



Shenzhen Huaxia Testing Technology Co., Ltd.

1F., Block A of Tongsheng Technology Building, Huahui Road, Dalang Street, Longhua District, Shenzhen, China

Telephone: +86-755-26648640

Fax: +86-755-26648637

Website: www.cqa-cert.com

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TEST REPORT

Report No.: CQASZ20221202165E-01

Applicant: SHENZHEN CLOBOT INTELLIGENT TECHNOLOGY CO., LTD.

Address of Applicant: Area A&B, 7/F, Building 1, SZST Industrial Park, No.3 Tongguan Road, Yutang Street, Guangming New District, Shenzhen, Guangdong, China

Equipment Under Test (EUT):

Product: Robotic Vacuum Cleaner

Model No.: MT-210, MT-200, MT-220, MT-230, MT-240, MT-250, MT-260, MT-270, MT-280, MT-290, R20, R21, R22

Test Model No.: MT-210

Brand Name: N/A

FCC ID: 2AT9W-MT210

Standards: 47 CFR Part 15, Subpart C

Date of Receipt: 2022-12-14

Date of Test: 2022-12-14 to 2023-01-03

Date of Issue: 2023-02-09

Test Result : **PASS***

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

Tested By:

Lewis Zhou

(Lewis Zhou)

Reviewed By:

Timo Lei

(Timo Lei)

Approved By:

Jack Ai

(Jack Ai)



The test report is effective only with both signature and specialized stamp, The result(s) shown in this report refer only to the sample(s) tested. Without written approval of CQA, this report can't be reproduced except in full.

1 Version

Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20221202165E-01	Rev.01	Initial report	2023-02-09

2 Test Summary

Test Item	Test Requirement	Test method	Result
Antenna Requirement	47 CFR Part 15, Subpart C Section 15.203/15.247 (c)	ANSI C63.10 2013	PASS
AC Power Line Conducted Emission	47 CFR Part 15, Subpart C Section 15.207	ANSI C63.10 2013	PASS
Conducted Peak & Average Output Power	47 CFR Part 15, Subpart C Section 15.247 (b)(3)	ANSI C63.10 2013	PASS
6dB Occupied Bandwidth	47 CFR Part 15, Subpart C Section 15.247 (a)(2)	ANSI C63.10 2013	PASS
Power Spectral Density	47 CFR Part 15, Subpart C Section 15.247 (e)	ANSI C63.10 2013	PASS
Band-edge for RF Conducted Emissions	47 CFR Part 15, Subpart C Section 15.247(d)	ANSI C63.10 2013	PASS
RF Conducted Spurious Emissions	47 CFR Part 15, Subpart C Section 15.247(d)	ANSI C63.10 2013	PASS
Radiated Spurious Emissions	47 CFR Part 15, Subpart C Section 15.205/15.209	ANSI C63.10 2013	PASS
Restricted bands around fundamental frequency (Radiated Emission)	47 CFR Part 15, Subpart C Section 15.205/15.209	ANSI C63.10 2013	PASS

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4 General Information

4.1 Client Information

Applicant:	SHENZHEN CLOBOT INTELLIGENT TECHNOLOGY CO., LTD.
Address of Applicant:	Area A&B, 7/F, Building 1, SZST Industrial Park, No.3 Tongguan Road, Yutang Street, Guangming New District, Shenzhen, Guangdong, China
Manufacturer:	SHENZHEN CLOBOT INTELLIGENT TECHNOLOGY CO., LTD.
Address of Manufacturer:	Area A&B, 7/F, Building 1, SZST Industrial Park, No.3 Tongguan Road, Yutang Street, Guangming New District, Shenzhen, Guangdong, China
Factory:	SHENZHEN CLOBOT INTELLIGENT TECHNOLOGY CO., LTD.
Address of Factory:	Area A&B, 7/F, Building 1, SZST Industrial Park, No.3 Tongguan Road, Yutang Street, Guangming New District, Shenzhen, Guangdong, China

4.2 General Description of EUT

Product Name:	Robotic Vacuum Cleaner
Model No.:	MT-210, MT-200, MT-220, MT-230, MT-240, MT-250, MT-260, MT-270, MT-280, MT-290, R20, R21, R22
Test Model No.:	MT-210
Trade Mark:	N/A
Software Version:	V28.2.4
Hardware Version:	M210_V2.0
Power Supply:	1# Li-ion battery: DC 14.8V 2600mAh, Charge by DC 19V for Charging Base 2# Li-ion battery: DC 12.8V 1800mAh, Charge by DC 19V for Charging Base Charging Base: Output: 19V 0.6A Dust collecting bucket: Power AC 120V~ 60Hz
EUT Supports Radios application:	2.4GHz: Wi-Fi: 802.11b/g/n(HT20): 2412MHz~2462MHz;

4.3 Product Specification subjective to this standard

Operation Frequency:	IEEE 802.11b/g/n(HT20): 2412MHz to 2462MHz
Channel Numbers:	IEEE 802.11b/g, IEEE 802.11n HT20: 11 Channels
Channel Separation:	5MHz
Type of Modulation:	IEEE for 802.11b: DSSS(CCK, DQPSK, DBPSK) IEEE for 802.11g : OFDM(64QAM, 16QAM, QPSK, BPSK) IEEE for 802.11n(HT20) : OFDM (64QAM, 16QAM, QPSK, BPSK)
Transfer Rate:	IEEE for 802.11b: 1Mbps/2Mbps/5.5Mbps/11Mbps IEEE for 802.11g : 6Mbps/9Mbps/12Mbps/18Mbps/24Mbps/36Mbps/48Mbps/54Mbps IEEE for 802.11n(HT20) : 6.5Mbps/13Mbps/19.5Mbps/26Mbps/39Mbps/52Mbps/58.5Mbps/65Mbps
Product Type:	☒ Mobile ☐ Portable

Test Software of EUT:	WIFI Test Tool V1.6.4
Antenna Type:	PCB antenna
Antenna Gain:	2.5dBi

Note :

Prototype The 1# and The 2# are the difference between the PCB of the fan and the battery.

Operation Frequency each of channel(802.11b/g/n HT20)							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
1	2412MHz	4	2427MHz	7	2442MHz	10	2457MHz
2	2417MHz	5	2432MHz	8	2447MHz	11	2462MHz
3	2422MHz	6	2437MHz	9	2452MHz		

Note:

In section 15.31(m), regards to the operating frequency range over 10 MHz, the Lowest frequency, the middle frequency, and the highest frequency of channel were selected to perform the test, and the selected channel see below:

For 802.11b/g/n (HT20):

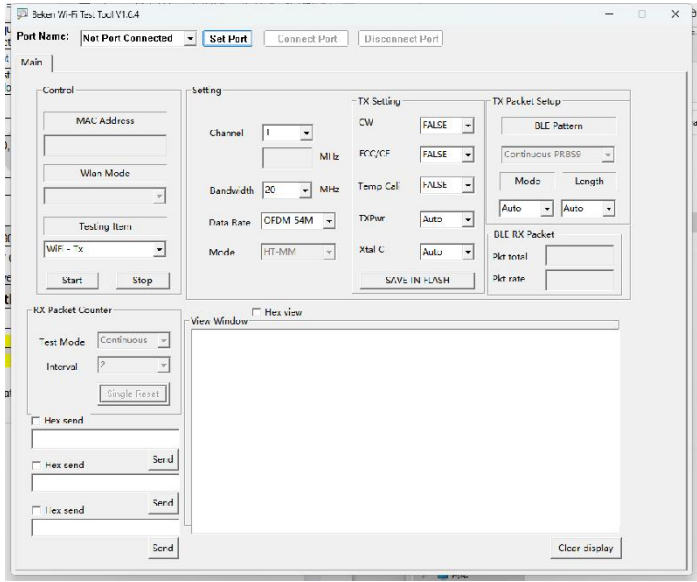
Channel	Frequency
The Lowest channel	2412MHz
The Middle channel	2437MHz
The Highest channel	2462MHz

Note:

Software provided by client enabled the EUT to transmit and receive data at lowest, middle and highest channel individually.

4.4 Test Environment and Mode

Operating Environment:	
Radiated Emissions:	
Temperature:	25.3 °C
Humidity:	55 % RH
Atmospheric Pressure:	1009 mbar
Conducted Emissions:	
Temperature:	25.6 °C
Humidity:	60 % RH
Atmospheric Pressure:	1009 mbar
Radio conducted item test (RF Conducted test room):	
Temperature:	25.5 °C
Humidity:	52 % RH
Atmospheric Pressure:	1009 mbar
Test mode:	
Transmitting mode:	Keep the EUT in transmitting mode with all kind of modulation and all kind of data rate.

Run Software:


Operated Mode for Worst Duty Cycle:		
Test Mode	Duty Cycle(%)	Average correction factor(dB)
IEEE802.11b	99.20	0.03
IEEE802.11g	94.91	0.23
IEEE802.11n (HT20)	94.55	0.24

Remark:

- 1) Duty cycle= On Time/ Period;
- 2) Duty Cycle factor = $10 * \log(1/ \text{Duty cycle})$;

4.5 Description of Support Units

The EUT has been tested with associated equipment below.

1) Support equipment

Description	Manufacturer	Model No.	Certification	Supplied by

2) Cable

Cable No.	Description	Manufacturer	Cable Type/Length	Supplied by
/	/	/	/	/

4.6 Test Location

All tests were performed at:

Shenzhen Huaxia Testing Technology Co., Ltd.

1F., Block A of Tongsheng Technology Building, Huahui Road, Dalang Street, Longhua New District, Shenzhen, Guangdong, China

4.7 Test Facility

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

• A2LA (Certificate No. 4742.01)

Shenzhen Huaxia Testing Technology Co., Ltd., Shenzhen EMC Laboratory is accredited by the American Association for Laboratory Accreditation(A2LA). Certificate No. 4742.01.

• FCC Registration No.: 522263

Shenzhen Huaxia Testing Technology Co., Ltd., Shenzhen EMC Laboratory has been registered and fully described in a report filed with the (FCC) Federal Communications Commission. The acceptance letter from the FCC is maintained in our files. Registration No.:522263

4.8 Statement of the measurement uncertainty

The data and results referenced in this document are true and accurate.

The reader is cautioned that there may be errors within the calibration limits of the equipment and facilities.

The measurement uncertainty was calculated for all measurements listed in this test report acc. to CISPR 16 - 4 „Specification for radio disturbance and immunity measuring apparatus and methods – Part 4: Uncertainty in EMC Measurements“ and is documented in the **Shenzhen Huaxia Testing Technology Co., Ltd.** quality system acc. to DIN EN ISO/IEC 17025.

Furthermore, component and process variability of devices similar to that tested may result in additional deviation. The manufacturer has the sole responsibility of continued compliance of the device.

Hereafter the best measurement capability for CQA laboratory is reported:

No.	Item	Uncertainty	Notes
1	Radiated Emission (Below 1GHz)	5.12dB	(1)
2	Radiated Emission (Above 1GHz)	4.60dB	(1)
3	Conducted Disturbance (0.15~30MHz)	3.34dB	(1)
4	Radio Frequency	3×10^{-8}	(1)
5	Duty cycle	0.6 %.	(1)
6	Occupied Bandwidth	1.1%	(1)
7	RF conducted power	0.86dB	(1)
8	RF power density	0.74	(1)
9	Conducted Spurious emissions	0.86dB	(1)
10	Temperature test	0.8℃	(1)
11	Humidity test	2.0%	(1)
12	Supply voltages	0.5 %.	(1)
13	Frequency Error	5.5 Hz	(1)

(1) This uncertainty represents an expanded uncertainty expressed at approximately the 95% confidence level using a coverage factor of $k=2$.

4.9 Deviation from Standards

None.

4.10 Abnormalities from Standard Conditions

None.

4.11 Other Information Requested by the Customer

None.

4.12 Equipment List

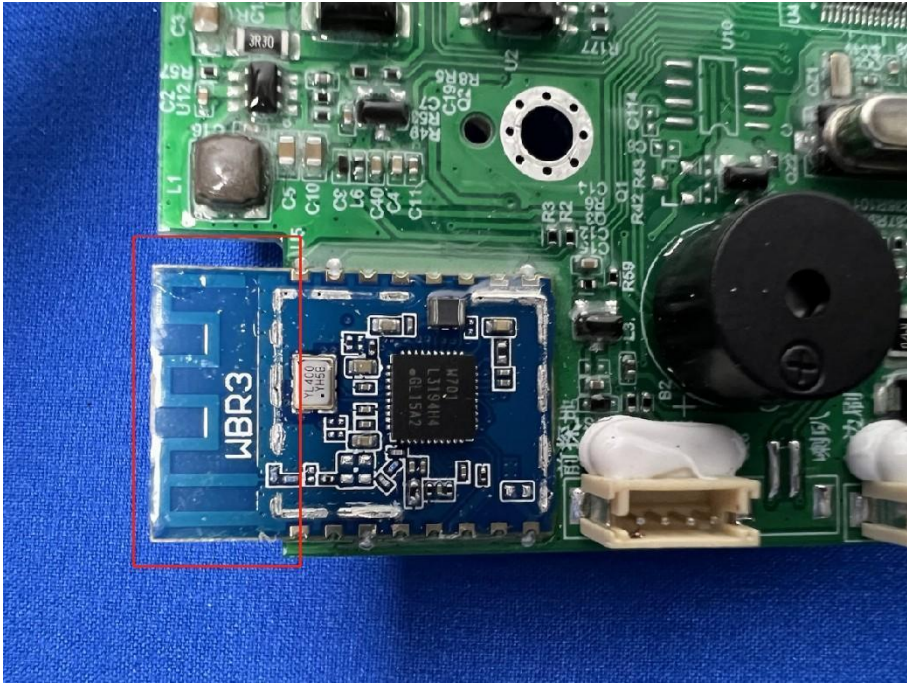
Test Equipment	Manufacturer	Model No.	Instrument No.	Calibration Date	Calibration Due Date
EMI Test Receiver	R&S	ESR7	CQA-005	2022/09/09	2023/09/08
Spectrum analyzer	R&S	FSU26	CQA-038	2022/09/09	2023/09/08
Spectrum analyzer	R&S	FSU40	CQA-075	2022/09/09	2023/09/08
Preamplifier	MITEQ	AFS4-00010300-18-10P-4	CQA-035	2022/09/09	2023/09/08
Preamplifier	MITEQ	AMF-6D-02001800-29-20P	CQA-036	2022/09/09	2023/09/08
Preamplifier	EMCI	EMC184055SE	CQA-089	2022/09/09	2023/09/08
Loop antenna	Schwarzbeck	FMZB1516	CQA-060	2021/09/16	2024/09/15
Bilog Antenna	R&S	HL562	CQA-011	2021/09/16	2024/09/15
Horn Antenna	R&S	HF906	CQA-012	2021/09/16	2024/09/15
Horn Antenna	Schwarzbeck	BBHA 9170	CQA-088	2021/09/16	2024/09/15
Coaxial Cable (Above 1GHz)	CQA	N/A	C007	2022/09/09	2023/09/08
Coaxial Cable (Below 1GHz)	CQA	N/A	C013	2022/09/09	2023/09/08
RF cable(9KHz~40GHz)	CQA	RF-01	CQA-079	2022/09/09	2023/09/08
Antenna Connector	CQA	RFC-01	CQA-080	2022/09/09	2023/09/08
Power Sensor	KEYSIGHT	U2021XA	CQA-30	2022/09/09	2023/09/08
N1918A Power Analysis Manager Power Panel	Agilent	N1918A	CQA-074	2022/09/09	2023/09/08
Power meter	R&S	NRVD	CQA-029	2022/09/09	2023/09/08
Power divider	MIDWEST	PWD-2533-02-SMA-79	CQA-067	2022/09/09	2023/09/08
EMI Test Receiver	R&S	ESR7	CQA-005	2022/09/09	2023/09/08
LISN	R&S	ENV216	CQA-003	2022/09/09	2023/09/08
Coaxial cable	CQA	N/A	CQA-C009	2022/09/09	2023/09/08
DC power	KEYSIGHT	E3631A	CQA-028	2022/09/09	2023/09/08

Test software:

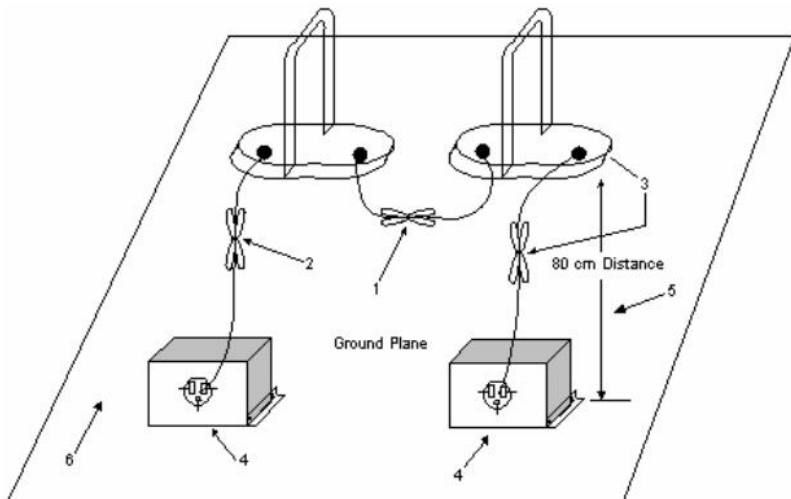
	Manufacturer	Software brand
Radiated Emissions test software	Tonscend	JS1120-3
Conducted Emissions test software	Audix	e3
RF Conducted test software	Audix	e3

5 Test results and Measurement Data

5.1 Antenna Requirement

Standard requirement:	47 CFR Part 15C Section 15.203 /247(c)
15.203 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 PCB antenna. The best case gain of the antenna is 2.5 dBi.	

5.2 Conducted Emissions

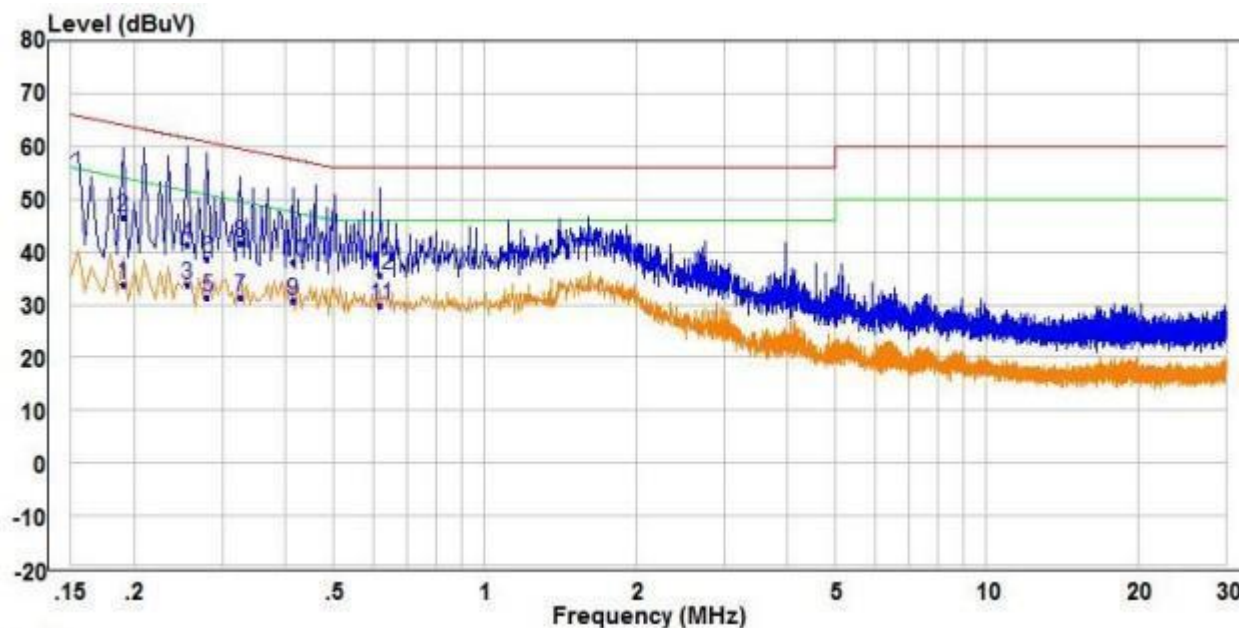
Test Requirement:	47 CFR Part 15C Section 15.207		
Test Method:	ANSI C63.10: 2013		
Test Frequency Range:	150kHz to 30MHz		
Limit:	Frequency range (MHz)	Limit (dBuV)	
		Quasi-peak	Average
	0.15-0.5	66 to 56*	56 to 46*
	0.5-5	56	46
	5-30	60	50
* Decreases with the logarithm of the frequency.			
Test Procedure:	1—Excess I/O cables shall be bundled in the center. If bundling is not possible, then the cables shall be arranged in serpentine fashion. Bundling shall not exceed 40 cm in length . 2—Excess power cords shall be bundled in the center or shortened to an appropriate length. 3—EUT and all cables shall be insulated, if required, from the ground plane by up to 12 mm of insulating material . 4—EUT connected to one LISN. LISN may be placed on top of, or immediately beneath, the ground plane. i All other equipment powered from a second LISN or additional LISN(s). ii A multiple-outlet strip may be used for multiple power cords of non-EUT equipment. 5—Horizontal projection from the closest point of EUT to the nearest point of the LISN. For radiated emission testing, the LISNs shall be removed. 6—Ground reference plane.		
Test Setup:			
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates at lowest, middle and highest channel.		
Final Test Mode:	Through Pre-scan, find the 1Mbps of rate of 802.11b at middle channel is the worst case. Only the worst case is recorded in the report.		
Test Voltage:	AC120V/60Hz		

Test Results:	Pass
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1#

Measurement Data

Live Line:

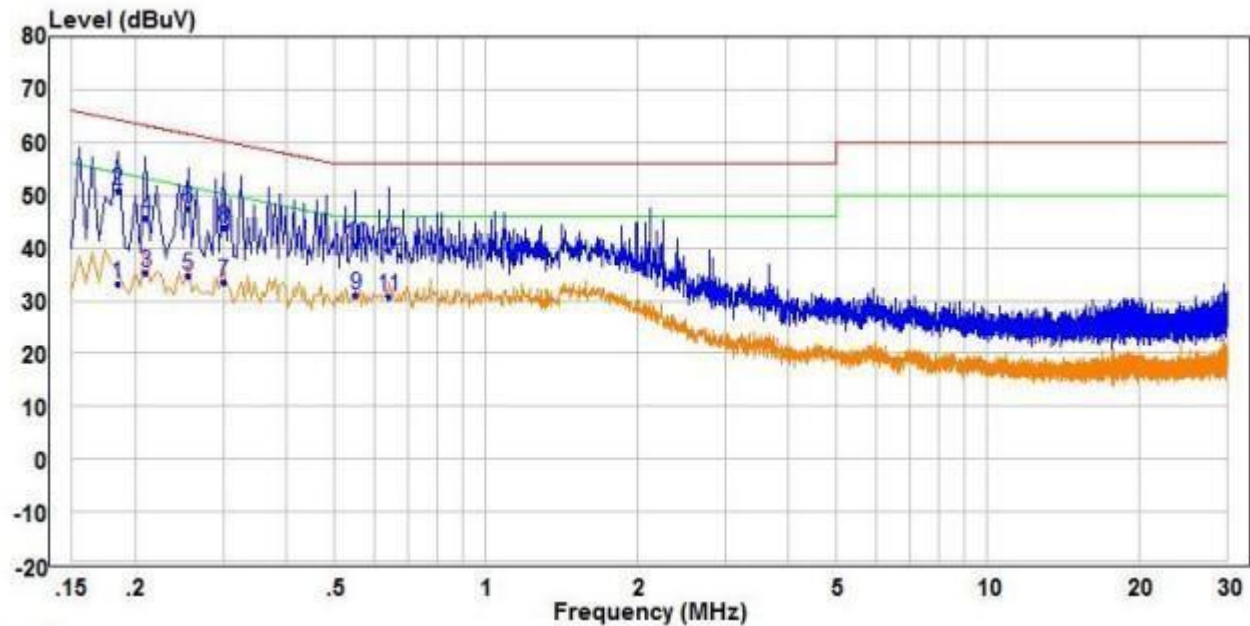


		Read		Limit	Over		
	Freq	Level	Factor	Level	Line	Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	Pol/Phase
1	0.190	24.20	9.63	33.83	54.04	-20.21	Average
2	0.190	36.94	9.63	46.57	64.04	-17.47	QP
3	0.255	24.15	9.54	33.69	51.59	-17.90	Average
4	0.255	32.02	9.54	41.56	61.59	-20.03	QP
5	0.280	21.91	9.51	31.42	50.82	-19.40	Average
6	0.280	29.06	9.51	38.57	60.82	-22.25	QP
7	0.325	21.89	9.52	31.41	49.58	-18.17	Average
8	0.325	32.04	9.52	41.56	59.58	-18.02	QP
9	0.415	21.05	9.62	30.67	47.55	-16.88	Average
10	0.415	28.52	9.62	38.14	57.55	-19.41	QP
11	0.620	20.17	9.82	29.99	46.00	-16.01	Average
12	0.620	25.75	9.82	35.57	56.00	-20.43	QP

Remark:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level = Receiver Reading + LISN Factor + Cable Loss.
3. If the Peak value under Average limit, the Average value is not recorded in the report.

Neutral Line:



	Freq	Read	Factor	Level	Limit	Over	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB		
1	0.185	23.52	9.63	33.15	54.26	-21.11	Average	Neutral
2 PP	0.185	41.08	9.63	50.71	64.26	-13.55	QP	Neutral
3	0.210	25.69	9.59	35.28	53.21	-17.93	Average	Neutral
4	0.210	36.04	9.59	45.63	63.21	-17.58	QP	Neutral
5	0.255	25.12	9.53	34.65	51.59	-16.94	Average	Neutral
6	0.255	37.90	9.53	47.43	61.59	-14.16	QP	Neutral
7	0.300	23.96	9.48	33.44	50.24	-16.80	Average	Neutral
8	0.300	34.38	9.48	43.86	60.24	-16.38	QP	Neutral
9 AV	0.550	21.25	9.75	31.00	46.00	-15.00	Average	Neutral
10	0.550	30.67	9.75	40.42	56.00	-15.58	QP	Neutral
11	0.640	21.00	9.84	30.84	46.00	-15.16	Average	Neutral
12	0.640	29.85	9.84	39.69	56.00	-16.31	QP	Neutral

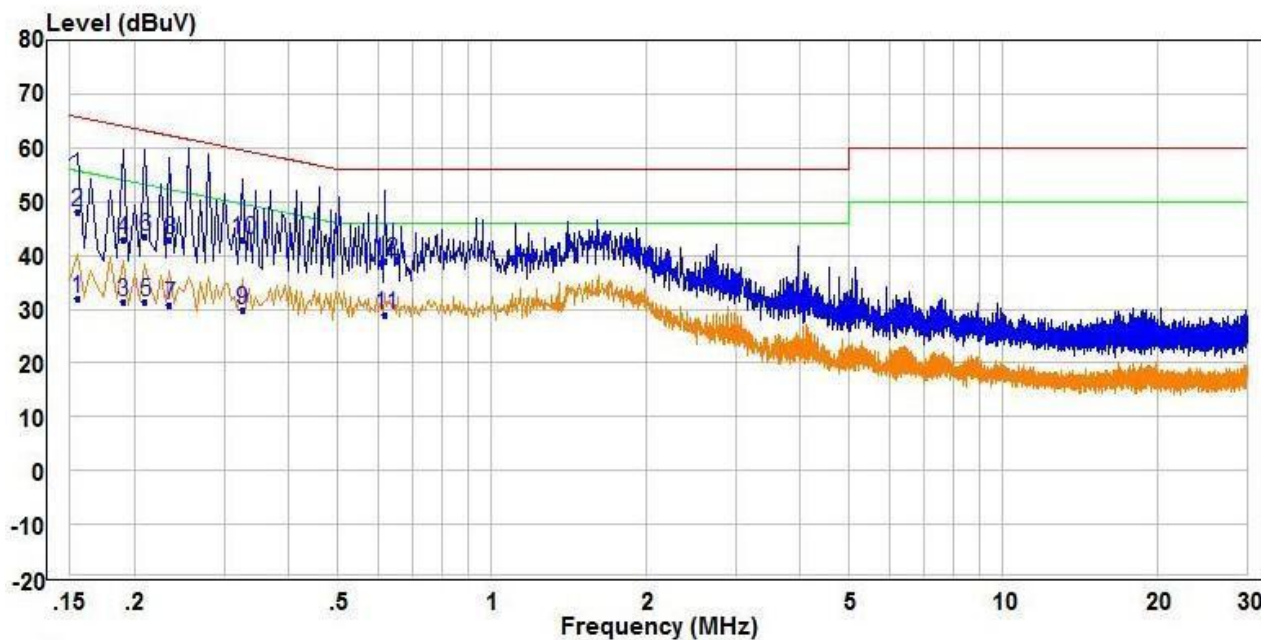
Remark:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level = Receiver Reading + LISN Factor + Cable Loss.
3. If the Peak value under Average limit, the Average value is not recorded in the report.

2#

Measurement Data

Live Line:

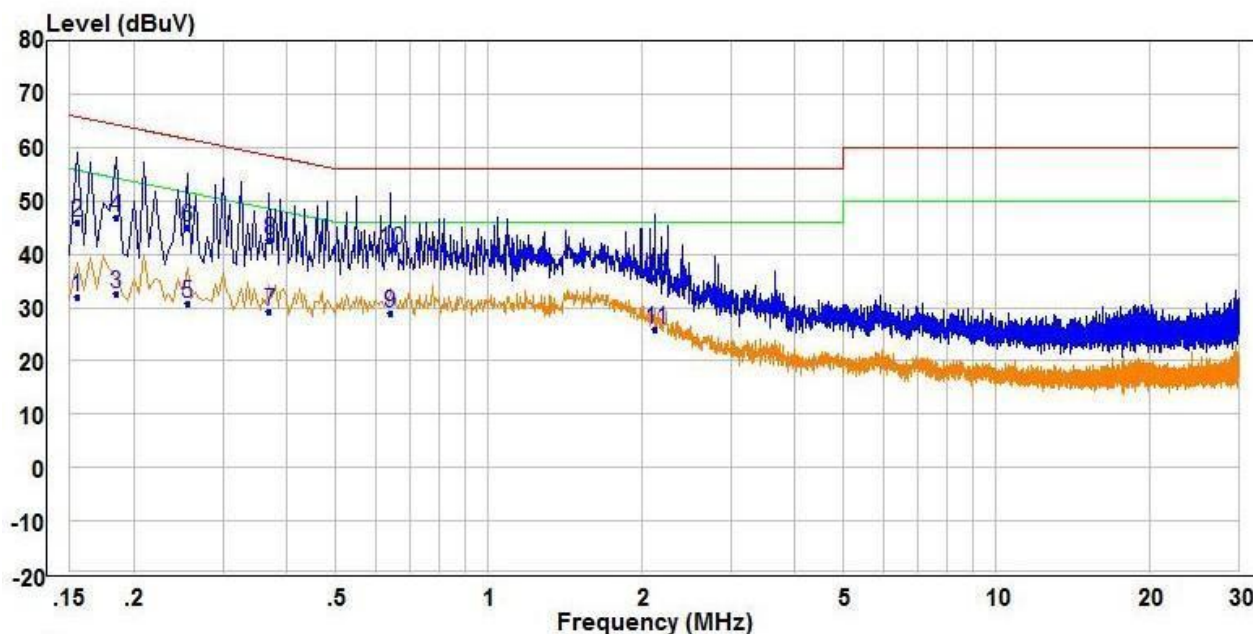


	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB		
1	0.155	22.23	9.69	31.92	55.73	-23.81	Average	Line
2	0.155	38.38	9.69	48.07	65.73	-17.66	QP	Line
3	0.190	21.69	9.63	31.32	54.04	-22.72	Average	Line
4	0.190	33.20	9.63	42.83	64.04	-21.21	QP	Line
5	0.210	21.69	9.60	31.29	53.21	-21.92	Average	Line
6	0.210	34.01	9.60	43.61	63.21	-19.60	QP	Line
7	0.235	21.16	9.56	30.72	52.27	-21.55	Average	Line
8	0.235	33.39	9.56	42.95	62.27	-19.32	QP	Line
9	0.325	20.37	9.52	29.89	49.58	-19.69	Average	Line
10 PP	0.325	33.44	9.52	42.96	59.58	-16.62	QP	Line
11 AV	0.620	19.06	9.82	28.88	46.00	-17.12	Average	Line
12	0.620	29.08	9.82	38.90	56.00	-17.10	QP	Line

Remark:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level = Receiver Reading + LISN Factor + Cable Loss.
3. If the Peak value under Average limit, the Average value is not recorded in the report.

Neutral Line:

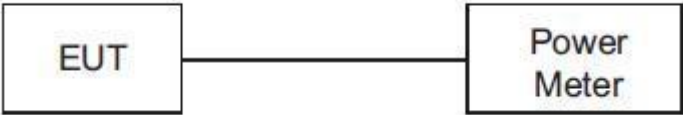


	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB		
1	0.155	22.21	9.69	31.90	55.73	-23.83	Average	Neutral
2	0.155	36.43	9.69	46.12	65.73	-19.61	QP	Neutral
3	0.185	22.94	9.63	32.57	54.26	-21.69	Average	Neutral
4	0.185	37.12	9.63	46.75	64.26	-17.51	QP	Neutral
5	0.255	21.31	9.53	30.84	51.59	-20.75	Average	Neutral
6	0.255	35.49	9.53	45.02	61.59	-16.57	QP	Neutral
7	0.370	19.69	9.57	29.26	48.50	-19.24	Average	Neutral
8	0.370	33.08	9.57	42.65	58.50	-15.85	QP	Neutral
9 AV	0.640	19.26	9.84	29.10	46.00	-16.90	Average	Neutral
10 PP	0.640	30.96	9.84	40.80	56.00	-15.20	QP	Neutral
11	2.130	16.22	9.75	25.97	46.00	-20.03	Average	Neutral
12	2.130	25.89	9.75	35.64	56.00	-20.36	QP	Neutral

Remark:

1. The following Quasi-Peak and Average measurements were performed on the EUT:
2. Final Test Level = Receiver Reading + LISN Factor + Cable Loss.
3. If the Peak value under Average limit, the Average value is not recorded in the report.

5.3 Conducted Peak & Average Output Power

Test Requirement:	47 CFR Part 15C Section 15.247 (b)(3)
Test Method:	ANSI C63.10: 2013
Test Setup:	
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Through Pre-scan, find the 1Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of 802.11g; 6.5Mbps of rate is the worst case of 802.11n(HT20). Only the worst case is recorded in the report.
Limit:	30dBm
Test Results:	Pass

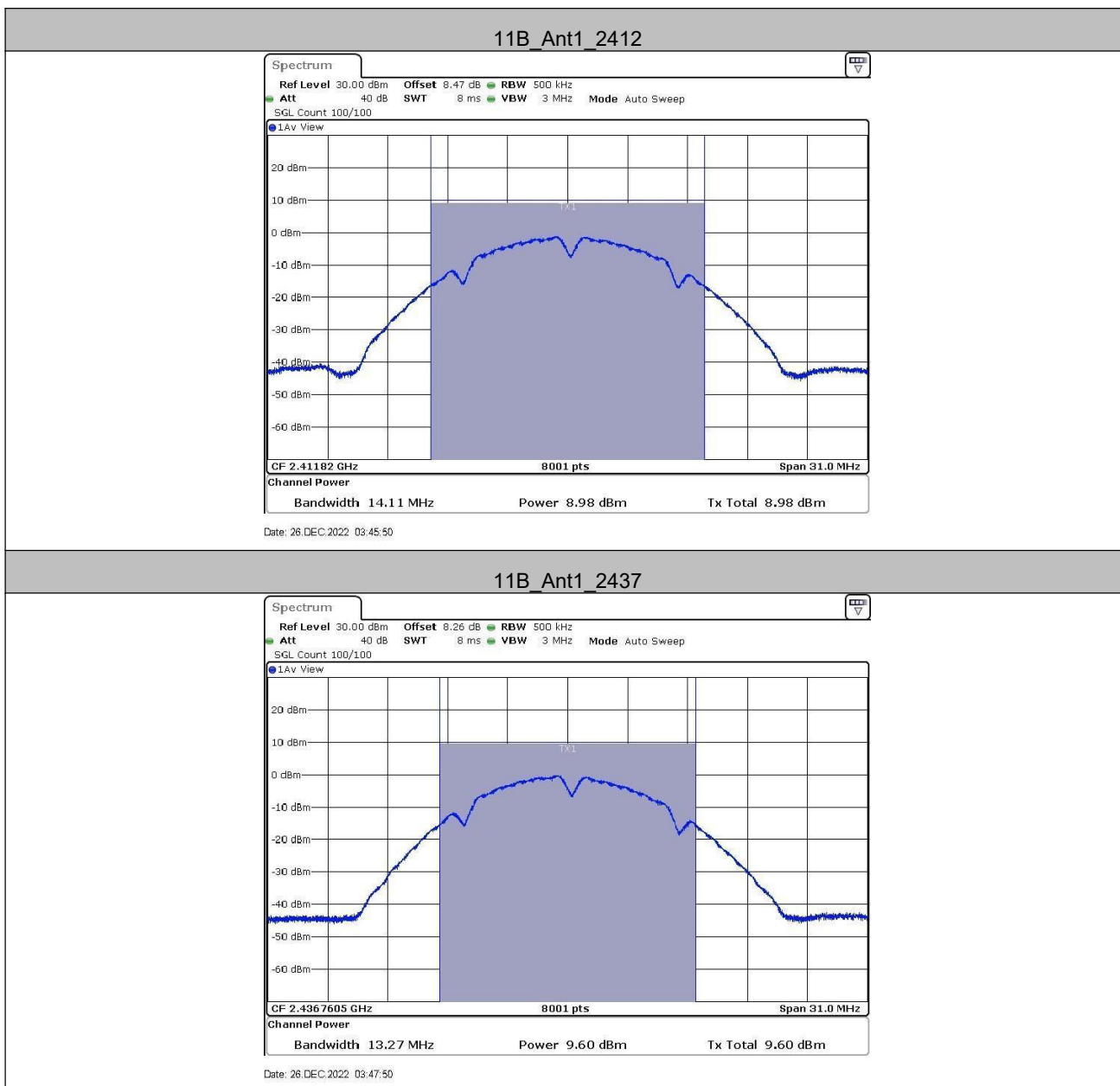
Test Result

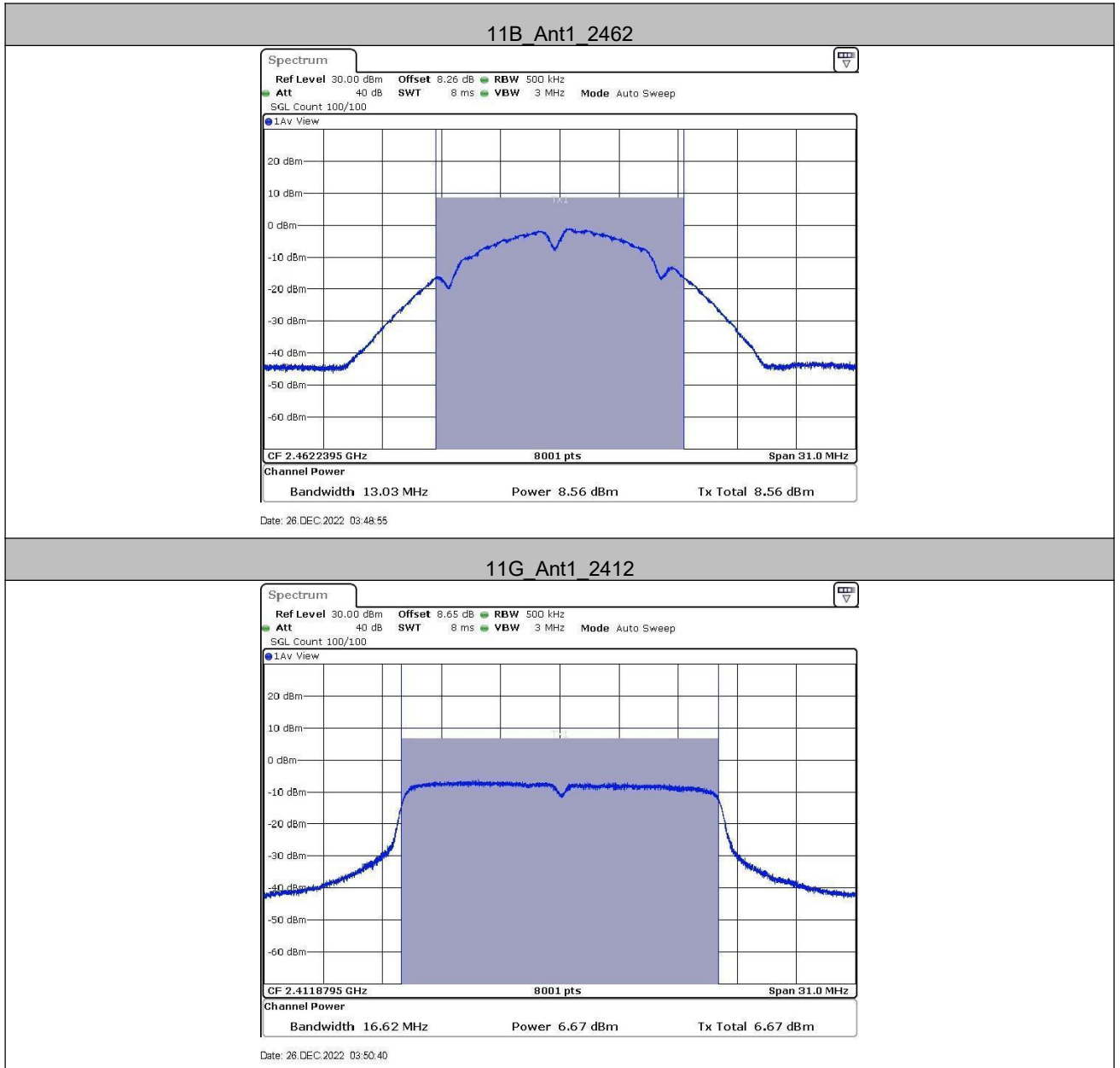
TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	2412	8.98	≤30	PASS
		2437	9.60	≤30	PASS
		2462	8.56	≤30	PASS
11G	Ant1	2412	6.67	≤30	PASS
		2437	7.46	≤30	PASS
		2462	6.57	≤30	PASS
11N20SISO	Ant1	2412	5.95	≤30	PASS
		2437	6.81	≤30	PASS
		2462	5.71	≤30	PASS

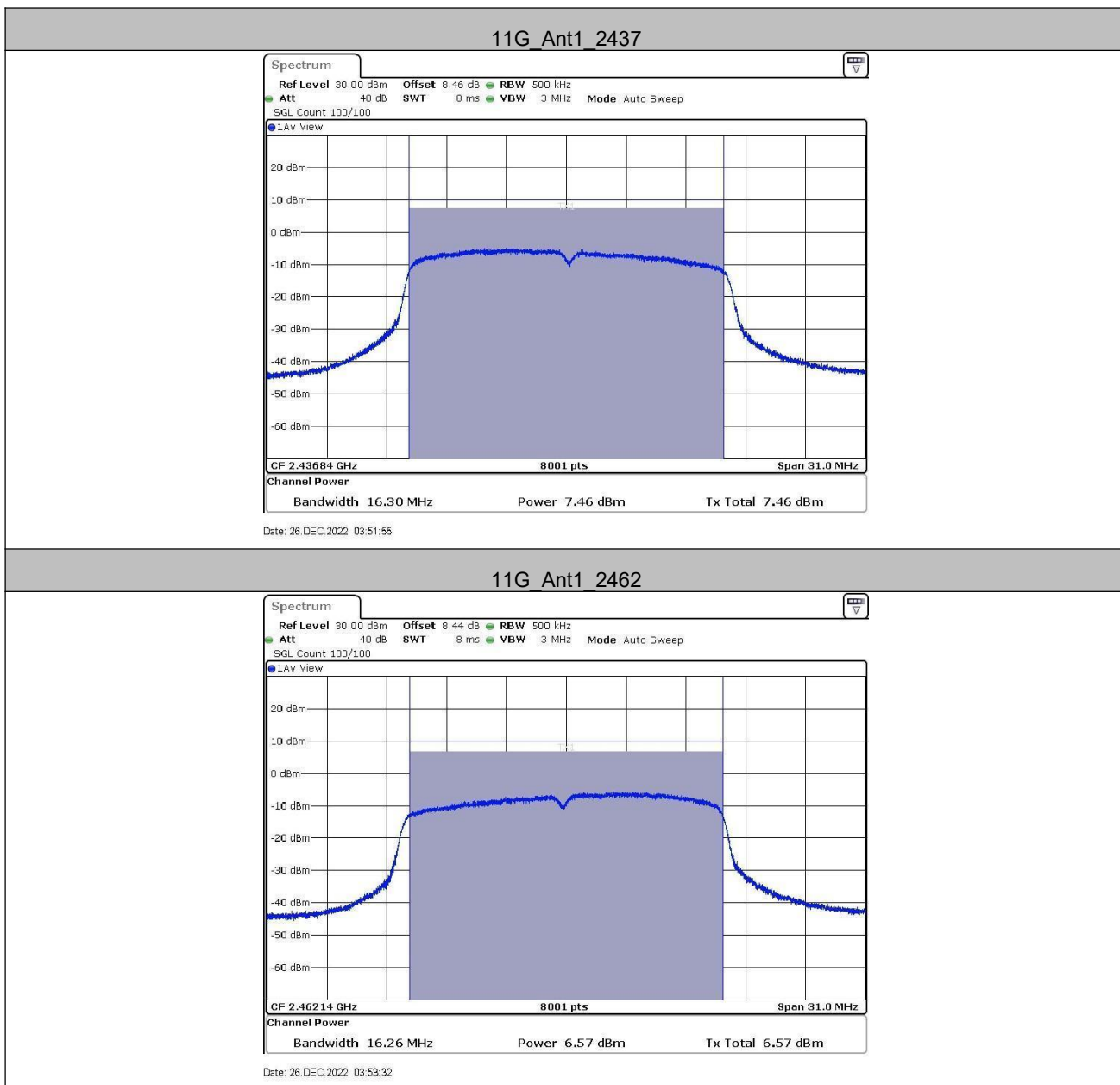
Note:

The Average correction factor was added to the test data

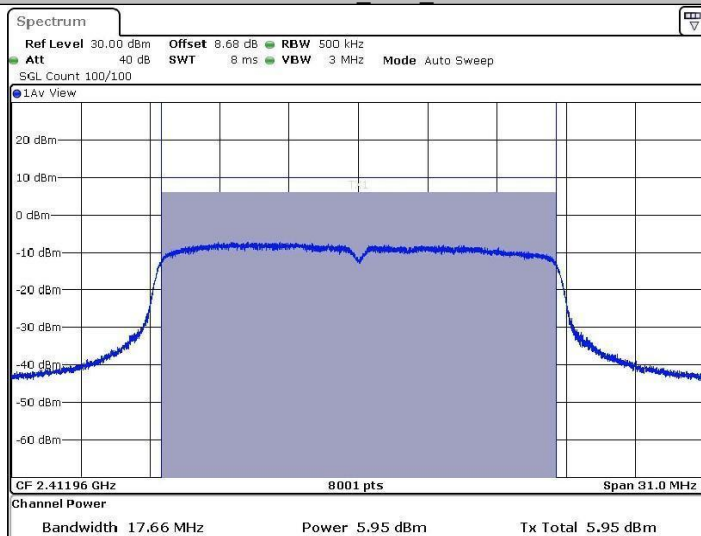
Test Graphs





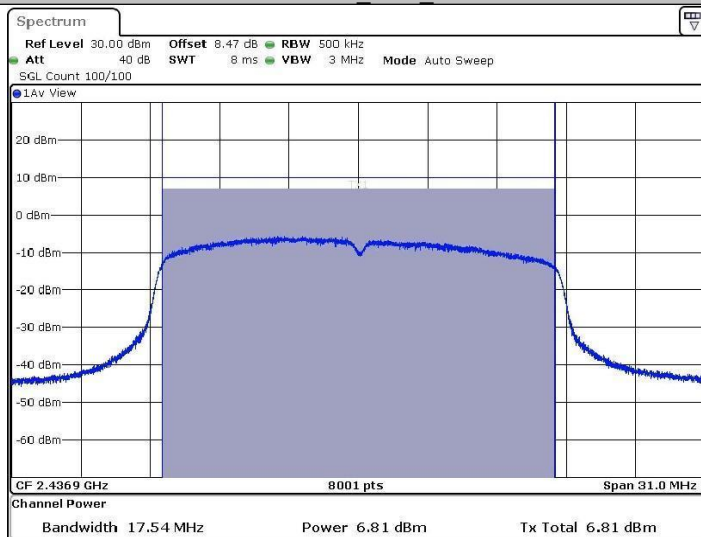


11N20SISO_Ant1_2412

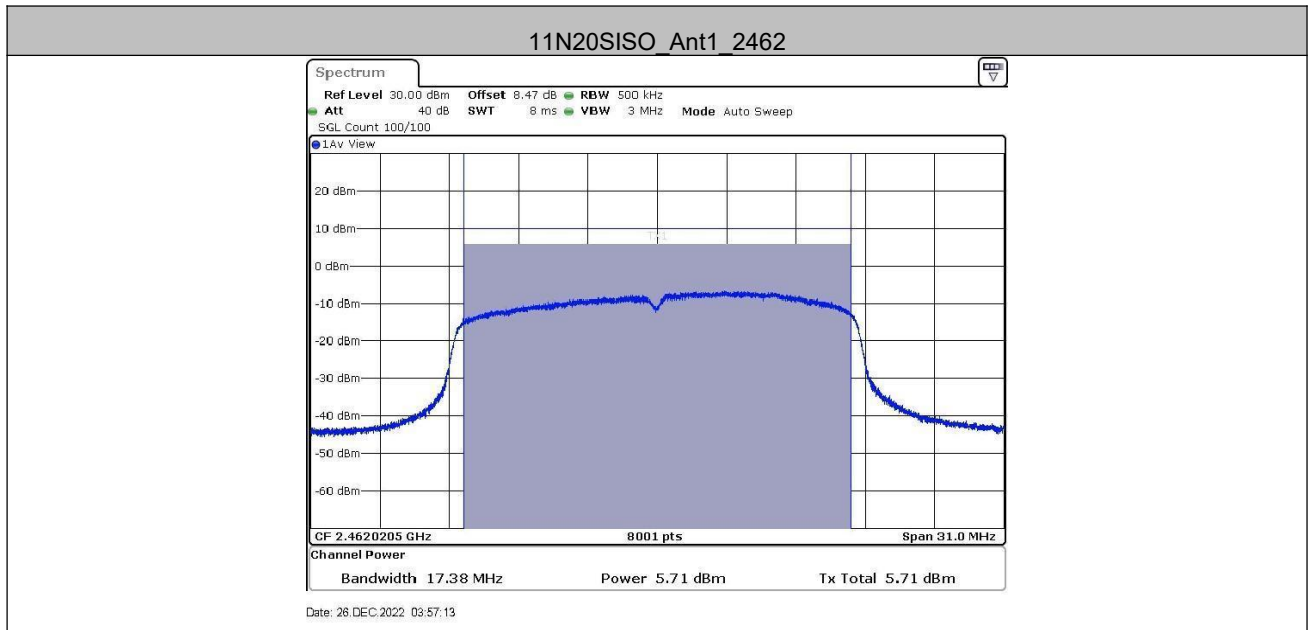


Date: 26 DEC.2022 03:54:59

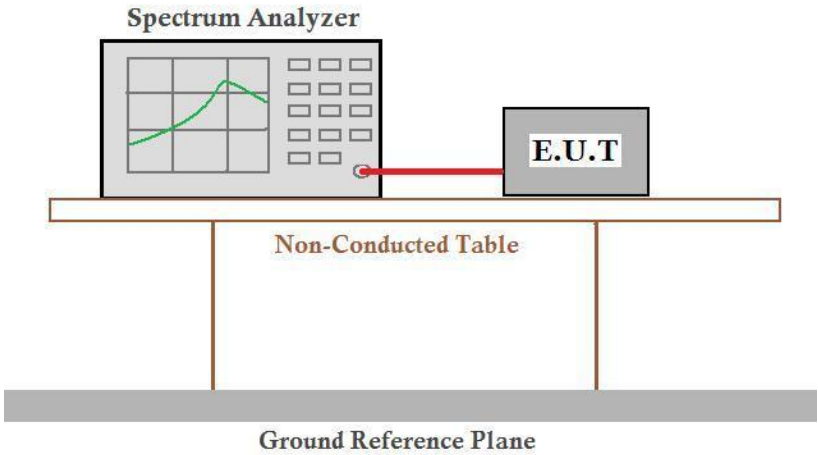
11N20SISO_Ant1_2437



Date: 26 DEC.2022 03:56:10



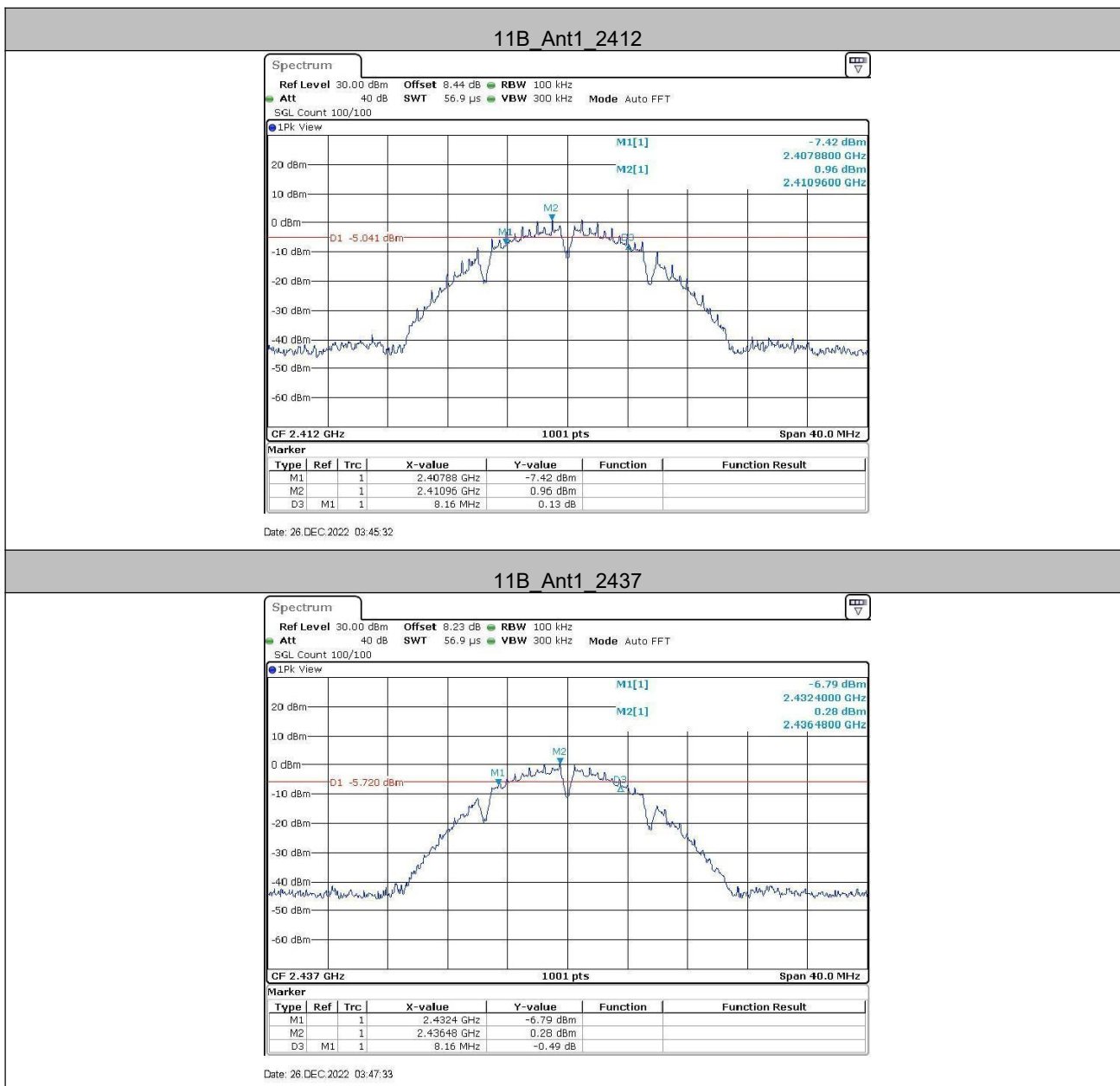
5.4 6dB Occupy Bandwidth

Test Requirement:	47 CFR Part 15C Section 15.247 (a)(2)
Test Method:	ANSI C63.10: 2013
Test Setup:	 Offset=cable loss+ attenuation factor
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Through Pre-scan, find the 1Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of 802.11g; 6.5Mbps of rate is the worst case of 802.11n(HT20). Only the worst case is recorded in the report.
Limit:	≥ 500 kHz
Test Results:	Pass

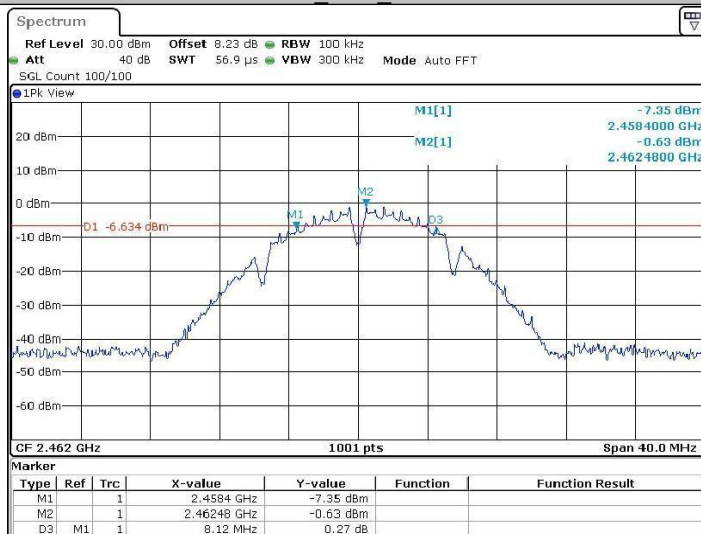
Test Result

TestMode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	8.160	2407.880	2416.040	0.5	PASS
		2437	8.160	2432.400	2440.560	0.5	PASS
		2462	8.120	2458.400	2466.520	0.5	PASS
11G	Ant1	2412	16.120	2403.760	2419.880	0.5	PASS
		2437	15.800	2428.760	2444.560	0.5	PASS
		2462	15.800	2454.360	2470.160	0.5	PASS
11N20SISO	Ant1	2412	17.680	2403.120	2420.800	0.5	PASS
		2437	15.760	2428.800	2444.560	0.5	PASS
		2462	16.040	2454.720	2470.760	0.5	PASS

Test Graphs

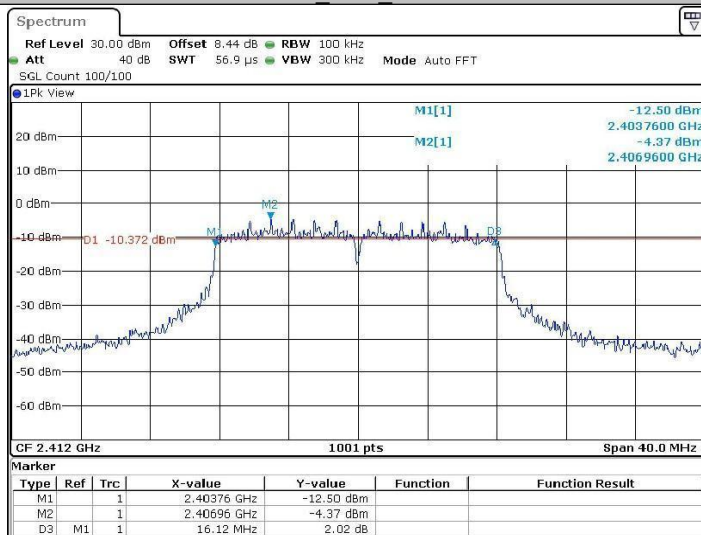


11B Ant1_2462



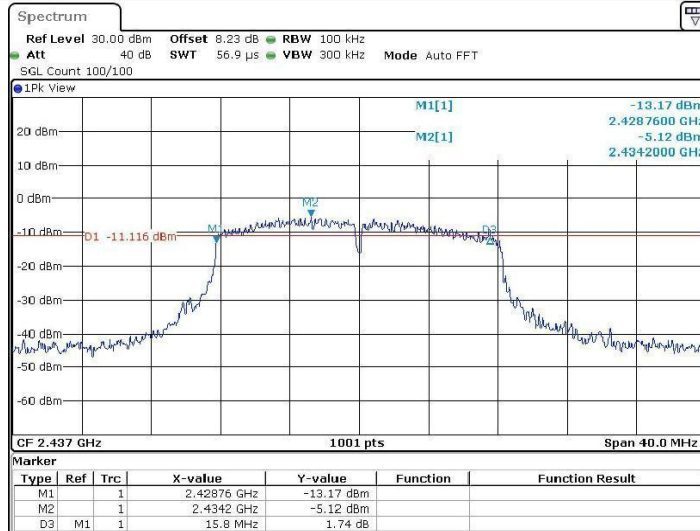
Date: 26 DEC.2022 03:48:38

11G Ant1_2412



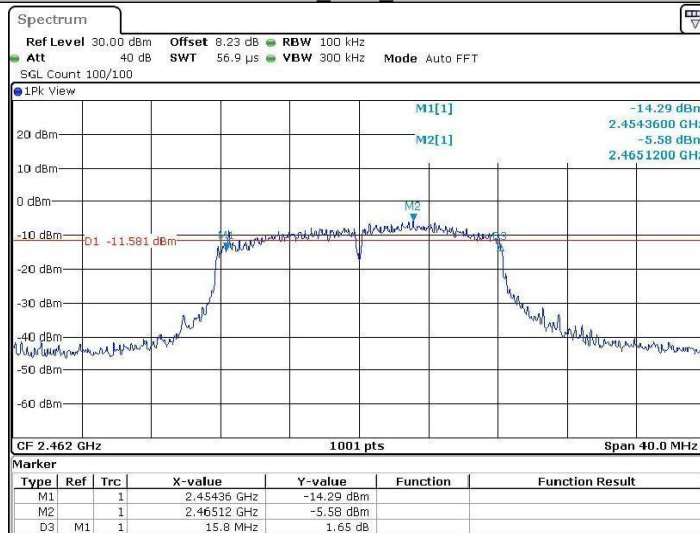
Date: 26 DEC.2022 03:50:22

11G_Ant1_2437



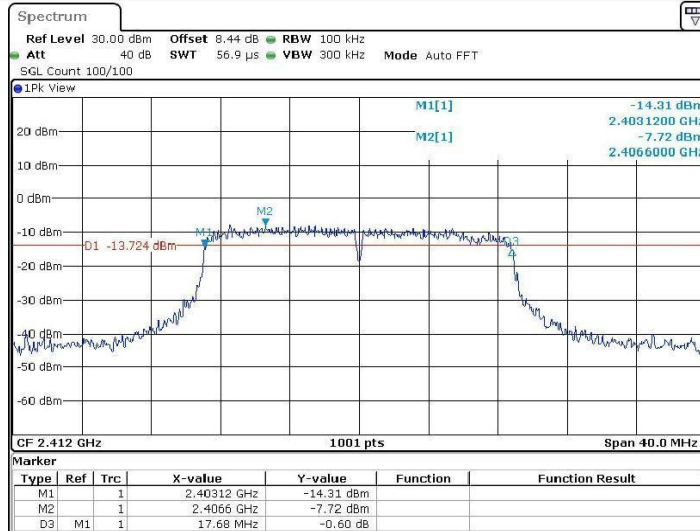
Date: 26 DEC.2022 03:51:37

11G_Ant1_2462



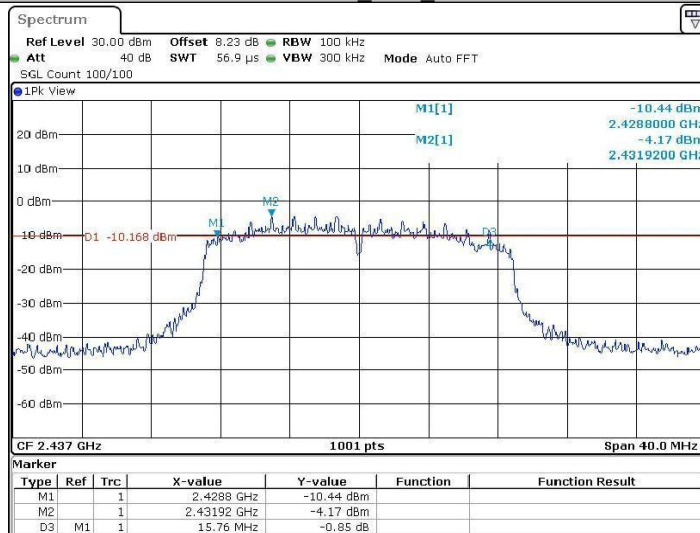
Date: 26 DEC.2022 03:53:15

11N20SISO_Ant1_2412

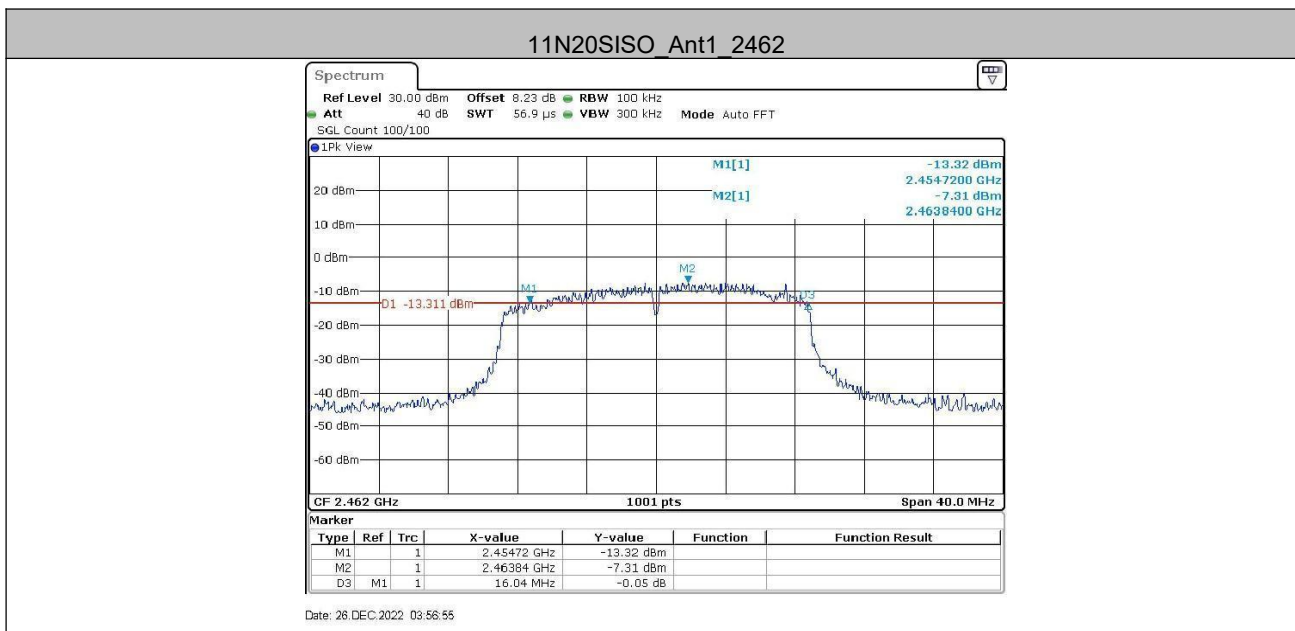


Date: 26 DEC.2022 03:54:41

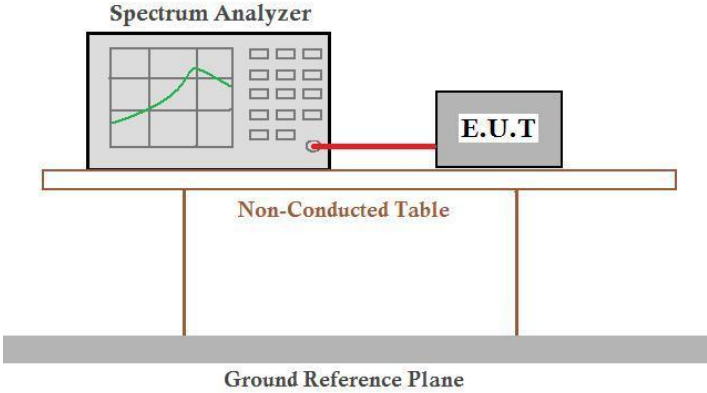
11N20SISO_Ant1_2437



Date: 26 DEC.2022 03:55:53



5.5 Power Spectral Density

Test Requirement:	47 CFR Part 15C Section 15.247 (e)
Test Method:	ANSI C63.10: 2013
Test Setup:	 Offset=cable loss+ attenuation factor
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Through Pre-scan, find the 1Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of 802.11g; 6.5Mbps of rate is the worst case of 802.11n(HT20). Only the worst case is recorded in the report.
Limit:	$\leq 8.00\text{dBm}/3\text{kHz}$
Test Results:	Pass

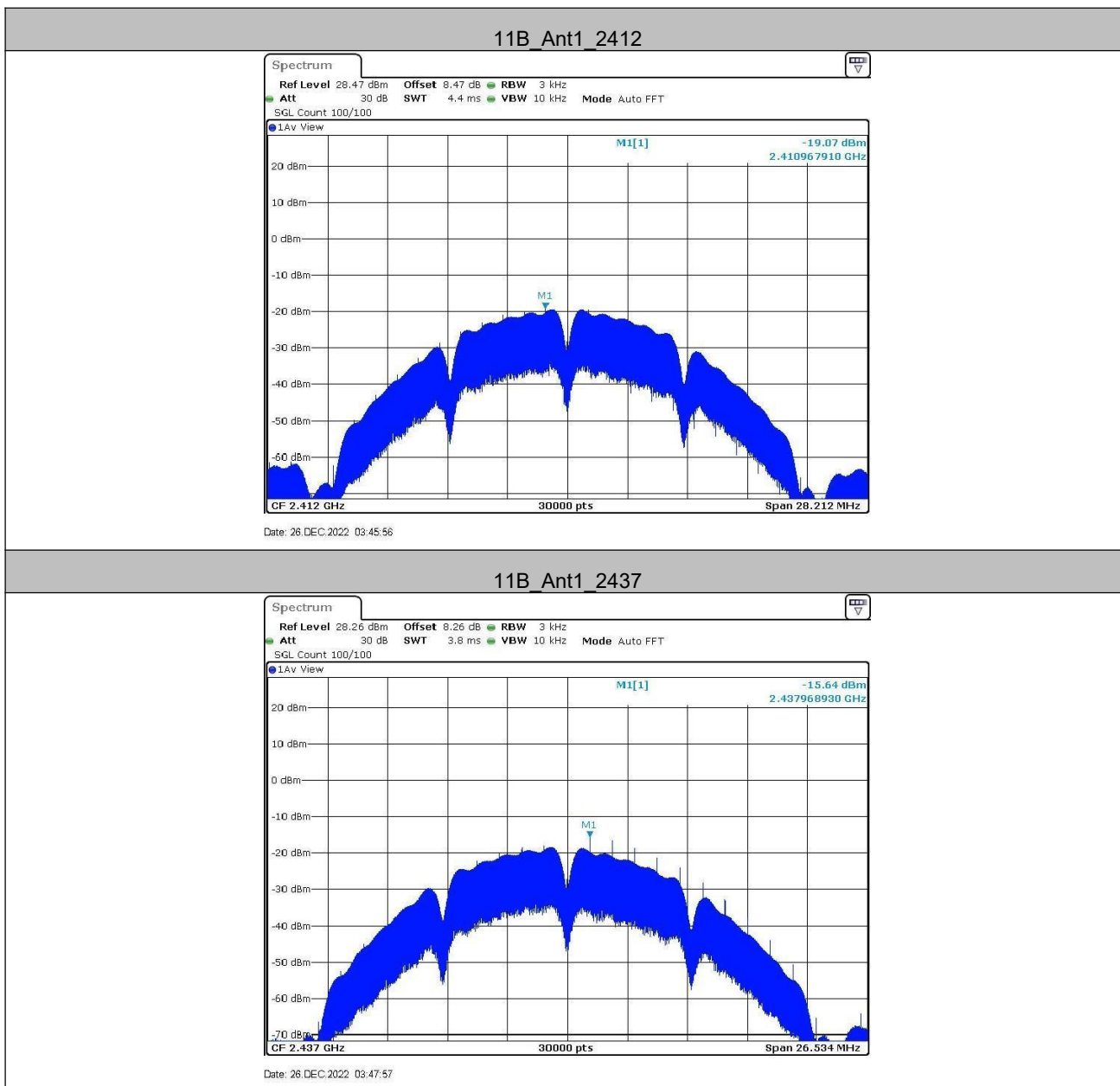
Test Result

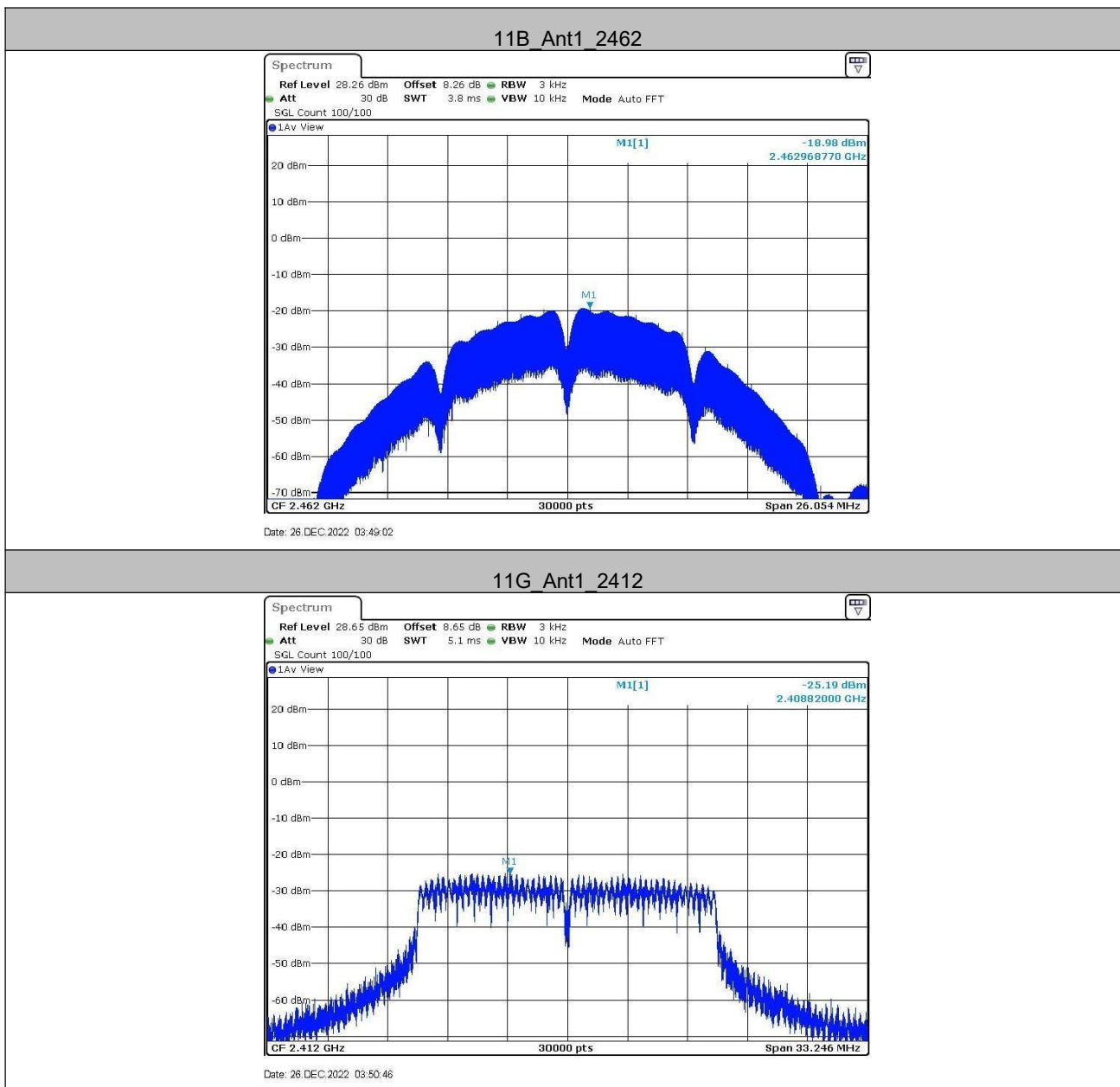
TestMode	Antenna	Channel	Result[dBm/3-100kHz]	Limit[dBm/3kHz]	Verdict
11B	Ant1	2412	-19.07	≤8	PASS
		2437	-15.64	≤8	PASS
		2462	-18.98	≤8	PASS
11G	Ant1	2412	-25.19	≤8	PASS
		2437	-23.41	≤8	PASS
		2462	-24.64	≤8	PASS
11N20SISO	Ant1	2412	-25.8	≤8	PASS
		2437	-24.76	≤8	PASS
		2462	-25.31	≤8	PASS

Note:

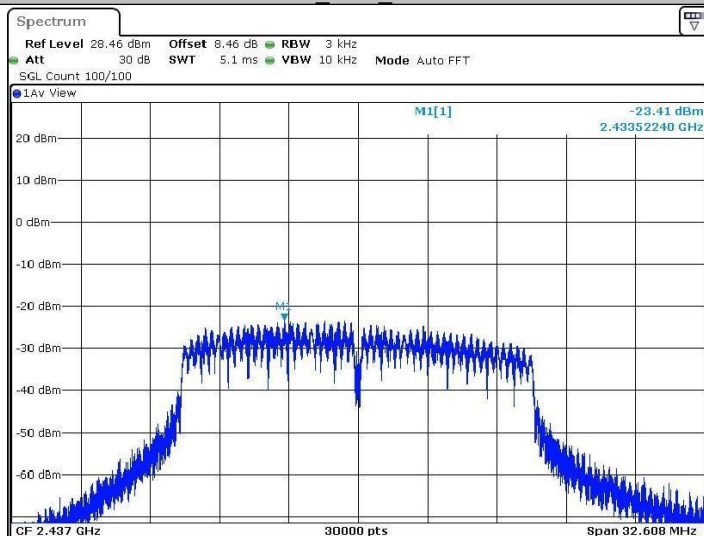
The Average correction factor was added to the test data

Test Graphs



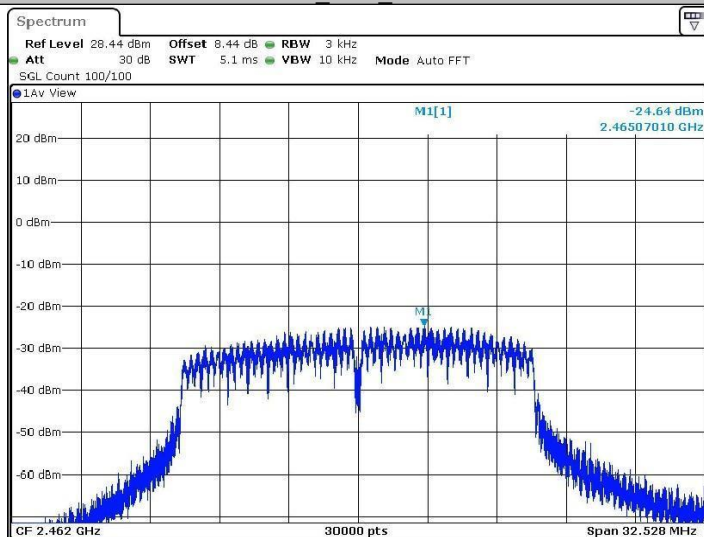


11G_Ant1_2437



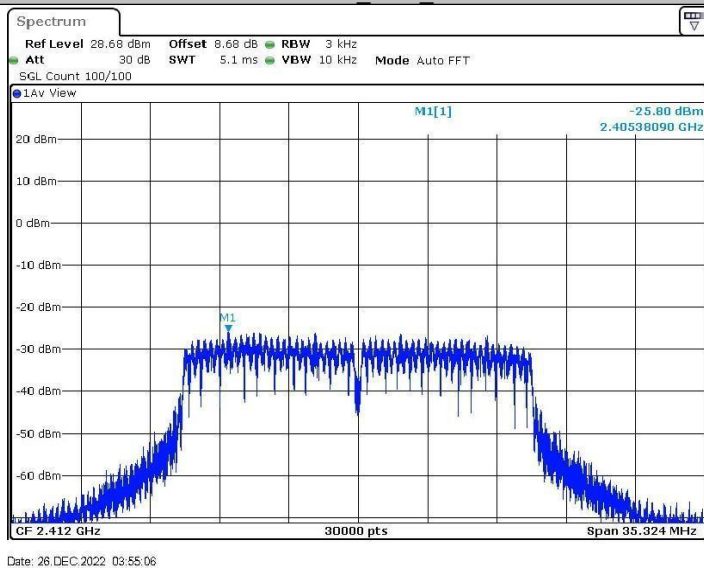
Date: 26 DEC 2022 03:52:02

11G_Ant1_2462

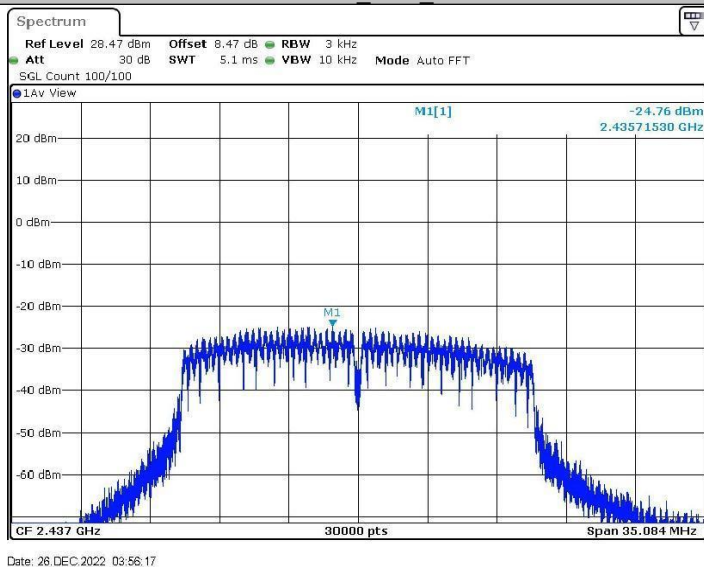


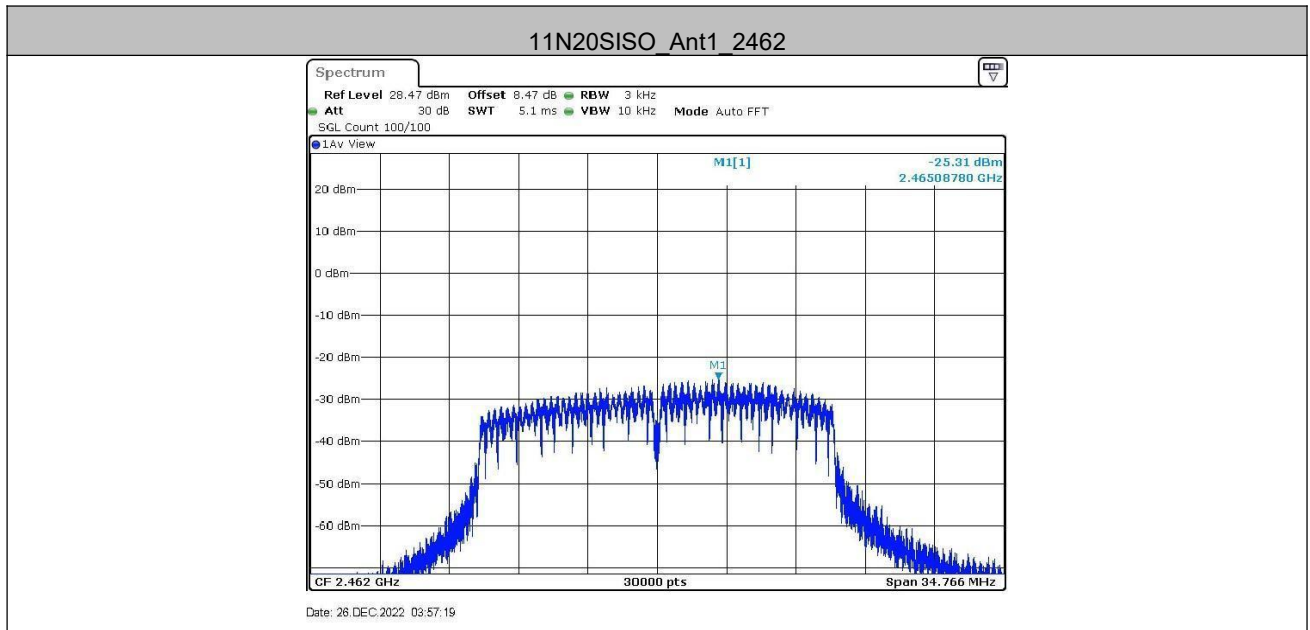
Date: 26 DEC 2022 03:53:39

11N20SISO_Ant1_2412

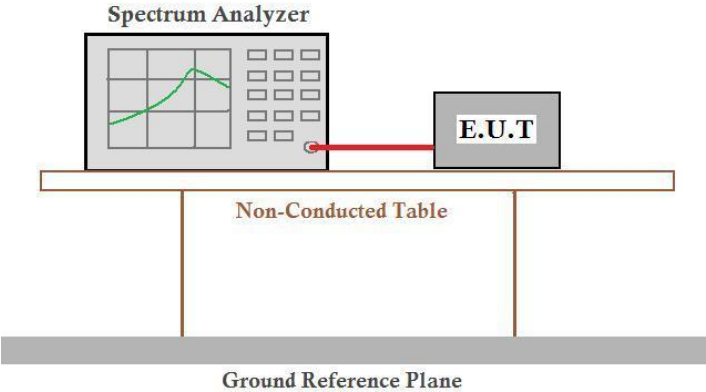


11N20SISO_Ant1_2437





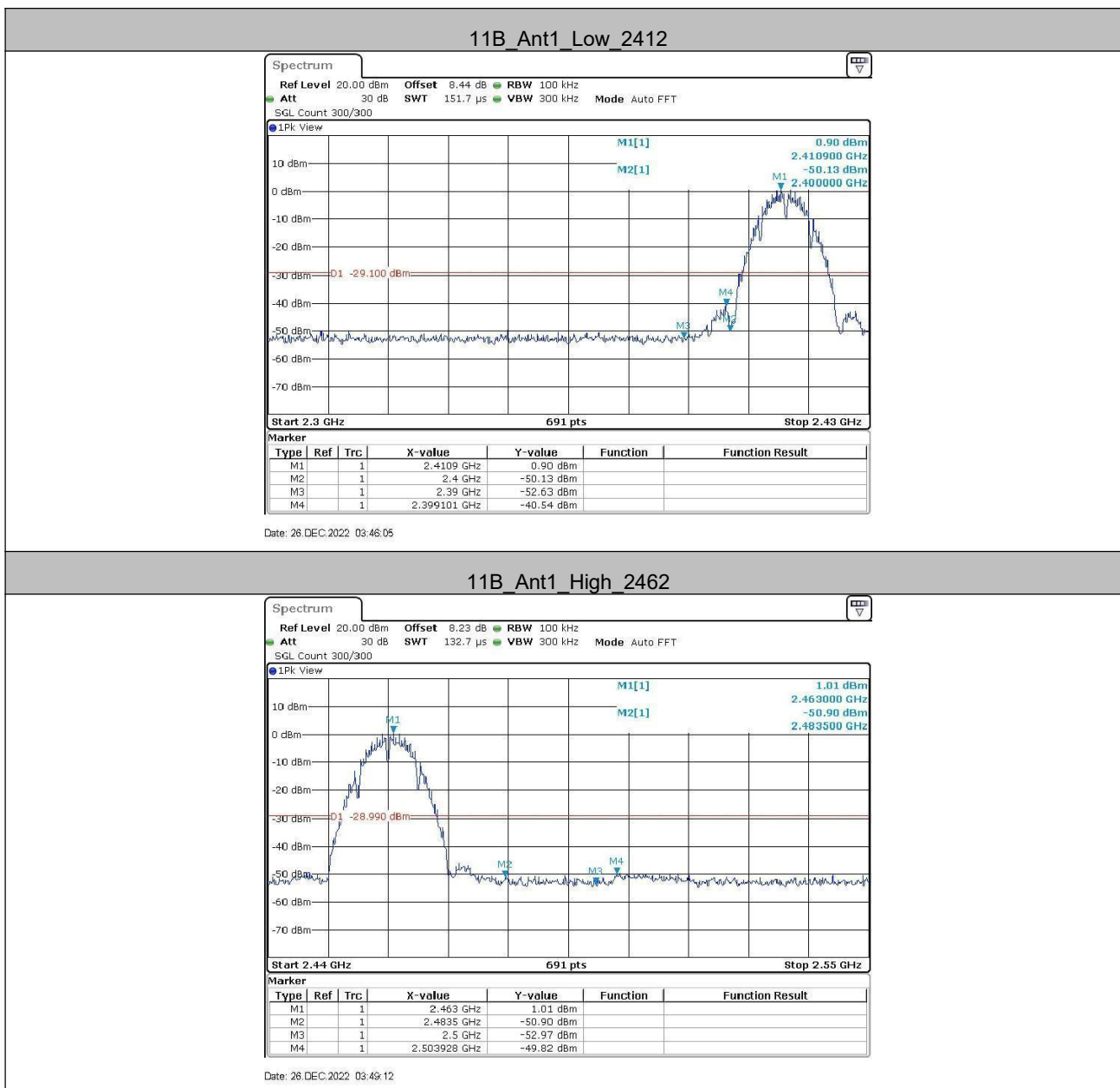
5.6 Band-edge for RF Conducted Emissions

Test Requirement:	47 CFR Part 15C Section 15.247 (d)
Test Method:	ANSI C63.10: 2013
Test Setup:	 Offset=cable loss+ attenuation factor
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Through Pre-scan, find the 1Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of 802.11g; 6.5Mbps of rate is the worst case of 802.11n(HT20). Only the worst case is recorded in the report.
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum 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.
Test Results:	Pass

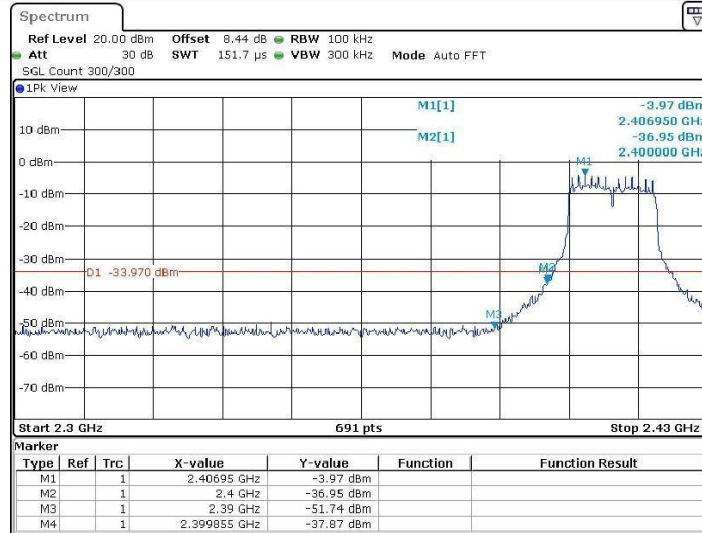
Test Result

TestMode	Antenna	ChName	Channel	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	Low	2412	0.90	-40.54	≤ -29.1	PASS
		High	2462	1.01	-49.82	≤ -28.99	PASS
11G	Ant1	Low	2412	-3.97	-37.87	≤ -33.97	PASS
		High	2462	-5.94	-49.41	≤ -35.94	PASS
11N20SISO	Ant1	Low	2412	-4.36	-39.08	≤ -34.36	PASS
		High	2462	-3.44	-48.52	≤ -33.44	PASS

5.6.1 Test Graphs

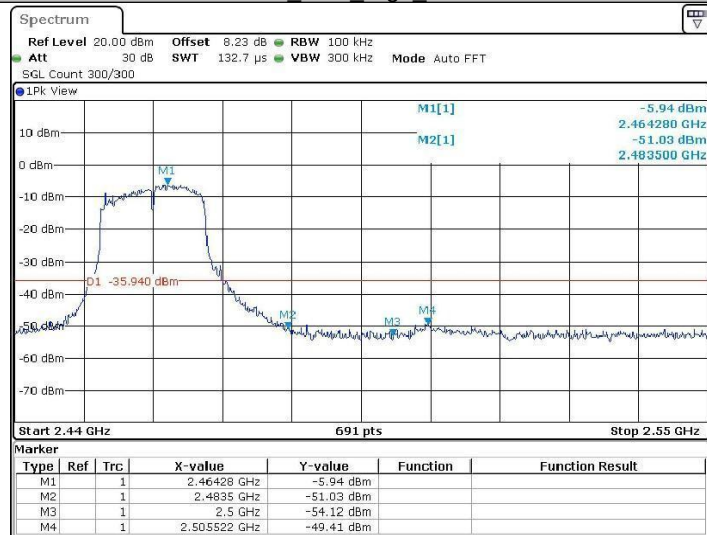


11G_Ant1_Low_2412



Date: 26 DEC.2022 03:50:56

11G_Ant1_High_2462



Date: 26 DEC.2022 03:53:49

11N20SISO_Ant1_Low_2412



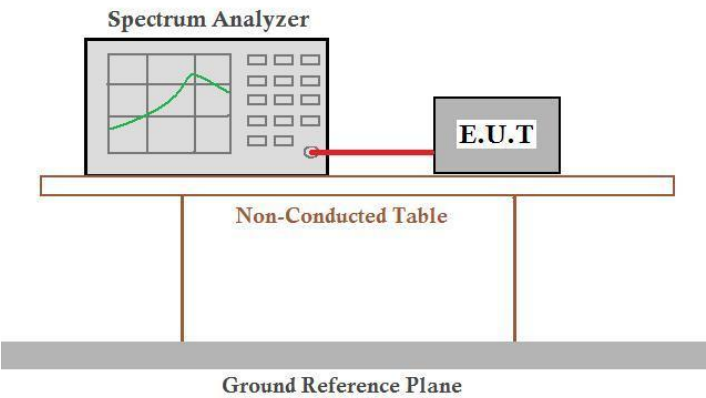
Date: 26 DEC.2022 03:55:15

11N20SISO_Ant1_High_2462



Date: 26 DEC.2022 03:57:29

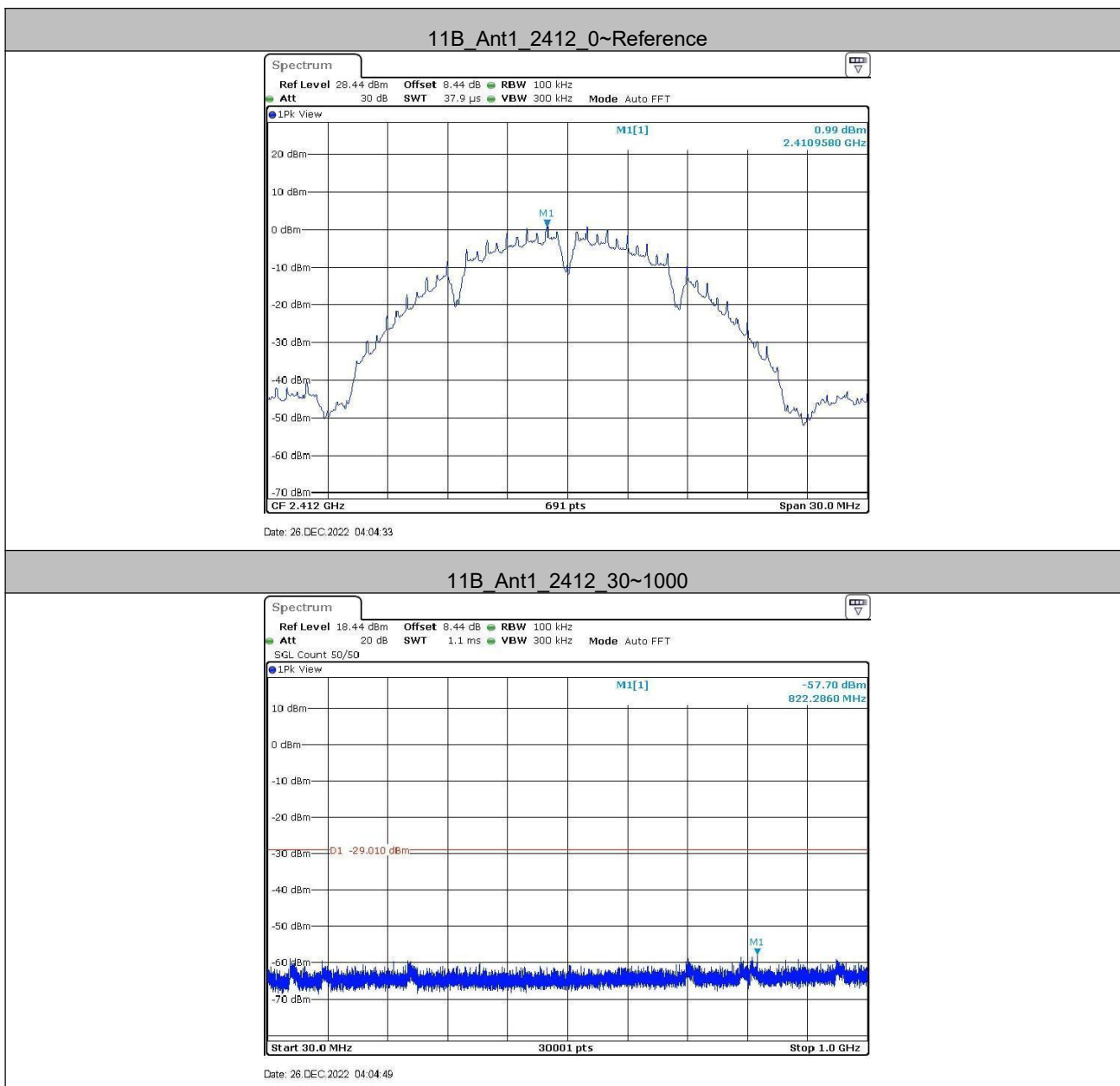
5.7 RF Conducted Spurious Emissions

Test Requirement:	47 CFR Part 15C Section 15.247 (d)
Test Method:	ANSI C63.10: 2013
Test Setup:	 Offset=cable loss+ attenuation factor
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Through Pre-scan, find the 1Mbps of rate is the worst case of 802.11b; 6Mbps of rate is the worst case of 802.11g; 6.5Mbps of rate is the worst case of 802.11n(HT20). Only the worst case is recorded in the report.
Limit:	In any 100 kHz bandwidth outside the frequency band in which the spread spectrum 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.
Test Results:	Pass

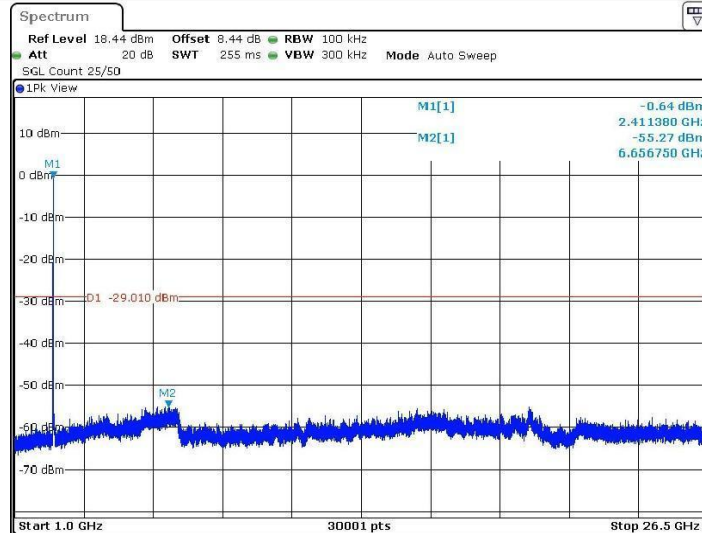
Test Result

TestMode	Antenna	Channel	FreqRange [Mhz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
11B	Ant1	2412	Reference	0.99	0.99	---	PASS
			30~1000	0.99	-57.7	≤-29.01	PASS
			1000~26500	0.99	-55.27	≤-29.01	PASS
		2437	Reference	2.10	2.10	---	PASS
			30~1000	2.10	-57.57	≤-27.9	PASS
			1000~26500	2.10	-54.69	≤-27.9	PASS
		2462	Reference	1.05	1.05	---	PASS
			30~1000	1.05	-58.54	≤-28.95	PASS
			1000~26500	1.05	-54.64	≤-28.95	PASS
11G	Ant1	2412	Reference	-3.09	-3.09	---	PASS
			30~1000	-3.09	-57.98	≤-33.09	PASS
			1000~26500	-3.09	-54.35	≤-33.09	PASS
		2437	Reference	-2.77	-2.77	---	PASS
			30~1000	-2.77	-58.19	≤-32.77	PASS
			1000~26500	-2.77	-54.67	≤-32.77	PASS
		2462	Reference	-2.58	-2.58	---	PASS
			30~1000	-2.58	-58.86	≤-32.58	PASS
			1000~26500	-2.58	-55.02	≤-32.58	PASS
11N20SISO	Ant1	2412	Reference	-3.47	-3.47	---	PASS
			30~1000	-3.47	-58.37	≤-33.47	PASS
			1000~26500	-3.47	-54.77	≤-33.47	PASS
		2437	Reference	-2.39	-2.39	---	PASS
			30~1000	-2.39	-57.43	≤-32.39	PASS
			1000~26500	-2.39	-54.86	≤-32.39	PASS
		2462	Reference	-3.47	-3.47	---	PASS
			30~1000	-3.47	-58.15	≤-33.47	PASS
			1000~26500	-3.47	-54.93	≤-33.47	PASS

Test Graphs

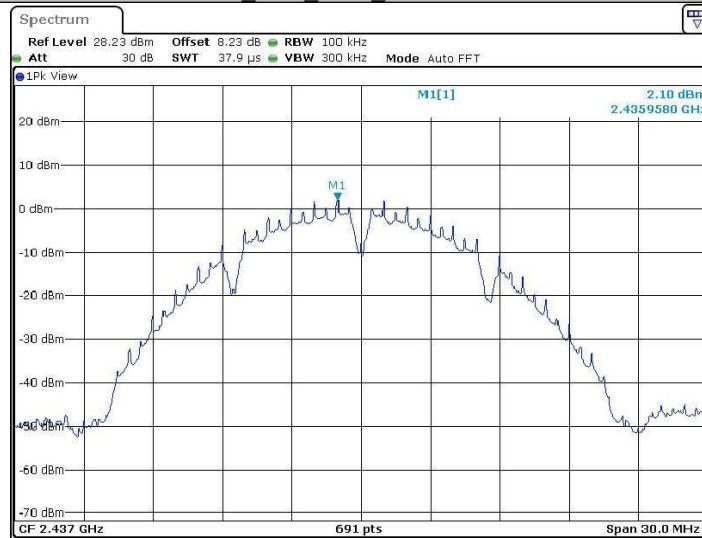


11B_Ant1_2412_1000~26500



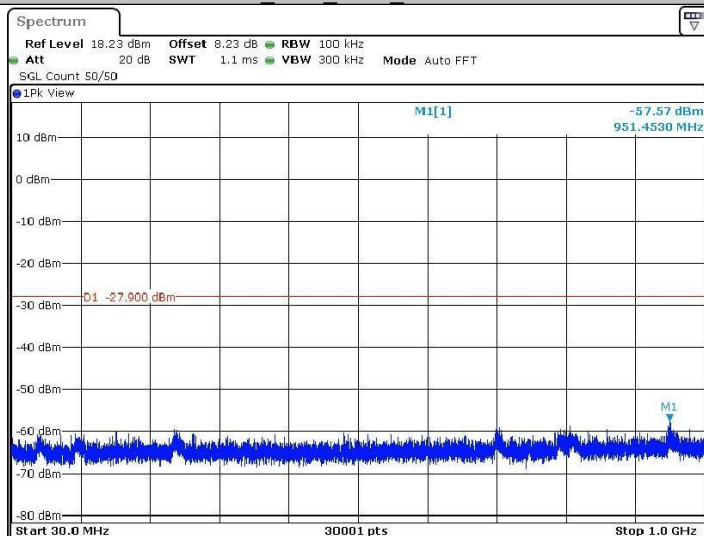
Date: 26 DEC 2022 04:05:12

11B_Ant1_2437_0~Reference



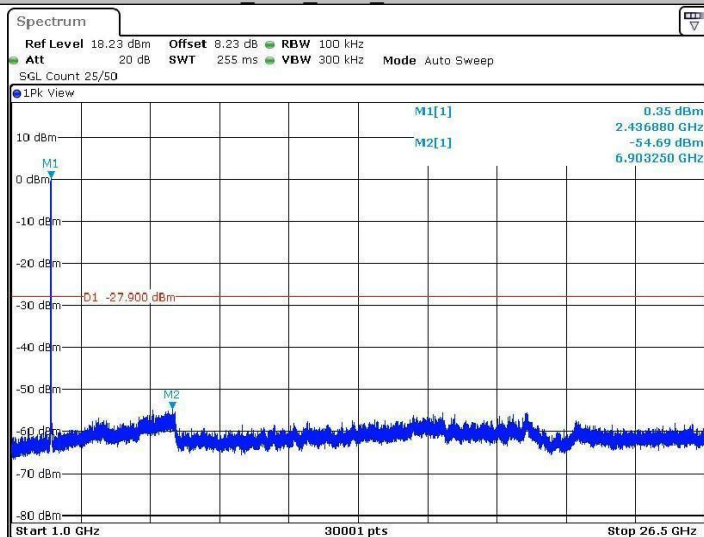
Date: 26 DEC 2022 04:05:42

11B_Ant1_2437_30~1000



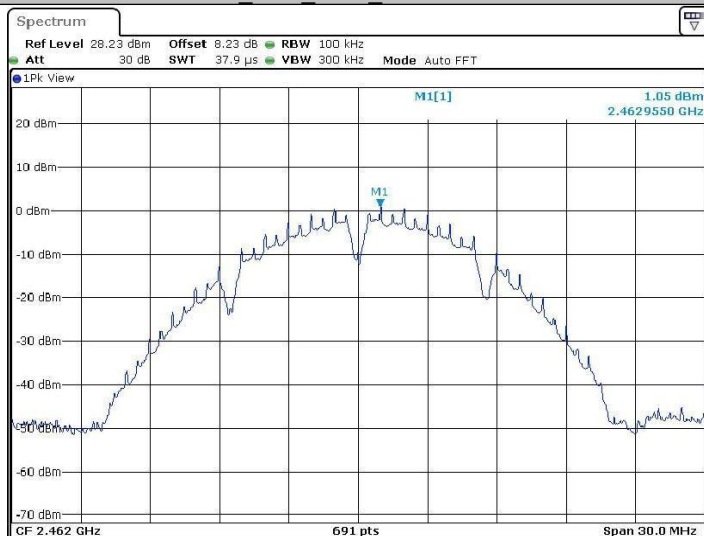
Date: 26 DEC 2022 04:05:59

11B_Ant1_2437_1000~26500



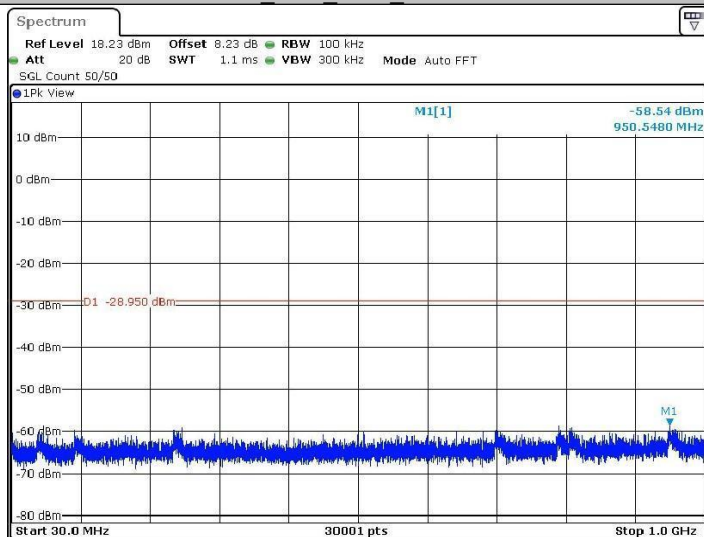
Date: 26 DEC 2022 04:06:21

11B_Ant1_2462_0~Reference



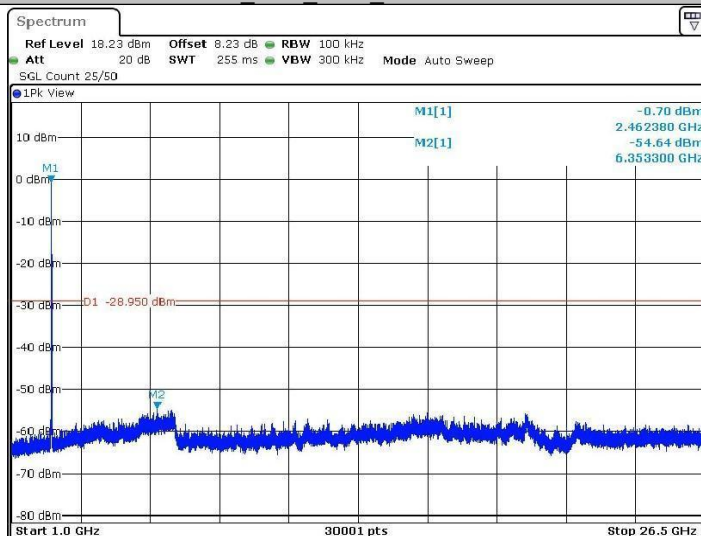
Date: 26 DEC.2022 04:07:19

11B_Ant1_2462_30~1000



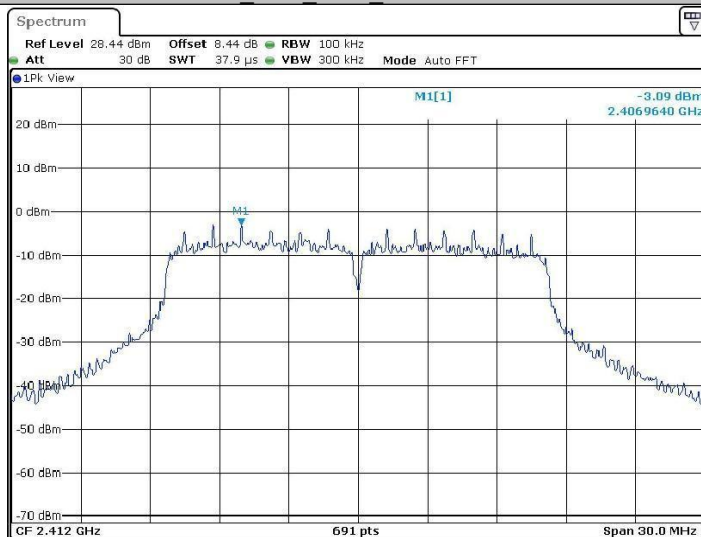
Date: 26 DEC.2022 04:07:35

11B_Ant1_2462_1000~26500



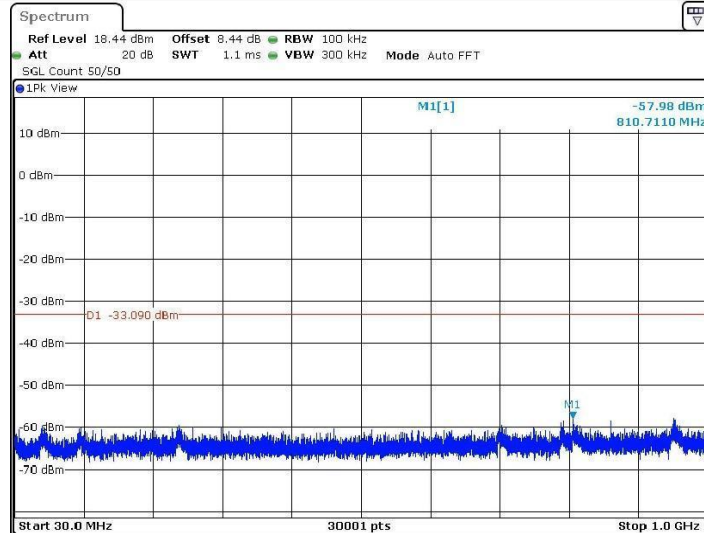
Date: 26 DEC 2022 04:07:57

11G_Ant1_2412_0~Reference



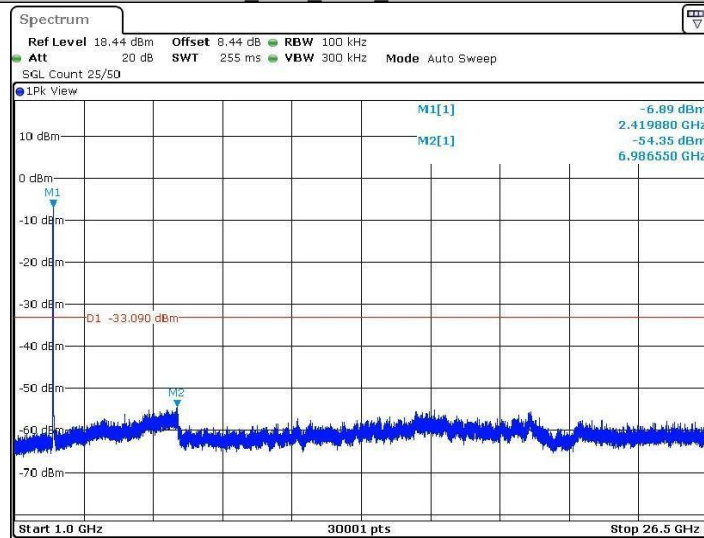
Date: 26 DEC 2022 04:08:27

11G_Ant1_2412_30~1000



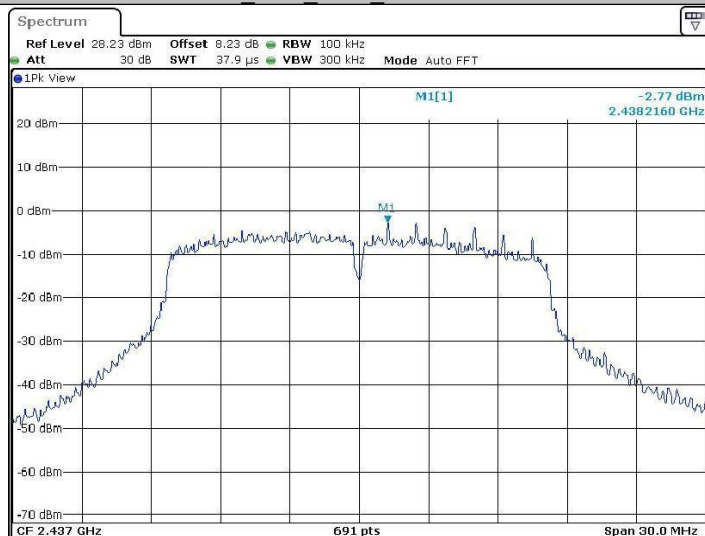
Date: 26 DEC.2022 04:08:43

11G_Ant1_2412_1000~26500



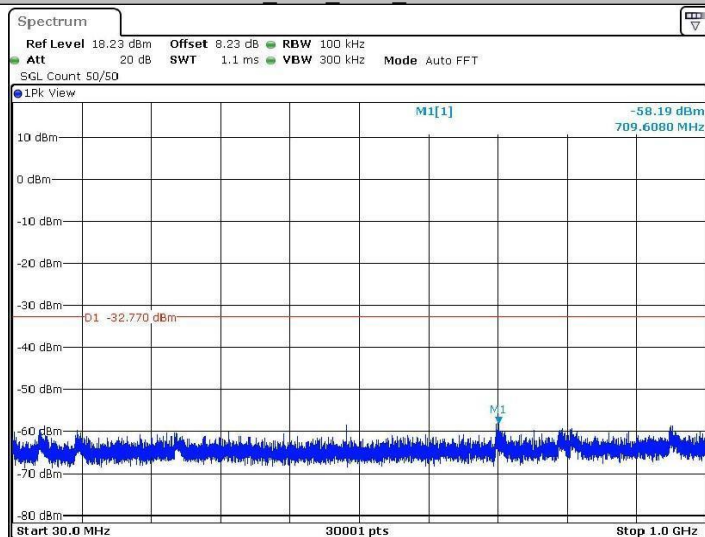
Date: 26 DEC.2022 04:09:05

11G_Ant1_2437_0~Reference



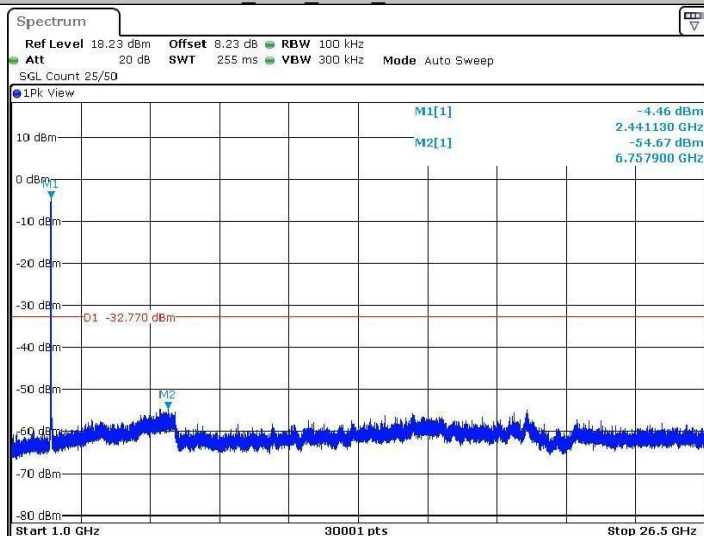
Date: 26 DEC.2022 04:10:16

11G_Ant1_2437_30~1000



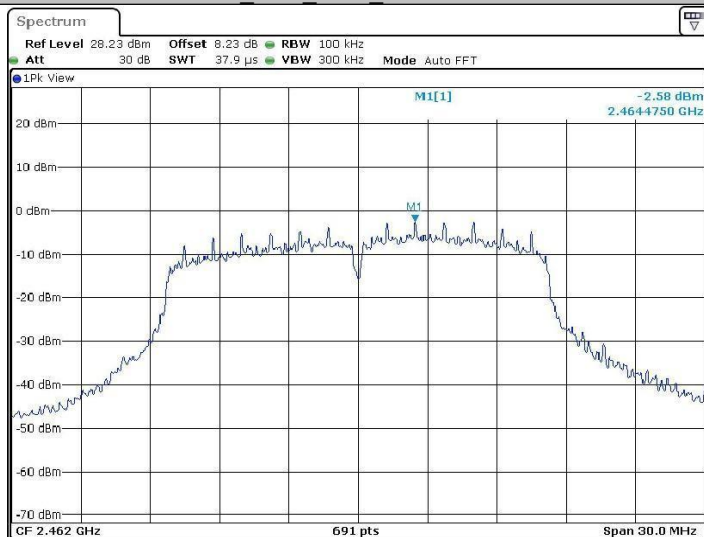
Date: 26 DEC.2022 04:10:32

11G_Ant1_2437_1000~26500



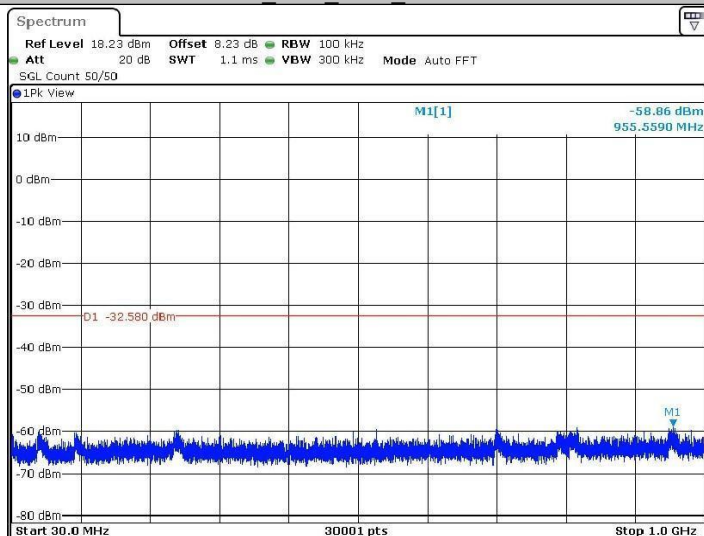
Date: 26 DEC.2022 04:10:54

11G_Ant1_2462_0~Reference



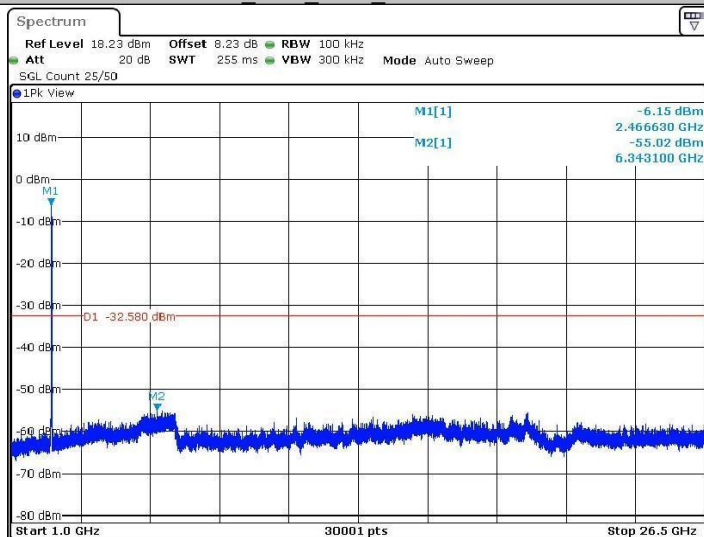
Date: 26 DEC.2022 04:13:58

11G_Ant1_2462_30~1000



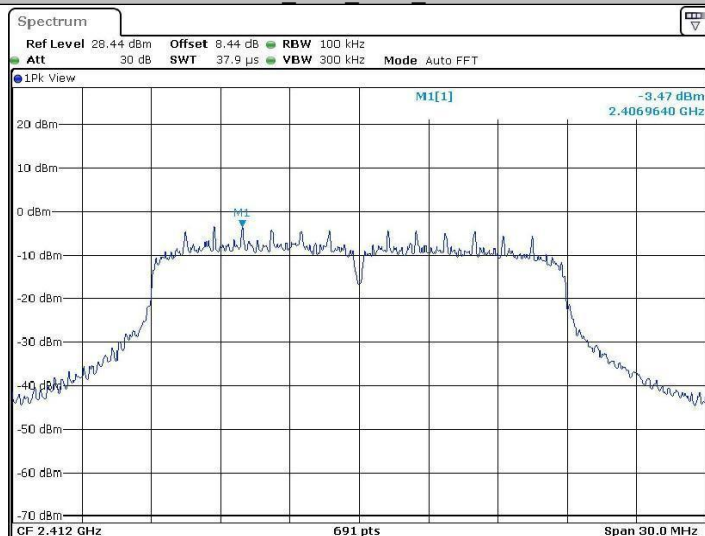
Date: 26 DEC.2022 04:14:15

11G_Ant1_2462_1000~26500



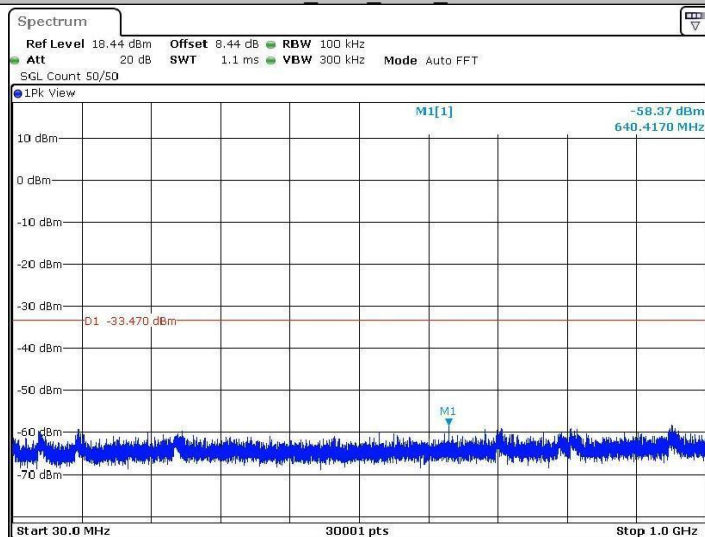
Date: 26 DEC.2022 04:14:37

11N20SISO_Ant1_2412_0~Reference



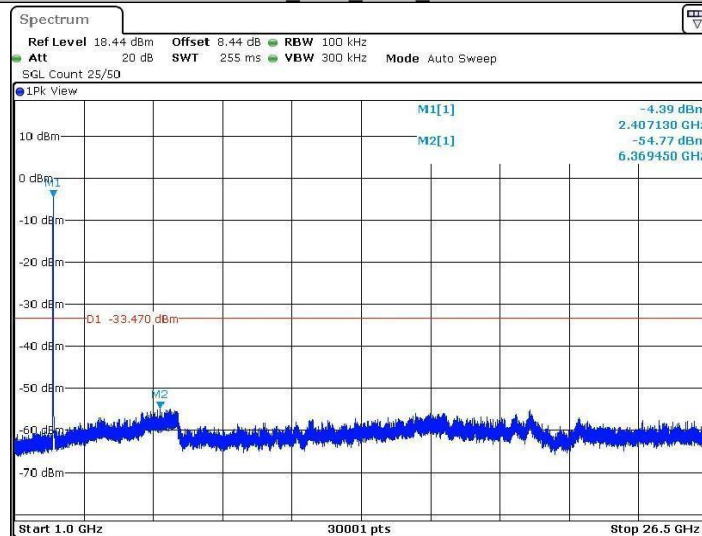
Date: 26 DEC 2022 04:18:11

11N20SISO_Ant1_2412_30~1000



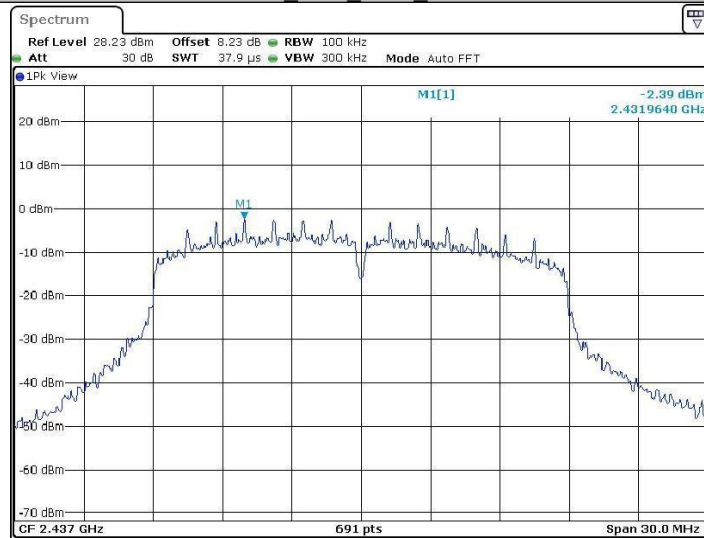
Date: 26 DEC 2022 04:18:27

11N20SISO_Ant1_2412_1000~26500



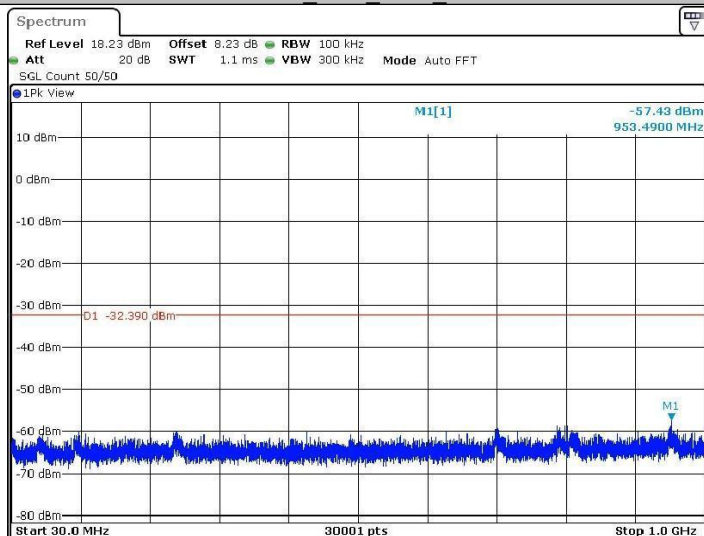
Date: 26 DEC.2022 04:18:49

11N20SISO_Ant1_2437_0~Reference



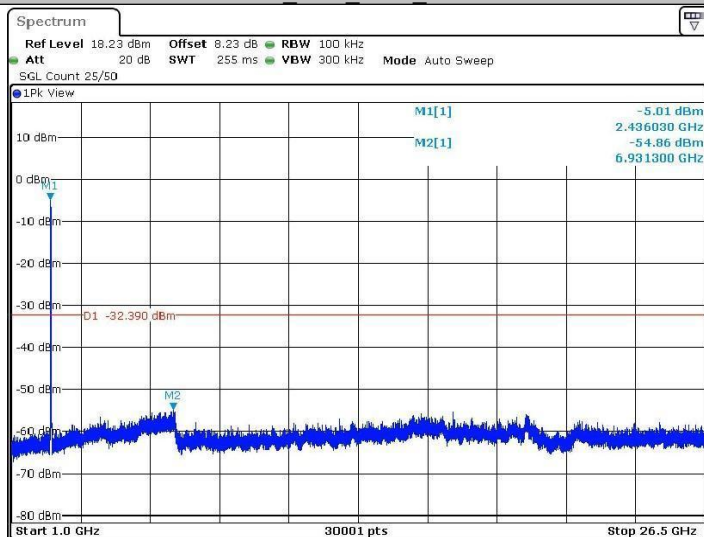
Date: 26 DEC.2022 04:19:18

11N20SISO_Ant1_2437_30~1000



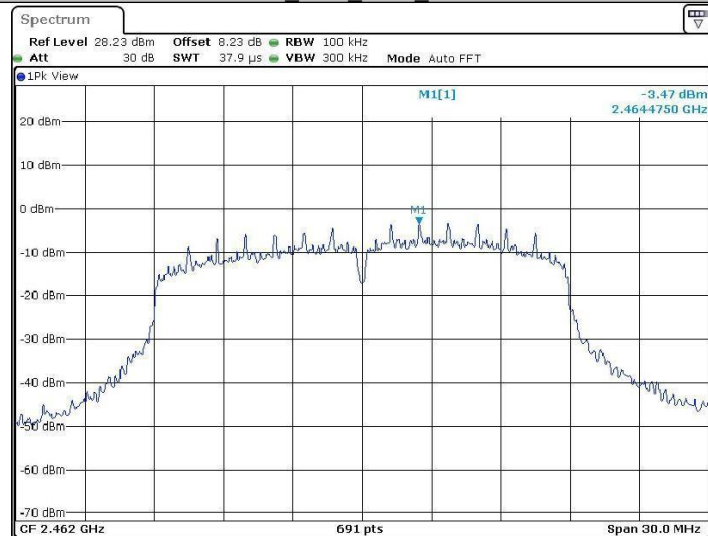
Date: 26 DEC.2022 04:19:34

11N20SISO_Ant1_2437_1000~26500



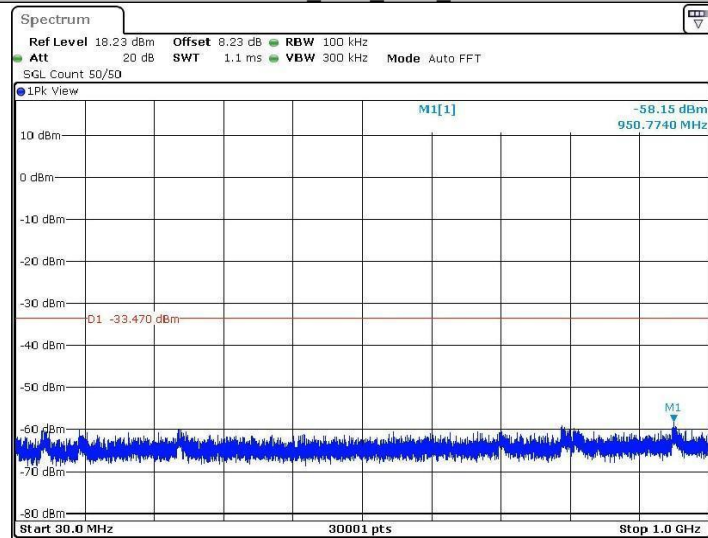
Date: 26 DEC.2022 04:19:58

11N20SISO_Ant1_2462_0~Reference

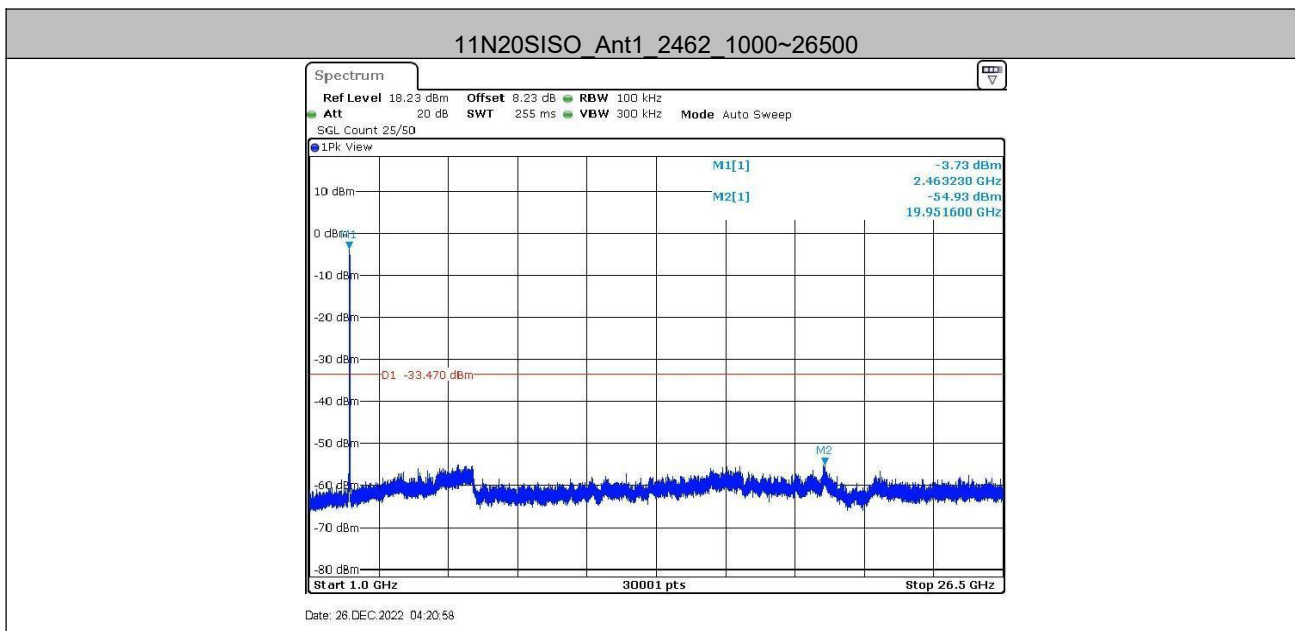


Date: 26 DEC.2022 04:20:20

11N20SISO_Ant1_2462_30~1000



Date: 26 DEC.2022 04:20:36



Remark:

Pretest 9kHz to 25GHz, find the highest point when testing, so only the worst data were shown in the test report. Per FCC Part 15.33 (a) and 15.31 (o) ,The amplitude of spurious emissions from intentional radiators which are attenuated more than 20 dB below the permissible value need not be reported unless specifically required elsewhere in this part.