TEST REPORT

Applicant Name :	Shenzhen Four Seas Global Link Network Technology Co., Ltd
Address :	Room 607-610, Block B, TAOJINDI Electronic Business Incubation Base, Tenglong Road, Longhua District, Shenzhen, China
Report Number :	SZNS220610-25629E-RF-00A
FCC ID:	OYR-CF-XR182

Test Standard (s)

FCC PART 15.247

Sample Description

Product Type:	Repeater
Model No.:	CF-XR182
Multiple Model(s) No.:	CF-XR183,CF-WR761AC,CF-WR760AC,CF-WR754AC V2, CF-WR756AC,CF-WR300S,CF-WR304S V2,CF-WR758AC, CF-AC1200 (Please refer to DOS for Model difference)
Trade Mark:	N/A
Date Received:	2022/06/10
Report Date:	2022/08/17

Test Result:	Pass*

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

Prepared and Checked By:

Nick Fang

EMC Engineer

Approved By:

Candy Li

EMC Engineer

Note: This report may contain data that are not covered by the A2LA accreditation and are marked with an asterisk "★ ".

Shenzhen Accurate Technology Co., Ltd. is not responsible for the authenticity of any test data provided by the applicant. Data included from the applicant that may affect test results are marked with an asterisk '*'. Customer model name, addresses, names, trademarks etc. are not considered data.

This report cannot be reproduced except in full, without prior written approval of the Company. Unless otherwise stated the results shown in this test report refer only to the sample(s) tested. This report is valid only with a valid digital signature. The digital signature may be available only under the Adobe software above version 7.0.

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GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Frequency Range	Wi-Fi: 2412-2462MHz
Maximum Conducted Peak Output Power	Wi-Fi: 802.11b: 14.14dBm, 802.11g: 13.83dBm, 802.11n-HT20: 14.20dBm, 802.11n-HT40: 13.88dBm, 802.11ax20: 13.52dBm, 802.11ax40: 13.63dBm
Modulation Technique	Wi-Fi: DSSS, OFDM, OFDMA
Antenna Specification*	3.0dBi(provided by the applicant)
Voltage Range	AC 120V/60Hz
Sample serial number	SZNS220610-25629E-RF-S1 (Assigned by ATC)
Sample/EUT Status	Good condition

Objective

This test report is in accordance with Part 2-Subpart J, Part 15-Subparts A and C of the Federal Communication Commission's rules.

The tests were performed in order to determine compliance with FCC Part 15, Subpart C, and section 15.203, 15.205, 15.207, 15.209 and 15.247 rules.

Test Methodology

All measurements contained in this report were conducted with ANSI C63.10-2013, American National Standard of Procedures for Compliance Testing of Unlicensed Wireless Devices.

And KDB 558074 D01 15.247 Meas Guidance v05r02.

All emissions measurement was performed at Shenzhen Accurate Technology Co., Ltd. The radiated testing was performed at an antenna-to-EUT distance of 3 meters.

Measurement Uncertainty

Parameter		Uncertainty
Occupied Channel Bandwidth		5%
RF Frequency		$0.082*10^{-7}$
RF output power, conducted		0.73dB
Unwanted Emission, conducted		1.6dB
AC Power Lines Conducted Emissions		2.72dB
Emissions, Radiated	9kHz - 30MHz	2.66dB
	30MHz - 1GHz	4.28dB
	1GHz - 18GHz	4.98dB
	18GHz - 26.5GHz	5.06dB
	26.5GHz - 40GHz	4.72dB
Temperature		1℃
Humidity		6%
Supply voltages		0.4%

Note: The extended uncertainty given in this report is obtained by combining the standard uncertainty times the coverage factor K with the 95% confidence interval. Otherwise required by the applicant or Product Regulations, Decision Rule in this report did not consider the uncertainty.

Test Facility

The test site used by Shenzhen Accurate Technology Co., Ltd. to collect test data is located on the 1/F., Building A, Changyuan New Material Port, Science & Industry Park, Nanshan District, Shenzhen, Guangdong, P.R. China.

The test site has been approved by the FCC under the KDB 974614 D01 and is listed in the FCC Public Access Link (PAL) database, FCC Registration No.: 708358, the FCC Designation No.: CN1189. Accredited by American Association for Laboratory Accreditation (A2LA) The Certificate Number is 429 7.01.

Listed by Innovation, Science and Economic Development Canada (ISEDC), the Registration Number is 5077A.

SYSTEM TEST CONFIGURATION

Description of Test Configuration

For Wi-Fi mode, total 11 channels are provided to testing:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
1	2412	8	2447
2	2417	9	2452
3	2422	10	2457
4	2427	11	2462
5	2432	/	/
6	2437	/	/
7	2442	/	/

802.11b, 802.11g, 802.11n-HT20 and 802.11ax20 mode was tested with Channel 1, 6 and 11.
802.11n-HT40 and 802.11ax40 mode was tested with Channel 3, 6 and 9.

Equipment Modifications

No modification was made to the EUT tested.

EUT Exercise Software

"QATool_Dbg.exe"*Software was used to test and power level as below:

Mode	Date rate	Power Level*		
		Low Channel	Middle Channel	High Channel
802.11b	1Mbps	10	10	10
802.11g	6Mbps	14	14	14
802.11n-HT20	MCS0	14	14	14
802.11n-HT40	MCS0	14	14	14

Mode	Date rate	RU Size	RU Index	Power Level*		
				Low Channel	Middle Channel	High Channel
802.11ax-HE20	MCS0	26Tone	0/8	4	4	4
	MCS0	52Tone	37/40	6	6	6
	MCS0	106Tone	53/54	9	9	9
	MCS0	242Tone	61	14	14	14
802.11ax-HE40	MCS0	26Tone	0/17	4	4	4
	MCS0	52Tone	37/44	4	4	4
	MCS0	106Tone	53/56	6	6	6
	MCS0	242Tone	61/62	8	8	8
	MCS0	484Tone	65	14	14	14

EUT has two antennas and support SISO/MIMO transmit, except 802.11b/g mode which only support SISO.

The software and power level was provided by applicant.

Duty cycle

Test Result: Compliant. Please refer to the Appendix Wi-Fi.

Support Equipment List and Details

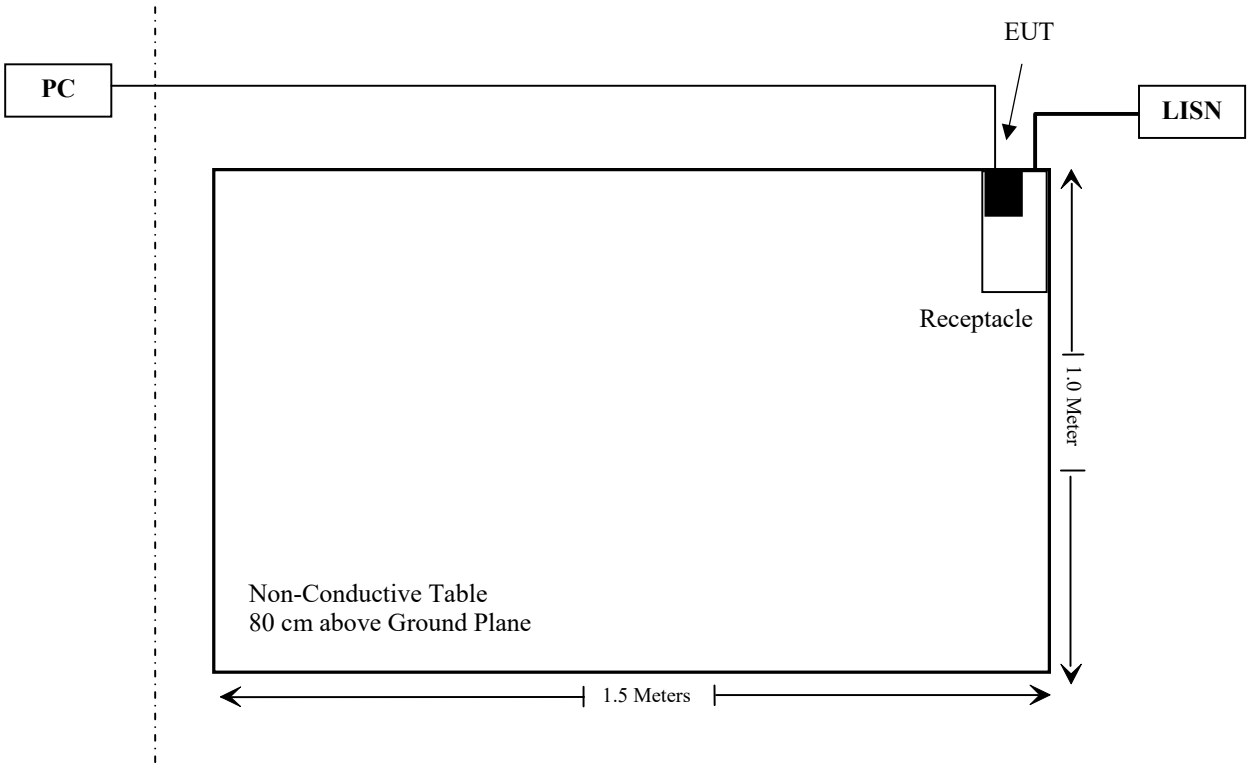
Manufacturer	Description	Model	Serial Number
Dell	PC	Latitude E4710	PC201911252059

External I/O Cable

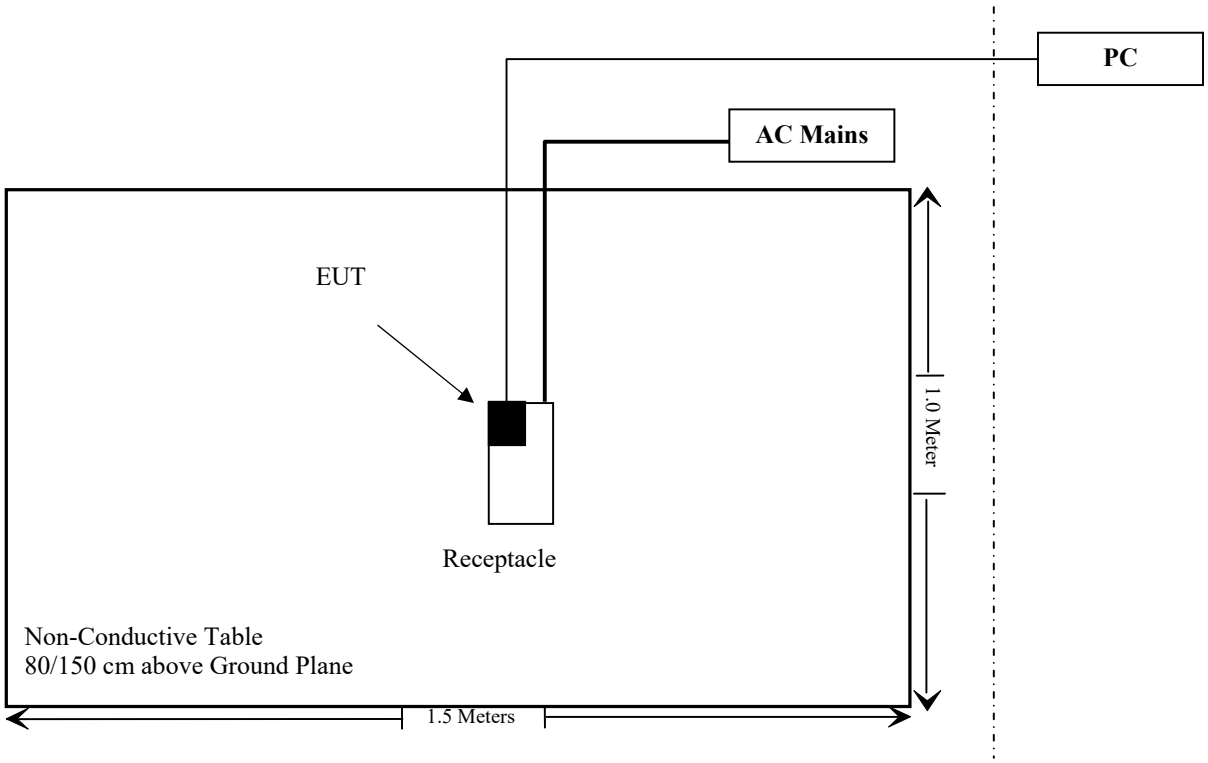
Cable Description	Length (m)	From Port	To
Un-shielded detachable RJ45 cable	10	EUT	PC

Block Diagram of Test Setup

For conducted emission:



For Radiated Emissions:



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.247 (i), §2.1091	MAXIMUM PERMISSIBLE EXPOSURE (MPE)	Compliant
§15.203	Antenna Requirement	Compliant
§15.207 (a)	AC Line Conducted Emissions	Compliant
§15.205, §15.209, §15.247(d)	Spurious Emissions	Compliant
§15.247 (a)(2)	6 dB Emission Bandwidth & Occupied Bandwidth	Compliant
§15.247(b)(3)	Maximum Conducted Output Power	Compliant
§15.247(d)	100 kHz Bandwidth of Frequency Band Edge	Compliant
§15.247(e)	Power Spectral Density	Compliant

TEST EQUIPMENT LIST

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
Conducted Emissions Test					
Rohde& Schwarz	EMI Test Receiver	ESCI	100784	2021/12/13	2022/12/12
Rohde & Schwarz	L.I.S.N.	ENV216	101314	2021/12/13	2022/12/12
Anritsu Corp	50 Coaxial Switch	MP59B	6100237248	2021/12/13	2022/12/12
Unknown	RF Coaxial Cable	No.17	N0350	2021/12/14	2022/12/13
Conducted Emission Test Software: e3 19821b (V9)					
Radiated Emissions Test					
Rohde& Schwarz	Test Receiver	ESR	102725	2021/12/13	2022/12/12
Rohde&Schwarz	Spectrum Analyzer	FSV40	101949	2021/12/13	2022/12/12
SONOMA INSTRUMENT	Amplifier	310 N	186131	2021/11/09	2022/11/08
A.H. Systems, inc.	Preamplifier	PAM-0118P	135	2021/11/09	2022/11/08
Quinstar	Amplifier	QLW-18405536-J0	15964001002	2021/11/11	2022/11/10
Schwarzbeck	Bilog Antenna	VULB9163	9163-323	2021/07/06	2024/07/05
Schwarzbeck	Horn Antenna	BBHA9120D	9120D-1067	2020/01/05	2023/01/04
Schwarzbeck	HORN ANTENNA	BBHA9170	9170-359	2020/01/05	2023/01/04
Radiated Emission Test Software: e3 19821b (V9)					
Unknown	RF Coaxial Cable	No.10	N050	2021/12/14	2022/12/13
Unknown	RF Coaxial Cable	No.11	N1000	2021/12/14	2022/12/13
Unknown	RF Coaxial Cable	No.12	N040	2021/12/14	2022/12/13
Unknown	RF Coaxial Cable	No.13	N300	2021/12/14	2022/12/13
Unknown	RF Coaxial Cable	No.14	N800	2021/12/14	2022/12/13
Unknown	RF Coaxial Cable	No.15	N600	2021/12/14	2022/12/13
Unknown	RF Coaxial Cable	No.16	N650	2021/12/14	2022/12/13
Wainwright	High Pass Filter	WHKX3.6/18G-10SS	5	2021/12/14	2022/12/13

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
RF Conducted Test					
Tonscend	RF Control Unit	JS0806-2	19G8060182	2022/07/06	2023/07/05
Rohde&Schwarz	Spectrum Analyzer	FSV-40	101948	2021/12/13	2022/12/12
Unknown	RF Coaxial Cable	No.31	RF-01	Each time	/
Unknown	RF Coaxial Cable	Unknown	2	Each time	/

*** Statement of Traceability:** Shenzhen Accurate Technology Co., Ltd. attests that all calibrations have been performed in accordance to requirements that traceable to National Primary Standards and International System of Units (SI).

FCC §15.247 (i) & §1.1307 (b) (3) & §2.1091- MAXIMUM PERMISSIBLE EXPOSURE (MPE)

Applicable Standard

According to subpart 15.247 (i) and subpart 2.1091 systems operating under the provisions of this section shall be operated in a manner that ensures the public is not exposed to RF energy level in excess of the communication guidelines.

According to KDB 447498 D04 Interim General RF Exposure Guidance

MPE-Based Exemption:

General frequency and separation-distance dependent MPE-based effective radiated power(ERP) thresholds are in Table B.1 [Table 1 of § 1.1307(b)(1)(i)(C)] to support an exemptionfrom further evaluation from 300 kHz through 100 GHz.

Table 1 to § 1.1307(b)(3)(i)(C) - Single RF Sources Subject to Routine Environmental Evaluation

RF Source frequency (MHz)	Threshold ERP (watts)
0.3-1.34	1,920 R^2.
1.34-30	3,450 R^2/f^2.
30-300	3.83 R^2.
300-1,500	0.0128 R^2f.
1,500-100,000	19.2R^2.

Ris the minimum separation distance in meters
f = frequency in MHz

For multiple RF sources: Multiple RF sources are exempt if:

in the case of fixed RF sources operating in the same time-averaging period, or of multiple mobile or portable RF sources within a device operating in the same time averaging period, if the sum of the fractional contributions to the applicable thresholds is less than or equal to 1 as indicated in the following equation:

$$\sum_{i=1}^{a}\frac{P_i}{P_{th,i}}+\sum_{j=1}^{b}\frac{ERP_j}{ERP_{th,j}}+\sum_{k=1}^{c}\frac{Evaluated_k}{Exposure\ Limit_k}\leq 1$$

Result

Frequency (MHz)	Tune up conducted power	Antenna Gain		ERP		Evaluation Distance (m)	ERP Limit (W)
	(dBm)	(dBi)	(dBd)	(dBm)	(W)		
2412-2462	14.5	3.0	0.85	15.35	0.034	0.2	0.768
5150-5250	17.5	3.0	0.85	18.35	0.068	0.2	0.768
5725-5850	18.5	3.0	0.85	19.35	0.086	0.2	0.768

Note: 1. The tune up conducted power and antenna gain was declared by the applicant.
2. The 2.4G Wi-Fi can transmit at the same time with the 5G Wi-Fi.

Simultaneous transmitting consideration (worst case):

The ratio=$ERP_{2.4G\ Wi\text{-}Fi}$/limit+$ERP_{5G\ Wi\text{-}Fi}$/limit=0.034/0.768+0.086/0.768=0.156＜1.0, so simultaneous exposure is compliant.

To maintain compliance with the FCC's RF exposure guidelines, place the equipment at least 20cm from nearby persons.

Result: Compliant.

FCC §15.203 - ANTENNA REQUIREMENT

Applicable Standard

According to § 15.203, 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 shall be considered sufficient to comply with the provisions of this section. The manufacturer may design the unit so that a broken antenna can be replaced by the user, but the user of a standard antenna jack or electrical connector is prohibited. The structure and application of the EUT were analyzed to determine compliance with section §15.203 of the rules. §15.203 state that the subject device must meet the following criteria:

a. Antenna must be permanently attached to the unit.
b. Antenna must use a unique type of connector to attach to the EUT.

Unit must be professionally installed, and installer shall be responsible for verifying that the correct antenna is employed with the unit.
And according to FCC 47 CFR section 15.247 (b), if the transmitting antennas of directional gain greater than 6dBi are used, the power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Antenna Connector Construction

The EUT has two internal antenna arrangement, which was permanently attached and both the antenna gain is 3.0dBi, fulfill the requirement of this section. Please refer to the EUT photos.

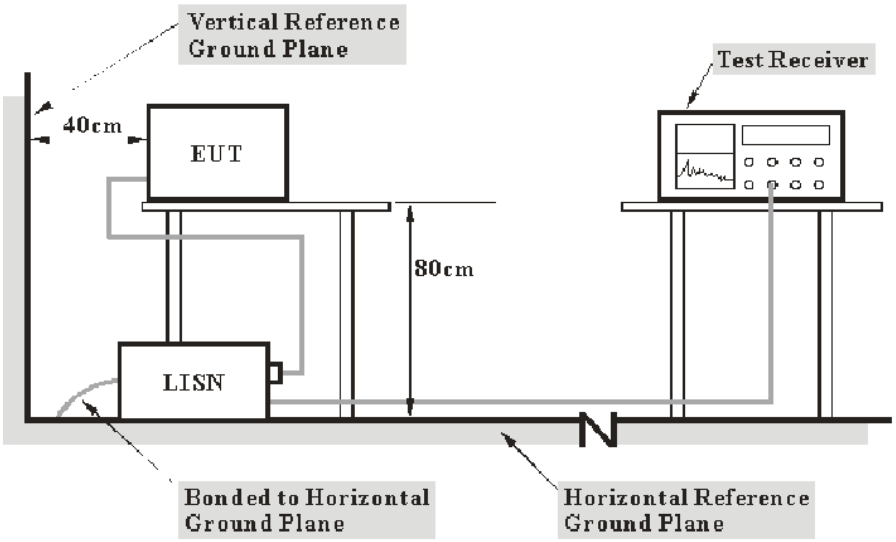
Result: Compliance.

FCC §15.207 (a) – AC LINE CONDUCTED EMISSIONS

Applicable Standard

FCC§15.207

EUT Setup



Note: 1. Support units were connected to second LISN.
2. Both of LISNs (AMN) 80 cm from EUT and at the least 80 cm from other units and other metal planes support units.

The setup of EUT is according with per ANSI C63.10-2013 measurement procedure. The specification used was with the FCC Part 15.207 limits.

The spacing between the peripherals was 10 cm.

EMI Test Receiver Setup

The EMI test receiver was set to investigate the spectrum from 150 kHz to 30 MHz.

During the conducted emission test, the EMI test receiver was set with the following configurations:

Frequency Range	IF B/W
150 kHz – 30 MHz	9 kHz

Test Procedure

During the conducted emission test, the device was connected to the outlet of the LISN.

Maximizing procedure was performed on the six (6) highest emissions of the EUT.

All final data was recorded in the Quasi-peak and average detection mode.

Transd Factor & Margin Calculation

The Transd factor is calculated by adding LISN VDF (Voltage Division Factor) and Cable Loss. The basic equation is as follows:

Transd Factor = LISN VDF + Cable Loss

The "**Over limit**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, an Over limit of -7 dB means the emission is 7 dB below the limit. The equation for calculation is as follows:

Over Limit = Level – Limit
Level = Read Level + Factor

Test Data

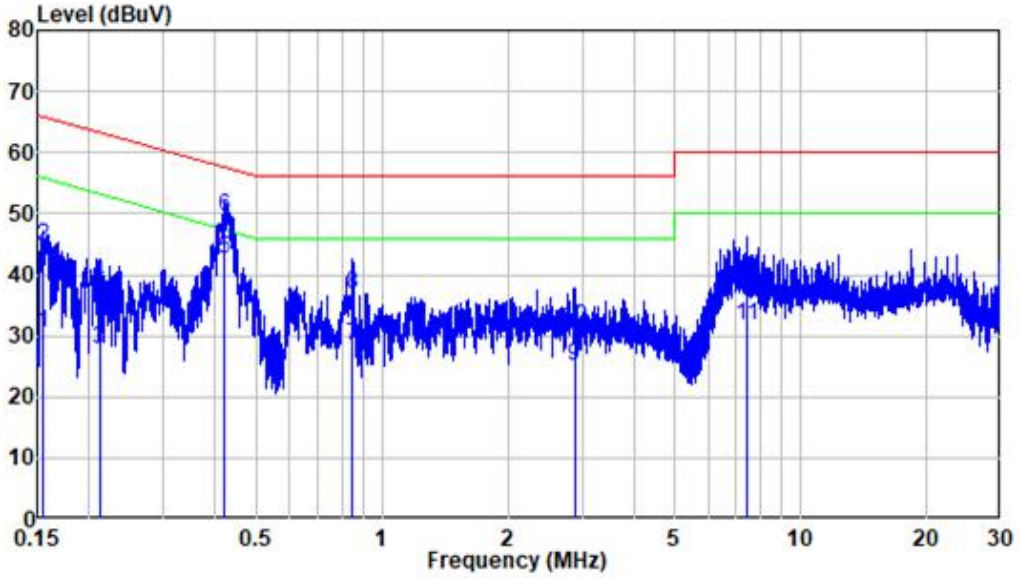
Environmental Conditions

Temperature:	24 ℃
Relative Humidity:	51 %
ATM Pressure:	101.0 kPa

The testing was performed by Jason on 2022-06-23.

EUT operation mode: Transmitting(worst case is 802.11n20, middle channel)

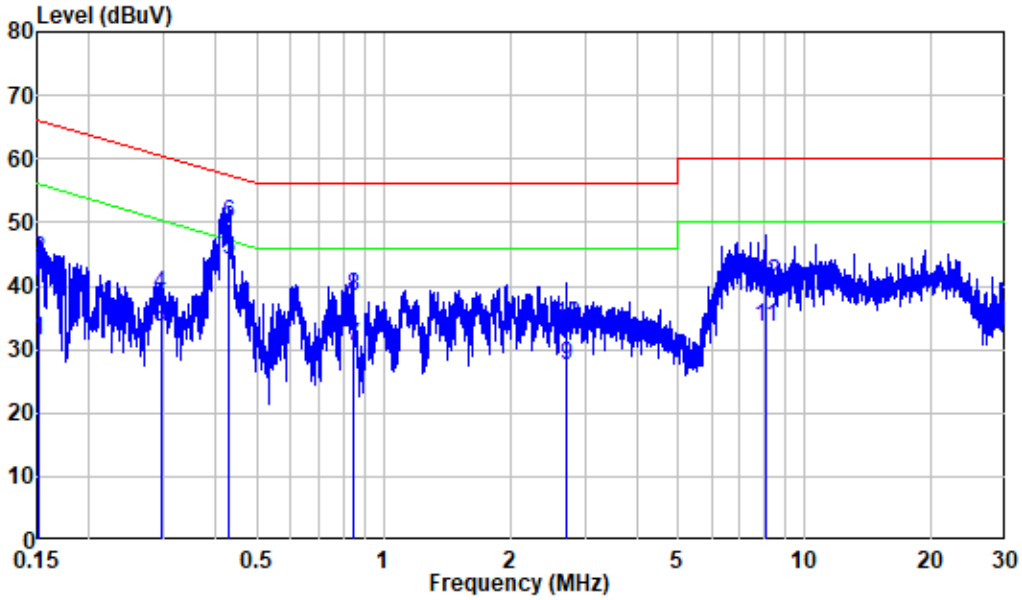
AC 120V/60 Hz, Line



Site : Shielding Room
Condition: Line
Mode : 2.4G WIFI
Model : CF-XR182
Power : AC 120V 60Hz

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dBuV	dBuV	dB	
1	0.154	9.80	20.69	30.49	55.76	-25.27	Average
2	0.154	9.80	34.79	44.59	65.76	-21.17	QP
3	0.211	9.80	17.86	27.66	53.17	-25.51	Average
4	0.211	9.80	28.92	38.72	63.17	-24.45	QP
5	0.421	9.80	32.71	42.51	47.42	-4.91	Average
6	0.421	9.80	39.60	49.40	57.42	-8.02	QP
7	0.851	9.81	18.57	28.38	46.00	-17.62	Average
8	0.851	9.81	27.10	36.91	56.00	-19.09	QP
9	2.877	9.83	15.21	25.04	46.00	-20.96	Average
10	2.877	9.83	21.45	31.28	56.00	-24.72	QP
11	7.427	9.87	21.70	31.57	50.00	-18.43	Average
12	7.427	9.87	27.75	37.62	60.00	-22.38	QP

AC 120V/60 Hz, Neutral



Site : Shielding Room
Condition: Neutral
Mode : 2.4G WIFI
Model : CF-XR182
Power : AC 120V 60Hz

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dBuV	dBuV	dB	
1	0.152	9.80	21.46	31.26	55.88	-24.62	Average
2	0.152	9.80	34.36	44.16	65.88	-21.72	QP
3	0.295	9.80	23.56	33.36	50.38	-17.02	Average
4	0.295	9.80	28.81	38.61	60.38	-21.77	QP
5	0.429	9.80	34.40	44.20	47.26	-3.06	Average
6	0.429	9.80	40.14	49.94	57.26	-7.32	QP
7	0.847	9.81	20.53	30.34	46.00	-15.66	Average
8	0.847	9.81	28.66	38.47	56.00	-17.53	QP
9	2.707	9.83	17.66	27.49	46.00	-18.51	Average
10	2.707	9.83	23.89	33.72	56.00	-22.28	QP
11	8.052	9.98	23.65	33.63	50.00	-16.37	Average
12	8.052	9.98	30.38	40.36	60.00	-19.64	QP

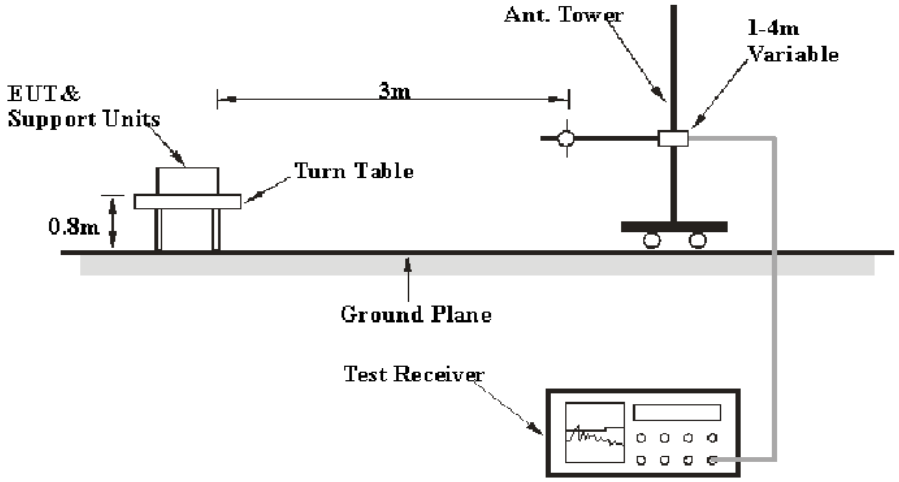
FCC §15.209, §15.205 & §15.247(d) - SPURIOUS EMISSIONS

Applicable Standard

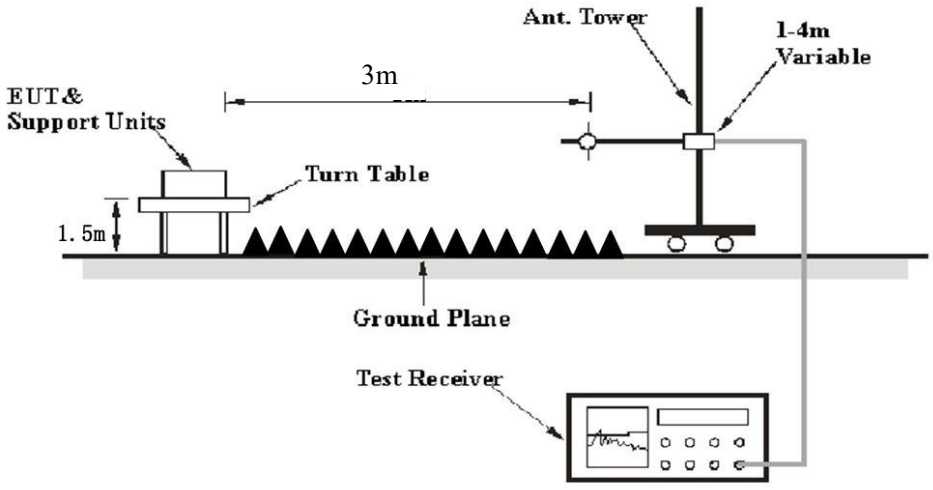
FCC §15.247 (d); §15.209; §15.205;

EUT Setup

Below 1 GHz:



Above 1 GHz:



The radiated emission tests were performed in the 3 meters test site, using the setup accordance with the ANSI C63.10-2013. The specification used was the FCC 15.209, and FCC 15.247 limits.

EMI Test Receiver & Spectrum Analyzer Setup

During the radiated emission test, the EMI test receiver & Spectrum Analyzer Setup were set with the following configurations:

Frequency Range	RBW	Video B/W	IF B/W	Measurement
30 MHz – 1000 MHz	100 kHz	300 kHz	120 kHz	QP
Above 1 GHz	1MHz	3 MHz	/	PK
	1MHz	10 Hz Note 1	/	Average
	1MHz	＞1/T Note 2	/	Average

Note 1: when duty cycle is no less than 98%
Note 2: when duty cycle is less than 98%

Test Procedure

Maximizing procedure was performed on the highest emissions to ensure that the EUT complied with all installation combinations.

Data was recorded in Quasi-peak detection mode for frequency range of 30 MHz-1 GHz, peak and Average detection modes for frequencies above 1 GHz.

Factor & Margin Calculation

The Factor is calculated by adding the Antenna Factor and Cable Loss, and subtracting the Amplifier Gain. The basic equation is as follows:

Factor = Antenna Factor + Cable Loss - Amplifier Gain

The "**Over Limit/Margin**" column of the following data tables indicates the degree of compliance with the applicable limit. For example, an Over Limit/margin of -7dB means the emission is 7dB below the limit. The equation for calculation is as follows:

Over Limit/Margin = Level / Corrected Amplitude – Limit
Level / Corrected Amplitude = Read Level + Factor

Test Data

Environmental Conditions

Temperature:	25~25.8℃
Relative Humidity:	50~62 %
ATM Pressure:	101.0 kPa

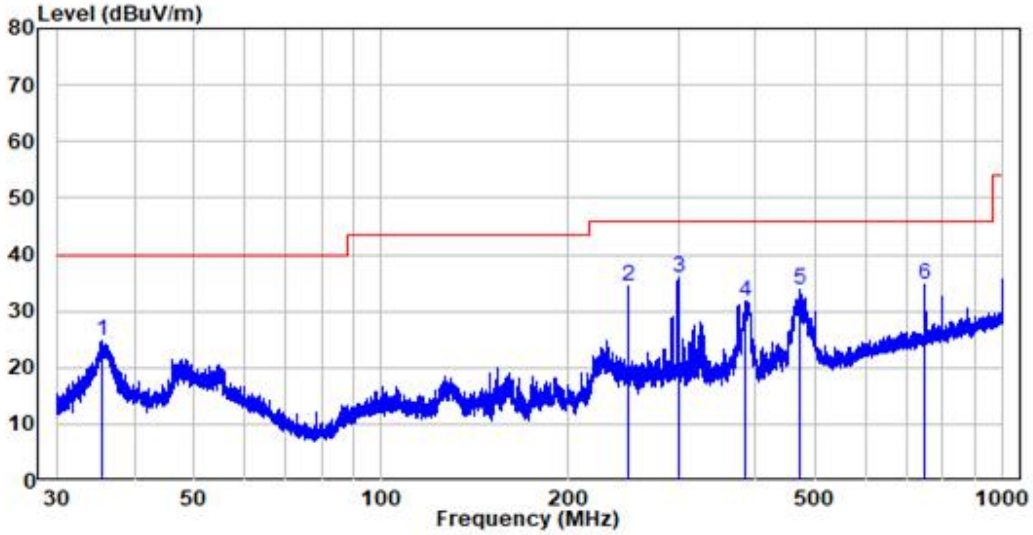
The testing was performed by Level on 2022-07-29 for below 1GHz and Level Li on 2022-07-11 for above 1GHz.

EUT operation mode: Transmitting (Pre-scan in the X, Y and Z axes of orientation, the worst case X-axis of orientation was recorded)

30MHz-1GHz: (Worst case is 802.11n20 mode, middle Channel)

Note: When the test result of Peak was less than the limit of QP, just the peak value was recorded.

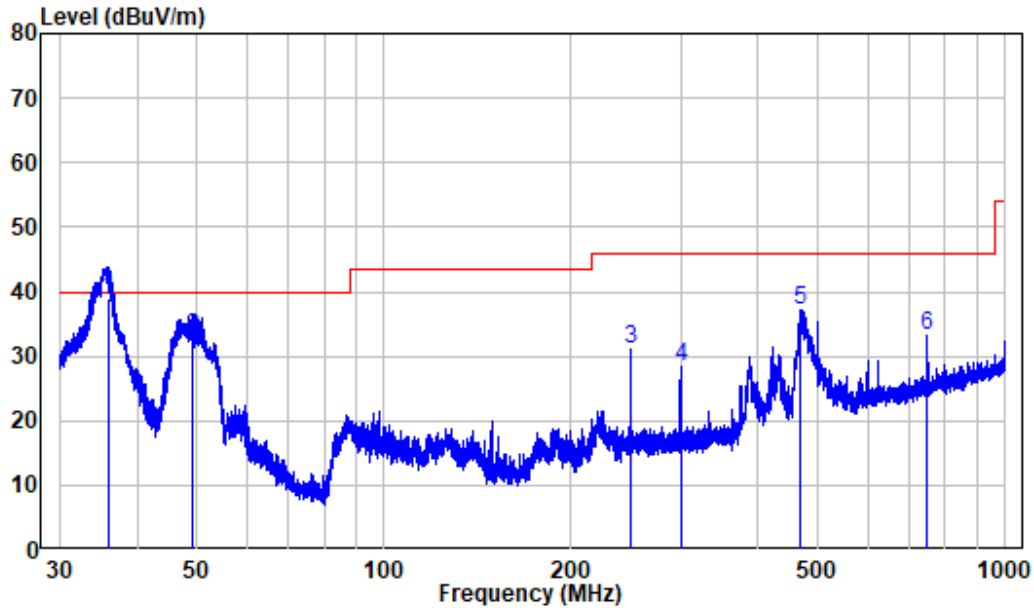
Horizontal



Site : chamber
Condition: 3m HORIZONTAL
Job No. : SZNS211102-56129E-RF
Test Mode: 2.4G WIFI

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	35.593	-11.34	36.02	24.68	40.00	-15.32	Peak
2	249.972	-10.74	45.23	34.49	46.00	-11.51	Peak
3	299.973	-9.23	45.16	35.93	46.00	-10.07	Peak
4	384.437	-7.07	38.81	31.74	46.00	-14.26	Peak
5	470.730	-5.54	39.24	33.70	46.00	-12.30	Peak
6	750.108	-0.87	35.57	34.70	46.00	-11.30	Peak

Vertical



Site : chamber
Condition: 3m VERTICAL
Job No. : SZNS220610-25629E-RF
Test Mode: 2.4G WIFI

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB/m	dBuV	dBuV/m	dBuV/m	dB	
1	36.032	-11.19	50.20	39.01	40.00	-0.99	QP
2	48.972	-9.96	42.90	32.94	40.00	-7.06	QP
3	249.972	-10.74	41.75	31.01	46.00	-14.99	Peak
4	299.973	-9.23	37.57	28.34	46.00	-17.66	Peak
5	466.008	-5.50	42.55	37.05	46.00	-8.95	Peak
6	750.108	-0.87	34.23	33.36	46.00	-12.64	Peak

1-25 GHz:

Frequency (MHz)	Receiver		Turntable Angle Degree	Rx Antenna		Factor (dB/m)	Absolute Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/Ave		Height (m)	Polar (H/V)				
802.11b(worst case ANT 1)									
Low Channel(2412MHz)									
2310	68.7	PK	312	2	H	-7.24	61.46	74	-12.54
2310	53.45	AV	312	2	H	-7.24	46.21	54	-7.79
2390	69.26	PK	51	1.5	H	-7.22	62.04	74	-11.96
2390	53.96	AV	51	1.5	H	-7.22	46.74	54	-7.26
2310	68.17	PK	160	2	V	-7.24	60.93	74	-13.07
2310	53.25	AV	160	2	V	-7.24	46.01	54	-7.99
2390	69.75	PK	107	1.8	V	-7.22	62.53	74	-11.47
2390	53.97	AV	107	1.8	V	-7.22	46.75	54	-7.25
4824	57.25	PK	316	1.9	H	-3.53	53.72	74	-20.28
4824	60.28	PK	205	1.2	V	-3.53	56.75	74	-17.25
4824	52.09	AV	205	1.2	V	-3.53	48.56	54	-5.44
Middle Channel(2437MHz)									
4874	57.57	PK	275	1.9	H	-3.41	54.16	74	-19.84
4874	50.27	AV	275	1.9	H	-3.41	46.86	54	-7.14
4874	58.75	PK	283	1.6	V	-3.41	55.34	74	-18.66
4874	53.22	AV	283	1.6	V	-3.41	49.81	54	-4.19
High Channel(2462 MHz)									
2483.5	69.39	PK	306	2.1	H	-7.2	62.19	74	-11.81
2483.5	55.04	AV	306	2.1	H	-7.2	47.84	54	-6.16
2500	68.93	PK	213	1.7	H	-7.18	61.75	74	-12.25
2500	54.9	AV	213	1.7	H	-7.18	47.72	54	-6.28
2483.5	69.93	PK	236	1	V	-7.2	62.73	74	-11.27
2483.5	54.9	AV	236	1	V	-7.2	47.7	54	-6.3
2500	68.6	PK	181	1.9	V	-7.18	61.42	74	-12.58
2500	55.11	AV	181	1.9	V	-7.18	47.93	54	-6.07
4924	56.93	PK	246	1.2	H	-3.16	53.77	74	-20.23
4924	58.88	PK	52	1.8	V	-3.16	55.72	74	-18.28
4924	53.09	AV	52	1.8	V	-3.16	49.93	54	-4.07

Frequency (MHz)	Receiver		Turntable Angle Degree	Rx Antenna		Factor (dB/m)	Absolute Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/Ave		Height (m)	Polar (H/V)				
802.11g(worst case ANT 1)									
Low Channel(2412MHz)									
2310	67.91	PK	21	2.4	H	-7.24	60.67	74	-13.33
2310	53.96	AV	21	2.4	H	-7.24	46.72	54	-7.28
2390	70.57	PK	54	2.1	H	-7.22	63.35	74	-10.65
2390	55.69	AV	54	2.1	H	-7.22	48.47	54	-5.53
2310	67.83	PK	245	2.3	V	-7.24	60.59	74	-13.41
2310	54.15	AV	245	2.3	V	-7.24	46.91	54	-7.09
2390	70.11	PK	321	2.2	V	-7.22	62.89	74	-11.11
2390	55.7	AV	321	2.2	V	-7.22	48.48	54	-5.52
4824	57.17	PK	280	2	H	-3.53	53.64	74	-20.36
4824	43.9	AV	280	2	H	-3.53	40.37	54	-13.63
4824	59.08	PK	318	1	V	-3.53	55.55	74	-18.45
4824	45.97	AV	318	1	V	-3.53	42.44	54	-11.56
Middle Channel(2437MHz)									
4874	54.42	PK	208	1.7	H	-3.41	51.01	74	-22.99
4874	56.29	PK	219	1.5	V	-3.41	52.88	74	-21.12
High Channel(2462 MHz)									
2483.5	74.59	PK	123	1.2	H	-7.2	67.39	74	-6.61
2483.5	57.38	AV	123	1.2	H	-7.2	50.18	54	-3.82
2500	69.23	PK	311	2	H	-7.18	62.05	74	-11.95
2500	55.93	AV	311	2	H	-7.18	48.75	54	-5.25
2483.5	77.69	PK	229	2.1	V	-7.2	70.49	74	-3.51
2483.5	58.07	AV	229	2.1	V	-7.2	50.87	54	-3.13
2500	69.18	PK	21	2.1	V	-7.18	62	74	-12
2500	55.98	AV	21	2.1	V	-7.18	48.8	54	-5.2
4924	54.41	PK	271	2.4	H	-3.16	51.25	74	-22.75
4924	56.36	PK	11	1.7	V	-3.16	53.2	74	-20.8

Frequency (MHz)	Receiver		Turntable Angle Degree	Rx Antenna		Factor (dB/m)	Absolute Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/Ave		Height (m)	Polar (H/V)				
802.11n20(worst case MIMO)									
Low Channel(2412MHz)									
2310	68.67	PK	243	1.7	H	-7.24	61.43	74	-12.57
2310	54.13	AV	243	1.7	H	-7.24	46.89	54	-7.11
2390	70.9	PK	356	2.3	H	-7.22	63.68	74	-10.32
2390	55.73	AV	356	2.3	H	-7.22	48.51	54	-5.49
2310	68.28	PK	118	2.3	V	-7.24	61.04	74	-12.96
2310	54.16	AV	118	2.3	V	-7.24	46.92	54	-7.08
2390	70.7	PK	172	2.1	V	-7.22	63.48	74	-10.52
2390	55.89	AV	172	2.1	V	-7.22	48.67	54	-5.33
4824	55.97	PK	230	1.4	H	-3.53	52.44	74	-21.56
4824	59.86	PK	353	1.9	V	-3.53	56.33	74	-17.67
4824	46.58	AV	353	1.9	V	-3.53	43.05	54	-10.95
Middle Channel(2437MHz)									
4874	55.95	PK	214	2.4	H	-3.41	52.54	74	-21.46
4874	57.35	PK	140	1.3	V	-3.41	53.94	74	-20.06
High Channel(2462MHz)									
2483.5	75.25	PK	205	2.4	H	-7.2	68.05	74	-5.95
2483.5	57.62	AV	205	2.4	H	-7.2	50.42	54	-3.58
2500	68.44	PK	145	1.5	H	-7.18	61.26	74	-12.74
2500	55.92	AV	145	1.5	H	-7.18	48.74	54	-5.26
2483.5	76.75	PK	248	2.4	V	-7.2	69.55	74	-4.45
2483.5	57.99	AV	248	2.4	V	-7.2	50.79	54	-3.21
2500	68.69	PK	197	1.7	V	-7.18	61.51	74	-12.49
2500	55.89	AV	197	1.7	V	-7.18	48.71	54	-5.29
4924	55.35	PK	145	1.9	H	-3.16	52.19	74	-21.81
4924	58.12	PK	204	1.8	V	-3.16	54.96	74	-19.04
4924	43.5	AV	204	1.8	V	-3.16	40.34	54	-13.66

Frequency (MHz)	Receiver		Turntable Angle Degree	Rx Antenna		Factor (dB/m)	Absolute Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/Ave		Height (m)	Polar (H/V)				
802.11n40(worst case MIMO)									
Low Channel(2422MHz)									
2310	67.92	PK	297	1.9	H	-7.24	60.68	74	-13.32
2310	54.17	AV	297	1.9	H	-7.24	46.93	54	-7.07
2390	70.53	PK	283	1.6	H	-7.22	63.31	74	-10.69
2390	55.77	AV	283	1.6	H	-7.22	48.55	54	-5.45
2310	68.16	PK	189	2.3	V	-7.24	60.92	74	-13.08
2310	53.94	AV	189	2.3	V	-7.24	46.7	54	-7.3
2390	70.71	PK	214	1.2	V	-7.22	63.49	74	-10.51
2390	55.82	AV	214	1.2	V	-7.22	48.6	54	-5.4
4844	55.23	PK	250	1.2	H	-3.53	51.7	74	-22.3
4844	56.39	PK	41	2.2	V	-3.53	52.86	74	-21.14
Middle Channel(2437MHz)									
4874	54.47	PK	161	1.3	H	-3.41	51.06	74	-22.94
4874	55.34	PK	53	2.1	V	-3.41	51.93	74	-22.07
High Channel(2452MHz)									
2483.5	70.37	PK	186	2.2	H	-7.2	63.17	74	-10.83
2483.5	57.48	AV	186	2.2	H	-7.2	50.28	54	-3.72
2500	68.56	PK	61	2	H	-7.18	61.38	74	-12.62
2500	55.85	AV	61	2	H	-7.18	48.67	54	-5.33
2483.5	71.4	PK	119	2.4	V	-7.2	64.2	74	-9.8
2483.5	57.91	AV	119	2.4	V	-7.2	50.71	54	-3.29
2500	68.36	PK	32	1.3	V	-7.18	61.18	74	-12.82
2500	55.86	AV	32	1.3	V	-7.18	48.68	54	-5.32
4904	54.9	PK	341	1.8	H	-3.16	51.74	74	-22.26
4904	55.61	PK	278	2	V	-3.16	52.45	74	-21.55

Frequency (MHz)	Receiver		Turntable Angle Degree	Rx Antenna		Factor (dB/m)	Absolute Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/Ave		Height (m)	Polar (H/V)				
802.11ax20(worst case MIMO+full RU)									
Low Channel(2412MHz)									
2310	68.3	PK	113	1.9	H	-7.24	61.06	74	-12.94
2310	54.1	AV	113	1.9	H	-7.24	46.86	54	-7.14
2390	69.33	PK	306	1.4	H	-7.22	62.11	74	-11.89
2390	55.09	AV	306	1.4	H	-7.22	47.87	54	-6.13
2310	68.62	PK	241	1.9	V	-7.24	61.38	74	-12.62
2310	54.27	AV	241	1.9	V	-7.24	47.03	54	-6.97
2390	69.12	PK	215	1.5	V	-7.22	61.9	74	-12.1
2390	55.04	AV	215	1.5	V	-7.22	47.82	54	-6.18
4824	54.23	PK	310	1.9	H	-3.53	50.7	74	-23.3
4824	55.11	PK	162	2.1	V	-3.53	51.58	74	-22.42
Middle Channel(2437MHz)									
4874	54.24	PK	87	2.2	H	-3.41	50.83	74	-23.17
4874	55.36	PK	337	1	V	-3.41	51.95	74	-22.05
High Channel(2462 MHz)									
2483.5	69.49	PK	199	1.3	H	-7.2	62.29	74	-11.71
2483.5	56.12	AV	199	1.3	H	-7.2	48.92	54	-5.08
2500	68.79	PK	330	1.9	H	-7.18	61.61	74	-12.39
2500	55.77	AV	330	1.9	H	-7.18	48.59	54	-5.41
2483.5	69.64	PK	107	1.4	V	-7.2	62.44	74	-11.56
2483.5	56.31	AV	107	1.4	V	-7.2	49.11	54	-4.89
2500	69.18	PK	197	2.2	V	-7.18	62	74	-12
2500	55.53	AV	197	2.2	V	-7.18	48.35	54	-5.65
4924	54.02	PK	299	2.1	H	-3.16	50.86	74	-23.14
4924	55.15	PK	235	1.6	V	-3.16	51.99	74	-22.01

Frequency (MHz)	Receiver		Turntable Angle Degree	Rx Antenna		Factor (dB/m)	Absolute Level (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/Ave		Height (m)	Polar (H/V)				
802.11ax40(worst case MIMO+full RU)									
Low Channel(2422MHz)									
2310	67.98	PK	130	1.7	H	-7.24	60.74	74	-13.26
2310	54.25	AV	130	1.7	H	-7.24	47.01	54	-6.99
2390	69.92	PK	278	1.4	H	-7.22	62.7	74	-11.3
2390	55.12	AV	278	1.4	H	-7.22	47.9	54	-6.1
2310	67.98	PK	227	2	V	-7.24	60.74	74	-13.26
2310	54.1	AV	227	2	V	-7.24	46.86	54	-7.14
2390	69.15	PK	248	1.8	V	-7.22	61.93	74	-12.07
2390	55.15	AV	248	1.8	V	-7.22	47.93	54	-6.07
4844	54.08	PK	303	1.7	H	-3.53	50.55	74	-23.45
4844	55.11	PK	217	2.4	V	-3.53	51.58	74	-22.42
Middle Channel(2437MHz)									
4874	54.5	PK	56	1.5	H	-3.41	51.09	74	-22.91
4874	53.6	PK	84	2.2	V	-3.41	50.19	74	-23.81
High Channel(2452 MHz)									
2483.5	71.19	PK	253	2.2	H	-7.2	63.99	74	-10.01
2483.5	56.16	AV	253	2.2	H	-7.2	48.96	54	-5.04
2500	68.81	PK	142	2.4	H	-7.18	61.63	74	-12.37
2500	55.61	AV	142	2.4	H	-7.18	48.43	54	-5.57
2483.5	70.94	PK	168	1.2	V	-7.2	63.74	74	-10.26
2483.5	56.18	AV	168	1.2	V	-7.2	48.98	54	-5.02
2500	69.08	PK	321	1.5	V	-7.18	61.9	74	-12.1
2500	55.69	AV	321	1.5	V	-7.18	48.51	54	-5.49
4904	54.28	PK	14	1.6	H	-3.16	51.12	74	-22.88
4904	52.94	PK	345	2.4	V	-3.16	49.78	74	-24.22

Note:

Factor = Antenna factor (RX) + Cable Loss – Amplifier Factor

Absolute Level (Corrected Amplitude） = Factor + Reading

Margin = Absolute Level - Limit

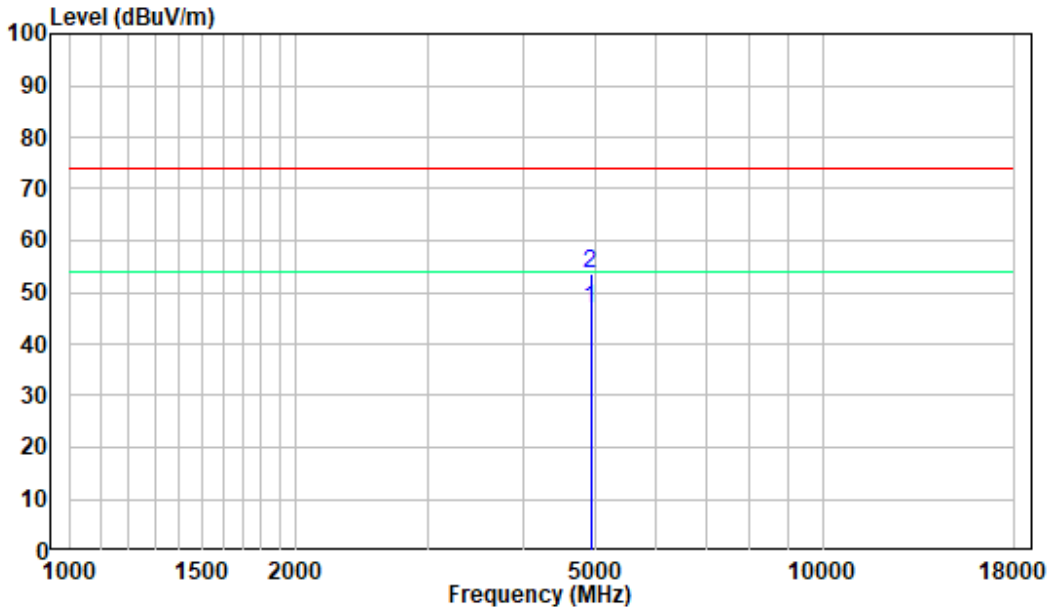
The other spurious emission which is 20dB below to the limit was not recorded.

The test result of peak was less than the limit of average, so just peak values were recorded.

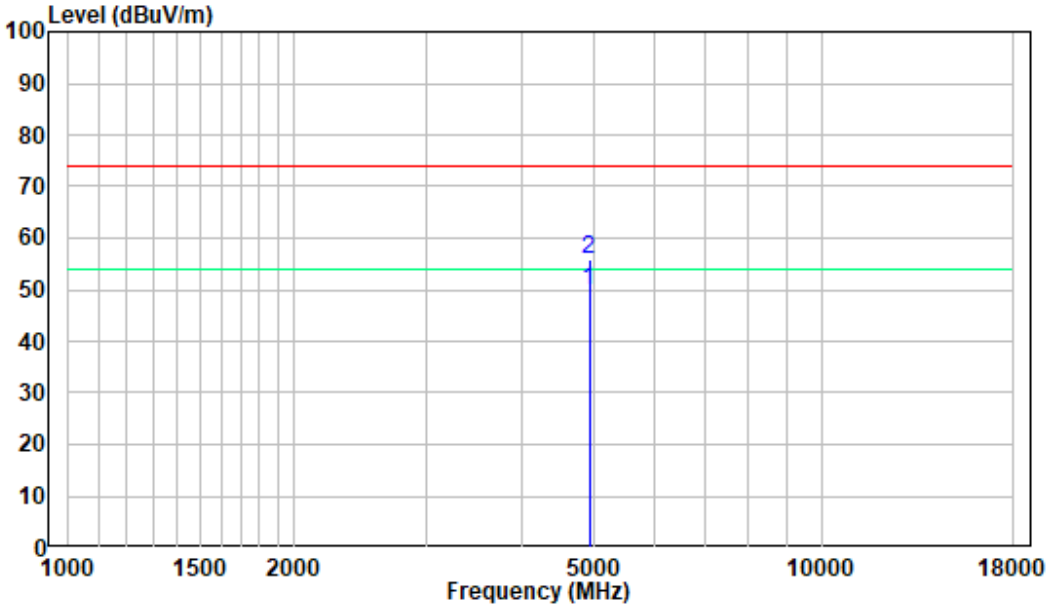
1-18 GHz:

Pre-scan Plots:

802.11 b High Channel
Horizontal



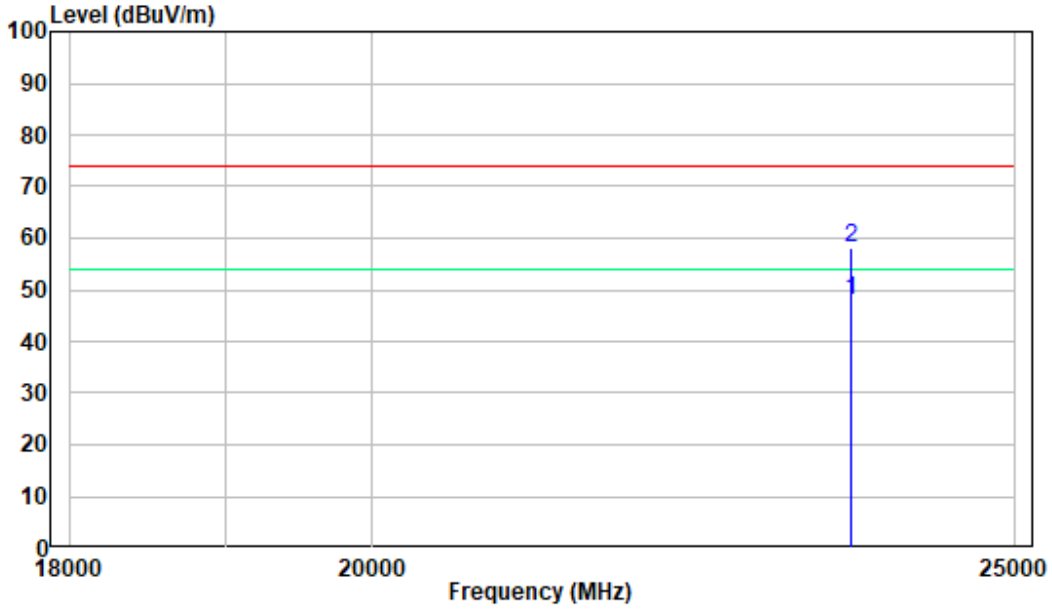
Vertical



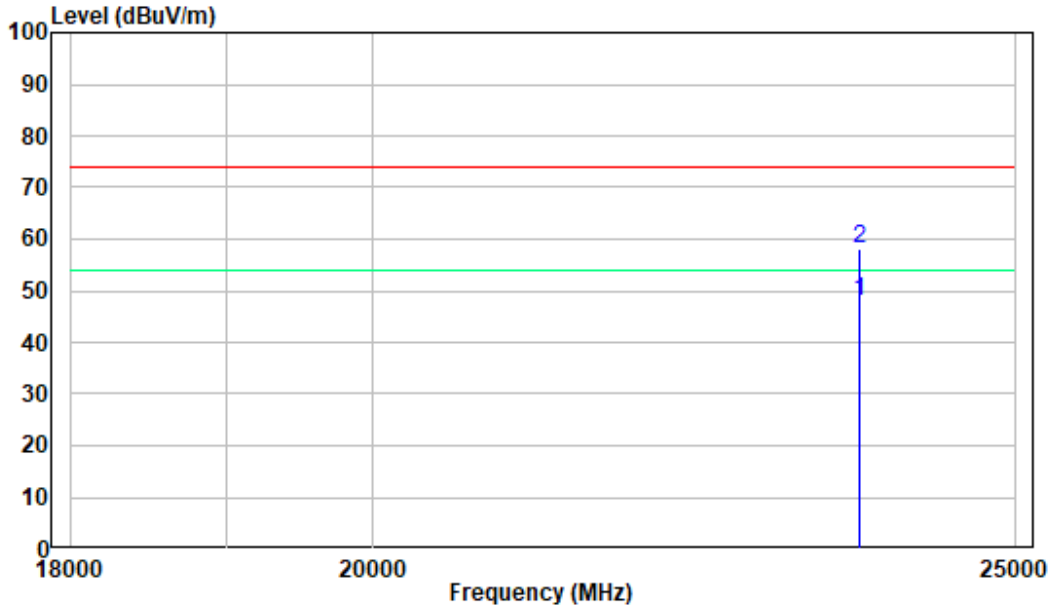
18 -25GHz:

Pre-scan Plots:

802.11 b High Channel
Horizontal



Vertical



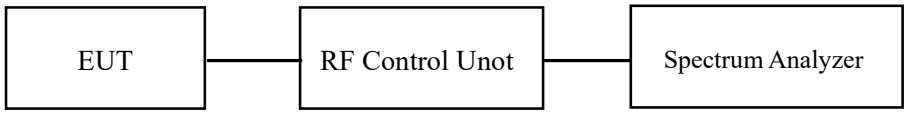
FCC §15.247(a) (2) – 6 dB EMISSION BANDWIDTH & OCCUPIED BANDWIDTH

Applicable Standard

Systems using digital modulation techniques may operate in the 902–928 MHz, 2400–2483.5 MHz, and 5725–5850 MHz bands. The minimum 6 dB bandwidth shall be at least 500 kHz.

Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect it to measurement instrument. Then set it to any one convenient frequency within its operating range. Set a reference level on the measuring instrument equal to the highest peak value.
3. Measure the frequency difference of two frequencies that were attenuated 6 dB from the reference level. Record the frequency difference as the emission bandwidth.
4. Repeat above procedures until all frequencies measured were complete.



Test Data

Environmental Conditions

Temperature:	22~25℃
Relative Humidity:	46~56 %
ATM Pressure:	101.0 kPa

The testing was performed by Roger Ling from 2022-07-23 to 2022-08-11.

EUT operation mode: Transmitting

Test Result: Compliant. Please refer to the Appendix.

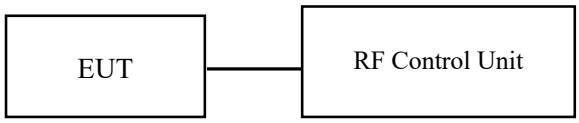
FCC §15.247(b) (3) - MAXIMUM CONDUCTED OUTPUT POWER

Applicable Standard

According to FCC §15.247(b) (3), for systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted Output Power is defined as the total transmit power delivered to all antennas and antenna elements averaged across all symbols in the signaling alphabet when the transmitter is operating at its maximum power control level. Power must be summed across all antennas and antenna elements. The average must not include any time intervals during which the transmitter is off or is transmitting at a reduced power level. If multiple modes of operation are possible (e.g., alternative modulation methods), the maximum conducted output power is the highest total transmit power occurring in any mode.

Test Procedure

1. Place the EUT on a bench and set it in transmitting mode.
2. Remove the antenna from the EUT and then connect a low loss RF cable from the antenna port to one test equipment.
3. Add a correction factor to the display.



Note: the RF control unit has a built-in power sensor

Test Data

Environmental Conditions

Temperature:	22~25℃
Relative Humidity:	46~56 %
ATM Pressure:	101.0 kPa

The testing was performed by Roger Ling from 2022-07-23 to 2022-08-11.

EUT operation mode: Transmitting

Test Result: Compliant. Please refer to the Appendix.

FCC §15.247(d) – 100 kHz BANDWIDTH OF FREQUENCY BAND EDGE

Applicable Standard

In any 100 kHz bandwidth outside the frequency band in which the spread spectrum or digitally modulated intentional radiator is operating, the radio frequency power that is produced by the intentional radiator shall be at least 20 dB below that in the 100 kHz bandwidth within the band that contains the highest level of the desired power, based on either an RF conducted or a radiated measurement, provided the transmitter demonstrates compliance with the peak conducted power limits. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, as permitted under paragraph (b)(3) of this section, the attenuation required under this paragraph shall be 30 dB instead of 20 dB. Attenuation below the general limits specified in §15.209(a) is not required. In addition, radiated emissions which fall in the restricted bands, as defined in §15.205(a), must also comply with the radiated emission limits specified in §15.209(a) (see §15.205(c)).

Test Procedure

1. Check the calibration of the measuring instrument using either an internal calibrator or a known signal from an external generator.
2. Position the EUT without connection to measurement instrument. Turn on the EUT and connect its antenna terminal to measurement instrument via a low loss cable. Then set it to any one measured frequency within its operating range, and make sure the instrument is operated in its linear range.
3. Set RBW to 100 kHz and VBW of spectrum analyzer to 300 kHz with a convenient frequency span including 100 kHz bandwidth from band edge.
4. Measure the highest amplitude appearing on spectral display and set it as a reference level. Plot the graph with marking the highest point and edge frequency.
5. Repeat above procedures until all measured frequencies were complete.

Test Data

Environmental Conditions

Temperature:	22~25℃
Relative Humidity:	46~51 %
ATM Pressure:	101.0 kPa

The testing was performed by Roger Ling on 2022-08-11.

EUT operation mode: Transmitting

Test Result: Compliant.

Conducted Band Edge Result:

Please refer to the Appendix.

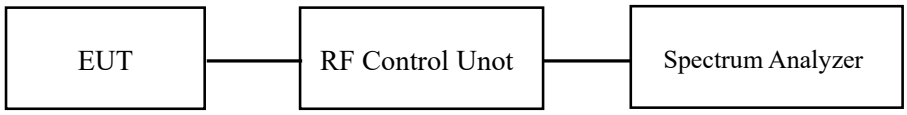
FCC §15.247(e) - POWER SPECTRAL DENSITY

Applicable Standard

For digitally modulated systems, the power spectral density conducted from the intentional radiator to the antenna shall not be greater than 8 dBm in any 3 kHz band during any time interval of continuous transmission. This power spectral density shall be determined in accordance with the provisions of paragraph (b) of this section. The same method of determining the conducted output power shall be used to determine the power spectral density.

Test Procedure

1. Use this procedure when the maximum peak conducted output power in the fundamental emission is used to demonstrate compliance.
2. Set the RBW to: 3kHz≤ RBW≤100 kHz.
3. Set the VBW ≥ 3×RBW.
4. Set the span to 1.5 times the DTS bandwidth.
5. Detector = peak.
6. Sweep time = auto couple.
7. Trace mode = max hold.
8. Allow trace to fully stabilize.
9. Use the peak marker function to determine the maximum amplitude level within the RBW.
10. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.



Test Data

Environmental Conditions

Temperature:	22~25℃
Relative Humidity:	46~56 %
ATM Pressure:	101.0 kPa

The testing was performed by Roger Ling from 2022-07-23 to 2022-08-15.

EUT operation mode: Transmitting

Test Result: Compliant. Please refer to the Appendix.

APPENDIX

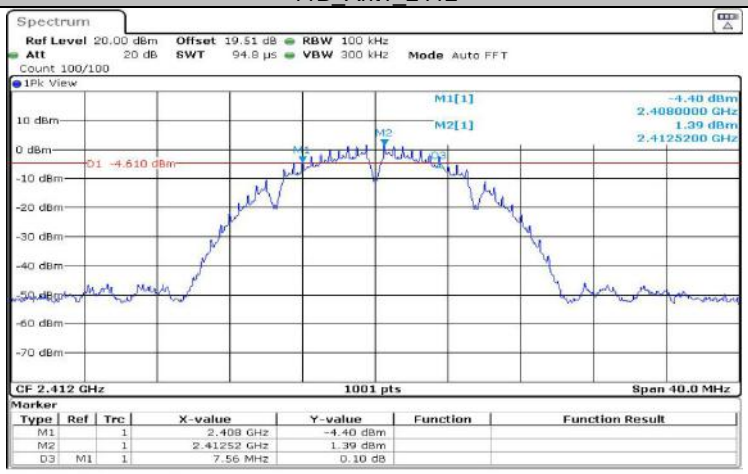
Appendix A: DTS Bandwidth

Test Result

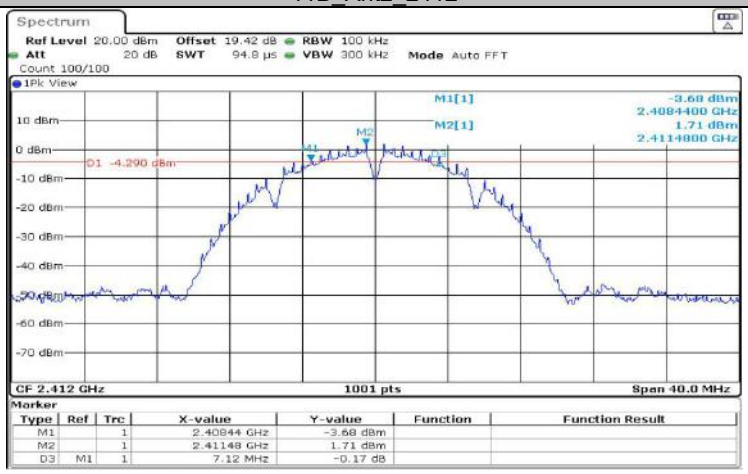
Test Mode	Antenna	Channel	DTS BW [MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	7.56	0.5	PASS
	Ant2	2412	7.12	0.5	PASS
	Ant1	2437	7.60	0.5	PASS
	Ant2	2437	7.12	0.5	PASS
	Ant1	2462	7.12	0.5	PASS
	Ant2	2462	7.12	0.5	PASS
11G	Ant1	2412	15.12	0.5	PASS
	Ant2	2412	15.12	0.5	PASS
	Ant1	2437	15.12	0.5	PASS
	Ant2	2437	15.12	0.5	PASS
	Ant1	2462	15.12	0.5	PASS
	Ant2	2462	15.32	0.5	PASS
11N20MIMO	Ant1	2412	15.28	0.5	PASS
	Ant2	2412	15.72	0.5	PASS
	Ant1	2437	14.44	0.5	PASS
	Ant2	2437	16.28	0.5	PASS
	Ant1	2462	17.08	0.5	PASS
	Ant2	2462	16.32	0.5	PASS
11N40MIMO	Ant1	2422	35.12	0.5	PASS
	Ant2	2422	35.12	0.5	PASS
	Ant1	2437	35.12	0.5	PASS
	Ant2	2437	35.12	0.5	PASS
	Ant1	2452	35.12	0.5	PASS
	Ant2	2452	35.12	0.5	PASS
11AX20MIMO	Ant1	2412	17.84	0.5	PASS
	Ant2	2412	18.32	0.5	PASS
	Ant1	2437	17.44	0.5	PASS
	Ant2	2437	18.72	0.5	PASS
	Ant1	2462	18.88	0.5	PASS
	Ant2	2462	18.56	0.5	PASS
11AX40MIMO	Ant1	2422	37.28	0.5	PASS
	Ant2	2422	36.96	0.5	PASS
	Ant1	2437	35.28	0.5	PASS
	Ant2	2437	35.12	0.5	PASS
	Ant1	2452	36.88	0.5	PASS
	Ant2	2452	35.20	0.5	PASS

Test Graphs

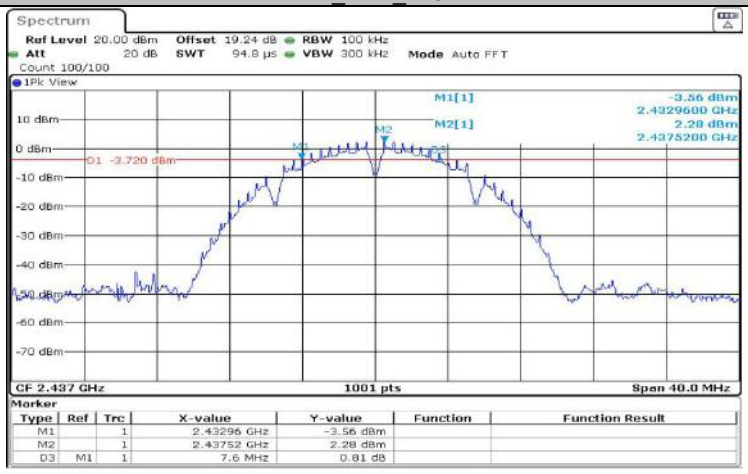
11B_Ant1_2412



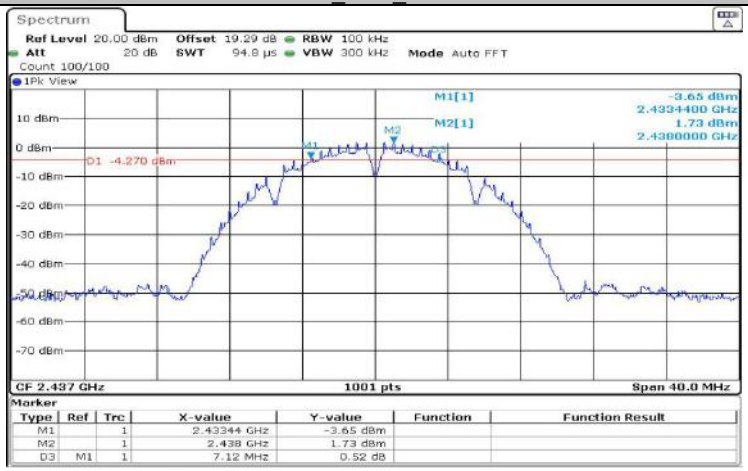
11B_Ant2_2412



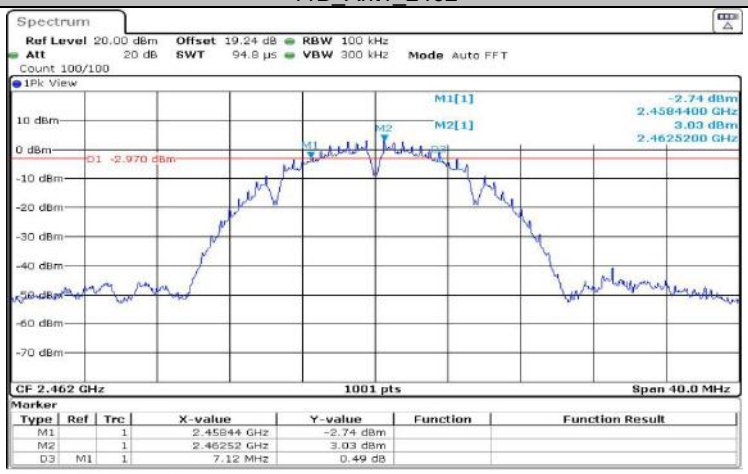
11B_Ant1_2437



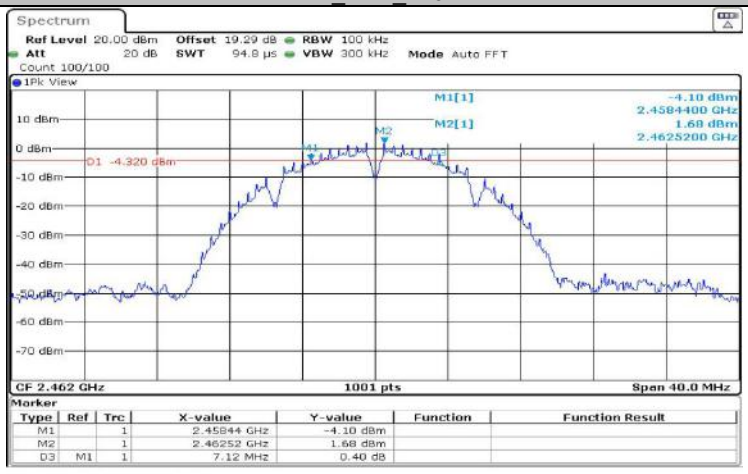
11B_Ant2_2437



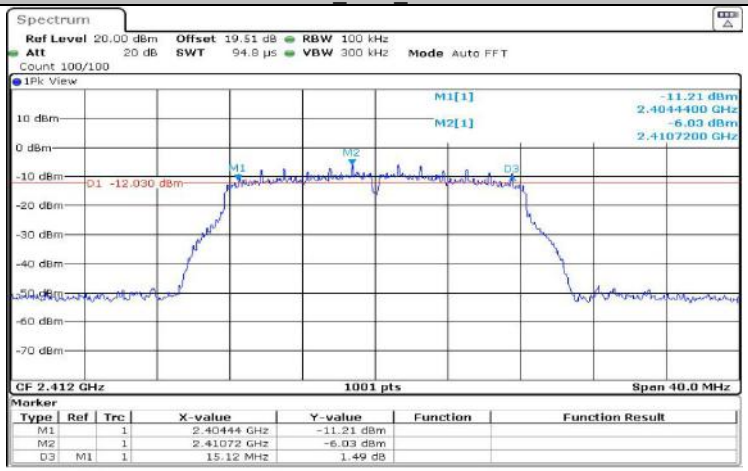
11B_Ant1_2462



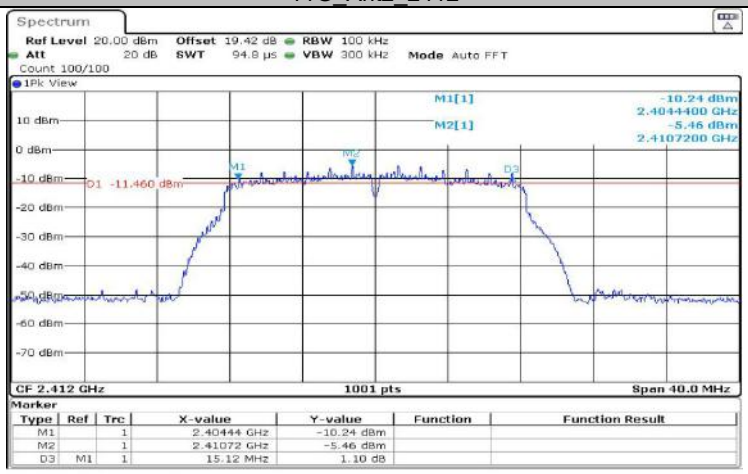
11B_Ant2_2462



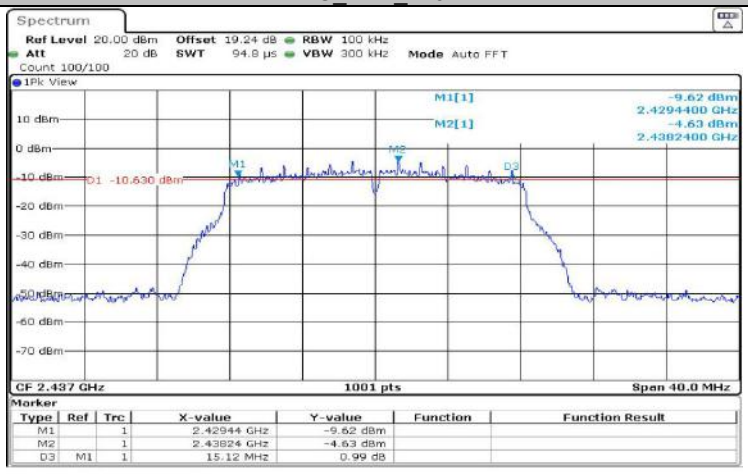
11G_Ant1_2412



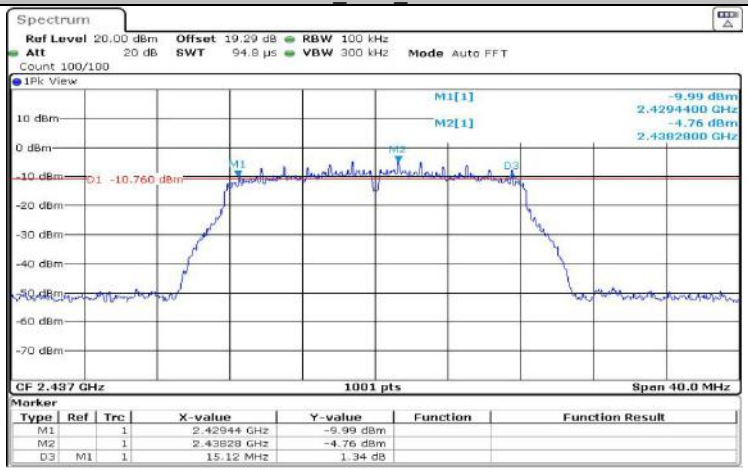
11G_Ant2_2412



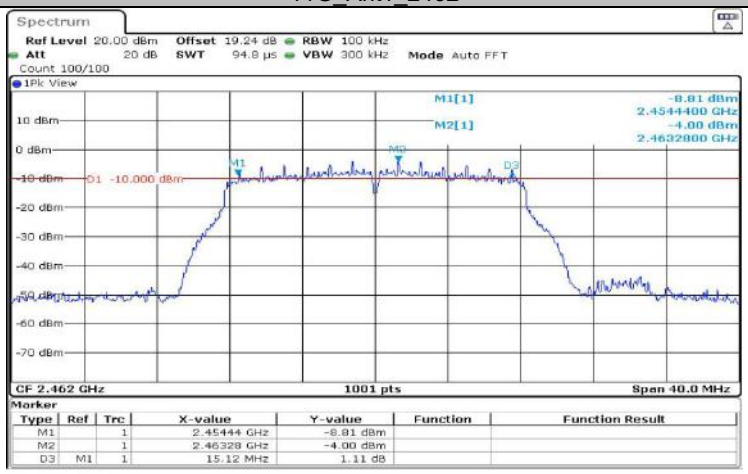
11G_Ant1_2437



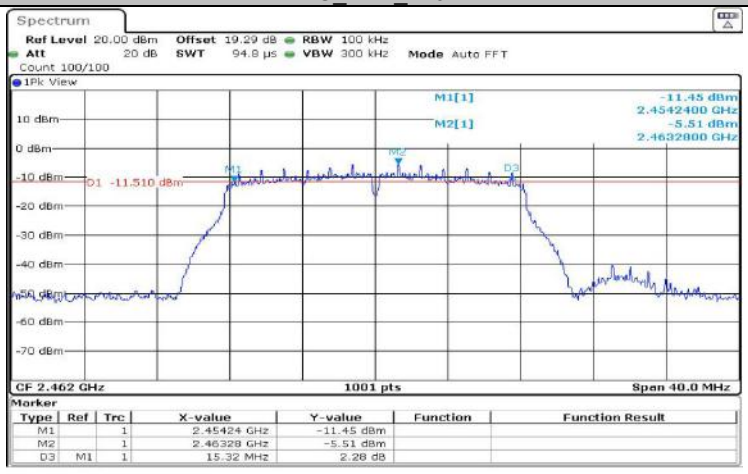
11G_Ant2_2437



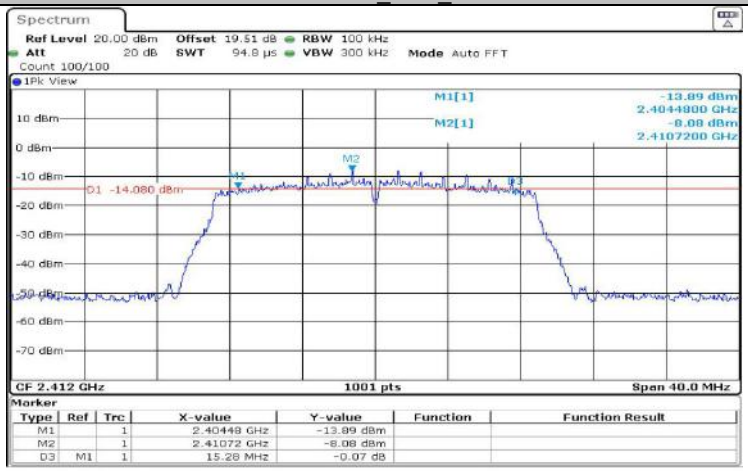
11G_Ant1_2462



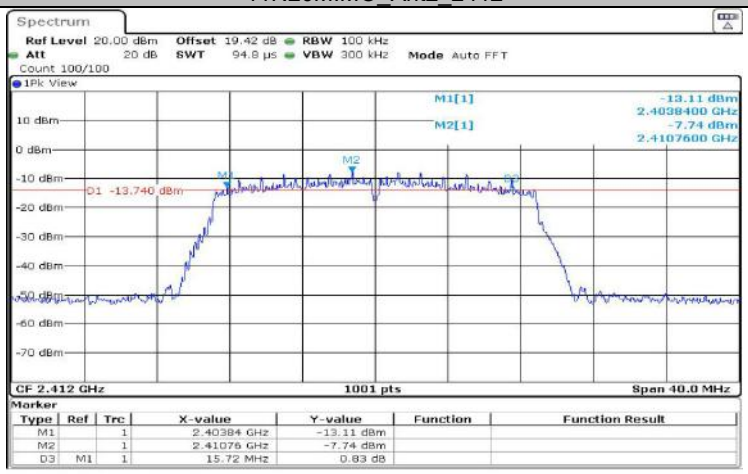
11G_Ant2_2462



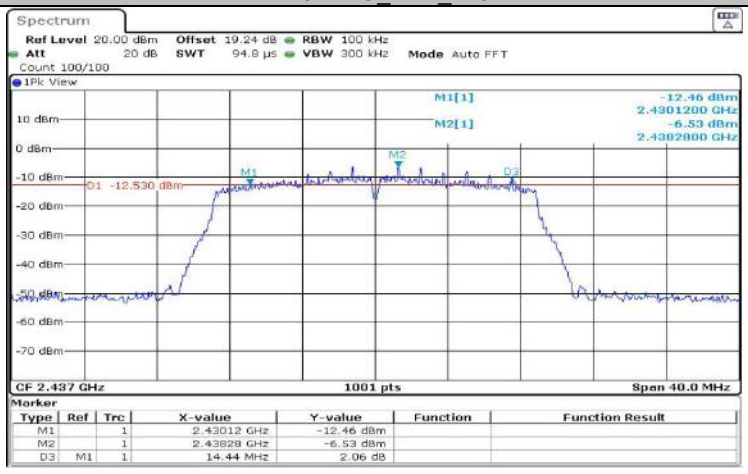
11N20MIMO_Ant1_2412



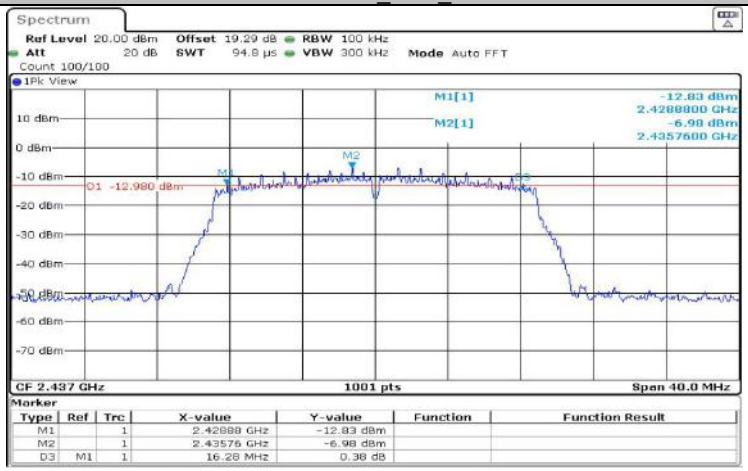
11N20MIMO_Ant2_2412



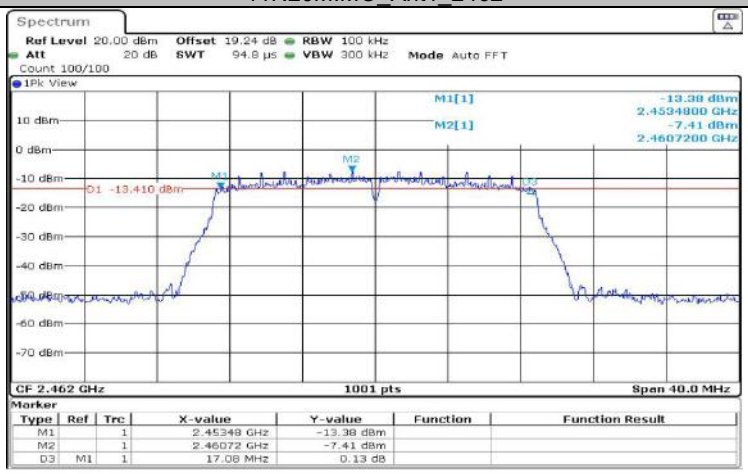
11N20MIMO_Ant1_2437



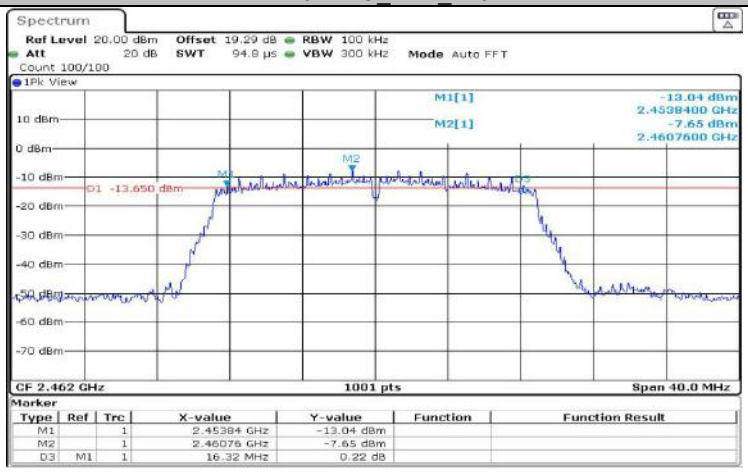
11N20MIMO_Ant2_2437



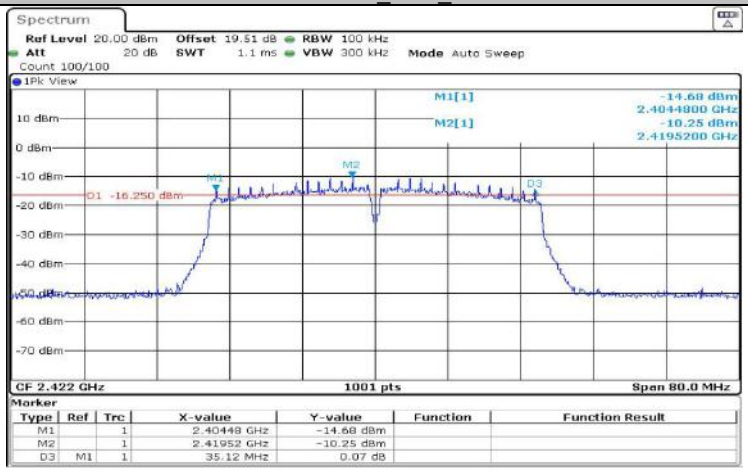
11N20MIMO_Ant1_2462



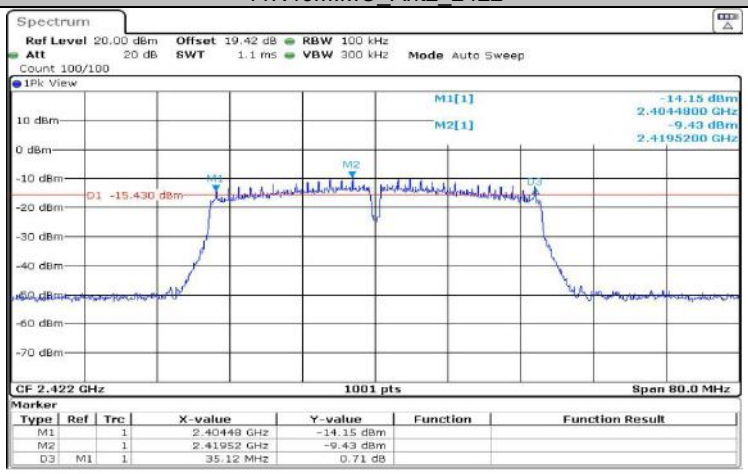
11N20MIMO_Ant2_2462



11N40MIMO_Ant1_2422



11N40MIMO_Ant2_2422



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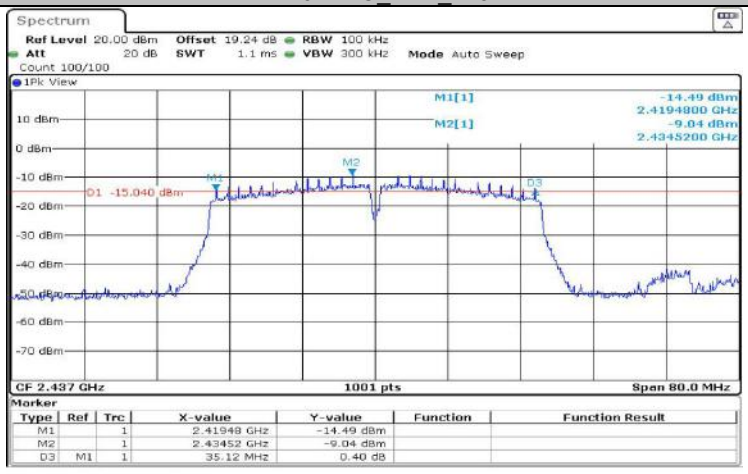
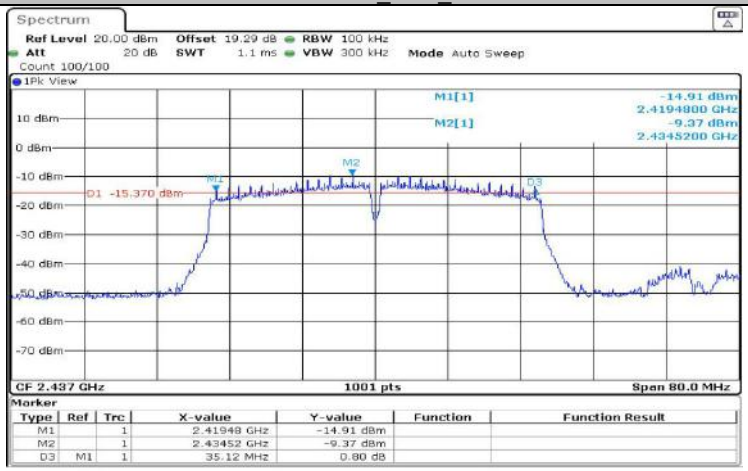
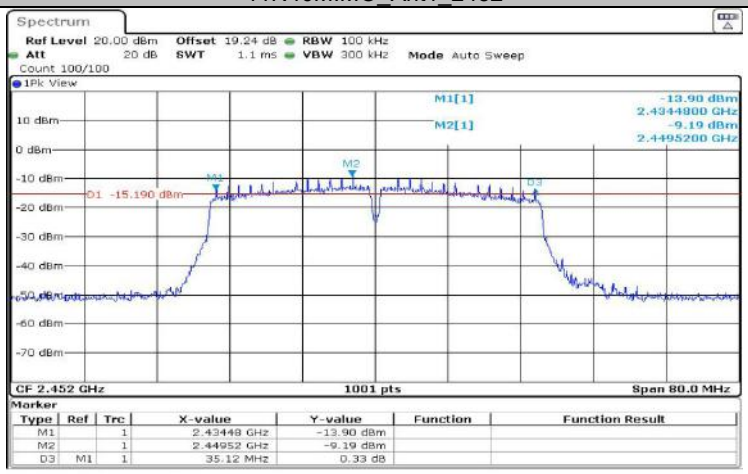


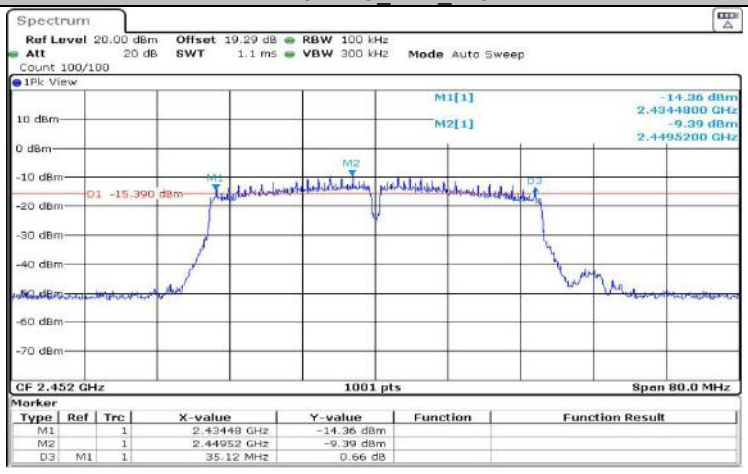
11N40MIMO_Ant2_2437



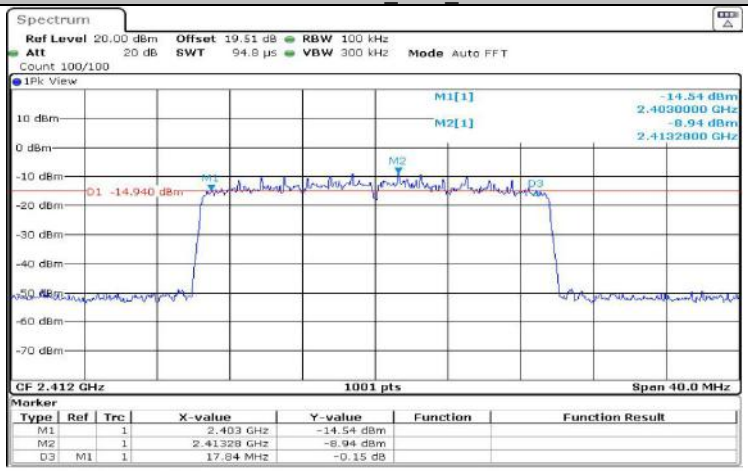
11N40MIMO_Ant1_2452



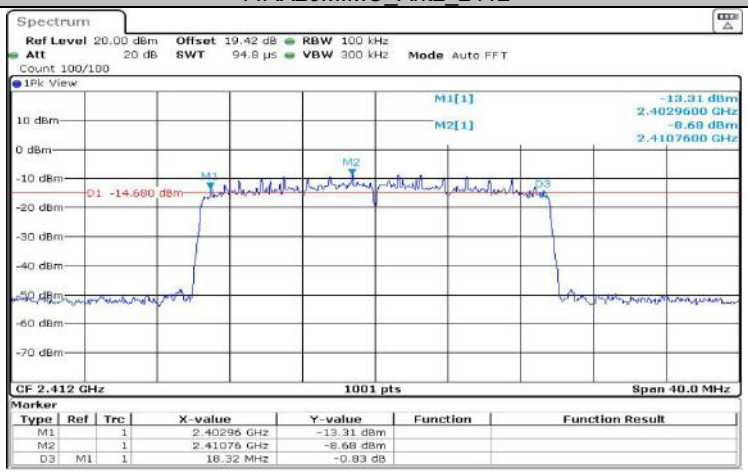
11N40MIMO_Ant2_2452



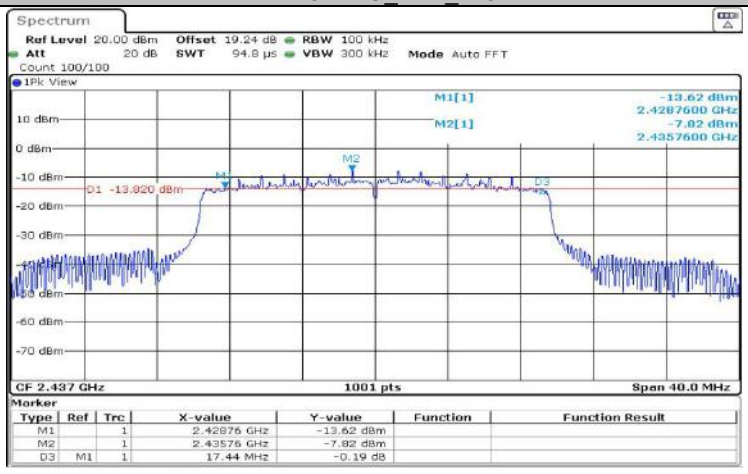
11AX20MIMO_Ant1_2412



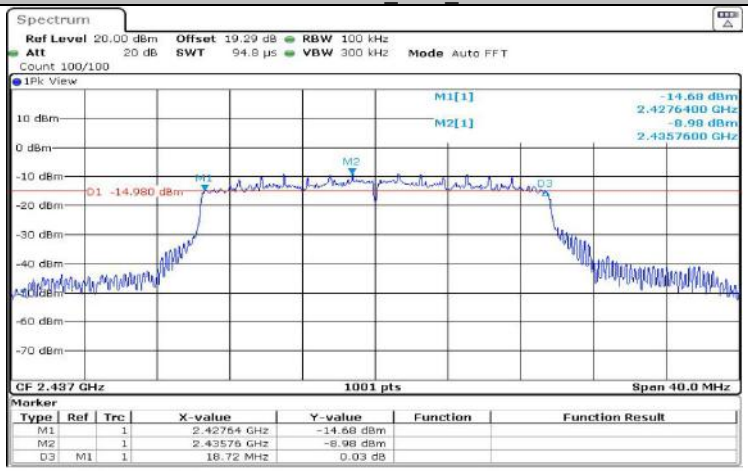
11AX20MIMO_Ant2_2412



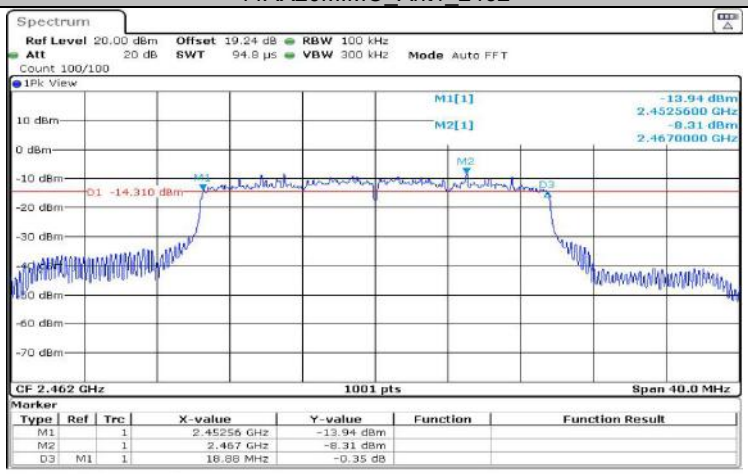
11AX20MIMO_Ant1_2437



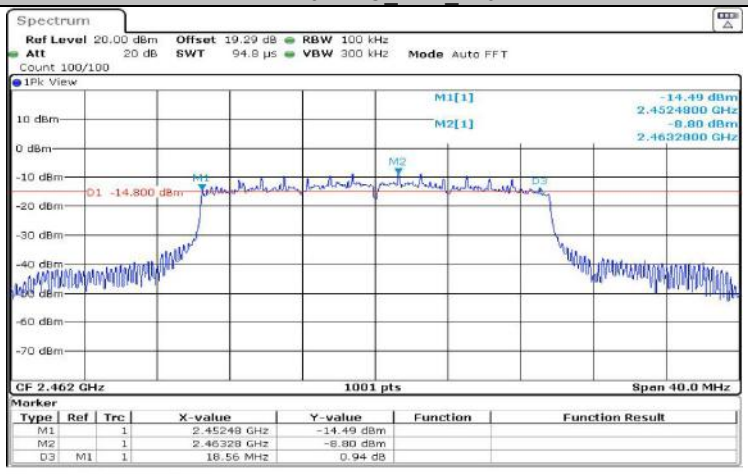
11AX20MIMO_Ant2_2437



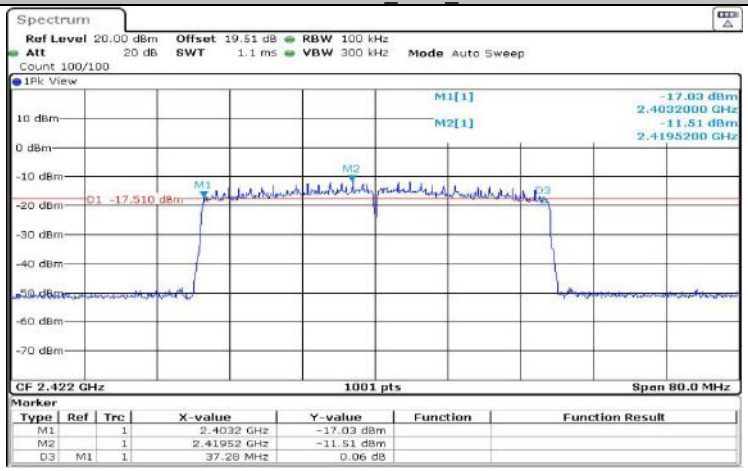
11AX20MIMO_Ant1_2462



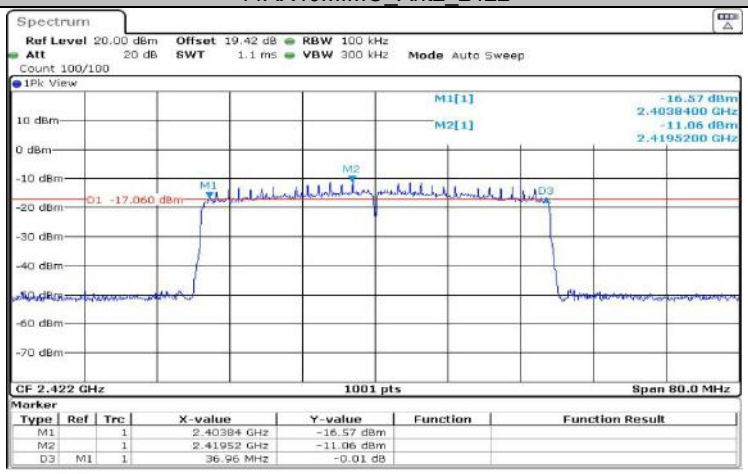
11AX20MIMO_Ant2_2462



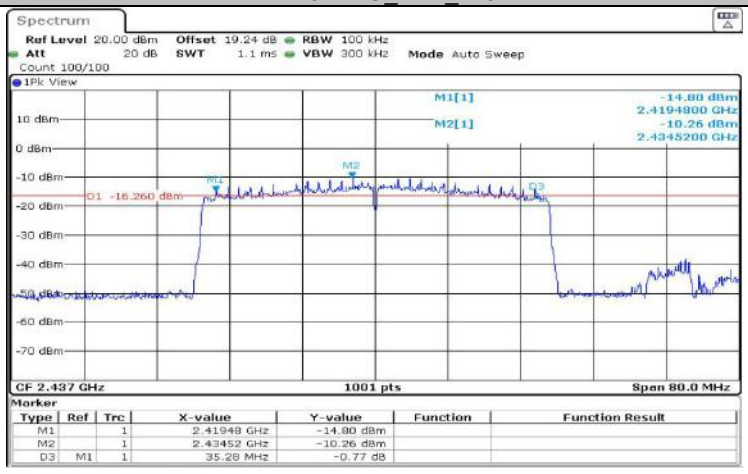
11AX40MIMO_Ant1_2422



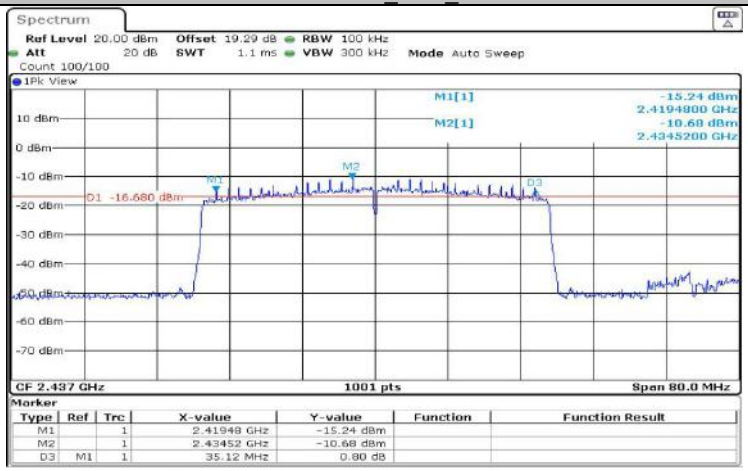
11AX40MIMO_Ant2_2422



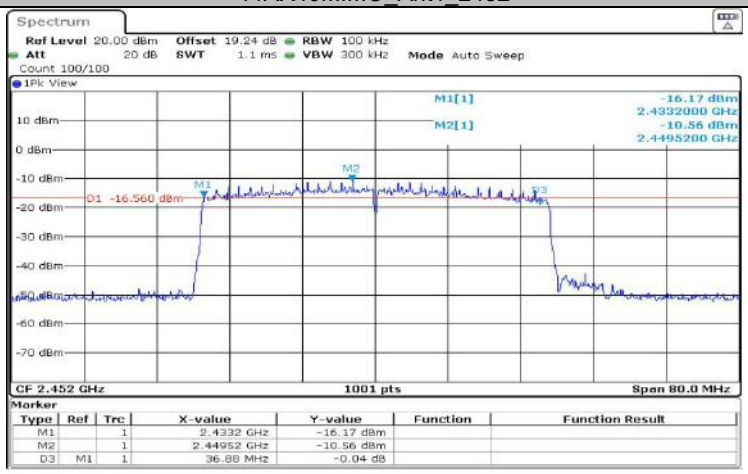
11AX40MIMO_Ant1_2437



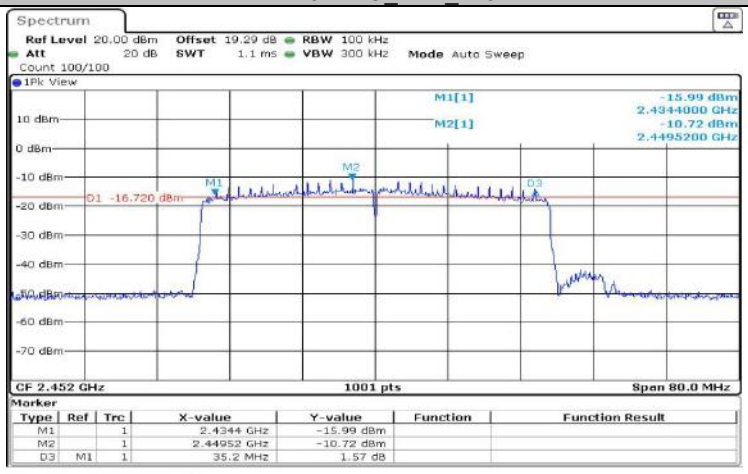
11AX40MIMO_Ant2_2437



11AX40MIMO_Ant1_2452



11AX40MIMO_Ant2_2452



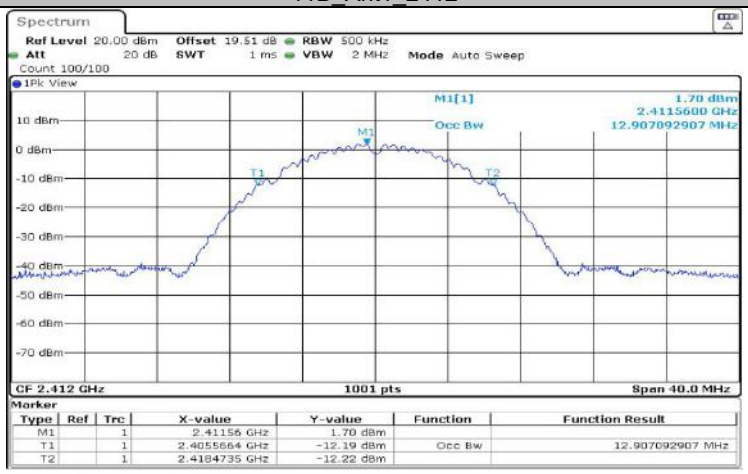
Appendix B: Occupied Channel Bandwidth

Test Result

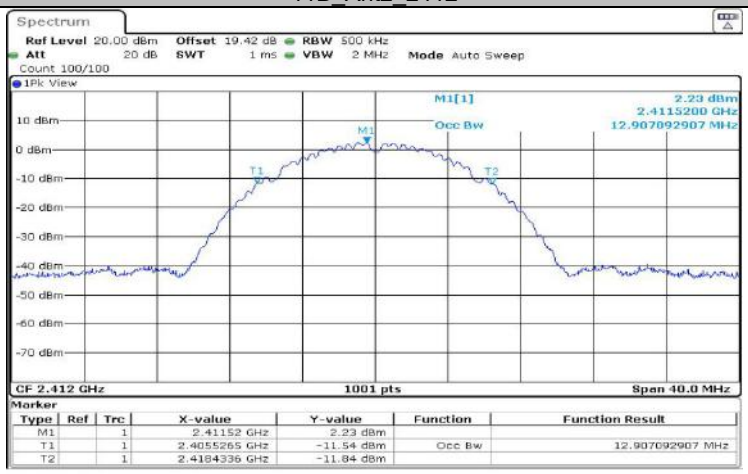
Test Mode	Antenna	Channel	OCB [MHz]	Limit[MHz]	Verdict
11B	Ant1	2412	12.907	---	---
	Ant2	2412	12.907	---	---
	Ant1	2437	12.787	---	---
	Ant2	2437	12.827	---	---
	Ant1	2462	12.907	---	---
	Ant2	2462	12.947	---	---
11G	Ant1	2412	17.263	---	---
	Ant2	2412	17.303	---	---
	Ant1	2437	17.143	---	---
	Ant2	2437	17.223	---	---
	Ant1	2462	17.263	---	---
	Ant2	2462	17.263	---	---
11N20MIMO	Ant1	2412	18.102	---	---
	Ant2	2412	17.782	---	---
	Ant1	2437	17.982	---	---
	Ant2	2437	17.742	---	---
11N40MIMO	Ant1	2422	36.523	---	---
	Ant2	2422	36.364	---	---
	Ant1	2437	36.284	---	---
	Ant2	2437	36.204	---	---
	Ant1	2452	36.444	---	---
	Ant2	2452	36.284	---	---
11AX20MIMO	Ant1	2412	18.861	---	---
	Ant2	2412	18.861	---	---
	Ant1	2437	19.341	---	---
	Ant2	2437	19.261	---	---
	Ant1	2462	19.381	---	---
	Ant2	2462	19.341	---	---
11AX40MIMO	Ant1	2422	37.882	---	---
	Ant2	2422	37.802	---	---
	Ant1	2437	37.722	---	---
	Ant2	2437	37.642	---	---
	Ant1	2452	37.802	---	---
	Ant2	2452	37.722	---	---

Test Graphs

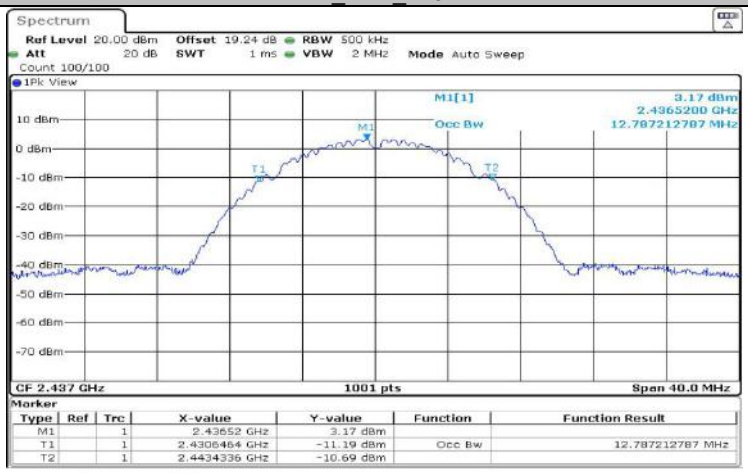
11B_Ant1_2412



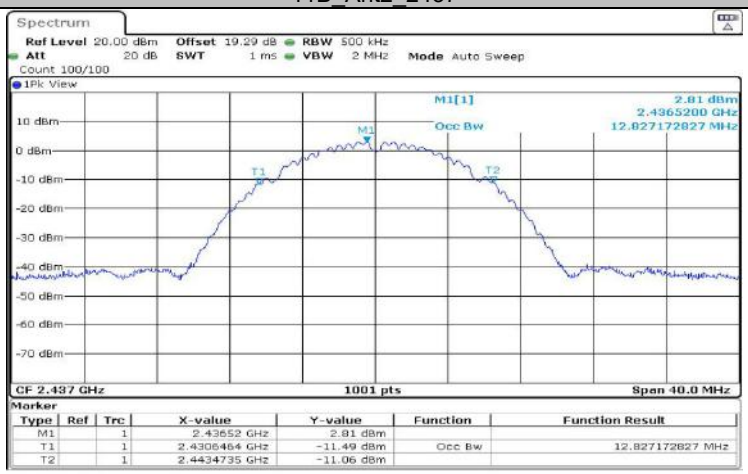
11B_Ant2_2412



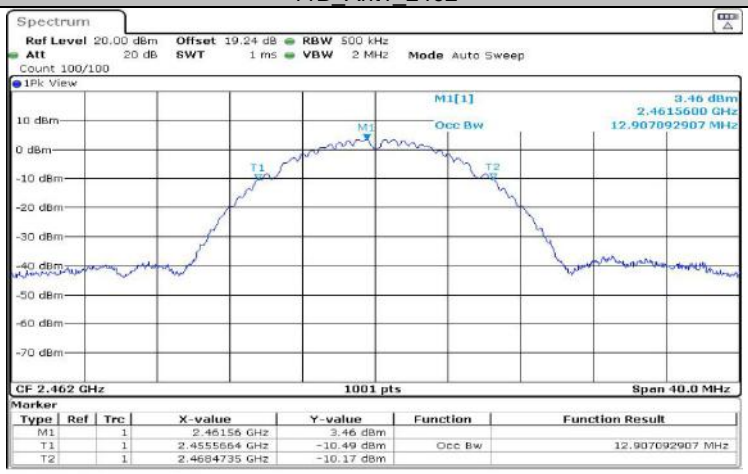
11B_Ant1_2437



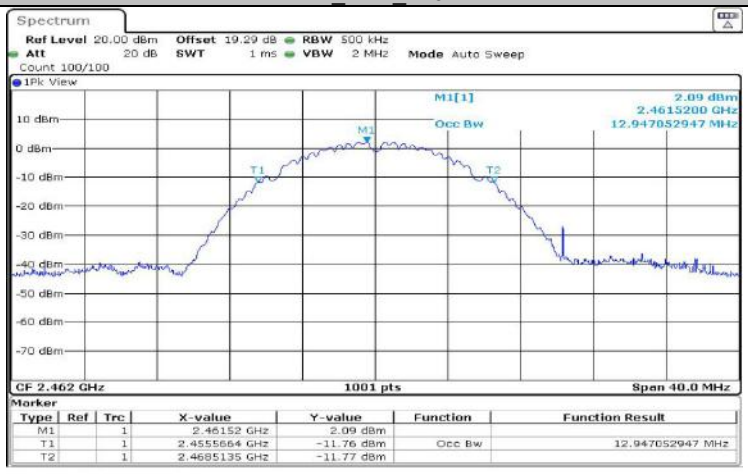
11B_Ant2_2437



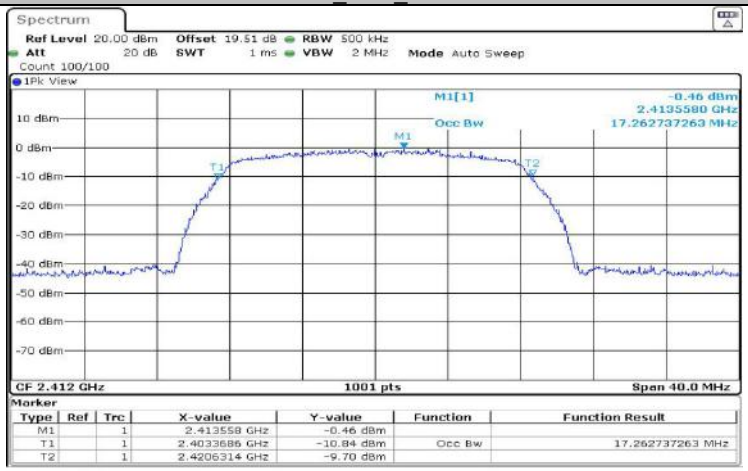
11B_Ant1_2462



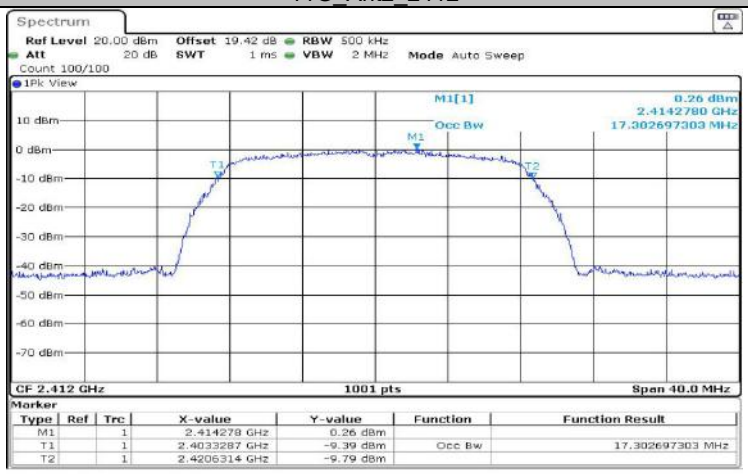
11B_Ant2_2462



11G_Ant1_2412

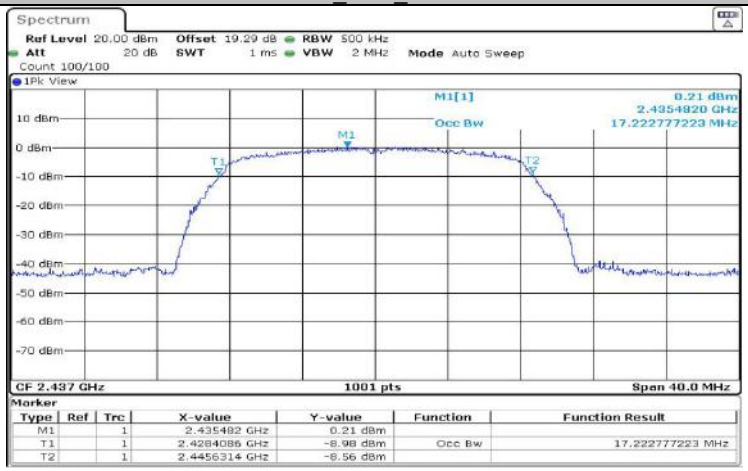


11G_Ant2_2412

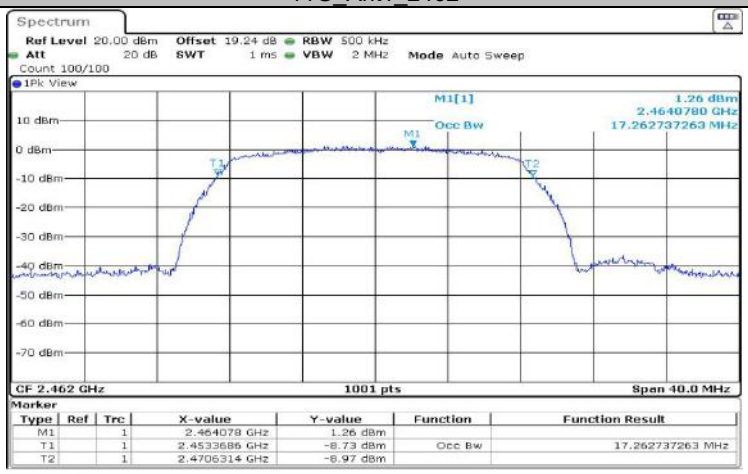


11G_Ant1_2437

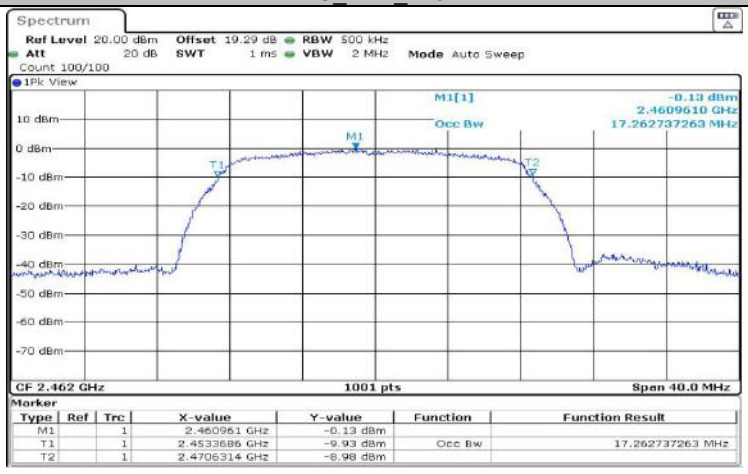
11G_Ant2_2437



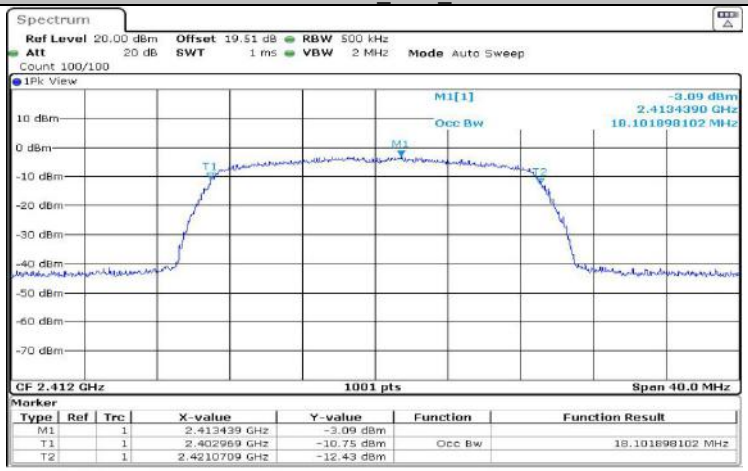
11G_Ant1_2462



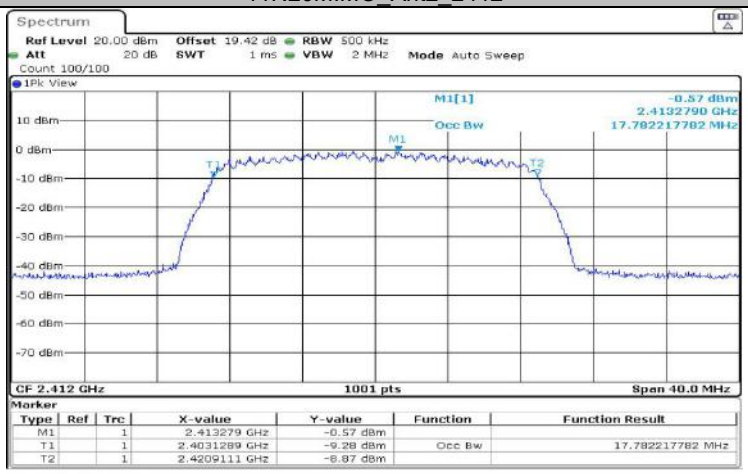
11G_Ant2_2462



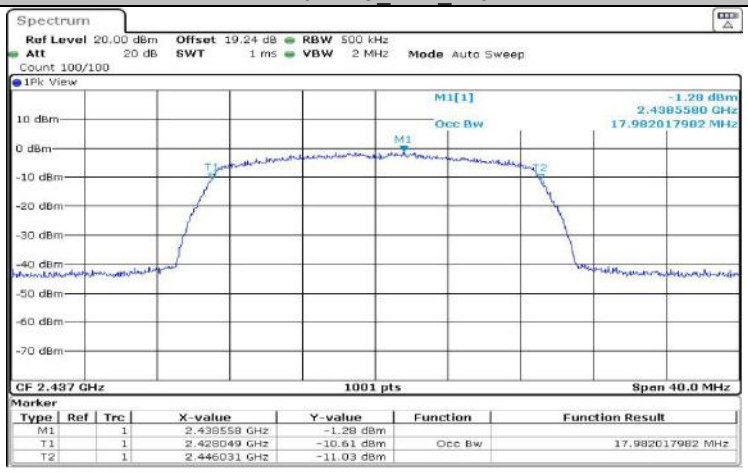
11N20MIMO_Ant1_2412



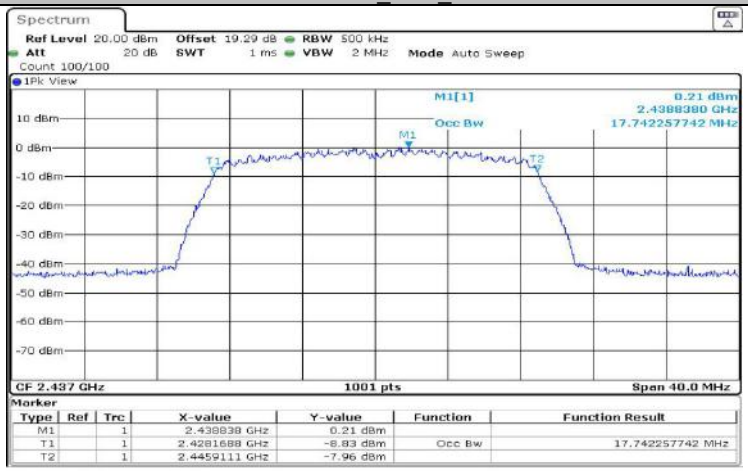
11N20MIMO_Ant2_2412



11N20MIMO_Ant1_2437

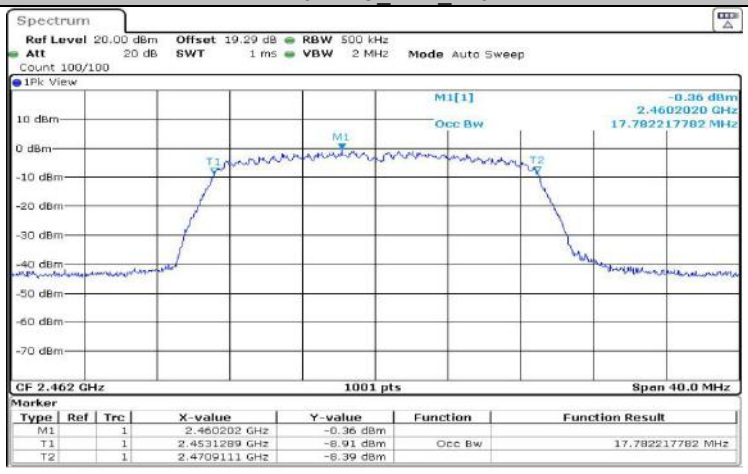


11N20MIMO_Ant2_2437

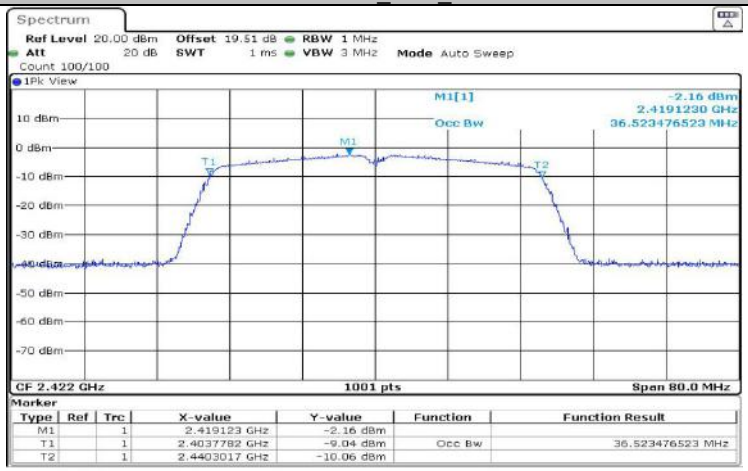


11N20MIMO_Ant1_2462

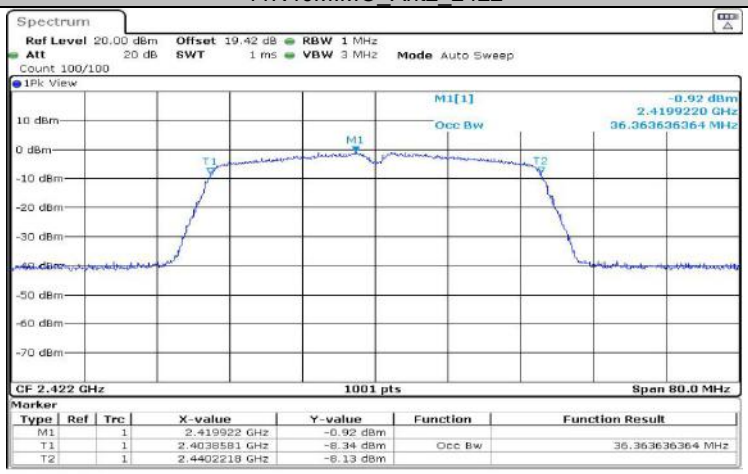
11N20MIMO_Ant2_2462



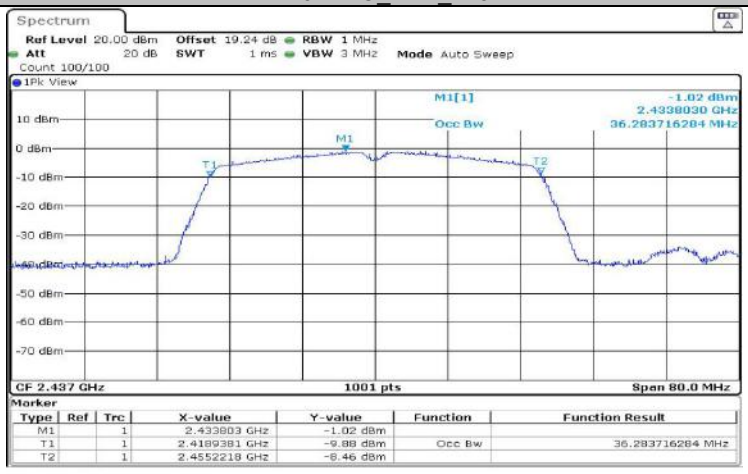
11N40MIMO_Ant1_2422



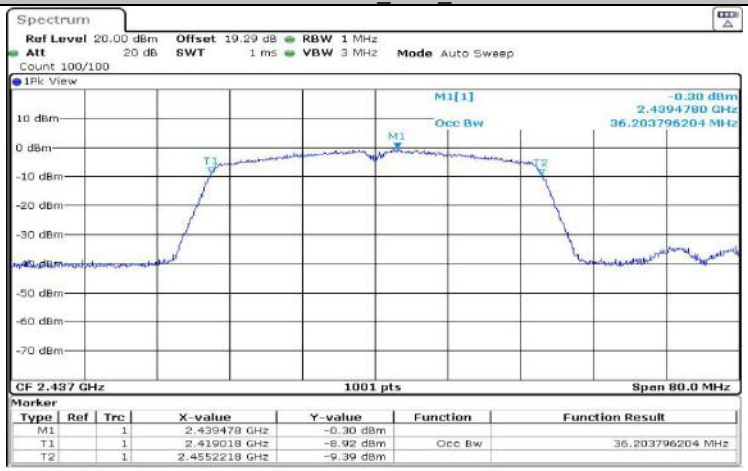
11N40MIMO_Ant2_2422



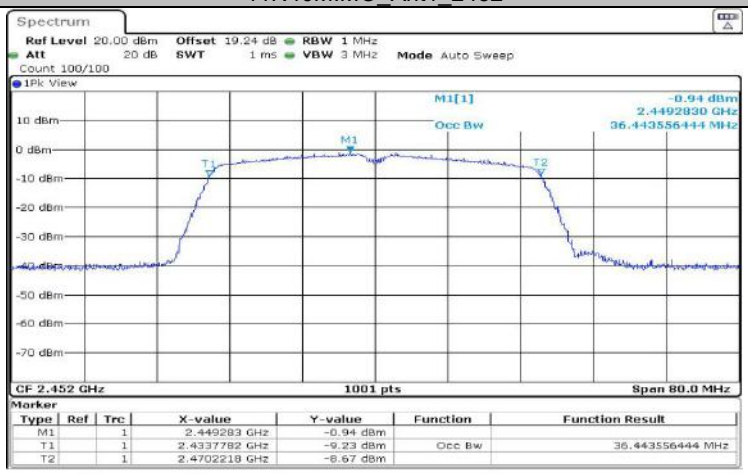
11N40MIMO_Ant1_2437



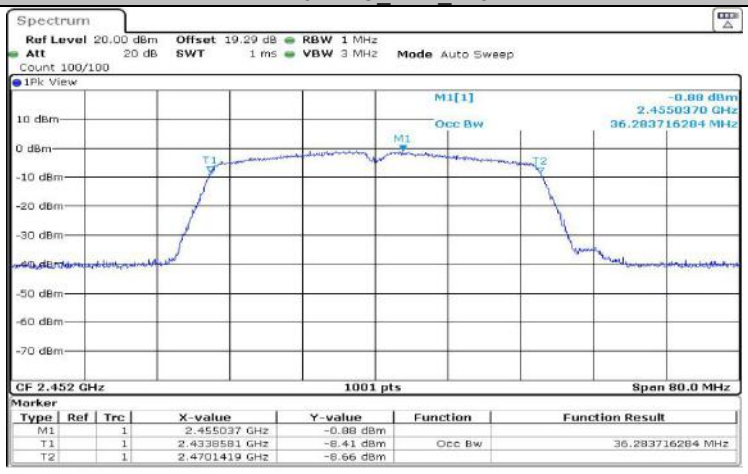
11N40MIMO_Ant2_2437



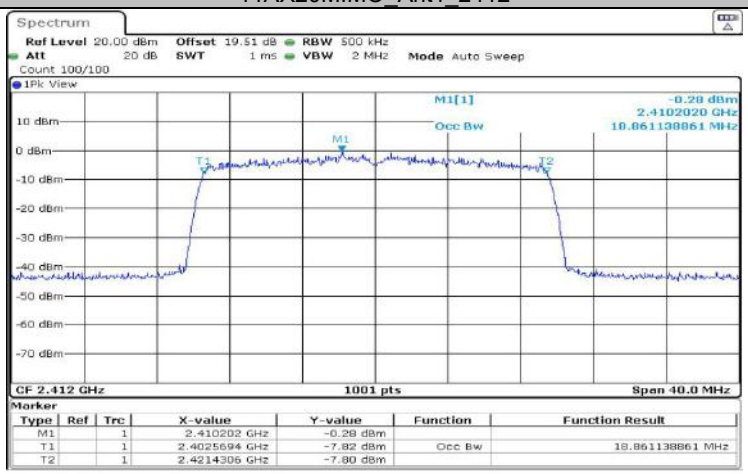
11N40MIMO_Ant1_2452



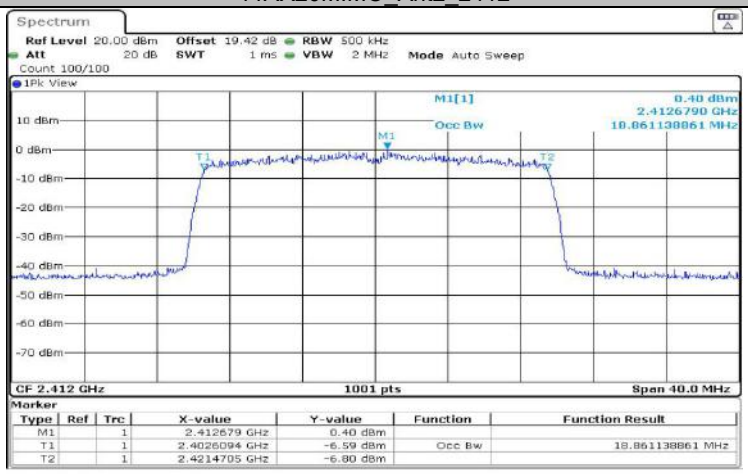
11N40MIMO_Ant2_2452



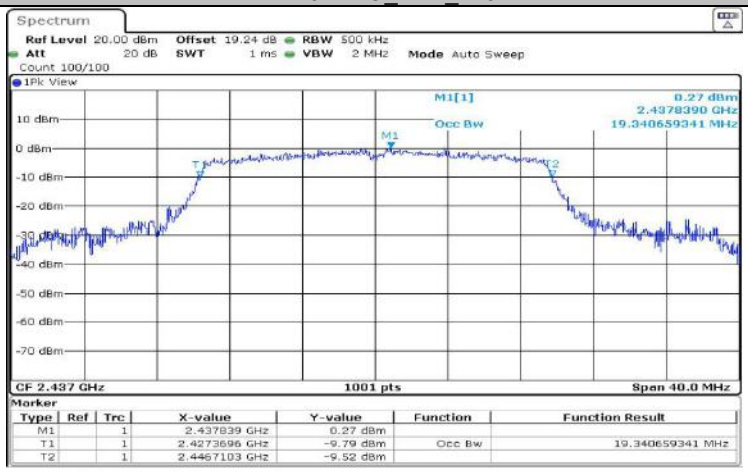
11AX20MIMO_Ant1_2412



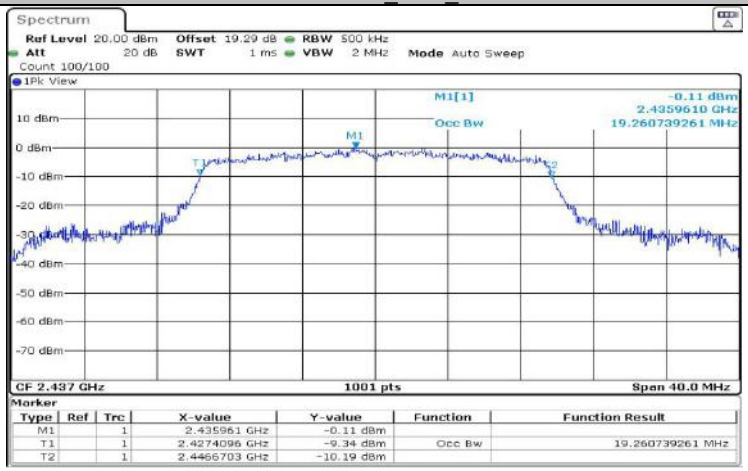
11AX20MIMO_Ant2_2412



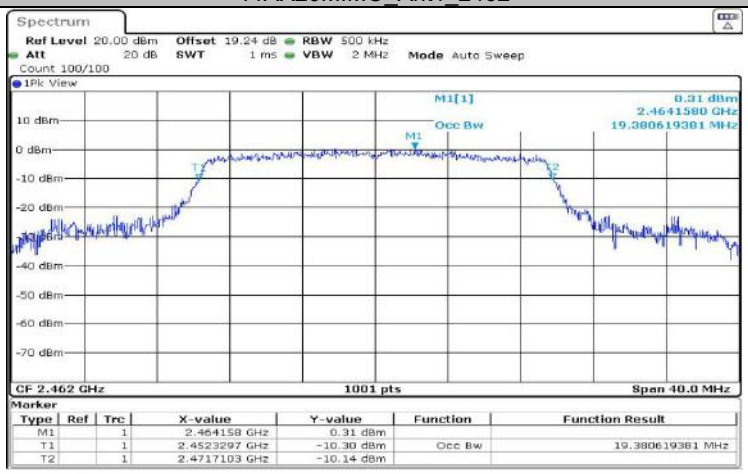
11AX20MIMO_Ant1_2437



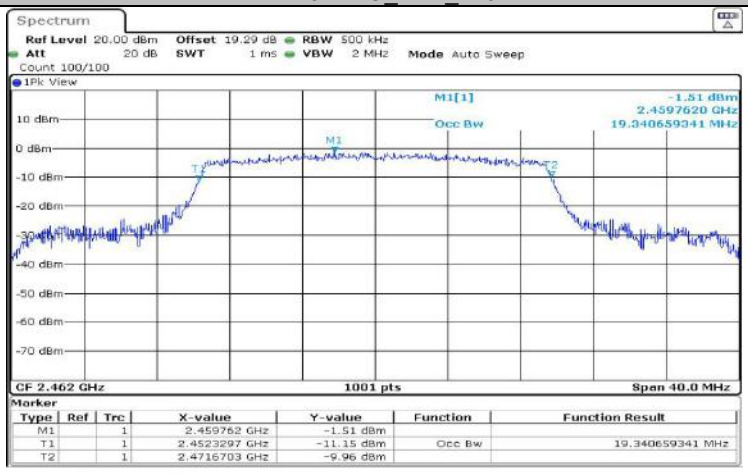
11AX20MIMO_Ant2_2437



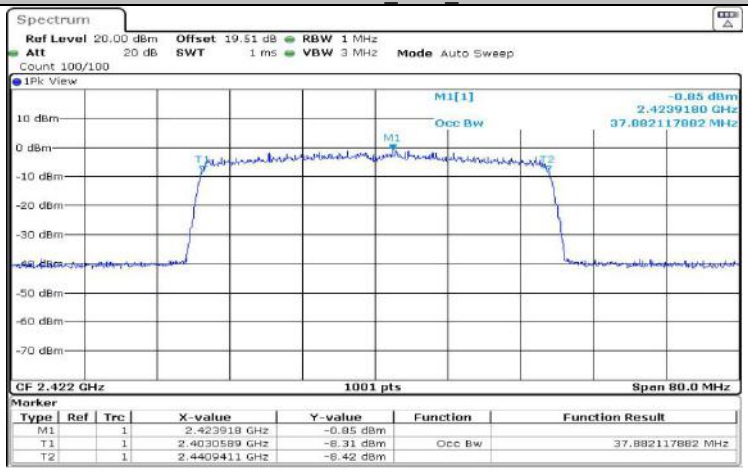
11AX20MIMO_Ant1_2462



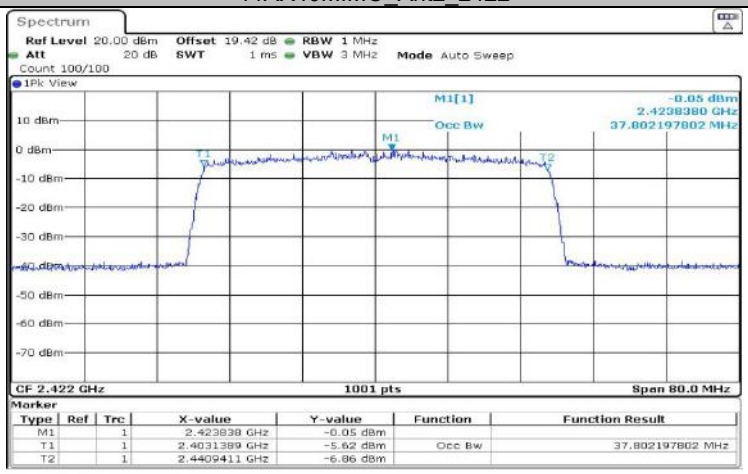
11AX20MIMO_Ant2_2462



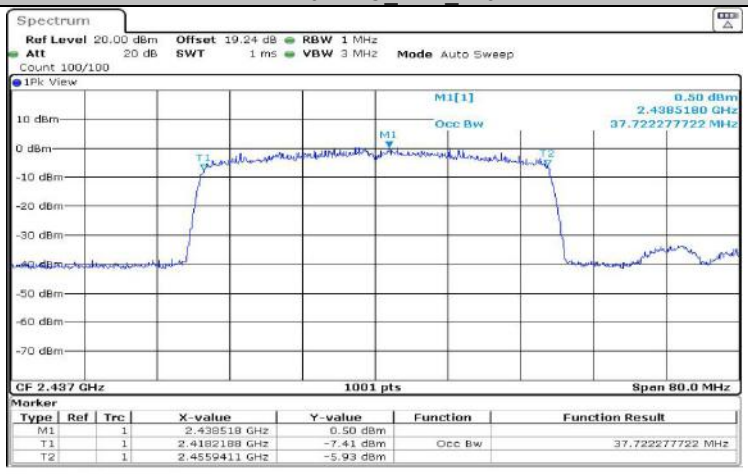
11AX40MIMO_Ant1_2422



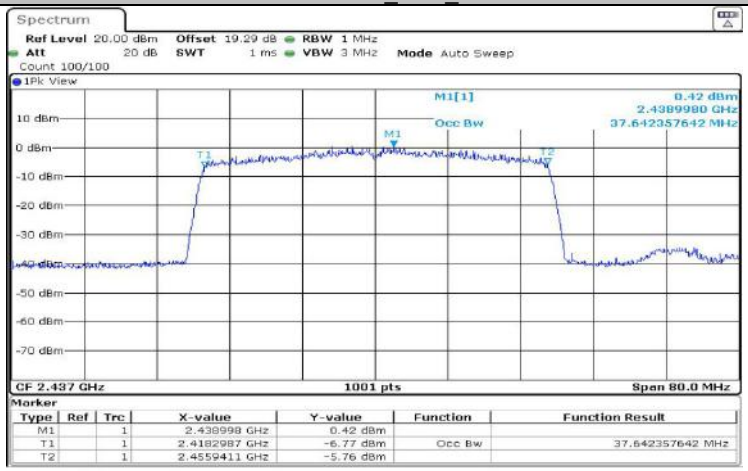
11AX40MIMO_Ant2_2422



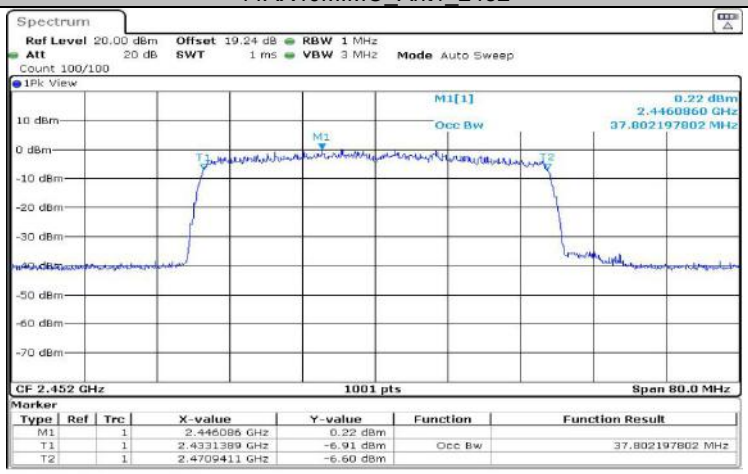
11AX40MIMO_Ant1_2437



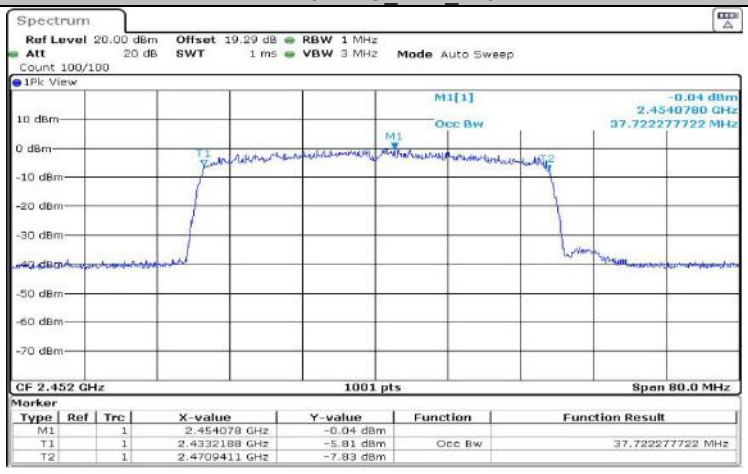
11AX40MIMO_Ant2_2437



11AX40MIMO_Ant1_2452



11AX40MIMO_Ant2_2452



Appendix C: Maximum conducted output power

Test Result

TestMode	Antenna	Channel	Result[dBm]	Limit[dBm]	Verdict
11B	Ant1	2412	12.36	≤30.00	PASS
	Ant2	2412	12.88	≤30.00	PASS
	Ant1	2437	13.82	≤30.00	PASS
	Ant2	2437	13.47	≤30.00	PASS
	Ant1	2462	14.14	≤30.00	PASS
	Ant2	2462	12.75	≤30.00	PASS
11G	Ant1	2412	11.96	≤30.00	PASS
	Ant2	2412	12.51	≤30.00	PASS
	Ant1	2437	13.38	≤30.00	PASS
	Ant2	2437	12.99	≤30.00	PASS
	Ant1	2462	13.83	≤30.00	PASS
	Ant2	2462	12.40	≤30.00	PASS
11N20MIMO	Ant1	2412	9.77	≤30.00	PASS
	Ant2	2412	10.72	≤30.00	PASS
	total	2412	13.28	≤30.00	PASS
	Ant1	2437	11.18	≤30.00	PASS
	Ant2	2437	11.19	≤30.00	PASS
	total	2437	14.20	≤30.00	PASS
	Ant1	2462	11.62	≤30.00	PASS
	Ant2	2462	10.62	≤30.00	PASS
	total	2462	14.16	≤30.00	PASS
11N40MIMO	Ant1	2422	9.76	≤30.00	PASS
	Ant2	2422	10.76	≤30.00	PASS
	total	2422	13.30	≤30.00	PASS
	Ant1	2437	10.88	≤30.00	PASS
	Ant2	2437	10.85	≤30.00	PASS
	total	2437	13.88	≤30.00	PASS
	Ant1	2452	10.75	≤30.00	PASS
	Ant2	2452	10.76	≤30.00	PASS
	total	2452	13.77	≤30.00	PASS

Test Mode	Antenna	Frequency [MHz]	Ru Size	Ru Index	Peak Powert[dBm]	Conducted Limit[dBm]	Verdict
11AX20MIMO	Ant1	2412	26Tone	RU0	1.41	≤30.00	PASS
				RU8	0.99	≤30.00	PASS
			52Tone	RU37	4.24	≤30.00	PASS
				RU40	3.93	≤30.00	PASS
			106Tone	RU53	6.00	≤30.00	PASS
				RU54	5.72	≤30.00	PASS
			242Tone	RU61	10.22	≤30.00	PASS
	Ant2	2412	26Tone	RU0	0.74	≤30.00	PASS
				RU8	0.41	≤30.00	PASS
			52Tone	RU37	3.49	≤30.00	PASS
				RU40	3.13	≤30.00	PASS
			106Tone	RU53	5.79	≤30.00	PASS
				RU54	5.46	≤30.00	PASS
			242Tone	RU61	10.04	≤30.00	PASS
	total	2412	26Tone	RU0	4.10	≤30.00	PASS
				RU8	3.72	≤30.00	PASS
			52Tone	RU37	6.89	≤30.00	PASS
				RU40	6.56	≤30.00	PASS
			106Tone	RU53	8.91	≤30.00	PASS
				RU54	8.60	≤30.00	PASS
			242Tone	RU61	13.14	≤30.00	PASS
	Ant1	2437	26Tone	RU0	1.14	≤30.00	PASS
				RU8	1.05	≤30.00	PASS
			52Tone	RU37	3.74	≤30.00	PASS
				RU40	3.86	≤30.00	PASS
			106Tone	RU53	4.54	≤30.00	PASS
				RU54	4.62	≤30.00	PASS
			242Tone	RU61	10.57	≤30.00	PASS
	Ant2	2437	26Tone	RU0	0.47	≤30.00	PASS
				RU8	0.31	≤30.00	PASS
			52Tone	RU37	3.00	≤30.00	PASS
				RU40	3.24	≤30.00	PASS
			106Tone	RU53	5.01	≤30.00	PASS
				RU54	4.58	≤30.00	PASS
			242Tone	RU61	10.41	≤30.00	PASS
	total	2437	26Tone	RU0	3.83	≤30.00	PASS
				RU8	3.71	≤30.00	PASS
			52Tone	RU37	6.40	≤30.00	PASS
				RU40	6.57	≤30.00	PASS
			106Tone	RU53	7.79	≤30.00	PASS
				RU54	7.61	≤30.00	PASS
			242Tone	RU61	13.50	≤30.00	PASS
	Ant1	2462	26Tone	RU0	1.13	≤30.00	PASS
				RU8	0.98	≤30.00	PASS
			52Tone	RU37	4.48	≤30.00	PASS
				RU40	3.65	≤30.00	PASS
			106Tone	RU53	5.75	≤30.00	PASS
				RU54	5.58	≤30.00	PASS
			242Tone	RU61	10.99	≤30.00	PASS
	Ant2	2462	26Tone	RU0	0.48	≤30.00	PASS
				RU8	0.69	≤30.00	PASS

			52Tone	RU37	2.77	≤30.00	PASS
				RU40	2.16	≤30.00	PASS
			106Tone	RU53	4.69	≤30.00	PASS
				RU54	4.57	≤30.00	PASS
			242Tone	RU61	9.96	≤30.00	PASS
	total	2462	26Tone	RU0	3.83	≤30.00	PASS
				RU8	3.85	≤30.00	PASS
			52Tone	RU37	6.72	≤30.00	PASS
				RU40	5.98	≤30.00	PASS
			106Tone	RU53	8.26	≤30.00	PASS
				RU54	8.11	≤30.00	PASS
			242Tone	RU61	13.52	≤30.00	PASS
11AX40MIMO	Ant1	2422	26Tone	RU0	0.64	≤30.00	PASS
				RU17	1.37	≤30.00	PASS
			52Tone	RU37	0.54	≤30.00	PASS
				RU44	0.93	≤30.00	PASS
			106Tone	RU53	2.90	≤30.00	PASS
				RU56	2.95	≤30.00	PASS
			242Tone	RU61	5.50	≤30.00	PASS
				RU62	5.82	≤30.00	PASS
			484Tone	RU65	10.46	≤30.00	PASS
	Ant2	2422	26Tone	RU0	0.16	≤30.00	PASS
				RU17	0.58	≤30.00	PASS
			52Tone	RU37	0.18	≤30.00	PASS
				RU44	0.12	≤30.00	PASS
			106Tone	RU53	2.17	≤30.00	PASS
				RU56	2.27	≤30.00	PASS
			242Tone	RU61	5.34	≤30.00	PASS
				RU62	5.49	≤30.00	PASS
			484Tone	RU65	10.15	≤30.00	PASS
	total	2422	26Tone	RU0	3.42	≤30.00	PASS
				RU17	4.00	≤30.00	PASS
			52Tone	RU37	3.37	≤30.00	PASS
				RU44	3.55	≤30.00	PASS
			106Tone	RU53	5.56	≤30.00	PASS
				RU56	5.63	≤30.00	PASS
			242Tone	RU61	8.43	≤30.00	PASS
				RU62	8.67	≤30.00	PASS
			484Tone	RU65	13.32	≤30.00	PASS
	Ant1	2437	26Tone	RU0	0.67	≤30.00	PASS
				RU17	0.82	≤30.00	PASS
			52Tone	RU37	1.15	≤30.00	PASS
				RU44	0.82	≤30.00	PASS
			106Tone	RU53	3.48	≤30.00	PASS
				RU56	3.65	≤30.00	PASS
			242Tone	RU61	7.16	≤30.00	PASS
				RU62	7.26	≤30.00	PASS
			484Tone	RU65	10.29	≤30.00	PASS
	Ant2	2437	26Tone	RU0	0.52	≤30.00	PASS
				RU17	0.73	≤30.00	PASS
			52Tone	RU37	0.50	≤30.00	PASS
				RU44	0.61	≤30.00	PASS
			106Tone	RU53	2.89	≤30.00	PASS
				RU56	3.32	≤30.00	PASS
			242Tone	RU61	7.02	≤30.00	PASS

				RU62	7.20	≤30.00	PASS
			484Tone	RU65	10.11	≤30.00	PASS
	total	2437	26Tone	RU0	3.61	≤30.00	PASS
				RU17	3.79	≤30.00	PASS
			52Tone	RU37	3.85	≤30.00	PASS
				RU44	3.73	≤30.00	PASS
			106Tone	RU53	6.21	≤30.00	PASS
				RU56	6.50	≤30.00	PASS
			242Tone	RU61	10.10	≤30.00	PASS
				RU62	10.24	≤30.00	PASS
			484Tone	RU65	13.21	≤30.00	PASS
	Ant1	2452	26Tone	RU0	1.03	≤30.00	PASS
				RU17	0.32	≤30.00	PASS
			52Tone	RU37	-0.06	≤30.00	PASS
				RU44	1.39	≤30.00	PASS
			106Tone	RU53	4.21	≤30.00	PASS
				RU56	3.97	≤30.00	PASS
			242Tone	RU61	6.17	≤30.00	PASS
				RU62	5.83	≤30.00	PASS
			484Tone	RU65	10.67	≤30.00	PASS
	Ant2	2452	26Tone	RU0	0.08	≤30.00	PASS
				RU17	-0.17	≤30.00	PASS
			52Tone	RU37	0.85	≤30.00	PASS
				RU44	0.97	≤30.00	PASS
			106Tone	RU53	4.18	≤30.00	PASS
				RU56	3.97	≤30.00	PASS
			242Tone	RU61	5.99	≤30.00	PASS
				RU62	5.79	≤30.00	PASS
			484Tone	RU65	10.57	≤30.00	PASS
	total	2452	26Tone	RU0	3.59	≤30.00	PASS
				RU17	3.09	≤30.00	PASS
			52Tone	RU37	3.43	≤30.00	PASS
				RU44	4.20	≤30.00	PASS
			106Tone	RU53	7.21	≤30.00	PASS
				RU56	6.98	≤30.00	PASS
			242Tone	RU61	9.09	≤30.00	PASS
				RU62	8.82	≤30.00	PASS
			484Tone	RU65	13.63	≤30.00	PASS

Note:

For 802.11 n/ax mode, EUT support CDD

Directional gain = GANT + Array Gain

For Power measurement, Array Gain=0 for Nant<4

Directional gain=3dBi+0dB=3dBi<6dBi

Appendix D: Maximum power spectral density

Test Result

Test Mode	Antenna	Channel	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
11B	Ant1	2412	-12.32	≤8.00	PASS
	Ant2	2412	-11.33	≤8.00	PASS
	Ant1	2437	-10.23	≤8.00	PASS
	Ant2	2437	-11.29	≤8.00	PASS
	Ant1	2462	-10.4	≤8.00	PASS
	Ant2	2462	-11.47	≤8.00	PASS
11G	Ant1	2412	-19.72	≤8.00	PASS
	Ant2	2412	-18.35	≤8.00	PASS
	Ant1	2437	-17.39	≤8.00	PASS
	Ant2	2437	-17.52	≤8.00	PASS
	Ant1	2462	-17.03	≤8.00	PASS
	Ant2	2462	-17.56	≤8.00	PASS
11N20MIMO	Ant1	2412	-20.2	≤8.00	PASS
	Ant2	2412	-20.27	≤8.00	PASS
	total	2412	-17.22	≤8.00	PASS
	Ant1	2437	-19.73	≤8.00	PASS
	Ant2	2437	-19.46	≤8.00	PASS
	total	2437	-16.58	≤8.00	PASS
	Ant1	2462	-19.79	≤8.00	PASS
	Ant2	2462	-20.54	≤8.00	PASS
	total	2462	-17.14	≤8.00	PASS
11N40MIMO	Ant1	2422	-23.98	≤8.00	PASS
	Ant2	2422	-24.58	≤8.00	PASS
	total	2422	-21.26	≤8.00	PASS
	Ant1	2437	-22.9	≤8.00	PASS
	Ant2	2437	-23.15	≤8.00	PASS
	total	2437	-20.01	≤8.00	PASS
	Ant1	2452	-22.66	≤8.00	PASS
	Ant2	2452	-23.44	≤8.00	PASS
	total	2452	-20.02	≤8.00	PASS

Test Mode	Antenna	Frequency[MHz]	RuSize	RuIndex	Result [dBm/3kHz]	Limit [dBm/3kHz]	Verdict
11AX20MIMO	Ant1	2412	242Tone	RU61	-23.15	≤8.00	PASS
	Ant2	2412	242Tone	RU61	-23.9	≤8.00	PASS
	total	2412	242Tone	RU61	-20.50	≤8.00	PASS
	Ant1	2437	242Tone	RU61	-21.24	≤8.00	PASS
	Ant2	2437	242Tone	RU61	-22.29	≤8.00	PASS
	total	2437	242Tone	RU61	-18.72	≤8.00	PASS
	Ant1	2462	242Tone	RU61	-21.14	≤8.00	PASS
	Ant2	2462	242Tone	RU61	-21.88	≤8.00	PASS
	total	2462	242Tone	RU61	-18.48	≤8.00	PASS
11AX40MIMO	Ant1	2422	484Tone	RU65	-25.7	≤8.00	PASS
	Ant2	2422	484Tone	RU65	-26.86	≤8.00	PASS
	total	2422	484Tone	RU65	-23.23	≤8.00	PASS
	Ant1	2437	484Tone	RU65	-25.84	≤8.00	PASS
	Ant2	2437	484Tone	RU65	-25.27	≤8.00	PASS
	total	2437	484Tone	RU65	-22.54	≤8.00	PASS
	Ant1	2452	484Tone	RU65	-24.7	≤8.00	PASS
	Ant2	2452	484Tone	RU65	-24.58	≤8.00	PASS
	total	2452	484Tone	RU65	-21.63	≤8.00	PASS

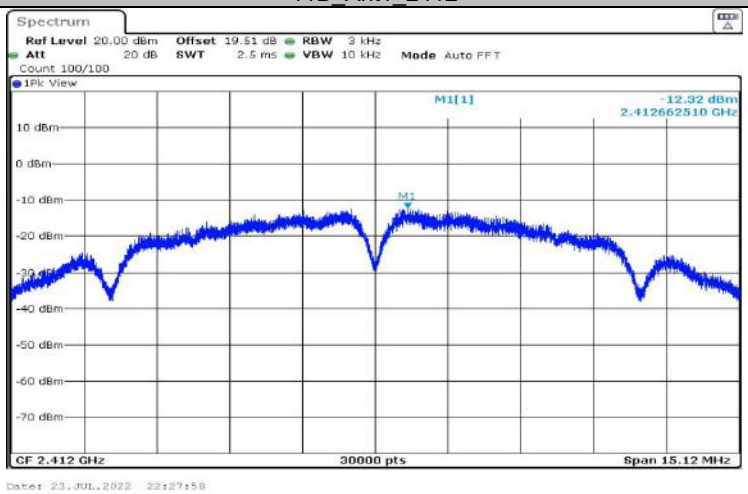
Note 1:

For 802.11 n/ax mode, EUT support CDD
Directional gain = GANT + Array Gain
For PSD measurement, Array Gain=10*logNant
Directional gain=3dBi+10*log2=6dBi≤6dBi

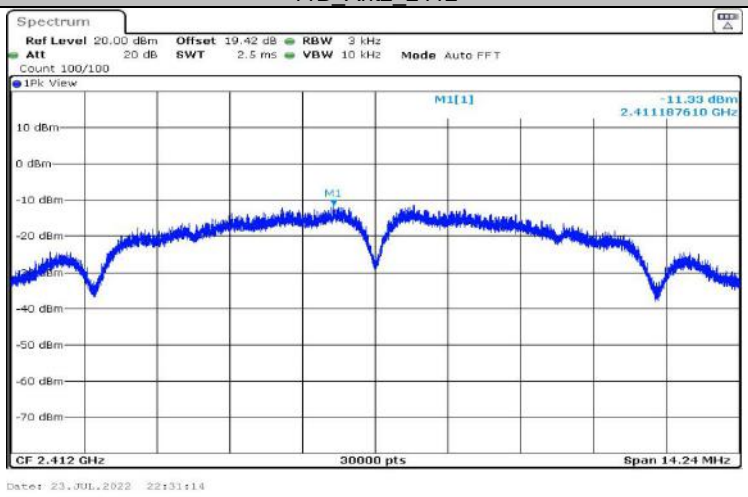
Note 2: For 802.11ax mode, the worst case full RU was tested.

Test Graphs

11B_Ant1_2412



11B_Ant2_2412



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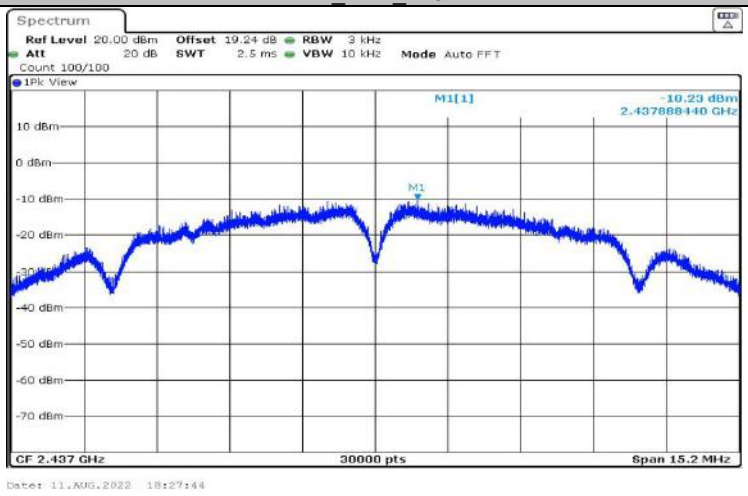

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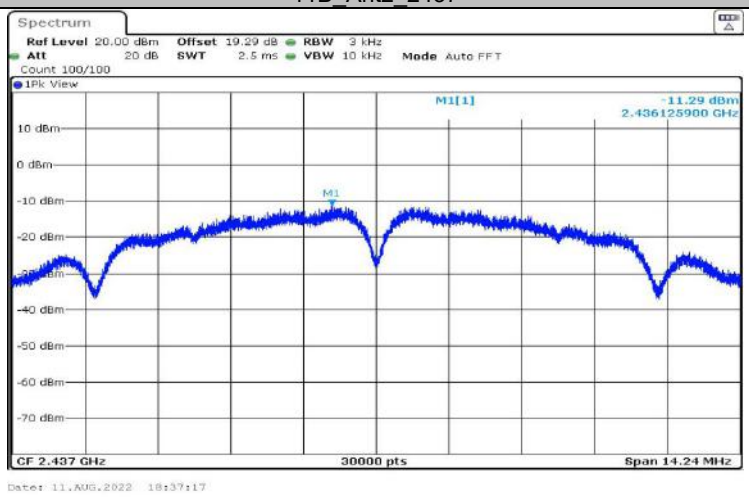

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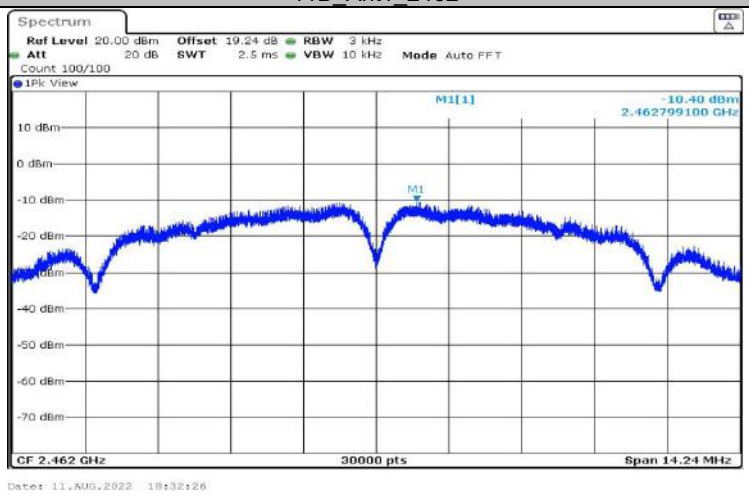

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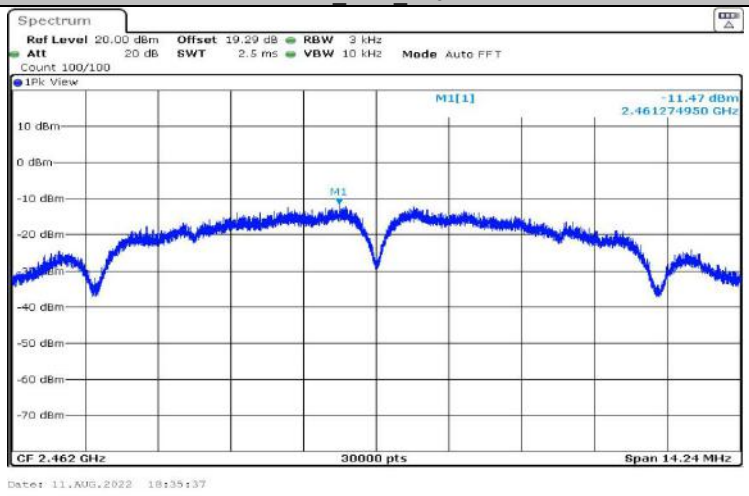

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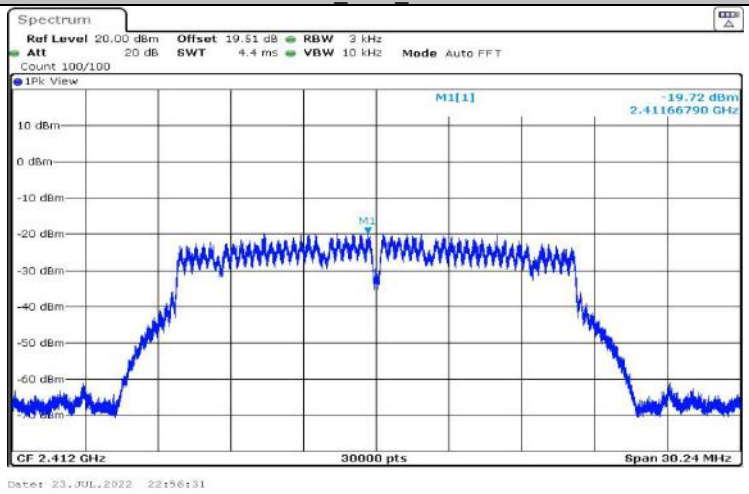

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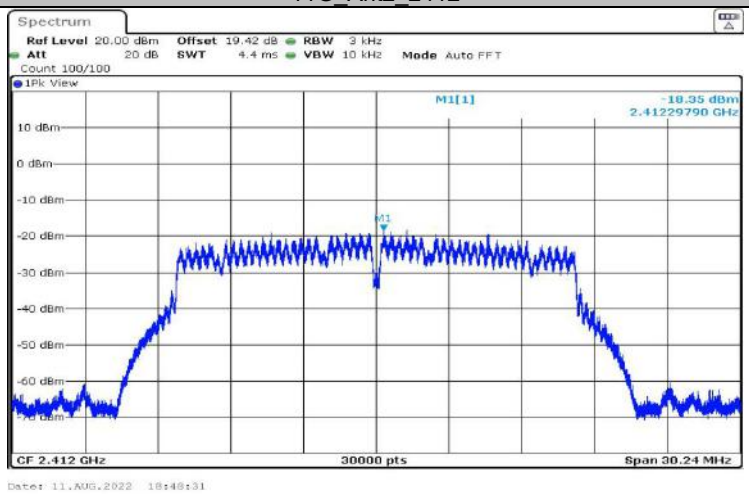

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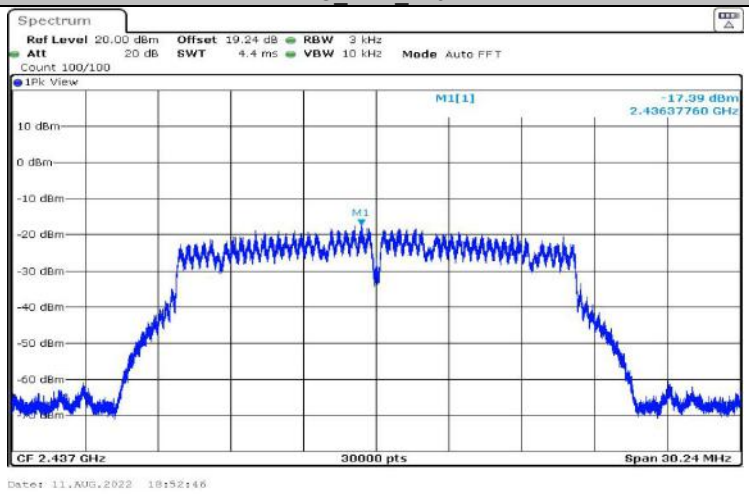

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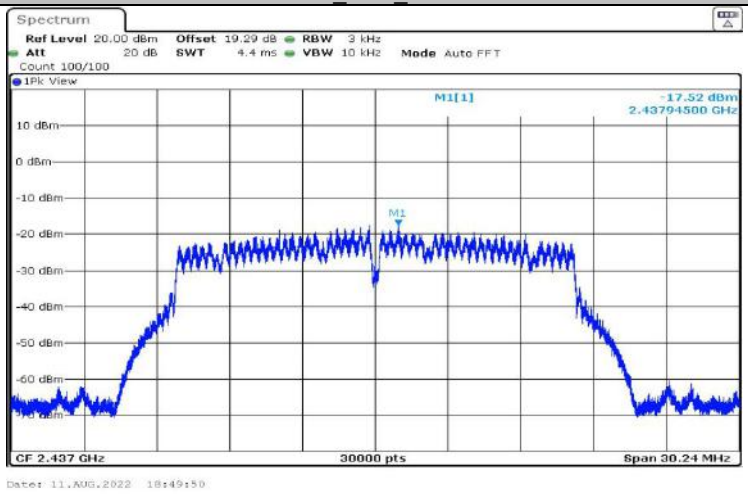

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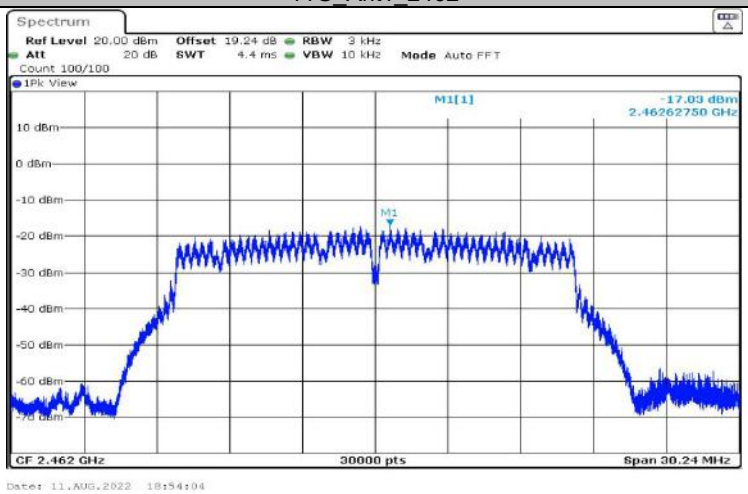

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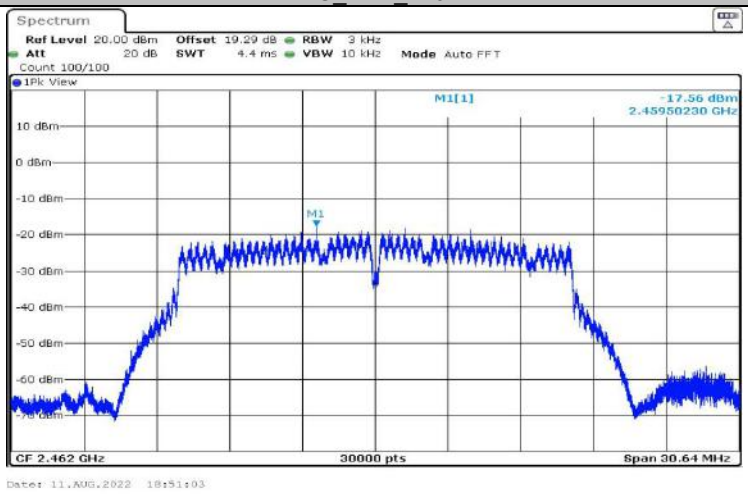

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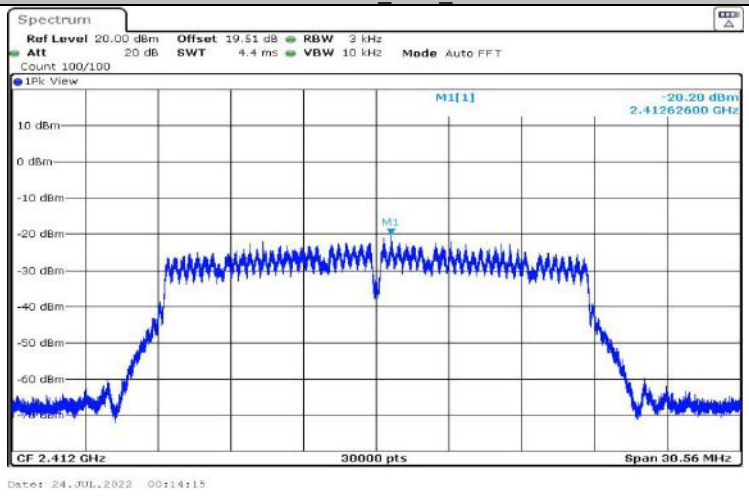

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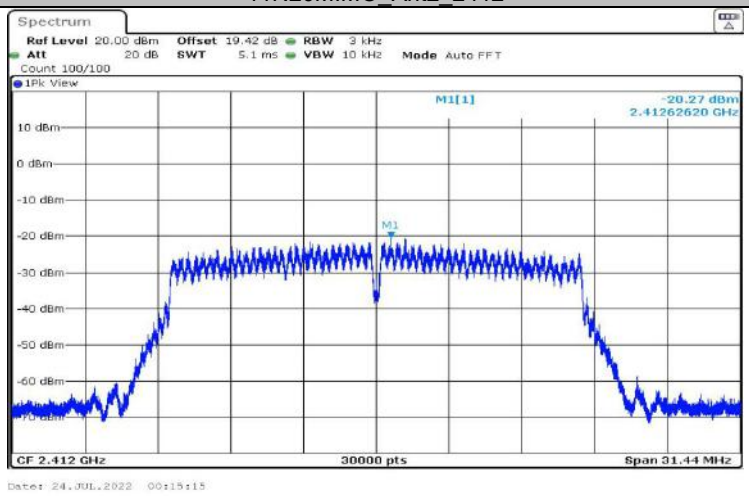

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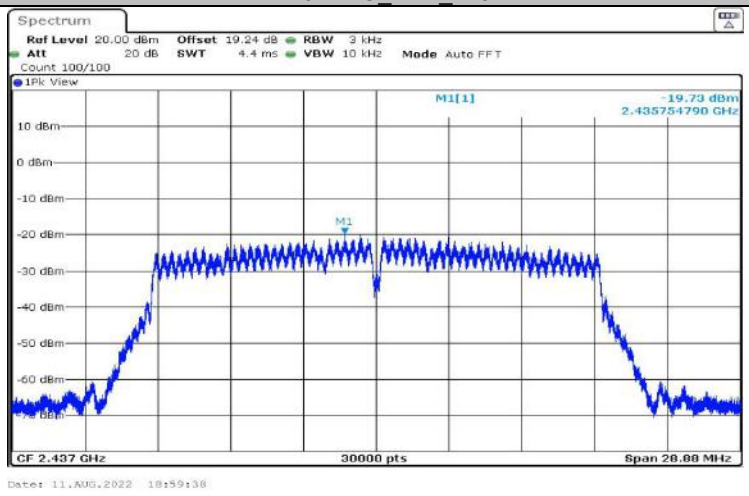

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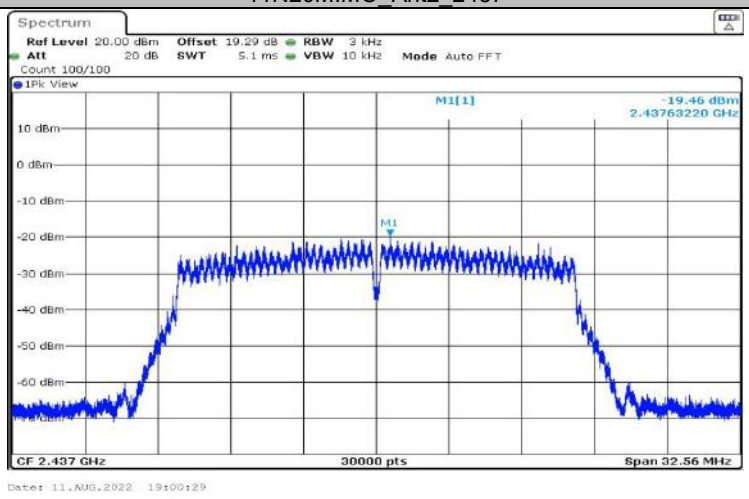

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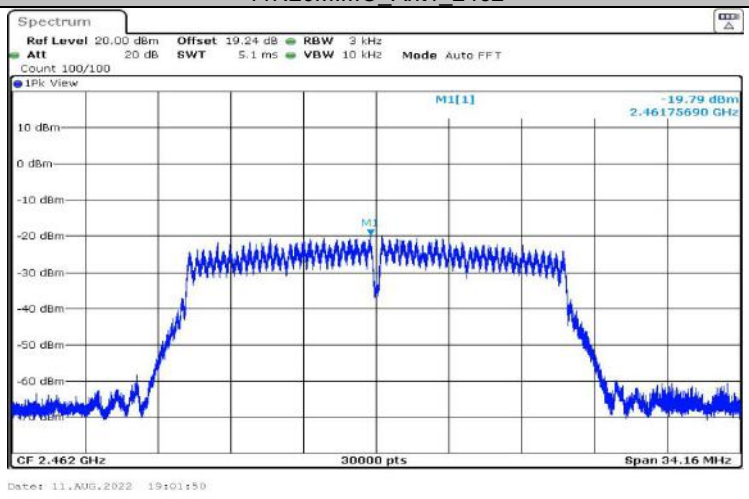

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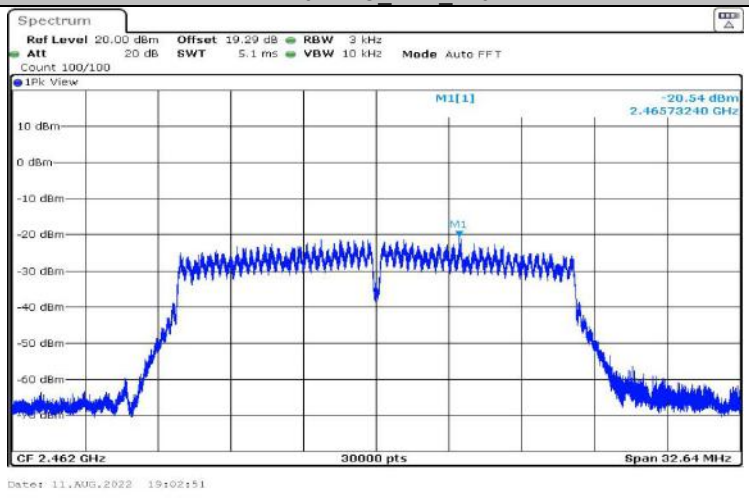

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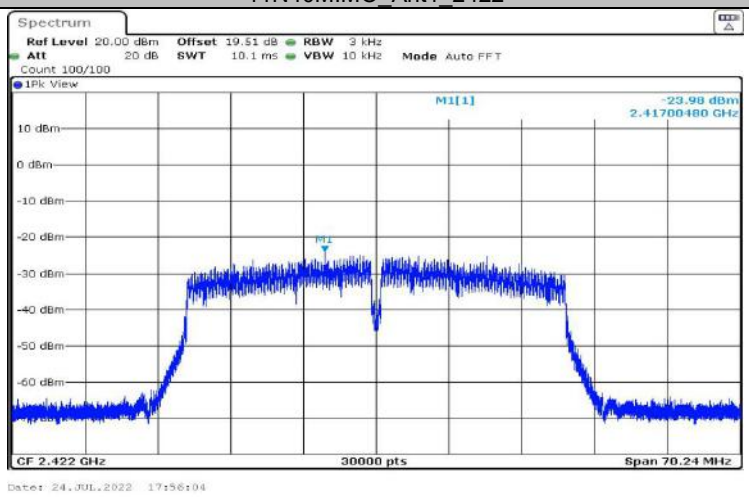

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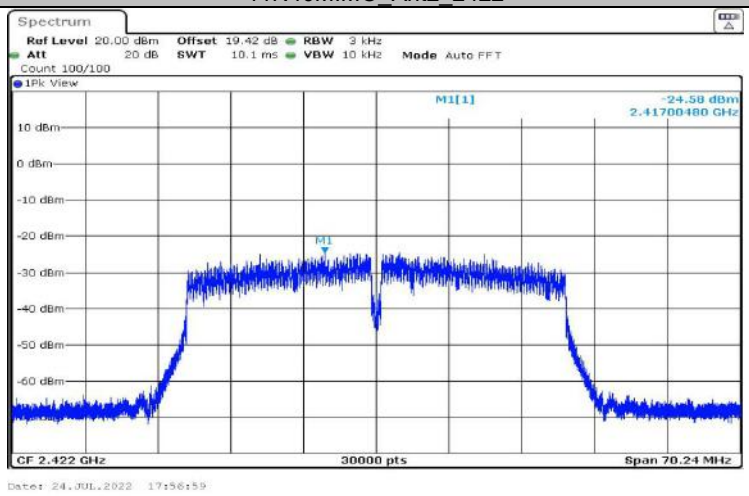

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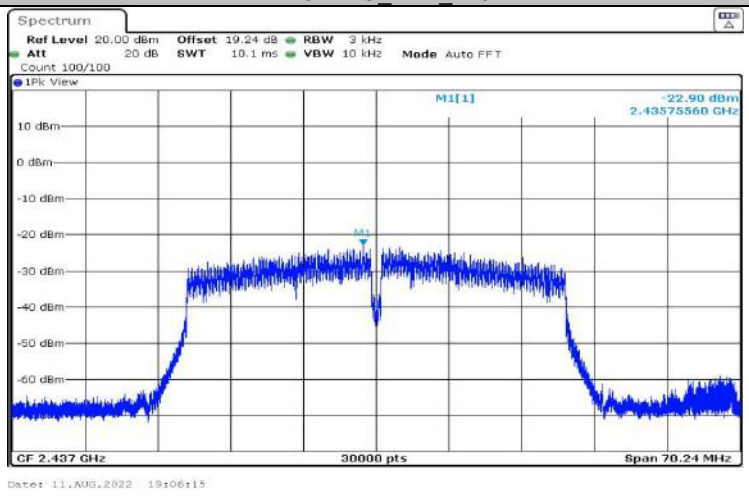

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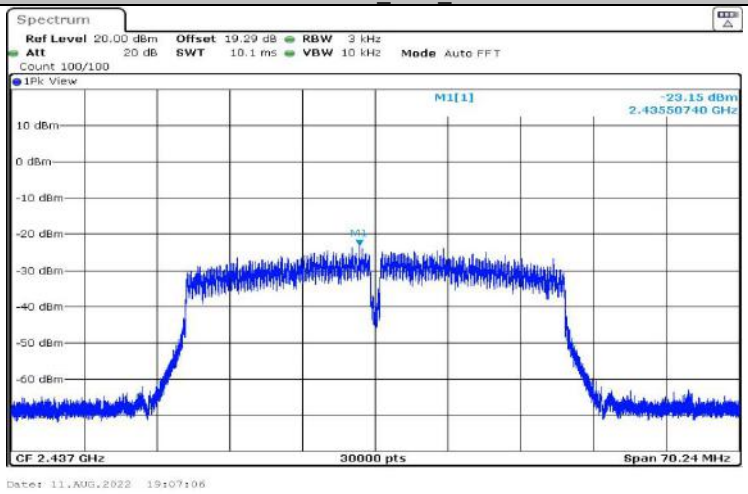

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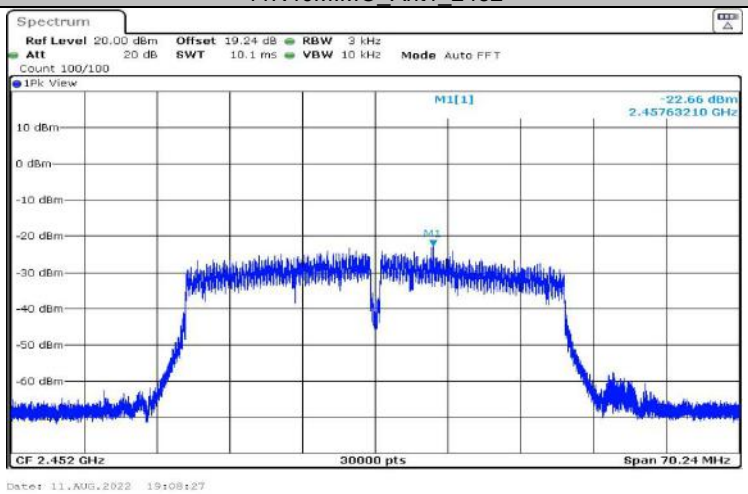

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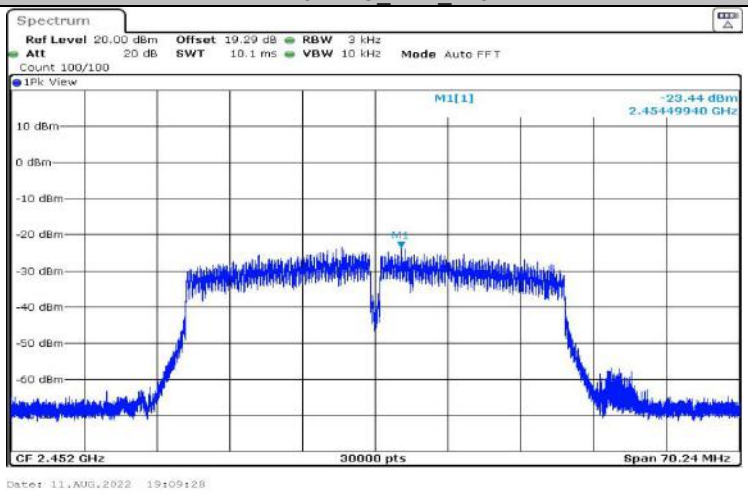

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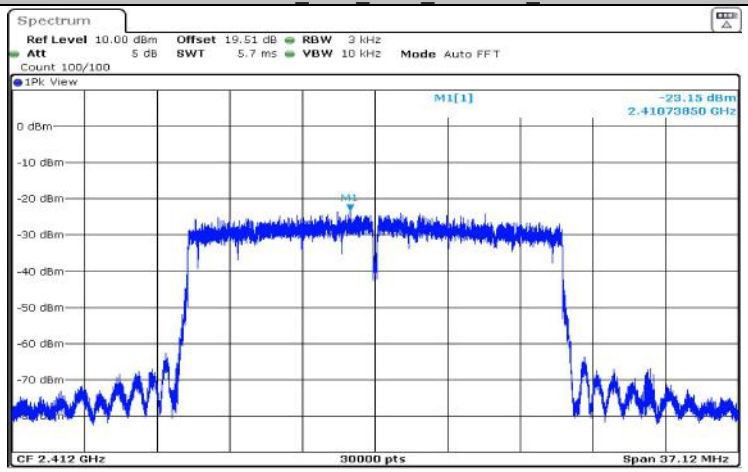

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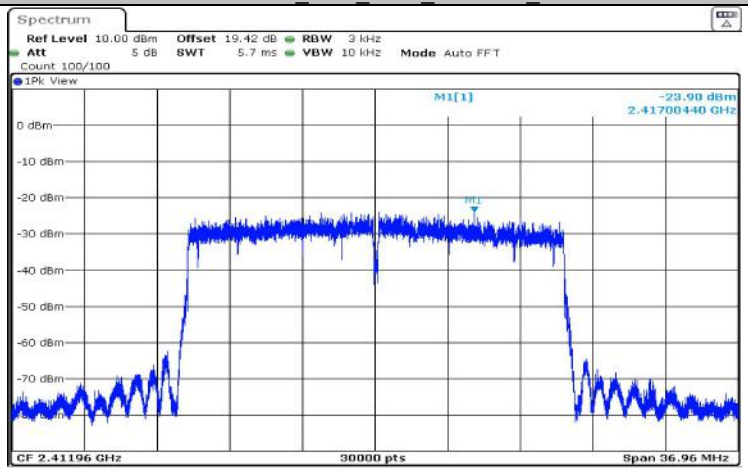

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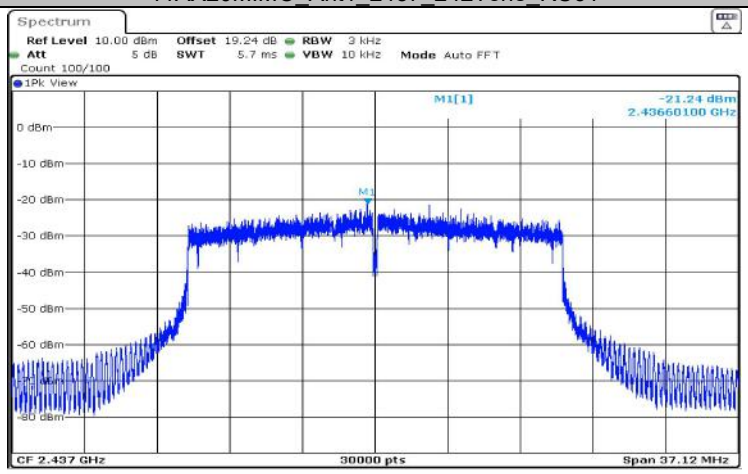

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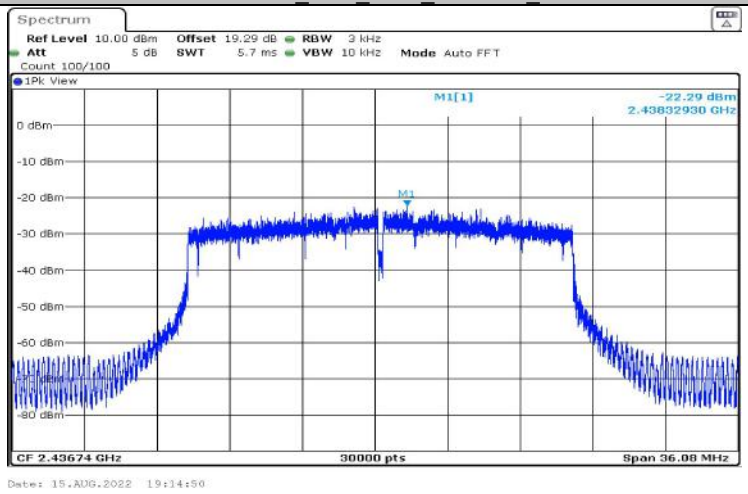

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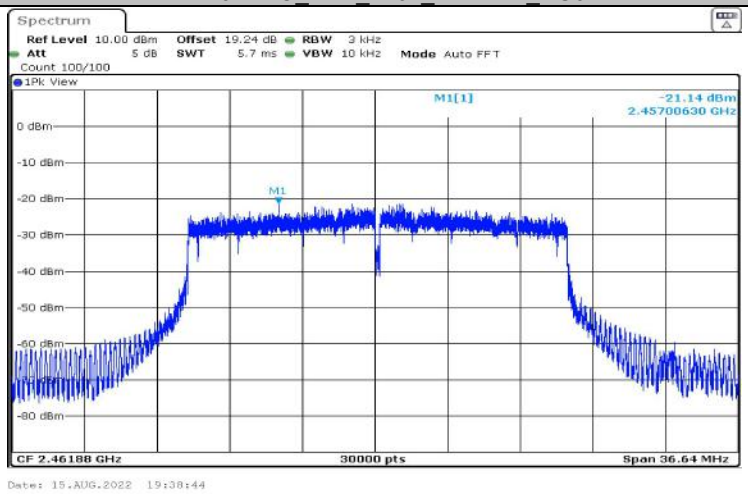

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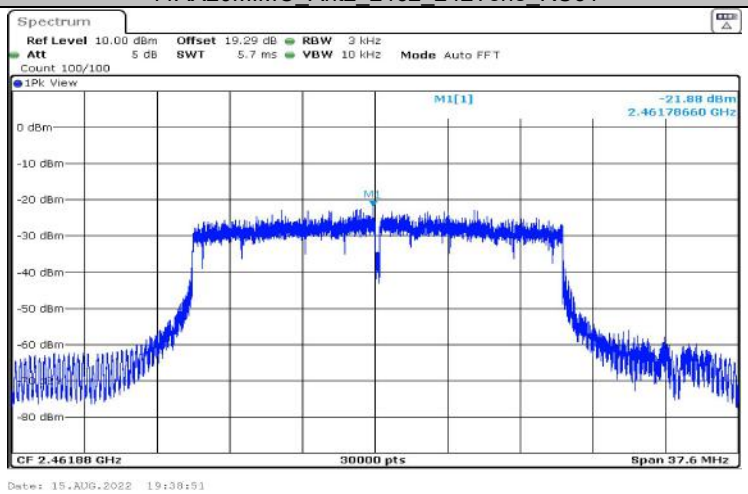

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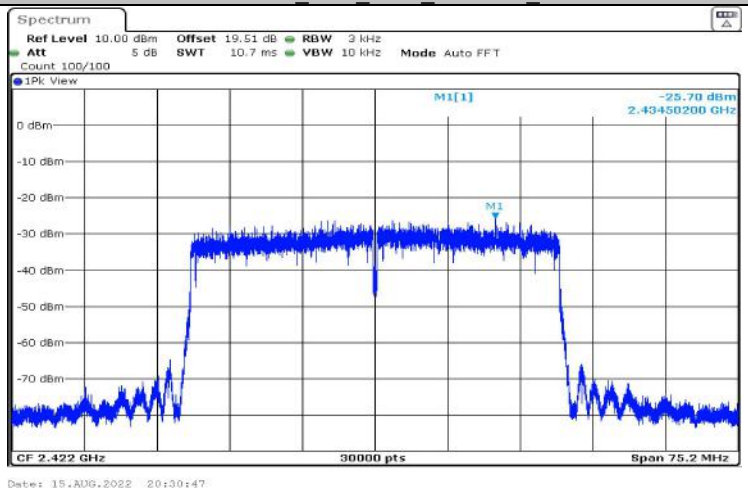

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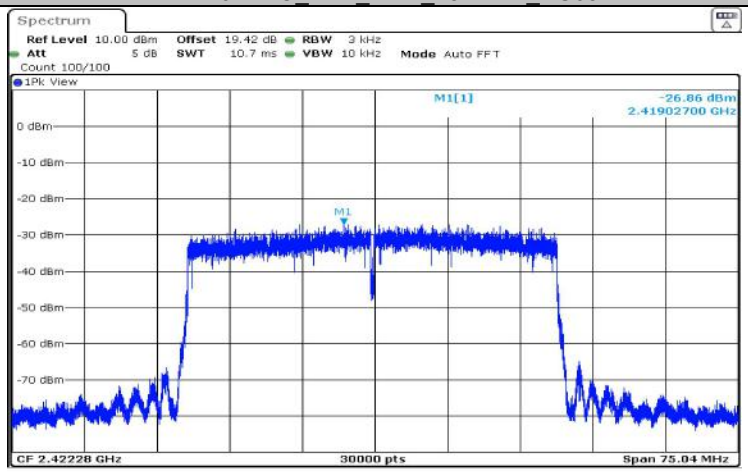

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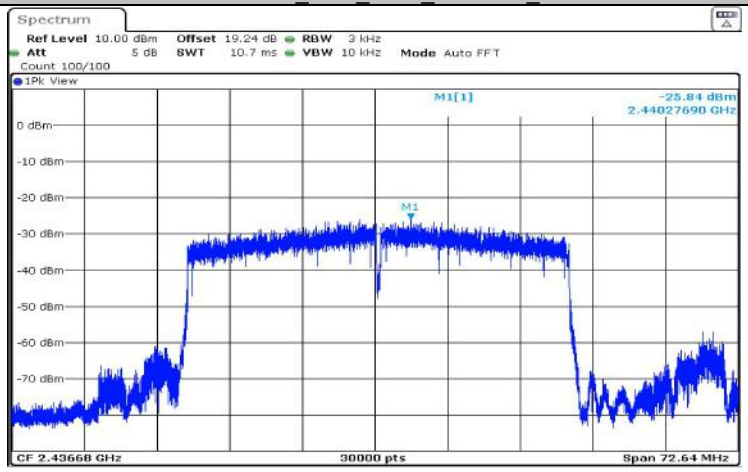

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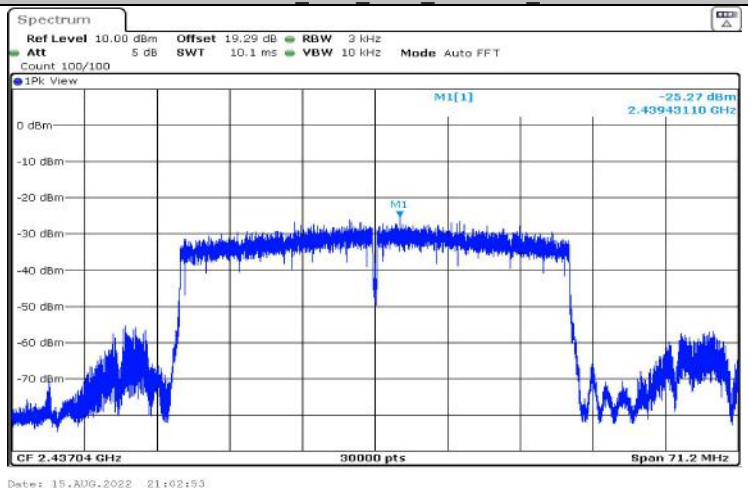

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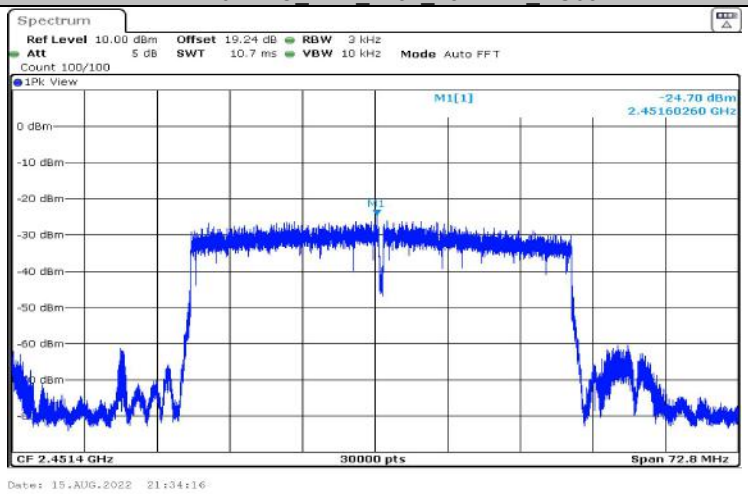

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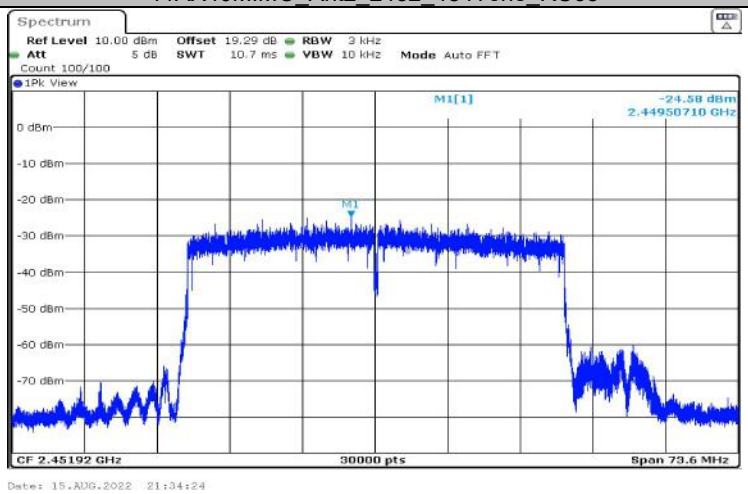
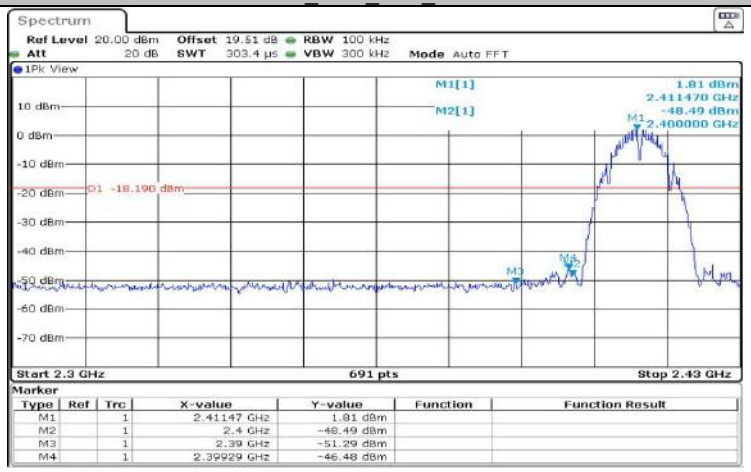


Appendix E: Band edge measurements

Test Graphs

11B_Ant1_Low_2412



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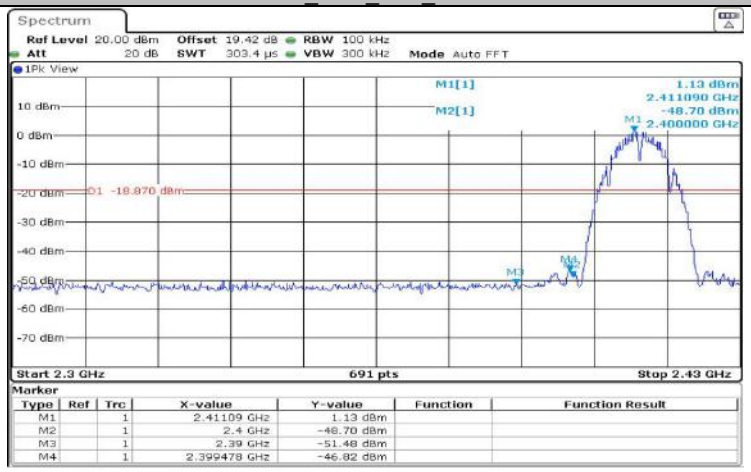
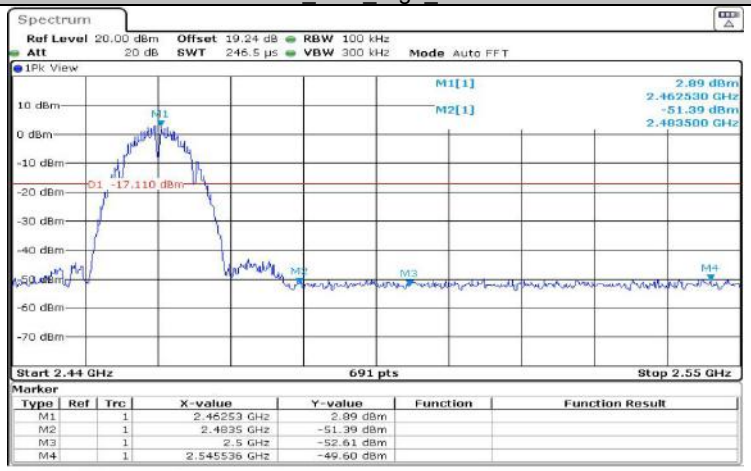


11B_Ant1_High_2462



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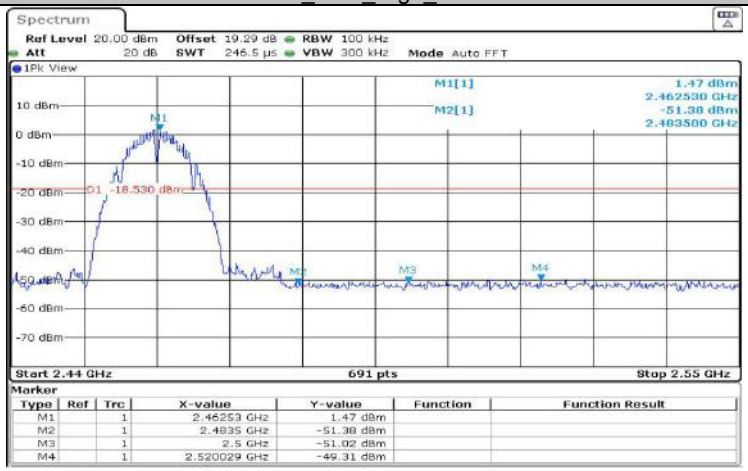

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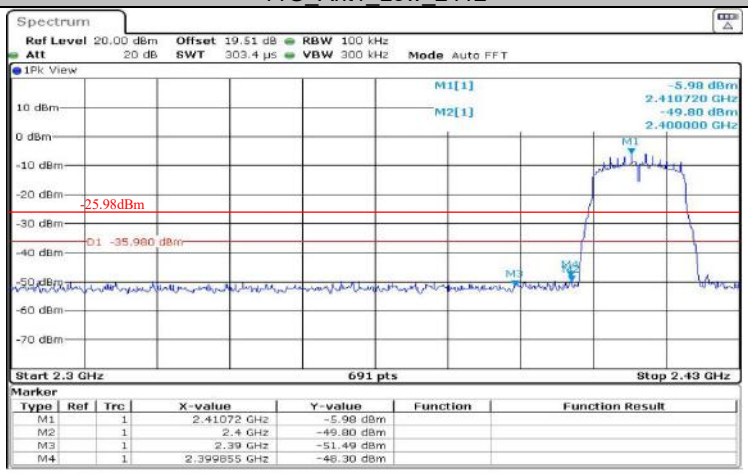

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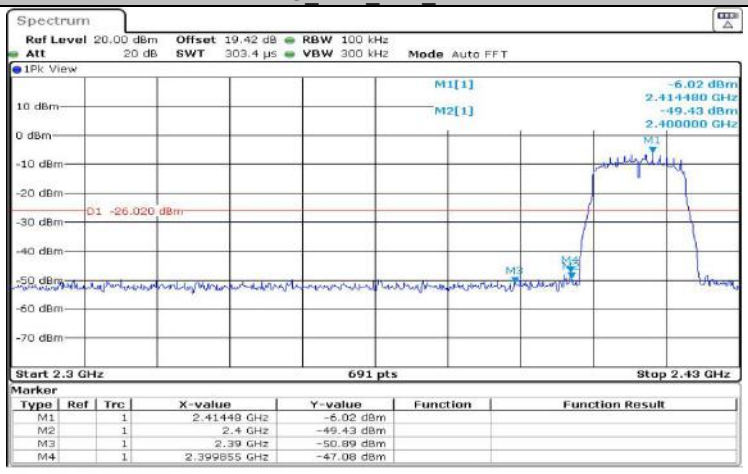

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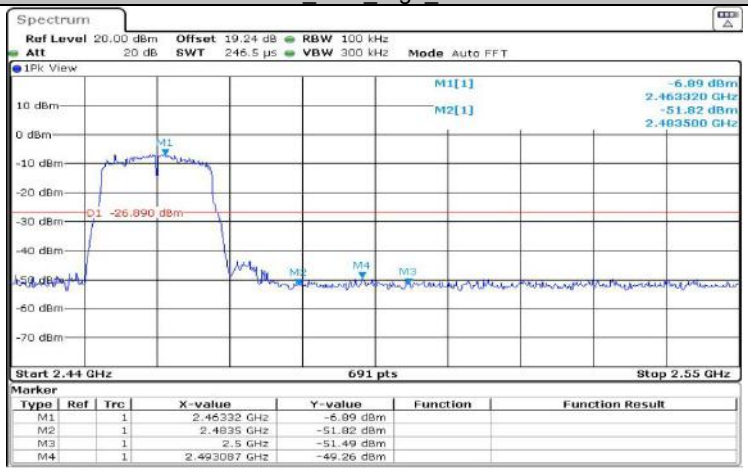

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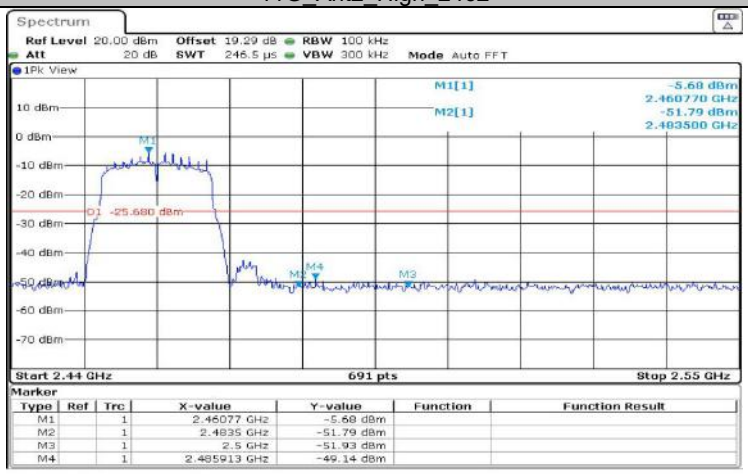

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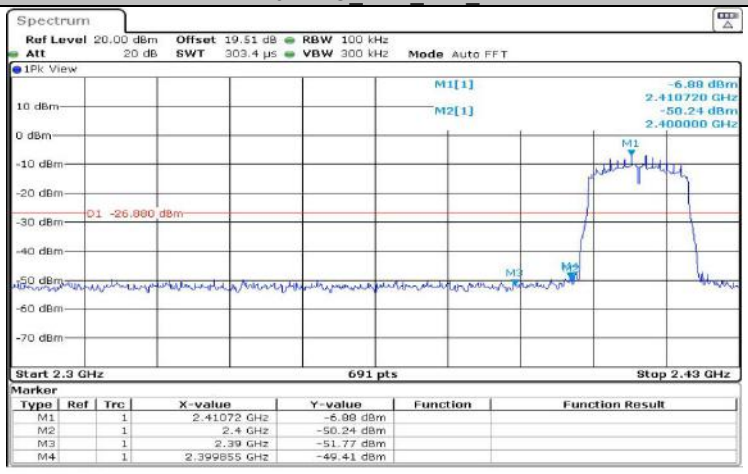

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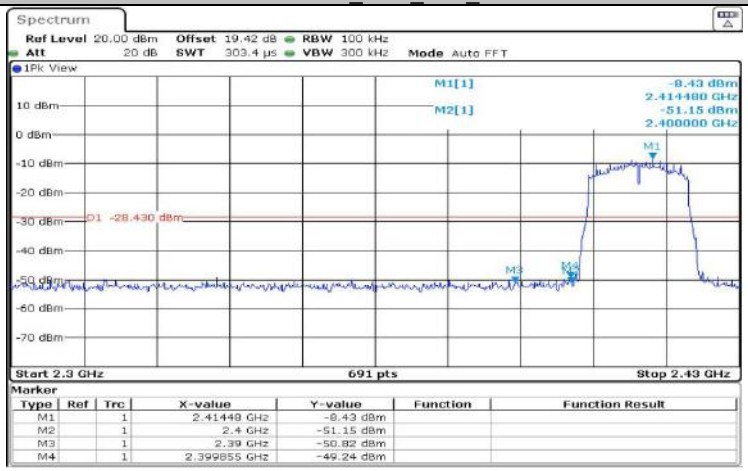

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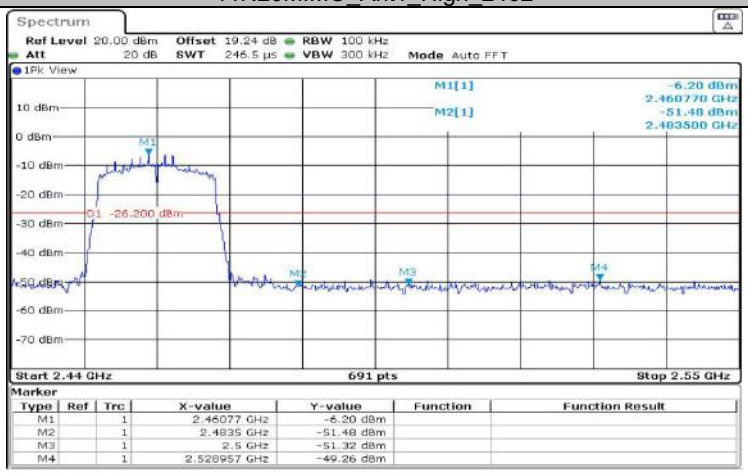

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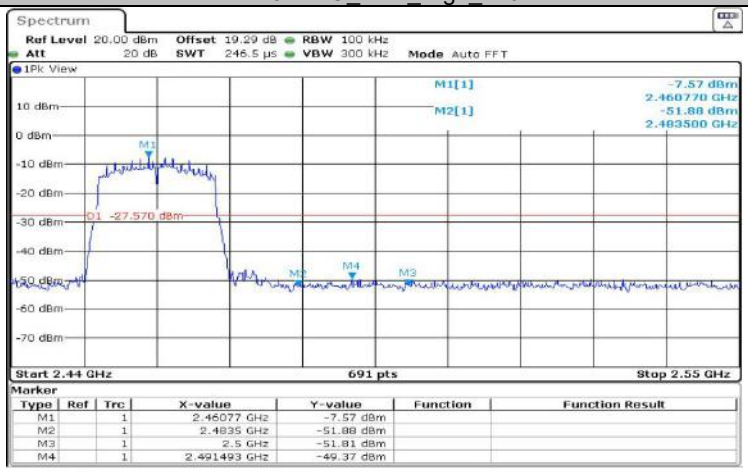

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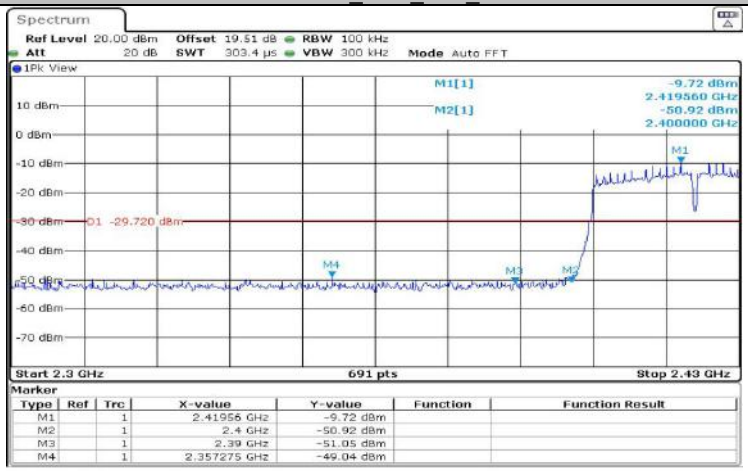

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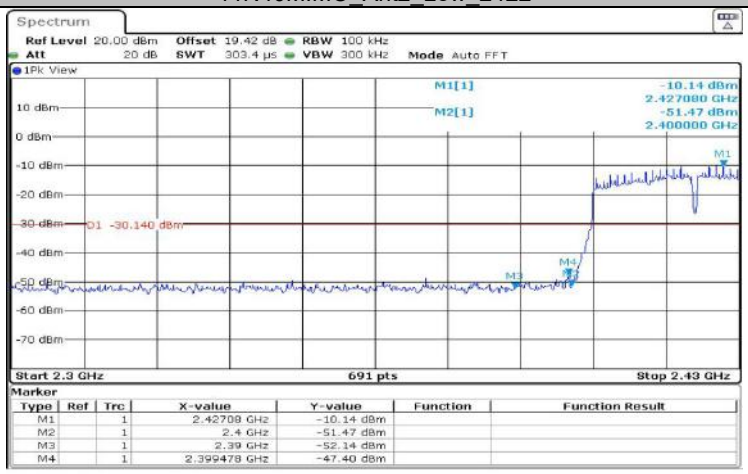

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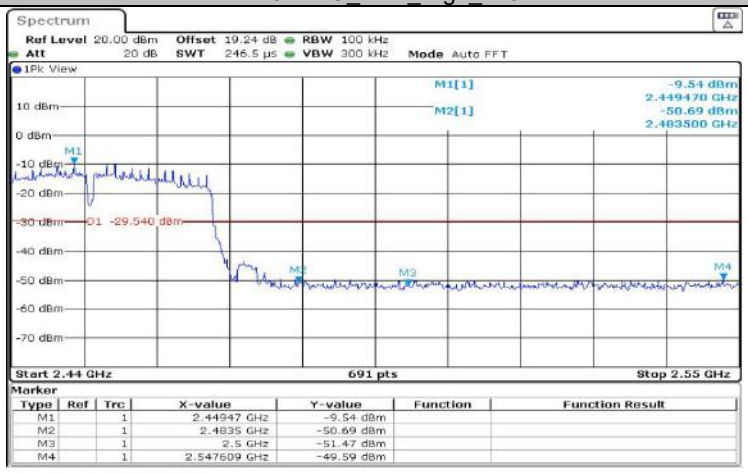

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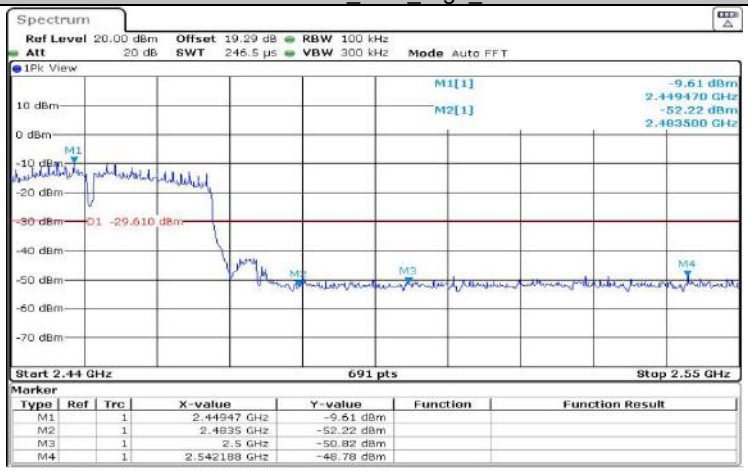

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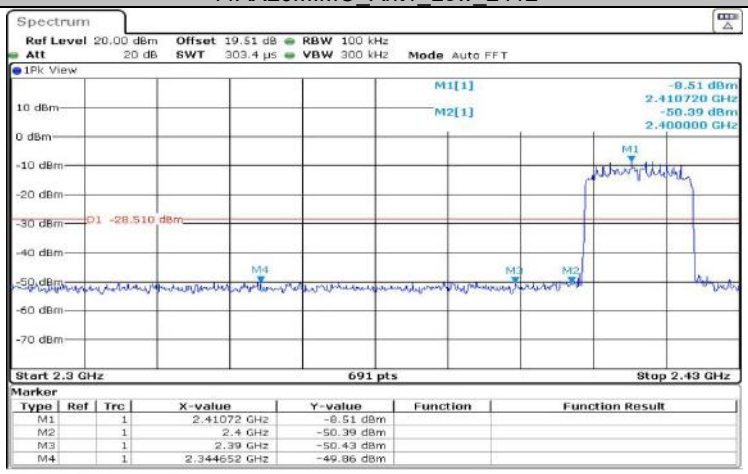

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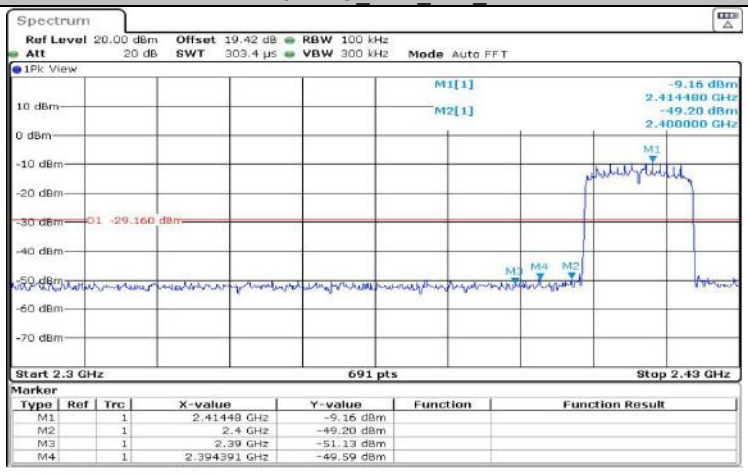

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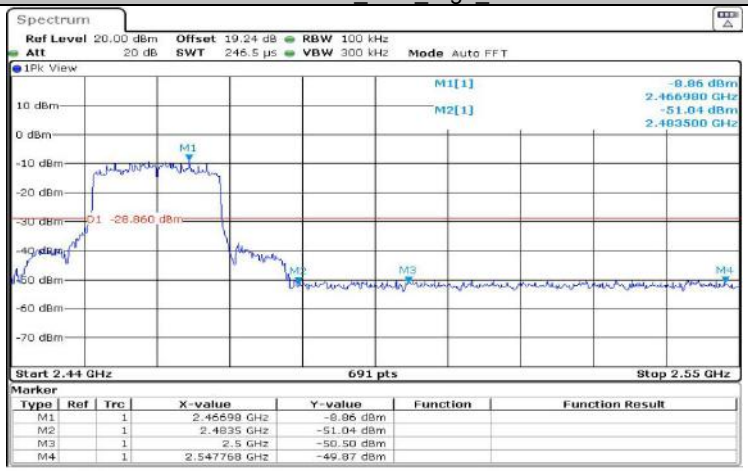

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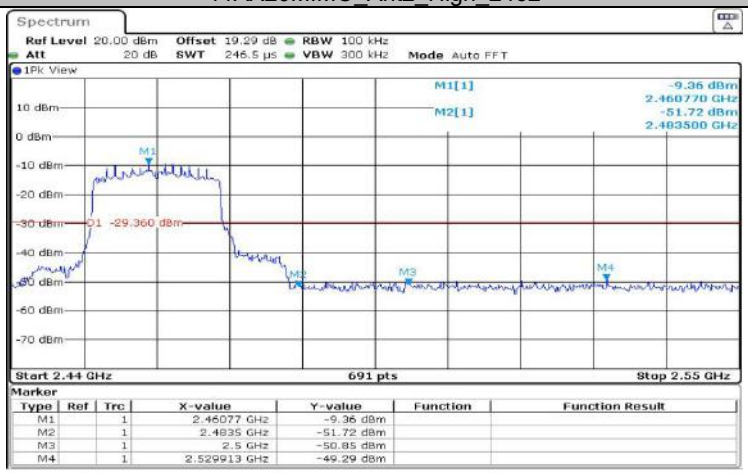

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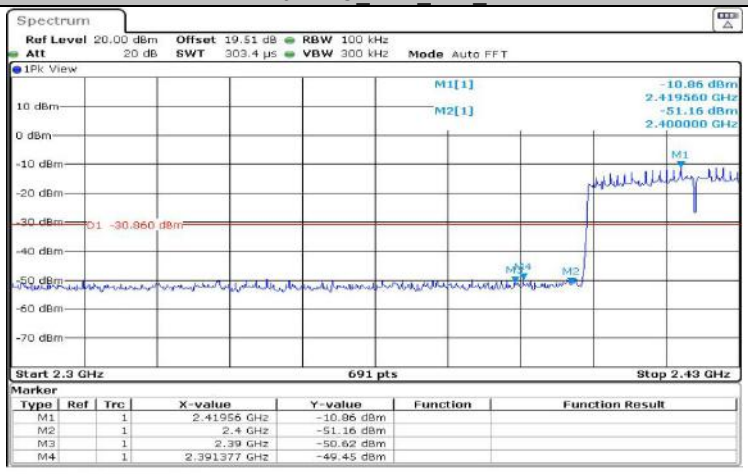
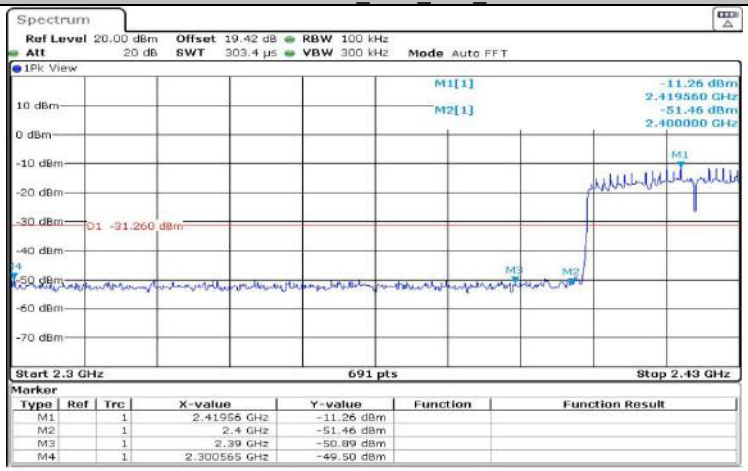
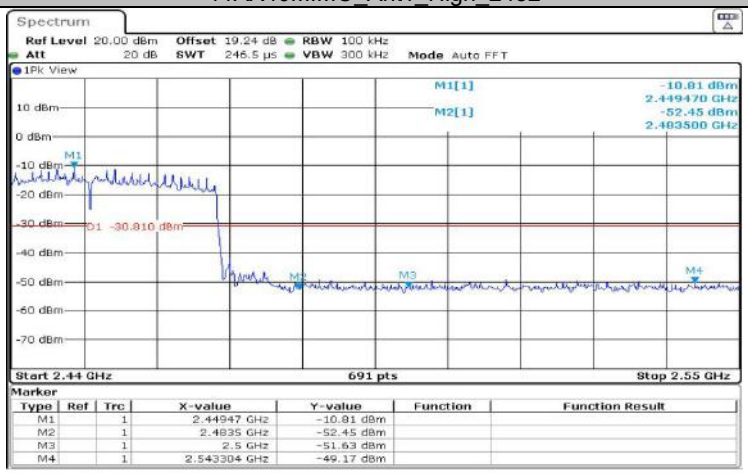


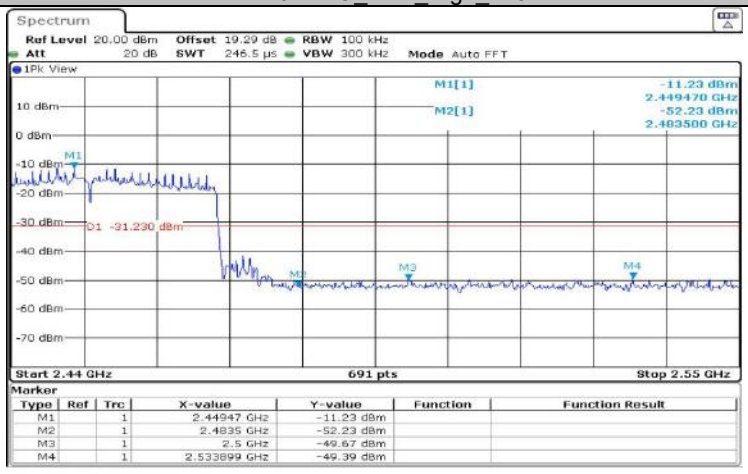
11AX40MIMO_Ant2_Low_2422



11AX40MIMO_Ant1_High_2452



11AX40MIMO_Ant2_High_2452



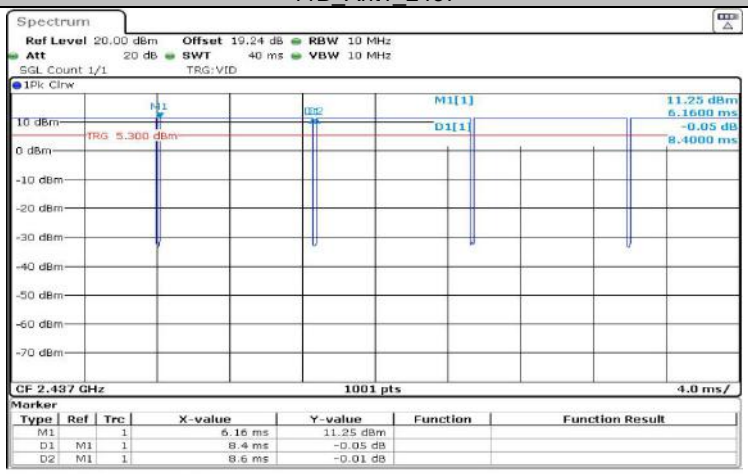
Appendix F: Duty Cycle

Test Result

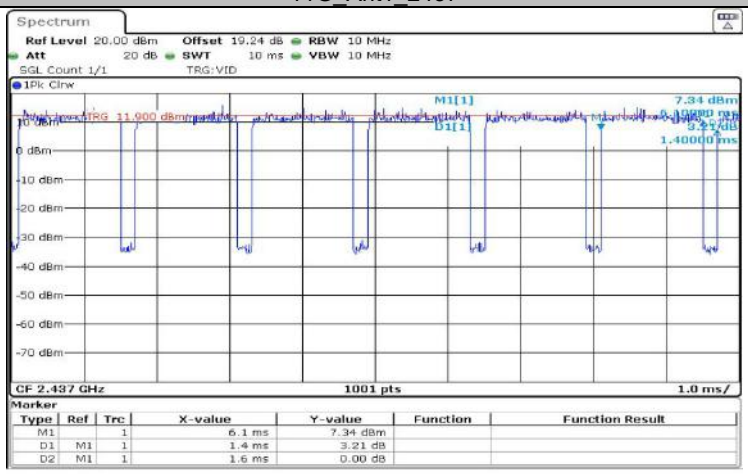
Test Mode	Antenna	Channel	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]
11B	Ant1	2437	8.40	8.60	97.67
11G	Ant1	2437	1.40	1.60	87.50
11N20MIMO	Ant1	2437	1.31	1.52	86.18
11N40MIMO	Ant1	2437	0.65	0.86	75.58
11AX20MIMO	Ant1	2437	1.04	1.24	83.87
11AX40MIMO	Ant1	2437	0.32	0.54	59.26

Test Graphs

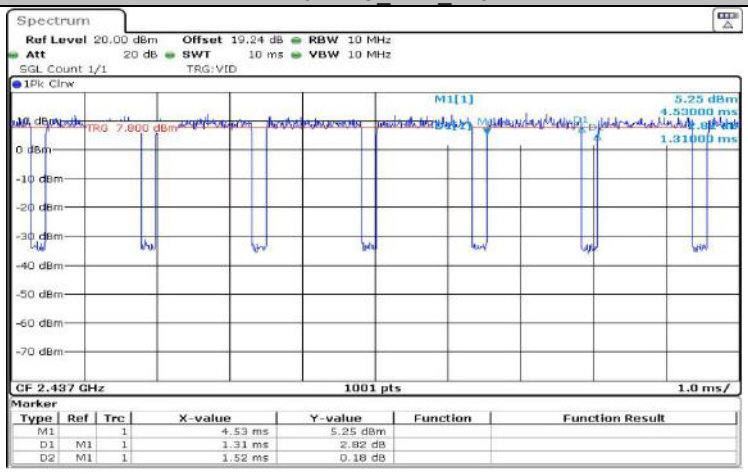
11B_Ant1_2437



11G_Ant1_2437



11N20MIMO_Ant1_2437



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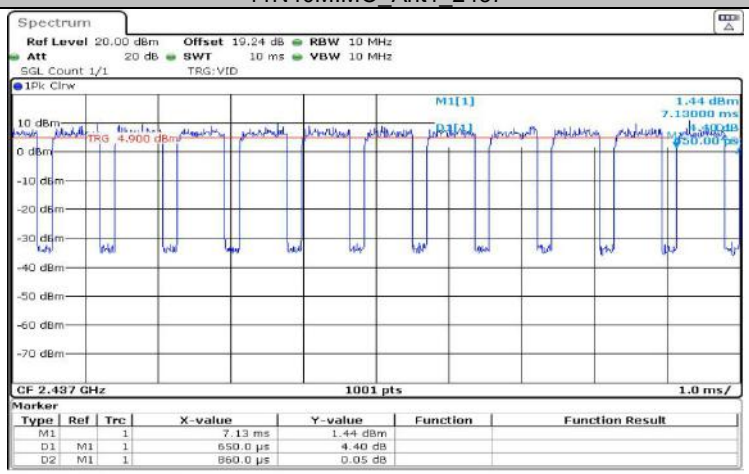

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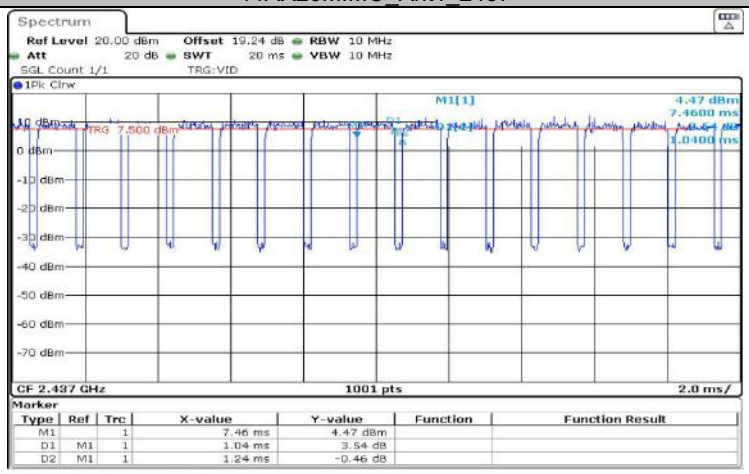
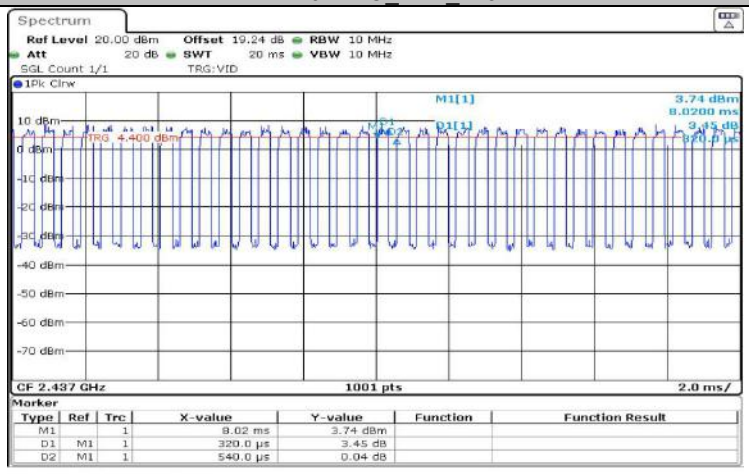


11AX40MIMO_Ant1_2437



******* END OF REPORT *******