TEST REPORT

Applicant Name :	Shenzhen Huion Trend Technology Co., Ltd.
Address :	Huion Science and Technology Park, Keji 1st Road, Bao'an District, Shenzhen China
Report Number :	RA221230-64660E-RF-00B
FCC ID:	2A8IG-D226

Test Standard (s)

FCC PART 15.247

Sample Description

Product Type:	Creative Pen Computer
Model No.:	KS1601
Multiple Model(s) No.:	KS1301,KT1001,KT1101,KT1201,KT1601
Trade Mark:	HUION
Date Received:	2022/12/30
Report Date:	2023/03/18

Test Result:	Pass*

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

Prepared and Checked By:

Andy Yu

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 "★ ".
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DOCUMENT REVISION HISTORY

Revision Number	Report Number	Description of Revision	Date of Revision
0	RA221230-64660E-RF-00B	Original Report	2023-03-18

GENERAL INFORMATION

Product Description for Equipment under Test (EUT)

Product	Creative Pen Computer
Tested Model	KS1601
Multiple Models	KS1301,KT1001,KT1101,KT1201,KT1601 (model difference see product declaration letter of similarity)
Frequency Range	BLE_1M/2M: 2402-2480MHz Wi-Fi: 2412-2462MHz
Maximum Conducted Output Power	BLE_Peak Power: 3.10dBm Wi-Fi_Average Power: 16.58dBm(802.11b), 17.12dBm(802.11g),17.22dBm(802.11n-HT20) 17.97dBm(802.11 n-HT40),16.88dBm(802.11ax20),17.79dBm(802.11ax40)
Modulation Technique	BLE: GFSK Wi-Fi: DSSS, OFDM, OFDMA
Antenna Specification*	BLE Wi-Fi ANT1:-2.03dBi, BLE ANT & Wi-Fi ANT2:-2.03dBi (provided by the applicant)
Voltage Range	DC 15.4V from battery or DC 5V/9V/12V/15V/20V from adapter
Sample serial number	1WNZ for Conducted and Radiated Emissions Test 1WO0 for RF Conducted Test (Assigned by ATC)
Adapter Information	Model: RH-PD65W Input: AC 100-240V,50/60Hz,1.5A Output: DC 5V,3A/9V,3A/12V,3A/15V,3A/20V,3.25A,65W max
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-Fimode, 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	/	/

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

For BLE mode, 40 channels are provided to testing:

Channel	Frequency (MHz)	Channel	Frequency (MHz)
0	2402	20	2442
1	2404	21	2444
2	2406	22	2446
3	2408	23	2448
4	2410	24	2450
5	2412	25	2452
6	2414	26	2454
7	2416	27	2456
8	2418	28	2458
9	2420	29	2460
10	2422	30	2462
11	2424	31	2464
12	2426	32	2466
13	2428	33	2468
14	2430	34	2470
15	2432	35	2472
16	2434	36	2474
17	2436	37	2476
18	2438	38	2478
19	2440	39	2480

EUT was tested with Channel 0, 19 and 39.

Equipment Modifications

No modification was made to the EUT tested.

EUT Exercise Software

"AX Series MP Toolkit.exe"* exercise software was used for Wi-Fi test, " RTLBTAPP.exe"* exercise software was used for BLE test,The software and power level was provided by the applicant.

The device was tested with the worst case was performed as below:

Test Mode	Data rate	RuSize	RuIndex	Power Level*		
				Low Channel	Middle Channel	High Channel
BLE	1Mbps/2Mbps	N/A	N/A	0X45	0X45	0X45
802.11b	1 Mbps	N/A	N/A	16	16	16
802.11g	6 Mbps	N/A	N/A	16	16	16
802.11n20	MCS0	N/A	N/A	16	16	16
802.11n40	MCS0	N/A	N/A	16	16	16
11AX20	MCS0	26Tone	RU0	8	8	8
		52Tone	RU37	10	10	10
		106Tone	RU53	12	12	12
		242Tone	RU61	16	16	16
11AX40	MCS0	26Tone	RU0	4	4	4
		52Tone	RU37	6	6	6
		106Tone	RU53	8	8	8
		242Tone	RU61	10	10	10
		484Tone	RU65	16	16	16

Note:

For Wi-Fi mode, EUT have two antennas, the 802.11 b/g/n/ax mode support SISO/MIMO transmitting. According pre-scan, the worst case MIMO mode was selected to test and record in report.

The worst-case data rates are determined to be as follows for each mode based upon inverstigation by measuring the average power, peak power and PSD across all data rates, bandwidths and modulations.

Support Equipment List and Details

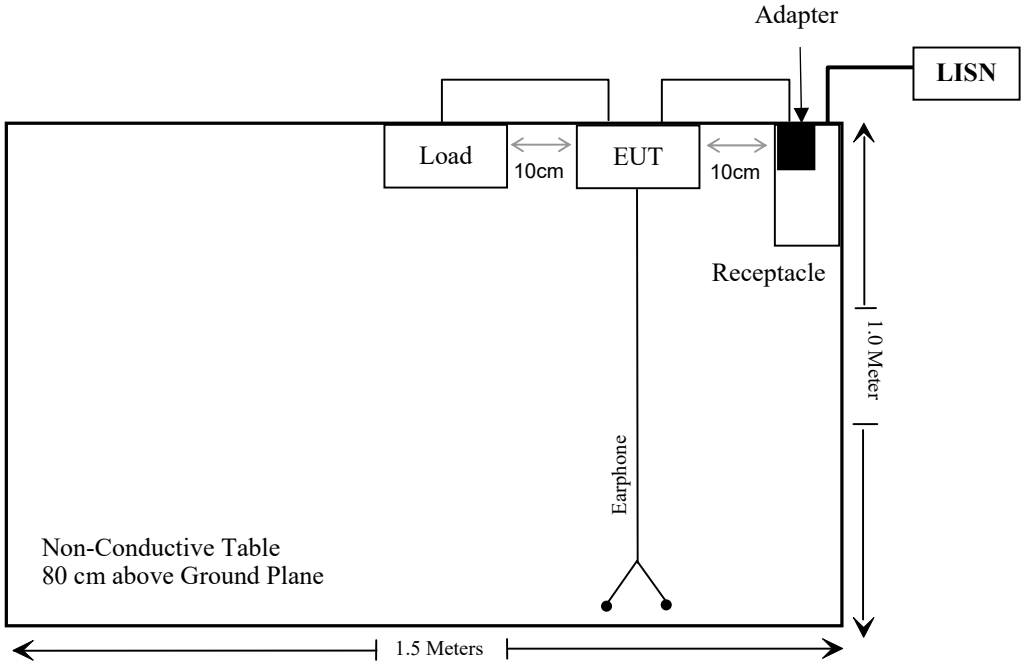
Manufacturer	Description	Model	Serial Number
Unknown	Earphone	Unknown	Unknown
ATC	Load	Unknown	Unknown

External I/O Cable

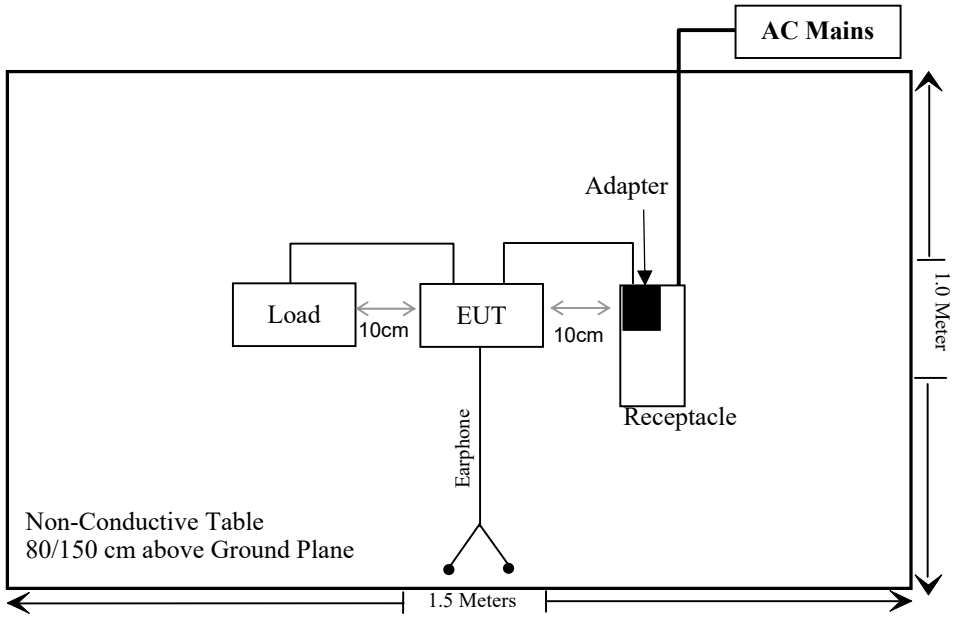
Cable Description	Length (m)	From Port	To
Un-shielding Un-Detachable AC Cable	1.2	Receptacle	LISN/AC Mains
Un-shielding Detachable Type-C Cable	1.2	Adapter	EUT
Un-shielding Un-Detachable DC Cable	0.2	Load	EUT

Block Diagram of Test Setup

For conducted emission:



For Radiated Emissions:



SUMMARY OF TEST RESULTS

FCC Rules	Description of Test	Result
§15.247 (i), §1.1307 (b) (1) & §2.1093	RF Exposure	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)	100kHz 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 emission test					
Rohde& Schwarz	EMI Test Receiver	ESCI	100784	2022/11/25	2023/11/24
Rohde & Schwarz	L.I.S.N.	ENV216	101314	2022/11/25	2023/11/24
Anritsu Corp	50 Coaxial Switch	MP59B	6100237248	2022/12/07	2023/12/06
Unknown	RF Coaxial Cable	No.17	N0350	2022/11/25	2023/11/24
Conducted Emission Test Software: e3 19821b (V9)					
Radiated emission test					
Rohde& Schwarz	Test Receiver	ESR	102725	2022/11/25	2023/11/24
Rohde&Schwarz	Spectrum Analyzer	FSV40	101949	2022/11/25	2023/11/24
SONOMA INSTRUMENT	Amplifier	310 N	186131	2022/11/08	2023/11/07
A.H. Systems, inc.	Preamplifier	PAM-0118P	135	2022/11/08	2023/11/07
Quinstar	Amplifier	QLW-18405536-J0	15964001002	2022/11/08	2023/11/07
Schwarzbeck	Bilog Antenna	VULB9163	9163-323	2021/07/06	2024/07/05
Schwarzbeck	Horn Antenna	BBHA9120D	9120D-1067	2022/11/30	2025/11/29
Schwarzbeck	HORN ANTENNA	BBHA9170	9170-359	2022/12/26	2025/12/25
Radiated Emission Test Software: e3 19821b (V9)					
Unknown	RF Coaxial Cable	No.10	N050	2022/11/25	2023/11/24
Unknown	RF Coaxial Cable	No.11	N1000	2022/11/25	2023/11/24
Unknown	RF Coaxial Cable	No.12	N040	2022/11/25	2023/11/24
Unknown	RF Coaxial Cable	No.13	N300	2022/11/25	2023/11/24
Unknown	RF Coaxial Cable	No.14	N800	2022/11/25	2023/11/24
Unknown	RF Coaxial Cable	No.15	N600	2022/11/25	2023/11/24
Unknown	RF Coaxial Cable	No.16	N650	2022/11/25	2023/11/24
Wainwright	High Pass Filter	WHKX3.6/18G-10SS	5	2022/11/25	2023/11/24

Manufacturer	Description	Model	Serial Number	Calibration Date	Calibration Due Date
RF Conducted Test					
Rohde&Schwarz	Spectrum Analyzer	FSV-40	101590	2022/11/25	2023/11/24
Tonscend	RF Control Unit	JS0806-2	19G8060182	2022/10/24	2023/10/23
Agilent	USB wideband power sensor	U2021XA	MY54250003	2022/06/27	2023/06/26
WEINSCHEL	10dB Attenuator	5324	AU 3842	2022/11/25	2023/11/24
HP	20dB Attenuator	8491A	53857	2022/11/25	2023/11/24
Unknown	RF Coaxial Cable	No.31	RF-01	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)(1)&§2.1093 – RF EXPOSURE

Applicable Standard

According to FCC §2.1093 and §1.1307(b)(1), systems operating under the provisions of this section shall be operated in a manner that ensure that the public is not exposed to radio frequency energy level in excess of the Commission's guideline.

According to KDB 447498 D01 General RF Exposure Guidance

The 1-g and 10-g SAR test exclusion thresholds for 100 MHz to 6 GHz at test separation distances ≤ 50 mm are determined by:
[(max. power of channel, including tune-up tolerance, mW)/(min. test separation distance, mm)] · [√f(GHz)] ≤ 3.0 for 1-g SAR and ≤ 7.5 for 10-g extremity SAR, where
1. f(GHz) is the RF channel transmit frequency in GHz.
2. Power and distance are rounded to the nearest mW and mm before calculation.
3. The result is rounded to one decimal place for comparison.
4. When the minimum test separation distance is < 5 mm, a distance of 5 mm is applied to determine SAR test Exclusion.

Measurement Result

For worst case:

Mode	Frequency (MHz)	Max tune-up conducted power (dBm)	Max tune-up conducted power (mW)	Distance (mm)	Calculated value	Threshold (1-g SAR)	SAR Test Exclusion
BLE	2402-2480	3.5	2.24	5	0.7	3.0	Yes

Result: No SAR test is required

For **Wi-Fi mode**, please refer to the SAR report: CR230206891-20A.

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.
c. 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 antennas arrangement for Wi-Fi and one internal antenna arrangement for BLE, which were permanently attached, the antenna gain is -2.03dBi for Wi-Fi ANT1 and -2.03dBi for BLE ANT & Wi-Fi Ant2, fulfill the requirement of this section. Please refer to the EUT photos.

Antenna	Antenna Type	Antenna Gain	Impedance	Frequency Range
Wi-Fi ANT1	FPC	-2.03dBi	50 Ω	2.4~2.5GHz
Wi-Fi ANT2/BLE ANT	FPC	-2.03dBi	50 Ω	2.4~2.5GHz

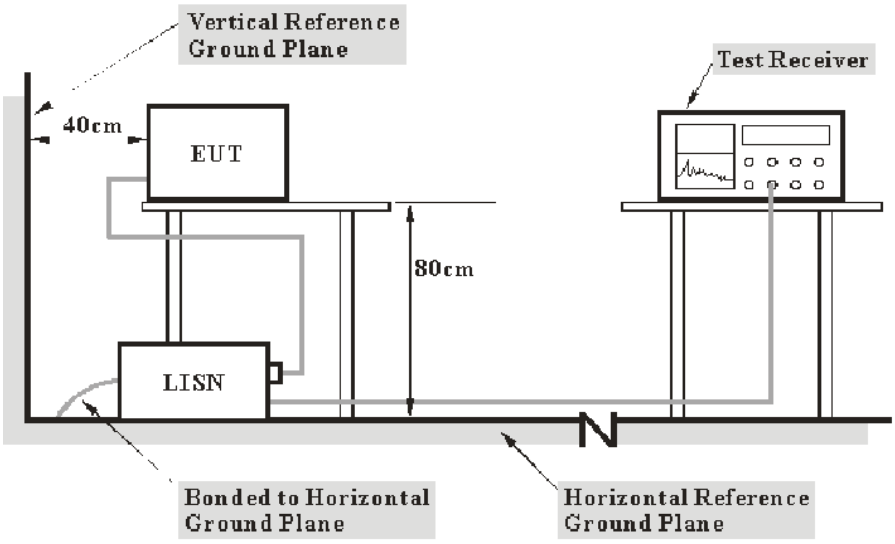
Result: Compliant

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 30MHz.

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 adapter 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 Transdfactor is calculated by addingLISN VDF (Voltage Division Factor) and Cable Loss. The basic equation is as follows:

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 -7dB 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

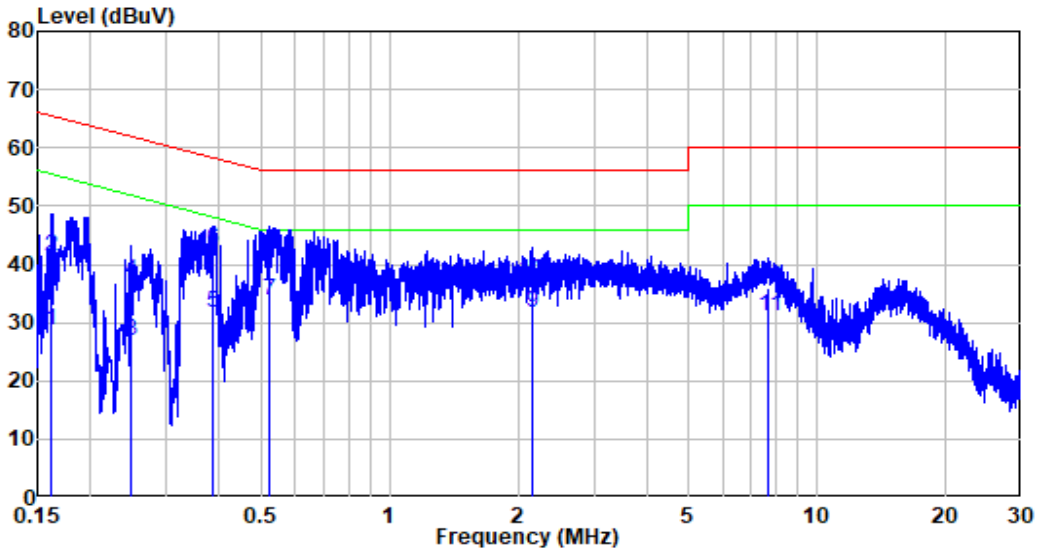
Environmental Conditions

Temperature:	23℃
Relative Humidity:	52%
ATM Pressure:	101.0 kPa

The testing was performed by Lipaon 2023-02-01.

EUT operation mode: Transmitting(worst case is 802.11g mode, Middle channel)

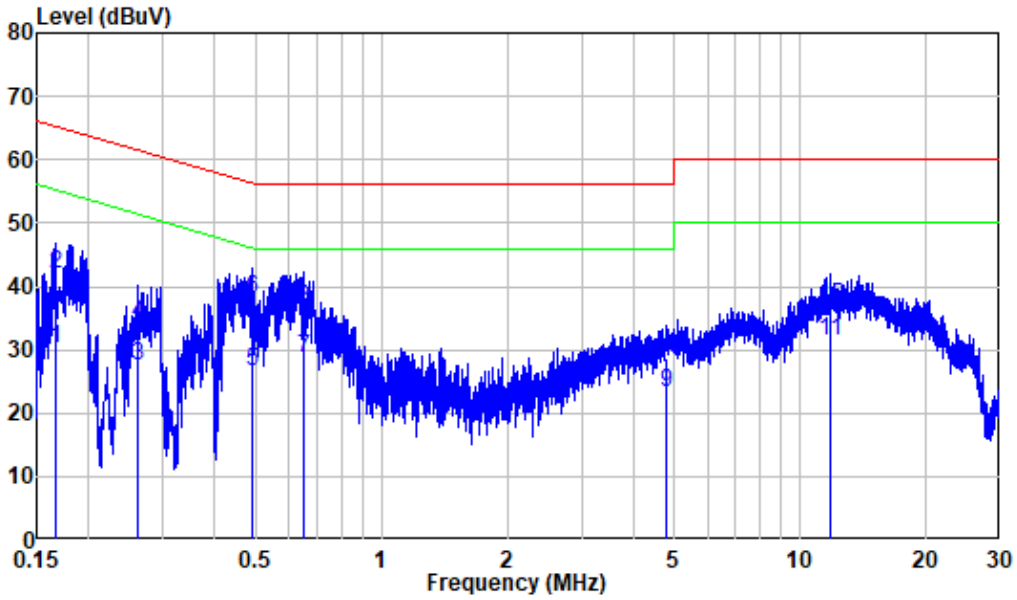
AC 120V/60 Hz, Line



Site : Shielding Room
Condition: Line
Job No. : RA221230-64660E-RF
Mode : 2.4G Wifi
Power : AC 120V 60Hz

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dBuV	dBuV	dB	
1	0.162	9.90	18.86	28.76	55.35	-26.59	Average
2	0.162	9.90	31.56	41.46	65.35	-23.89	QP
3	0.249	9.88	16.94	26.82	51.79	-24.97	Average
4	0.249	9.88	27.31	37.19	61.79	-24.60	QP
5	0.386	9.83	21.79	31.62	48.14	-16.52	Average
6	0.386	9.83	32.69	42.52	58.14	-15.62	QP
7	0.521	9.82	23.93	33.75	46.00	-12.25	Average
8	0.521	9.82	31.73	41.55	56.00	-14.45	QP
9	2.145	9.92	21.72	31.64	46.00	-14.36	Average
10	2.145	9.92	27.30	37.22	56.00	-18.78	QP
11	7.697	9.98	21.17	31.15	50.00	-18.85	Average
12	7.697	9.98	26.08	36.06	60.00	-23.94	QP

AC 120V/60 Hz, Neutral



Site : Shielding Room
Condition: Neutral
Job No. : RA221230-64660E-RF
Mode : 2.4G Wifi
Power : AC 120V 60Hz

	Freq	Factor	Read Level	Level	Limit Line	Over Limit	Remark
	MHz	dB	dBuV	dBuV	dBuV	dB	
1	0.167	9.80	20.32	30.12	55.13	-25.01	Average
2	0.167	9.80	32.28	42.08	65.13	-23.05	QP
3	0.262	9.83	17.79	27.62	51.36	-23.74	Average
4	0.262	9.83	24.30	34.13	61.36	-27.23	QP
5	0.490	9.90	16.68	26.58	46.18	-19.60	Average
6	0.490	9.90	28.06	37.96	56.18	-18.22	QP
7	0.653	9.83	18.82	28.65	46.00	-17.35	Average
8	0.653	9.83	26.69	36.52	56.00	-19.48	QP
9	4.775	9.91	13.39	23.30	46.00	-22.70	Average
10	4.775	9.91	18.65	28.56	56.00	-27.44	QP
11	11.768	10.02	21.42	31.44	50.00	-18.56	Average
12	11.768	10.02	26.73	36.75	60.00	-23.25	QP

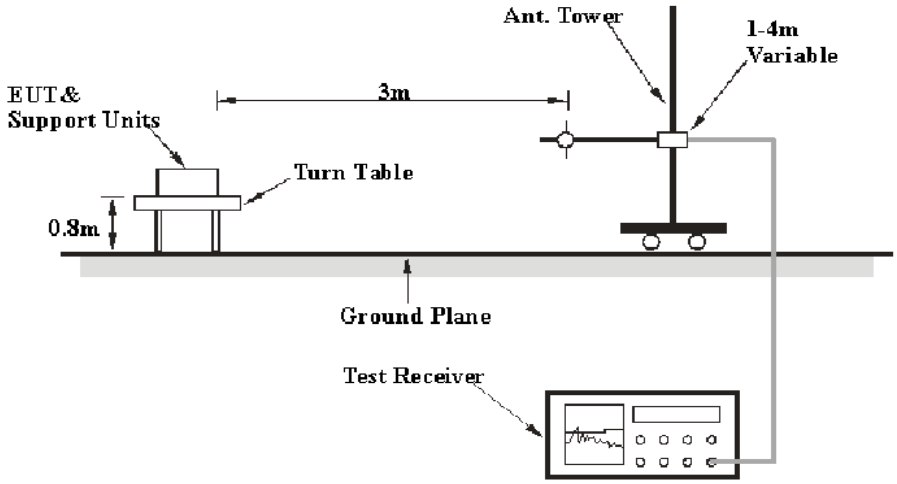
FCC §15.209, §15.205 &§15.247(d) - SPURIOUS EMISSIONS

Applicable Standard

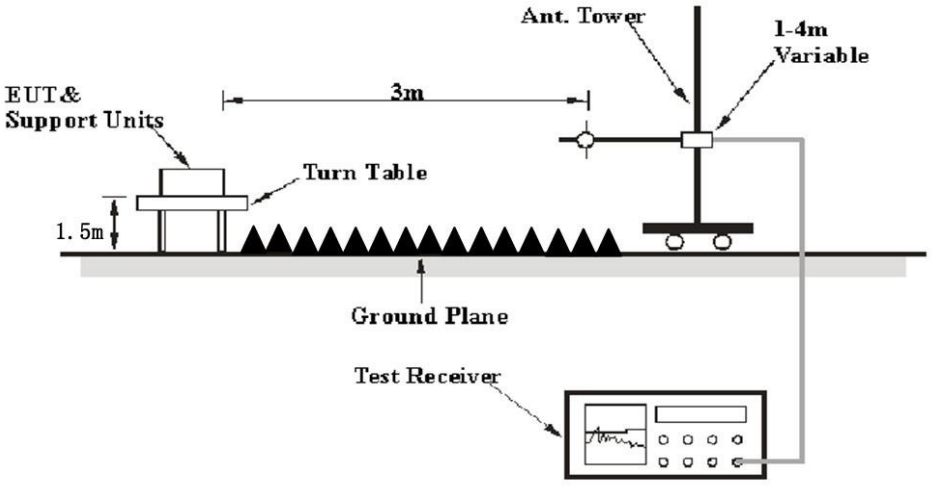
FCC §15.247 (d); §15.209;§15.205;

EUT Setup

Below 1 GHz:



Above 1GHz:



The radiated emission tests were performed in the 3meters 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
30MHz – 1000 MHz	100 kHz	300 kHz	120kHz	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:	24~25.5℃
Relative Humidity:	52~56%
ATM Pressure:	101.0 kPa

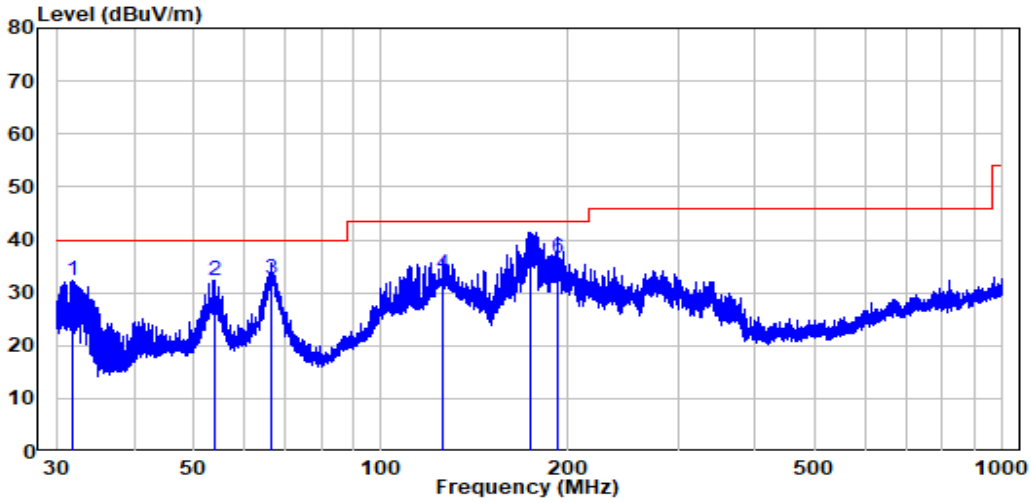
The testing was performed by Jimi Zheng on 2023-02-01 for below 1GHz,Level Li on 2023-01-28 and 2023-02-08 for above 1GHz

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

30 MHz~1 GHz: *(worst case is 802.11g mode, middle channel)*

Note: When the result of Peak less than the limit of QP by more than 6dB, just the peak value was recorded.

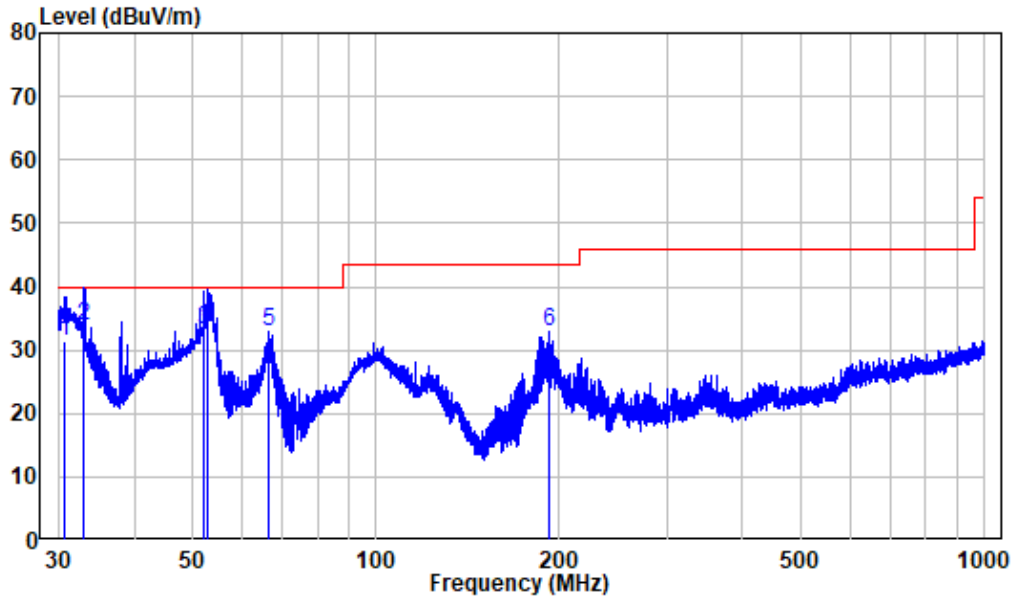
Horizontal



Site : chamber
Condition: 3m HORIZONTAL
Job No. : RA221230-64660E-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	31.829	-12.20	44.56	32.36	40.00	-7.64	Peak
2	53.787	-10.31	42.74	32.43	40.00	-7.57	Peak
3	66.616	-13.18	45.90	32.72	40.00	-7.28	QP
4	125.886	-14.40	47.76	33.36	43.50	-10.14	QP
5	173.585	-13.22	47.54	34.32	43.50	-9.18	QP
6	191.997	-11.25	47.70	36.45	43.50	-7.05	QP

Vertical



Site : chamber
Condition: 3m VERTICAL
Job No. : RA221230-64660E-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	30.826	-12.31	43.77	31.46	40.00	-8.54	QP
2	33.139	-11.99	45.86	33.87	40.00	-6.13	QP
3	52.162	-10.00	43.33	33.33	40.00	-6.67	QP
4	52.992	-10.17	44.58	34.41	40.00	-5.59	QP
5	66.412	-13.09	45.99	32.90	40.00	-7.10	Peak
6	191.745	-11.29	44.29	33.00	43.50	-10.50	Peak

1 GHz-25 GHz:

Wi-Fi:

Frequency (MHz)	Receiver		Turntable Angle Degree	Rx Antenna		Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/Ave		Height (m)	Polar (H/V)				
802.11b									
Low Channel2412MHz									
2310	60.88	PK	262	2	H	-7.24	53.64	74	-20.36
2310	49.45	AV	262	2	H	-7.24	42.21	54	-11.79
2310	61.22	PK	103	1.2	V	-7.24	53.98	74	-20.02
2310	49.37	AV	103	1.2	V	-7.24	42.13	54	-11.87
2390	63.37	PK	3	2.5	H	-7.22	56.15	74	-17.85
2390	50.45	AV	3	2.5	H	-7.22	43.23	54	-10.77
2390	63.75	PK	230	2.4	V	-7.22	56.53	74	-17.47
2390	50.79	AV	230	2.4	V	-7.22	43.57	54	-10.43
4824	58.58	PK	269	1.4	H	-3.52	55.06	74	-18.94
4824	44.96	AV	269	1.4	H	-3.52	41.44	54	-12.56
4824	58.85	PK	178	1.3	V	-3.52	55.33	74	-18.67
4824	46.33	AV	178	1.3	V	-3.52	42.81	54	-11.19
Middle Channel2437MHz									
4874	58.54	PK	213	1.6	H	-3.42	55.12	74	-18.88
4874	45.12	AV	213	1.6	H	-3.42	41.7	54	-12.30
4874	58.83	PK	36	2.1	V	-3.42	55.41	74	-18.59
4874	46.35	AV	36	2.1	V	-3.42	42.93	54	-11.07
High Channel2462MHz									
2483.5	64.07	PK	172	1.2	H	-7.20	56.87	74	-17.13
2483.5	53.43	AV	172	1.2	H	-7.20	46.23	54	-7.77
2483.5	64.55	PK	209	1.9	V	-7.20	57.35	74	-16.65
2483.5	52.78	AV	209	1.9	V	-7.20	45.58	54	-8.42
2500	62.87	PK	71	1.7	H	-7.18	55.69	74	-18.31
2500	49.95	AV	71	1.7	H	-7.18	42.77	54	-11.23
2500	62.83	PK	118	1.1	V	-7.18	55.65	74	-18.35
2500	49.80	AV	118	1.1	V	-7.18	42.62	54	-11.38
4924	58.14	PK	66	1.3	H	-3.16	54.98	74	-19.02
4924	44.87	AV	66	1.3	H	-3.16	41.71	54	-12.29
4924	58.46	PK	155	1.6	V	-3.16	55.30	74	-18.70
4924	45.81	AV	155	1.6	V	-3.16	42.65	54	-11.35

Frequency (MHz)	Receiver		Turntable Angle Degree	Rx Antenna		Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/Ave		Height (m)	Polar (H/V)				
802.11g									
Low Channel2412MHz									
2310	61.74	PK	250	1.8	H	-7.24	54.50	74	-19.50
2310	48.81	AV	250	1.8	H	-7.24	41.57	54	-12.43
2310	61.87	PK	243	1.6	V	-7.24	54.63	74	-19.37
2310	49.95	AV	243	1.6	V	-7.24	42.71	54	-11.29
2390	65.33	PK	91	1	H	-7.22	58.11	74	-15.89
2390	50.90	AV	91	1	H	-7.22	43.68	54	-10.32
2390	65.77	PK	259	1.5	V	-7.22	58.55	74	-15.45
2390	51.21	AV	259	1.5	V	-7.22	43.99	54	-10.01
4824	58.53	PK	311	2	H	-3.52	55.01	74	-18.99
4824	44.42	AV	311	2	H	-3.52	40.90	54	-13.10
4824	58.74	PK	39	1	V	-3.52	55.22	74	-18.78
4824	44.61	AV	39	1	V	-3.52	41.09	54	-12.91
Middle Channel2437MHz									
4874	58.53	PK	90	1.9	H	-3.42	55.11	74	-18.89
4874	44.36	AV	90	1.9	H	-3.42	40.94	54	-13.06
4874	54.72	PK	104	1.8	V	-3.42	51.3	74	-22.70
4874	44.61	AV	104	1.8	V	-3.42	41.19	54	-12.81
High Channel2462MHz									
2483.5	67.90	PK	16	1.1	H	-7.20	60.7	74	-13.30
2483.5	52.82	AV	16	1.1	H	-7.20	45.62	54	-8.38
2483.5	68.97	PK	269	1.3	V	-7.20	61.77	74	-12.23
2483.5	53.91	AV	269	1.3	V	-7.20	46.71	54	-7.29
2500	63.01	PK	18	1.8	H	-7.18	55.83	74	-18.17
2500	50.92	AV	18	1.8	H	-7.18	43.74	54	-10.26
2500	63.14	PK	131	1.4	V	-7.18	55.96	74	-18.04
2500	51.17	AV	131	1.4	V	-7.18	43.99	54	-10.01
4924	58.29	PK	35	1.5	H	-3.16	55.13	74	-18.87
4924	44.11	AV	35	1.5	H	-3.16	40.95	54	-13.05
4924	58.55	PK	91	1.1	V	-3.16	55.39	74	-18.61
4924	44.40	AV	91	1.1	V	-3.16	41.24	54	-12.76

Frequency (MHz)	Receiver		Turntable Angle Degree	Rx Antenna		Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/Ave		Height (m)	Polar (H/V)				
802.11n20									
Low Channel2412MHz									
2310	61.70	PK	63	1.9	H	-7.24	54.46	74	-19.54
2310	48.73	AV	63	1.9	H	-7.24	41.49	54	-12.51
2310	61.82	PK	339	1.7	V	-7.24	54.58	74	-19.42
2310	48.84	AV	339	1.7	V	-7.24	41.60	54	-12.40
2390	65.39	PK	294	2.1	H	-7.22	58.17	74	-15.83
2390	50.98	AV	294	2.1	H	-7.22	43.76	54	-10.24
2390	65.55	PK	14	2	V	-7.22	58.33	74	-15.67
2390	51.14	AV	14	2	V	-7.22	43.92	54	-10.08
4824	58.90	PK	201	1.8	H	-3.52	55.38	74	-18.62
4824	44.17	AV	201	1.8	H	-3.52	40.65	54	-13.35
4824	59.44	PK	181	2.5	V	-3.52	55.92	74	-18.08
4824	44.53	AV	181	2.5	V	-3.52	41.01	54	-12.99
Middle Channel2437MHz									
4874	58.84	PK	244	1.5	H	-3.42	55.42	74	-18.58
4874	44.25	AV	244	1.5	H	-3.42	40.83	54	-13.17
4874	59.31	PK	103	1.4	V	-3.42	55.89	74	-18.11
4874	44.52	AV	103	1.4	V	-3.42	41.1	54	-12.90
High Channel2462MHz									
2483.5	67.98	PK	249	1.5	H	-7.20	60.78	74	-13.22
2483.5	53.14	AV	249	1.5	H	-7.20	45.94	54	-8.06
2483.5	69.09	PK	331	1.6	V	-7.20	61.89	74	-12.11
2483.5	54.93	AV	331	1.6	V	-7.20	47.73	54	-6.27
2500	63.20	PK	304	1.4	H	-7.18	56.02	74	-17.98
2500	50.78	AV	304	1.4	H	-7.18	43.6	54	-10.40
2500	63.49	PK	319	1.4	V	-7.18	56.31	74	-17.69
2500	51.44	AV	319	1.4	V	-7.18	44.26	54	-9.74
4924	58.20	PK	168	2	H	-3.16	55.04	74	-18.96
4924	43.89	AV	168	2	H	-3.16	40.73	54	-13.27
4924	58.57	PK	291	1.2	V	-3.16	55.41	74	-18.59
4924	44.03	AV	291	1.2	V	-3.16	40.87	54	-13.13

Frequency (MHz)	Receiver		Turntable Angle Degree	Rx Antenna		Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/Ave		Height (m)	Polar (H/V)				
802.11n40									
Low Channel2422MHz									
2310	61.84	PK	235	2.4	H	-7.24	54.60	74	-19.40
2310	49.02	AV	235	2.4	H	-7.24	41.78	54	-12.22
2310	61.98	PK	150	1.3	V	-7.24	54.74	74	-19.26
2310	49.24	AV	150	1.3	V	-7.24	42.00	54	-12.00
2390	67.53	PK	301	1.1	H	-7.22	60.31	74	-13.69
2390	52.12	AV	301	1.1	H	-7.22	44.90	54	-9.10
2390	68.27	PK	244	1.2	V	-7.22	61.05	74	-12.95
2390	52.64	AV	244	1.2	V	-7.22	45.42	54	-8.58
4844	59.20	PK	240	1.5	H	-3.54	55.66	74	-18.34
4844	44.95	AV	240	1.5	H	-3.54	41.41	54	-12.59
4844	59.52	PK	295	2.5	V	-3.54	55.98	74	-18.02
4844	45.13	AV	295	2.5	V	-3.54	41.59	54	-12.41
Middle Channel2437MHz									
4874	58.92	PK	233	2.1	H	-3.42	55.5	74	-18.50
4874	44.76	AV	233	2.1	H	-3.42	41.34	54	-12.66
4874	59.11	PK	86	2	V	-3.42	55.69	74	-18.31
4874	44.93	AV	86	2	V	-3.42	41.51	54	-12.49
High Channel2452MHz									
2483.5	72.18	PK	310	1.3	H	-7.20	64.98	74	-9.02
2483.5	55.74	AV	310	1.3	H	-7.20	48.54	54	-5.46
2483.5	75.76	PK	206	1.3	V	-7.20	68.56	74	-5.44
2483.5	57.60	AV	206	1.3	V	-7.20	50.40	54	-3.60
2500	65.43	PK	84	1.8	H	-7.18	58.25	74	-15.75
2500	53.85	AV	84	1.8	H	-7.18	46.67	54	-7.33
2500	65.77	PK	81	2.1	V	-7.18	58.59	74	-15.41
2500	55.31	AV	81	2.1	V	-7.18	48.13	54	-5.87
4904	58.47	PK	205	1.1	H	-3.26	55.21	74	-18.79
4904	44.35	AV	205	1.1	H	-3.26	41.09	54	-12.91
4904	58.66	PK	89	1.1	V	-3.26	55.40	74	-18.60
4904	44.48	AV	89	1.1	V	-3.26	41.22	54	-12.78

Frequency (MHz)	Receiver		Turntable Angle Degree	Rx Antenna		Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/Ave		Height (m)	Polar (H/V)				
802.11ax20_242Tone_RU61(Worst Case)									
Low Channel2412MHz									
2310	61.81	PK	104	1.6	H	-7.24	54.57	74	-19.43
2310	48.90	AV	104	1.6	H	-7.24	41.66	54	-12.34
2310	61.94	PK	329	2.3	V	-7.24	54.70	74	-19.30
2310	49.03	AV	329	2.3	V	-7.24	41.79	54	-12.21
2390	65.13	PK	146	2.3	H	-7.22	57.91	74	-16.09
2390	51.04	AV	146	2.3	H	-7.22	43.82	54	-10.18
2390	65.41	PK	55	2.4	V	-7.22	58.19	74	-15.81
2390	51.25	AV	55	2.4	V	-7.22	44.03	54	-9.97
4824	58.77	PK	224	2.1	H	-3.52	55.25	74	-18.75
4824	44.08	AV	224	2.1	H	-3.52	40.56	54	-13.44
4824	59.20	PK	244	1.9	V	-3.52	55.68	74	-18.32
4824	44.31	AV	244	1.9	V	-3.52	40.79	54	-13.21
Middle Channel2437MHz									
4874	58.73	PK	4	2.2	H	-3.42	55.31	74	-18.69
4874	44.16	AV	4	2.2	H	-3.42	40.74	54	-13.26
4874	59.02	PK	244	1.6	V	-3.42	55.6	74	-18.40
4874	44.37	AV	244	1.6	V	-3.42	40.95	54	-13.05
High Channel2462MHz									
2483.5	67.30	PK	116	1.3	H	-7.20	60.1	74	-13.90
2483.5	53.69	AV	116	1.3	H	-7.20	46.49	54	-7.51
2483.5	68.21	PK	246	1.8	V	-7.20	61.01	74	-12.99
2483.5	55.42	AV	246	1.8	V	-7.20	48.22	54	-5.78
2500	62.98	PK	204	2.1	H	-7.18	55.8	74	-18.20
2500	51.05	AV	204	2.1	H	-7.18	43.87	54	-10.13
2500	63.42	PK	252	2.4	V	-7.18	56.24	74	-17.76
2500	51.46	AV	252	2.4	V	-7.18	44.28	54	-9.72
4924	58.26	PK	207	2.4	H	-3.16	55.10	74	-18.90
4924	43.81	AV	207	2.4	H	-3.16	40.65	54	-13.35
4924	58.50	PK	348	1.6	V	-3.16	55.34	74	-18.66
4924	43.99	AV	348	1.6	V	-3.16	40.83	54	-13.17

Frequency (MHz)	Receiver		Turntable Angle Degree	Rx Antenna		Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/Ave		Height (m)	Polar (H/V)				
802.11ax40_484Tone_RU65(Worst Case)									
Low Channel2422MHz									
2310	61.63	PK	272	1.7	H	-7.24	54.39	74	-19.61
2310	49.09	AV	272	1.7	H	-7.24	41.85	54	-12.15
2310	61.76	PK	226	1.7	V	-7.24	54.52	74	-19.48
2310	49.20	AV	226	1.7	V	-7.24	41.96	54	-12.04
2390	66.41	PK	327	2.4	H	-7.22	59.19	74	-14.81
2390	52.29	AV	327	2.4	H	-7.22	45.07	54	-8.93
2390	66.74	PK	325	1.5	V	-7.22	59.52	74	-14.48
2390	53.18	AV	325	1.5	V	-7.22	45.96	54	-8.04
4844	58.83	PK	35	2	H	-3.54	55.29	74	-18.71
4844	44.66	AV	35	2	H	-3.54	41.12	54	-12.88
4844	59.07	PK	17	1	V	-3.54	55.53	74	-18.47
4844	44.81	AV	17	1	V	-3.54	41.27	54	-12.73
Middle Channel2437MHz									
4874	58.76	PK	336	1.1	H	-3.42	55.34	74	-18.66
4874	43.60	AV	336	1.1	H	-3.42	40.18	54	-13.82
4874	58.99	PK	274	2	V	-3.42	55.57	74	-18.43
4874	44.78	AV	274	2	V	-3.42	41.36	54	-12.64
High Channel2452MHz									
2483.5	70.27	PK	142	1.6	H	-7.20	63.07	74	-10.93
2483.5	56.08	AV	142	1.6	H	-7.20	48.88	54	-5.12
2483.5	71.24	PK	310	1.7	V	-7.20	64.04	74	-9.96
2483.5	57.42	AV	310	1.7	V	-7.20	50.22	54	-3.78
2500	65.79	PK	14	1.1	H	-7.18	58.61	74	-15.39
2500	54.16	AV	14	1.1	H	-7.18	46.98	54	-7.02
2500	66.01	PK	190	2.2	V	-7.18	58.83	74	-15.17
2500	55.24	AV	190	2.2	V	-7.18	48.06	54	-5.94
4904	58.54	PK	247	2.1	H	-3.26	55.28	74	-18.72
4904	44.31	AV	247	2.1	H	-3.26	41.05	54	-12.95
4904	58.73	PK	96	2	V	-3.26	55.47	74	-18.53
4904	44.56	AV	96	2	V	-3.26	41.30	54	-12.70

BLE:

Frequency (MHz)	Receiver		Turntable Angle Degree	Rx Antenna		Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/Ave		Height (m)	Polar (H/V)				
BLE_1M									
Low Channel 2402MHz									
2310	61.44	PK	356	1.9	H	-7.24	54.20	74	-19.80
2310	48.58	AV	356	1.9	H	-7.24	41.34	54	-12.66
2310	61.27	PK	345	2.2	V	-7.24	54.03	74	-19.97
2310	48.52	AV	345	2.2	V	-7.24	41.28	54	-12.72
2390	62.74	PK	2	1.5	H	-7.22	55.52	74	-18.48
2390	49.98	AV	2	1.5	H	-7.22	42.76	54	-11.24
2390	62.59	PK	265	1.1	V	-7.22	55.37	74	-18.63
2390	49.75	AV	265	1.1	V	-7.22	42.53	54	-11.47
4804	57.27	PK	123	2.2	H	-3.51	53.76	74	-20.24
4804	57.24	PK	229	1.5	V	-3.51	53.73	74	-20.27
Middle Channel 2440MHz									
4880	56.83	PK	150	1.6	H	-3.38	53.45	74	-20.55
4880	56.96	PK	122	1.5	V	-3.38	53.58	74	-20.42
High Channel 2480MHz									
2483.5	63.40	PK	203	1.6	H	-7.20	56.2	74	-17.80
2483.5	51.24	AV	203	1.6	H	-7.20	44.04	54	-9.96
2483.5	63.76	PK	211	1.1	V	-7.20	56.56	74	-17.44
2483.5	51.07	AV	211	1.1	V	-7.20	43.87	54	-10.13
2500	64.04	PK	18	2	H	-7.18	56.86	74	-17.14
2500	50.33	AV	18	2	H	-7.18	43.15	54	-10.85
2500	62.66	PK	21	1	V	-7.18	55.48	74	-18.52
2500	50.24	AV	21	1	V	-7.18	43.06	54	-10.94
4960	56.41	PK	146	2.3	H	-3.01	53.40	74	-20.60
4960	56.19	PK	19	1.3	V	-3.01	53.18	74	-20.82

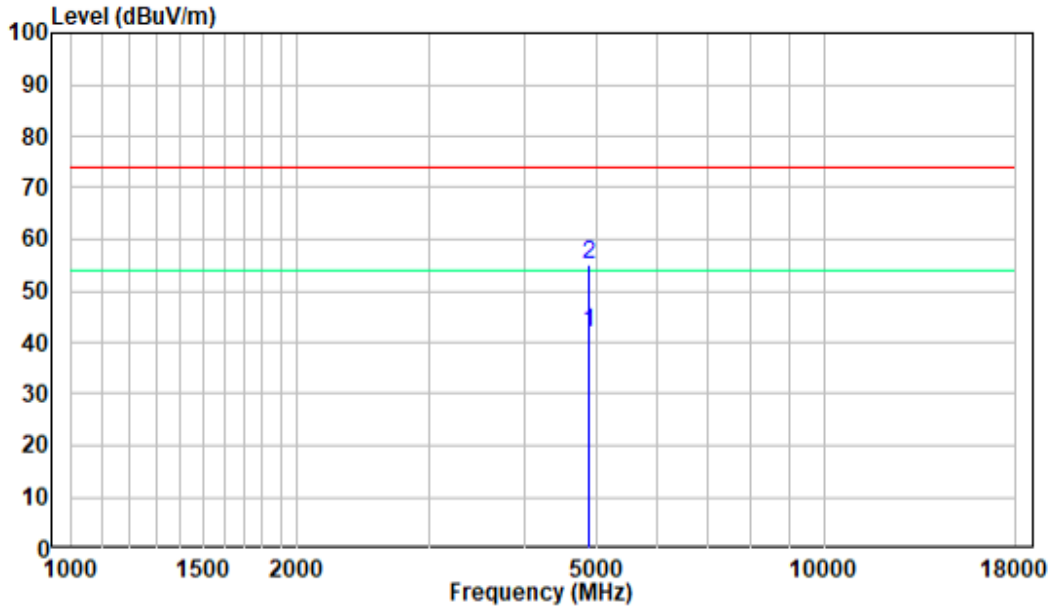
Frequency (MHz)	Receiver		Turntable Angle Degree	Rx Antenna		Factor (dB/m)	Corrected Amplitude (dBμV/m)	Limit (dBμV/m)	Margin (dB)
	Reading (dBμV)	PK/Ave		Height (m)	Polar (H/V)				
BLE_2M									
Low Channel 2402MHz									
2310	61.55	PK	299	1.9	H	-7.24	54.31	74	-19.69
2310	49.14	AV	299	1.9	H	-7.24	41.90	54	-12.10
2310	61.60	PK	220	1.3	V	-7.24	54.36	74	-19.64
2310	49.07	AV	220	1.3	V	-7.24	41.83	54	-12.17
2390	63.23	PK	268	2	H	-7.22	56.01	74	-17.99
2390	50.70	AV	268	2	H	-7.22	43.48	54	-10.52
2390	63.27	PK	250	1.6	V	-7.22	56.05	74	-17.95
2390	50.62	AV	250	1.6	V	-7.22	43.40	54	-10.60
4804	57.26	PK	41	1.6	H	-3.51	53.75	74	-20.25
4804	57.11	PK	5	1.1	V	-3.51	53.60	74	-20.40
Middle Channel 2440MHz									
4880	57.03	PK	92	1.3	H	-3.38	53.65	74	-20.35
4880	56.88	PK	47	2.1	V	-3.38	53.5	74	-20.50
High Channel 2480MHz									
2483.5	63.59	PK	224	1.4	H	-7.20	56.39	74	-17.61
2483.5	51.88	AV	224	1.4	H	-7.20	44.68	54	-9.32
2483.5	63.67	PK	85	1.1	V	-7.20	56.47	74	-17.53
2483.5	51.52	AV	85	1.1	V	-7.20	44.32	54	-9.68
2500	63.16	PK	50	1.7	H	-7.18	55.98	74	-18.02
2500	51.34	AV	50	1.7	H	-7.18	44.16	54	-9.84
2500	63.00	PK	235	1.5	V	-7.18	55.82	74	-18.18
2500	51.09	AV	235	1.5	V	-7.18	43.91	54	-10.09
4960	56.58	PK	259	1.1	H	-3.01	53.57	74	-20.43
4960	56.50	PK	302	1.4	V	-3.01	53.49	74	-20.51

Note:
Corrected Factor=Antenna factor (RX) + Cable Loss – Amplifier Factor
Corrected Amplitude = Corrected Factor + Reading
Margin = Corrected. Amplitude - Limit
The other spurious emission which is 20dB to the limit or in the noise floor level was not recorded.
When the test result of peak was less than the limit of average, just peak values were recorded.

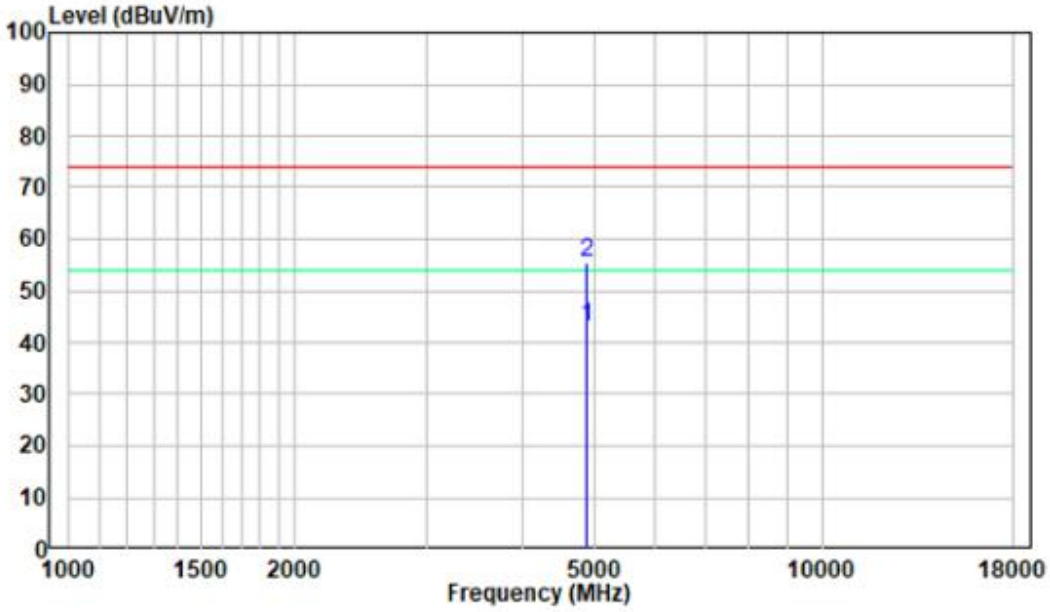
1-18 GHz:

Pre-scan for 802.11b Middle Channel

Horizontal



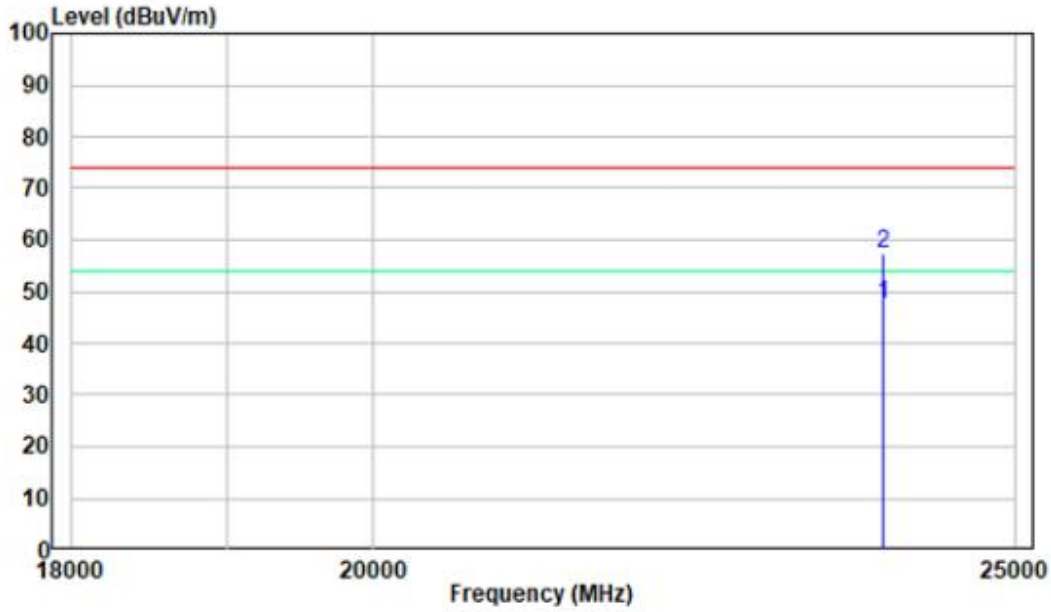
Vertical



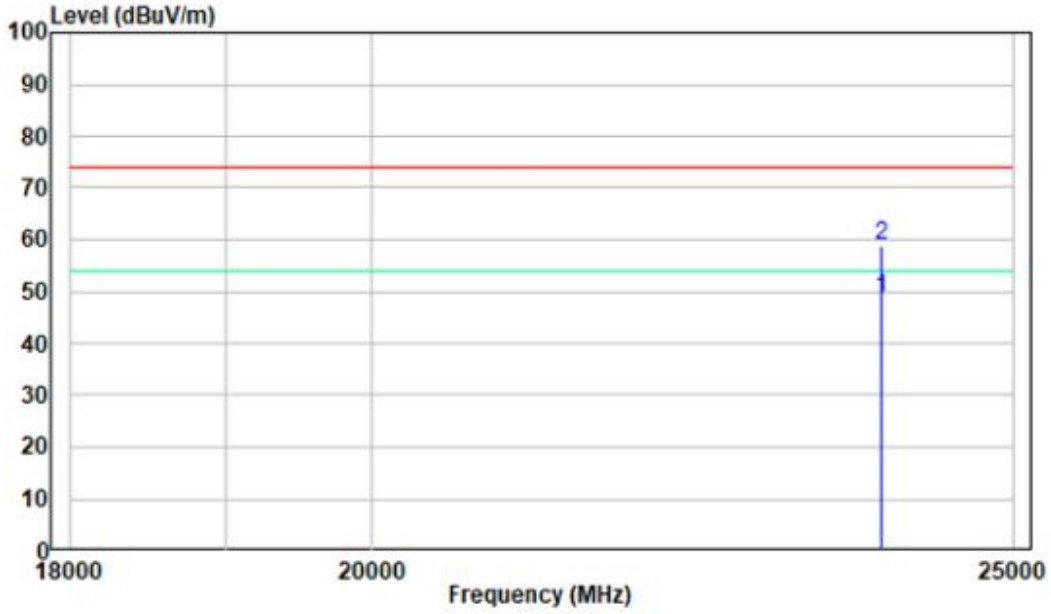
18 -25GHz:

Pre-scan for 802.11b Middle Channel

Horizontal



Vertical



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

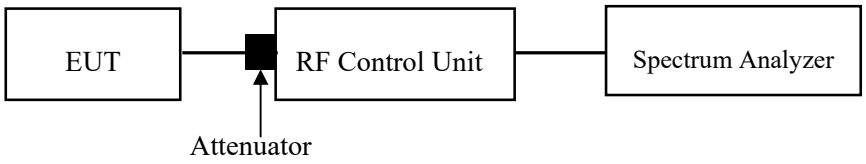
Applicable Standard

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

Test Method: ANSI C63.10-2013 Clause 11.8.1 &Clause 6.9.3

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℃
Relative Humidity:	56%
ATM Pressure:	101.0 kPa

The testing was performed by Andy Yu from 2023-02-02 to 2023-02-11

EUT operation mode: Transmitting

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

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

Applicable Standard

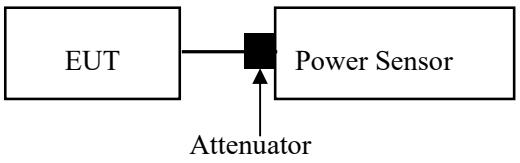
According to FCC §15.247(b) (3), for systems using digital modulation in the 902-928 MHz, 2400-2483.5 MHz, and 5725-5850 MHz bands: 1 Watt. As an alternative to a peak power measurement, compliance with the one Watt limit can be based on a measurement of the maximum conducted output power. Maximum Conducted 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

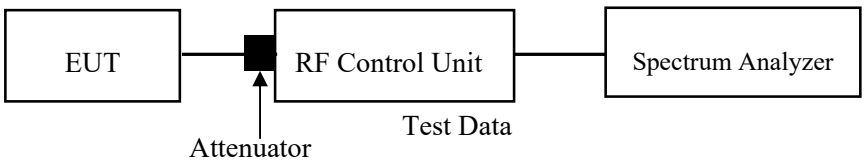
Test Method: ANSI C63.10-2013 Clause 11.9.1.1 for BLE &Clause 11.9.2.3 for Wi-Fi

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.

For Wi-Fi mode:



For BLE mode:



Environmental Conditions

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

The testing was performed by Andy Yu from 2023-02-02 to 2023-02-24.

EUT operation mode: Transmitting

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

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

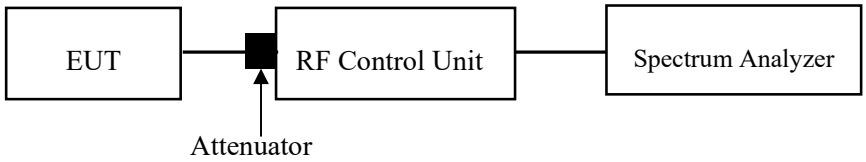
Applicable Standard

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

Test Method: ANSI C63.10-2013 Clause 11.11

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℃
Relative Humidity:	56%
ATM Pressure:	101.0 kPa

The testing was performed by Andy Yu from 2023-02-02 to 2023-02-24

EUT operation mode: Transmitting

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

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

Test Method: ANSI C63.10-2013 Clause 11.10.2

Use this procedure when the maximum peak conducted output power in the fundamental emission is used to demonstrate compliance.

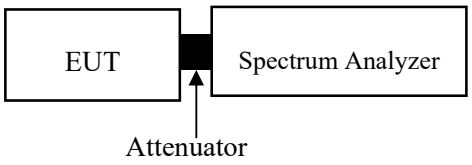
1. Set the RBW to: 3kHz≤ RBW≤100 kHz.
2. Set the VBW ≥ 3×RBW.
3. Set the span to 1.5 times the DTS bandwidth.
4. Detector = peak.
5. Sweep time = auto couple.
6. Trace mode = max hold.
7. Allow trace to fully stabilize.
8. Use the peak marker function to determine the maximum amplitude level within the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

Test Method: ANSI C63.10-2013 Clause 11.10.3 &11.10.5

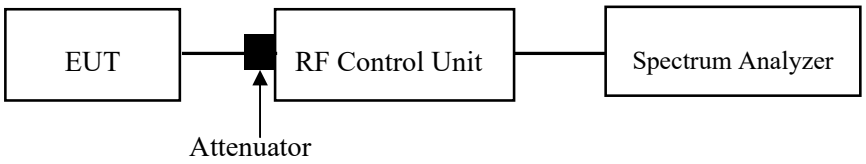
Use this procedure when the maximum average conducted output power in the fundamental emission is used to demonstrate compliance.

1. Measure the duty cycle (*D*) of the transmitter output signal as described in ANSI C63.10-201311.6.
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 = Power Averaging (rms).
6. Ensure that the number of measurement points in the sweep ≥ [2 ×span / RBW].
7. Sweep time = auto couple.
8. Trace mode = trace averaging (rms) mode over a minimum of 100 traces.
9. Allow trace to fully stabilize.
10. Use the peak marker function to determine the maximum amplitude level.
11. When the EUT cannot be configured to transmit continuously (i.e.,*D*< 98%), when sweep triggering/signal gating cannot be used to measure only when the EUT is transmitting at its maximum power control level, and when the transmission duty cycle is constant (i.e.,duty cycle variations are less than ±2%), add [10 log (1 / D)], where D is the duty cycle measured in step 1), to the measured PSD to compute the average PSD during the actual transmission time.
12. When the EUT transmits continuously (or with a $D \geqslant 98\%$), step 11 is not required.
13. If measured value exceeds limit, reduce RBW (no less than 3 kHz) and repeat.

For Wi-Fi mode:



For BLE mode:



Test Data

Environmental Conditions

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

The testing was performed by Andy Yu from 2023-02-11 to 2023-03-18.

EUT operation mode: Transmitting

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

APPENDIX Wi-Fi

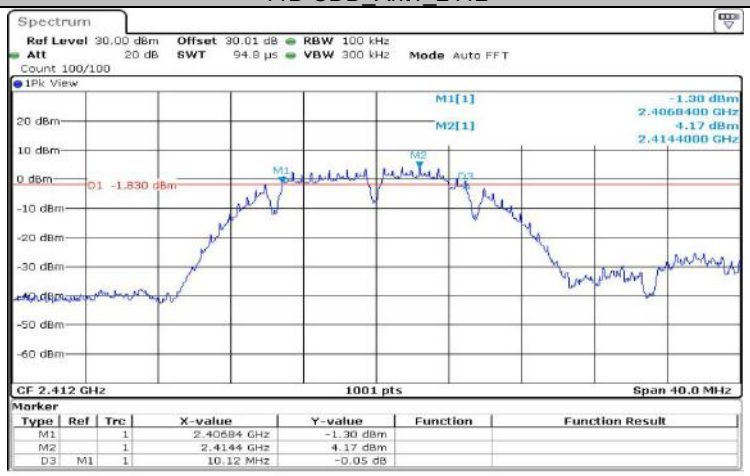
Appendix A: DTS Bandwidth

Test Result

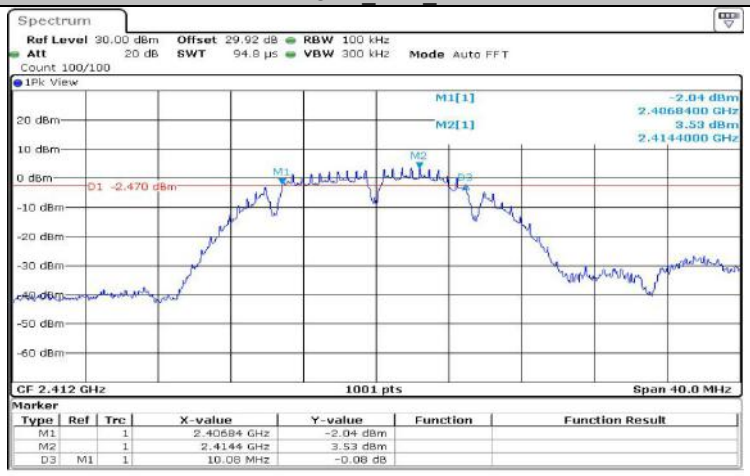
Test Mode	Antenna	Frequency[MHz]	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B-CDD	Ant1	2412	10.12	2406.84	2416.96	0.5	PASS
	Ant2	2412	10.08	2406.84	2416.92	0.5	PASS
	Ant1	2437	10.12	2431.84	2441.96	0.5	PASS
	Ant2	2437	10.12	2431.84	2441.96	0.5	PASS
	Ant1	2462	11.08	2455.88	2466.96	0.5	PASS
	Ant2	2462	10.12	2456.84	2466.96	0.5	PASS
11G-CDD	Ant1	2412	15.48	2404.00	2419.48	0.5	PASS
	Ant2	2412	15.92	2403.76	2419.68	0.5	PASS
	Ant1	2437	15.48	2429.00	2444.48	0.5	PASS
	Ant2	2437	16.28	2428.76	2445.04	0.5	PASS
	Ant1	2462	16.32	2453.76	2470.08	0.5	PASS
	Ant2	2462	16.28	2453.76	2470.04	0.5	PASS
11N20MIMO	Ant1	2412	16.60	2403.68	2420.28	0.5	PASS
	Ant2	2412	16.32	2403.96	2420.28	0.5	PASS
	Ant1	2437	16.56	2428.68	2445.24	0.5	PASS
	Ant2	2437	17.00	2428.68	2445.68	0.5	PASS
	Ant1	2462	17.12	2453.40	2470.52	0.5	PASS
	Ant2	2462	17.52	2453.16	2470.68	0.5	PASS
11N40MIMO	Ant1	2422	36.24	2403.68	2439.92	0.5	PASS
	Ant2	2422	36.24	2403.68	2439.92	0.5	PASS
	Ant1	2437	36.16	2418.76	2454.92	0.5	PASS
	Ant2	2437	36.40	2418.76	2455.16	0.5	PASS
	Ant1	2452	36.16	2433.76	2469.92	0.5	PASS
	Ant2	2452	36.16	2433.76	2469.92	0.5	PASS
11AX20MIMO (worst case 242Tone_RU61)	Ant1	2412	17.96	2403.04	2421.00	0.5	PASS
	Ant2	2412	17.96	2403.04	2421.00	0.5	PASS
	Ant1	2437	17.68	2428.28	2445.96	0.5	PASS
	Ant2	2437	17.76	2428.56	2446.32	0.5	PASS
	Ant1	2462	18.44	2452.92	2471.36	0.5	PASS
	Ant2	2462	18.44	2452.92	2471.36	0.5	PASS
11AX40MIMO (worst case 484Tone_RU65)	Ant1	2422	37.92	2403.04	2440.96	0.5	PASS
	Ant2	2422	37.92	2403.04	2440.96	0.5	PASS
	Ant1	2437	37.92	2418.04	2455.96	0.5	PASS
	Ant2	2437	37.92	2418.04	2455.96	0.5	PASS
	Ant1	2452	37.92	2433.04	2470.96	0.5	PASS
	Ant2	2452	37.92	2433.04	2470.96	0.5	PASS

Test Graphs

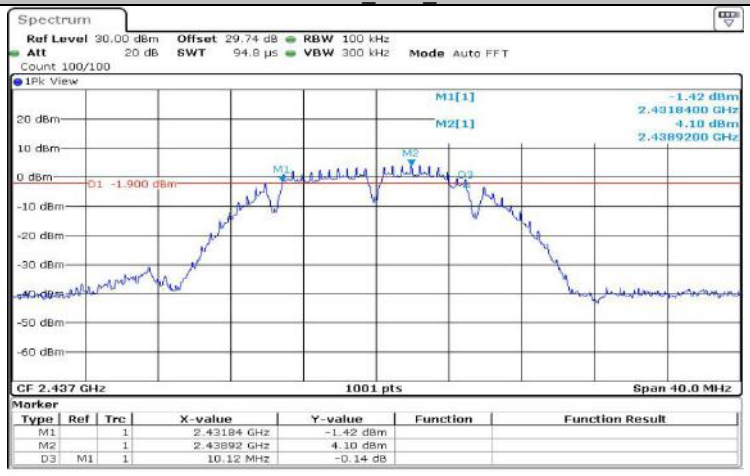
11B-CDD_Ant1_2412



11B-CDD_Ant2_2412



11B-CDD_Ant1_2437



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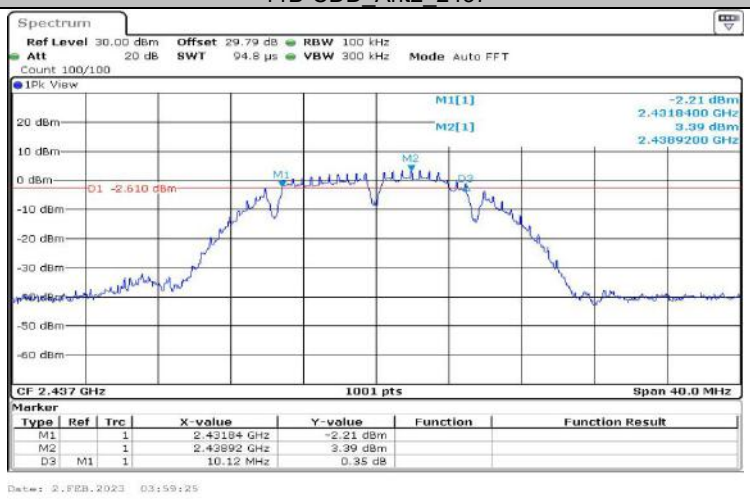
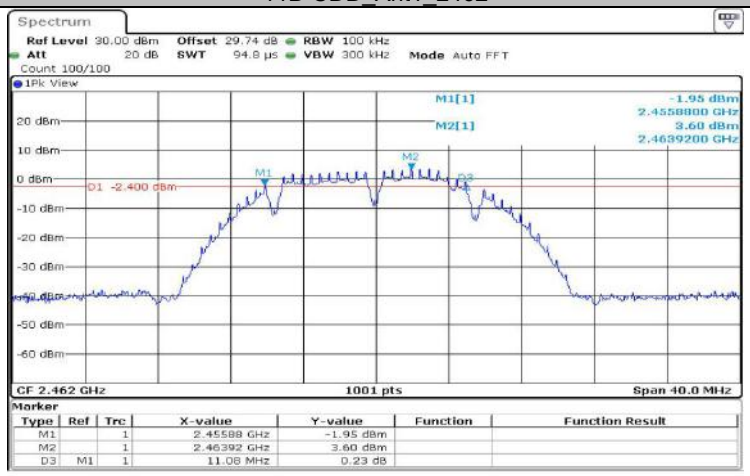
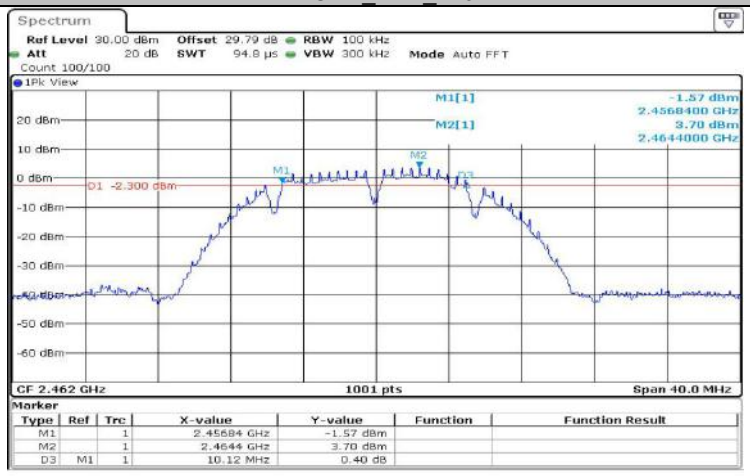


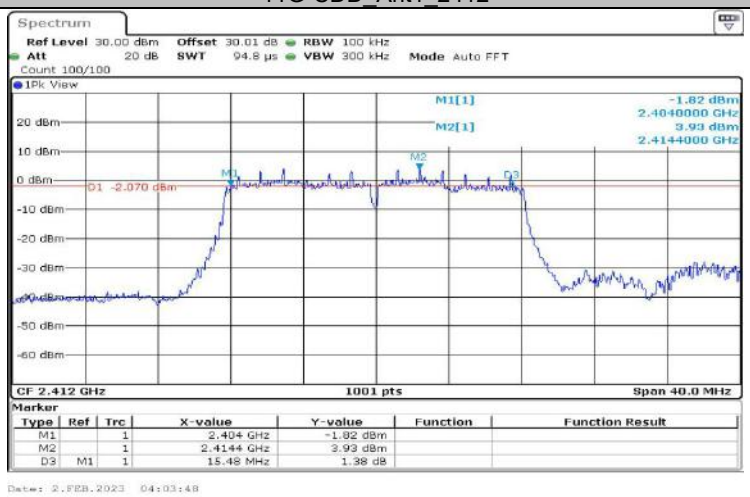
11B-CDD_Ant1_2462



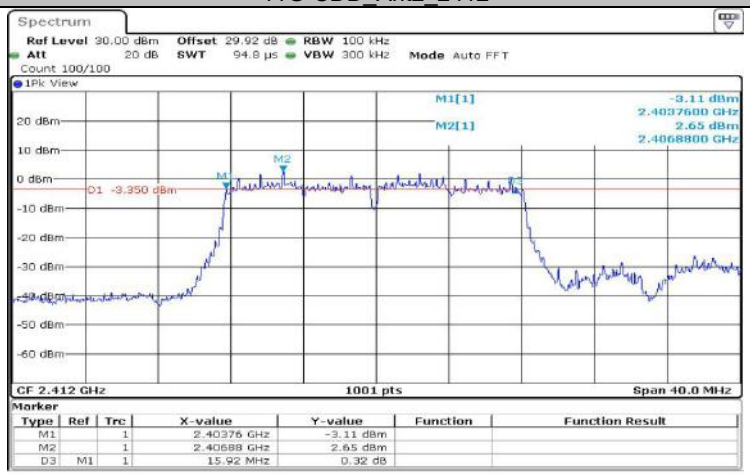
11B-CDD_Ant2_2462



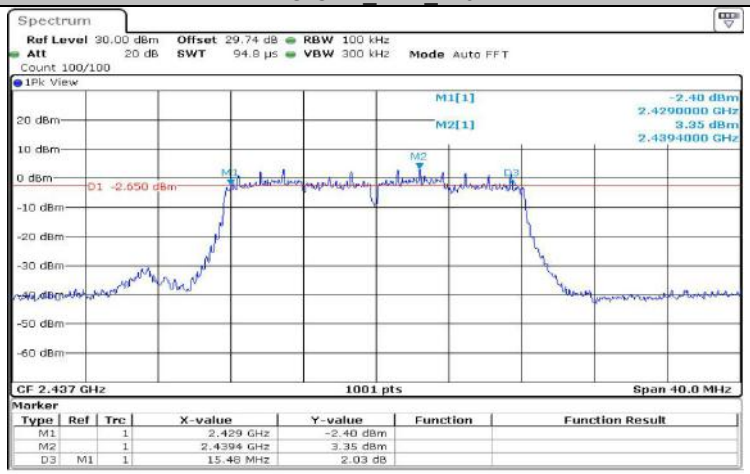
11G-CDD_Ant1_2412



11G-CDD_Ant2_2412

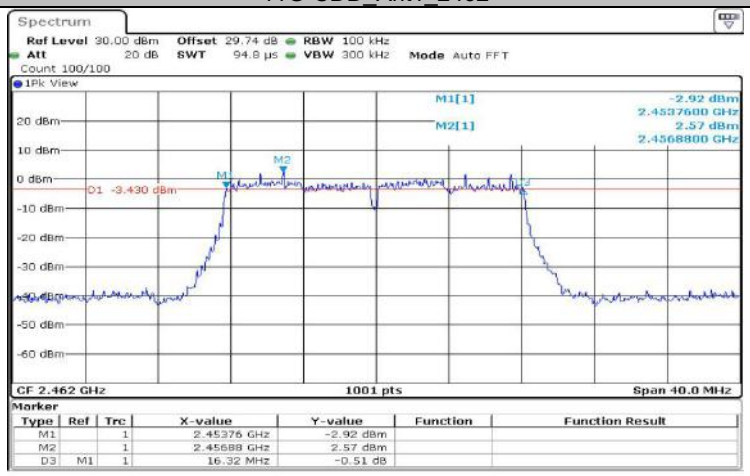


11G-CDD_Ant1_2437



11G-CDD_Ant2_2437

11G-CDD_Ant1_2462



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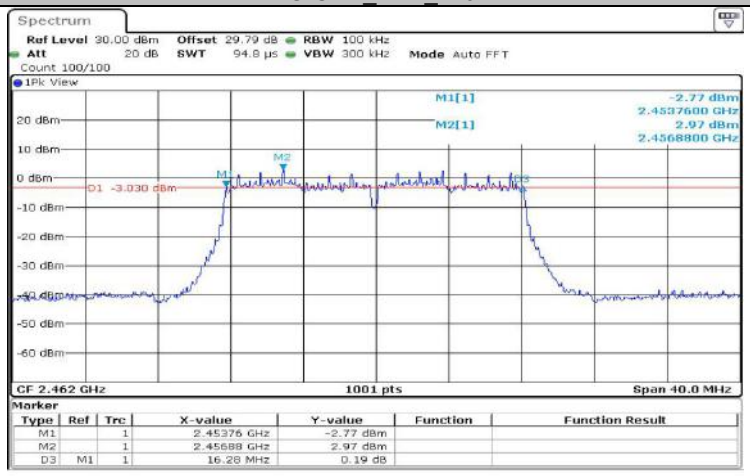
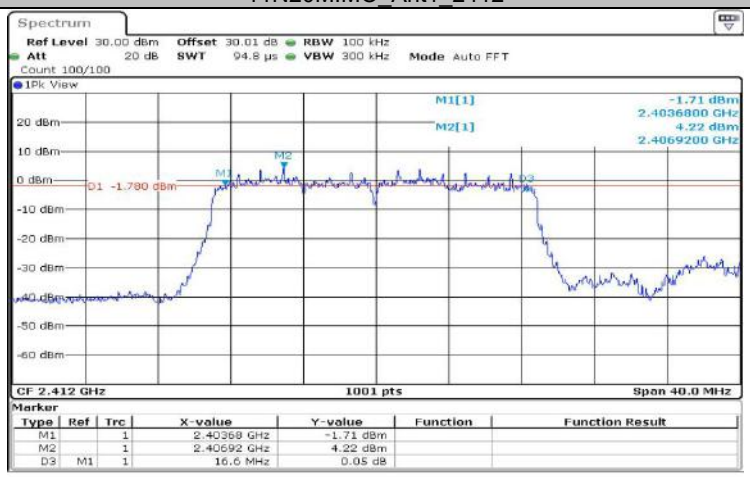
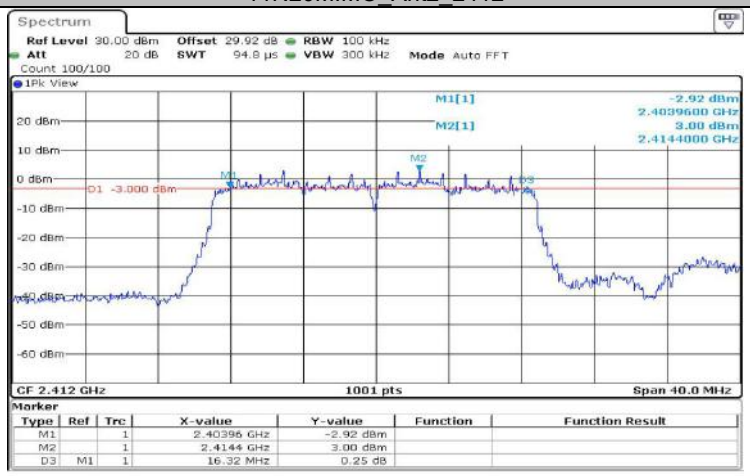


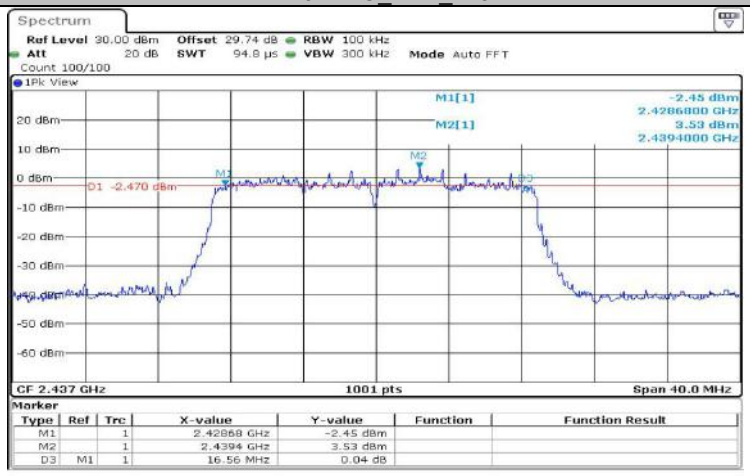
11N20MIMO_Ant1_2412



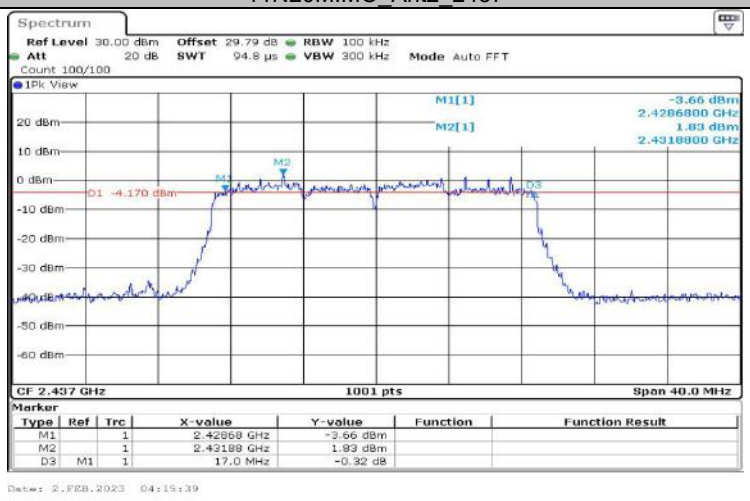
11N20MIMO_Ant2_2412



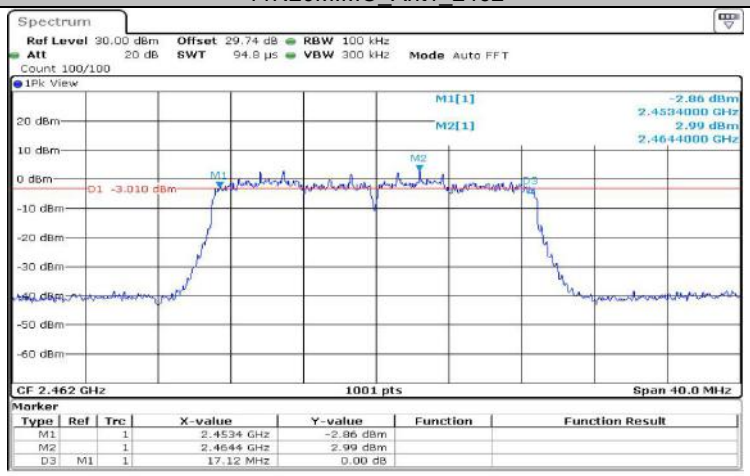
11N20MIMO_Ant1_2437



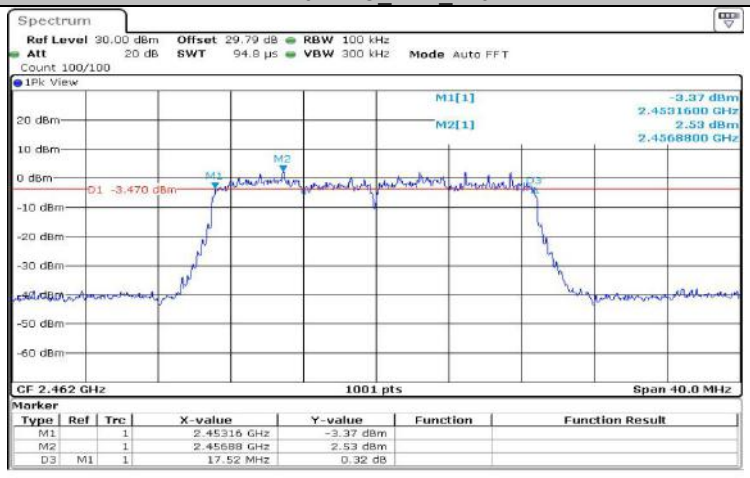
11N20MIMO_Ant2_2437



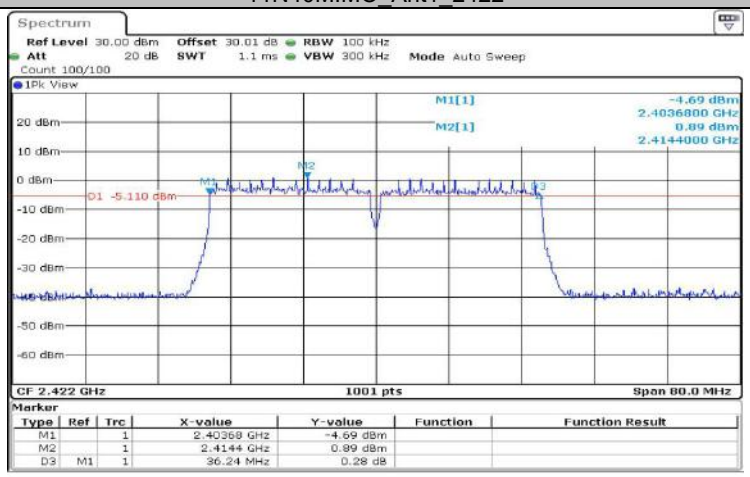
11N20MIMO_Ant1_2462



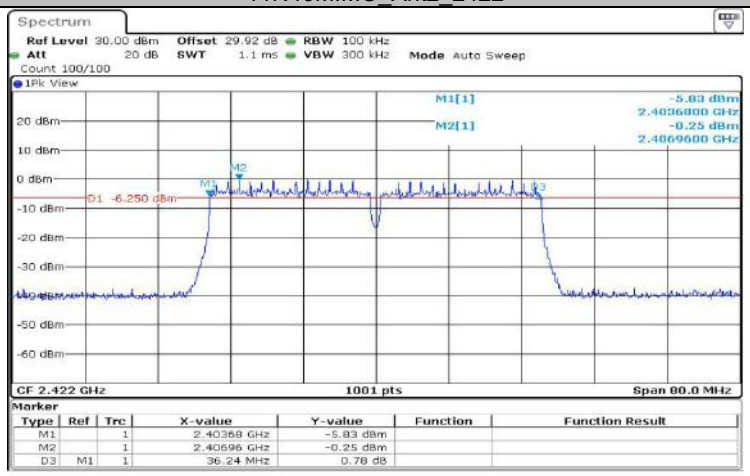
11N20MIMO_Ant2_2462



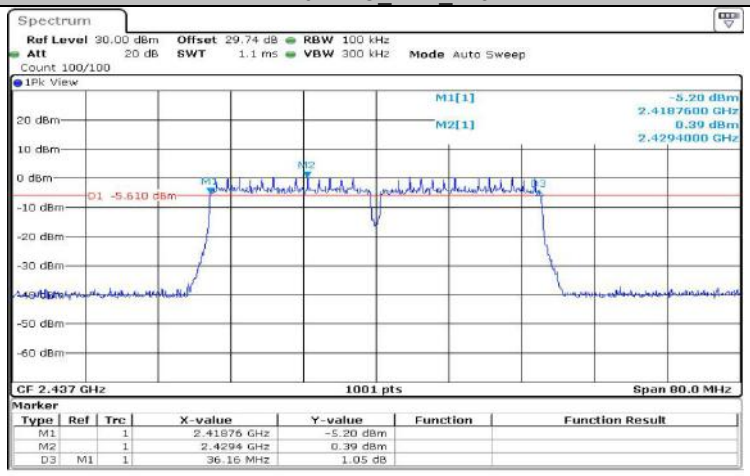
11N40MIMO_Ant1_2422



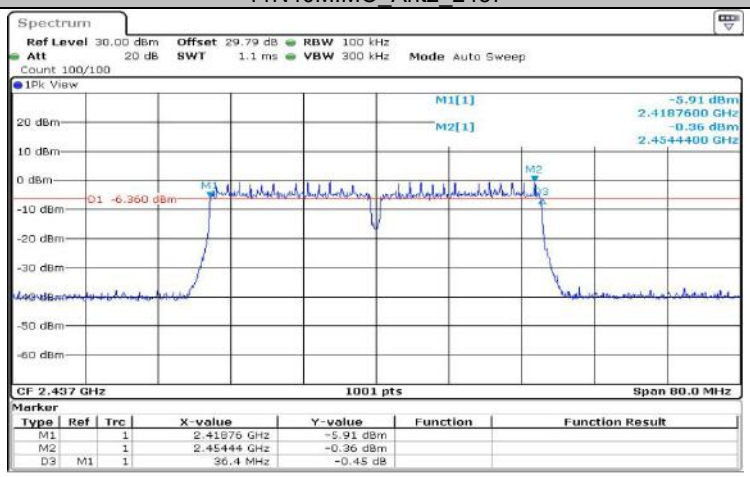
11N40MIMO_Ant2_2422



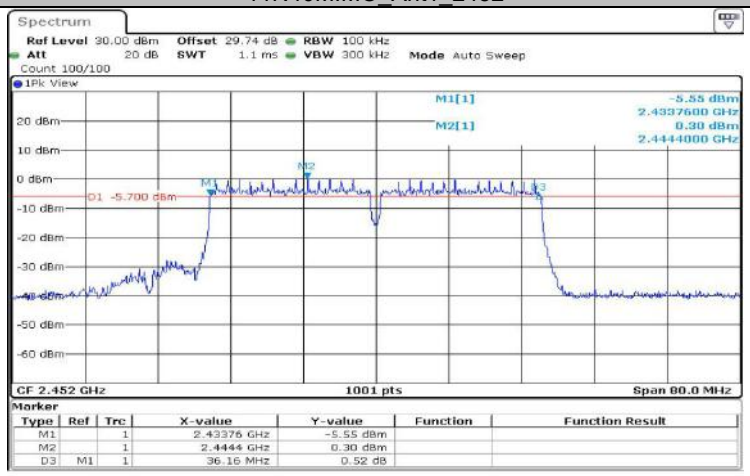
11N40MIMO_Ant1_2437



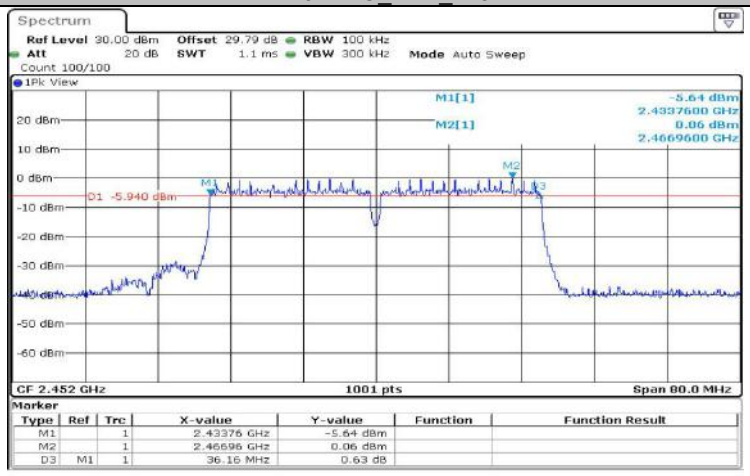
11N40MIMO_Ant2_2437



11N40MIMO_Ant1_2452

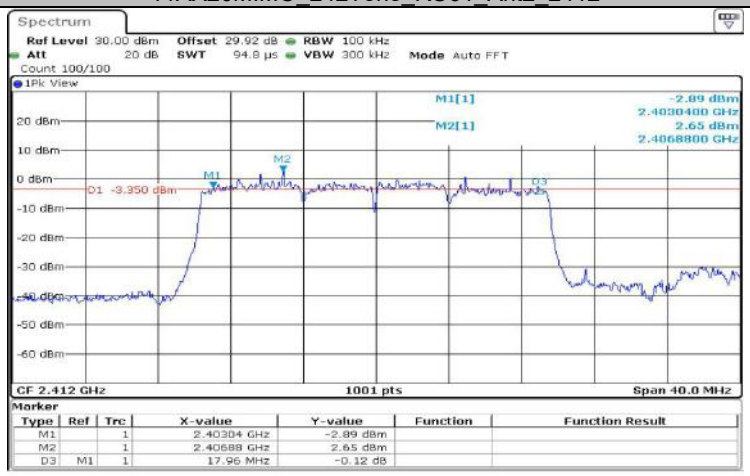


11N40MIMO_Ant2_2452

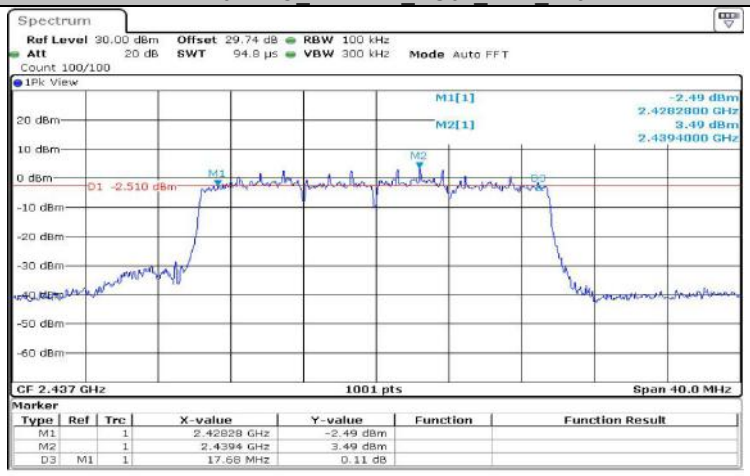


11AX20MIMO_242Tone_RU61_Ant1_2412

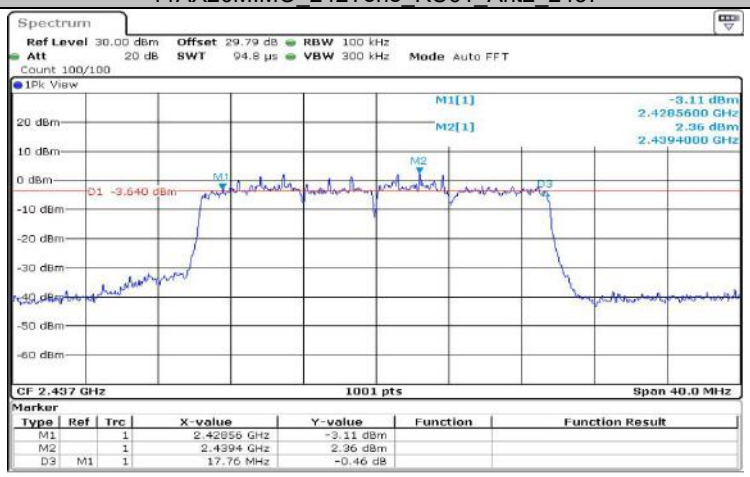
11AX20MIMO_242Tone_RU61_Ant2_2412



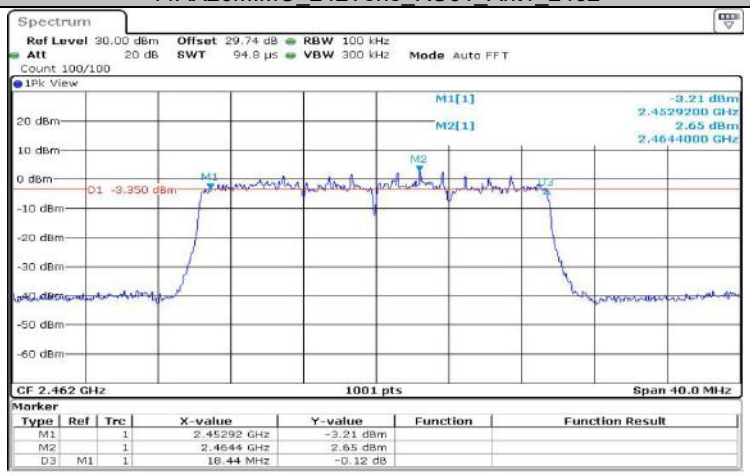
11AX20MIMO_242Tone_RU61_Ant1_2437



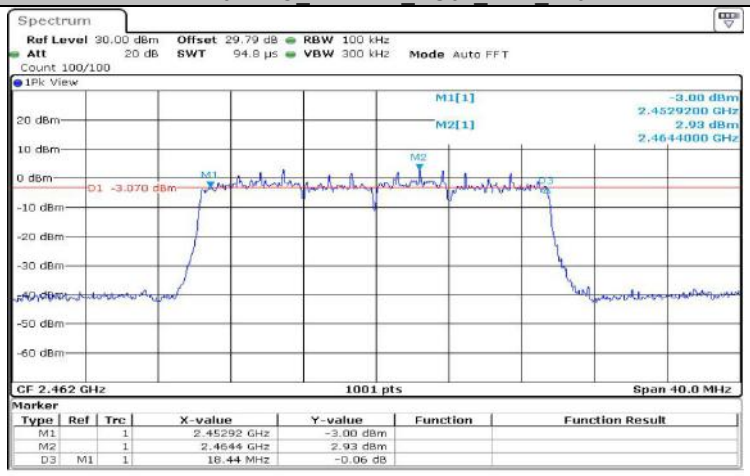
11AX20MIMO_242Tone_RU61_Ant2_2437



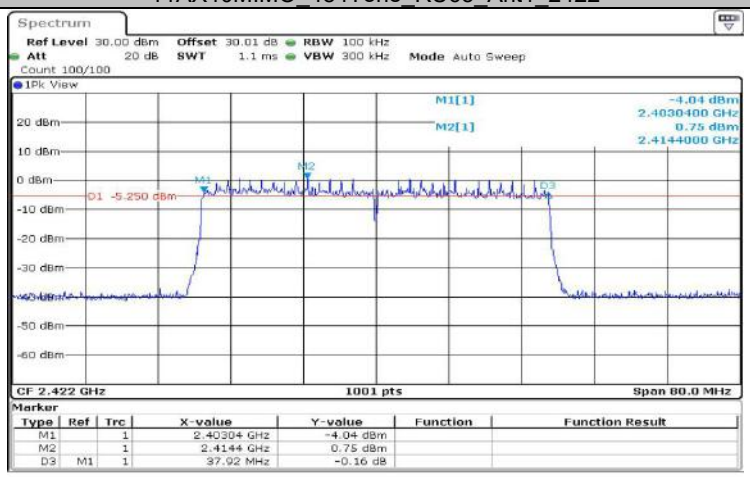
11AX20MIMO_242Tone_RU61_Ant1_2462



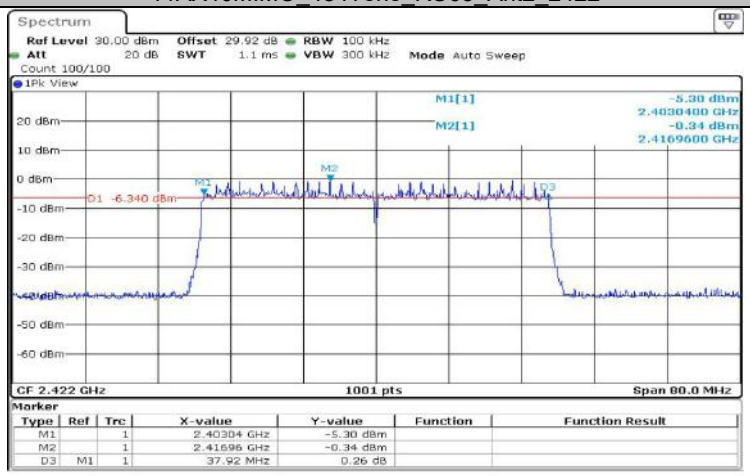
11AX20MIMO_242Tone_RU61_Ant2_2462



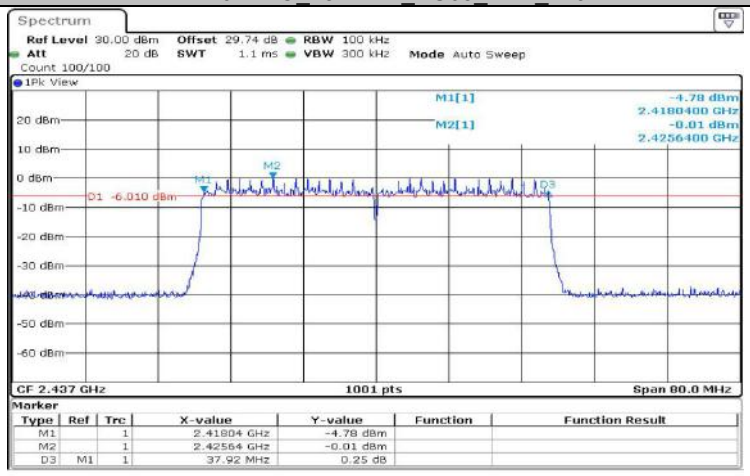
11AX40MIMO_484Tone_RU65_Ant1_2422



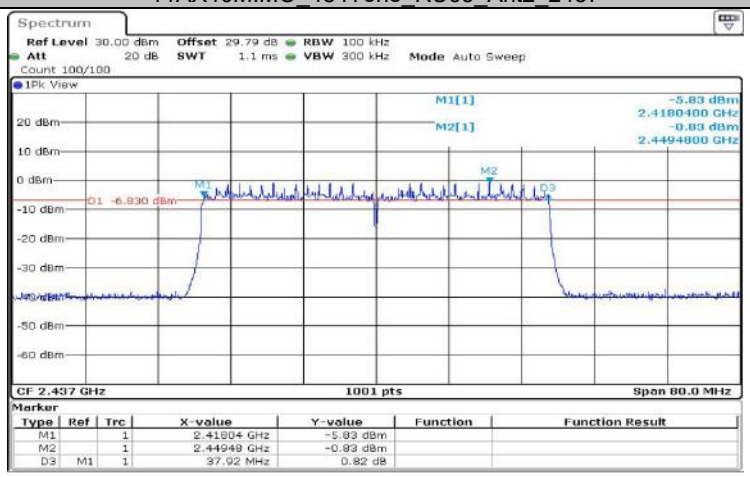
11AX40MIMO_484Tone_RU65_Ant2_2422



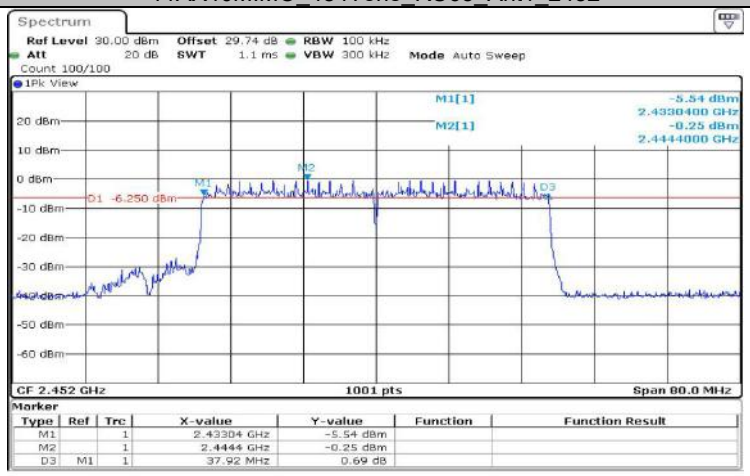
11AX40MIMO_484Tone_RU65_Ant1_2437



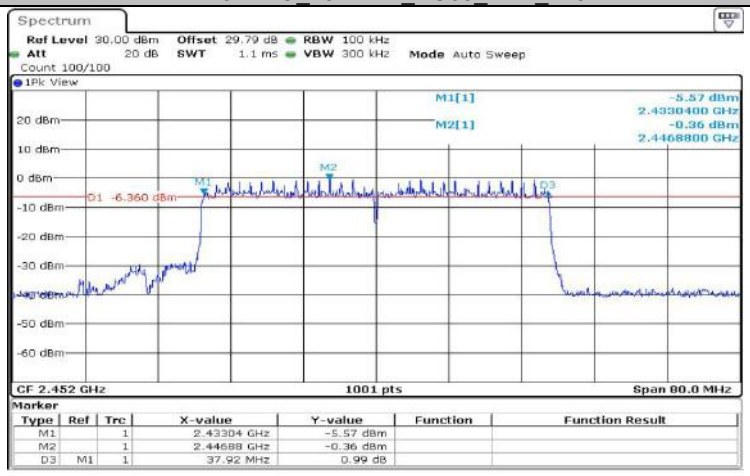
11AX40MIMO_484Tone_RU65_Ant2_2437



11AX40MIMO_484Tone_RU65_Ant1_2452



11AX40MIMO_484Tone_RU65_Ant2_2452



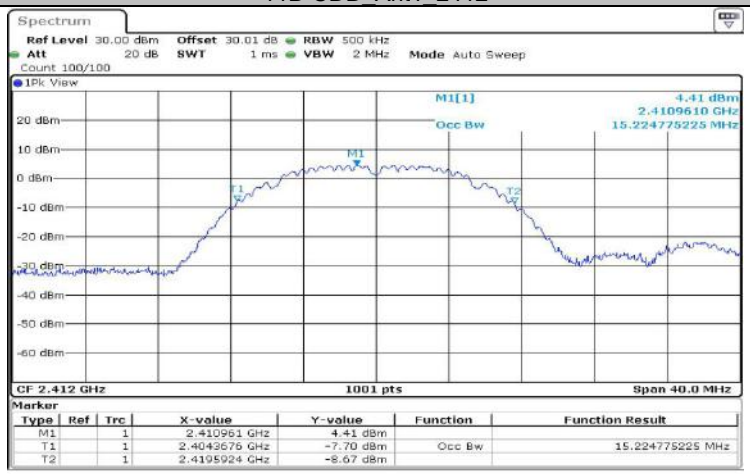
Appendix B: Occupied Channel Bandwidth

Test Result

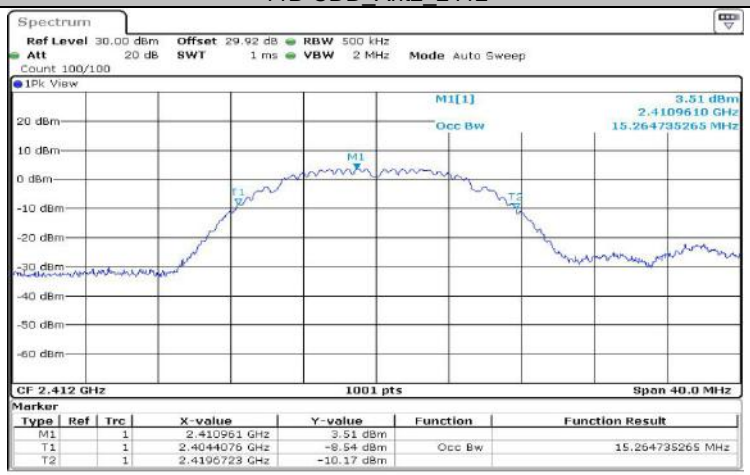
Test Mode	Antenna	Channel Frequency[MHz]	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B-CDD	Ant1	2412	15.225	2404.368	2419.592	---	---
	Ant2	2412	15.265	2404.408	2419.672	---	---
	Ant1	2437	15.185	2429.288	2444.473	---	---
	Ant2	2437	15.225	2429.288	2444.512	---	---
	Ant1	2462	15.065	2454.368	2469.433	---	---
	Ant2	2462	15.065	2454.408	2469.473	---	---
11G-CDD	Ant1	2412	16.663	2403.608	2420.272	---	---
	Ant2	2412	16.503	2403.688	2420.192	---	---
	Ant1	2437	16.663	2428.608	2445.272	---	---
	Ant2	2437	16.503	2428.688	2445.192	---	---
	Ant1	2462	16.663	2453.608	2470.272	---	---
	Ant2	2462	16.464	2453.688	2470.152	---	---
11N20MIMO	Ant1	2412	17.582	2403.129	2420.711	---	---
	Ant2	2412	17.582	2403.129	2420.711	---	---
	Ant1	2437	17.582	2428.129	2445.711	---	---
	Ant2	2437	17.582	2428.129	2445.711	---	---
	Ant1	2462	17.582	2453.129	2470.711	---	---
	Ant2	2462	17.582	2453.129	2470.711	---	---
11N40MIMO	Ant1	2422	36.364	2403.778	2440.142	---	---
	Ant2	2422	36.364	2403.778	2440.142	---	---
	Ant1	2437	36.364	2418.778	2455.142	---	---
	Ant2	2437	36.364	2418.778	2455.142	---	---
	Ant1	2452	36.284	2433.858	2470.142	---	---
	Ant2	2452	36.364	2433.778	2470.142	---	---
11AX20MIMO (worst case 242Tone_RU61)	Ant1	2412	18.861	2402.490	2421.351	---	---
	Ant2	2412	18.901	2402.490	2421.391	---	---
	Ant1	2437	18.901	2427.490	2446.391	---	---
	Ant2	2437	18.901	2427.490	2446.391	---	---
	Ant1	2462	18.861	2452.490	2471.351	---	---
	Ant2	2462	18.861	2452.490	2471.351	---	---
11AX40MIMO (worst case 484Tone_RU65)	Ant1	2422	37.962	2402.899	2440.861	---	---
	Ant2	2422	37.962	2402.979	2440.941	---	---
	Ant1	2437	38.042	2417.899	2455.941	---	---
	Ant2	2437	37.962	2417.979	2455.941	---	---
	Ant1	2452	38.042	2432.899	2470.941	---	---
	Ant2	2452	37.962	2432.979	2470.941	---	---

Test Graphs

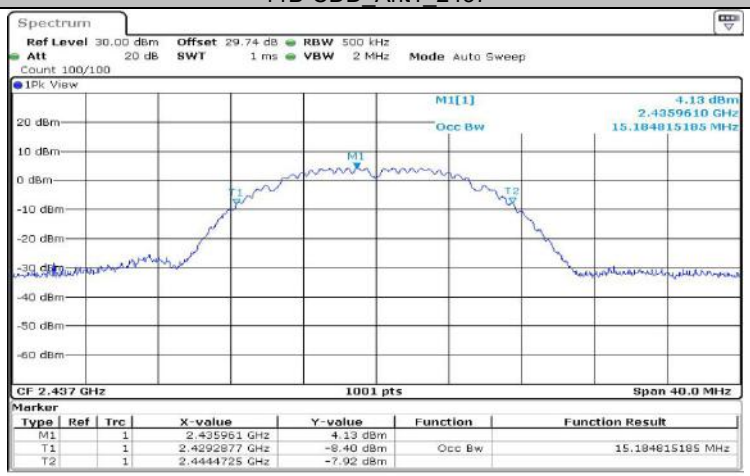
11B-CDD_Ant1_2412



11B-CDD_Ant2_2412

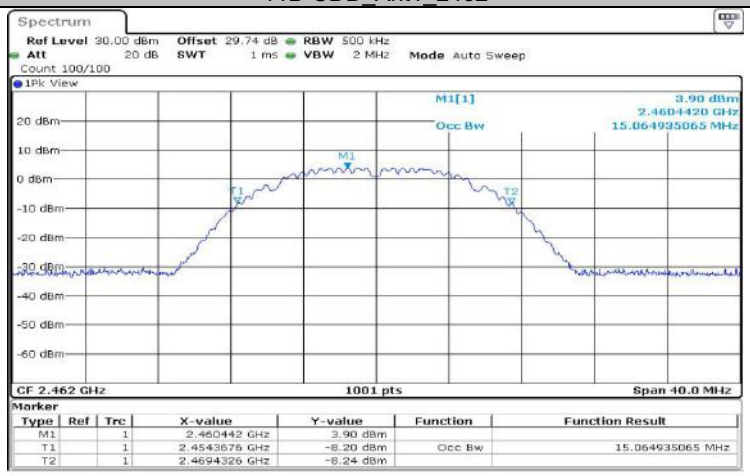


11B-CDD_Ant1_2437

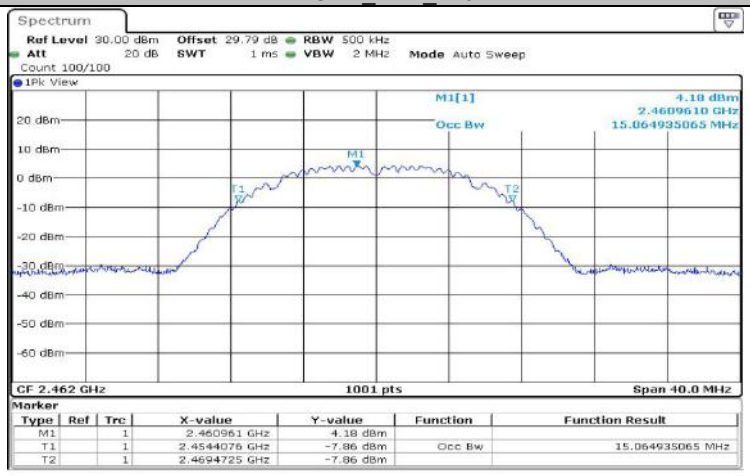


11B-CDD_Ant2_2437

11B-CDD_Ant1_2462

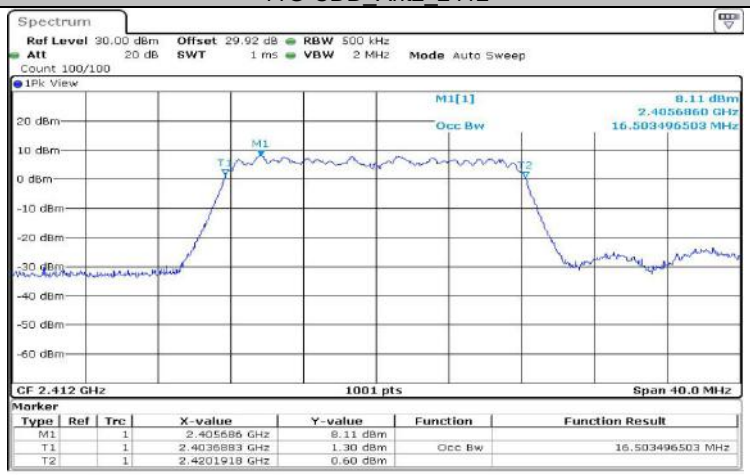


11B-CDD_Ant2_2462

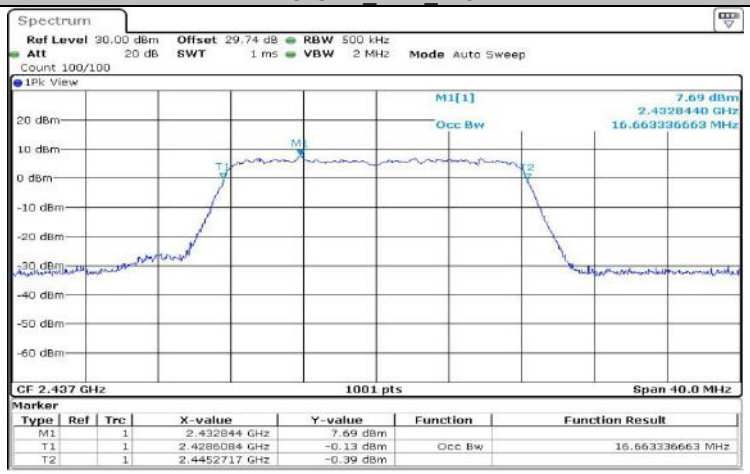


11G-CDD_Ant1_2412

11G-CDD_Ant2_2412

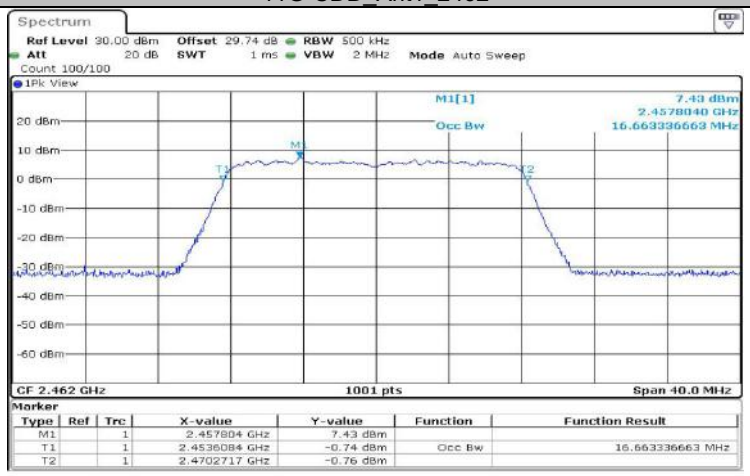


11G-CDD_Ant1_2437

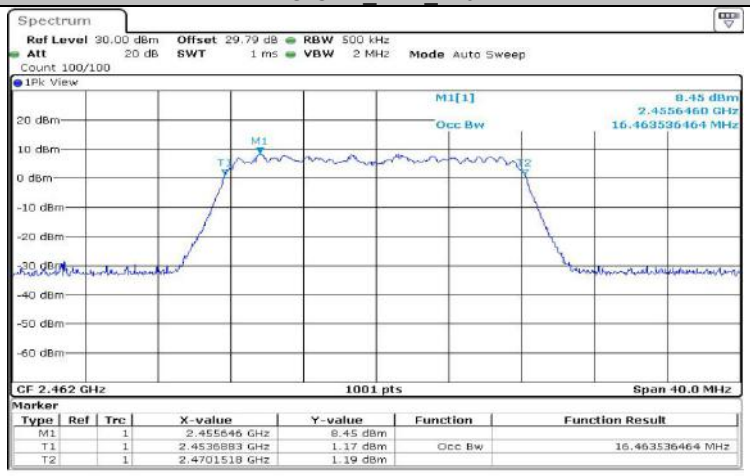


11G-CDD_Ant2_2437

11G-CDD_Ant1_2462

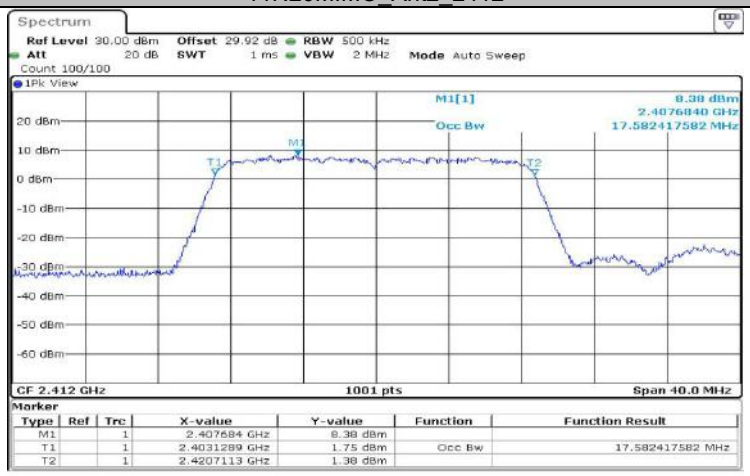


11G-CDD_Ant2_2462



11N20MIMO_Ant1_2412

11N20MIMO_Ant2_2412



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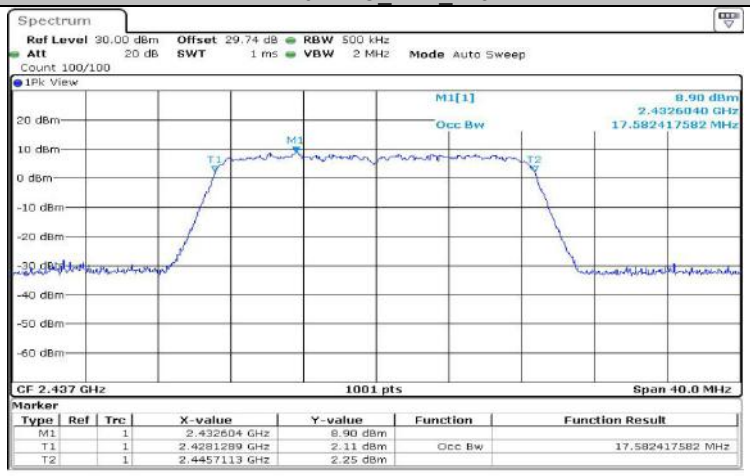
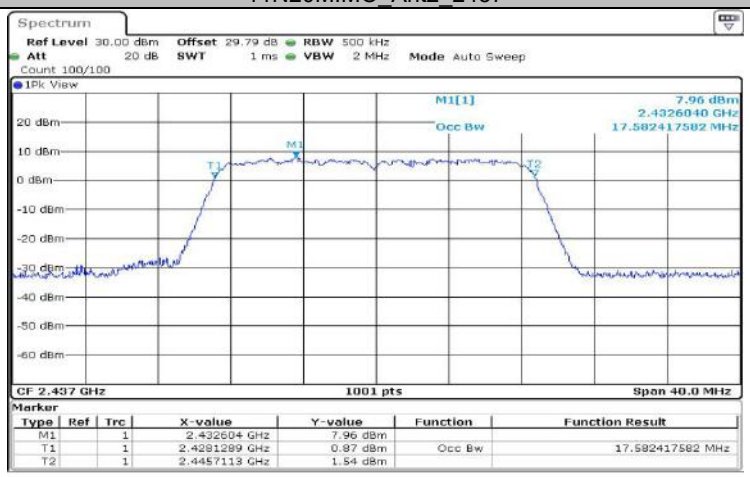
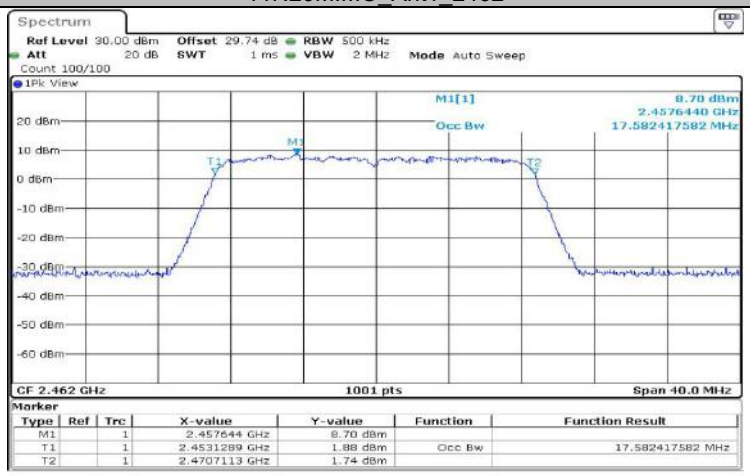


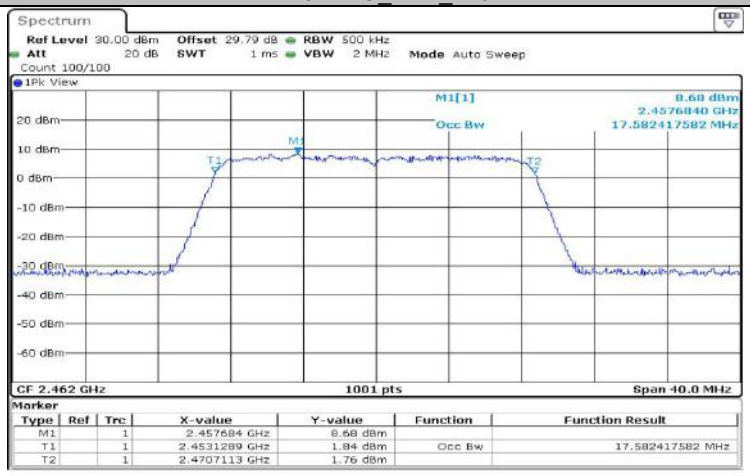
11N20MIMO_Ant2_2437



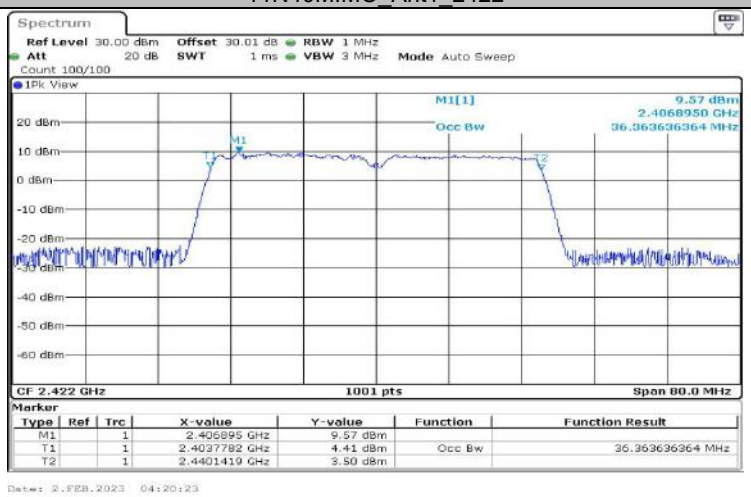
11N20MIMO_Ant1_2462



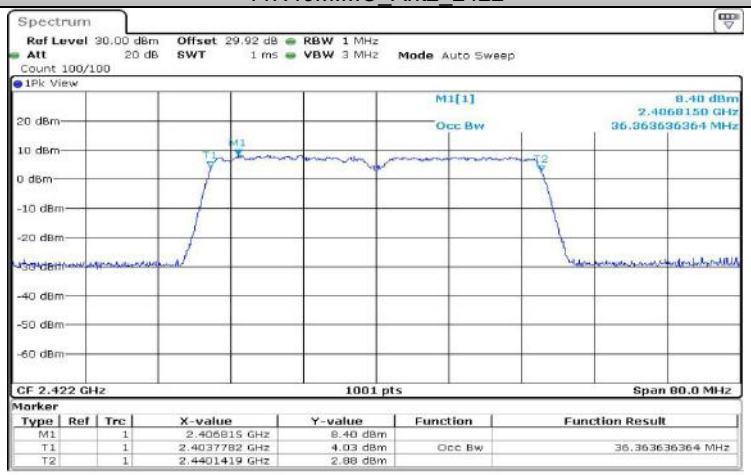
11N20MIMO_Ant2_2462



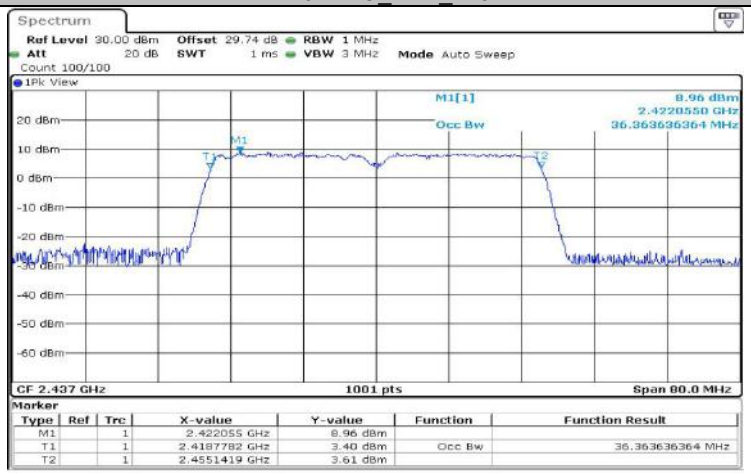
11N40MIMO_Ant1_2422



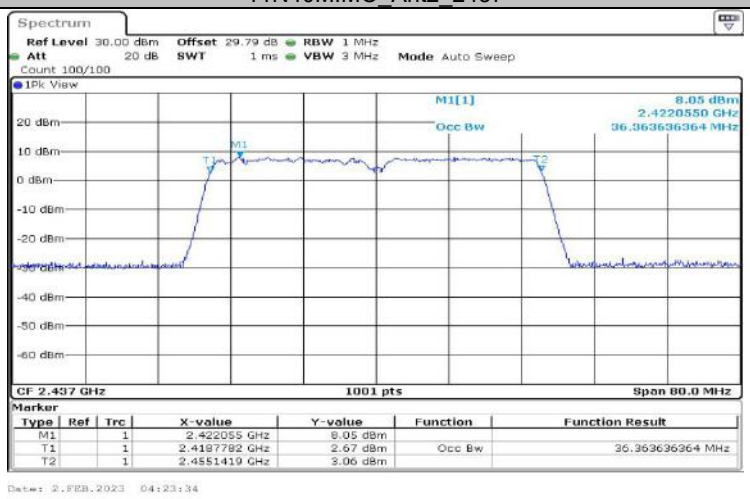
11N40MIMO_Ant2_2422



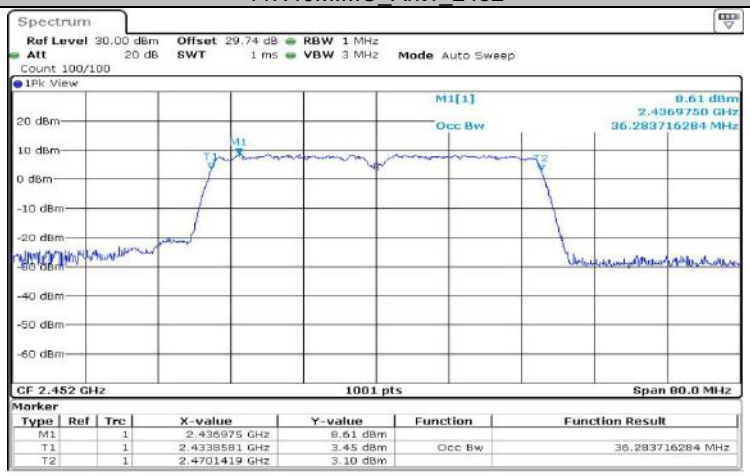
11N40MIMO_Ant1_2437



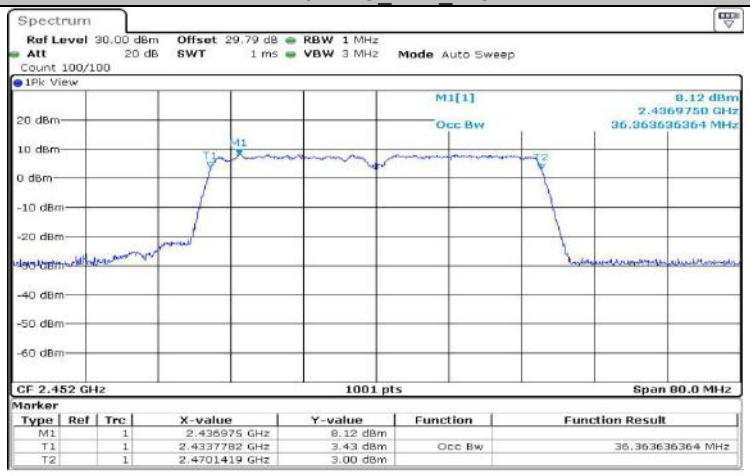
11N40MIMO_Ant2_2437



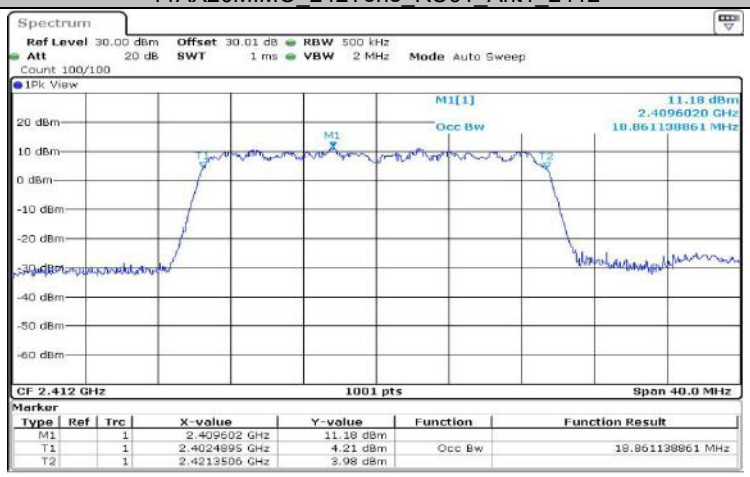
11N40MIMO_Ant1_2452



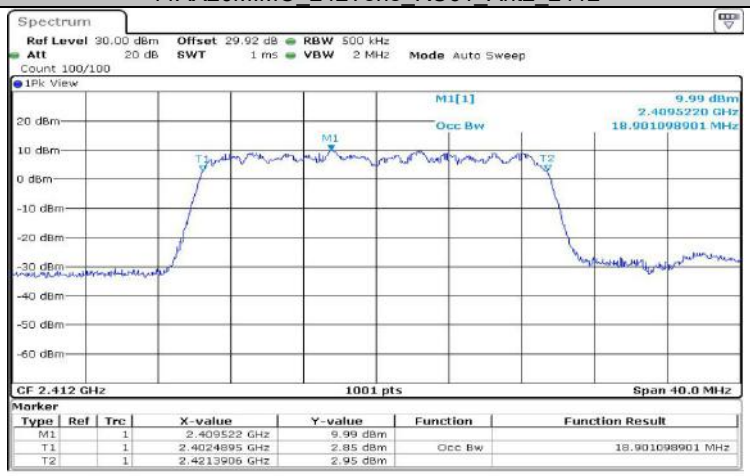
11N40MIMO_Ant2_2452



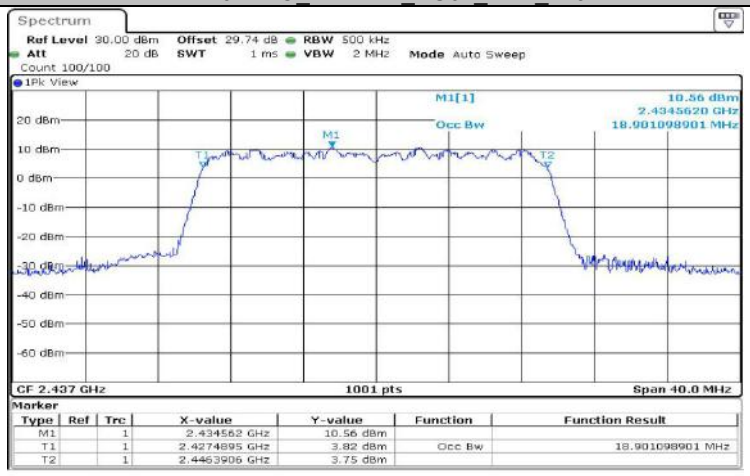
11AX20MIMO_242Tone_RU61_Ant1_2412



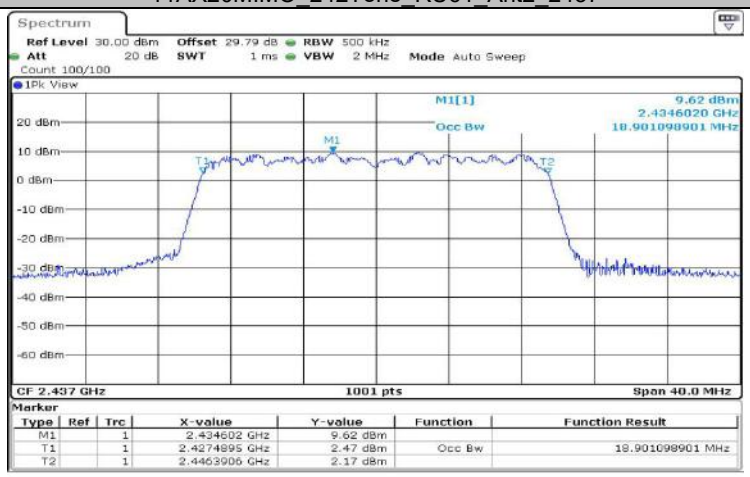
11AX20MIMO_242Tone_RU61_Ant2_2412



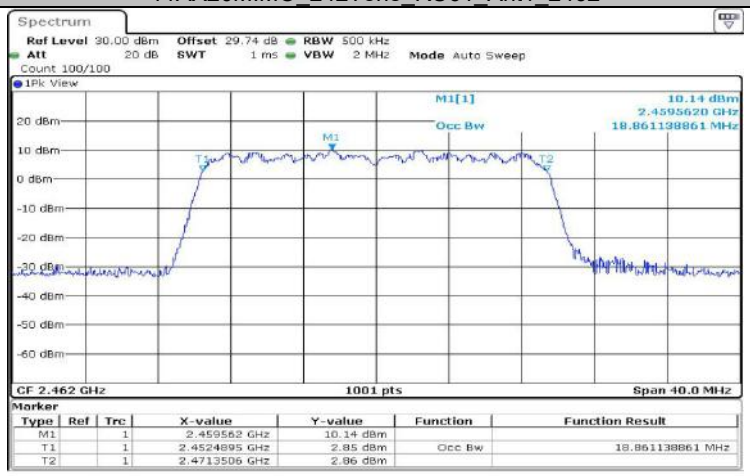
11AX20MIMO_242Tone_RU61_Ant1_2437



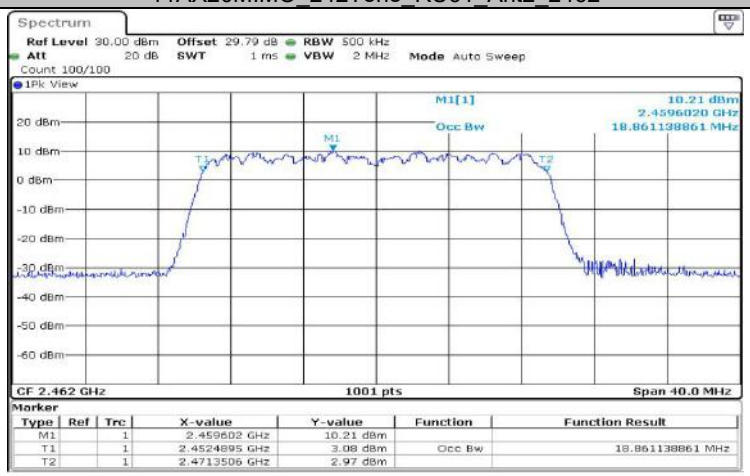
11AX20MIMO_242Tone_RU61_Ant2_2437



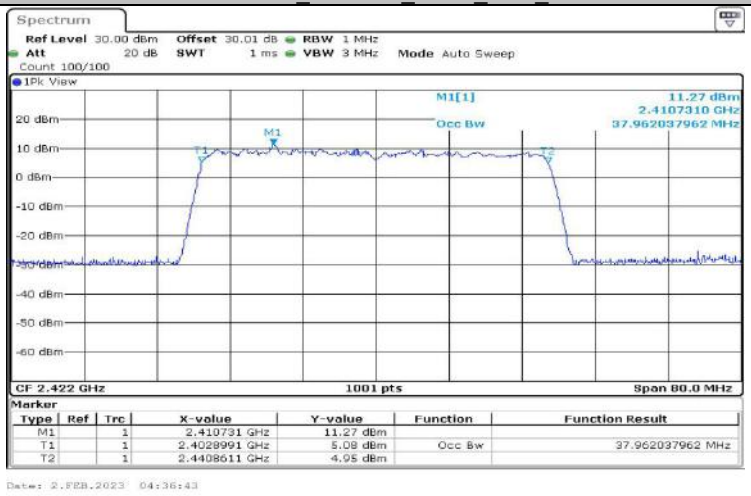
11AX20MIMO_242Tone_RU61_Ant1_2462



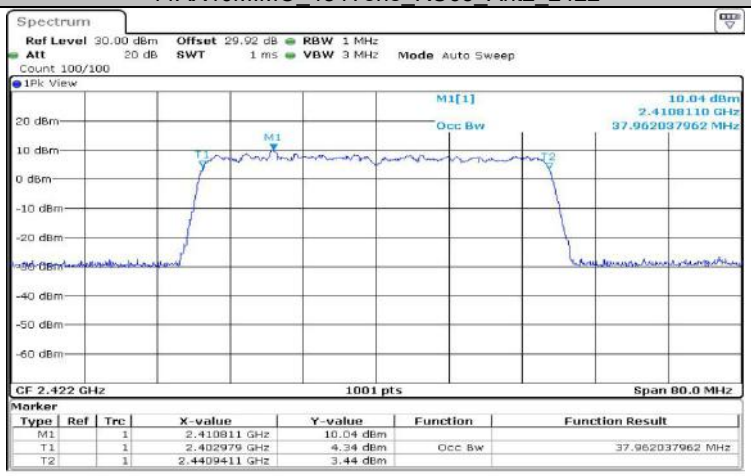
11AX20MIMO_242Tone_RU61_Ant2_2462



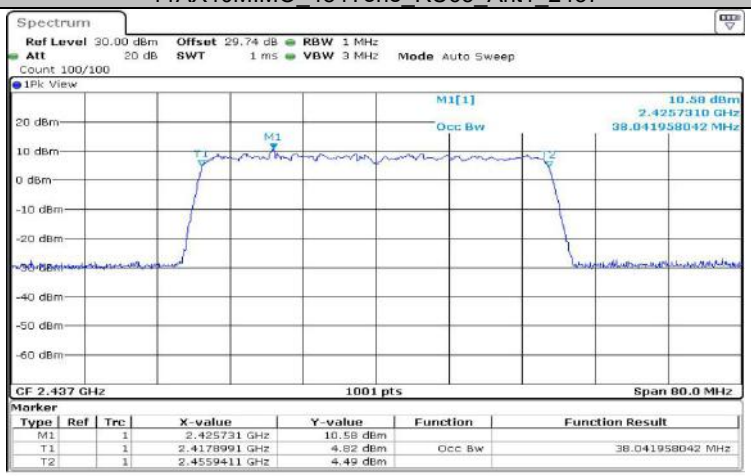
11AX40MIMO_484Tone_RU65_Ant1_2422



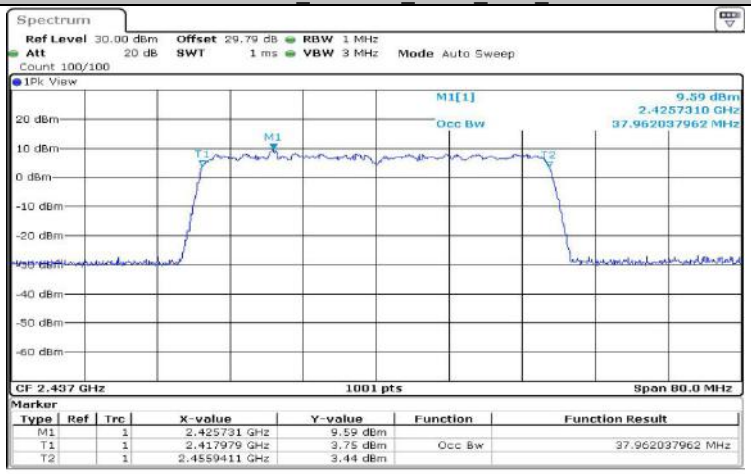
11AX40MIMO_484Tone_RU65_Ant2_2422



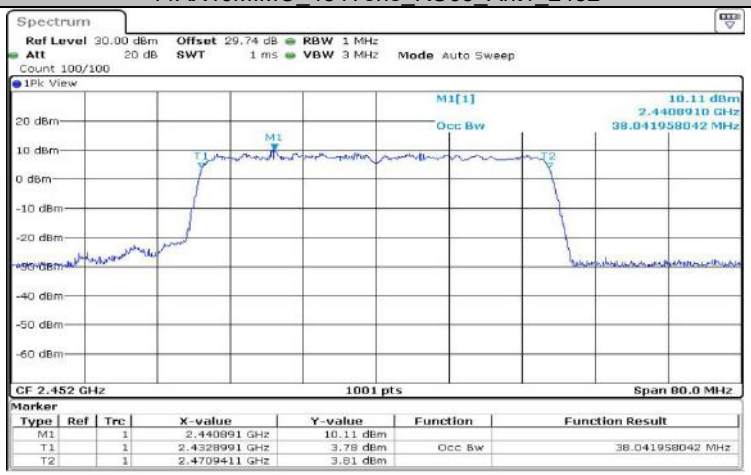
11AX40MIMO_484Tone_RU65_Ant1_2437



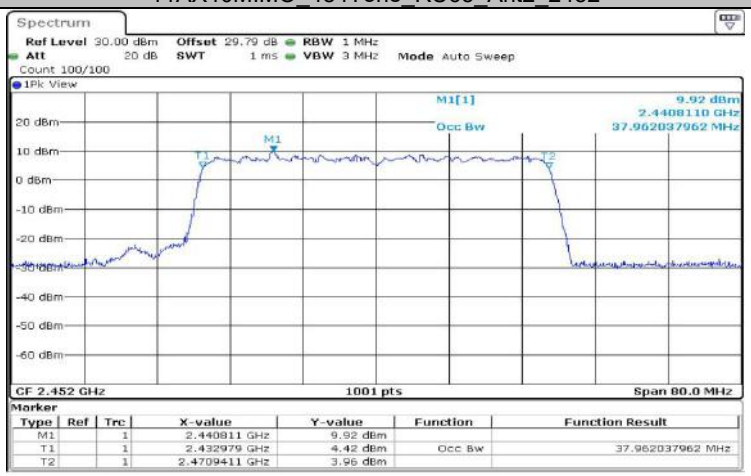
11AX40MIMO_484Tone_RU65_Ant2_2437



11AX40MIMO_484Tone_RU65_Ant1_2452



11AX40MIMO_484Tone_RU65_Ant2_2452



Appendix C: Maximum conducted output power

Test Result

Test Mode	Antenna	Frequency[MHz]	Average Power[dBm]	Conducted Limit[dBm]	Verdict
11B-CDD	Ant1	2412	13.09	≤30.00	PASS
	Ant2	2412	13.40	≤30.00	PASS
	total	2412	16.26	≤30.00	PASS
	Ant1	2437	13.17	≤30.00	PASS
	Ant2	2437	13.77	≤30.00	PASS
	total	2437	16.49	≤30.00	PASS
	Ant1	2462	12.93	≤30.00	PASS
	Ant2	2462	14.12	≤30.00	PASS
	total	2462	16.58	≤30.00	PASS
11G-CDD	Ant1	2412	14.07	≤30.00	PASS
	Ant2	2412	14.14	≤30.00	PASS
	total	2412	17.12	≤30.00	PASS
	Ant1	2437	14.01	≤30.00	PASS
	Ant2	2437	14.19	≤30.00	PASS
	total	2437	17.11	≤30.00	PASS
	Ant1	2462	13.47	≤30.00	PASS
	Ant2	2462	14.20	≤30.00	PASS
	total	2462	16.86	≤30.00	PASS
11N20MIMO	Ant1	2412	14.28	≤30.00	PASS
	Ant2	2412	14.13	≤30.00	PASS
	total	2412	17.22	≤30.00	PASS
	Ant1	2437	13.94	≤30.00	PASS
	Ant2	2437	14.47	≤30.00	PASS
	total	2437	17.22	≤30.00	PASS
	Ant1	2462	13.38	≤30.00	PASS
	Ant2	2462	14.54	≤30.00	PASS
	total	2462	17.01	≤30.00	PASS
11N40MIMO	Ant1	2422	14.91	≤30.00	PASS
	Ant2	2422	15.00	≤30.00	PASS
	total	2422	17.97	≤30.00	PASS
	Ant1	2437	14.81	≤30.00	PASS
	Ant2	2437	15.10	≤30.00	PASS
	total	2437	17.97	≤30.00	PASS
	Ant1	2452	14.47	≤30.00	PASS
	Ant2	2452	15.16	≤30.00	PASS
	total	2452	17.84	≤30.00	PASS

Test Mode	Antenna	Frequency [MHz]	Ru Size	Ru Index	Average Power[dBm]	Conducted Limit[dBm]	Verdict
11AX20MIMO	Ant1	2412	26Tone	RU0	3.88	≤30.00	PASS
			52Tone	RU37	7.32	≤30.00	PASS
			106Tone	RU53	10.95	≤30.00	PASS
			242Tone	RU61	14.32	≤30.00	PASS
	Ant2	2412	26Tone	RU0	2.86	≤30.00	PASS
			52Tone	RU37	6.06	≤30.00	PASS
			106Tone	RU53	9.60	≤30.00	PASS
			242Tone	RU61	13.21	≤30.00	PASS
	total	2412	26Tone	RU0	6.41	≤30.00	PASS
			52Tone	RU37	9.75	≤30.00	PASS
			106Tone	RU53	13.34	≤30.00	PASS
			242Tone	RU61	16.81	≤30.00	PASS
	Ant1	2437	26Tone	RU0	3.89	≤30.00	PASS
			52Tone	RU37	7.02	≤30.00	PASS
			106Tone	RU53	10.76	≤30.00	PASS
			242Tone	RU61	14.37	≤30.00	PASS
	Ant2	2437	26Tone	RU0	2.56	≤30.00	PASS
			52Tone	RU37	5.66	≤30.00	PASS
			106Tone	RU53	9.78	≤30.00	PASS
			242Tone	RU61	13.31	≤30.00	PASS
	total	2437	26Tone	RU0	6.29	≤30.00	PASS
			52Tone	RU37	9.40	≤30.00	PASS
			106Tone	RU53	13.31	≤30.00	PASS
			242Tone	RU61	16.88	≤30.00	PASS
	Ant1	2462	26Tone	RU0	3.07	≤30.00	PASS
			52Tone	RU37	6.02	≤30.00	PASS
			106Tone	RU53	10.33	≤30.00	PASS
			242Tone	RU61	13.64	≤30.00	PASS
	Ant2	2462	26Tone	RU0	2.71	≤30.00	PASS
			52Tone	RU37	6.11	≤30.00	PASS
			106Tone	RU53	9.91	≤30.00	PASS
			242Tone	RU61	13.59	≤30.00	PASS
	total	2462	26Tone	RU0	5.90	≤30.00	PASS
			52Tone	RU37	9.08	≤30.00	PASS
			106Tone	RU53	13.14	≤30.00	PASS
			242Tone	RU61	16.63	≤30.00	PASS
11AX40MIMO	Ant1	2422	26Tone	RU0	3.10	≤30.00	PASS
			52Tone	RU37	6.00	≤30.00	PASS
			106Tone	RU53	8.23	≤30.00	PASS
			242Tone	RU61	11.51	≤30.00	PASS
			484Tone	RU65	14.95	≤30.00	PASS
	Ant2	2422	26Tone	RU0	1.70	≤30.00	PASS
			52Tone	RU37	4.57	≤30.00	PASS
			106Tone	RU53	7.84	≤30.00	PASS
			242Tone	RU61	10.15	≤30.00	PASS
			484Tone	RU65	13.80	≤30.00	PASS
	total	2422	26Tone	RU0	5.47	≤30.00	PASS
			52Tone	RU37	8.35	≤30.00	PASS
			106Tone	RU53	11.05	≤30.00	PASS
			242Tone	RU61	13.89	≤30.00	PASS
			484Tone	RU65	17.42	≤30.00	PASS
	Ant1	2437	26Tone	RU0	2.29	≤30.00	PASS
			52Tone	RU37	6.47	≤30.00	PASS
			106Tone	RU53	7.78	≤30.00	PASS

			242Tone	RU61	12.03	≤30.00	PASS
			484Tone	RU65	14.98	≤30.00	PASS
	Ant2	2437	26Tone	RU0	1.11	≤30.00	PASS
			52Tone	RU37	4.17	≤30.00	PASS
			106Tone	RU53	7.50	≤30.00	PASS
			242Tone	RU61	10.72	≤30.00	PASS
			484Tone	RU65	14.12	≤30.00	PASS
	total	2437	26Tone	RU0	4.75	≤30.00	PASS
			52Tone	RU37	8.48	≤30.00	PASS
			106Tone	RU53	10.65	≤30.00	PASS
			242Tone	RU61	14.43	≤30.00	PASS
			484Tone	RU65	17.58	≤30.00	PASS
	Ant1	2452	26Tone	RU0	2.86	≤30.00	PASS
			52Tone	RU37	6.04	≤30.00	PASS
			106Tone	RU53	7.96	≤30.00	PASS
			242Tone	RU61	12.37	≤30.00	PASS
			484Tone	RU65	15.07	≤30.00	PASS
	Ant2	2452	26Tone	RU0	1.90	≤30.00	PASS
			52Tone	RU37	5.32	≤30.00	PASS
			106Tone	RU53	8.24	≤30.00	PASS
			242Tone	RU61	10.75	≤30.00	PASS
			484Tone	RU65	14.47	≤30.00	PASS
	total	2452	26Tone	RU0	5.42	≤30.00	PASS
			52Tone	RU37	8.71	≤30.00	PASS
			106Tone	RU53	11.11	≤30.00	PASS
			242Tone	RU61	14.65	≤30.00	PASS
			484Tone	RU65	17.79	≤30.00	PASS

Note 1:

The EUT employ CDD for MIMO

Directional Gain = G_{ANT} + *Array Gain*

For Output Power Measurement, *Array Gain* = 0dB for $N_{ANT} \leqslant 4$

G_{ANT} = -2.03dBi, *Directional Gain* =-2.03dBi + 0dB = -2.03dBi < 6dBi

Appendix D: Maximum power spectral density

Test Result (Worst Case)

Test Mode	Antenna	Frequency[MHz]	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
11B-CDD	Ant1	2412	-18.21	≤8.00	PASS
	Ant2	2412	-19.44	≤8.00	PASS
	total	2412	-15.77	≤8.00	PASS
	Ant1	2437	-16.94	≤8.00	PASS
	Ant2	2437	-17.89	≤8.00	PASS
	total	2437	-14.38	≤8.00	PASS
	Ant1	2462	-17.73	≤8.00	PASS
	Ant2	2462	-18.41	≤8.00	PASS
	total	2462	-15.05	≤8.00	PASS
11G-CDD	Ant1	2412	-16.9	≤8.00	PASS
	Ant2	2412	-18.58	≤8.00	PASS
	total	2412	-14.65	≤8.00	PASS
	Ant1	2437	-16.81	≤8.00	PASS
	Ant2	2437	-18.12	≤8.00	PASS
	total	2437	-14.41	≤8.00	PASS
	Ant1	2462	-17.81	≤8.00	PASS
	Ant2	2462	-17.66	≤8.00	PASS
	total	2462	-14.72	≤8.00	PASS
11N20MIMO	Ant1	2412	-15.41	≤8.00	PASS
	Ant2	2412	-18.02	≤8.00	PASS
	total	2412	-13.51	≤8.00	PASS
	Ant1	2437	-17.54	≤8.00	PASS
	Ant2	2437	-18.7	≤8.00	PASS
	total	2437	-15.07	≤8.00	PASS
	Ant1	2462	-18.25	≤8.00	PASS
	Ant2	2462	-18.69	≤8.00	PASS
	total	2462	-15.45	≤8.00	PASS
11AX20MIMO_242Tone_RU61	Ant1	2412	-16.37	≤8.00	PASS
	Ant2	2412	-16.9	≤8.00	PASS
	total	2412	-13.62	≤8.00	PASS
	Ant1	2437	-15.05	≤8.00	PASS
	Ant2	2437	-16.82	≤8.00	PASS
	total	2437	-12.84	≤8.00	PASS
	Ant1	2462	-16.23	≤8.00	PASS
	Ant2	2462	-16.41	≤8.00	PASS
	total	2462	-13.31	≤8.00	PASS

Test Mode	Antenna	Frequency[MHz]	Result[dBm/10kHz]	Limit[dBm/3kHz]	Verdict
11N40MIMO	Ant1	2422	-15.00	≤8.00	PASS
	Ant2	2422	-16.48	≤8.00	PASS
	total	2422	-12.67	≤8.00	PASS
	Ant1	2437	-15.35	≤8.00	PASS
	Ant2	2437	-16.64	≤8.00	PASS
	total	2437	-12.94	≤8.00	PASS
	Ant1	2452	-14.93	≤8.00	PASS
	Ant2	2452	-15.60	≤8.00	PASS
	total	2452	-12.24	≤8.00	PASS
11AX40MIMO_484Tone_RU65	Ant1	2422	-14.32	≤8.00	PASS
	Ant2	2422	-16.41	≤8.00	PASS
	total	2422	-12.23	≤8.00	PASS
	Ant1	2437	-14.78	≤8.00	PASS
	Ant2	2437	-17.23	≤8.00	PASS
	total	2437	-12.82	≤8.00	PASS
	Ant1	2452	-14.29	≤8.00	PASS
	Ant2	2452	-16.08	≤8.00	PASS
	total	2452	-12.08	≤8.00	PASS

Note: The Duty Cycle Factor is compensated in the graph.

Note:

The EUT employ CDD for MIMO

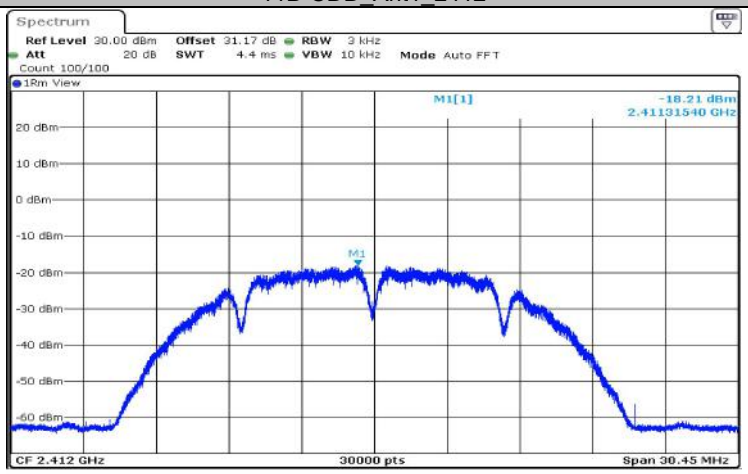
Directional Gain = G_{ANT} + *Array Gain*

For PSD Measurement, *Array Gain* = *10*log*N_{ANT}*=10*log2=3dB*

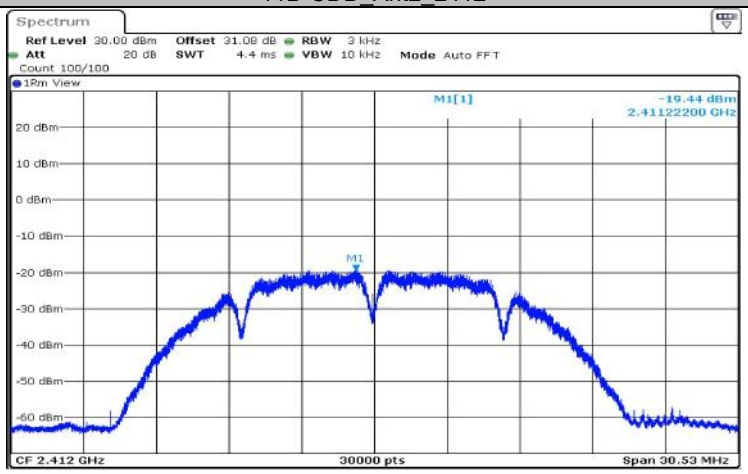
G_{ANT} = *-2.03dBi, Directional Gain* = -2.03dBi + 3dB = 0.97dBi < 6dBi

Test Graphs

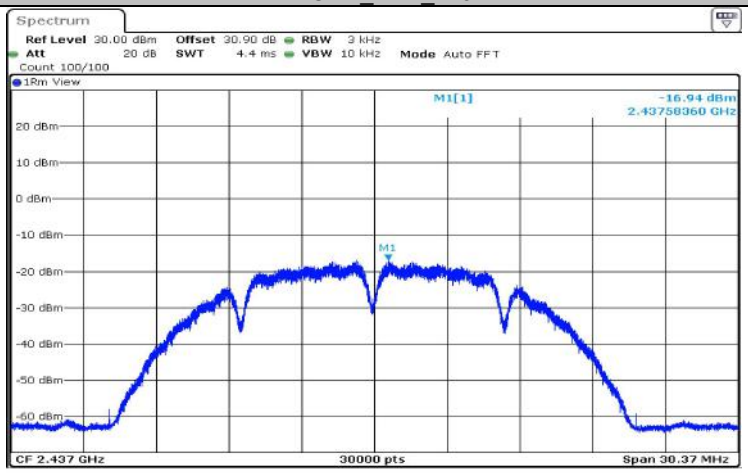
11B-CDD_Ant1_2412



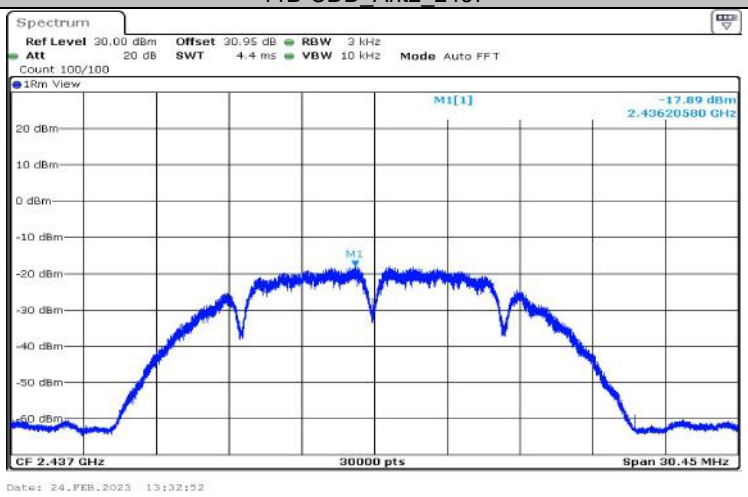
11B-CDD_Ant2_2412



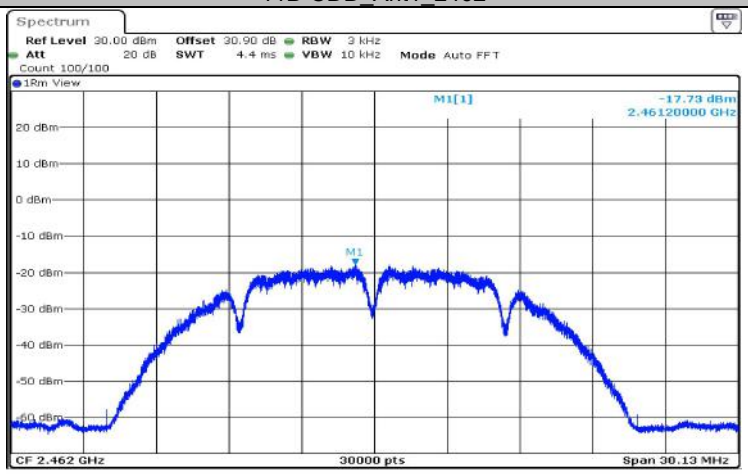
11B-CDD_Ant1_2437



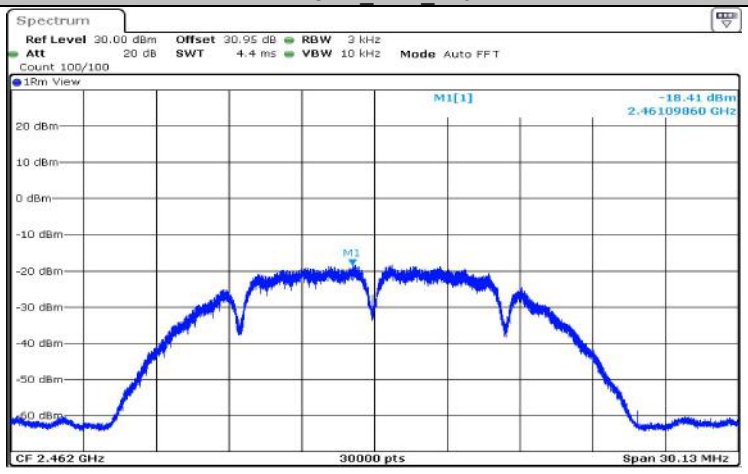
11B-CDD_Ant2_2437



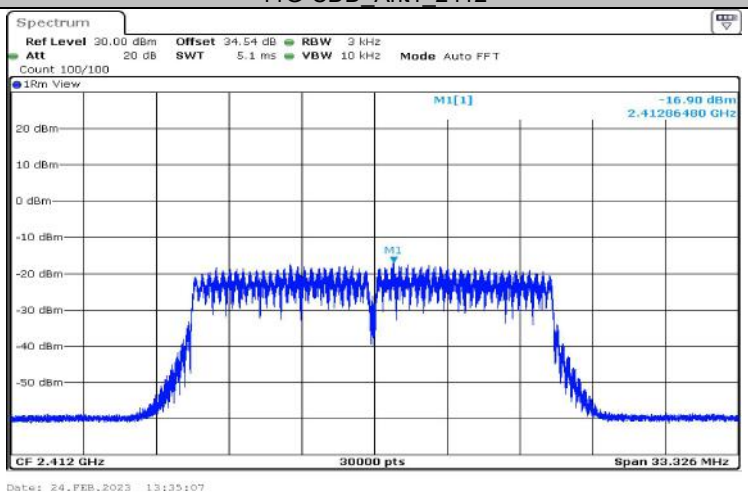
11B-CDD_Ant1_2462



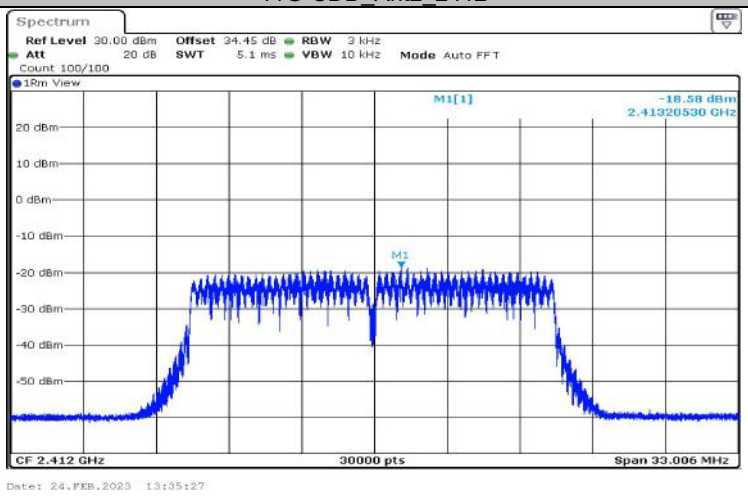
11B-CDD_Ant2_2462



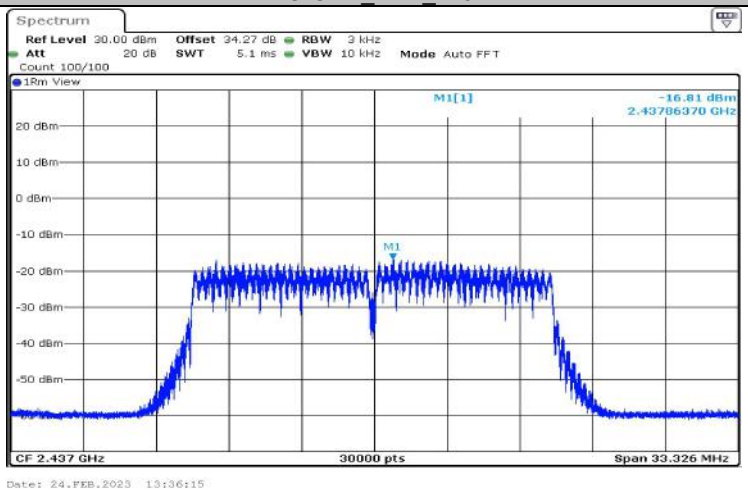
11G-CDD_Ant1_2412



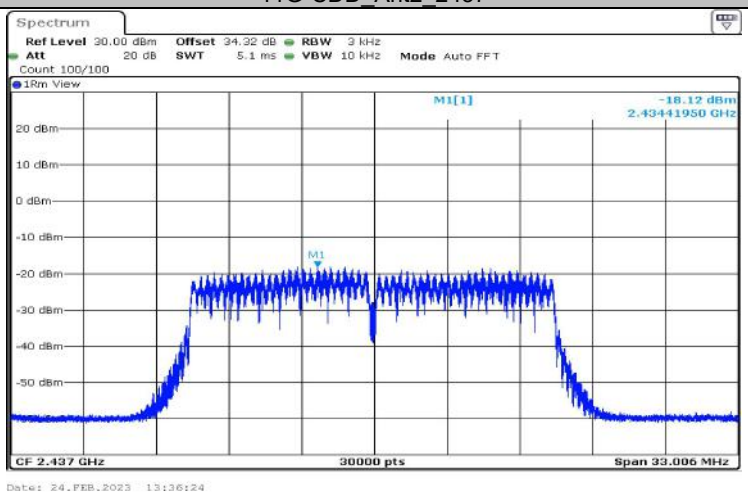
11G-CDD_Ant2_2412



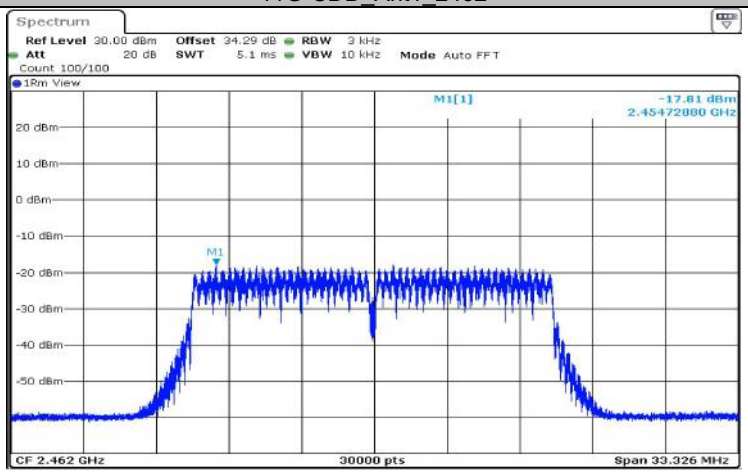
11G-CDD_Ant1_2437



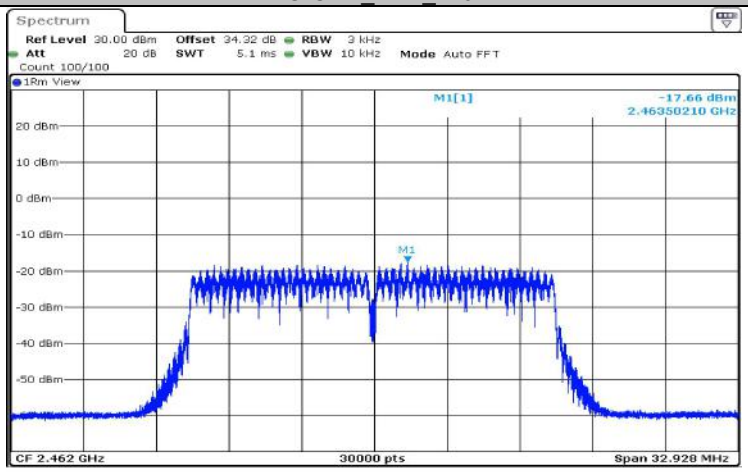
11G-CDD_Ant2_2437



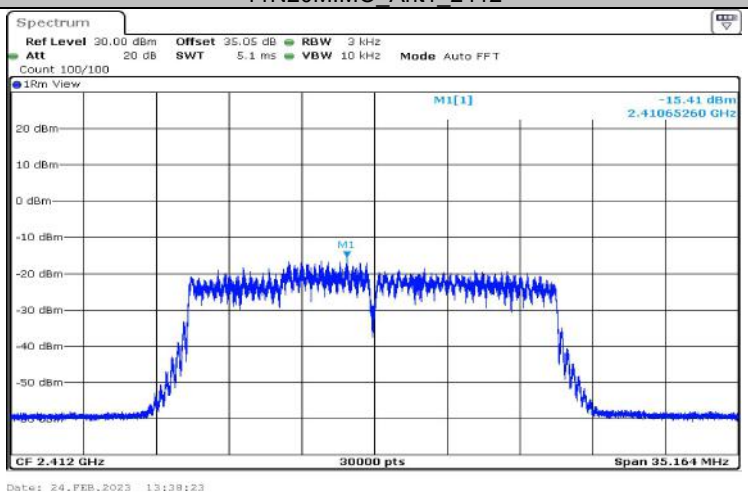
11G-CDD_Ant1_2462



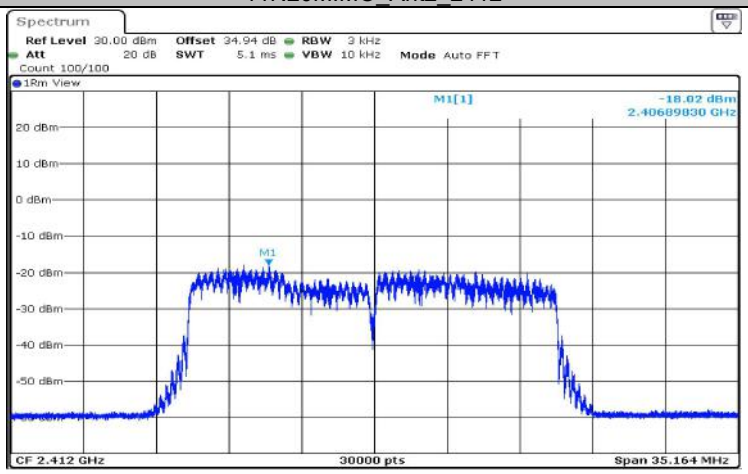
11G-CDD_Ant2_2462



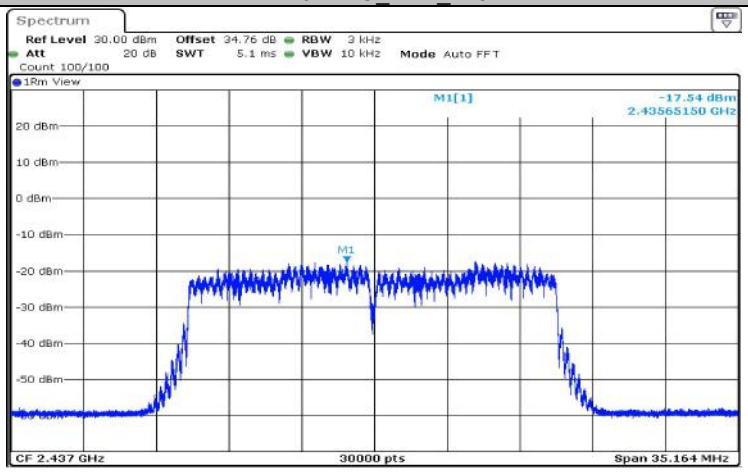
11N20MIMO_Ant1_2412



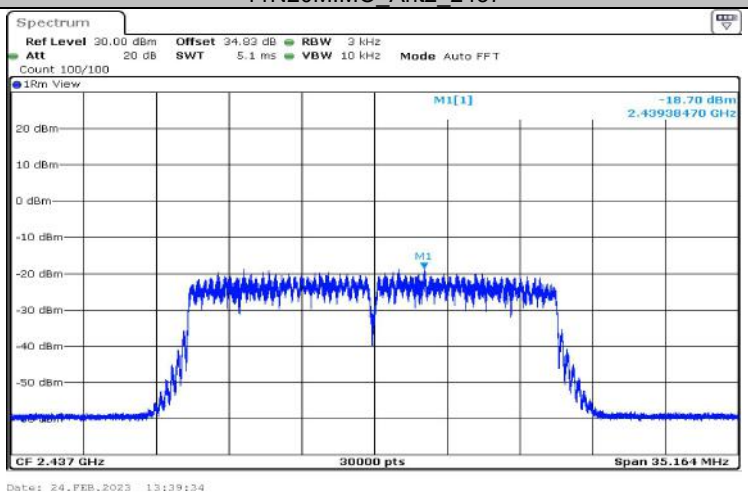
11N20MIMO_Ant2_2412



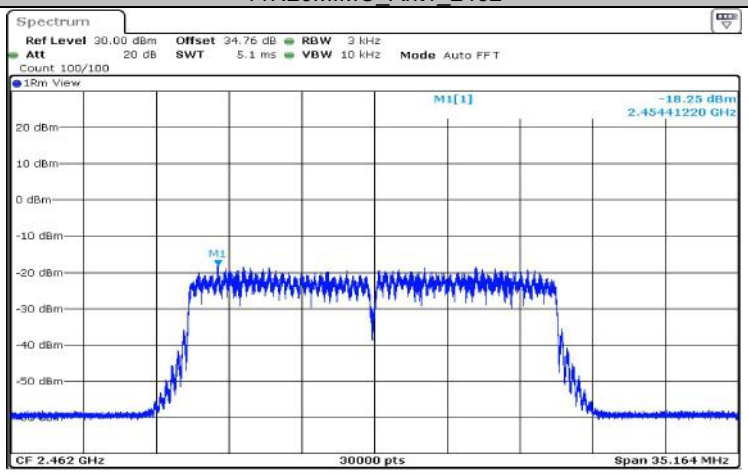
11N20MIMO_Ant1_2437



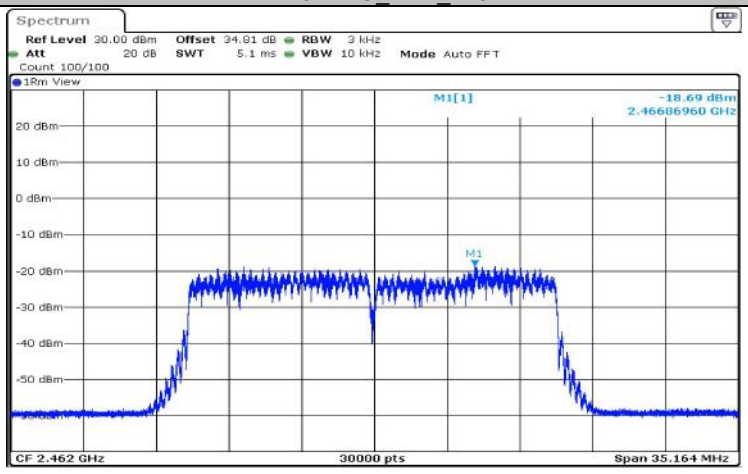
11N20MIMO_Ant2_2437

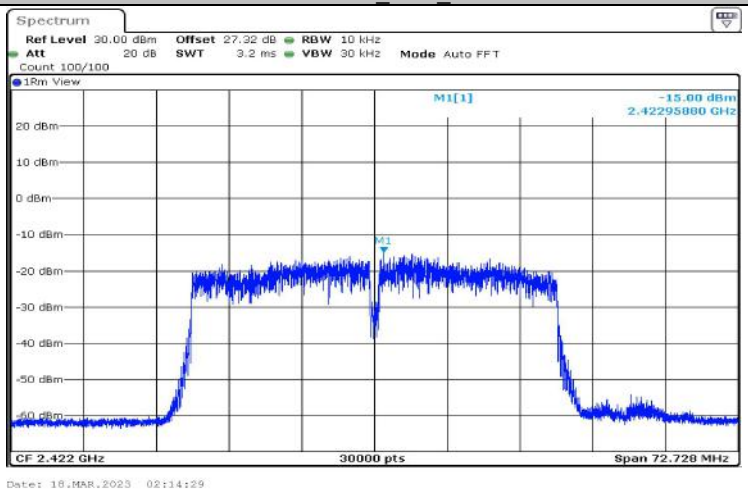
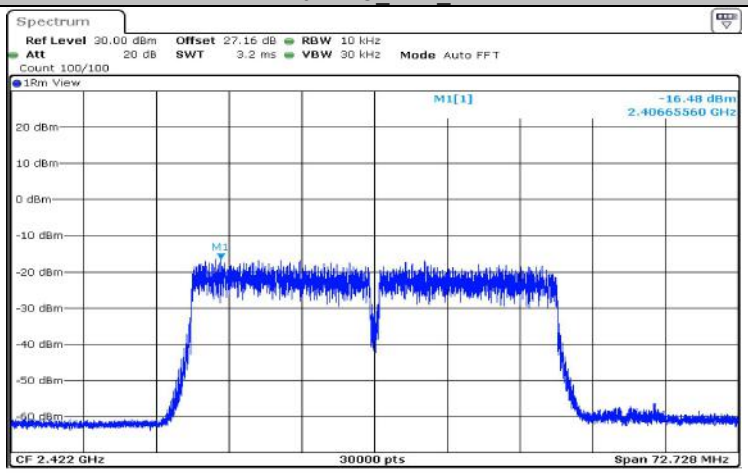


11N20MIMO_Ant1_2462



11N20MIMO_Ant2_2462



11N40MIMO_Ant1_2422

11N40MIMO_Ant2_2422

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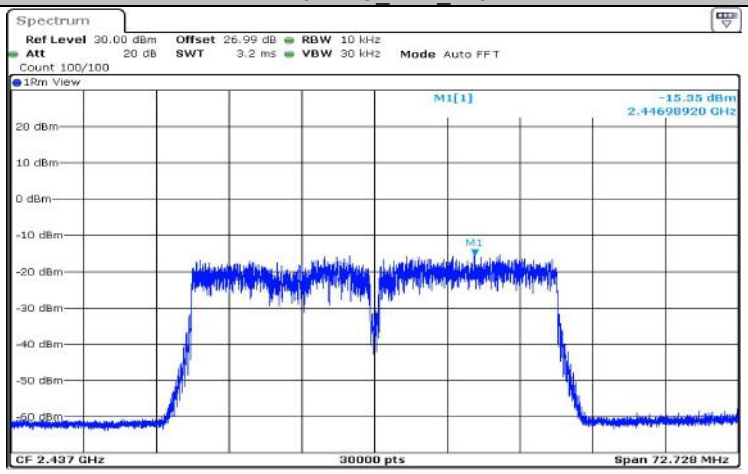
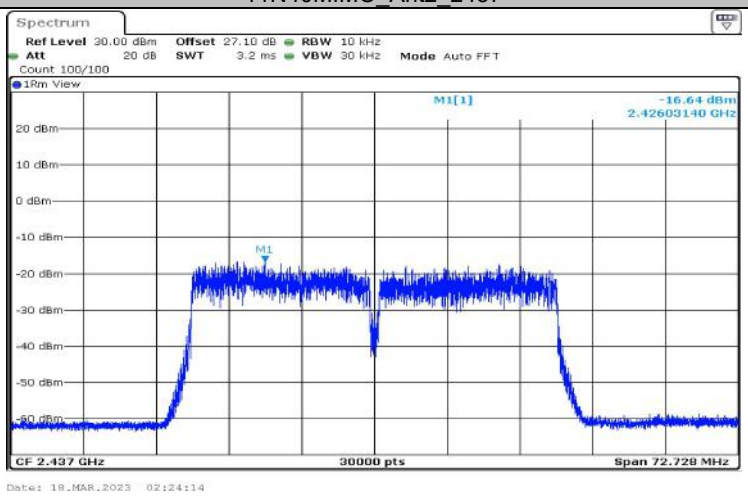
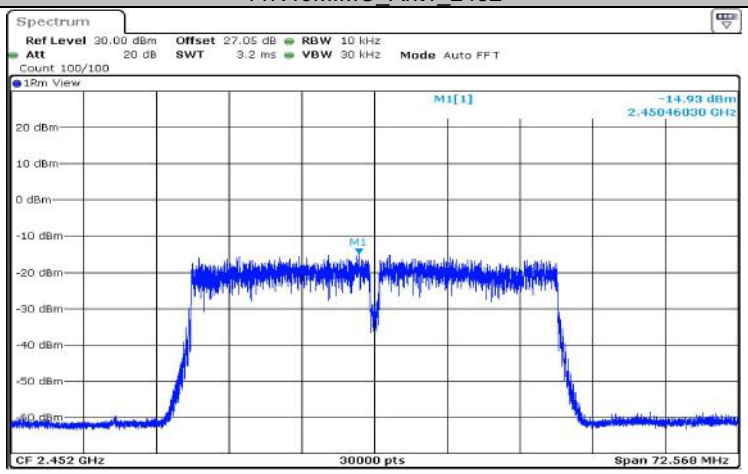


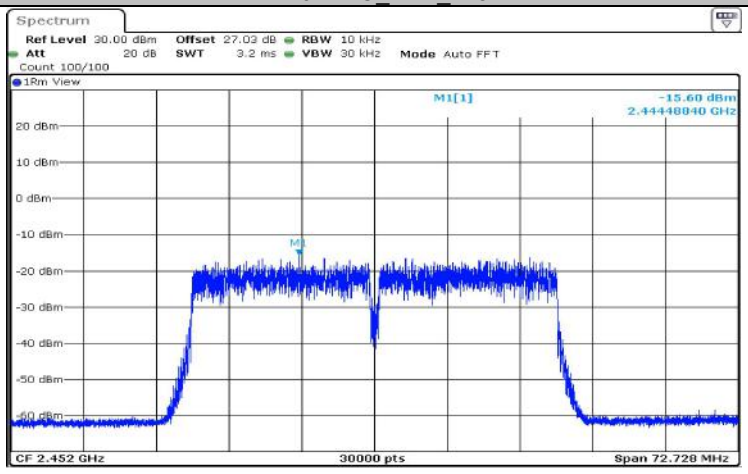
11N40MIMO_Ant2_2437



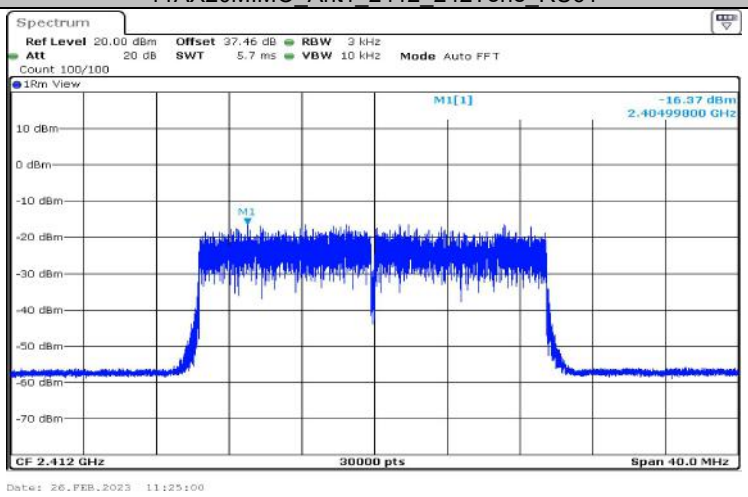
11N40MIMO_Ant1_2452



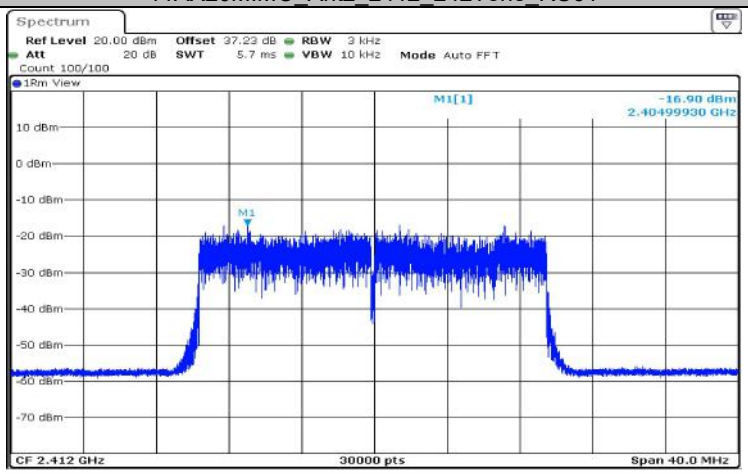
11N40MIMO_Ant2_2452



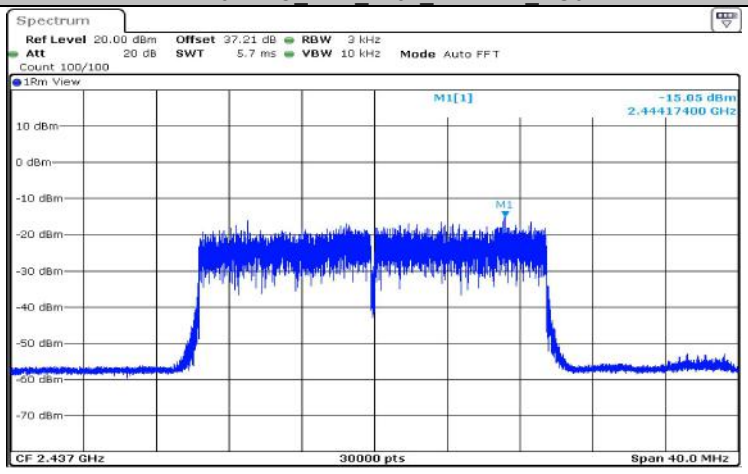
11AX20MIMO_Ant1_2412_242Tone_RU61



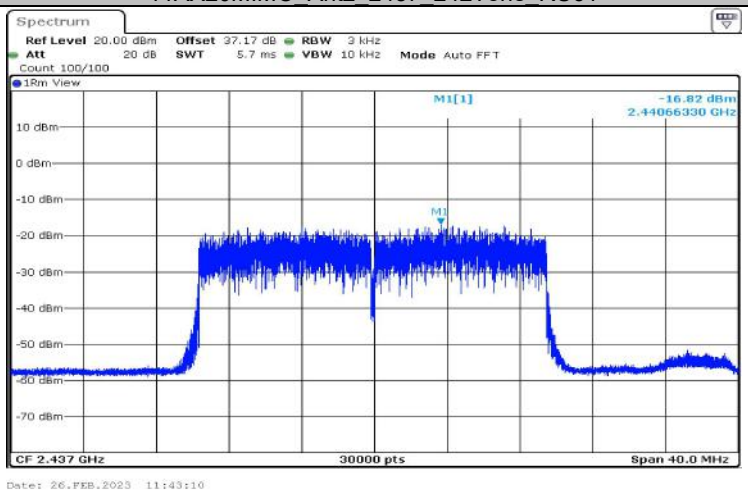
11AX20MIMO_Ant2_2412_242Tone_RU61



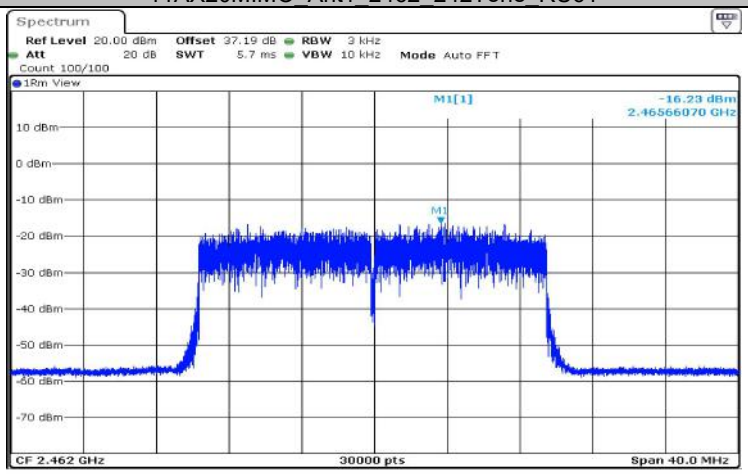
11AX20MIMO_Ant1_2437_242Tone_RU61



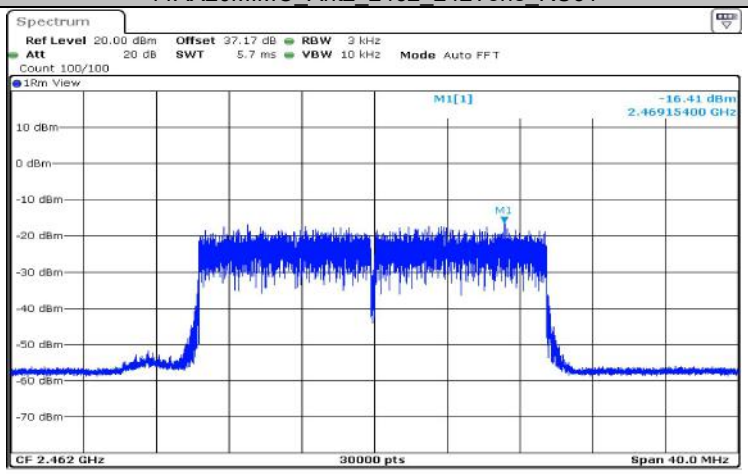
11AX20MIMO_Ant2_2437_242Tone_RU61



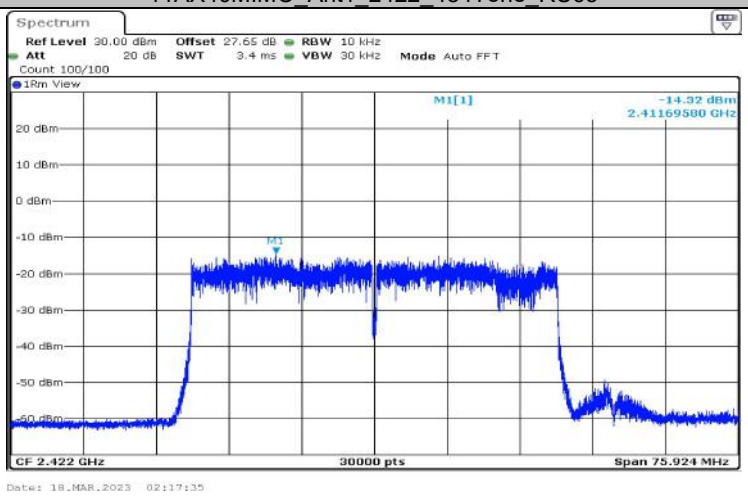
11AX20MIMO_Ant1_2462_242Tone_RU61



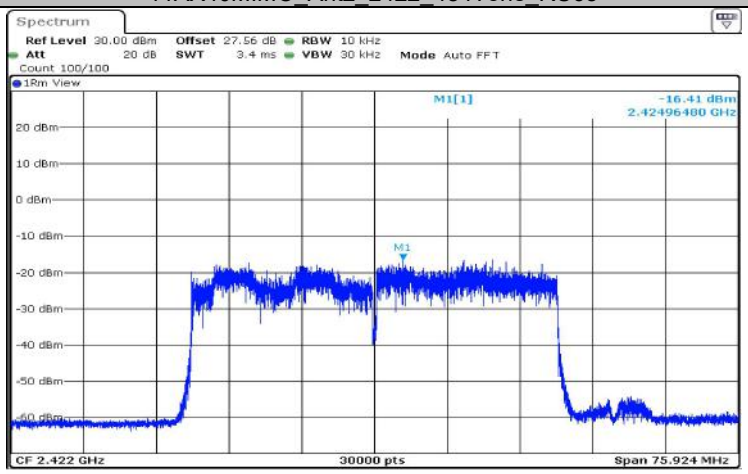
11AX20MIMO_Ant2_2462_242Tone_RU61



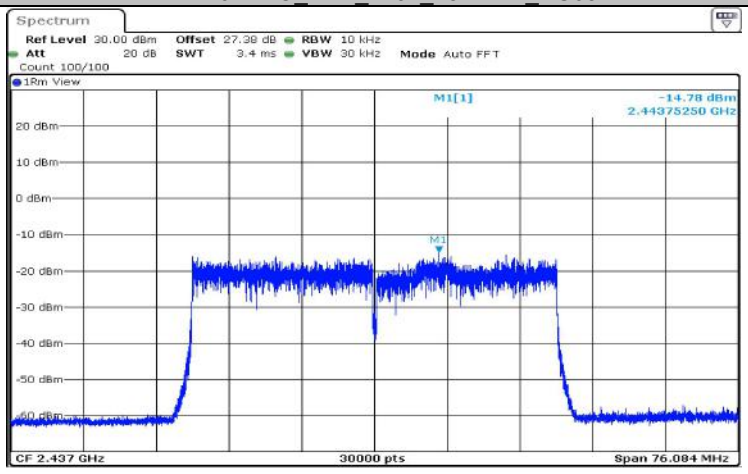
11AX40MIMO_Ant1_2422_484Tone_RU65



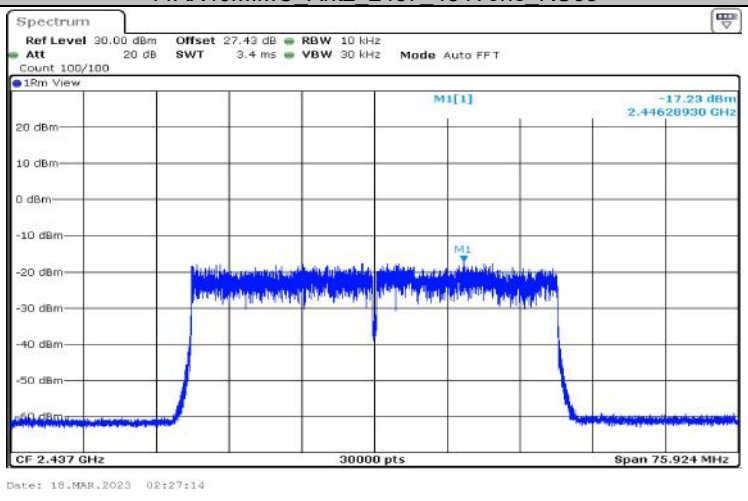
11AX40MIMO_Ant2_2422_484Tone_RU65



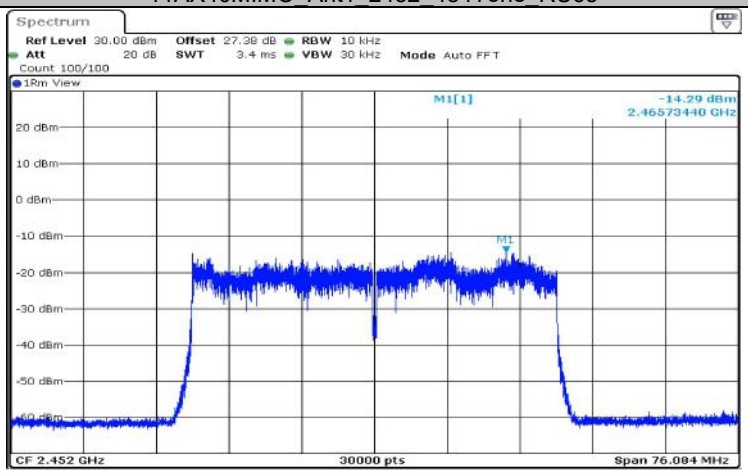
11AX40MIMO_Ant1_2437_484Tone_RU65



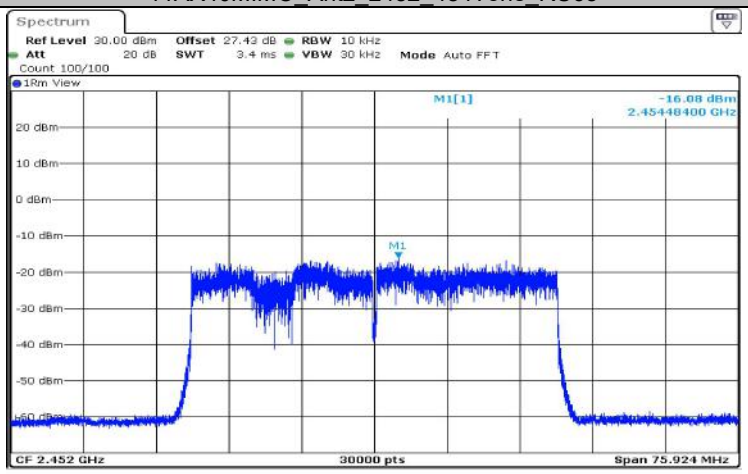
11AX40MIMO_Ant2_2437_484Tone_RU65



11AX40MIMO_Ant1_2452_484Tone_RU65



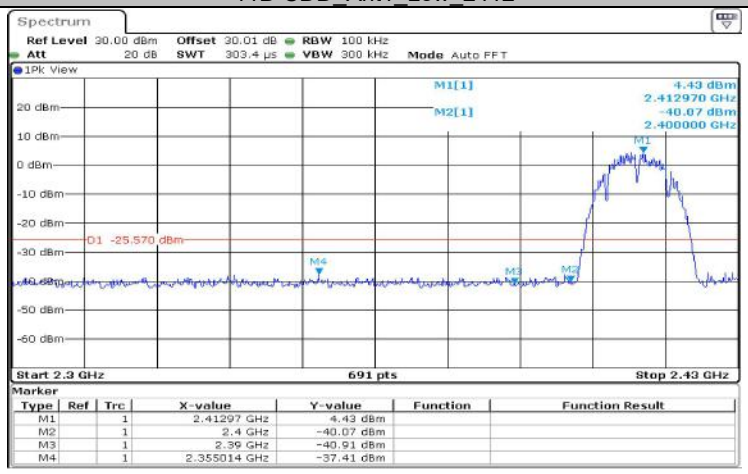
11AX40MIMO_Ant2_2452_484Tone_RU65



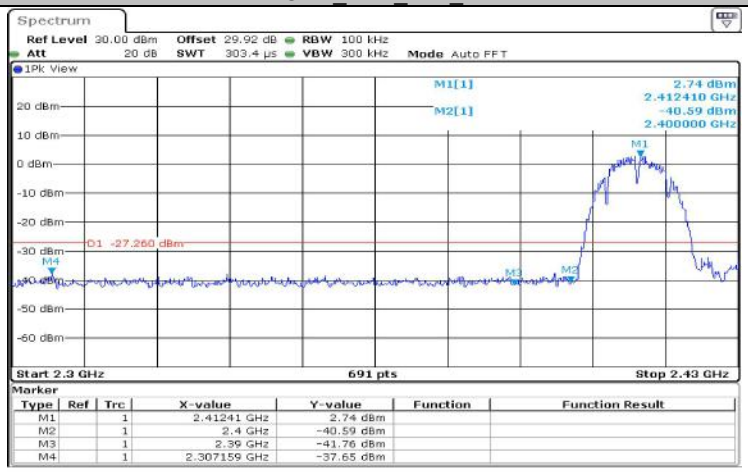
Appendix E: Band edge measurements

Test Graphs

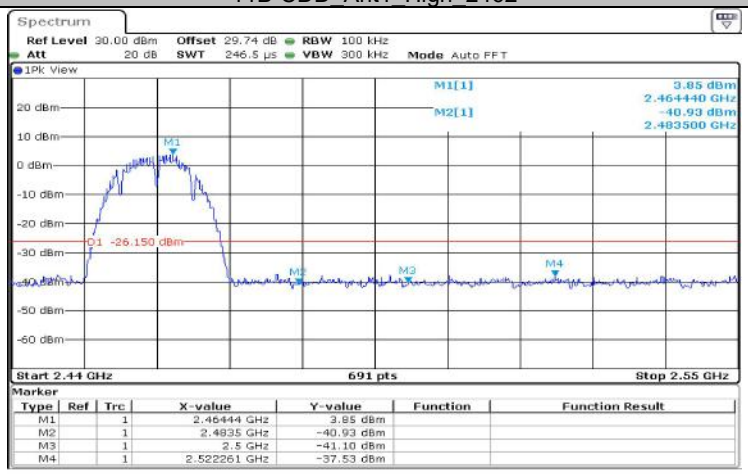
11B-CDD_Ant1_Low_2412



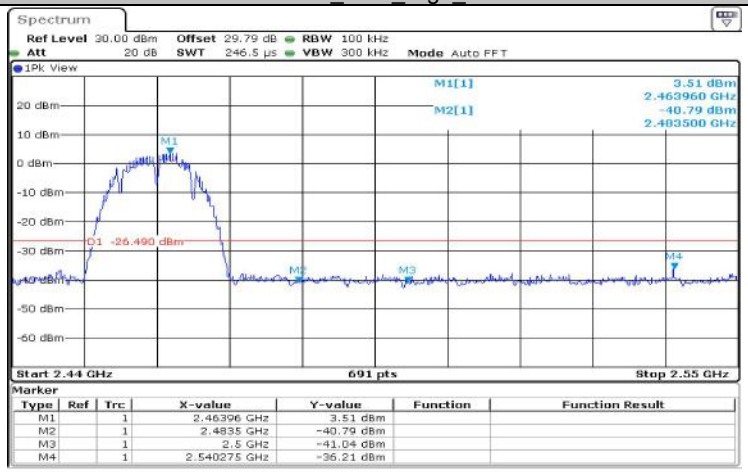
11B-CDD_Ant2_Low_2412



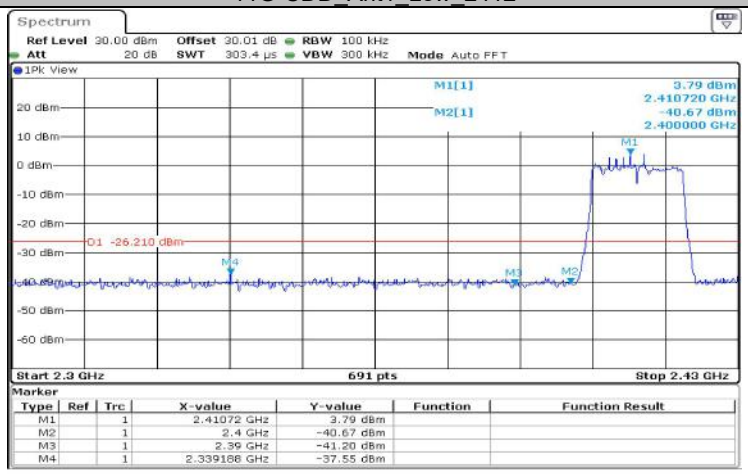
11B-CDD_Ant1_High_2462



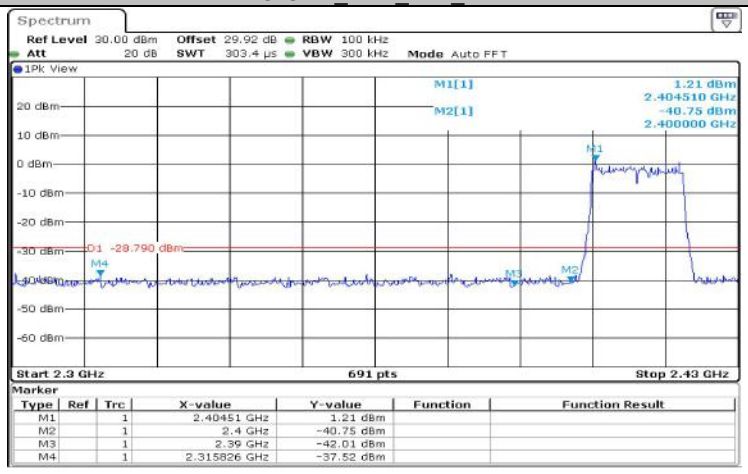
11B-CDD_Ant2_High_2462



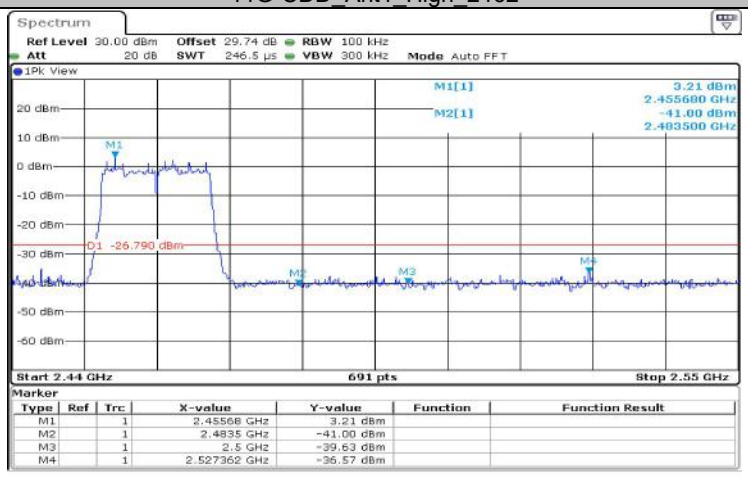
11G-CDD_Ant1_Low_2412



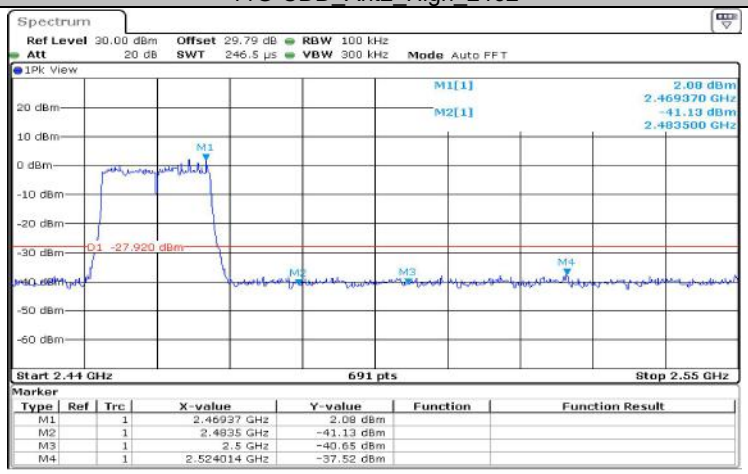
11G-CDD_Ant2_Low_2412



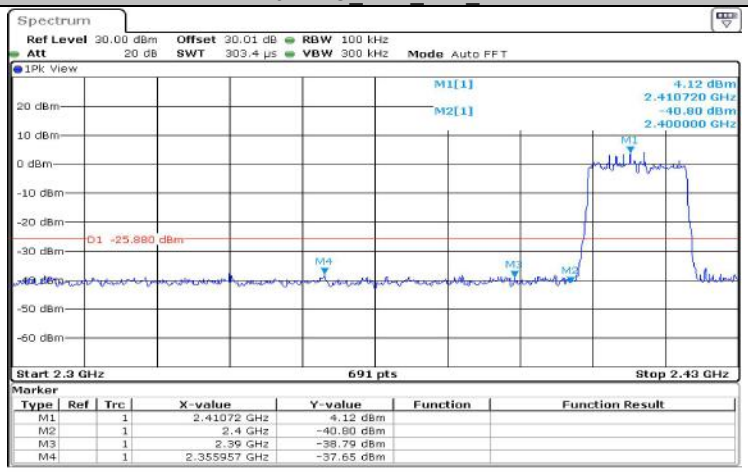
11G-CDD_Ant1_High_2462



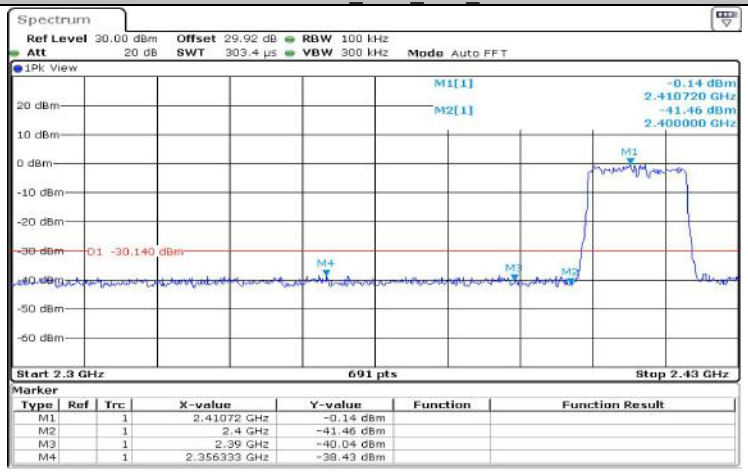
11G-CDD_Ant2_High_2462



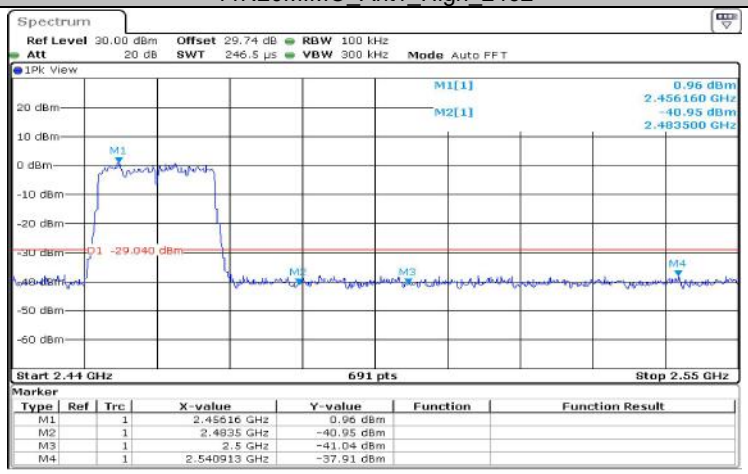
11N20MIMO_Ant1_Low_2412



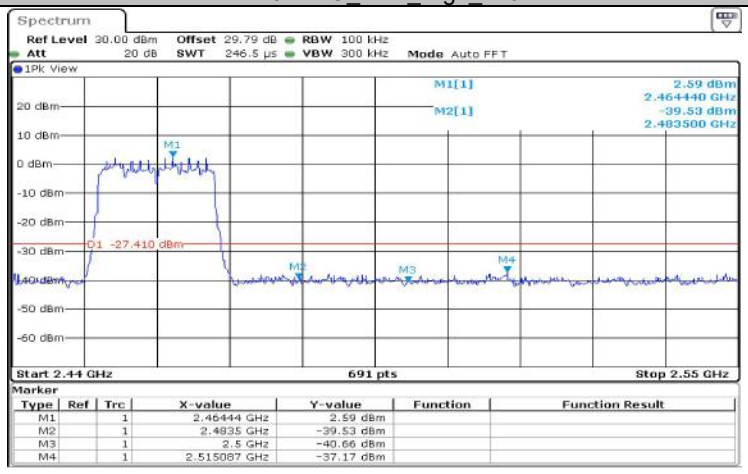
11N20MIMO_Ant2_Low_2412



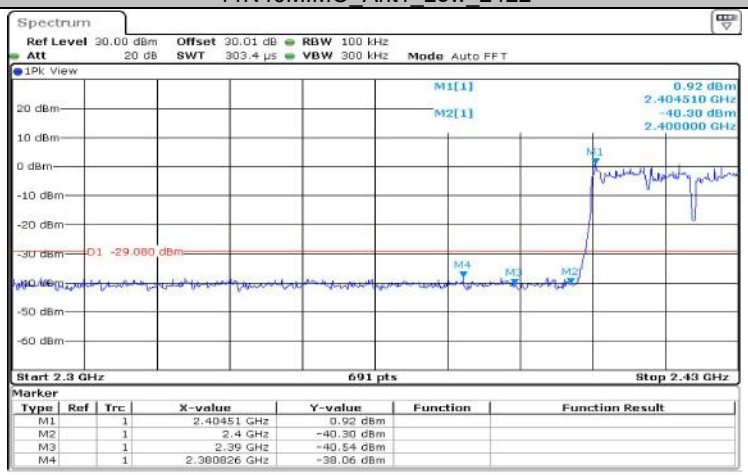
11N20MIMO_Ant1_High_2462



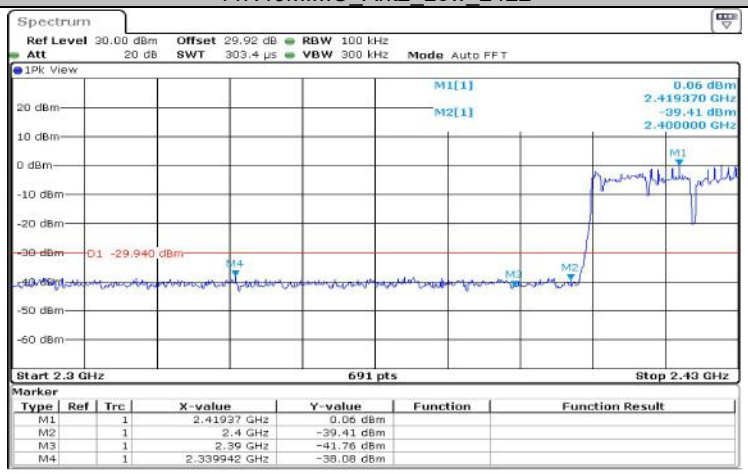
11N20MIMO_Ant2_High_2462



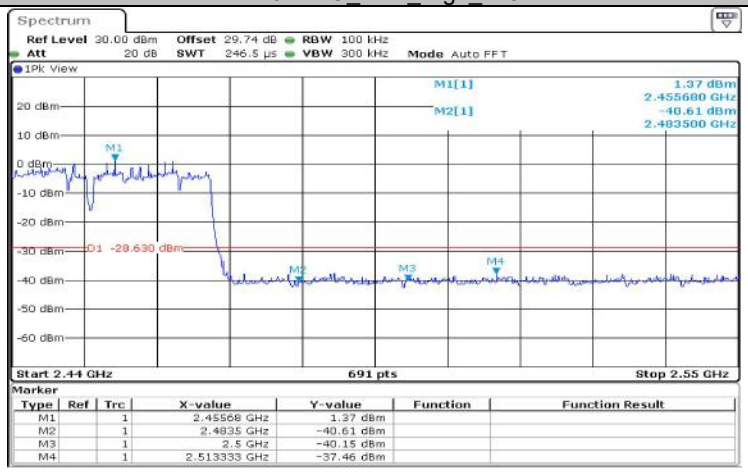
11N40MIMO_Ant1_Low_2422



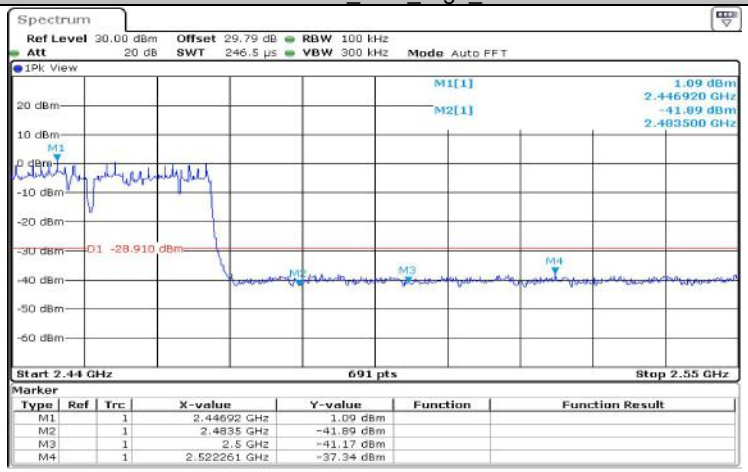
11N40MIMO_Ant2_Low_2422



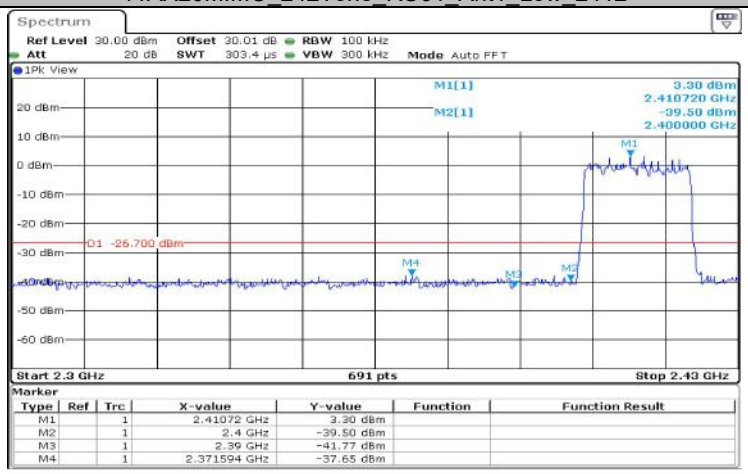
11N40MIMO_Ant1_High_2452



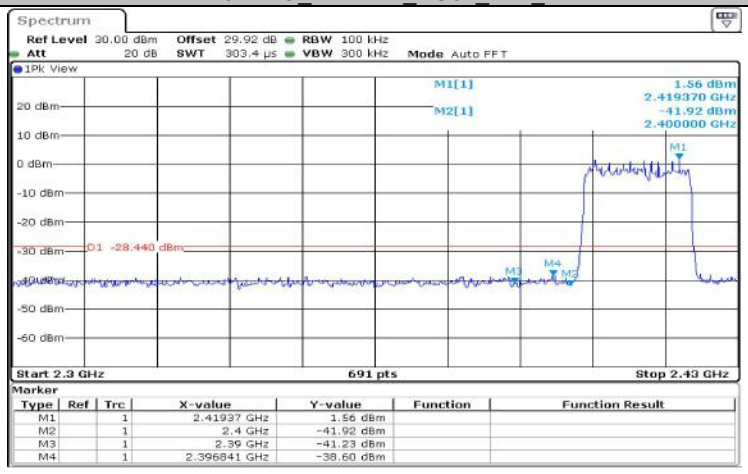
11N40MIMO_Ant2_High_2452



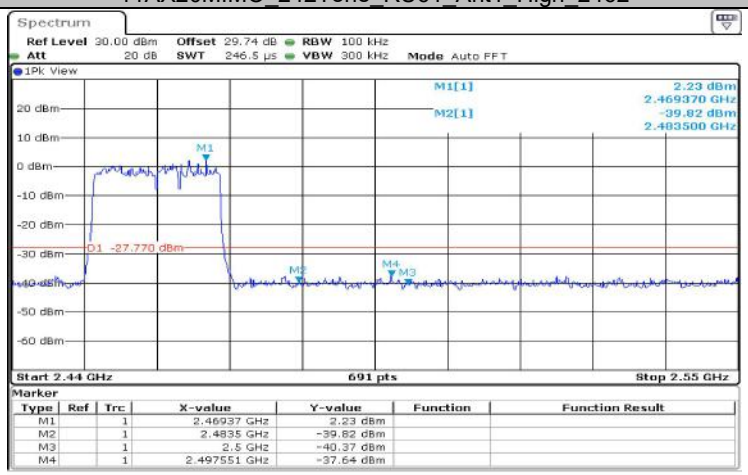
11AX20MIMO_242Tone_RU61_Ant1_Low_2412



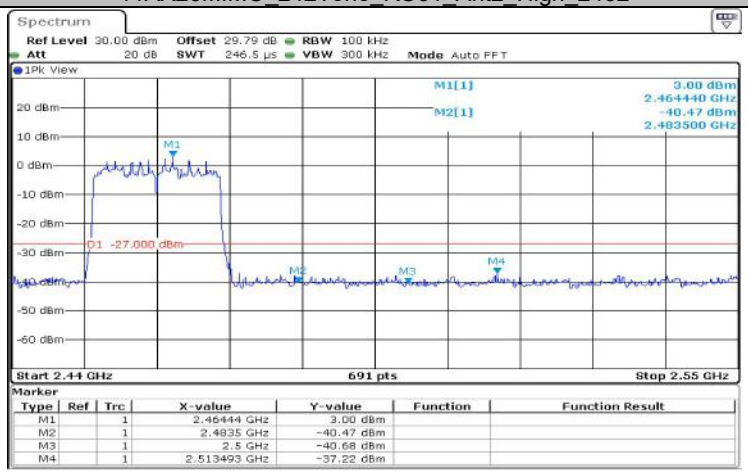
11AX20MIMO_242Tone_RU61_Low_2412



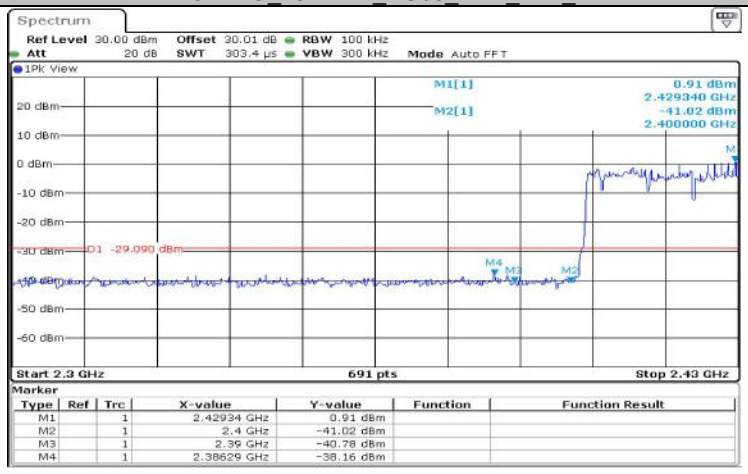
11AX20MIMO_242Tone_RU61_Ant1_High_2462



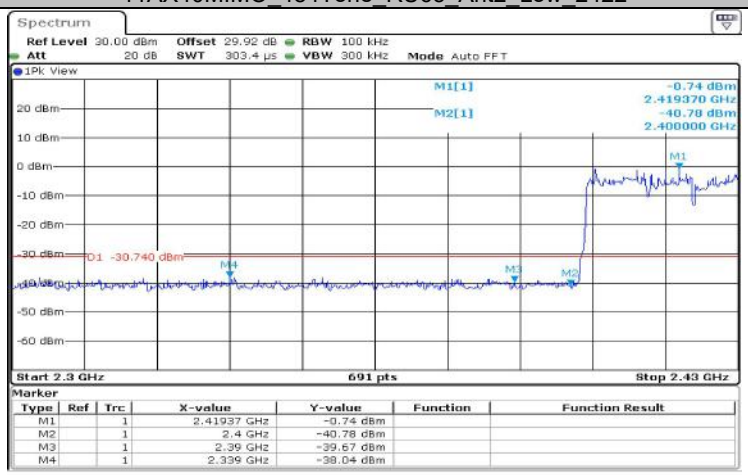
11AX20MIMO_242Tone_RU61_Ant2_High_2462



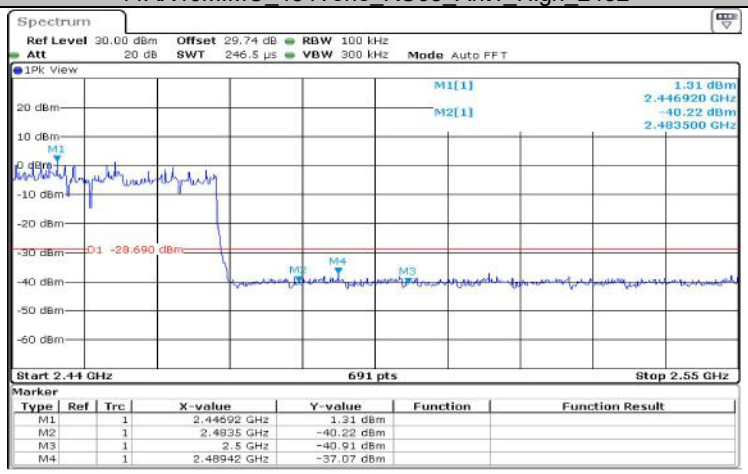
11AX40MIMO_484Tone_RU65_Ant1_Low_2422



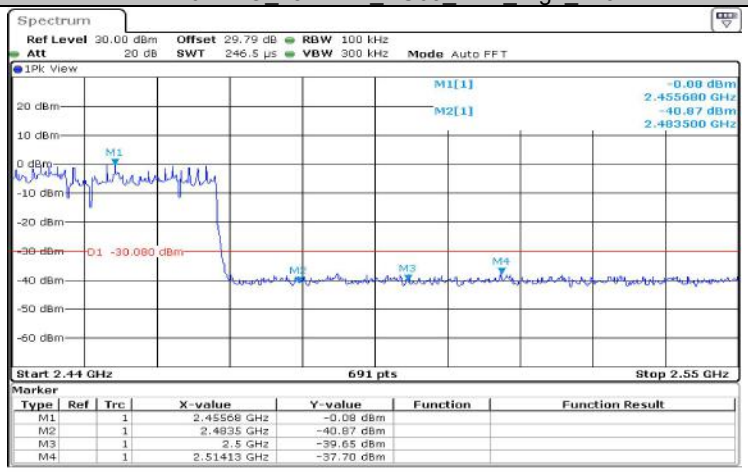
11AX40MIMO_484Tone_RU65_Ant2_Low_2422



11AX40MIMO_484Tone_RU65_Ant1_High_2452



11AX40MIMO_484Tone_RU65_Ant2_High_2452



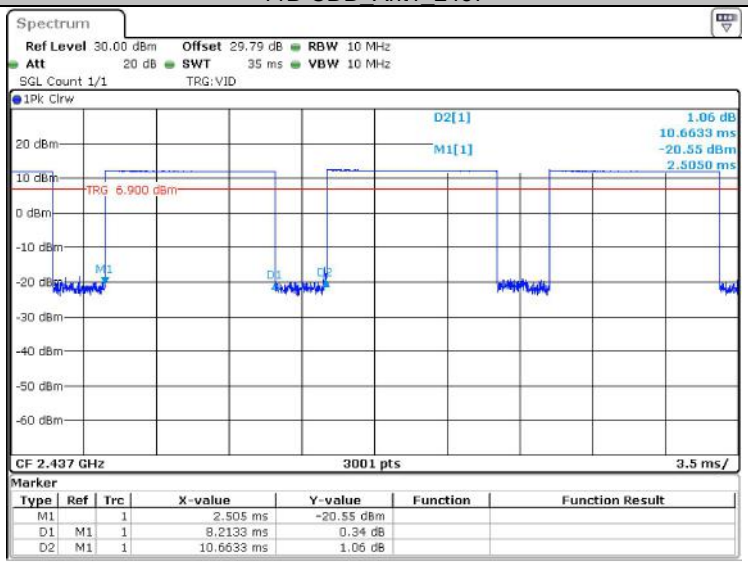
Appendix F: Duty Cycle

Test Result

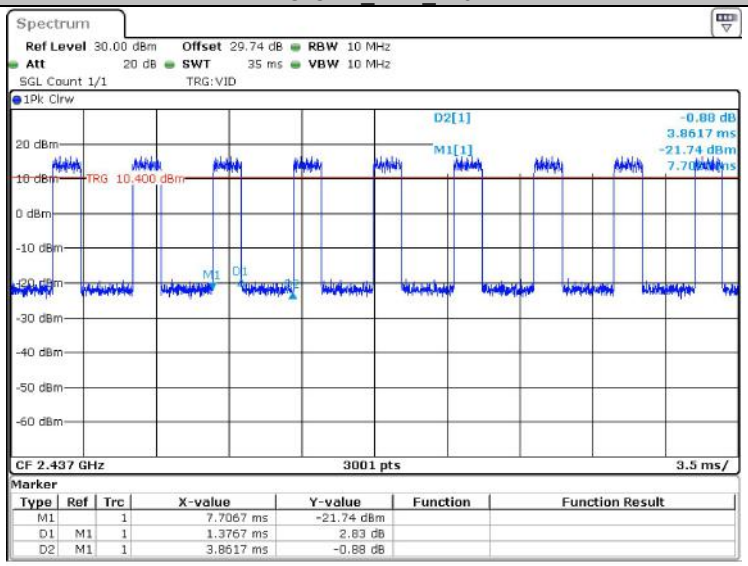
Test Mode	Antenna	Frequency [MHz]	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	Duty Cycle Correction Factor [dB]	1/T Minimum VBW [kHz]
11B-CDD	Ant1	2437	8.21	10.66	77.02	1.13	0.12
11G-CDD	Ant1	2437	1.38	3.86	35.75	4.47	0.72
11N20MIMO	Ant1	2437	1.17	3.65	32.05	4.94	0.85
11N40MIMO	Ant1	2437	0.61	3.08	19.81	7.03	1.64
11AX20MIMO_ 242Tone_RU61	Ant1	2437	0.61	3.08	19.81	7.03	1.64
11AX40MIMO_ 484Tone_RU65	Ant1	2437	0.61	3.08	19.81	7.03	1.64

Test Graphs

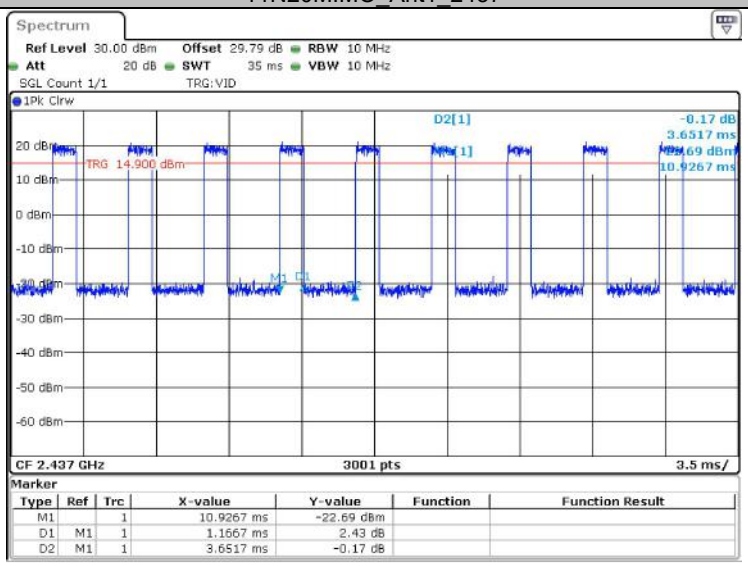
11B-CDD_Ant1_2437



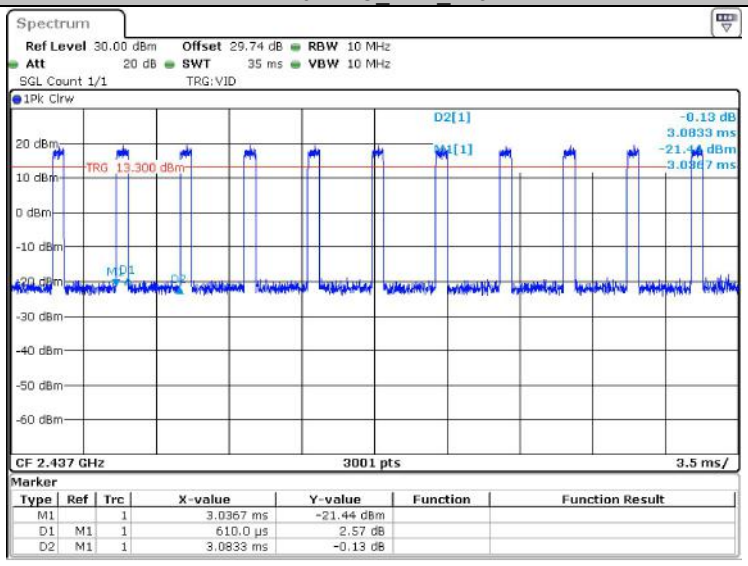
11G-CDD_Ant1_2437



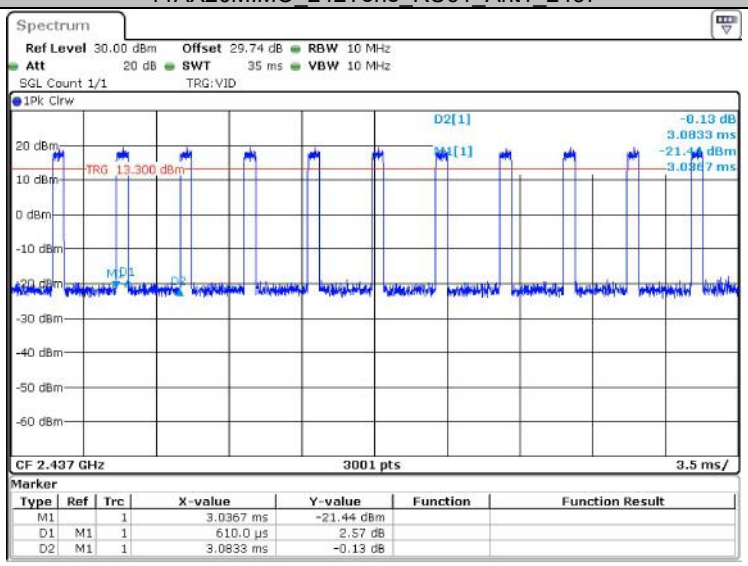
11N20MIMO_Ant1_2437



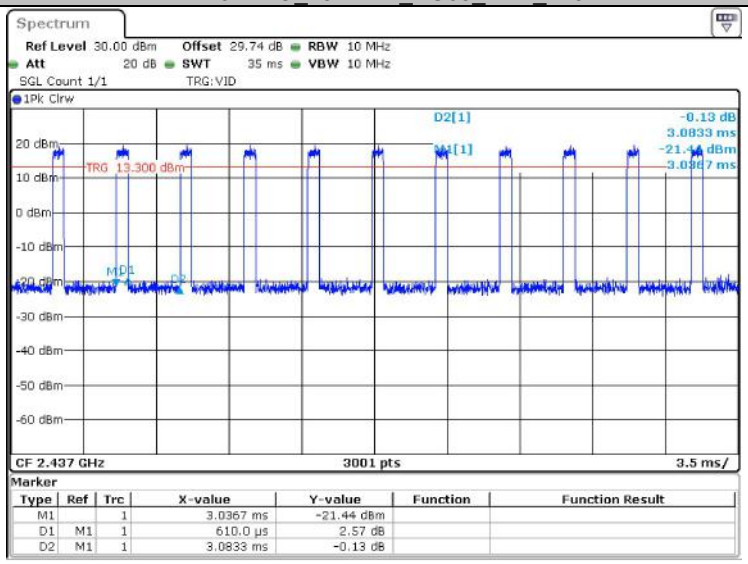
11N40MIMO_Ant1_2437



11AX20MIMO_242Tone_RU61_Ant1_2437



11AX40MIMO_484Tone_RU65_Ant1_2437



APPENDIXBLE

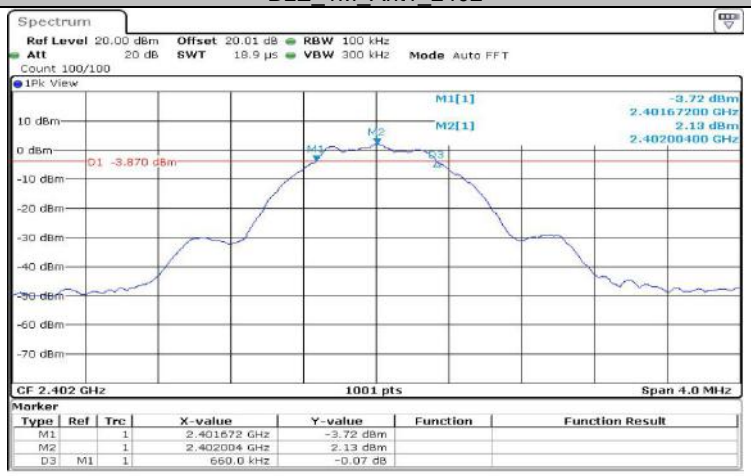
Appendix A: DTS Bandwidth

Test Result

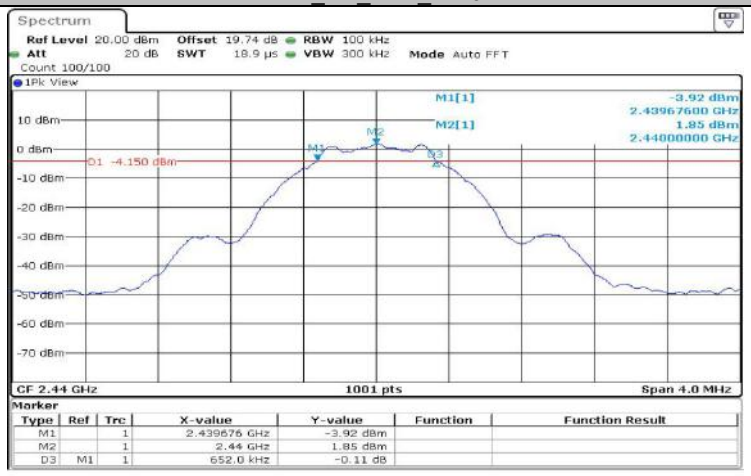
Test Mode	Antenna	Frequency[MHz]	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	0.66	2401.67	2402.33	0.5	PASS
		2440	0.65	2439.68	2440.33	0.5	PASS
		2480	0.66	2479.67	2480.33	0.5	PASS
BLE_2M	Ant1	2402	1.10	2401.46	2402.56	0.5	PASS
		2440	1.11	2439.47	2440.58	0.5	PASS
		2480	1.12	2479.46	2480.58	0.5	PASS

Test Graphs

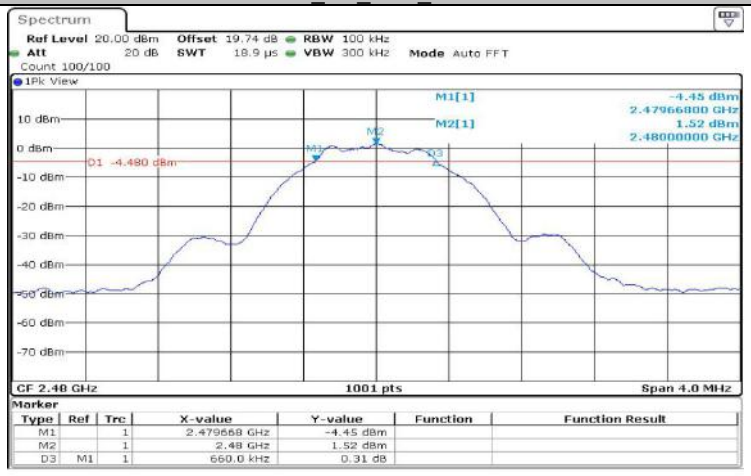
BLE_1M_Ant1_2402



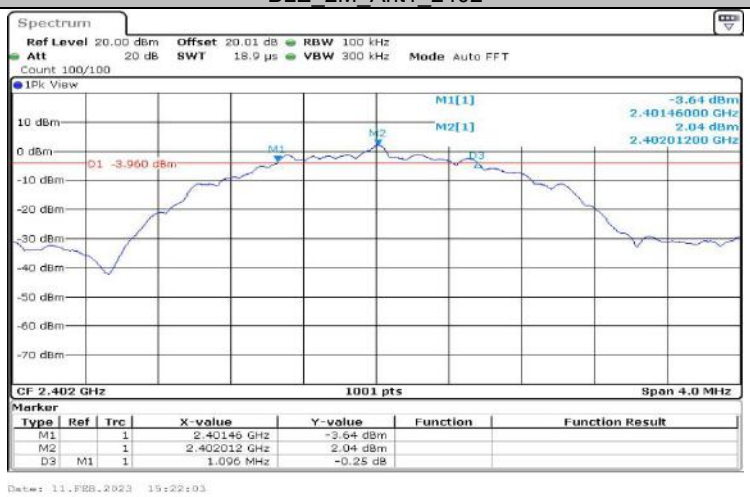
BLE_1M_Ant1_2440



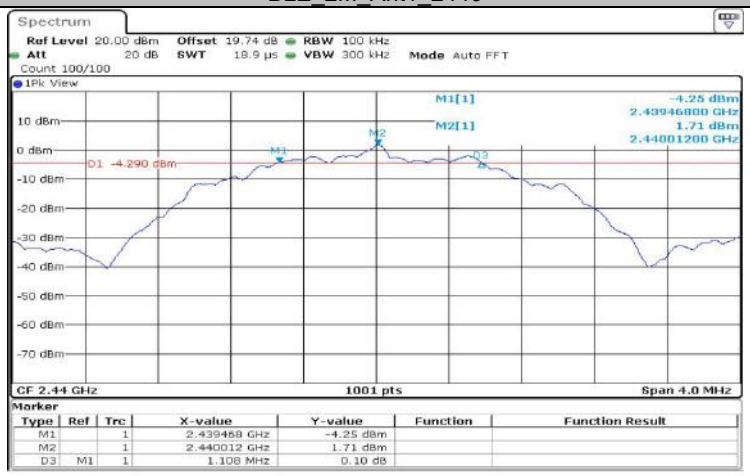
BLE_1M_Ant1_2480



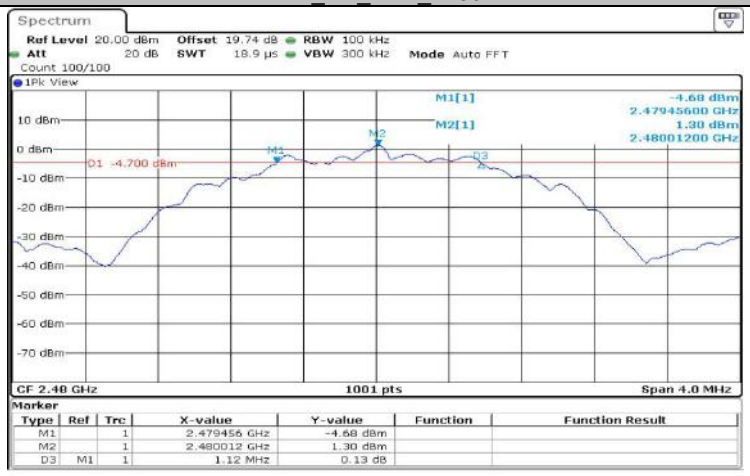
BLE_2M_Ant1_2402



BLE_2M_Ant1_2440



BLE_2M_Ant1_2480



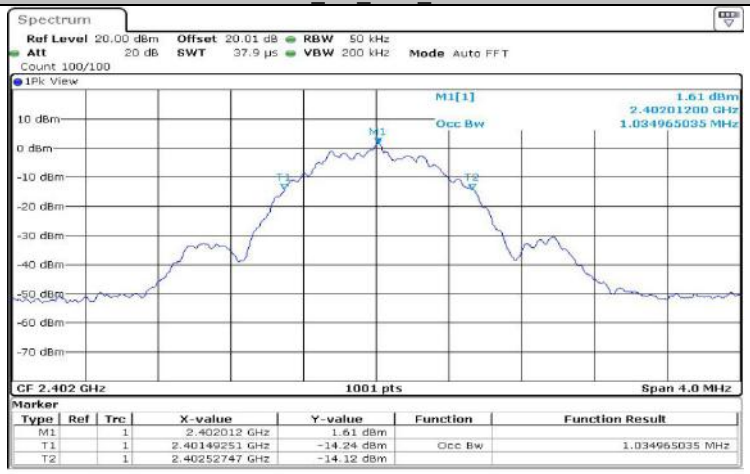
Appendix B: Occupied Channel Bandwidth

Test Result

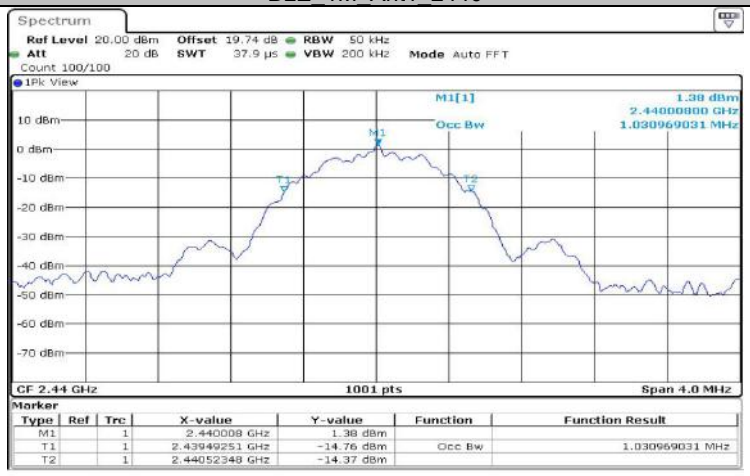
Test Mode	Antenna	Frequency[MHz]	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
BLE_1M	Ant1	2402	1.035	2401.493	2402.527	---	---
		2440	1.031	2439.493	2440.523	---	---
		2480	1.031	2479.497	2480.527	---	---
BLE_2M	Ant1	2402	2.046	2401.009	2403.055	---	---
		2440	2.054	2439.009	2441.063	---	---
		2480	2.058	2479.005	2481.063	---	---

Test Graphs

BLE_1M_Ant1_2402

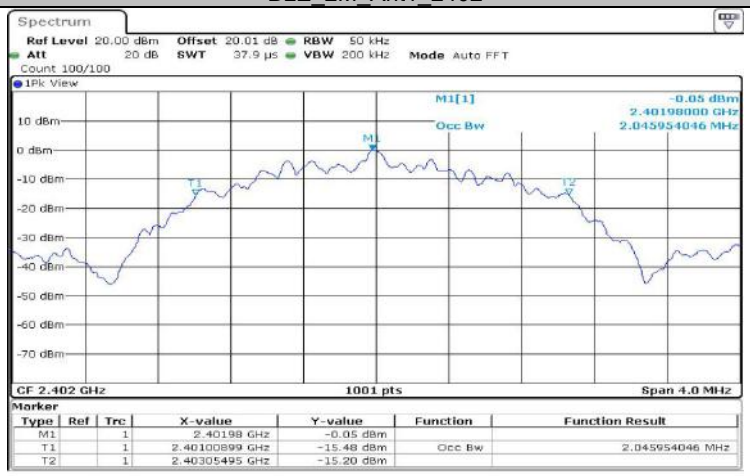


BLE_1M_Ant1_2440

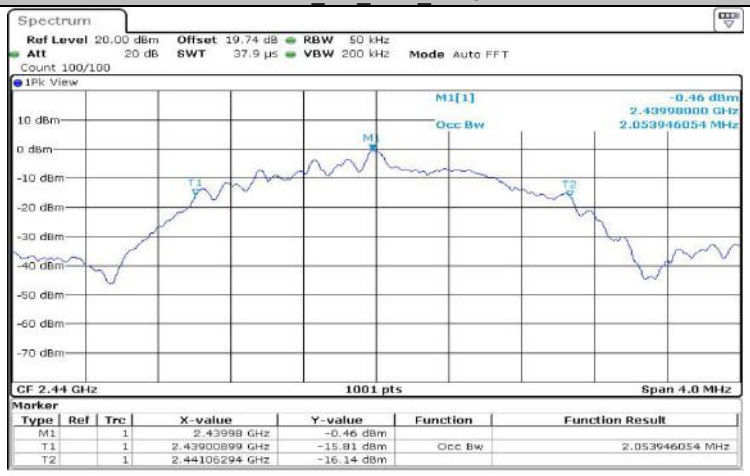


BLE_1M_Ant1_2480

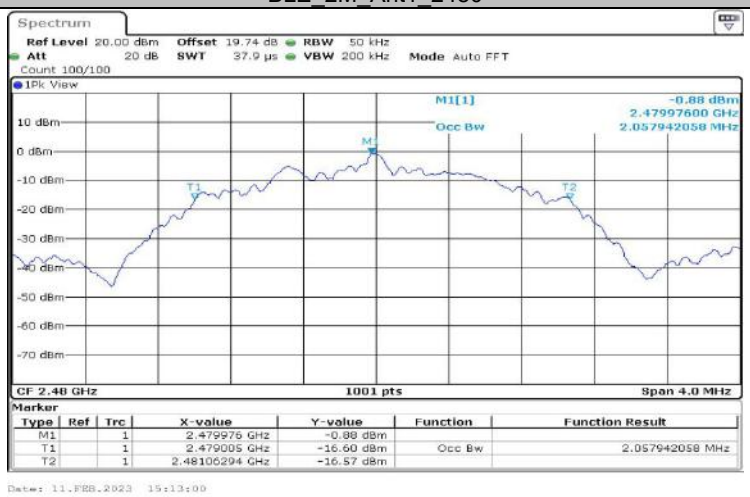
BLE_2M_Ant1_2402



BLE_2M_Ant1_2440



BLE_2M_Ant1_2480



Appendix C: Maximum conducted output power

Test Result

Test Mode	Antenna	Frequency[MHz]	Conducted Peak Power[dBm]	Conducted Limit[dBm]	Verdict
BLE_1M	Ant1	2402	2.73	≤30	PASS
		2440	3.10	≤30	PASS
		2480	2.54	≤30	PASS
BLE_2M	Ant1	2402	2.82	≤30	PASS
		2440	2.80	≤30	PASS
		2480	2.29	≤30	PASS

Test Graphs

BLE_1M_Ant1_2402

BLE_1M_Ant1_2440

BLE_1M_Ant1_2480

BLE_2M_Ant1_2402

BLE_2M_Ant1_2440

BLE_2M_Ant1_2480

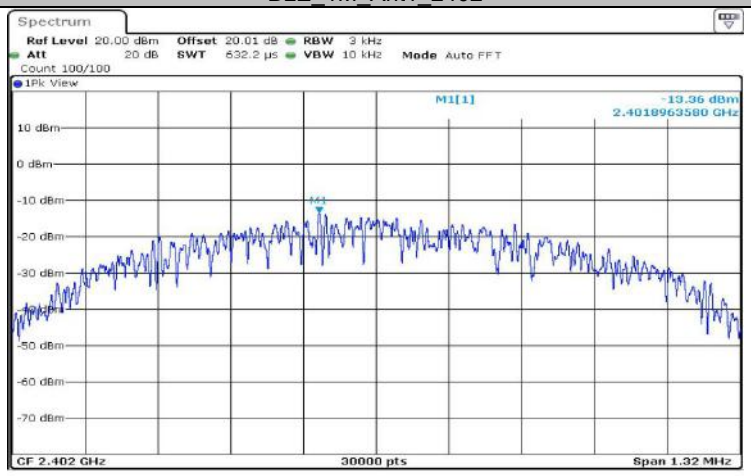
Appendix D: Maximum power spectral density

Test Result

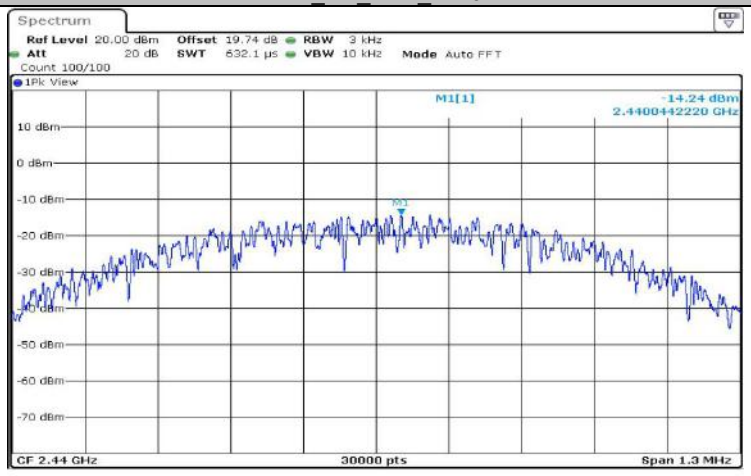
Test Mode	Antenna	Frequency[MHz]	Result[dBm/3kHz]	Limit[dBm/3kHz]	Verdict
BLE_1M	Ant1	2402	-13.36	≤8.00	PASS
		2440	-14.24	≤8.00	PASS
		2480	-13.2	≤8.00	PASS
BLE_2M	Ant1	2402	-14.46	≤8.00	PASS
		2440	-15.76	≤8.00	PASS
		2480	-16.58	≤8.00	PASS

Test Graphs

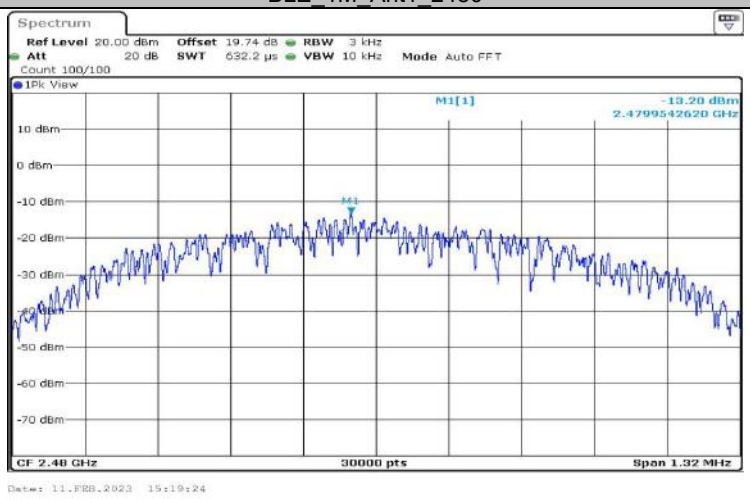
BLE_1M_Ant1_2402



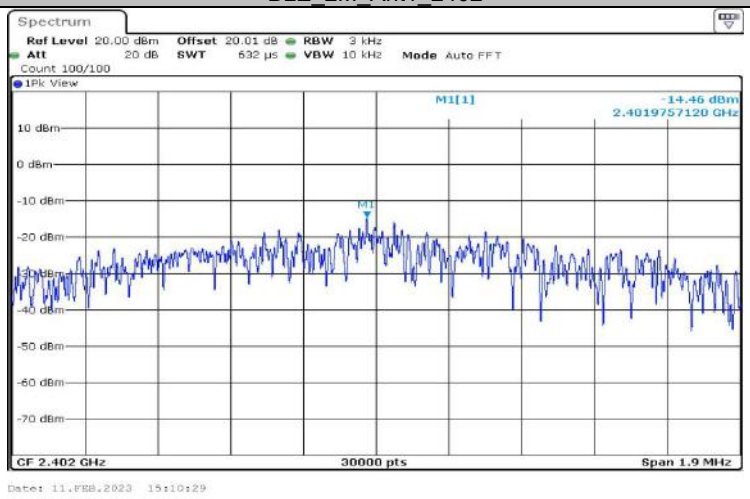
BLE_1M_Ant1_2440



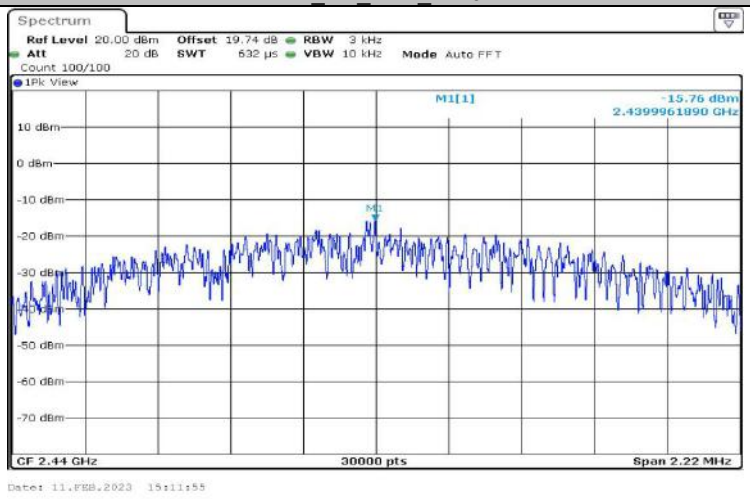
BLE_1M_Ant1_2480



BLE_2M_Ant1_2402



BLE_2M_Ant1_2440



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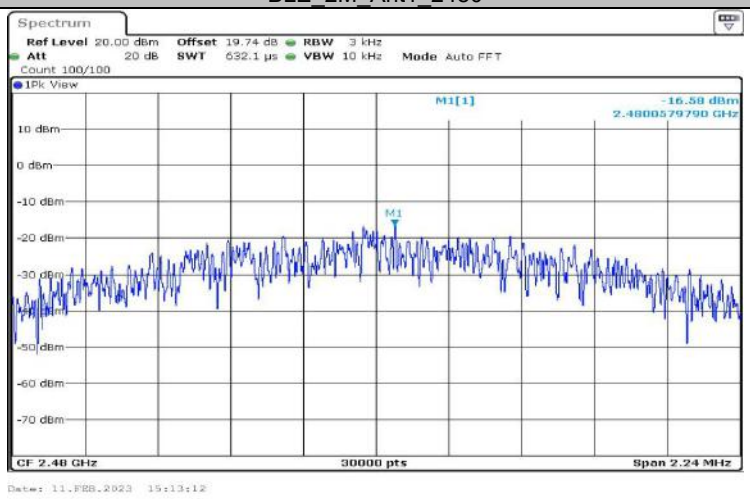
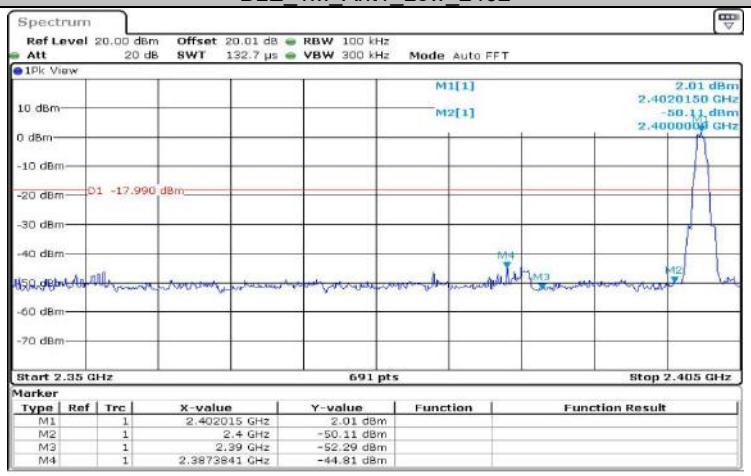


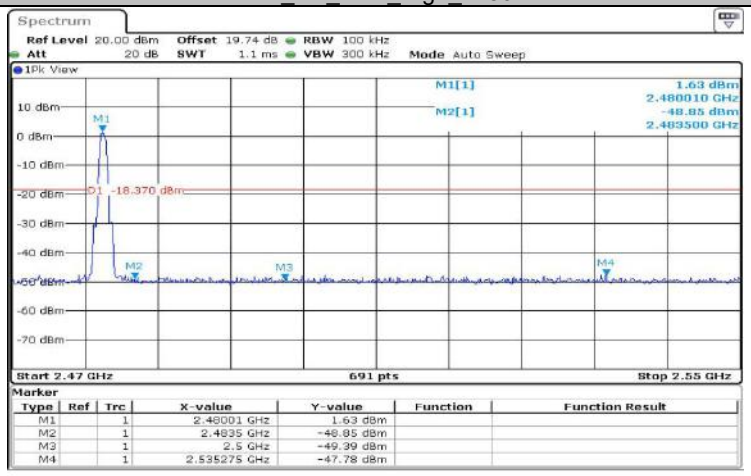
Appendix E: Band edge measurements

Test Graphs

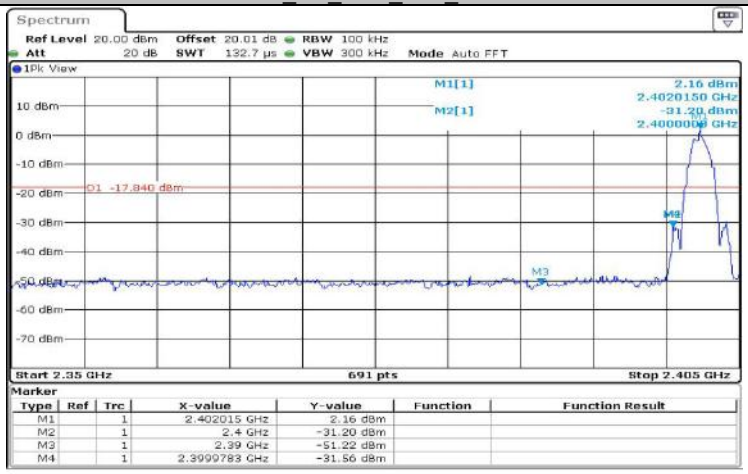
BLE_1M_Ant1_Low_2402



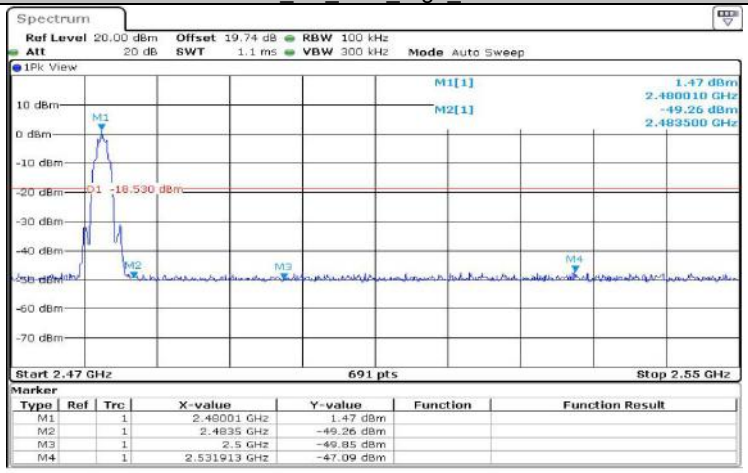
BLE_1M_Ant1_High_2480



BLE_2M_Ant1_Low_2402



BLE_2M_Ant1_High_2480



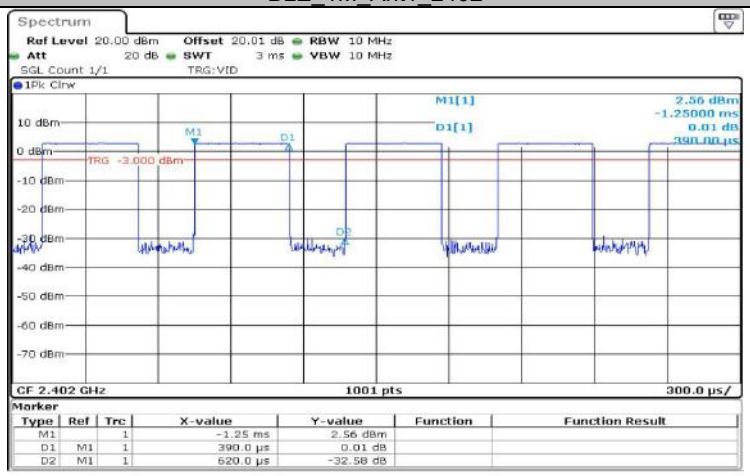
Appendix F: Duty Cycle

Test Result

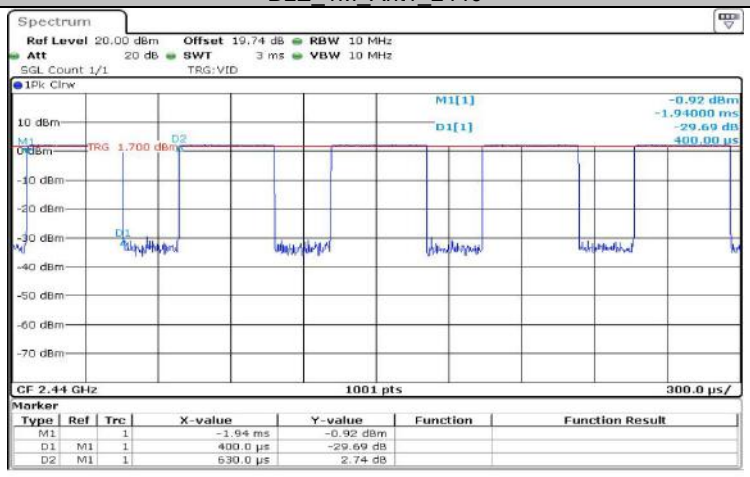
Test Mode	Antenna	Frequency [MHz]	Transmission Duration [ms]	Transmission Period [ms]	Duty Cycle [%]	Duty Cycle Correction Factor [dB]	1/T Minimum VBW [kHz]
BLE_1M	Ant1	2402	0.39	0.62	62.90	2.01	2.56
		2440	0.40	0.63	63.49	1.97	2.50
		2480	0.39	0.62	62.90	2.01	2.56
BLE_2M	Ant1	2402	0.21	0.62	33.87	4.70	4.76
		2440	0.21	0.62	33.87	4.70	4.76
		2480	0.21	0.62	33.87	4.70	4.76

Test Graphs

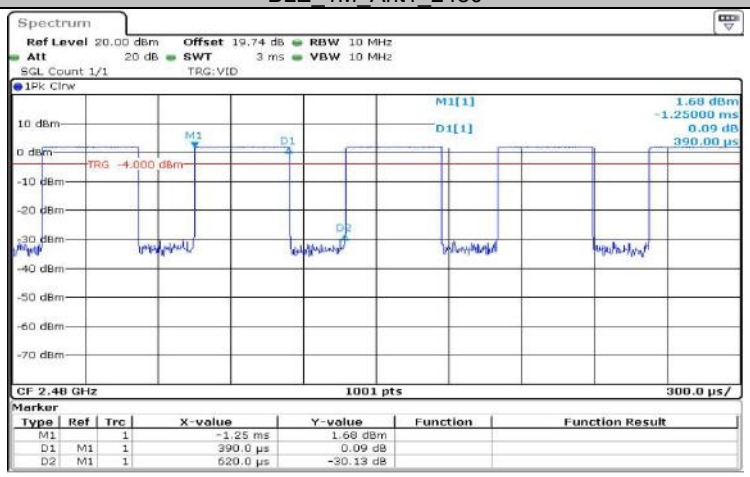
BLE_1M_Ant1_2402



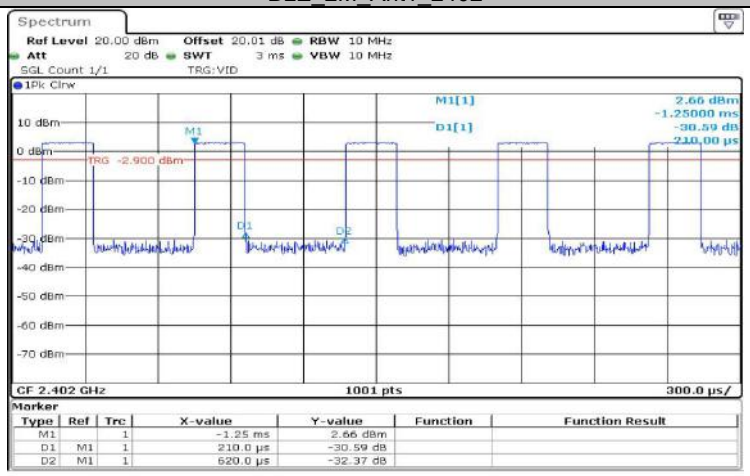
BLE_1M_Ant1_2440



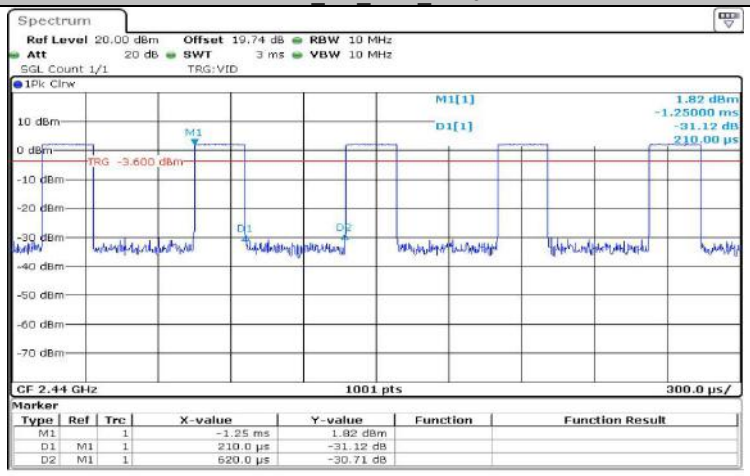
BLE_1M_Ant1_2480



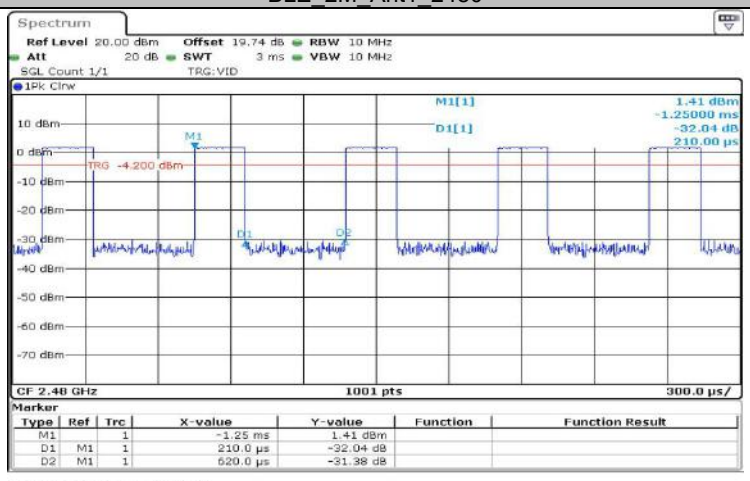
BLE_2M_Ant1_2402



BLE_2M_Ant1_2440



BLE_2M_Ant1_2480



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