



## Shenzhen Huaxia Testing Technology Co., Ltd.

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# TEST REPORT

**Report No.:** CQASZ20220901574E-01  
**Applicant:** Shanghai TUGE Data Technologies Co., Ltd.  
**Address of Applicant:** Room 316, Lane 302, Lane 838, Shuyuan Town, Pudong New Area, Shanghai  
**Equipment Under Test (EUT):**  
**Product:** 4G Wireless Router  
**Model No.:** TR110  
**Test Model No.:** TR110  
**Brand Name:** N/A  
**FCC ID:** 2AU4T-TR110  
**Standards:** 47 CFR Part 15, Subpart C  
**Date of Receipt:** 2022-09-09  
**Date of Test:** 2022-09-09 to 2022-10-13  
**Date of Issue:** 2022-10-19  
**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 )



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## 1 Version

### Revision History Of Report

Report No.	Version	Description	Issue Date
CQASZ20220901574E-01	Rev.01	Initial report	2022-10-19

## 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:	Shanghai TUGE Data Technologies Co., Ltd.
Address of Applicant:	Room 316, Lane 302, Lane 838, Shuyuan Town, Pudong New Area, Shanghai
Manufacturer:	Shenzhen Zhibotong Eletronics Co., Ltd.
Address of Manufacturer:	Bldg A2, Hedian Industrial Park, NO.9 Shijing Rd, Guanlan, Longhua District, ShenZhen, China
Factory:	Shenzhen Zhibotong Eletronics Co., Ltd.
Address of Factory:	Bldg A2, Hedian Industrial Park, NO.9 Shijing Rd, Guanlan, Longhua District, ShenZhen, China

### 4.2 General Description of EUT

Product Name:	4G Wireless Router
Model No.:	TR110
Test Model No.:	TR110
Trade Mark:	N/A
Software Version:	22.0321_220709
Hardware Version:	V02
Power Supply:	AC:100~240V ,50~60Hz DC:12V/1A
EUT Supports Radios application:	2.4GHz: Wi-Fi: 802.11b/g/n(HT20): 2412MHz~2462MHz; 802.11n(HT40): 2422MHz~2452MHz

### 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:	<input checked="" type="checkbox"/> Mobile <input type="checkbox"/> Portable <input type="checkbox"/> Fix Location
Test Software of EUT:	MT7663 QA 0.0.2.6

Antenna Type:	External antenna
Antenna Gain:	5.0dBi

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

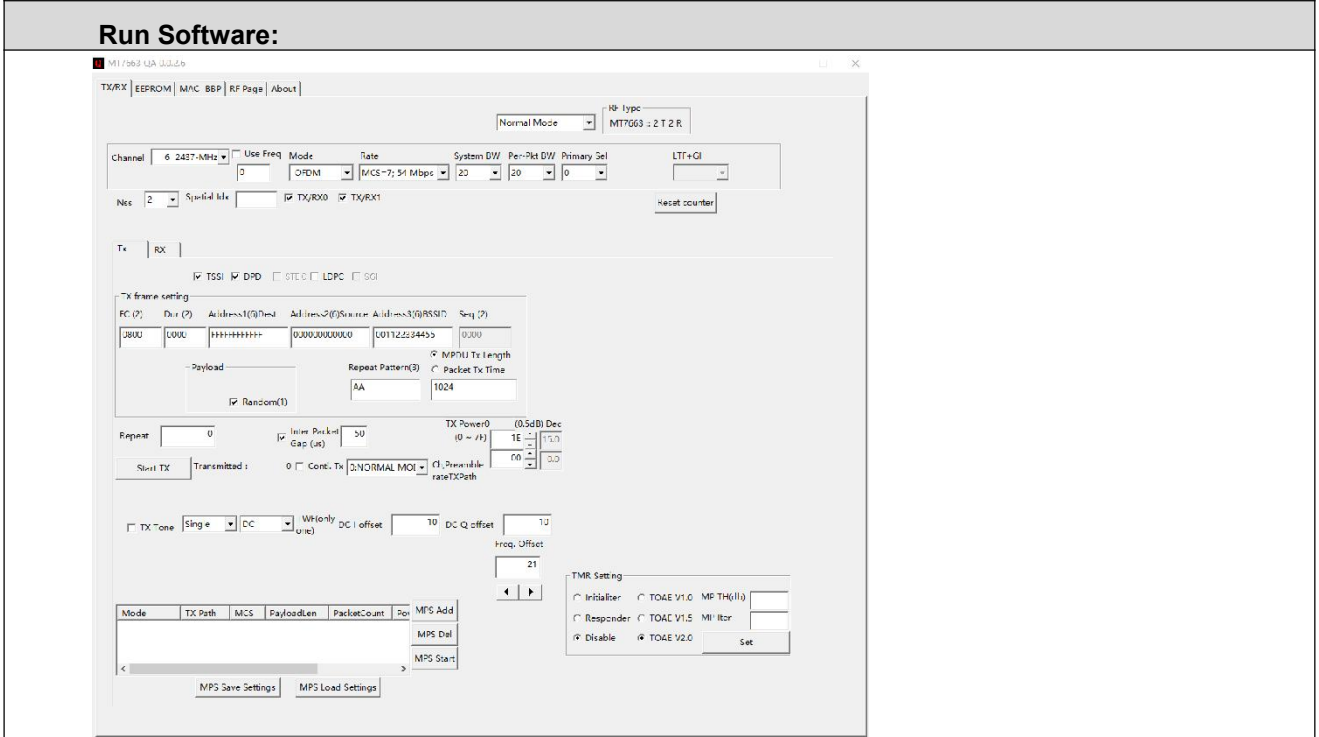
Note:

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

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

**Run Software:**

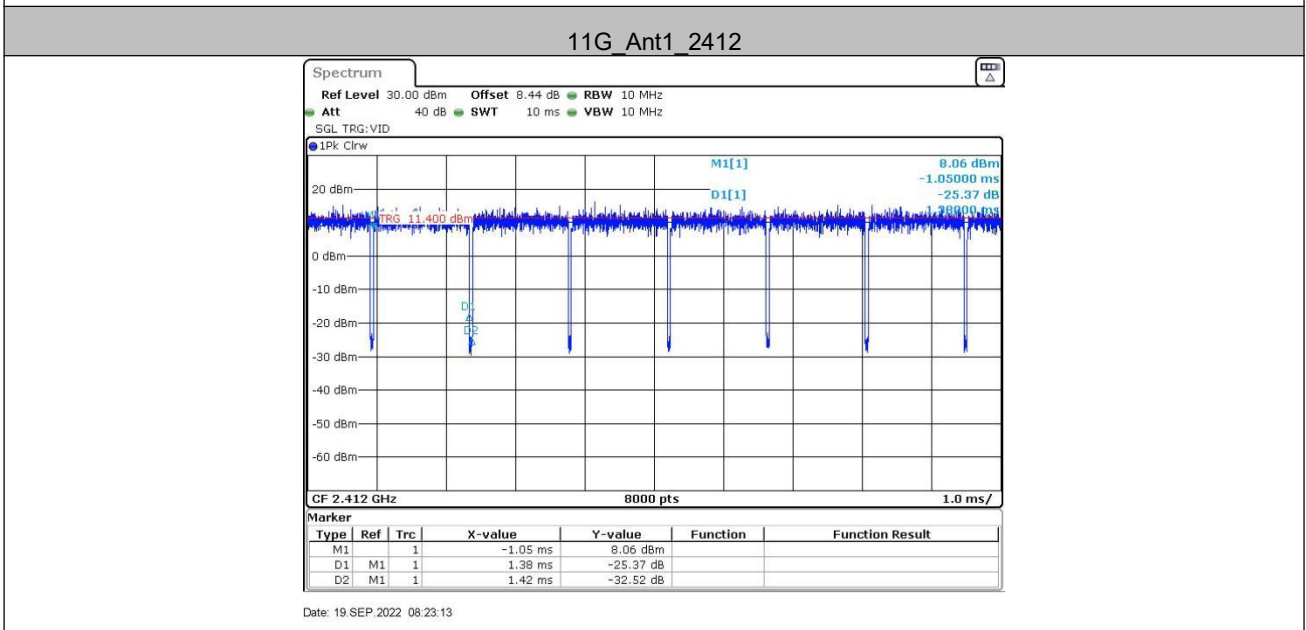
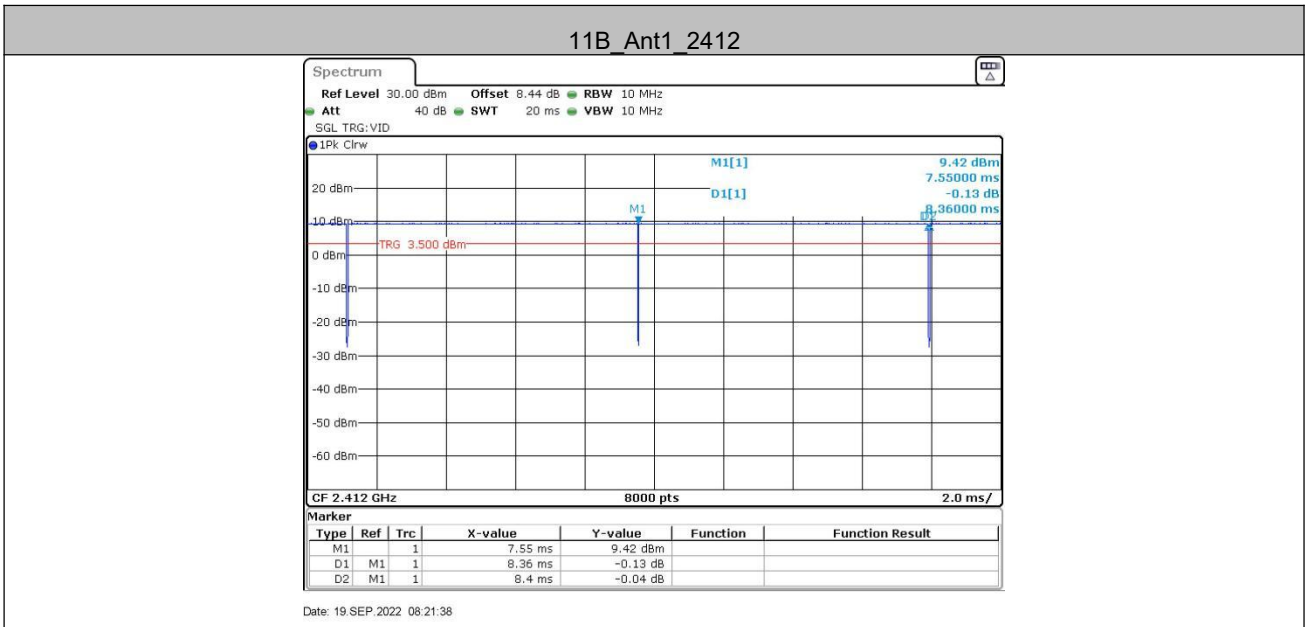


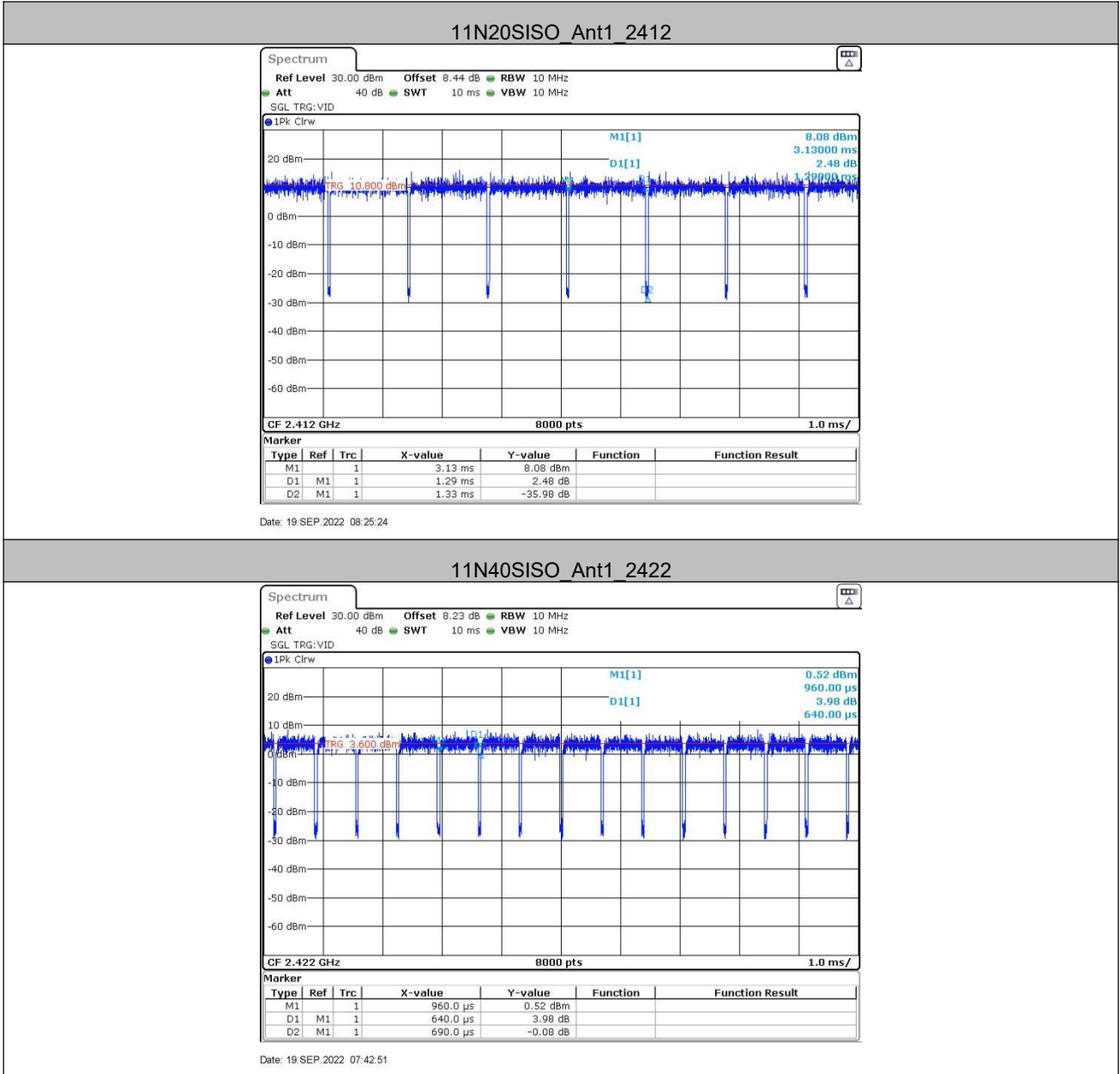
The screenshot shows a software window titled 'MI7962 1A 33333' with a menu bar (TX/RX, EEPROM, MAC, BBP, RF, Page, About). The main interface is divided into several sections:

- Mode and Channel:** 'Normal Mode' selected, 'IS type' set to 'MT7663 : 2 T 2 R'. Channel is '6 2437-MHz', 'Use Freq' is checked, 'Mode' is 'OFDM', 'Rate' is 'MCS-7: 54 Mbps', 'System DW' is '20', 'Per-Pkt DW' is '20', 'Primary Sel' is '0', and 'LTF+GI' is selected.
- Nss:** '2' selected, 'Spatial Mux' is unchecked, 'TX/RX0' and 'TX/RX1' are checked, and a 'Reset counter' button is present.
- Tx/Rx Settings:** 'Tx' tab is active. 'TSSI', 'DPD', 'STE0', 'LDPC', and 'SD' are checked. Under 'Tx frame setting', 'FC (P)' is 'J80U', 'Dur (P)' is '0000', 'Address1 (Q) Dest' is 'FFFFFFFF', 'Address2 (Q) Source' is '0000000000', 'Address3 (Q) RSSID' is '001122334455', and 'Seq (P)' is '0000'. 'Payload' is empty, 'Repeat Pattern (E)' is 'AA', 'N/PDU Tx Length' is '1024', and 'Packet Tx Time' is checked. 'Repeat' is '0', 'Inter-Packet Gap (us)' is '50', and 'TX Power (0-14)' is '1E'. 'Start TX' and 'Transmitted' buttons are visible, along with 'Conc. Tx' and 'Normal Mode' checkboxes.
- TX Tone:** 'Single' selected, 'DC' is checked, 'W/only (uic)' is checked, 'DC offset' is '10', and 'DC Q offset' is '10'. 'Freq. Offset' is '21'.
- TMR Setting:** 'Initiator' and 'Responder' are unchecked, 'TOAE V1.0' and 'MP TH(1)' are checked, 'Disable' and 'TOAE V2.0' are unchecked, and a 'Set' button is present.
- MPS Settings:** A table with columns 'Mode', 'TX Path', 'MCS', 'PayloadLen', 'PacketCount', and 'Pwr'. Below it are 'MPS Add', 'MPS Del', and 'MPS Start' buttons, and 'MPS Save Settings' and 'MPS Load Settings' buttons.



Operated Mode for Worst Duty Cycle:		
Test Mode	Duty Cycle(%)	Average correction factor(dB)
IEEE802.11b	99.52	0.02
IEEE802.11g	97.18	0.12
IEEE802.11n (HT20)	96.99	0.13
IEEE802.11n (HT40)	92.75	0.33





**Remark:**

- 1) Duty cycle= On Time/ Period;
- 2) Duty Cycle factor = 10 \* log(1/ 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
PC	/	/	/	CQA

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	$3 \times 10^{-8}$	(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°C	(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	2022/09/9	2023/09/08
Spectrum analyzer	R&S	FSU26	CQA-038	2022/09/9	2023/09/08
Spectrum analyzer	R&S	FSU40	CQA-075	2022/09/9	2023/09/08
Preamplifier	MITEQ	AFS4-00010300-18-10P-4	CQA-035	2022/09/9	2023/09/08
Preamplifier	MITEQ	AMF-6D-02001800-29-20P	CQA-036	2022/09/9	2023/09/08
Preamplifier	EMCI	EMC184055SE	CQA-089	2022/09/9	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	2022/09/9	2023/09/08
Coaxial Cable (Below 1GHz)	CQA	N/A	C013	2022/09/9	2023/09/08
RF cable(9KHz~40GHz)	CQA	RF-01	CQA-079	2022/09/9	2023/09/08
Antenna Connector	CQA	RFC-01	CQA-080	2022/09/9	2023/09/08
Power Sensor	KEYSIGHT	U2021XA	CQA-30	2022/09/9	2023/09/08
N1918A Power Analysis Manager Power Panel	Agilent	N1918A	CQA-074	2022/09/9	2023/09/08
Power meter	R&S	NRVD	CQA-029	2022/09/9	2023/09/08
Power divider	MIDWEST	PWD-2533-02-SMA-79	CQA-067	2022/09/9	2023/09/08
EMI Test Receiver	R&S	ESR7	CQA-005	2022/09/9	2023/09/08
LISN	R&S	ENV216	CQA-003	2022/09/9	2023/09/08
Coaxial cable	CQA	N/A	CQA-C009	2022/09/9	2023/09/08
DC power	KEYSIGHT	E3631A	CQA-028	2022/09/9	2023/09/08

Test software:

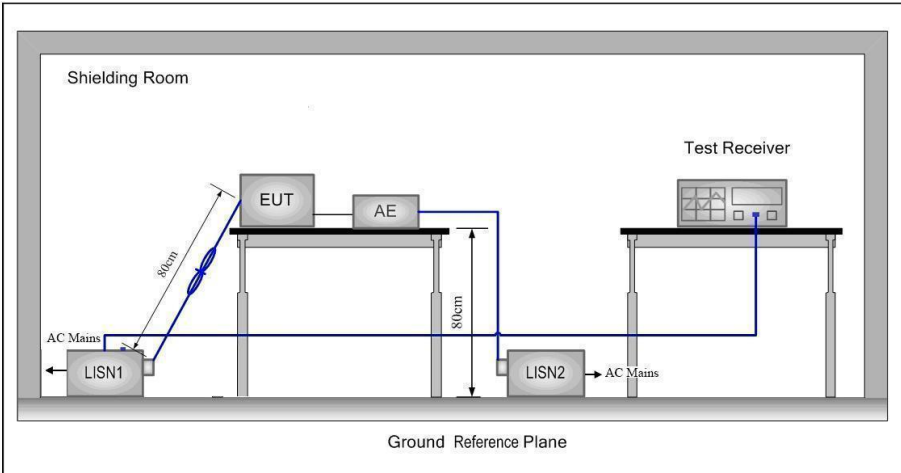
	Manufacturer	Software brand
Radiated Emissions test software	Tonscend	JS1120-3
Conducted Emissions test software	Audix	e3
RF Conducted test software	Audix	e3

## 5 Test results and Measurement Data

### 5.1 Antenna Requirement

<b>Standard requirement:</b>	47 CFR Part 15C Section 15.203 /247(c)
<p>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.</p> <p>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.</p>	
<b>EUT Antenna:</b>	 
<p>The antenna is external antenna. Ant1:5dBi Ant2:5dBi Ant1+Ant2=8.01</p>	

## 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:	<table border="1"> <thead> <tr> <th rowspan="2">Frequency range (MHz)</th> <th colspan="2">Limit (dBuV)</th> </tr> <tr> <th>Quasi-peak</th> <th>Average</th> </tr> </thead> <tbody> <tr> <td>0.15-0.5</td> <td>66 to 56*</td> <td>56 to 46*</td> </tr> <tr> <td>0.5-5</td> <td>56</td> <td>46</td> </tr> <tr> <td>5-30</td> <td>60</td> <td>50</td> </tr> </tbody> </table>	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
	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:	 <p>The diagram illustrates the test setup within a shielding room. An Equipment Under Test (EUT) and Associated Equipment (AE) are placed on a table that is 80cm high above a Ground Reference Plane. LISN1 is connected to the AC Mains and is positioned 80cm from the EUT. LISN2 is also connected to the AC Mains and is bonded to the Ground Reference Plane. A Test Receiver is placed on another table to the right, connected to the EUT and LISN2. The entire setup is enclosed in a shielding room.</p>														

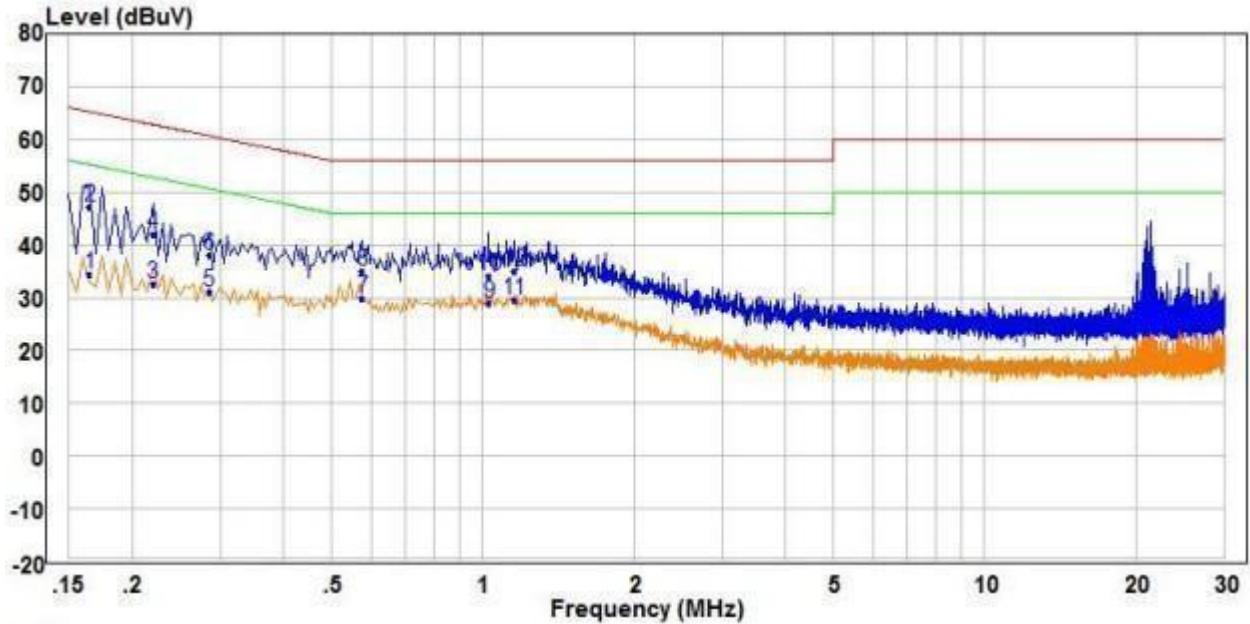
Exploratory Test Mode:	Transmitting with all kind of modulations, data rates at lowest, middle and highest channel.
Final Test Mode:	Through Pre-scan, find the 1Mbps of rate of 802.11b at middle channel is the worst case. Only the worst case is recorded in the report.
Test Voltage:	AC120V/60Hz
Test Results:	Pass



Measurement Data

ANT 1:

Live Line:

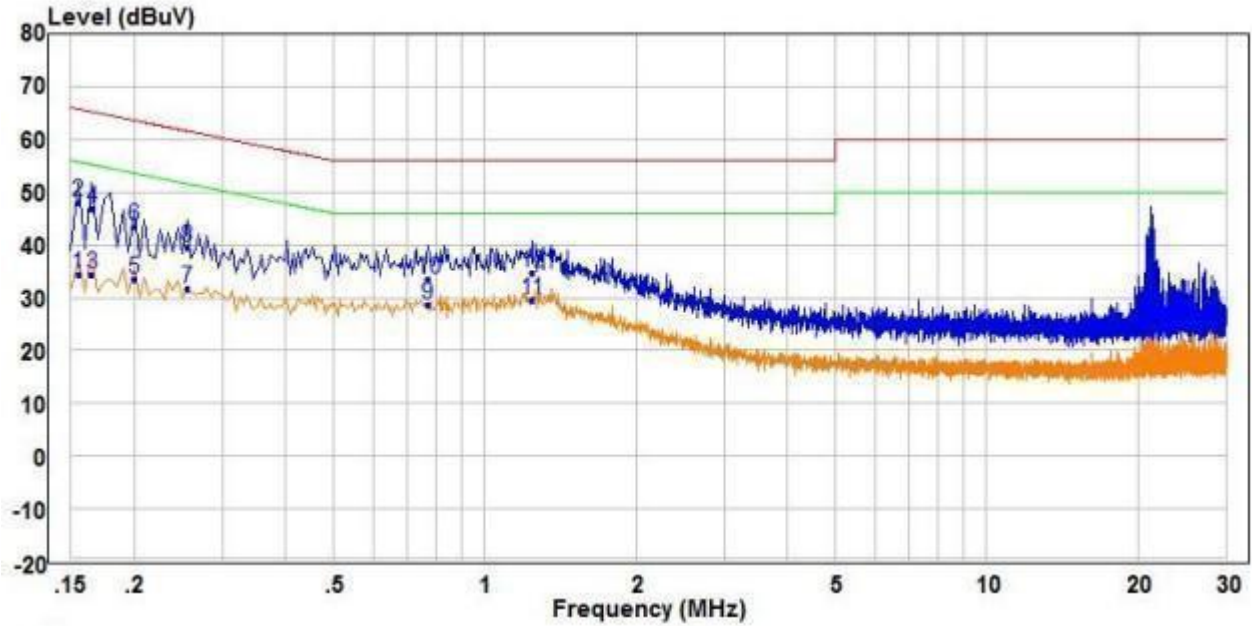


	Read Freq	Read Level	Factor	Level	Limit	Over	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB		
1	0.165	24.84	9.49	34.33	55.21	-20.88	Average	Line
2	QP 0.165	37.66	9.49	47.15	65.21	-18.06	QP	Line
3	0.220	22.96	9.49	32.45	52.82	-20.37	Average	Line
4	0.220	32.41	9.49	41.90	62.82	-20.92	QP	Line
5	0.285	21.46	9.49	30.95	50.67	-19.72	Average	Line
6	0.285	28.43	9.49	37.92	60.67	-22.75	QP	Line
7	PP 0.575	20.24	9.66	29.90	46.00	-16.10	Average	Line
8	0.575	25.29	9.66	34.95	56.00	-21.05	QP	Line
9	1.030	19.56	9.53	29.09	46.00	-16.91	Average	Line
10	1.030	24.44	9.53	33.97	56.00	-22.03	QP	Line
11	1.155	19.95	9.53	29.48	46.00	-16.52	Average	Line
12	1.155	25.38	9.53	34.91	56.00	-21.09	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:



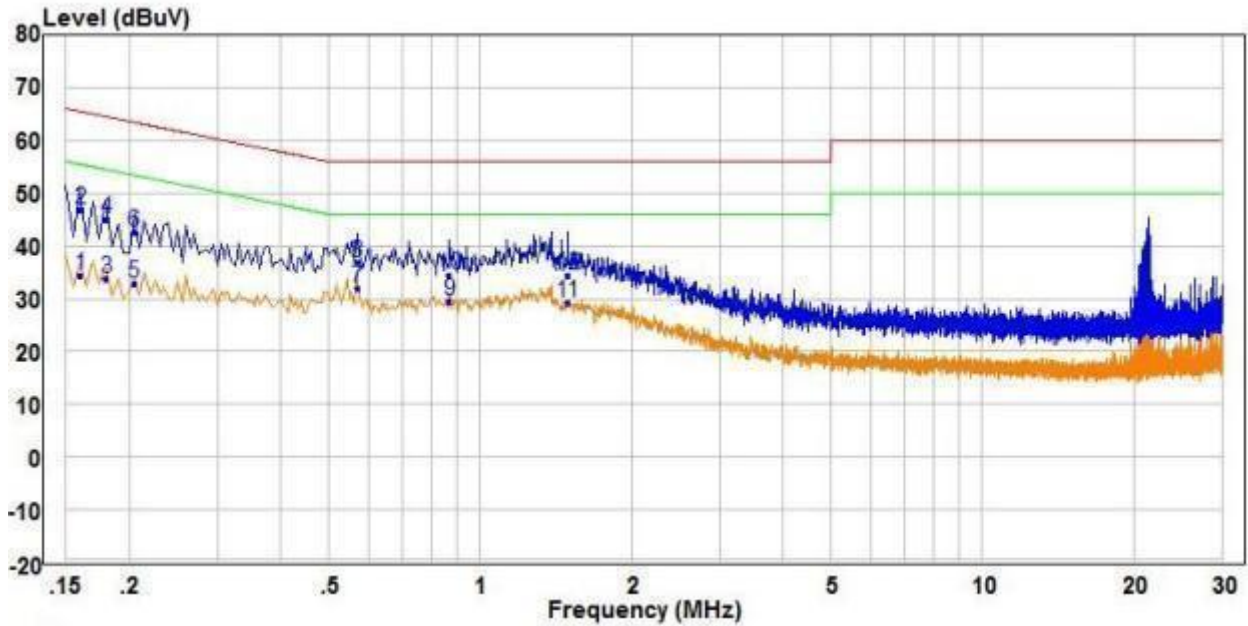
	Freq	Read	Factor	Level	Limit	Over	Remark	Pol/Phase
	MHz	dBuV	dB	dBuV	dBuV	dB		
1	0.155	24.72	9.69	34.41	55.73	-21.32	Average	Neutral
2	0.155	38.32	9.69	48.01	65.73	-17.72	QP	Neutral
3	0.165	24.87	9.67	34.54	55.21	-20.67	Average	Neutral
4	0.165	37.32	9.67	46.99	65.21	-18.22	QP	Neutral
5	0.200	23.81	9.61	33.42	53.61	-20.19	Average	Neutral
6	0.200	33.78	9.61	43.39	63.61	-20.22	QP	Neutral
7	0.255	22.27	9.53	31.80	51.59	-19.79	Average	Neutral
8	0.255	30.11	9.53	39.64	61.59	-21.95	QP	Neutral
9	0.770	18.89	9.85	28.74	46.00	-17.26	Average	Neutral
10	0.770	23.74	9.85	33.59	56.00	-22.41	QP	Neutral
11	1.240	19.81	9.71	29.52	46.00	-16.48	Average	Neutral
12	1.240	25.03	9.71	34.74	56.00	-21.26	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.

ANT 2 :

Live Line:

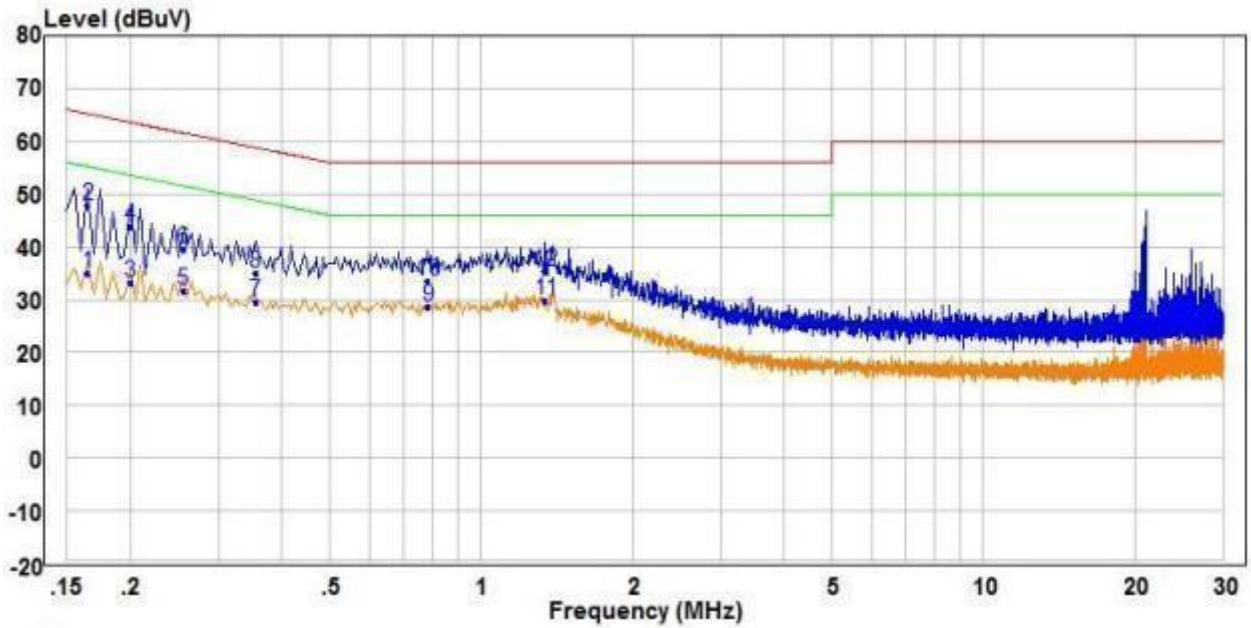


	Read Freq	Read Level	Factor	Limit Level	Over Limit	Remark	Pol/Phase		
	MHz	dBuV	dB	dBuV	dBuV	dB			
1	0.160	24.83	9.68	34.51	55.46	-20.95	Average	Line	
2	QP	0.160	37.11	9.68	46.79	65.46	-18.67	QP	Line
3	0.180	24.15	9.64	33.79	54.49	-20.70	Average	Line	
4	0.180	35.43	9.64	45.07	64.49	-19.42	QP	Line	
5	0.205	23.37	9.61	32.98	53.41	-20.43	Average	Line	
6	0.205	33.09	9.61	42.70	63.41	-20.71	QP	Line	
7	PP	0.570	22.18	9.77	31.95	46.00	-14.05	Average	Line
8	0.570	26.94	9.77	36.71	56.00	-19.29	QP	Line	
9	0.870	19.78	9.79	29.57	46.00	-16.43	Average	Line	
10	0.870	24.71	9.79	34.50	56.00	-21.50	QP	Line	
11	1.495	18.34	10.82	29.16	46.00	-16.84	Average	Line	
12	1.495	23.45	10.82	34.27	56.00	-21.73	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:

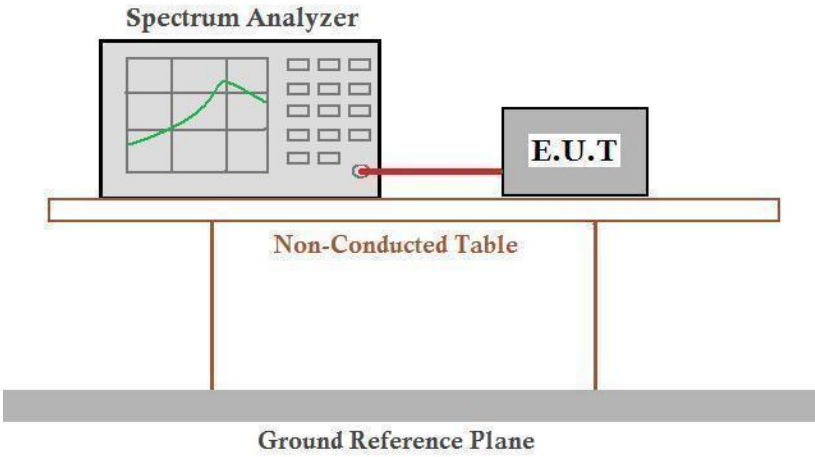


	Read	Limit	Over				
	Freq	Level	Factor	Level	Line	Limit	Remark
	MHz	dBuV	dB	dBuV	dBuV	dB	Pol/Phase
1	0.165	25.25	9.67	34.92	55.21	-20.29	Average Neutral
2	QP 0.165	38.19	9.67	47.86	65.21	-17.35	QP Neutral
3	0.200	23.63	9.61	33.24	53.61	-20.37	Average Neutral
4	0.200	34.15	9.61	43.76	63.61	-19.85	QP Neutral
5	0.255	22.14	9.53	31.67	51.59	-19.92	Average Neutral
6	0.255	30.17	9.53	39.70	61.59	-21.89	QP Neutral
7	0.355	19.96	9.55	29.51	48.84	-19.33	Average Neutral
8	0.355	25.54	9.55	35.09	58.84	-23.75	QP Neutral
9	0.785	18.87	9.84	28.71	46.00	-17.29	Average Neutral
10	0.785	23.75	9.84	33.59	56.00	-22.41	QP Neutral
11	PP 1.340	20.17	9.72	29.89	46.00	-16.11	Average Neutral
12	1.340	25.48	9.72	35.20	56.00	-20.80	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:	 <p>The diagram illustrates the test setup. A Spectrum Analyzer is connected to an E.U.T. (Equipment Under Test) via a red cable. Both are placed on a Non-Conducted Table, which is supported by two legs. Below the table is a Ground Reference Plane.</p>
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); 13.5Mbps of rate is the worst case of 802.11n(HT40). Only the worst case is recorded in the report.
Limit:	30dBm
Test Results:	Pass

## Test Result

### ANT1:

TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	2412	6.84	≤30	PASS
		2437	7.78	≤30	PASS
		2462	7.74	≤30	PASS
11G	Ant1	2412	7.13	≤30	PASS
		2437	7.85	≤30	PASS
		2462	7.77	≤30	PASS
11N20SISO	Ant1	2412	7.82	≤30	PASS
		2437	8.72	≤30	PASS
		2462	9.87	≤30	PASS
11N40SISO	Ant1	2422	7.02	≤30	PASS
		2437	7.33	≤30	PASS
		2452	7.39	≤30	PASS

### ANT2:

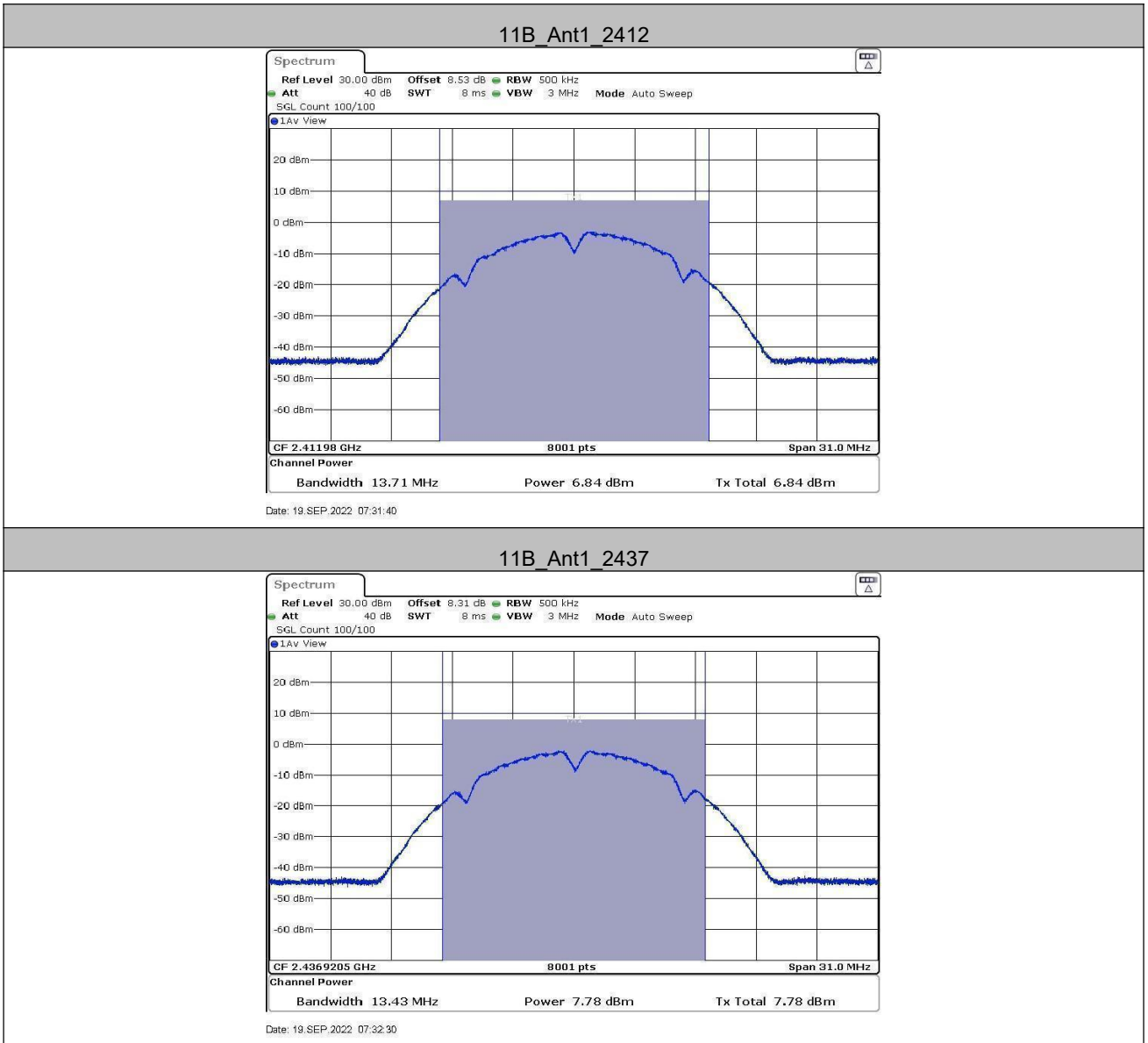
TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
11B	Ant2	2412	6.86	≤30	PASS
		2437	7.69	≤30	PASS
		2462	7.66	≤30	PASS
11G	Ant2	2412	7.18	≤30	PASS
		2437	8.32	≤30	PASS
		2462	7.81	≤30	PASS
11N20SISO	Ant2	2412	7.58	≤30	PASS
		2437	8.72	≤30	PASS
		2462	8.43	≤30	PASS
11N40SISO	Ant2	2422	6.93	≤30	PASS
		2437	7.35	≤30	PASS
		2452	8.44	≤30	PASS

ANT1+ANT2:

TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
11N20SISO	Ant1+Ant2	2412	10.71	≤27.99	PASS
		2437	11.73	≤27.99	PASS
		2462	12.22	≤27.99	PASS
11N40SISO	Ant1+Ant2	2422	9.99	≤27.99	PASS
		2437	10.35	≤27.99	PASS
		2452	10.96	≤27.99	PASS

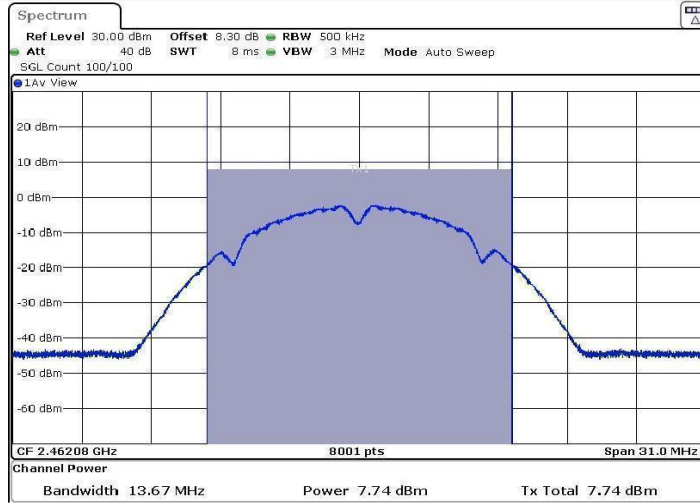
Test Graphs

ANT1:



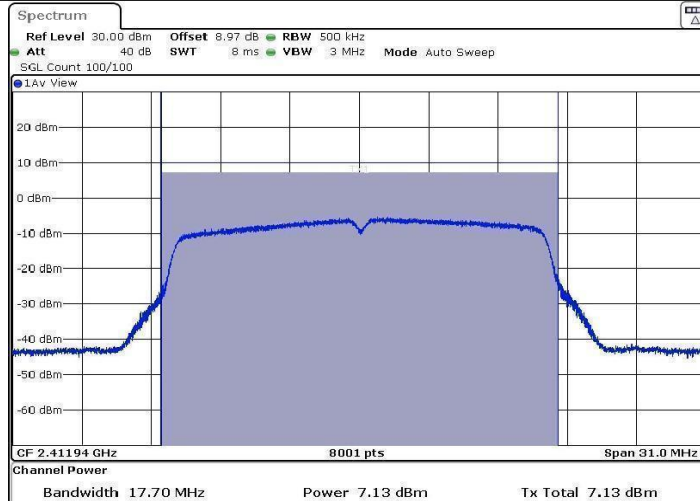


11B\_Ant1\_2462



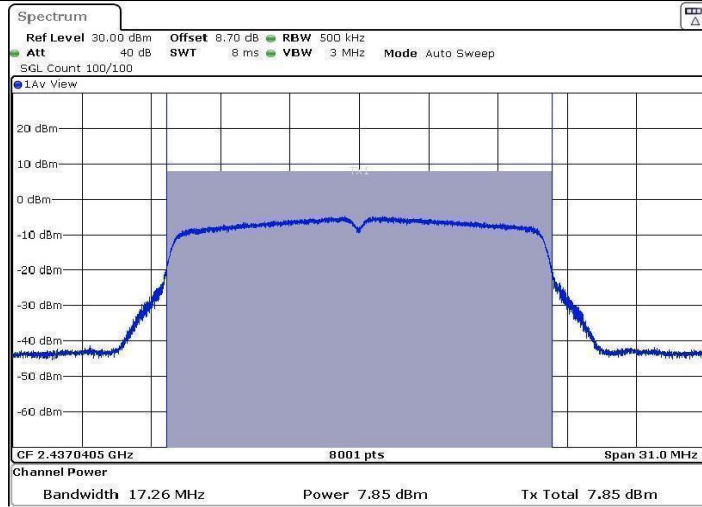
Date: 19 SEP.2022 07:33:28

11G\_Ant1\_2412



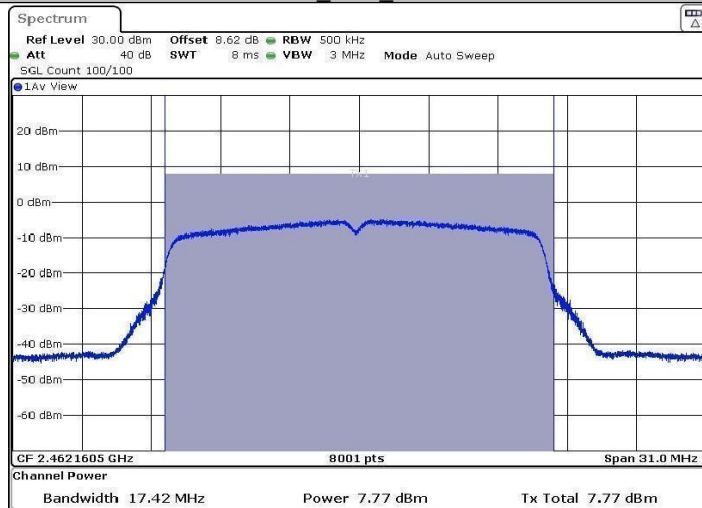
Date: 19 SEP.2022 07:34:03

11G\_Ant1\_2437



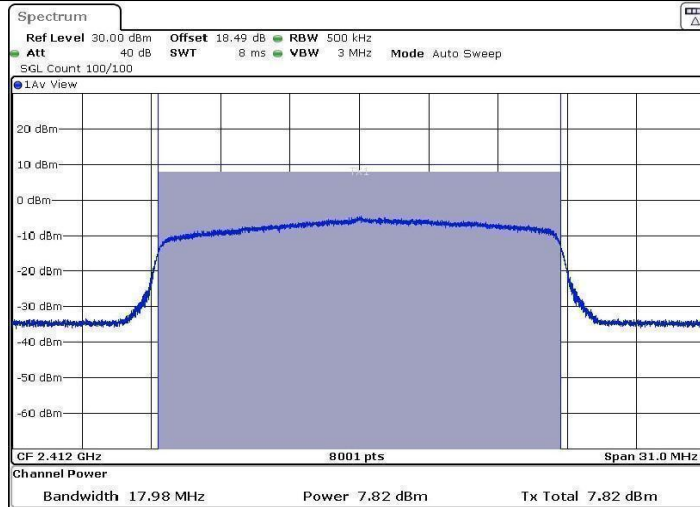
Date: 19 SEP 2022 07:34:42

11G\_Ant1\_2462



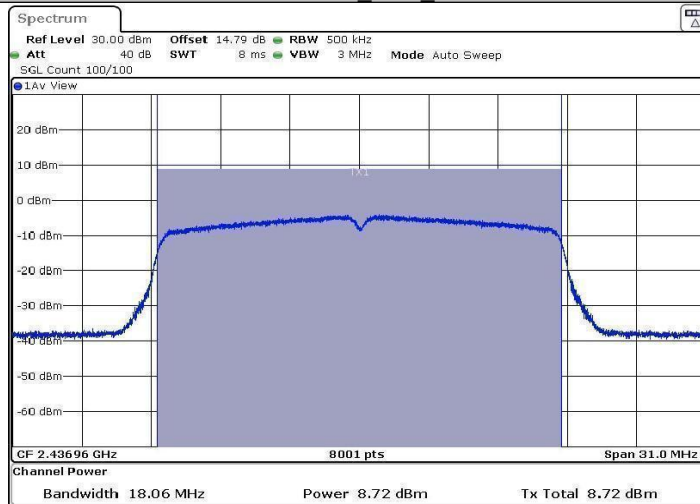
Date: 19 SEP 2022 07:35:25

11N20SISO\_Ant1\_2412

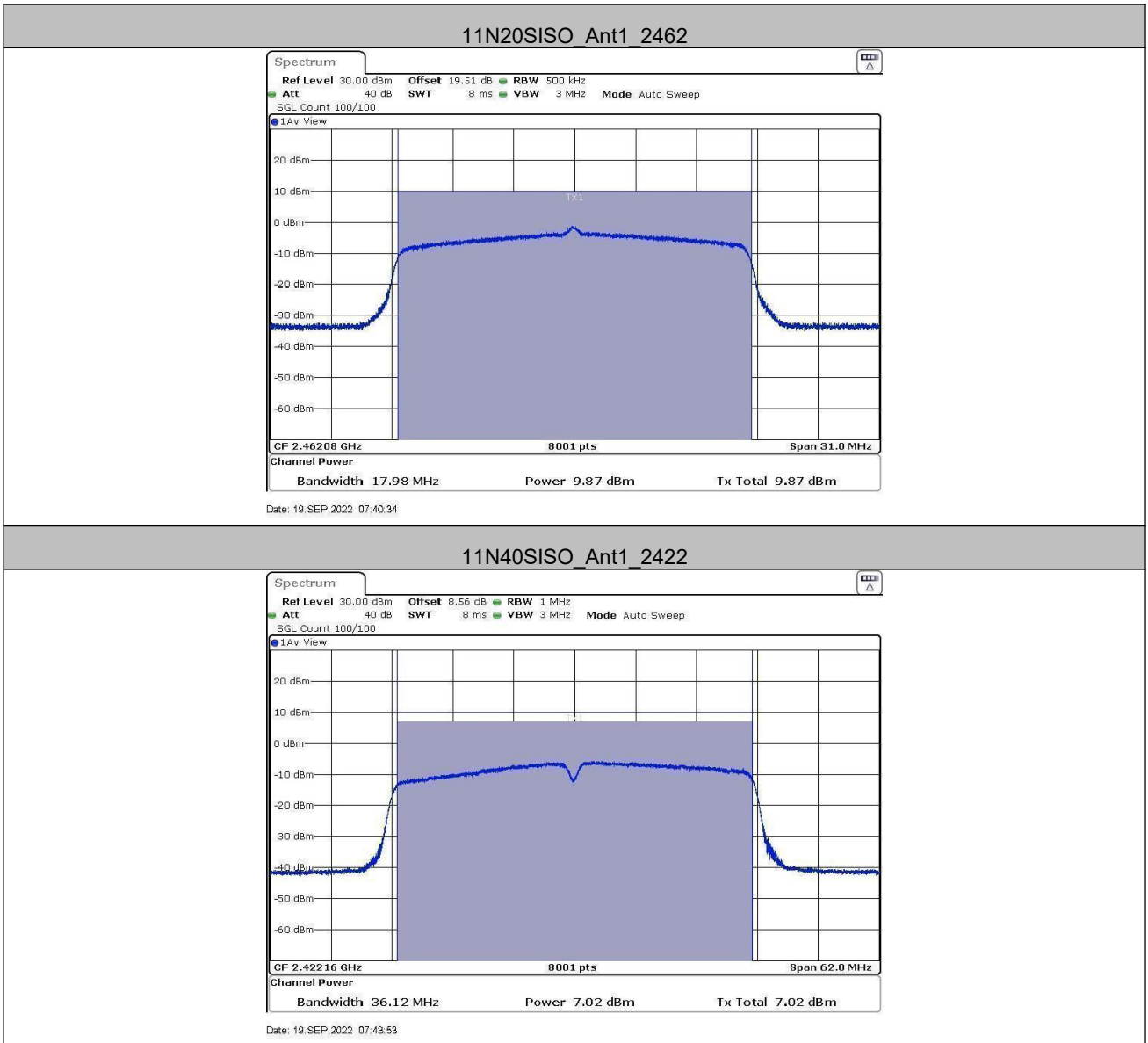


Date: 19.SEP.2022 07:38:08

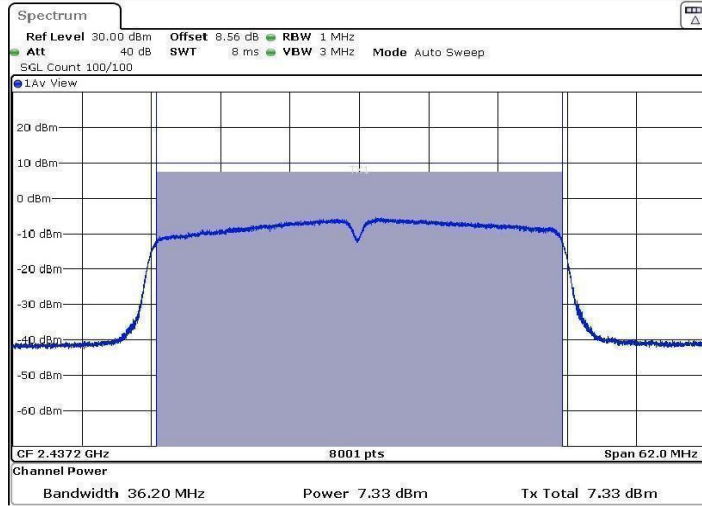
11N20SISO\_Ant1\_2437



Date: 19.SEP.2022 07:39:33

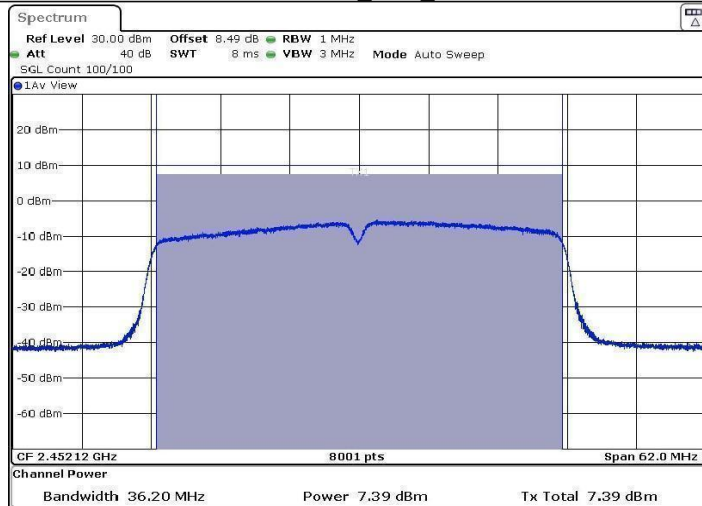


11N40SISO\_Ant1\_2437



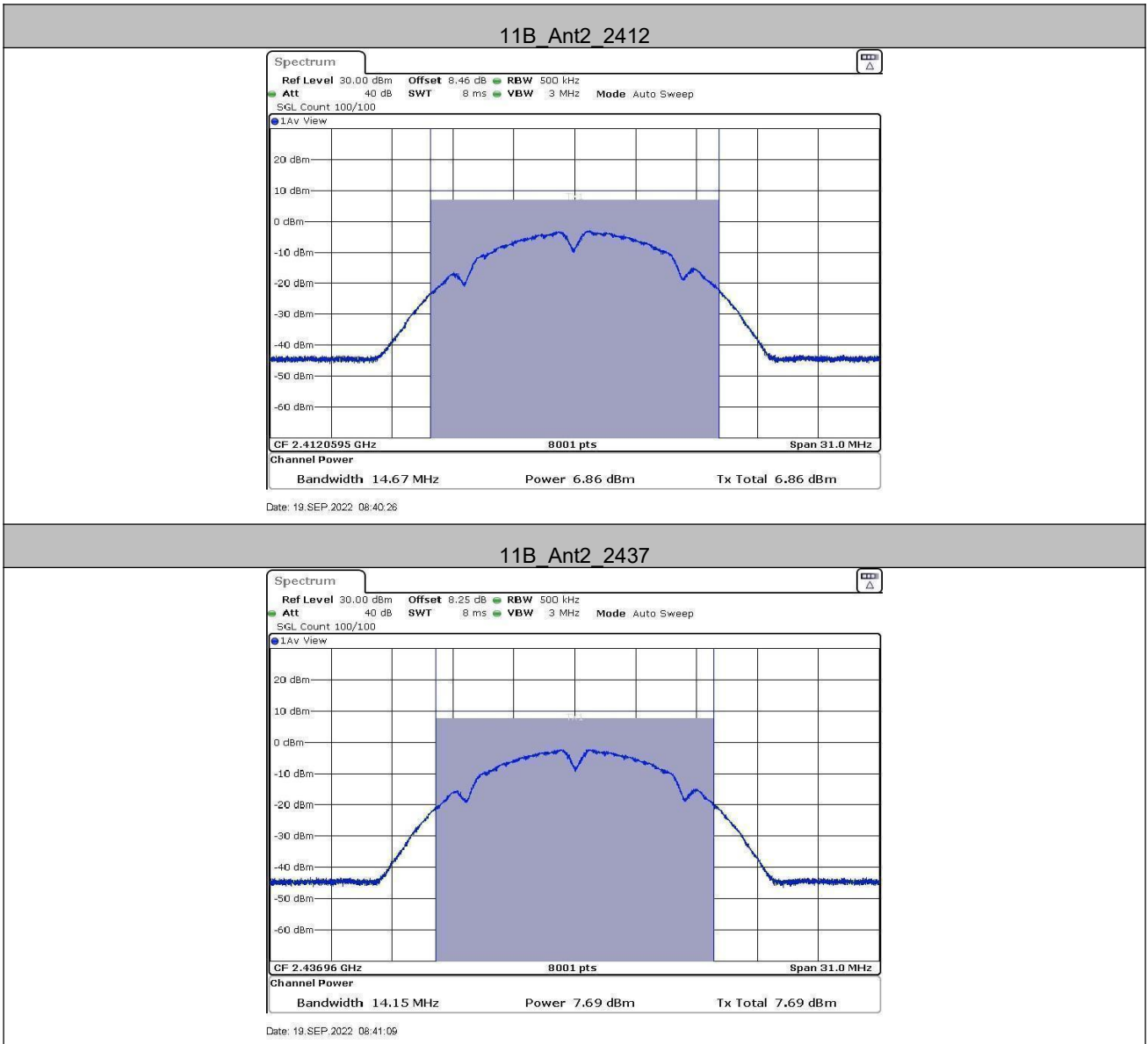
Date: 19 SEP 2022 07:46:41

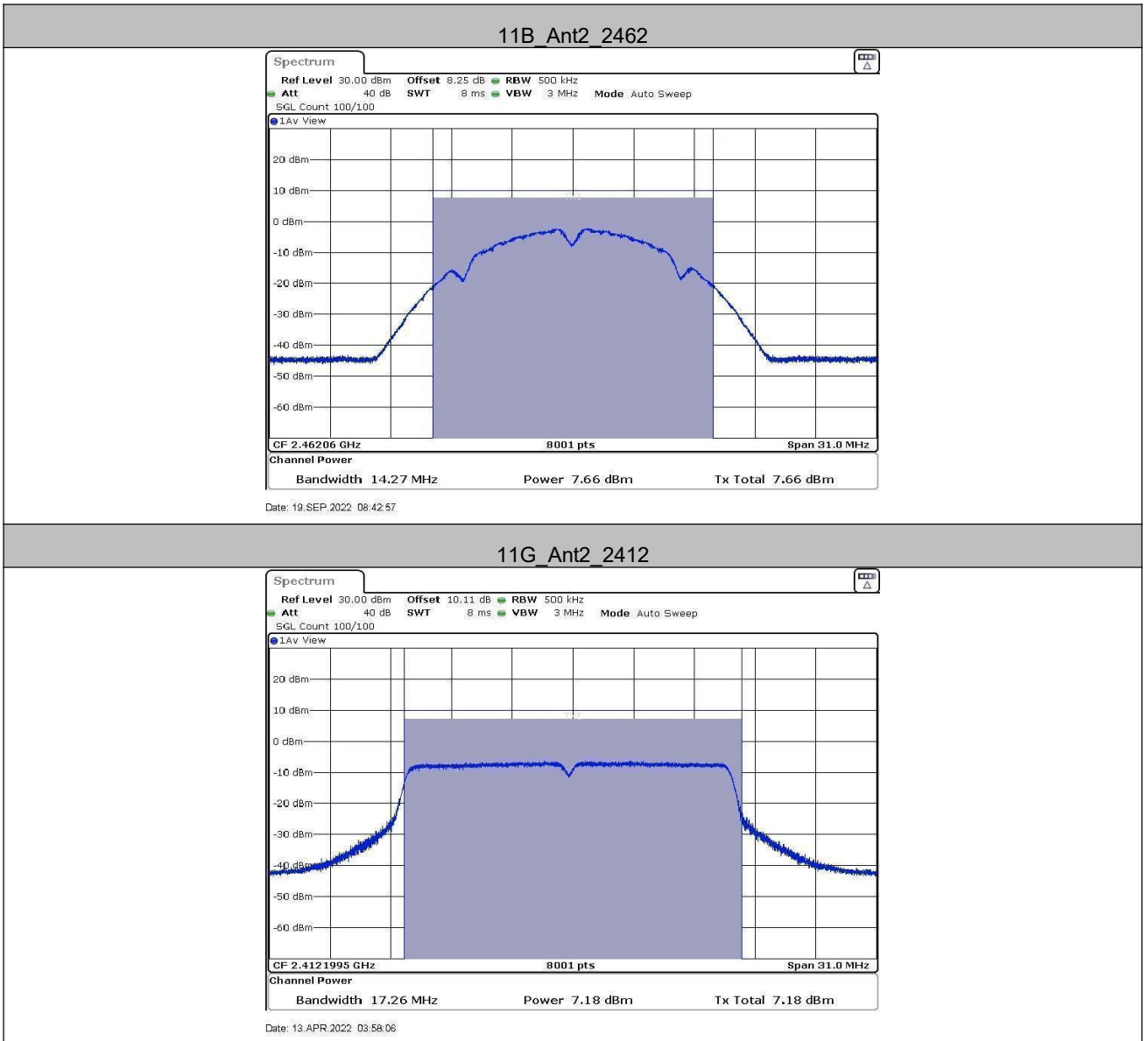
11N40SISO\_Ant1\_2452

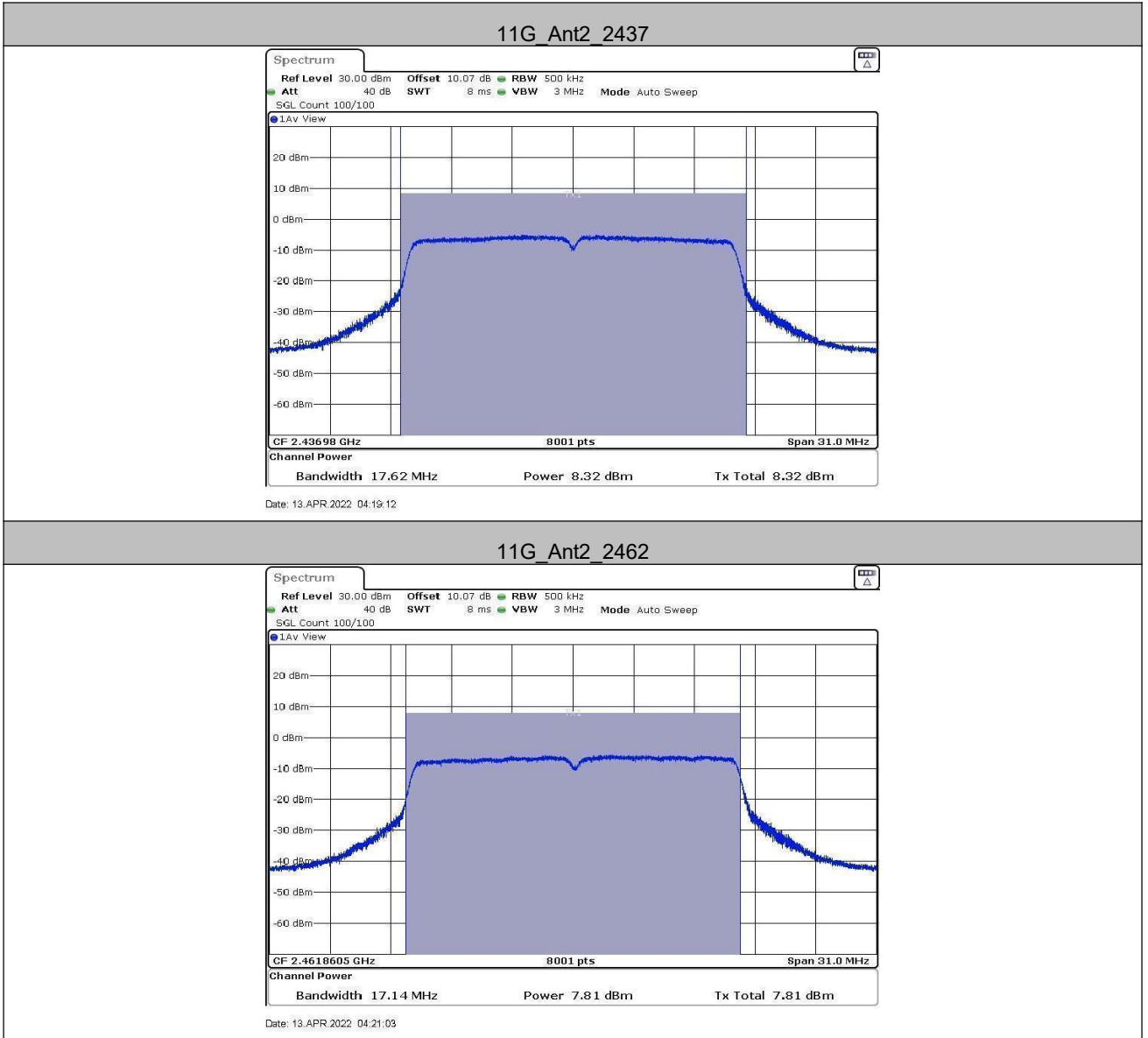


Date: 19 SEP 2022 07:48:28

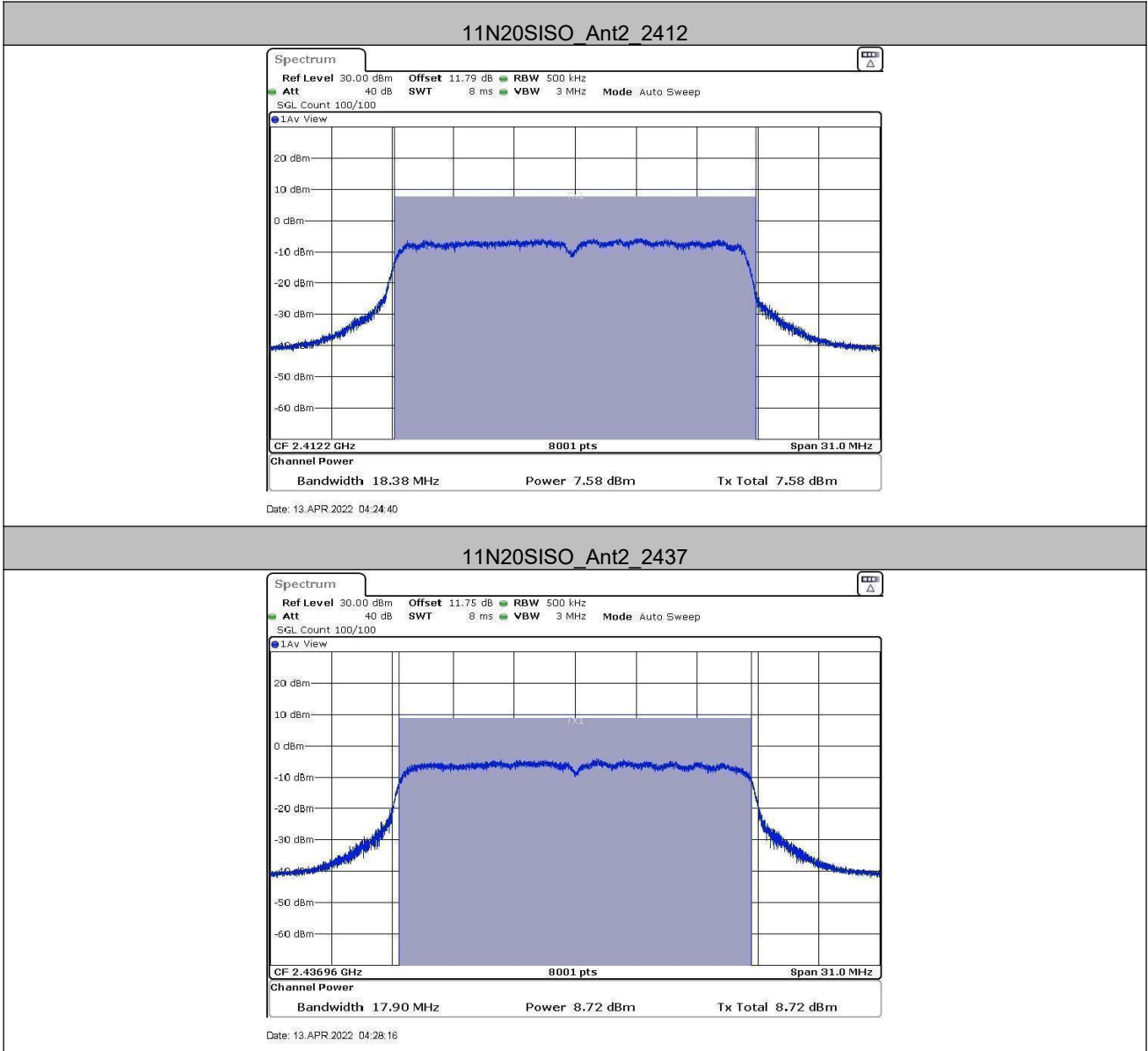
ANT2:

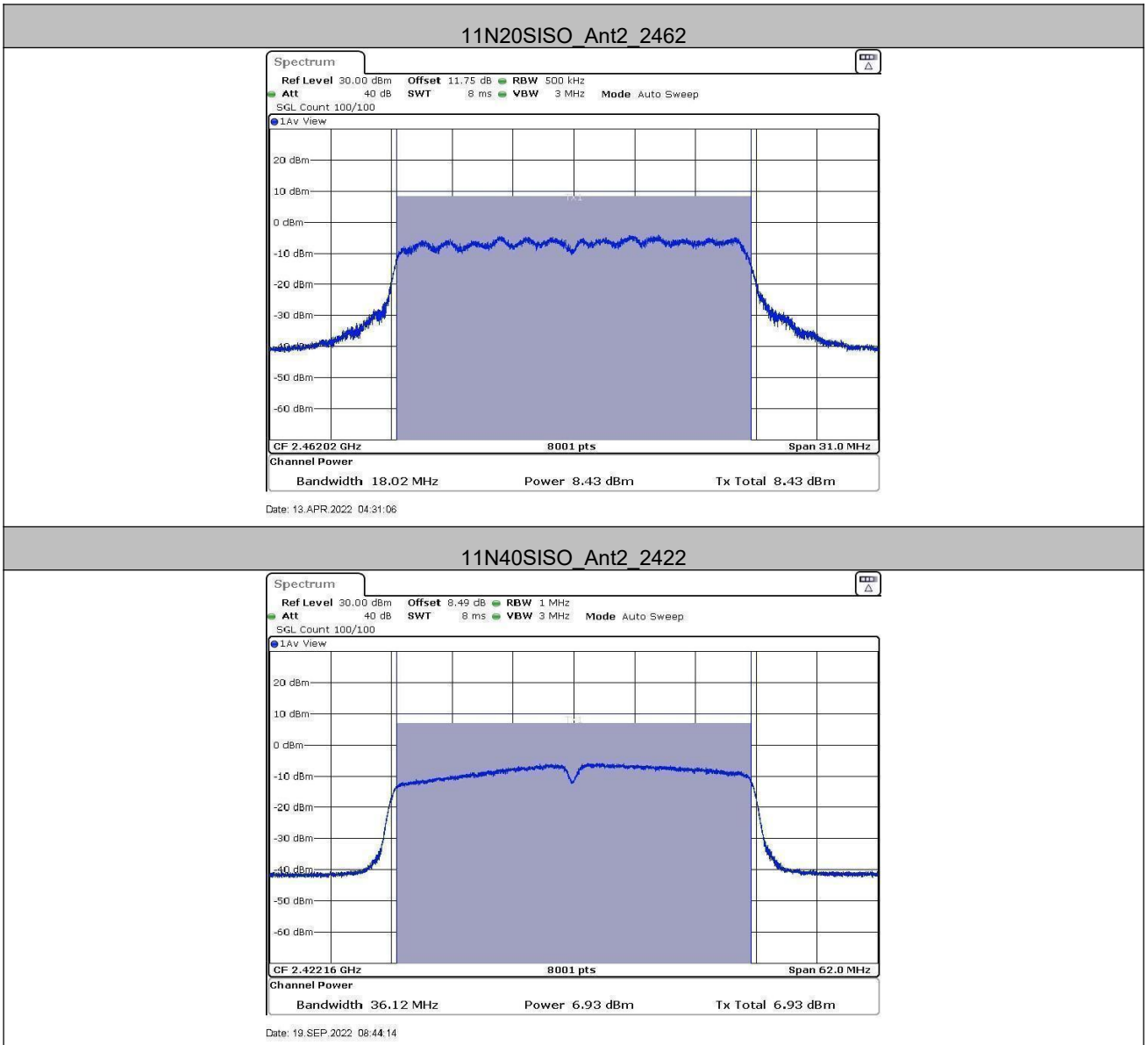


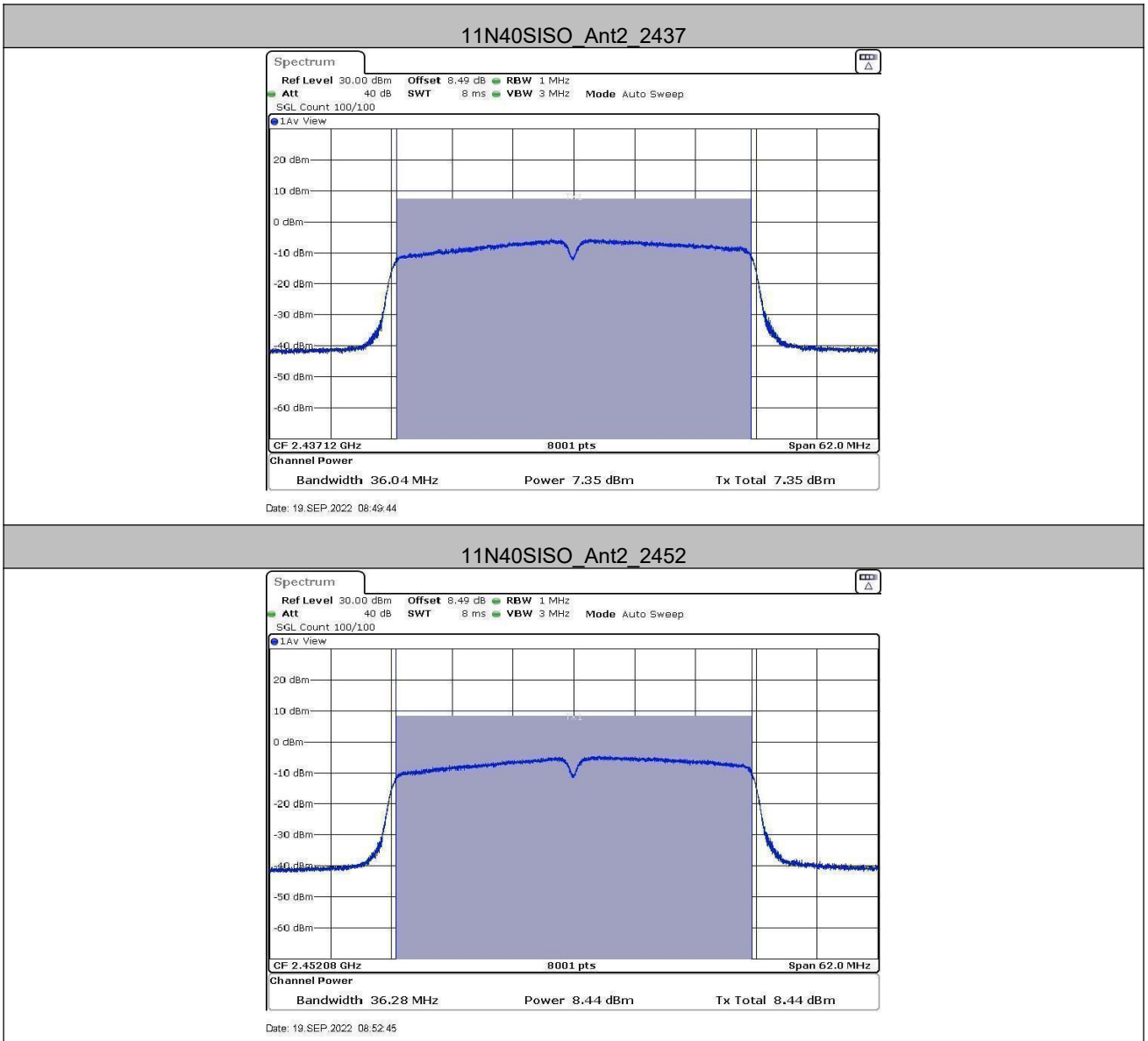




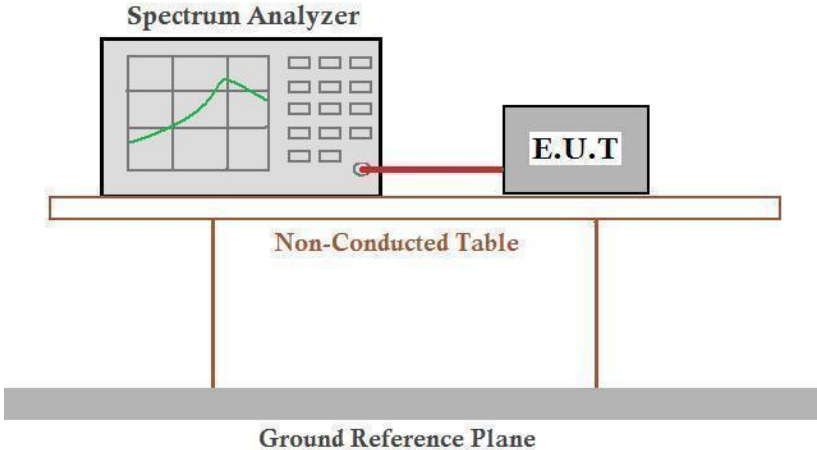








## 5.4 6dB Occupy Bandwidth

Test Requirement:	47 CFR Part 15C Section 15.247 (a)(2)
Test Method:	ANSI C63.10: 2013
Test Setup:	 <p style="text-align: center;">Offset=cable loss+ attenuation factor</p>
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); 13.5Mbps of rate is the worst case of 802.11n(HT40). Only the worst case is recorded in the report.
Limit:	≥ 500 kHz
Test Results:	Pass

## Test Result

### ANT 1:

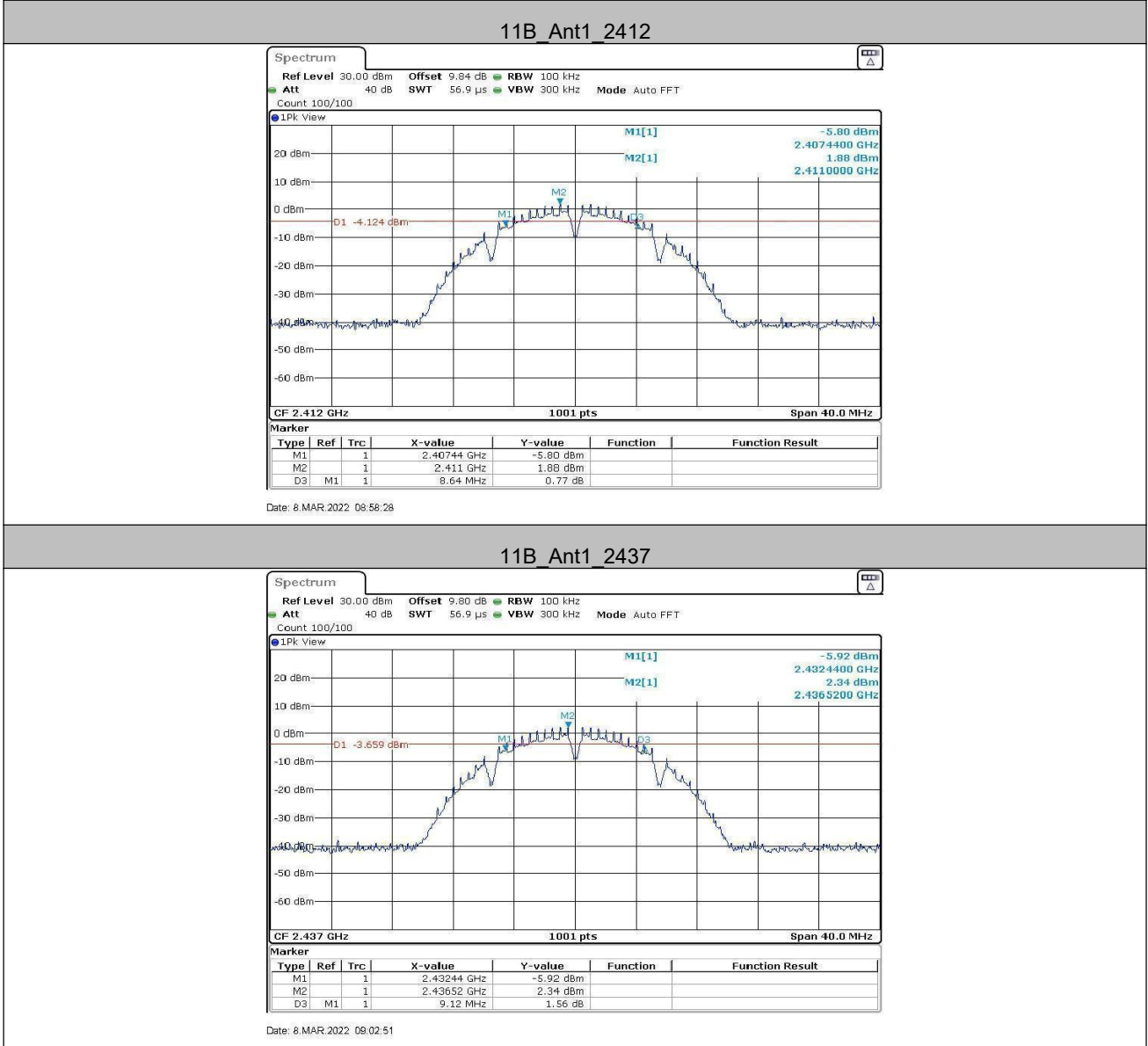
TestMode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	8.640	2407.440	2416.080	0.5	PASS
		2437	9.120	2432.440	2441.560	0.5	PASS
		2462	9.160	2457.440	2466.600	0.5	PASS
11G	Ant1	2412	16.440	2403.800	2420.240	0.5	PASS
		2437	16.400	2428.800	2445.200	0.5	PASS
		2462	16.440	2453.800	2470.240	0.5	PASS
11N20SISO	Ant1	2412	17.760	2403.120	2420.880	0.5	PASS
		2437	17.760	2428.120	2445.880	0.5	PASS
		2462	17.760	2453.120	2470.880	0.5	PASS
11N40SISO	Ant1	2422	35.920	2404.320	2440.240	0.5	PASS
		2437	35.840	2419.400	2455.240	0.5	PASS
		2452	35.280	2434.400	2469.680	0.5	PASS

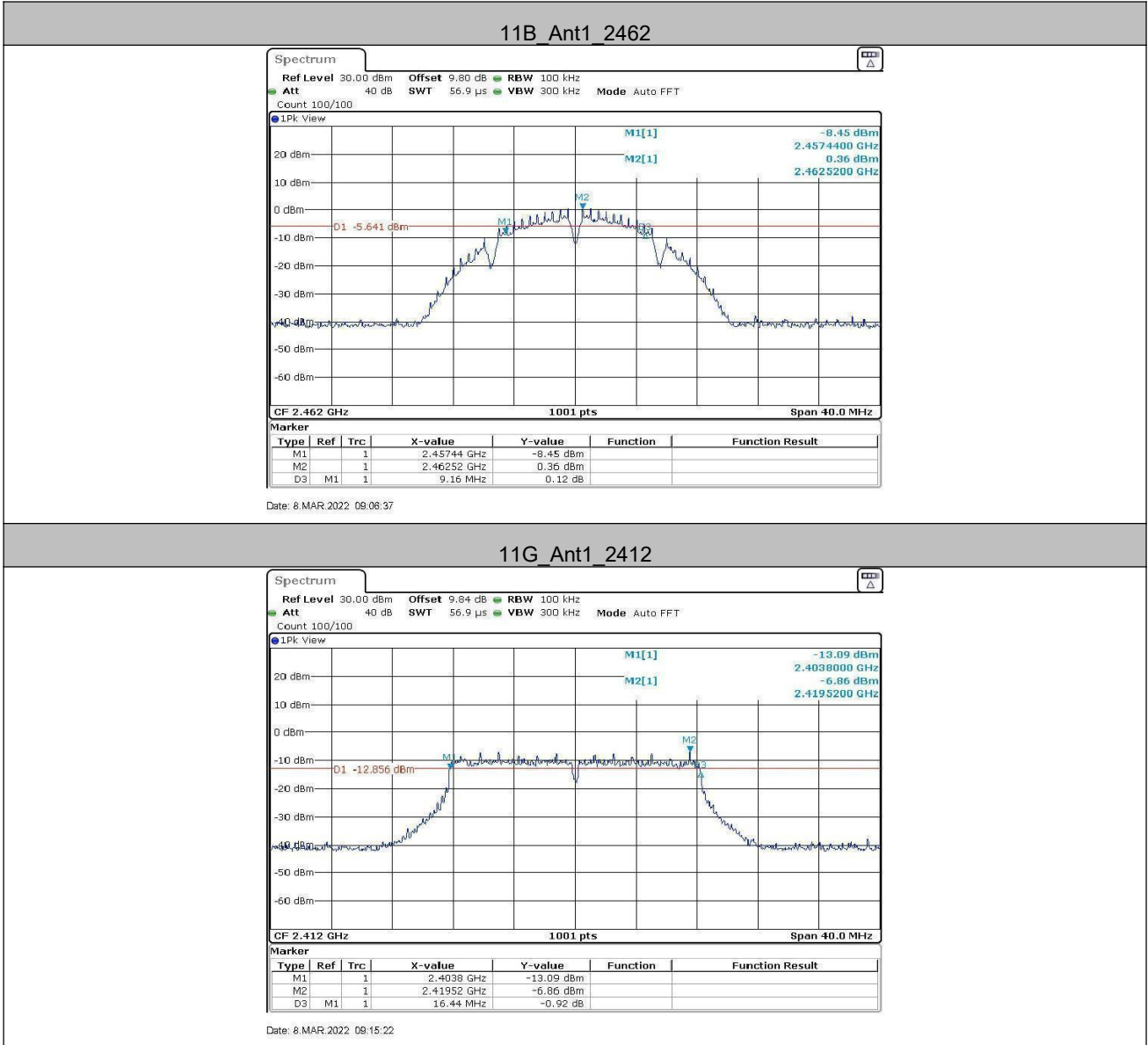
### ANT 2:

TestMode	Antenna	Channel	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B	Ant2	2412	9.160	2407.400	2416.560	0.5	PASS
		2437	9.160	2432.400	2441.560	0.5	PASS
		2462	9.160	2457.880	2467.040	0.5	PASS
11G	Ant2	2412	16.440	2403.760	2420.200	0.5	PASS
		2437	16.400	2428.760	2445.160	0.5	PASS
		2462	16.440	2453.760	2470.200	0.5	PASS
11N20SISO	Ant2	2412	17.680	2403.120	2420.800	0.5	PASS
		2437	17.720	2428.160	2445.880	0.5	PASS
		2462	17.680	2453.200	2470.880	0.5	PASS
11N40SISO	Ant2	2422	28.560	2411.280	2439.840	0.5	PASS
		2437	36.240	2419.000	2455.240	0.5	PASS
		2452	35.840	2434.400	2470.240	0.5	PASS

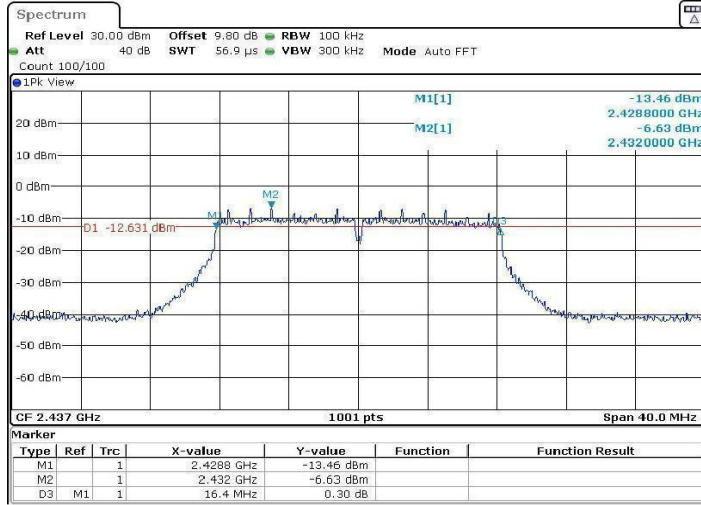
Test Graphs

ANT 1:



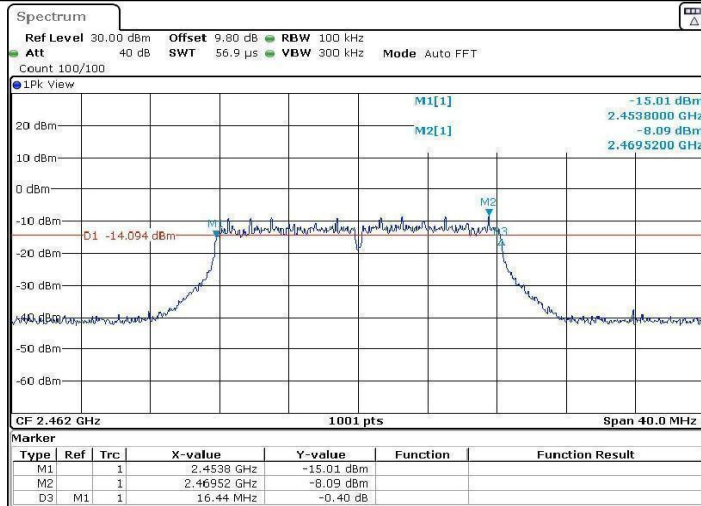


11G Ant1\_2437



Date: 8.MAR.2022 09:19:30

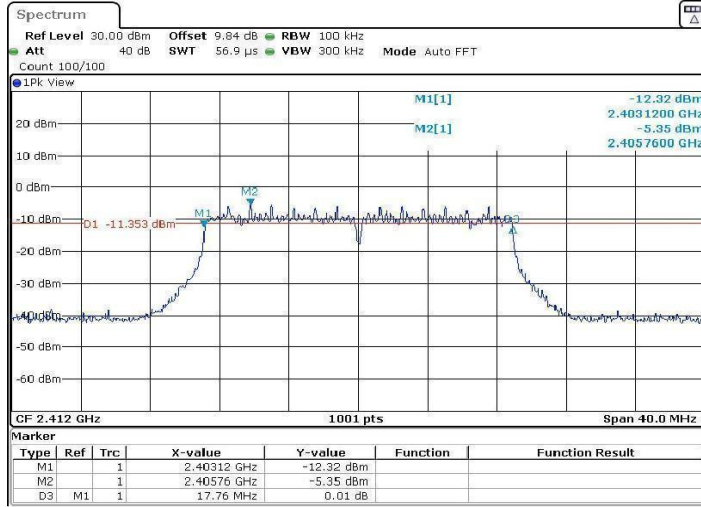
11G Ant1\_2462



Date: 8.MAR.2022 09:21:28

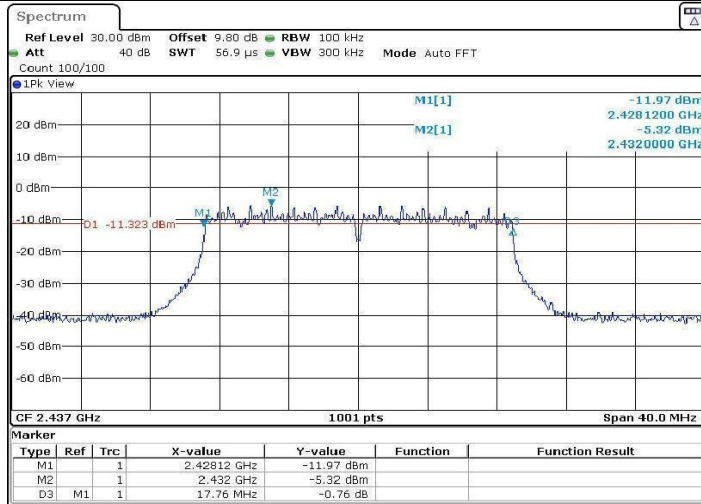


11N20SISO Ant1 2412



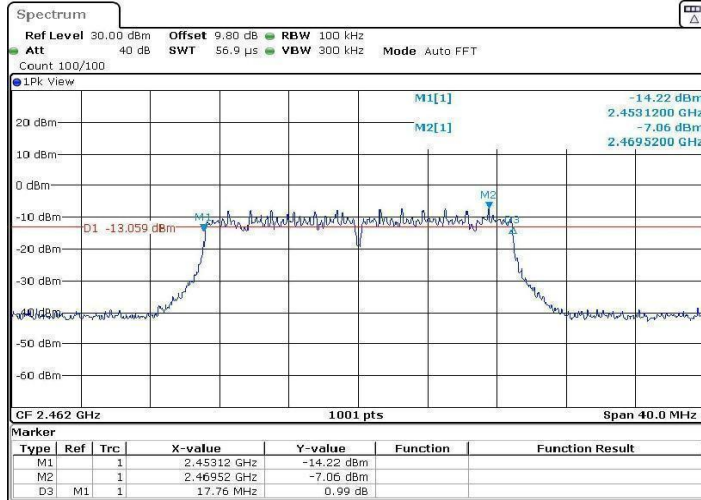
Date: 8 MAR 2022 09:25:17

11N20SISO Ant1 2437



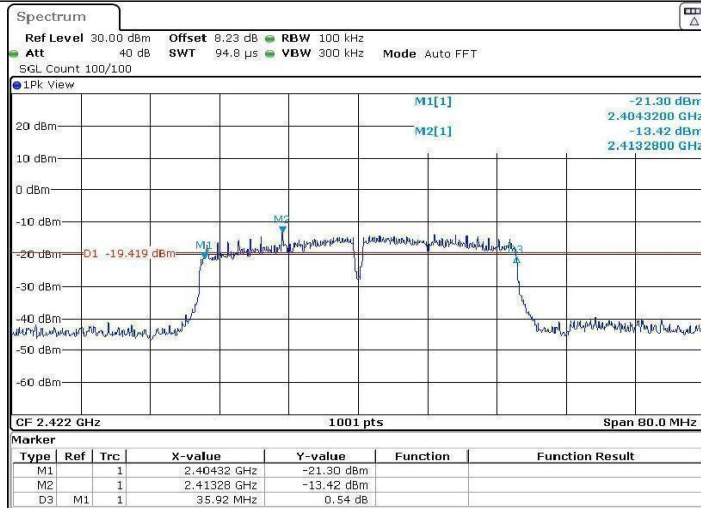
Date: 8 MAR 2022 09:31:12

11N20SISO\_Ant1\_2462



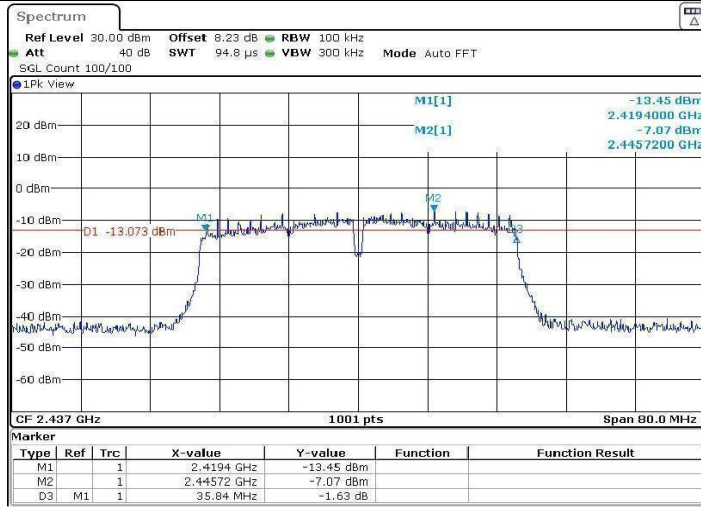
Date: 8.MAR.2022 09:33:51

11N40SISO\_Ant1\_2422

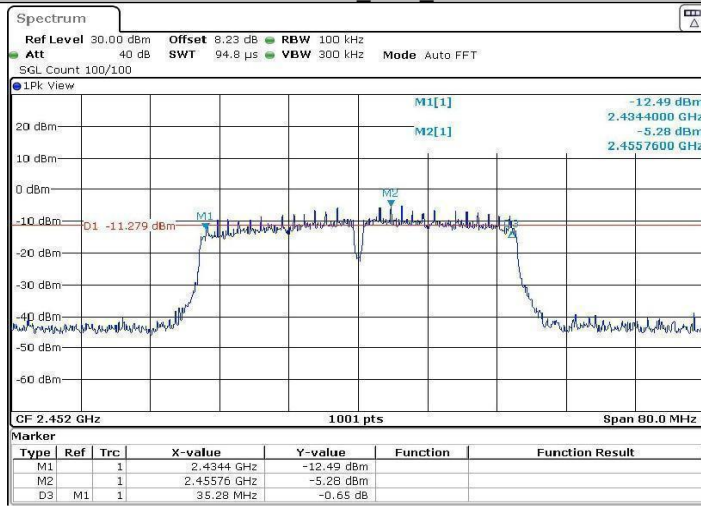


Date: 19.SEP.2022 07:43:04

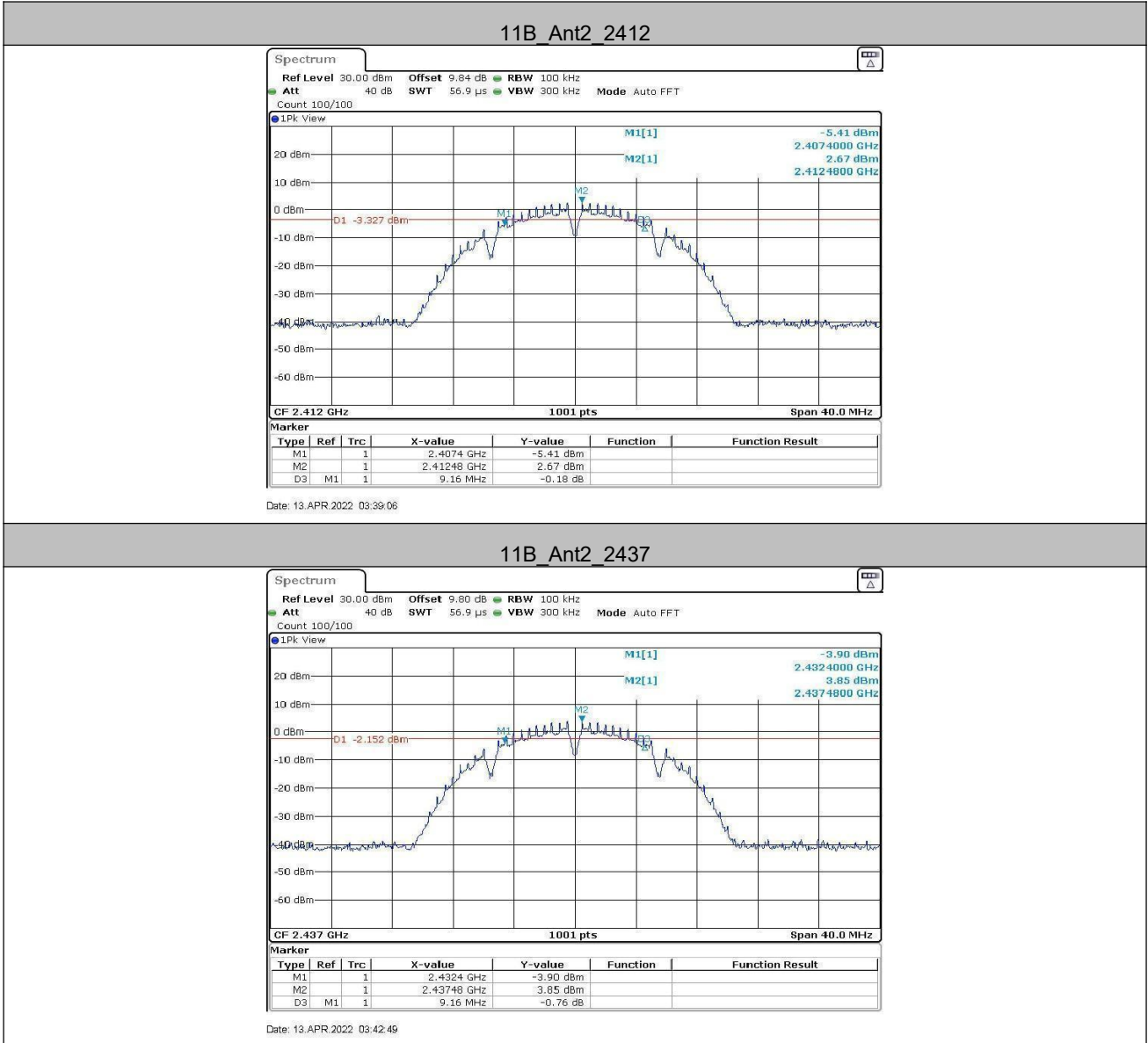
11N40SISO Ant1\_2437



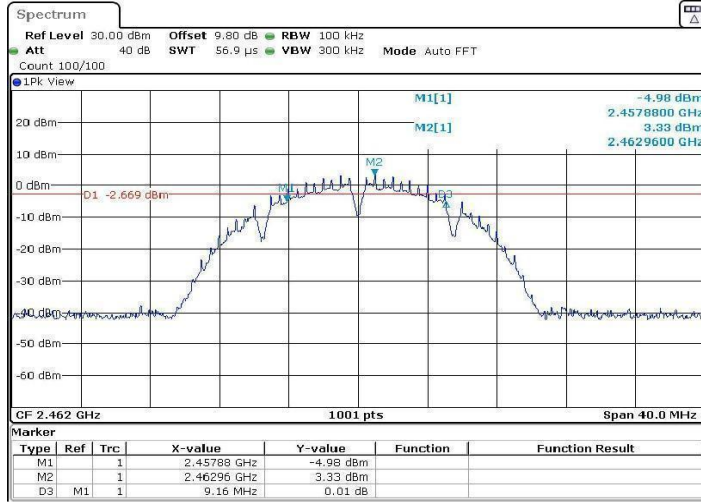
11N40SISO Ant1\_2452



ANT 2:

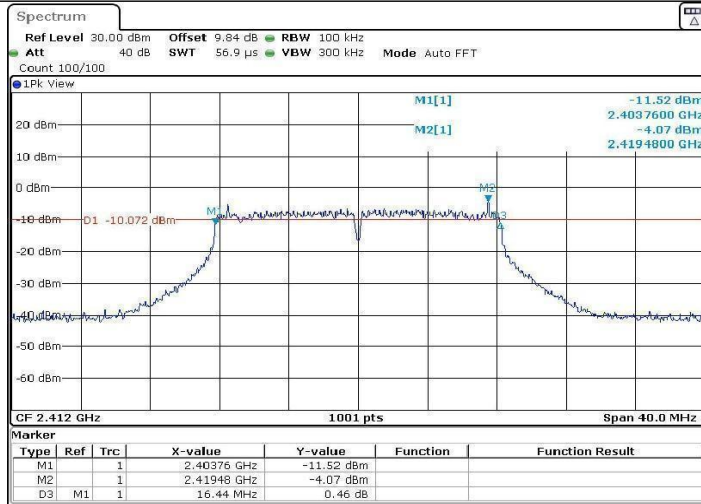


11B\_Ant2\_2462



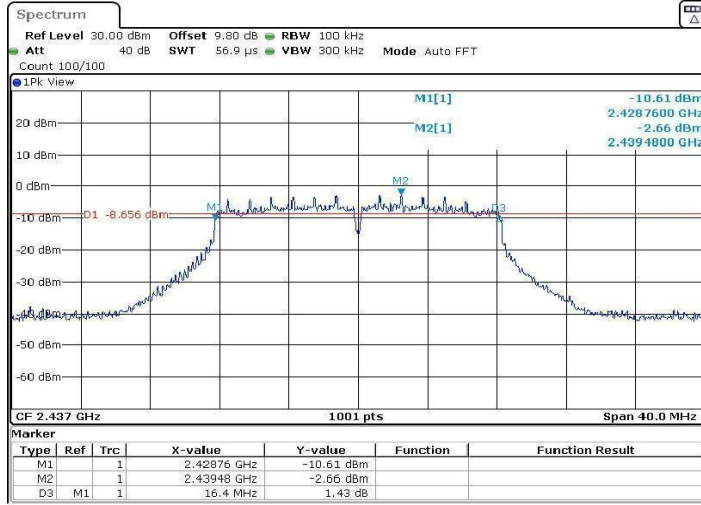
Date: 13.APR.2022 03:54:40

11G\_Ant2\_2412



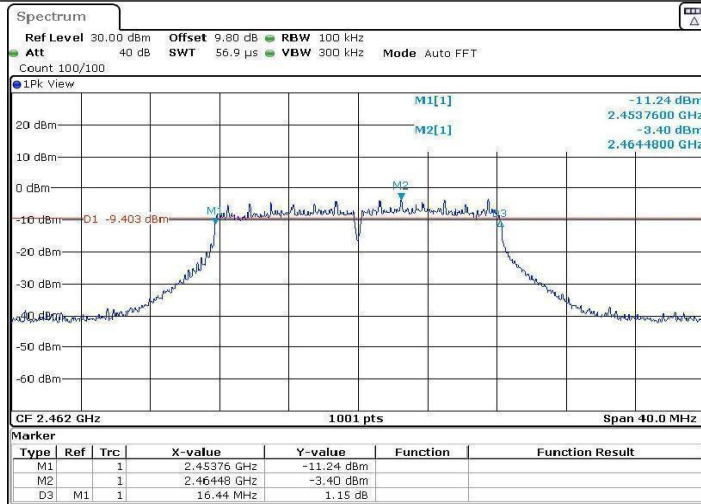
Date: 13.APR.2022 03:57:49

11G\_Ant2\_2437



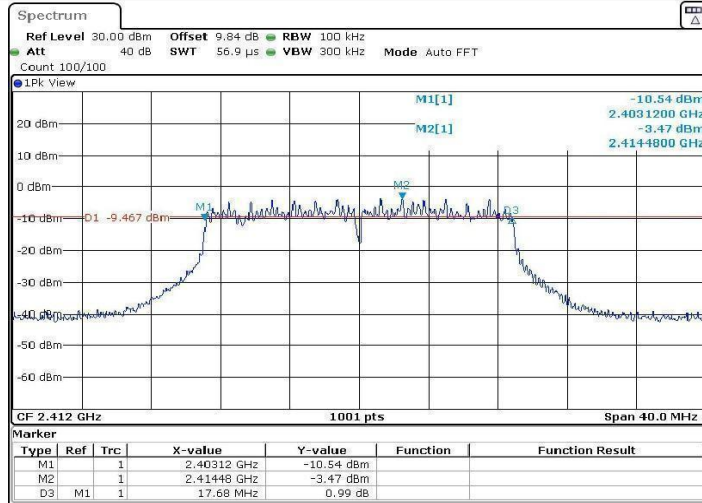
Date: 13.APR.2022 04:18:54

11G\_Ant2\_2462



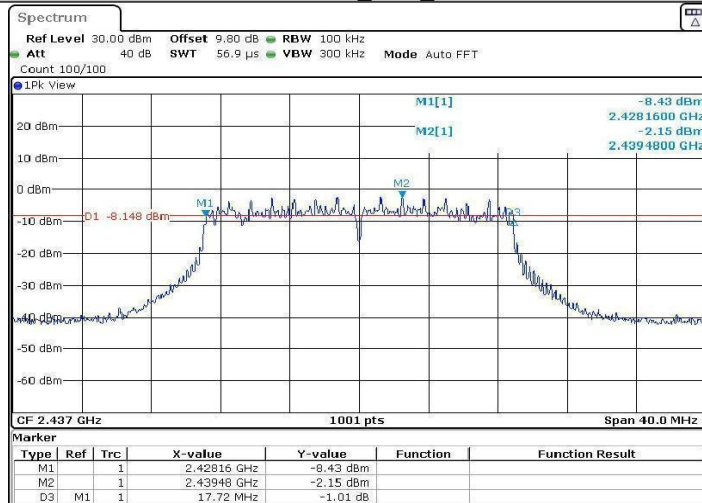
Date: 13.APR.2022 04:20:45

11N20SISO\_Ant2\_2412



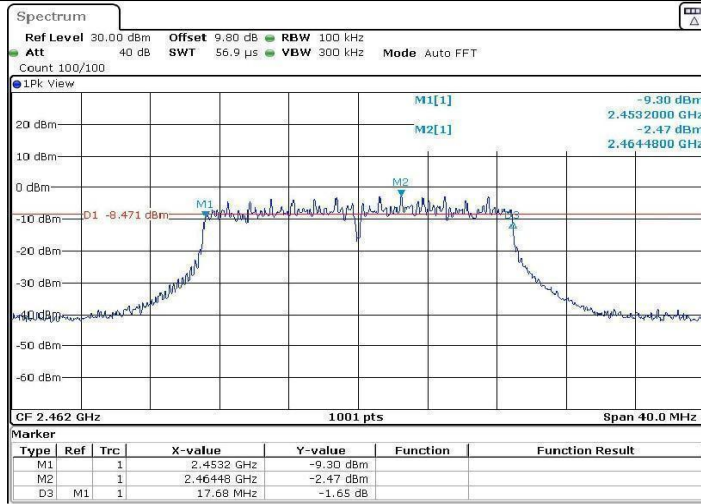
Date: 13.APR.2022 04:24:23

11N20SISO\_Ant2\_2437

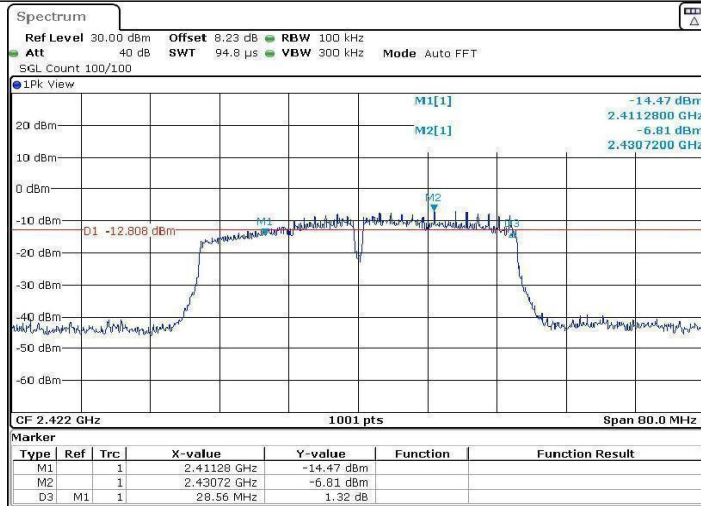


Date: 13.APR.2022 04:27:58

11N20SISO\_Ant2\_2462

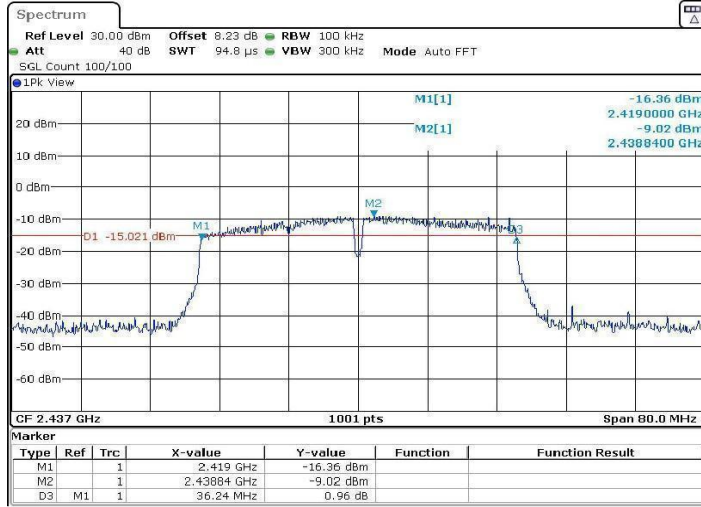


11N40SISO\_Ant2\_2422



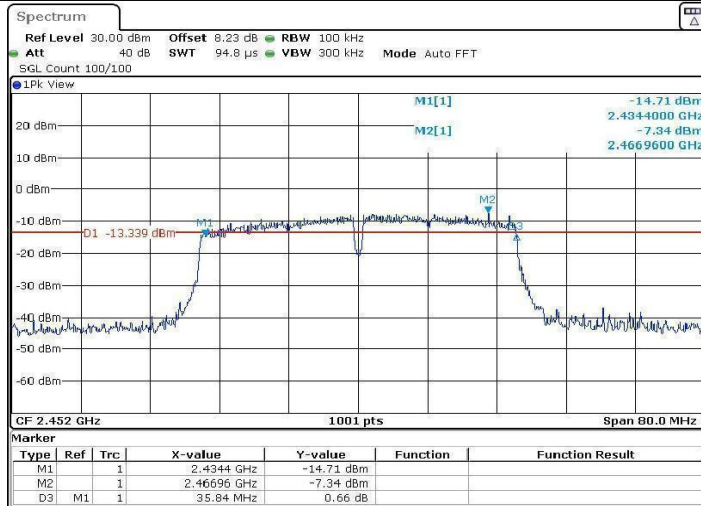


11N40SISO\_Ant2\_2437



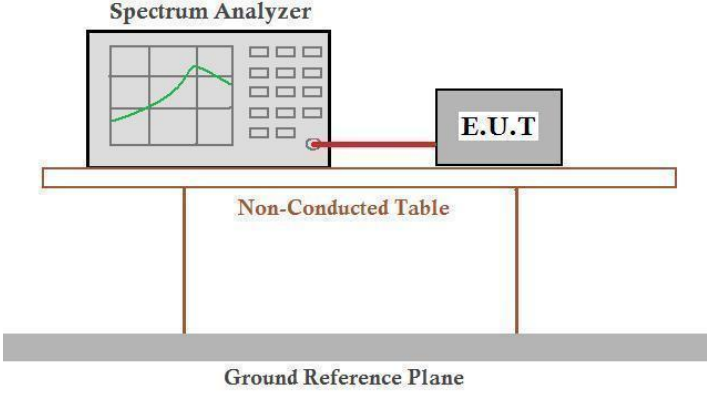
Date: 19.SEP.2022 08:49:26

11N40SISO\_Ant2\_2452



Date: 19.SEP.2022 08:52:28

## 5.5 Power Spectral Density

Test Requirement:	47 CFR Part 15C Section 15.247 (e)
Test Method:	ANSI C63.10: 2013
Test Setup:	 <p>Offset=cable loss+ attenuation factor</p>
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); 13.5Mbps of rate is the worst case of 802.11n(HT40). Only the worst case is recorded in the report.
Limit:	$\leq 8.00\text{dBm}/3\text{kHz}$
Test Results:	Pass