



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

Report Template Version: V05

Report Template Revision Date: 2021-11-03

TEST REPORT

Report No.: CQASZ20241002264E-01
Applicant: Vincent Medical Excel Limited
Address of Applicant: Units 1604-1607A, 16/F, Two Harbourfront, 22 Tak Fung St., Hung Hom, Kowloon, Hong Kong China.
Equipment Under Test (EUT):
Product: Helsi IcePlunge
Model No.: IP_V1
Test Model No.: IP_V1
Brand Name: Helsi
FCC ID: 2BMH3-IP-V1
Standards: 47 CFR Part 15, Subpart C
KDB558074 D01 15.247 Meas Guidance v05r02
ANSI C63.10:2013
Date of Receipt: 2024-10-23
Date of Test: 2024-10-23 to 2024-11-14
Date of Issue: 2025-2-8
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
CQASZ20241002264E-01	Rev.01	Initial report	2025-2-8

2 Test Summary

Test Item	Test Requirement	Test method	Result
Antenna Requirement	47 CFR Part 15.203	N/A	PASS
AC Power Line Conducted Emission	47 CFR Part 15.207	ANSI C63.10-2013	PASS
Conducted Peak & Average Output Power	47 CFR Part 15.247	ANSI C63.10-2013	PASS
6dB Occupied Bandwidth	47 CFR Part 15.247	ANSI C63.10-2013	PASS
Power Spectral Density	47 CFR Part 15.247	ANSI C63.10-2013	PASS
Band-edge for RF Conducted Emissions	47 CFR Part 15.247	ANSI C63.10-2013	PASS
RF Conducted Spurious Emissions	47 CFR Part 15.247	ANSI C63.10-2013	PASS
Radiated Spurious Emissions	47 CFR Part 15.209	ANSI C63.10-2013	PASS
Restricted bands around fundamental frequency (Radiated Emission)	47 CFR Part 15.205/15.209	ANSI C63.10-2013	PASS

Remark:

The tested sample(s) and the sample information are provided by the client.

Tx: In this whole report Tx (or tx) means Transmitter.

Rx: In this whole report Rx (or rx) means Receiver.

RF: In this whole report RF means Radiated Frequency.

CH: In this whole report CH means channel.

Volt: In this whole report Volt means Voltage.

Temp: In this whole report Temp means Temperature.

Humid: In this whole report Humid means humidity.

Press: In this whole report Press means Pressure.

N/A: In this whole report not application

3 Contents

	Page
1 VERSION	2
2 TEST SUMMARY	3
3 CONTENTS	4
4 GENERAL INFORMATION	5
4.1 CLIENT INFORMATION	5
4.2 GENERAL DESCRIPTION OF EUT	5
4.3 PRODUCT SPECIFICATION SUBJECTIVE TO THIS STANDARD	5
4.4 TEST ENVIRONMENT AND MODE	8
4.5 DESCRIPTION OF SUPPORT UNITS	12
4.6 TEST LOCATION	12
4.7 TEST FACILITY	12
4.8 STATEMENT OF THE MEASUREMENT UNCERTAINTY	13
4.9 DEVIATION FROM STANDARDS	13
4.10 ABNORMALITIES FROM STANDARD CONDITIONS	13
4.11 OTHER INFORMATION REQUESTED BY THE CUSTOMER	13
4.12 EQUIPMENT LIST	14
5 TEST RESULTS AND MEASUREMENT DATA	15
5.1 ANTENNA REQUIREMENT	15
5.2 CONDUCTED EMISSIONS	16
5.3 CONDUCTED PEAK & AVERAGE OUTPUT POWER	20
<i>Test Result</i>	<i>21</i>
<i>Note: Duty cycle correction factor details please see section 4.4.</i>	<i>21</i>
<i>When Duty cycle >98%, D.C.F is not required.</i>	<i>21</i>
<i>Test Graphs</i>	<i>22</i>
5.4 6DB OCCUPIED BANDWIDTH	27
<i>Test Result</i>	<i>28</i>
<i>Test Graphs</i>	<i>29</i>
5.5 POWER SPECTRAL DENSITY	34
<i>Test Result</i>	<i>35</i>
<i>Test Graphs</i>	<i>36</i>
5.6 BAND-EDGE FOR RF CONDUCTED EMISSIONS	41
<i>Test Result</i>	<i>42</i>
5.6.1 <i>Test Graphs</i>	<i>43</i>
5.7 RF CONDUCTED SPURIOUS EMISSIONS	47
<i>Test Result</i>	<i>48</i>
<i>Test Graphs</i>	<i>50</i>
5.8 RADIATED SPURIOUS EMISSIONS	65
5.8.1 <i>Radiated emission below 1GHz</i>	<i>68</i>
5.8.2 <i>Transmitter emission above 1GHz</i>	<i>70</i>
5.9 RESTRICTED BANDS AROUND FUNDAMENTAL FREQUENCY	78
6 PHOTOGRAPHS - EUT TEST SETUP	84
6.1 RADIATED SPURIOUS EMISSION	84
6.2 CONDUCTED EMISSION	85
7 PHOTOGRAPHS - EUT CONSTRUCTIONAL DETAILS	86

4 General Information

4.1 Client Information

Applicant:	Vincent Medical Excel Limited
Address of Applicant:	Units 1604-1607A, 16/F, Two Harbourfront, 22 Tak Fung St., Hung Hom, Kowloon, Hong Kong China.
Manufacturer:	Vincent Raya (Dong Guan) Electronics Co Ltd
Address of Manufacturer:	11 Shabu Street, Qiaolong District, Tangxia Town, Dongguan City, Guangdong Province, PRC
Factory:	Vincent Raya (Dong Guan) Electronics Co Ltd
Address of Factory:	11 Shabu Street, Qiaolong District, Tangxia Town, Dongguan City, Guangdong Province, PRC

4.2 General Description of EUT

Product Name:	Helsi IcePlunge
Model No.:	IP_V1
Test Model No.:	IP_V1
Trade Mark:	Helsi
Software Version:	V1.0
Hardware Version:	V1.0
Power Supply:	Power supply AC120V
EUT Supports Radios application:	2.4GHz: Wi-Fi: 802.11b/g/n(HT20): 2412MHz~2462MHz; 802.11n(HT40): 2422MHz~2452MHz
Simultaneous Transmission	☐ Simultaneous TX is supported and evaluated in this report. ☒ Simultaneous TX is not supported.

4.3 Product Specification subjective to this standard

Operation Frequency:	IEEE 802.11b/g/n(HT20): 2412MHz to 2462MHz IEEE 802.11n(HT40): 2422MHz to 2452MHz
Channel Numbers:	IEEE 802.11b/g, IEEE 802.11n HT20: 11 Channels IEEE 802.11n HT40: 7 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 and HT40) : 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 IEEE for 802.11n(HT40) : 13.5Mbps/27Mbps/40.5Mbps/54Mbps/81Mbps/108Mbps/121.5Mbps/135Mbps

Product Type:	☒ Mobile ☐ Portable
Test Software of EUT:	EspRFTestTool
Antenna Type:	External antenna
Antenna Gain:	4.4dBi

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		
Operation Frequency each of channel(802.11n HT40)							
Channel	Frequency	Channel	Frequency	Channel	Frequency	Channel	Frequency
3	2422MHz	6	2437MHz	9	2452MHz		
4	2427MHz	7	2442MHz				
5	2432MHz	8	2447MHz				

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

For 802.11n (HT40):

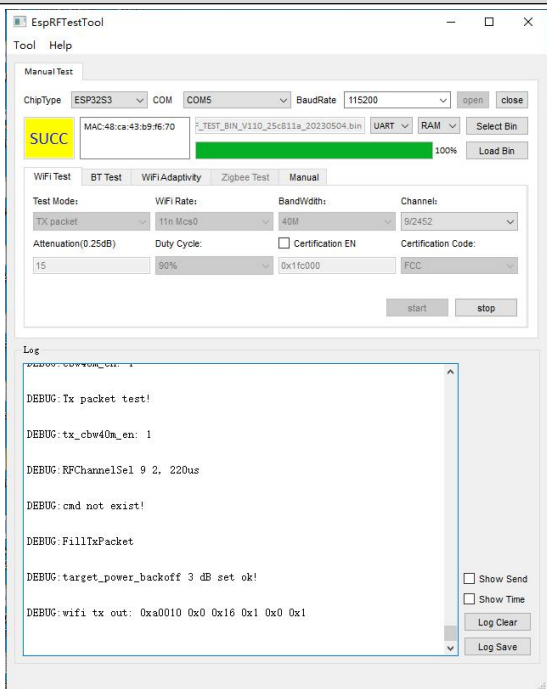
Channel	Frequency
The Lowest channel	2422MHz
The Middle channel	2437MHz
The Highest channel	2452MHz

Note:

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

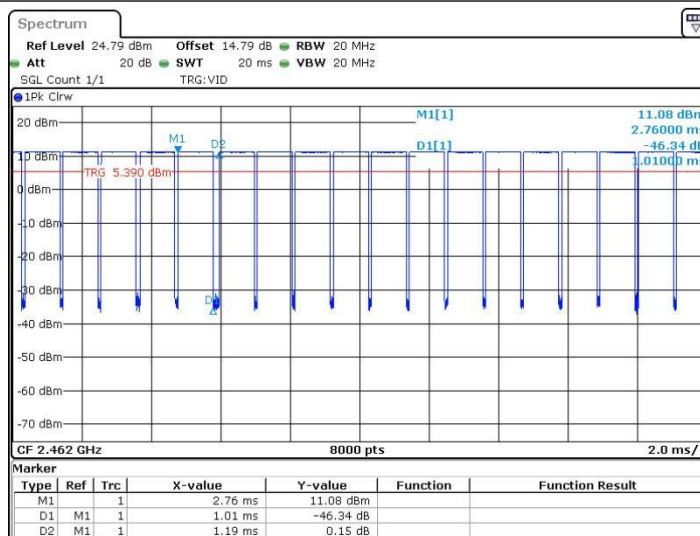
4.4 Test Environment and Mode

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:	EUT is set in RF test mode in all supported modulation types, bandwidth and data rate, etc.

Run Software:	
	

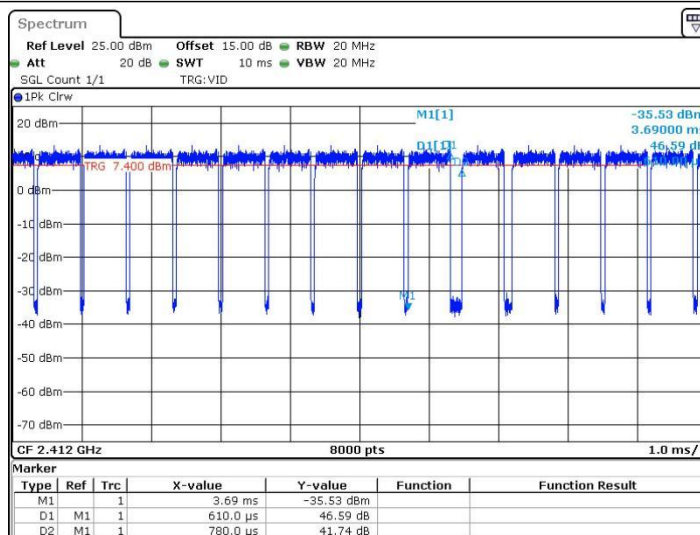
Operated Mode for Worst Duty Cycle:		
Test Mode	Duty Cycle(%)	Average correction factor(dB)
IEEE802.11b	84.87	0.71
IEEE802.11g	78.21	1.07
IEEE802.11n (HT20)	90.91	0.41
IEEE802.11n (HT40)	89.71	0.47

Test Graph_IEEE802.11b Duty Cycle:



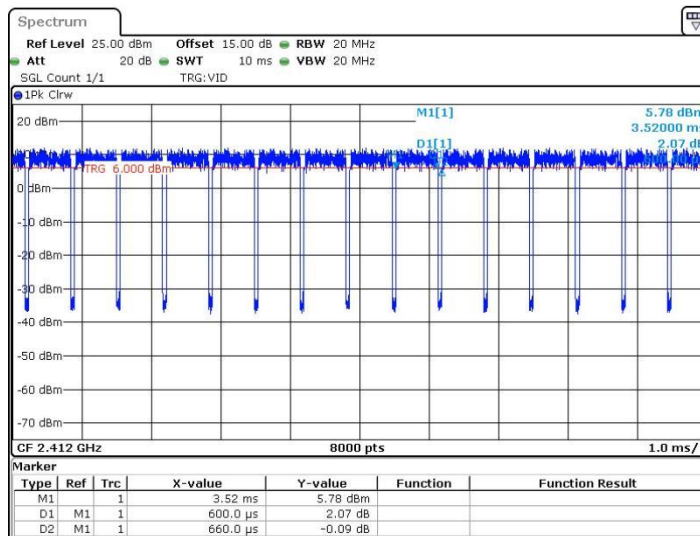
Date: 1 NOV. 2024 14:53:29

Test Graph_IEEE802.11g Duty Cycle:



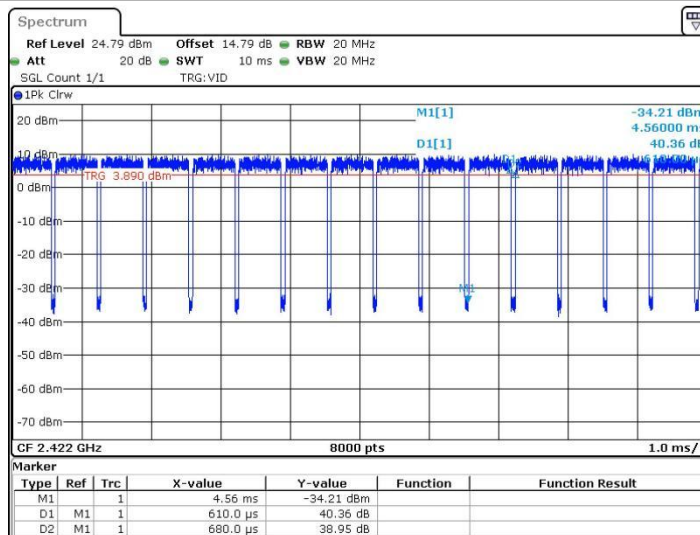
Date: 1 NOV. 2024 15:07:27

Test Graph_IEEE802.11 n (HT20) Duty Cycle:



Date: 1 NOV. 2024 15:15:17

Test Graph_IEEE802.11 n (HT40) Duty Cycle:



Date: 1 NOV. 2024 15:25:55

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	2024/9/2	2025/9/1
Spectrum analyzer	R&S	FSU26	CQA-038	2024/9/2	2025/9/1
Spectrum analyzer	R&S	FSU40	CQA-075	2024/9/2	2025/9/1
Preamplifier	MITEQ	AFS4-00010300-18-10P-4	CQA-035	2024/9/2	2025/9/1
Preamplifier	MITEQ	AMF-6D-02001800-29-20P	CQA-036	2024/9/2	2025/9/1
Preamplifier	EMCI	EMC184055SE	CQA-089	2024/9/2	2025/9/1
Loop antenna	Schwarzbeck	FMZB1516	CQA-060	2023/9/8	2026/9/7
Bilog Antenna	R&S	HL562	CQA-011	2023/11/01	2026/10/31
Horn Antenna	R&S	HF906	CQA-012	2023/11/01	2026/10/31
Horn Antenna	Schwarzbeck	BBHA 9170	CQA-088	2023/9/7	2026/9/6
Coaxial Cable (Above 1GHz)	CQA	N/A	C007	2024/9/2	2025/9/1
Coaxial Cable (Below 1GHz)	CQA	N/A	C013	2024/9/2	2025/9/1
Antenna Connector	CQA	RFC-01	CQA-080	2024/9/2	2025/9/1
RF cable(9KHz~40GHz)	CQA	RF-01	CQA-079	2024/9/2	2025/9/1
Power meter	R&S	NRVD	CQA-029	2024/9/2	2025/9/1
Power divider	MIDWEST	PWD-2533-02-SMA-79	CQA-067	2024/9/2	2025/9/1
EMI Test Receiver	R&S	ESR7	CQA-005	2024/9/2	2025/9/1
LISN	R&S	ENV216	CQA-003	2024/9/2	2025/9/1
Coaxial cable	CQA	N/A	CQA-C009	2024/9/2	2025/9/1
DC power	KEYSIGHT	E3631A	CQA-028	2024/9/2	2025/9/1

Test software:

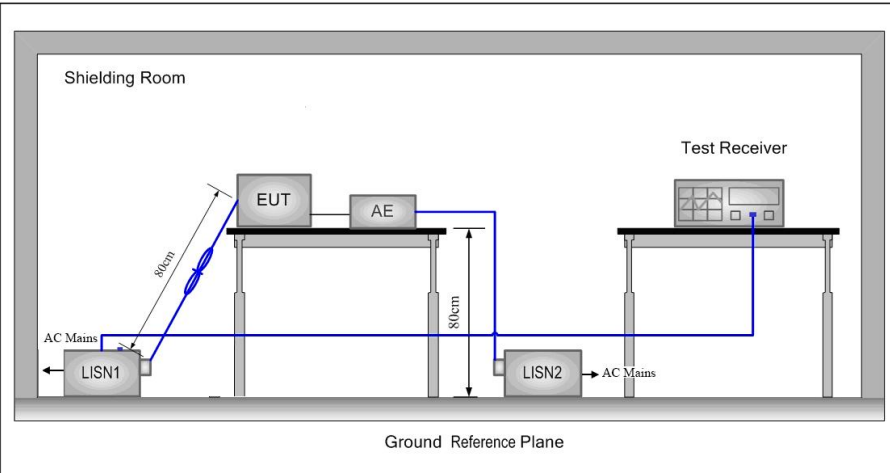
	Manufacturer	Software brand
Radiated Emissions test software	Tonscend	JS1120-3
Conducted Emissions test software	Audix	e3
RF Conducted test software	Audix	e3

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 External antenna. The connection/connection type between the antenna to the EUT's antenna port is: unique coupling. This is either permanently attachment or a unique coupling that satisfies the requirement.	

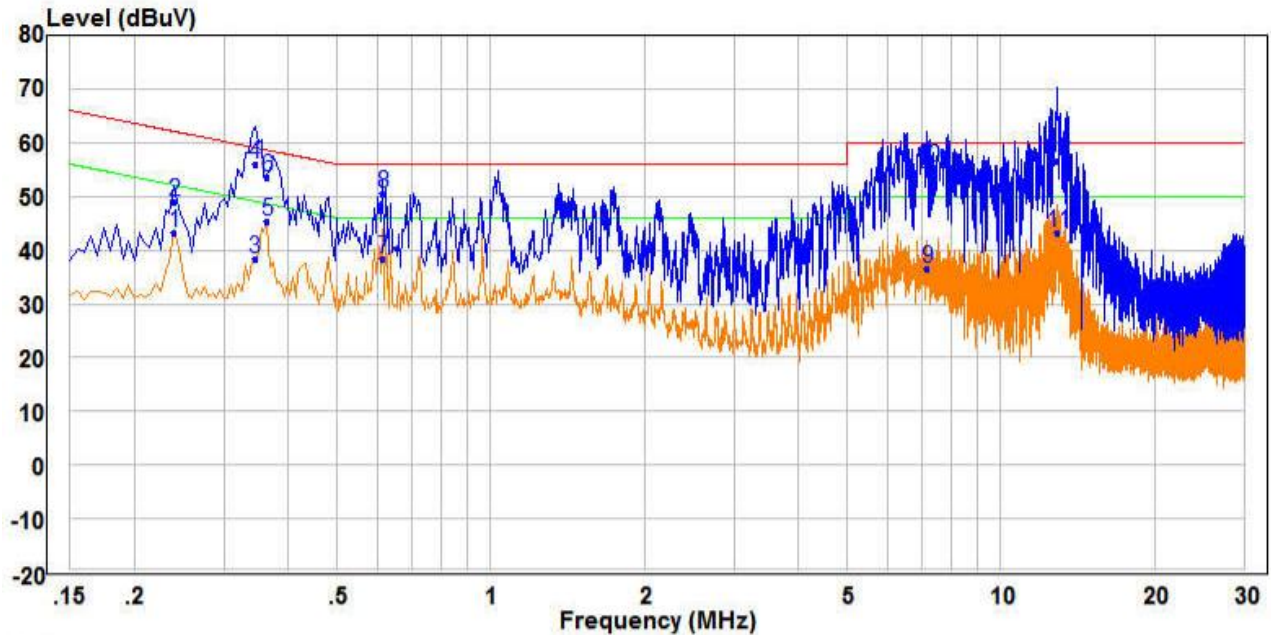
5.2 Conducted Emissions

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) 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 $50\Omega/50\mu\text{H} + 5\Omega$ 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: 2013 on conducted measurement.		
Test Setup:	 The diagram illustrates the test setup within a Shielding Room. An Equipment Under Test (EUT) and an Auxiliary Equipment (AE) are placed on a table that is 80cm high. A Line Impedance Stabilization Network (LISN1) is connected to the AC Mains and the EUT. Another LISN (LISN2) is connected to the AE and the AC Mains. A Test Receiver is positioned on a separate table. A Ground Reference Plane is indicated at the base of the setup. The distance between the EUT and LISN1 is marked as 80cm.		

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

Measurement Data

Live Line:

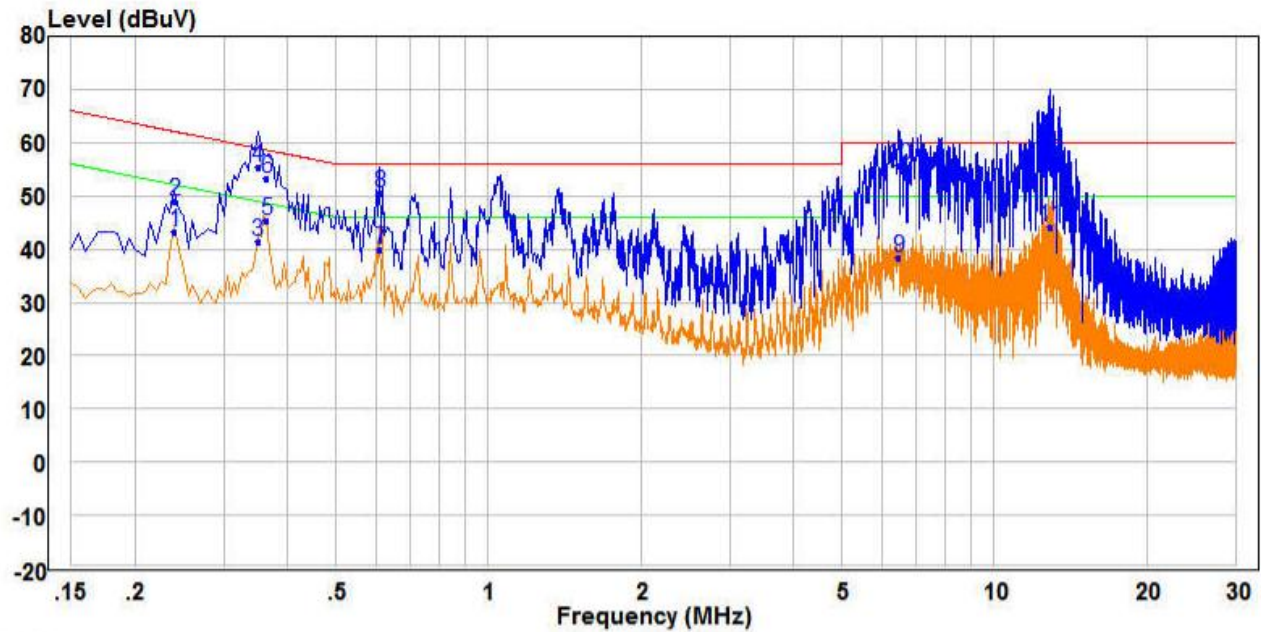


	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB		
1	0.240	33.65	9.56	43.21	52.10	-8.89	Average	Line
2	0.240	39.42	9.56	48.98	62.10	-13.12	QP	Line
3	0.345	28.73	9.55	38.28	49.08	-10.80	Average	Line
4 PP	0.345	46.47	9.55	56.02	59.08	-3.06	QP	Line
5 AV	0.365	35.85	9.57	45.42	48.61	-3.19	Average	Line
6	0.365	43.96	9.57	53.53	58.61	-5.08	QP	Line
7	0.615	28.60	9.82	38.42	46.00	-7.58	Average	Line
8	0.615	40.57	9.82	50.39	56.00	-5.61	QP	Line
9	7.175	26.63	9.81	36.44	50.00	-13.56	Average	Line
10	7.175	45.48	9.81	55.29	60.00	-4.71	QP	Line
11	12.925	33.29	9.80	43.09	50.00	-6.91	Average	Line
12	12.925	46.81	9.80	56.61	60.00	-3.39	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:

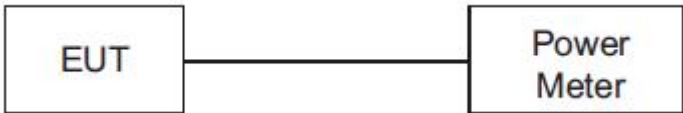
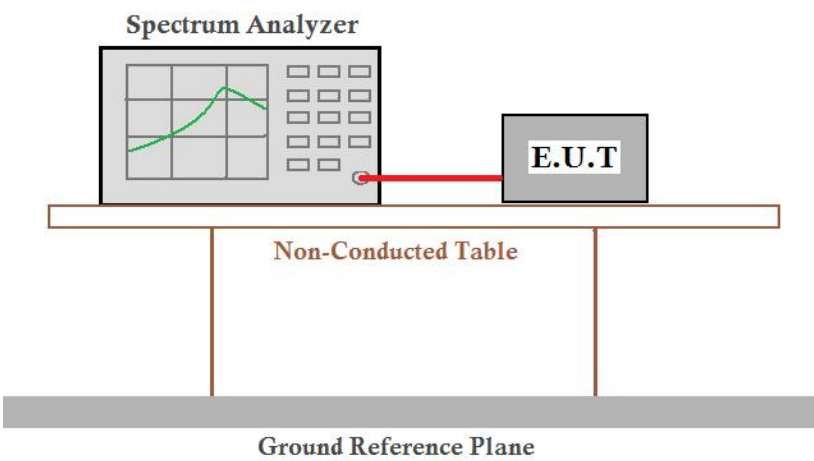


	Freq	Read Level	Factor	Level	Limit Line	Over Limit	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB		
1	0.240	33.84	9.55	43.39	52.10	-8.71	Average	Neutral
2	0.240	39.41	9.55	48.96	62.10	-13.14	QP	Neutral
3	0.350	31.91	9.55	41.46	48.96	-7.50	Average	Neutral
4 QP	0.350	45.74	9.55	55.29	58.96	-3.67	QP	Neutral
5 PP	0.365	35.70	9.56	45.26	48.61	-3.35	Average	Neutral
6	0.365	43.78	9.56	53.34	58.61	-5.27	QP	Neutral
7	0.610	30.18	9.81	39.99	46.00	-6.01	Average	Neutral
8	0.610	40.85	9.81	50.66	56.00	-5.34	QP	Neutral
9	6.480	28.47	9.81	38.28	50.00	-11.72	Average	Neutral
10	6.480	45.91	9.81	55.72	60.00	-4.28	QP	Neutral
11	12.890	34.39	9.80	44.19	50.00	-5.81	Average	Neutral
12	12.890	46.44	9.80	56.24	60.00	-3.76	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:	<i>Setup for Power meter measurement method</i>  <i>Setup for Spectrum analyser measurement method</i> 
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Only the worst case is recorded in the report.
Limit:	30dBm
Test Results:	Pass

Test Result

Test Mode	Frequency[MHz]	Result [dBm]	Limit [dBm]	Verdict
11B	2412	4.92	≤30.00	PASS
	2437	6.65	≤30.00	PASS
	2462	8.71	≤30.00	PASS
11G	2412	4.83	≤30.00	PASS
	2437	5.97	≤30.00	PASS
	2462	7.65	≤30.00	PASS
11N20SISO	2412	3.26	≤30.00	PASS
	2437	4.72	≤30.00	PASS
	2462	6.66	≤30.00	PASS
11N40SISO	2422	2.79	≤30.00	PASS
	2437	3.67	≤30.00	PASS
	2452	4.70	≤30.00	PASS

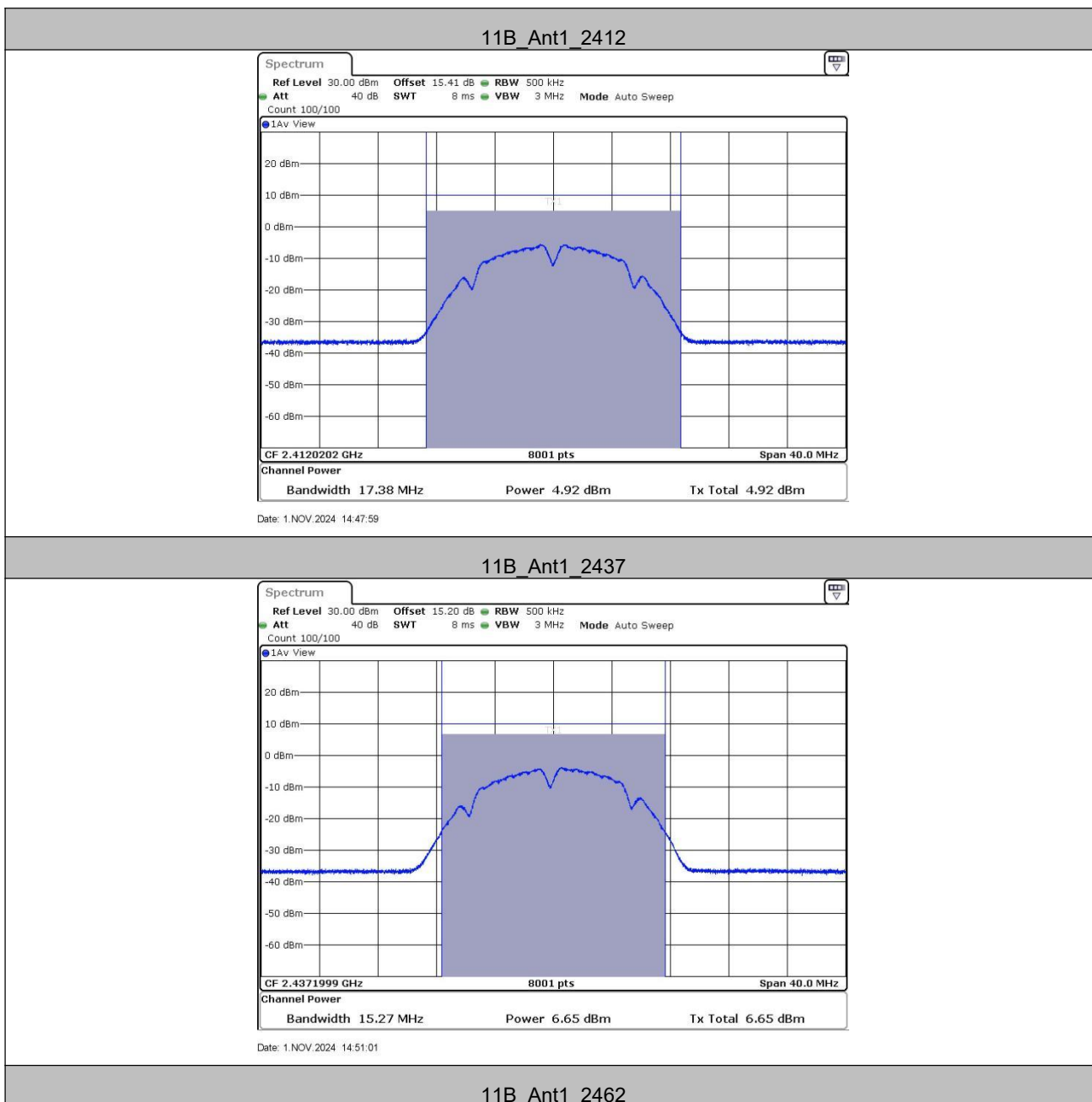
Note:

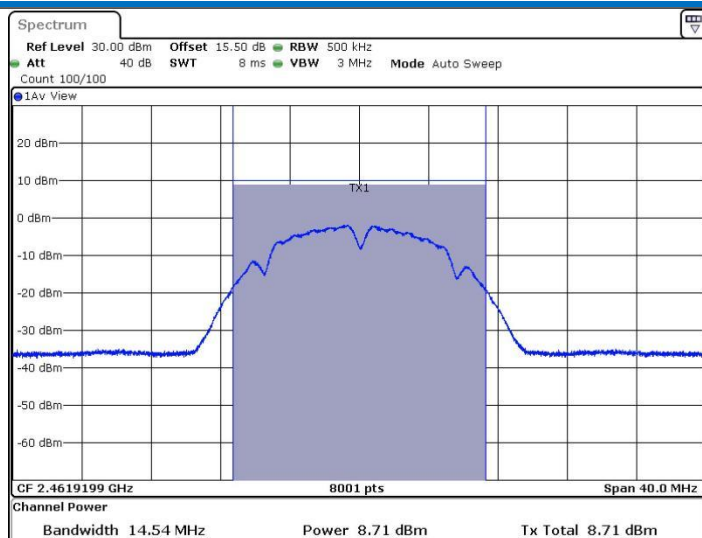
Result=conducted + cycle factor

Duty cycle correction factor details please see section 4.4.

When Duty cycle >98%, D.C.F is not required.

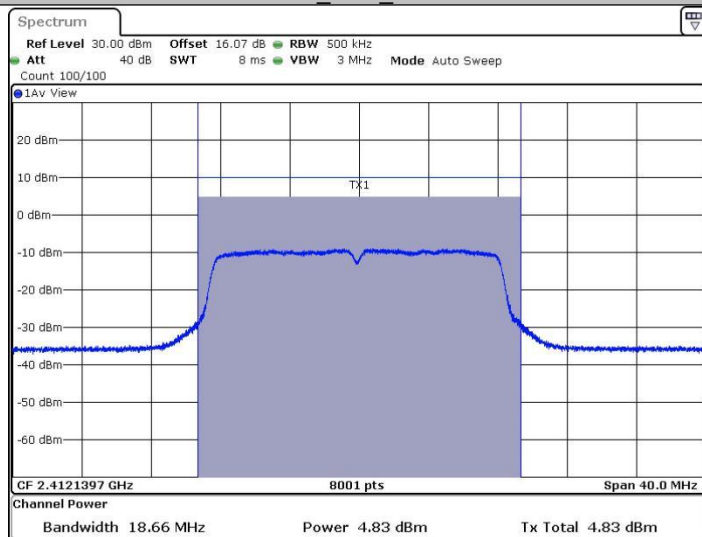
Test Graphs





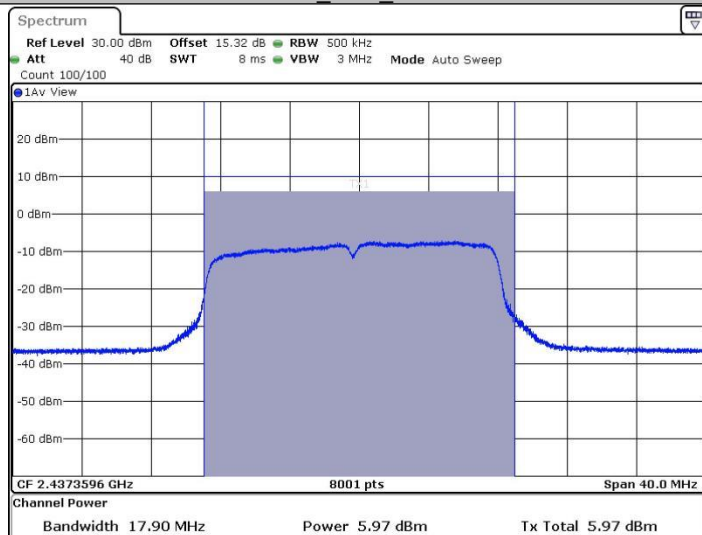
Date: 1.NOV.2024 14:53:52

11G_Ant1_2412



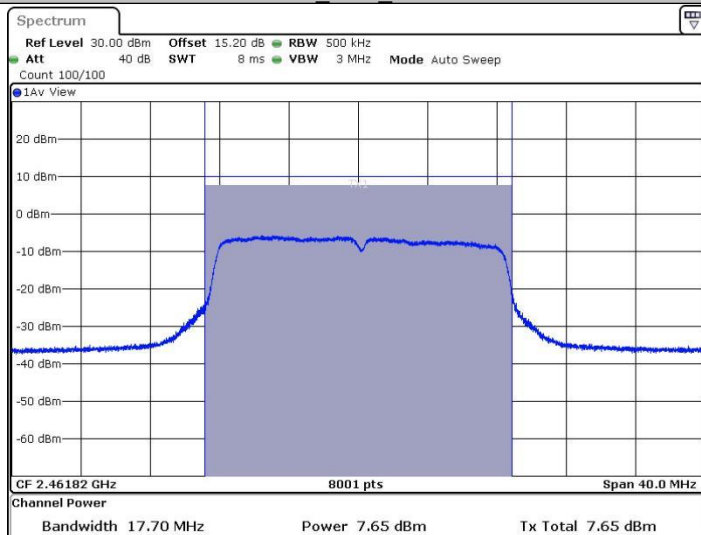
Date: 1.NOV.2024 15:07:50

11G_Ant1_2437



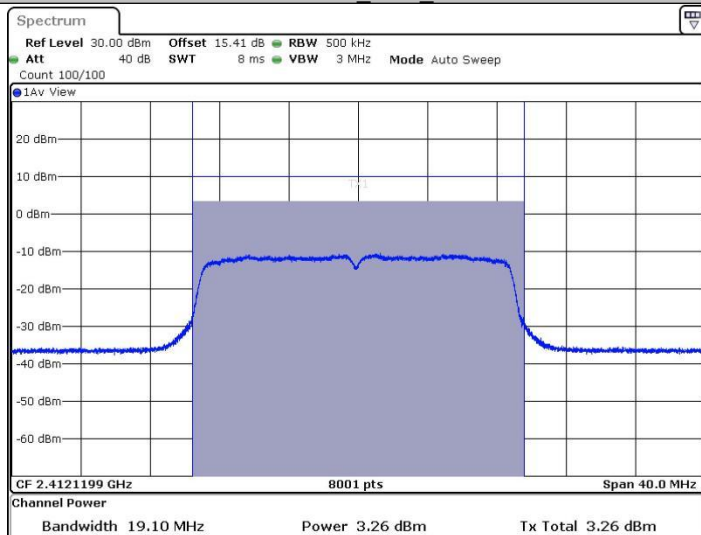
Date: 1.NOV.2024 15:09:34

11G_Ant1_2462



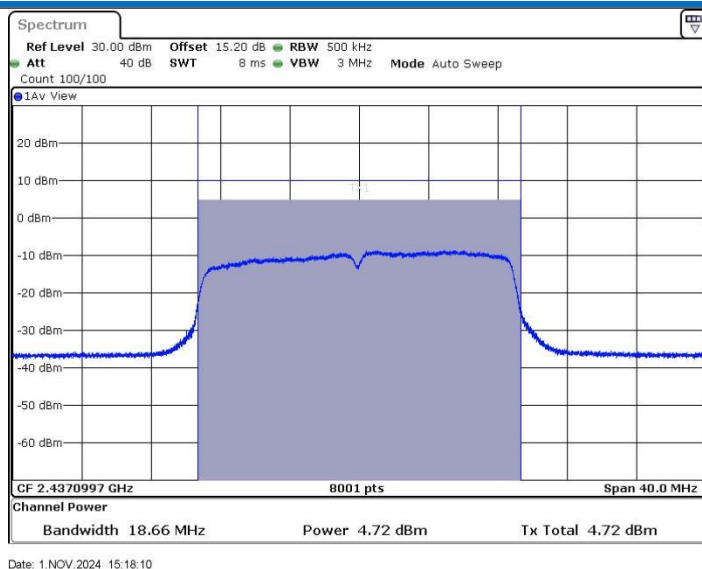
Date: 1.NOV.2024 15:12:11

11N20SISO_Ant1_2412

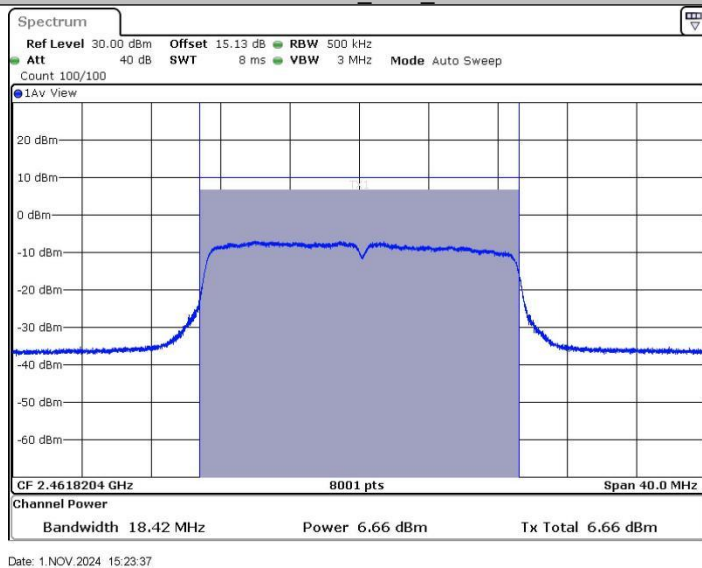


Date: 1.NOV.2024 15:15:40

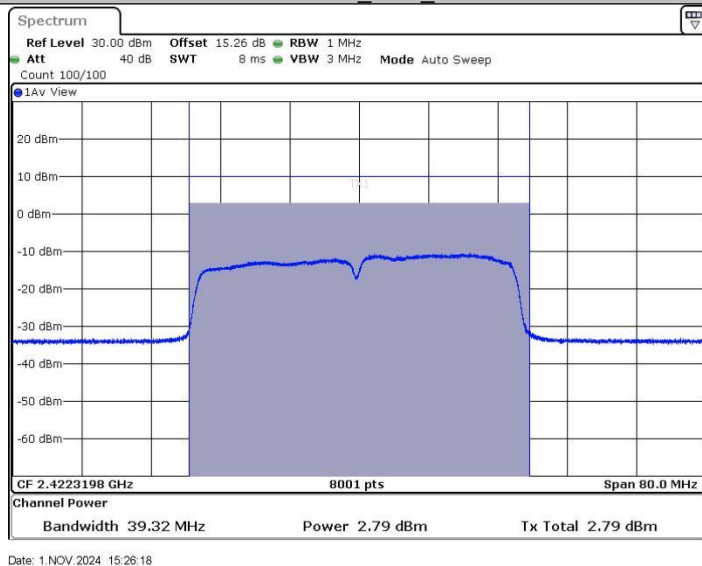
11N20SISO_Ant1_2437



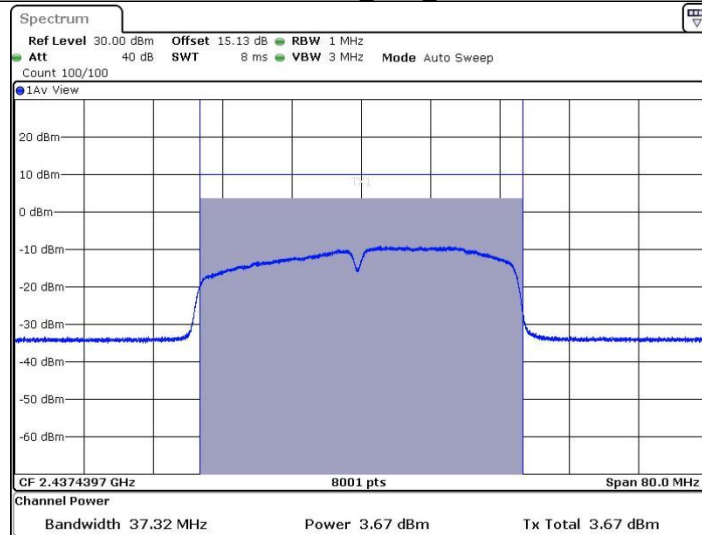
11N20SISO_Ant1_2462



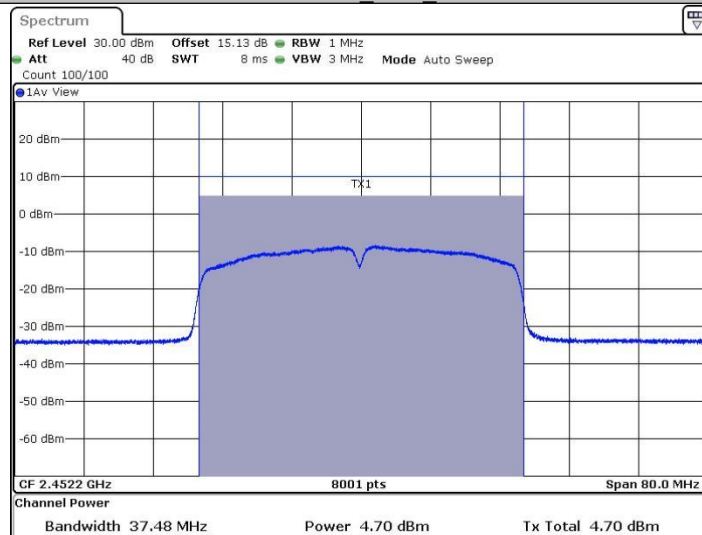
11N40SISO_Ant1_2422



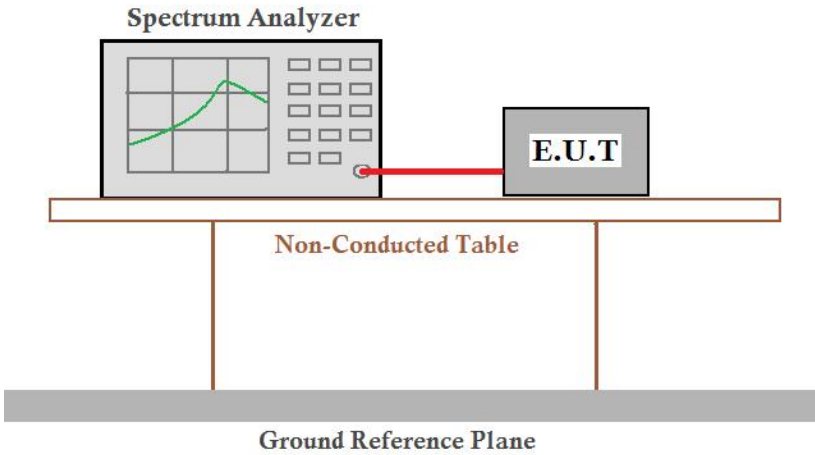
11N40SISO_Ant1_2437



11N40SISO_Ant1_2452



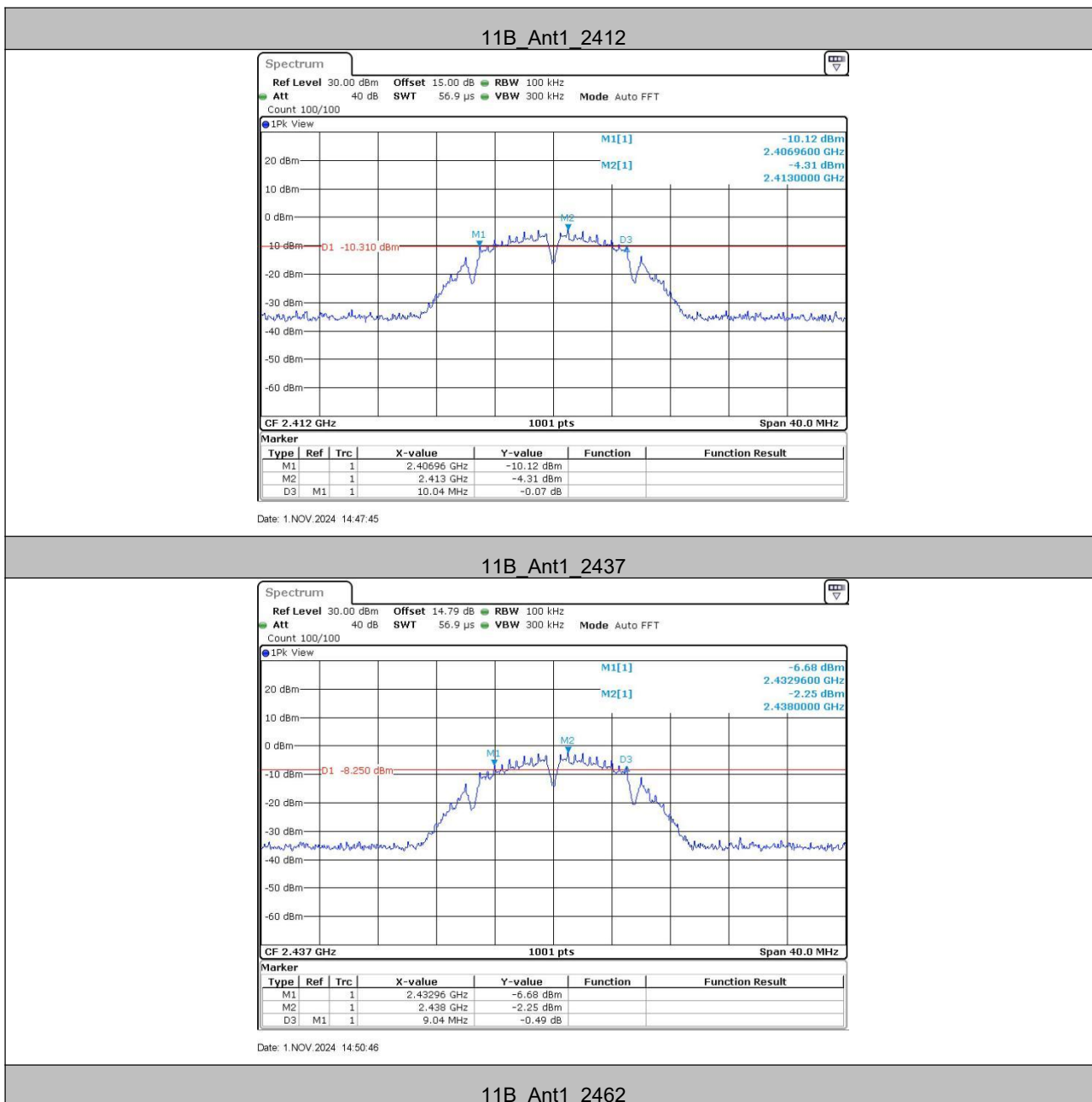
5.4 6dB Occupied Bandwidth

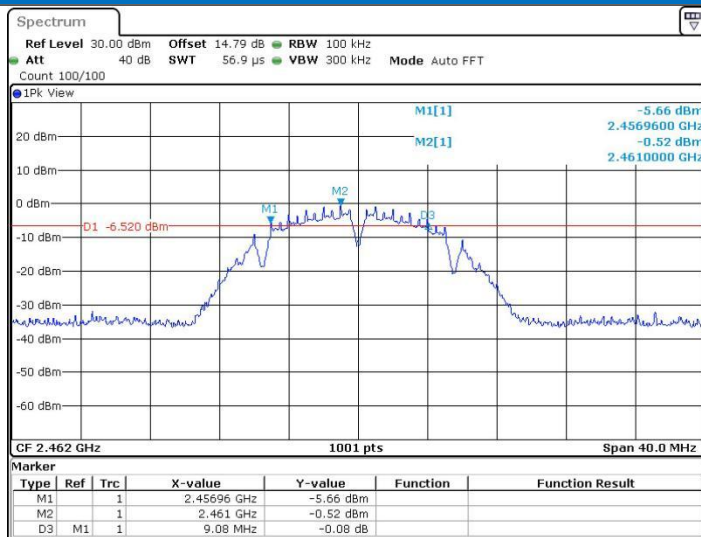
Test Requirement:	47 CFR Part 15C Section 15.247 (a)(2)
Test Method:	ANSI C63.10: 2013
Test Setup:	 Offset=cable loss+ attenuation factor
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Only the worst case is recorded in the report.
Limit:	≥ 500 kHz
Test Results:	Pass

Test Result

TestMode	Frequency[MHz]	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	2412	10.04	2406.96	2417.00	0.5	PASS
	2437	9.04	2432.96	2442.00	0.5	PASS
	2462	9.08	2456.96	2466.04	0.5	PASS
11G	2412	16.32	2403.84	2420.16	0.5	PASS
	2437	15.72	2429.44	2445.16	0.5	PASS
	2462	16.32	2453.80	2470.12	0.5	PASS
11N20SISO	2412	17.60	2403.20	2420.80	0.5	PASS
	2437	16.32	2429.44	2445.76	0.5	PASS
	2462	16.36	2453.20	2469.56	0.5	PASS
11N40SISO	2422	35.68	2404.48	2440.16	0.5	PASS
	2437	31.28	2423.24	2454.52	0.5	PASS
	2452	33.84	2435.68	2469.52	0.5	PASS

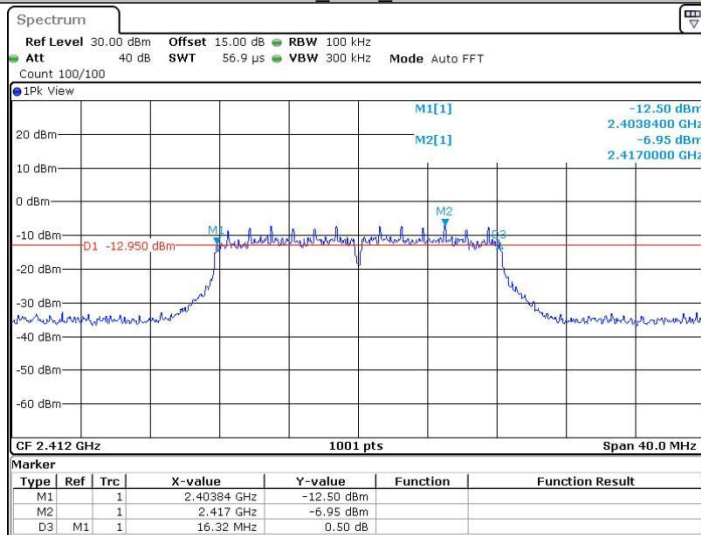
Test Graphs





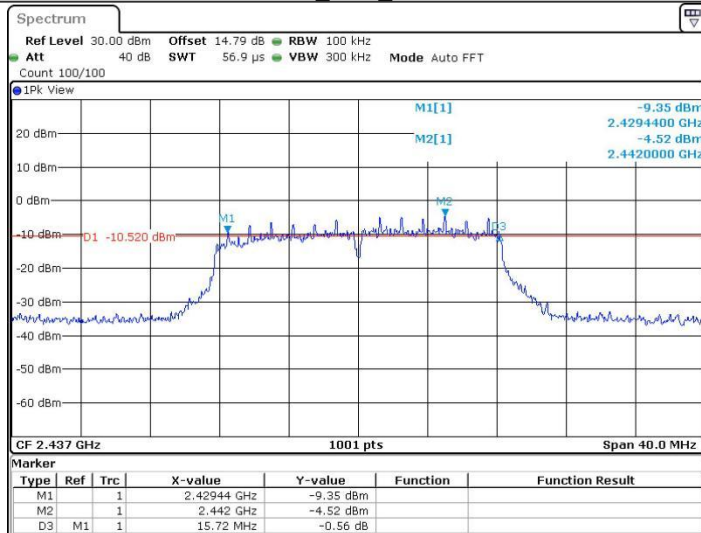
Date: 1.NOV.2024 14:53:38

11G_Ant1_2412



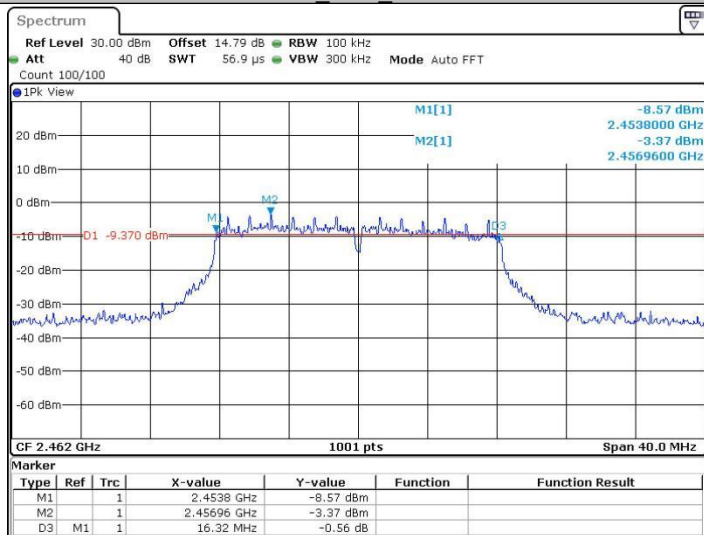
Date: 1.NOV.2024 15:07:36

11G_Ant1_2437



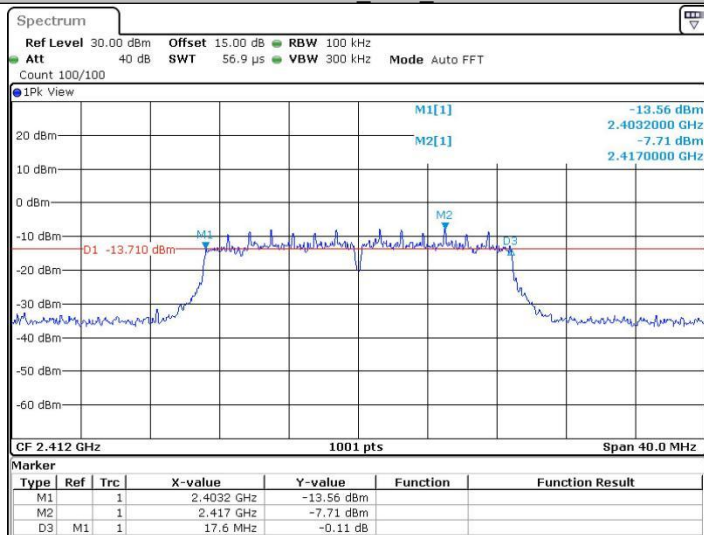
Date: 1.NOV.2024 15:09:20

11G_Ant1_2462



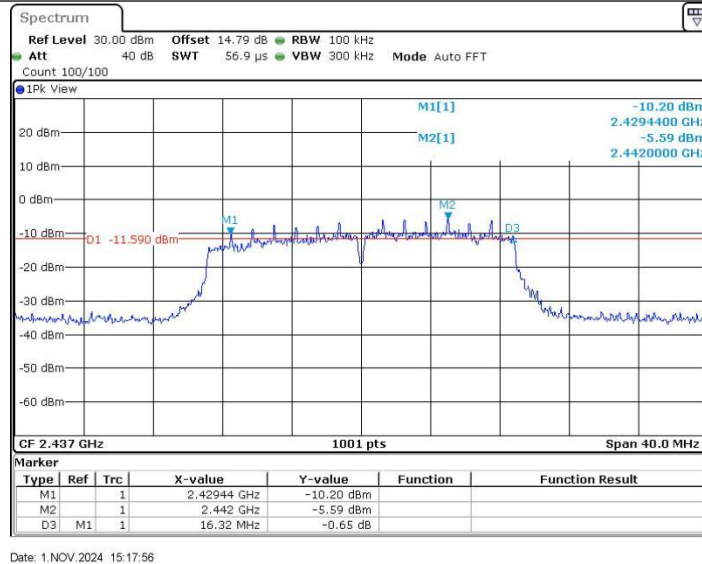
Date: 1.NOV.2024 15:11:57

11N20SISO_Ant1_2412



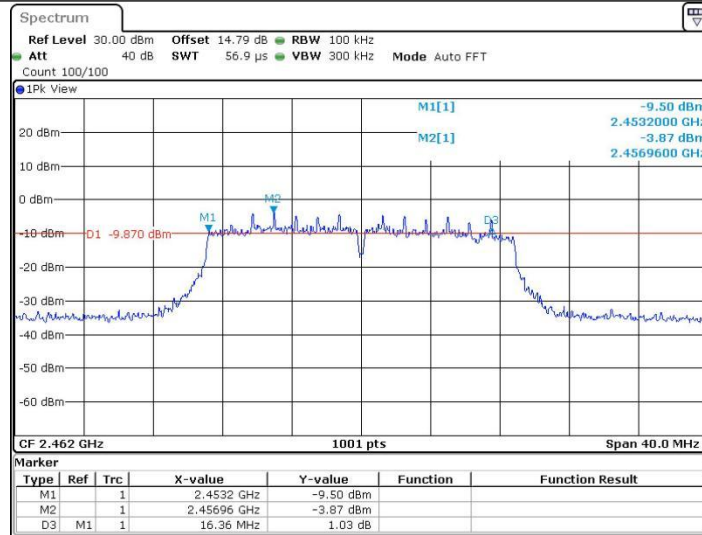
Date: 1.NOV.2024 15:15:26

11N20SISO_Ant1_2437



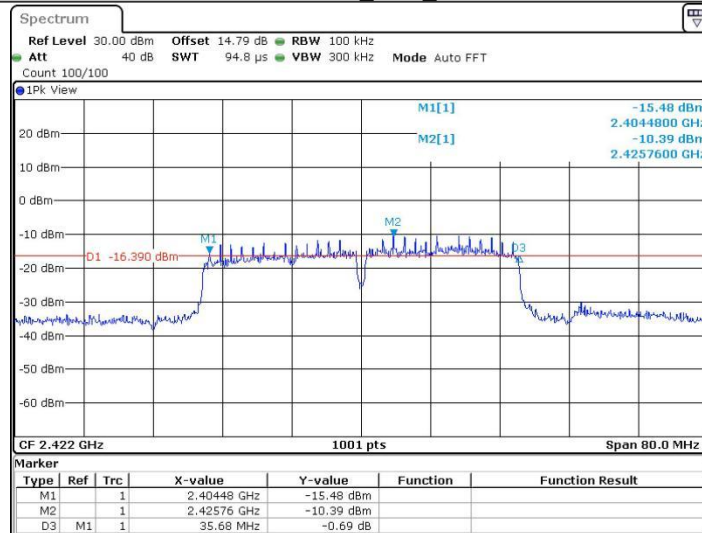
Date: 1.NOV.2024 15:17:56

11N20SISO_Ant1_2462



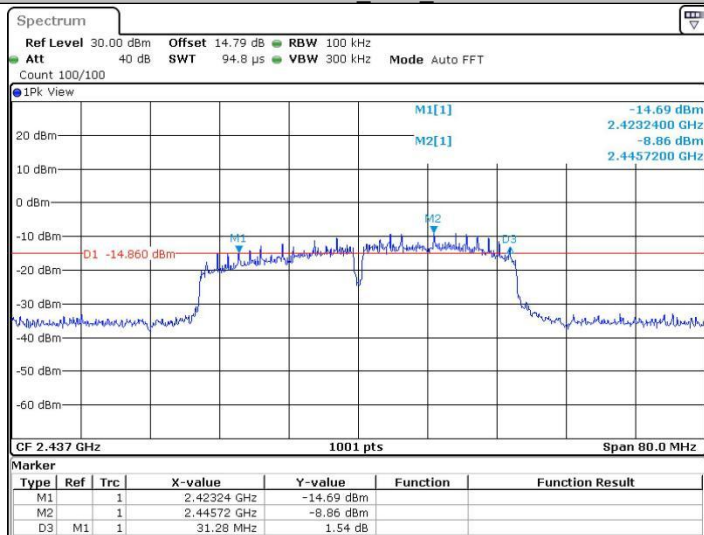
Date: 1.NOV.2024 15:23:23

11N40SISO_Ant1_2422



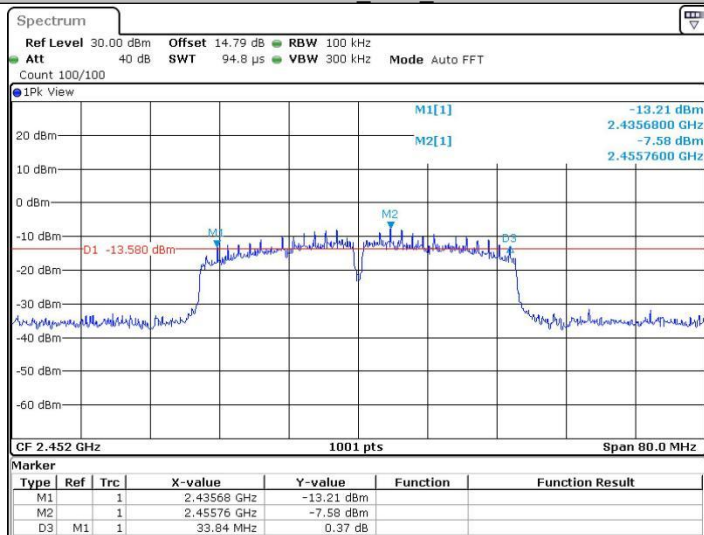
Date: 1.NOV.2024 15:26:03

11N40SISO_Ant1_2437



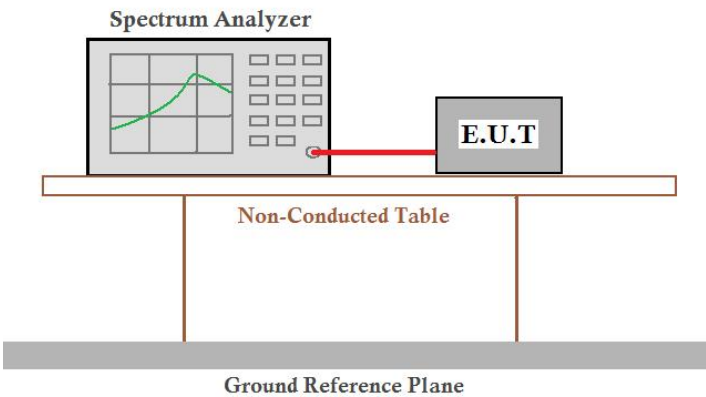
Date: 1.NOV.2024 15:27:53

11N40SISO_Ant1_2452



Date: 1.NOV.2024 15:29:23

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:	Only the worst case is recorded in the report.
Limit:	≤8.00dBm/3kHz
Test Results:	Pass

Test Result

TestMode	Frequency[MHz]	Result[dBm/3-100kHz]	Limit[dBm/3kHz]	Verdict
11B	2412	-23.44	≤8.00	PASS
	2437	-22.05	≤8.00	PASS
	2462	-20.14	≤8.00	PASS
11G	2412	-24.28	≤8.00	PASS
	2437	-22.98	≤8.00	PASS
	2462	-21.16	≤8.00	PASS
11N20SISO	2412	-25.38	≤8.00	PASS
	2437	-23.98	≤8.00	PASS
	2462	-21.7	≤8.00	PASS
11N40SISO	2422	-28.63	≤8.00	PASS
	2437	-26.28	≤8.00	PASS
	2452	-25.31	≤8.00	PASS

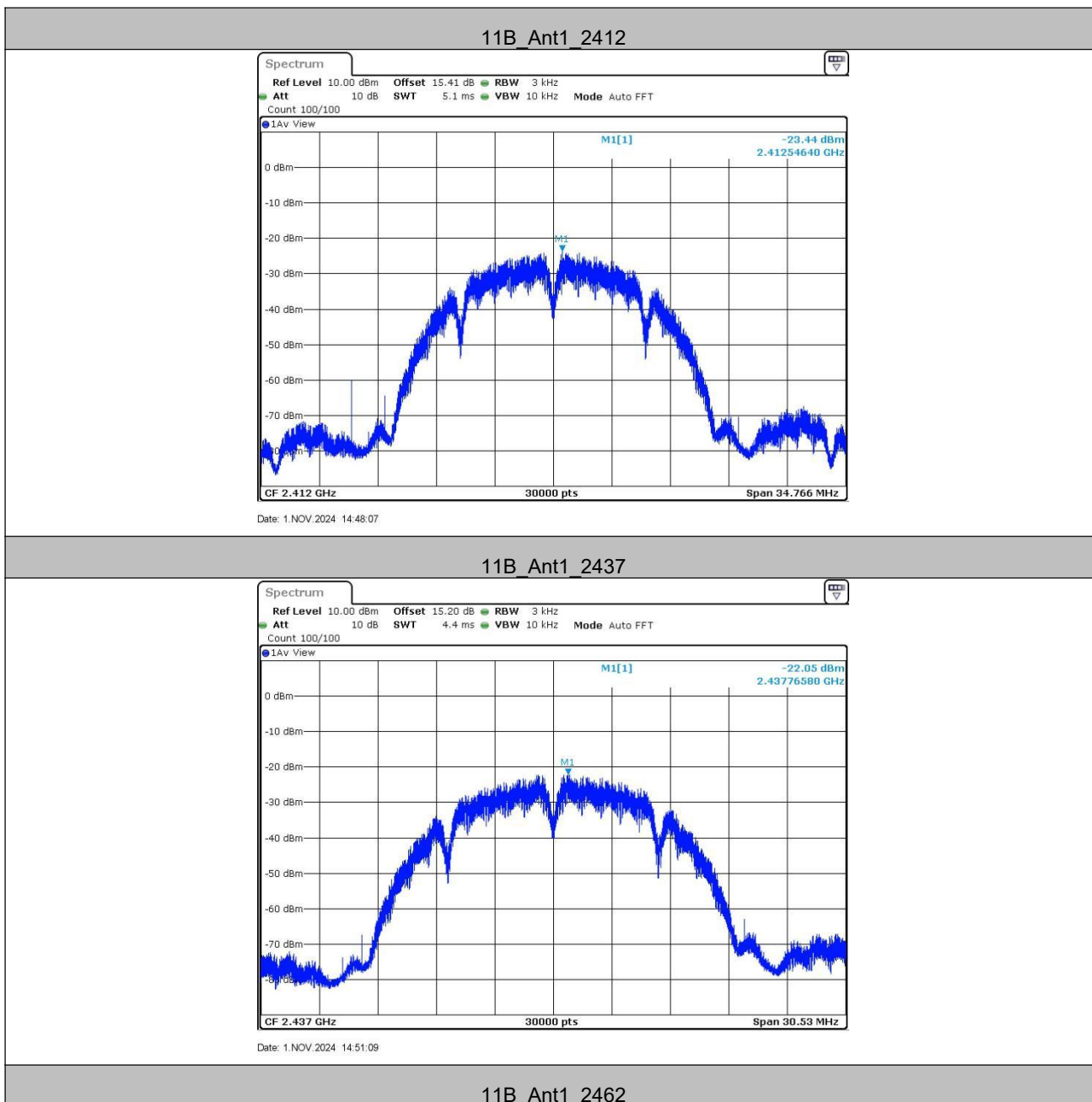
Note:

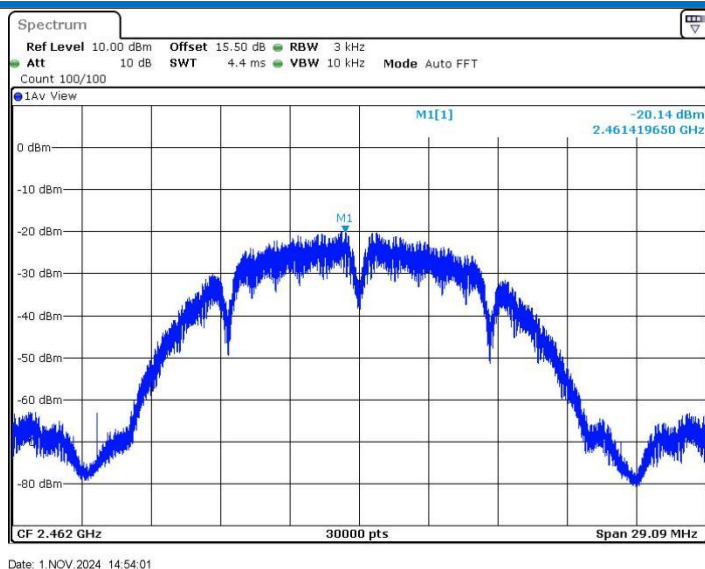
Result=conducted + cycle factor

Duty cycle correction factor details please see section 4.4.

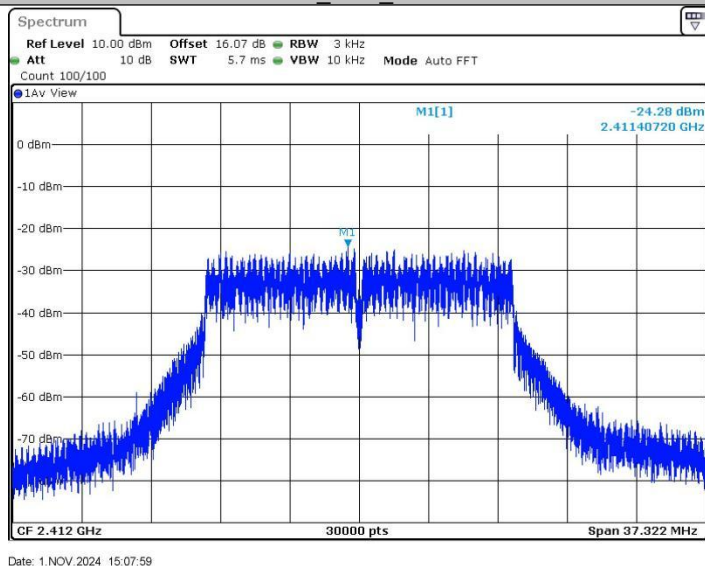
When Duty cycle >98%, D.C.F is not required.

Test Graphs

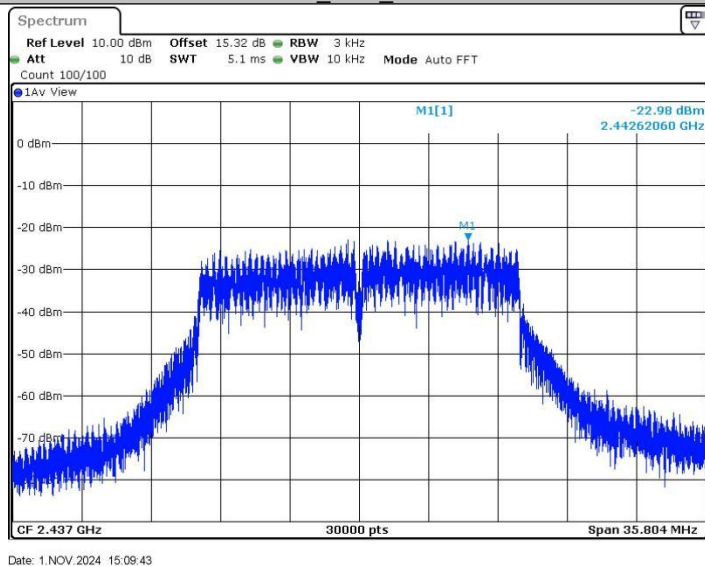




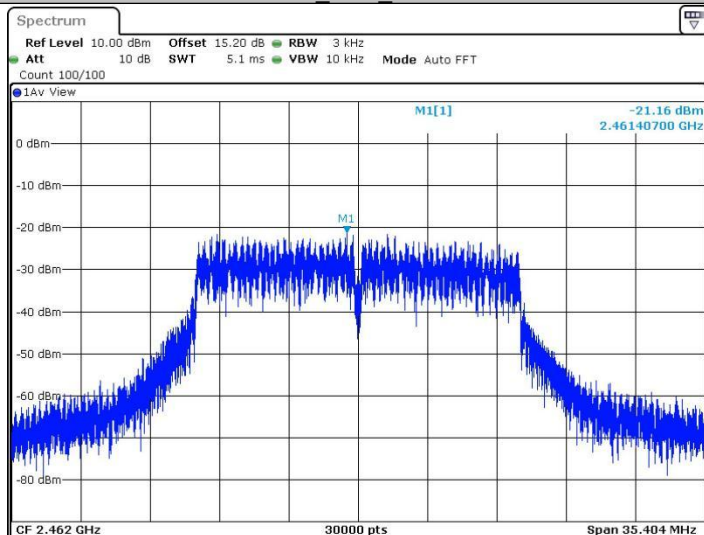
11G_Ant1_2412



11G_Ant1_2437

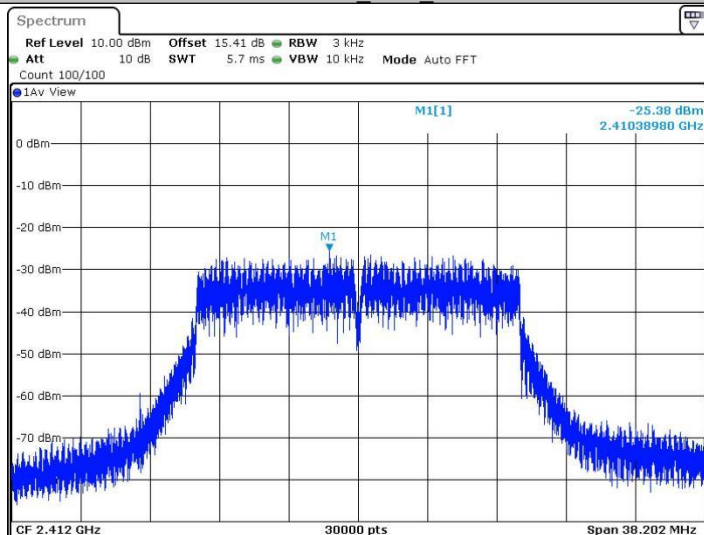


11G_Ant1_2462



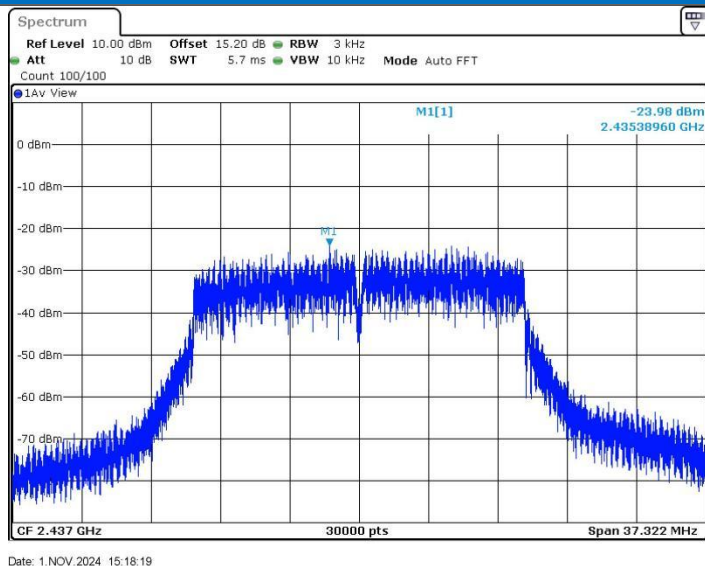
Date: 1.NOV.2024 15:12:19

11N20SISO_Ant1_2412

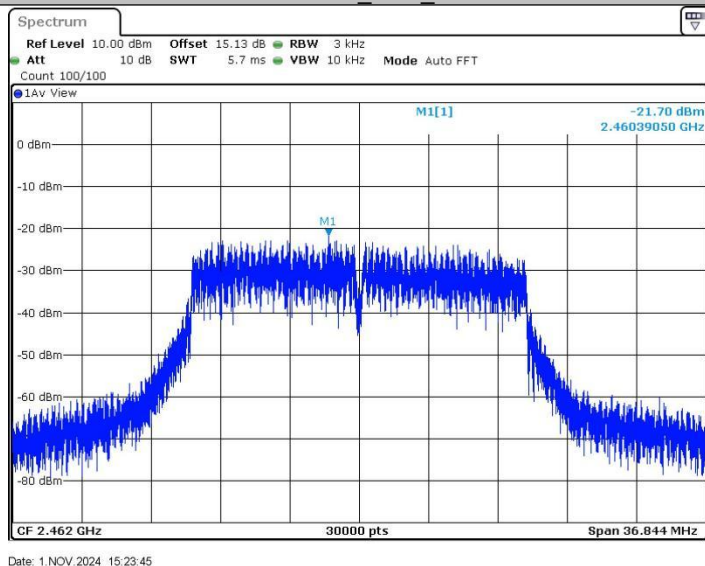


Date: 1.NOV.2024 15:15:49

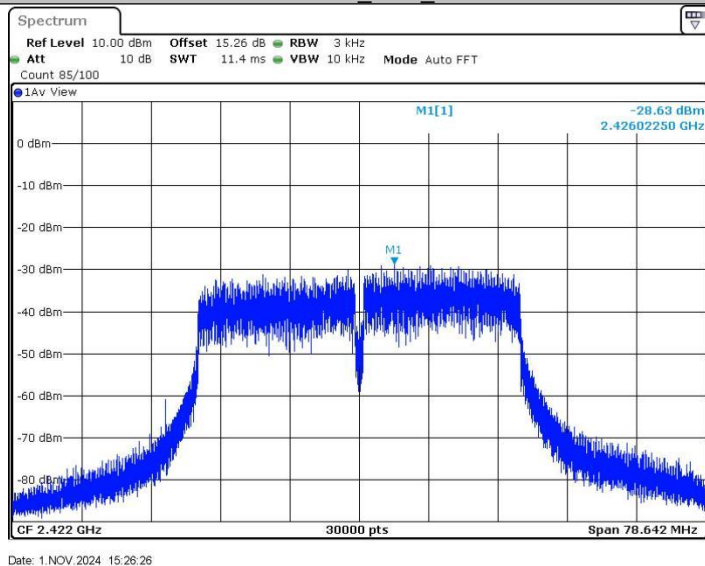
11N20SISO_Ant1_2437



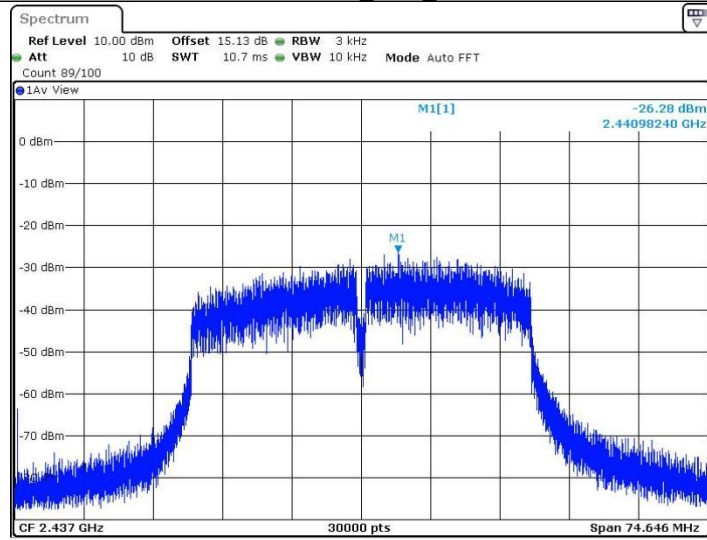
11N20SISO_Ant1_2462



11N40SISO_Ant1_2422

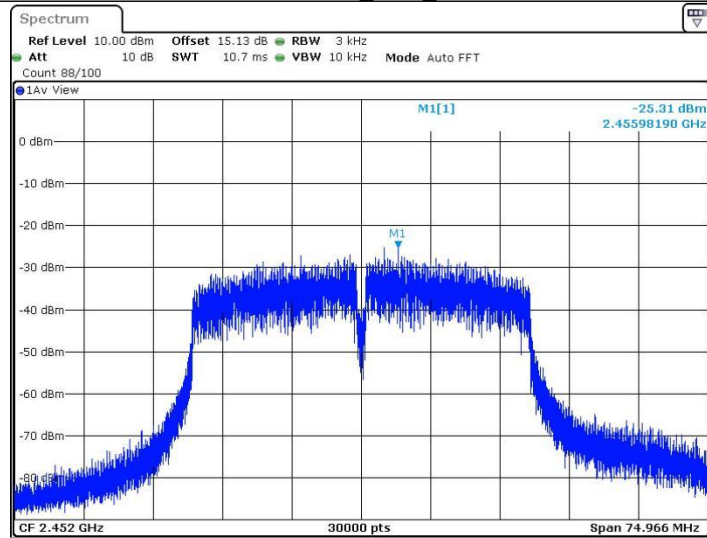


11N40SISO_Ant1_2437



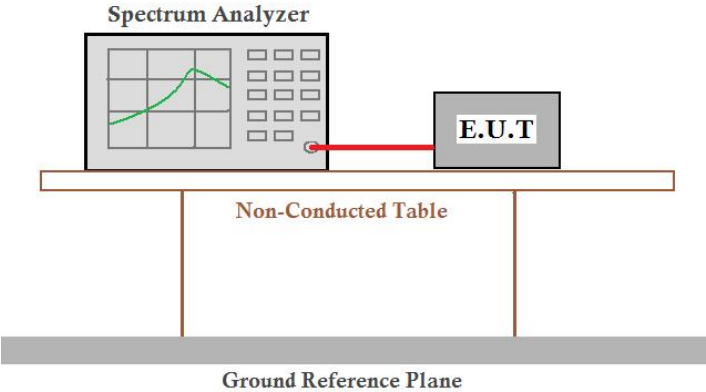
Date: 1.NOV.2024 15:28:16

11N40SISO_Ant1_2452



Date: 1.NOV.2024 15:29:45

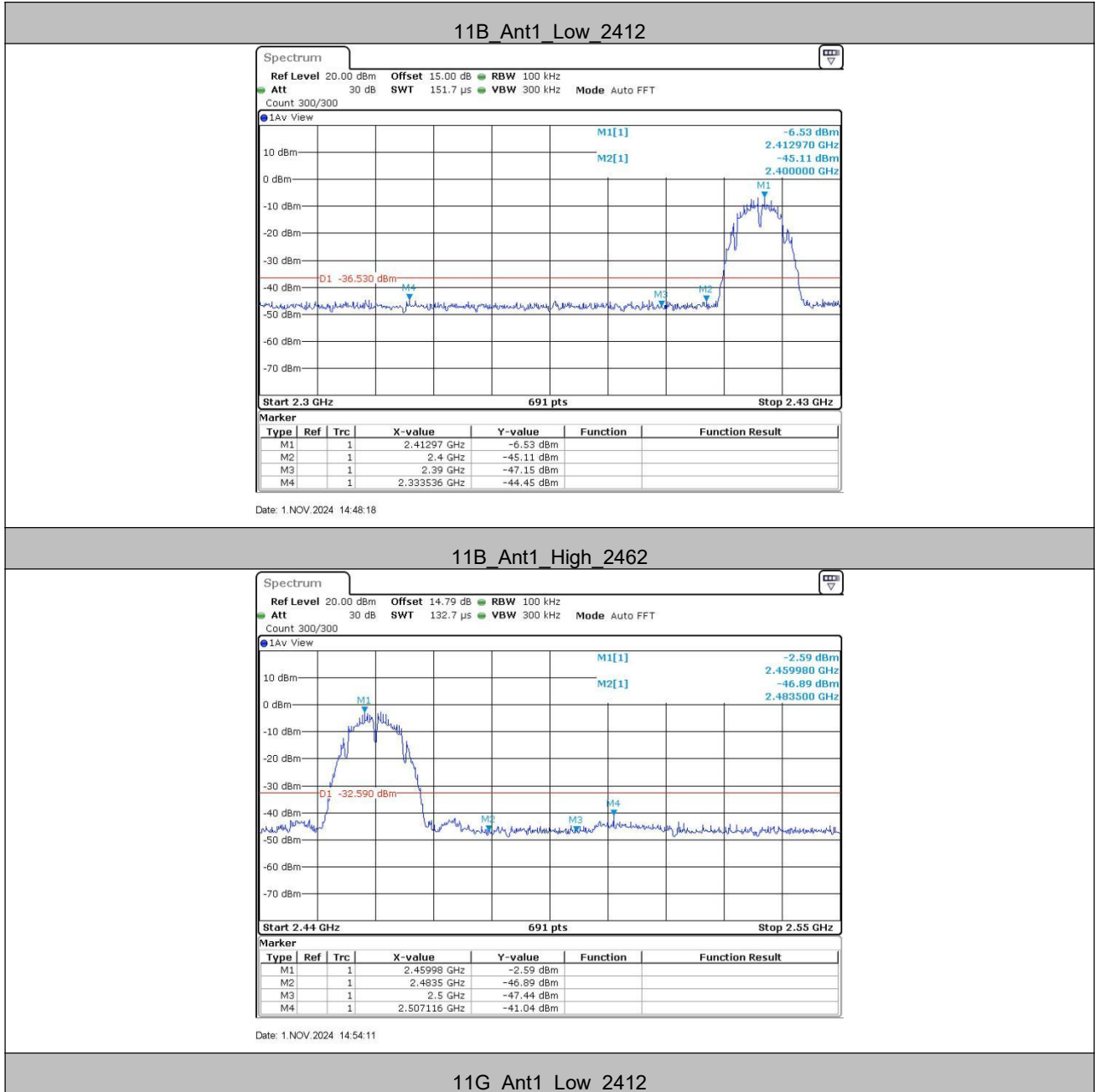
5.6 Band-edge for RF Conducted Emissions

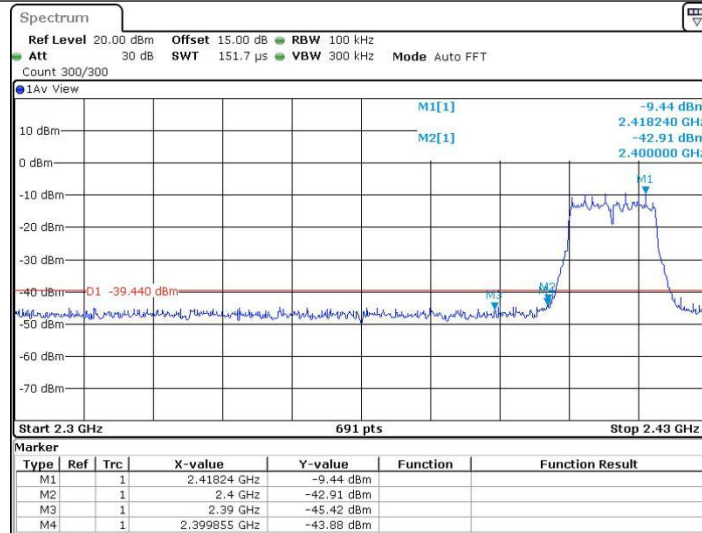
Test Requirement:	47 CFR Part 15C Section 15.247 (d)
Test Method:	ANSI C63.10: 2013
Test Setup:	 Offset=cable loss+ attenuation factor
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Only the worst case is recorded in the report.
Limit:	In any 100 kHz bandwidth 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 30 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	ChName	Frequency[MHz]	RefLevel[dBm]	Result[dBm]	Limit[dBm]	Verdict
11B	Low	2412	-6.53	-44.45	≤ -36.53	PASS
	High	2462	-2.59	-41.04	≤ -32.59	PASS
11G	Low	2412	-9.44	-43.88	≤ -39.44	PASS
	High	2462	-4.97	-41.84	≤ -34.97	PASS
11N20SISO	Low	2412	-10.27	-44.37	≤ -40.27	PASS
	High	2462	-5.86	-43.13	≤ -35.86	PASS
11N40SISO	Low	2422	-13.27	-43.89	≤ -43.27	PASS
	High	2452	-10.27	-42.67	≤ -40.27	PASS

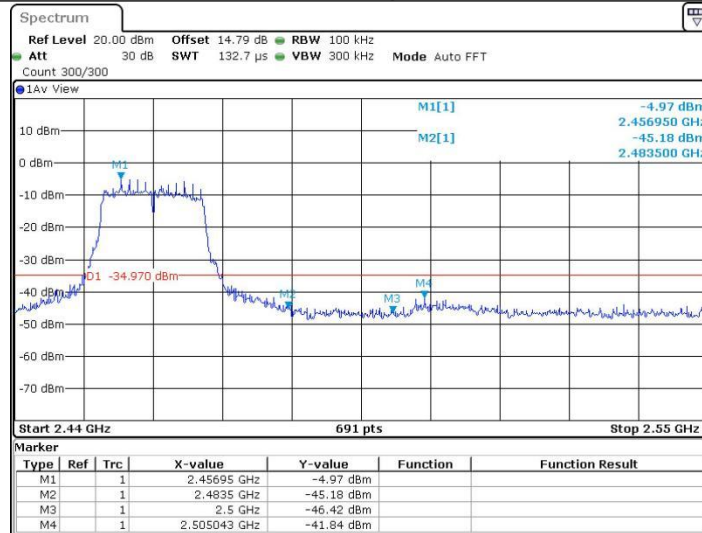
5.6.1 Test Graphs





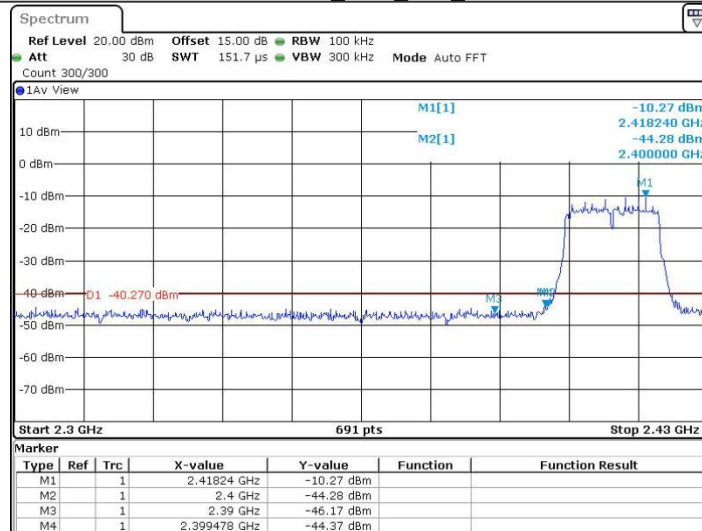
Date: 1.NOV.2024 15:08:09

11G_Ant1_High_2462



Date: 1.NOV.2024 15:12:30

11N20SISO_Ant1_Low_2412



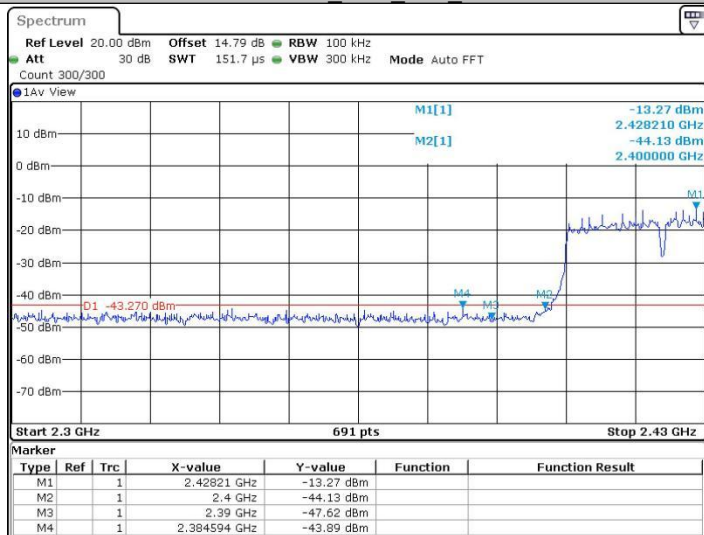
Date: 1.NOV.2024 15:15:59

11N20SISO_Ant1_High_2462



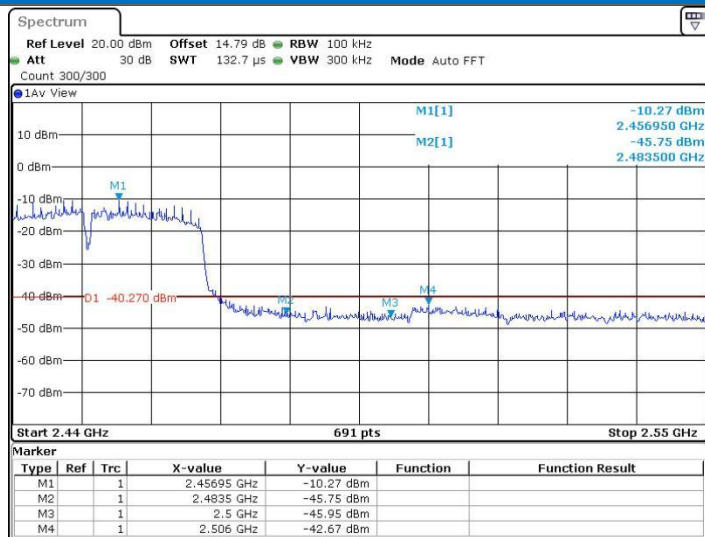
Date: 1.NOV.2024 15:23:56

11N40SISO_Ant1_Low_2422



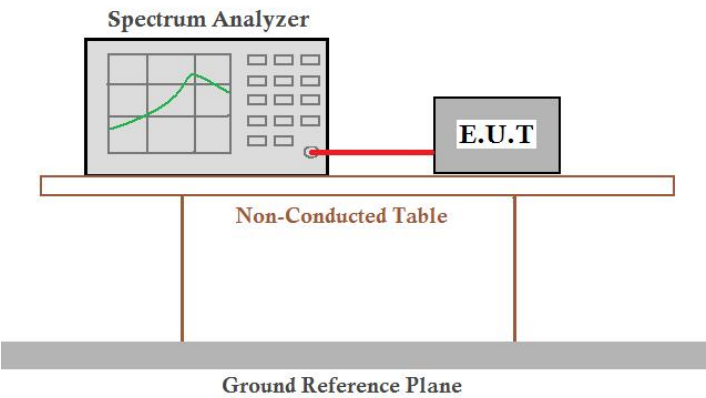
Date: 1.NOV.2024 15:26:36

11N40SISO_Ant1_High_2452



Date: 1.NOV.2024 15:29:56

5.7 RF Conducted Spurious Emissions

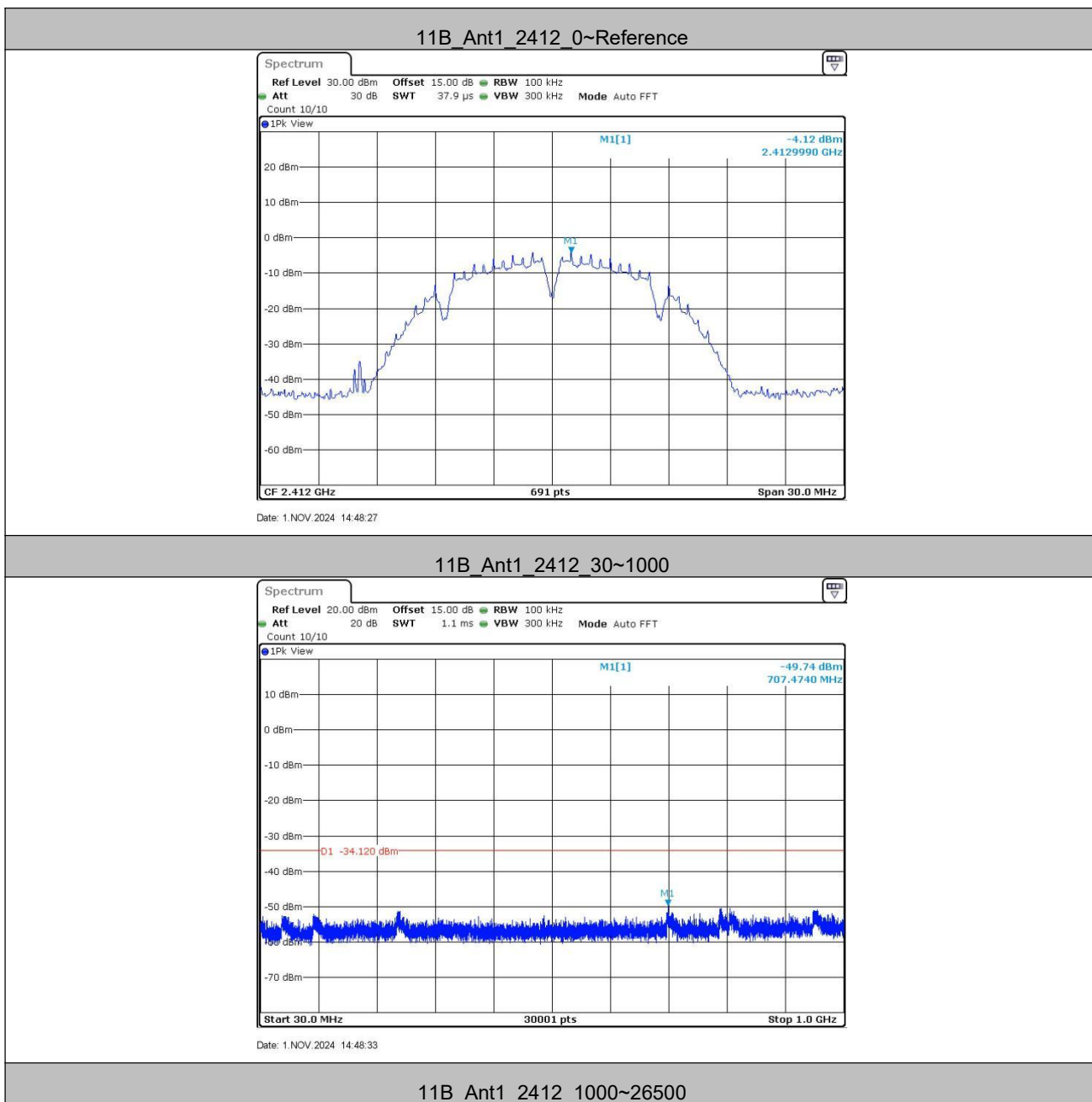
Test Requirement:	47 CFR Part 15C Section 15.247 (d)
Test Method:	ANSI C63.10: 2013
Test Setup:	 Offset=cable loss+ attenuation factor
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates
Final Test Mode:	Only the worst case is recorded in the report.
Limit:	In any 100 kHz bandwidth 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 30 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

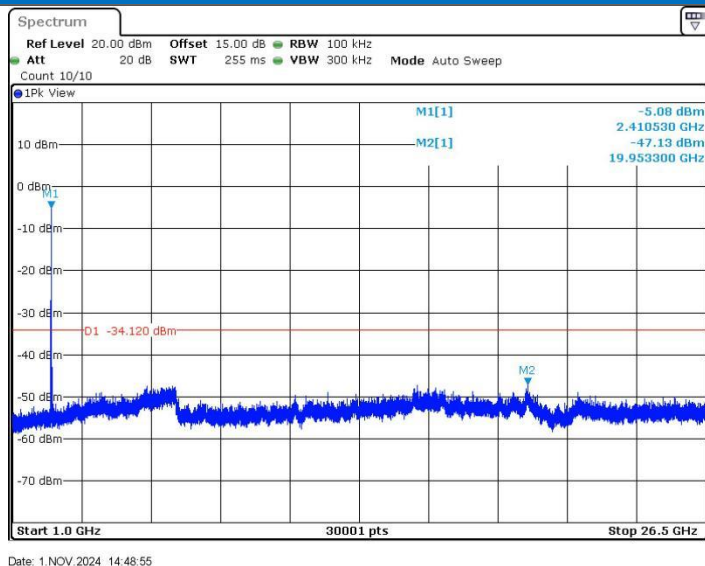
Test Result

TestMode	Frequency[MHz]	FreqRange [Mhz]	RefLevel [dBm]	Result [dBm]	Limit [dBm]	Verdict
11B	2412	Reference	-4.12	-4.12	---	PASS
		30~1000	-4.12	-49.74	≤ -34.12	PASS
		1000~26500	-4.12	-47.13	≤ -34.12	PASS
	2437	Reference	-2.00	-2.00	---	PASS
		30~1000	-2.00	-47.55	≤ -32	PASS
		1000~26500	-2.00	-47.13	≤ -32	PASS
	2462	Reference	-0.29	-0.29	---	PASS
		30~1000	-0.29	-50.08	≤ -30.29	PASS
		1000~26500	-0.29	-47.22	≤ -30.29	PASS
11G	2412	Reference	-6.98	-6.98	---	PASS
		30~1000	-6.98	-50.27	≤ -36.98	PASS
		1000~26500	-6.98	-47.15	≤ -36.98	PASS
	2437	Reference	-4.35	-4.35	---	PASS
		30~1000	-4.35	-49.58	≤ -34.35	PASS
		1000~26500	-4.35	-47.52	≤ -34.35	PASS
	2462	Reference	-2.76	-2.76	---	PASS
		30~1000	-2.76	-50.51	≤ -32.76	PASS
		1000~26500	-2.76	-47.12	≤ -32.76	PASS
11N20SISO	2412	Reference	-7.74	-7.74	---	PASS
		30~1000	-7.74	-49.74	≤ -37.74	PASS
		1000~26500	-7.74	-46.67	≤ -37.74	PASS
	2437	Reference	-5.27	-5.27	---	PASS
		30~1000	-5.27	-50.3	≤ -35.27	PASS
		1000~26500	-5.27	-47.51	≤ -35.27	PASS
	2462	Reference	-3.60	-3.60	---	PASS
		30~1000	-3.60	-50.68	≤ -33.6	PASS
		1000~26500	-3.60	-46.33	≤ -33.6	PASS
11N40SISO	2422	Reference	-10.44	-10.44	---	PASS
		30~1000	-10.44	-50.34	≤ -40.44	PASS
		1000~26500	-10.44	-47.73	≤ -40.44	PASS
	2437	Reference	-8.28	-8.28	---	PASS
		30~1000	-8.28	-50.72	≤ -38.28	PASS
		1000~26500	-8.28	-47.13	≤ -38.28	PASS
	2452	Reference	-7.86	-7.86	---	PASS

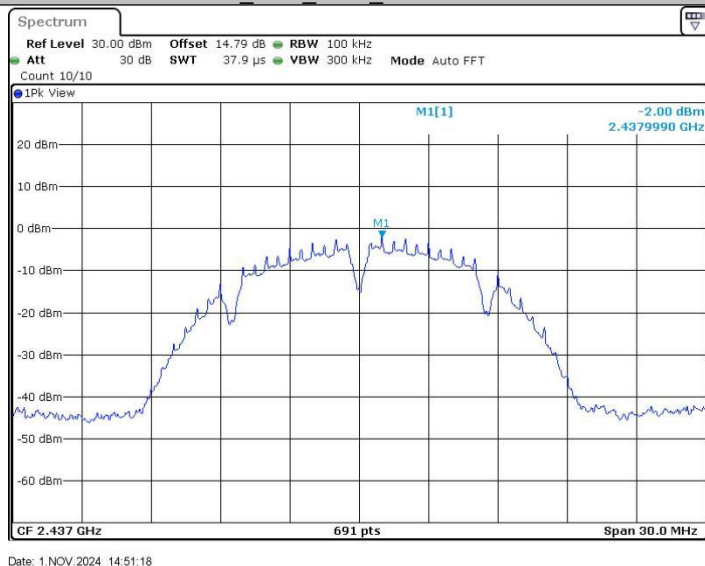
		30~1000	-7.86	-49.98	≤ -37.86	PASS
		1000~26500	-7.86	-46.52	≤ -37.86	PASS

Test Graphs

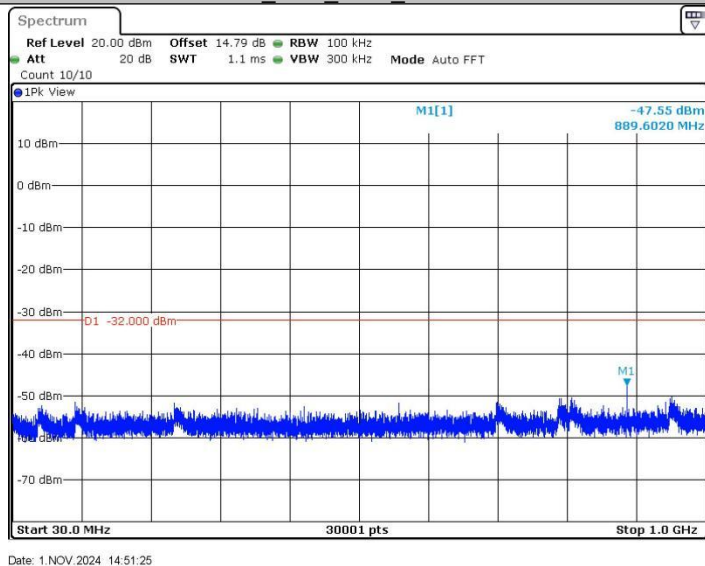




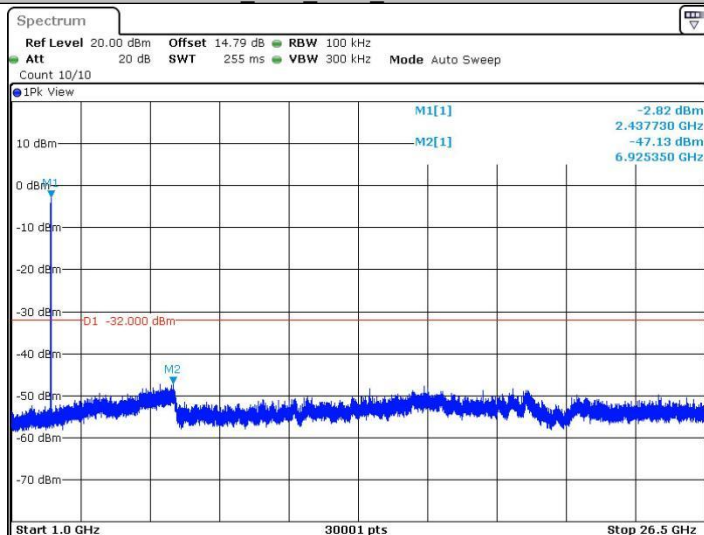
11B_Ant1_2437_0~Reference



11B_Ant1_2437_30~1000

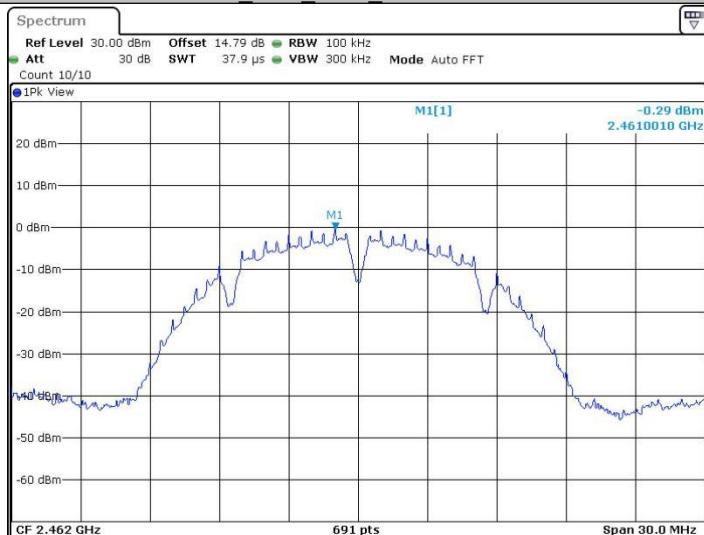


11B_Ant1_2437_1000~26500



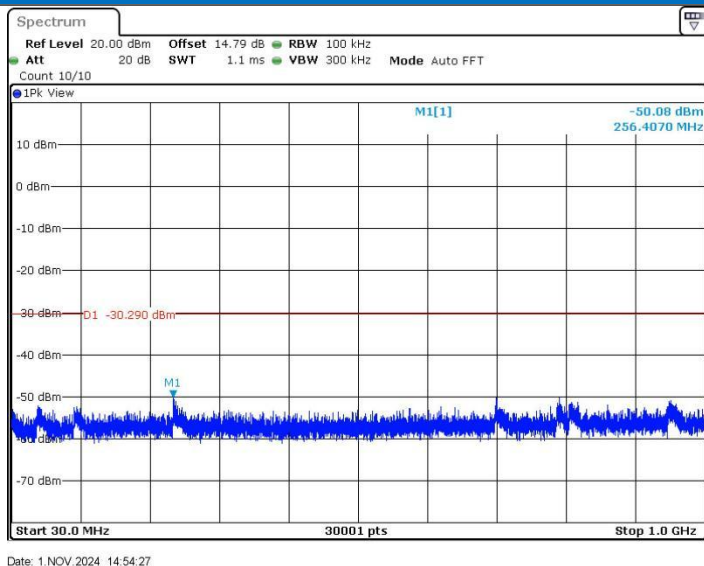
Date: 1.NOV.2024 14:51:47

11B_Ant1_2462_0~Reference

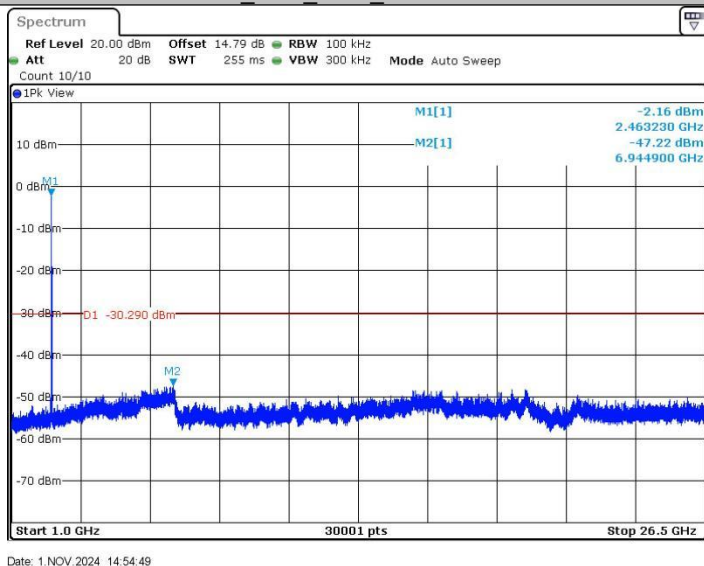


Date: 1.NOV.2024 14:54:21

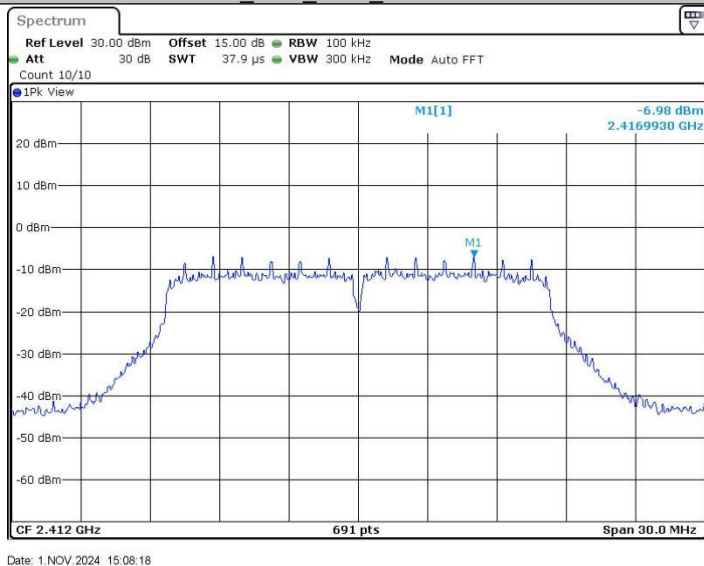
11B_Ant1_2462_30~1000



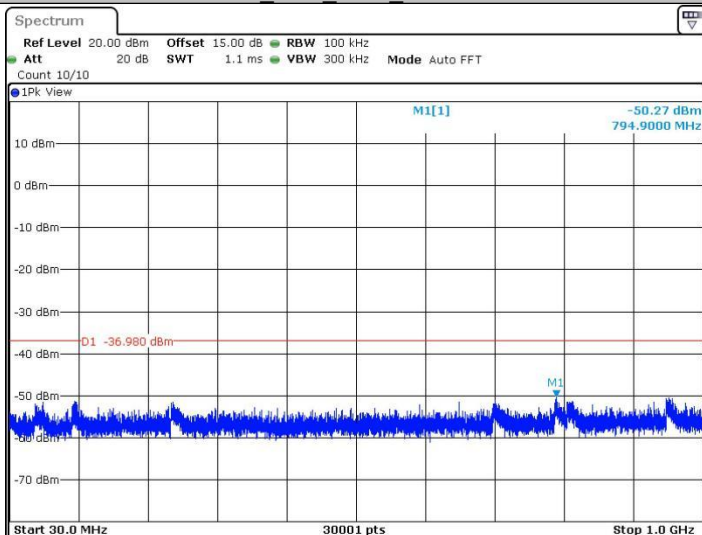
11B_Ant1_2462_1000~26500



11G_Ant1_2412_0~Reference

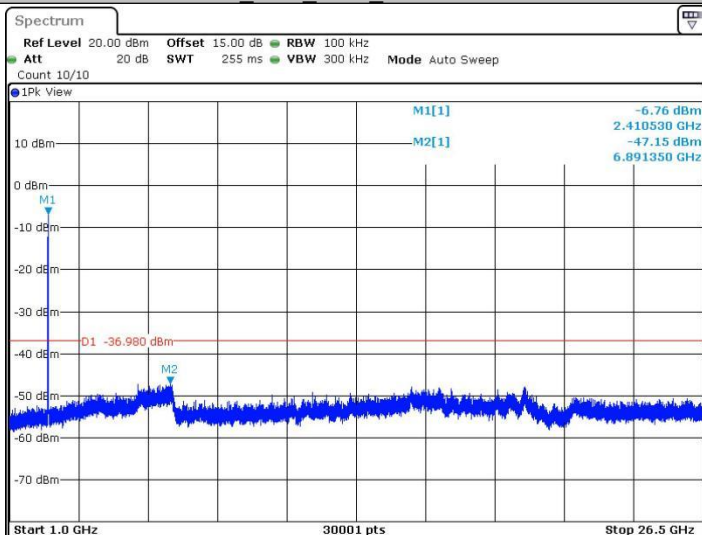


11G_Ant1_2412_30~1000



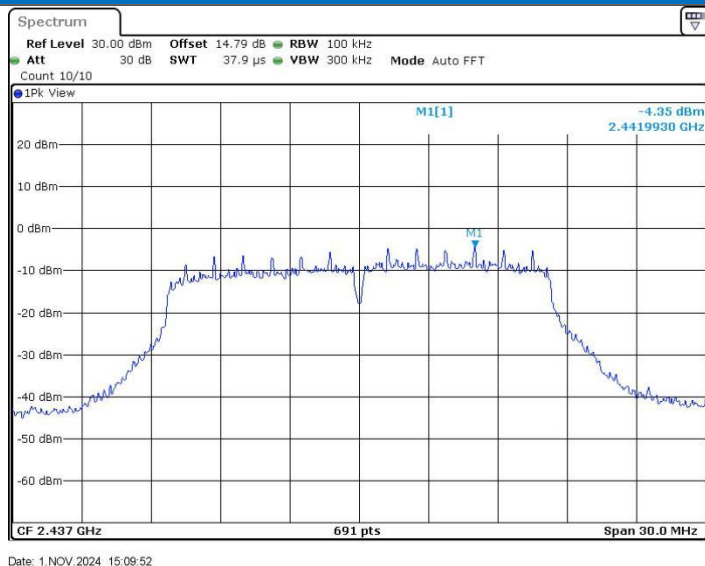
Date: 1.NOV.2024 15:08:25

11G_Ant1_2412_1000~26500

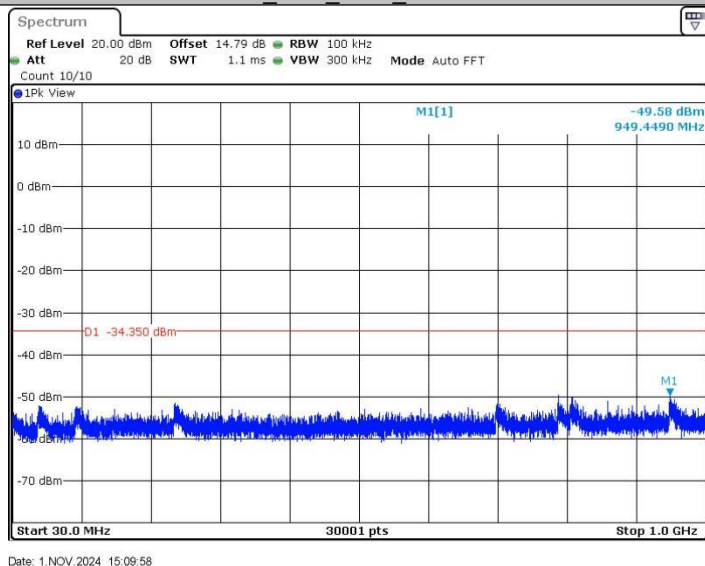


Date: 1.NOV.2024 15:08:47

11G_Ant1_2437_0~Reference



11G_Ant1_2437_30~1000



11G_Ant1_2437_1000~26500

