57.34	33.03	-41.27	49.11	54.00	4.89	Horizontal

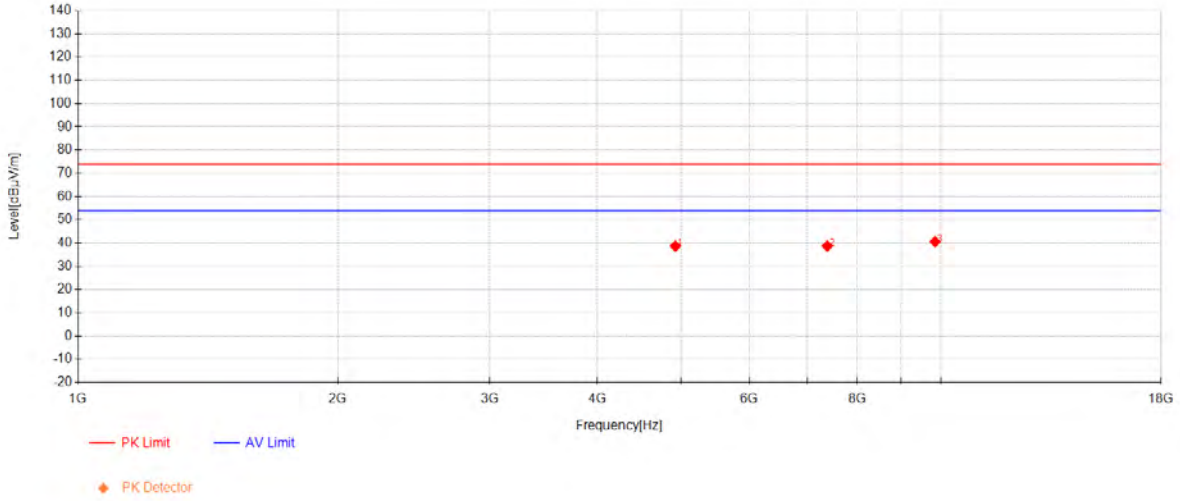
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802.11b_Channel 11



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	4924	46.89	33.03	-41.26	38.66	74.00	35.34	Vertical
2	7386	40.03	36.46	-37.82	38.68	74.00	35.32	Vertical
3	9848	35.57	37.85	-32.85	40.57	74.00	33.43	Vertical



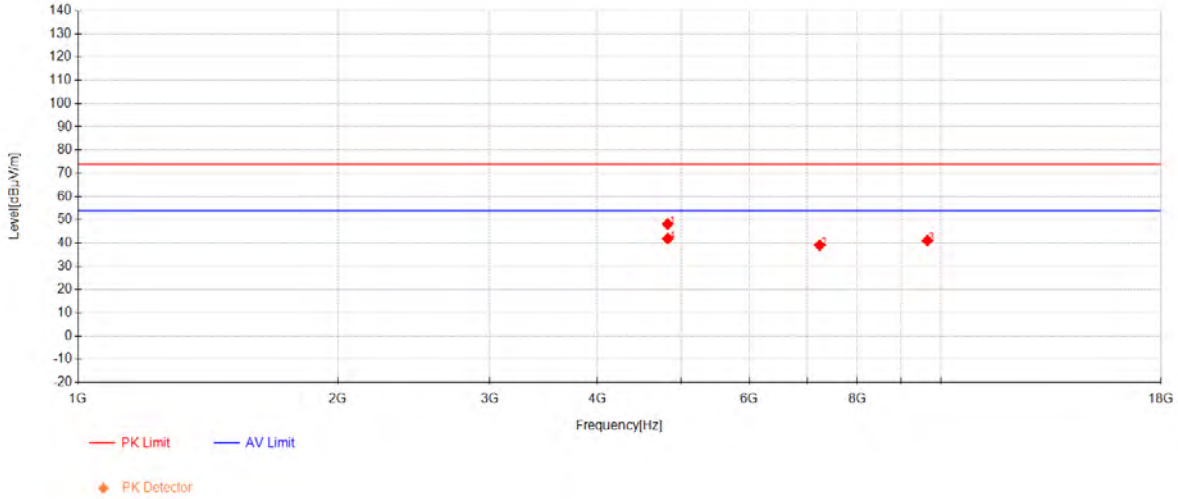
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802.11g_Channel 01



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	4824	56.72	32.81	-41.43	48.10	74.00	25.90	Horizontal
2	7236	40.60	36.28	-37.81	39.08	74.00	34.92	Horizontal
3	9648	36.53	37.79	-33.26	41.06	74.00	32.94	Horizontal
4	4824.5	50.50	32.81	-41.43	41.89	54.00	12.11	Horizontal



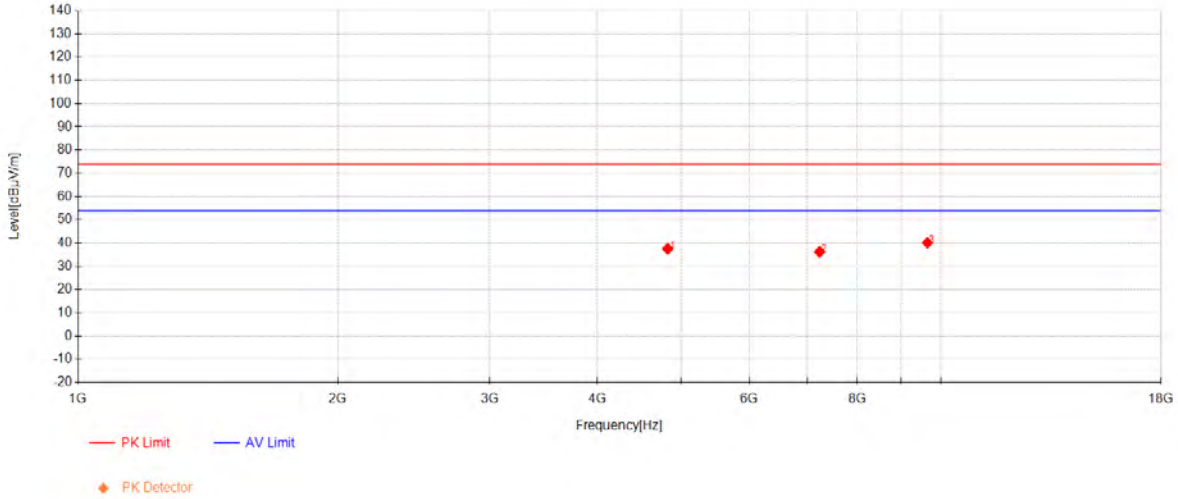
Compliance Certification Services (Kunshan) Inc.

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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	4824	46.11	32.81	-41.43	37.49	74.00	36.51	Vertical
2	7236	37.73	36.28	-37.81	36.21	74.00	37.79	Vertical
3	9648	35.60	37.79	-33.26	40.13	74.00	33.87	Vertical



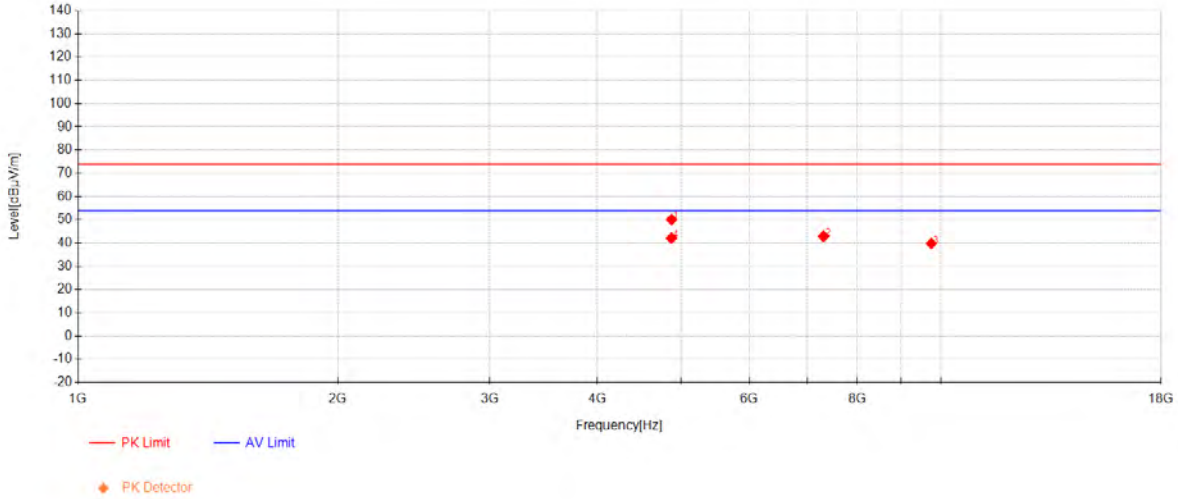
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802.11g_Channel 06



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	4874	58.42	32.92	-41.28	50.06	74.00	23.94	Horizontal
2	7311	43.97	36.37	-37.42	42.92	74.00	31.08	Horizontal
3	9748	35.02	37.82	-33.06	39.79	74.00	34.21	Horizontal
4	4872.5	50.48	32.92	-41.28	42.12	54.00	11.88	Horizontal



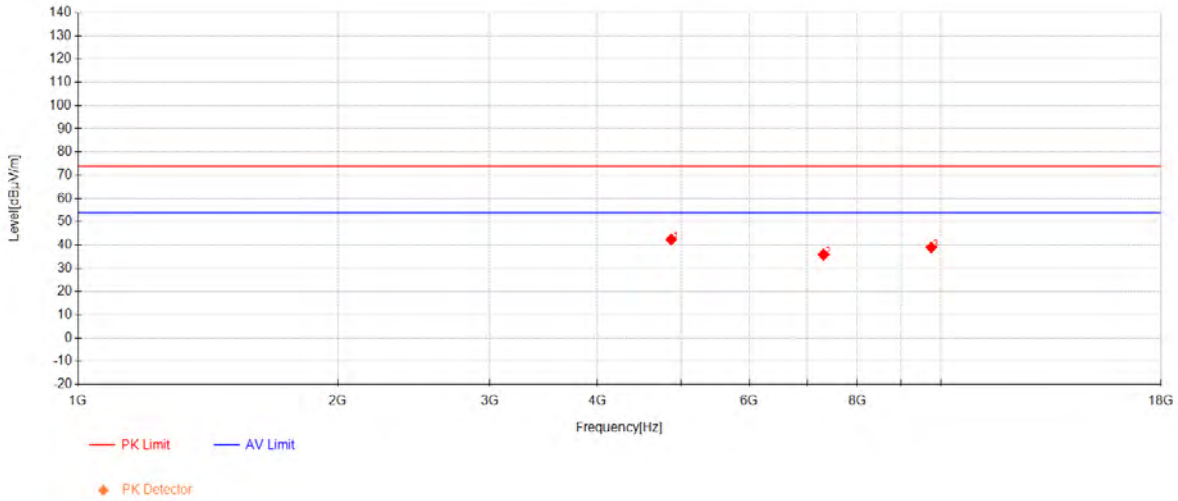
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802.11g_Channel 06



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	4870	50.82	32.91	-41.29	42.44	74.00	31.56	Vertical
2	7311	36.93	36.37	-37.42	35.88	74.00	38.12	Vertical
3	9748	34.21	37.82	-33.06	38.98	74.00	35.02	Vertical



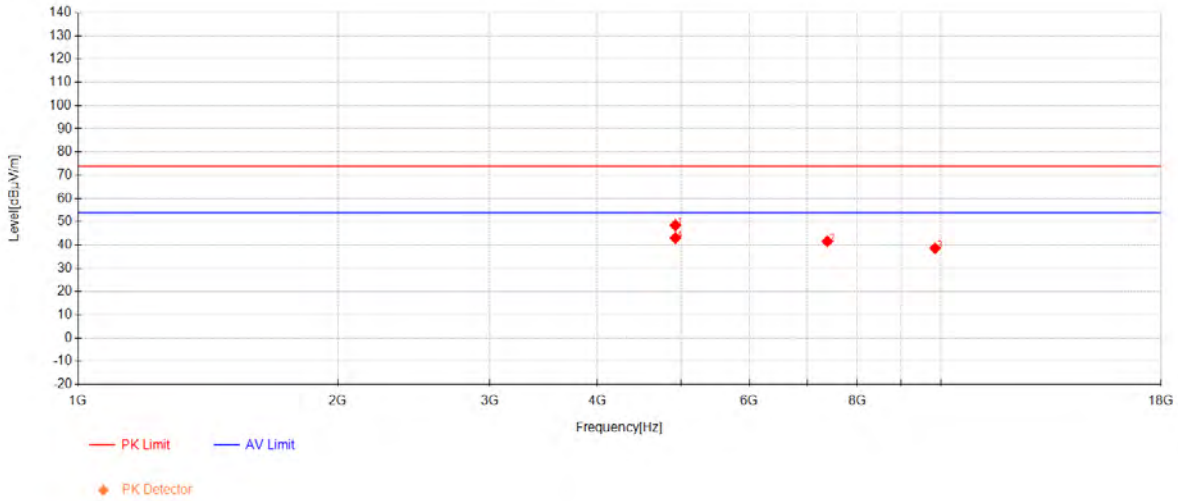
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802.11g_Channel 11



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	4924	56.69	33.03	-41.26	48.46	74.00	25.54	Horizontal
2	7386	42.94	36.46	-37.82	41.59	74.00	32.41	Horizontal
3	9848	33.58	37.85	-32.85	38.58	74.00	35.42	Horizontal
4	4924.5	51.30	33.03	-41.27	43.07	54.00	10.93	Horizontal

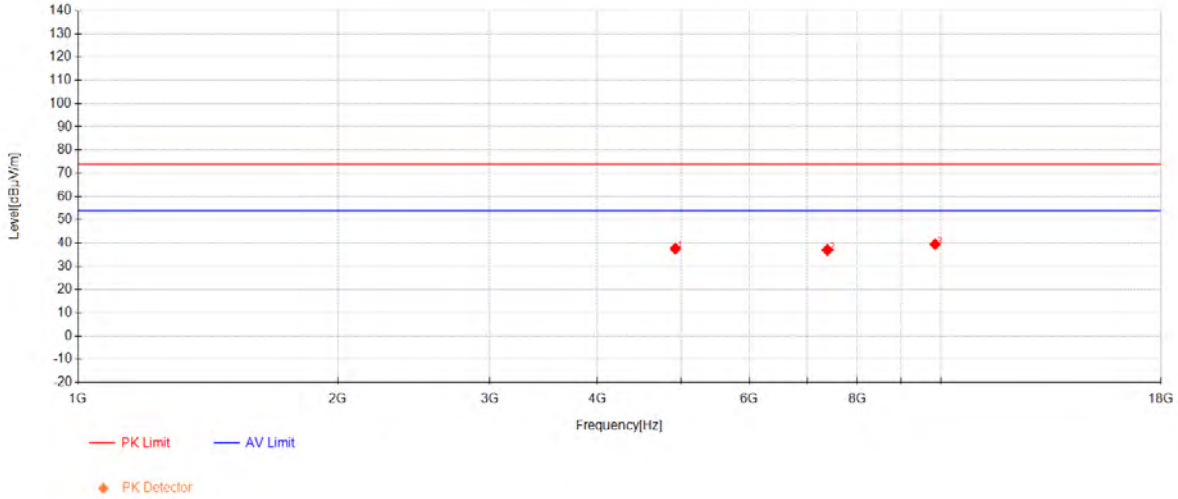
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802.11g_Channel 11



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	4924	45.77	33.03	-41.26	37.54	74.00	36.46	Vertical
2	7386	38.32	36.46	-37.82	36.97	74.00	37.03	Vertical
3	9848	34.50	37.85	-32.85	39.50	74.00	34.50	Vertical



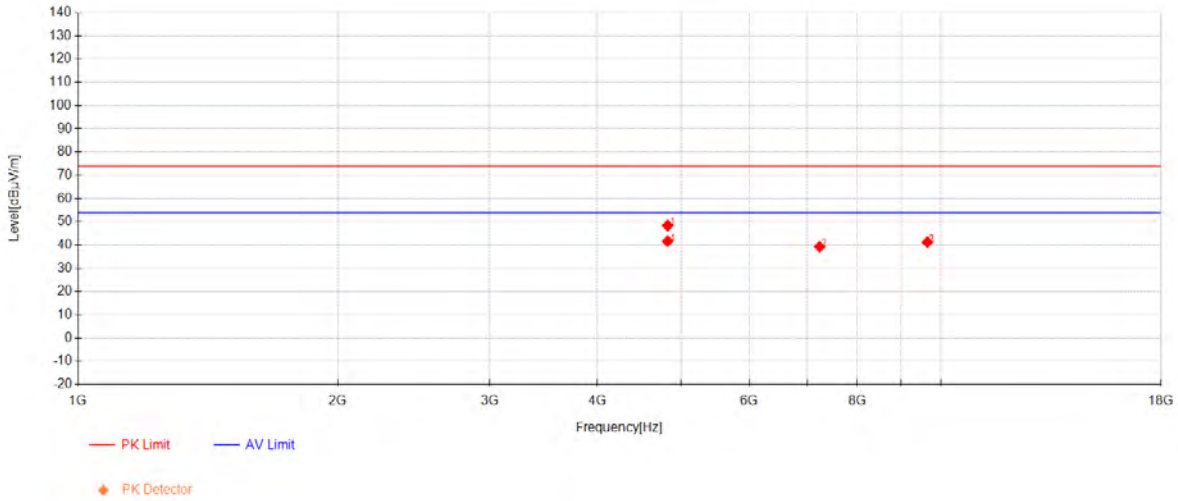
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802.11n20_Channel 01



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	4824	56.95	32.81	-41.43	48.33	74.00	25.67	Horizontal
2	7236	40.82	36.28	-37.81	39.30	74.00	34.70	Horizontal
3	9648	36.75	37.79	-33.26	41.28	74.00	32.72	Horizontal
4	4823	50.26	32.81	-41.43	41.64	54.00	12.36	Horizontal



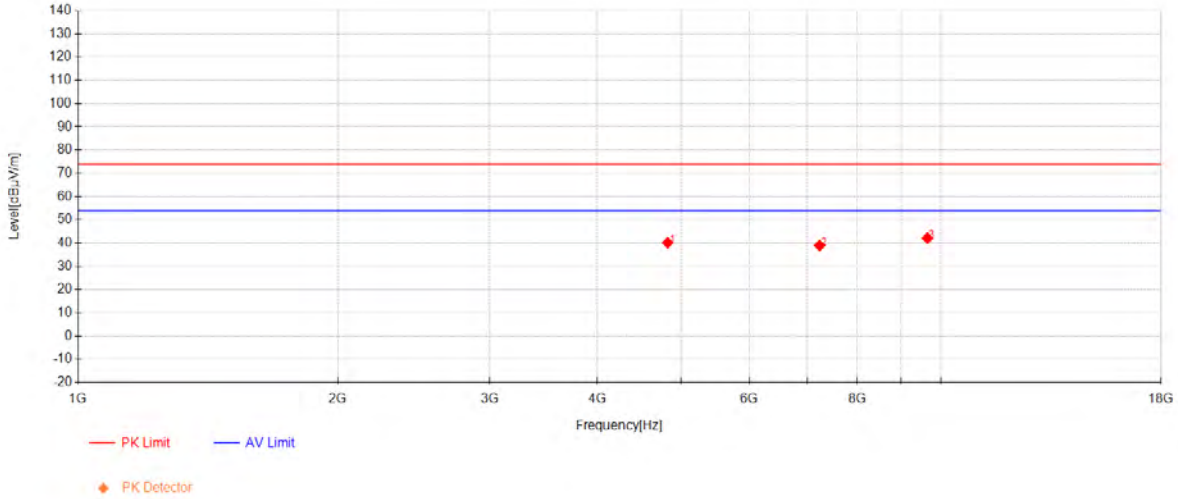
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802.11n20_Channel 01



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	4823.5	48.77	32.81	-41.43	40.15	74.00	33.85	Vertical
2	7236	40.46	36.28	-37.81	38.94	74.00	35.06	Vertical
3	9648	37.60	37.79	-33.26	42.13	74.00	31.87	Vertical



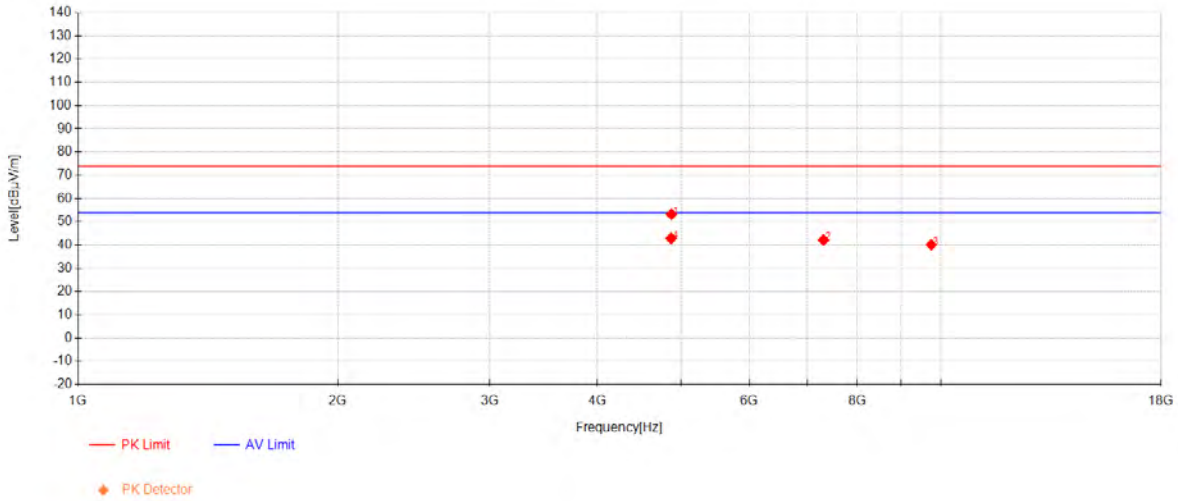
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802.11n20_Channel 06



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	4873	61.59	32.92	-41.28	53.23	74.00	20.77	Horizontal
2	7311	43.24	36.37	-37.42	42.19	74.00	31.81	Horizontal
3	9748	35.37	37.82	-33.06	40.14	74.00	33.86	Horizontal
4	4868.5	51.28	32.91	-41.29	42.90	54.00	11.10	Horizontal



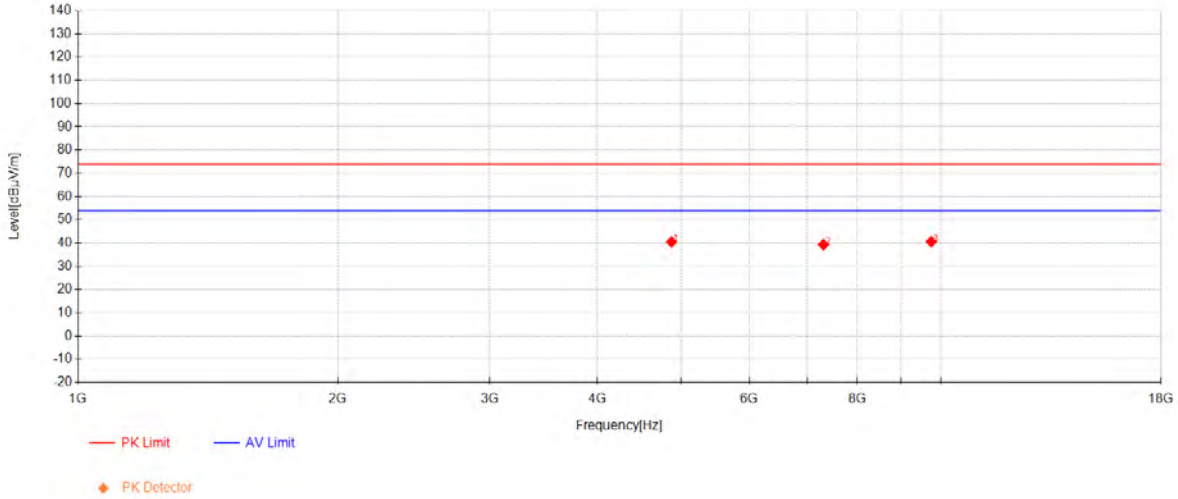
Compliance Certification Services (Kunshan) Inc.

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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	4874	48.86	32.92	-41.28	40.50	74.00	33.50	Vertical
2	7311	40.35	36.37	-37.42	39.30	74.00	34.70	Vertical
3	9748	35.82	37.82	-33.06	40.59	74.00	33.41	Vertical



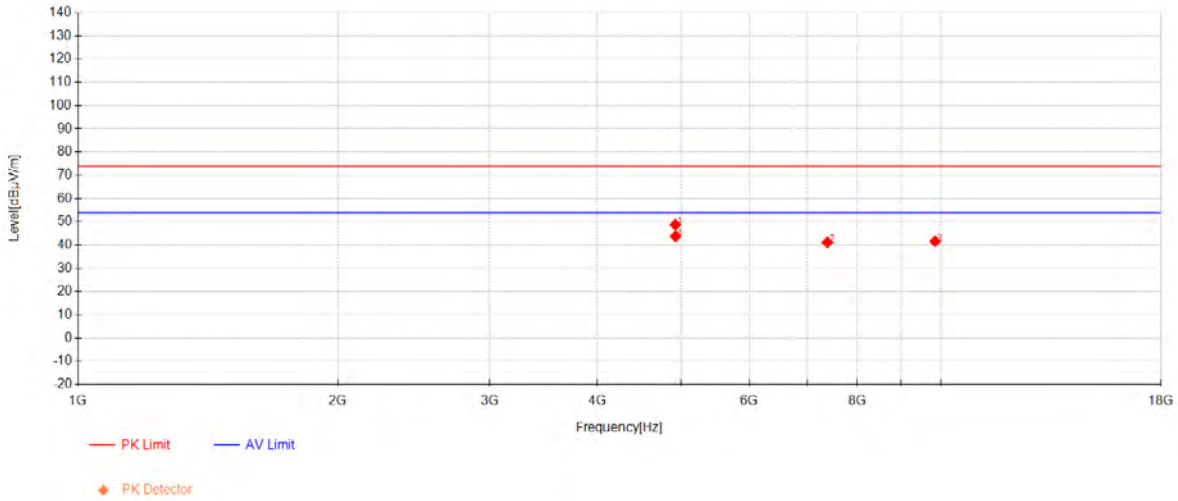
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802.11n20_Channel 11



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	4924	56.92	33.03	-41.26	48.69	74.00	25.31	Horizontal
2	7386	42.51	36.46	-37.82	41.16	74.00	32.84	Horizontal
3	9848	36.60	37.85	-32.85	41.60	74.00	32.40	Horizontal
4	4926.5	52.01	33.04	-41.27	43.78	54.00	10.22	Horizontal

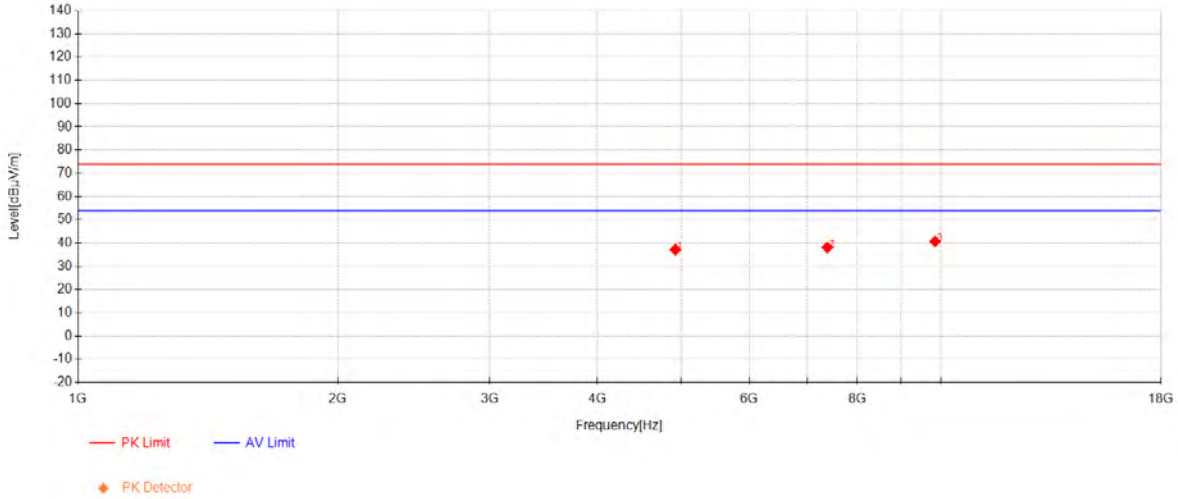
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802.11n20_Channel 11



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	4924	45.36	33.03	-41.26	37.13	74.00	36.87	Vertical
2	7386	39.46	36.46	-37.82	38.11	74.00	35.89	Vertical
3	9848	35.68	37.85	-32.85	40.68	74.00	33.32	Vertical



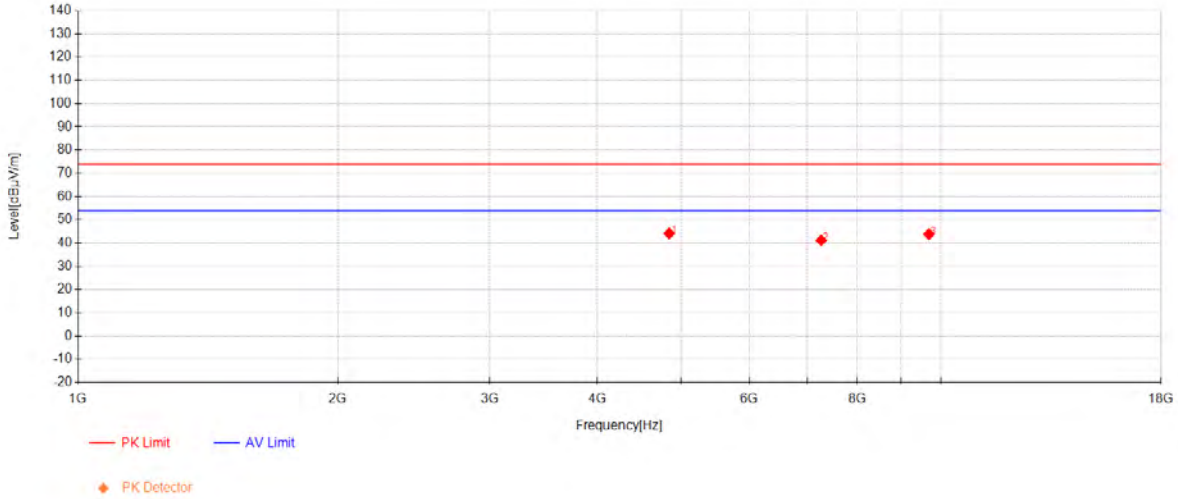
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802.11n40_Channel 03



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	4844	52.67	32.86	-41.37	44.16	74.00	29.84	Horizontal
2	7266	42.47	36.32	-37.60	41.19	74.00	32.81	Horizontal
3	9688	39.12	37.81	-33.08	43.85	74.00	30.15	Horizontal



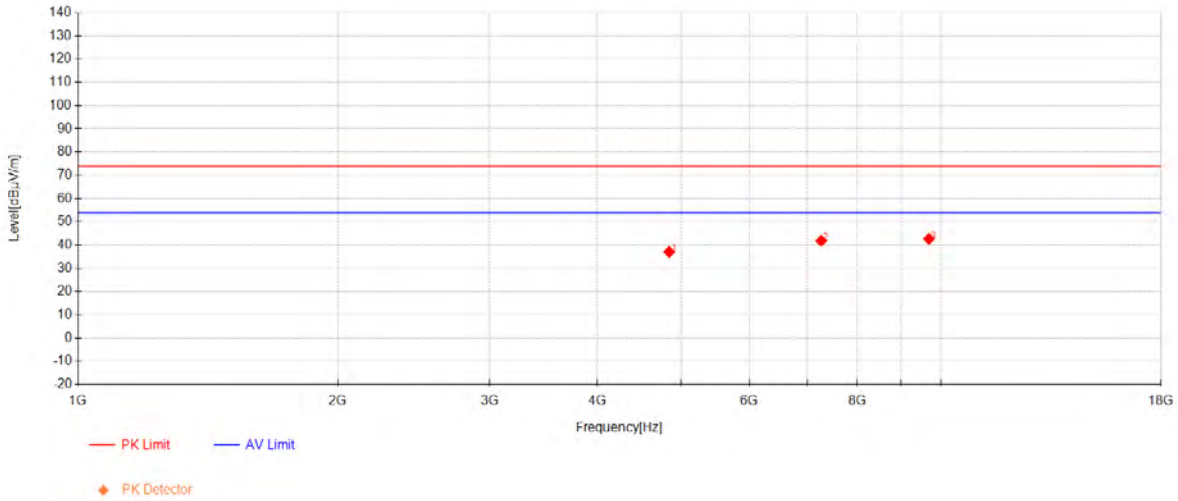
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802.11n40_Channel 03



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	4844	45.53	32.86	-41.37	37.02	74.00	36.98	Vertical
2	7266	43.11	36.32	-37.60	41.83	74.00	32.17	Vertical
3	9688	37.97	37.81	-33.08	42.70	74.00	31.30	Vertical



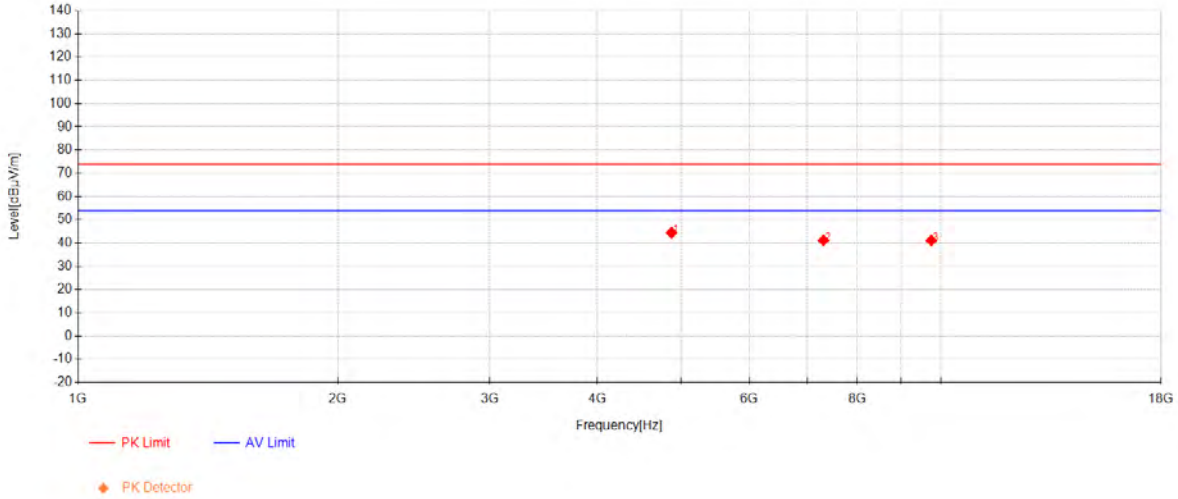
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802.11n40_Channel 06



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	4874	52.83	32.92	-41.28	44.47	74.00	29.53	Horizontal
2	7311	42.22	36.37	-37.42	41.17	74.00	32.83	Horizontal
3	9748	36.37	37.82	-33.06	41.14	74.00	32.86	Horizontal

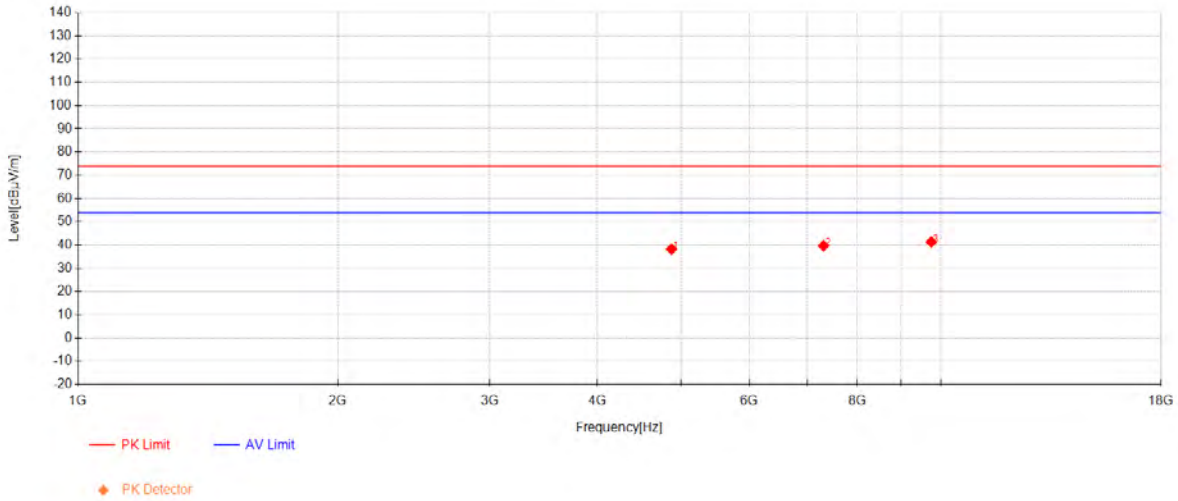
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802.11n40_Channel 06



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	4874	46.60	32.92	-41.28	38.24	74.00	35.76	Vertical
2	7311	40.71	36.37	-37.42	39.66	74.00	34.34	Vertical
3	9748	36.59	37.82	-33.06	41.36	74.00	32.64	Vertical



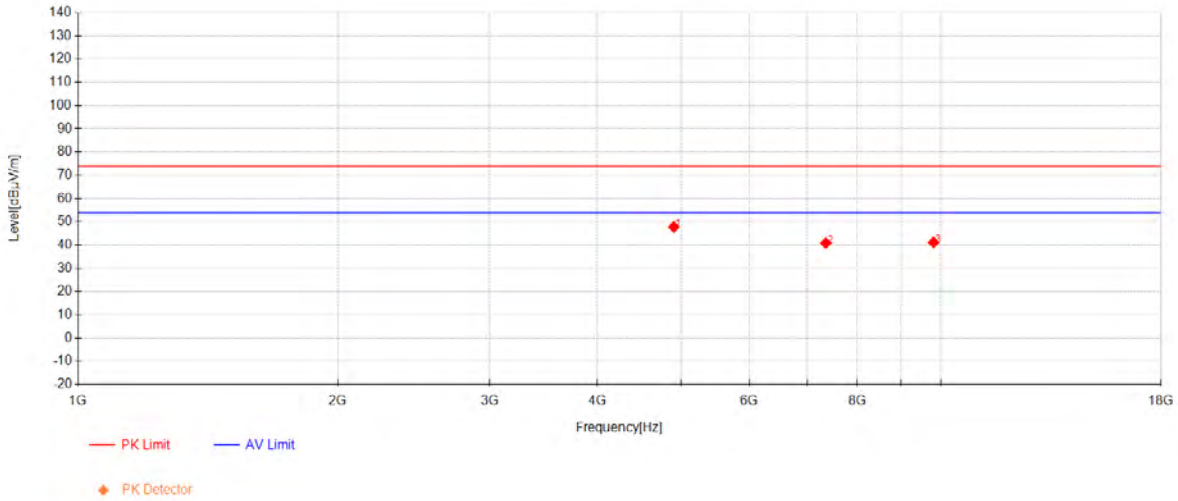
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802.11n40_Channel 09



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	4904	55.98	32.99	-41.21	47.76	74.00	26.24	Horizontal
2	7356	42.07	36.43	-37.66	40.84	74.00	33.16	Horizontal
3	9808	36.38	37.84	-33.06	41.16	74.00	32.84	Horizontal



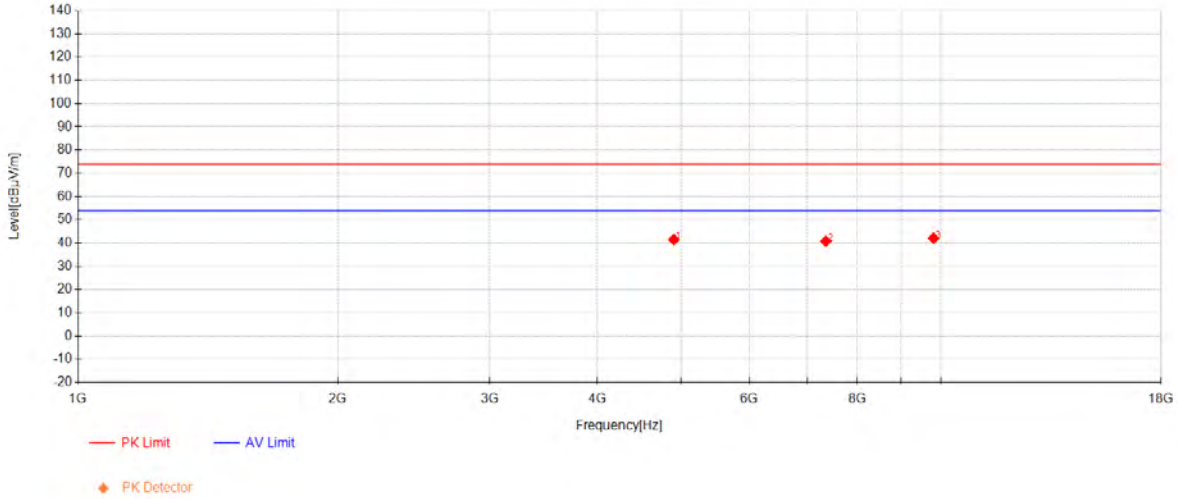
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802.11n40_Channel 09



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	4904	49.71	32.99	-41.21	41.49	74.00	32.51	Vertical
2	7356	41.99	36.43	-37.66	40.76	74.00	33.24	Vertical
3	9808	37.31	37.84	-33.06	42.09	74.00	31.91	Vertical



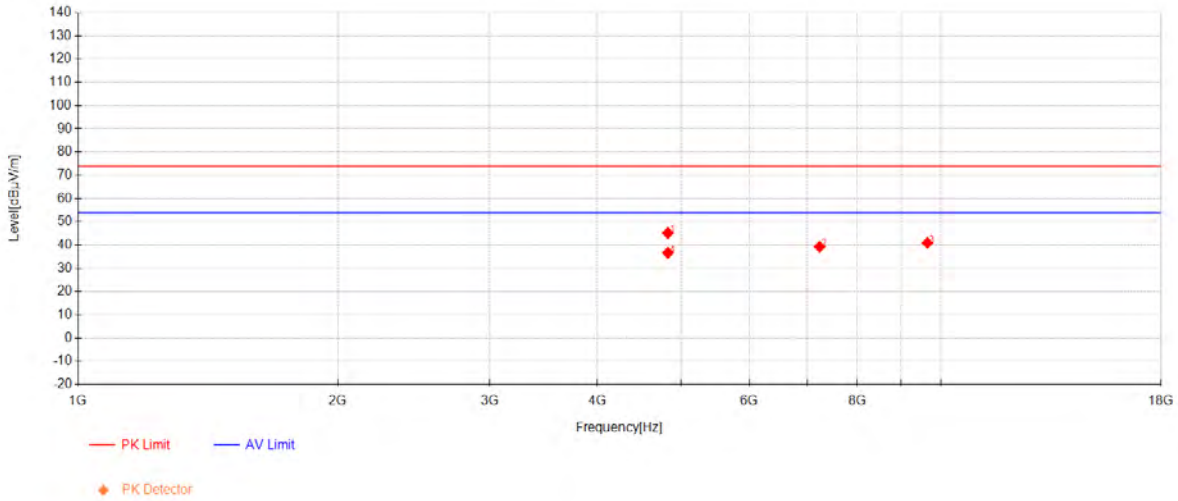
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802.11ax20_Channel 01



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	4826	53.81	32.82	-41.42	45.21	74.00	28.79	Horizontal
2	7236	40.81	36.28	-37.81	39.29	74.00	34.71	Horizontal
3	9648	36.37	37.79	-33.26	40.90	74.00	33.10	Horizontal
4	4826.5	45.20	32.82	-41.42	36.60	54.00	17.40	Horizontal



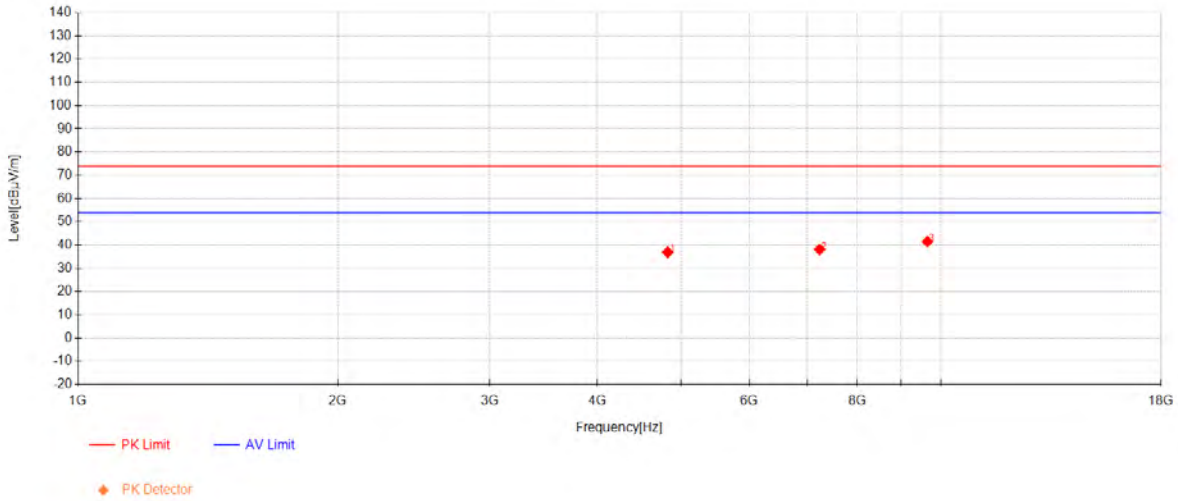
Compliance Certification Services (Kunshan) Inc.

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802.11ax20_Channel 01



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	4824	45.50	32.81	-41.43	36.88	74.00	37.12	Vertical
2	7236	39.63	36.28	-37.81	38.11	74.00	35.89	Vertical
3	9648	36.98	37.79	-33.26	41.51	74.00	32.49	Vertical



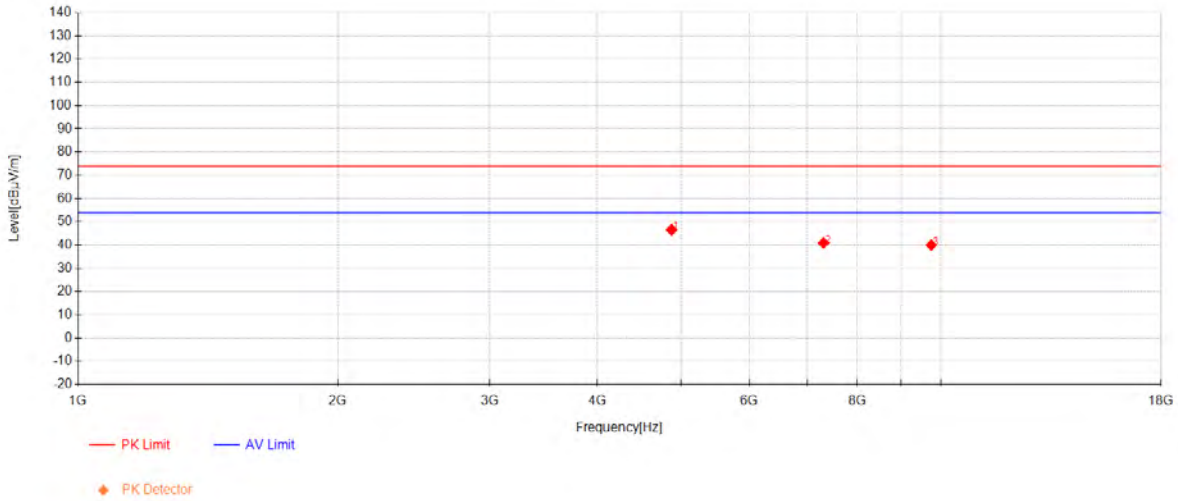
Compliance Certification Services (Kunshan) Inc.

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802.11ax20_Channel 06



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	4874	54.89	32.92	-41.28	46.53	74.00	27.47	Horizontal
2	7311	41.93	36.37	-37.42	40.88	74.00	33.12	Horizontal
3	9748	35.21	37.82	-33.06	39.98	74.00	34.02	Horizontal

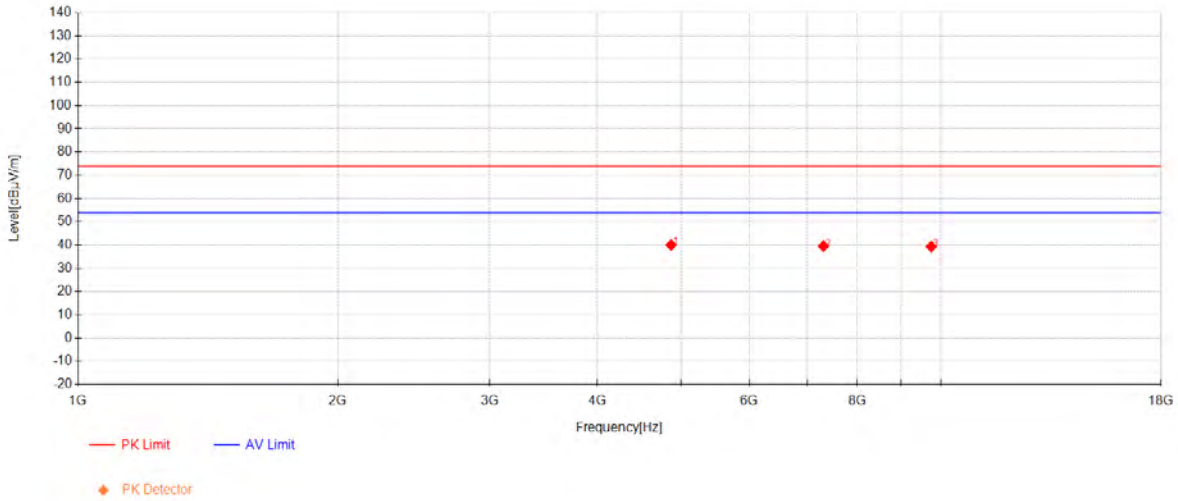
Compliance Certification Services (Kunshan) Inc.

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802.11ax20_Channel 06



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	4868	48.40	32.91	-41.30	40.01	74.00	33.99	Vertical
2	7311	40.61	36.37	-37.42	39.56	74.00	34.44	Vertical
3	9748	34.58	37.82	-33.06	39.35	74.00	34.65	Vertical

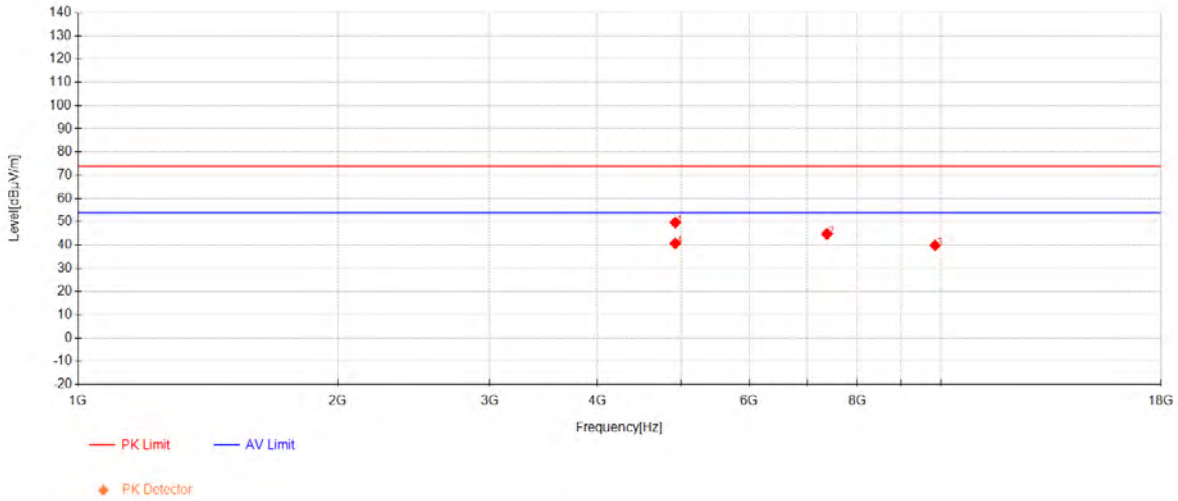
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802.11ax20_Channel 11



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	4924	57.87	33.03	-41.26	49.64	74.00	24.36	Horizontal
2	7379.5	46.11	36.46	-37.78	44.78	74.00	29.22	Horizontal
3	9848	34.84	37.85	-32.85	39.84	74.00	34.16	Horizontal
4	4922	48.90	33.03	-41.26	40.67	54.00	13.33	Horizontal



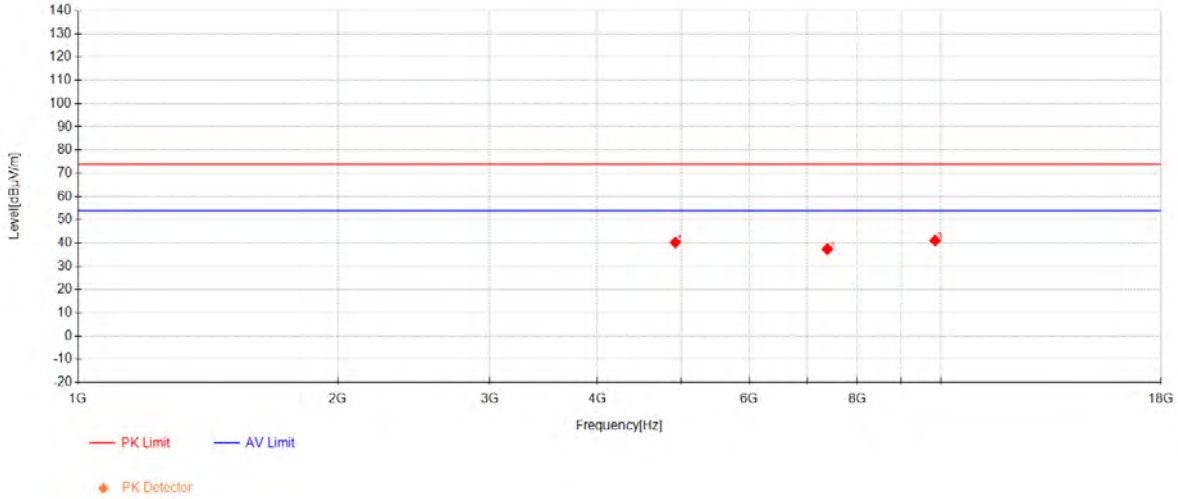
Compliance Certification Services (Kunshan) Inc.

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802.11ax20_Channel 11



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	4924	48.48	33.03	-41.26	40.25	74.00	33.75	Vertical
2	7386	38.71	36.46	-37.82	37.36	74.00	36.64	Vertical
3	9848	36.10	37.85	-32.85	41.10	74.00	32.90	Vertical



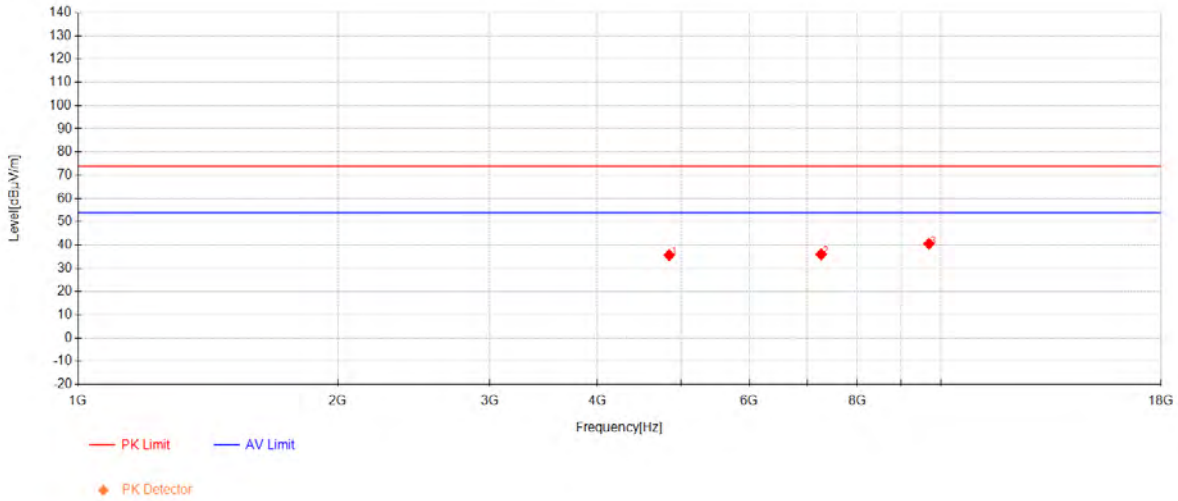
Compliance Certification Services (Kunshan) Inc.

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802.11ax40_Channel 03



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	4844	44.13	32.86	-41.37	35.62	74.00	38.38	Horizontal
2	7266	37.25	36.32	-37.60	35.97	74.00	38.03	Horizontal
3	9688	35.82	37.81	-33.08	40.55	74.00	33.45	Horizontal



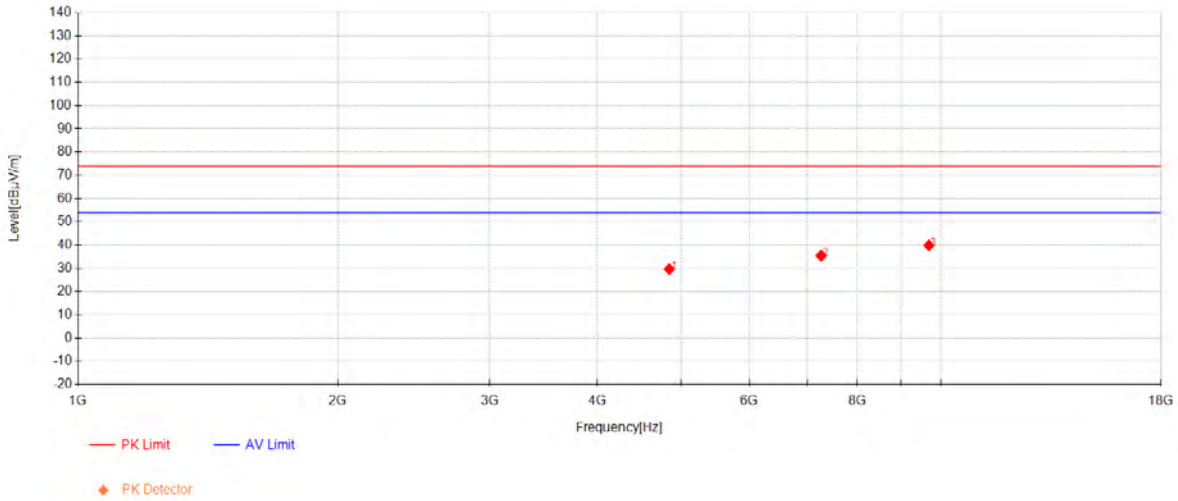
Compliance Certification Services (Kunshan) Inc.

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802.11ax40_Channel 03



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	4844	38.15	32.86	-41.37	29.64	74.00	44.36	Vertical
2	7266	36.70	36.32	-37.60	35.42	74.00	38.58	Vertical
3	9688	35.15	37.81	-33.08	39.88	74.00	34.12	Vertical



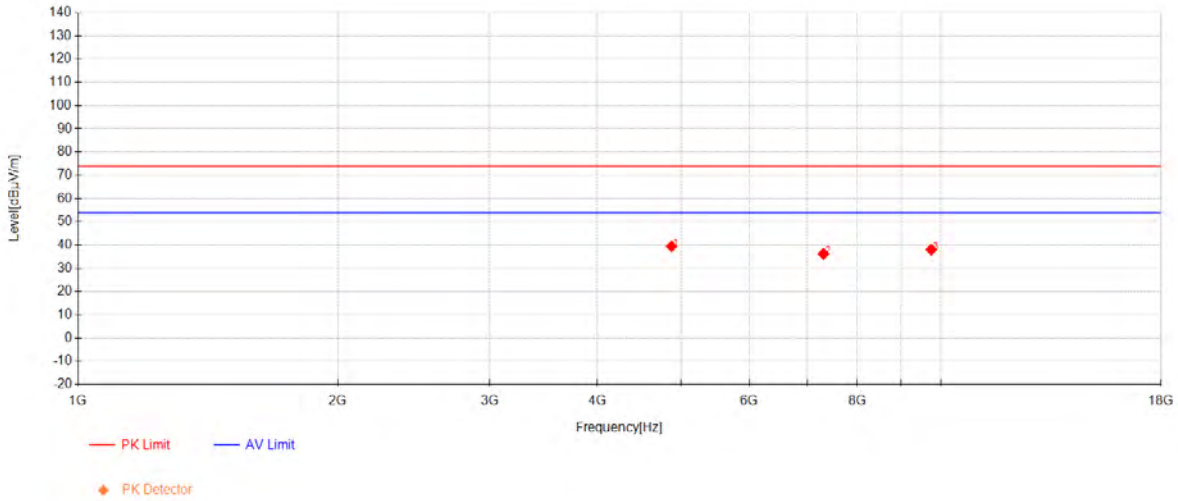
Compliance Certification Services (Kunshan) Inc.

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802.11ax40_Channel 06



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	4874	47.80	32.92	-41.28	39.44	74.00	34.56	Horizontal
2	7311	37.22	36.37	-37.42	36.17	74.00	37.83	Horizontal
3	9748	33.23	37.82	-33.06	38.00	74.00	36.00	Horizontal



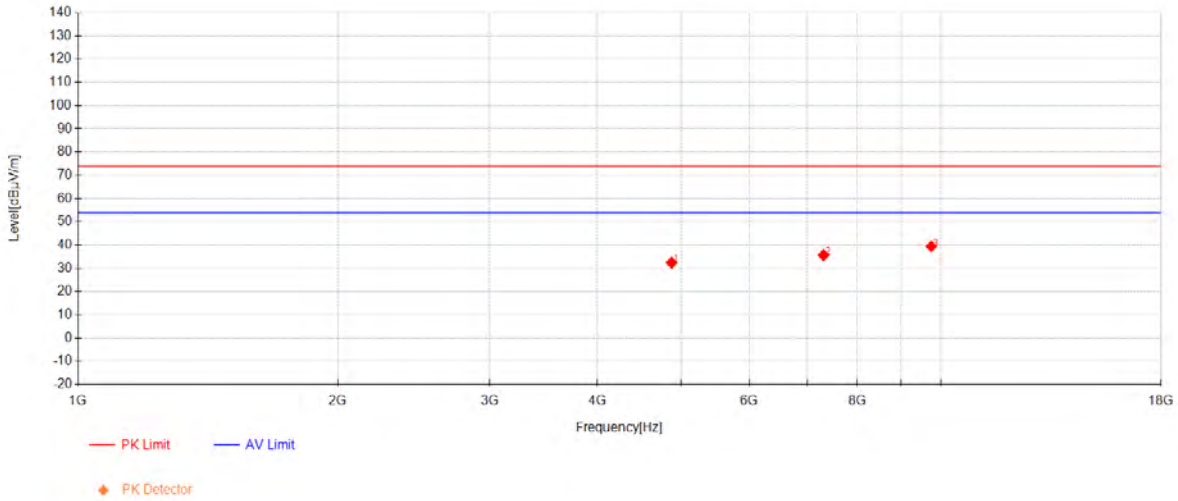
Compliance Certification Services (Kunshan) Inc.

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802.11ax40_Channel 06



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	4874	40.81	32.92	-41.28	32.45	74.00	41.55	Vertical
2	7311	36.67	36.37	-37.42	35.62	74.00	38.38	Vertical
3	9748	34.66	37.82	-33.06	39.43	74.00	34.57	Vertical

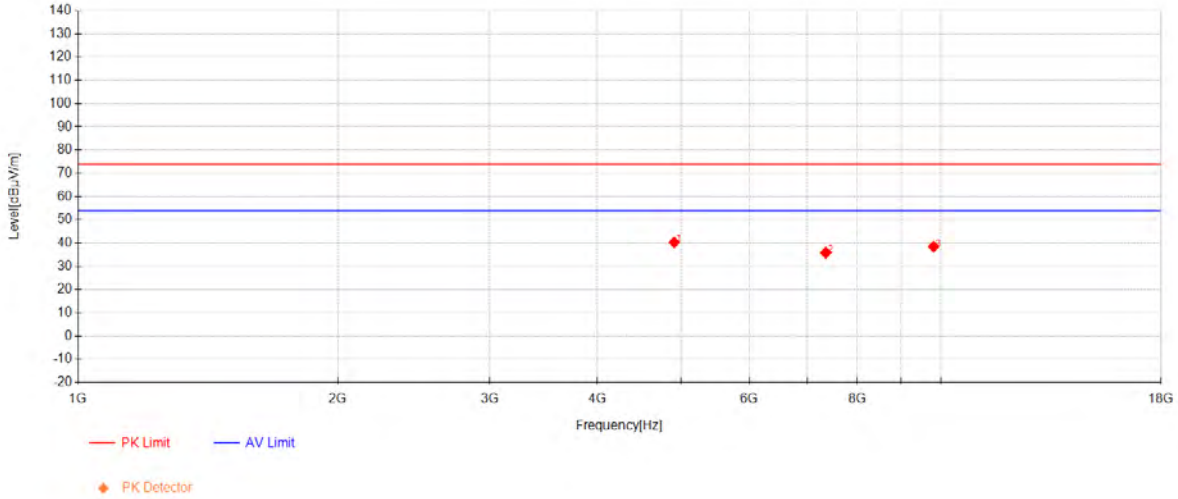
Compliance Certification Services (Kunshan) Inc.

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802.11ax40_Channel 09



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	4909	48.52	33.00	-41.22	40.30	74.00	33.70	Horizontal
2	7356	37.06	36.43	-37.66	35.83	74.00	38.17	Horizontal
3	9808	33.67	37.84	-33.06	38.45	74.00	35.55	Horizontal

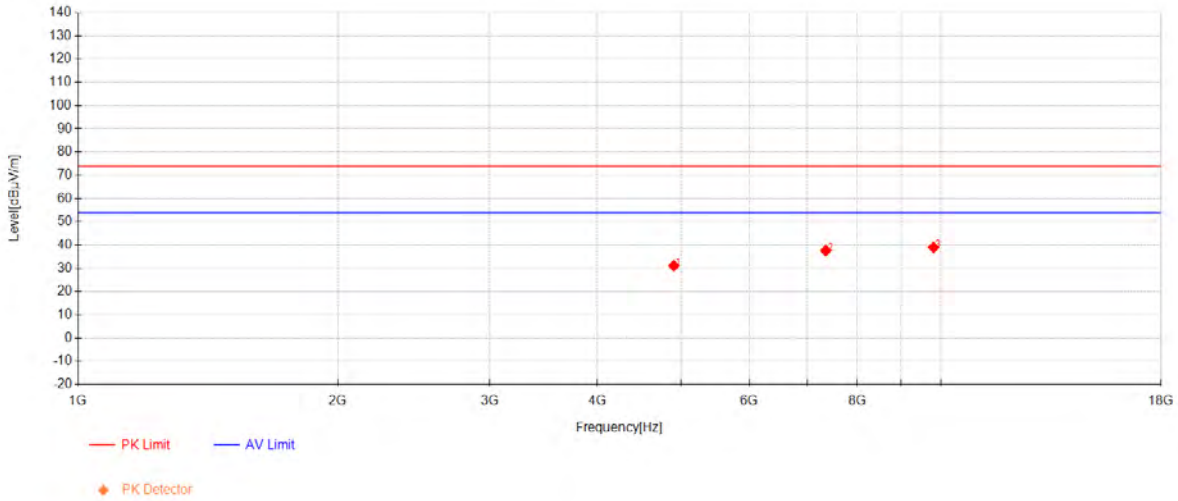
Compliance Certification Services (Kunshan) Inc.

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802.11ax40_Channel 09



Data List								
NO.	Frequency [MHz]	Reading [dBµV]	AF [dB/m]	Factor [dB]	Level [dBµV/m]	Limit [dBµV/m]	Margin [dB]	Polarity
1	4904	39.33	32.99	-41.21	31.11	74.00	42.89	Vertical
2	7356	38.81	36.43	-37.66	37.58	74.00	36.42	Vertical
3	9808	34.20	37.84	-33.06	38.98	74.00	35.02	Vertical

7.5 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≤ 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

7.5.1 E.U.T. Operation

Operating Environment:

Temperature: 24.3 °C

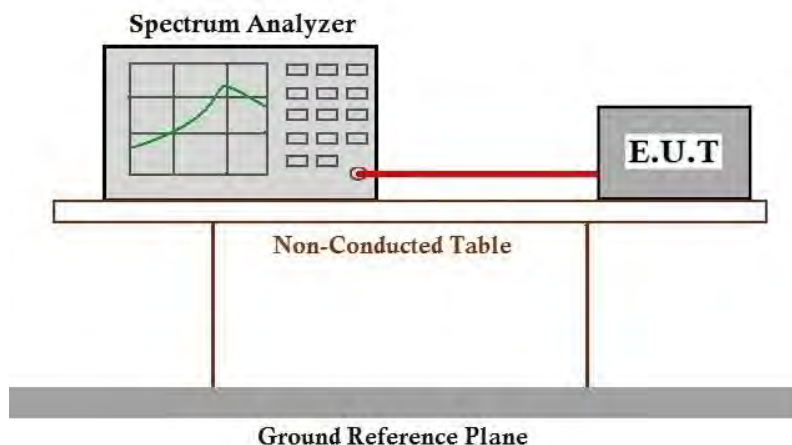
Humidity: 43.2 % RH

Atmospheric Pressure: 1010 mbar

7.5.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	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); data rate @ MCS0 is the worst case of IEEE 802.11ax(HE20); data rate @ MCS0 is the worst case of IEEE 802.11ax(HE40). Only the data of worst case is recorded in the report.

7.5.3 Test Setup Diagram





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7.5.4 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

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7.6 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

7.6.1 E.U.T. Operation

Operating Environment:

Temperature: 24.3 °C

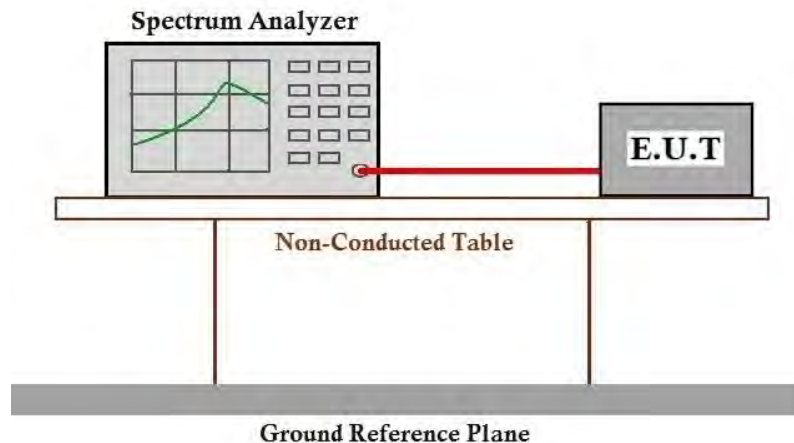
Humidity: 43.2 % RH

Atmospheric Pressure: 1010 mbar

7.6.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	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); data rate @ MCS0 is the worst case of IEEE 802.11ax(HE20); data rate @ MCS0 is the worst case of IEEE 802.11ax(HE40). Only the data of worst case is recorded in the report.

7.6.3 Test Setup Diagram



7.6.4 Measurement Procedure and Data

Please Refer to Appendix for Details

7.7 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

7.7.1 E.U.T. Operation

Operating Environment:

Temperature: 24.3 °C

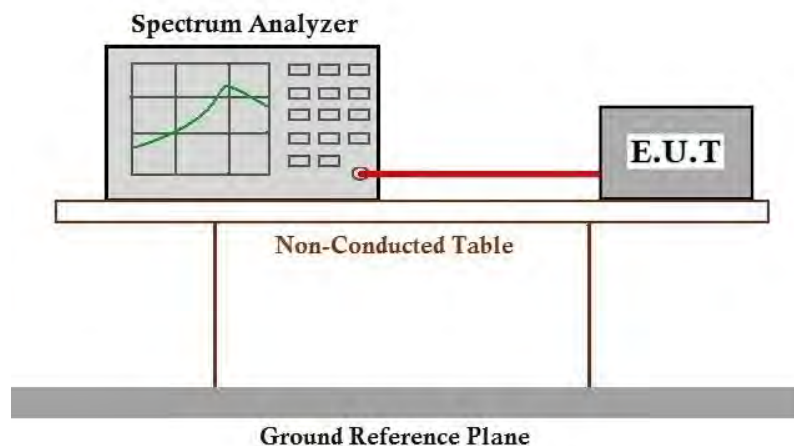
Humidity: 43.2 % RH

Atmospheric Pressure: 1010 mbar

7.7.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	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); data rate @ MCS0 is the worst case of IEEE 802.11ax(HE20); data rate @ MCS0 is the worst case of IEEE 802.11ax(HE40). Only the data of worst case is recorded in the report.

7.7.3 Test Setup Diagram



7.7.4 Measurement Procedure and Data

Please Refer to Appendix for Details



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7.8 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)).

7.8.1 E.U.T. Operation

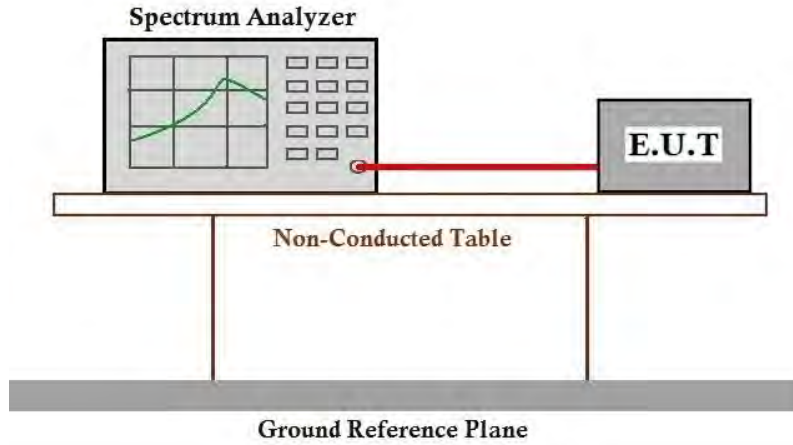
Operating Environment:

Temperature: 24.3 °C Humidity: 43.2 % RH Atmospheric Pressure: 1010 mbar

7.8.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	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); data rate @ MCS0 is the worst case of IEEE 802.11ax(HE20); data rate @ MCS0 is the worst case of IEEE 802.11ax(HE40). Only the data of worst case is recorded in the report.

7.8.3 Test Setup Diagram



7.8.4 Measurement Procedure and Data

Please Refer to Appendix for Details



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7.9 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)).

7.9.1 E.U.T. Operation

Operating Environment:

Temperature: 24.3 °C

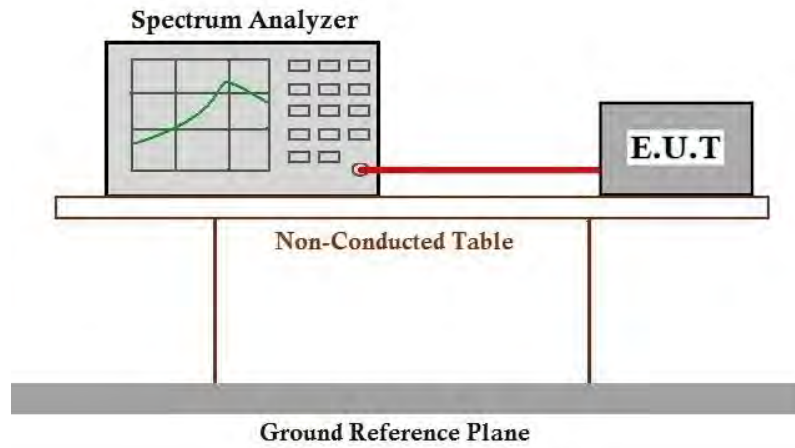
Humidity: 43.2 % RH

Atmospheric Pressure: 1010 mbar

7.9.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	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); data rate @ MCS0 is the worst case of IEEE 802.11ax(HE20); data rate @ MCS0 is the worst case of IEEE 802.11ax(HE40). Only the data of worst case is recorded in the report.

7.9.3 Test Setup Diagram



7.9.4 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 KSCR2408001624AT

9 EUT Constructional Details (EUT Photos)

Refer to Appendix - Photographs of EUT Constructional Details for KSCR2408001624AT

10 Appendix

1. Duty Cycle

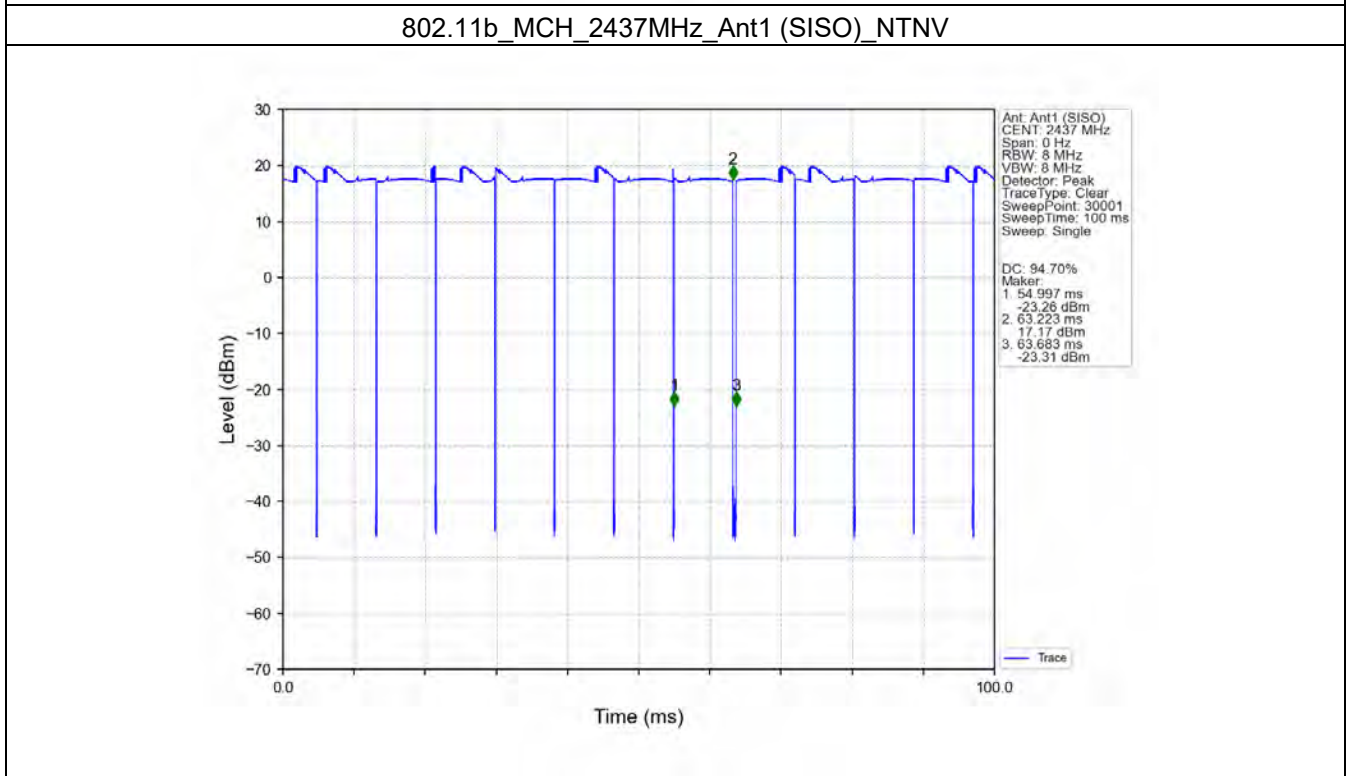
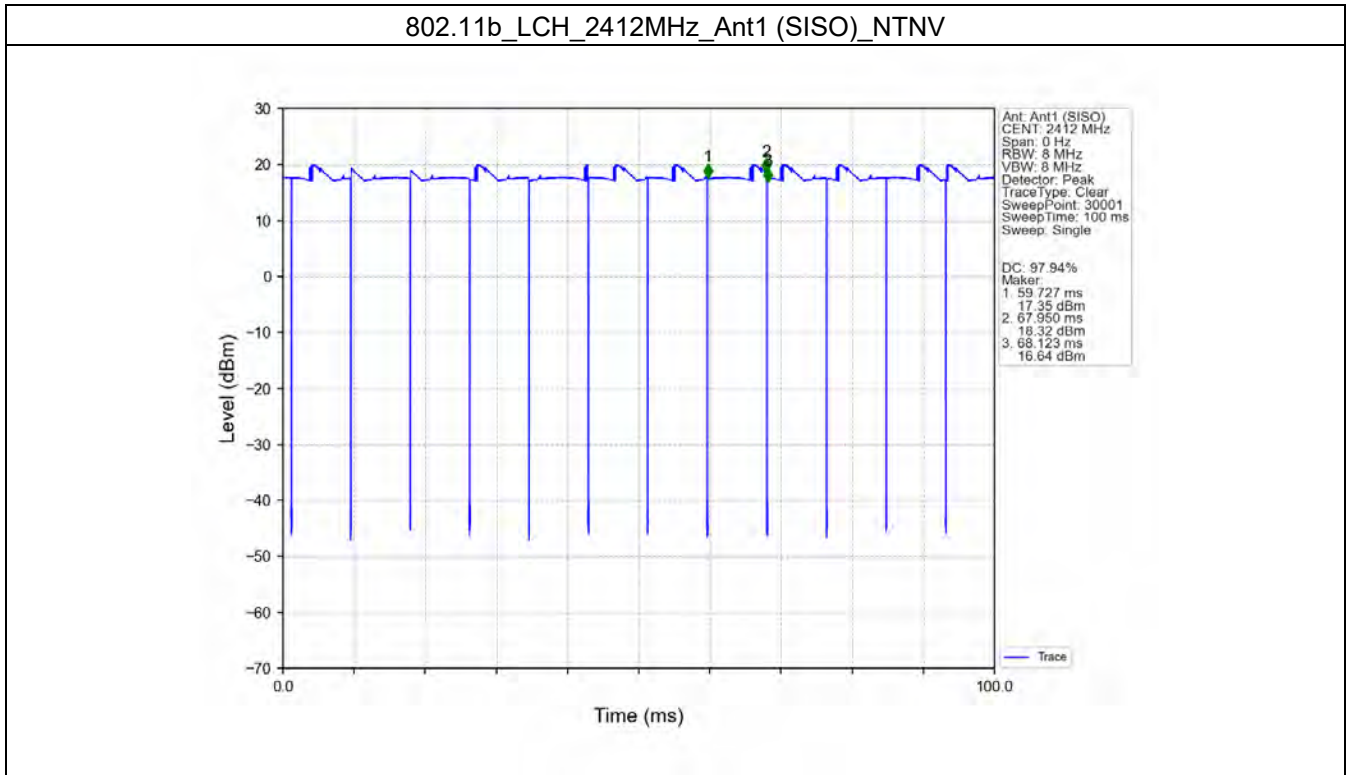
1.1 Test Result

1.1.1 Ant1

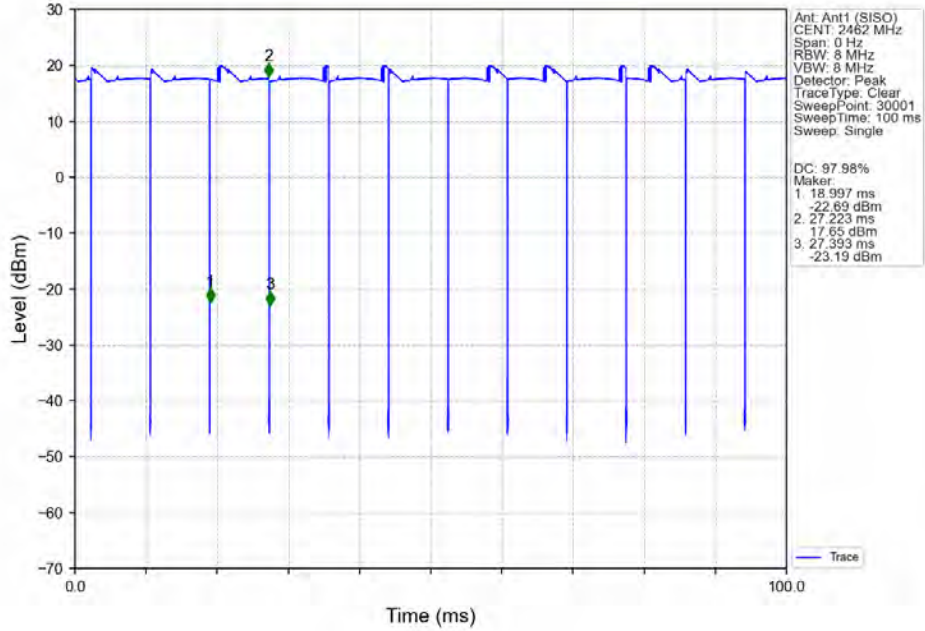
Ant1									
Mode	TX Type	Frequency (MHz)	RU	RU Pos	T_on (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	Max. DC Variation (%)
802.11b	SISO	2412	/	/	8.223	8.396	97.94	0.09	0.67
		2437	/	/	8.226	8.686	94.70	0.24	3.90
		2462	/	/	8.226	8.396	97.98	0.09	0.63
802.11g	SISO	2412	/	/	1.365	1.593	85.69	0.67	5.69
		2437	/	/	1.367	1.518	90.05	0.46	1.65
		2462	/	/	1.366	1.592	85.80	0.66	5.67
802.11n (HT20)	SISO	2412	/	/	1.276	1.469	86.86	0.61	3.92
		2437	/	/	1.276	1.411	90.43	0.44	0.61
		2462	/	/	1.276	1.487	85.81	0.66	4.96
802.11n (HT40)	SISO	2422	/	/	0.637	0.797	79.92	0.97	3.81
		2437	/	/	0.636	0.864	73.61	1.33	9.52
		2452	/	/	0.638	0.855	74.62	1.27	8.76
802.11ax (HE20)	SISO	2412	RU242	Left	0.999	1.179	84.73	0.72	4.07
		2437	RU242	Left	1.000	1.171	85.40	0.69	3.46
		2462	RU242	Left	1.000	1.162	86.06	0.65	2.78
802.11ax (HE40)	SISO	2422	RU484	Left	0.532	0.710	74.93	1.25	6.26
		2437	RU484	Left	0.531	0.750	70.80	1.50	7.51
		2452	RU484	Left	0.532	0.751	70.84	1.50	9.66

1.2 Test Graph

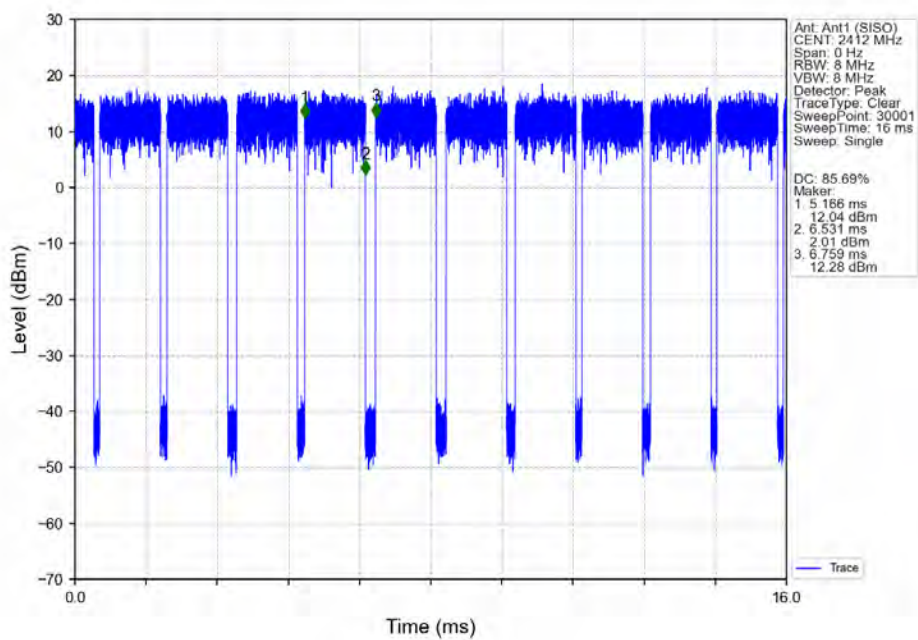
1.2.1 Ant1



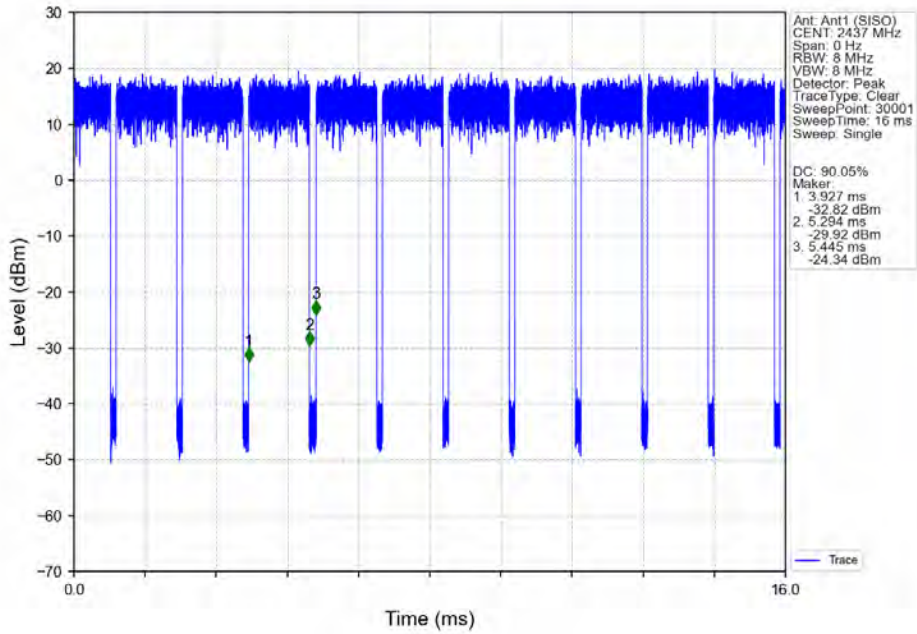
802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



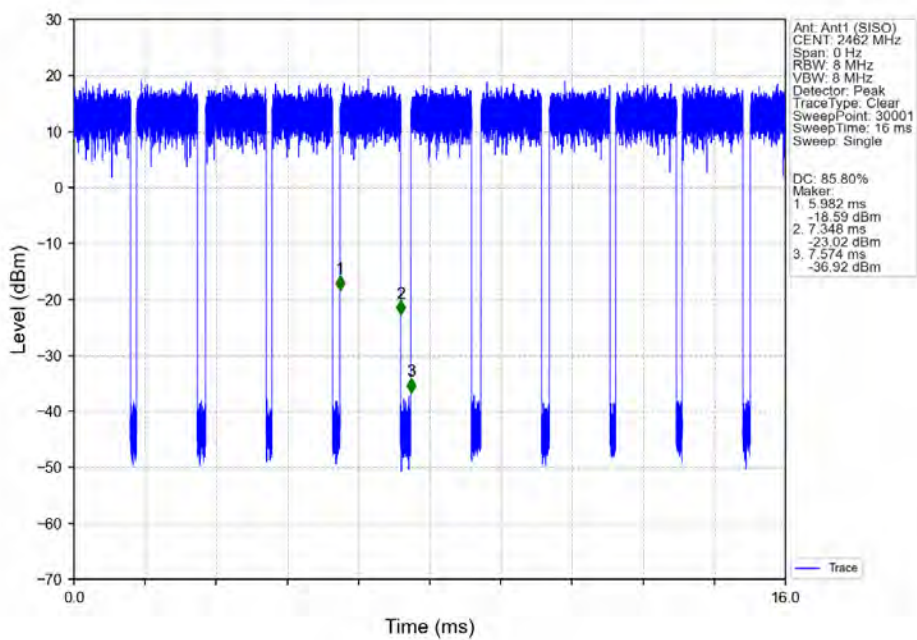
802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV



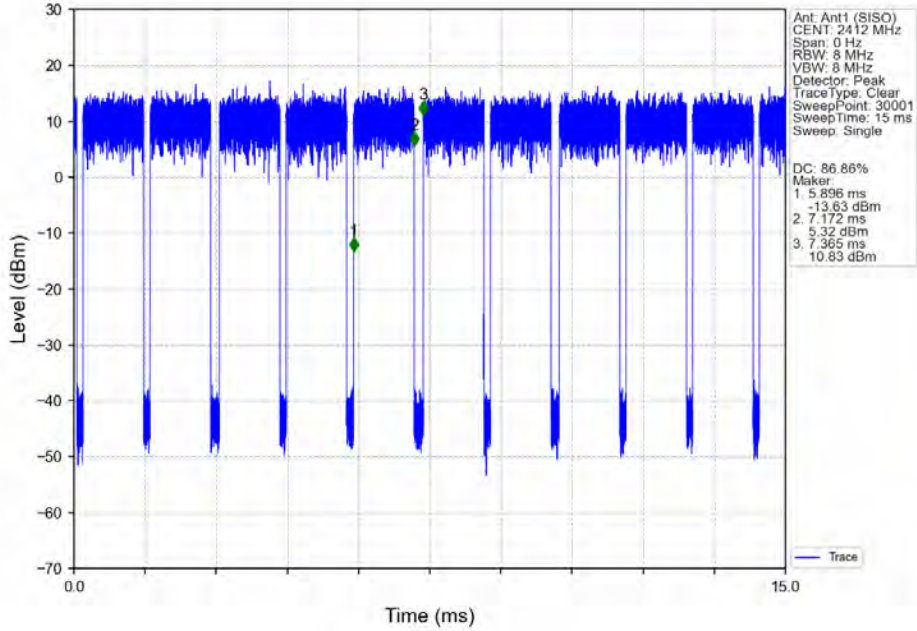
802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



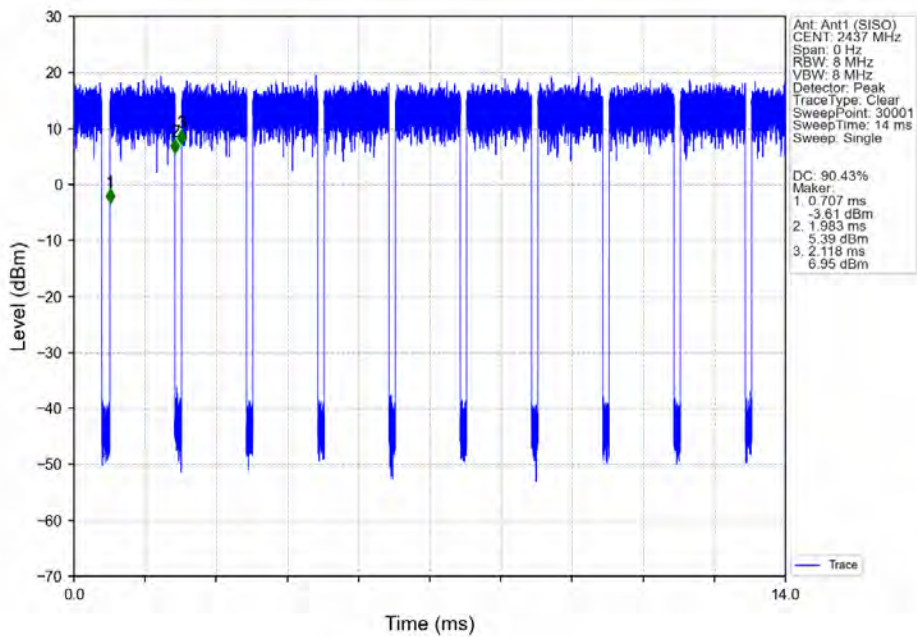
802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



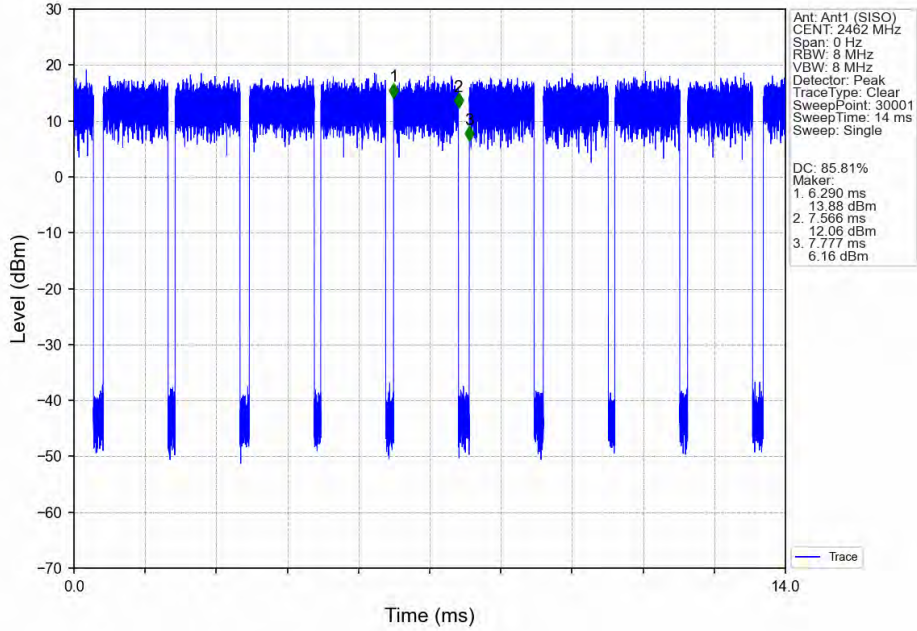
802.11n(HT20)_LCH_2412MHz_Ant1 (SISO)_NTNV



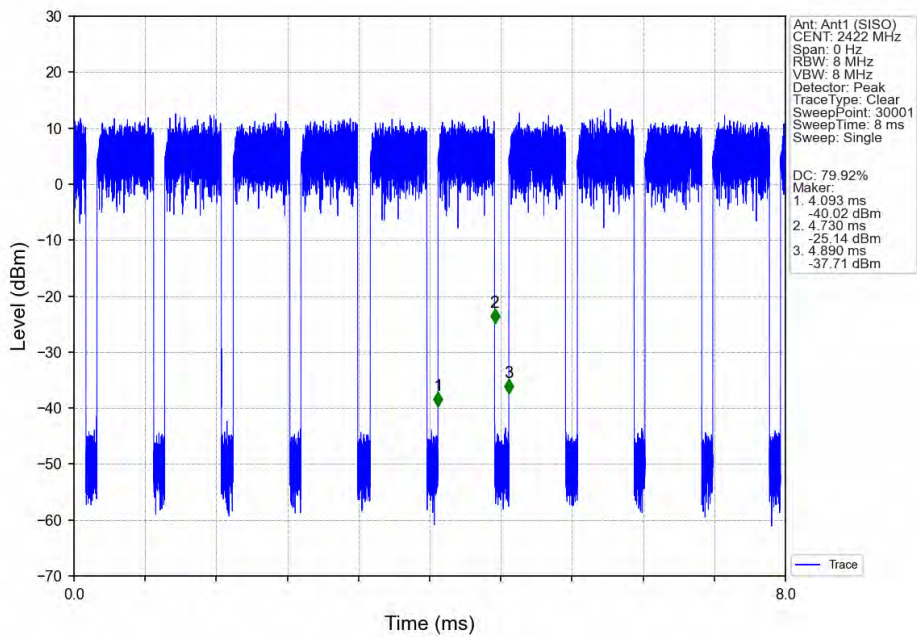
802.11n(HT20)_MCH_2437MHz_Ant1 (SISO)_NTNV



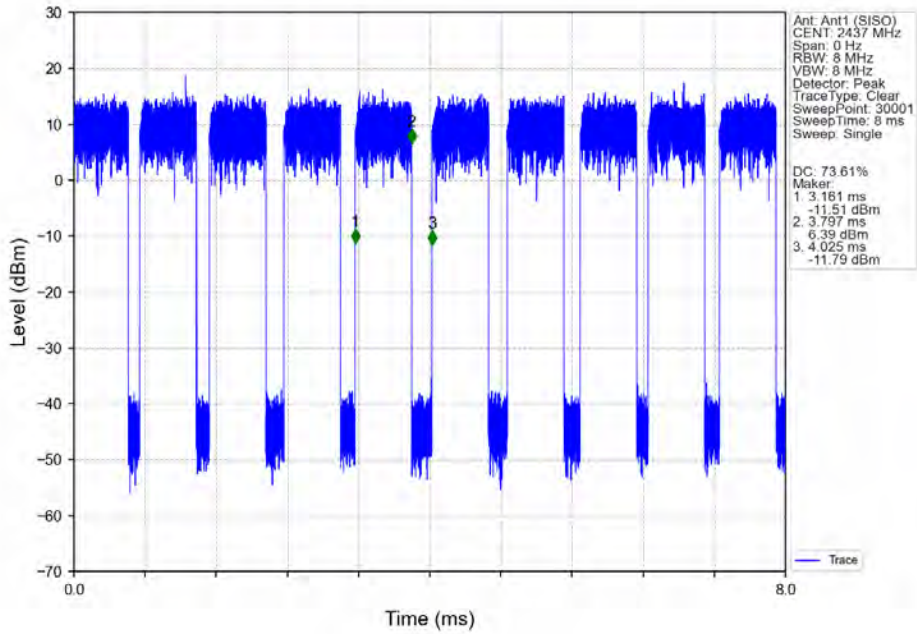
802.11n(HT20)_HCH_2462MHz_Ant1 (SISO)_NTNV



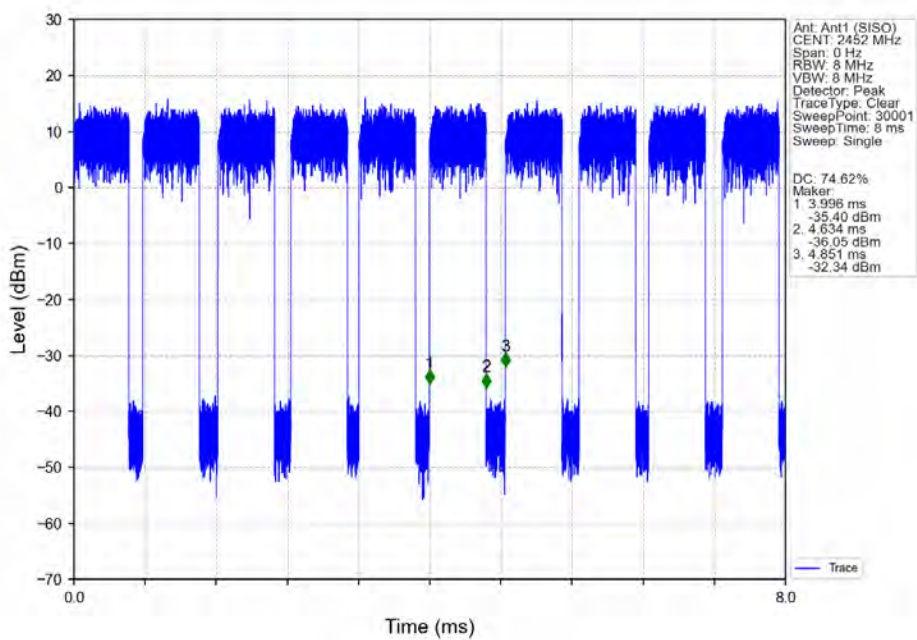
802.11n(HT40)_LCH_2422MHz_Ant1 (SISO)_NTNV



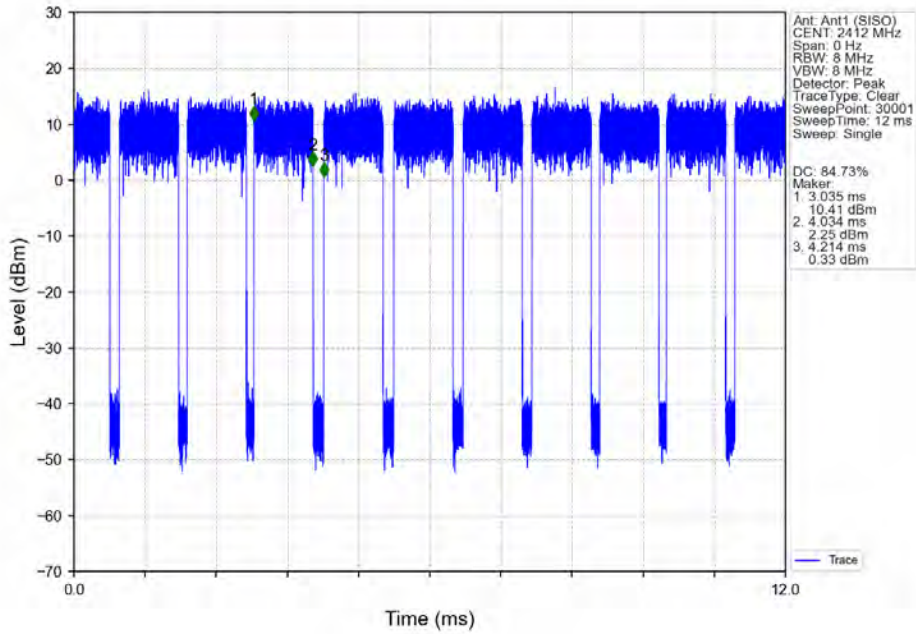
802.11n(HT40)_MCH_2437MHz_Ant1 (SISO)_NTNV



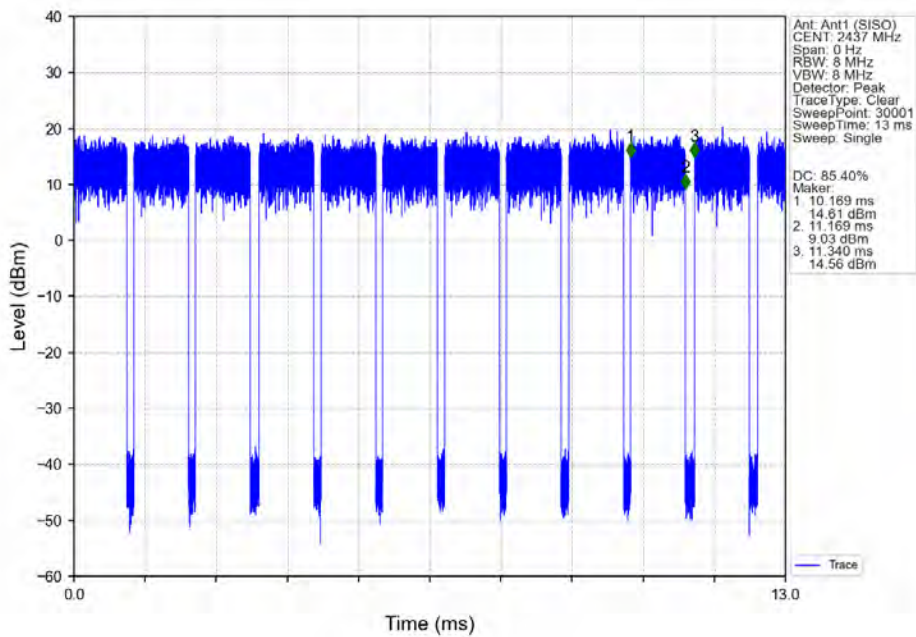
802.11n(HT40)_HCH_2452MHz_Ant1 (SISO)_NTNV



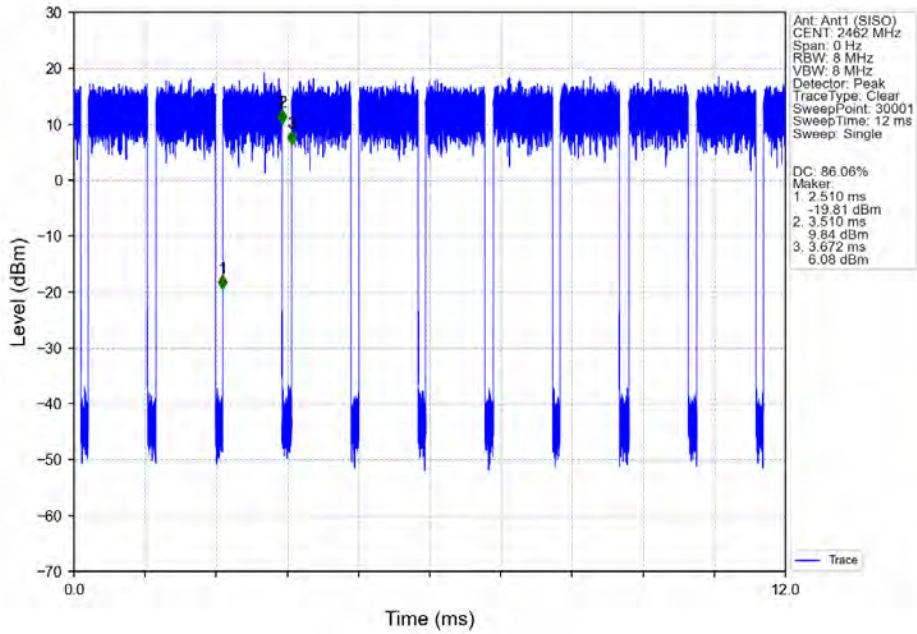
802.11ax(HE20)_LCH_2412MHz_RU242_Left_Ant1 (SISO)_NTNV



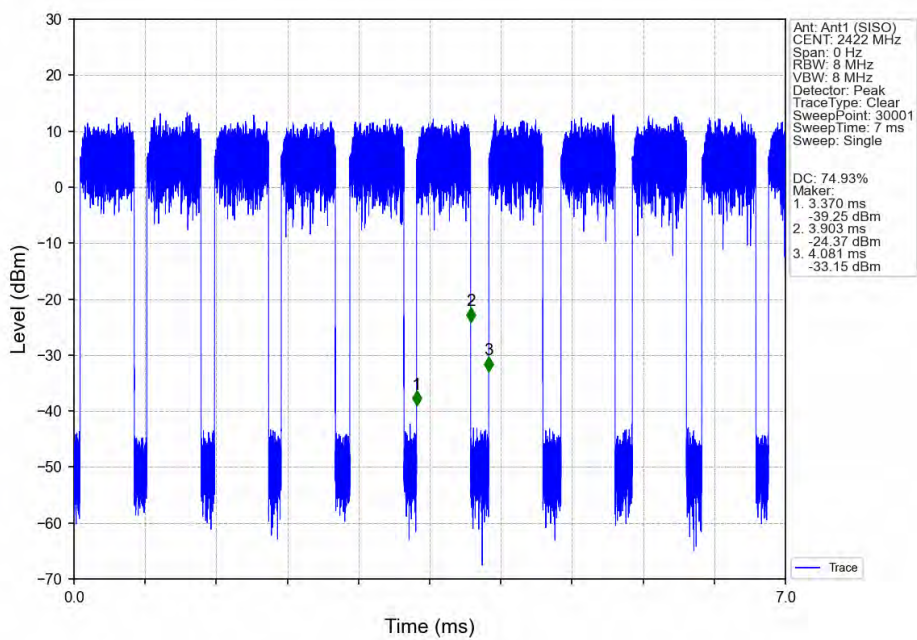
802.11ax(HE20)_MCH_2437MHz_RU242_Left_Ant1 (SISO)_NTNV



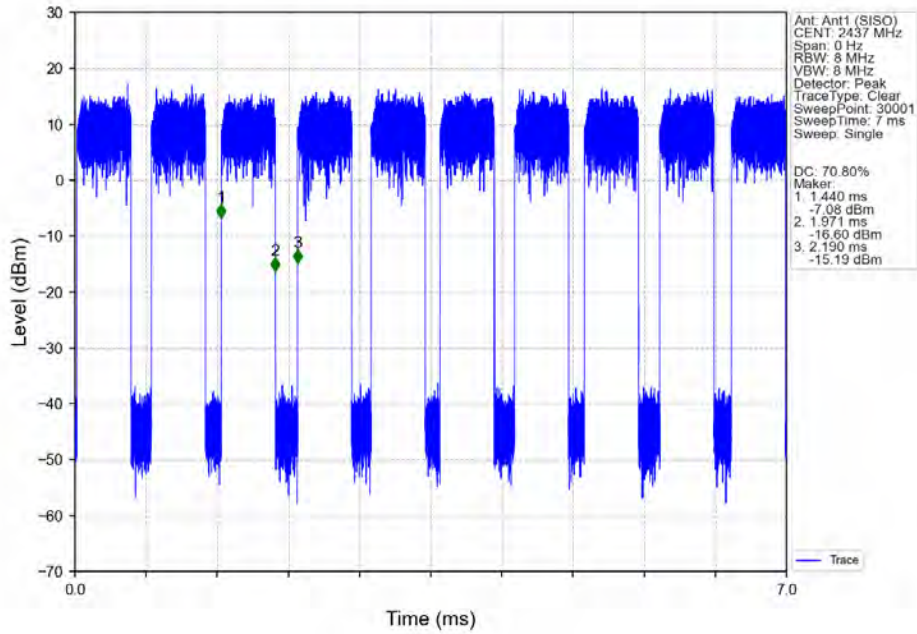
802.11ax(HE20)_HCH_2462MHz_RU242_Left_Ant1 (SISO)_NTNV



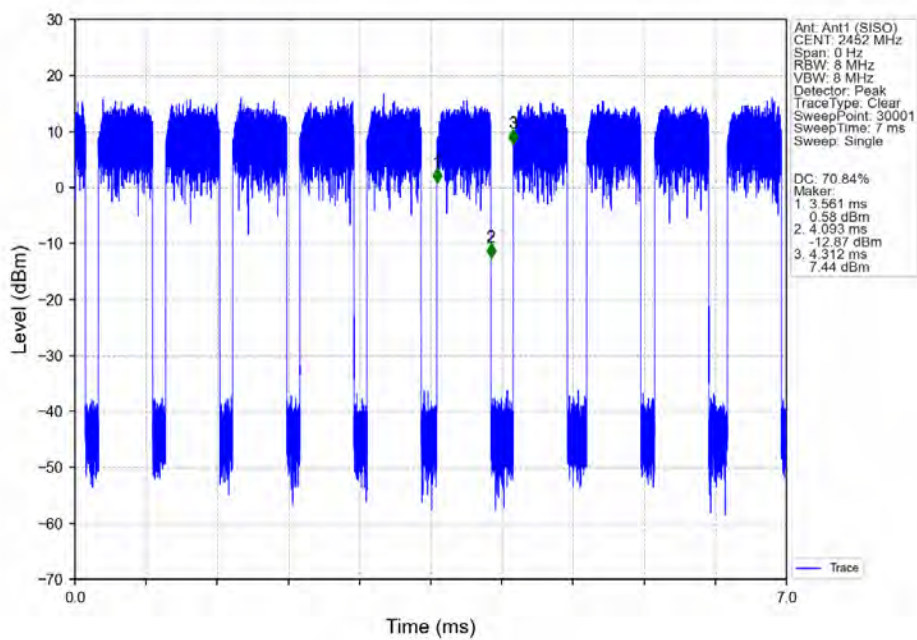
802.11ax(HE40)_LCH_2422MHz_RU484_Left_Ant1 (SISO)_NTNV



802.11ax(HE40)_MCH_2437MHz_RU484_Left_Ant1 (SISO)_NTNV



802.11ax(HE40)_HCH_2452MHz_RU484_Left_Ant1 (SISO)_NTNV



2. Bandwidth

2.1 Test Result

2.1.1 OBW

Mode	TX Type	Frequency (MHz)	RU	RU Pos	ANT	99% Occupied Bandwidth (MHz)		Verdict
						Result	Limit	
802.11b	SISO	2412	/	/	1	15.033	/	Pass
		2437	/	/	1	15.095	/	Pass
		2462	/	/	1	15.099	/	Pass
802.11g	SISO	2412	/	/	1	18.541	/	Pass
		2437	/	/	1	18.569	/	Pass
		2462	/	/	1	18.561	/	Pass
802.11n (HT20)	SISO	2412	/	/	1	19.314	/	Pass
		2437	/	/	1	19.661	/	Pass
		2462	/	/	1	19.536	/	Pass
802.11n (HT40)	SISO	2422	/	/	1	37.371	/	Pass
		2437	/	/	1	37.552	/	Pass
		2452	/	/	1	37.537	/	Pass
802.11ax (HE20)	SISO	2412	RU242	Left	1	19.784	/	Pass
		2437	RU242	Left	1	19.818	/	Pass
		2462	RU242	Left	1	19.782	/	Pass
802.11ax (HE40)	SISO	2422	RU484	Left	1	38.335	/	Pass
		2437	RU484	Left	1	38.552	/	Pass
		2452	RU484	Left	1	38.558	/	Pass

2.1.2 6dB BW

Mode	TX Type	Frequency (MHz)	RU	RU Pos	ANT	6dB Bandwidth (MHz)		Verdict
						Result	Limit	
802.11b	SISO	2412	/	/	1	10.079	>=0.5	Pass
		2437	/	/	1	10.083	>=0.5	Pass
		2462	/	/	1	9.590	>=0.5	Pass
802.11g	SISO	2412	/	/	1	15.673	>=0.5	Pass
		2437	/	/	1	15.801	>=0.5	Pass
		2462	/	/	1	15.818	>=0.5	Pass
802.11n (HT20)	SISO	2412	/	/	1	15.986	>=0.5	Pass
		2437	/	/	1	16.116	>=0.5	Pass
		2462	/	/	1	15.386	>=0.5	Pass
802.11n (HT40)	SISO	2422	/	/	1	35.157	>=0.5	Pass
		2437	/	/	1	35.154	>=0.5	Pass
		2452	/	/	1	35.162	>=0.5	Pass



Compliance Certification Services (Kunshan) Inc.

CCSEM-TRF-001 Rev. 02 Sep 01, 2023

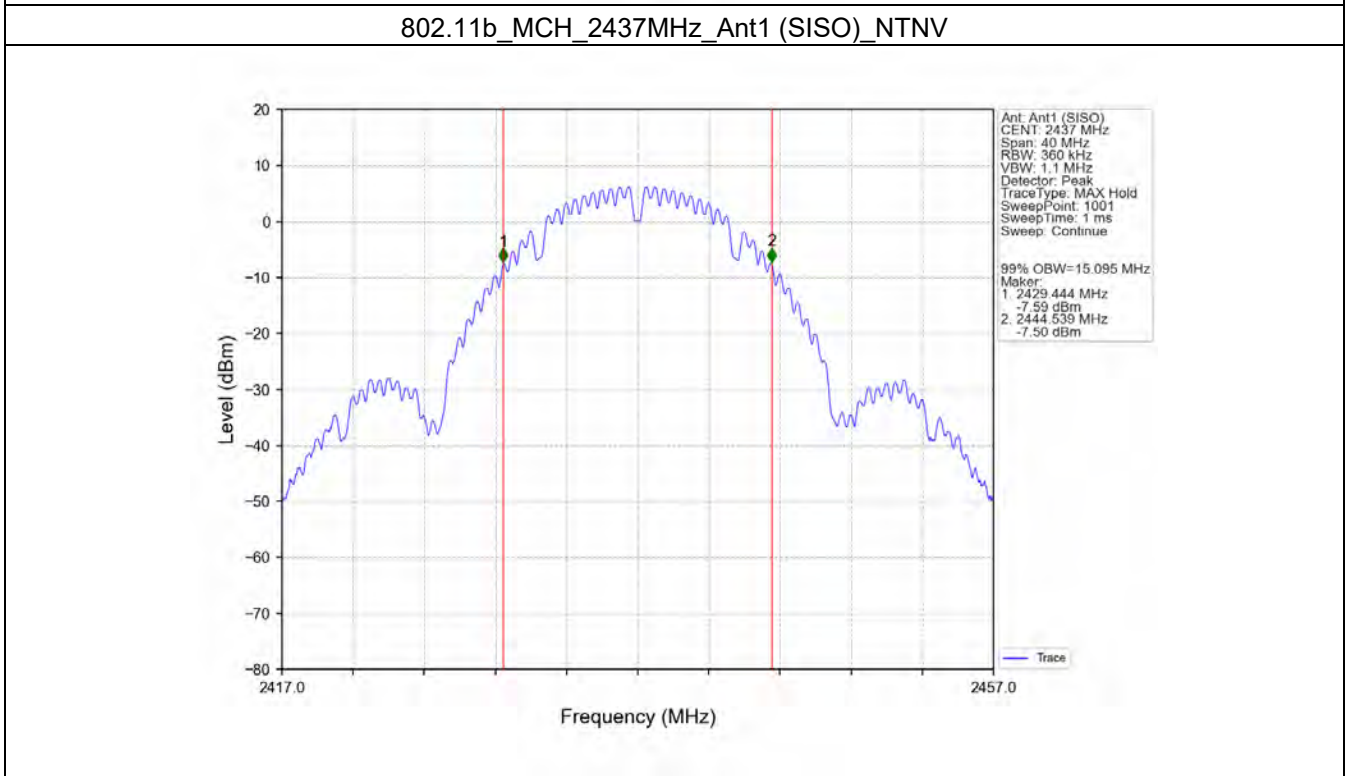
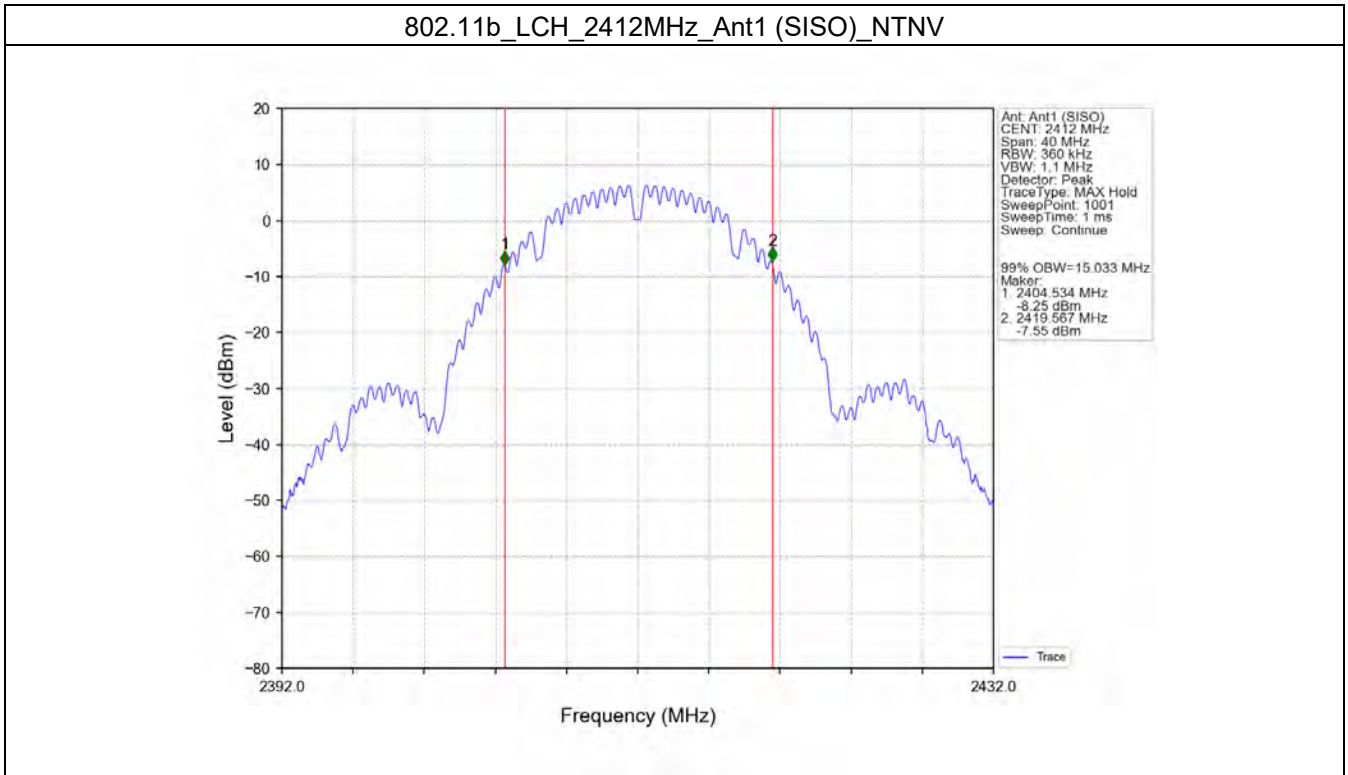
Report No.: KSCR240800162403

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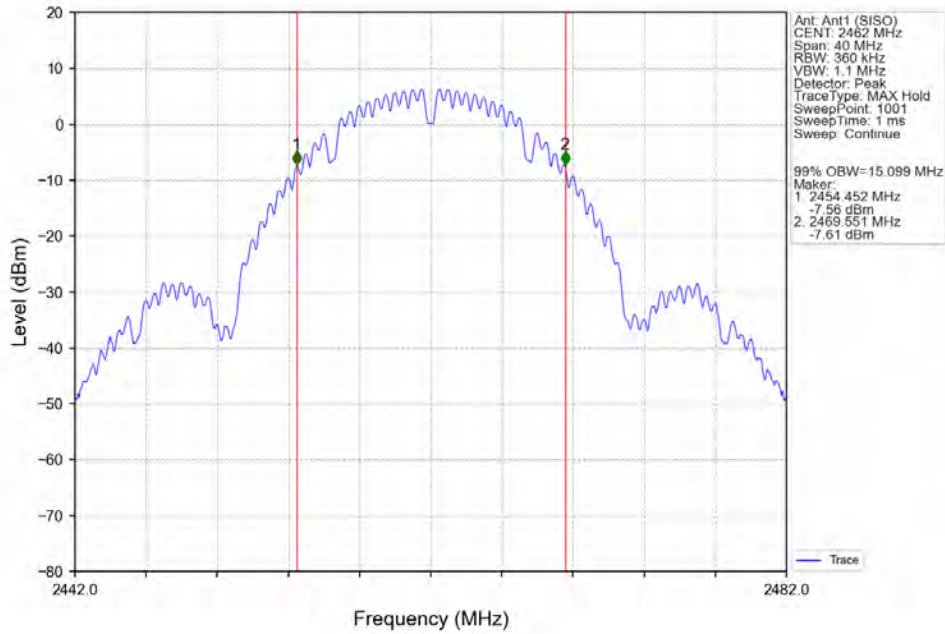
802.11ax (HE20)	SISO	2412	RU242	Left	1	17.749	≥ 0.5	Pass
		2437	RU242	Left	1	17.949	≥ 0.5	Pass
		2462	RU242	Left	1	18.150	≥ 0.5	Pass
802.11ax (HE40)	SISO	2422	RU484	Left	1	36.372	≥ 0.5	Pass
		2437	RU484	Left	1	36.383	≥ 0.5	Pass
		2452	RU484	Left	1	36.396	≥ 0.5	Pass

2.2 Test Graph

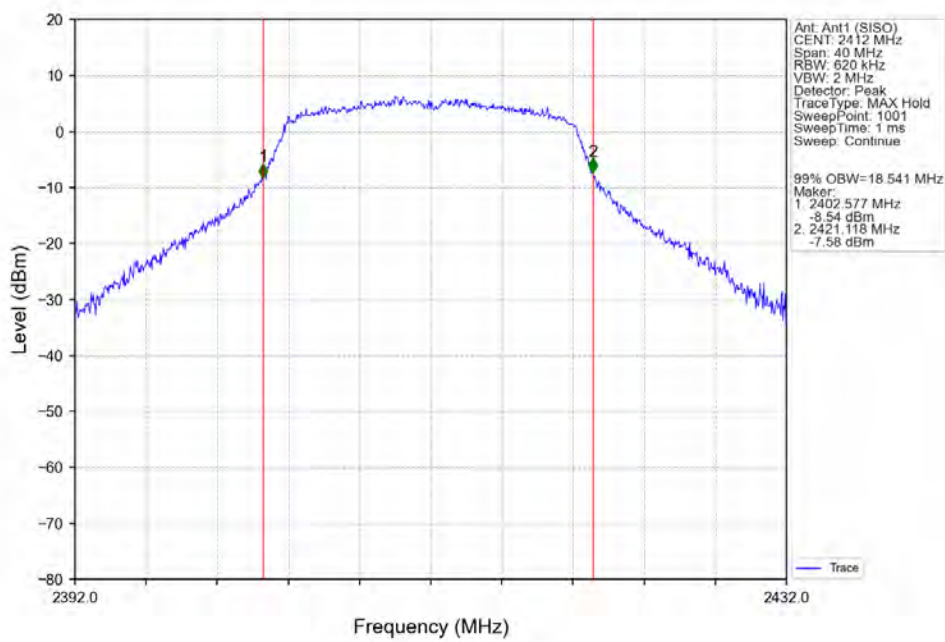
2.2.1 OBW



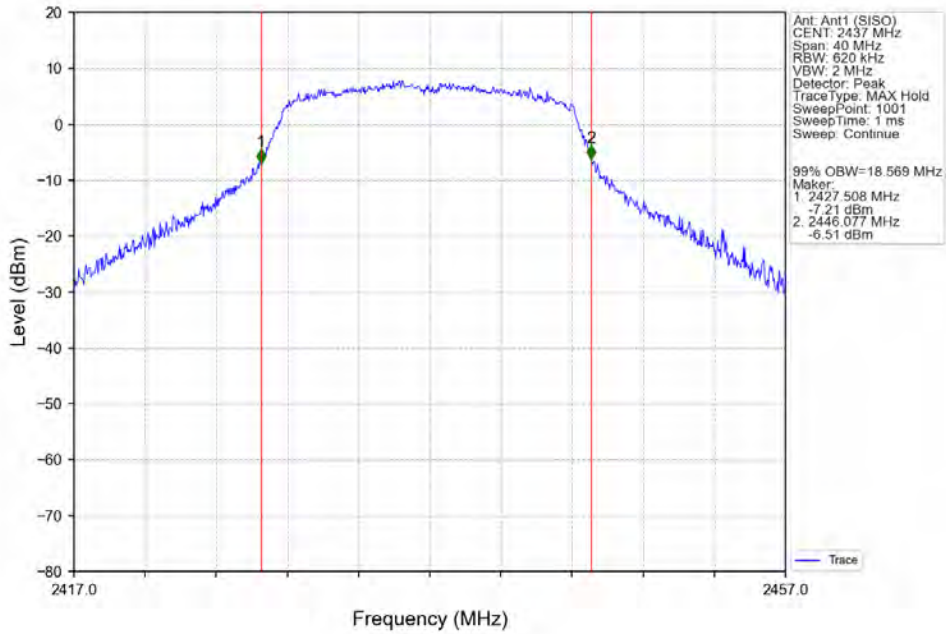
802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



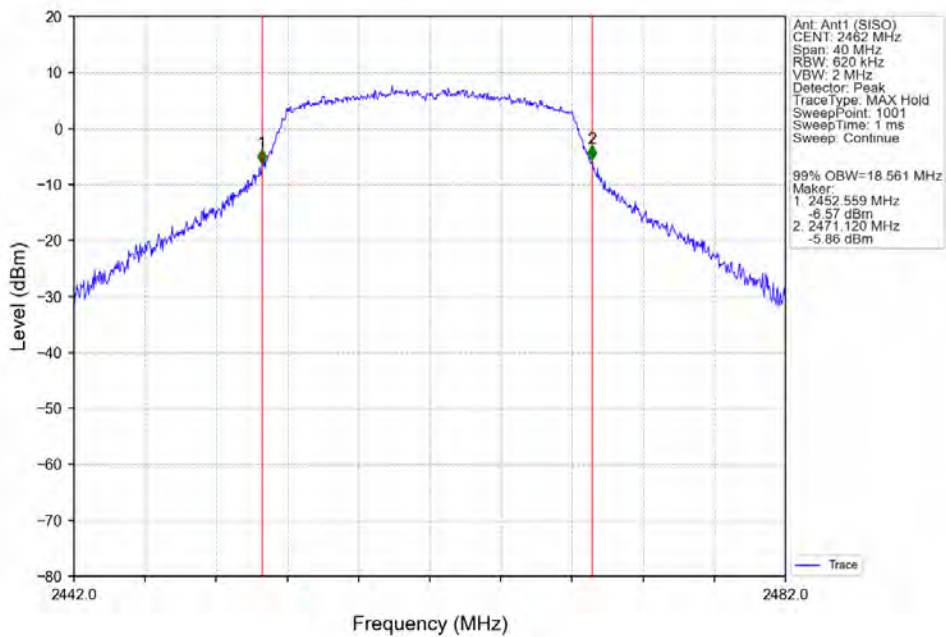
802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV



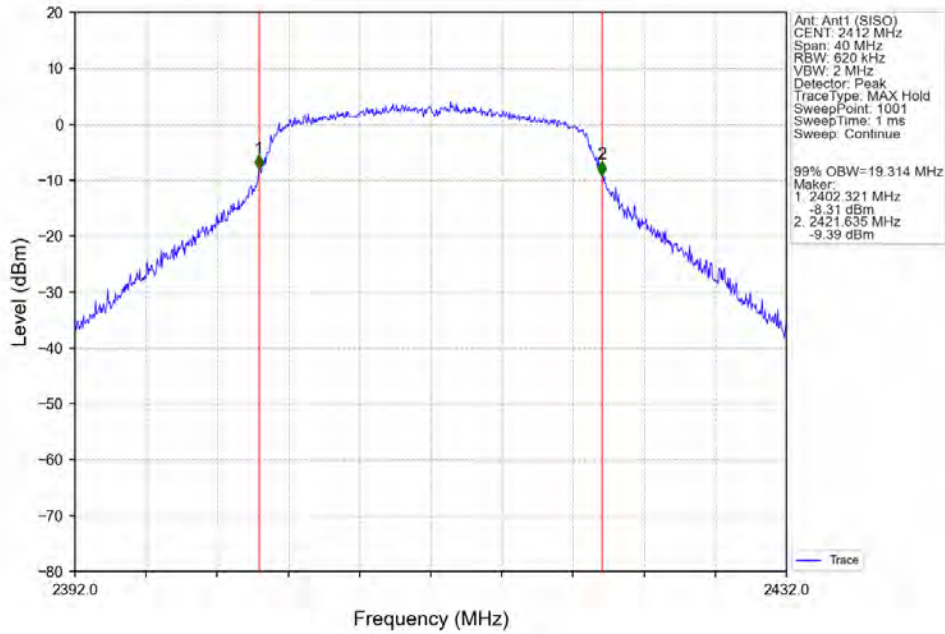
802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



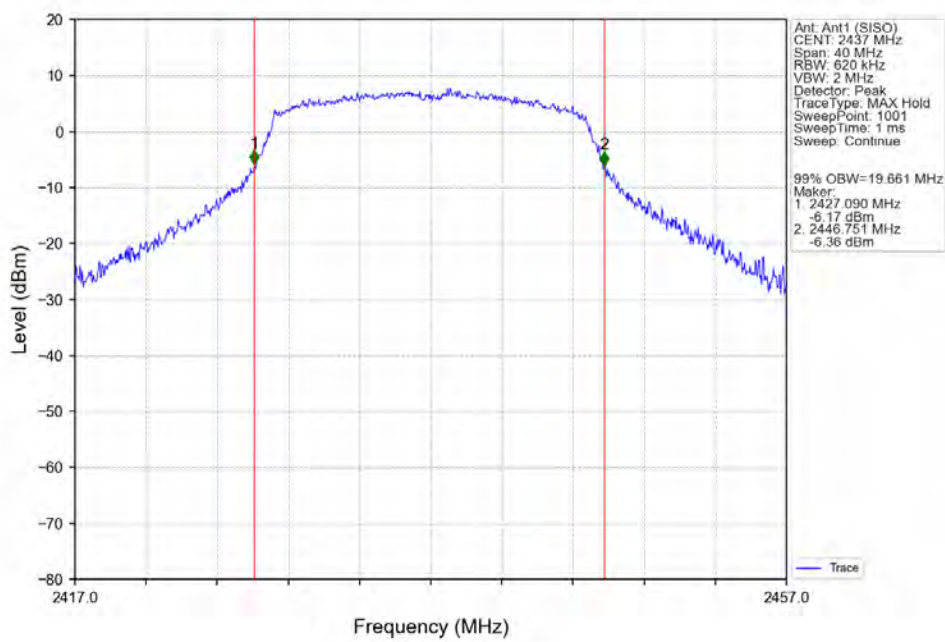
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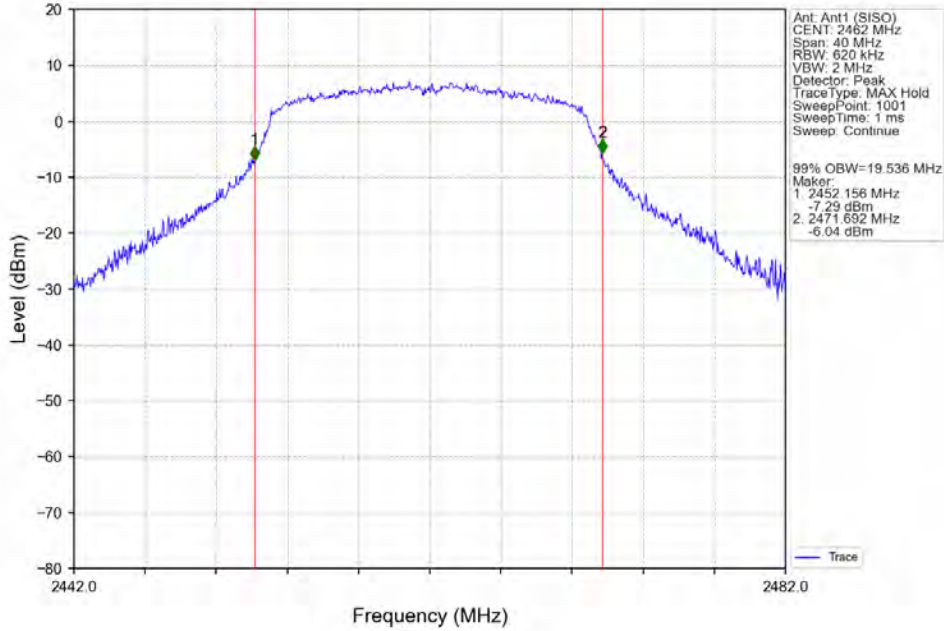
802.11n(HT20)_LCH_2412MHz_Ant1 (SISO)_NTNV



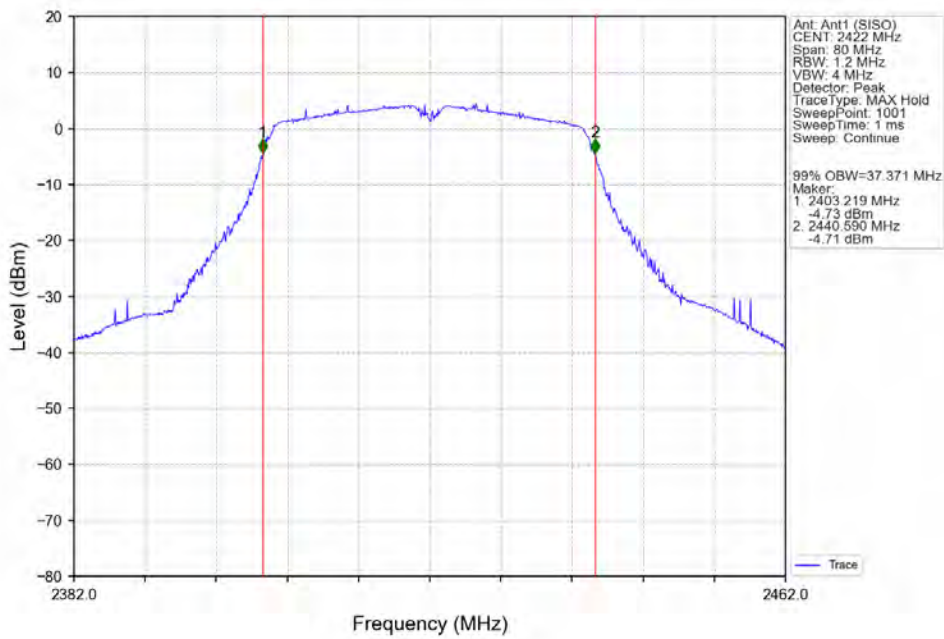
802.11n(HT20)_MCH_2437MHz_Ant1 (SISO)_NTNV



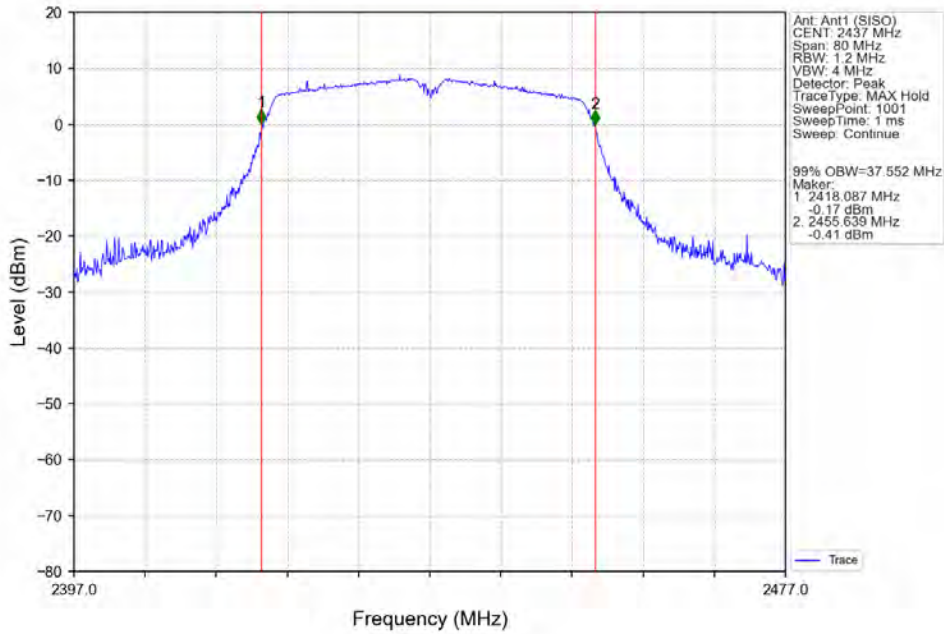
802.11n(HT20)_HCH_2462MHz_Ant1 (SISO)_NTNV



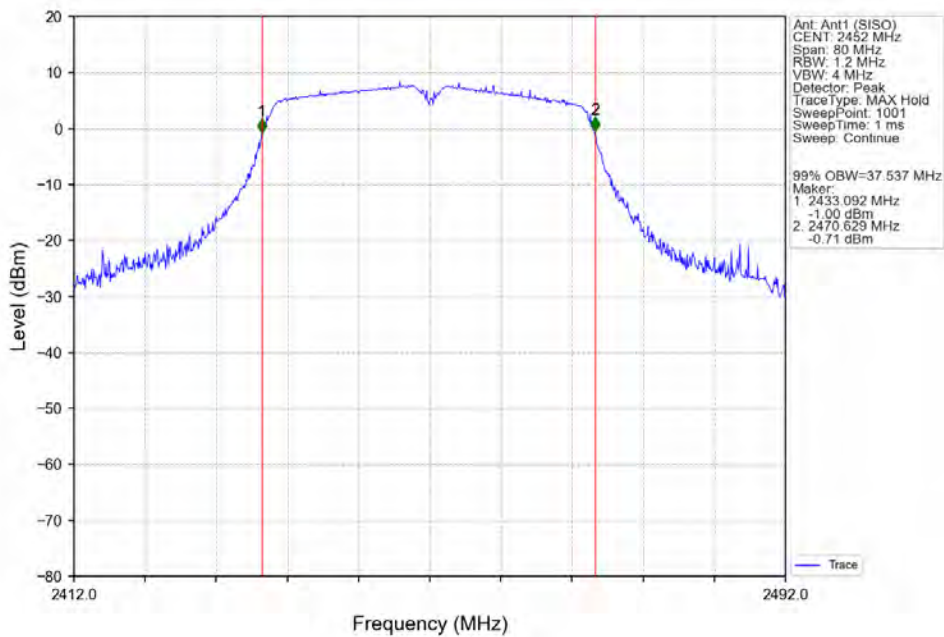
802.11n(HT40)_LCH_2422MHz_Ant1 (SISO)_NTNV



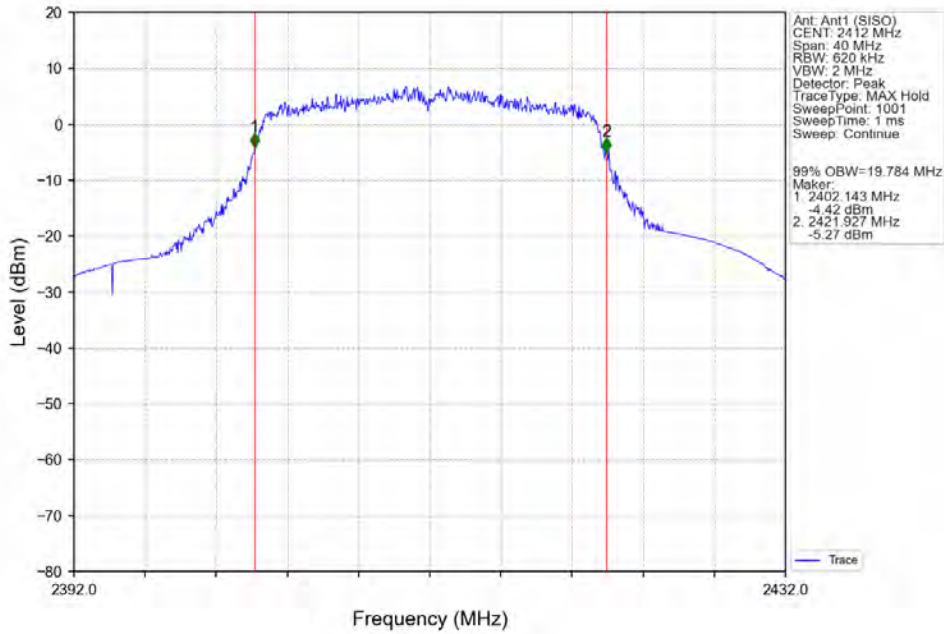
802.11n(HT40)_MCH_2437MHz_Ant1 (SISO)_NTNV



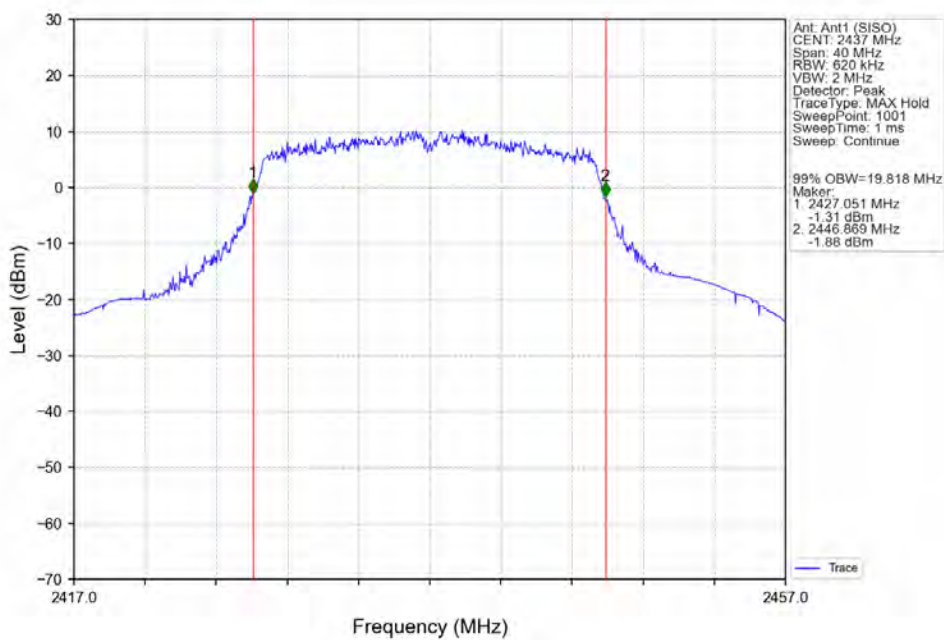
802.11n(HT40)_HCH_2452MHz_Ant1 (SISO)_NTNV



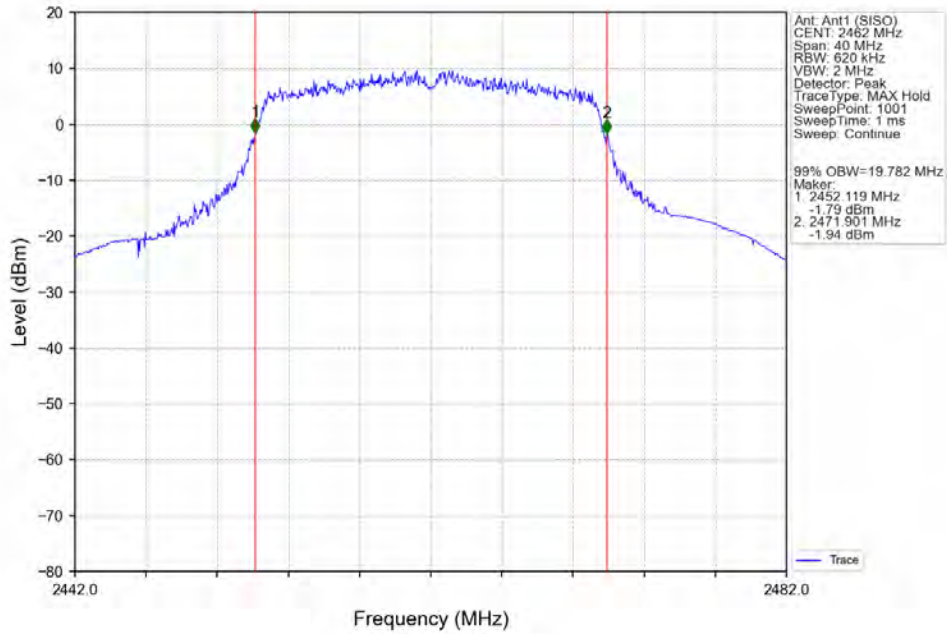
802.11ax(HE20)_LCH_2412MHz_RU242_Left_Ant1 (SISO)_NTNV



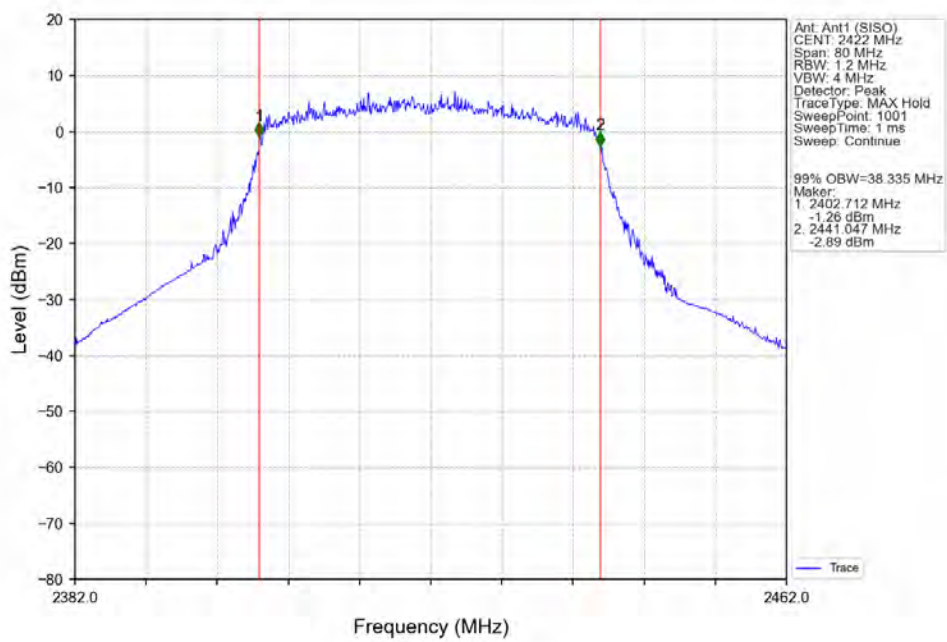
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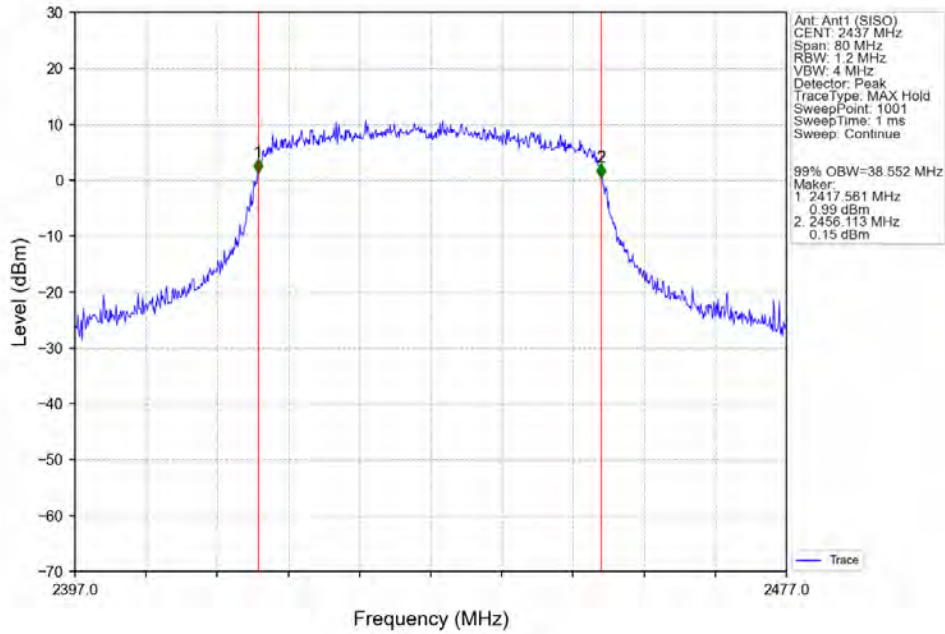
802.11ax(HE20)_HCH_2462MHz_RU242_Left_Ant1 (SISO)_NTNV



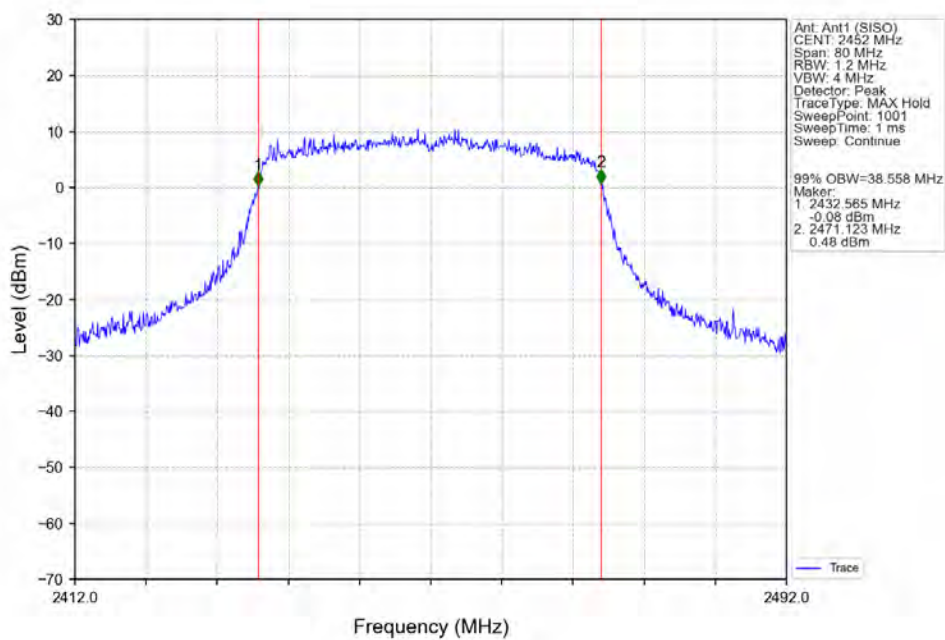
802.11ax(HE40)_LCH_2422MHz_RU484_Left_Ant1 (SISO)_NTNV



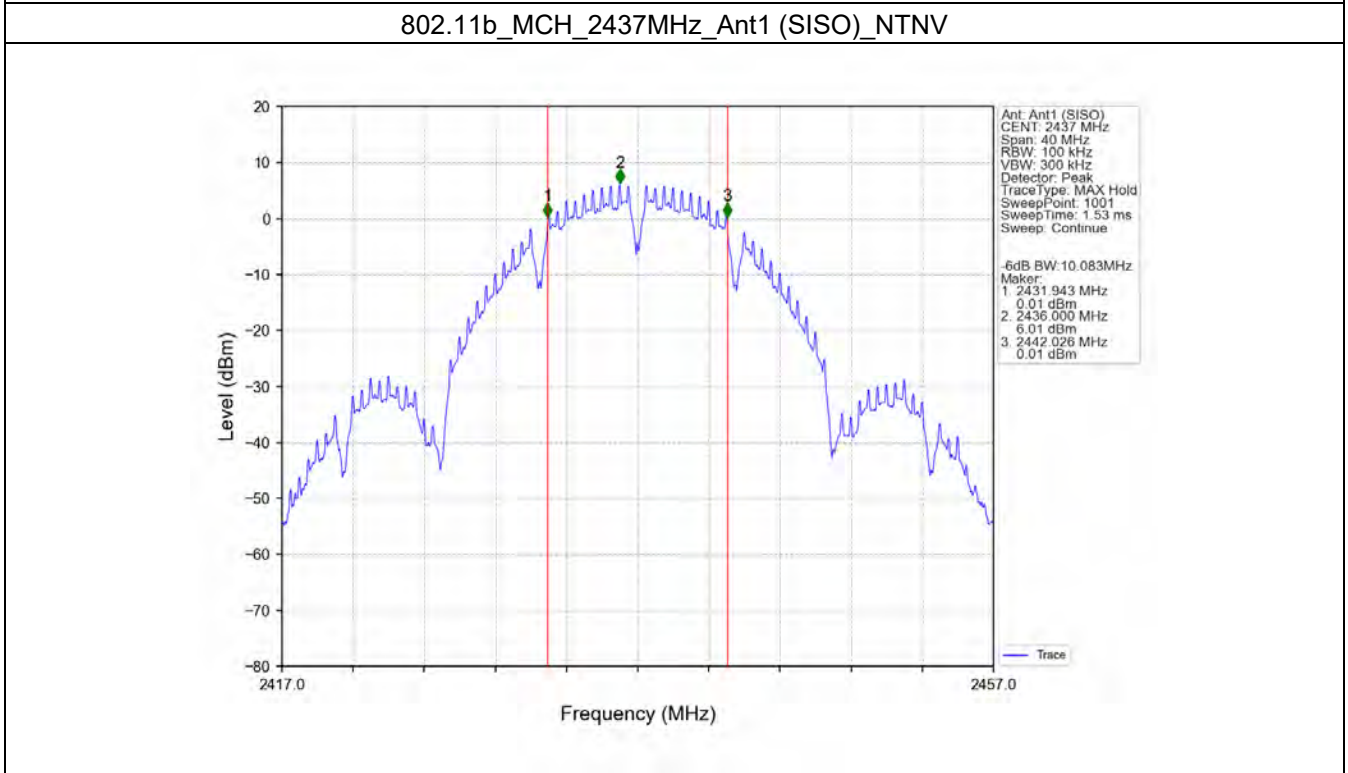
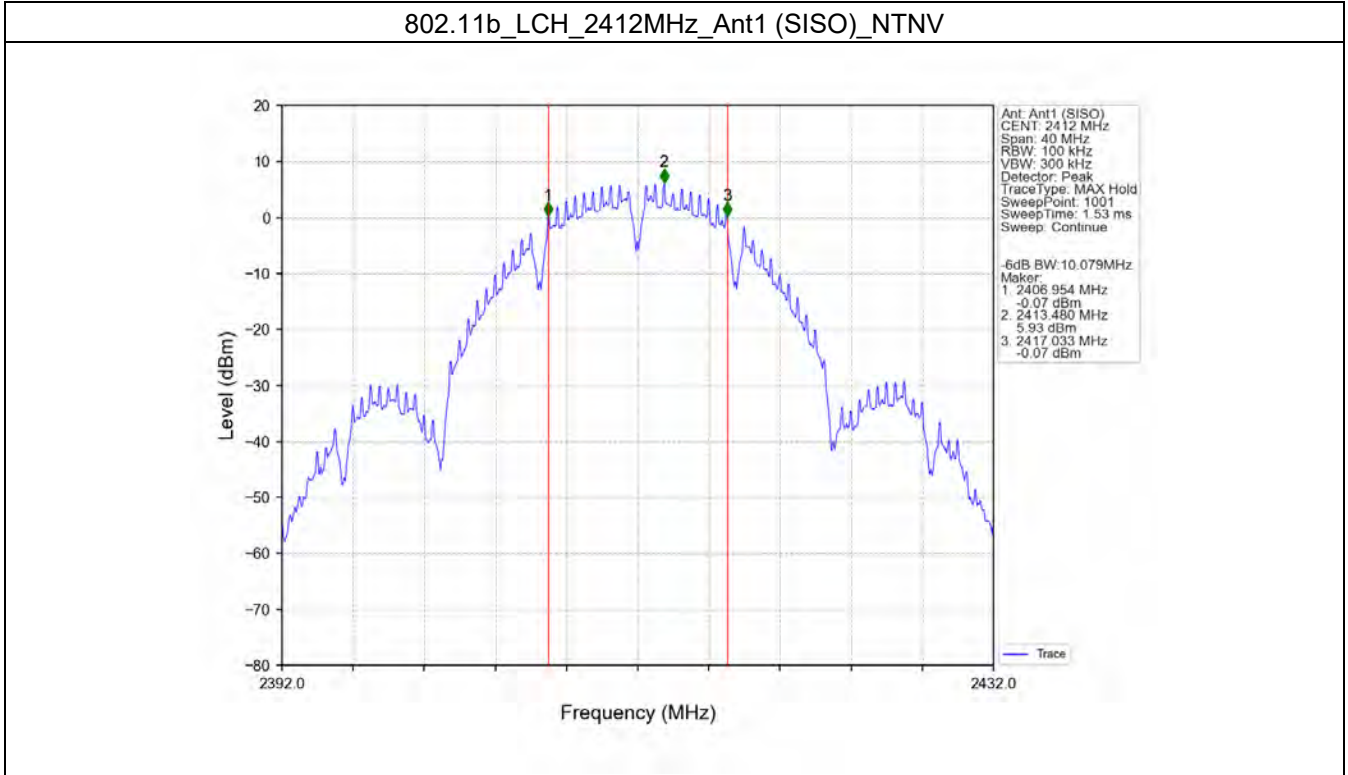
802.11ax(HE40)_MCH_2437MHz_RU484_Left_Ant1 (SISO)_NTNV



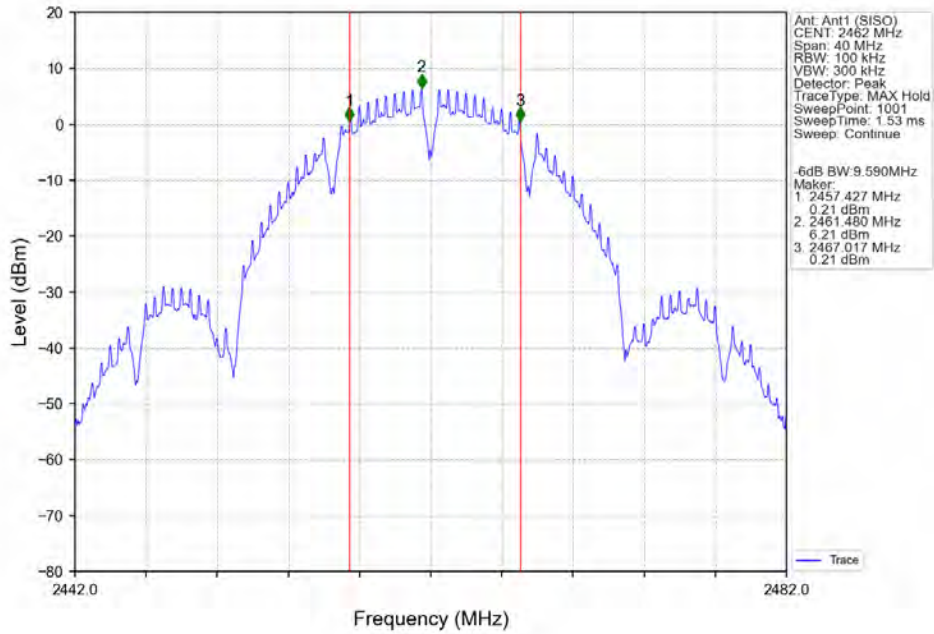
802.11ax(HE40)_HCH_2452MHz_RU484_Left_Ant1 (SISO)_NTNV



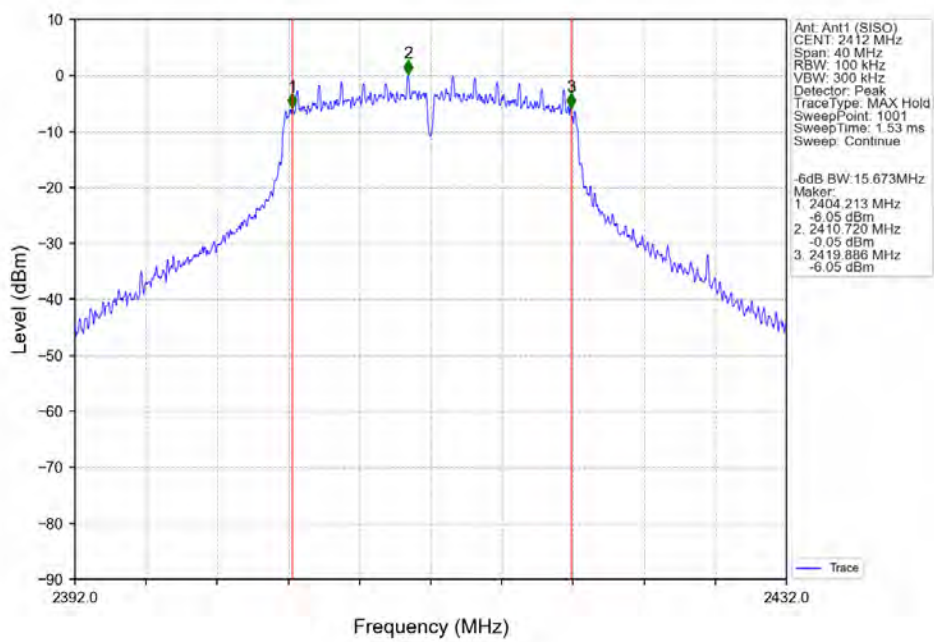
2.2.2 6dB BW



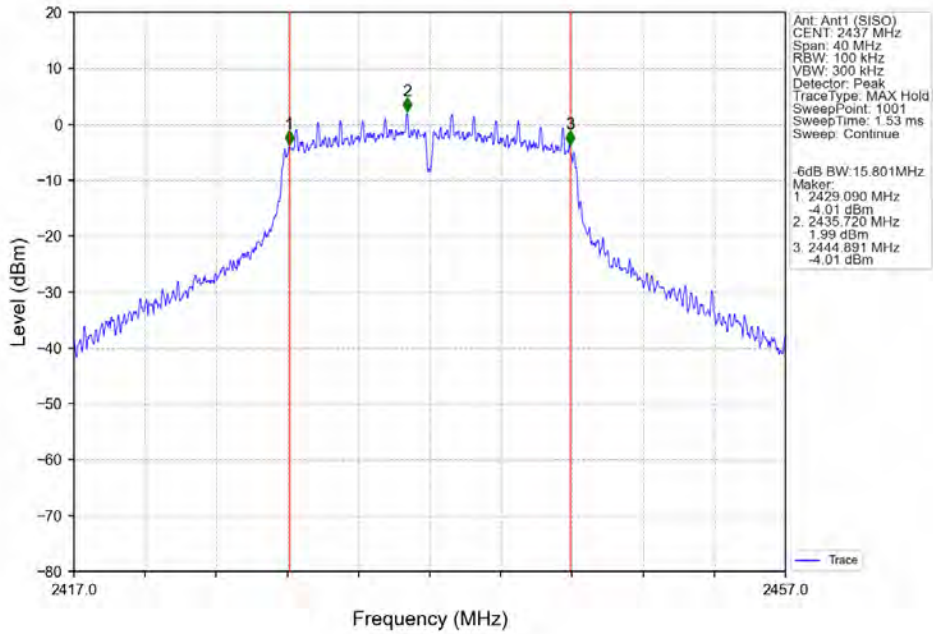
802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



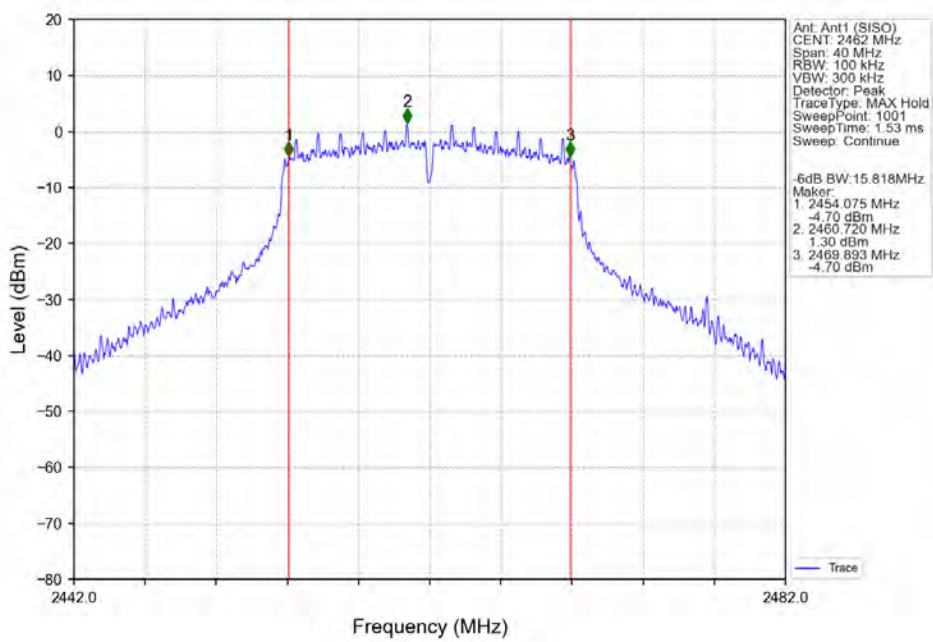
802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV



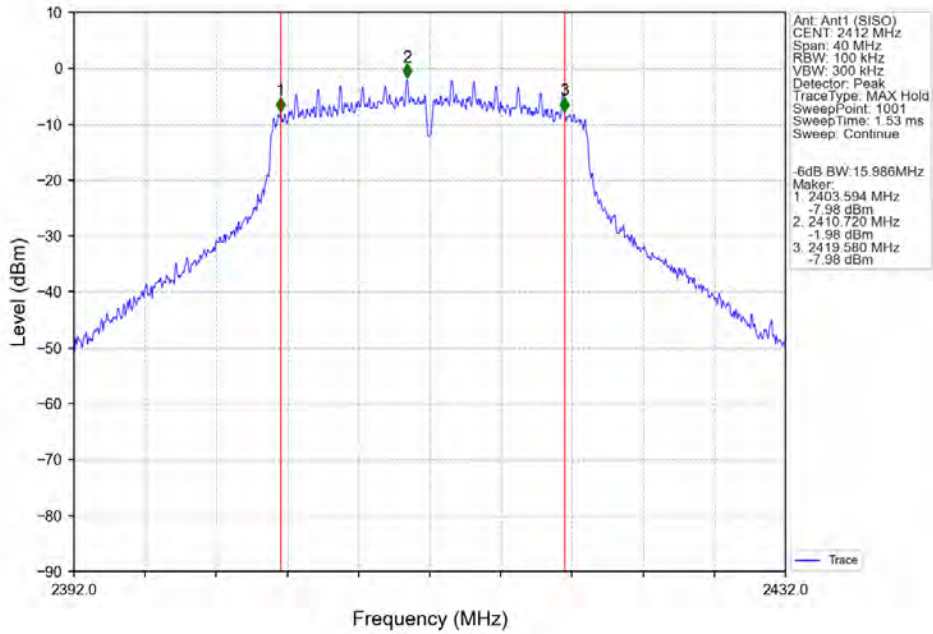
802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



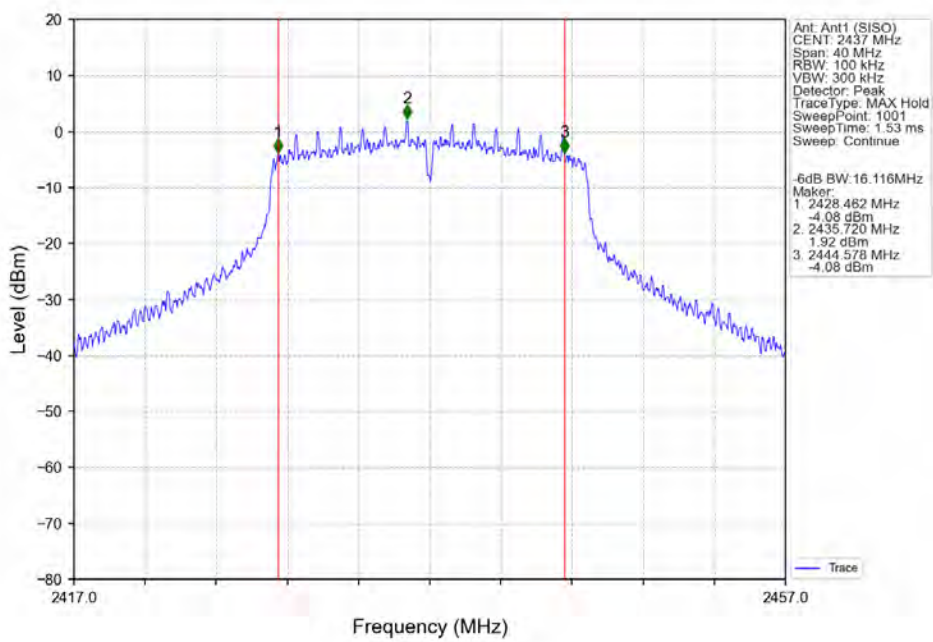
802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



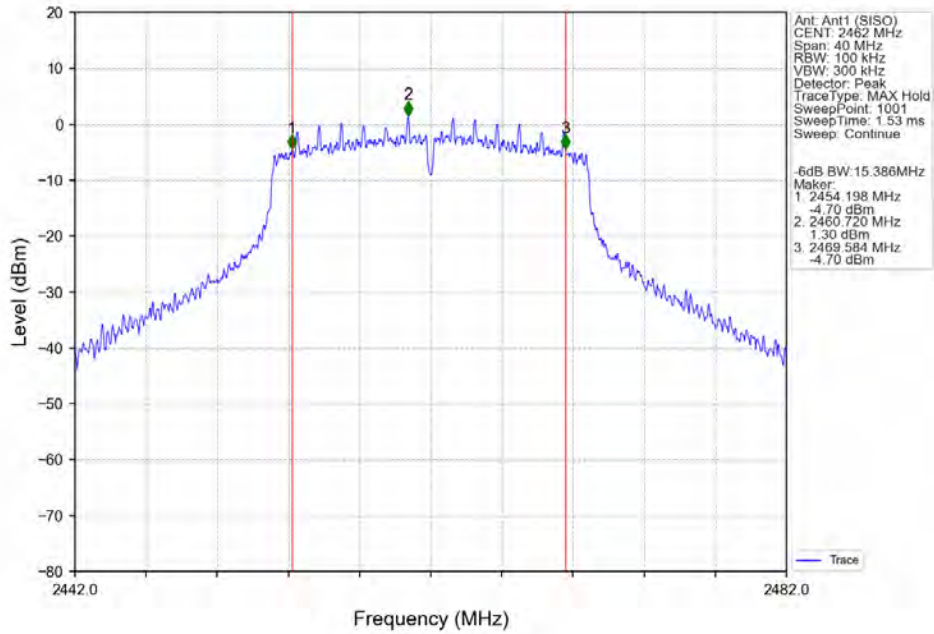
802.11n(HT20)_LCH_2412MHz_Ant1 (SISO)_NTNV



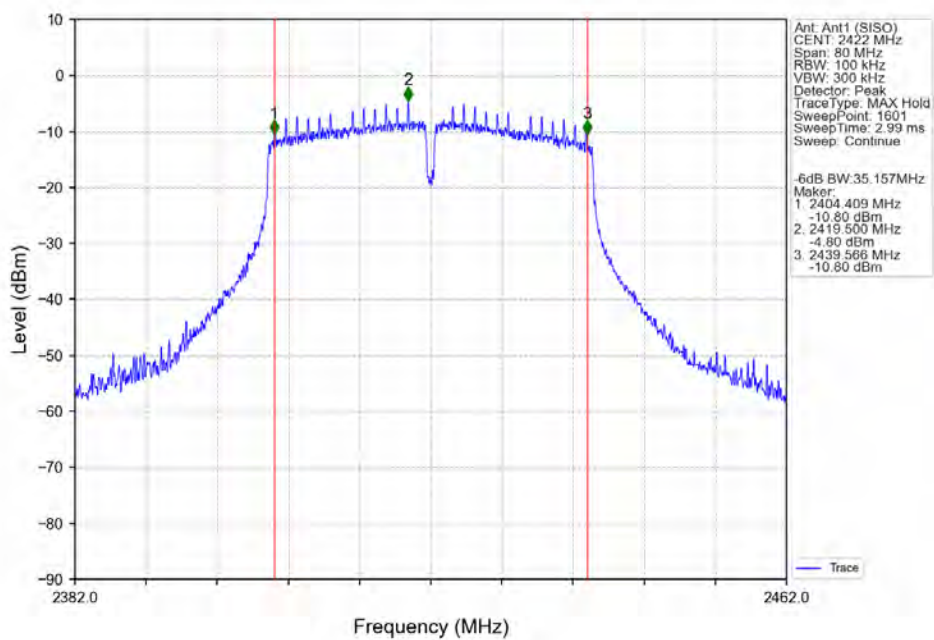
802.11n(HT20)_MCH_2437MHz_Ant1 (SISO)_NTNV



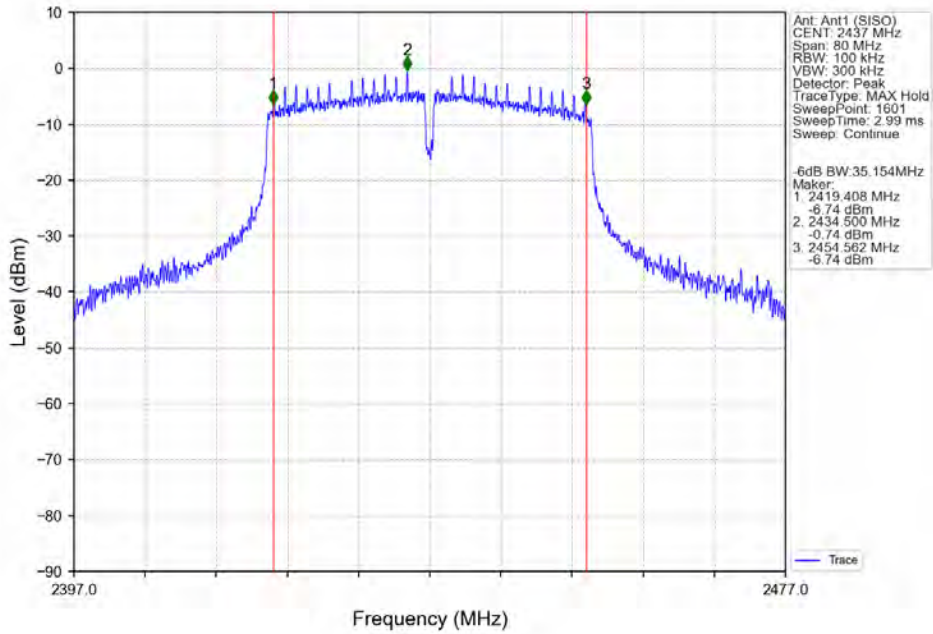
802.11n(HT20)_HCH_2462MHz_Ant1 (SISO)_NTNV



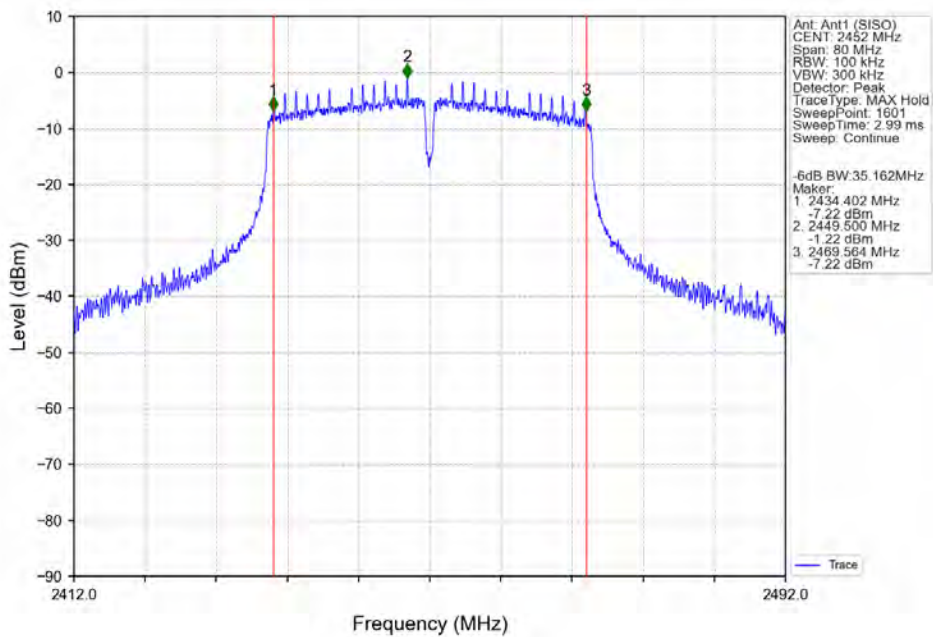
802.11n(HT40)_LCH_2422MHz_Ant1 (SISO)_NTNV



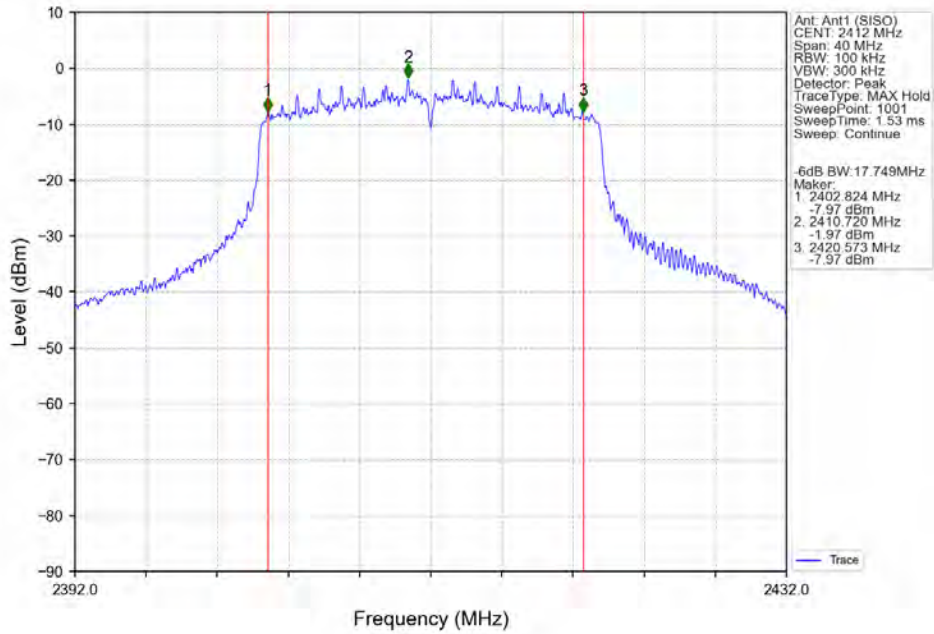
802.11n(HT40)_MCH_2437MHz_Ant1 (SISO)_NTNV



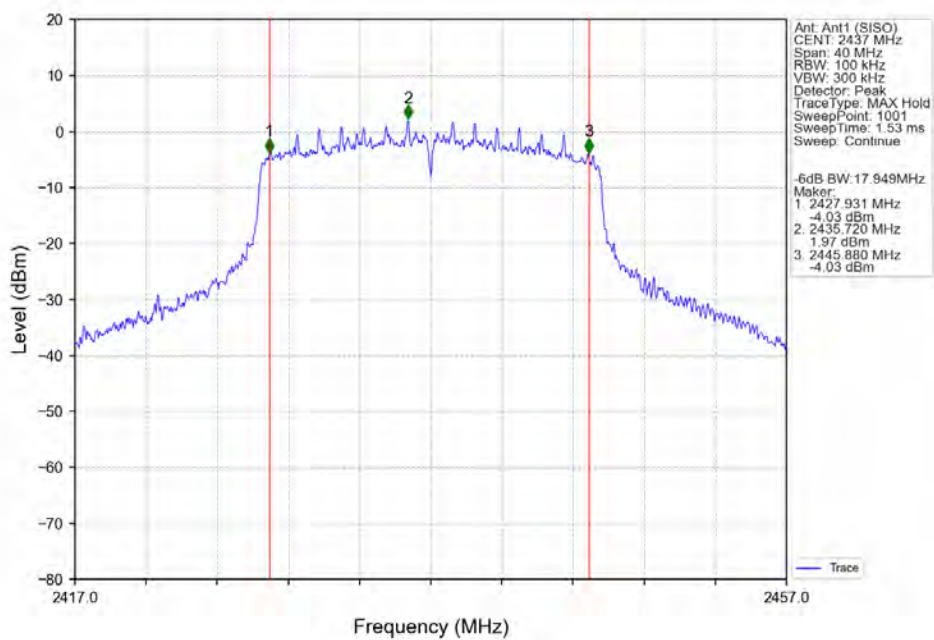
802.11n(HT40)_HCH_2452MHz_Ant1 (SISO)_NTNV



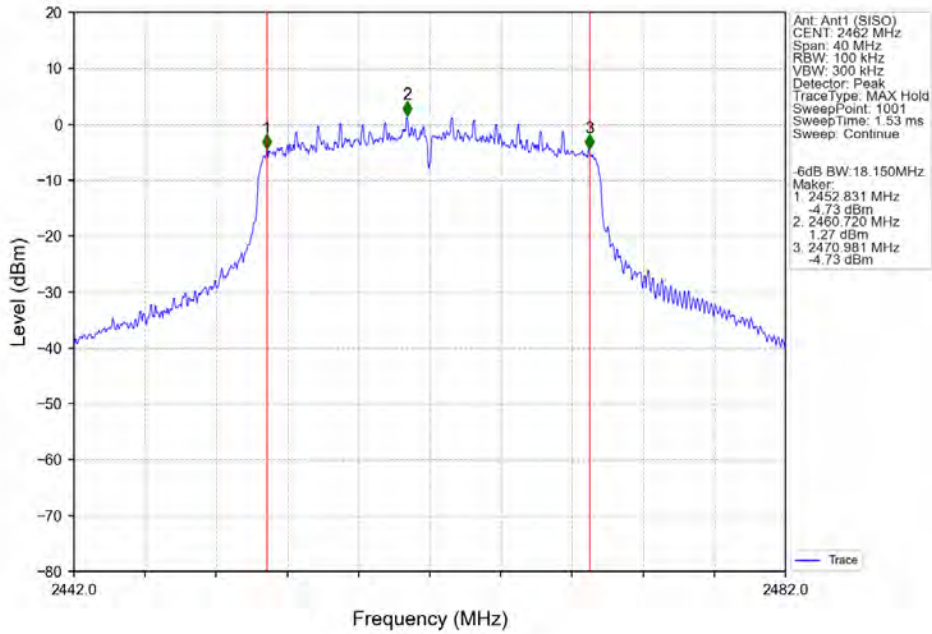
802.11ax(HE20)_LCH_2412MHz_RU242_Left_Ant1 (SISO)_NTNV



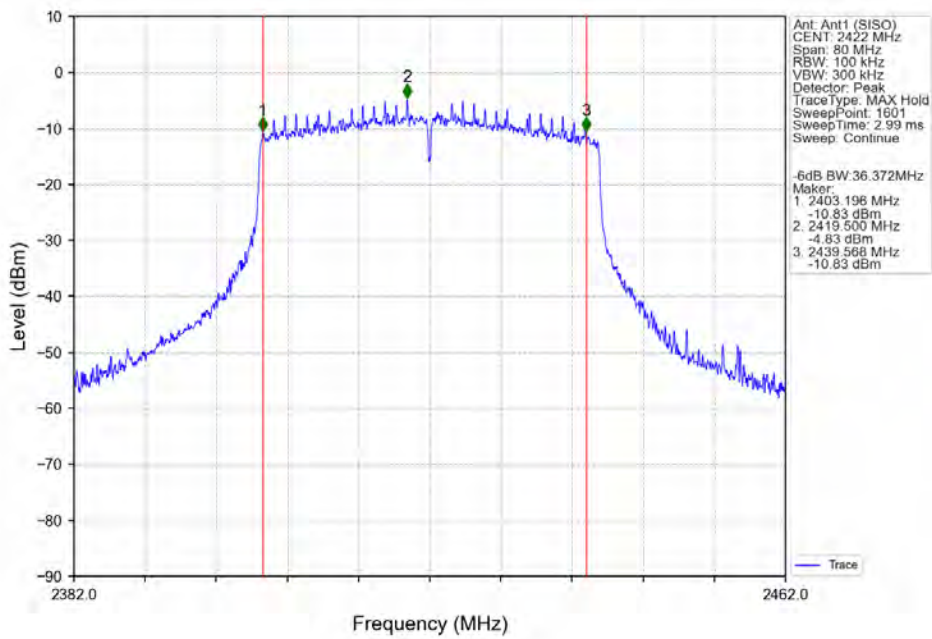
802.11ax(HE20)_MCH_2437MHz_RU242_Left_Ant1 (SISO)_NTNV



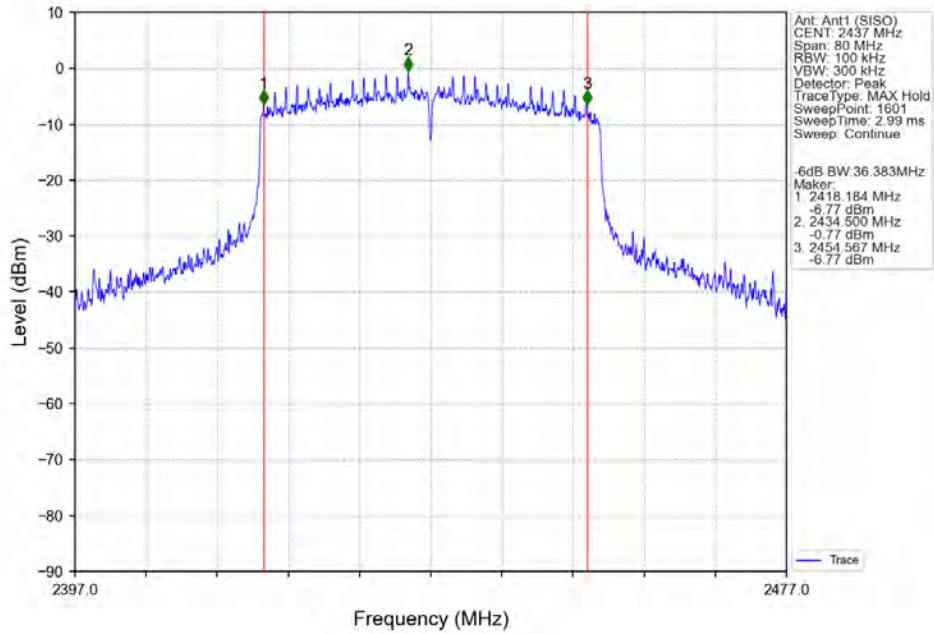
802.11ax(HE20)_HCH_2462MHz_RU242_Left_Ant1 (SISO)_NTNV



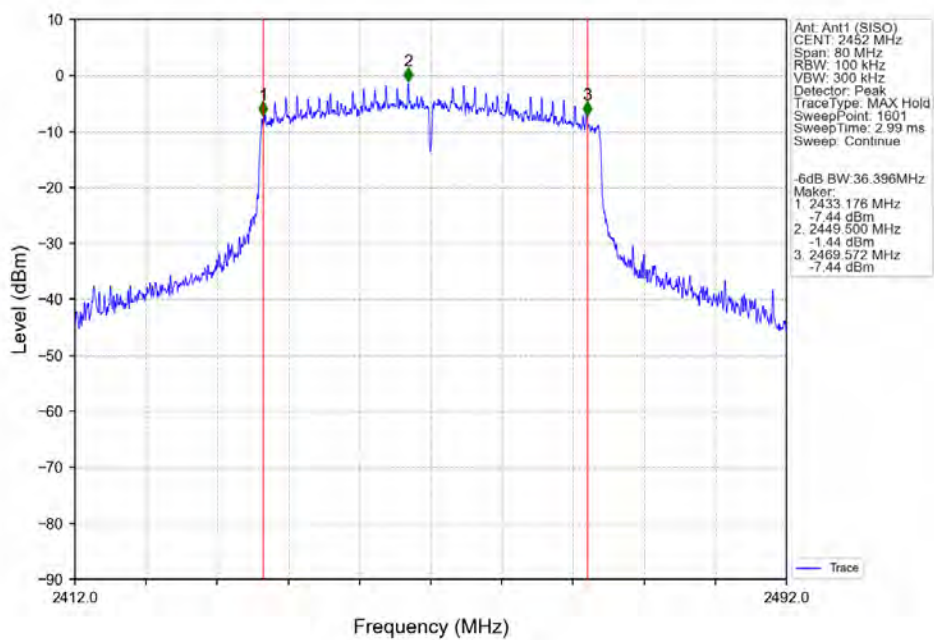
802.11ax(HE40)_LCH_2422MHz_RU484_Left_Ant1 (SISO)_NTNV



802.11ax(HE40)_MCH_2437MHz_RU484_Left_Ant1 (SISO)_NTNV



802.11ax(HE40)_HCH_2452MHz_RU484_Left_Ant1 (SISO)_NTNV



3. Maximum Conducted Output Power

3.1 Test Result

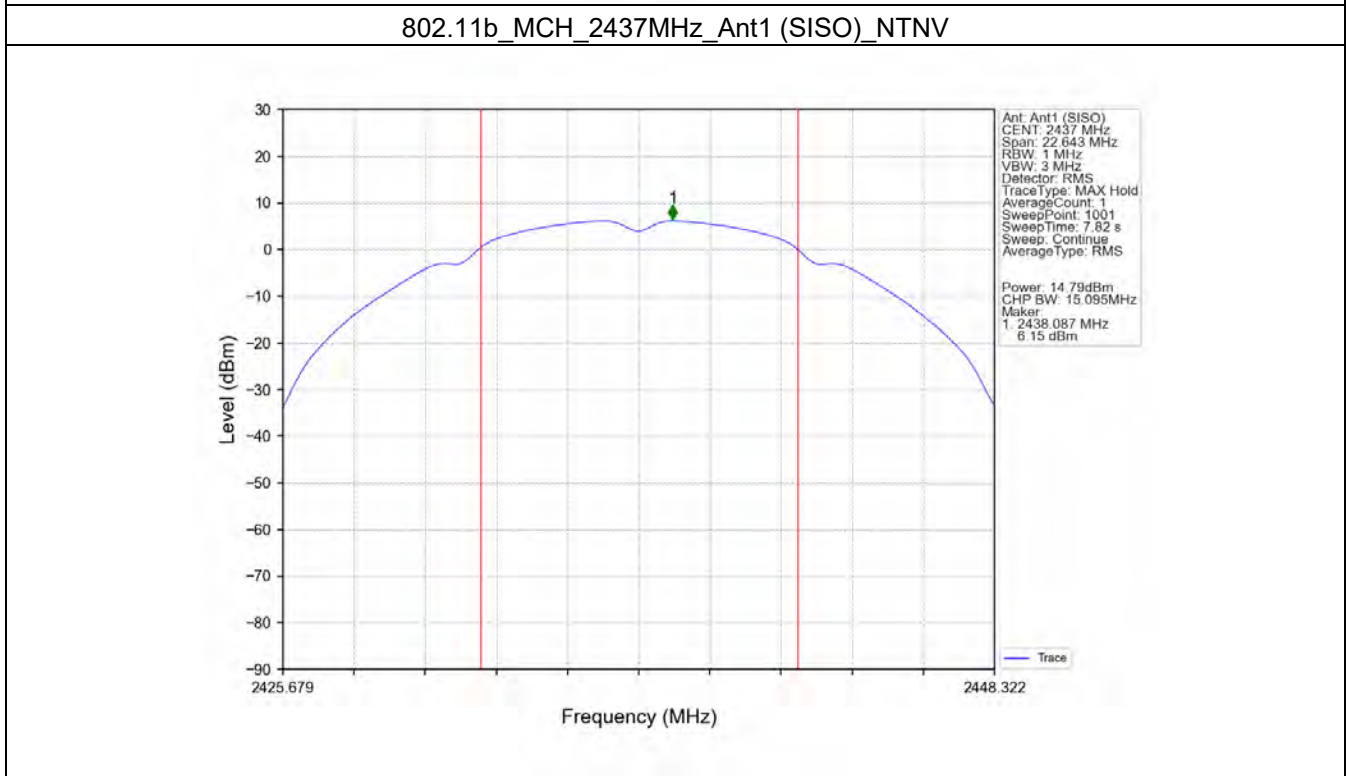
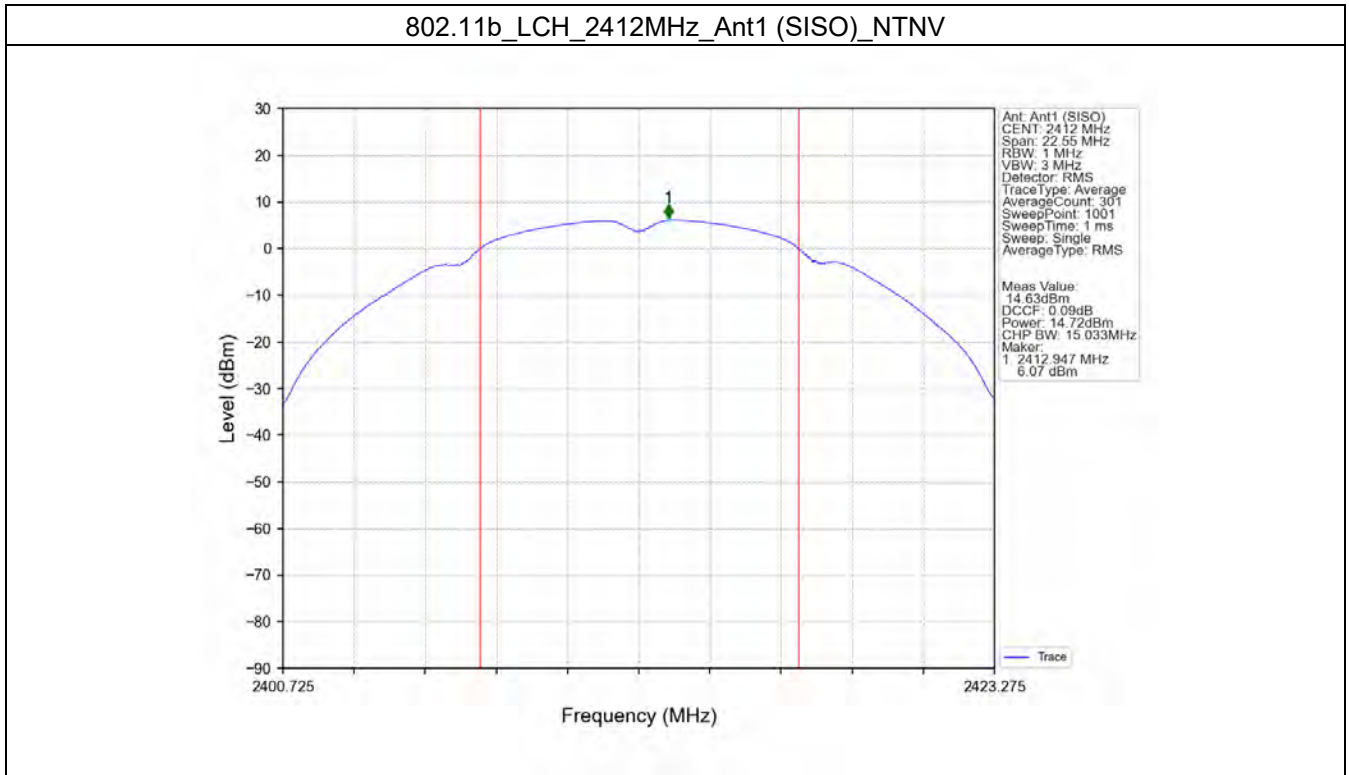
3.1.1 Power

Mode	TX Type	Frequency (MHz)	RU	RU Pos	Maximum Average Conducted Output Power (dBm)		Verdict
					ANT1	Limit	
802.11b	SISO	2412	/	/	14.72	<=30	Pass
		2437	/	/	14.79	<=30	Pass
		2462	/	/	14.89	<=30	Pass
802.11g	SISO	2412	/	/	10.68	<=30	Pass
		2437	/	/	12.49	<=30	Pass
		2462	/	/	11.90	<=30	Pass
802.11n (HT20)	SISO	2412	/	/	10.15	<=30	Pass
		2437	/	/	11.93	<=30	Pass
		2462	/	/	11.81	<=30	Pass
802.11n (HT40)	SISO	2422	/	/	9.86	<=30	Pass
		2437	/	/	12.40	<=30	Pass
		2452	/	/	12.00	<=30	Pass
802.11ax (HE20)	SISO	2412	RU242	Left	10.02	<=30	Pass
		2437	RU242	Left	12.32	<=30	Pass
		2462	RU242	Left	11.68	<=30	Pass
802.11ax (HE40)	SISO	2422	RU484	Left	9.80	<=30	Pass
		2437	RU484	Left	12.33	<=30	Pass
		2452	RU484	Left	11.77	<=30	Pass

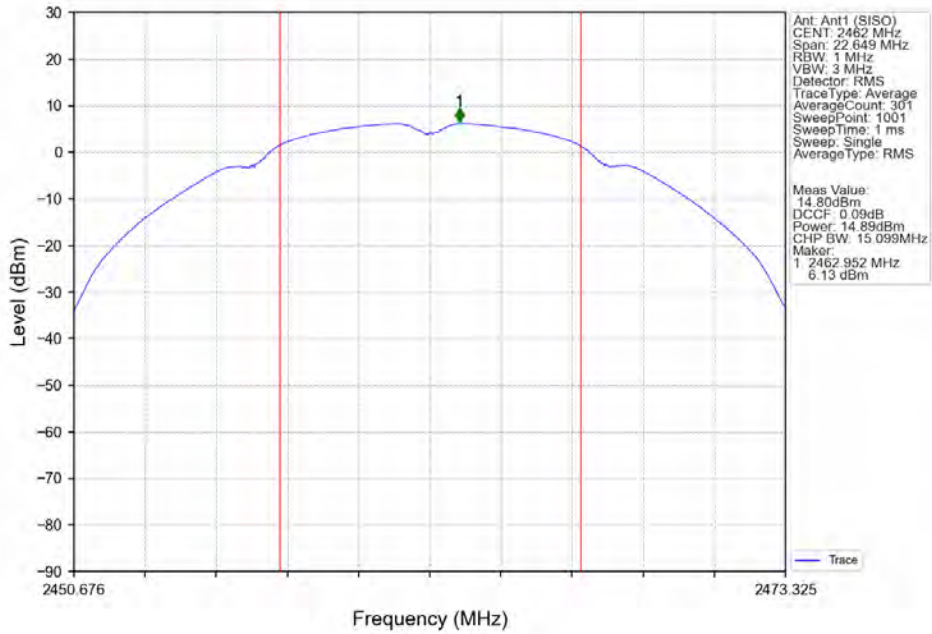
Note1: Antenna Gain: Ant1: 3.00dBi;

3.2 Test Graph

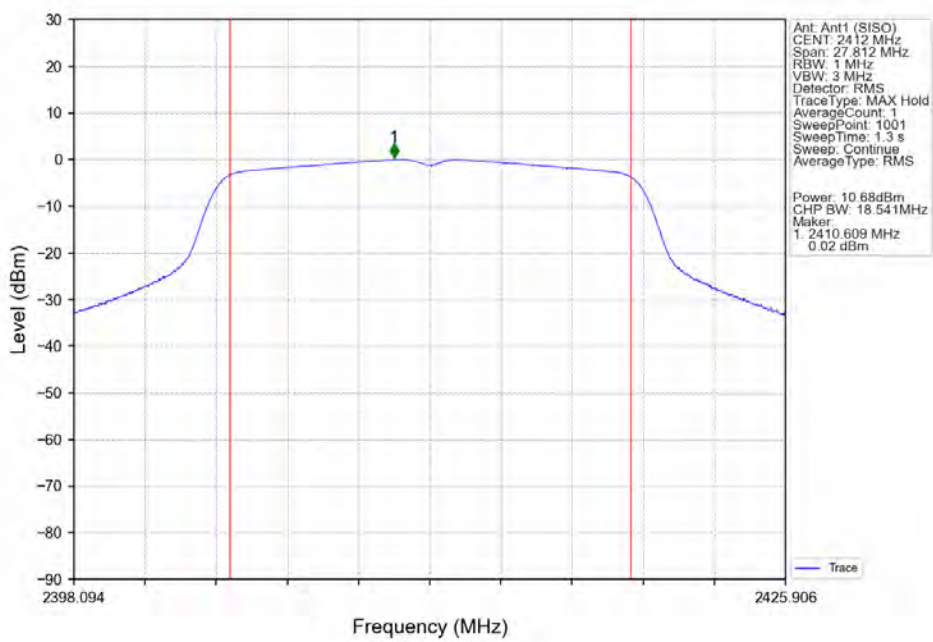
3.2.1 Power



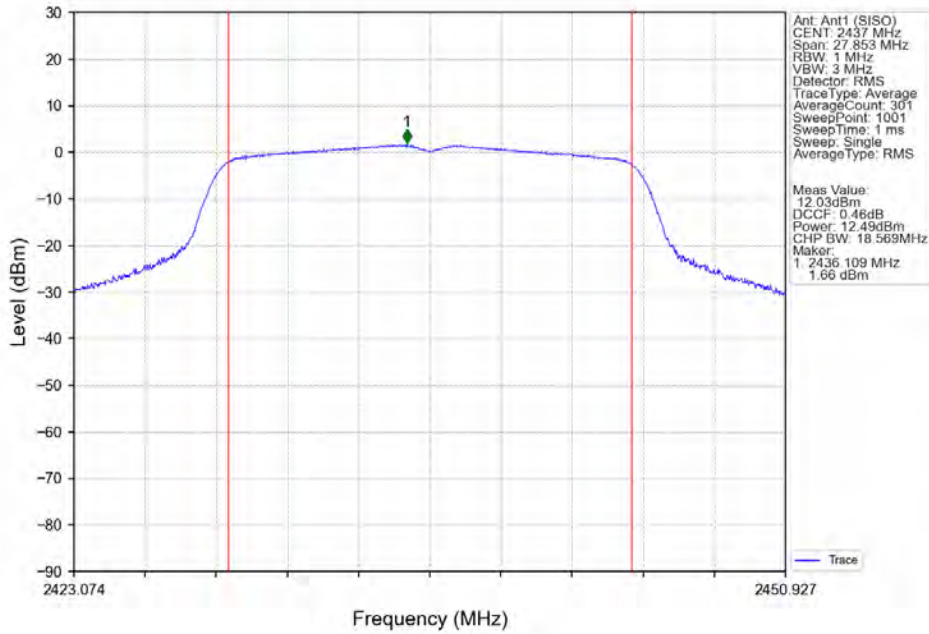
802.11b_HCH_2462MHz_Ant1 (SISO)_NTNV



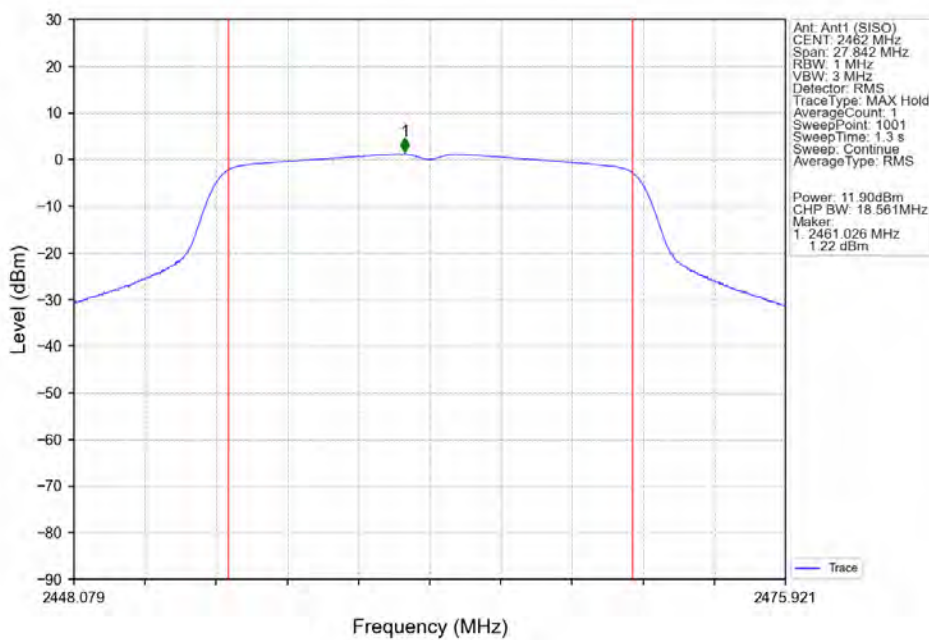
802.11g_LCH_2412MHz_Ant1 (SISO)_NTNV



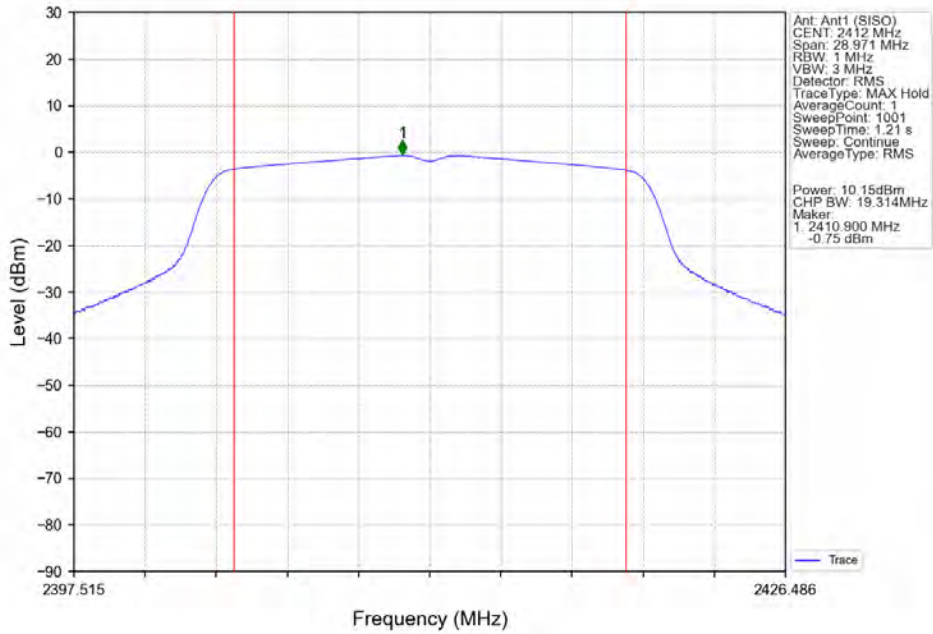
802.11g_MCH_2437MHz_Ant1 (SISO)_NTNV



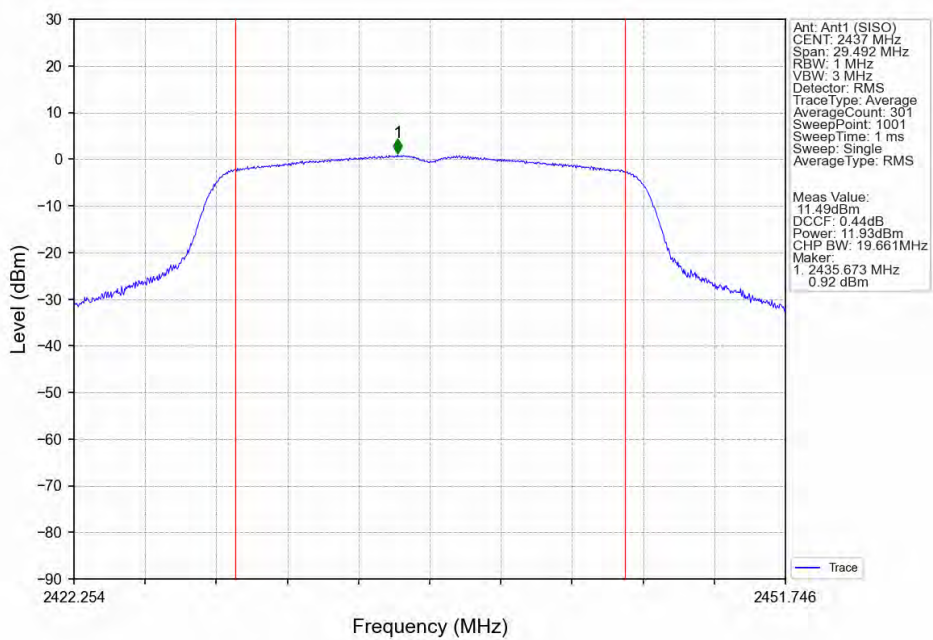
802.11g_HCH_2462MHz_Ant1 (SISO)_NTNV



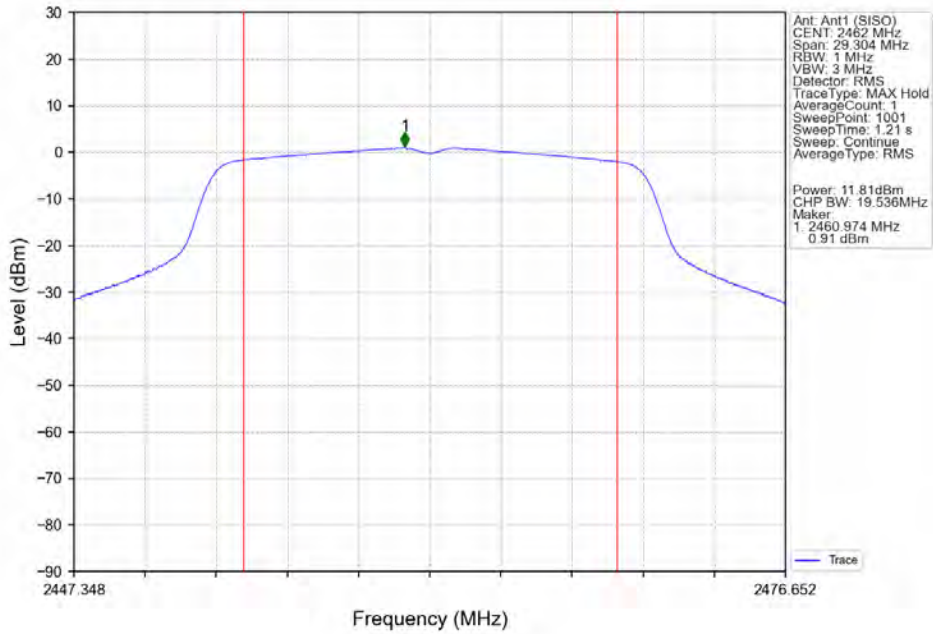
802.11n(HT20)_LCH_2412MHz_Ant1 (SISO)_NTNV



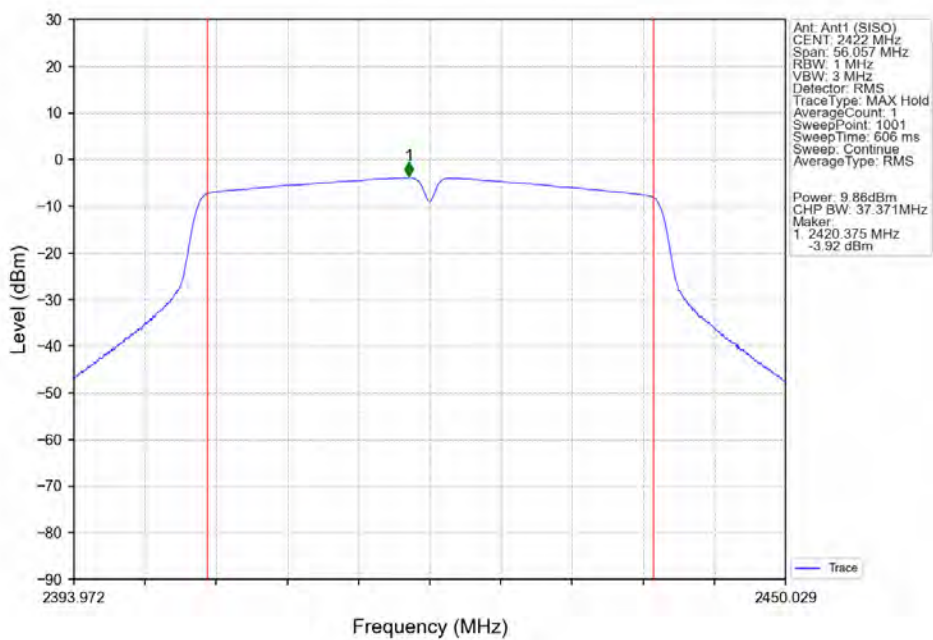
802.11n(HT20)_MCH_2437MHz_Ant1 (SISO)_NTNV



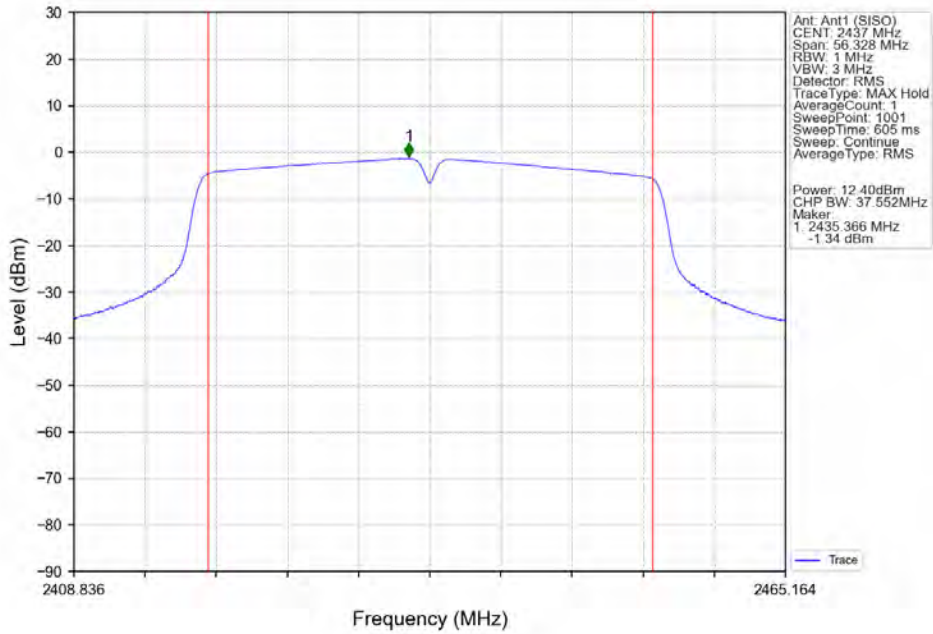
802.11n(HT20)_HCH_2462MHz_Ant1 (SISO)_NTNV



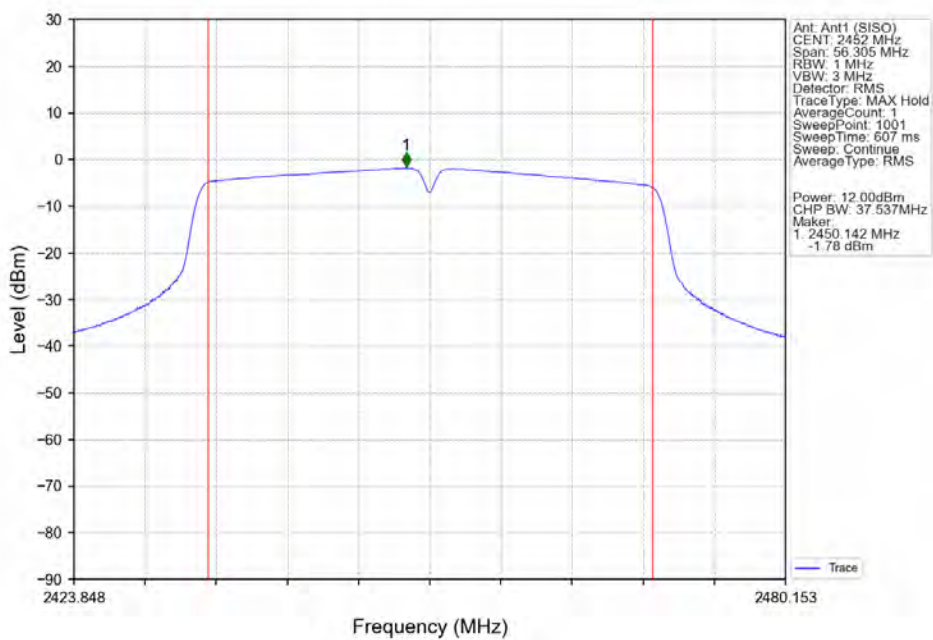
802.11n(HT40)_LCH_2422MHz_Ant1 (SISO)_NTNV



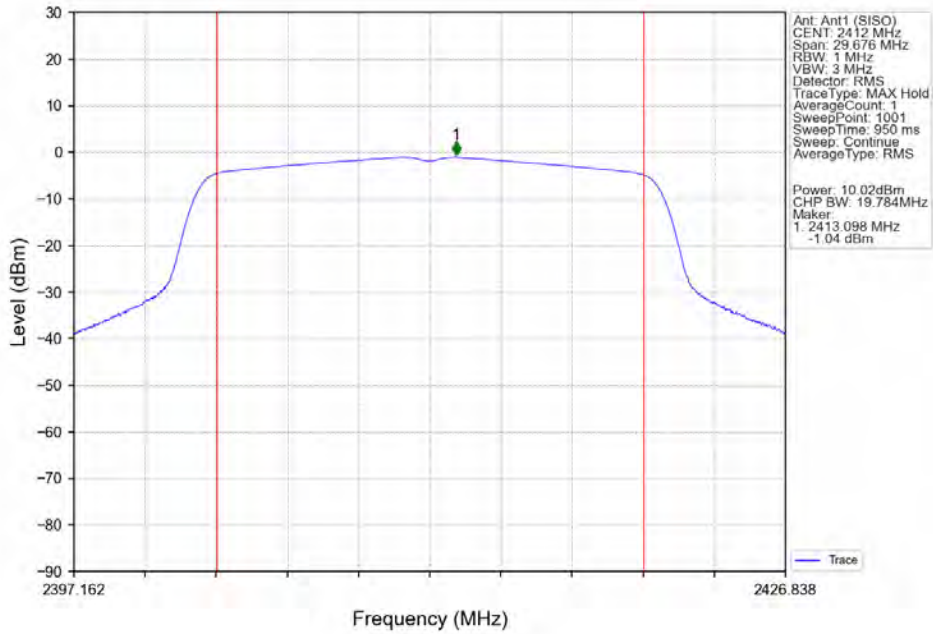
802.11n(HT40)_MCH_2437MHz_Ant1 (SISO)_NTNV



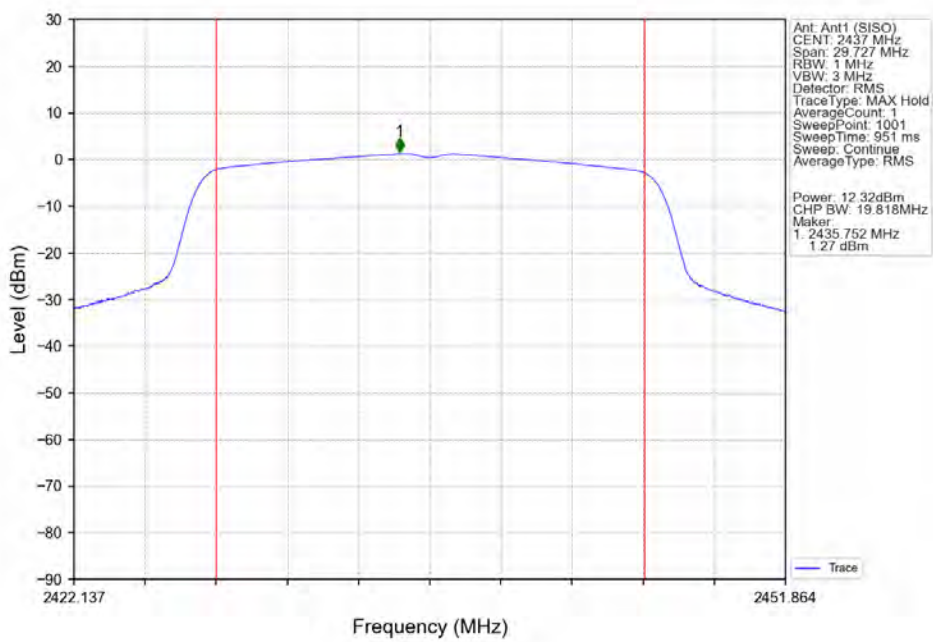
802.11n(HT40)_HCH_2452MHz_Ant1 (SISO)_NTNV



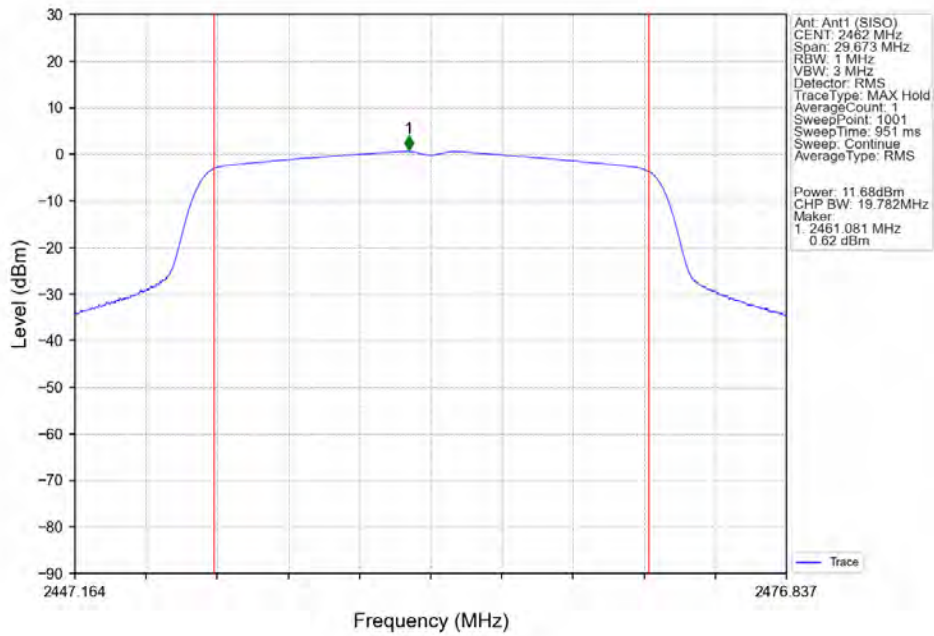
802.11ax(HE20)_LCH_2412MHz_RU242_Left_Ant1 (SISO)_NTNV



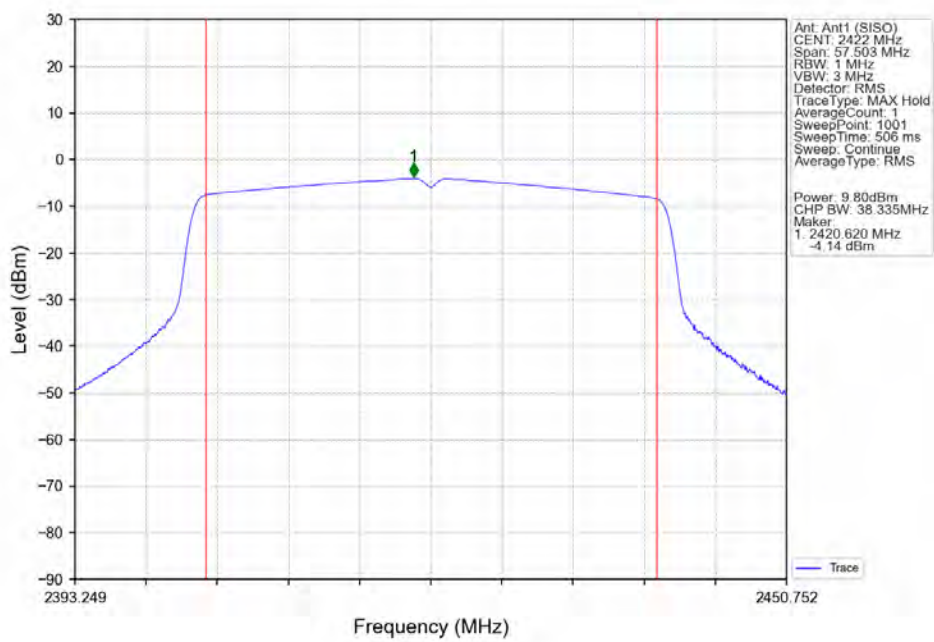
802.11ax(HE20)_MCH_2437MHz_RU242_Left_Ant1 (SISO)_NTNV



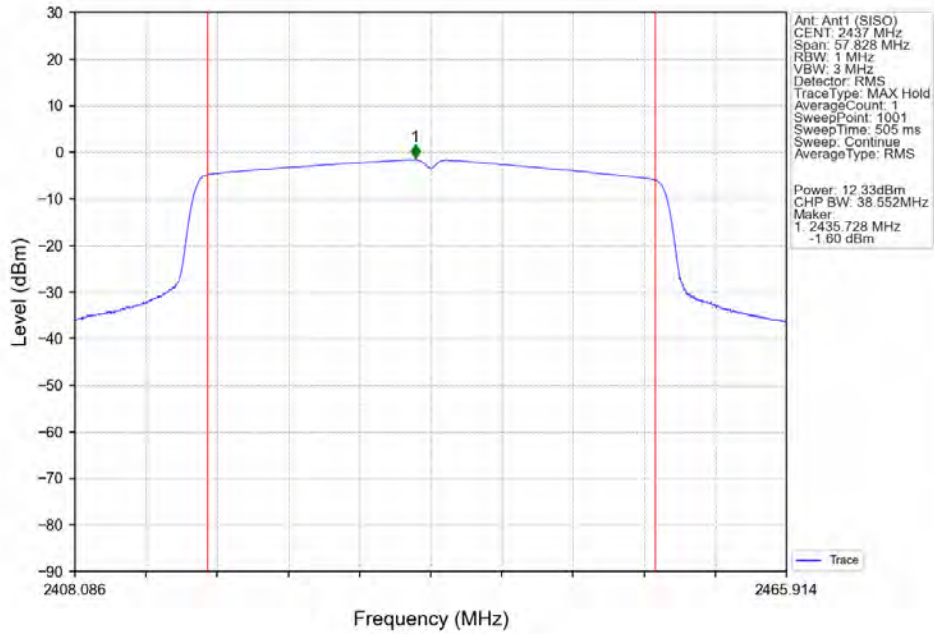
802.11ax(HE20)_HCH_2462MHz_RU242_Left_Ant1 (SISO)_NTNV



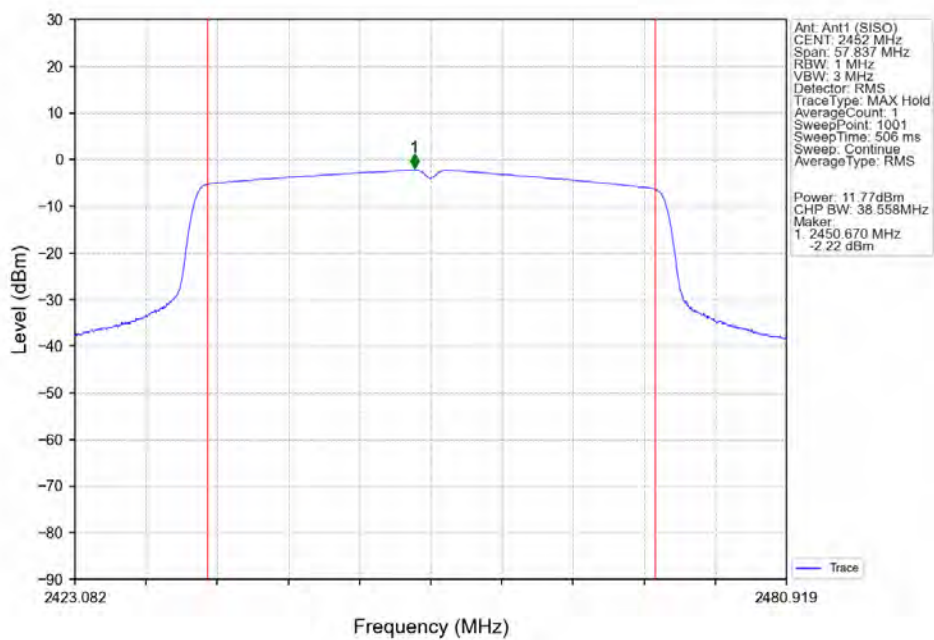
802.11ax(HE40)_LCH_2422MHz_RU484_Left_Ant1 (SISO)_NTNV



802.11ax(HE40)_MCH_2437MHz_RU484_Left_Ant1 (SISO)_NTNV



802.11ax(HE40)_HCH_2452MHz_RU484_Left_Ant1 (SISO)_NTNV



4. Maximum Power Spectral Density

4.1 Test Result

4.1.1 PSD

Mode	TX Type	Frequency (MHz)	RU	RU Pos	Maximum PSD (dBm/3kHz)		Verdict
					ANT1	Limit	
802.11b	SISO	2412	/	/	-8.95	<=8	Pass
		2437	/	/	-8.30	<=8	Pass
		2462	/	/	-9.32	<=8	Pass
802.11g	SISO	2412	/	/	-15.54	<=8	Pass
		2437	/	/	-12.31	<=8	Pass
		2462	/	/	-12.91	<=8	Pass
802.11n (HT20)	SISO	2412	/	/	-17.20	<=8	Pass
		2437	/	/	-13.31	<=8	Pass
		2462	/	/	-13.36	<=8	Pass
802.11n (HT40)	SISO	2422	/	/	-20.78	<=8	Pass
		2437	/	/	-15.80	<=8	Pass
		2452	/	/	-15.84	<=8	Pass
802.11ax (HE20)	SISO	2412	RU242	Left	-18.22	<=8	Pass
		2437	RU242	Left	-14.06	<=8	Pass
		2462	RU242	Left	-14.72	<=8	Pass
802.11ax (HE40)	SISO	2422	RU484	Left	-20.64	<=8	Pass
		2437	RU484	Left	-15.46	<=8	Pass
		2452	RU484	Left	-17.79	<=8	Pass

Note1: Antenna Gain: Ant1: 3.00dBi;