

TEST REPORT

Application No.: SUCR2512001219TL
FCC ID: RF41995B
Applicant: KEYENCE CORPORATION
Address of Applicant: 1-3-14, Higashinakajima Higashiyodogawa-ku, Osaka 533-8555, Japan
Manufacturer: KEYENCE CORPORATION
Address of Manufacturer: 1-3-14, Higashinakajima Higashiyodogawa-ku, Osaka 533-8555, Japan
Equipment Under Test (EUT):
EUT Description: Handheld Terminal
Model No.: BT-A800
Trade Mark: KEYENCE
Standard(s) : 47 CFR Part 15, Subpart C 15.247
Date of Receipt: 2025-12-22
Date of Test: 2026-02-23 to 2026-04-23
Date of Issue: 2026-04-23

Test Result:
Pass*

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

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Revision Record			
Version	Description	Date	Remark
00	Original	2026-04-23	/

Authorized for issue by:			
Tested By		Nature Shen	
		Nature_Shen/Project Engineer	
Approved By		Cedar cheng	
		Cedar Cheng /Reviewer	

2 Test Summary

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

Radio Spectrum Matter Part				
Item	Standard	Method	Requirement	Result
Conducted Emissions at AC Power Line (150kHz-30MHz)	47 CFR Part 15, Subpart C 15.247	ANSI C63.10 (2020) Section 6.2	47 CFR Part 15, Subpart C 15.207	Pass
Radiated Emissions which fall in the restricted bands		ANSI C63.10 (2020) Section 6.10.5 & 11.12	47 CFR Part 15, Subpart C 15.205 & 15.209	Pass
Radiated Spurious Emissions Below 1GHz		ANSI C63.10 (2020) Section 6.4,6.5	47 CFR Part 15, Subpart C 15.205 & 15.209	Pass
Radiated Spurious Emissions Above 1GHz		ANSI C63.10 (2020) Section 6.6 & 11.12	47 CFR Part 15, Subpart C 15.205 & 15.209	Pass
Conducted Peak Output Power		ANSI C63.10 (2020) Section 11.9.1	47 CFR Part 15, Subpart C 15.247(b)(3)	Pass
Minimum 6dB Bandwidth		ANSI C63.10 (2020) Section 11.8.1	47 CFR Part 15, Subpart C 15.247a(2)	Pass
Power Spectrum Density		ANSI C63.10 (2020) Section 11.10.2	47 CFR Part 15, Subpart C 15.247(e)	Pass
Conducted Band Edges Measurement		ANSI C63.10 (2020) Section 6.10.4	47 CFR Part 15, Subpart C 15.247(d)	Pass
Conducted Spurious Emissions		ANSI C63.10 (2020) Section 11.11	47 CFR Part 15, Subpart C 15.247(d)	Pass

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4 General Information

4.1 Details of E.U.T.

Hardware Version:	V1.04
Software Version:	T23
SN:	B0ES200005/B0ES200019
Power supply:	5V
Operation Frequency:	2402MHz to 2480MHz
Modulation Type:	GFSK
Number of Channels:	40
Channel Spacing:	1MHz,2MHz
Antenna Type:	LDS Antenna
Antenna Gain:	0.8dBi(Ant5)

4.2 Environment Parameter

Environment Parameter	Selected Values During Tests	
Relative Humidity	Ambient	
Value	Temperature(°C)	Voltage(V)
NTNV	25	3.6
Note: NV:Normal Voltage LV:Low Extreme Test Voltage HV:High Extreme Test Voltage NT:Normal Temperature LT:Low Extreme Test Temperature HT:High Extreme Test Temperature		

4.3 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Computer	Lenovo	T14	2YK6GR
Mouse	Lenovo	3D optical Mouse	N/A
The EUT has been tested as an independent unit.			

4.4 Measurement Uncertainty & Decision Rule

No.	Item	Measurement Uncertainty
1	Radio Frequency	$\pm 7.25 \times 10^{-8}$
2	Duty cycle	$\pm 0.37\%$
3	Occupied Bandwidth	$\pm 3\%$
4	Conduction emission	$\pm 3.0\text{dB}$ (150kHz to 30MHz)
5	RF conducted power	$\pm 0.75\text{dB}$
6	RF power density	$\pm 2.84\text{dB}$
7	Conducted Spurious emissions	$\pm 0.75\text{dB}$
8	RF Radiated power	$\pm 1.56\text{dB}$ (9KHz-30MHz)
		$\pm 4.80\text{dB}$ (30MHz-1GHz)
		$\pm 4.80\text{dB}$ (1GHz-18GHz)
		$\pm 4.80\text{dB}$ (18GHz-40GHz)
9	Temperature test	$\pm 1^{\circ}\text{C}$
10	Humidity test	$\pm 3\%$
11	Supply voltages	$\pm 1\%$
12	Time	$\pm 3\%$
Remark: The U_{lab} (lab Uncertainty) is less than $U_{\text{CISPR/ETSI}}$ (CISPR/ETSI Uncertainty), so the test results – compliance is deemed to occur if no measured disturbance level exceeds the disturbance limit; – non-compliance is deemed to occur if any measured disturbance level exceeds the disturbance limit.		

4.5 Test Location

All tests were performed 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

No tests were sub-contracted.

Note:

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

4.6 Test Facility

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

- **A2LA (Certificate No. 6336.01)**

SGS-CSTC Standards Technical Services (Suzhou) Co., Ltd.is accredited by the American Association for Laboratory Accreditation (A2LA).

- **FCC (Designation Number: CN1312)**

SGS-CSTC Standards Technical Services (Suzhou) Co., Ltd. has been recognized as an accredited testing laboratory. Test Firm Registration Number:717327

- **ISED (CAB Identifier: CN0120)**

SGS-CSTC Standards Technical Services (Suzhou) Co., Ltd. has been recognized by Innovation, Science and Economic Development Canada (ISED) as an accredited testing laboratory.

Company Number: 27594

4.7 Deviation from Standards

None

4.8 Abnormalities from Standard Conditions

None

5 Equipment List

Item	Equipment	Manufacturer	Model	Inventory No	Cal Date	Cal. Due Date
Conducted Emission at Mains Terminals						
1	EMI Test Receive	R&S	ESR7	SUWI-01-10-01	1/14/2026	1/13/2027
2	LISN	R&S	ENV216	SUWI-01-19-03	5/8/2025	5/7/2026
3	LISN	Schwarzbeck	ENV216	SUWI-01-19-04	5/8/2025	5/7/2026
4	Test Software	Tonscend	JS32-CE_4.0.0.2	SUWI-02-09-05	N.C.R	N.C.R
RF Conducted Test						
1	Signal Analyzer	ROHDE&SCHWARZ	FSW43	SUWI-01-02-04	1/14/2026	1/13/2027
2	Signal Analyzer	KEYSIGHT	N9020A	SUWI-01-02-15	11/21/2025	11/20/2026
3	MXG Vector signal genitor	KEYSIGHT	N5182B	SUWI-01-38-01	1/14/2026	1/13/2027
4	Signal Generator	ROHDE&SCHWARZ	SMW200A	SUWI-01-07-08	1/14/2026	1/13/2027
5	Signal Generator	ROHDE&SCHWARZ	SMW100A	SUWI-01-08-01	1/14/2026	1/13/2027
6	MXG Vector Signal Generator	ROHDE&SCHWARZ	SMR20	SUWI-01-33-01	11/21/2025	11/20/2026
7	Wideband Radio Communication Tester	ROHDE&SCHWARZ	CMW500	SUWI-01-16-13	5/8/2025	5/7/2026
8	Wideband Radio Communication Test Station	Anritsu	MT8000A	SUWI-01-34-02	11/21/2025	11/20/2026
9	Wideband Radio Communication Tester	Anritsu	MT8821C	SUWI-01-26-03	11/21/2025	11/20/2026
10	Power meter	Anritsu	ML2495A	SUWI-01-31-01	11/21/2025	11/20/2026
11	Pulse power sensor	Anritsu	MA2411B	SUWI-01-32-01	11/21/2025	11/20/2026
12	DC Power Supply	HYELEC	HY3005B	SUWI-01-18-01	1/14/2026	1/13/2027
13	Temperature and humidity meter	MingGao	TH101B	SUWI-01-01-07	2/11/2026	2/10/2027
14	Temperature Chamber	GIANT FORCE	ICT-017-40-SP-SD	SUWI-01-13-02	5/7/2025	5/6/2026
15	Measurement Software	TST	TST 272 V2.02	SUWI-03-55-03	NCR	NCR
16	RF Control unit	TST	TSCB3023R2	SUWI-02-20-01	NCR	NCR
17	RFCables	Tonscend	NA	SUWI-01-03-01	1/15/2026	1/14/2027
RF Radiated Test						
1	Semi-Anechoic Chamber	Brilliant-emc	N/A	SUWI-04-02-01	6/3/2023	6/2/2026
2	Signal Analyzer	ROHDE&SCHWARZ	FSW43	SUWI-01-02-04	1/14/2026	1/13/2027
3	Signal Analyzer	KEYSIGHT	N9020A	SUWI-01-02-09	11/21/2025	11/20/2026
4	Test receiver	ROHDE&SCHWARZ	ESR7	SUWI-01-10-01	1/14/2026	1/13/2027
5	Signal Generator	ROHDE&SCHWARZ	SMW100A	SUWI-01-18-01	1/14/2026	1/13/2027

6	Receiving antenna	SCHWRZBECK MESS- ELEKTRONIK	VULB 9168	SUWI-01-11-04	9/10/2025	9/9/2027
7	Receiving antenna	SCHWRZBECK MESS- ELEKTRONIK	BBHA 9120D	SUWI-01-11-02	5/7/2025	5/6/2027
8	Receiving antenna	SCHWRZBECK MESS- ELEKTRONIK	BBHA 9170	SUWI-01-11-03	5/7/2025	5/6/2027
9	Active Loop Antenna	SCHWRZBECK MESS- ELEKTRONIK	FMZB 1519B	SUWI-01-21-01	5/7/2025	5/6/2027
10	Amplifier	Tonscend	TAP9K3G40	SUWI-01-14-01	1/14/2026	1/13/2027
11	Amplifier	Tonscend	TAP01018050	SUWI-01-14-02	1/14/2026	1/13/2027
12	Amplifier	Tonscend	TAP18040048	SUWI-01-14-03	1/14/2026	1/13/2027
13	Wideband Radio Communication Tester	Anritsu	MT8820C	SUWI-01-26-01	11/21/2025	11/20/2026
14	Wideband Radio Communication Tester	Anritsu	MT8821C	SUWI-01-26-03	8/25/2025	8/24/2026
15	Wideband Radio Communication Tester	ROHDE&SCHWARZ	CMW500	SUWI-01-16-09	8/26/2025	8/25/2026
16	Radio Communication Analyzer	StarPoint	SP9500E	SUWI-01-28-02	11/21/2025	11/20/2026
17	Signal Generator	ROHDE&SCHWARZ	SMB100A	SUWI-01-08-01	1/14/2026	1/13/2027
18	DC Power Supply	HYELEC	HY3005B	SUWI-01-18-01	1/14/2026	1/13/2027
19	Temperature and humidity meter	MingGao	TH101B	SUWI-01-01-05	2/11/2026	2/10/2027
20	Measurement Software	Tonscend	JS32-RE 4.0.0.0	SUWI-02-09-06	NCR	NCR
21	RF Control unit	Tonscend	JS0806-1	SUWI-02-20-01	NCR	NCR
22	RFCables	Tonscend	NA	SUWI-01-03-02	1/15/2026	1/14/2027

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 LDS Antenna and no consideration of replacement. The best case gain of the antenna is 0.8dBi(Ant5).

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 (2020) 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: 23 °C

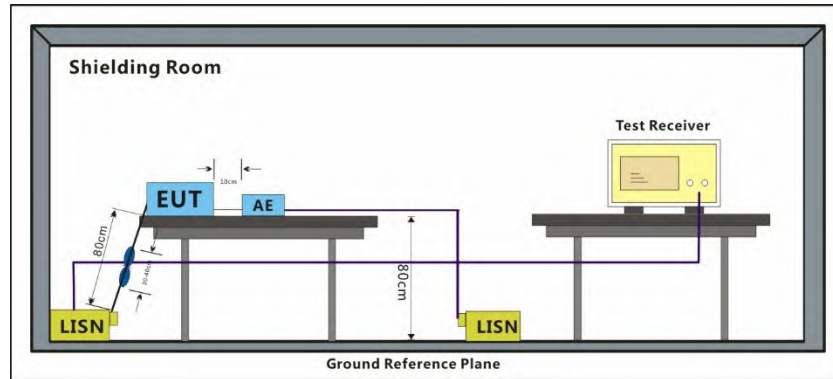
Humidity: 43 % RH

Atmospheric Pressure: 1001 mbar

7.1.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	02	TX mode(1Mbps)_Keep the EUT in charging and continuously transmitting mode with GFSK modulation.
Pre-scan	03	TX mode(2Mbps)_Keep the EUT in charging and continuously transmitting mode with GFSK modulation.

7.1.3 Test Setup Diagram

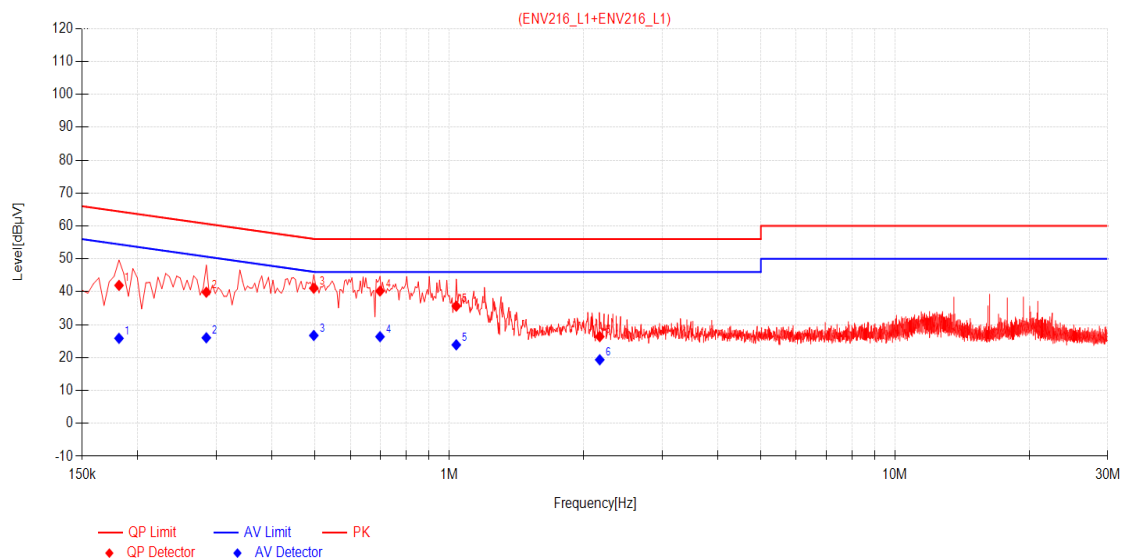


7.1.4 Measurement Procedure and Data

- 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

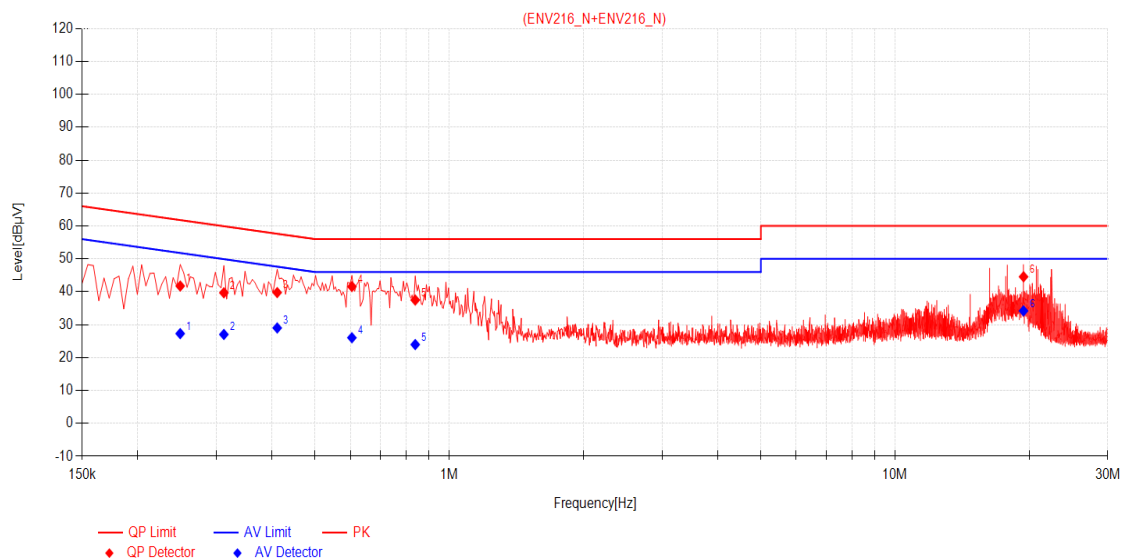
Test Mode: 02; Line: Live line



Final Data List

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	0.1815	9.96	31.98	41.94	64.42	22.48	15.89	25.85	54.42	28.57	PASS
2	0.2850	9.96	29.90	39.86	60.67	20.81	16.06	26.02	50.67	24.65	PASS
3	0.4965	9.94	31.14	41.08	56.06	14.98	16.77	26.71	46.06	19.35	PASS
4	0.6990	9.95	30.26	40.21	56.00	15.79	16.40	26.35	46.00	19.65	PASS
5	1.0365	9.94	25.70	35.64	56.00	20.36	13.93	23.87	46.00	22.13	PASS
6	2.1750	10.01	16.36	26.37	56.00	29.63	9.33	19.34	46.00	26.66	PASS

Test Mode: 02; Line: Neutral Line



Final Data List

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	0.2490	9.98	31.76	41.74	61.79	20.05	17.31	27.29	51.79	24.50	PASS
2	0.3120	9.97	29.73	39.70	59.92	20.22	17.06	27.03	49.92	22.89	PASS
3	0.4110	9.94	29.82	39.76	57.63	17.87	19.07	29.01	47.63	18.62	PASS
4	0.6045	9.92	31.66	41.58	56.00	14.42	16.12	26.04	46.00	19.96	PASS
5	0.8385	9.91	27.57	37.48	56.00	18.52	14.05	23.96	46.00	22.04	PASS
6	19.4235	10.91	33.65	44.56	60.00	15.44	23.28	34.19	50.00	15.81	PASS

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 (2020) Section 6.10.5 & 11.12

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

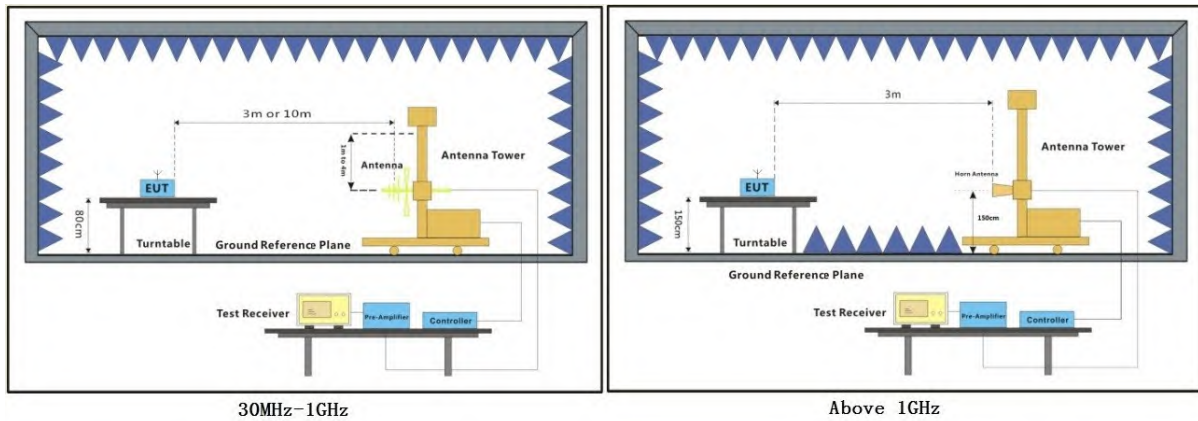
Operating Environment:

Temperature: 23 °C Humidity: 43 % RH Atmospheric Pressure: 1001 mbar

7.2.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	02	TX mode(1Mbps)_Keep the EUT in charging and continuously transmitting mode with GFSK modulation.
Final test	03	TX mode(2Mbps)_Keep the EUT in charging and continuously transmitting mode with GFSK modulation.

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.

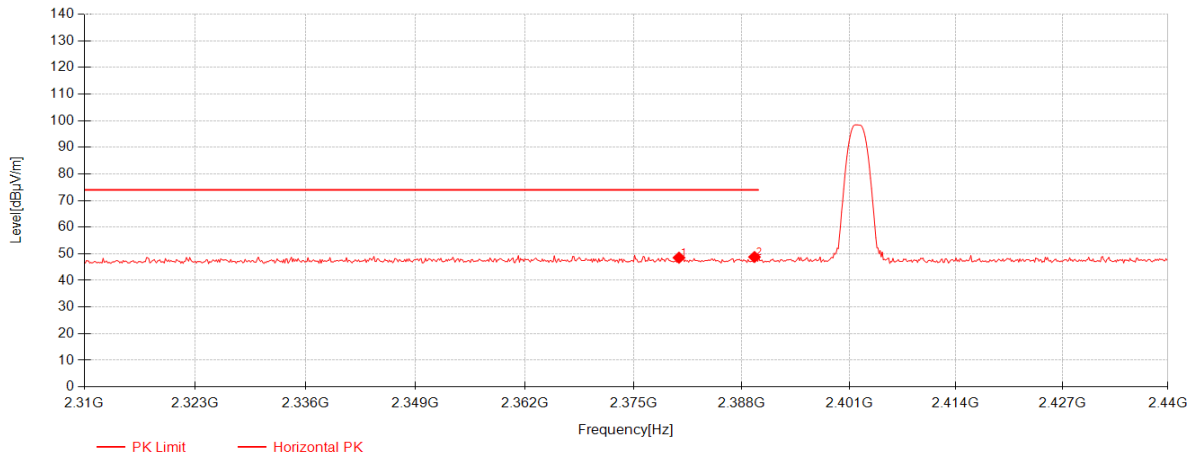
Remark 1: $\text{Level} = \text{Read Level} + \text{Cable Loss} + \text{Antenna Factor} - \text{Preamp Factor}$

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

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

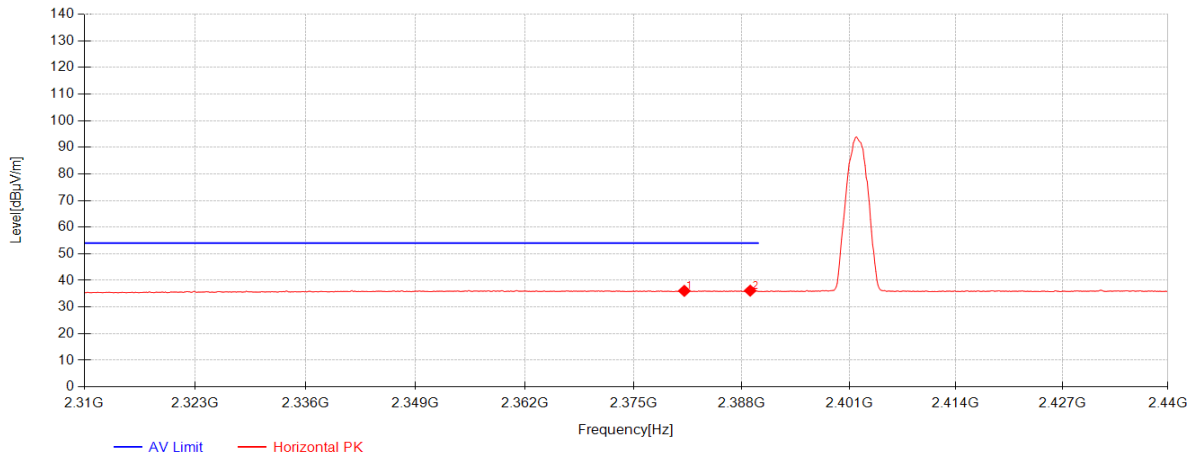
Remark 4: For fundamental and harmonic signal measurement, the resolution bandwidth of test receiver/spectrum analyzer is 1MHz and the video bandwidth is $\geq 1/T$ (Duty cycle $< 98\%$) or 10Hz (Duty cycle $\geq 98\%$) for Average detection (AV) at frequency above 1GHz.

BLE_1M_TX_CH_00_Horizontal_Peak



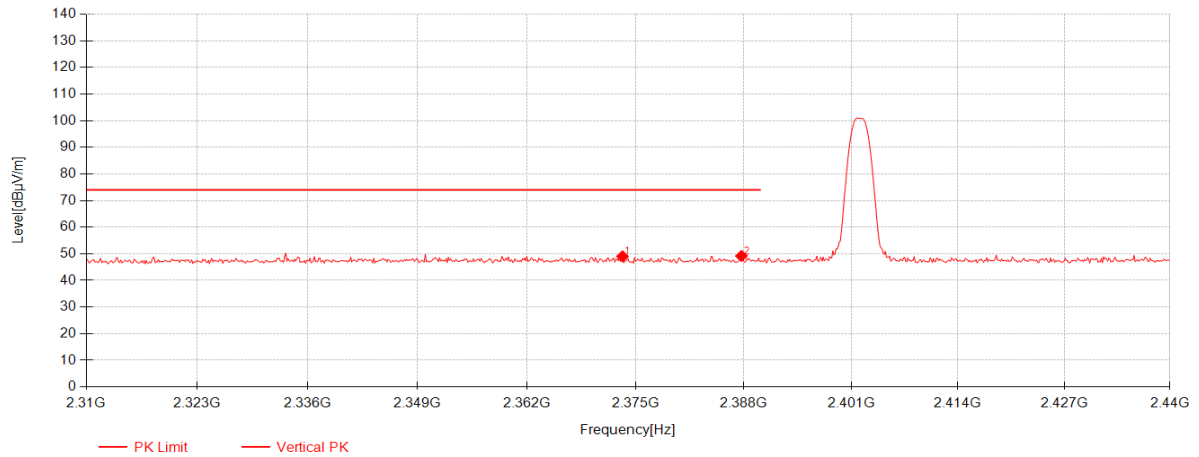
Data List							
NO.	Frequency [MHz]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	2380.46	27.48	-17.57	48.53	74.00	25.47	Horizontal
2	2389.56	27.44	-17.56	48.79	74.00	25.21	Horizontal

BLE_1M_TX_CH_00_Horizontal_Average



Data List							
NO.	Frequency [MHz]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	2381.11	27.48	-17.57	36.08	54.00	17.92	Horizontal
2	2389.04	27.44	-17.56	36.14	54.00	17.86	Horizontal

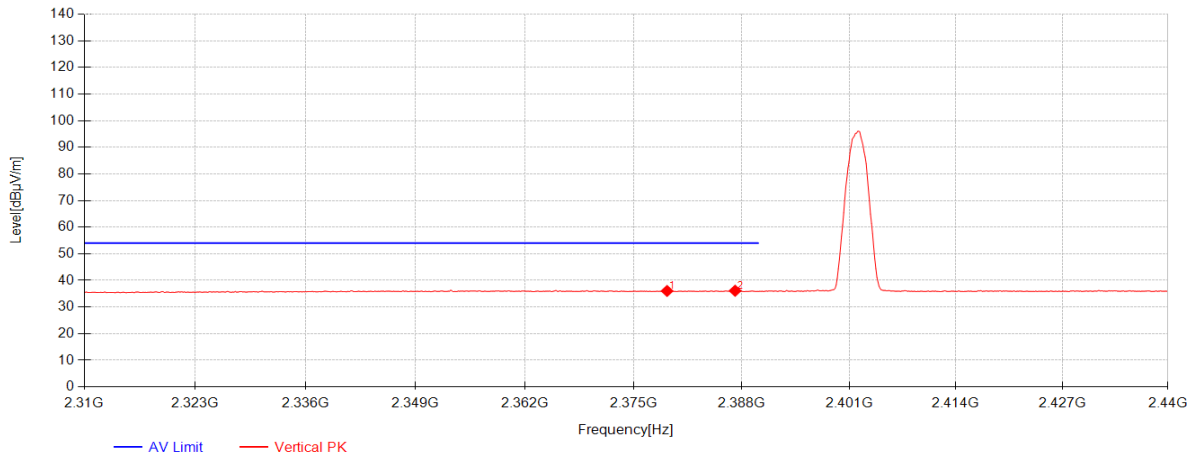
BLE_1M_TX_CH_00_Vertical_Peak



Data List

NO.	Frequency [MHz]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	2373.44	27.51	-17.58	49.05	74.00	24.95	Vertical
2	2387.74	27.45	-17.56	49.18	74.00	24.82	Vertical

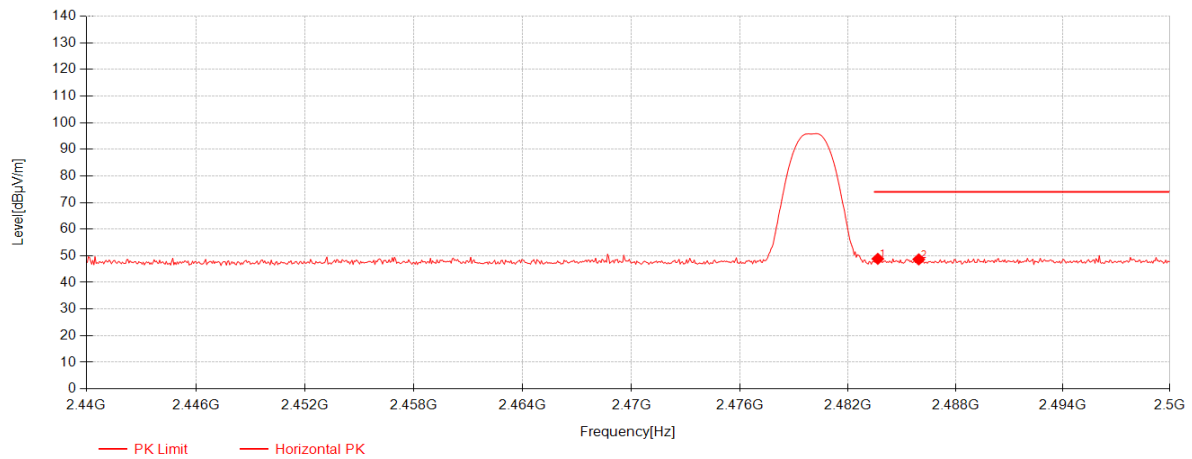
BLE_1M_TX_CH_00_Vertical_Average



Data List

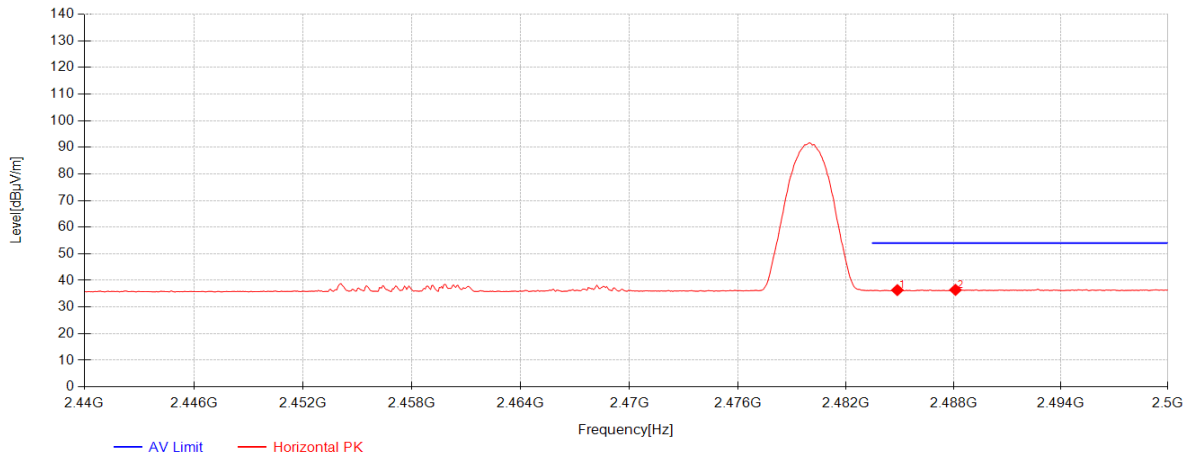
NO.	Frequency [MHz]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	2379.03	27.48	-17.57	36.03	54.00	17.97	Vertical
2	2387.22	27.45	-17.56	36.11	54.00	17.89	Vertical

BLE_1M_TX_CH_39_Horizontal_Peak



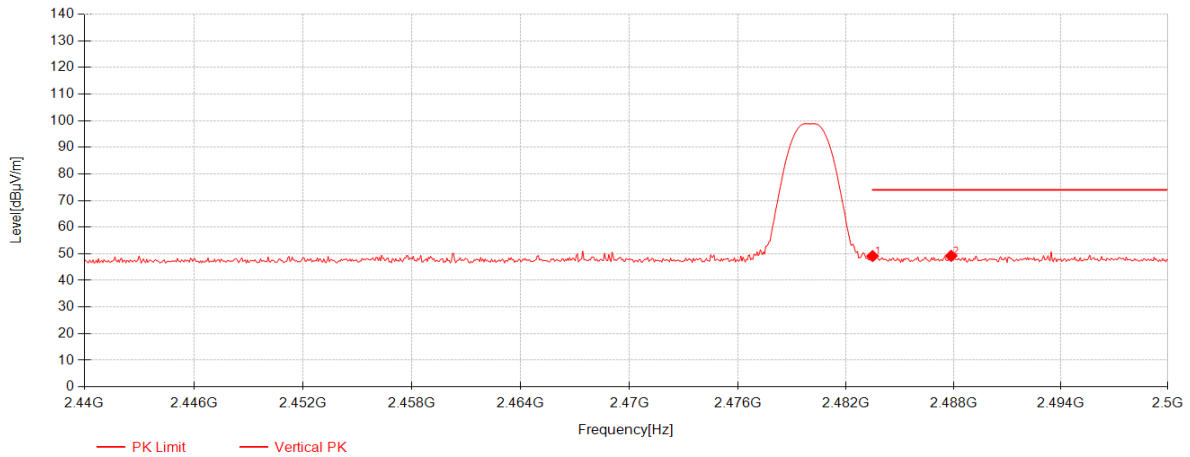
Data List							
NO.	Frequency [MHz]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	2483.68	27.73	-17.55	48.86	74.00	25.14	Horizontal
2	2485.96	27.74	-17.55	48.65	74.00	25.35	Horizontal

BLE_1M_TX_CH_39_Horizontal_Average



Data List							
NO.	Frequency [MHz]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	2484.88	27.74	-17.55	36.37	54.00	17.63	Horizontal
2	2488.12	27.75	-17.55	36.45	54.00	17.55	Horizontal

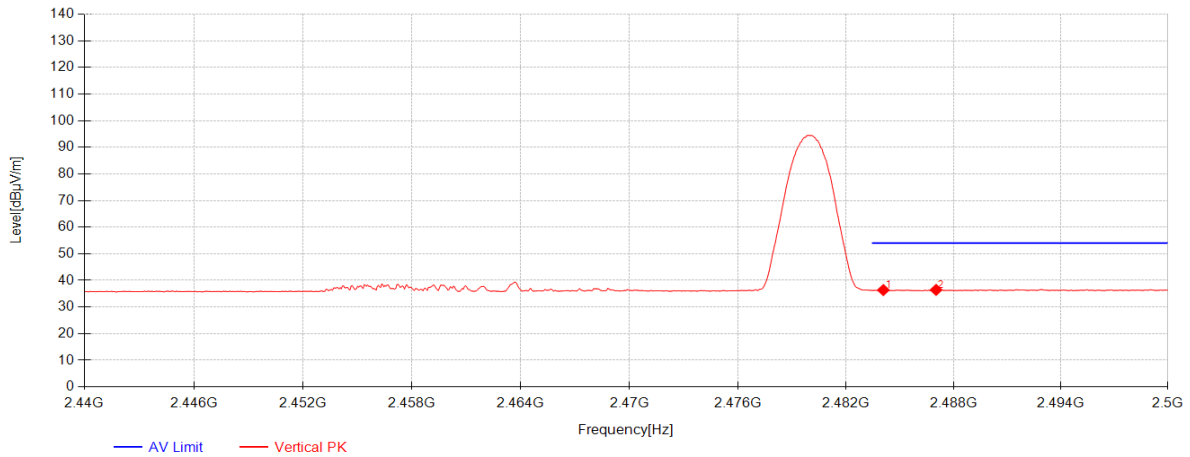
BLE_1M_TX_CH_39_Vertical_Peak



Data List

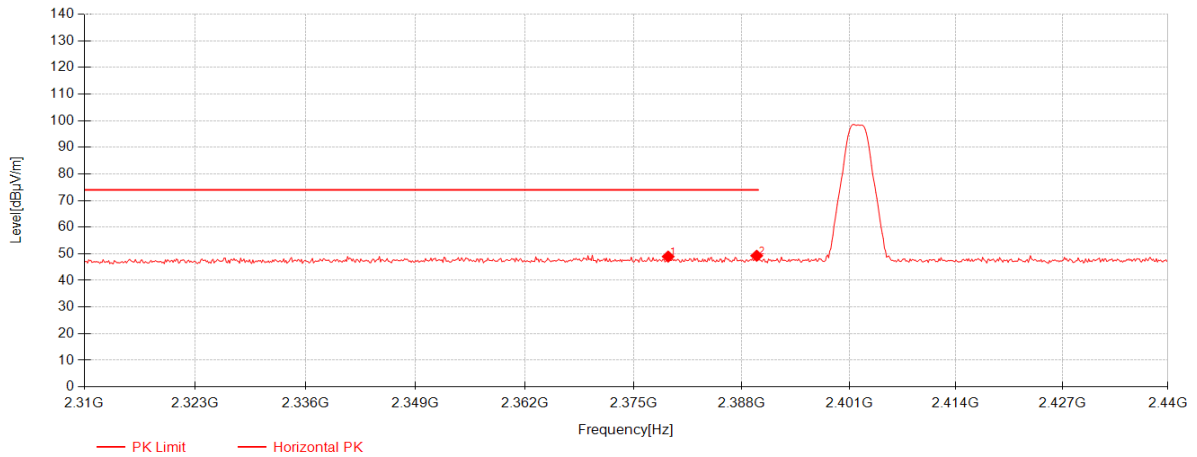
NO.	Frequency [MHz]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	2483.5	27.73	-17.55	49.15	74.00	24.85	Vertical
2	2487.88	27.75	-17.55	49.21	74.00	24.79	Vertical

BLE_1M_TX_CH_39_Verical_Average



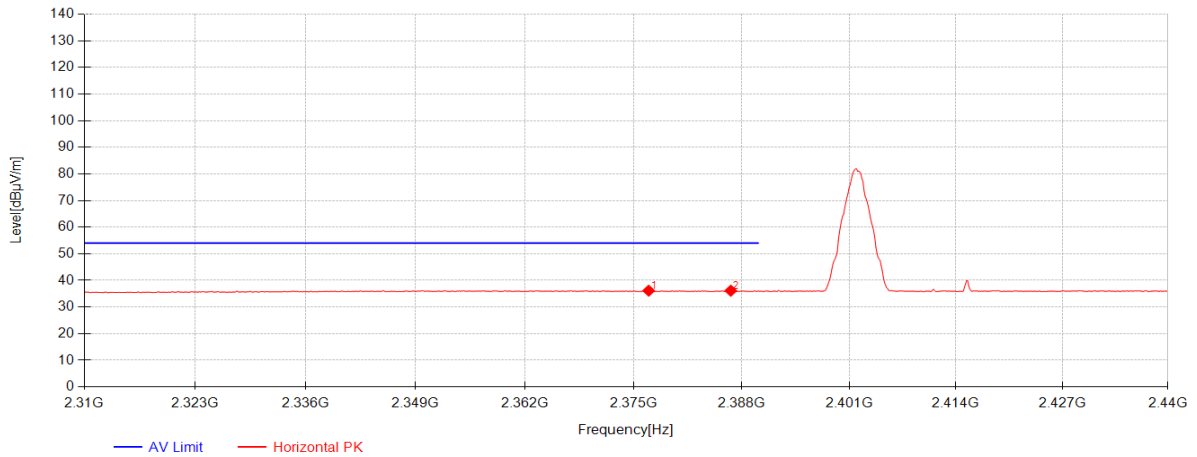
Data List							
NO.	Frequency [MHz]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	2484.1	27.74	-17.55	36.38	54.00	17.62	Vertical
2	2487.04	27.75	-17.55	36.45	54.00	17.55	Vertical

BLE_2M_TX_CH_00_Horizontal_Peak



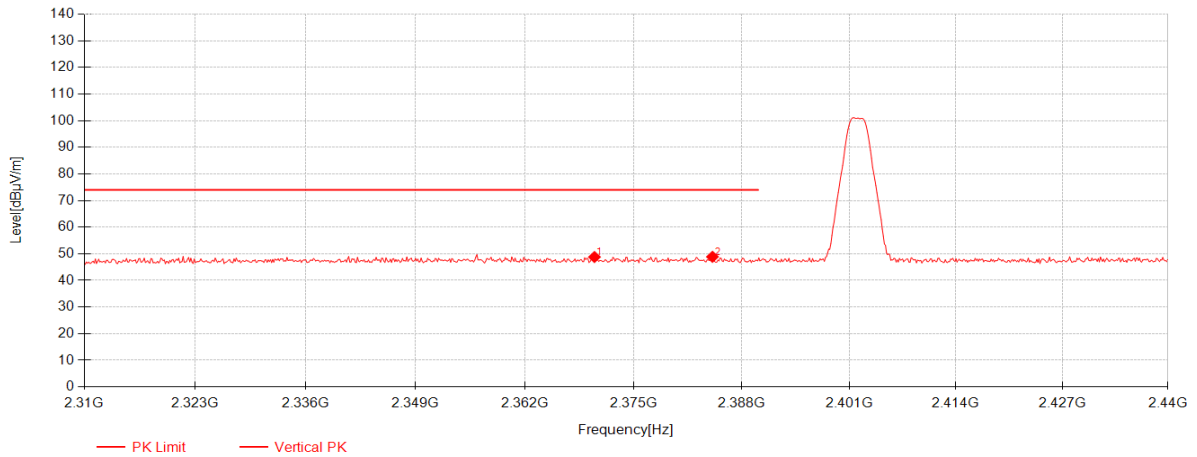
Data List							
NO.	Frequency [MHz]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	2379.16	27.48	-17.57	48.95	74.00	25.05	Horizontal
2	2389.82	27.44	-17.56	49.27	74.00	24.73	Horizontal

BLE_2M_TX_CH_00_Horizontal_Average



Data List							
NO.	Frequency [MHz]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	2376.82	27.49	-17.58	36.14	54.00	17.86	Horizontal
2	2386.7	27.45	-17.56	36.14	54.00	17.86	Horizontal

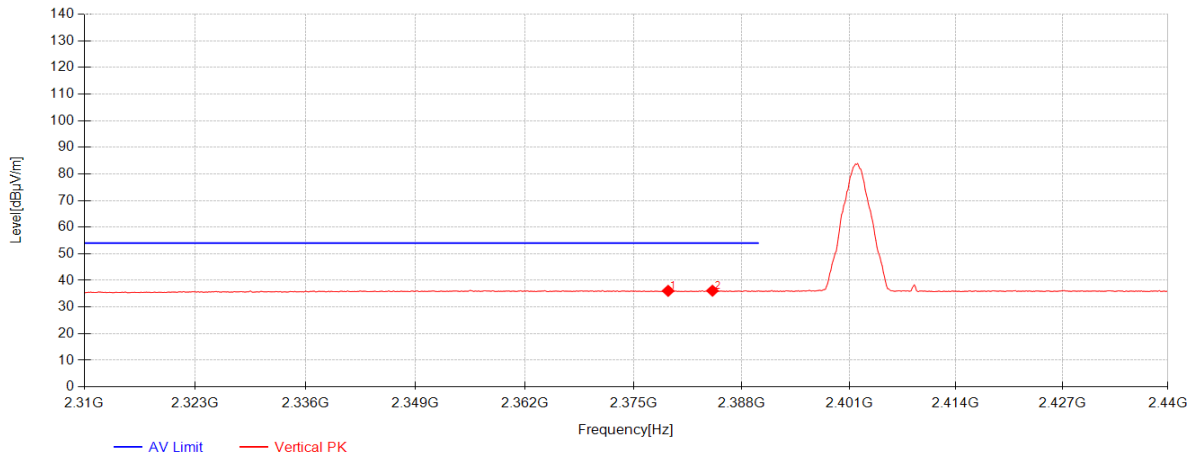
BLE_2M_TX_CH_00_Vertical_Peak



Data List

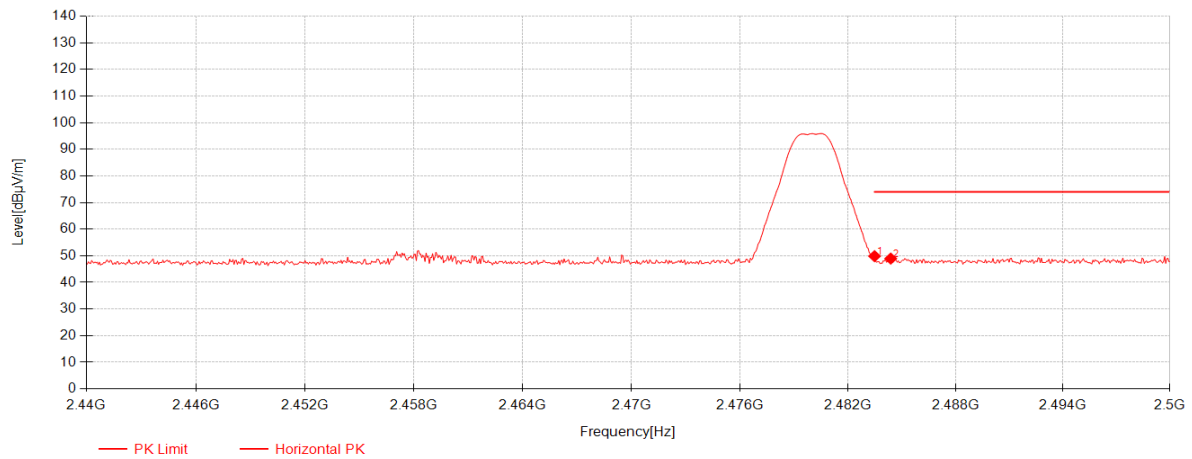
NO.	Frequency [MHz]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	2370.32	27.52	-17.58	48.78	74.00	25.22	Vertical
2	2384.49	27.46	-17.57	48.87	74.00	25.13	Vertical

BLE_2M_TX_CH_00_Vertical_Average



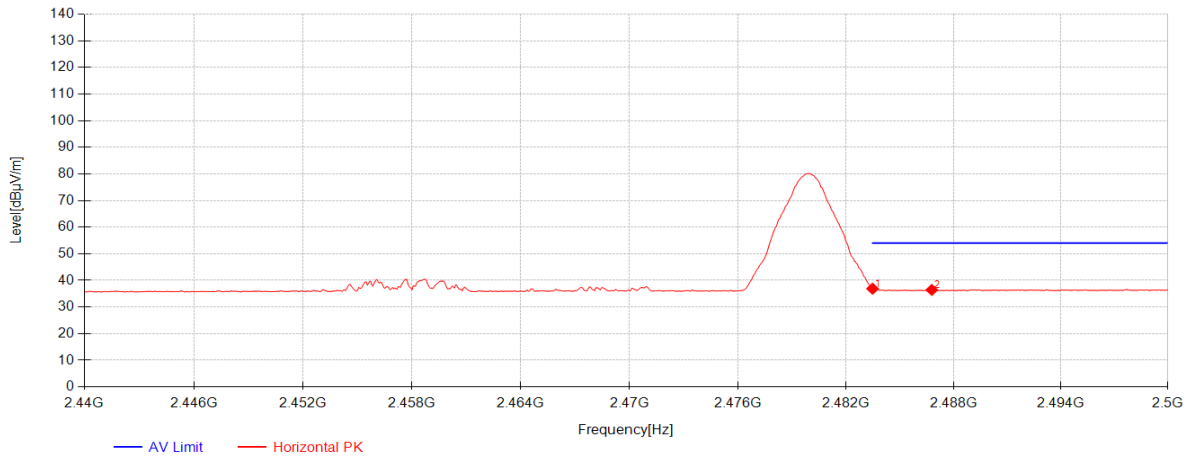
Data List							
NO.	Frequency [MHz]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	2379.16	27.48	-17.57	36.08	54.00	17.92	Vertical
2	2384.49	27.46	-17.57	36.13	54.00	17.87	Vertical

BLE_2M_TX_CH_39_Horizontal_Peak



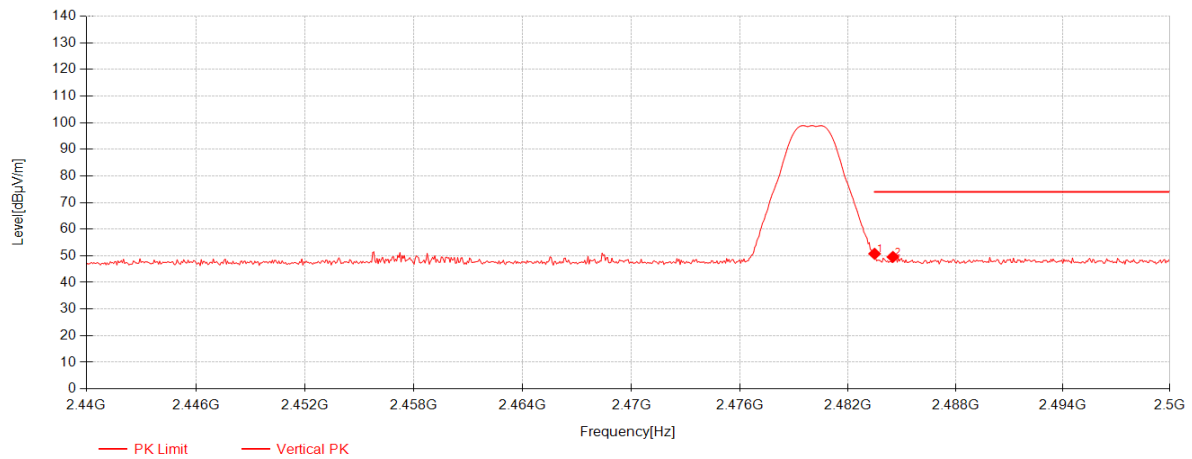
Data List							
NO.	Frequency [MHz]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	2483.5	27.73	-17.55	49.86	74.00	24.14	Horizontal
2	2484.4	27.74	-17.55	48.95	74.00	25.05	Horizontal

BLE_2M_TX_CH_39_Horizontal_Average



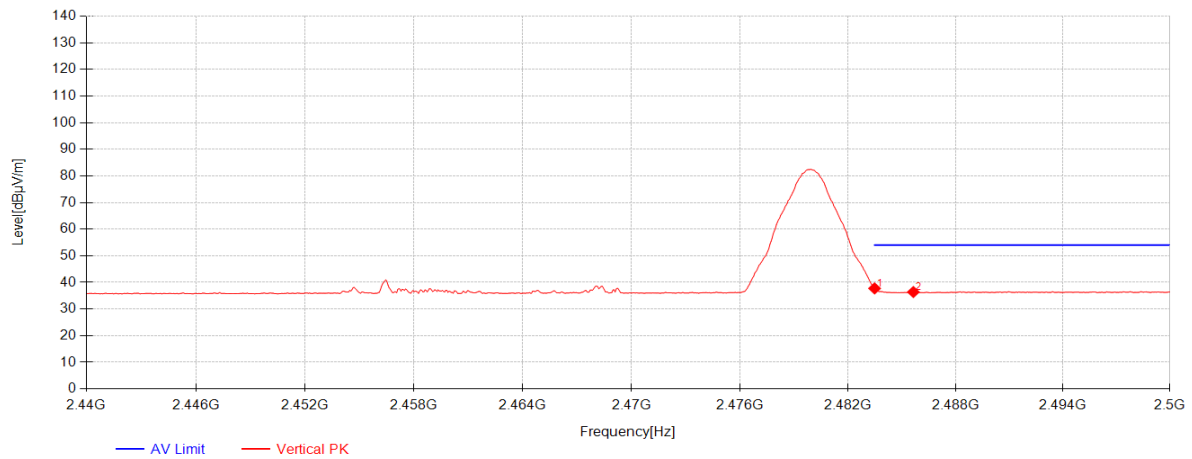
Data List							
NO.	Frequency [MHz]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	2483.5	27.73	-17.55	36.88	54.00	17.12	Horizontal
2	2486.8	27.75	-17.55	36.43	54.00	17.57	Horizontal

BLE_2M_TX_CH_39_Vertical_Peak



Data List							
NO.	Frequency [MHz]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	2483.5	27.73	-17.55	50.75	74.00	23.25	Vertical
2	2484.52	27.74	-17.55	49.58	74.00	24.42	Vertical

BLE_2M_TX_CH_39_Verical_Average



Data List							
NO.	Frequency [MHz]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	2483.5	27.73	-17.55	37.74	54.00	16.26	Vertical
2	2485.66	27.74	-17.55	36.39	54.00	17.61	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 (2020) Section 6.4,6.5

Limit:

Frequency (MHz)	Field strength (microvolts/meter)	Measurement distance (meters)	Field strength (dBμV/m@3m)
0.009-0.490	2400/F(kHz)	300	128.5 to 93.8
0.490-1.705	24000/F(kHz)	30	73.8 to 62.9
1.705-30.0	30	30	69.60
30-88	100	3	40.0
88-216	150	3	43.5
216-960	200	3	46.0
960-1000	500	3	54.0

Note : The above table are based on measurements employing a CISPR quasi-peak detector except for the frequency bands 9-90 kHz, 110-490 kHz. Radiated emission limits in these two bands are based on measurements employing an average detector.

7.3.1 E.U.T. Operation

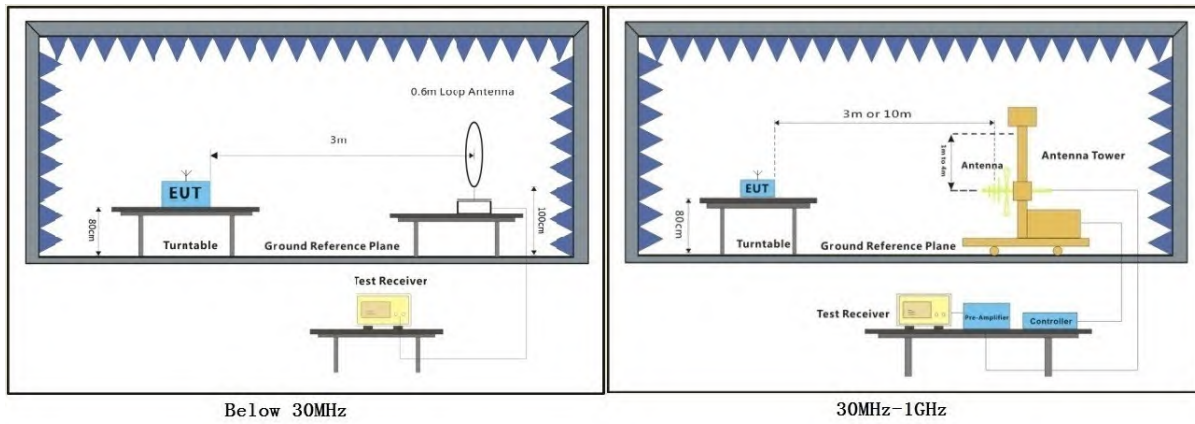
Operating Environment:

Temperature: 23 °C Humidity: 43 % RH Atmospheric Pressure: 1001 mbar

7.3.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	02	TX mode(1Mbps)_Keep the EUT in charging and continuously transmitting mode with GFSK modulation.
Pre-scan	03	TX mode(2Mbps)_Keep the EUT in charging and continuously transmitting mode with GFSK modulation.

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 0.8m above the ground at a semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3m or 10m away from the interference-receiving antenna, which was mounted on the variable-height antenna tower.
- c. The antenna height is varied from 1m to 4m 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 1m to 4m (for the test frequency of below 30MHz, the antenna was tuned to heights 1m) 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. At frequencies below 1GHz, measurements may be performed at a distance different to specified in the regulations.

Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor+ Aux Factor (if applicable)

The aux factor needs to be added when measurements are performed at a distance other than the limit distance provided.

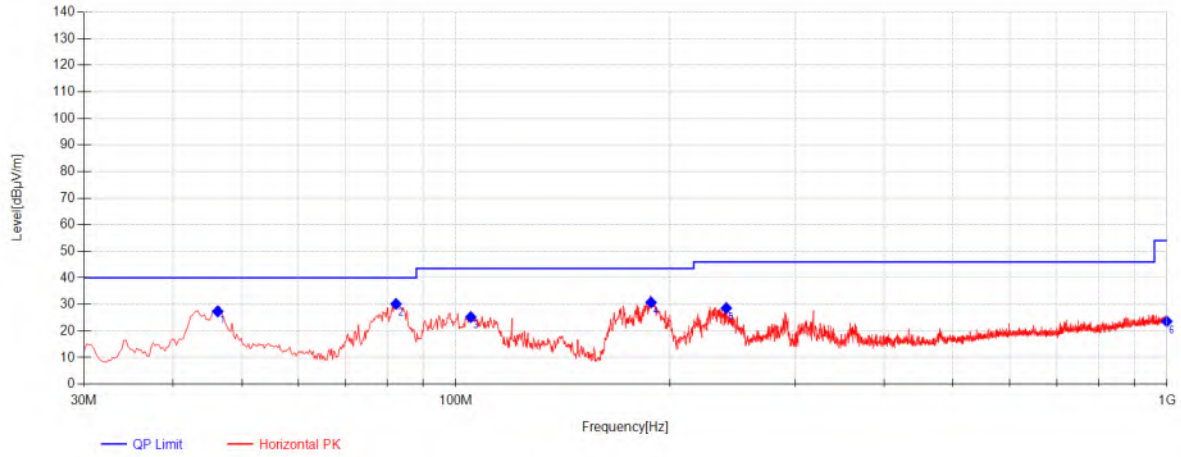
EX. Below 30MHz, Aux Factor = 40 dB/decade of distance, the aux factor is $40\log(3/300) = -80\text{dB}$ (for 3m test distance).

EX. Above 30MHz, Aux Factor = 20 dB/decade of distance, the aux factor is $20\log(10/3) = 10.46\text{dB}$ (for 10m test distance).

2. Scan from 9kHz to 30MHz, the disturbance below 30MHz was very low. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.

3. The disturbance below 1GHz was very low and the harmonics were the highest point could be found when testing, so only the worst-case test curve is displayed.

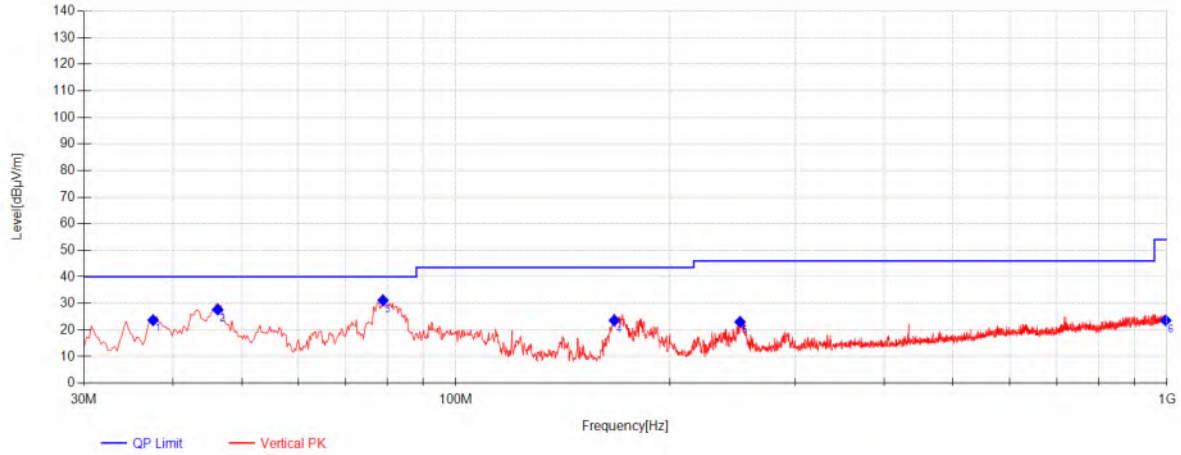
Test Mode: 02; Polarity: Horizontal



Final Data List

NO.	Frequency [MHz]	AF [dB/m]	Factor [dB]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity
1	46.2475	14.25	-41.06	27.35	40.00	12.65	187	114	Horizontal
2	82.38	8.78	-40.54	30.17	40.00	9.83	168	70	Horizontal
3	104.9325	12.77	-40.27	25.24	43.50	18.26	157	91	Horizontal
4	188.11	10.51	-39.35	30.76	43.50	12.74	193	25	Horizontal
5	240.005	12.50	-38.73	28.60	46.00	17.40	190	41	Horizontal
6	999.2725	22.00	-33.69	23.57	54.00	30.43	145	1	Horizontal

Test Mode: 02; Polarity: Vertical



Final Data List									
NO.	Frequency [MHz]	AF [dB/m]	Factor [dB]	QP Value [dBμV/m]	QP Limit [dBμV/m]	QP Margin [dB]	Height [cm]	Angle [°]	Polarity
1	37.5175	12.26	-41.24	23.66	40.00	16.34	101	1	Vertical
2	46.2475	14.25	-41.06	27.66	40.00	12.34	137	48	Vertical
3	78.985	8.40	-40.60	31.15	40.00	8.85	142	140	Vertical
4	167.0125	9.70	-39.58	23.62	43.50	19.88	164	3	Vertical
5	250.9175	12.64	-38.61	23.03	46.00	22.97	179	109	Vertical
6	995.635	22.00	-33.73	23.57	54.00	30.43	158	275	Vertical

7.4 Radiated Spurious Emissions Above 1GHz

Test Requirement 47 CFR Part 15, Subpart C 15.205 & 15.209

Test Method: ANSI C63.10 (2020) Section 6.6 & 11.12

Limit:

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

Note:

At Above 18GHz, measurements may be performed at a distance shorter than that specified in the regulations

Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor+ Aux Factor (if applicable)

The aux factor needs to be added when measurements are performed at a distance other than the limit distance provided.

EX. Above 18GHz, Aux Factor = 20 dB/decade of distance, the aux factor is $20\log(1/3) = -9.54\text{dB}$ (for 1m test distance).

7.4.1 E.U.T. Operation

Operating Environment:

Temperature: 23 °C

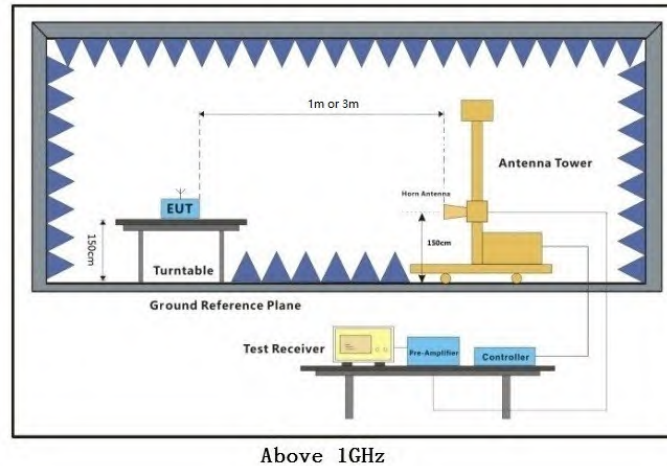
Humidity: 43 % RH

Atmospheric Pressure: 1001 mbar

7.4.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	02	TX mode(1Mbps)_Keep the EUT in charging and continuously transmitting mode with GFSK modulation.
Final test	03	TX mode(2Mbps)_Keep the EUT in charging and continuously transmitting mode with GFSK modulation.

7.4.3 Test Setup Diagram



Above 1GHz

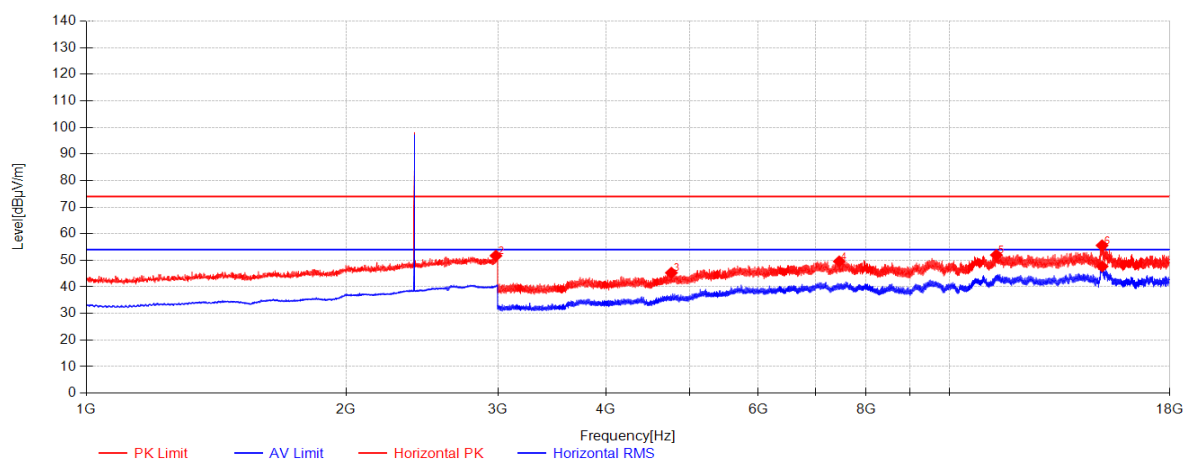
7.4.4 Measurement Procedure and Data

- For above 1GHz, the EUT was placed on the top of a rotating table 1.5m above the ground at a 3m fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation. The EUT was set 3m away from the interference-receiving antenna from 1GHz to 18GHz, and 1m away from the interference-receiving antenna above 18GHz.
- The interference-receiving antenna was mounted on the variable-height antenna tower, with its boresight facing the EUT throughout the test.
- The antenna height is varied from 1m to 4m 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.
- For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1m to 4m and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- Test the EUT in the lowest channel, the middle channel, the Highest channel.
- 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.
- Repeat above procedures until all frequencies measured was complete.

Remark:

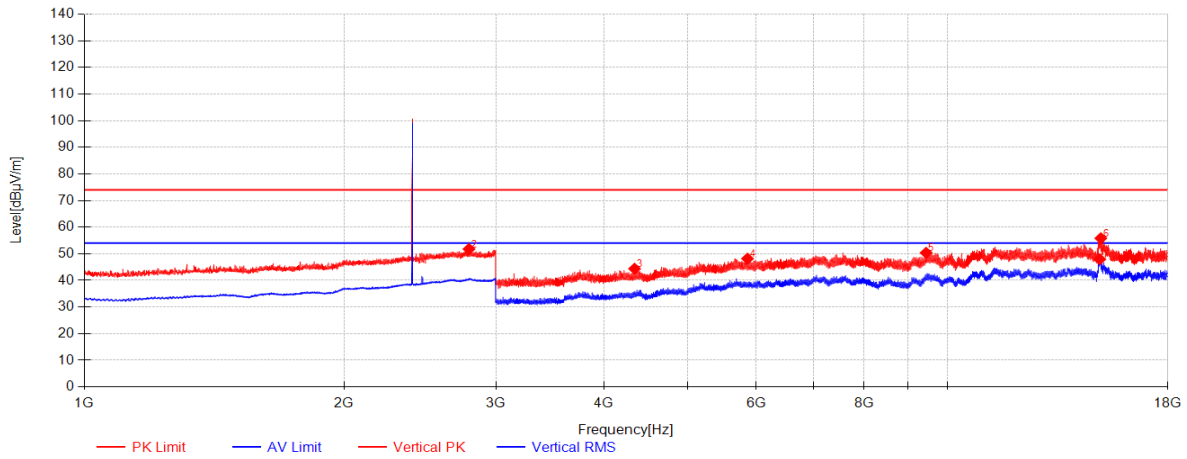
- Scan from 1GHz to 10th harmonic of the highest frequency or 40 GHz, whichever is lower.
- As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits 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.
- For the frequency above 18GHz, testing had been executed under all test modes, only the worst-case test curve is displayed in the report.
- For devices with multiple operating modes, measurements on the middle channel is used to determine the worst-case mode(s). Only the worst-case mode with the highest output power and the mode with the highest output power spectral density for each modulation family (e.g., OFDM and direct sequence spread spectrum) is recorded in the test report.

BLE_1M_TX_CH_00_Horizontal



Data List							
NO.	Frequency [MHz]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	15022.5	40.61	-35.86	47.70	54.00	6.30	Horizontal
2	2982.5	28.50	-16.56	51.71	74.00	22.29	Horizontal
3	4761.75	30.57	-42.13	45.29	74.00	28.71	Horizontal
4	7450.875	36.80	-40.69	49.56	74.00	24.44	Horizontal
5	11329.125	40.16	-40.99	51.97	74.00	22.03	Horizontal
6	15018.375	40.63	-35.87	55.59	74.00	18.41	Horizontal

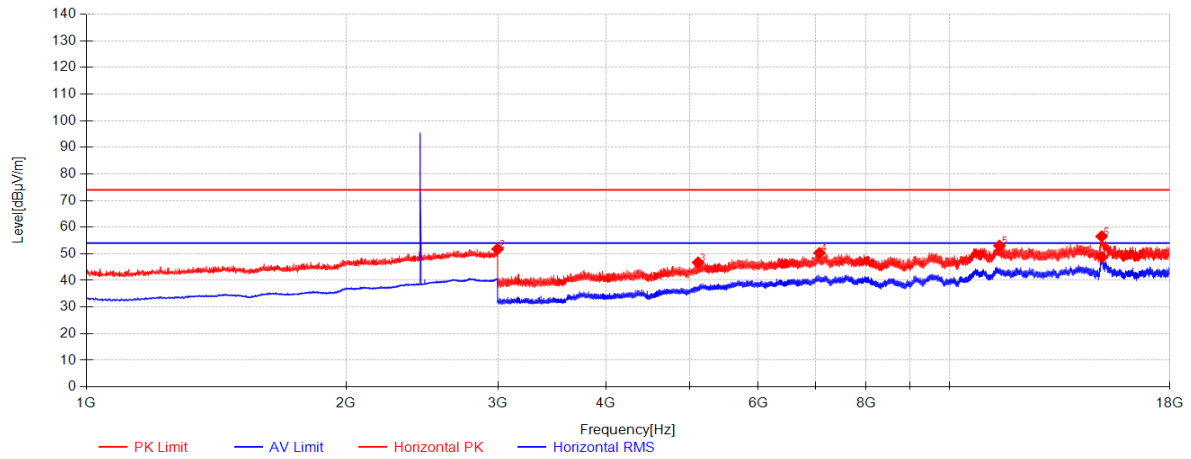
BLE_1M_TX_CH_00_Vertical



Data List

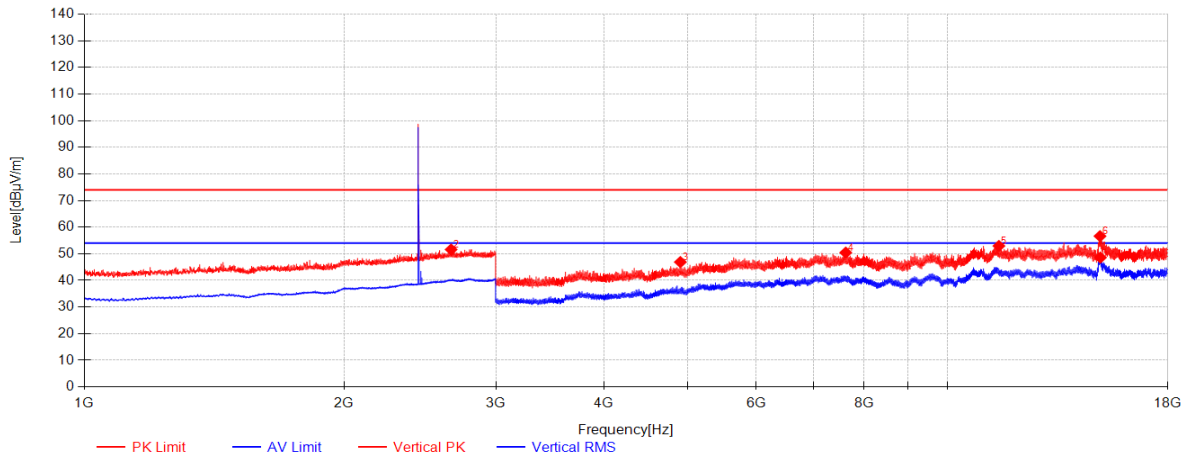
NO.	Frequency [MHz]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	15007.125	40.67	-35.87	47.95	54.00	6.05	Vertical
2	2790.5	28.26	-16.63	51.78	74.00	22.22	Vertical
3	4339.875	29.82	-42.72	44.38	74.00	29.62	Vertical
4	5865	32.66	-40.17	48.17	74.00	25.83	Vertical
5	9442.875	37.47	-40.82	50.37	74.00	23.63	Vertical
6	15047.625	40.51	-35.84	55.84	74.00	18.16	Vertical

BLE_1M_TX_CH_19_Horizontal



Data List							
NO.	Frequency [MHz]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	15020.25	40.62	-35.86	48.74	54.00	5.26	Horizontal
2	2995.5	28.57	-16.55	51.77	74.00	22.23	Horizontal
3	5113.125	31.58	-41.60	46.73	74.00	27.27	Horizontal
4	7068	36.09	-40.67	50.31	74.00	23.69	Horizontal
5	11420.625	40.28	-40.36	53.04	74.00	20.96	Horizontal
6	14998.125	40.71	-35.97	56.54	74.00	17.46	Horizontal

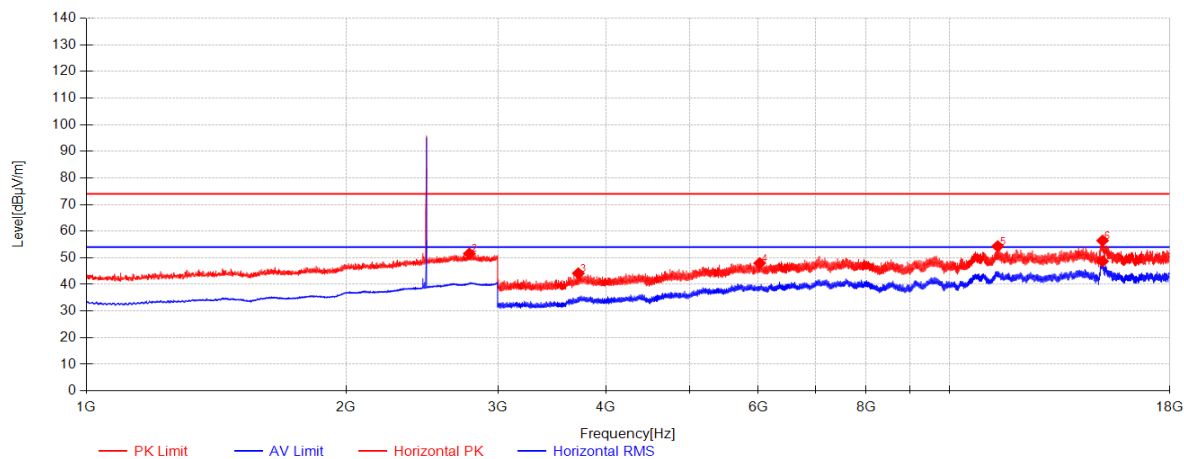
BLE_1M_TX_CH_19_Vertical



Data List

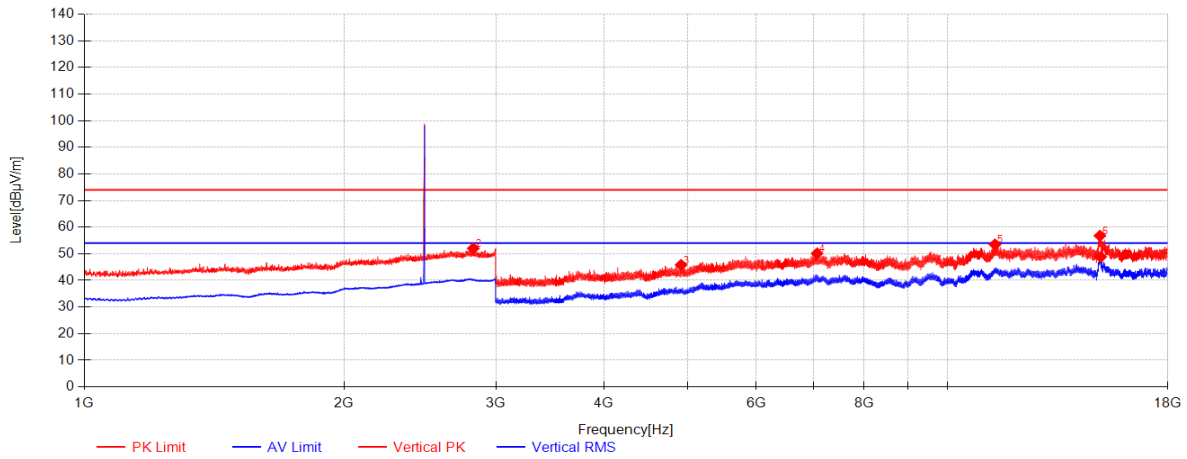
NO.	Frequency [MHz]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	15031.125	40.58	-35.86	48.59	54.00	5.41	Vertical
2	2660.5	27.92	-17.23	51.60	74.00	22.40	Vertical
3	4903.5	30.91	-41.96	46.89	74.00	27.11	Vertical
4	7621.125	36.72	-40.49	50.44	74.00	23.56	Vertical
5	11466.375	40.23	-40.67	52.94	74.00	21.06	Vertical
6	15014.25	40.64	-35.87	56.63	74.00	17.37	Vertical

BLE_1M_TX_CH_39_Horizontal



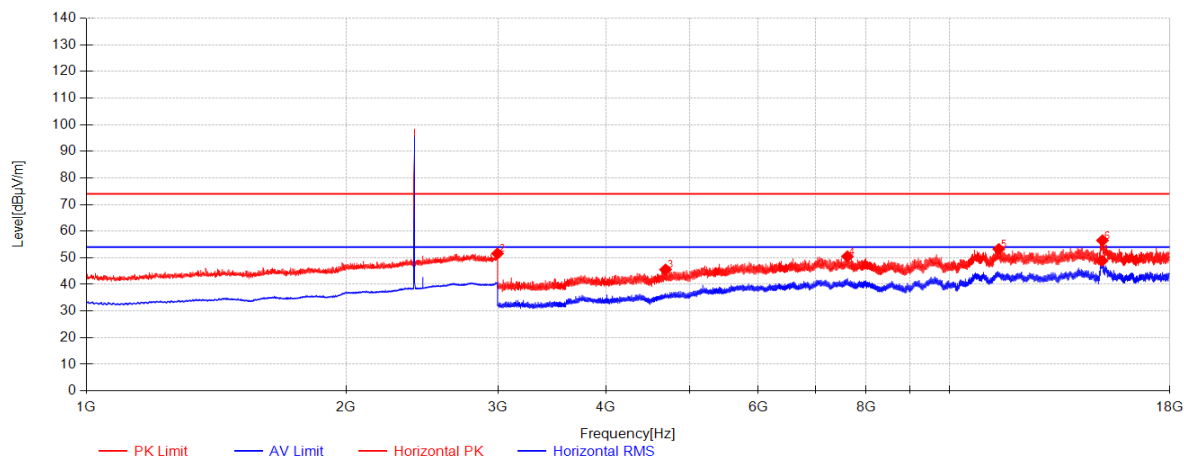
Data List							
NO.	Frequency [MHz]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	15037.5	40.55	-35.85	48.68	54.00	5.32	Horizontal
2	2778.5	28.21	-16.71	51.56	74.00	22.44	Horizontal
3	3715.125	29.39	-43.65	44.16	74.00	29.84	Horizontal
4	6026.25	33.26	-40.49	47.98	74.00	26.02	Horizontal
5	11367.375	40.23	-40.57	54.34	74.00	19.66	Horizontal
6	15038.25	40.55	-35.85	56.46	74.00	17.54	Horizontal

BLE_1M_TX_CH_39_Vertical



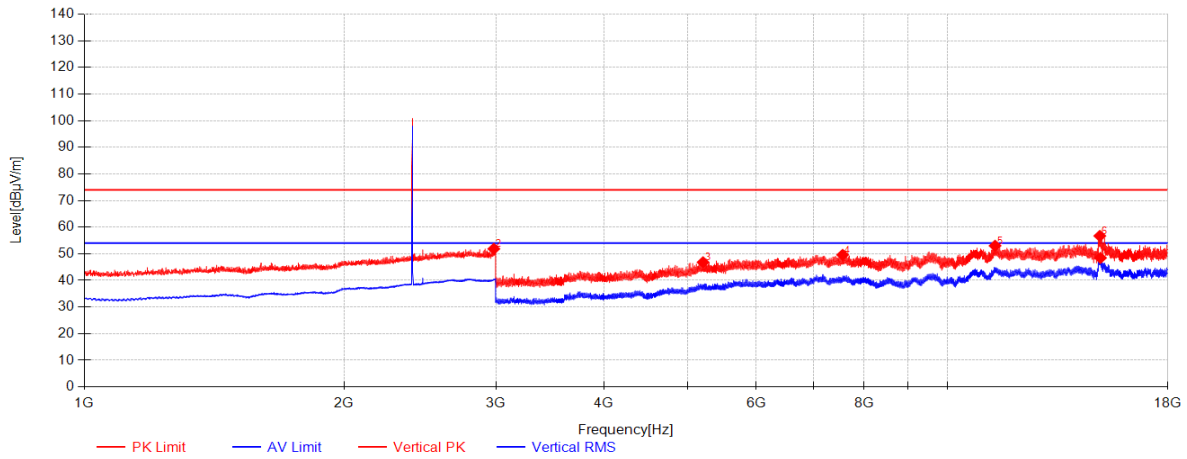
Data List							
NO.	Frequency [MHz]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	15042	40.53	-35.85	48.84	54.00	5.16	Vertical
2	2822.5	28.30	-16.59	52.02	74.00	21.98	Vertical
3	4912.875	30.93	-41.91	45.80	74.00	28.20	Vertical
4	7060.5	36.14	-40.67	50.14	74.00	23.86	Vertical
5	11347.5	40.20	-40.79	53.48	74.00	20.52	Vertical
6	15011.25	40.66	-35.87	56.78	74.00	17.22	Vertical

BLE_2M_TX_CH_00_Horizontal



Data List							
NO.	Frequency [MHz]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	15016.875	40.63	-35.87	48.84	54.00	5.16	Horizontal
2	2994.5	28.57	-16.55	51.58	74.00	22.42	Horizontal
3	4687.875	30.50	-42.30	45.57	74.00	28.43	Horizontal
4	7614	36.74	-40.52	50.50	74.00	23.50	Horizontal
5	11402.625	40.30	-40.24	53.28	74.00	20.72	Horizontal
6	15033	40.57	-35.85	56.52	74.00	17.48	Horizontal

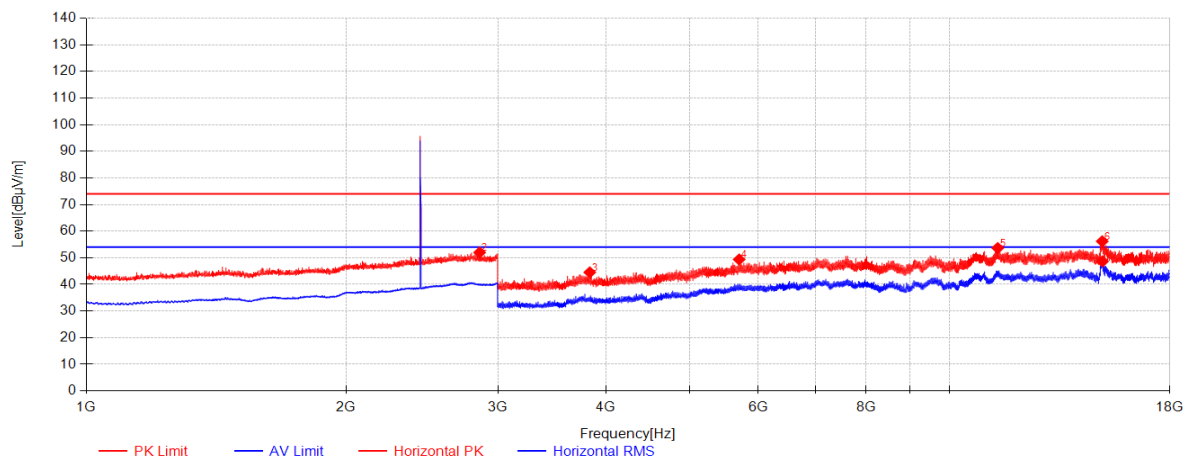
BLE_2M_TX_CH_00_Vetical



Data List

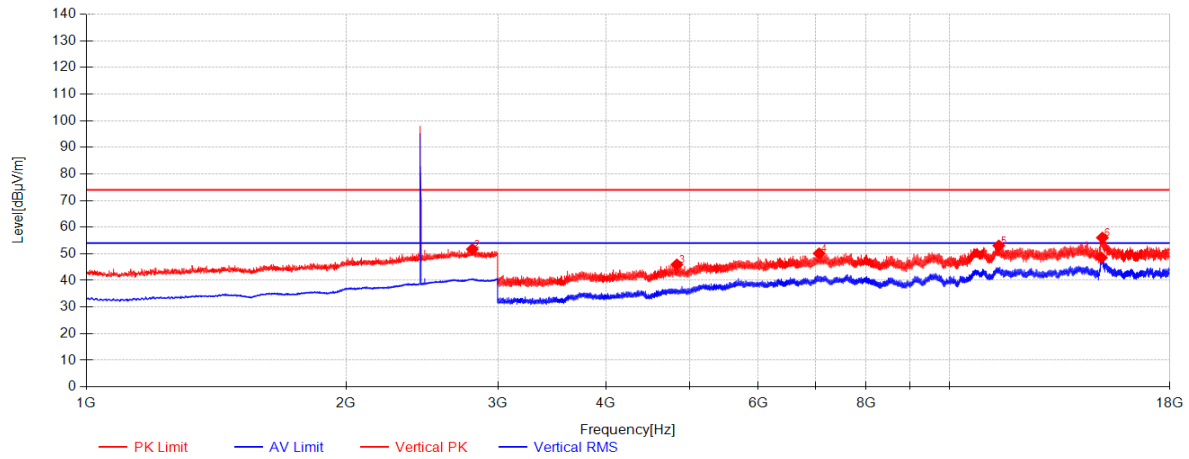
NO.	Frequency [MHz]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	15033.75	40.57	-35.85	48.46	54.00	5.54	Vertical
2	2981.5	28.49	-16.56	51.85	74.00	22.15	Vertical
3	5209.125	31.85	-41.32	46.83	74.00	27.17	Vertical
4	7558.125	36.47	-40.67	49.60	74.00	24.40	Vertical
5	11349	40.20	-40.77	53.01	74.00	20.99	Vertical
6	15006	40.68	-35.88	56.71	74.00	17.29	Vertical

BLE_2M_TX_CH_19_Horizontal



Data List							
NO.	Frequency [MHz]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	15033	40.57	-35.85	48.65	54.00	5.35	Horizontal
2	2855.5	28.28	-16.63	52.00	74.00	22.00	Horizontal
3	3830.25	29.74	-43.52	44.53	74.00	29.47	Horizontal
4	5705.25	32.50	-40.31	49.38	74.00	24.62	Horizontal
5	11369.25	40.24	-40.55	53.66	74.00	20.34	Horizontal
6	15023.625	40.61	-35.86	56.19	74.00	17.81	Horizontal

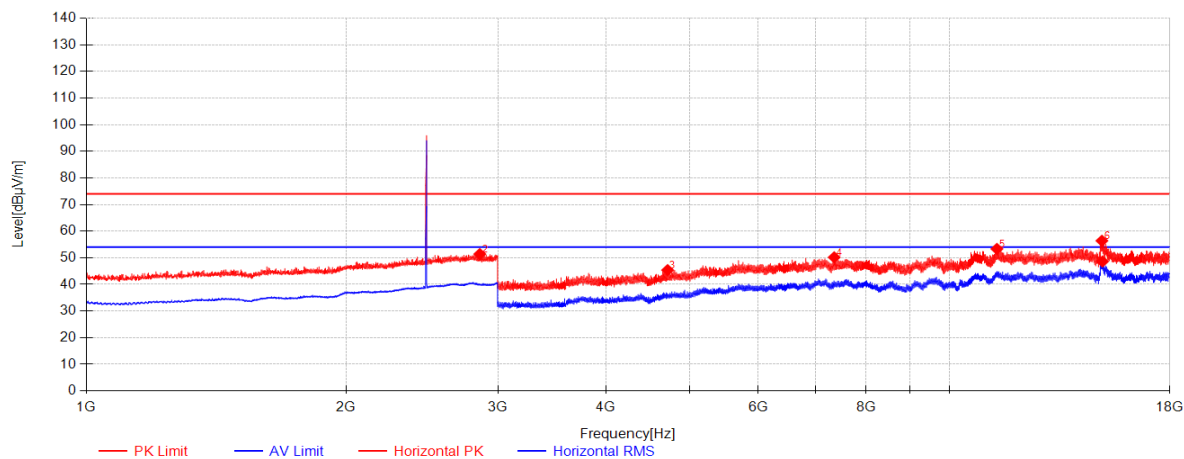
BLE_2M_TX_CH_19_Vertical



Data List

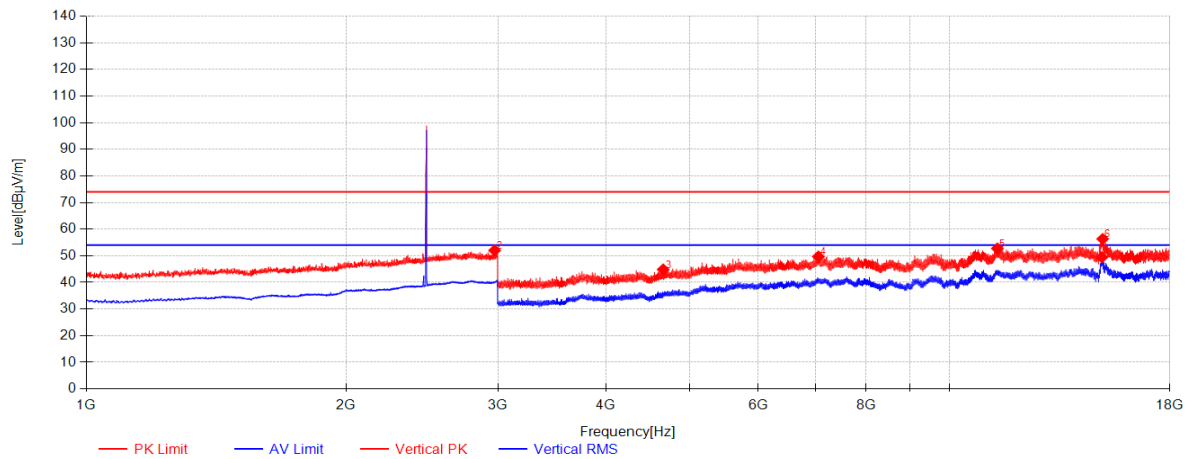
NO.	Frequency [MHz]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	14991.75	40.72	-36.28	48.57	54.00	5.43	Vertical
2	2800.5	28.30	-16.57	51.72	74.00	22.28	Vertical
3	4832.25	30.67	-42.01	45.96	74.00	28.04	Vertical
4	7061.625	36.13	-40.67	50.13	74.00	23.87	Vertical
5	11403	40.30	-40.24	53.06	74.00	20.94	Vertical
6	15028.5	40.59	-35.86	56.04	74.00	17.96	Vertical

BLE_2M_TX_CH_39_Horizontal



Data List							
NO.	Frequency [MHz]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	15035.25	40.56	-35.85	48.61	54.00	5.39	Horizontal
2	2856.5	28.27	-16.63	51.40	74.00	22.60	Horizontal
3	4714.125	30.57	-42.25	45.37	74.00	28.63	Horizontal
4	7351.5	36.51	-40.59	50.18	74.00	23.82	Horizontal
5	11344.875	40.19	-40.82	53.34	74.00	20.66	Horizontal
6	15011.25	40.66	-35.87	56.40	74.00	17.60	Horizontal

BLE_2M_TX_CH_39_Vetical



Data List							
NO.	Frequency [MHz]	AF [dB/m]	Factor [dB]	Level [dBμV/m]	Limit [dBμV/m]	Margin [dB]	Polarity
1	15012.75	40.65	-35.87	49.48	54.00	4.52	Vertical
2	2971.5	28.43	-16.58	52.01	74.00	21.99	Vertical
3	4658.25	30.27	-42.34	44.86	74.00	29.14	Vertical
4	7047	36.16	-40.66	49.70	74.00	24.30	Vertical
5	11358.375	40.22	-40.67	52.74	74.00	21.26	Vertical
6	15040.125	40.54	-35.85	56.31	74.00	17.69	Vertical

7.5 Conducted Peak Output Power

Test Requirement 47 CFR Part 15, Subpart C 15.247(b)(3)

Test Method: ANSI C63.10 (2020) Section 11.9.1

Limit:

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

7.5.1 E.U.T. Operation

Operating Environment:

Temperature: 24.9 °C

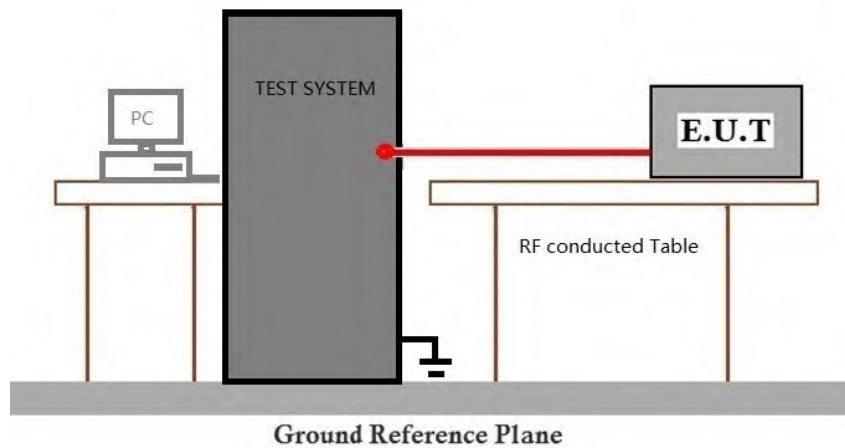
Humidity: 58.5 % RH

Atmospheric Pressure: 1001 mbar

7.5.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	02	TX mode(1Mbps)_Keep the EUT in charging and continuously transmitting mode with GFSK modulation.
Final test	03	TX mode(2Mbps)_Keep the EUT in charging and continuously transmitting mode with GFSK modulation.

7.5.3 Test Setup Diagram



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

7.6 Minimum 6dB Bandwidth

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

Test Method: ANSI C63.10 (2020) Section 11.8.1

Limit:

≥500 kHz

7.6.1 E.U.T. Operation

Operating Environment:

Temperature: 24.9 °C

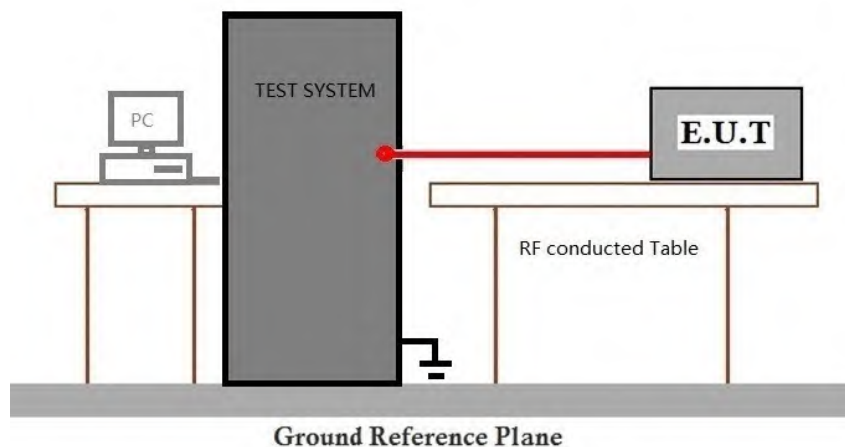
Humidity: 58.5 % RH

Atmospheric Pressure: 1001 mbar

7.6.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	02	TX mode(1Mbps)_Keep the EUT in charging and continuously transmitting mode with GFSK modulation.
Final test	03	TX mode(2Mbps)_Keep the EUT in charging and continuously transmitting mode with GFSK modulation.

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 (2020) 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: 24.9 °C

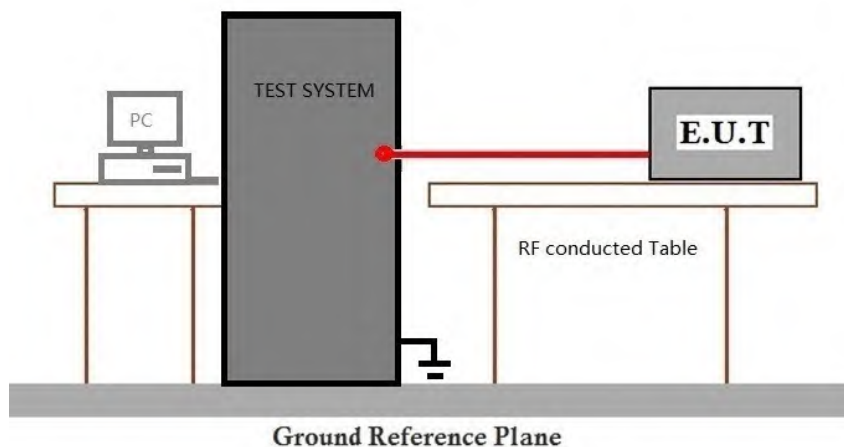
Humidity: 58.5 % RH

Atmospheric Pressure: 1001 mbar

7.7.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	02	TX mode(1Mbps)_Keep the EUT in charging and continuously transmitting mode with GFSK modulation.
Final test	03	TX mode(2Mbps)_Keep the EUT in charging and continuously transmitting mode with GFSK modulation.

7.7.3 Test Setup Diagram



7.7.4 Measurement Procedure and Data

Please Refer to Appendix for Details

7.8 Conducted Band Edges Measurement

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

Test Method: ANSI C63.10 (2020) Section 6.10.4

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: 24.9 °C

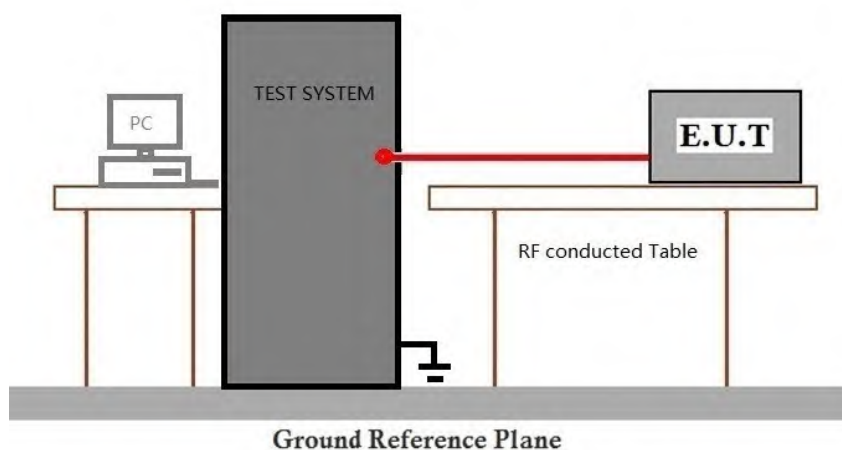
Humidity: 58.5 % RH

Atmospheric Pressure: 1001 mbar

7.8.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	02	TX mode(1Mbps)_Keep the EUT in charging and continuously transmitting mode with GFSK modulation.
Final test	03	TX mode(2Mbps)_Keep the EUT in charging and continuously transmitting mode with GFSK modulation.

7.8.3 Test Setup Diagram





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7.8.4 Measurement Procedure and Data

Please Refer to Appendix for Details

7.9 Conducted Spurious Emissions

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

Test Method: ANSI C63.10 (2020) 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: 24.9 °C

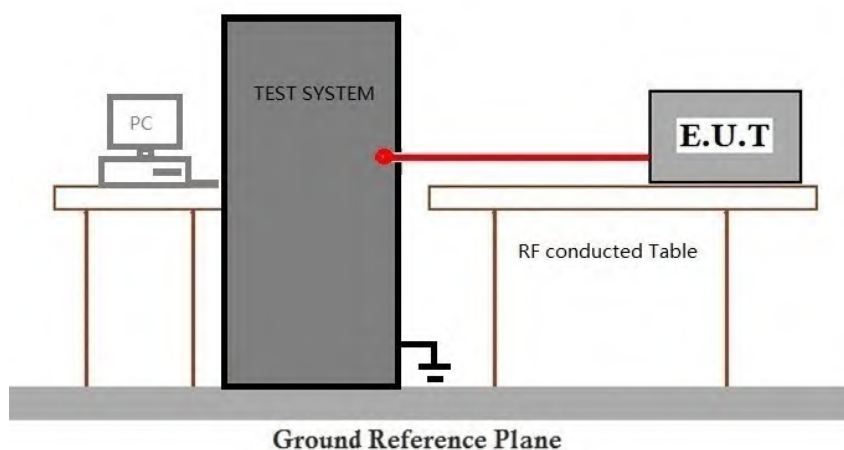
Humidity: 58.5 % RH

Atmospheric Pressure: 1001 mbar

7.9.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	02	TX mode(1Mbps)_Keep the EUT in charging and continuously transmitting mode with GFSK modulation.
Final test	03	TX mode(2Mbps)_Keep the EUT in charging and continuously transmitting mode with GFSK modulation.

7.9.3 Test Setup Diagram





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7.9.4 Measurement Procedure and Data

Please Refer to Appendix for Details

8 Test Setup Photo

Refer to Appendix - Test Setup Photo for SUCR2512001219TL

9 EUT Constructional Details (EUT Photos)

Refer to Appendix_Photographs of EUT Constructional Details for SUCR2512001219TL

10 Appendix

1. Duty Cycle

1.1 Test Result

1.1.1 Ant5

Ant5									
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	/	/	0.672	0.684	98.25	0.08	0.07
802.11g	SISO	2412	/	/	2.097	2.114	99.20	0.04	0.03
802.11n (HT20)	MIMO	2412	/	/	5.428	5.444	99.71	0.01	0.00
802.11n (HT40)	MIMO	2422	/	/	5.429	5.446	99.69	0.01	0.00
802.11ax (HEW20)	MIMO	2412	SU	/	5.445	5.463	99.67	0.01	0.03
802.11ax (HEW40)	MIMO	2422	SU	/	5.444	5.462	99.67	0.01	0.04
802.11be (EHT20)	MIMO	2412	SU	/	5.452	5.471	99.65	0.02	0.03
802.11be (EHT40)	MIMO	2422	SU	/	5.452	5.470	99.67	0.01	0.04

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	/	/	5	12.980	/	Pass
		2437	/	/	5	13.088	/	Pass
		2462	/	/	5	13.234	/	Pass
802.11g	SISO	2412	/	/	5	17.156	/	Pass
		2437	/	/	5	17.323	/	Pass
		2462	/	/	5	17.444	/	Pass
802.11n (HT20)	MIMO	2412	/	/	5	18.564	/	Pass
		2437	/	/	5	18.735	/	Pass
		2462	/	/	5	18.796	/	Pass
802.11n (HT40)	MIMO	2422	/	/	5	37.415	/	Pass
		2437	/	/	5	37.444	/	Pass
		2452	/	/	5	37.342	/	Pass
802.11ax (HEW20)	MIMO	2412	SU	/	5	19.154	/	Pass
		2437	SU	/	5	19.261	/	Pass
		2462	SU	/	5	19.317	/	Pass
802.11ax (HEW40)	MIMO	2422	SU	/	5	38.377	/	Pass
		2437	SU	/	5	38.454	/	Pass
		2452	SU	/	5	38.493	/	Pass
802.11be (EHT20)	MIMO	2412	SU	/	5	19.254	/	Pass
		2437	SU	/	5	19.281	/	Pass
		2462	SU	/	5	19.383	/	Pass
802.11be (EHT40)	MIMO	2422	SU	/	5	38.455	/	Pass
		2437	SU	/	5	38.431	/	Pass
		2452	SU	/	5	38.412	/	Pass

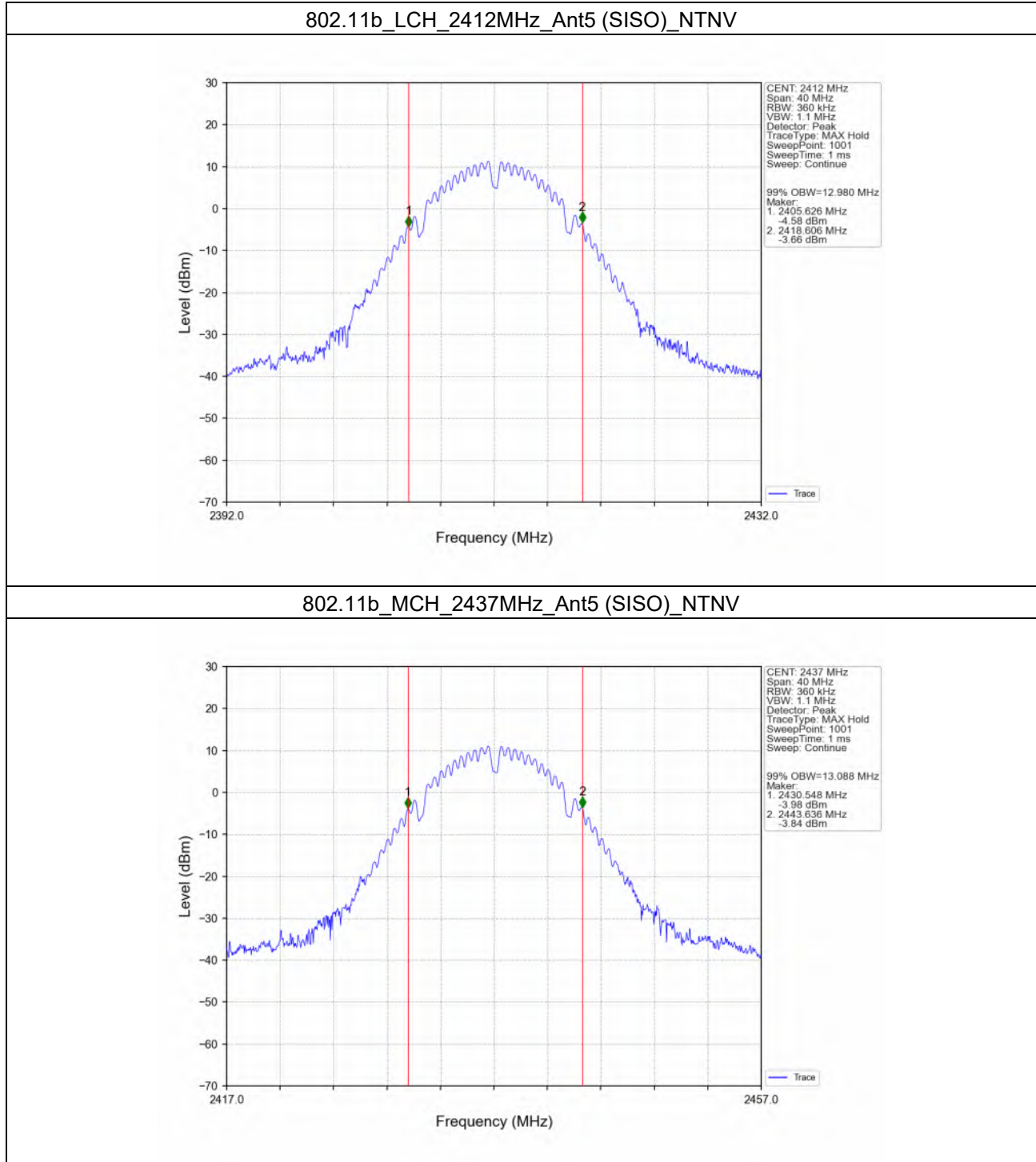
2.1.2 6dB BW

Mode	TX Type	Frequency (MHz)	RU	RU Pos	ANT	6dB Bandwidth (MHz)		Verdict
						Result	Limit	
802.11b	SISO	2412	/	/	5	8.124	≥ 0.5	Pass
		2437	/	/	5	8.158	≥ 0.5	Pass
		2462	/	/	5	8.156	≥ 0.5	Pass
802.11g	SISO	2412	/	/	5	16.465	≥ 0.5	Pass

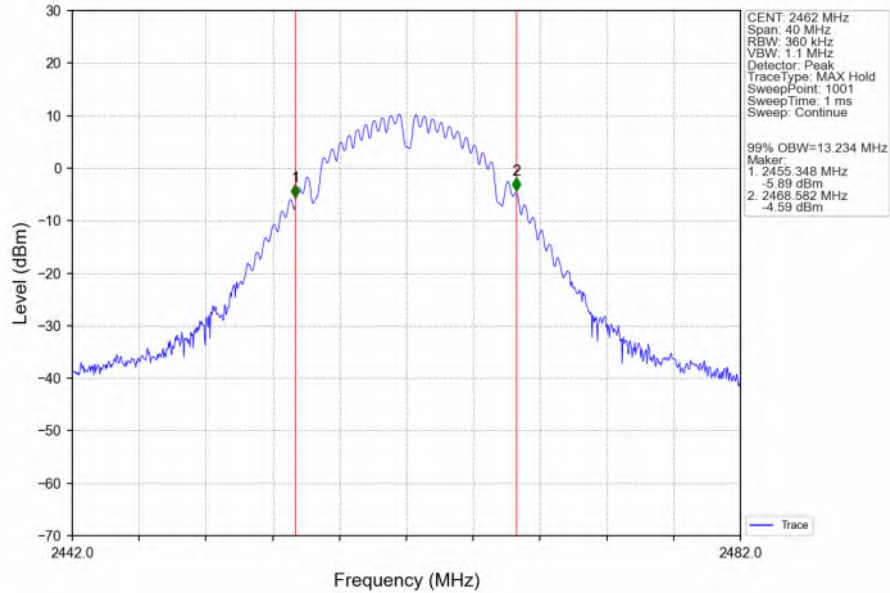
		2437	/	/	5	16.470	≥ 0.5	Pass
		2462	/	/	5	16.615	≥ 0.5	Pass
802.11n (HT20)	MIMO	2412	/	/	5	17.754	≥ 0.5	Pass
		2437	/	/	5	17.925	≥ 0.5	Pass
		2462	/	/	5	17.748	≥ 0.5	Pass
802.11n (HT40)	MIMO	2422	/	/	5	36.643	≥ 0.5	Pass
		2437	/	/	5	36.739	≥ 0.5	Pass
		2452	/	/	5	36.313	≥ 0.5	Pass
802.11ax (HEW20)	MIMO	2412	SU	/	5	18.815	≥ 0.5	Pass
		2437	SU	/	5	18.845	≥ 0.5	Pass
		2462	SU	/	5	18.889	≥ 0.5	Pass
802.11ax (HEW40)	MIMO	2422	SU	/	5	37.456	≥ 0.5	Pass
		2437	SU	/	5	37.713	≥ 0.5	Pass
		2452	SU	/	5	38.075	≥ 0.5	Pass
802.11be (EHT20)	MIMO	2412	SU	/	5	18.796	≥ 0.5	Pass
		2437	SU	/	5	18.950	≥ 0.5	Pass
		2462	SU	/	5	19.027	≥ 0.5	Pass
802.11be (EHT40)	MIMO	2422	SU	/	5	37.889	≥ 0.5	Pass
		2437	SU	/	5	38.071	≥ 0.5	Pass
		2452	SU	/	5	37.530	≥ 0.5	Pass

2.2 Test Graph

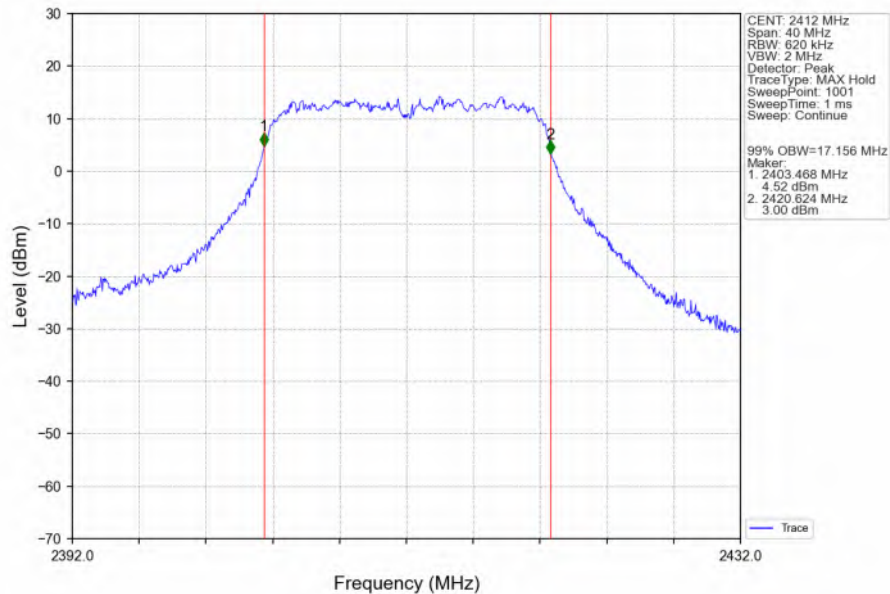
2.2.1 OBW



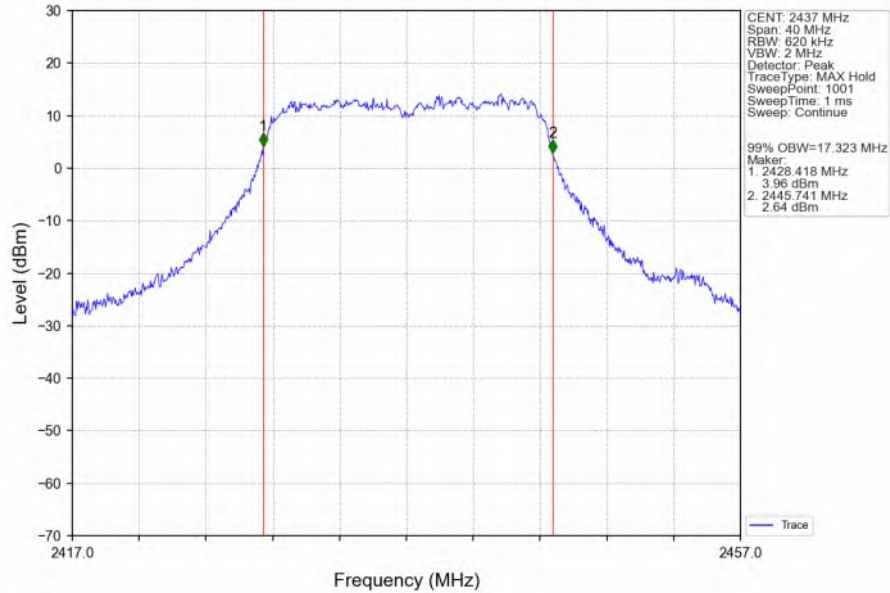
802.11b_HCH_2462MHz_Ant5 (SISO)_NTNV



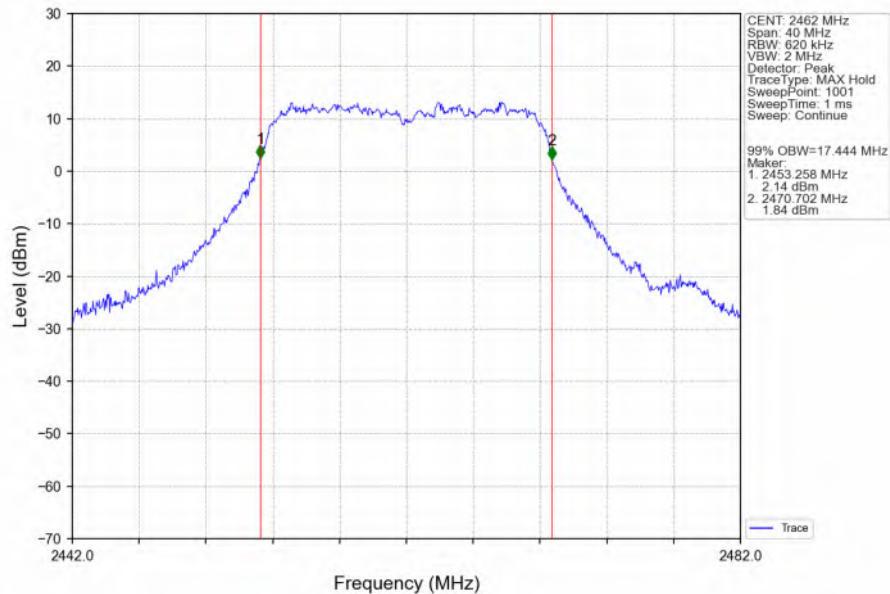
802.11g_LCH_2412MHz_Ant5 (SISO)_NTNV



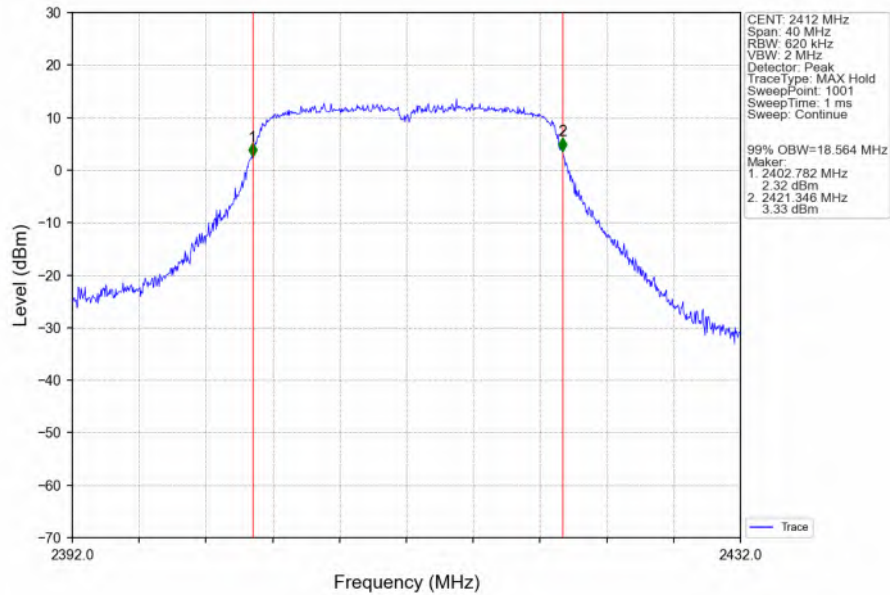
802.11g_MCH_2437MHz_Ant5 (SISO)_NTNV



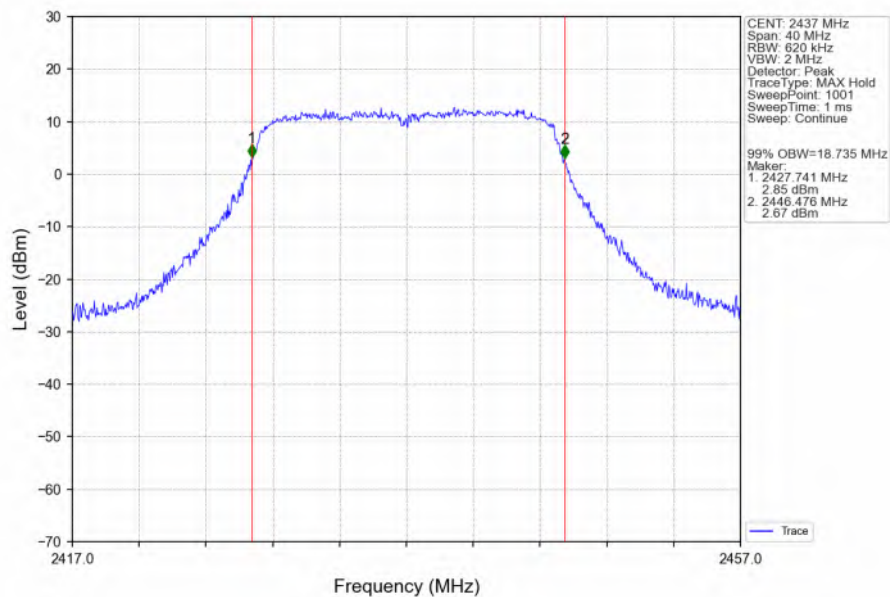
802.11g_HCH_2462MHz_Ant5 (SISO)_NTNV



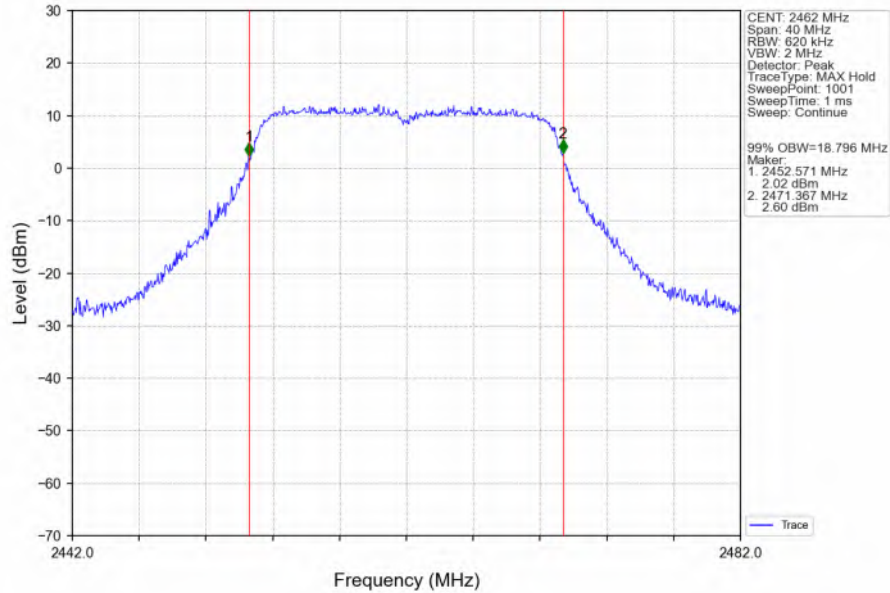
802.11n(HT20)_LCH_2412MHz_Ant5 (MIMO)_NTNV



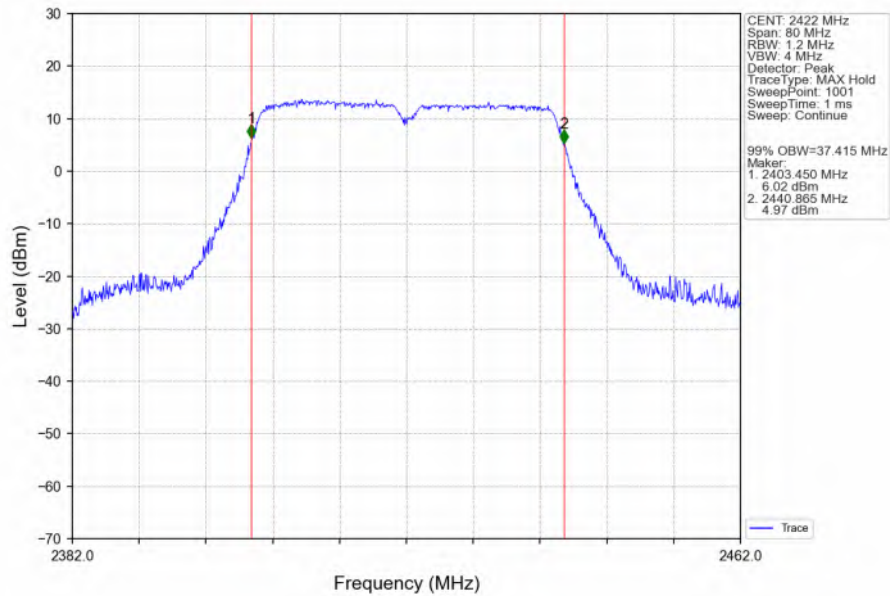
802.11n(HT20)_MCH_2437MHz_Ant5 (MIMO)_NTNV



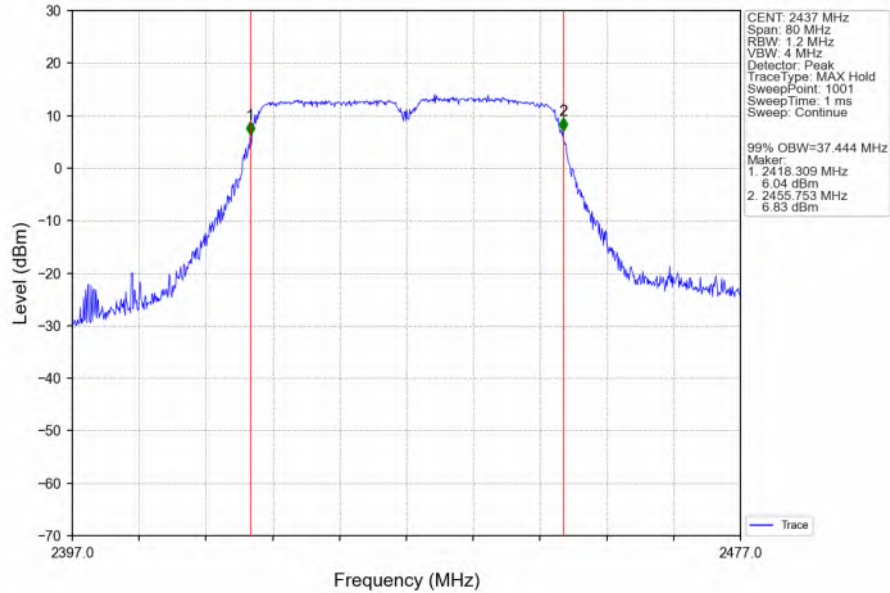
802.11n(HT20)_HCH_2462MHz_Ant5 (MIMO)_NTNV



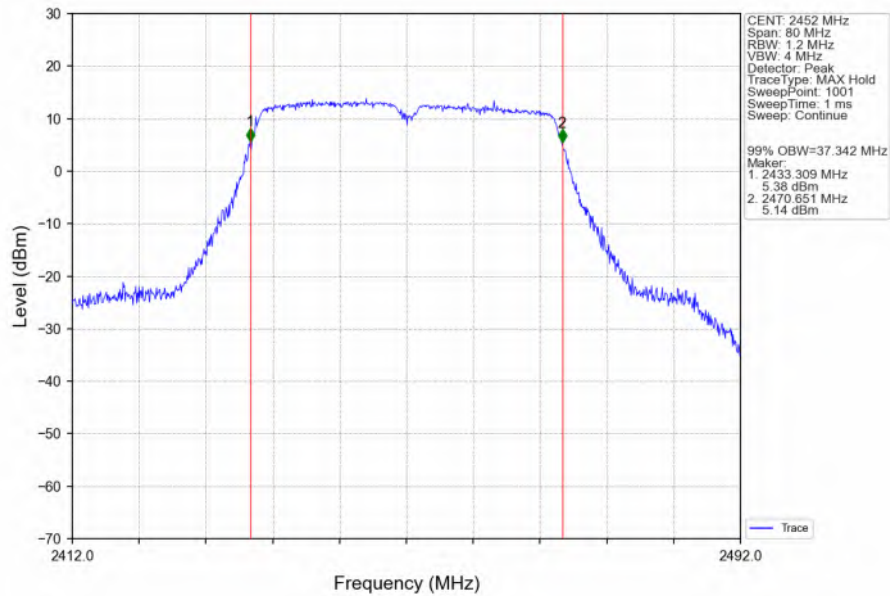
802.11n(HT40)_LCH_2422MHz_Ant5 (MIMO)_NTNV



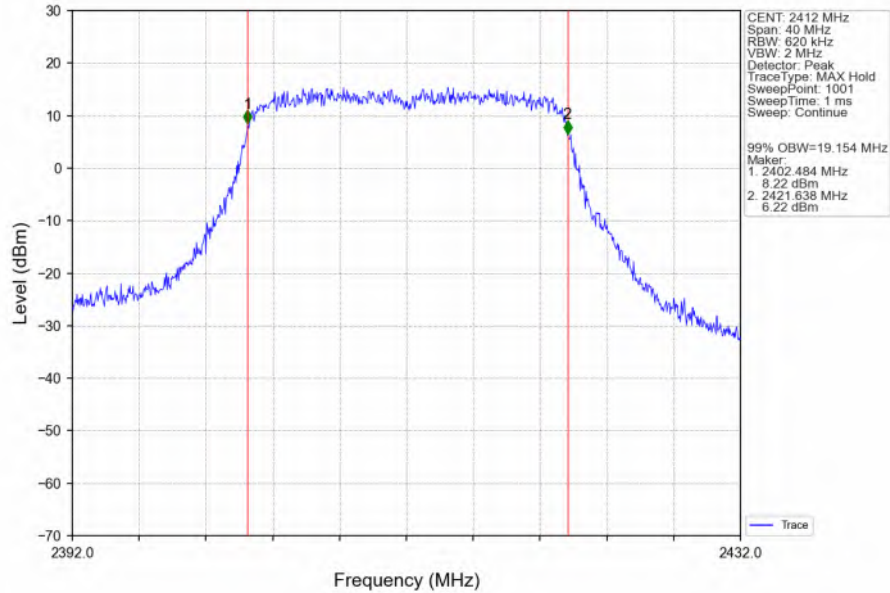
802.11n(HT40)_MCH_2437MHz_Ant5 (MIMO)_NTNV



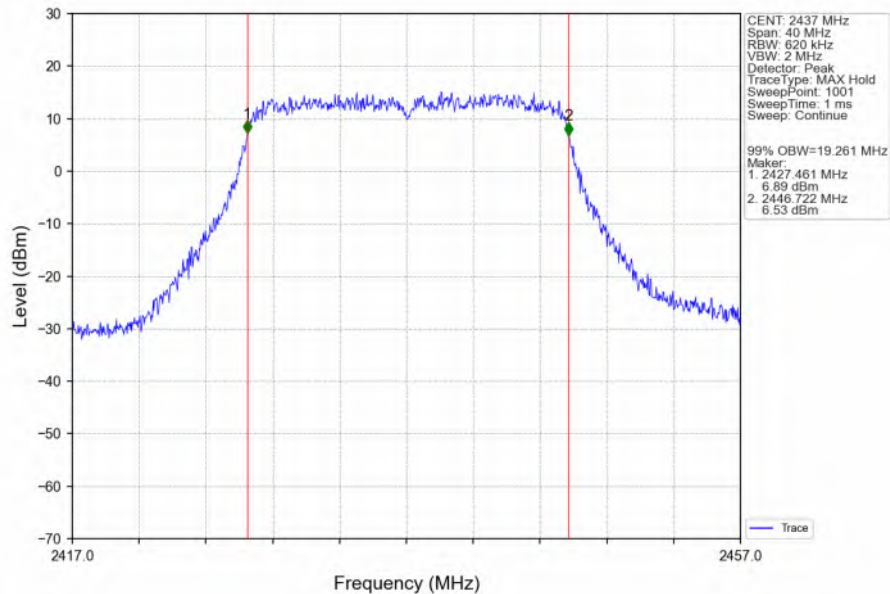
802.11n(HT40)_HCH_2452MHz_Ant5 (MIMO)_NTNV



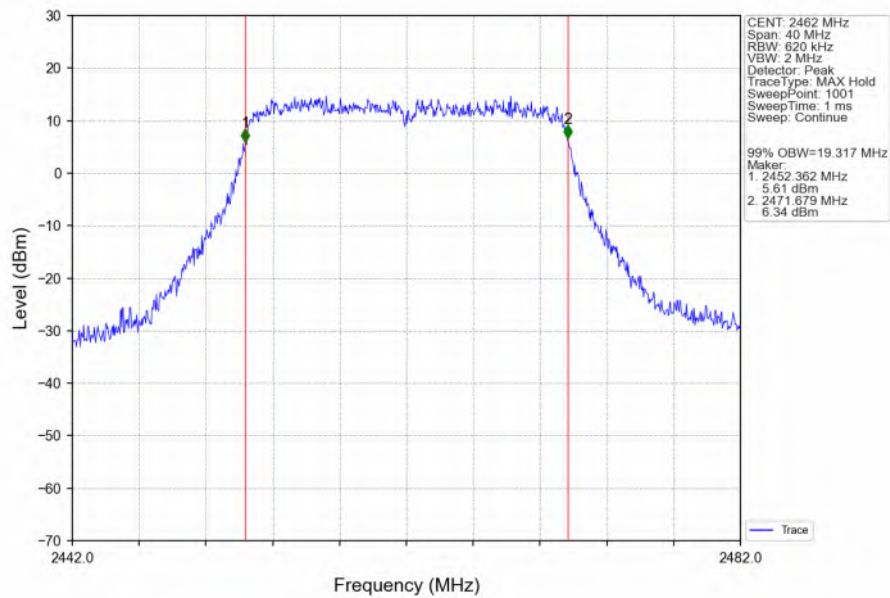
802.11ax(HEW20)_LCH_2412MHz_SU_/_Ant5 (MIMO)_NTNV



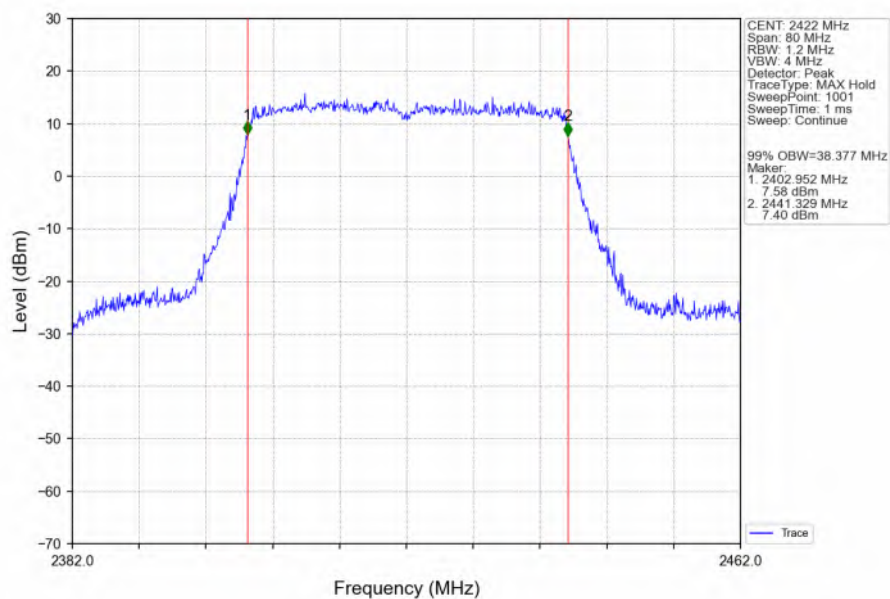
802.11ax(HEW20)_MCH_2437MHz_SU_/_Ant5 (MIMO)_NTNV



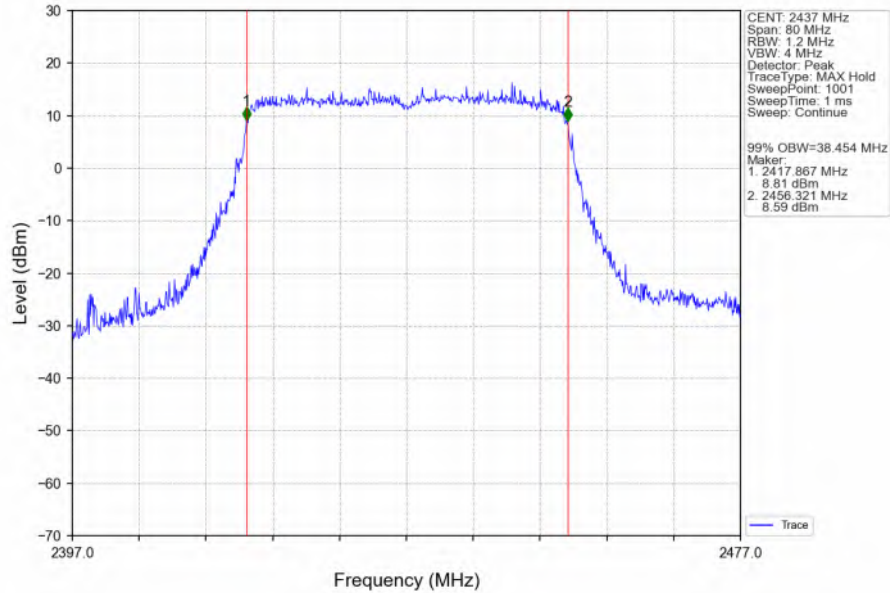
802.11ax(HEW20)_HCH_2462MHz_SU_/_Ant5 (MIMO)_NTNV



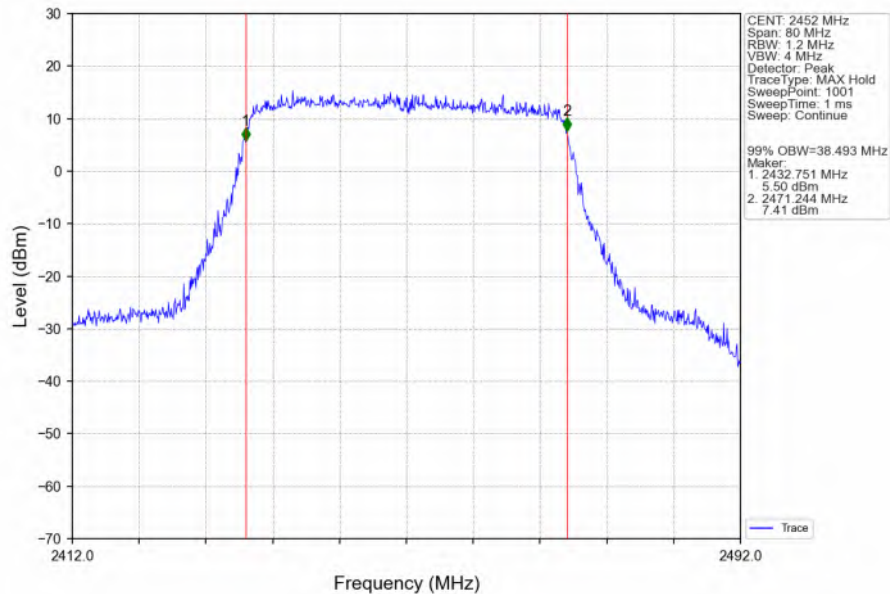
802.11ax(HEW40)_LCH_2422MHz_SU_/_Ant5 (MIMO)_NTNV



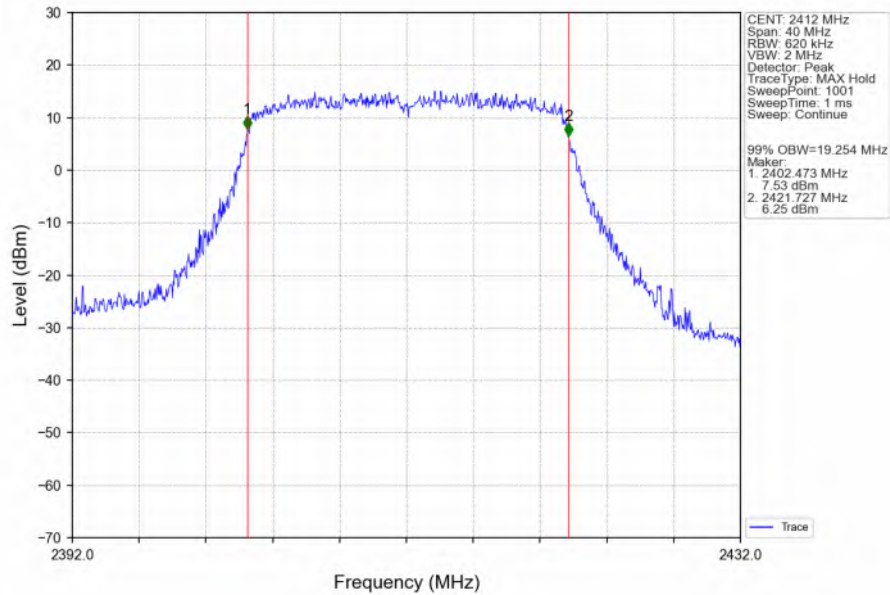
802.11ax(HEW40)_MCH_2437MHz_SU_/_Ant5 (MIMO)_NTNV



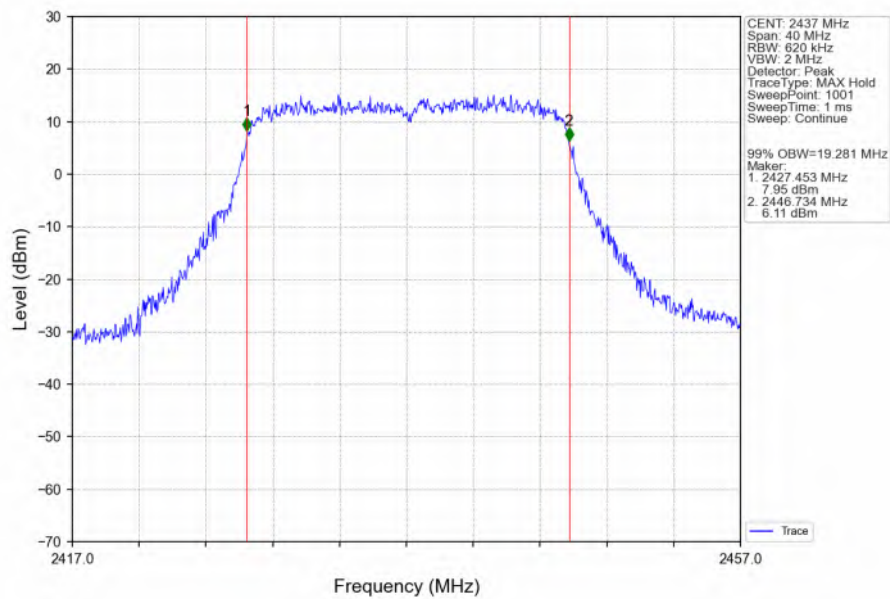
802.11ax(HEW40)_HCH_2452MHz_SU_/_Ant5 (MIMO)_NTNV



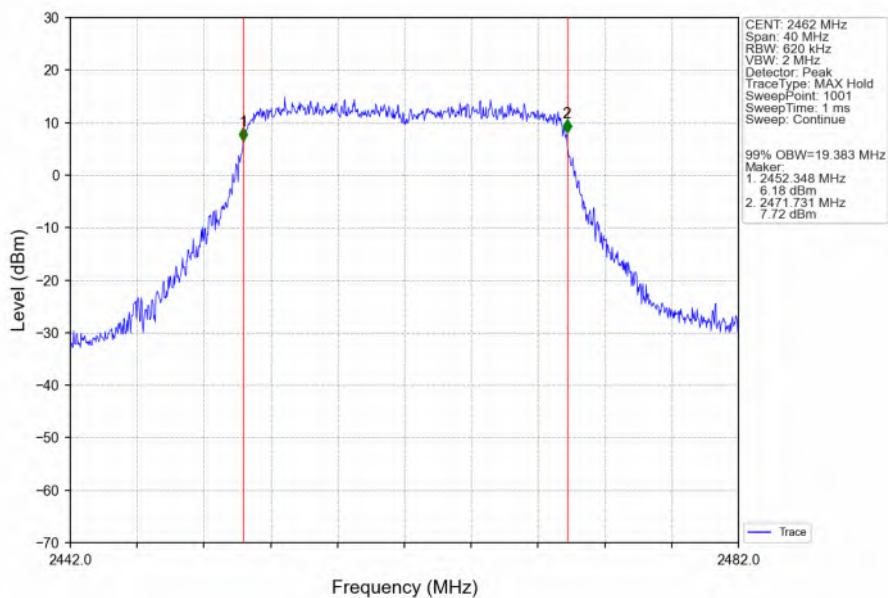
802.11be(EHT20)_LCH_2412MHz_SU_/_Ant5 (MIMO)_NTNV



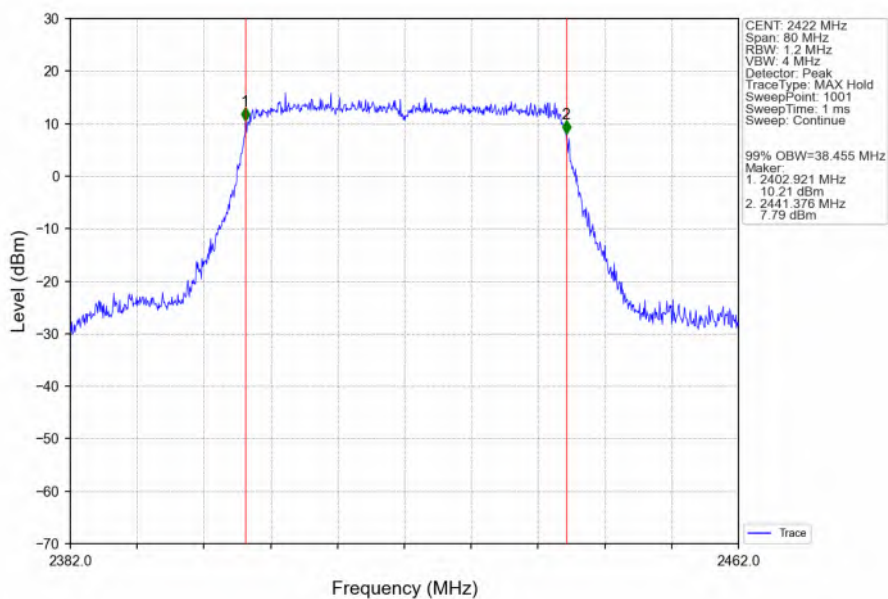
802.11be(EHT20)_MCH_2437MHz_SU_/_Ant5 (MIMO)_NTNV



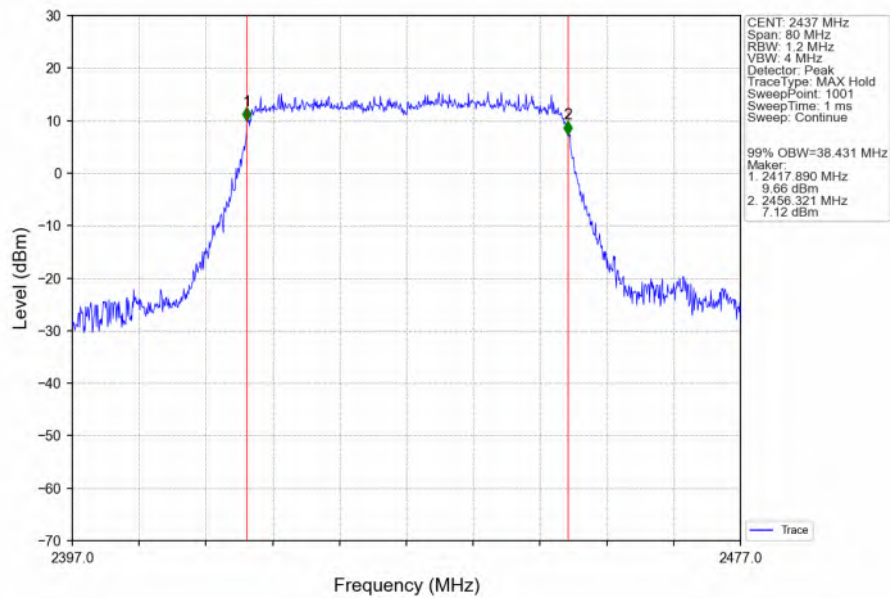
802.11be(EHT20)_HCH_2462MHz_SU_/_Ant5 (MIMO)_NTNV



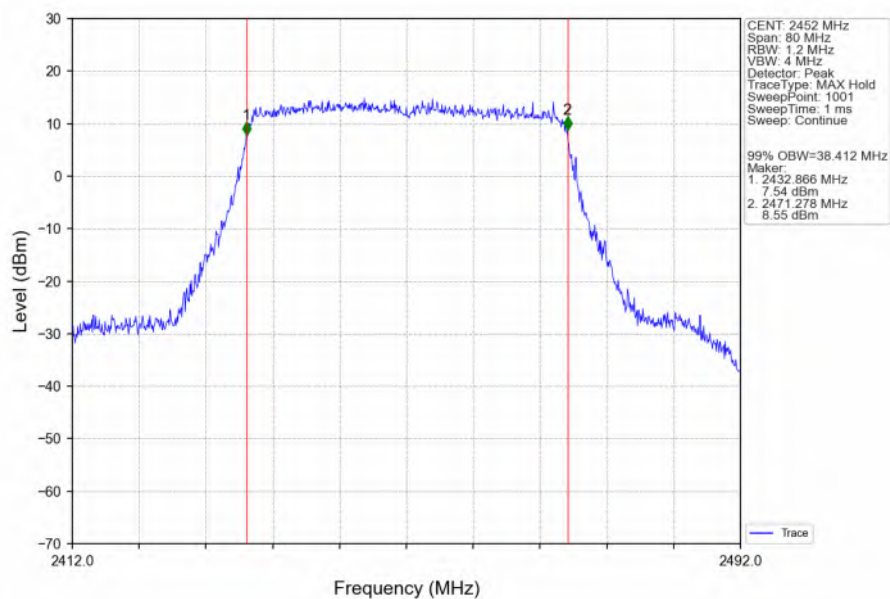
802.11be(EHT40)_LCH_2422MHz_SU_/_Ant5 (MIMO)_NTNV



802.11be(EHT40)_MCH_2437MHz_SU_/_Ant5 (MIMO)_NTNV

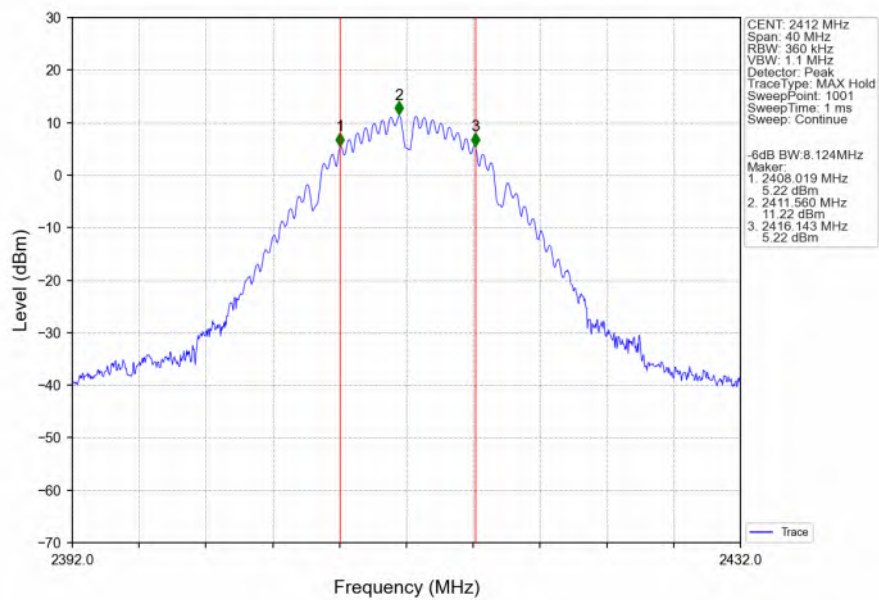


802.11be(EHT40)_HCH_2452MHz_SU_/_Ant5 (MIMO)_NTNV

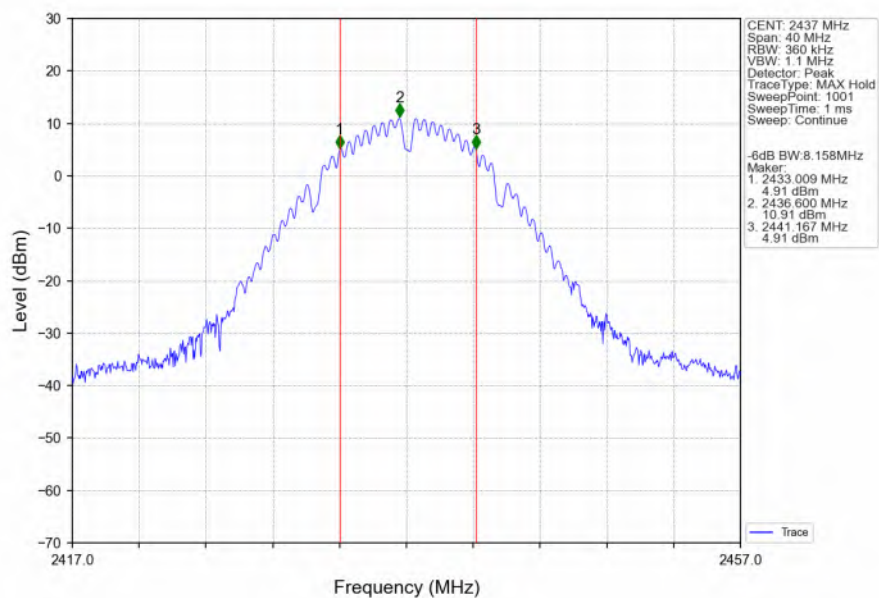


2.2.2 6dB BW

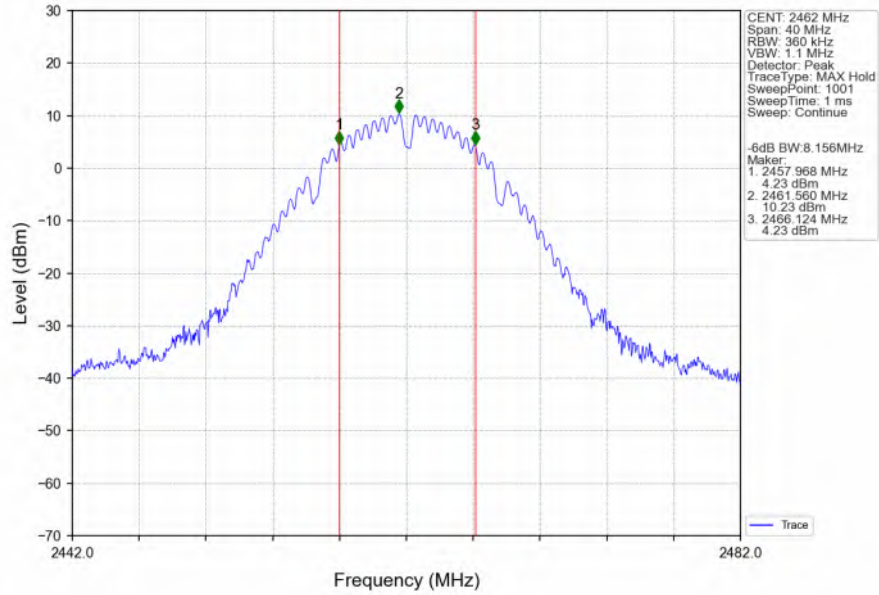
802.11b_LCH_2412MHz_Ant5 (SISO)_NTNV



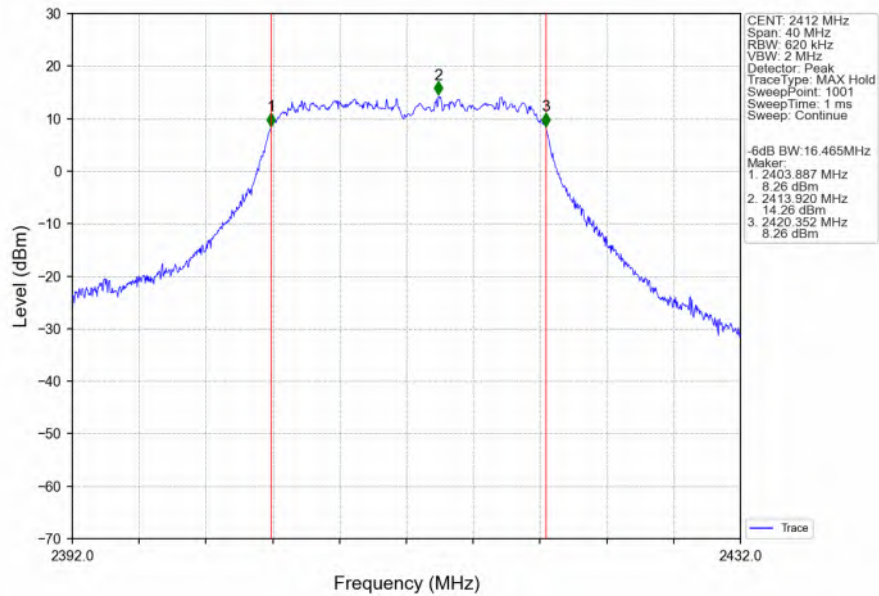
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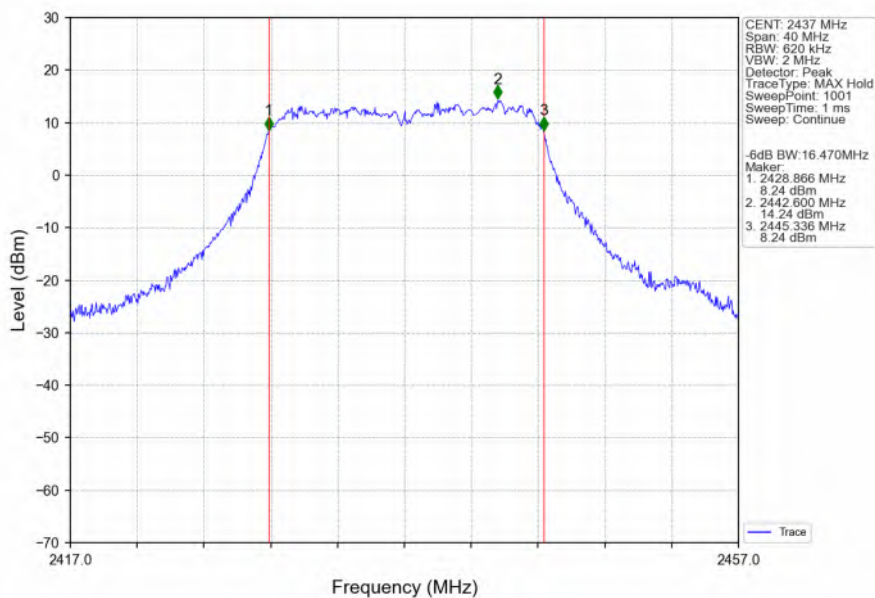
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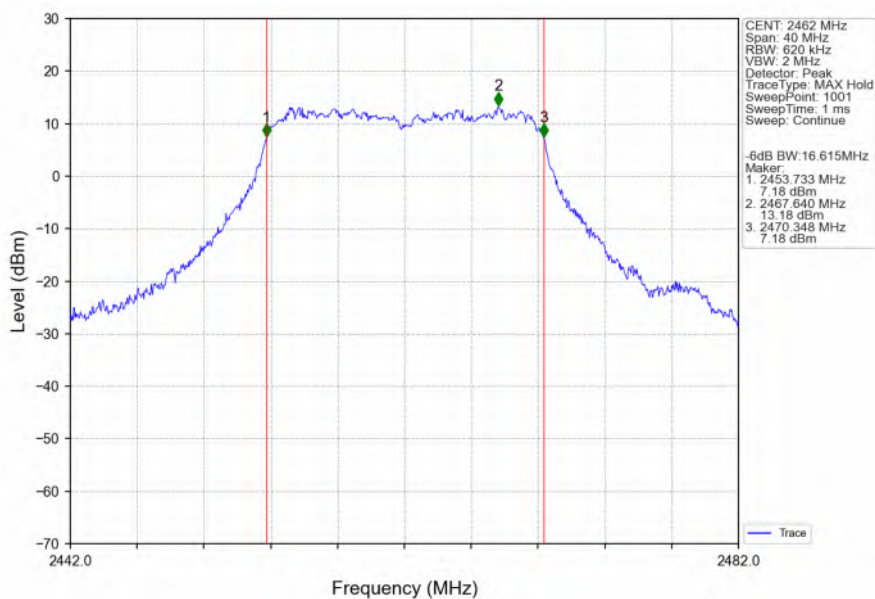
802.11g_LCH_2412MHz_Ant5 (SISO)_NTNV



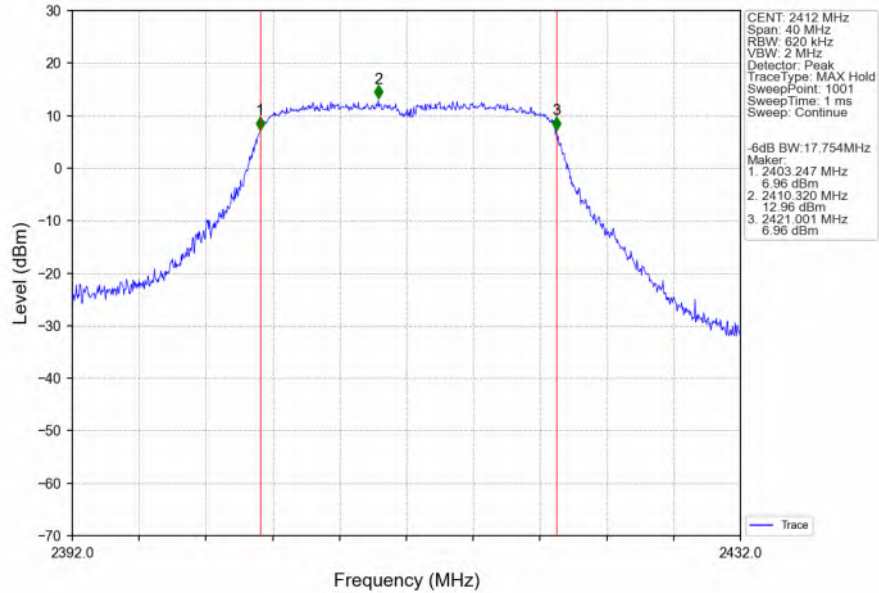
802.11g_MCH_2437MHz_Ant5 (SISO)_NTNV



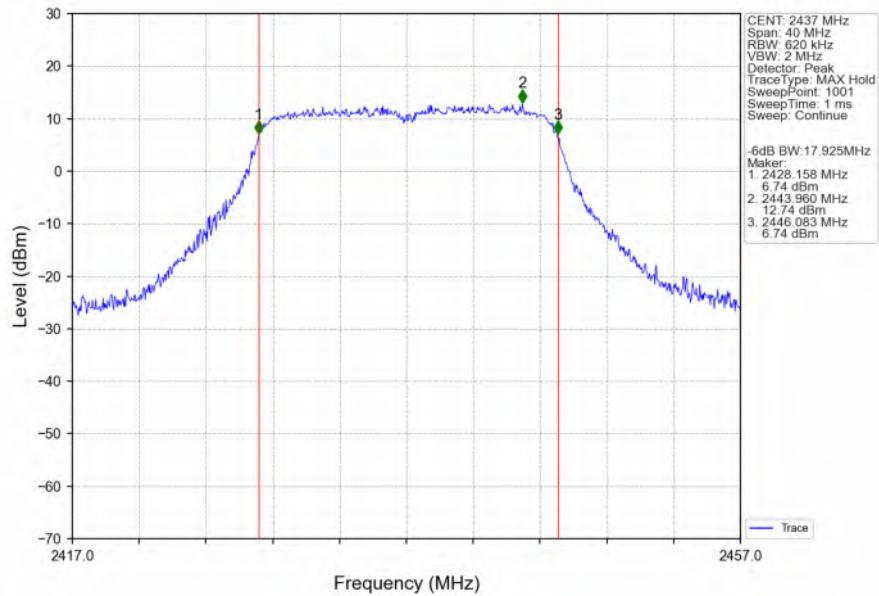
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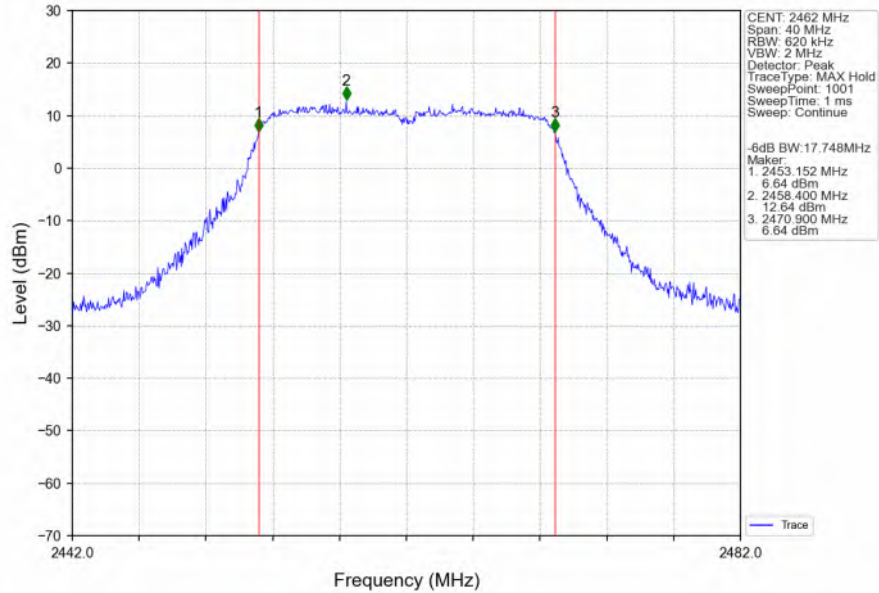
802.11n(HT20)_LCH_2412MHz_Ant5 (MIMO)_NTNV



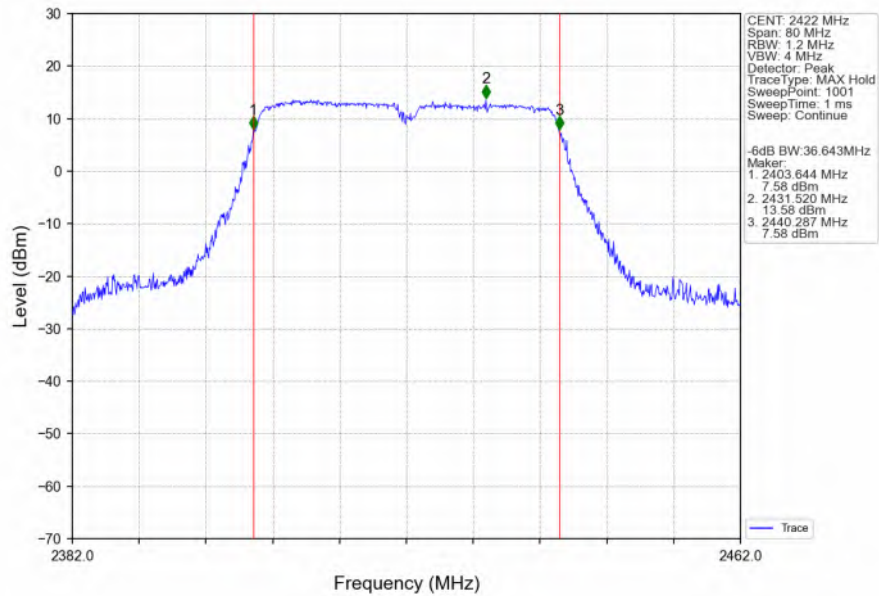
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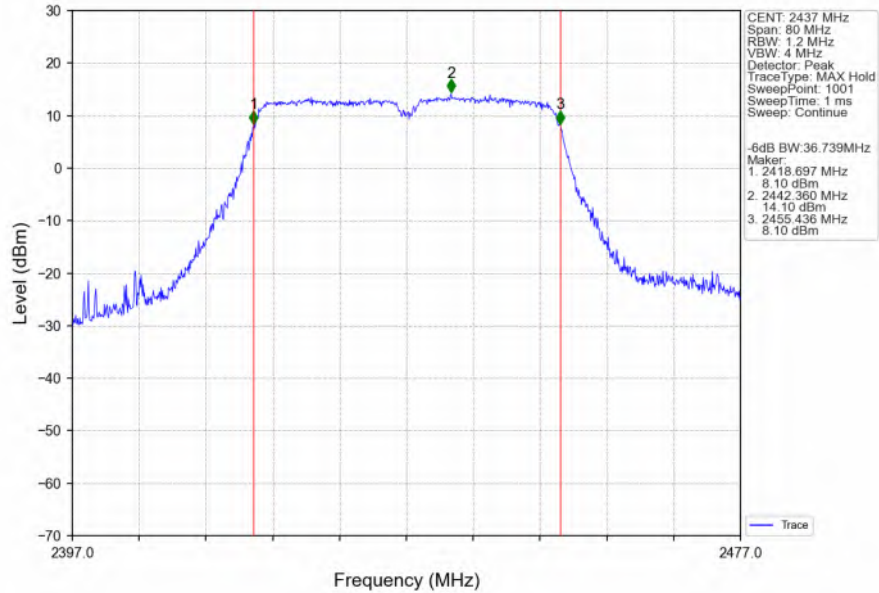
802.11n(HT20)_HCH_2462MHz_Ant5 (MIMO)_NTNV



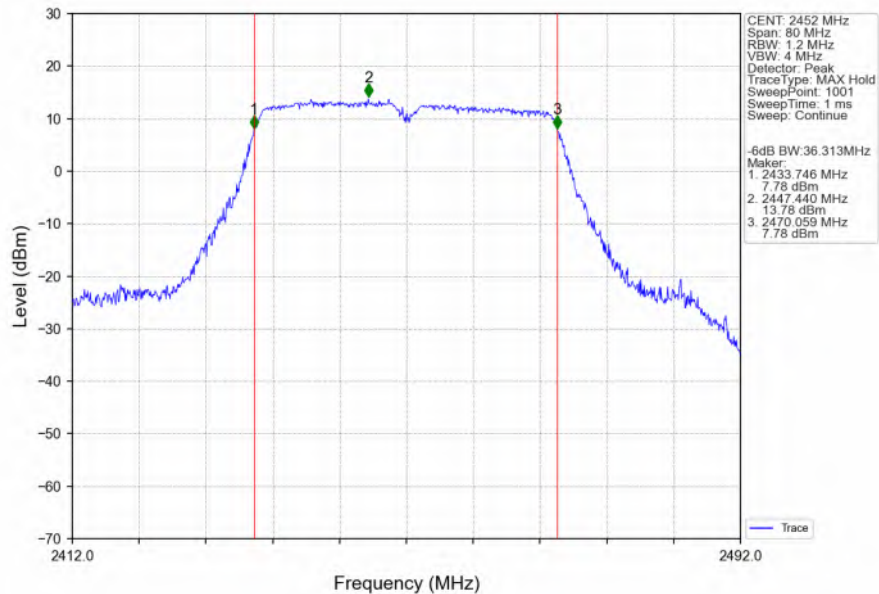
802.11n(HT40)_LCH_2422MHz_Ant5 (MIMO)_NTNV



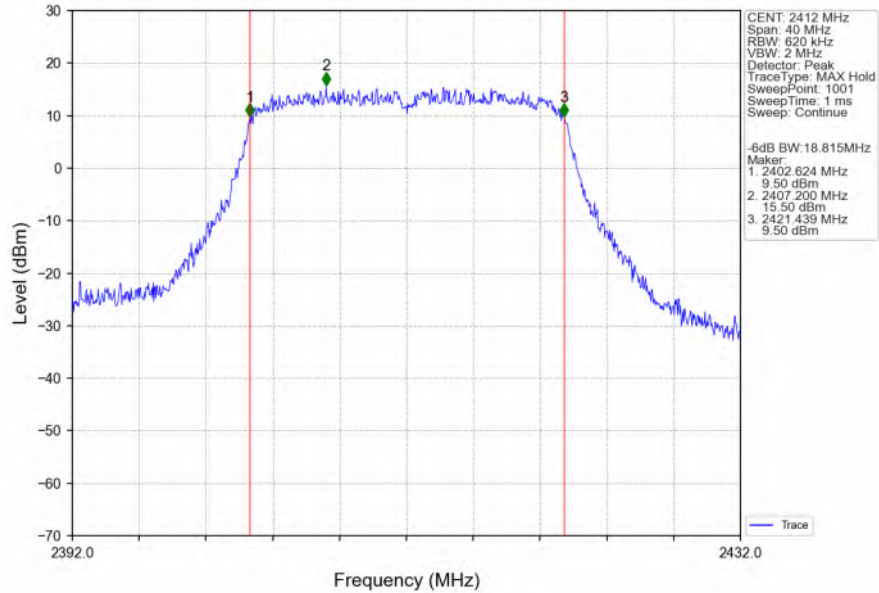
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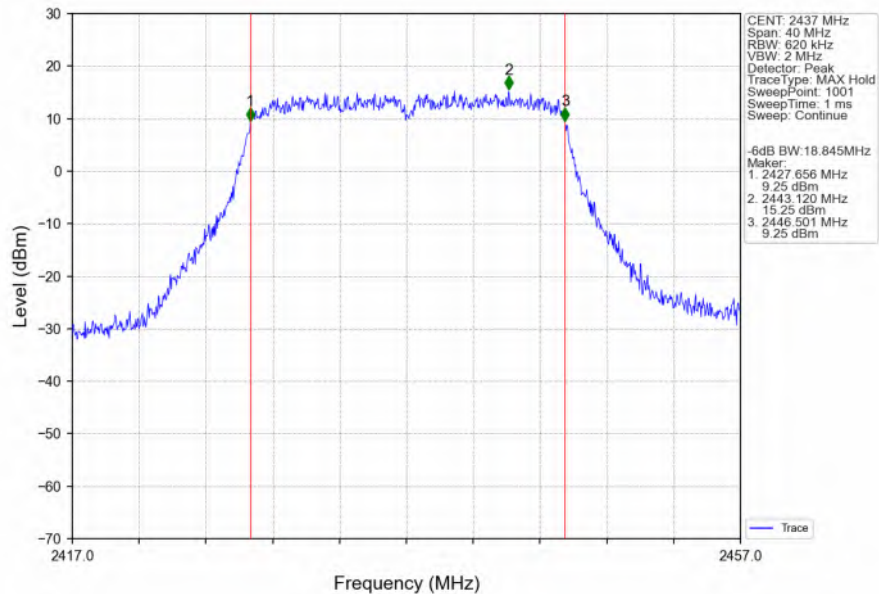
802.11n(HT40)_HCH_2452MHz_Ant5 (MIMO)_NTNV



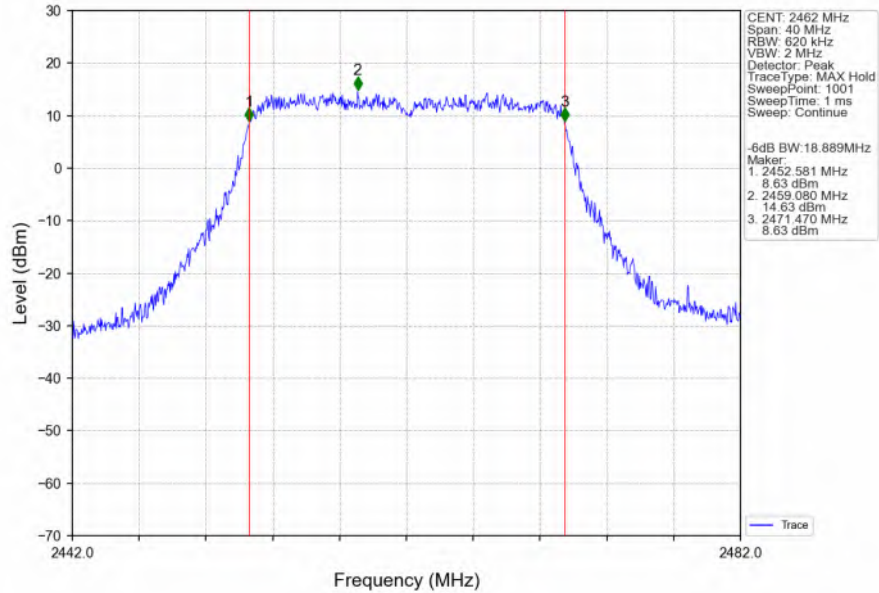
802.11ax(HEW20)_LCH_2412MHz_SU_/_Ant5 (MIMO)_NTNV



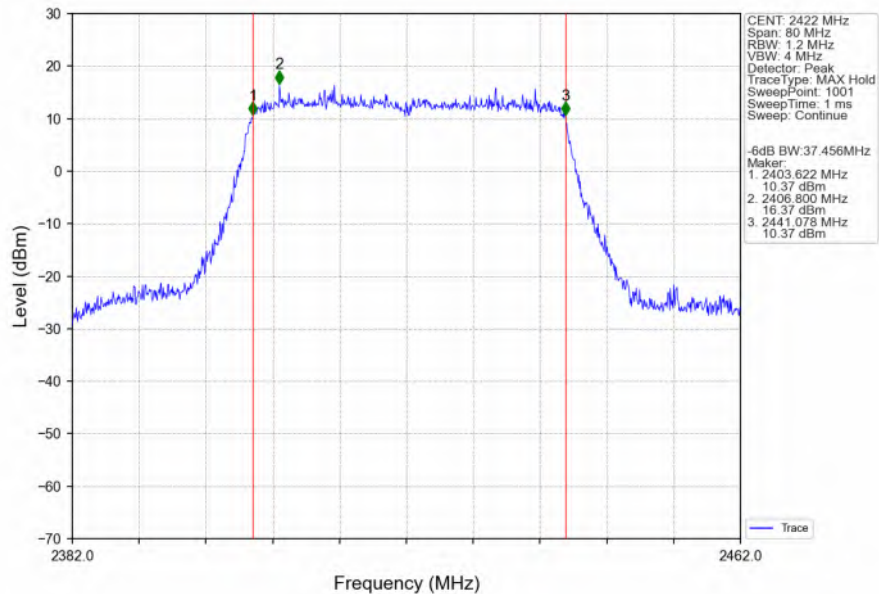
802.11ax(HEW20)_MCH_2437MHz_SU_/_Ant5 (MIMO)_NTNV



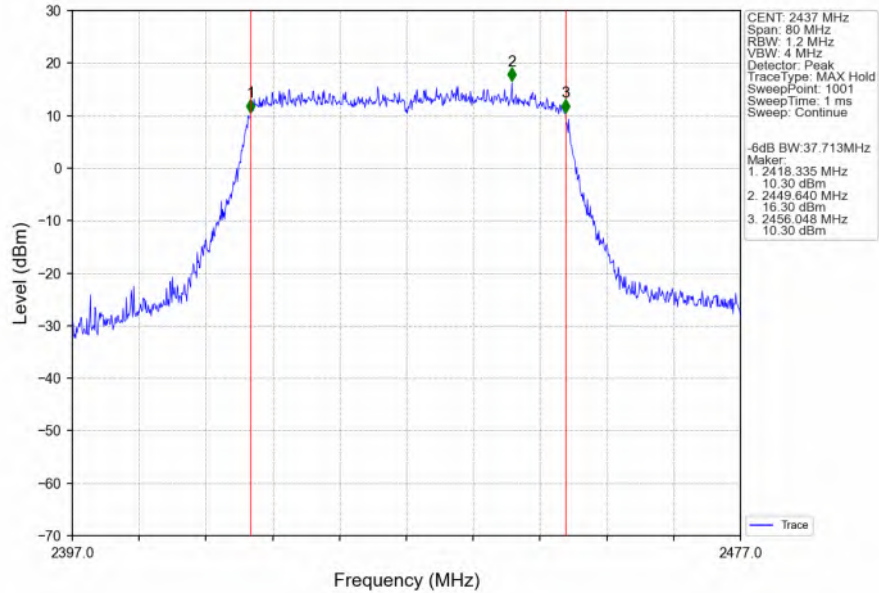
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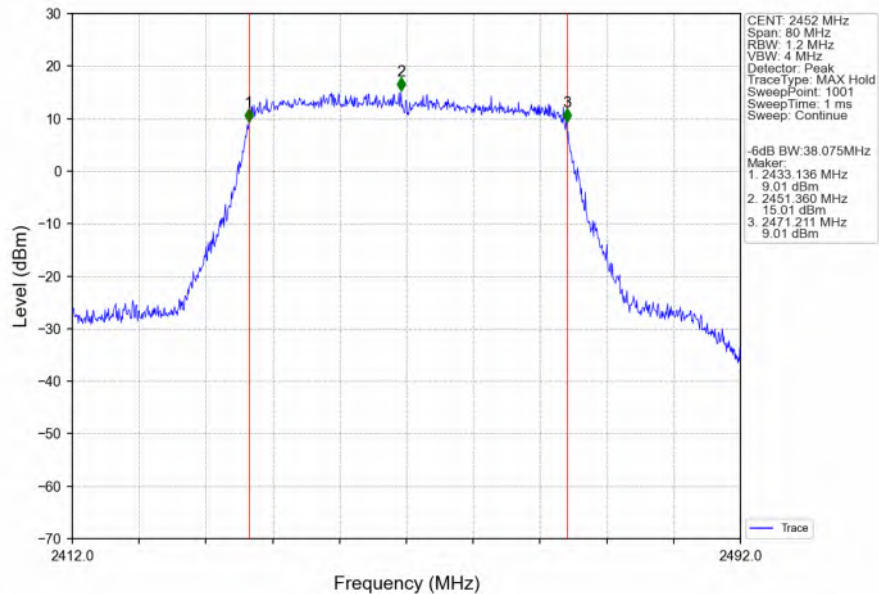
802.11ax(HEW40)_LCH_2422MHz_SU_/_Ant5 (MIMO)_NTNV



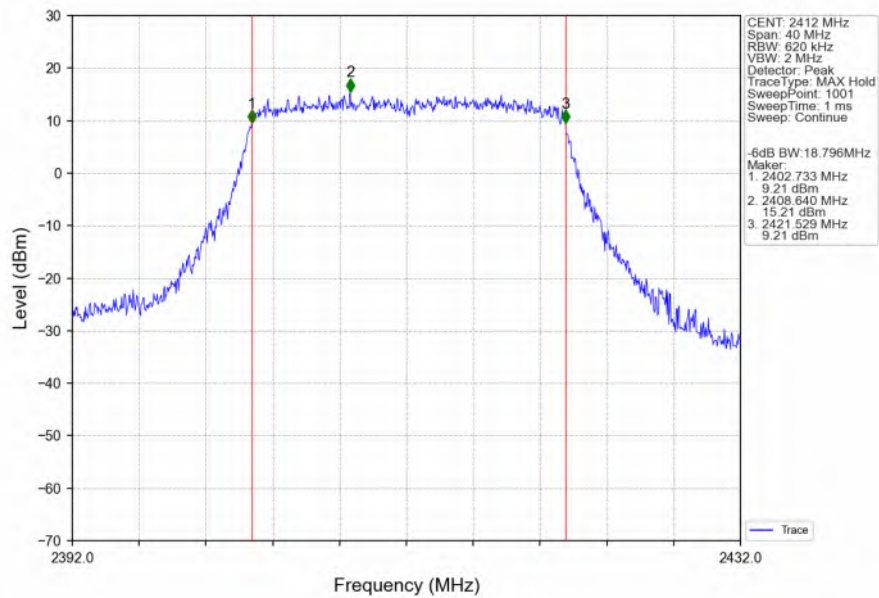
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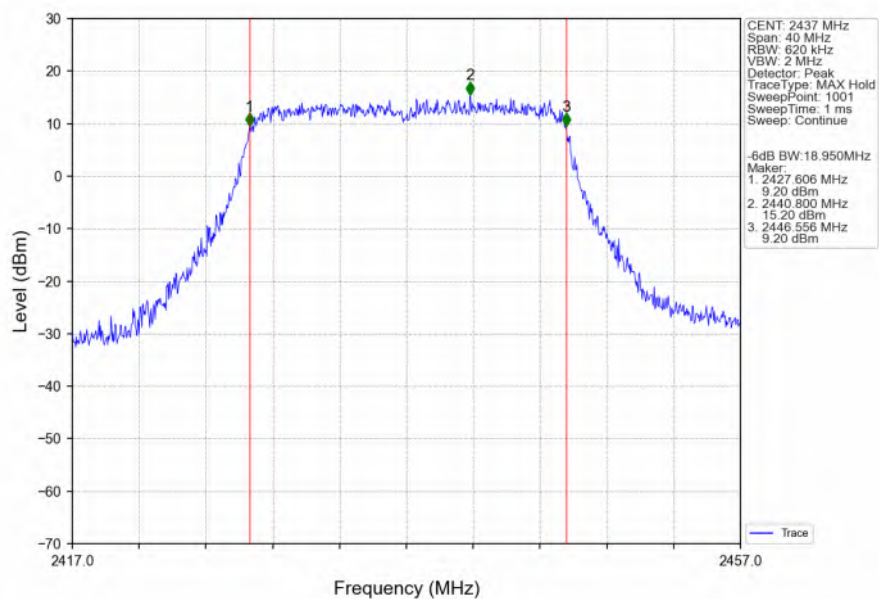
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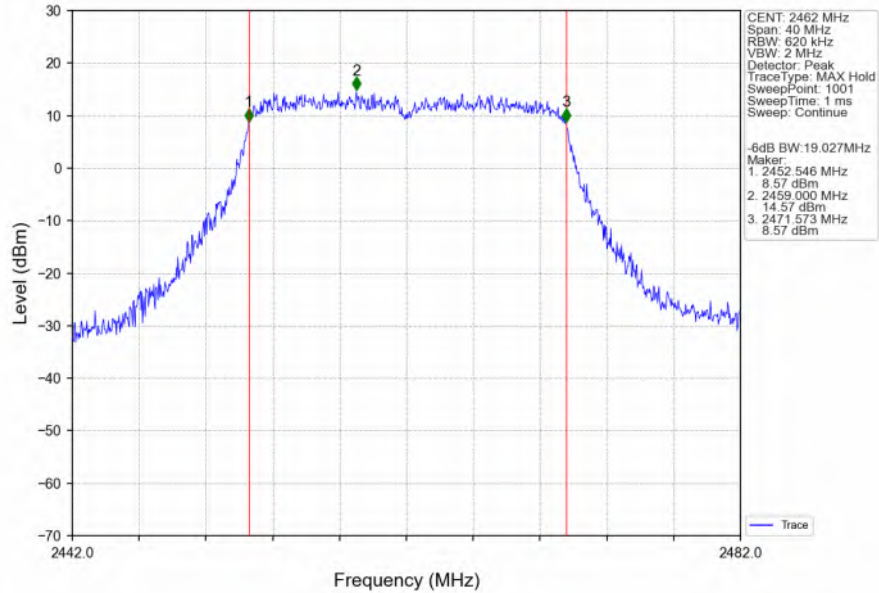
802.11be(EHT20)_LCH_2412MHz_SU_/_Ant5 (MIMO)_NTNV



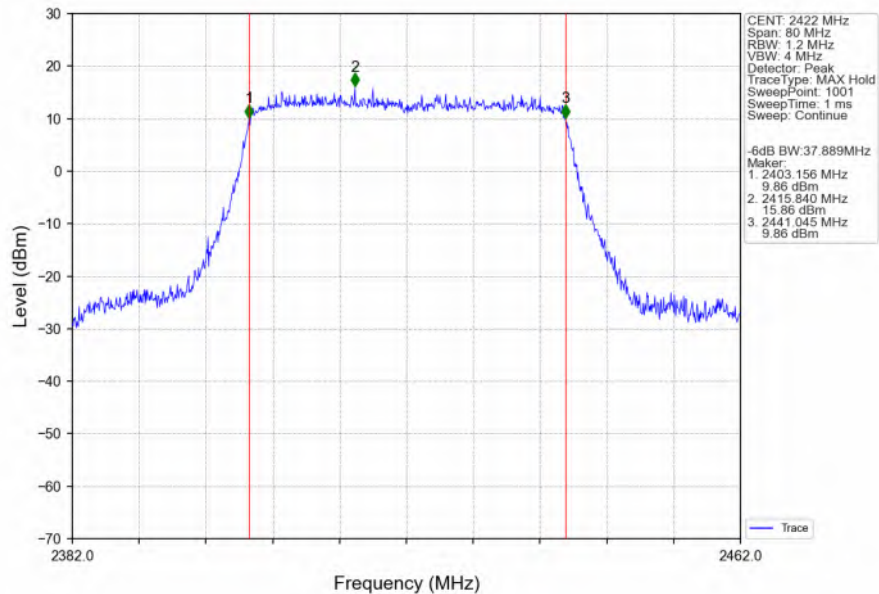
802.11be(EHT20)_MCH_2437MHz_SU_/_Ant5 (MIMO)_NTNV



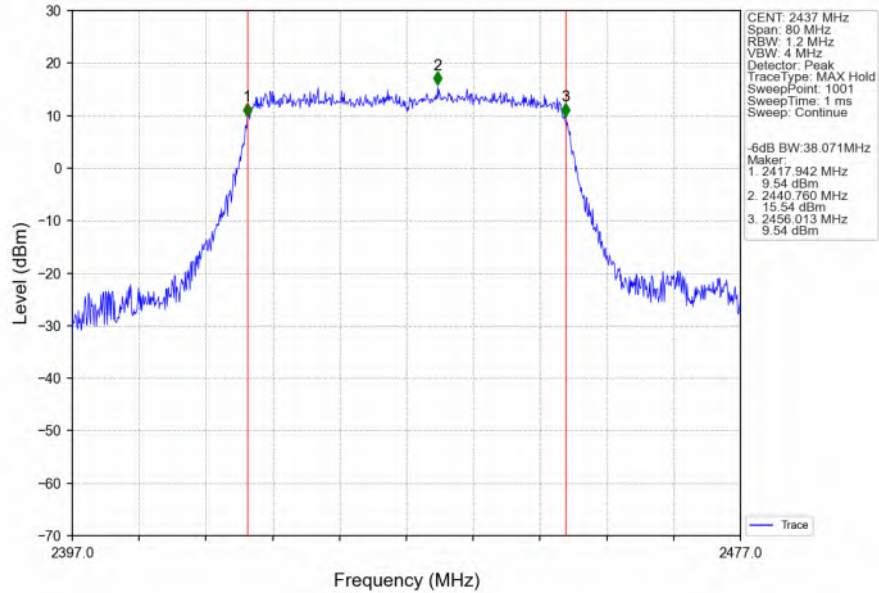
802.11be(EHT20)_HCH_2462MHz_SU_/_Ant5 (MIMO)_NTNV



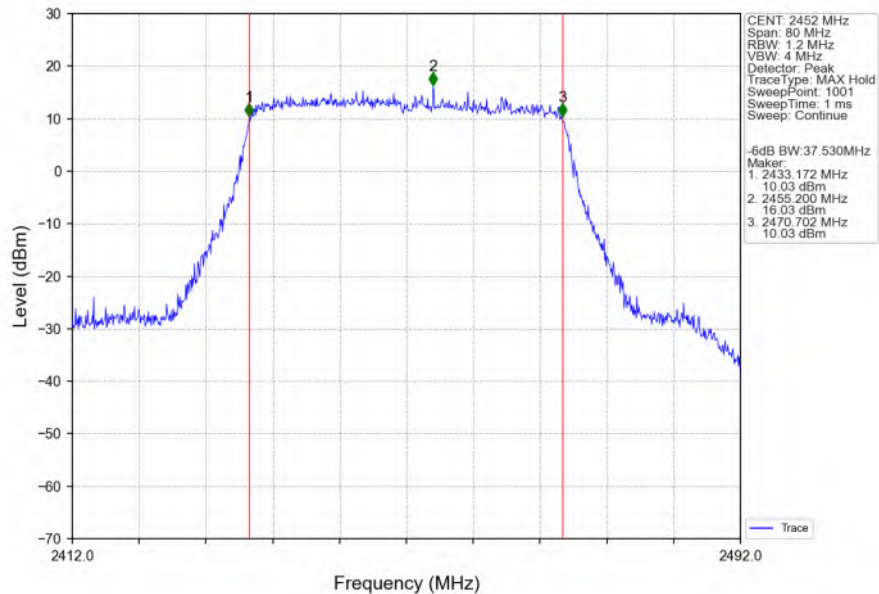
802.11be(EHT40)_LCH_2422MHz_SU_/_Ant5 (MIMO)_NTNV



802.11be(EHT40)_MCH_2437MHz_SU_/_Ant5 (MIMO)_NTNV



802.11be(EHT40)_HCH_2452MHz_SU_/_Ant5 (MIMO)_NTNV



3. Maximum Conducted Output Power

3.1 Test Result

3.1.1 Power

Mode	TX Type	Frequency (MHz)	RU	RU Pos	Maximum Peak Conducted Output Power (dBm)				Verdict
					ANT5	ANT6	MIMO	Limit	
802.11b	SISO	2412	/	/	21.17	20.81	/	<=30	Pass
		2437	/	/	20.93	20.56	/	<=30	Pass
		2462	/	/	20.17	20.40	/	<=30	Pass
802.11g	SISO	2412	/	/	26.43	25.86	/	<=30	Pass
		2437	/	/	26.15	25.60	/	<=30	Pass
		2462	/	/	25.58	25.53	/	<=30	Pass
802.11n (HT20)	MIMO	2412	/	/	26.32	26.04	29.19	<=30	Pass
		2437	/	/	26.10	25.79	28.96	<=30	Pass
		2462	/	/	25.52	25.63	28.59	<=30	Pass
802.11n (HT40)	MIMO	2422	/	/	26.27	26.24	29.27	<=30	Pass
		2437	/	/	26.47	26.11	29.30	<=30	Pass
		2452	/	/	26.05	25.87	28.97	<=30	Pass
802.11ax (HEW20)	MIMO	2412	SU	/	26.98	26.91	29.96	<=30	Pass
		2437	SU	/	26.94	26.68	29.82	<=30	Pass
		2462	SU	/	26.38	26.59	29.50	<=30	Pass
802.11ax (HEW40)	MIMO	2422	SU	/	26.77	26.86	29.83	<=30	Pass
		2437	SU	/	27.12	26.70	29.93	<=30	Pass
		2452	SU	/	26.75	26.55	29.66	<=30	Pass
802.11be (EHT20)	MIMO	2412	SU	/	27.00	26.72	29.87	<=30	Pass
		2437	SU	/	26.82	26.54	29.69	<=30	Pass
		2462	SU	/	26.23	26.38	29.32	<=30	Pass
802.11be (EHT40)	MIMO	2422	SU	/	26.86	26.84	29.86	<=30	Pass
		2437	SU	/	27.12	26.74	29.94	<=30	Pass
		2452	SU	/	26.61	26.53	29.58	<=30	Pass

Note1: Antenna Gain: Ant5: 0.80dBi

4. Maximum Power Spectral Density

4.1 Test Result

4.1.1 PSD

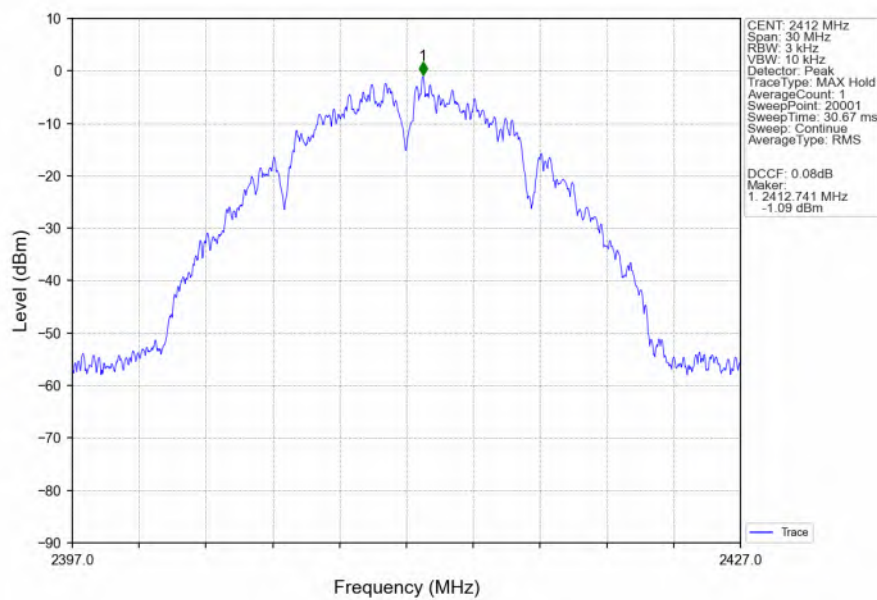
Mode	TX Type	Frequency (MHz)	RU	RU Pos	Maximum PSD (dBm)				Verdict
					ANT5	ANT6	MIMO	Limit	
802.11b	SISO	2412	/	/	-1.09	-2.65	/	<=8	Pass
		2437	/	/	-3.28	-3.06	/	<=8	Pass
		2462	/	/	-2.12	-3.02	/	<=8	Pass
802.11g	SISO	2412	/	/	-8.31	-7.70	/	<=8	Pass
		2437	/	/	-8.56	-9.41	/	<=8	Pass
		2462	/	/	-8.44	-9.17	/	<=8	Pass
802.11n (HT20)	MIMO	2412	/	/	-6.47	-7.73	-5.62	<=8	Pass
		2437	/	/	-7.26	-6.06	-5.12	<=8	Pass
		2462	/	/	-8.88	-7.60	-6.58	<=8	Pass
802.11n (HT40)	MIMO	2422	/	/	-9.70	-10.54	-7.96	<=8	Pass
		2437	/	/	-10.33	-10.95	-7.98	<=8	Pass
		2452	/	/	-9.22	-10.60	-8.39	<=8	Pass
802.11ax (HEW20)	MIMO	2412	SU	/	-7.90	-7.58	-5.72	<=8	Pass
		2437	SU	/	-8.67	-7.87	-6.49	<=8	Pass
		2462	SU	/	-8.74	-7.69	-6.45	<=8	Pass
802.11ax (HEW40)	MIMO	2422	SU	/	-11.04	-11.05	-9.66	<=8	Pass
		2437	SU	/	-10.90	-11.34	-8.99	<=8	Pass
		2452	SU	/	-10.24	-10.69	-9.09	<=8	Pass
802.11be (EHT20)	MIMO	2412	SU	/	-8.44	-8.63	-7.26	<=8	Pass
		2437	SU	/	-8.22	-8.12	-7.09	<=8	Pass
		2462	SU	/	-8.44	-8.98	-7.54	<=8	Pass
802.11be (EHT40)	MIMO	2422	SU	/	-11.75	-10.98	-9.96	<=8	Pass
		2437	SU	/	-11.14	-10.65	-9.16	<=8	Pass
		2452	SU	/	-9.36	-10.50	-9.00	<=8	Pass

Note1: Antenna Gain: Ant5: 0.80dBi;

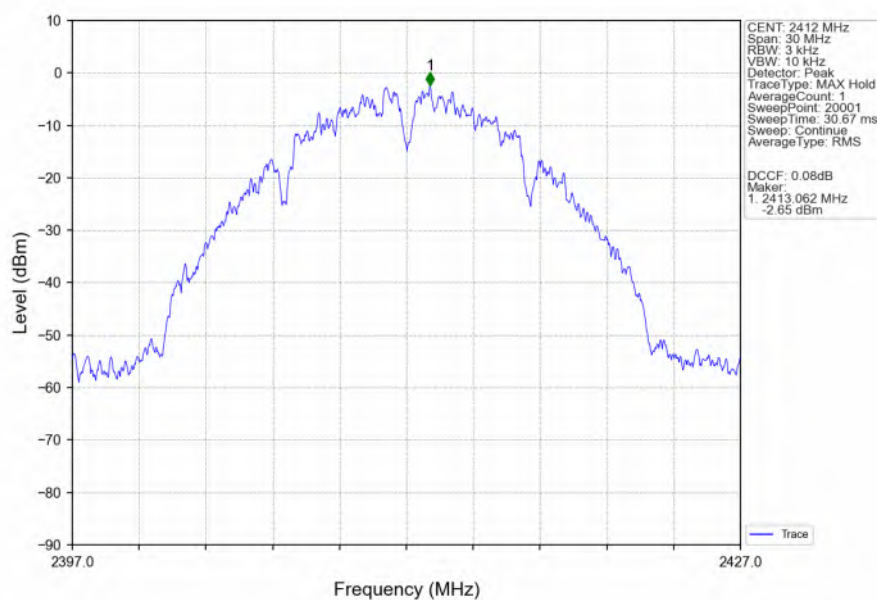
4.2 Test Graph

4.2.1 PSD

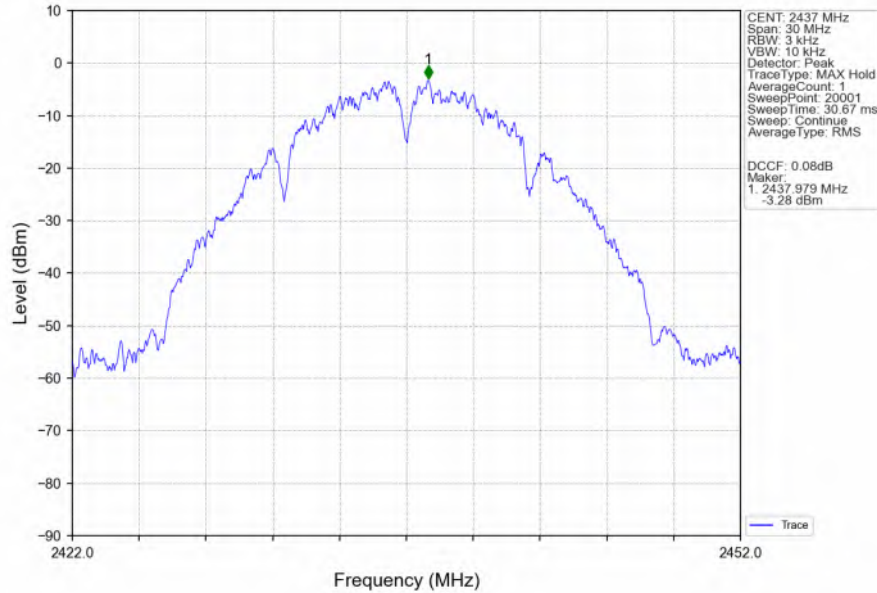
802.11b_LCH_2412MHz_Ant5 (SISO)_NTNV



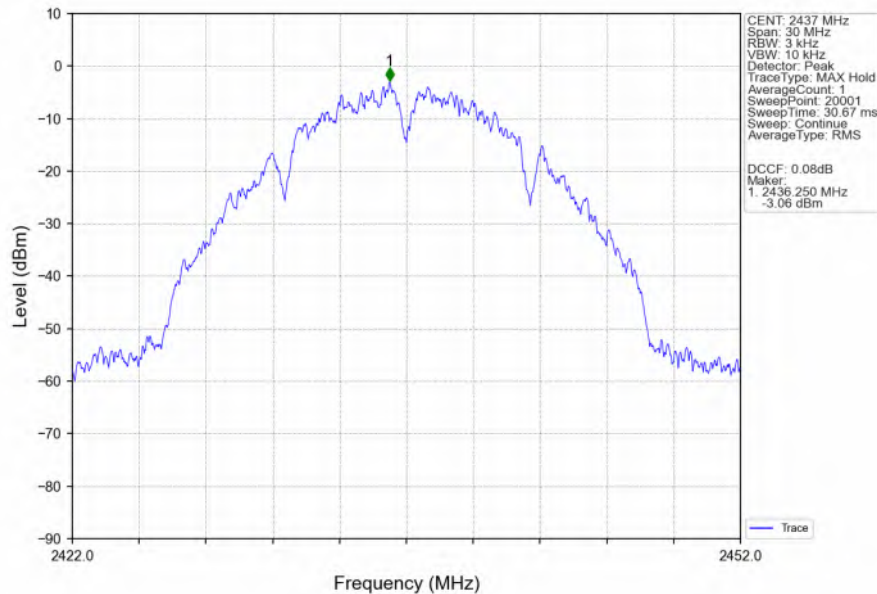
802.11b_LCH_2412MHz_Ant6 (SISO)_NTNV



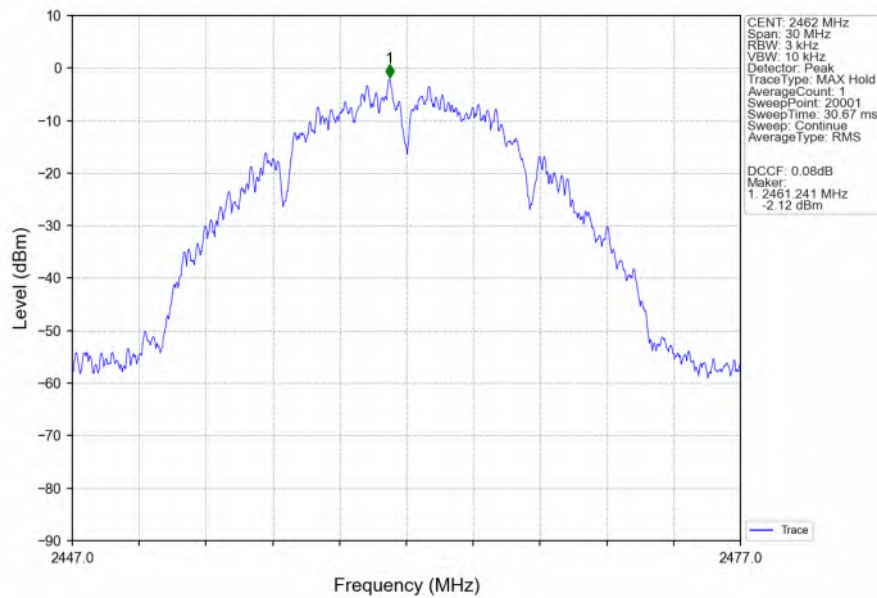
802.11b_MCH_2437MHz_Ant5 (SISO)_NTNV



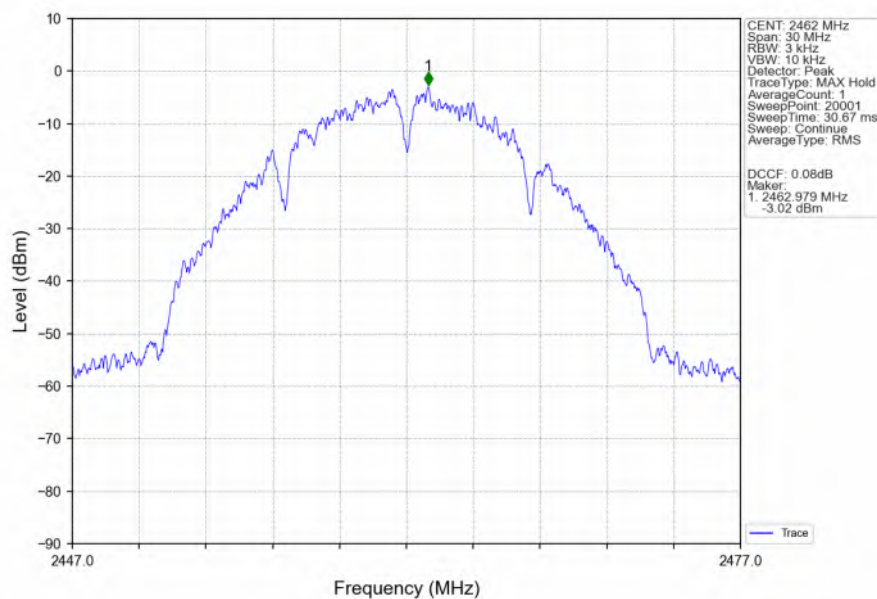
802.11b_MCH_2437MHz_Ant6 (SISO)_NTNV



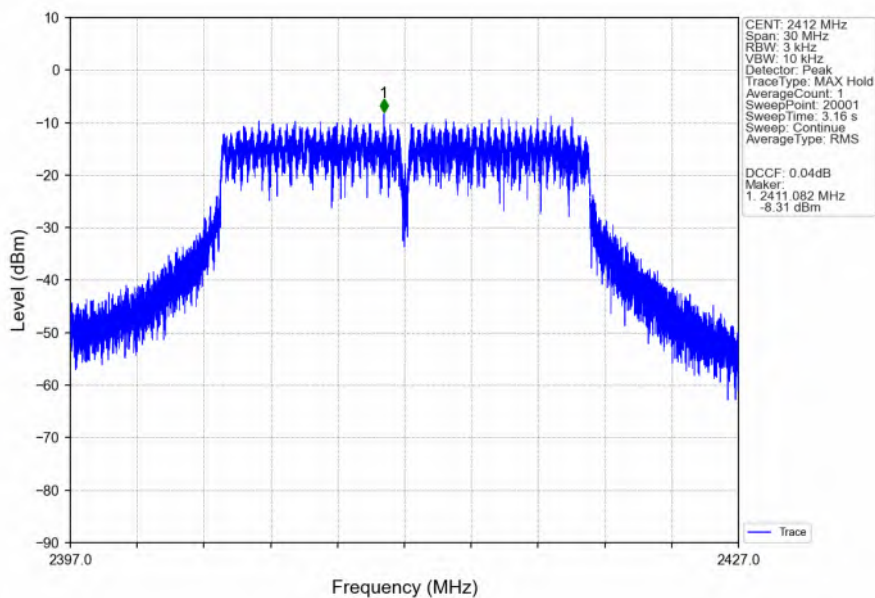
802.11b_HCH_2462MHz_Ant5 (SISO)_NTNV



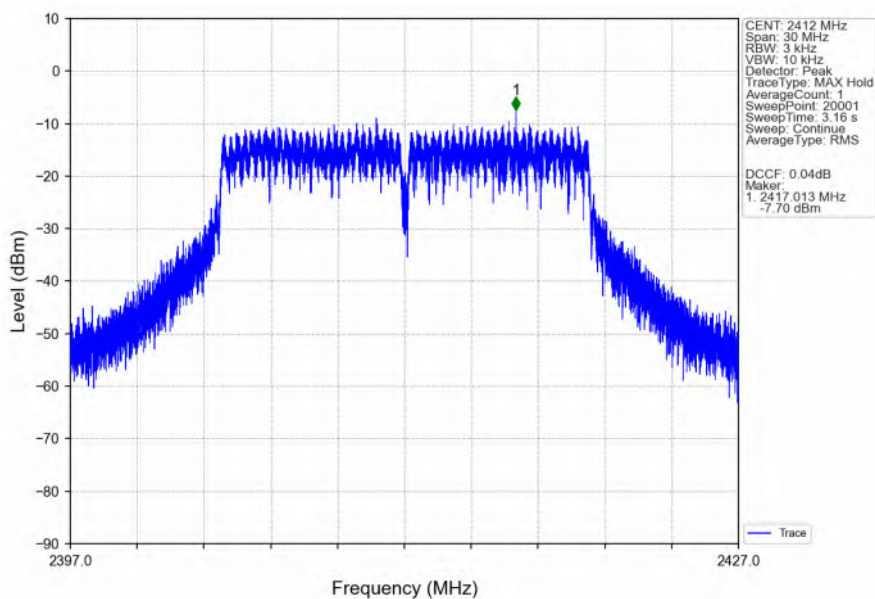
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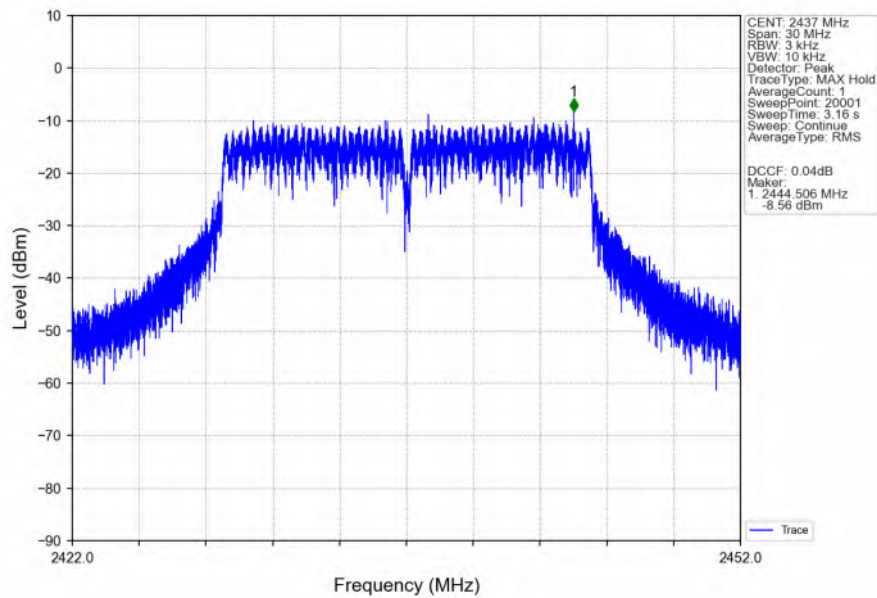
802.11g_LCH_2412MHz_Ant5 (SISO)_NTNV



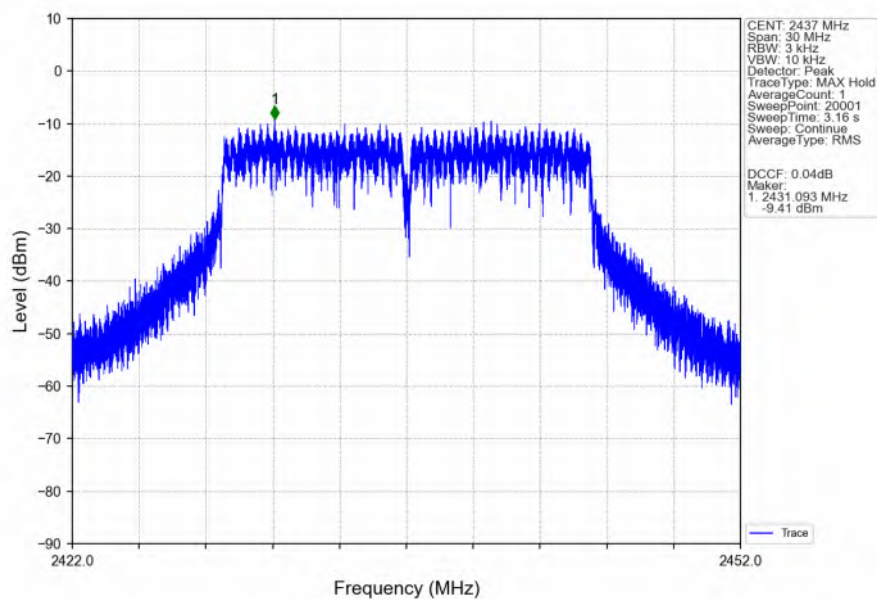
802.11g_LCH_2412MHz_Ant6 (SISO)_NTNV



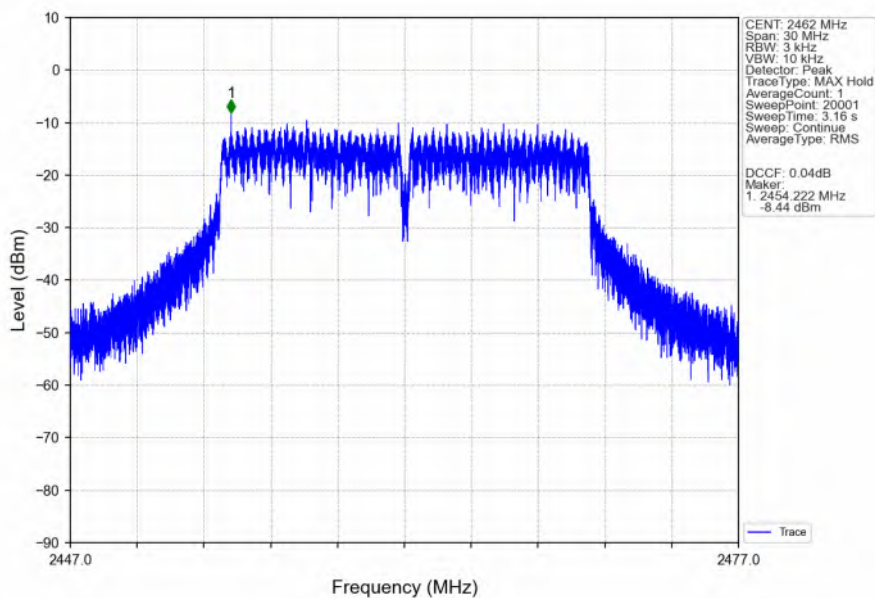
802.11g_MCH_2437MHz_Ant5 (SISO)_NTNV



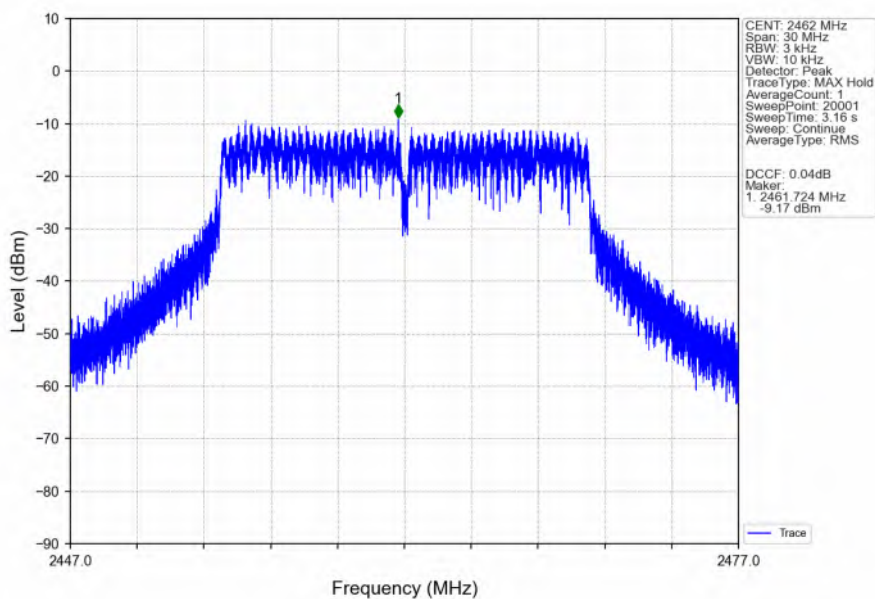
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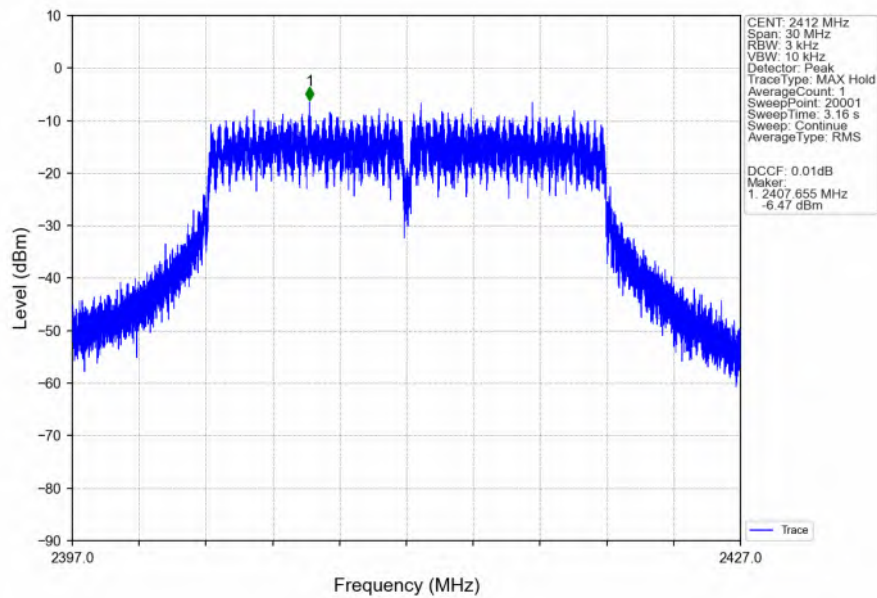
802.11g_HCH_2462MHz_Ant5 (SISO)_NTNV



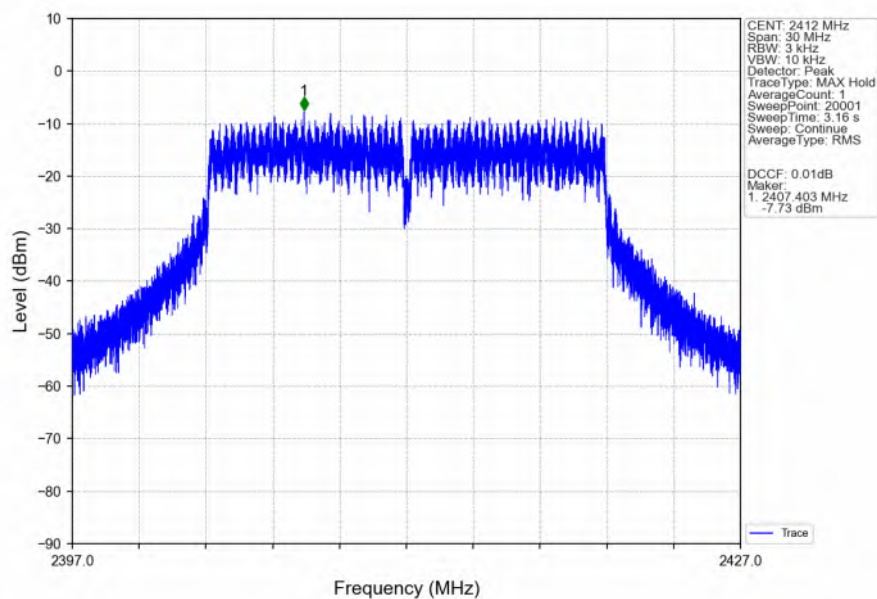
802.11g_HCH_2462MHz_Ant6 (SISO)_NTNV



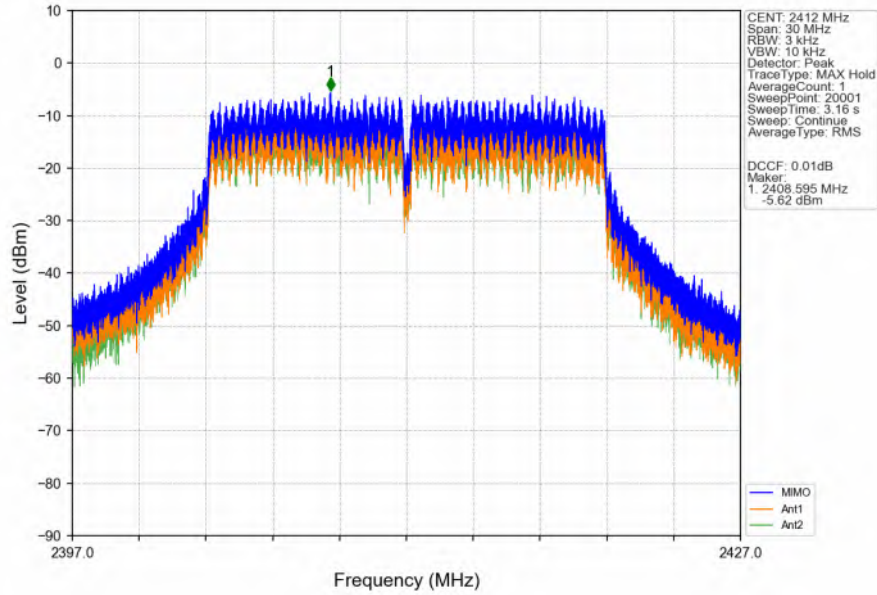
802.11n(HT20)_LCH_2412MHz_Ant5 (MIMO)_NTNV



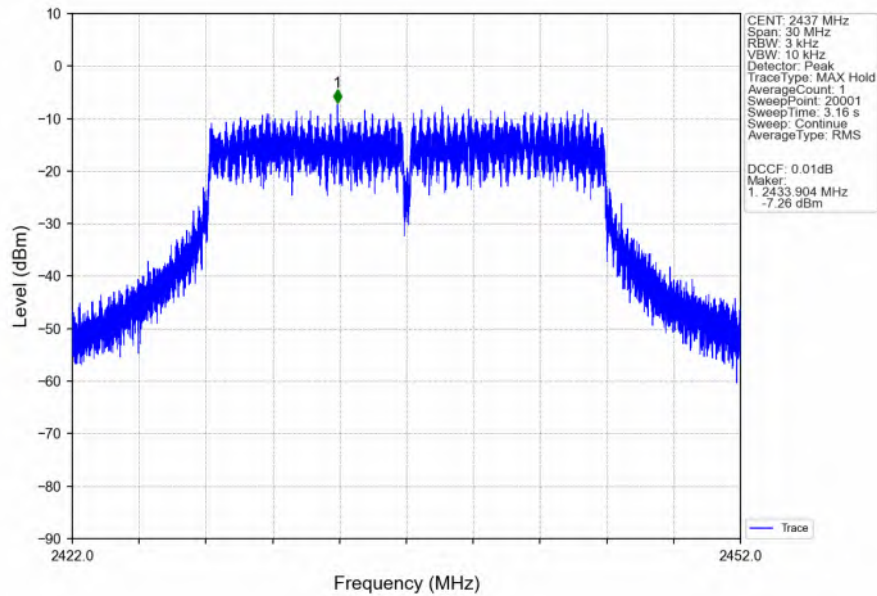
802.11n(HT20)_LCH_2412MHz_Ant6 (MIMO)_NTNV



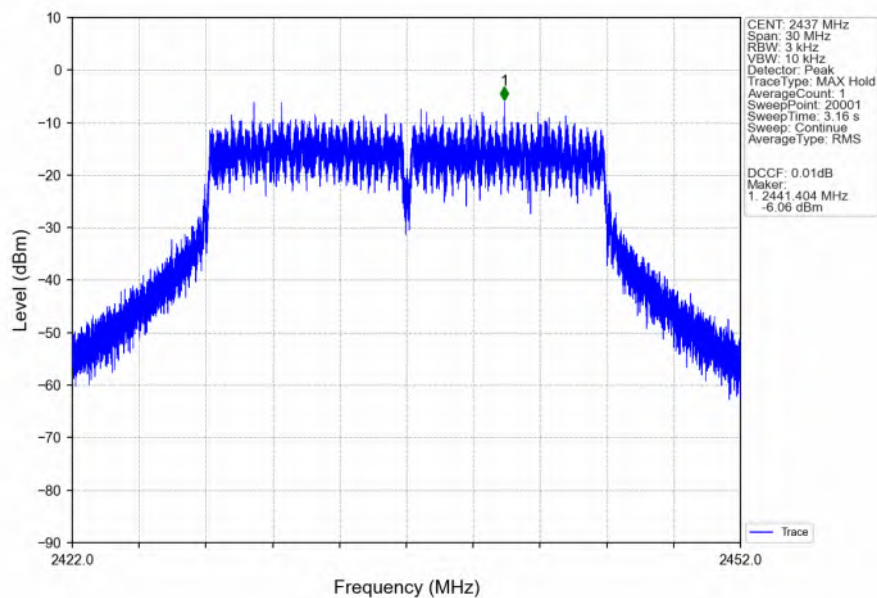
802.11n(HT20)_LCH_2412MHz_MIMO_NTNV



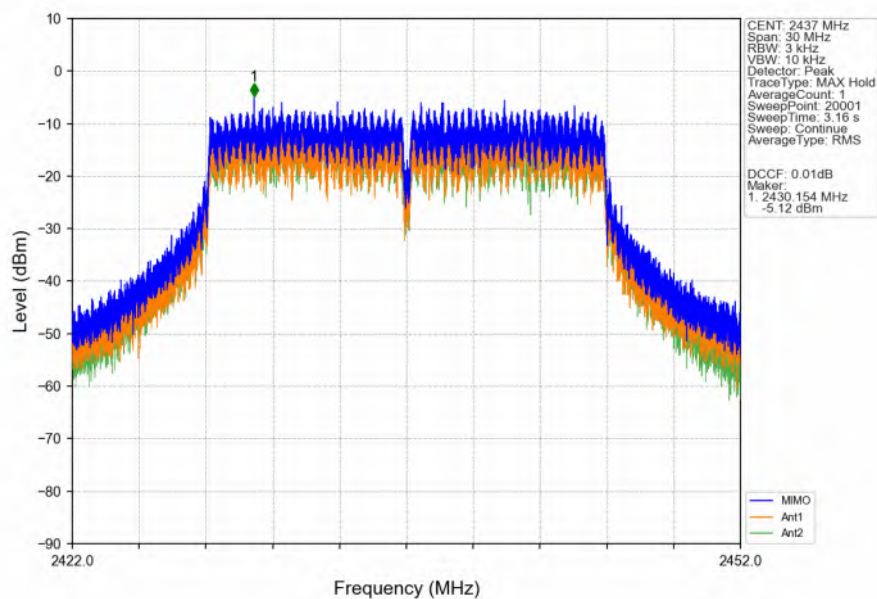
802.11n(HT20)_MCH_2437MHz_Ant5 (MIMO)_NTNV



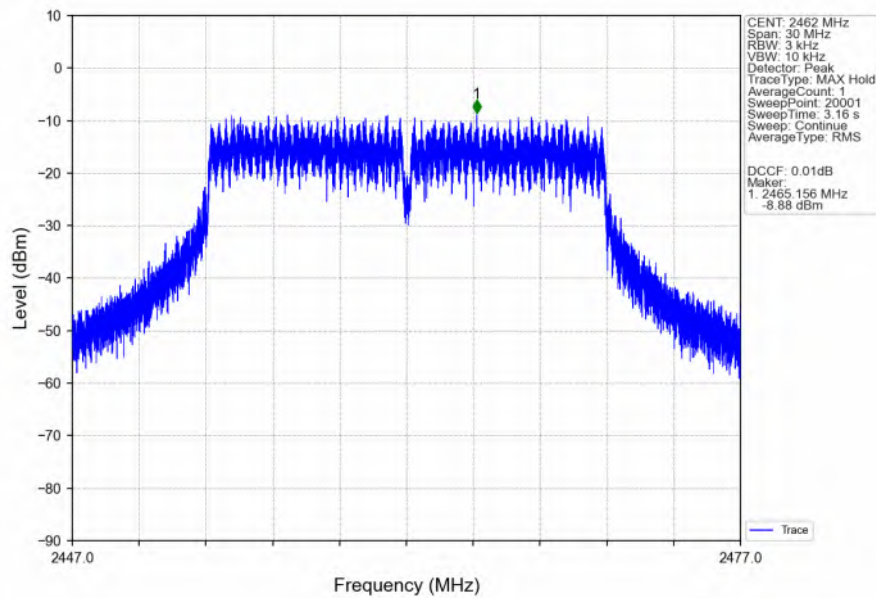
802.11n(HT20)_MCH_2437MHz_Ant6 (MIMO)_NTNV



802.11n(HT20)_MCH_2437MHz_MIMO_NTNV



802.11n(HT20)_HCH_2462MHz_Ant5 (MIMO)_NTNV



802.11n(HT20)_HCH_2462MHz_Ant6 (MIMO)_NTNV

