

SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen Branch

SZEMC-TRF-01 Rev. A/1

Report No.: SZCR230900320402

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TEST REPORT

Application No.: SZCR2309003204AT
Applicant: Anzu Robotics LLC
Address of Applicant: c/o Corporation Trust Center, 1209 Orange Street, Wilmington, Delaware 19801
Manufacturer: Anzu Robotics LLC
Address of Manufacturer: c/o Corporation Trust Center, 1209 Orange Street, Wilmington, Delaware 19801
Equipment Under Test (EUT):
EUT Name: Raptor /Raptor T
Model No.: RAPTOR01, RAPTOR01 ♣
♣ Please refer to section 2 of this report which indicates which model was actually tested and which were electrically identical.
FCC ID: 2BBYS-RAPTOR
Standard(s) : 47 CFR Part 15, Subpart C 15.247
Date of Receipt: 2023-09-28
Date of Test: 2023-10-25 to 2023-11-06
Date of Issue: 2023-11-08

Test Result:**Pass***

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

Kenx. Xu

Keny Xu
EMC Laboratory ManagerSGS-CSTC Standards Technical Services Co., Ltd.
Shenzhen Branch EMC Laboratory

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Revision Record				
Version	Chapter	Date	Modifier	Remark
01		2023-11-08		Original

Authorized for issue by:				
		Darren Yuan		
		Darren Yuan/Project Engineer		
		Eric Fu		
		Eric Fu/Reviewer		



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2 Test Summary

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

Radio Spectrum Matter Part				
Item	Standard	Method	Requirement	Result
Conducted 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
Conducted Peak Output Power		ANSI C63.10 (2013) Section 11.9.1	47 CFR Part 15, Subpart C 15.247(b)(3)	Pass
Minimum 6dB Bandwidth		ANSI C63.10 (2013) Section 11.8.1	47 CFR Part 15, Subpart C 15.247a(2)	Pass
Power Spectrum Density		ANSI C63.10 (2013) Section 11.10.2	47 CFR Part 15, Subpart C 15.247(e)	Pass
Conducted Band Edges Measurement		ANSI C63.10 (2013) Section 11.13.3.2	47 CFR Part 15, Subpart C 15.247(d)	Pass
Conducted Spurious Emissions		ANSI C63.10 (2013) Section 11.11	47 CFR Part 15, Subpart C 15.247(d)	Pass
Radiated Emissions which fall in the restricted bands		ANSI C63.10 (2013) Section 6.10.5	47 CFR Part 15, Subpart C 15.205 & 15.209	Pass
Radiated Spurious Emissions Below 1GHz		ANSI C63.10 (2013) Section 6.4,6.5	47 CFR Part 15, Subpart C 15.205 & 15.209	Pass
Radiated Spurious Emissions Above 1GHz		ANSI C63.10 (2013) Section 6.6	47 CFR Part 15, Subpart C 15.205 & 15.209	Pass

Declaration of EUT Family Grouping:

Model No.: RAPTOR01, RAPTOR01

Model RAPTOR01 was final tested, since according to the declaration from the applicant, the electrical circuit design, PCB layout, components used and internal wiring and functions were identical for the above models, with only difference on camera.

Remark: Pre-scans were performed on model RAPTOR01 and model RAPTOR01, model RAPTOR01 is the worst-case, only the worst-case test data were recorded in this report.



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4 General Information

4.1 Details of E.U.T.

Power supply:	Powered by Lithium Ion Polymer Rechargeable Battery Battery information Model: RBATT01 Rated Voltage: 15.4V DC Rated Capacity: 5000mAh, 77Wh
Operation Frequency:	1.4MHz mode: 2403.5MHz-2469.5MHz 1.4MHz CA mode: 2405.12MHz-2471.12MHz 3MHz mode: 2405.5MHz-2468.5MHz 3MHz CA mode: 2408.2MHz-2471.2MHz 10MHz mode: 2407.5MHz-2467.5MHz 20MHz mode: 2412.5MHz-2462.5MHz 40MHz mode: 2422.5MHz-2452.5MHz
Modulation Type:	OFDM
Channel Spacing:	1.4MHz mode: 2MHz 1.4MHz CA mode: 2MHz 3MHz mode: 3MHz 3MHz CA mode: 3MHz 10MHz mode: 1MHz 20MHz mode: 1MHz 40MHz mode: 1MHz
Number of Channels:	1.4MHz mode: 34 1.4MHz CA mode: 34 3MHz mode: 22 3MHz CA mode: 22 10MHz mode: 61 20MHz mode: 51 40MHz mode: 31
Antenna Type:	PCB Antenna
Antenna Gain:	ANT0&ANT3: 1.5dBi; ANT1&ANT2: 2dBi
Cable Loss (for RF conducted test):	1dB

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

4.2 Description of Support Units

Description	Manufacturer	Model No.	Serial No.
Power Adapter	HONOR	RUSBCPA01	N/A



4.3 Measurement Uncertainty

Test Item	Measurement Uncertainty
Conducted Emissions at AC Power Line (150kHz-30MHz)	$\pm 3.1\text{dB}$
Conducted Peak Output Power	$\pm 0.75\text{dB}$
Minimum 6dB Bandwidth	$\pm 3\%$
Power Spectrum Density	$\pm 2.84\text{dB}$
Conducted Band Edges Measurement	$\pm 0.75\text{dB}$
Conducted Spurious Emissions	$\pm 0.75\text{dB}$
Radiated Emissions which fall in the restricted bands	$\pm 6.0\text{dB}$ (Below 1GHz); $\pm 4.6\text{dB}$ (Above 1GHz)
Radiated Spurious Emissions Below 1GHz	$\pm 6.0\text{dB}$ for 3m; $\pm 5.0\text{dB}$ for 10m
Radiated Spurious Emissions Above 1GHz	$\pm 4.6\text{dB}$ (1-18GHz); $\pm 4.8\text{dB}$ (18-40GHz)

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.



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4.4 Test Location

All tests were performed at:

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Tel: +86 755 2601 2053 Fax: +86 755 2671 0594

No tests were sub-contracted.

4.5 Test Facility

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

• A2LA (Certificate No. 3816.01)

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 3816.01.

• VCCI (Member No. 1937)

The 3m Fully-anechoic chamber for above 1GHz, 10m Semi-anechoic chamber for below 1GHz, Shielded Room for Mains Port Conducted Interference Measurement and Telecommunication Port Conducted Interference Measurement of SGS-CSTC Standards Technical Services Co., Ltd. Shenzhen EMC laboratory have been registered in accordance with the Regulations for Voluntary Control Measures with Registration No.: G-20026, R-14188, C-12383 and T-11153 respectively.

• FCC –Designation Number: CN1336

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized as an accredited testing laboratory.

Designation Number: CN1336. Test Firm Registration Number: 787754.

• Innovation, Science and Economic Development Canada

SGS-CSTC Standards Technical Services Co., Ltd., Shenzhen EMC Laboratory has been recognized by ISED as an accredited testing laboratory.

CAB identifier: CN0006.

IC#: 4620C.

4.6 Deviation from Standards

None

4.7 Abnormalities from Standard Conditions

None



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5 Equipment List

Conducted Emissions at AC Power Line (150kHz-30MHz)					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Shielding Room	ZhongYu Electron	GB-88	SEM001-06	2022-05-14	2025-05-13
EMI Test Receiver	Rohde&Schwarz	ESCI	SEM004-02	2023-03-20	2024-03-19
Measurement Software	AUDIX	e3 V8.2014-6-27a	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM024-01	2023-07-07	2024-07-06
LISN	Rohde&Schwarz	ENV216	SEM007-01	2023-09-19	2024-09-18
LISN	ETS-LINDGREN	3816/2	SEM007-02	2023-03-20	2024-03-19

Conducted Peak Output Power					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Power Sensor	TST PASS	TSPS2023R	SEM009-26	2023-04-01	2024-03-31
Power Sensor	KEYSIGHT	U2021XA	SEM009-16	2023-03-21	2024-03-20
DC Power Supply	Chroma	62012P-80-60	SEM011-11	2023-10-19	2024-10-18
MXA Signal Analyzer	KEYSIGHT	N9020A	SEM004-19	2023-03-21	2024-03-20
Measurement Software	TST PASS	TST PASS V2.0	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM031-01	2023-07-07	2024-07-06
Attenuator	Huber+Suhner	6620_SMA-50-1	SEM021-09	2023-03-31	2024-03-30

Minimum 6dB Bandwidth					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
DC Power Supply	Chroma	62012P-80-60	SEM011-11	2023-10-19	2024-10-18
MXA Signal Analyzer	KEYSIGHT	N9020A	SEM004-19	2023-03-21	2024-03-20
Measurement Software	TST PASS	TST PASS V2.0	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM031-01	2023-07-07	2024-07-06
Attenuator	Huber+Suhner	6620_SMA-50-1	SEM021-09	2023-03-31	2024-03-30

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Power Spectrum Density					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
DC Power Supply	Chroma	62012P-80-60	SEM011-11	2023-10-19	2024-10-18
MXA Signal Analyzer	KEYSIGHT	N9020A	SEM004-19	2023-03-21	2024-03-20
Measurement Software	TST PASS	TST PASS V2.0	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM031-01	2023-07-07	2024-07-06
Attenuator	Huber+Suhner	6620_SMA-50-1	SEM021-09	2023-03-31	2024-03-30

Conducted Band Edges Measurement					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
DC Power Supply	Chroma	62012P-80-60	SEM011-11	2023-10-19	2024-10-18
MXA Signal Analyzer	KEYSIGHT	N9020A	SEM004-19	2023-03-21	2024-03-20
Measurement Software	TST PASS	TST PASS V2.0	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM031-01	2023-07-07	2024-07-06
Attenuator	Huber+Suhner	6620_SMA-50-1	SEM021-09	2023-03-31	2024-03-30

Conducted Spurious Emissions					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
DC Power Supply	Chroma	62012P-80-60	SEM011-11	2023-10-19	2024-10-18
MXA Signal Analyzer	KEYSIGHT	N9020A	SEM004-19	2023-03-21	2024-03-20
Measurement Software	TST PASS	TST PASS V2.0	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM031-01	2023-07-07	2024-07-06
Attenuator	Huber+Suhner	6620_SMA-50-1	SEM021-09	2023-03-31	2024-03-30



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Radiated Emissions which fall in the restricted bands

Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
3m Fully-Anechoic Chamber	AUDIX	N/A	SEM001-02	2023-04-01	2026-03-31
Signal Analyzer	Rohde & Schwarz	FSV40	SEM008-04	2023-03-20	2024-03-19
Horn Antenna	Rohde&Schwarz	HF907	SEM003-07	2023-07-23	2025-07-22
Microwave system amplifier	Agilent	83017A	SEM005-25	2023-09-19	2024-09-18
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM026-01	2023-07-07	2024-07-06
Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	SEM003-15	2022-08-10	2024-08-09
Pre-Amplifier	Compliance Directions Systems Inc.	PAP-2640-50	SEM005-08	2023-03-20	2024-03-19

Radiated Spurious Emissions Below 1GHz

Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Loop Antenna	ETS-Lindgren	6502	SEM003-08	2021-11-30	2023-11-29
3m Semi-Anechoic Chamber	ETS-LINDGREN	N/A	SEM001-01	2023-06-19	2026-06-18
MXE EMI Receiver	Agilent Technologies	N9038A	SEM004-15	2023-10-19	2024-10-18
BiConiLog Antenna	ETS-LINDGREN	3142C	SEM003-01	2023-09-16	2025-09-15
Pre-Amplifier	Agilent Technologies	8447D	SEM005-01	2023-03-20	2024-03-19
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM025-01	2023-07-07	2024-07-06



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Radiated Spurious Emissions Above 1GHz					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
3m Fully-Anechoic Chamber	AUDIX	N/A	SEM001-02	2023-04-01	2026-03-31
Signal Analyzer	Rohde & Schwarz	FSV40	SEM008-04	2023-03-20	2024-03-19
Horn Antenna	Rohde&Schwarz	HF907	SEM003-07	2023-07-23	2025-07-22
Microwave system amplifier	Agilent	83017A	SEM005-25	2023-09-19	2024-09-18
Measurement Software	AUDIX	e3 V8.2014-6-27	N/A	N/A	N/A
Coaxial Cable	SGS	N/A	SEM026-01	2023-07-07	2024-07-06
Broad-Band Horn Antenna	Schwarzbeck	BBHA 9170	SEM003-15	2022-08-10	2024-08-09
Pre-Amplifier	Compliance Directions Systems Inc.	PAP-2640-50	SEM005-08	2023-03-20	2024-03-19

General used equipment					
Equipment	Manufacturer	Model No.	Inventory No.	Cal Date	Cal Due Date
Humidity/ Temperature Indicator	deli	8838	SEM002-32	2023-07-28	2024-07-27
Humidity/ Temperature Indicator	deli	8838	SEM002-33	2023-07-28	2024-07-27
Barometer	Changchun Meteorological Industry Factory	DYM3	SEM002-01	2023-03-23	2024-03-22



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6 Radio Spectrum Technical Requirement

6.1 Antenna Requirement

6.1.1 Test Requirement:

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

6.1.2 Conclusion

Standard Requirement:

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

15.247(b) (4) requirement:

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

EUT Antenna:

The antenna is integrated on the main PCB and no consideration of replacement. The best case gain of the antennas are ANT0&ANT3: 1.5dBi; ANT1&ANT2: 2dBi, the directional gain is 5.01dBi.

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: 23.4 °C

Humidity: 47.3 % RH

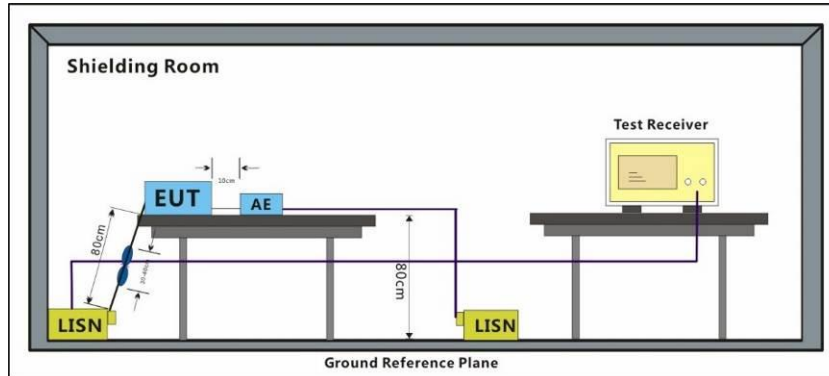
Atmospheric Pressure: 1000 mbar

7.1.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	01	Charge + TX mode(2.4G SDR 1.4MHz)_Keep the EUT in charging and continuously transmitting mode.
Pre-scan	03	Charge + TX mode(2.4G SDR 3MHz)_Keep the EUT in charging and continuously transmitting mode.
Pre-scan	05	Charge + TX mode(2.4G SDR 10MHz)_Keep the EUT in charging and continuously transmitting mode.
Pre-scan	07	Charge + TX mode(2.4G SDR 20MHz)_Keep the EUT in charging and continuously transmitting mode.
Pre-scan	09	Charge + TX mode(2.4G SDR 40MHz)_Keep the EUT in charging and continuously transmitting mode.



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



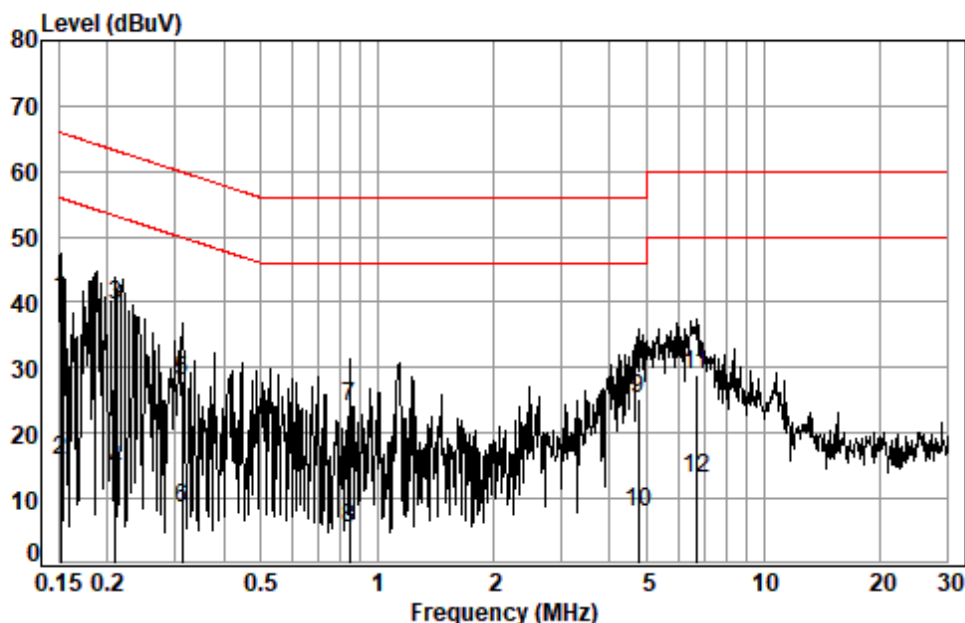
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Test Mode: 01; Line: Live line



Site : Shielding Room

Condition: Line

Job No. : 03204AT

Test mode: 01

	Freq	Cable Loss	LISN Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	0.1516	0.02	10.26	30.03	40.31	65.91	-25.60	QP
2	0.1516	0.02	10.26	5.55	15.83	55.91	-40.08	Average
3 *	0.2094	0.02	10.28	29.16	39.46	63.23	-23.77	QP
4	0.2094	0.02	10.28	3.91	14.21	53.23	-39.02	Average
5	0.3133	0.03	10.31	17.64	27.98	59.88	-31.90	QP
6	0.3133	0.03	10.31	-1.86	8.48	49.88	-41.40	Average
7	0.8483	0.05	10.35	13.71	24.11	56.00	-31.89	QP
8	0.8483	0.05	10.35	-4.88	5.52	46.00	-40.48	Average
9	4.7464	0.09	10.71	14.33	25.13	56.00	-30.87	QP
10	4.7464	0.09	10.71	-2.83	7.97	46.00	-38.03	Average
11	6.6978	0.12	11.15	17.68	28.95	60.00	-31.05	QP
12 *	6.6978	0.12	11.15	1.71	12.98	50.00	-37.02	Average



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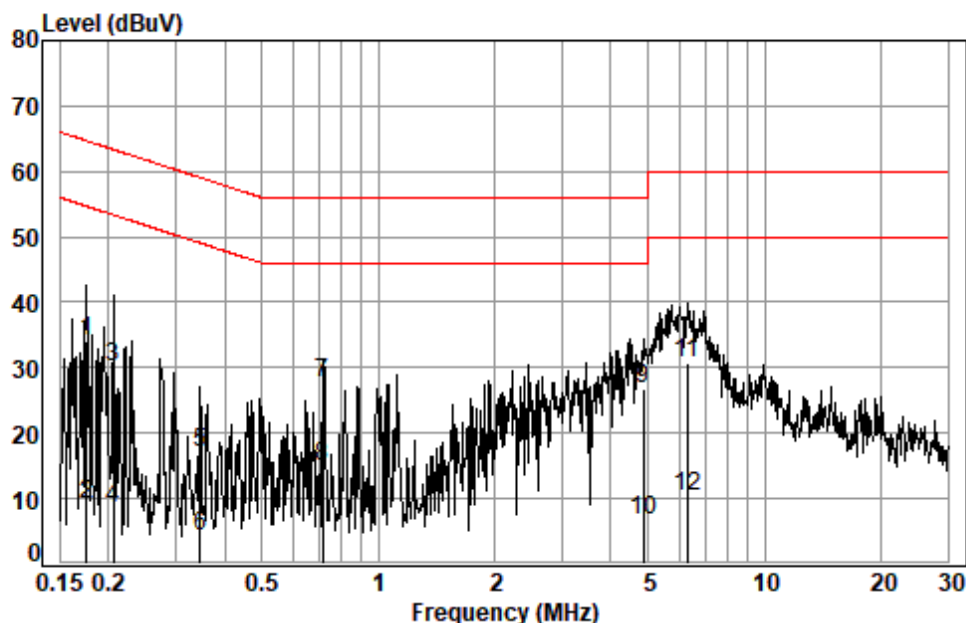
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Test Mode: 01; Line: Neutral Line



Site : Shielding Room
Condition: Neutral
Job No. : 03204AT
Test mode: 01

	Freq	Cable Loss	LISN Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB	dBuV	dBuV	dBuV	dB	
1	0.1758	0.02	10.25	23.90	34.17	64.68	-30.51	QP
2	0.1758	0.02	10.25	-1.09	9.18	54.68	-45.50	Average
3	0.2061	0.02	10.25	19.76	30.03	63.36	-33.33	QP
4	0.2061	0.02	10.25	-1.61	8.66	53.36	-44.70	Average
5	0.3465	0.03	10.28	6.80	17.11	59.05	-41.94	QP
6	0.3465	0.03	10.28	-5.95	4.36	49.05	-44.69	Average
7 *	0.7160	0.05	10.34	17.24	27.63	56.00	-28.37	QP
8 *	0.7160	0.05	10.34	4.47	14.86	46.00	-31.14	Average
9	4.8480	0.09	10.72	15.95	26.76	56.00	-29.24	QP
10	4.8480	0.09	10.72	-4.03	6.78	46.00	-39.22	Average
11	6.3186	0.11	11.06	19.61	30.78	60.00	-29.22	QP
12	6.3186	0.11	11.06	-0.71	10.46	50.00	-39.54	Average



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7.2 Conducted Peak Output Power

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

Test Method: ANSI C63.10 (2013) Section 11.9.1

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

7.2.1 E.U.T. Operation

Operating Environment:

Temperature: 24.9 °C

Humidity: 42.7 % RH

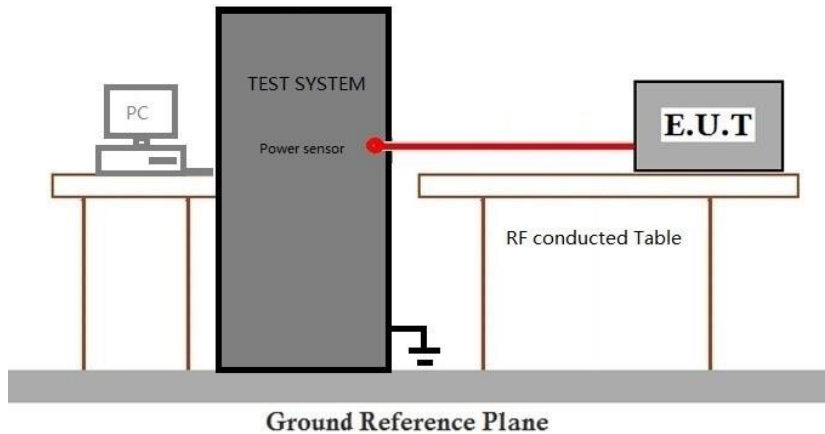
Atmospheric Pressure: 1000 mbar

7.2.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode(2.4G SDR 1.4MHz)_Keep the EUT in continuously transmitting mode.
Final test	02	TX mode(2.4G SDR 3MHz)_Keep the EUT in continuously transmitting mode.
Final test	04	TX mode(2.4G SDR 10MHz)_Keep the EUT in continuously transmitting mode.
Final test	06	TX mode(2.4G SDR 20MHz)_Keep the EUT in continuously transmitting mode.
Final test	08	TX mode(2.4G SDR 40MHz)_Keep the EUT in continuously transmitting mode.



7.2.3 Test Setup Diagram



7.2.4 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

7.3 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

7.3.1 E.U.T. Operation

Operating Environment:

Temperature: 24.9 °C

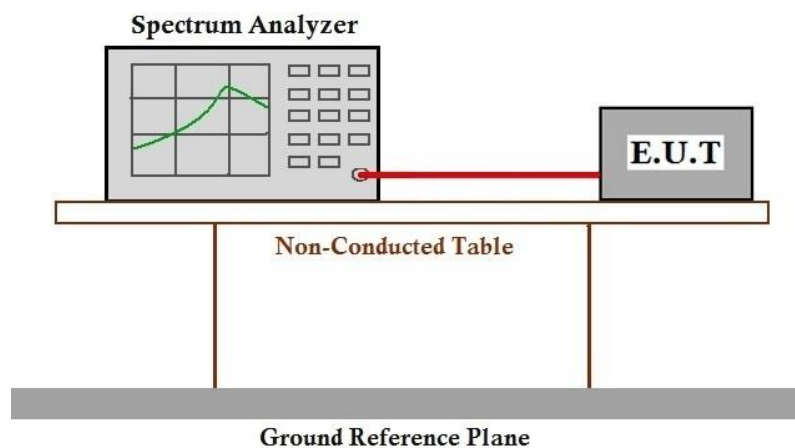
Humidity: 42.7 % RH

Atmospheric Pressure: 1000 mbar

7.3.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode(2.4G SDR 1.4MHz)_Keep the EUT in continuously transmitting mode.
Final test	02	TX mode(2.4G SDR 3MHz)_Keep the EUT in continuously transmitting mode.
Final test	04	TX mode(2.4G SDR 10MHz)_Keep the EUT in continuously transmitting mode.
Final test	06	TX mode(2.4G SDR 20MHz)_Keep the EUT in continuously transmitting mode.
Final test	08	TX mode(2.4G SDR 40MHz)_Keep the EUT in continuously transmitting mode.

7.3.3 Test Setup Diagram



7.3.4 Measurement Procedure and Data

Please Refer to Appendix for Details

7.4 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

7.4.1 E.U.T. Operation

Operating Environment:

Temperature: 24.9 °C

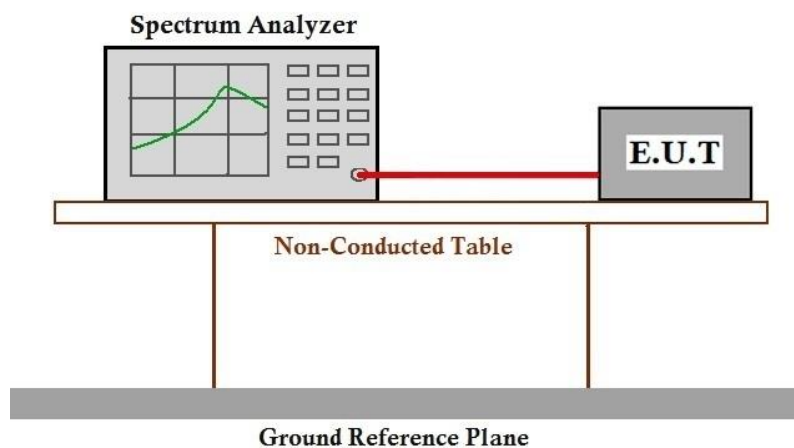
Humidity: 42.7 % RH

Atmospheric Pressure: 1000 mbar

7.4.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode(2.4G SDR 1.4MHz)_Keep the EUT in continuously transmitting mode.
Final test	02	TX mode(2.4G SDR 3MHz)_Keep the EUT in continuously transmitting mode.
Final test	04	TX mode(2.4G SDR 10MHz)_Keep the EUT in continuously transmitting mode.
Final test	06	TX mode(2.4G SDR 20MHz)_Keep the EUT in continuously transmitting mode.
Final test	08	TX mode(2.4G SDR 40MHz)_Keep the EUT in continuously transmitting mode.

7.4.3 Test Setup Diagram



7.4.4 Measurement Procedure and Data

Please Refer to Appendix for Details

7.5 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)).

7.5.1 E.U.T. Operation

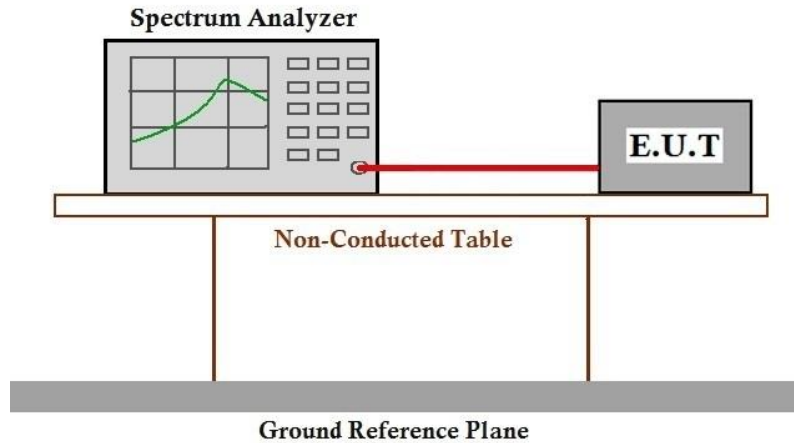
Operating Environment:

Temperature: 24.9 °C Humidity: 42.7 % RH Atmospheric Pressure: 1000 mbar

7.5.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode(2.4G SDR 1.4MHz)_Keep the EUT in continuously transmitting mode.
Final test	02	TX mode(2.4G SDR 3MHz)_Keep the EUT in continuously transmitting mode.
Final test	04	TX mode(2.4G SDR 10MHz)_Keep the EUT in continuously transmitting mode.
Final test	06	TX mode(2.4G SDR 20MHz)_Keep the EUT in continuously transmitting mode.
Final test	08	TX mode(2.4G SDR 40MHz)_Keep the EUT in continuously transmitting mode.

7.5.3 Test Setup Diagram



7.5.4 Measurement Procedure and Data

Please Refer to Appendix for Details



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7.6 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)).

7.6.1 E.U.T. Operation

Operating Environment:

Temperature: 24.9 °C

Humidity: 42.7 % RH

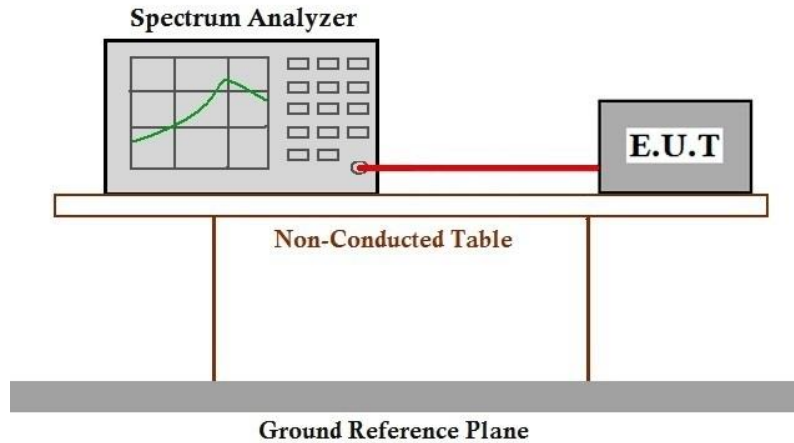
Atmospheric Pressure: 1000 mbar

7.6.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Final test	00	TX mode(2.4G SDR 1.4MHz)_Keep the EUT in continuously transmitting mode.
Final test	02	TX mode(2.4G SDR 3MHz)_Keep the EUT in continuously transmitting mode.
Final test	04	TX mode(2.4G SDR 10MHz)_Keep the EUT in continuously transmitting mode.
Final test	06	TX mode(2.4G SDR 20MHz)_Keep the EUT in continuously transmitting mode.
Final test	08	TX mode(2.4G SDR 40MHz)_Keep the EUT in continuously transmitting mode.



7.6.3 Test Setup Diagram



7.6.4 Measurement Procedure and Data

Please Refer to Appendix for Details

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7.7 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.

7.7.1 E.U.T. Operation

Operating Environment:

Temperature: 23.5 °C

Humidity: 52.9 % RH

Atmospheric Pressure: 1000 mbar



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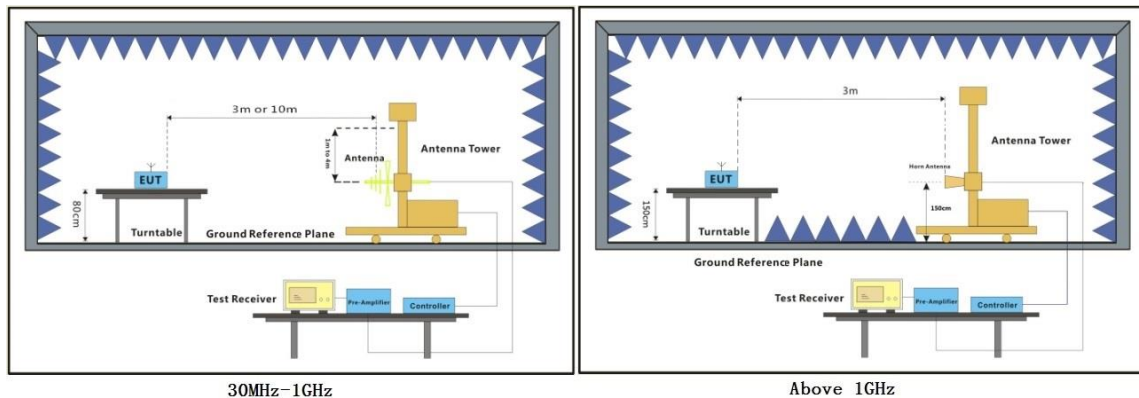
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7.7.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Pre-scan	00	TX mode(2.4G SDR 1.4MHz)_Keep the EUT in continuously transmitting mode.
Final test	01	Charge + TX mode(2.4G SDR 1.4MHz)_Keep the EUT in charging and continuously transmitting mode.
Pre-scan	02	TX mode(2.4G SDR 3MHz)_Keep the EUT in continuously transmitting mode.
Final test	03	Charge + TX mode(2.4G SDR 3MHz)_Keep the EUT in charging and continuously transmitting mode.
Pre-scan	04	TX mode(2.4G SDR 10MHz)_Keep the EUT in continuously transmitting mode.
Final test	05	Charge + TX mode(2.4G SDR 10MHz)_Keep the EUT in charging and continuously transmitting mode.
Pre-scan	06	TX mode(2.4G SDR 20MHz)_Keep the EUT in continuously transmitting mode.
Final test	07	Charge + TX mode(2.4G SDR 20MHz)_Keep the EUT in charging and continuously transmitting mode.
Pre-scan	08	TX mode(2.4G SDR 40MHz)_Keep the EUT in continuously transmitting mode.
Final test	09	Charge + TX mode(2.4G SDR 40MHz)_Keep the EUT in charging and continuously transmitting mode.

7.7.3 Test Setup Diagram



7.7.4 Measurement Procedure and Data

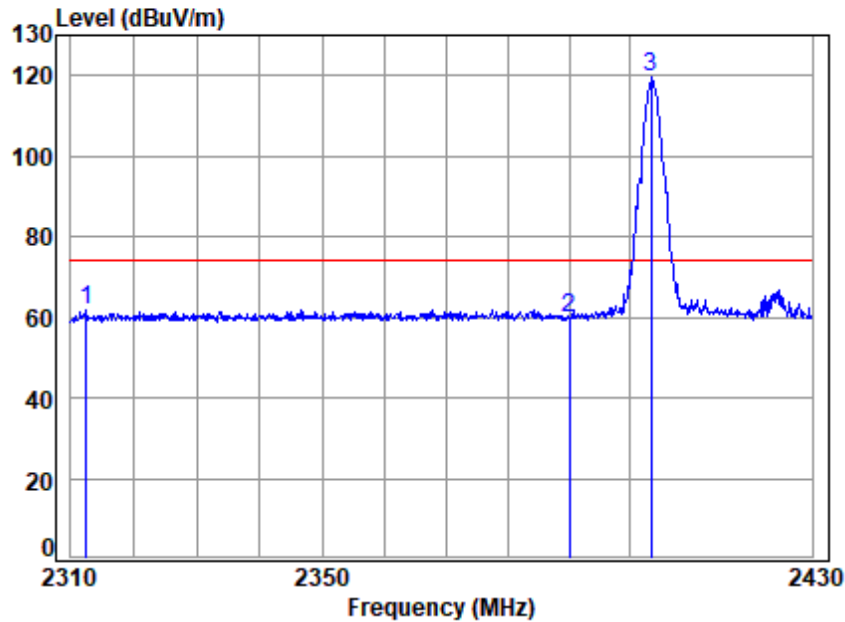
- a. For below 1GHz, the EUT was placed on the top of a rotating table 0.8 meters above the ground at a 3 or 10 meter semi-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 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.



Test Mode: 01; Polarity: Horizontal; Modulation: OFDM; Channel: Low

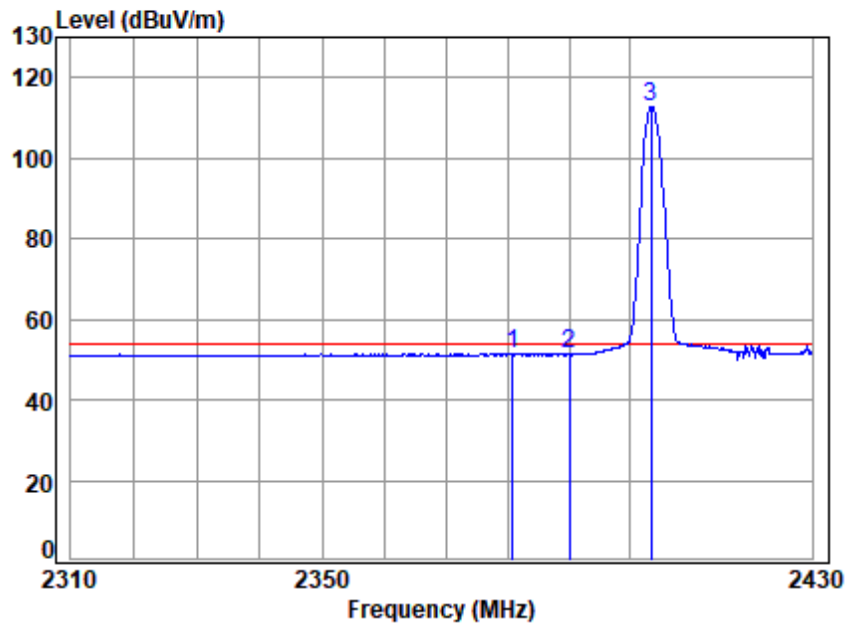


Site : chamber
Condition: 3m HORIZONTAL
Job No : 03204AT/03205AT
Mode : 2403.5 Band edge
Note : 1.4M

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2312.46	5.00	28.58	37.62	65.96	61.92	74.00	-12.08 peak
2	2390.00	5.08	29.10	37.44	62.84	59.58	74.00	-14.42 peak
3	2403.50	5.09	29.09	37.40	122.92	119.70	74.00	45.70 peak



Test Mode: 01; Polarity: Horizontal; Modulation: OFDM; Channel: Low

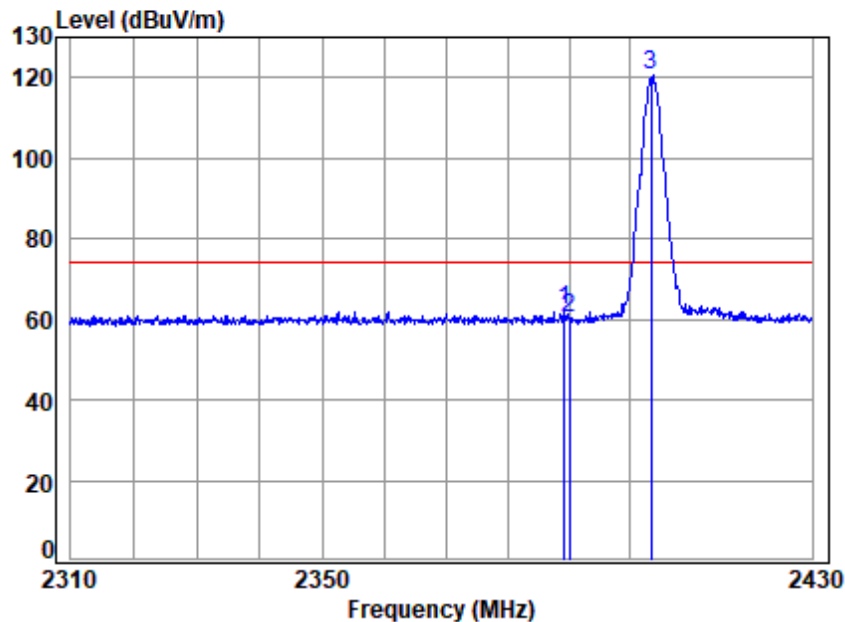


Site : chamber
Condition: 3m HORIZONTAL
Job No : 03204AT/03205AT
Mode : 2403.5 Band edge
Note : 1.4M

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2380.79	5.07	29.10	37.46	54.69	51.40	54.00	-2.60 Average
2	2390.00	5.08	29.10	37.44	54.48	51.22	54.00	-2.78 Average
3	2403.50	5.09	29.09	37.40	116.00	112.78	54.00	58.78 Average



Test Mode: 01; Polarity: Vertical; Modulation: OFDM; Channel: Low

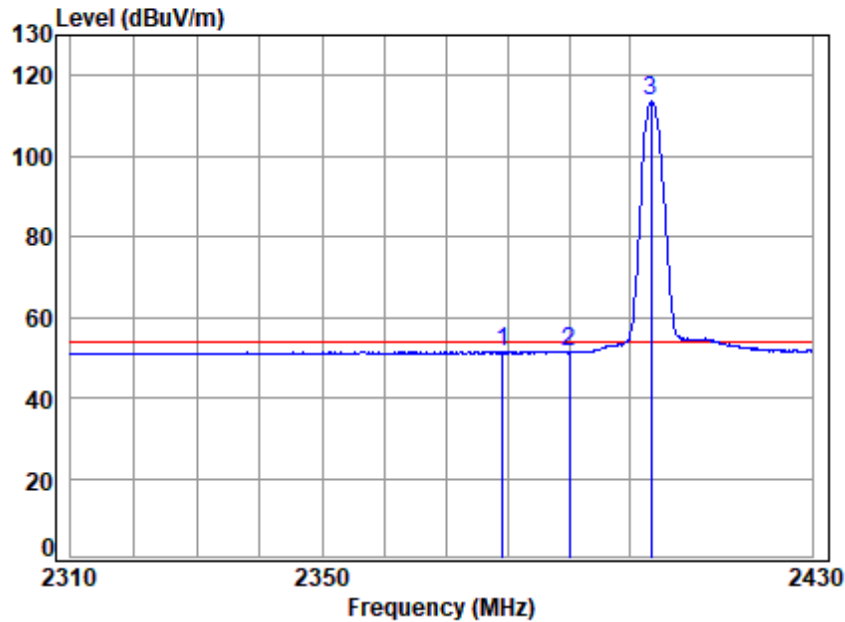


Site : chamber
Condition: 3m VERTICAL
Job No : 03204AT/03205AT
Mode : 2403.5 Band edge
Note : 1.4M

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2389.24	5.07	29.10	37.44	65.50	62.23	74.00	-11.77 Peak
2	2390.00	5.08	29.10	37.44	63.43	60.17	74.00	-13.83 Peak
3	2403.50	5.09	29.09	37.40	123.60	120.38	74.00	46.38 Peak



Test Mode: 01; Polarity: Vertical; Modulation: OFDM; Channel: Low

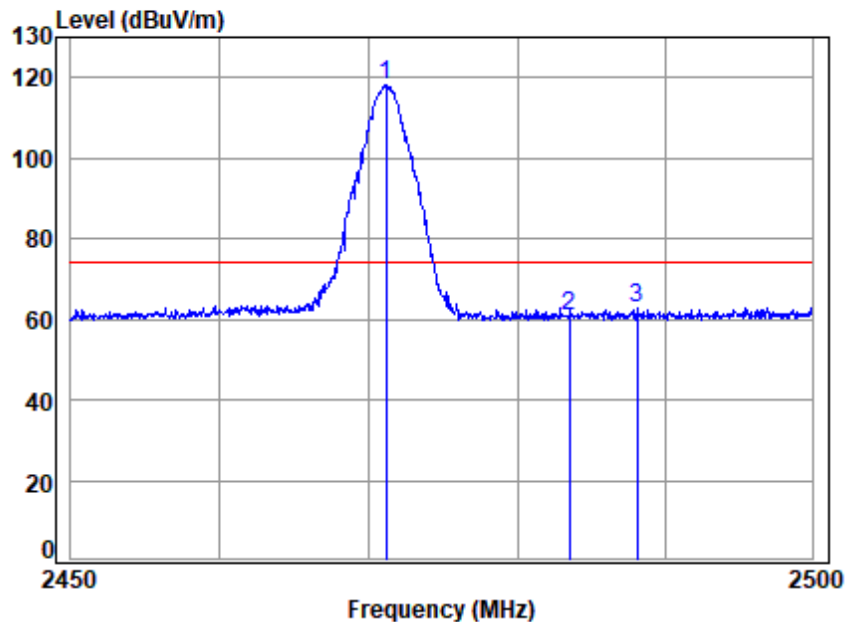


Site : chamber
Condition: 3m VERTICAL
Job No : 03204AT/03205AT
Mode : 2403.5 Band edge
Note : 1.4M

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2379.10	5.07	29.10	37.46	54.76	51.47	54.00	-2.53 Average
2	2390.00	5.08	29.10	37.44	54.44	51.18	54.00	-2.82 Average
3	2403.50	5.09	29.09	37.40	116.76	113.54	54.00	59.54 Average



Test Mode: 01; Polarity: Horizontal; Modulation: OFDM; Channel: High



Site : chamber
Condition: 3m HORIZONTAL
Job No : 03204AT/03205AT
Mode : 2471.12 Band edge
Note : 1.4M

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2471.12	5.15	28.90	37.24	121.29	118.10	74.00	44.10 peak
2	2483.50	5.16	28.90	37.22	63.88	60.72	74.00	-13.28 peak
3	2488.11	5.16	28.90	37.21	66.07	62.92	74.00	-11.08 peak



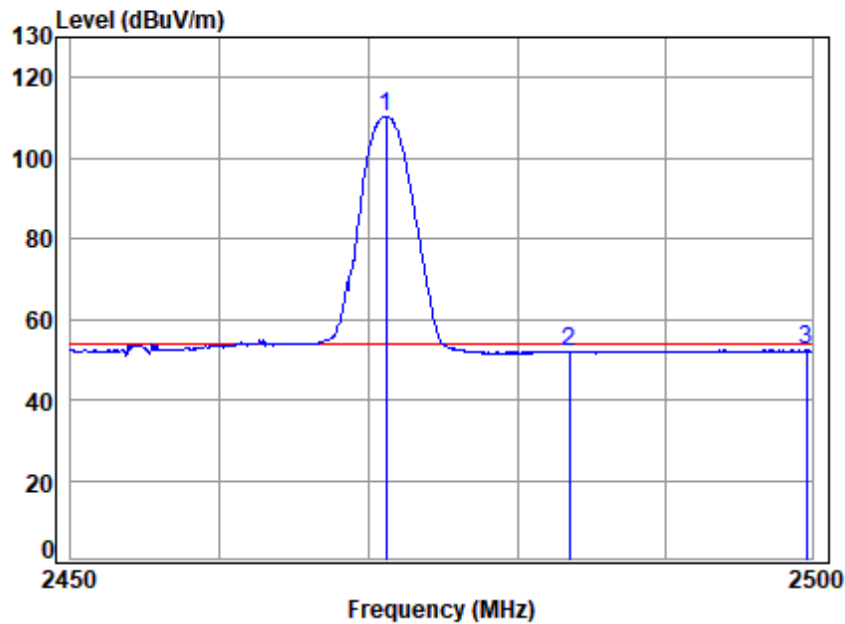
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Shenzhen Branch Inspection and Testing Laboratory

No.1 Workshop, M-10, Middle Section, Science & Technology Park, Nanshan District, Shenzhen, Guangdong, China 518057 t (86-755) 26012053 f (86-755) 26710594 www.sgsgroup.com.cn
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Test Mode: 01; Polarity: Horizontal; Modulation: OFDM; Channel: High



Site : chamber
Condition: 3m HORIZONTAL
Job No : 03204AT/03205AT
Mode : 2471.12 Band edge
Note : 1.4M

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2471.12	5.15	28.90	37.24	113.64	110.45	54.00	56.45 Average
2	2483.50	5.16	28.90	37.22	54.93	51.77	54.00	-2.23 Average
3	2499.65	5.17	28.90	37.18	55.44	52.33	54.00	-1.67 Average



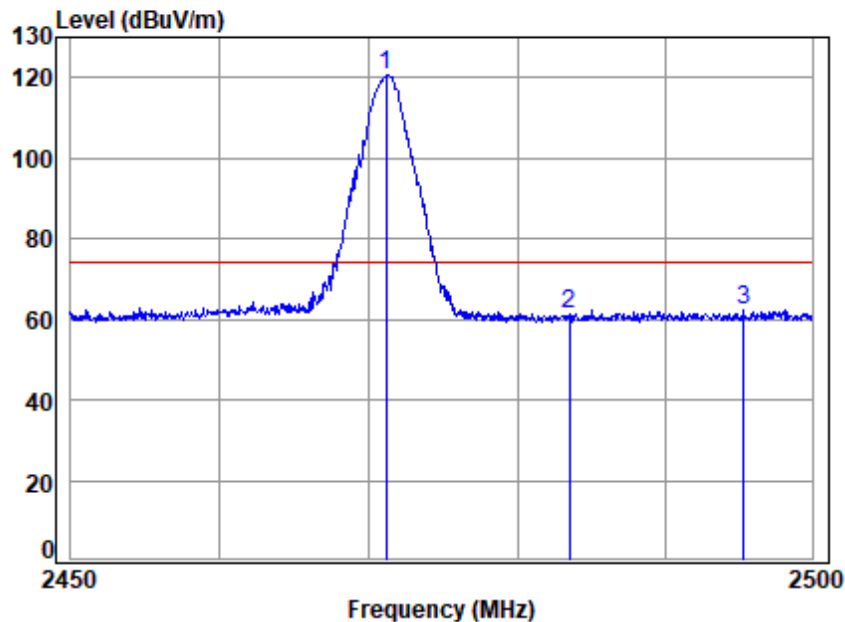
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Test Mode: 01; Polarity: Vertical; Modulation: OFDM; Channel: High



Site : chamber
Condition: 3m VERTICAL
Job No : 03204AT/03205AT
Mode : 2471.12 Band edge
Note : 1.4M

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2471.12	5.15	28.90	37.24	123.92	120.73	74.00	46.73 Peak
2	2483.50	5.16	28.90	37.22	64.22	61.06	74.00	-12.94 Peak
3	2495.36	5.17	28.90	37.19	65.44	62.32	74.00	-11.68 Peak



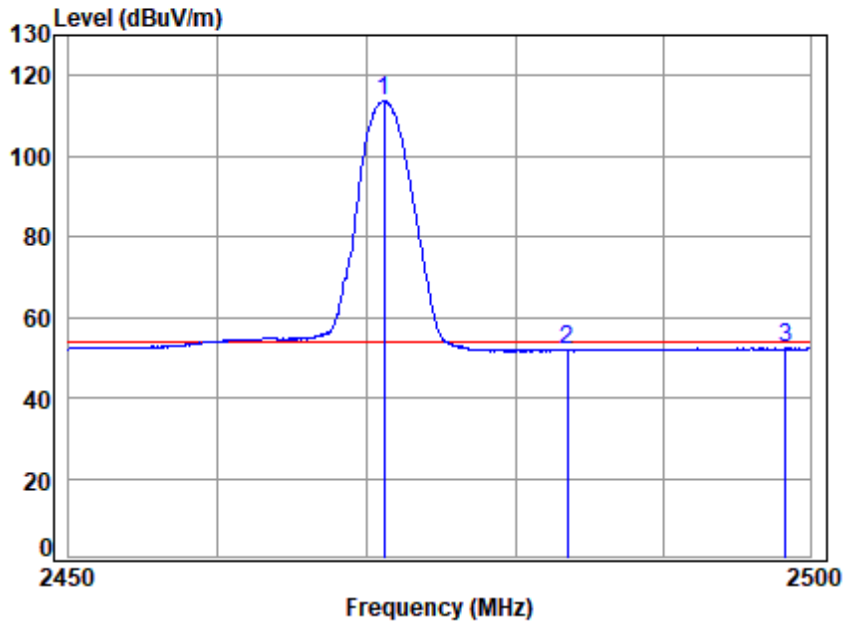
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Test Mode: 01; Polarity: Vertical; Modulation: OFDM; Channel: High



Site : chamber
Condition: 3m VERTICAL
Job No : 03204AT/03205AT
Mode : 2471.12 Band edge
Note : 1.4M

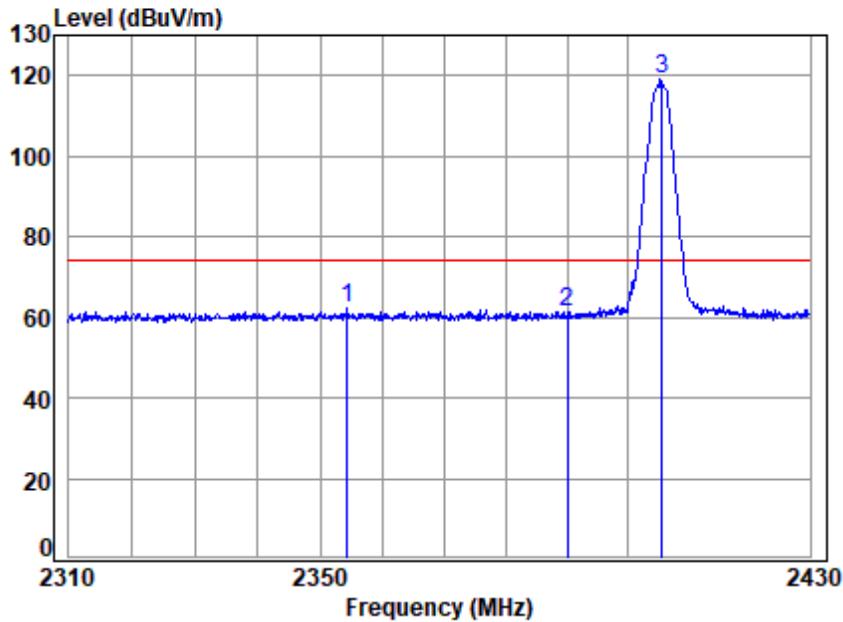
		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2471.12	5.15	28.90	37.24	116.74	113.55	54.00	59.55 Average
2	2483.50	5.16	28.90	37.22	54.88	51.72	54.00	-2.28 Average
3	2498.33	5.17	28.90	37.18	55.40	52.29	54.00	-1.71 Average



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Test Mode: 03; Polarity: Horizontal; Modulation: OFDM; Channel: Low

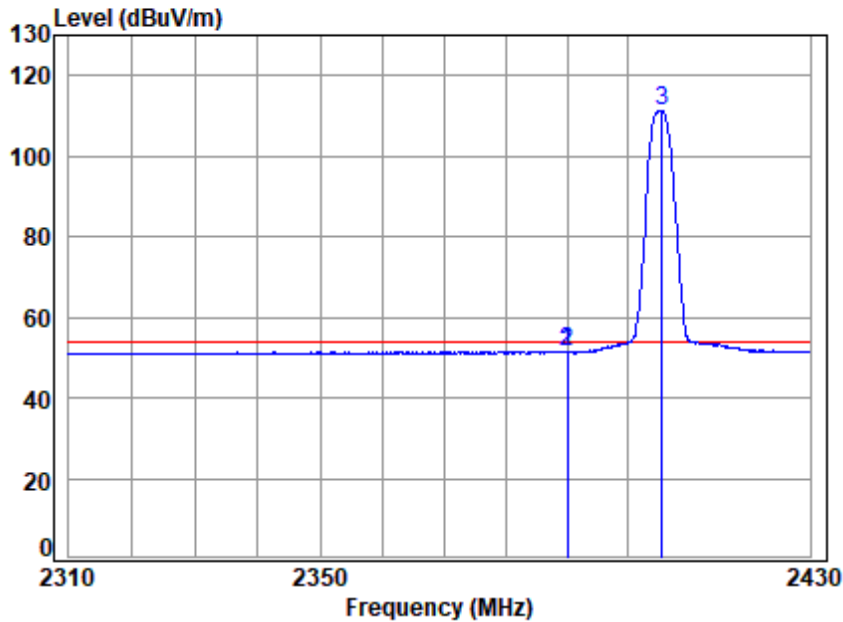


Site : chamber
Condition: 3m HORIZONTAL
Job No : 03204AT/03205AT
Mode : 2405.5 Band edge
Note : 3M

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2354.41	5.04	29.10	37.52	65.46	62.08	74.00	-11.92 peak
2	2390.00	5.08	29.10	37.44	64.58	61.32	74.00	-12.68 peak
3	2405.50	5.09	29.08	37.40	122.18	118.95	74.00	44.95 peak



Test Mode: 03; Polarity: Horizontal; Modulation: OFDM; Channel: Low



Site : chamber
Condition: 3m HORIZONTAL
Job No : 03204AT/03205AT
Mode : 2405.5 Band edge
Note : 3M

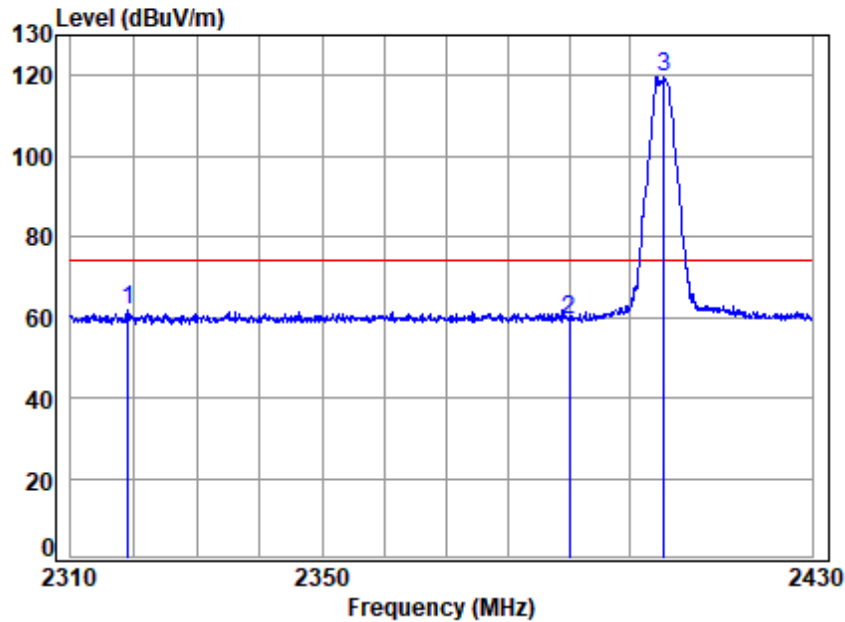
		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2389.97	5.08	29.10	37.44	54.67	51.41	54.00	-2.59 Average
2	2390.00	5.08	29.10	37.44	54.67	51.41	54.00	-2.59 Average
3	2405.50	5.09	29.08	37.40	114.47	111.24	54.00	57.24 Average



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Test Mode: 03; Polarity: Vertical; Modulation: OFDM; Channel: Low



Site : chamber
Condition: 3m VERTICAL
Job No : 03204AT/03205AT
Mode : 2405.5 Band edge
Note : 3M

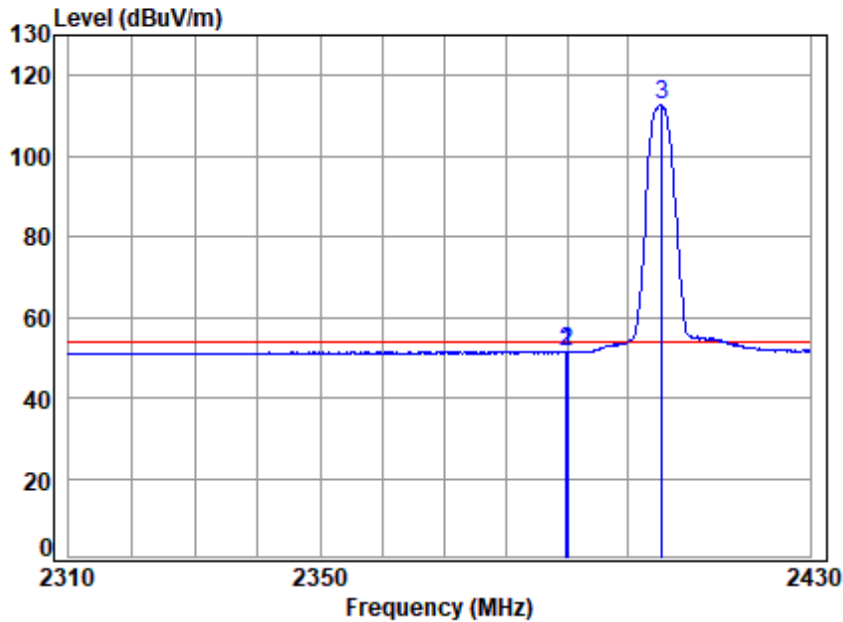
		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2319.03	5.01	28.67	37.61	65.82	61.89	74.00	-12.11 Peak
2	2390.00	5.08	29.10	37.44	62.78	59.52	74.00	-14.48 Peak
3	2405.50	5.09	29.08	37.40	122.86	119.63	74.00	45.63 Peak



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Test Mode: 03; Polarity: Vertical; Modulation: OFDM; Channel: Low

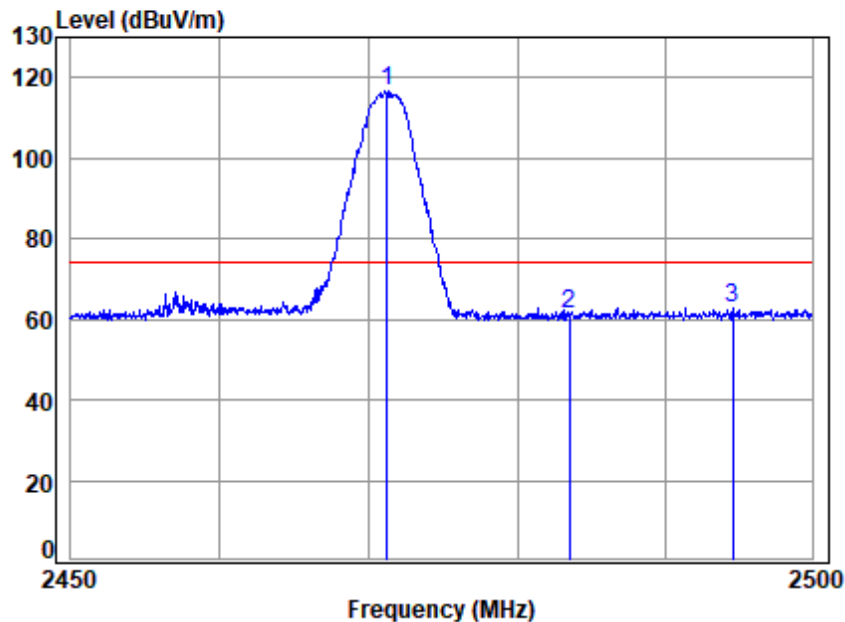


Site : chamber
Condition: 3m VERTICAL
Job No : 03204AT/03205AT
Mode : 2405.5 Band edge
Note : 3M

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2389.85	5.08	29.10	37.44	54.72	51.46	54.00	-2.54 Average
2	2390.00	5.08	29.10	37.44	54.50	51.24	54.00	-2.76 Average
3	2405.50	5.09	29.08	37.40	115.79	112.56	54.00	58.56 Average



Test Mode: 03; Polarity: Horizontal; Modulation: OFDM; Channel: High

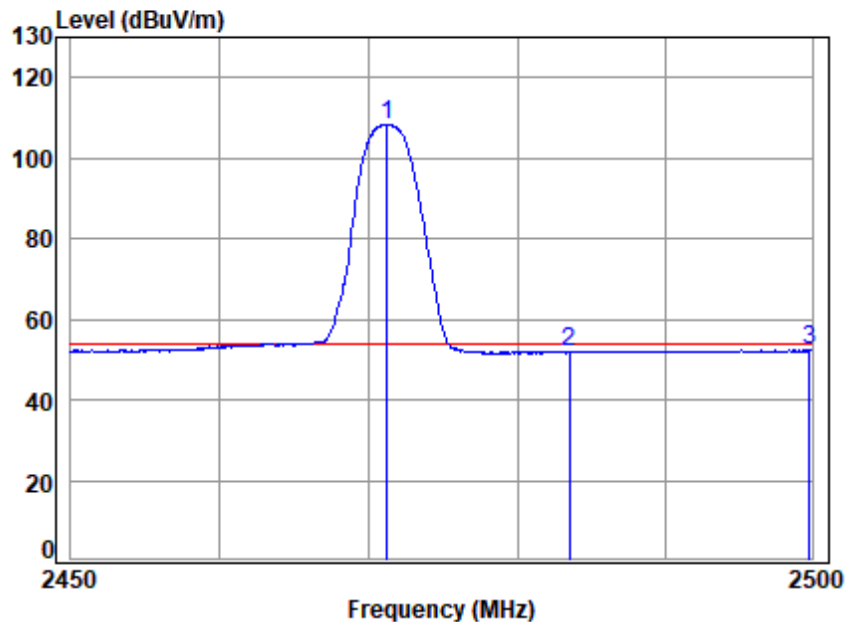


Site : chamber
Condition: 3m HORIZONTAL
Job No : 03204AT/03205AT
Mode : 2471.2 Band edge
Note : 3M

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2471.20	5.15	28.90	37.24	119.97	116.78	74.00	42.78 peak
2	2483.50	5.16	28.90	37.22	64.66	61.50	74.00	-12.50 peak
3	2494.60	5.17	28.90	37.19	65.91	62.79	74.00	-11.21 peak



Test Mode: 03; Polarity: Horizontal; Modulation: OFDM; Channel: High



Site : chamber
Condition: 3m HORIZONTAL
Job No : 03204AT/03205AT
Mode : 2471.2 Band edge
Note : 3M

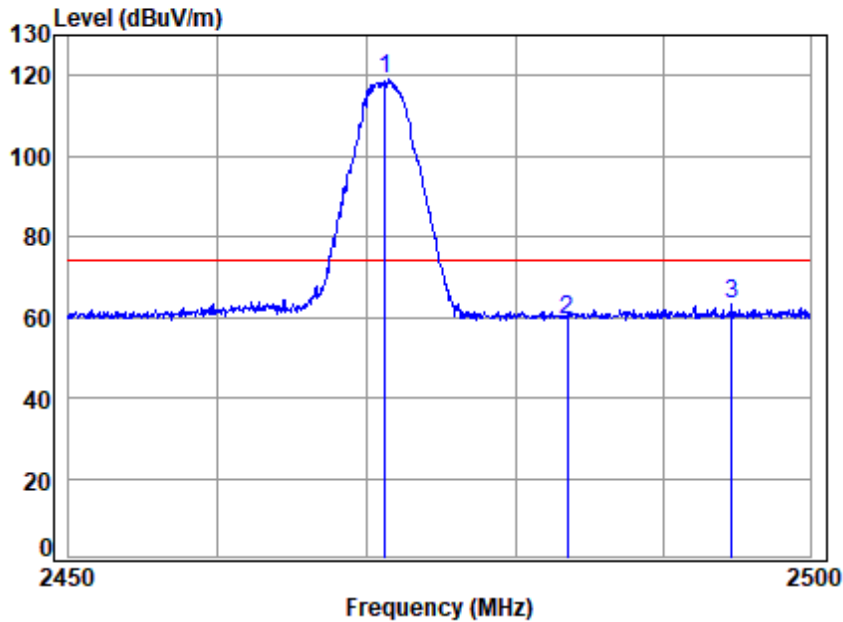
		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2471.20	5.15	28.90	37.24	111.43	108.24	54.00	54.24 Average
2	2483.50	5.16	28.90	37.22	54.88	51.72	54.00	-2.28 Average
3	2499.80	5.18	28.90	37.18	55.41	52.31	54.00	-1.69 Average



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Test Mode: 03; Polarity: Vertical; Modulation: OFDM; Channel: High

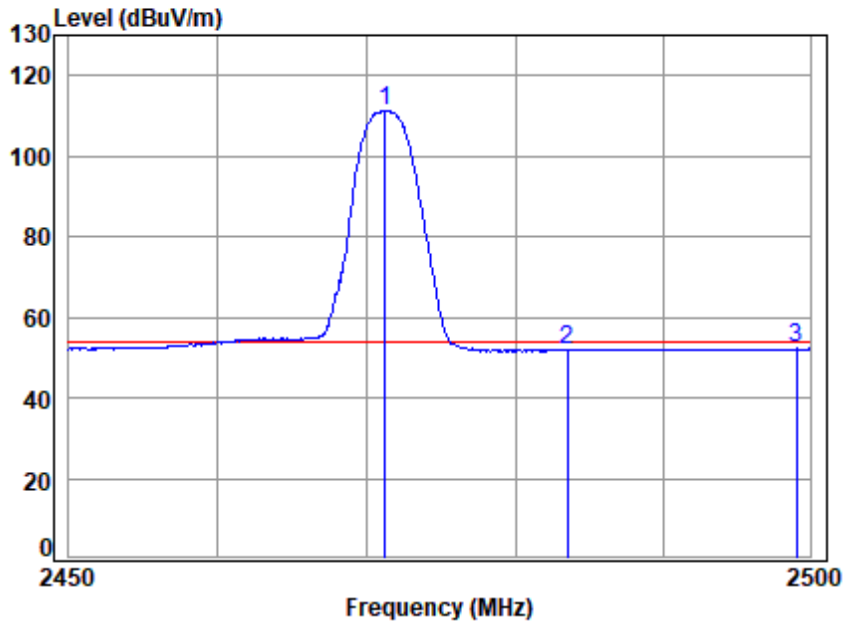


Site : chamber
Condition: 3m VERTICAL
Job No : 03204AT/03205AT
Mode : 2471.2 Band edge
Note : 3M

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2471.20	5.15	28.90	37.24	122.47	119.28	74.00	45.28 Peak
2	2483.50	5.16	28.90	37.22	62.65	59.49	74.00	-14.51 Peak
3	2494.70	5.17	28.90	37.19	66.32	63.20	74.00	-10.80 Peak



Test Mode: 03; Polarity: Vertical; Modulation: OFDM; Channel: High



Site : chamber
Condition: 3m VERTICAL
Job No : 03204AT/03205AT
Mode : 2471.2 Band edge
Note : 3M

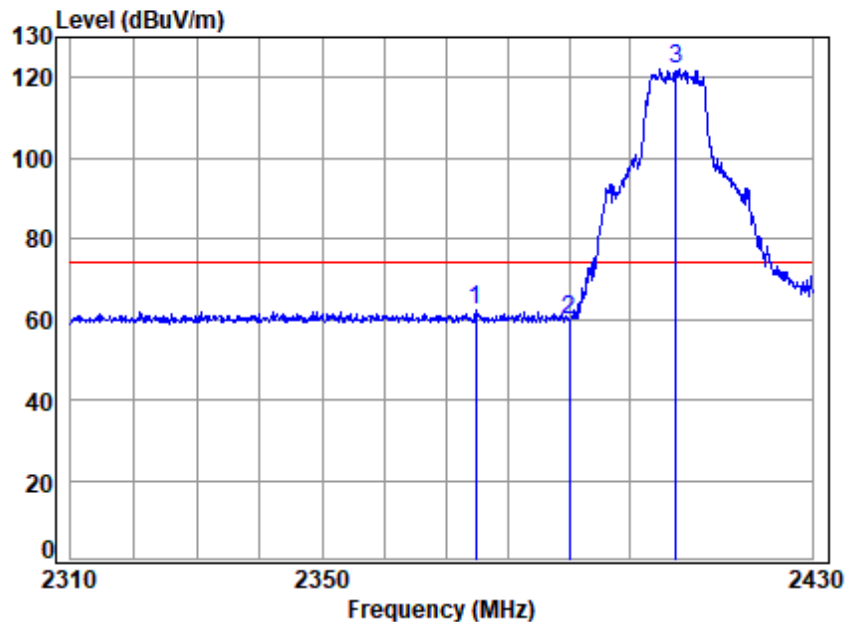
		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2471.20	5.15	28.90	37.24	114.39	111.20	54.00	57.20 Average
2	2483.50	5.16	28.90	37.22	54.92	51.76	54.00	-2.24 Average
3	2499.09	5.17	28.90	37.18	55.27	52.16	54.00	-1.84 Average



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Test Mode: 05; Polarity: Horizontal; Modulation: OFDM; Channel: Low

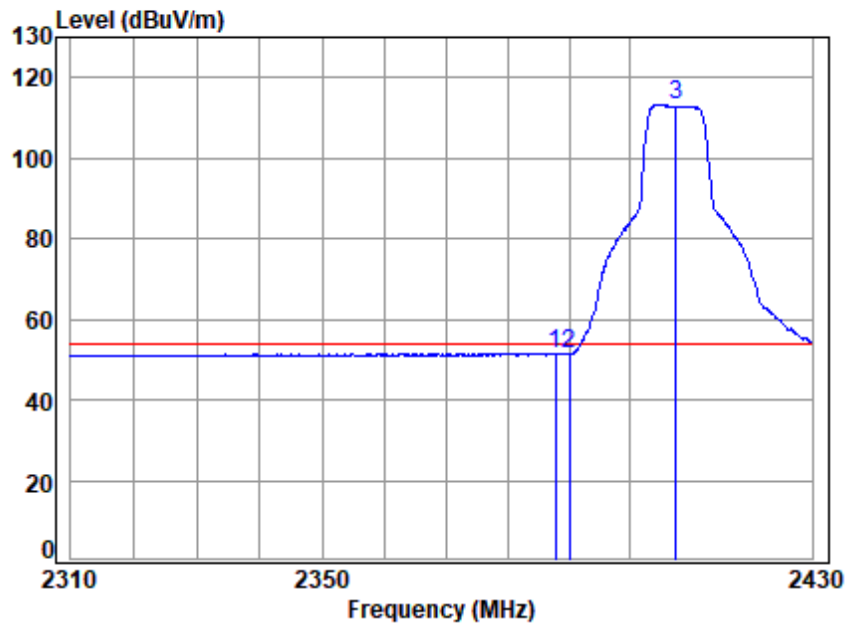


Site : chamber
Condition: 3m HORIZONTAL
Job No : 03204AT/03205AT
Mode : 2407.5 Band edge
Note : 10M

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2374.77	5.06	29.10	37.47	65.46	62.15	74.00	-11.85 peak
2	2390.00	5.08	29.10	37.44	63.30	60.04	74.00	-13.96 peak
3	2407.50	5.09	29.07	37.39	125.11	121.88	74.00	47.88 peak



Test Mode: 05; Polarity: Horizontal; Modulation: OFDM; Channel: Low

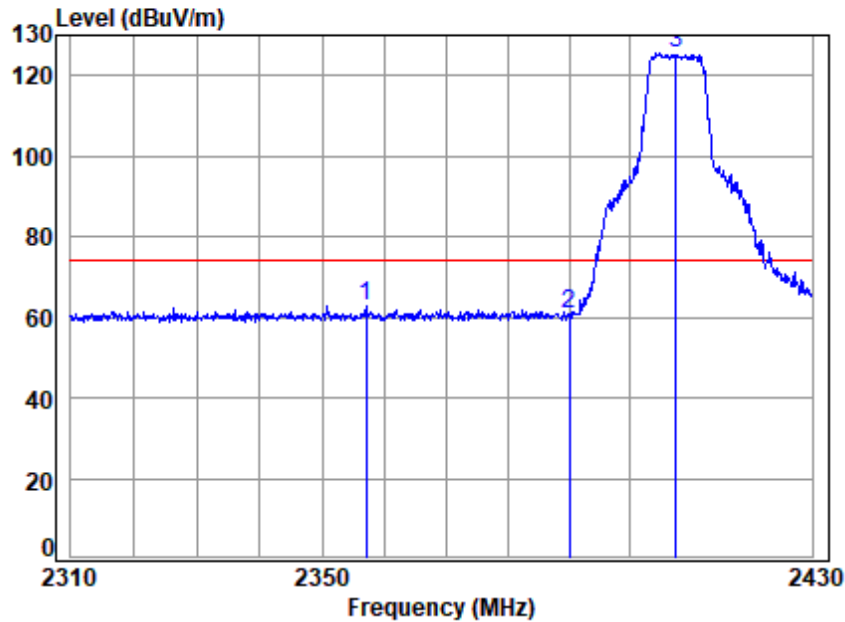


Site : chamber
Condition: 3m HORIZONTAL
Job No : 03204AT/03205AT
Mode : 2407.5 Band edge
Note : 10M

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dB	
1	2387.79	5.07	29.10	37.44	54.75	51.48	54.00	-2.52 Average
2	2390.00	5.08	29.10	37.44	54.50	51.24	54.00	-2.76 Average
3	2407.50	5.09	29.07	37.39	116.64	113.41	54.00	59.41 Average



Test Mode: 05; Polarity: Vertical; Modulation: OFDM; Channel: Low

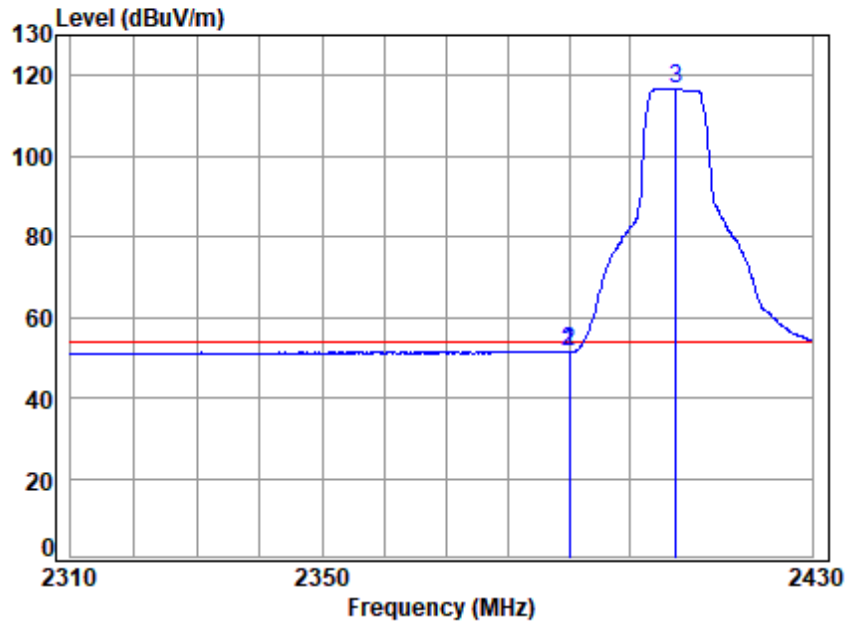


Site : chamber
Condition: 3m VERTICAL
Job No : 03204AT/03205AT
Mode : 2407.5 Band edge
Note : 10M

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2357.03	5.04	29.10	37.51	66.20	62.83	74.00	-11.17 Peak
2	2390.00	5.08	29.10	37.44	63.83	60.57	74.00	-13.43 Peak
3	2407.50	5.09	29.07	37.39	128.58	125.35	74.00	51.35 Peak



Test Mode: 01; Polarity: Vertical; Modulation: OFDM; Channel: Low

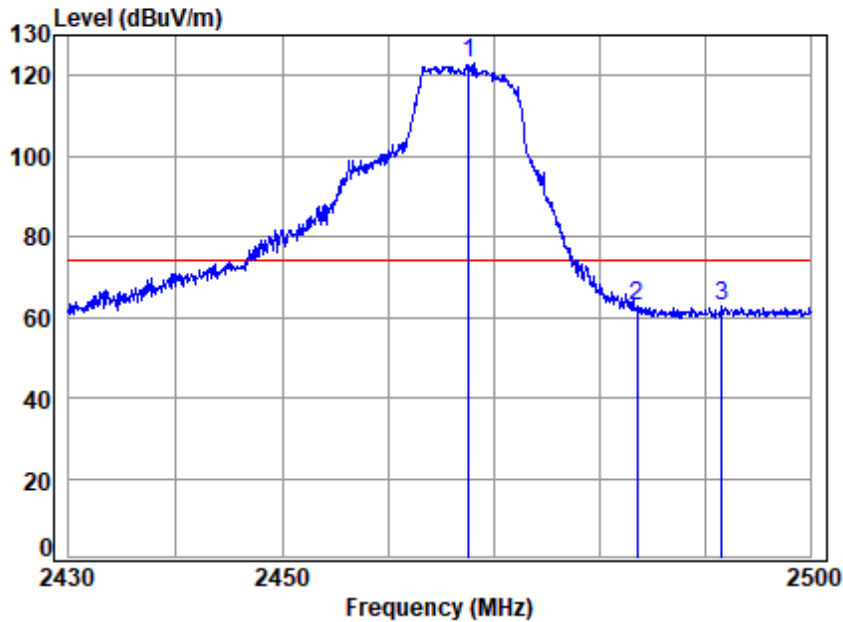


Site : chamber
Condition: 3m VERTICAL
Job No : 03204AT/03205AT
Mode : 2407.5 Band edge
Note : 10M

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2389.97	5.08	29.10	37.44	54.77	51.51	54.00	-2.49 Average
2	2390.00	5.08	29.10	37.44	54.77	51.51	54.00	-2.49 Average
3	2407.50	5.09	29.07	37.39	119.92	116.69	54.00	62.69 Average



Test Mode: 05; Polarity: Horizontal; Modulation: OFDM; Channel: High



Site : chamber
Condition: 3m HORIZONTAL
Job No : 03204AT/03205AT
Mode : 2467.5 Band edge
Note : 10M

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2467.50	5.15	28.90	37.25	126.17	122.97	74.00	48.97 peak
2	2483.50	5.16	28.90	37.22	65.79	62.63	74.00	-11.37 peak
3	2491.57	5.17	28.90	37.20	66.07	62.94	74.00	-11.06 peak



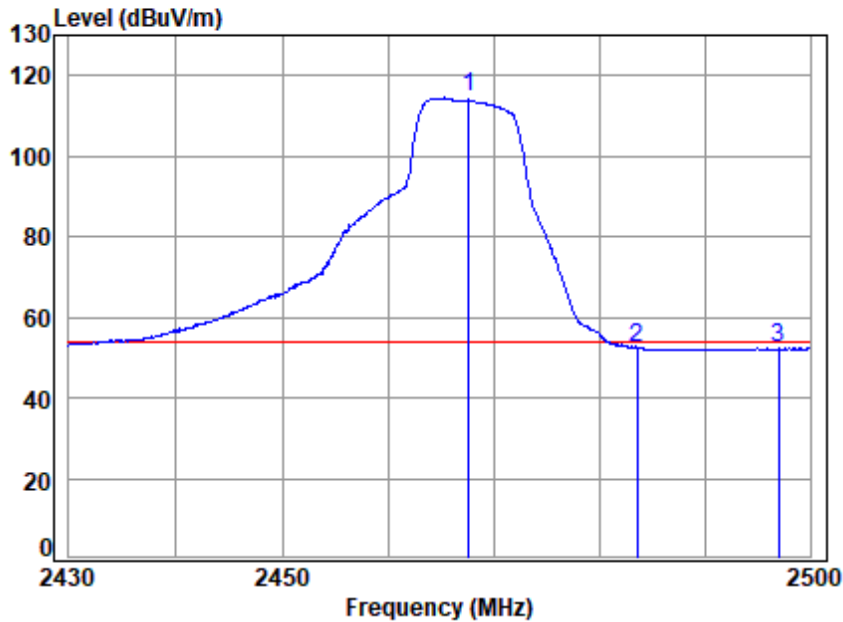
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Test Mode: 05; Polarity: Horizontal; Modulation: OFDM; Channel: High

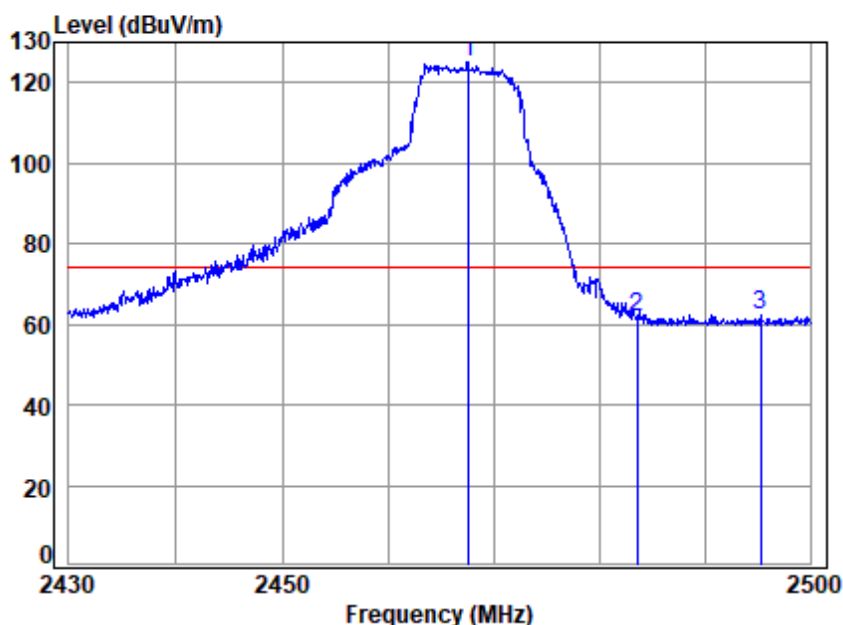


Site : chamber
Condition: 3m HORIZONTAL
Job No : 03204AT/03205AT
Mode : 2467.5 Band edge
Note : 10M

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2467.50	5.15	28.90	37.25	117.69	114.49	54.00	60.49 Average
2	2483.50	5.16	28.90	37.22	55.53	52.37	54.00	-1.63 Average
3	2497.02	5.17	28.90	37.19	55.41	52.29	54.00	-1.71 Average



Test Mode: 05; Polarity: Vertical; Modulation: OFDM; Channel: High



Site : chamber
Condition: 3m VERTICAL
Job No : 03204AT/03205AT
Mode : 2467.5 Band edge
Note : 10M

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2467.50	5.15	28.90	37.25	128.42	125.22	74.00	51.22 Peak
2	2483.50	5.16	28.90	37.22	64.92	61.76	74.00	-12.24 Peak
3	2495.25	5.17	28.90	37.19	65.56	62.44	74.00	-11.56 Peak



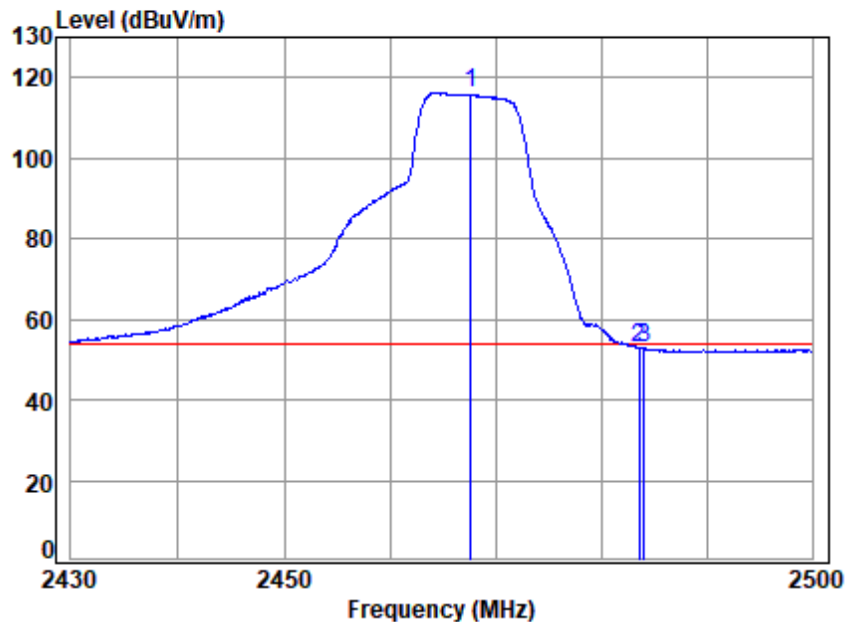
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Test Mode: 05; Polarity: Vertical; Modulation: OFDM; Channel: High

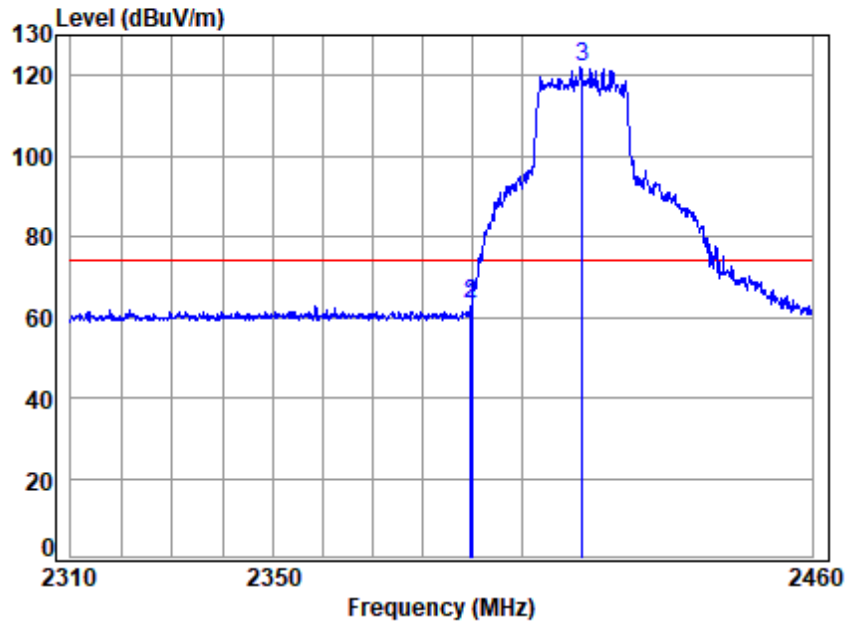


Site : chamber
Condition: 3m VERTICAL
Job No : 03204AT/03205AT
Mode : 2467.5 Band edge
Note : 10M

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Line	Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dB	
1	2467.50	5.15	28.90	37.25	119.29	116.09	54.00	62.09 Average
2	2483.50	5.16	28.90	37.22	56.04	52.88	54.00	-1.12 Average
3	2484.01	5.16	28.90	37.22	55.96	52.80	54.00	-1.20 Average



Test Mode: 07; Polarity: Horizontal; Modulation: OFDM; Channel: Low



Site : chamber
Condition: 3m HORIZONTAL
Job No : 03204AT/03205AT
Mode : 2412.5 Band edge
Note : 20M

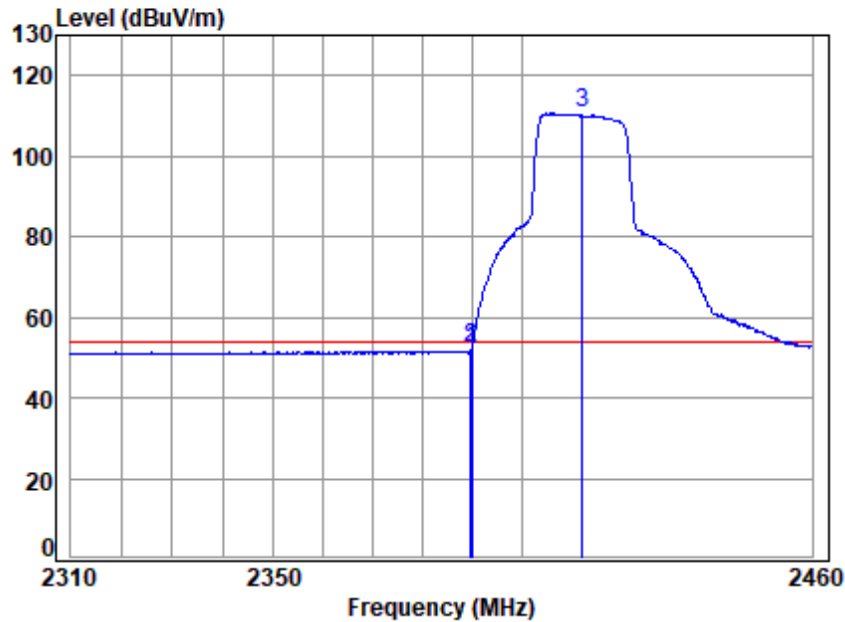
		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2389.68	5.08	29.10	37.44	66.16	62.90	74.00	-11.10 peak
2	2390.00	5.08	29.10	37.44	66.29	63.03	74.00	-10.97 peak
3	2412.50	5.10	29.05	37.38	125.08	121.85	74.00	47.85 peak



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Test Mode: 07; Polarity: Horizontal; Modulation: OFDM; Channel: Low

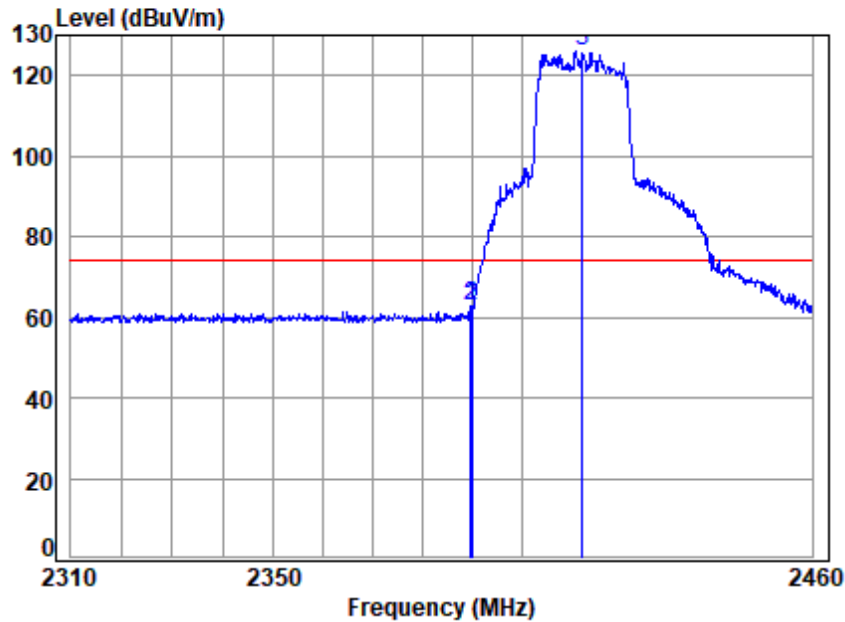


Site : chamber
Condition: 3m HORIZONTAL
Job No : 03204AT/03205AT
Mode : 2412.5 Band edge
Note : 20M

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2389.83	5.08	29.10	37.44	55.14	51.88	54.00	-2.12 Average
2	2390.00	5.08	29.10	37.44	55.84	52.58	54.00	-1.42 Average
3	2412.50	5.10	29.05	37.38	113.76	110.53	54.00	56.53 Average



Test Mode: 07; Polarity: Vertical; Modulation: OFDM; Channel: Low

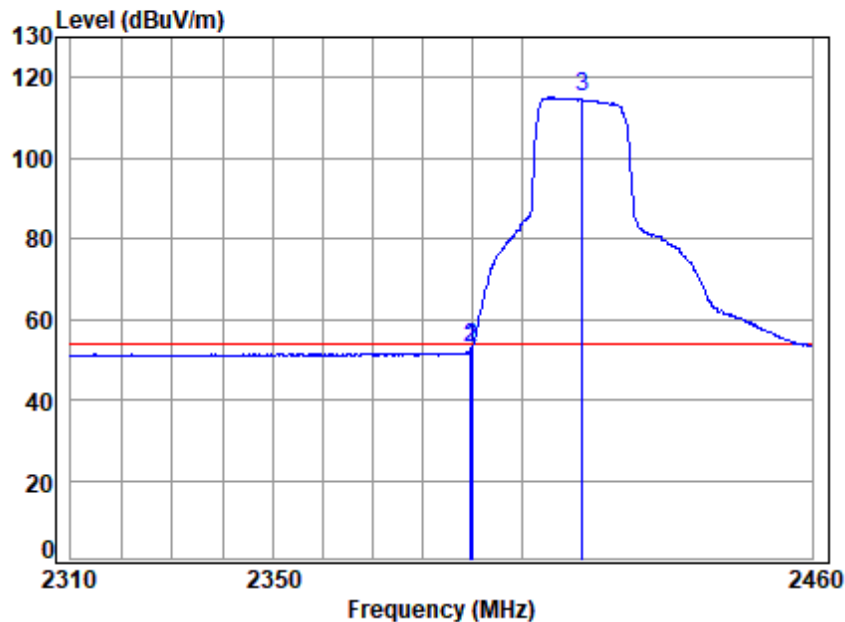


Site : chamber
Condition: 3m VERTICAL
Job No : 03204AT/03205AT
Mode : 2412.5 Band edge
Note : 20M

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2389.83	5.08	29.10	37.44	66.19	62.93	74.00	-11.07 Peak
2	2390.00	5.08	29.10	37.44	66.20	62.94	74.00	-11.06 Peak
3	2412.50	5.10	29.05	37.38	129.14	125.91	74.00	51.91 Peak



Test Mode: 07; Polarity: Vertical; Modulation: OFDM; Channel: Low

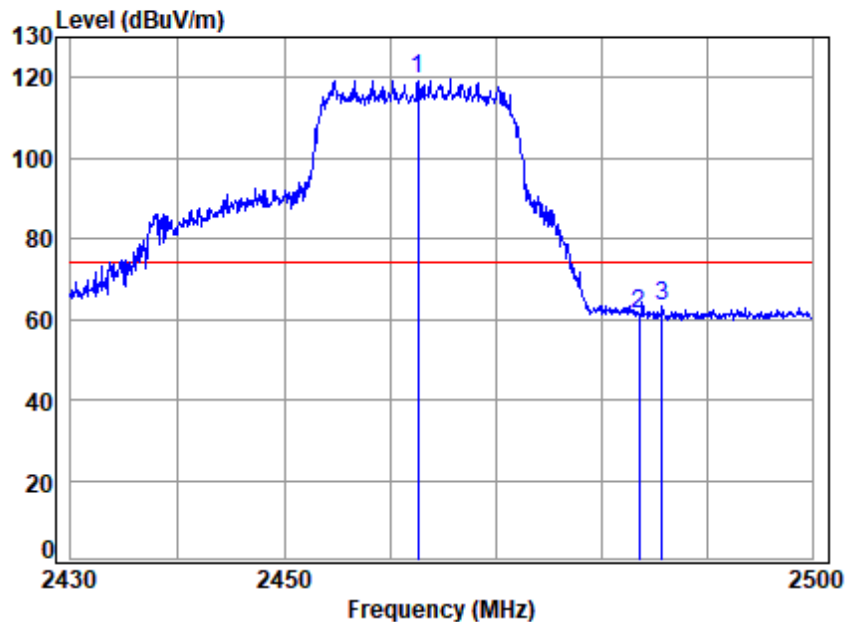


Site : chamber
Condition: 3m VERTICAL
Job No : 03204AT/03205AT
Mode : 2412.5 Band edge
Note : 20M

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2389.83	5.08	29.10	37.44	56.02	52.76	54.00	-1.24 Average
2	2390.00	5.08	29.10	37.44	56.19	52.93	54.00	-1.07 Average
3	2412.50	5.10	29.05	37.38	118.24	115.01	54.00	61.01 Average



Test Mode: 07; Polarity: Horizontal; Modulation: OFDM; Channel: High



Site : chamber
Condition: 3m HORIZONTAL
Job No : 03204AT/03205AT
Mode : 2462.5 Band edge
Note : 20M

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2462.50	5.14	28.90	37.26	122.60	119.38	74.00	45.38 peak
2	2483.50	5.16	28.90	37.22	64.39	61.23	74.00	-12.77 peak
3	2485.63	5.16	28.90	37.21	66.45	63.30	74.00	-10.70 peak



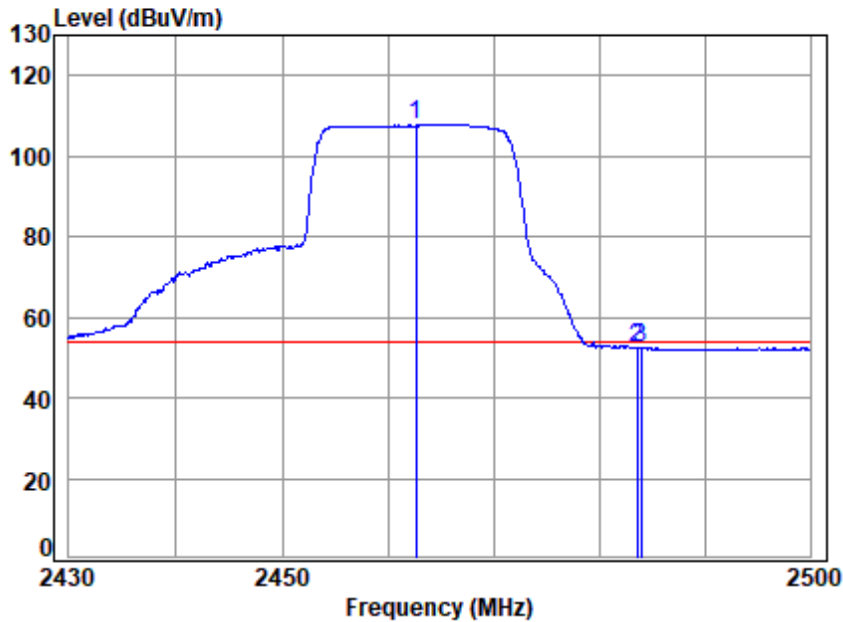
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Test Mode: 07; Polarity: Horizontal; Modulation: OFDM; Channel: High

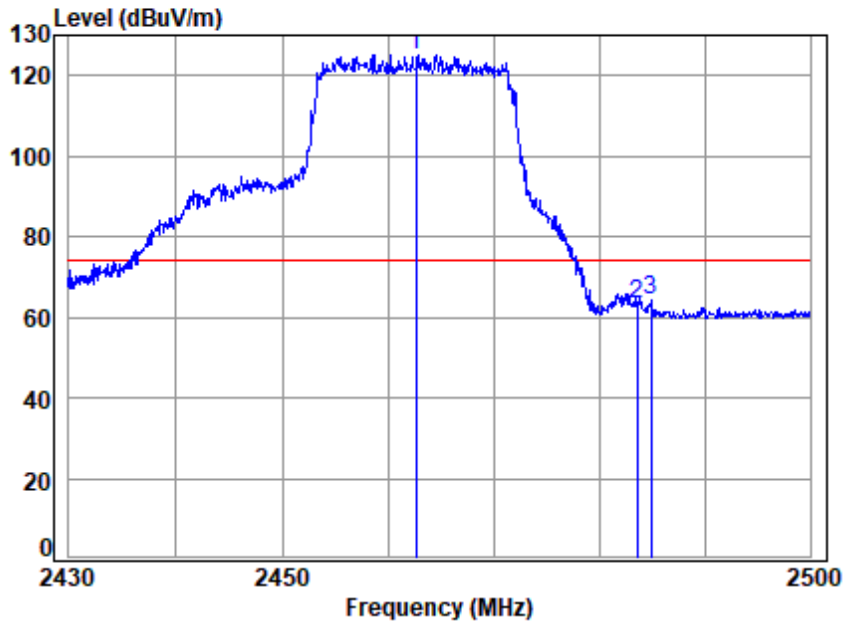


Site : chamber
Condition: 3m HORIZONTAL
Job No : 03204AT/03205AT
Mode : 2462.5 Band edge
Note : 20M

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2462.50	5.14	28.90	37.26	111.11	107.89	54.00	53.89 Average
2	2483.50	5.16	28.90	37.22	55.50	52.34	54.00	-1.66 Average
3	2483.87	5.16	28.90	37.22	55.59	52.43	54.00	-1.57 Average



Test Mode: 07; Polarity: Vertical; Modulation: OFDM; Channel: High

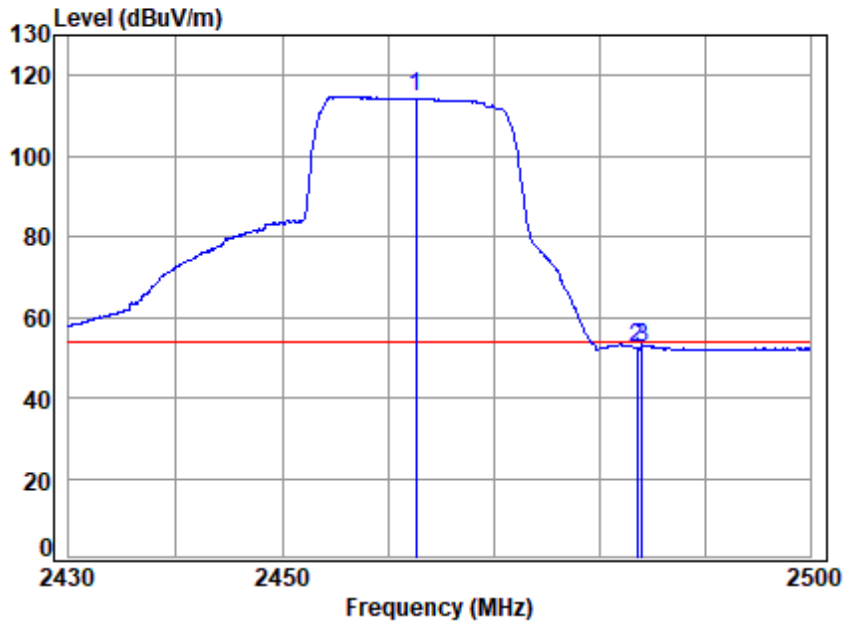


Site : chamber
Condition: 3m VERTICAL
Job No : 03204AT/03205AT
Mode : 2462.5 Band edge
Note : 20M

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2462.50	5.14	28.90	37.26	128.48	125.26	74.00	51.26 Peak
2	2483.50	5.16	28.90	37.22	66.51	63.35	74.00	-10.65 Peak
3	2484.78	5.16	28.90	37.21	67.35	64.20	74.00	-9.80 Peak



Test Mode: 07; Polarity: Vertical; Modulation: OFDM; Channel: High



Site : chamber
Condition: 3m VERTICAL
Job No : 03204AT/03205AT
Mode : 2462.5 Band edge
Note : 20M

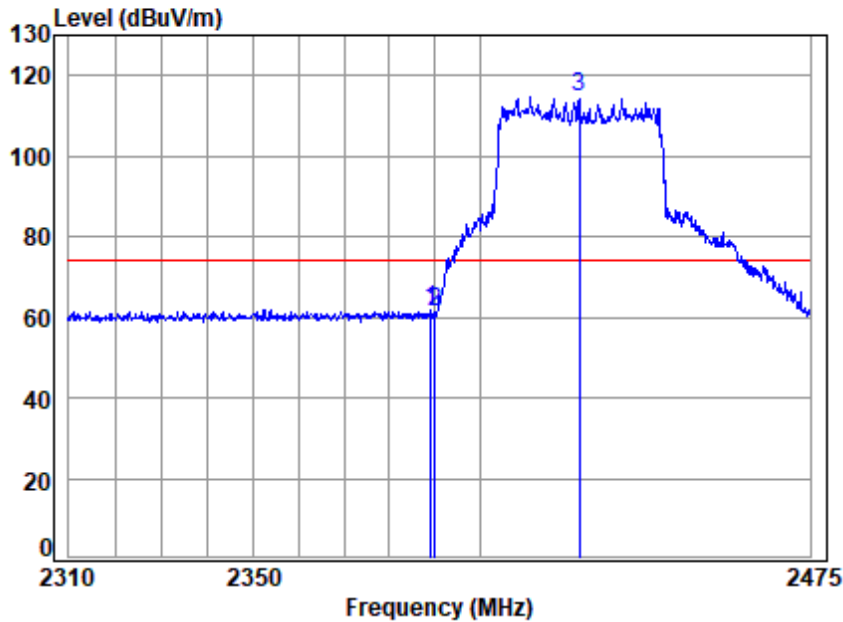
		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2462.50	5.14	28.90	37.26	117.97	114.75	54.00	60.75 Average
2	2483.50	5.16	28.90	37.22	55.66	52.50	54.00	-1.50 Average
3	2483.94	5.16	28.90	37.22	55.35	52.19	54.00	-1.81 Average



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Test Mode: 09; Polarity: Horizontal; Modulation: OFDM; Channel: Low

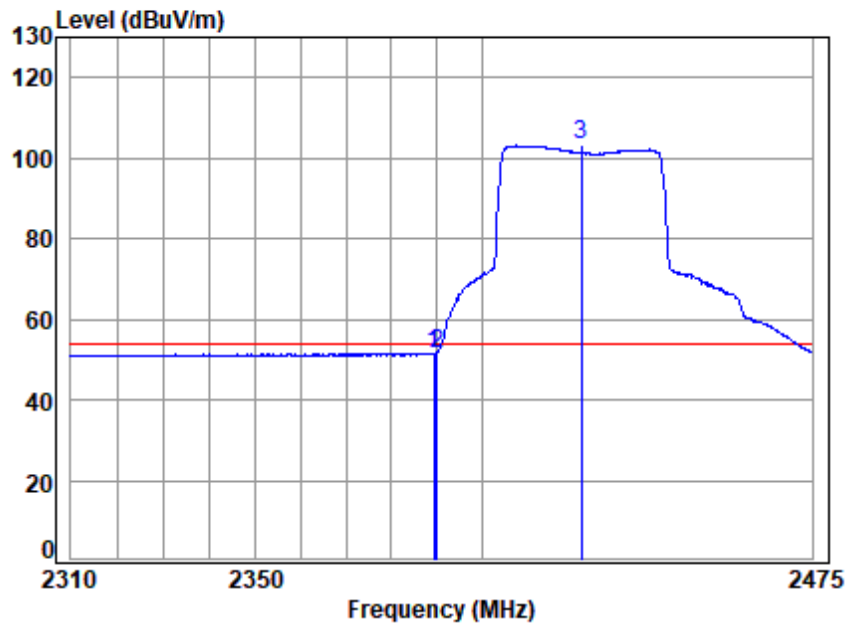


Site : chamber
Condition: 3m HORIZONTAL
Job No : 03204AT/03205AT
Mode : 2422.5 Band edge
Note : 40M

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2389.26	5.07	29.10	37.44	65.08	61.81	74.00	-12.19 peak
2	2390.00	5.08	29.10	37.44	64.50	61.24	74.00	-12.76 peak
3	2422.50	5.11	29.01	37.36	117.73	114.49	74.00	40.49 peak



Test Mode: 09; Polarity: Horizontal; Modulation: OFDM; Channel: Low



Site : chamber
Condition: 3m HORIZONTAL
Job No : 03204AT/03205AT
Mode : 2422.5 Band edge
Note : 40M

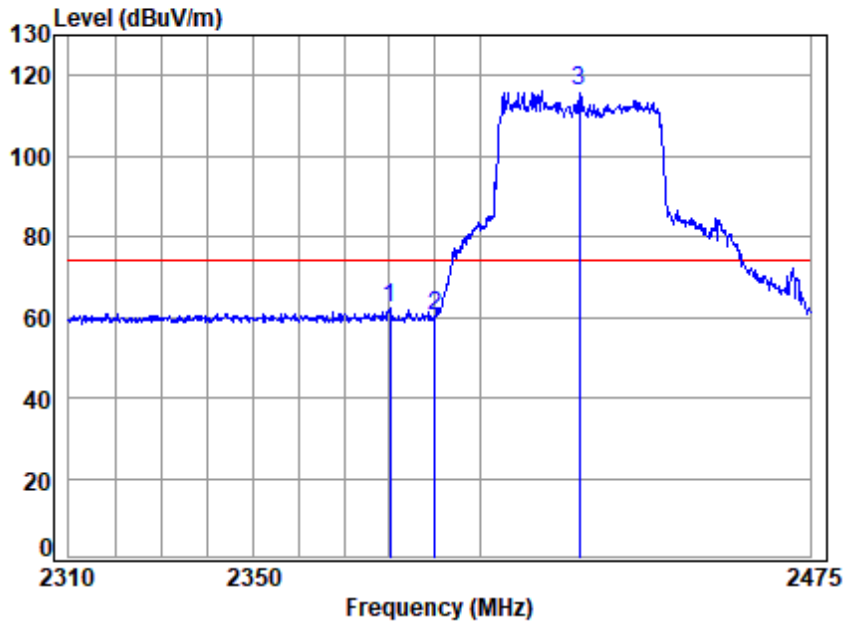
		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2389.43	5.07	29.10	37.44	54.77	51.50	54.00	-2.50 Average
2	2390.00	5.08	29.10	37.44	54.70	51.44	54.00	-2.56 Average
3	2422.50	5.11	29.01	37.36	106.40	103.16	54.00	49.16 Average



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Test Mode: 09; Polarity: Vertical; Modulation: OFDM; Channel: Low

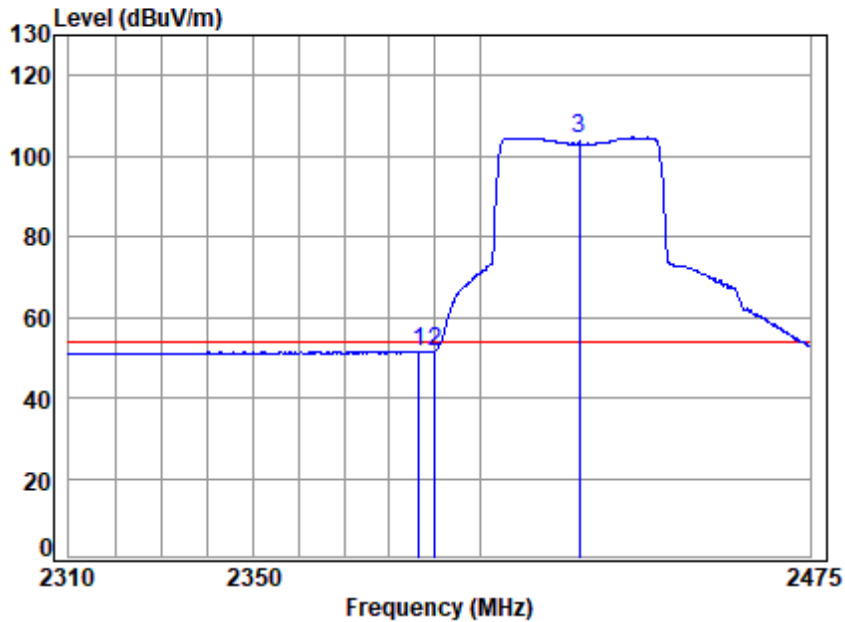


Site : chamber
Condition: 3m VERTICAL
Job No : 03204AT/03205AT
Mode : 2422.5 Band edge
Note : 40M

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2380.05	5.07	29.10	37.46	65.44	62.15	74.00	-11.85 Peak
2	2390.00	5.08	29.10	37.44	63.53	60.27	74.00	-13.73 Peak
3	2422.50	5.11	29.01	37.36	119.33	116.09	74.00	42.09 Peak



Test Mode: 09; Polarity: Vertical; Modulation: OFDM; Channel: Low

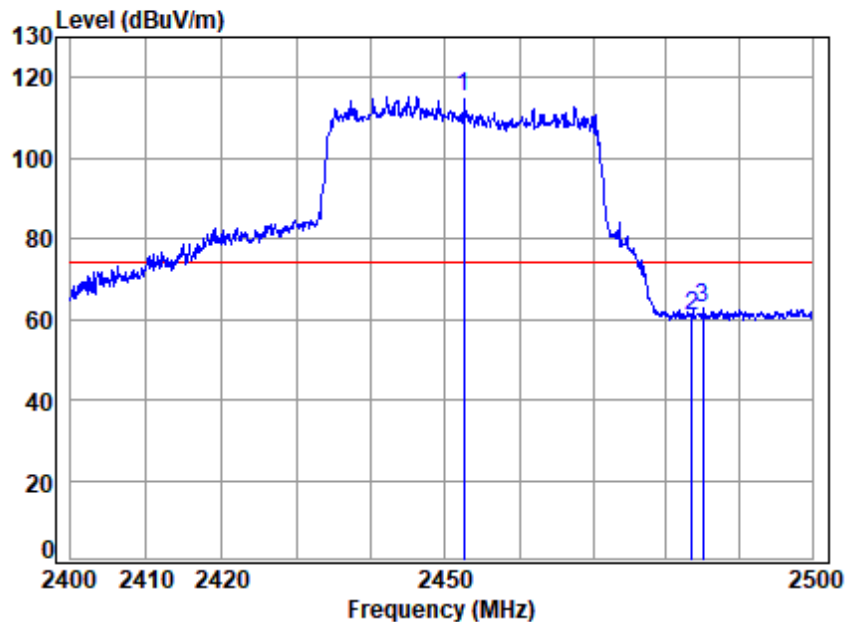


Site : chamber
Condition: 3m VERTICAL
Job No : 03204AT/03205AT
Mode : 2422.5 Band edge
Note : 40M

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2386.63	5.07	29.10	37.44	54.74	51.47	54.00	-2.53 Average
2	2390.00	5.08	29.10	37.44	54.67	51.41	54.00	-2.59 Average
3	2422.50	5.11	29.01	37.36	107.64	104.40	54.00	50.40 Average



Test Mode: 09; Polarity: Horizontal; Modulation: OFDM; Channel: High

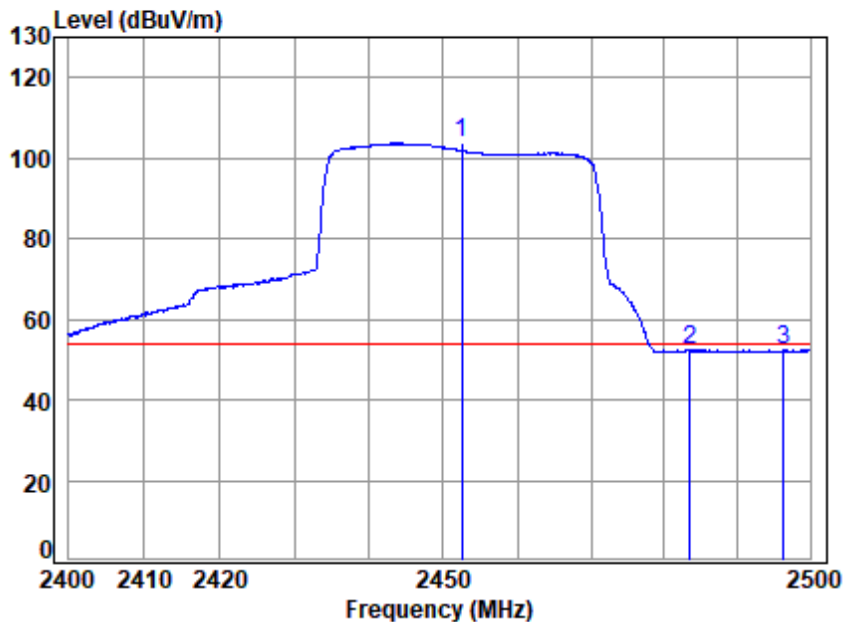


Site : chamber
Condition: 3m HORIZONTAL
Job No : 03204AT/03205AT
Mode : 2452.5 Band edge
Note : 40M

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2452.50	5.13	28.90	37.29	118.56	115.30	74.00	41.30 peak
2	2483.50	5.16	28.90	37.22	64.14	60.98	74.00	-13.02 peak
3	2485.04	5.16	28.90	37.21	66.08	62.93	74.00	-11.07 peak



Test Mode: 09; Polarity: Horizontal; Modulation: OFDM; Channel: High

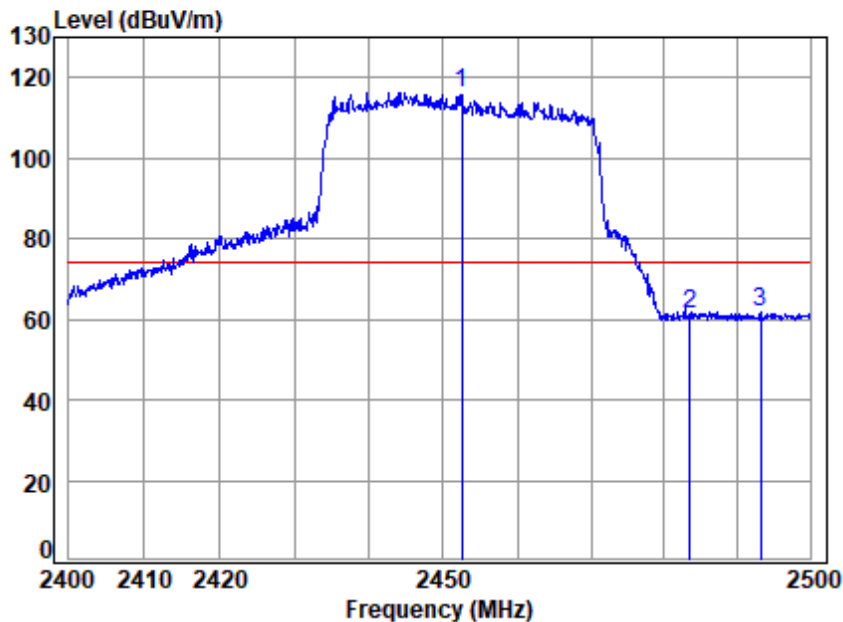


Site : chamber
Condition: 3m HORIZONTAL
Job No : 03204AT/03205AT
Mode : 2452.5 Band edge
Note : 40M

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2452.50	5.13	28.90	37.29	106.90	103.64	54.00	49.64 Average
2	2483.50	5.16	28.90	37.22	55.34	52.18	54.00	-1.82 Average
3	2496.33	5.17	28.90	37.19	55.40	52.28	54.00	-1.72 Average



Test Mode: 09; Polarity: Vertical; Modulation: OFDM; Channel: High



Site : chamber
Condition: 3m VERTICAL
Job No : 03204AT/03205AT
Mode : 2452.5 Band edge
Note : 40M

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2452.50	5.13	28.90	37.29	119.65	116.39	74.00	42.39 Peak
2	2483.50	5.16	28.90	37.22	64.49	61.33	74.00	-12.67 Peak
3	2493.17	5.17	28.90	37.19	65.06	61.94	74.00	-12.06 Peak



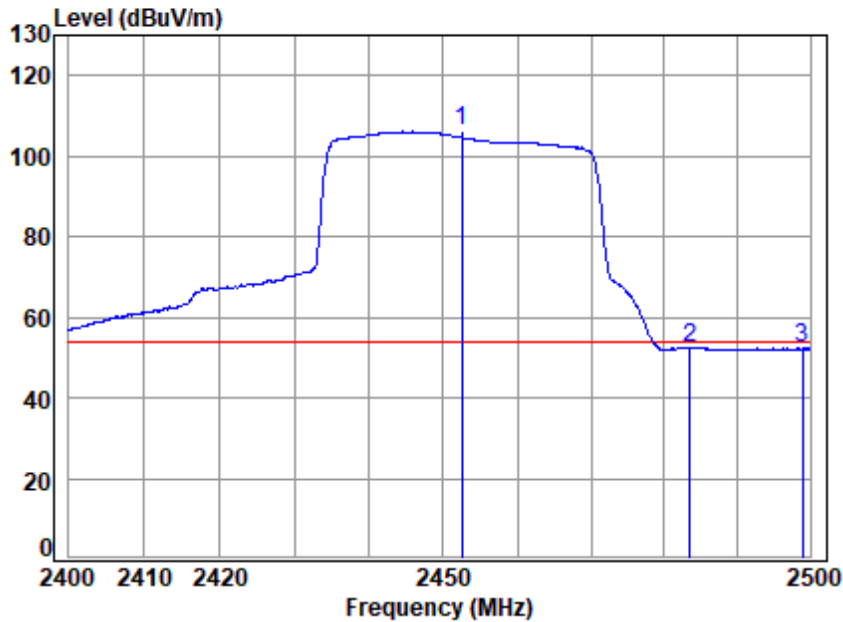
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Test Mode: 09; Polarity: Vertical; Modulation: OFDM; Channel: High



Site : chamber
Condition: 3m VERTICAL
Job No : 03204AT/03205AT
Mode : 2452.5 Band edge
Note : 40M

		Cable	Ant	Preamp	Read	Limit	Over	
	Freq	Loss	Factor	Factor	Level	Level	Line	Limit Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	2452.50	5.13	28.90	37.29	109.34	106.08	54.00	52.08 Average
2	2483.50	5.16	28.90	37.22	55.32	52.16	54.00	-1.84 Average
3	2498.98	5.17	28.90	37.18	55.48	52.37	54.00	-1.63 Average



7.8 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

7.8.1 E.U.T. Operation

Operating Environment:

Temperature: 23.2 °C

Humidity: 45.8 % RH

Atmospheric Pressure: 1000 mbar

7.8.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Pre-scan	00	TX mode(2.4G SDR 1.4MHz)_Keep the EUT in continuously transmitting mode.
Pre-scan	01	Charge + TX mode(2.4G SDR 1.4MHz)_Keep the EUT in charging and continuously transmitting mode.
Pre-scan	02	TX mode(2.4G SDR 3MHz)_Keep the EUT in continuously transmitting mode.
Pre-scan	03	Charge + TX mode(2.4G SDR 3MHz)_Keep the EUT in charging and continuously transmitting mode.
Pre-scan	04	TX mode(2.4G SDR 10MHz)_Keep the EUT in continuously transmitting mode.
Final test	05	Charge + TX mode(2.4G SDR 10MHz)_Keep the EUT in charging and continuously transmitting mode.
Pre-scan	06	TX mode(2.4G SDR 20MHz)_Keep the EUT in continuously transmitting mode.
Pre-scan	07	Charge + TX mode(2.4G SDR 20MHz)_Keep the EUT in charging and continuously transmitting mode.
Pre-scan	08	TX mode(2.4G SDR 40MHz)_Keep the EUT in continuously transmitting mode.
Pre-scan	09	Charge + TX mode(2.4G SDR 40MHz)_Keep the EUT in charging and continuously transmitting mode.



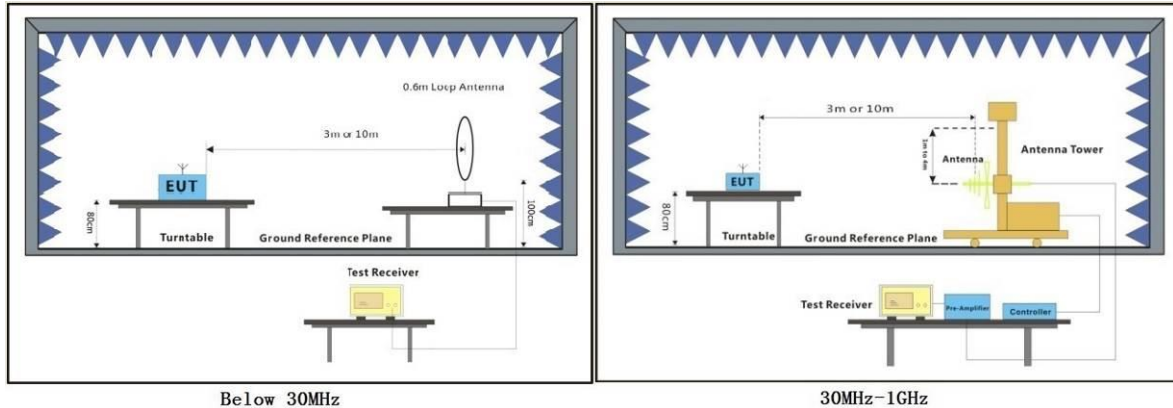
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7.8.3 Test Setup Diagram



7.8.4 Measurement Procedure and Data

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

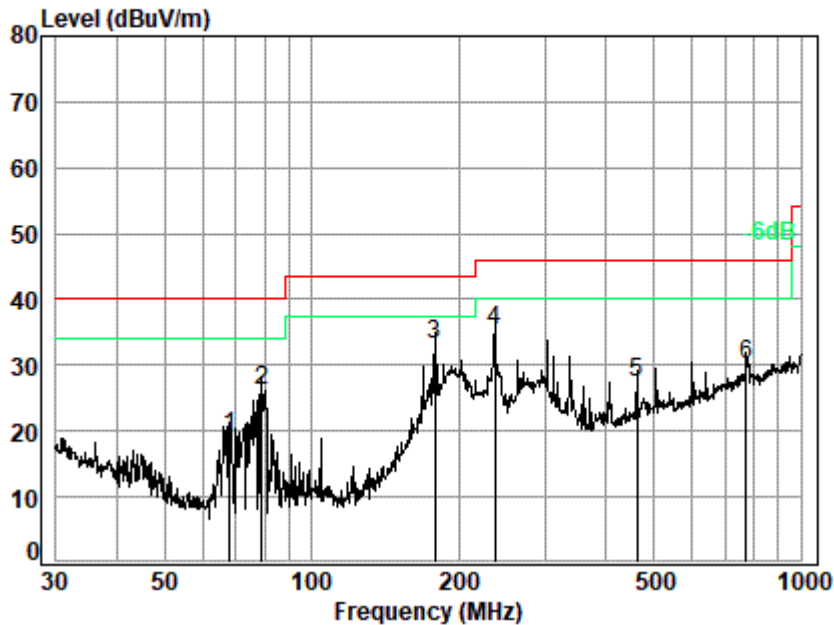
Remark:

- Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor
- 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.
- The disturbance below 1GHz was very low and the harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.
- 10MHz mode is the worst-case, only the worst-case test data were recorded in this report.

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Test Mode: 05; Polarity: Horizontal; Modulation: OFDM; Channel: Middle

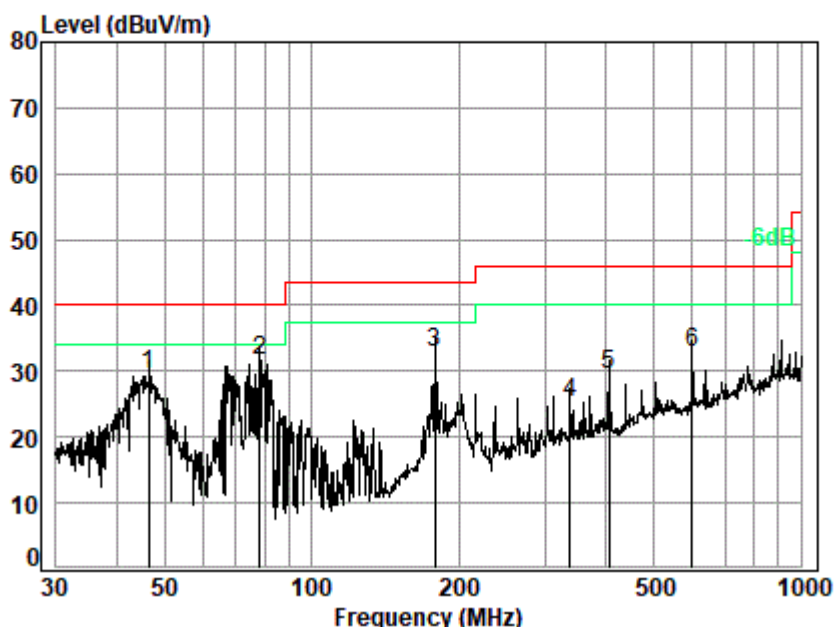


Site : chamber
Condition: 3m HORIZONTAL
Job No. : 03204AT
Test Mode: 05

	Ant Freq	Cable Factor	Preamp Loss	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dB	dB	dBuV	dBuV/m	dBuV/m	dB
1	67.91	10.73	0.98	27.70	35.28	19.29	40.00	-20.71 QP
2	78.97	10.42	1.05	27.67	42.36	26.16	40.00	-13.84 QP
3 q	178.76	14.04	1.62	27.33	44.71	33.04	43.50	-10.46 QP
4	236.64	17.13	1.89	27.12	43.29	35.19	46.00	-10.81 QP
5	462.35	21.55	2.76	27.62	30.54	27.23	46.00	-18.77 QP
6	774.16	26.81	3.75	27.69	27.22	30.09	46.00	-15.91 QP



Test Mode: 05; Polarity: Vertical; Modulation: OFDM; Channel: Middle



Site : chamber
Condition: 3m VERTICAL
Job No. : 03204AT
Test Mode: 05

	Ant Freq	Cable Factor	Preamp Loss	Read Level	Limit Level	Over Line	Remark
	MHz	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	46.50	13.79	0.80	27.76	42.74	29.57	40.00 -10.43 QP
2 q	78.41	10.40	1.05	27.67	47.73	31.51	40.00 -8.49 QP
3	178.76	14.04	1.62	27.33	44.54	32.87	43.50 -10.63 QP
4	337.22	18.90	2.31	27.06	31.11	25.26	46.00 -20.74 QP
5	404.67	20.54	2.57	27.36	33.90	29.65	46.00 -16.35 QP
6	599.32	24.42	3.21	28.23	33.35	32.75	46.00 -13.25 QP



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7.9 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

7.9.1 E.U.T. Operation

Operating Environment:

Temperature: 22.3 °C

Humidity: 52.6 % RH

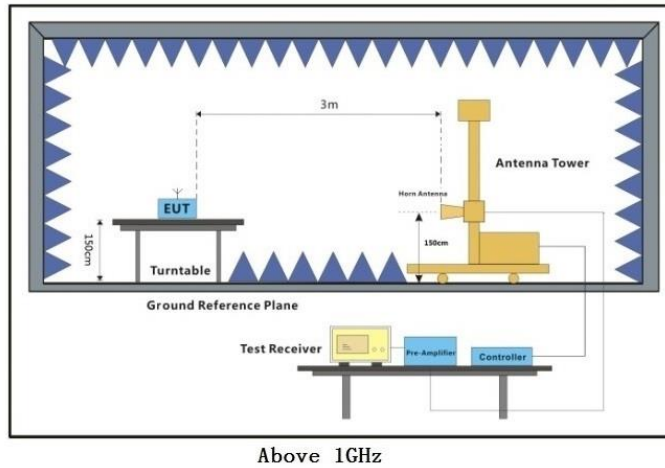
Atmospheric Pressure: 1000 mbar

7.9.2 Test Mode Description

Pre-scan / Final test	Mode Code	Description
Pre-scan	00	TX mode(2.4G SDR 1.4MHz)_Keep the EUT in continuously transmitting mode.
Pre-scan	01	Charge + TX mode(2.4G SDR 1.4MHz)_Keep the EUT in charging and continuously transmitting mode.
Pre-scan	02	TX mode(2.4G SDR 3MHz)_Keep the EUT in continuously transmitting mode.
Pre-scan	03	Charge + TX mode(2.4G SDR 3MHz)_Keep the EUT in charging and continuously transmitting mode.
Pre-scan	04	TX mode(2.4G SDR 10MHz)_Keep the EUT in continuously transmitting mode.
Final test	05	Charge + TX mode(2.4G SDR 10MHz)_Keep the EUT in charging and continuously transmitting mode.
Pre-scan	06	TX mode(2.4G SDR 20MHz)_Keep the EUT in continuously transmitting mode.
Pre-scan	07	Charge + TX mode(2.4G SDR 20MHz)_Keep the EUT in charging and continuously transmitting mode.
Pre-scan	08	TX mode(2.4G SDR 40MHz)_Keep the EUT in continuously transmitting mode.
Pre-scan	09	Charge + TX mode(2.4G SDR 40MHz)_Keep the EUT in charging and continuously transmitting mode.



7.9.3 Test Setup Diagram



7.9.4 Measurement Procedure and Data

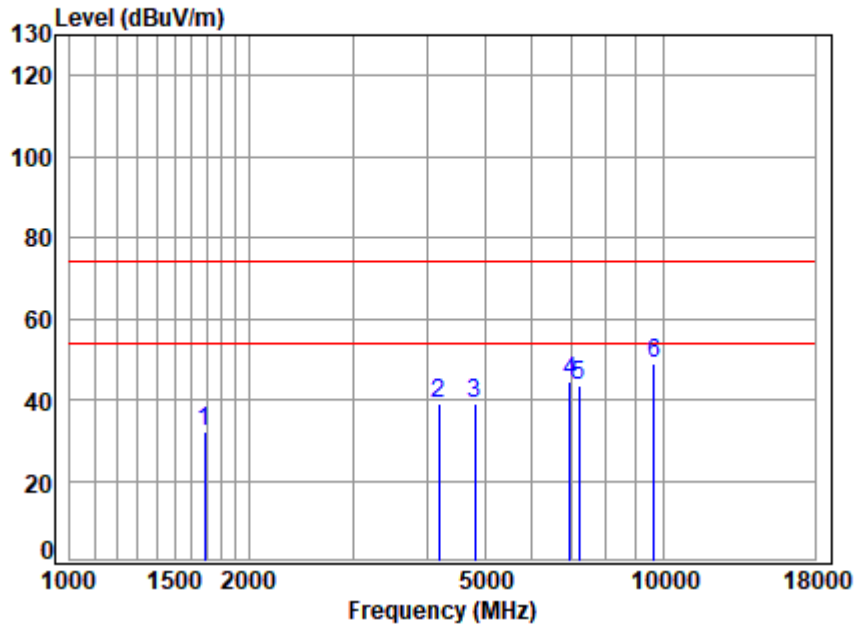
- a. For above 1GHz, the EUT was placed on the top of a rotating table 1.5 meters above the ground at a 3 meter fully-anechoic chamber. The table was rotated 360 degrees to determine the position of the highest radiation.
- b. The EUT was set 3 meters away from the interference-receiving antenna, which was mounted on the top of a variable-height antenna tower.
- c. The antenna height is varied from one meter to four meters above the ground to determine the maximum value of the field strength. Both horizontal and vertical polarizations of the antenna are set to make the measurement.
- d. For each suspected emission, the EUT was arranged to its worst case and then the antenna was tuned to heights from 1 meter to 4 meters (for the test frequency of below 30MHz, the antenna was tuned to heights 1 meter) and the rotatable table was turned from 0 degrees to 360 degrees to find the maximum reading.
- e. The test-receiver system was set to Peak Detect Function and Specified Bandwidth with Maximum Hold Mode.
- f. If the emission level of the EUT in peak mode was 10dB lower than the limit specified, then testing could be stopped and the peak values of the EUT would be reported. Otherwise the emissions that did not have 10dB margin would be re-tested one by one using peak or average method as specified and then reported in a data sheet.
- g. Test the EUT in the lowest channel, the middle channel, the Highest channel.
- h. The radiation measurements are performed in X, Y, Z axis positioning for Transmitting mode, and found the X axis positioning which it is the worst case.
- i. Repeat above procedures until all frequencies measured was complete.

Remark:

1. Level= Read Level+ Cable Loss+ Antenna Factor- Preamp Factor
2. Scan from 1GHz to 25GHz, the disturbance above 18GHz was very low. The points marked on above plots are the highest emissions could be found when testing, so only above points had been displayed. The amplitude of spurious emissions from the radiator which are attenuated more than 20dB below the limit need not be reported.
3. As shown in this section, for frequencies above 1GHz, the field strength limits are based on average limits. However, the peak field strength of any emission shall not exceed the maximum permitted average limits specified above by more than 20 dB under any condition of modulation. For the emissions whose peak level is lower than the average limit, only the peak measurement is shown in the report.
4. The disturbance above 18GHz were very low and the harmonics were the highest point could be found when testing, so only the above harmonics had been displayed.
5. 10MHz mode is the worst-case, only the worst-case test data were recorded in this report.



Test Mode: 05; Polarity: Horizontal; Modulation: OFDM; Channel: Low

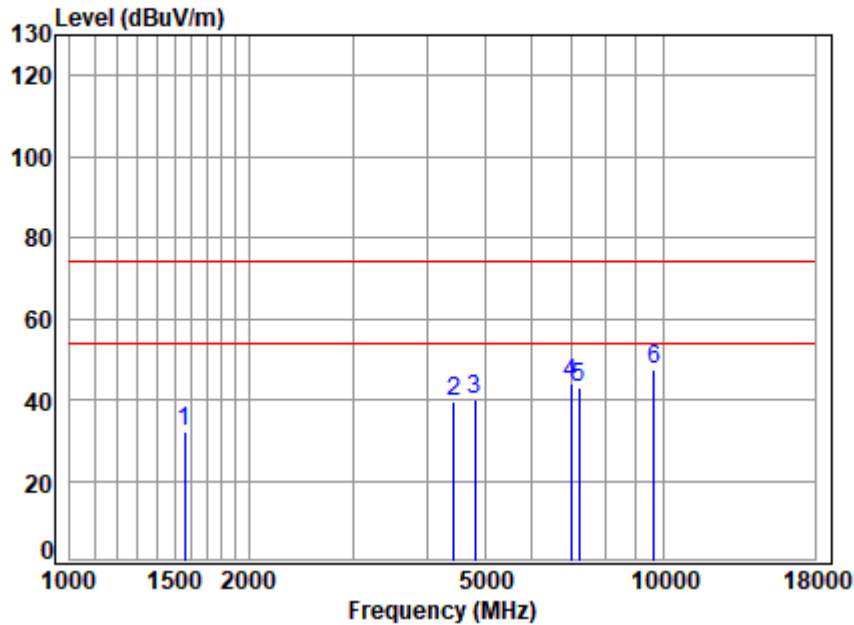


Site : chamber
 Condition: 3m HORIZONTAL
 Job No : 03204AT/03205AT
 Mode : 2407.5 TX RSE
 Note : 10M

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1687.35	4.31	26.23	38.41	40.04	32.17	74.00	-41.83	peak
2	4181.77	6.91	33.80	35.96	34.11	38.86	74.00	-35.14	peak
3	4815.00	7.32	34.36	35.51	32.67	38.84	74.00	-35.16	peak
4	6954.85	8.89	35.79	35.54	35.27	44.41	74.00	-29.59	peak
5	7222.50	9.20	35.70	35.80	34.51	43.61	74.00	-30.39	peak
6	9630.00	12.38	37.46	37.46	36.45	48.83	74.00	-25.17	peak



Test Mode: 05; Polarity: Vertical; Modulation: OFDM; Channel: Low

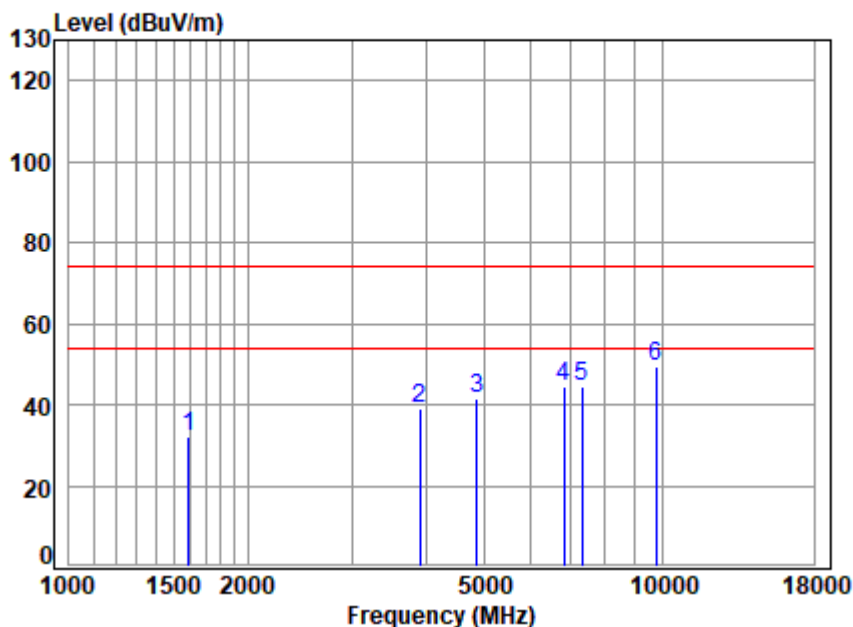


Site : chamber
Condition: 3m VERTICAL
Job No : 03204AT/03205AT
Mode : 2407.5 TX RSE
Note : 10M

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1560.67	4.15	26.96	38.40	39.45	32.16	74.00	-41.84	peak
2	4443.45	7.09	34.28	35.77	33.87	39.47	74.00	-34.53	peak
3	4815.00	7.32	34.36	35.51	33.79	39.96	74.00	-34.04	peak
4	6974.98	8.90	35.75	35.55	34.94	44.04	74.00	-29.96	peak
5	7222.50	9.20	35.70	35.80	33.89	42.99	74.00	-31.01	peak
6	9630.00	12.38	37.46	37.46	35.30	47.68	74.00	-26.32	peak



Test Mode: 05; Polarity: Horizontal; Modulation: OFDM; Channel: Middle

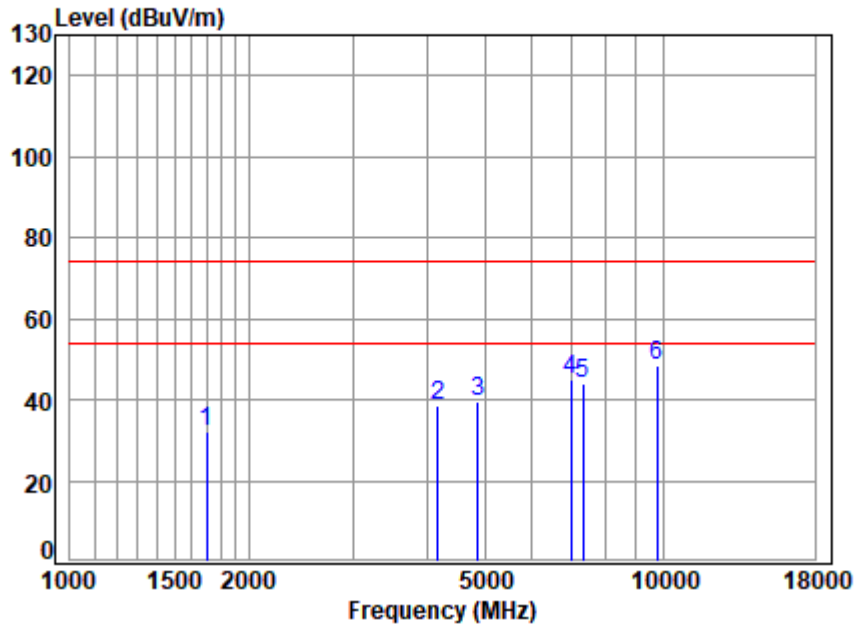


Site : chamber
 Condition: 3m HORIZONTAL
 Job No : 03204AT/03205AT
 Mode : 2437.5 TX RSE
 Note : 10M

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1592.57	4.19	26.83	38.40	39.72	32.34	74.00	-41.66	peak
2	3901.52	6.68	33.79	36.10	34.77	39.14	74.00	-34.86	peak
3	4875.00	7.36	34.60	35.47	35.25	41.74	74.00	-32.26	peak
4	6815.55	8.79	35.36	35.45	35.80	44.50	74.00	-29.50	peak
5	7312.50	9.31	35.70	35.89	35.47	44.59	74.00	-29.41	peak
6	9750.00	12.46	37.40	37.43	37.23	49.66	74.00	-24.34	peak



Test Mode: 05; Polarity: Vertical; Modulation: OFDM; Channel: Middle

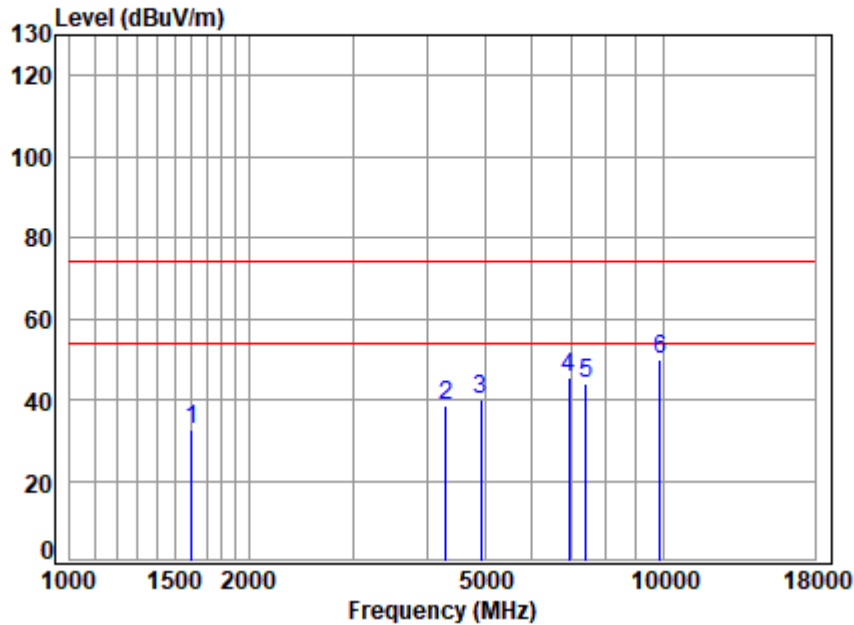


Site : chamber
 Condition: 3m VERTICAL
 Job No : 03204AT/03205AT
 Mode : 2437.5 TX RSE
 Note : 10M

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1702.04	4.33	26.22	38.42	40.19	32.32	74.00	-41.68	peak
2	4169.70	6.90	33.80	35.97	33.78	38.51	74.00	-35.49	peak
3	4875.00	7.36	34.60	35.47	32.98	39.47	74.00	-34.53	peak
4	6974.98	8.90	35.75	35.55	35.71	44.81	74.00	-29.19	peak
5	7312.50	9.31	35.70	35.89	34.79	43.91	74.00	-30.09	peak
6	9750.00	12.46	37.40	37.43	36.22	48.65	74.00	-25.35	peak



Test Mode: 05; Polarity: Horizontal; Modulation: OFDM; Channel: High

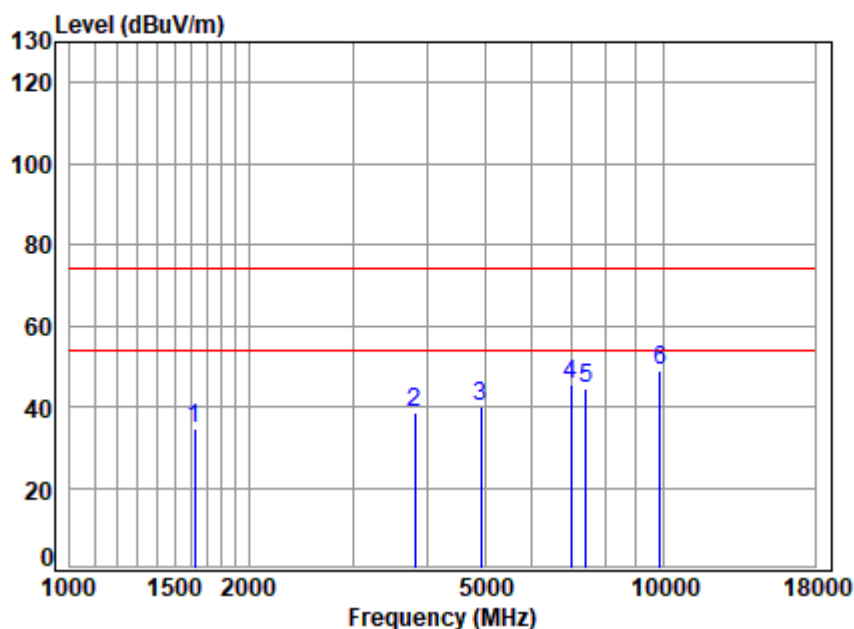


Site : chamber
 Condition: 3m HORIZONTAL
 Job No : 03204AT/03205AT
 Mode : 2467.5 TX RSE
 Note : 10M

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dB/m	dB	dBuV	dBuV/m	dBuV/m	dB	
1	1606.44	4.21	26.73	38.40	40.13	32.67	74.00	-41.33	peak
2	4304.40	6.99	34.04	35.87	33.59	38.75	74.00	-35.25	peak
3	4935.00	7.39	34.63	35.43	33.44	40.03	74.00	-33.97	peak
4	6934.78	8.87	35.74	35.53	36.30	45.38	74.00	-28.62	peak
5	7402.50	9.41	35.81	35.98	34.97	44.21	74.00	-29.79	peak
6	9870.00	12.54	37.24	37.40	37.34	49.72	74.00	-24.28	peak



Test Mode: 05; Polarity: Vertical; Modulation: OFDM; Channel: High



Site : chamber

Condition: 3m VERTICAL

Job No : 03204AT/03205AT

Mode : 2467.5 TX RSE

Note : 10M

	Freq	Cable Loss	Ant Factor	Preamp Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB		dB/m	dB	dBuV	dBuV/m	dBuV/m	dB
1	1620.43	4.23	26.59	38.40	41.99	34.41	74.00	-39.59	peak
2	3812.34	6.58	32.57	36.11	35.36	38.40	74.00	-35.60	peak
3	4935.00	7.39	34.63	35.43	33.26	39.85	74.00	-34.15	peak
4	6995.17	8.92	35.71	35.57	36.32	45.38	74.00	-28.62	peak
5	7402.50	9.41	35.81	35.98	35.30	44.54	74.00	-29.46	peak
6	9870.00	12.54	37.24	37.40	36.32	48.70	74.00	-25.30	peak



8 Test Setup Photo

Refer to Setup Photo for SZCR2309003204AT

9 EUT Constructional Details (EUT Photos)

Refer to External and Internal Photos for SZCR2309003204AT



10 Appendix

Note: Both 1.4MHz bandwidth and 3MHz bandwidth were selected the lowest, middle and highest frequency to test, among these modes, only the operation frequency is different, modulation type and target power are the same.

2.4G SDR SISO Mode

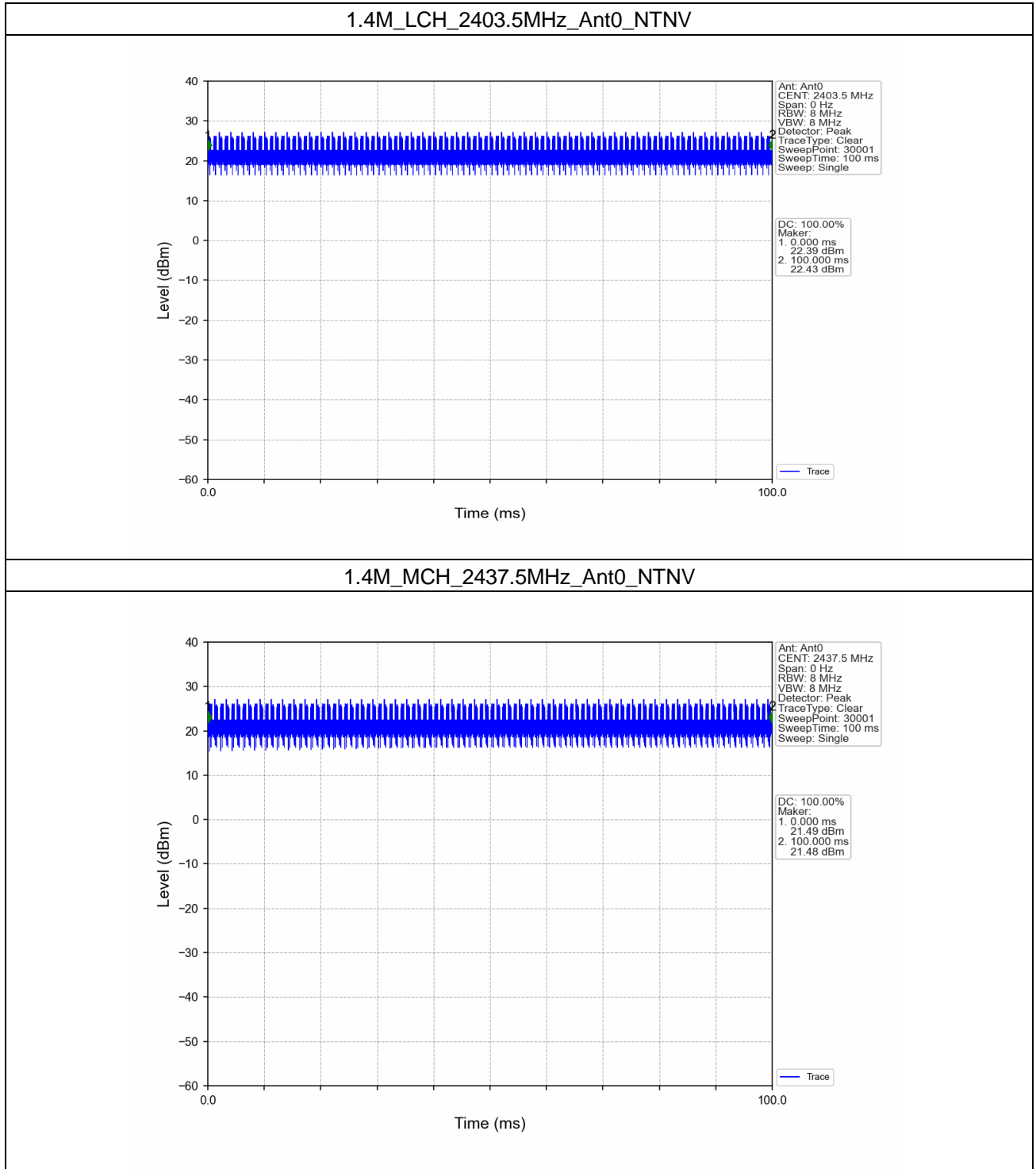
1. Duty Cycle

1.1 Ant0

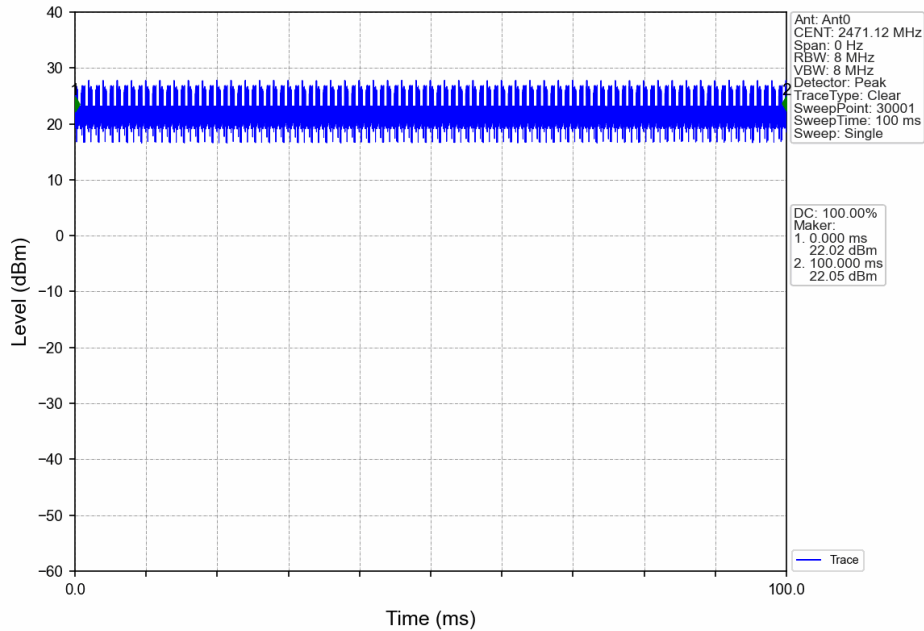
1.1.1 Test Result

Ant0							
Mode	TX Type	Frequency (MHz)	T_on (ms)	Period (ms)	Duty Cycle (%)	Duty Cycle Correction Factor (dB)	Max. DC Variation (%)
1.4M	SISO	2403.5	100.000	100.000	100.00	0.00	0.00
		2437.5	100.000	100.000	100.00	0.00	0.00
		2471.12	100.000	100.000	100.00	0.00	0.00
3M	SISO	2405.5	100.000	100.000	100.00	0.00	0.00
		2438.2	100.000	100.000	100.00	0.00	0.00
		2471.2	100.000	100.000	100.00	0.00	0.00
10M	SISO	2407.5	100.000	100.000	100.00	0.00	0.00
		2437.5	100.000	100.000	100.00	0.00	0.00
		2467.5	100.000	100.000	100.00	0.00	0.00
20M	SISO	2412.5	100.000	100.000	100.00	0.00	0.00
		2437.5	100.000	100.000	100.00	0.00	0.00
		2462.5	100.000	100.000	100.00	0.00	0.00
40M	SISO	2422.5	100.000	100.000	100.00	0.00	0.00
		2437.5	100.000	100.000	100.00	0.00	0.00
		2452.5	100.000	100.000	100.00	0.00	0.00

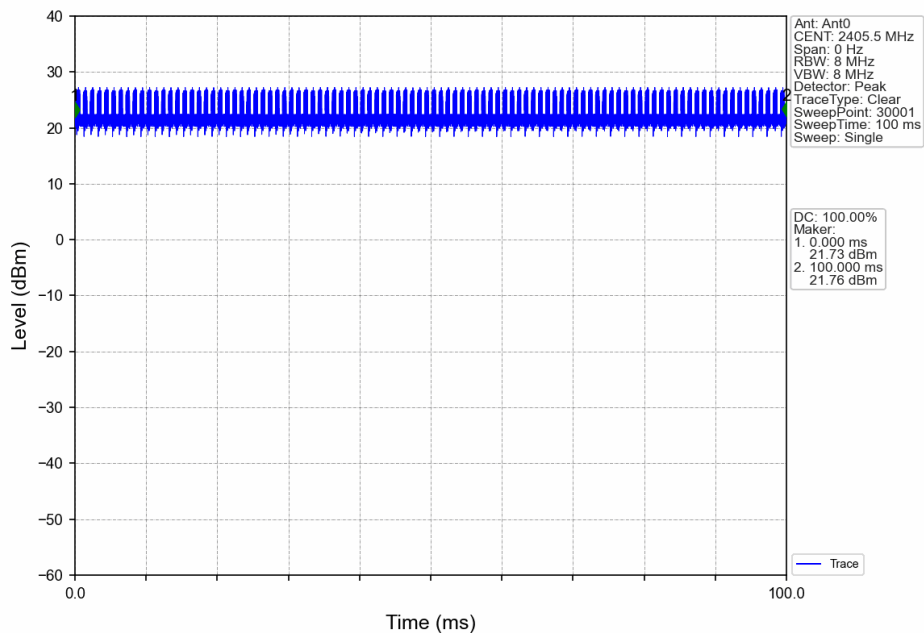
1.1.2 Test Graph



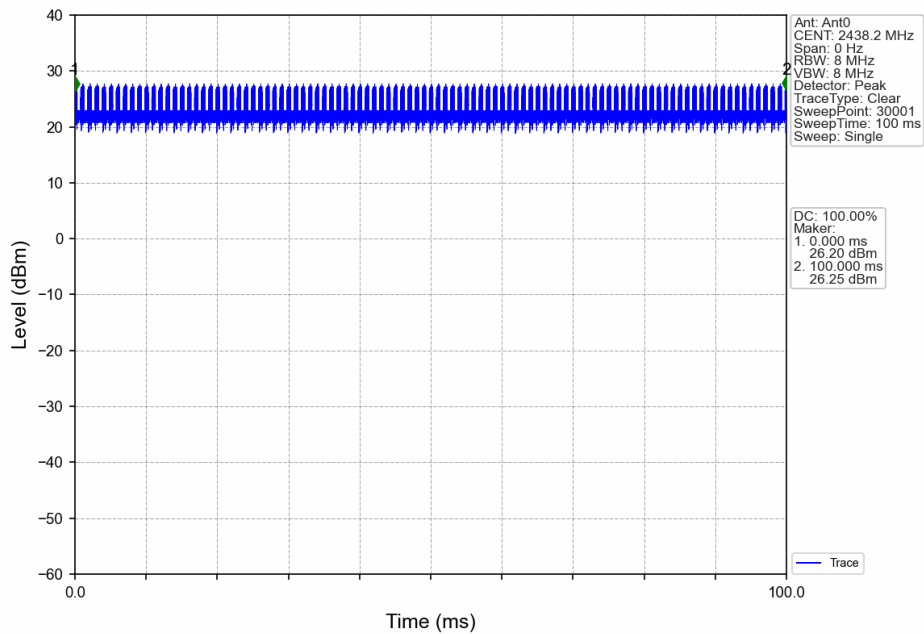
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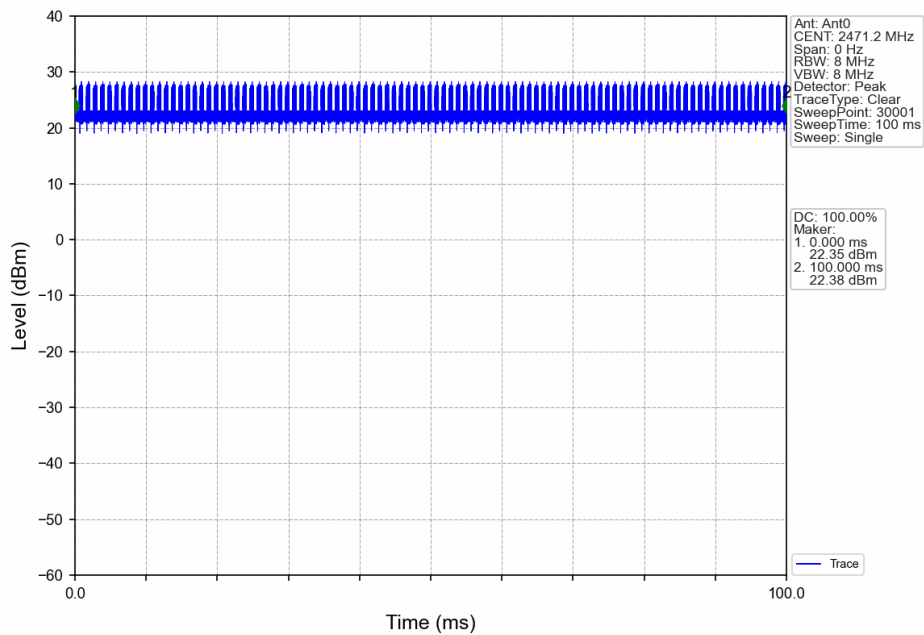
3M_LCH_2405.5MHz_Ant0_NTNV



3M_MCH_2438.2MHz_Ant0_NTNV



3M_HCH_2471.2MHz_Ant0_NTNV



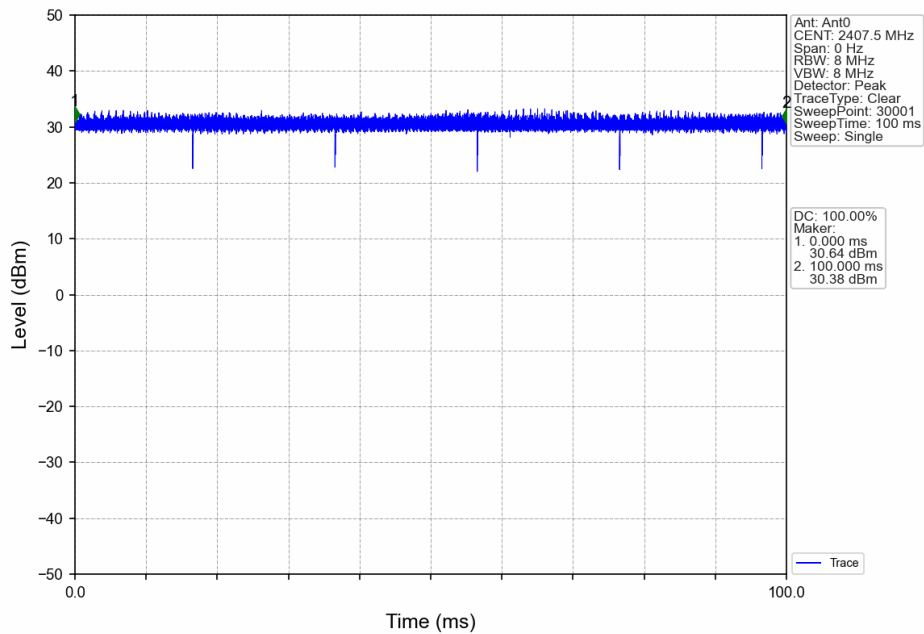
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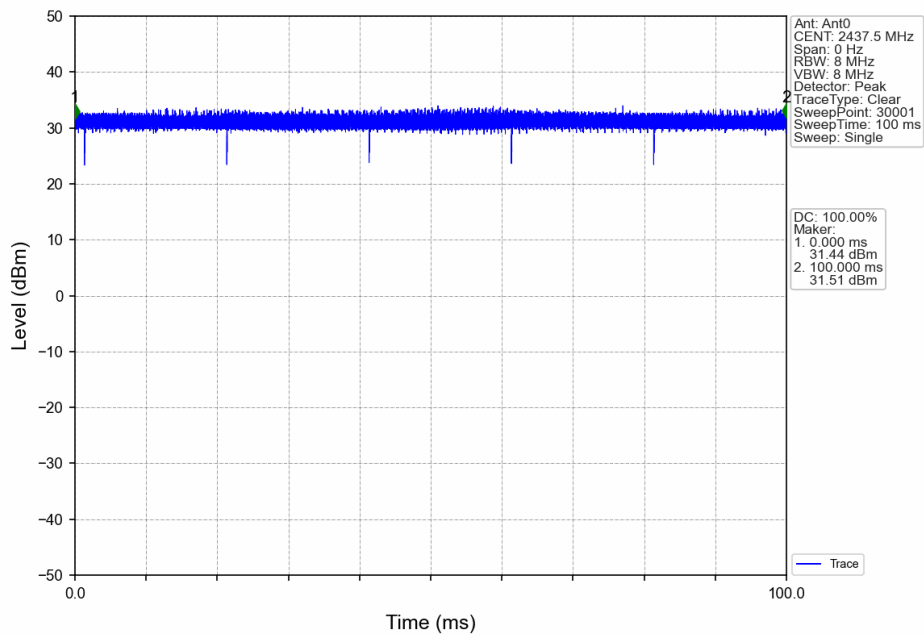
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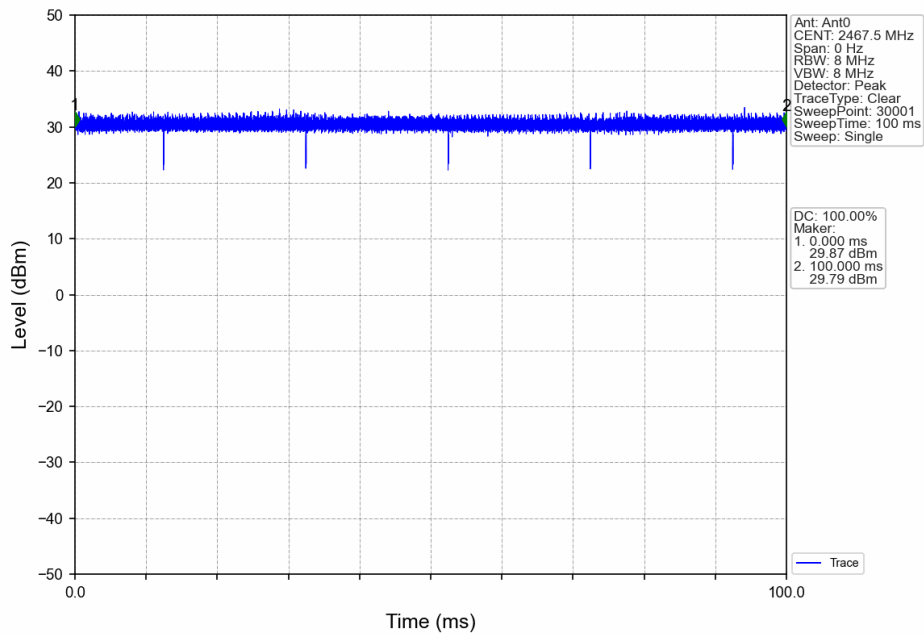
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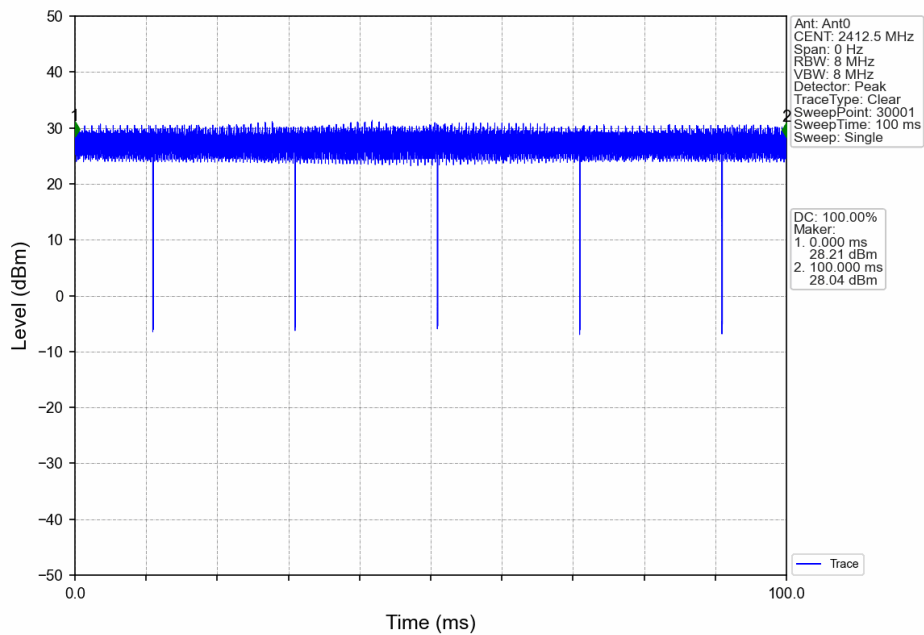
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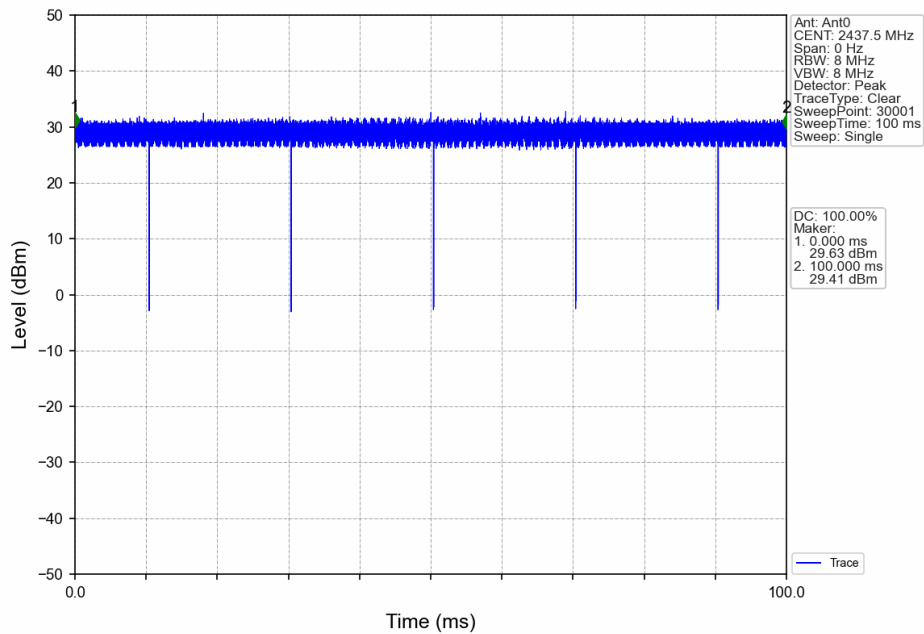
10M_HCH_2467.5MHz_Ant0_NTNV



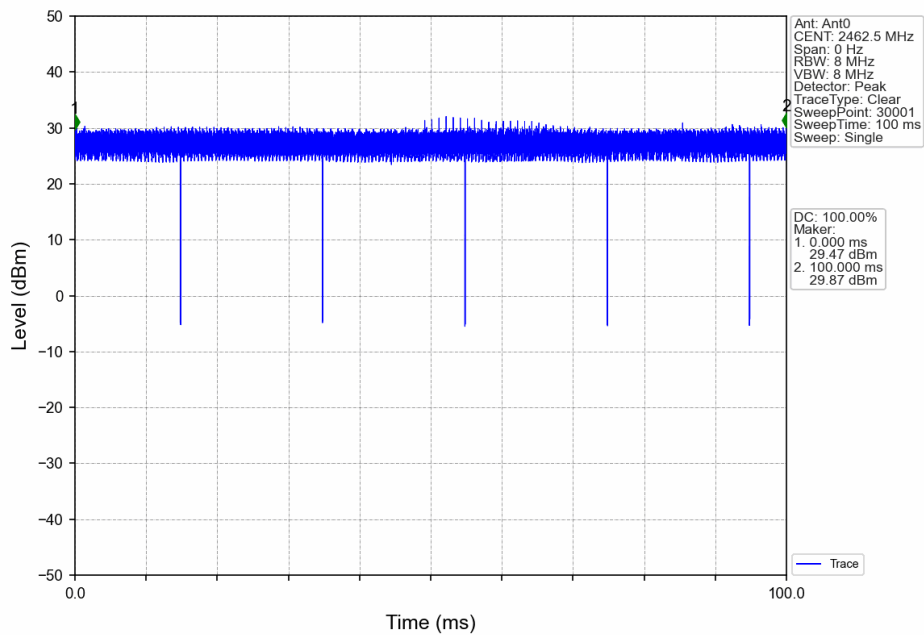
20M_LCH_2412.5MHz_Ant0_NTNV



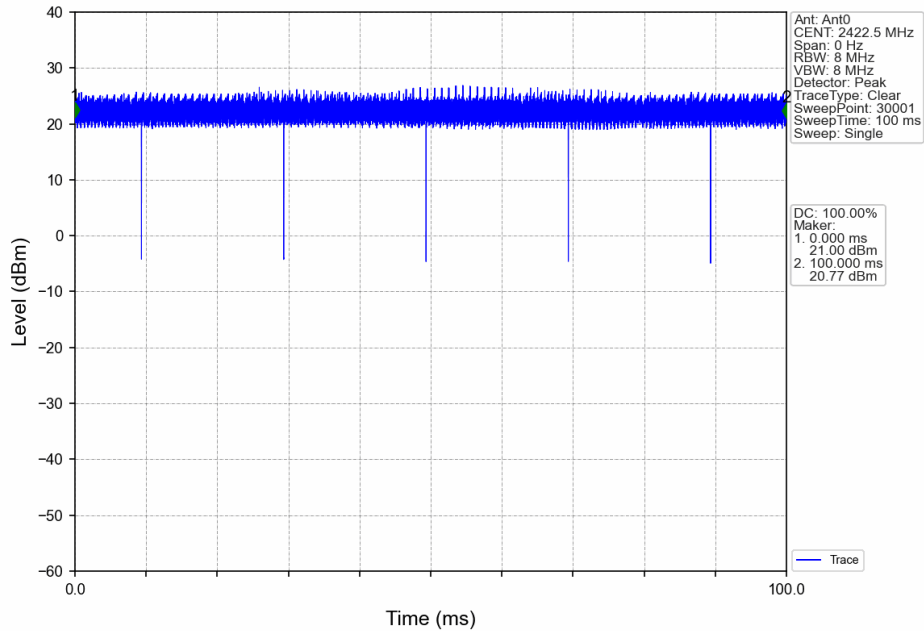
20M_MCH_2437.5MHz_Ant0_NTNV



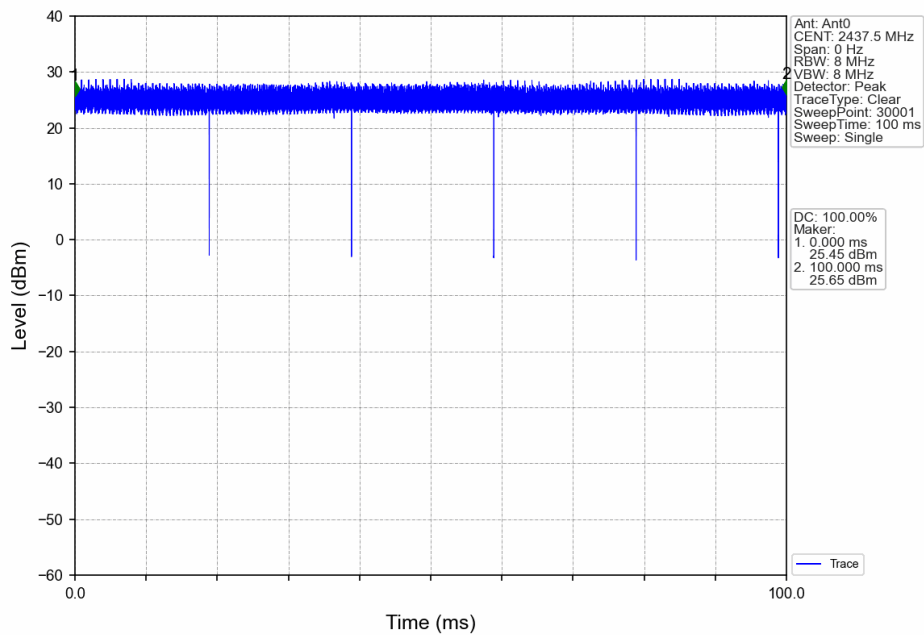
20M_HCH_2462.5MHz_Ant0_NTNV

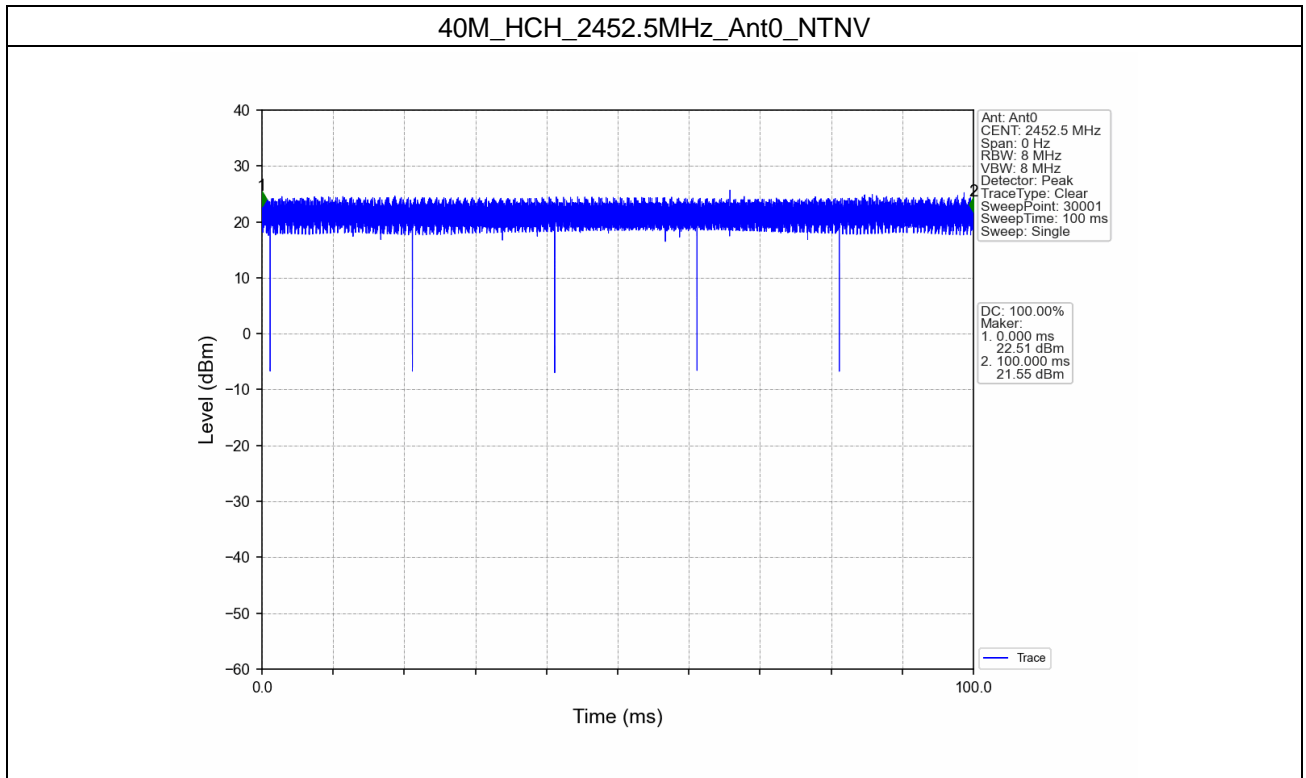


40M_LCH_2422.5MHz_Ant0_NTNV



40M_MCH_2437.5MHz_Ant0_NTNV





2. Bandwidth

2.1 OBW

2.1.1 Test Result

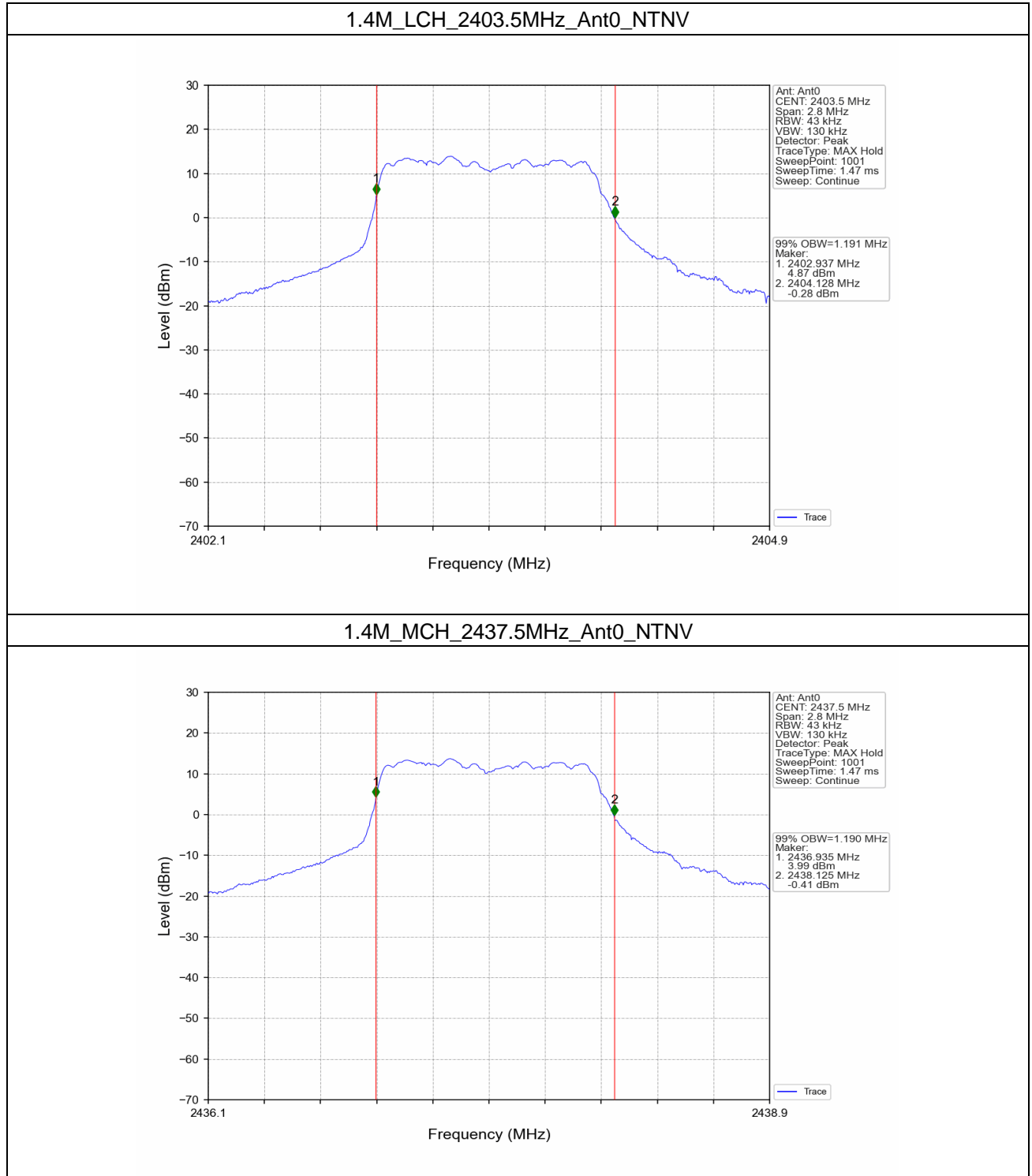
Mode	TX Type	Frequency (MHz)	ANT	99% Occupied Bandwidth (MHz)		Verdict
				Result	Limit	
1.4M	SISO	2403.5	0	1.191	/	Pass
		2437.5	0	1.190	/	Pass
		2471.12	0	1.190	/	Pass
3M	SISO	2405.5	0	2.296	/	Pass
		2438.2	0	2.302	/	Pass
		2471.2	0	2.291	/	Pass
10M	SISO	2407.5	0	9.081	/	Pass
		2437.5	0	9.075	/	Pass
		2467.5	0	9.051	/	Pass
20M	SISO	2412.5	0	18.119	/	Pass
		2437.5	0	18.115	/	Pass
		2462.5	0	18.124	/	Pass
40M	SISO	2422.5	0	36.327	/	Pass
		2437.5	0	36.871	/	Pass
		2452.5	0	36.517	/	Pass



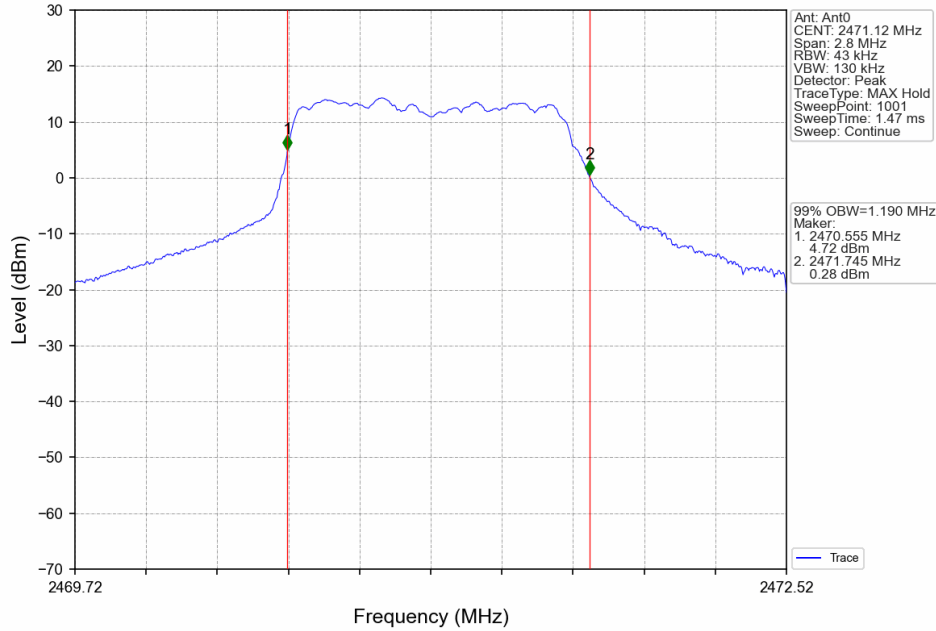
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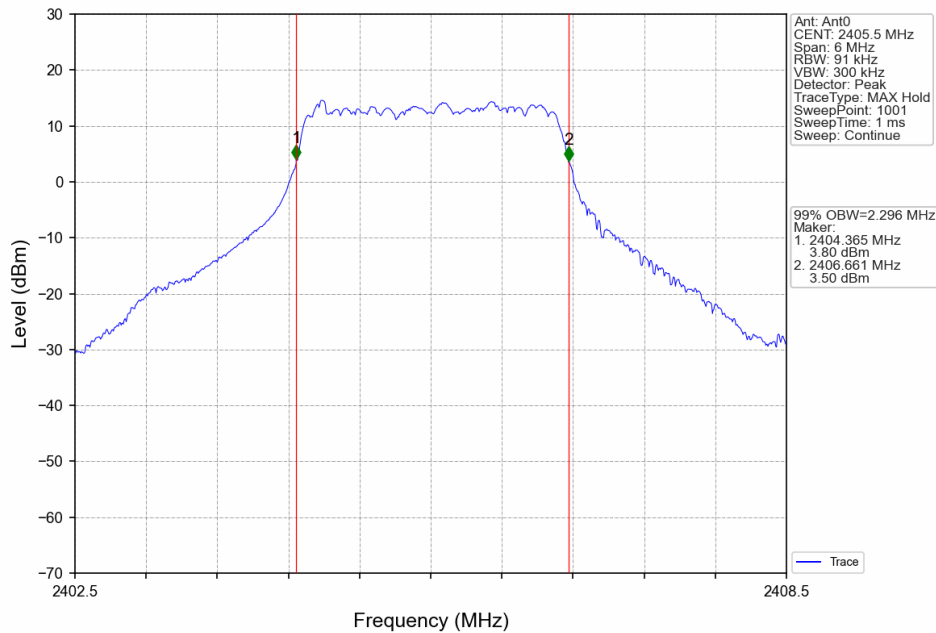
2.1.2 Test Graph



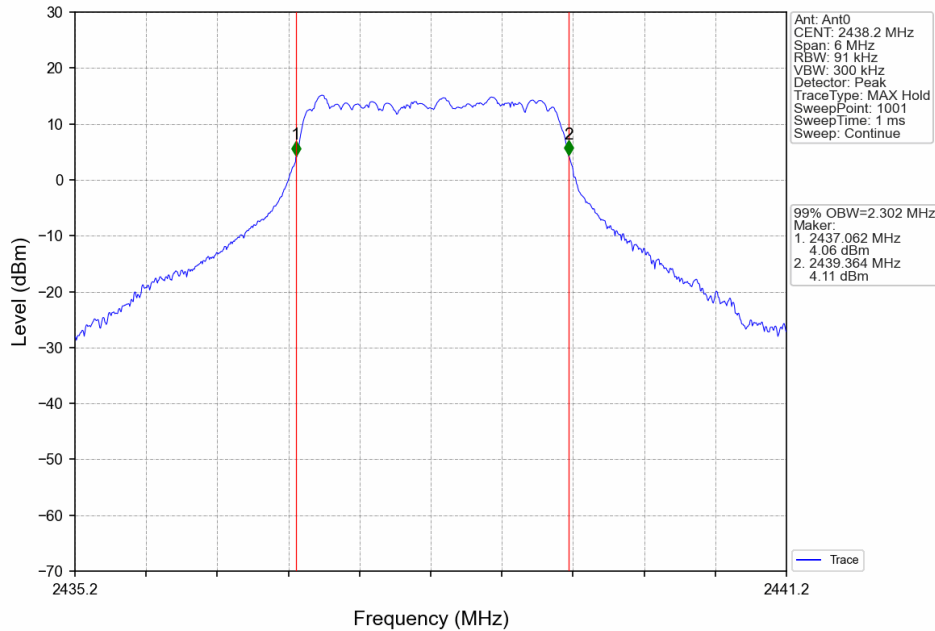
1.4M_HCH_2471.12MHz_Ant0_NTNV



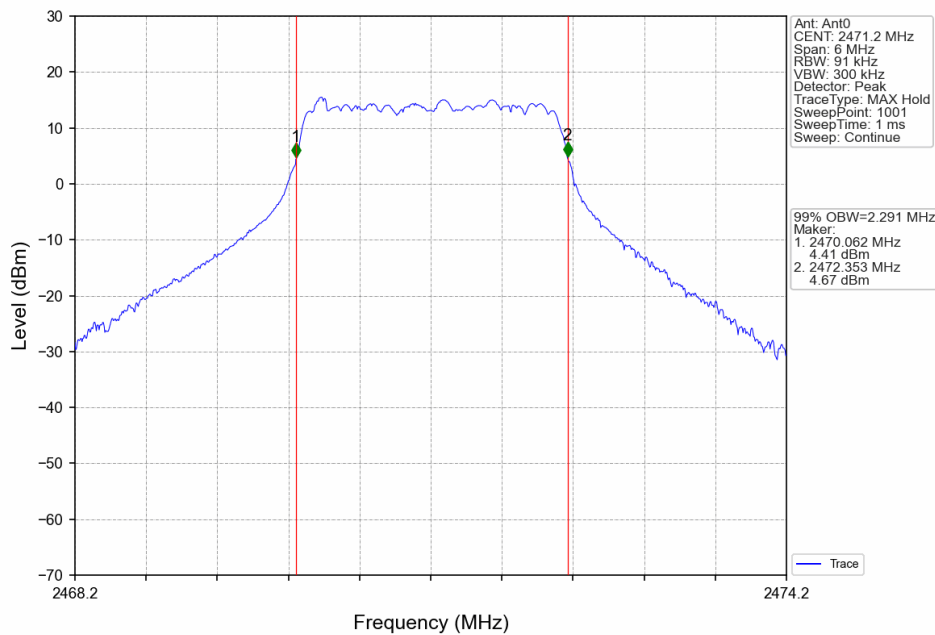
3M_LCH_2405.5MHz_Ant0_NTNV



3M_MCH_2438.2MHz_Ant0_NTNV



3M_HCH_2471.2MHz_Ant0_NTNV



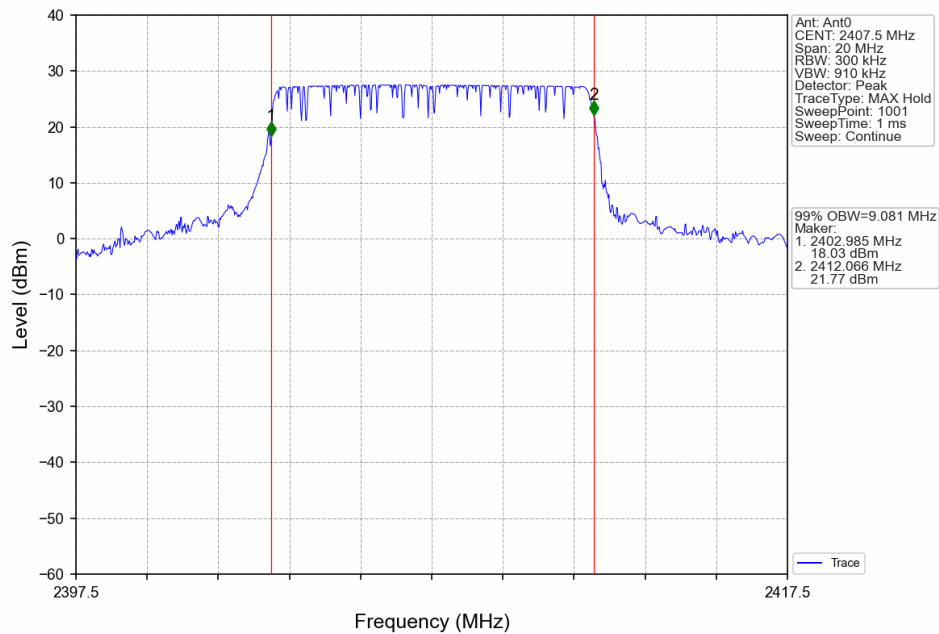
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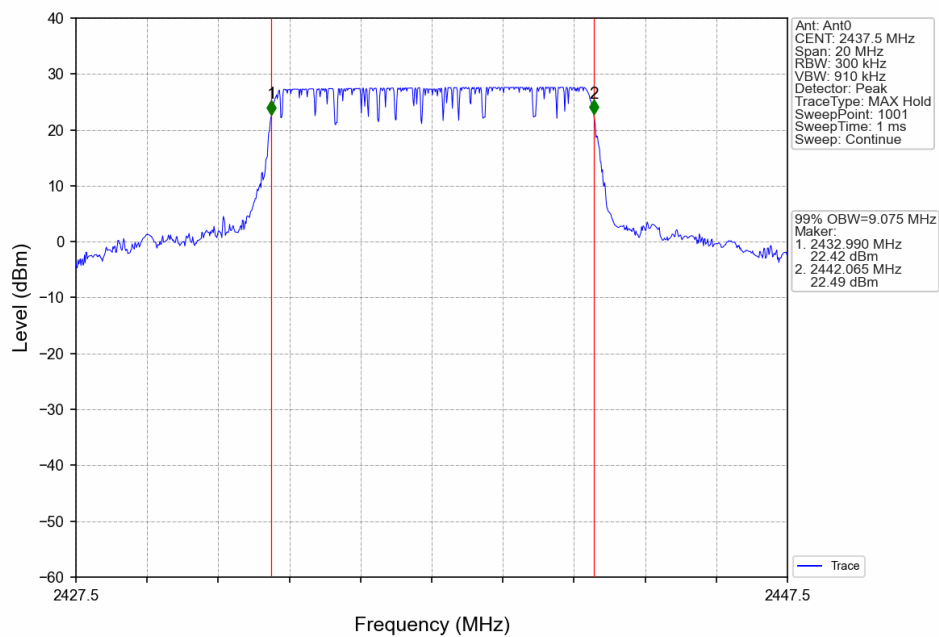
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10M_LCH_2407.5MHz_Ant0_NTNV



10M_MCH_2437.5MHz_Ant0_NTNV



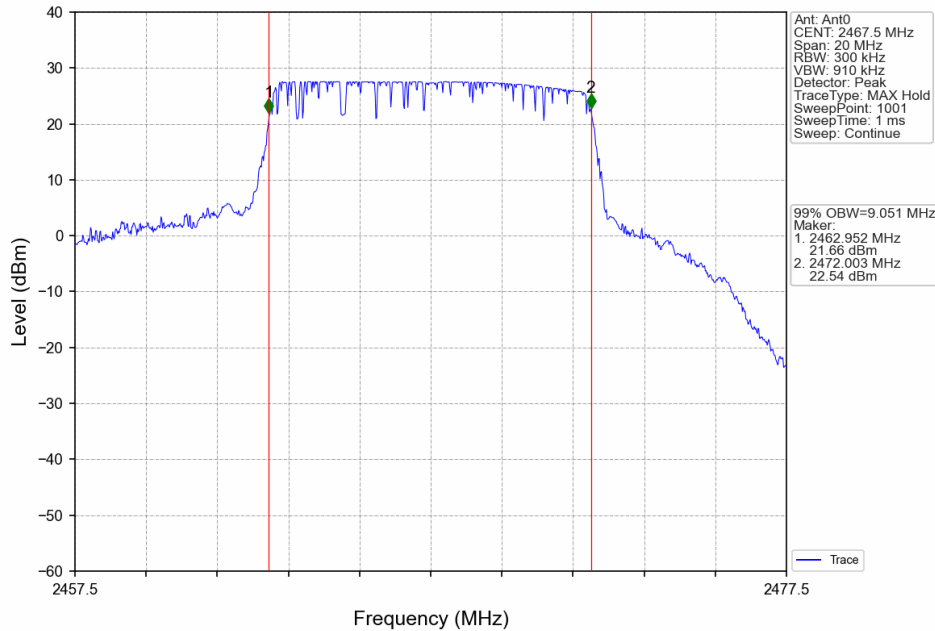
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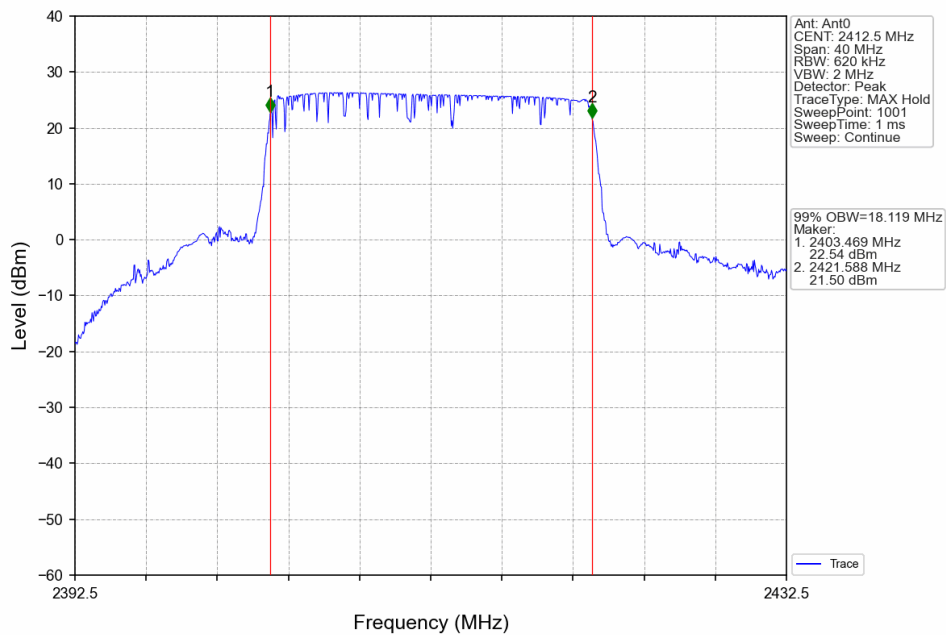
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10M_HCH_2467.5MHz_Ant0_NTNV



20M_LCH_2412.5MHz_Ant0_NTNV



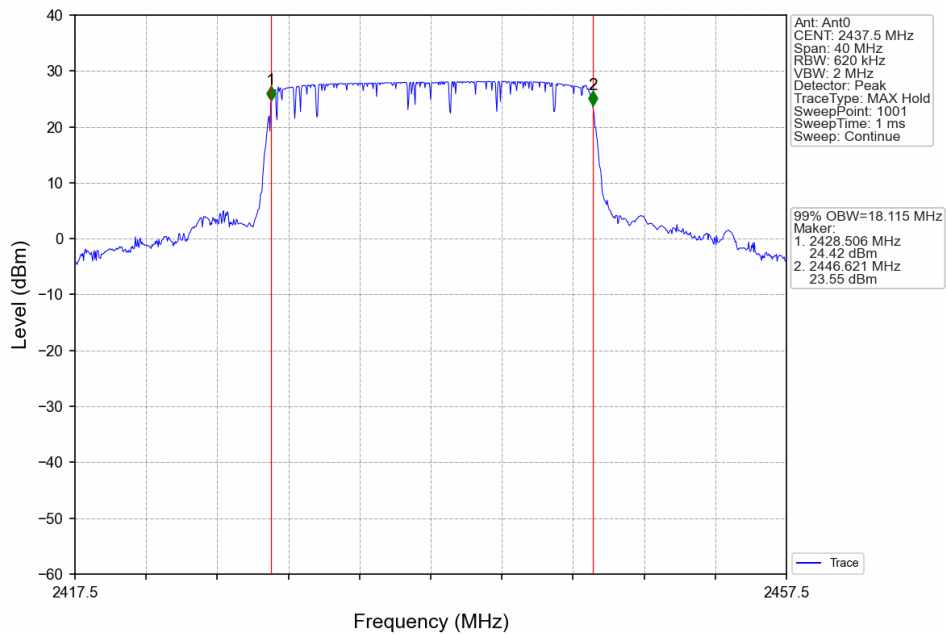
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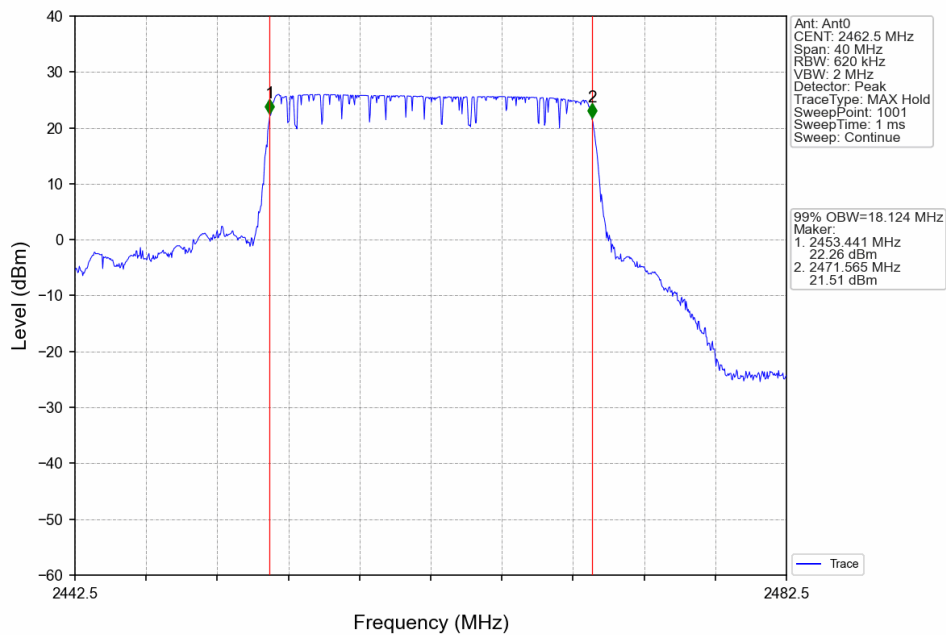
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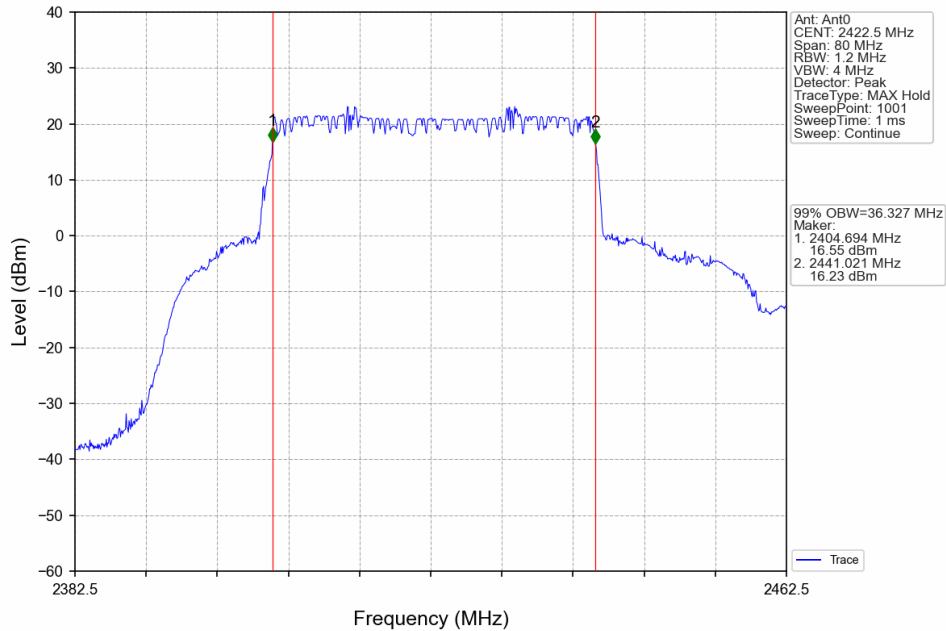
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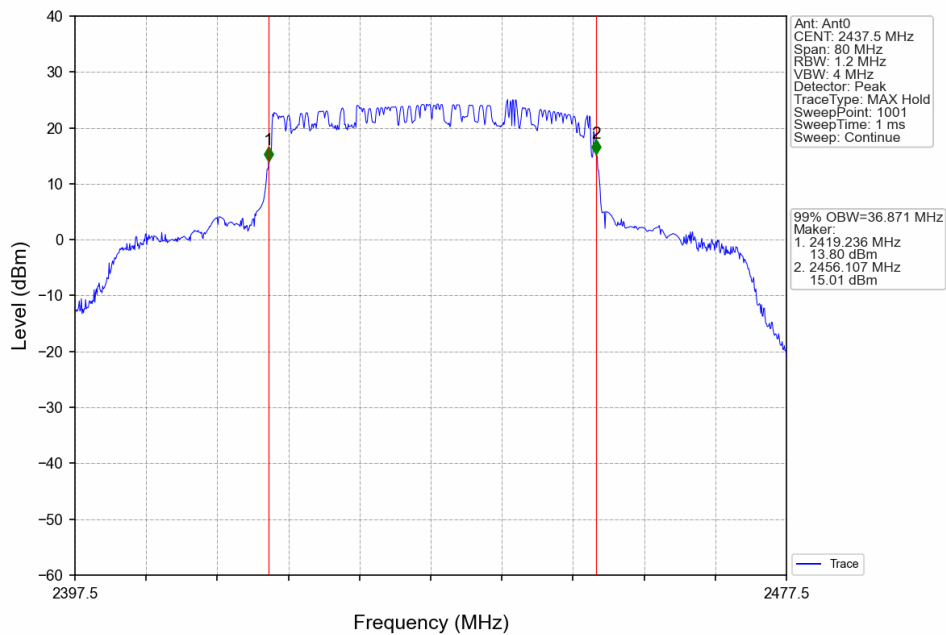
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40M_LCH_2422.5MHz_Ant0_NTNV



40M_MCH_2437.5MHz_Ant0_NTNV

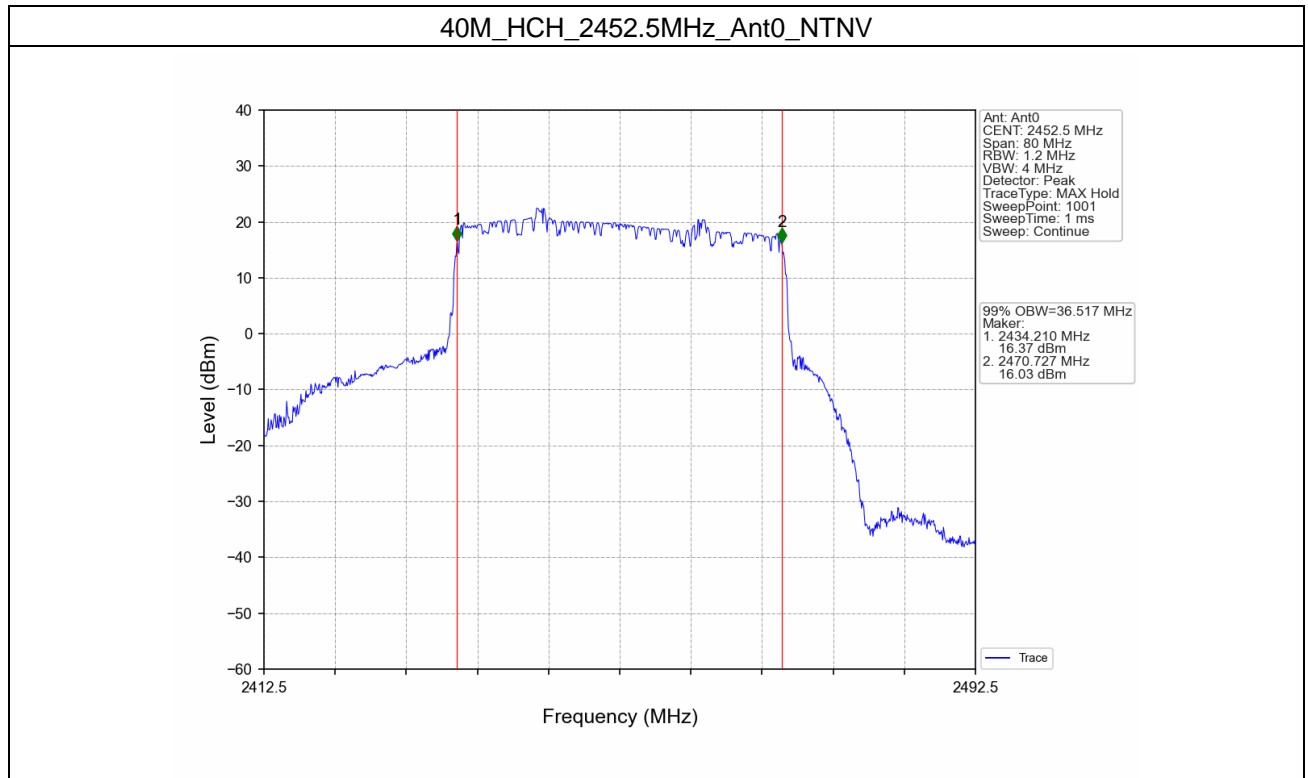


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SZEMC-TRF-01 Rev. A/1

Report No.: SZCR230900320402

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2.2 6dB BW

2.2.1 Test Result

Mode	TX Type	Frequency (MHz)	ANT	6dB Bandwidth (MHz)		Verdict
				Result	Limit	
1.4M	SISO	2403.5	0	1.095	≥ 0.5	Pass
		2437.5	0	1.093	≥ 0.5	Pass
		2471.12	0	1.089	≥ 0.5	Pass
3M	SISO	2405.5	0	2.196	≥ 0.5	Pass
		2438.2	0	2.194	≥ 0.5	Pass
		2471.2	0	2.185	≥ 0.5	Pass
10M	SISO	2407.5	0	8.982	≥ 0.5	Pass
		2437.5	0	9.011	≥ 0.5	Pass
		2467.5	0	9.014	≥ 0.5	Pass
20M	SISO	2412.5	0	18.003	≥ 0.5	Pass
		2437.5	0	17.972	≥ 0.5	Pass
		2462.5	0	18.016	≥ 0.5	Pass
40M	SISO	2422.5	0	36.015	≥ 0.5	Pass
		2437.5	0	35.902	≥ 0.5	Pass
		2452.5	0	35.913	≥ 0.5	Pass



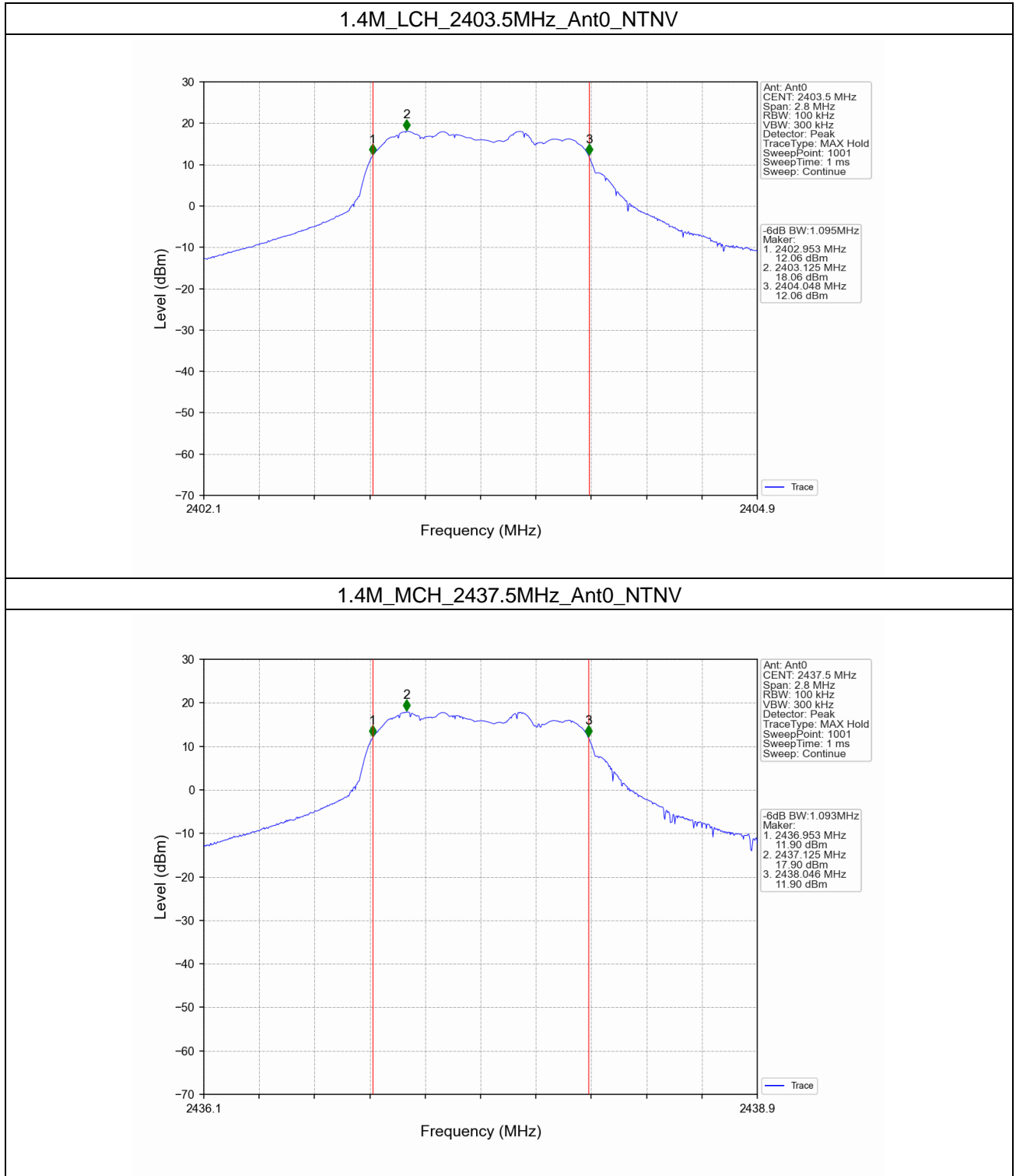
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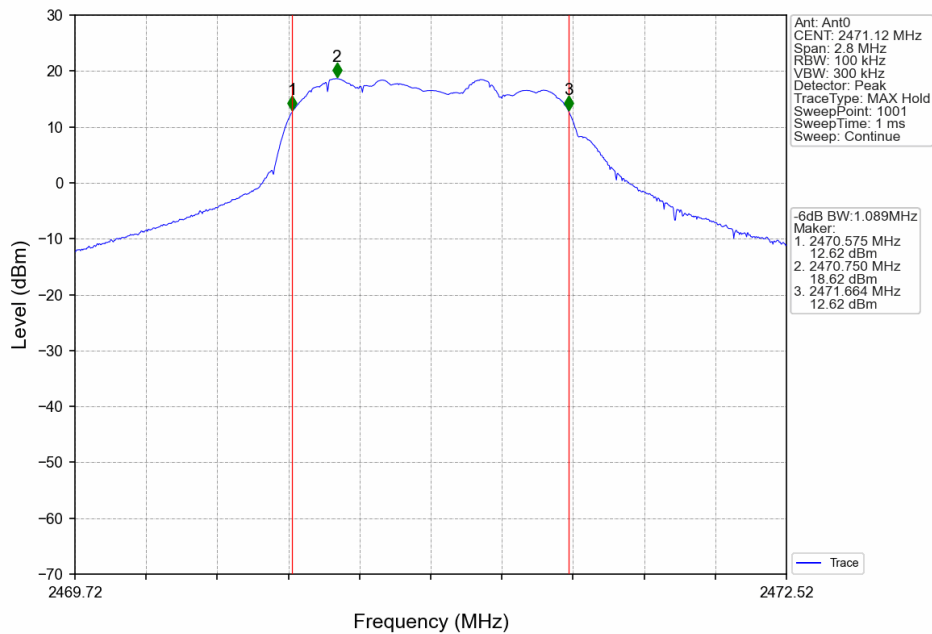
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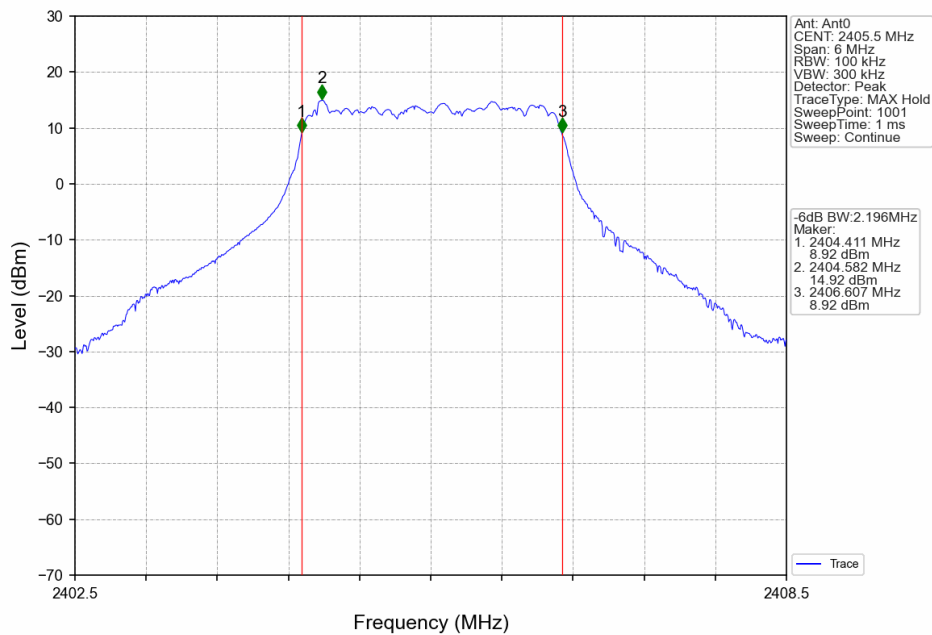
2.2.2 Test Graph



1.4M_HCH_2471.12MHz_Ant0_NTNV



3M_LCH_2405.5MHz_Ant0_NTNV



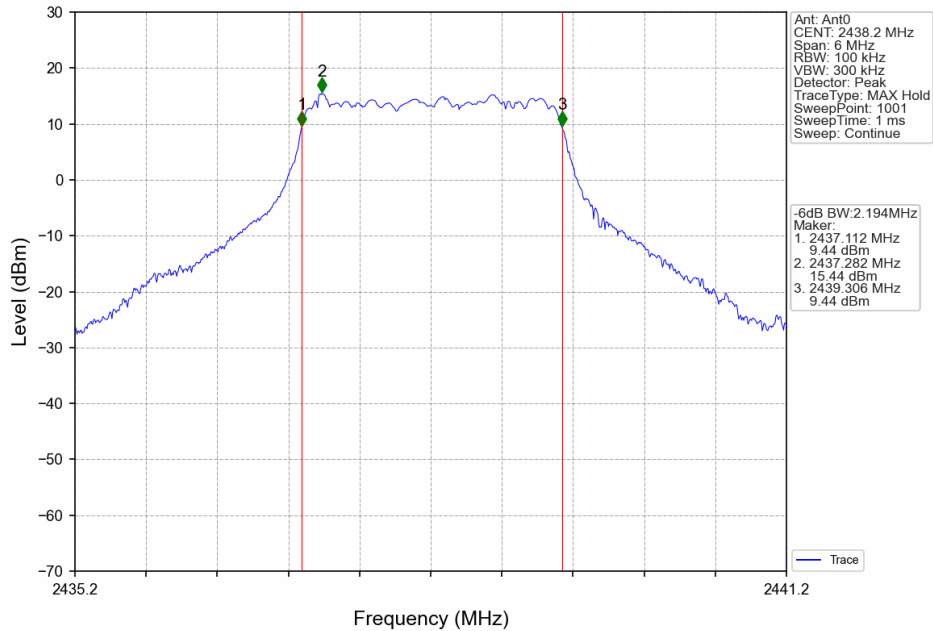
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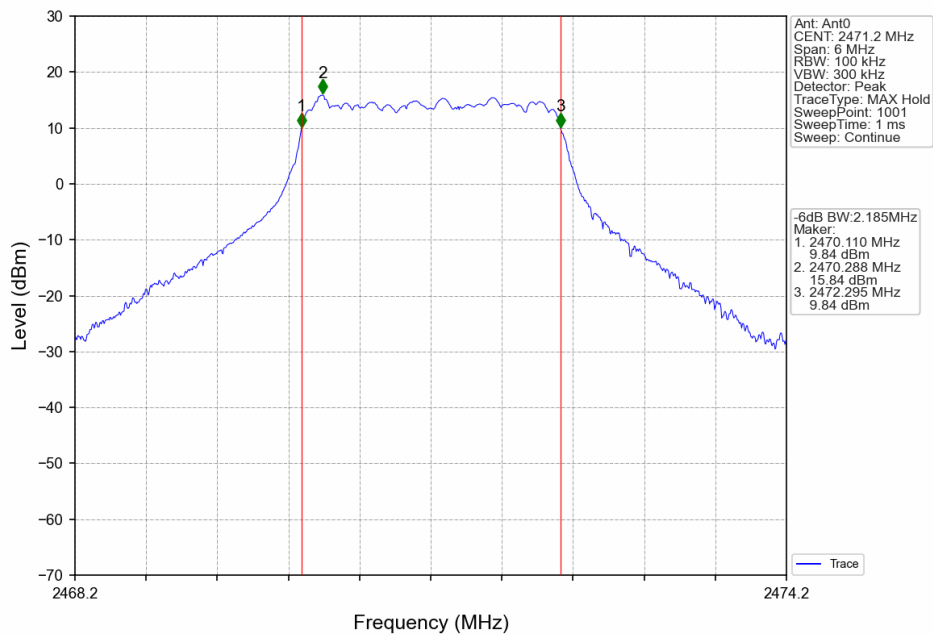
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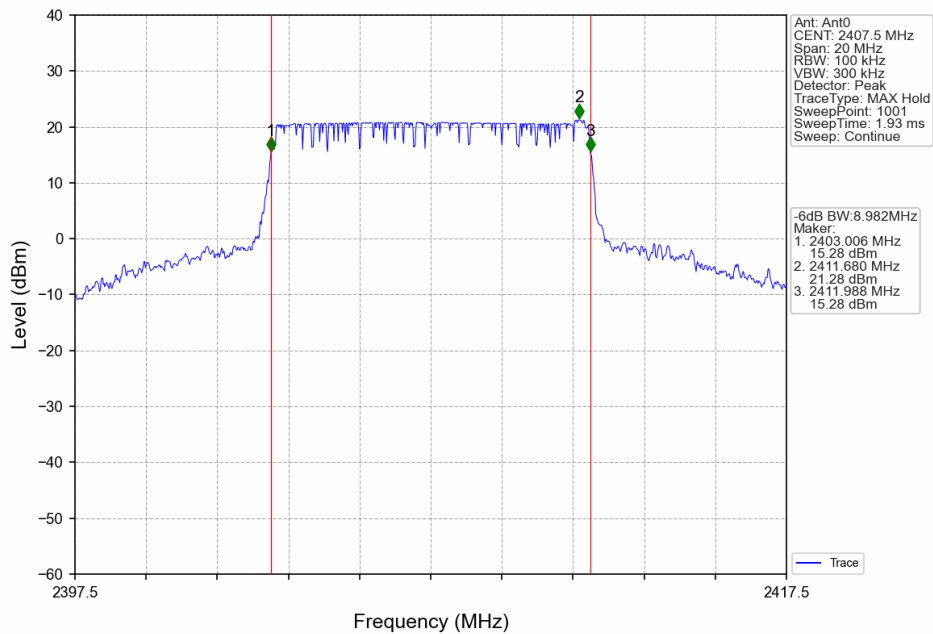
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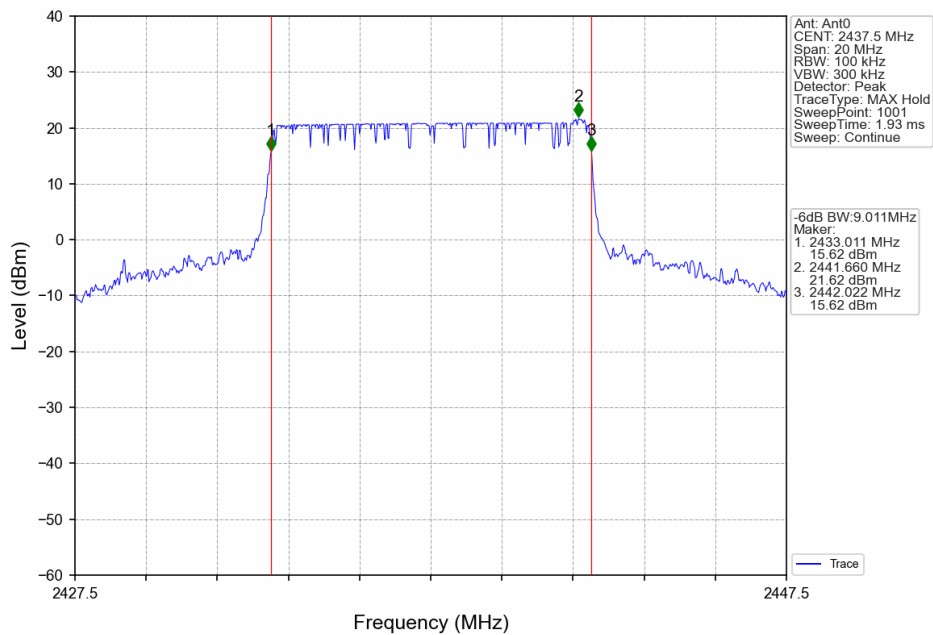
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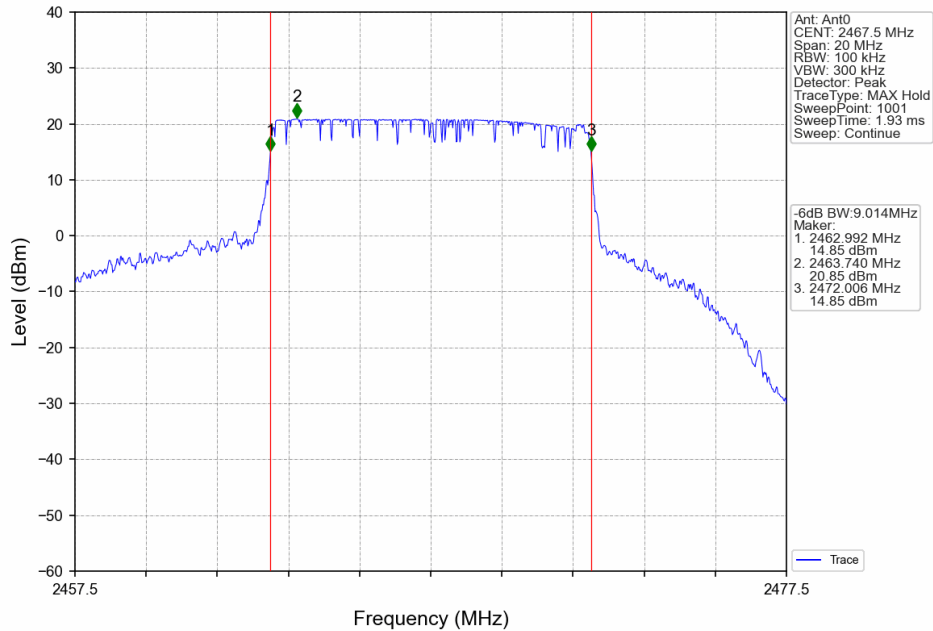
10M_LCH_2407.5MHz_Ant0_NTNV



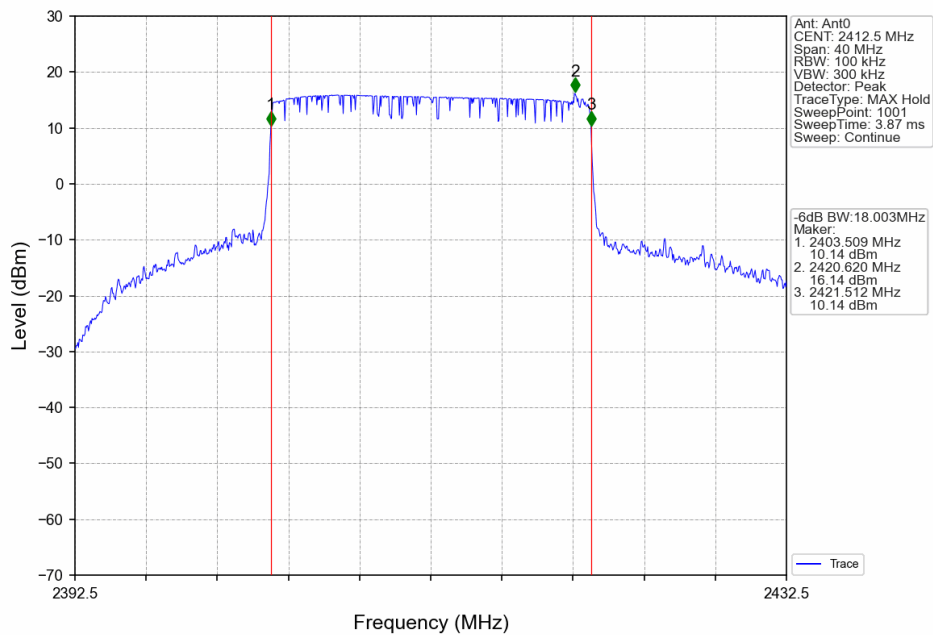
10M_MCH_2437.5MHz_Ant0_NTNV



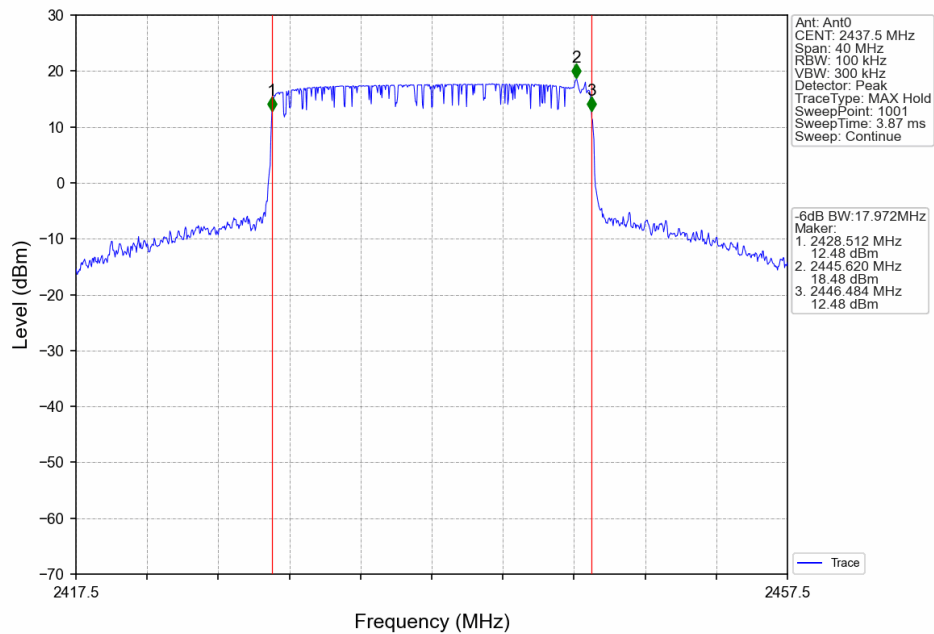
10M_HCH_2467.5MHz_Ant0_NTNV



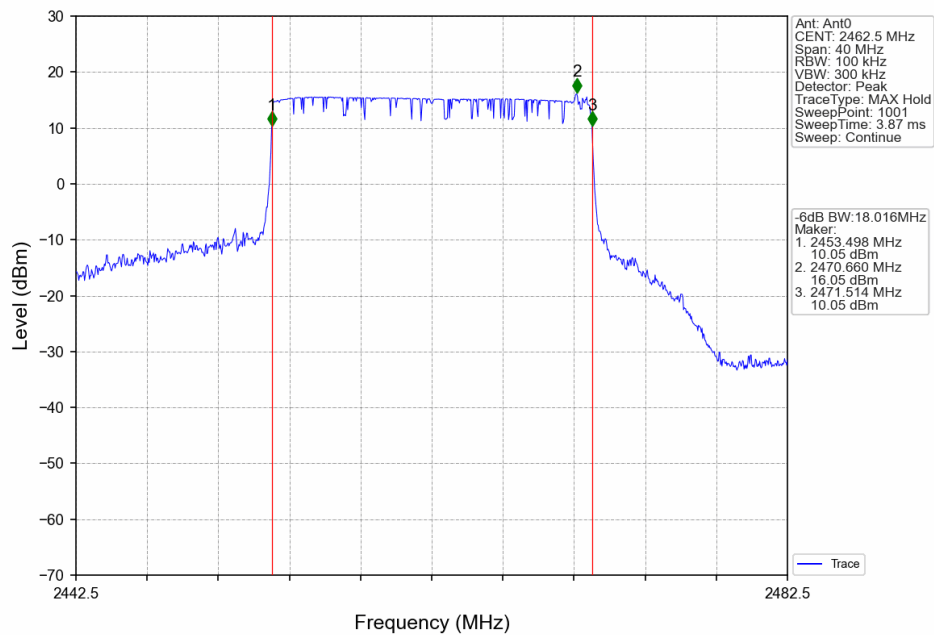
20M_LCH_2412.5MHz_Ant0_NTNV



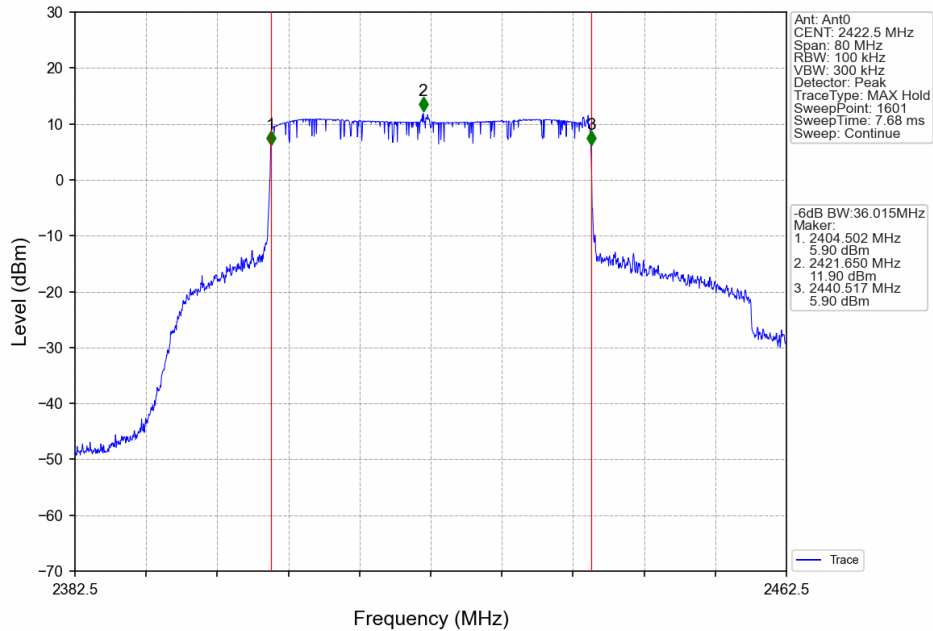
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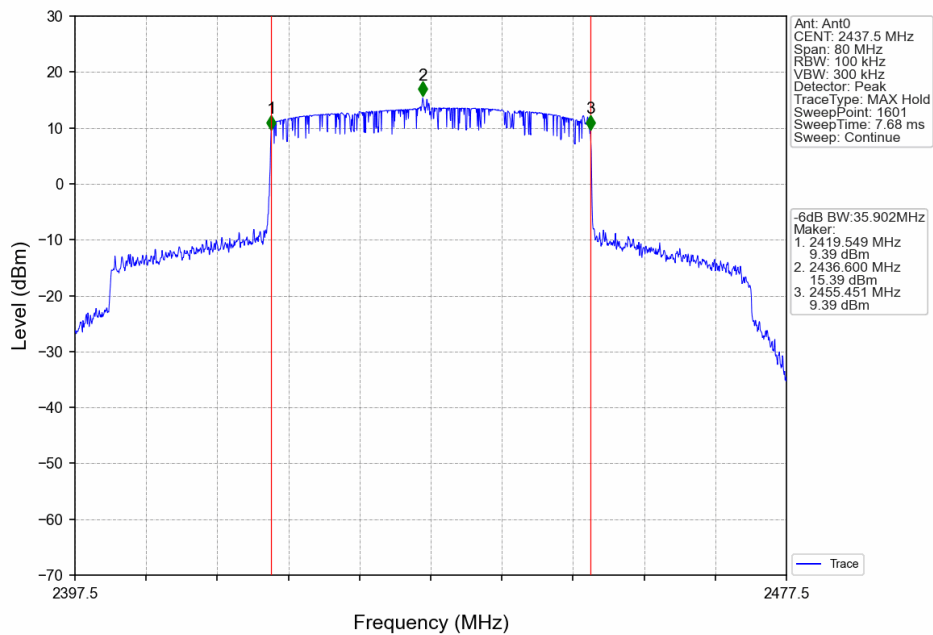
20M_HCH_2462.5MHz_Ant0_NTNV

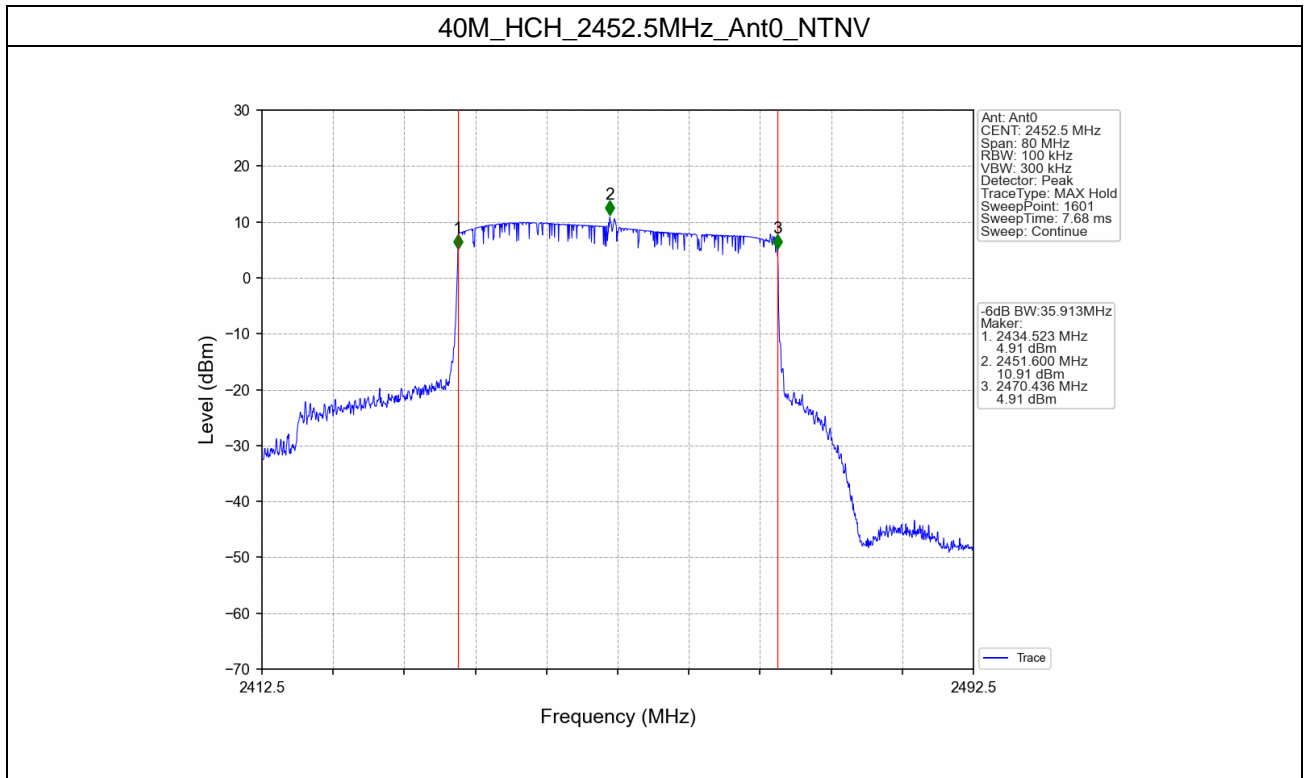


40M_LCH_2422.5MHz_Ant0_NTNV



40M_MCH_2437.5MHz_Ant0_NTNV





3. Maximum Conducted Output Power

3.1 Power

3.1.1 Test Result

Mode	TX Type	Frequency (MHz)	Maximum Average Conducted Output Power (dBm)					Verdict
			ANT0	ANT1	ANT2	ANT3	Limit	
1.4M	SISO	2403.5	19.23	18.88	18.25	19.24	<=30	Pass
		2437.5	19.04	19.04	18.49	19.33	<=30	Pass
		2471.12	19.65	19.21	18.34	19.13	<=30	Pass
3M	SISO	2405.5	18.93	18.49	17.81	18.87	<=30	Pass
		2438.2	19.43	19.37	18.38	19.73	<=30	Pass
		2471.2	19.68	19.01	18.17	18.92	<=30	Pass
10M	SISO	2407.5	25.48	25.90	25.10	25.88	<=30	Pass
		2437.5	28.53	28.62	28.26	28.77	<=30	Pass
		2467.5	26.78	26.22	25.96	26.16	<=30	Pass
20M	SISO	2412.5	25.34	25.11	24.57	25.65	<=30	Pass
		2437.5	28.48	28.53	28.23	28.71	<=30	Pass
		2462.5	25.17	24.76	23.74	24.73	<=30	Pass
40M	SISO	2422.5	23.49	23.56	22.72	23.91	<=30	Pass
		2437.5	27.45	27.47	27.19	27.57	<=30	Pass
		2452.5	27.03	26.79	26.54	27.00	<=30	Pass

Note1: Antenna Gain: Ant0: 1.50dBi; Ant1: 2.00dBi; Ant2: 2.00dBi; Ant3: 1.50dBi;



4. Maximum Power Spectral Density

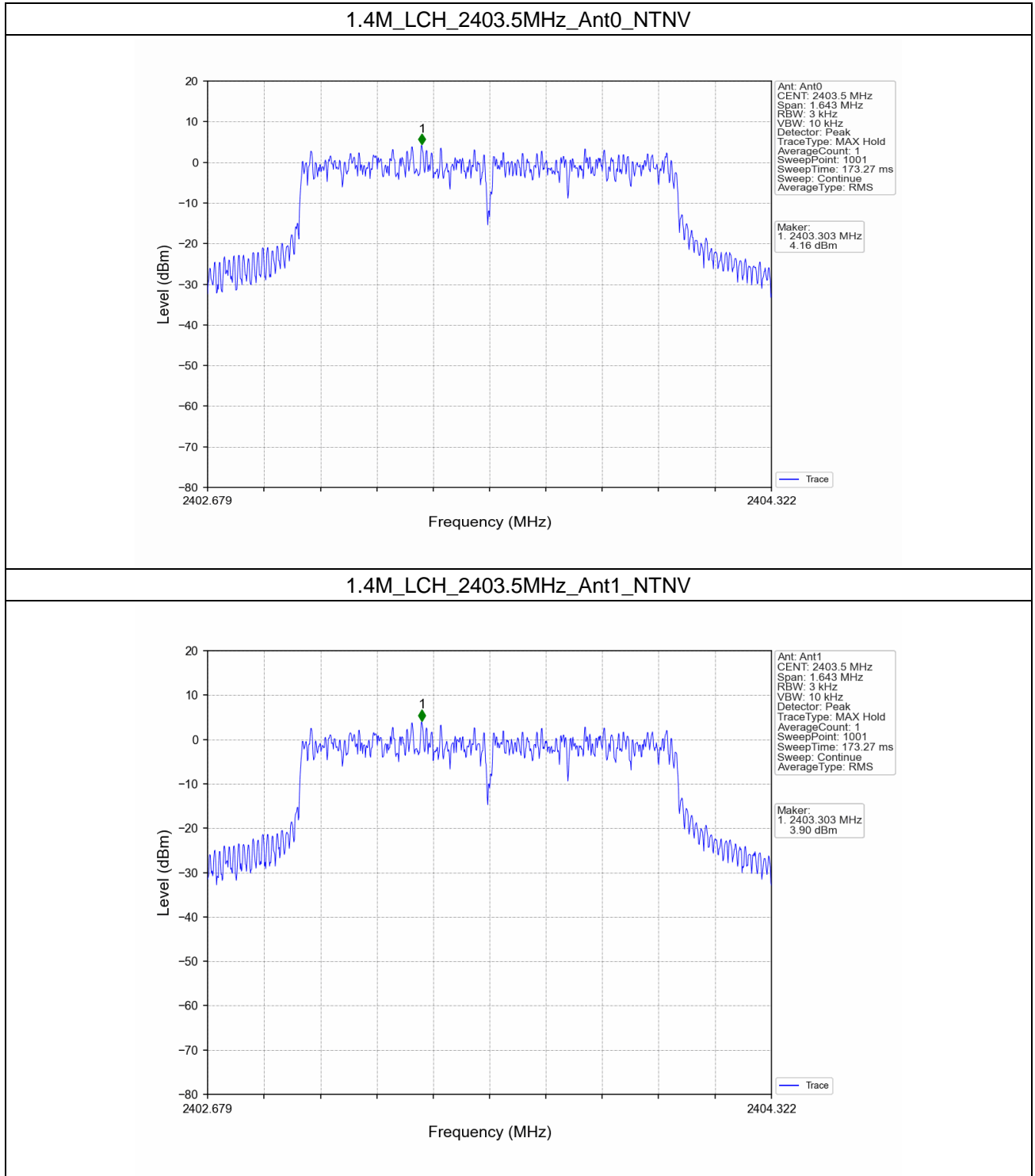
4.1 PSD

4.1.1 Test Result

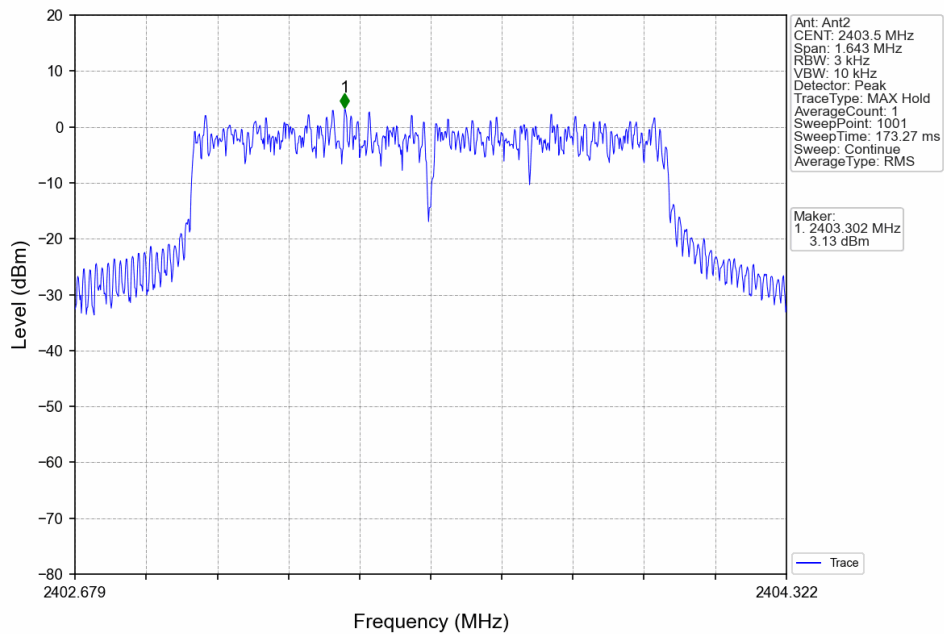
Mode	TX Type	Frequency (MHz)	Maximum PSD (dBm/3kHz)					Verdict
			ANT0	ANT1	ANT2	ANT3	Limit	
1.4M	SISO	2403.5	4.16	3.90	3.13	4.07	<=8	Pass
		2437.5	3.98	3.93	3.41	4.38	<=8	Pass
		2471.12	4.29	4.32	3.26	4.12	<=8	Pass
3M	SISO	2405.5	0.18	-0.20	-0.85	0.13	<=8	Pass
		2438.2	0.63	0.62	-0.42	1.04	<=8	Pass
		2471.2	0.81	0.21	-0.60	0.05	<=8	Pass
10M	SISO	2407.5	-0.37	0.20	-0.75	0.22	<=8	Pass
		2437.5	3.20	3.31	2.62	3.77	<=8	Pass
		2467.5	1.48	1.18	0.49	1.01	<=8	Pass
20M	SISO	2412.5	-2.99	-2.77	-3.15	-2.84	<=8	Pass
		2437.5	0.58	0.01	0.48	0.40	<=8	Pass
		2462.5	-2.51	-3.62	-4.88	-3.57	<=8	Pass
40M	SISO	2422.5	-7.91	-7.92	-8.10	-7.54	<=8	Pass
		2437.5	-3.41	-2.89	-3.80	-3.26	<=8	Pass
		2452.5	-3.47	-4.25	-4.39	-3.47	<=8	Pass

Note1: Antenna Gain: Ant0: 1.50dBi; Ant1: 2.00dBi; Ant2: 2.00dBi; Ant3: 1.50dBi;

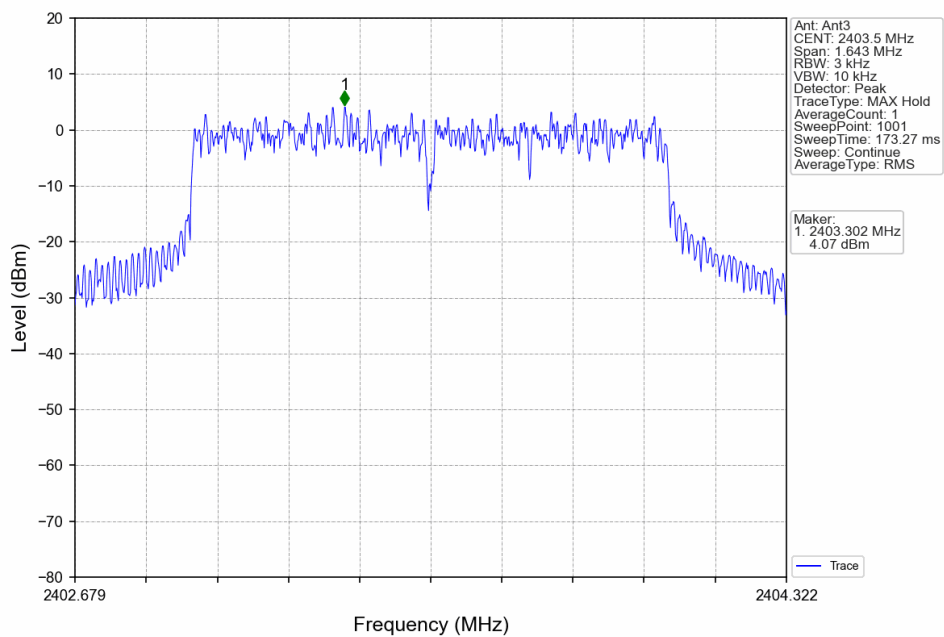
4.1.2 Test Graph



1.4M_LCH_2403.5MHz_Ant2-NTNV



1.4M_LCH_2403.5MHz_Ant3-NTNV



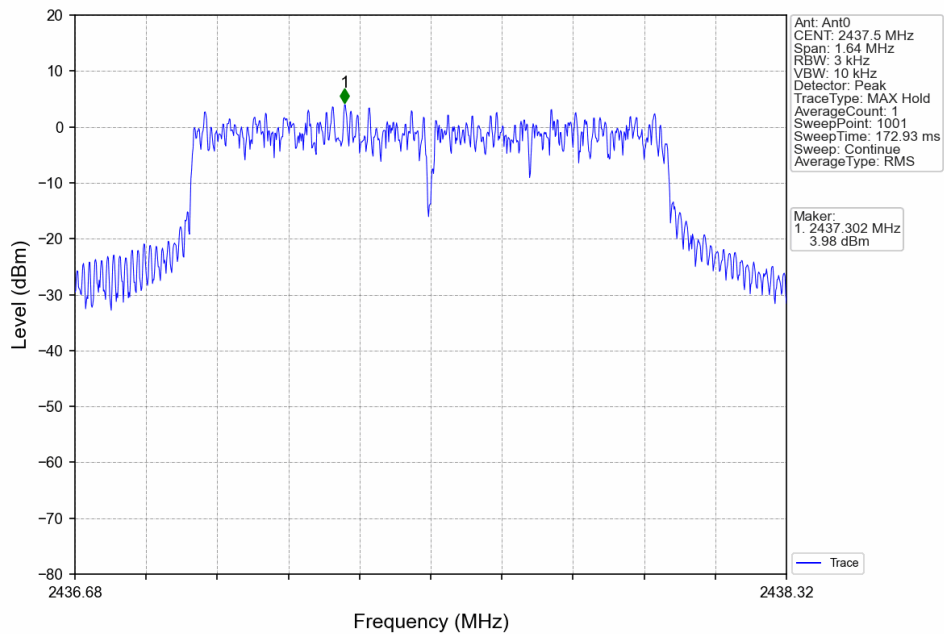
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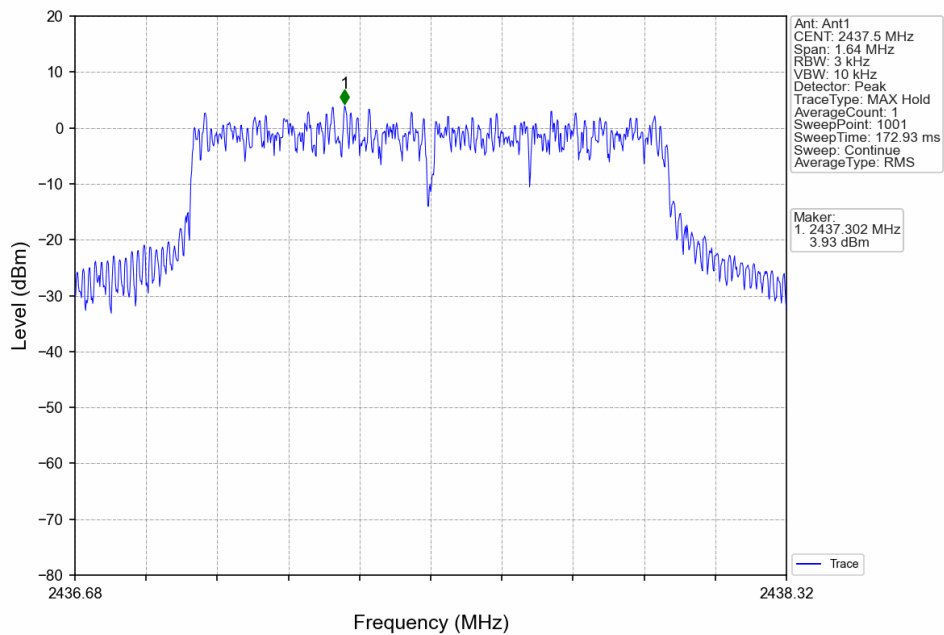
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1.4M_MCH_2437.5MHz_Ant0_NTNV



1.4M_MCH_2437.5MHz_Ant1_NTNV



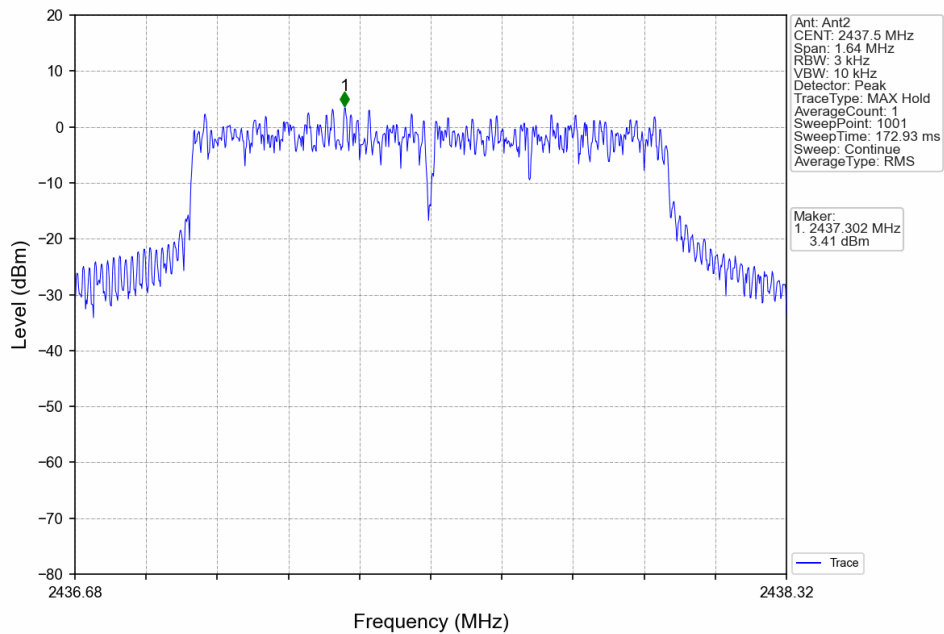
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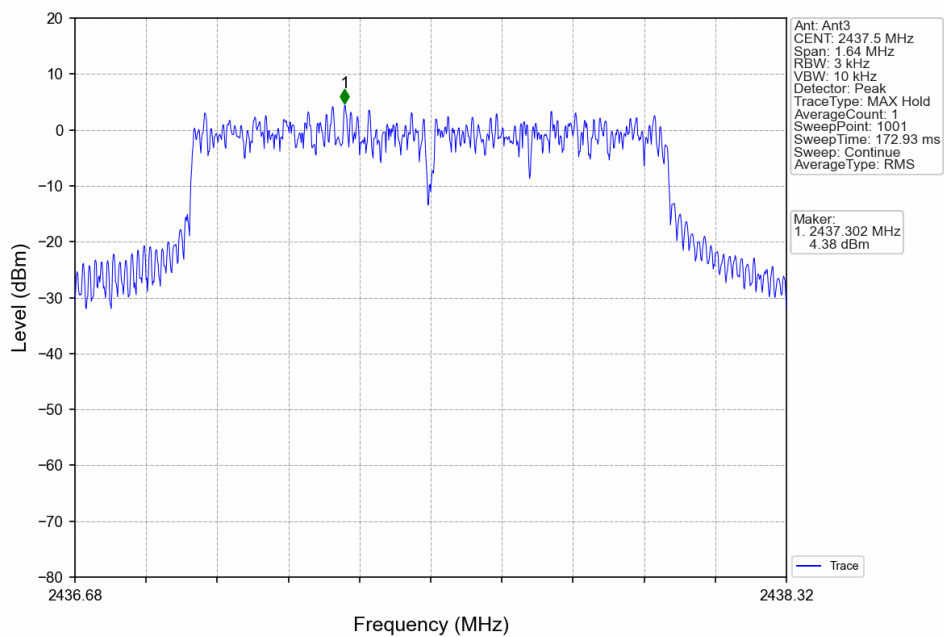
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1.4M_MCH_2437.5MHz_Ant2_NTNV



1.4M_MCH_2437.5MHz_Ant3_NTNV



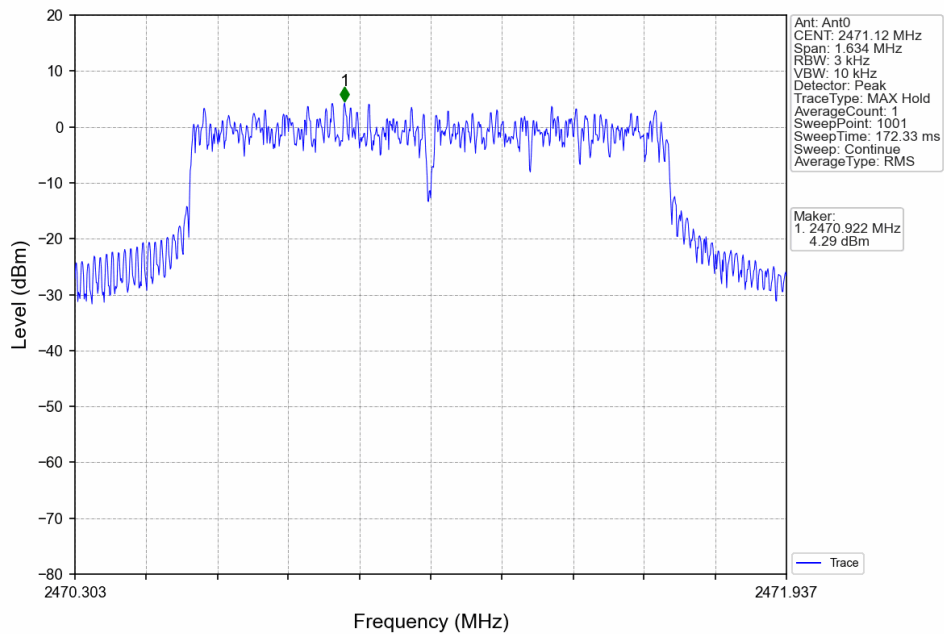
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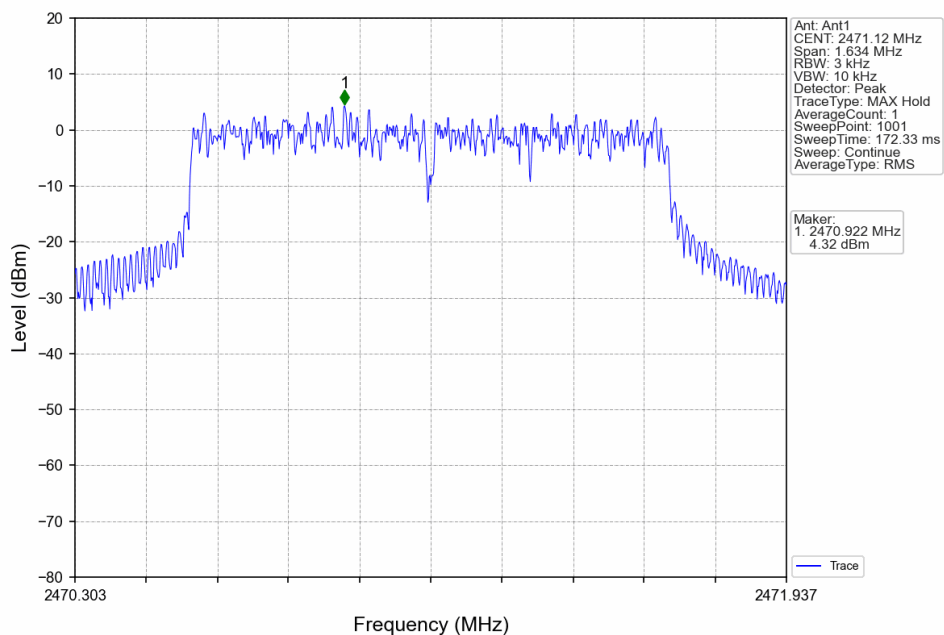
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1.4M_HCH_2471.12MHz_Ant0_NTNV



1.4M_HCH_2471.12MHz_Ant1_NTNV



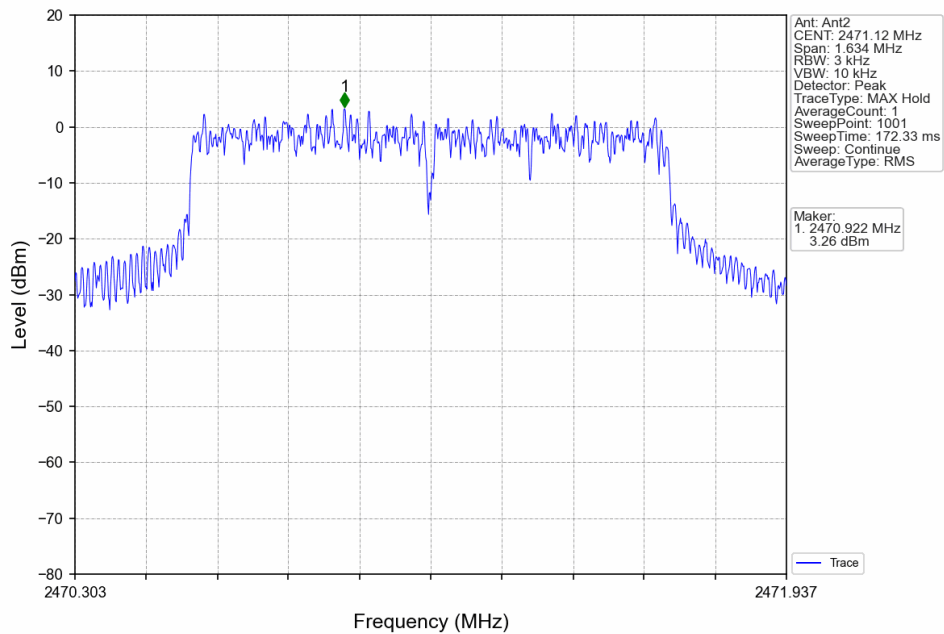
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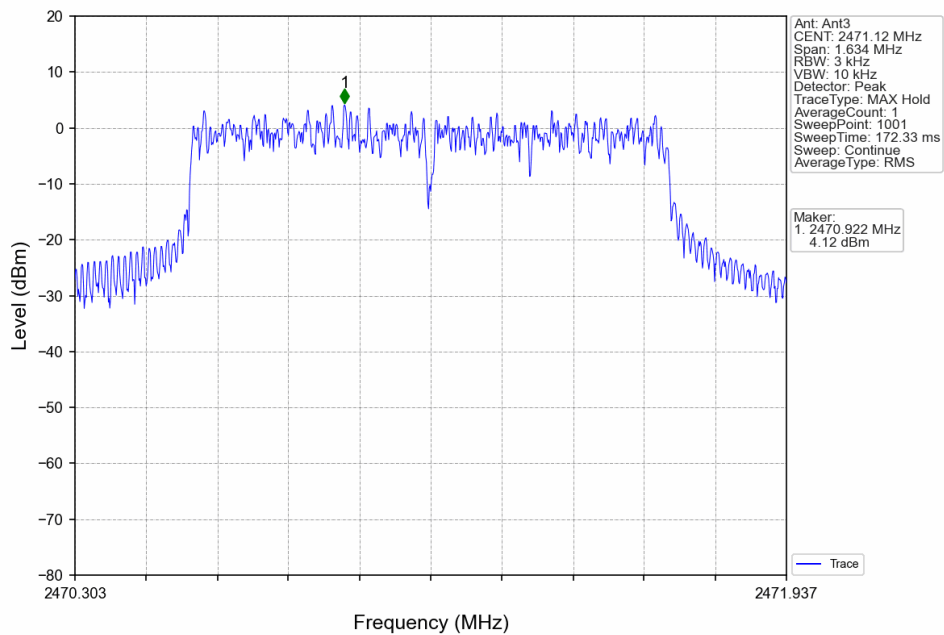
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1.4M_HCH_2471.12MHz_Ant2_NTNV



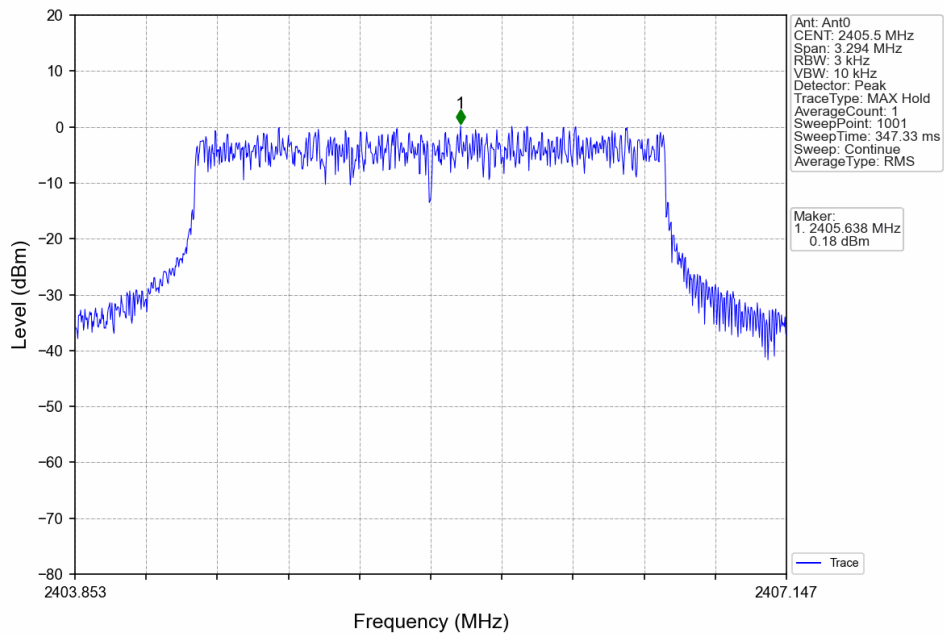
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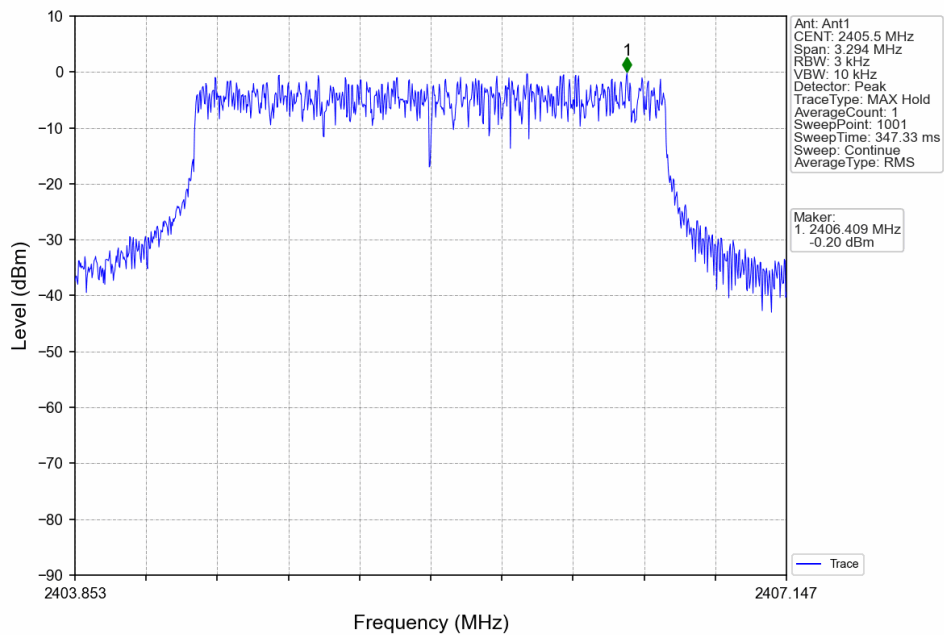
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3M_LCH_2405.5MHz_Ant0_NTNV



3M_LCH_2405.5MHz_Ant1_NTNV



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