



# FCC RF Test Report

APPLICANT : ASUSTeK COMPUTER INC.  
EQUIPMENT : ASUS Phone (Mobile Phone)  
BRAND NAME : ASUS  
MODEL NAME : ASUS\_AI2205\_E, ASUS\_AI2205\_F  
FCC ID : MSQAI2205  
STANDARD : FCC Part 15 Subpart C §15.247  
CLASSIFICATION : (DTS) Digital Transmission System  
TEST DATE(S) : Feb. 05, 2023 ~ Mar. 13, 2023

We, Sporton International Inc. (Shenzhen), would like to declare that the tested sample has been evaluated in accordance with the test procedures and has been in compliance with the applicable technical standards.

The test results in this report apply exclusively to the tested model / sample. Without written approval of Sporton International Inc. (Shenzhen), the test report shall not be reproduced except in full.

Jason Jia



Approved by: Jason Jia

**Sporton International Inc. (ShenZhen)**

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People's Republic of China



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### SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit	Result	Remark
3.1	15.247(a)(2)	6dB Bandwidth	≥ 0.5MHz	Pass	-
3.1	-	99% Bandwidth	-	Report Only	-
3.2	15.247(b)	Power Output Measurement	≤ 30dBm	Pass	-
3.3	15.247(e)	Power Spectral Density	≤ 8dBm/3kHz	Pass	-
3.4	15.247(d)	Conducted Band Edges	≤ 20dBc	Pass	-
		Conducted Spurious Emission		Pass	-
3.5	15.247(d)	Radiated Band Edges and Radiated Spurious Emission	15.209(a) & 15.247(d)	Pass	Under limit 2.09 dB at 2389.97 MHz
3.6	15.207	AC Conducted Emission	15.207(a)	Pass	Under limit 8.07 dB at 0.15 MHz
3.7	15.203 & 15.247(b)	Antenna Requirement	15.203 & 15.247(b)	Pass	-

<b>Declaration of Conformity:</b>
The test results with all measurement uncertainty excluded are presented in accordance with the regulation limits.
<b>Comments and Explanations:</b>
The declared of product specification for EUT presented in the report are provided by the manufacturer, and the manufacturer takes all the responsibilities for the accuracy of product specification.



# 1 General Description

## 1.1 Applicant

ASUSTeK COMPUTER INC.

1F., No. 15, Lide Rd., Beitou Dist., Taipei City 112, Taiwan

## 1.2 Manufacturer

ASUSTeK COMPUTER INC.

1F., No. 15, Lide Rd., Beitou Dist., Taipei City 112, Taiwan

## 1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	ASUS Phone (Mobile Phone)
Brand Name	ASUS
Model Name	ASUS_AI2205_E, ASUS_AI2205_F
FCC ID	MSQAI2205
IMEI Code	Conducted: 357795480101637/357795480101645 Conduction: 355156850100851/355156850100869 Radiation: 355156850101099/355156850101107 for Sample 1 350217060100977/350217060100985 for Sample 2
HW Version	R2.0
SW Version	Android 13
EUT Stage	Identical Prototype

**Remark:**

- The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.
- There are four SKUs of EUT for this project. The differences between them are summary below, According to the difference, we evaluate SKU1 (ASUS\_AI2205\_F) to perform full test and SKU2 (ASUS\_AI2205\_E) verify the worst case of RSE.

Sample list				
	SKU1	SKU2	SKU3	SKU4
Model name	ASUS_AI2205_F	ASUS_AI2205_E	ASUS_AI2205_F	ASUS_AI2205_E
Config.	US(Pro)	US(Entry)	US(Pro)	US(Entry)
RF module board	US(Pro)	US(Entry)	US(Pro)	US(Entry)
LCD+Touch front frame	AI2205 FRONT CASE ASSY WW			
DDR	16G(Micron) Micron / MT62F2G64D8CL-023 WT:B			
UFS	512G(Kioxia)(UFS4.0) Kioxia / THGJFJT2T85BAT0	512G(Samsung)(UFS4.0) Samsung /KLUF8RHHD-B0G1	512G(Kioxia)(UFS4.0) Kioxia / THGJFJT2T85BAT0	512G(Samsung)(UFS4.0) Samsung /KLUF8RHHD-B0G1
MB	AI2205_MB	AI2205_MB	AI2205_MB	AI2205_MB
Back cover	WW-Dark-Ult	WW-Light-Entry	WW-Dark-Ult	WW-Light-Entry



Battery	SCUD / C21P2101	SWD / C21P2101	SWD / C21P2101	SCUD / C21P2101
Rear Camera 50+13M	SHINETECH/CDN60B	TRIPLEWIN/CASDA-002A 1	TRIPLEWIN/CASDA-002A 1	SHINETECH/CDN60B
Front Camera 32M	TSPRECISION/TVHF2170	SHINETECH/ST-CMG07B	SHINETECH/ST-CMG07B	TSPRECISION/TVHF2170
Rear Camera 5M	HUNAN KINGCOME/KBFE378	TSPRECISION/TV8F2224	TSPRECISION/TV8F2224	HUNAN KINGCOME/KBFE378
PCB	COMPEQ	COMPEQ	COMPEQ	COMPEQ
CPU	QUALCOMM MPSP1581 / SM-8550 MPSP1581 CS			

### 1.4 Product Specification of Equipment Under Test

Standards-related Product Specification	
<b>Tx/Rx Channel Frequency Range</b>	2412 MHz ~ 2462 MHz
<b>Maximum (Peak) Output Power to antenna</b>	<p><b>&lt;MIMO Ant. 4+5&gt;</b>                      802.11b : 25.79 dBm (0.3793 W)                      802.11g : 28.64 dBm (0.7311 W)                      802.11n HT20 : 28.09 dBm (0.6442 W)                      802.11n HT40 : 28.53 dBm (0.7129 W)                      802.11ac VHT20 : 27.98 dBm (0.6281 W)                      802.11ac VHT40 : 28.39 dBm (0.6902 W)                      802.11ax HE20 : 29.01 dBm (0.7962 W)                      802.11ax HE40 : 28.82 dBm (0.7621 W)                      802.11be EHT20 : 29.14 dBm (0.8204 W)                      802.11be EHT40 : 29.05 dBm (0.8035 W)</p> <p><b>&lt;MIMO Ant. 5+6&gt;</b>                      802.11b : 25.19 dBm (0.3304 W)                      802.11g : 28.16 dBm (0.6546 W)                      802.11n HT20 : 27.69 dBm (0.5875 W)                      802.11n HT40 : 28.26 dBm (0.6699 W)                      802.11ac VHT20 : 27.61 dBm (0.5768 W)                      802.11ac VHT40 : 28.12 dBm (0.6486 W)                      802.11ax HE20 : 28.65 dBm (0.7328 W)                      802.11ax HE40 : 28.59 dBm (0.7228 W)                      802.11be EHT20 : 28.80 dBm (0.7586 W)                      802.11be EHT40 : 28.70 dBm (0.7413 W)</p>
<b>Antenna Type / Gain</b>	<p><b>&lt;Ant 4&gt;</b>: PIFA Antenna type with gain -0.80 dBi  <b>&lt;Ant 5&gt;</b>: PIFA Antenna type with gain -0.60 dBi  <b>&lt;Ant 6&gt;</b>: PIFA Antenna type with gain -5.00 dBi</p>
<b>Type of Modulation</b>	802.11b : DSSS (DBPSK / DQPSK / CCK) 802.11g/n: OFDM (BPSK / QPSK / 16QAM / 64QAM) 802.11ac: OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM) 802.11ax: OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM / 1024QAM) 802.11be: OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM / 1024QAM / 4096QAM)

**Note:**

1. For WLAN SISO & MIMO mode, the whole testing has assessed MIMO mode to cover SISO mode.
2. MIMO mode only support CDD mode.
3. The device supports WLAN MIMO Ant.5+4 for Normal mode, and switch to MIMO Ant.5+6 for



Camera mode.

- 4. For 802.11n/11ac/11ax/11be mode, the whole testing have assessed 802.11be EHT20/EHT40 by referring to the higher output power.
- 5. 802.11ax/be support OFDMA full RU tone and partial RU tone, both full RU and partial RU-left (for low CH) and partial RU-right (for high CH) test output power/PSD, the full RU PSD > partial RU, therefore the full RU perform full test to cover partial RU, and partial RU verify Bandedge & Spurious.
- 6. 802.11be support OFDMA for small size RU, 52Tone + 26 Tone or 106Tone + 26Tone, test MRU combination as below:
  - a. For Low channel, 52Tone\_Index38 + 26Tone\_Index1 and 106Tone\_Index53 + 26Tone\_Index4.
  - b. For High channel, 52Tone\_Index39 + 26Tone\_Index7 and 106Tone\_Index54 + 26Tone\_Index4.

### 1.5 Modification of EUT

No modifications are made to the EUT during all test items.

### 1.6 Testing Location

Sporton International Inc. (ShenZhen) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.01.

<b>Test Firm</b>	Sporton International Inc. (ShenZhen)		
<b>Test Site Location</b>	1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan, Shenzhen, 518055 People's Republic of China TEL: +86-755-86379589 FAX: +86-755-86379595		
<b>Test Site No.</b>	<b>Sporton Site No.</b>	<b>FCC Designation No.</b>	<b>FCC Test Firm Registration No.</b>
	CO01-SZ TH01-SZ	CN1256	421272

<b>Test Firm</b>	Sporton International Inc. (ShenZhen)		
<b>Test Site Location</b>	101, 1st Floor, Block B, Building 1, No. 2, Tengfeng 4th Road, Fenghuang Community, Fuyong Street, Baoan District, Shenzhen City Guangdong Province China 518103 TEL: +86-755-33202398		
<b>Test Site No.</b>	<b>Sporton Site No.</b>	<b>FCC Designation No.</b>	<b>FCC Test Firm Registration No.</b>
	03CH04-SZ	CN1256	421272

### 1.7 Test Software

Item	Site	Manufacturer	Name	Version
1.	03CH04-SZ	AUDIX	E3	6.2009-8-24
2.	CO01-SZ	AUDIX	E3	6.120613b



## 1.8 Applicable Standards

According to the specifications of the manufacturer, the EUT must comply with the requirements of the following standards:

- ♦ 47 CFR Part 15 Subpart C §15.247
- ♦ FCC KDB 558074 D01 15.247 Meas Guidance v05r02
- ♦ FCC KDB 662911 D01 Multiple Transmitter Output v02r01.
- ♦ ANSI C63.10-2013

### **Remark:**

1. All test items were verified and recorded according to the standards and without any deviation during the test.
2. This EUT has also been tested and complied with the requirements of FCC Part 15, Subpart B, recorded in a separate test report.



## 2 Test Configuration of Equipment Under Test

- a. The EUT has been associated with peripherals and configuration operated in a manner tended to maximize its emission characteristics in a typical application. Frequency range investigated: conduction emission (150 kHz to 30 MHz), radiation emission (9 kHz to the 10th harmonic of the highest fundamental frequency or to 40 GHz, whichever is lower). For radiated measurement, pre-scanned in three orthogonal panels, X, Y, Z. The worst cases (Z plane) were recorded in this report.
- b. AC power line Conducted Emission was tested under maximum output power.

### 2.1 Carrier Frequency and Channel

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
2400-2483.5 MHz	1	2412	7	2442
	2	2417	8	2447
	3	2422	9	2452
	4	2427	10	2457
	5	2432	11	2462
	6	2437	-	-

### 2.2 Test Mode

Final test modes are considering the modulation and worse data rates as below table.

#### MIMO Antenna

Modulation	Data Rate
802.11b	1 Mbps
802.11g	6 Mbps
802.11be EHT20 (cover 11ac VHT20/11ax HE20)	MCS0
802.11be EHT40 (cover 11ac VHT40/11ax HE40)	MCS0

Test Cases	
AC Conducted Emission	Mode 1 :GSM 850 Idle + BT Link + WLAN Link(2.4G) + USB Cable1 (Charging from Adapter1)+Battery 1

**Sample 1 (Ant4+5):**

<b>Simultaneous transmission</b>
<b>802.11be EHT40 CH03 + LTE Band 48 Link</b> <b>802.11be EHT40 CH03 + Bluetooth LE(2Mbps) CH39 + LTE Band 48 Link</b>

**Sample 1 (Ant5+6):**

<b>Simultaneous transmission</b>
<b>802.11be EHT40 CH03 + LTE B48 Link</b> <b>802.11be EHT40 CH03 + Bluetooth LE(2Mbps) CH39 + LTE Band 48 Link</b>

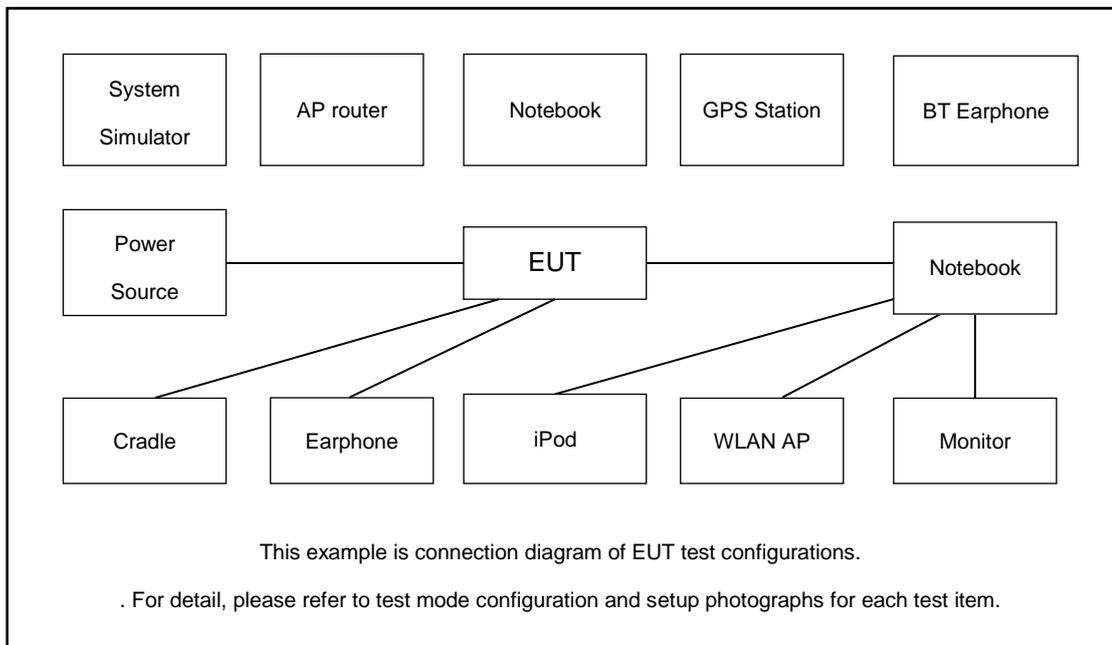
**Sample 2 (Ant4+5):**

<b>Simultaneous transmission</b>
<b>802.11be EHT40 CH03 + LTE B48 Link</b> <b>802.11be EHT40 CH03 + Bluetooth LE(2Mbps) CH39 + LTE Band 48 Link</b>

**Remark:**

1. For Radiated Test Cases, The tests were performance with Adapter 1, Battery 1, USB Cable 1.
2. The Simultaneous transmission mode are assessed from the worst combination of WLAN 2.4G TX + Bluetooth TX + WWAN Link mode.

### 2.3 Connection Diagram of Test System





## 2.4 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	System Simulator	Anritsu	MT8820C	N/A	N/A	Unshielded,1.8m
2.	WLAN AP	Dlink	DIR-820L	KA2IR820LA1	N/A	Unshielded,1.8m
3.	Bluetooth Earphone	Samsung	EO-MG900	PYAHS-107W	N/A	N/A

## 2.5 EUT Operation Test Setup

For WLAN RF test items, an engineering test program was provided and enabled to make EUT continuous transmit.

For AC power line conducted emissions, the EUT was set to connect with the WLAN AP under large package sizes transmission.

## 2.6 Measurement Results Explanation Example

For all conducted test items:

The offset level is set in the spectrum analyzer to compensate the RF cable loss and attenuator factor between EUT conducted output port and spectrum analyzer. With the offset compensation, the spectrum analyzer reading level is exactly the EUT RF output level.

Example:

The spectrum analyzer offset is derived from RF cable loss and attenuator factor.

*Offset = RF cable loss + attenuator factor.*

Following shows an offset computation example with cable loss 1.92 dB and 10dB attenuator.

*Offset(dB) = RF cable loss(dB) + attenuator factor(dB).*

*= 1.92 + 10 = 11.92 (dB)*

### 3 Test Result

#### 3.1 6dB and 99% Bandwidth Measurement

##### 3.1.1 Limit of 6dB Bandwidth

The minimum 6 dB bandwidth shall be at least 500 kHz.

##### 3.1.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

##### 3.1.3 Test Procedures

1. The testing follows ANSI C63.10-2013 clause 11.8
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 100 kHz. Set the Video bandwidth (VBW) = 300 kHz. In order to make an accurate measurement. The 6 dB bandwidth must be greater than 500 kHz.
5. Measure and record the results in the test report.

##### 3.1.4 Test Setup



##### 3.1.5 Test Result of 6dB and 99% Occupied Bandwidth

Please refer to Appendix A.

## 3.2 Output Power Measurement

### 3.2.1 Limit of Output Power

For systems using digital modulation in the 2400-2483.5MHz, the limit for peak output power is 30dBm. If transmitting antenna with directional gain greater than 6dBi is used, the peak output power from the intentional radiator shall be reduced below the above stated value by the amount in dB that the directional gain of the antenna exceeds 6 dBi. In case of point-to-point operation, the limit has to be reduced by 1dB for every 3dB that the directional gain of the antenna exceeds 6dBi.

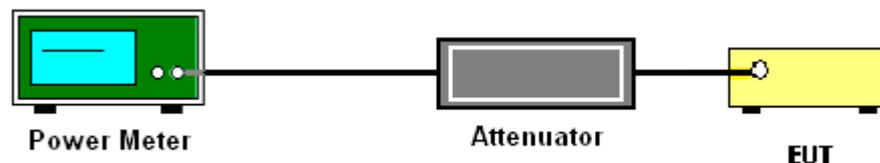
### 3.2.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

### 3.2.3 Test Procedures

1. The testing follows the Measurement Procedure of ANSI C63.10-2013 clause 11.9.1.3 PKPM1 Peak power meter or ANSI C63.10-2013 clause 11.9.2.3.1 Method AVGPM method.
2. The RF output of EUT was connected to the power meter by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Measure the conducted output power and record the results in the test report.
5. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

### 3.2.4 Test Setup



### 3.2.5 Test Result of Peak Output Power

Please refer to Appendix A.

### 3.2.6 Test Result of Average Output Power (Reporting Only)

Please refer to Appendix A.



### 3.3 Power Spectral Density Measurement

#### 3.3.1 Limit of Power Spectral Density

The peak power spectral density shall not be greater than 8dBm in any 3kHz band at any time interval of continuous transmission.

#### 3.3.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

#### 3.3.3 Test Procedures

1. The testing follows Measurement Procedure of ANSI C63.10-2013 clause 11.10.2 Method PKPSD.
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Make the measurement with the spectrum analyzer's resolution bandwidth (RBW) = 3 kHz. Video bandwidth VBW = 10 kHz In order to make an accurate measurement, set the span to 1.5 times DTS Channel Bandwidth. (6dB BW)
5. Detector = peak, Sweep time = auto couple, Trace mode = max hold, Allow trace to fully stabilize. Use the peak marker function to determine the maximum power level.
6. Measure and record the results in the test report.
7. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

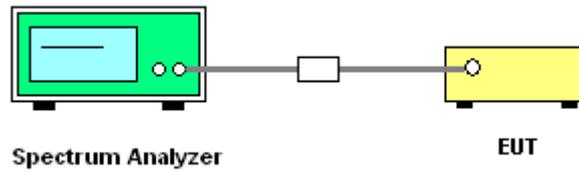
If measurements performed using method (2) plus  $10 \log(N)$  exceeds the emission limit, the test should choose method (1) before declaring that the device fails the emission limit.

Method (1): Measure and sum the spectra across the outputs.

The total final Power Spectral Density is from a device with 2 transmitter outputs. The spectrum measurements of the individual outputs are all performed with the same span and number of points, the spectrum value in the first spectral bin of output 1 is summed with that in the first spectral bin of output 2 to obtain the value for the first frequency bin of the summed spectrum.

Method (2): Measure and add  $10 \log(N)$  dB, where N is the number of outputs. (N=2)

### 3.3.4 Test Setup



### 3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.

## 3.4 Conducted Band Edges and Spurious Emission Measurement

### 3.4.1 Limit of Conducted Band Edges and Spurious Emission Measurement

In any 100 kHz bandwidth outside of the authorized frequency band, the emissions which fall in the non-restricted bands shall be attenuated at least 20 dB relative to the maximum PSD level in 100 kHz by RF conducted measurement.

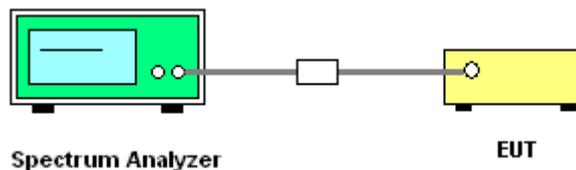
### 3.4.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

### 3.4.3 Test Procedures

1. The testing follows ANSI C63.10-2013 clause 11.13
2. The RF output of EUT was connected to the spectrum analyzer by RF cable and attenuator. The path loss was compensated to the results for each measurement.
3. Set to the maximum power setting and enable the EUT transmit continuously.
4. Set RBW = 100 kHz, VBW=300 kHz, Peak Detector. Unwanted Emissions measured in any 100 kHz bandwidth outside of the authorized frequency band shall be attenuated by at least 20 dB relative to the maximum in-band peak PSD level in 100 kHz when maximum peak conducted output power procedure is used. If the transmitter complies with the conducted power limits based on the use of RMS averaging over a time interval, the attenuation required under this paragraph shall be 30 dB instead of 20 dB per 15.247(d).
5. Measure and record the results in the test report.
6. The RF fundamental frequency should be excluded against the limit line in the operating frequency band.

### 3.4.4 Test Setup



### 3.4.5 Test Result of Conducted Band Edges and Spurious Emission

Please refer to Appendix A.



### 3.5 Radiated Band Edges and Spurious Emission Measurement

#### 3.5.1 Limit of Radiated band edge and Spurious Emission Measurement

In any 100 kHz bandwidth outside the intentional radiator frequency band, all harmonics/spurious must be at least 20 dB below the highest emission level within the authorized band. If the output power of this device was measured by spectrum analyzer, the attenuation under this paragraph shall be 30 dB instead of 20 dB. In addition, radiated emissions which fall in the restricted bands must also comply with the limits as below.

Frequency (MHz)	Field Strength (microvolts/meter)	Measurement Distance (meters)
0.009 – 0.490	2400/F(kHz)	300
0.490 – 1.705	24000/F(kHz)	30
1.705 – 30.0	30	30
30 – 88	100	3
88 – 216	150	3
216 - 960	200	3
Above 960	500	3

#### 3.5.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

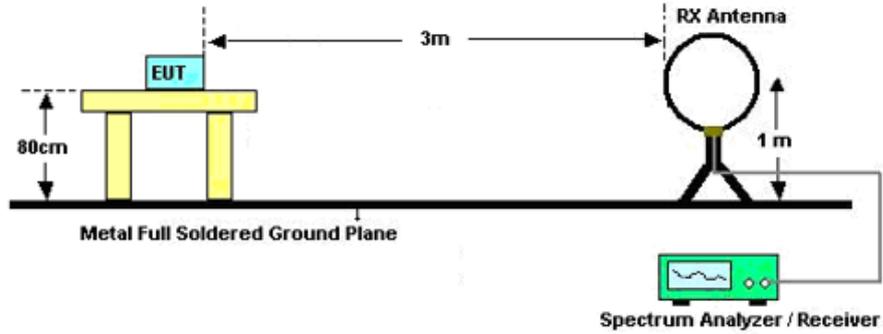


### 3.5.3 Test Procedures

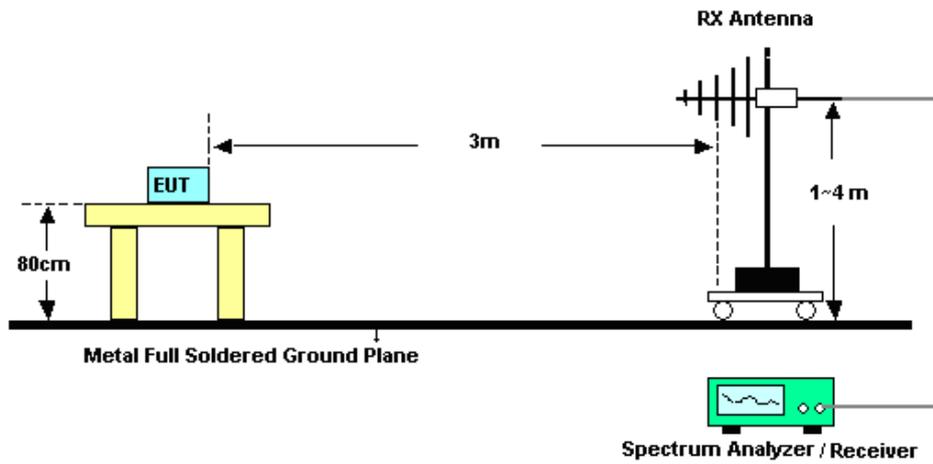
1. The testing follows ANSI C63.10-2013 clause 11.11 & 11.12
2. The EUT was arranged to its worst case and then tune the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading. A pre-amp and a high pass filter are used for the test in order to get better signal level.
3. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
4. The EUT was set 3 meters from the interference receiving antenna, which was mounted on the top of a variable height antenna tower.
5. Corrected Reading: Antenna Factor + Cable Loss + Read Level - Preamp Factor = Level
6. For testing below 1GHz, if the emission level of the EUT in peak mode was 3 dB lower than the limit specified, then peak values of EUT will be reported, otherwise, the emissions will be repeated one by one using the CISPR quasi-peak method and reported.
7. For testing above 1GHz, the emission level of the EUT in peak mode was 20dB lower than peak limit (that means the emission level in average mode also complies with the limit in average mode), then peak values of EUT will be reported, otherwise, the emissions will be measured in average mode again and reported.
8. Use the following spectrum analyzer settings:
  - (1) Span shall wide enough to fully capture the emission being measured;
  - (2) Set RBW=100 kHz for  $f < 1$  GHz; VBW  $\geq$  RBW; Sweep = auto; Detector function = peak; Trace = max hold;
  - (3) Set RBW = 1 MHz, VBW= 3MHz for  $f \geq 1$  GHz for peak measurement.  
For average measurement:
    - VBW = 10 Hz, when duty cycle is no less than 98 percent.
    - VBW  $\geq 1/T$ , when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on and is transmitting at its maximum power control level for the tested mode of operation.

### 3.5.4 Test Setup

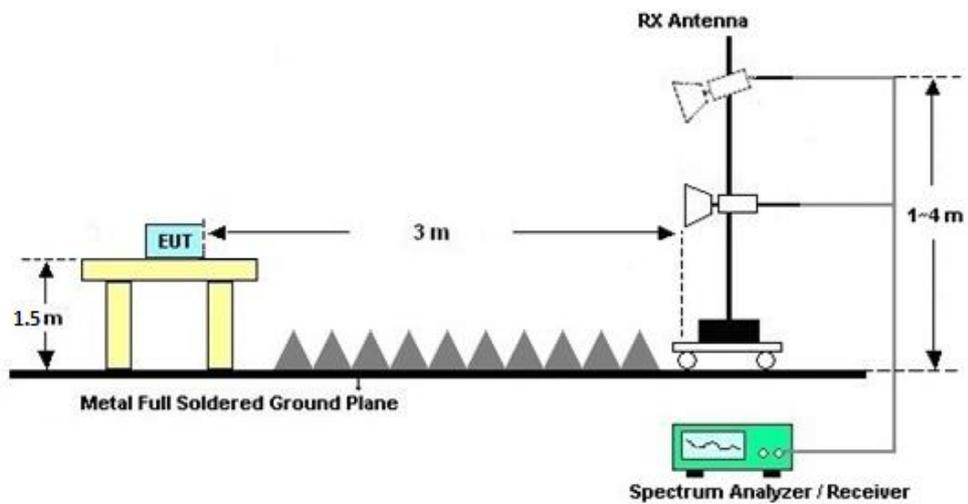
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz





### **3.5.5 Test Results of Radiated Spurious Emissions (9kHz ~ 30MHz)**

The low frequency, which started from 9 kHz to 30MHz, was pre-scanned and the result which was 20dB lower than the limit line was not reported.

There is a comparison data of both open-field test site and semi-Anechoic chamber, and the result came out very similar.

### **3.5.6 Test Result of Radiated Spurious at Band Edges**

Please refer to Appendix C.

### **3.5.7 Duty Cycle**

Please refer to Appendix D.

### **3.5.8 Test Result of Radiated Spurious Emission (30MHz ~ 10th Harmonic or 40GHz, whichever is lower)**

Please refer to Appendix C.



### 3.6 AC Conducted Emission Measurement

#### 3.6.1 Limit of AC Conducted Emission

For equipment that is designed to be connected to the public utility (AC) power line, the radio frequency voltage that is conducted back onto the AC power line on any frequency or frequencies within the band 150 kHz to 30 MHz shall not exceed the limits in the following table.

Frequency of Emission (MHz)	Conducted Limit (dBµV)	
	Quasi-Peak	Average
0.15-0.5	66 to 56*	56 to 46*
0.5-5	56	46
5-30	60	50

\*Decreases with the logarithm of the frequency.

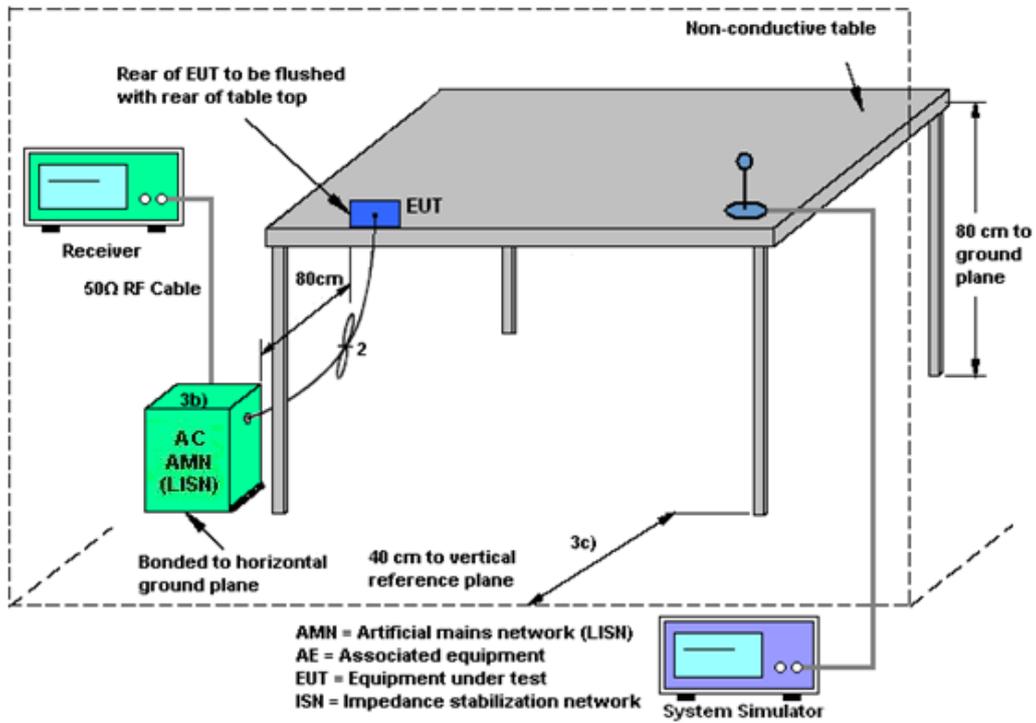
#### 3.6.2 Measuring Instruments

The measuring equipment is listed in the section 4 of this test report.

#### 3.6.3 Test Procedures

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room, and it was kept at least 80 centimeters from any other grounded conducting surface.
2. Connect EUT to the power mains through a line impedance stabilization network (LISN).
3. All the support units are connecting to the other LISN.
4. The LISN provides 50 ohm coupling impedance for the measuring instrument.
5. The FCC states that a 50 ohm, 50 microhenry LISN should be used.
6. Both sides of AC line were checked for maximum conducted interference.
7. The frequency range from 150 kHz to 30 MHz was searched.
8. Set the test-receiver system to Peak Detect Function and specified bandwidth (IF bandwidth = 9kHz) with Maximum Hold Mode.

### 3.6.4 Test Setup



### 3.6.5 Test Result of AC Conducted Emission

Please refer to Appendix B.



### 3.7 Antenna Requirements

#### 3.7.1 Standard Applicable

If directional gain of transmitting Antennas is greater than 6dBi, the power shall be reduced by the same level in dB comparing to gain minus 6dBi. 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 rule.

#### 3.7.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

#### 3.7.3 Antenna Gain

<CDD Modes >

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

For CDD transmissions, directional gain is calculated as

Directional gain =  $G_{ANT}$  + Array Gain, where Array Gain is as follows.

For power spectral density (PSD) measurements on all devices,

Array Gain =  $10 \log(N_{ANT}/N_{SS}=1)$  dB.

For power measurements on IEEE 802.11 devices,

Array Gain = 0 dB (i.e., no array gain) for  $N_{ANT} \leq 4$ .

Directional gain may be calculated by using the formulas applicable to equal gain antennas with

$G_{ANT}$  set equal to the gain of the antenna having the highest gain;

The EUT supports CDD mode.

For power, the directional gain  $G_{ANT}$  is set equal to the antenna having the highest gain, i.e., F)2)f)i).

For PSD, the directional gain calculation is following F)2)f)ii) of KDB 662911 D01 v02r01.

The power and PSD limit should be modified if the directional gain of EUT is over 6 dBi,

The directional gain "DG" is calculated as following table.

<b>&lt;CDD Modes&gt;</b>							
				<b>DG</b>	<b>DG</b>	<b>DG</b>	<b>Power</b>
	<b>Ant. 4</b>	<b>Ant. 5</b>	<b>Ant. 6</b>	<b>for</b>	<b>for PSD</b>	<b>for PSD</b>	<b>Limit</b>
	<b>(dBi)</b>	<b>(dBi)</b>	<b>(dBi)</b>	<b>Power</b>	<b>Ant.(4+5)</b>	<b>Ant.(5+6)</b>	<b>Reduction</b>
				<b>(dBi)</b>	<b>(dBi)</b>	<b>(dBi)</b>	<b>(dB)</b>
<b>2.4 GHz</b>	-0.80	-0.60	-5.00	-0.60	2.31	0.49	0.00

$Power\ Limit\ Reduction = DG(Power) - 6dBi, (min = 0)$

$PSD\ Limit\ Reduction = DG(PSD) - 6dBi, (min = 0)$



## 4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101078	10Hz~40GHz	Apr. 07, 2022	Feb. 25, 2023~ Feb. 28, 2023	Apr. 08, 2023	Conducted (TH01-SZ)
Pulse Power Sensor	Anritsu	MA2411B	1339473	30MHz~40GHz	Dec. 27, 2022	Feb. 25, 2023~ Feb. 28, 2023	Dec. 26, 2023	Conducted (TH01-SZ)
Power Meter	Anritsu	ML2495A	1542004	50MHz Bandwidth	Dec. 27, 2022	Feb. 25, 2023~ Feb. 28, 2023	Dec. 26, 2023	Conducted (TH01-SZ)
EMI Test Receiver	R&S	ESR7	101404	9kHz~7GHz	Oct. 19, 2022	Feb. 05, 2023~ Mar. 13, 2023	Oct. 18, 2023	Radiation (03CH04-SZ)
EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY551502 13	10Hz~44GHz	Jul. 07, 2022	Feb. 05, 2023~ Mar. 13, 2023	Jul. 06, 2023	Radiation (03CH04-SZ)
Loop Antenna	R&S	HFH2-Z2	100354	9kHz~30MHz	Jun. 28, 2022	Feb. 05, 2023~ Mar. 13, 2023	Jun. 27, 2024	Radiation (03CH04-SZ)
Bilog Antenna	TeseQ	CBL6111D	41909	30MHz~1GHz	Apr. 27, 2022	Feb. 05, 2023~ Mar. 13, 2023	Apr. 27, 2023	Radiation (03CH04-SZ)
Double Ridge Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-147 4	1GHz~18GHz	Jul. 07, 2022	Feb. 05, 2023~ Mar. 13, 2023	Jul. 06, 2023	Radiation (03CH04-SZ)
Horn Antenna	SCHWARZBECK	BBHA9170	9170#679	15GHz~40GHz	Jul. 07, 2022	Feb. 05, 2023~ Mar. 13, 2023	Jul. 06, 2023	Radiation (03CH04-SZ)
Amplifier	Burgeon	BPA-530	102211	0.01Hz~3000MHz	Oct. 19, 2022	Feb. 05, 2023~ Mar. 13, 2023	Oct. 18, 2023	Radiation (03CH04-SZ)
HF Amplifier	MITEQ	AMF-7D-0010 1800-30-10P-R	1943528	1GHz~18GHz	Oct. 19, 2022	Feb. 05, 2023~ Mar. 13, 2023	Oct. 18, 2023	Radiation (03CH04-SZ)
Amplifier	Agilent Technologies	83017A	MY572801 36	500MHz~26.5G Hz	Sep. 30, 2022	Feb. 05, 2023~ Mar. 13, 2023	Sep. 29, 2023	Radiation (03CH04-SZ)
HF Amplifier	MITEQ	TTA1840-35-HG	1871923	18GHz~40GHz	Jul. 06, 2022	Feb. 05, 2023~ Mar. 13, 2023	Jul. 05, 2023	Radiation (03CH04-SZ)
AC Power Source	APC	AFV-S-600B	F11905001 9	N/A	Nov. 10, 2022	Feb. 05, 2023~ Mar. 13, 2023	Nov. 10, 2023	Radiation (03CH04-SZ)
Turn Table	EM	EM1000	N/A	0~360 degree	NCR	Feb. 05, 2023~ Mar. 13, 2023	NCR	Radiation (03CH04-SZ)
Antenna Mast	EM	EM1000	N/A	1 m~4 m	NCR	Feb. 05, 2023~ Mar. 13, 2023	NCR	Radiation (03CH04-SZ)
EMI Receiver	R&S	ESR7	101630	9kHz~7GHz;	Jul. 07, 2022	Feb. 09, 2023~ Feb. 10, 2023	Jul. 06, 2023	Conduction (CO01-SZ)
AC LISN	R&S	ENV216	100063	9kHz~30MHz	Sep. 15, 2022	Feb. 09, 2023~ Feb. 10, 2023	Sep. 14, 2023	Conduction (CO01-SZ)
AC LISN (for auxiliary equipment)	EMCO	3816/2SH	00103892	9kHz~30MHz	Oct. 17, 2022	Feb. 09, 2023~ Feb. 10, 2023	Oct. 16, 2023	Conduction (CO01-SZ)
AC Power Source	Chroma	61602	616020000 891	100Vac~250Vac	Jul. 07, 2022	Feb. 09, 2023~ Feb. 10, 2023	Jul. 06, 2023	Conduction (CO01-SZ)

NCR: No Calibration Required



## 5 Uncertainty of Evaluation

The measurement uncertainties shown below were calculated in accordance with the requirements of ANSI 63.10-2013. All the measurement uncertainty value were shown with a coverage K=2 to indicate 95% level of confidence. The measurement data show herein meets or exceeds the CISPR measurement uncertainty values specified in CISPR 16-4-2 and can be compared directly to specified limit to determine compliance.

### Uncertainty of Conducted Measurement

Test Item	Uncertainty
Conducted Power	±1.34 dB
Conducted Emissions	±1.34 dB
Occupied Channel Bandwidth	±0.13 %
Conducted Power Spectral Density	±1.32 dB

### Uncertainty of Conducted Emission Measurement (150kHz ~ 30MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	2.2dB
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### Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	5.1dB
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### Uncertainty of Radiated Emission Measurement (1000 MHz ~ 18000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	4.8dB
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### Uncertainty of Radiated Emission Measurement (18000 MHz ~ 40000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	5.1dB
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----- THE END -----



## Appendix A. Conducted Test Results

## A1. Conducted Test Results

Test Engineer:	Chen Ran	Temperature:	21~25	°C
Test Date:	2023/2/25~2023/2/28	Relative Humidity:	51~54	%

**TEST RESULTS DATA**  
**Peak Output Power**

2.4GHz Band MIMO																
Mod.	Data Rate	Ntx	CH.	Freq. (MHz)	Peak Conducted Power (dBm)			Conducted Power Limit (dBm)		DG (dBi)		EIRP Power (dBm)		EIRP Power Limit (dBm)		Pass /Fail
					Ant5	Ant4	SUM	Ant5	Ant4	Ant5	Ant4	Ant5	Ant4	Ant5	Ant4	
11b	1Mbps	2	1	2412	22.87	22.69	25.79	30.00		-0.60		25.19		36.00	Pass	
11b	1Mbps	2	6	2437	22.63	22.70	25.68	30.00		-0.60		25.08		36.00	Pass	
11b	1Mbps	2	11	2462	22.56	22.51	25.55	30.00		-0.60		24.95		36.00	Pass	
11g	6Mbps	2	1	2412	24.79	24.02	27.43	30.00		-0.60		26.83		36.00	Pass	
11g	6Mbps	2	6	2437	25.76	25.49	28.64	30.00		-0.60		28.04		36.00	Pass	
11g	6Mbps	2	11	2462	23.83	23.61	26.73	30.00		-0.60		26.13		36.00	Pass	
HT20	MCS0	2	1	2412	25.21	24.79	28.02	30.00		-0.60		27.42		36.00	Pass	
HT20	MCS0	2	6	2437	25.45	24.68	28.09	30.00		-0.60		27.49		36.00	Pass	
HT20	MCS0	2	11	2462	22.21	22.44	25.34	30.00		-0.60		24.74		36.00	Pass	
HT40	MCS0	2	3	2422	24.55	23.77	27.19	30.00		-0.60		26.59		36.00	Pass	
HT40	MCS0	2	6	2437	25.76	25.27	28.53	30.00		-0.60		27.93		36.00	Pass	
HT40	MCS0	2	9	2452	22.77	22.68	25.74	30.00		-0.60		25.14		36.00	Pass	
VHT20	MCS0	2	1	2412	25.06	24.64	27.87	30.00		-0.60		27.27		36.00	Pass	
VHT20	MCS0	2	6	2437	25.39	24.51	27.98	30.00		-0.60		27.38		36.00	Pass	
VHT20	MCS0	2	11	2462	22.06	22.29	25.19	30.00		-0.60		24.59		36.00	Pass	
VHT40	MCS0	2	3	2422	24.37	23.58	27.00	30.00		-0.60		26.40		36.00	Pass	
VHT40	MCS0	2	6	2437	25.58	25.17	28.39	30.00		-0.60		27.79		36.00	Pass	
VHT40	MCS0	2	9	2452	22.64	22.55	25.61	30.00		-0.60		25.01		36.00	Pass	

Note: Measured power (dBm) has offset with cable loss.

**TEST RESULTS DATA**  
**Average Output Power**

2.4GHz Band MIMO																
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power (dBm)			Conducted Power Limit (dBm)		DG (dBi)		EIRP Power (dBm)		EIRP Power Limit (dBm)		Pass /Fail
					ANT5	ANT4	SUM	ANT5	ANT4	ANT5	ANT4	ANT5	ANT4	ANT5	ANT4	
11b	1Mbps	2	1	2412	19.80	19.70	22.76	30.00		-0.60		22.16		36.00	Pass	
11b	1Mbps	2	6	2437	19.80	19.80	22.81	30.00		-0.60		22.21		36.00	Pass	
11b	1Mbps	2	11	2462	19.60	19.60	22.61	30.00		-0.60		22.01		36.00	Pass	
11g	6Mbps	2	1	2412	19.80	19.50	22.66	30.00		-0.60		22.06		36.00	Pass	
11g	6Mbps	2	6	2437	20.20	20.10	23.16	30.00		-0.60		22.56		36.00	Pass	
11g	6Mbps	2	11	2462	17.70	18.00	20.86	30.00		-0.60		20.26		36.00	Pass	
HT20	MCS0	2	1	2412	18.80	19.30	22.07	30.00		-0.60		21.47		36.00	Pass	
HT20	MCS0	2	6	2437	20.20	20.20	23.21	30.00		-0.60		22.61		36.00	Pass	
HT20	MCS0	2	11	2462	16.30	16.60	19.46	30.00		-0.60		18.86		36.00	Pass	
HT40	MCS0	2	3	2422	18.10	18.40	21.26	30.00		-0.60		20.66		36.00	Pass	
HT40	MCS0	2	6	2437	20.10	20.10	23.11	30.00		-0.60		22.51		36.00	Pass	
HT40	MCS0	2	9	2452	16.60	16.80	19.71	30.00		-0.60		19.11		36.00	Pass	
VHT20	MCS0	2	1	2412	18.70	19.20	21.97	30.00		-0.60		21.37		36.00	Pass	
VHT20	MCS0	2	6	2437	20.10	20.10	23.11	30.00		-0.60		22.51		36.00	Pass	
VHT20	MCS0	2	11	2462	16.20	16.50	19.36	30.00		-0.60		18.76		36.00	Pass	
VHT40	MCS0	2	3	2422	18.00	18.30	21.16	30.00		-0.60		20.56		36.00	Pass	
VHT40	MCS0	2	6	2437	20.00	20.00	23.01	30.00		-0.60		22.41		36.00	Pass	
VHT40	MCS0	2	9	2452	16.50	16.70	19.61	30.00		-0.60		19.01		36.00	Pass	

Setting	
Ant 5	Ant 4
20.00	20.00
20.00	20.00
20.00	20.00
19.50	20.00
20.00	20.00
17.50	20.00
18.50	20.00
20.00	20.00
16.00	20.00
17.50	20.00
20.00	20.00
16.00	20.00
17.50	20.00
20.00	20.00
16.00	20.00

Note: Measured power (dBm) has offset with cable loss.

**TEST RESULTS DATA**  
**Peak Output Power**

2.4GHz Band MIMO																	
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	RU Config.	Peak Conducted Power (dBm)			Conducted Power Limit (dBm)		DG (dBi)		EIRP Power (dBm)		EIRP Power Limit (dBm)		Pass /Fail
						Ant5	Ant4	SUM	Ant5	Ant4	Ant5	Ant4	Ant5	Ant4	Ant5	Ant4	
HE20	MCS0	2	1	2412	Full	25.58	25.16	28.39	30.00		-0.60		27.79		36.00		Pass
					26/0	15.56	16.41	19.02	30.00		-0.60		18.42		36.00		Pass
					52/37	20.76	20.53	23.66	30.00		-0.60		23.06		36.00		Pass
					106/53	23.15	23.23	26.20	30.00		-0.60		25.60		36.00		Pass
HE20	MCS0	2	6	2437	Full	26.39	25.58	29.01	30.00		-0.60		28.41		36.00		Pass
HE20	MCS0	2	11	2462	Full	22.98	23.21	26.11	30.00		-0.60		25.51		36.00		Pass
					26/8	13.53	13.84	16.70	30.00		-0.60		16.10		36.00		Pass
					52/40	16.63	16.84	19.75	30.00		-0.60		19.15		36.00		Pass
					106/54	21.10	20.57	23.85	30.00		-0.60		23.25		36.00		Pass
HE40	MCS0	2	3	2422	Full	24.94	24.13	27.56	30.00		-0.60		26.96		36.00		Pass
HE40	MCS0	2	6	2437	Full	25.98	25.63	28.82	30.00		-0.60		28.22		36.00		Pass
HE40	MCS0	2	9	2452	Full	22.95	22.87	25.92	30.00		-0.60		25.32		36.00		Pass

Note: Measured power (dBm) has offset with cable loss.

**TEST RESULTS DATA**  
**Average Output Power**

2.4GHz Band MIMO																
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	RU Config.	Average Conducted Power (dBm)			Conducted Power Limit (dBm)		DG (dBi)		EIRP Power (dBm)		EIRP Power Limit (dBm)	Pass /Fail
						ANT5	ANT4	SUM	ANT5	ANT4	ANT5	ANT4	ANT5	ANT4		
HE20	MCS0	2	1	2412	Full	18.90	19.40	22.17	30.00	-0.60	21.57	36.00	Pass			
					26/0	6.80	8.60	10.80	30.00	-0.60	10.20	36.00	Pass			
					52/37	11.40	12.90	15.22	30.00	-0.60	14.62	36.00	Pass			
					106/53	14.60	15.60	18.14	30.00	-0.60	17.54	36.00	Pass			
HE20	MCS0	2	6	2437	Full	20.40	20.30	23.36	30.00	-0.60	22.76	36.00	Pass			
HE20	MCS0	2	11	2462	Full	16.40	16.70	19.56	30.00	-0.60	18.96	36.00	Pass			
					26/8	4.90	5.70	8.33	30.00	-0.60	7.73	36.00	Pass			
					52/40	8.50	9.30	11.93	30.00	-0.60	11.33	36.00	Pass			
					106/54	12.40	13.00	15.72	30.00	-0.60	15.12	36.00	Pass			
HE40	MCS0	2	3	2422	Full	18.20	18.50	21.36	30.00	-0.60	20.76	36.00	Pass			
HE40	MCS0	2	6	2437	Full	20.20	20.20	23.21	30.00	-0.60	22.61	36.00	Pass			
HE40	MCS0	2	9	2452	Full	16.70	16.90	19.81	30.00	-0.60	19.21	36.00	Pass			

Setting	
Ant 5	Ant 4
18.50	
9.00	
12.00	
14.50	
20.00	
16.00	
6.00	
9.50	
12.00	
17.50	
20.00	
16.00	

Note: Measured power (dBm) has offset with cable loss.

**TEST RESULTS DATA**  
**Peak Output Power**

2.4GHz Band MIMO																	
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	RU Config.	Peak Conducted Power (dBm)			Conducted Power Limit (dBm)		DG (dBi)		EIRP Power (dBm)		EIRP Power Limit (dBm)		Pass /Fail
						Ant5	Ant4	SUM	Ant5	Ant4	Ant5	Ant4	Ant5	Ant4	Ant5	Ant4	
EHT20	MCS0	2	1	2412	Full	25.91	25.49	28.72	30.00		-0.60		28.12		36.00		Pass
					26/0	15.89	16.74	19.35	30.00		-0.60		18.75		36.00		Pass
					52/37	21.09	20.86	23.99	30.00		-0.60		23.39		36.00		Pass
					106/53	23.48	23.56	26.53	30.00		-0.60		25.93		36.00		Pass
EHT20	MCS0	2	6	2437	Full	26.48	25.74	29.14	30.00		-0.60		28.54		36.00		Pass
EHT20	MCS0	2	11	2462	Full	23.21	23.44	26.34	30.00		-0.60		25.74		36.00		Pass
					26/8	13.86	14.17	17.03	30.00		-0.60		16.43		36.00		Pass
					52/40	16.96	17.17	20.08	30.00		-0.60		19.48		36.00		Pass
					106/54	21.43	20.90	24.18	30.00		-0.60		23.58		36.00		Pass
EHT40	MCS0	2	3	2422	Full	25.21	24.57	27.91	30.00		-0.60		27.31		36.00		Pass
EHT40	MCS0	2	6	2437	Full	26.24	25.84	29.05	30.00		-0.60		28.45		36.00		Pass
EHT40	MCS0	2	9	2452	Full	23.33	23.24	26.30	30.00		-0.60		25.70		36.00		Pass

Note: Measured power (dBm) has offset with cable loss.

**TEST RESULTS DATA**  
**Average Output Power**

2.4GHz Band MIMO																
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	RU Config.	Average Conducted Power (dBm)			Conducted Power Limit (dBm)		DG (dBi)		EIRP Power (dBm)		EIRP Power Limit (dBm)	Pass /Fail
						ANT5	ANT4	SUM	ANT5	ANT4	ANT5	ANT4	ANT5	ANT4		
EHT20	MCS0	2	1	2412	Full	19.00	19.50	22.27	30.00	-0.60	21.67	36.00	Pass			
					26/0	6.90	8.70	10.90	30.00	-0.60	10.30	36.00	Pass			
					52/37	11.50	13.00	15.32	30.00	-0.60	14.72	36.00	Pass			
					106/53	14.70	15.70	18.24	30.00	-0.60	17.64	36.00	Pass			
EHT20	MCS0	2	6	2437	Full	20.50	20.40	23.46	30.00	-0.60	22.86	36.00	Pass			
EHT20	MCS0	2	11	2462	Full	16.50	16.80	19.66	30.00	-0.60	19.06	36.00	Pass			
					26/8	5.00	5.80	8.43	30.00	-0.60	7.83	36.00	Pass			
					52/40	8.60	9.40	12.03	30.00	-0.60	11.43	36.00	Pass			
					106/54	12.50	13.10	15.82	30.00	-0.60	15.22	36.00	Pass			
EHT40	MCS0	2	3	2422	Full	18.30	18.60	21.46	30.00	-0.60	20.86	36.00	Pass			
EHT40	MCS0	2	6	2437	Full	20.30	20.30	23.31	30.00	-0.60	22.71	36.00	Pass			
EHT40	MCS0	2	9	2452	Full	16.80	17.00	19.91	30.00	-0.60	19.31	36.00	Pass			

Setting	
Ant 5	Ant 4
18.50	
9.00	
12.00	
14.50	
20.00	
16.00	
6.00	
9.50	
12.00	
17.50	
20.00	
16.00	

Note: Measured power (dBm) has offset with cable loss.

**TEST RESULTS DATA**  
**Peak Output Power**

2.4GHz Band MIMO																
Mod.	Data Rate	Ntx	CH.	Freq. (MHz)	Peak Conducted Power (dBm)			Conducted Power Limit (dBm)		DG (dBi)		EIRP Power (dBm)		EIRP Power Limit (dBm)		Pass /Fail
					Ant5	Ant6	SUM	Ant5	Ant6	Ant5	Ant6	Ant5	Ant6	Ant5	Ant6	
11b	1Mbps	2	1	2412	22.80	21.25	25.10	30.00		-0.60		24.50		36.00	Pass	
11b	1Mbps	2	6	2437	22.71	21.58	25.19	30.00		-0.60		24.59		36.00	Pass	
11b	1Mbps	2	11	2462	22.63	21.14	24.96	30.00		-0.60		24.36		36.00	Pass	
11g	6Mbps	2	1	2412	24.87	22.76	26.95	30.00		-0.60		26.35		36.00	Pass	
11g	6Mbps	2	6	2437	25.88	24.26	28.16	30.00		-0.60		27.56		36.00	Pass	
11g	6Mbps	2	11	2462	24.66	22.51	26.73	30.00		-0.60		26.13		36.00	Pass	
HT20	MCS0	2	1	2412	25.51	23.03	27.45	30.00		-0.60		26.85		36.00	Pass	
HT20	MCS0	2	6	2437	25.34	23.90	27.69	30.00		-0.60		27.09		36.00	Pass	
HT20	MCS0	2	11	2462	24.01	21.63	25.99	30.00		-0.60		25.39		36.00	Pass	
HT40	MCS0	2	3	2422	25.45	23.05	27.42	30.00		-0.60		26.82		36.00	Pass	
HT40	MCS0	2	6	2437	25.98	24.36	28.26	30.00		-0.60		27.66		36.00	Pass	
HT40	MCS0	2	9	2452	23.87	21.74	25.94	30.00		-0.60		25.34		36.00	Pass	
VHT20	MCS0	2	1	2412	25.38	22.90	27.32	30.00		-0.60		26.72		36.00	Pass	
VHT20	MCS0	2	6	2437	25.29	23.79	27.61	30.00		-0.60		27.01		36.00	Pass	
VHT20	MCS0	2	11	2462	23.88	21.50	25.86	30.00		-0.60		25.26		36.00	Pass	
VHT40	MCS0	2	3	2422	25.27	22.87	27.24	30.00		-0.60		26.64		36.00	Pass	
VHT40	MCS0	2	6	2437	25.90	24.14	28.12	30.00		-0.60		27.52		36.00	Pass	
VHT40	MCS0	2	9	2452	23.69	21.56	25.76	30.00		-0.60		25.16		36.00	Pass	

Note: Measured power (dBm) has offset with cable loss.

**TEST RESULTS DATA**  
**Average Output Power**

2.4GHz Band MIMO																
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Average Conducted Power (dBm)			Conducted Power Limit (dBm)		DG (dBi)		EIRP Power (dBm)		EIRP Power Limit (dBm)		Pass /Fail
					ANT5	ANT6	SUM	ANT5	ANT6	ANT5	ANT6	ANT5	ANT6	ANT5	ANT6	
11b	1Mbps	2	1	2412	19.90	18.50	22.27	30.00	-0.60	21.67	36.00	Pass				
11b	1Mbps	2	6	2437	19.80	18.80	22.34	30.00	-0.60	21.74	36.00	Pass				
11b	1Mbps	2	11	2462	19.70	18.40	22.11	30.00	-0.60	21.51	36.00	Pass				
11g	6Mbps	2	1	2412	19.90	18.50	22.27	30.00	-0.60	21.67	36.00	Pass				
11g	6Mbps	2	6	2437	20.40	19.20	22.85	30.00	-0.60	22.25	36.00	Pass				
11g	6Mbps	2	11	2462	18.50	16.80	20.74	30.00	-0.60	20.14	36.00	Pass				
HT20	MCS0	2	1	2412	18.90	17.50	21.27	30.00	-0.60	20.67	36.00	Pass				
HT20	MCS0	2	6	2437	20.40	19.10	22.81	30.00	-0.60	22.21	36.00	Pass				
HT20	MCS0	2	11	2462	17.50	16.00	19.82	30.00	-0.60	19.22	36.00	Pass				
HT40	MCS0	2	3	2422	19.30	17.60	21.54	30.00	-0.60	20.94	36.00	Pass				
HT40	MCS0	2	6	2437	20.30	18.80	22.62	30.00	-0.60	22.02	36.00	Pass				
HT40	MCS0	2	9	2452	17.80	16.20	20.08	30.00	-0.60	19.48	36.00	Pass				
VHT20	MCS0	2	1	2412	18.80	17.40	21.17	30.00	-0.60	20.57	36.00	Pass				
VHT20	MCS0	2	6	2437	20.30	19.00	22.71	30.00	-0.60	22.11	36.00	Pass				
VHT20	MCS0	2	11	2462	17.40	15.90	19.72	30.00	-0.60	19.12	36.00	Pass				
VHT40	MCS0	2	3	2422	19.20	17.50	21.44	30.00	-0.60	20.84	36.00	Pass				
VHT40	MCS0	2	6	2437	20.20	18.70	22.52	30.00	-0.60	21.92	36.00	Pass				
VHT40	MCS0	2	9	2452	17.70	16.10	19.98	30.00	-0.60	19.38	36.00	Pass				

Setting	
Ant 5	Ant 6
20.00	20.00
20.00	20.00
20.00	20.00
19.50	20.00
20.00	20.00
17.50	20.00
18.00	20.00
20.00	20.00
16.50	20.00
18.00	20.00
20.00	20.00
16.50	20.00
18.00	20.00
20.00	20.00
16.50	20.00

Note: Measured power (dBm) has offset with cable loss.

**TEST RESULTS DATA**  
**Peak Output Power**

2.4GHz Band MIMO																	
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	RU Config.	Peak Conducted Power (dBm)			Conducted Power Limit (dBm)		DG (dBi)		EIRP Power (dBm)		EIRP Power Limit (dBm)		Pass /Fail
						Ant5	Ant6	SUM	Ant5	Ant6	Ant5	Ant6	Ant5	Ant6	Ant5	Ant6	
HE20	MCS0	2	1	2412	Full	25.92	23.44	27.86	30.00		-0.60		27.26		36.00		Pass
					26/0	16.02	14.95	18.53	30.00		-0.60		17.93		36.00		Pass
					52/37	20.31	19.29	22.84	30.00		-0.60		22.24		36.00		Pass
					106/53	23.45	21.94	25.77	30.00		-0.60		25.17		36.00		Pass
HE20	MCS0	2	6	2437	Full	26.47	24.62	28.65	30.00		-0.60		28.05		36.00		Pass
HE20	MCS0	2	11	2462	Full	24.42	22.04	26.40	30.00		-0.60		25.80		36.00		Pass
					26/8	14.79	13.77	17.32	30.00		-0.60		16.72		36.00		Pass
					52/40	20.07	19.17	22.65	30.00		-0.60		22.05		36.00		Pass
					106/54	21.80	20.59	24.25	30.00		-0.60		23.65		36.00		Pass
HE40	MCS0	2	3	2422	Full	26.06	23.42	27.95	30.00		-0.60		27.35		36.00		Pass
HE40	MCS0	2	6	2437	Full	26.52	24.39	28.59	30.00		-0.60		27.99		36.00		Pass
HE40	MCS0	2	9	2452	Full	24.31	22.06	26.34	30.00		-0.60		25.74		36.00		Pass

Note: Measured power (dBm) has offset with cable loss.

**TEST RESULTS DATA**  
**Average Output Power**

2.4GHz Band MIMO																
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	RU Config.	Average Conducted Power (dBm)			Conducted Power Limit (dBm)		DG (dBi)		EIRP Power (dBm)		EIRP Power Limit (dBm)	Pass /Fail
						ANT5	ANT6	SUM	ANT5	ANT6	ANT5	ANT6	ANT5	ANT6		
HE20	MCS0	2	1	2412	Full	19.00	17.60	21.37	30.00	-0.60	20.77	36.00	Pass			
					26/0	7.20	7.60	10.41	30.00	-0.60	9.81	36.00	Pass			
					52/37	11.80	11.50	14.66	30.00	-0.60	14.06	36.00	Pass			
					106/53	15.00	14.50	17.77	30.00	-0.60	17.17	36.00	Pass			
HE20	MCS0	2	6	2437	Full	20.60	19.30	23.01	30.00	-0.60	22.41	36.00	Pass			
HE20	MCS0	2	11	2462	Full	17.60	16.10	19.92	30.00	-0.60	19.32	36.00	Pass			
					26/8	6.80	6.50	9.66	30.00	-0.60	9.06	36.00	Pass			
					52/40	12.10	11.80	14.96	30.00	-0.60	14.36	36.00	Pass			
					106/54	13.80	12.80	16.34	30.00	-0.60	15.74	36.00	Pass			
HE40	MCS0	2	3	2422	Full	19.40	17.70	21.64	30.00	-0.60	21.04	36.00	Pass			
HE40	MCS0	2	6	2437	Full	20.40	18.90	22.72	30.00	-0.60	22.12	36.00	Pass			
HE40	MCS0	2	9	2452	Full	17.90	16.30	20.18	30.00	-0.60	19.58	36.00	Pass			

Setting	
Ant 5	Ant 6
18.00	
8.50	
11.50	
14.00	
20.00	
16.50	
7.00	
10.00	
12.50	
18.00	
20.00	
16.50	

Note: Measured power (dBm) has offset with cable loss.

**TEST RESULTS DATA**  
**Peak Output Power**

2.4GHz Band MIMO																	
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	RU Config.	Peak Conducted Power (dBm)			Conducted Power Limit (dBm)		DG (dBi)		EIRP Power (dBm)		EIRP Power Limit (dBm)		Pass /Fail
						Ant5	Ant6	SUM	Ant5	Ant6	Ant5	Ant6	Ant5	Ant6	Ant5	Ant6	
EHT20	MCS0	2	1	2412	Full	26.27	23.79	28.21	30.00		-0.60		27.61		36.00		Pass
					26/0	16.37	15.30	18.88	30.00		-0.60		18.28		36.00		Pass
					52/37	20.66	19.64	23.19	30.00		-0.60		22.59		36.00		Pass
					106/53	23.80	22.29	26.12	30.00		-0.60		25.52		36.00		Pass
EHT20	MCS0	2	6	2437	Full	26.68	24.67	28.80	30.00		-0.60		28.20		36.00		Pass
EHT20	MCS0	2	11	2462	Full	24.77	22.39	26.75	30.00		-0.60		26.15		36.00		Pass
					26/8	15.14	14.12	17.67	30.00		-0.60		17.07		36.00		Pass
					52/40	20.42	19.52	23.00	30.00		-0.60		22.40		36.00		Pass
					106/54	22.15	20.94	24.60	30.00		-0.60		24.00		36.00		Pass
EHT40	MCS0	2	3	2422	Full	26.39	23.75	28.28	30.00		-0.60		27.68		36.00		Pass
EHT40	MCS0	2	6	2437	Full	26.64	24.48	28.70	30.00		-0.60		28.10		36.00		Pass
EHT40	MCS0	2	9	2452	Full	24.64	22.39	26.67	30.00		-0.60		26.07		36.00		Pass

Note: Measured power (dBm) has offset with cable loss.

**TEST RESULTS DATA**  
**Average Output Power**

2.4GHz Band MIMO																
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	RU Config.	Average Conducted Power (dBm)			Conducted Power Limit (dBm)		DG (dBi)		EIRP Power (dBm)		EIRP Power Limit (dBm)	Pass /Fail
						ANT5	ANT6	SUM	ANT5	ANT6	ANT5	ANT6	ANT5	ANT6		
EHT20	MCS0	2	1	2412	Full	19.10	17.70	21.47	30.00	-0.60	20.87	36.00	Pass			
					26/0	7.30	7.70	10.51	30.00	-0.60	9.91	36.00	Pass			
					52/37	11.90	11.60	14.76	30.00	-0.60	14.16	36.00	Pass			
					106/53	15.10	14.60	17.87	30.00	-0.60	17.27	36.00	Pass			
EHT20	MCS0	2	6	2437	Full	20.70	19.40	23.11	30.00	-0.60	22.51	36.00	Pass			
EHT20	MCS0	2	11	2462	Full	17.70	16.20	20.02	30.00	-0.60	19.42	36.00	Pass			
					26/8	6.90	6.60	9.76	30.00	-0.60	9.16	36.00	Pass			
					52/40	12.20	11.90	15.06	30.00	-0.60	14.46	36.00	Pass			
					106/54	13.90	12.90	16.44	30.00	-0.60	15.84	36.00	Pass			
EHT40	MCS0	2	3	2422	Full	19.50	17.80	21.74	30.00	-0.60	21.14	36.00	Pass			
EHT40	MCS0	2	6	2437	Full	20.50	19.00	22.82	30.00	-0.60	22.22	36.00	Pass			
EHT40	MCS0	2	9	2452	Full	18.00	16.40	20.28	30.00	-0.60	19.68	36.00	Pass			

Setting	
Ant 5	Ant 6
18.00	18.00
8.50	8.50
11.50	11.50
14.00	14.00
20.00	20.00
16.50	16.50
7.00	7.00
10.00	10.00
12.50	12.50
18.00	18.00
20.00	20.00
16.50	16.50

Note: Measured power (dBm) has offset with cable loss.



Ambient Condition: 24~26 °C, 45~55 %RH

Test Date: 2023/2/25~2023/2/28

Test Engineer: Zhang Xue Yi

MIMO<ANT4+5>

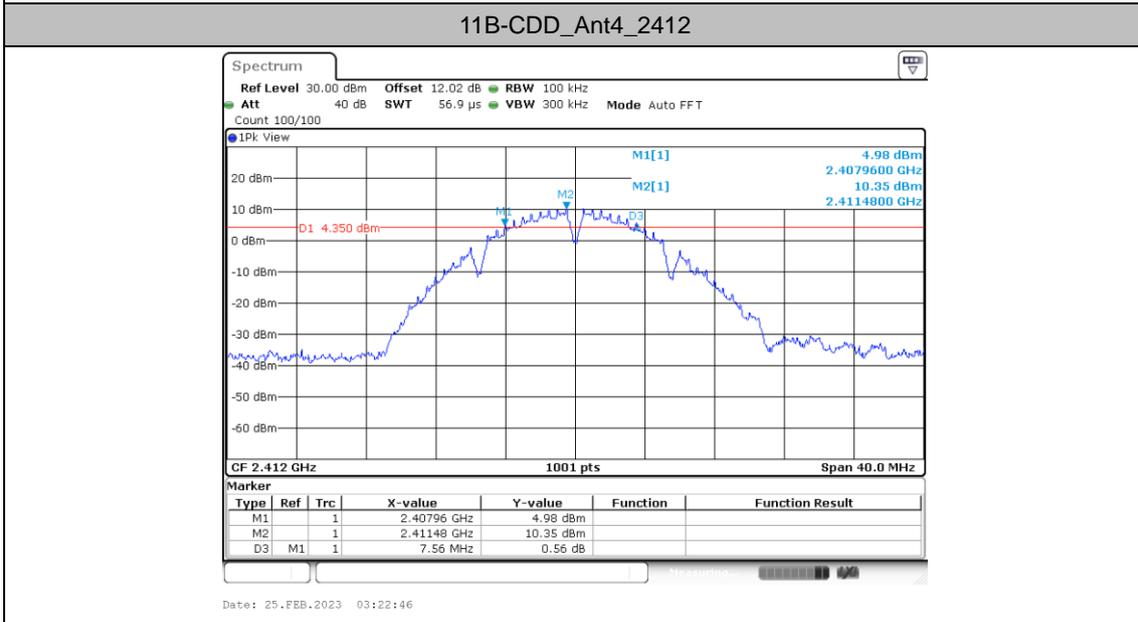
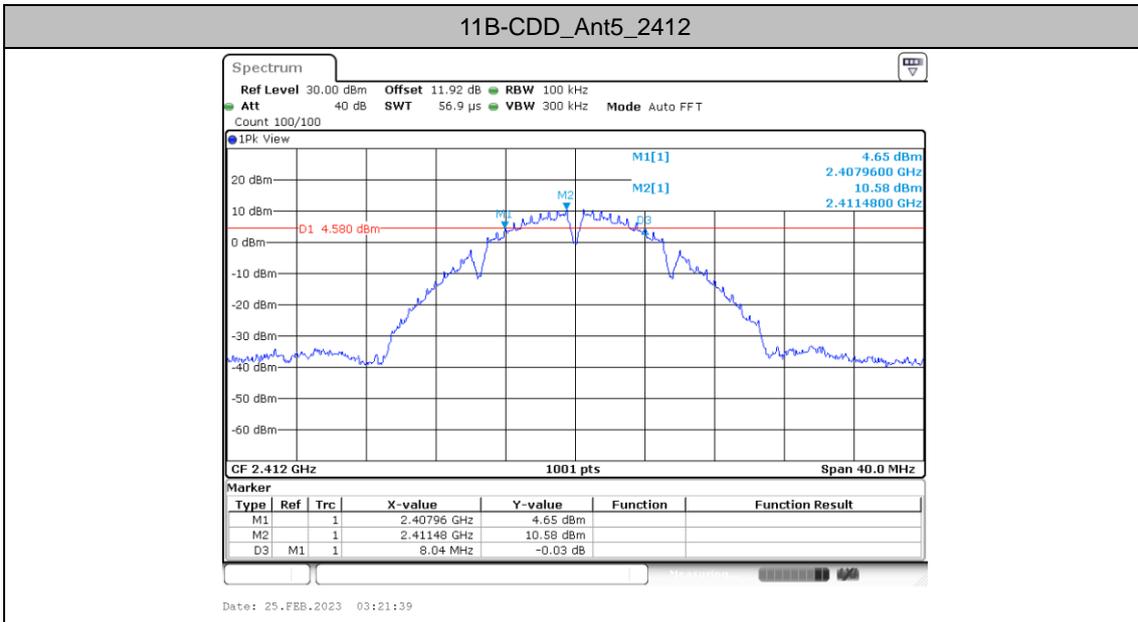
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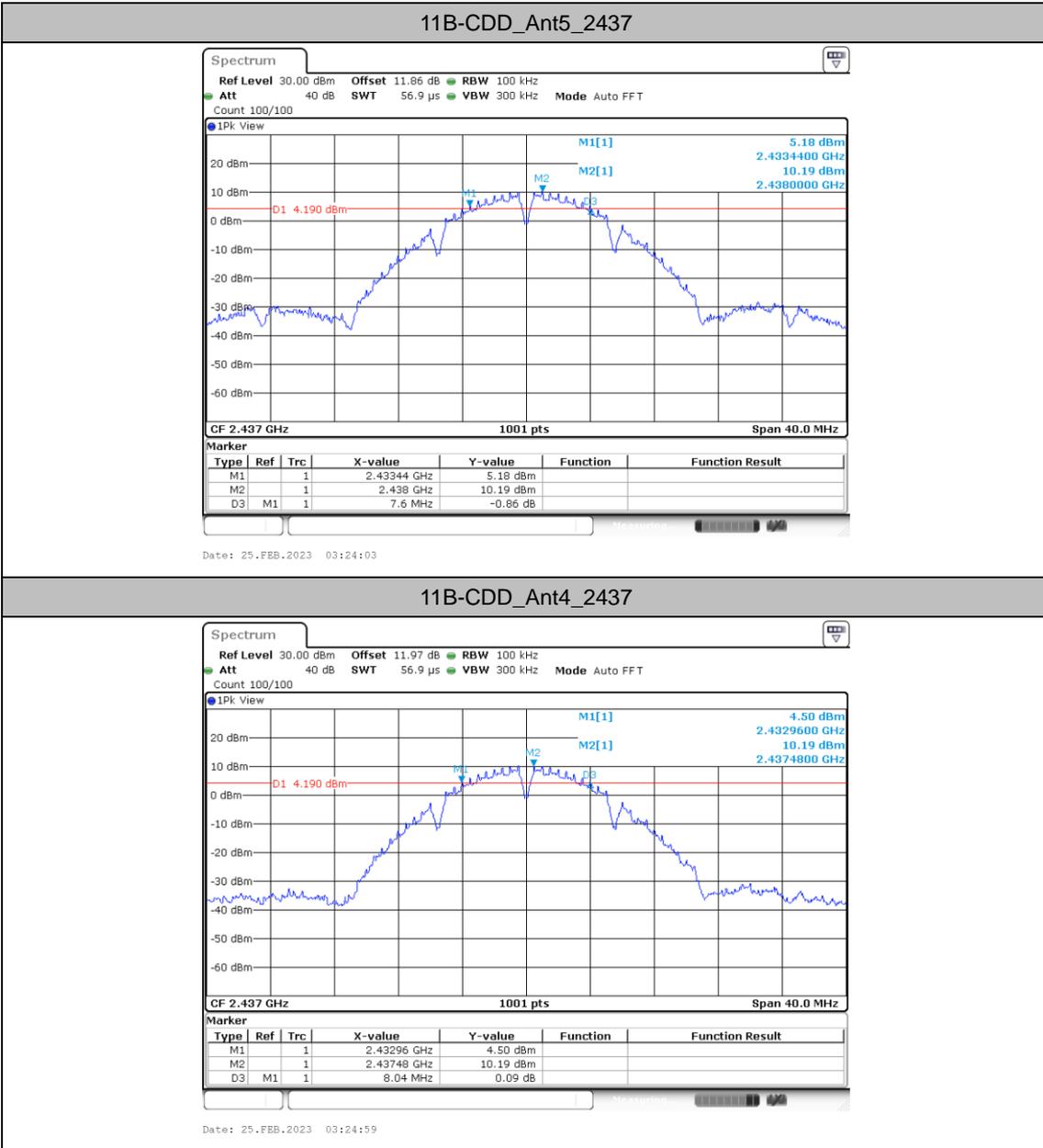
Test Result

TestMode	Antenna	Freq(MHz)	DTS BW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B-CDD	Ant5	2412	8.04	2407.96	2416.00	0.5	PASS
	Ant4	2412	7.56	2407.96	2415.52	0.5	PASS
	Ant5	2437	7.60	2433.44	2441.04	0.5	PASS
	Ant4	2437	8.04	2432.96	2441.00	0.5	PASS
	Ant5	2462	8.04	2457.96	2466.00	0.5	PASS
	Ant4	2462	8.08	2457.96	2466.04	0.5	PASS
11G-CDD	Ant5	2412	16.32	2403.84	2420.16	0.5	PASS
	Ant4	2412	16.36	2403.80	2420.16	0.5	PASS
	Ant5	2437	16.36	2428.84	2445.20	0.5	PASS
	Ant4	2437	16.32	2428.84	2445.16	0.5	PASS
	Ant5	2462	16.36	2453.80	2470.16	0.5	PASS
	Ant4	2462	16.32	2453.84	2470.16	0.5	PASS
11BE20MIMO	Ant5	2412	19.00	2402.48	2421.48	0.5	PASS
	Ant4	2412	19.00	2402.48	2421.48	0.5	PASS
	Ant5	2437	19.12	2427.44	2446.56	0.5	PASS
	Ant4	2437	18.88	2427.60	2446.48	0.5	PASS
	Ant5	2462	19.00	2452.44	2471.44	0.5	PASS
	Ant4	2462	18.76	2452.68	2471.44	0.5	PASS
11BE40MIMO	Ant5	2422	38.08	2402.96	2441.04	0.5	PASS
	Ant4	2422	38.00	2402.96	2440.96	0.5	PASS
	Ant5	2437	38.24	2417.80	2456.04	0.5	PASS
	Ant4	2437	37.60	2418.20	2455.80	0.5	PASS
	Ant5	2452	38.32	2432.80	2471.12	0.5	PASS
	Ant4	2452	38.16	2432.88	2471.04	0.5	PASS



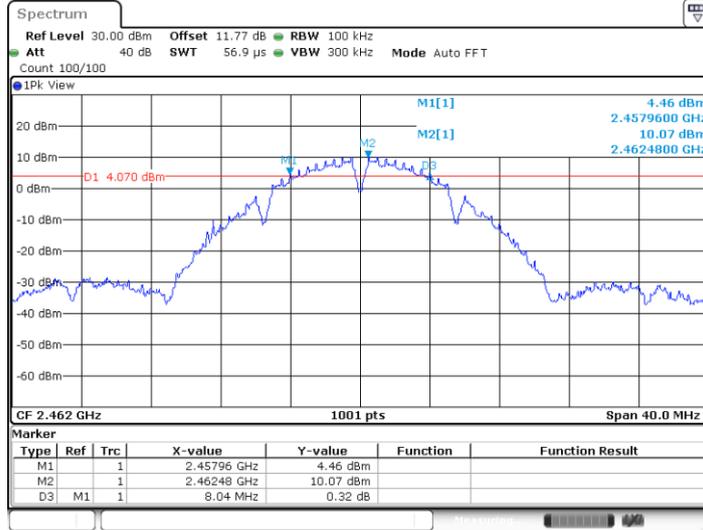
Test Graphs



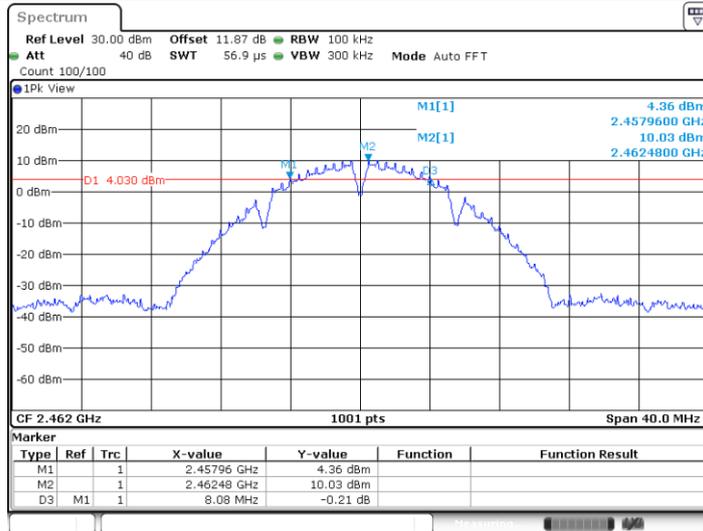




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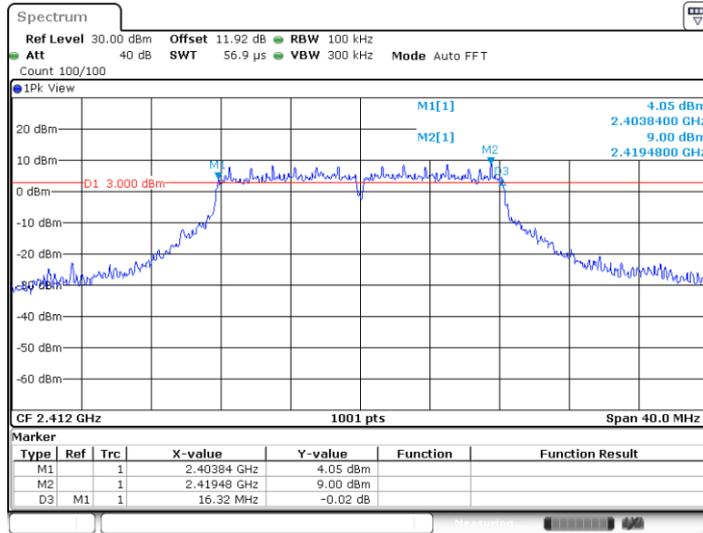


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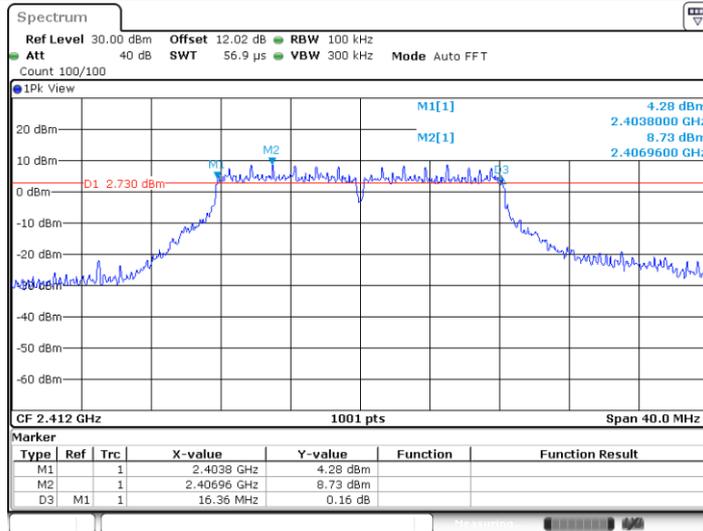


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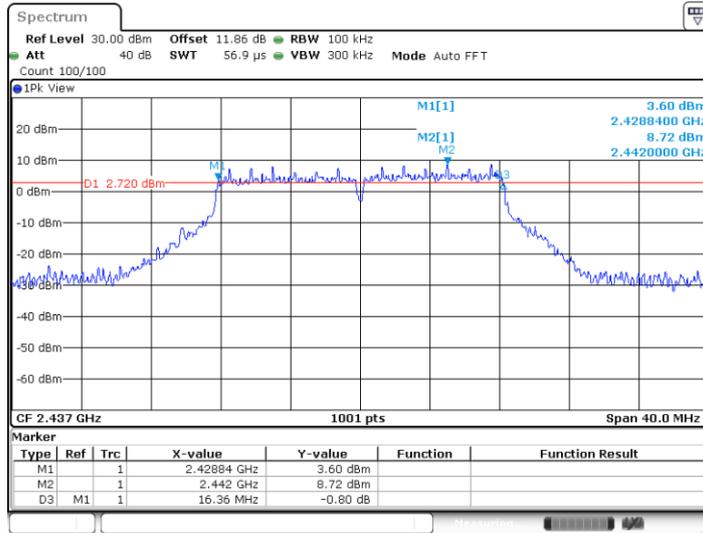
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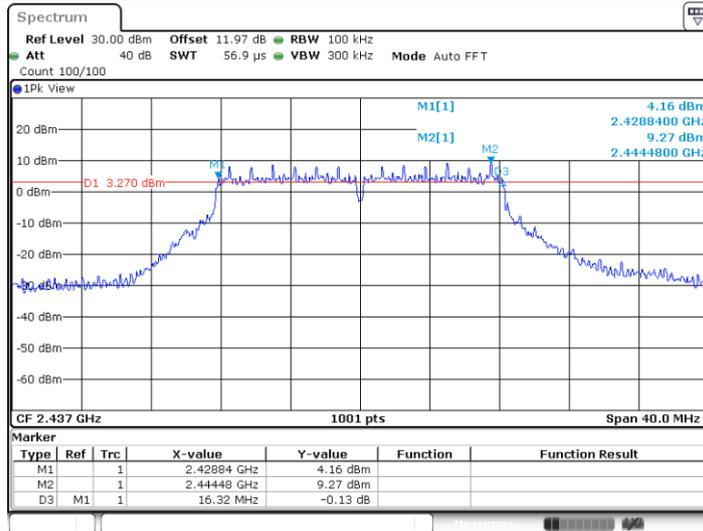


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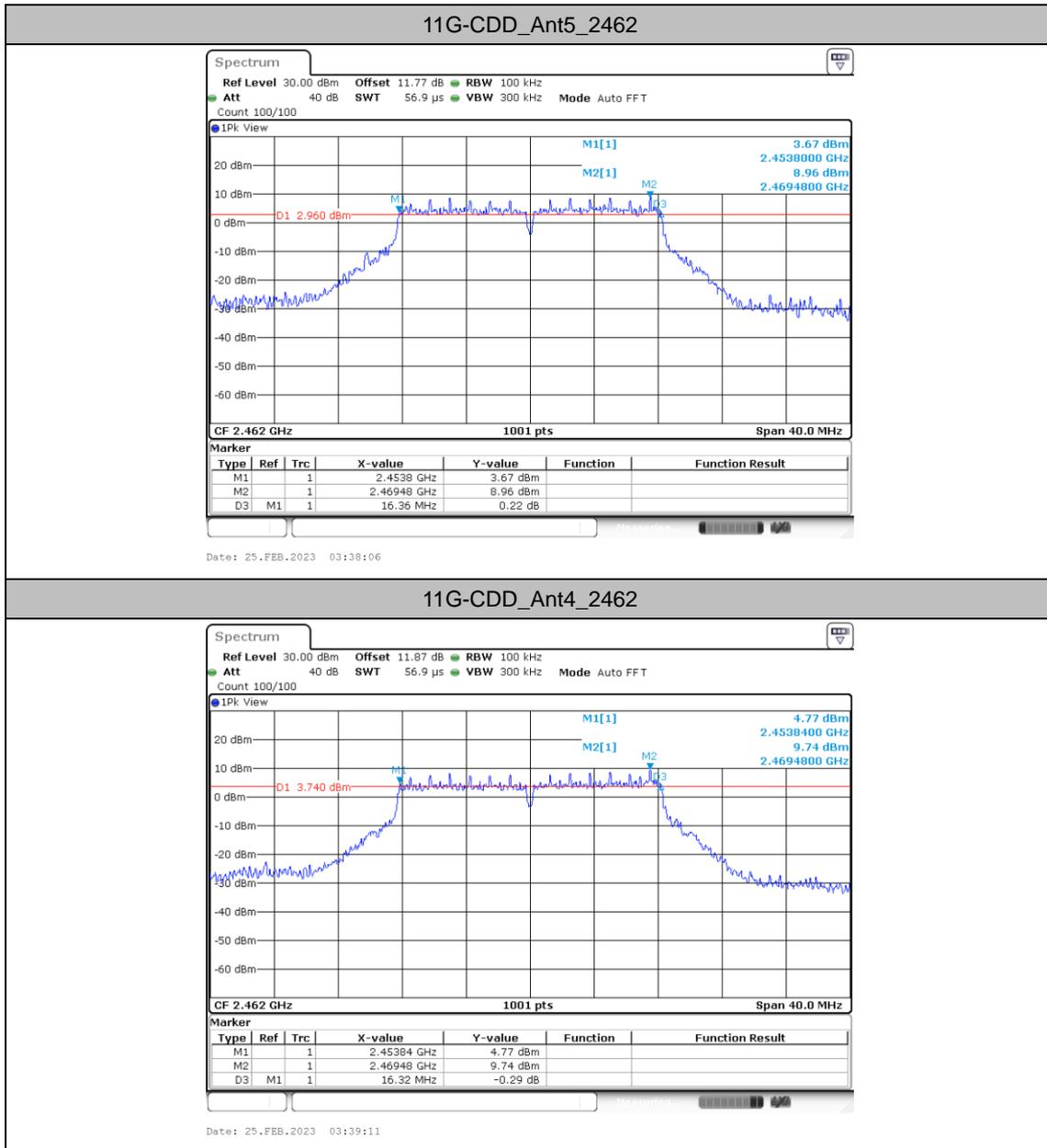


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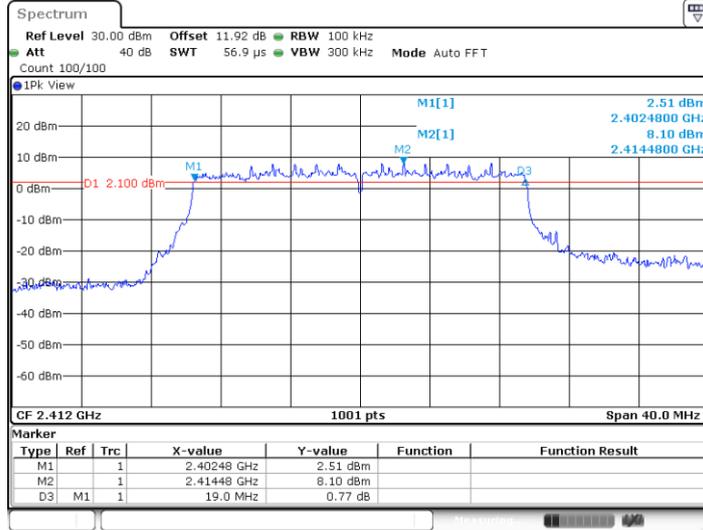


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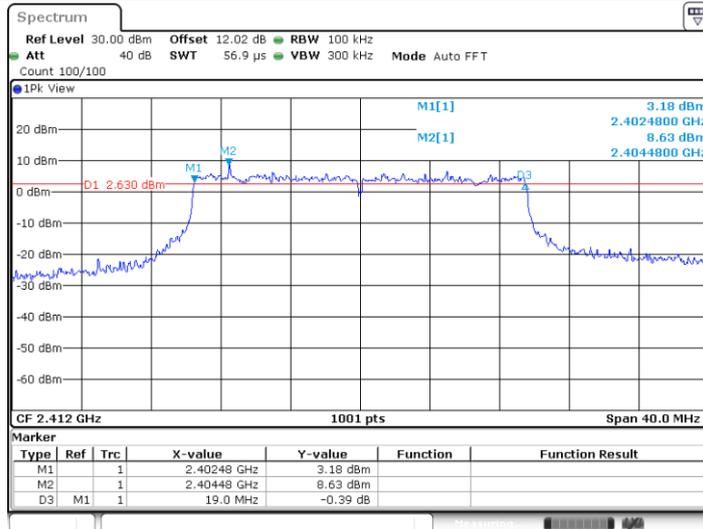


11BE20MIMO\_Ant5\_2412

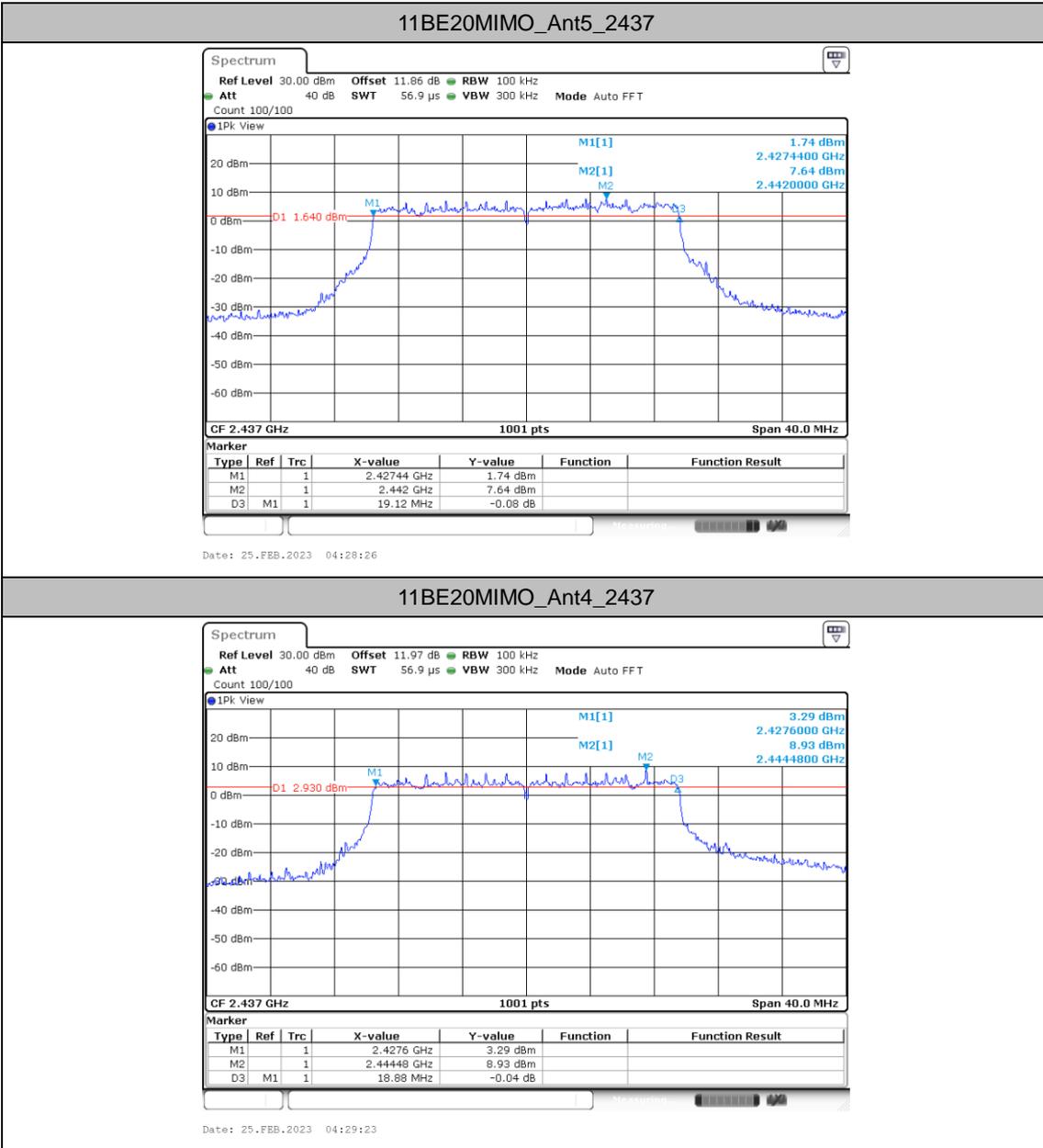


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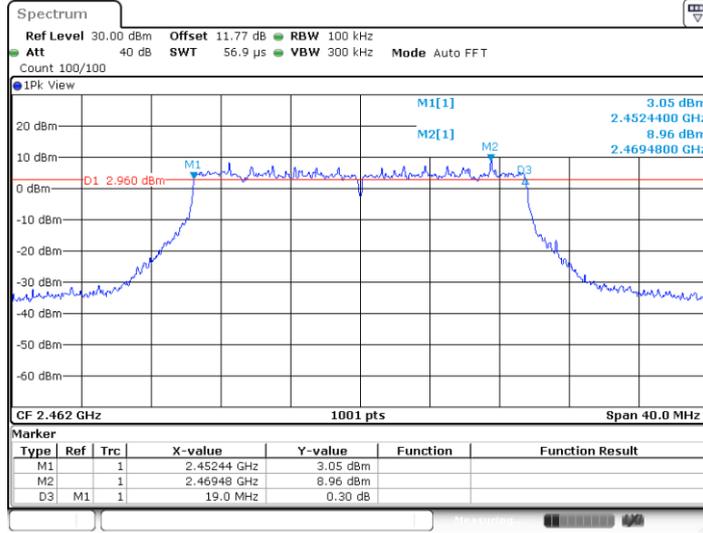


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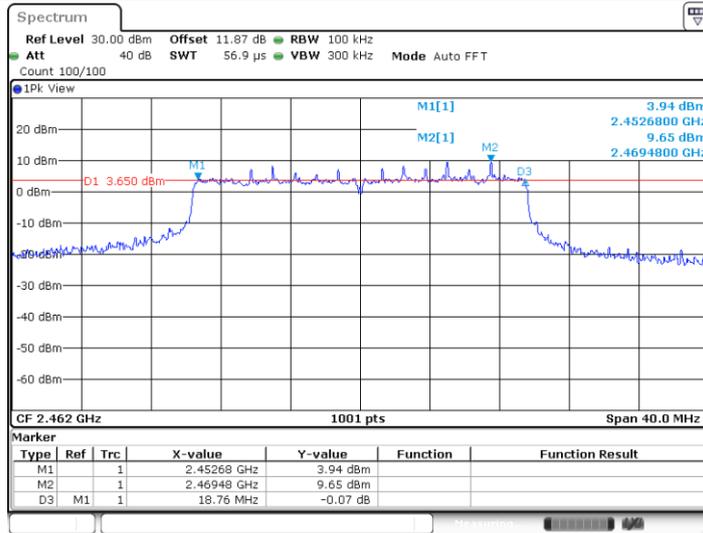




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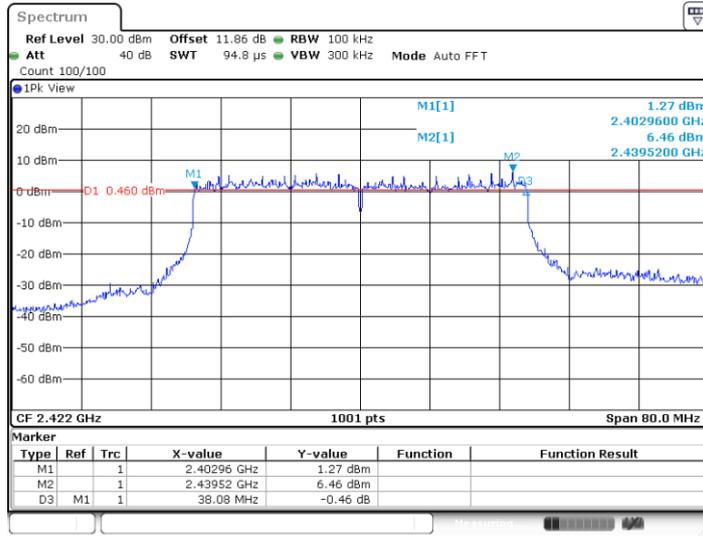


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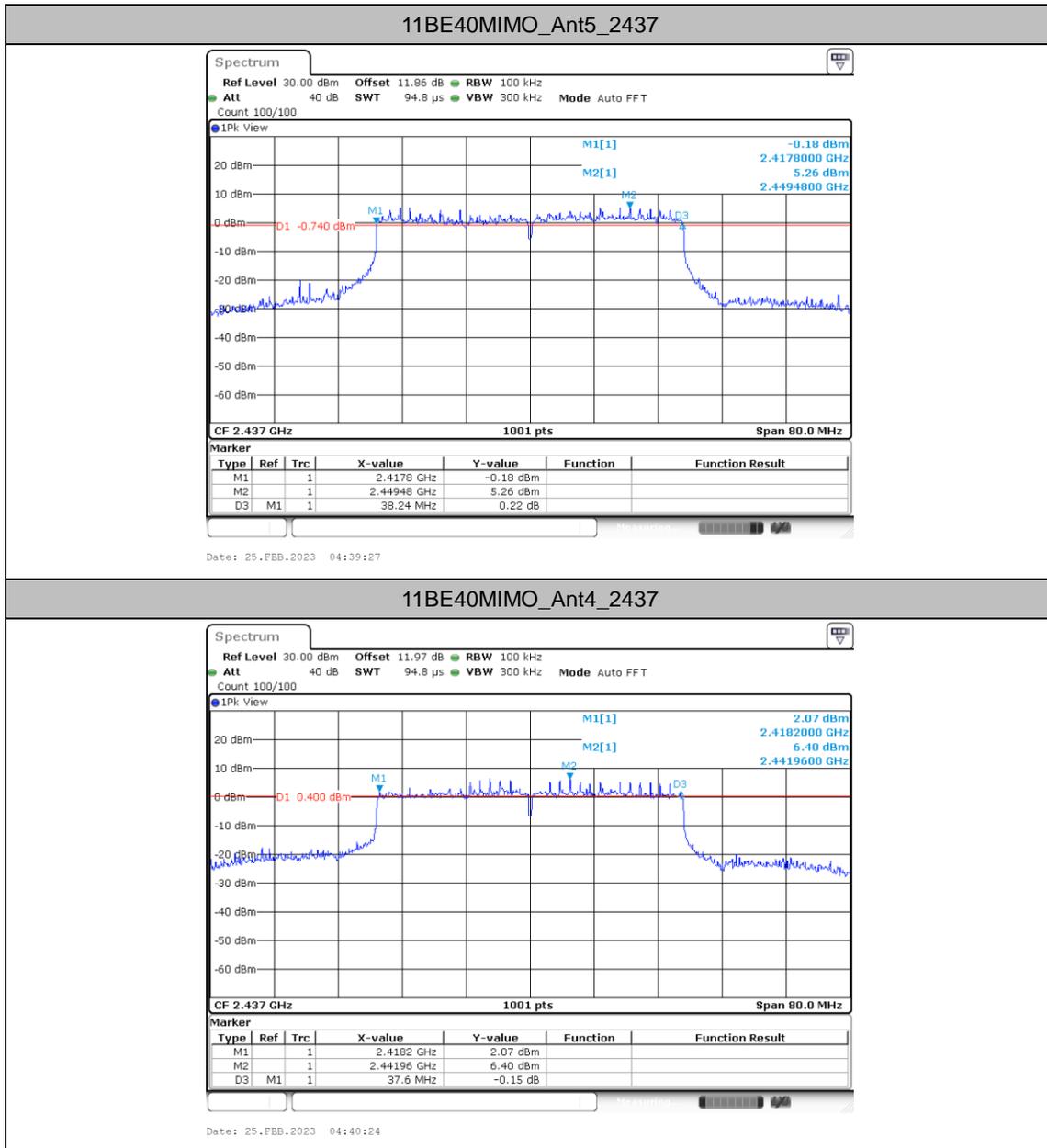


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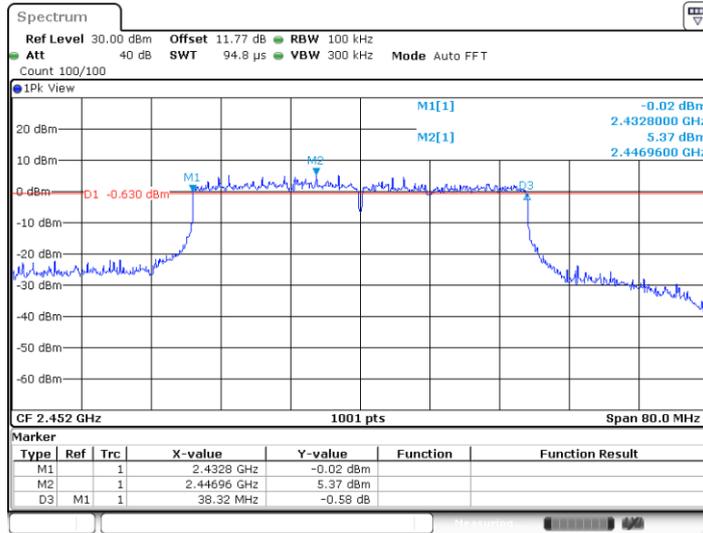
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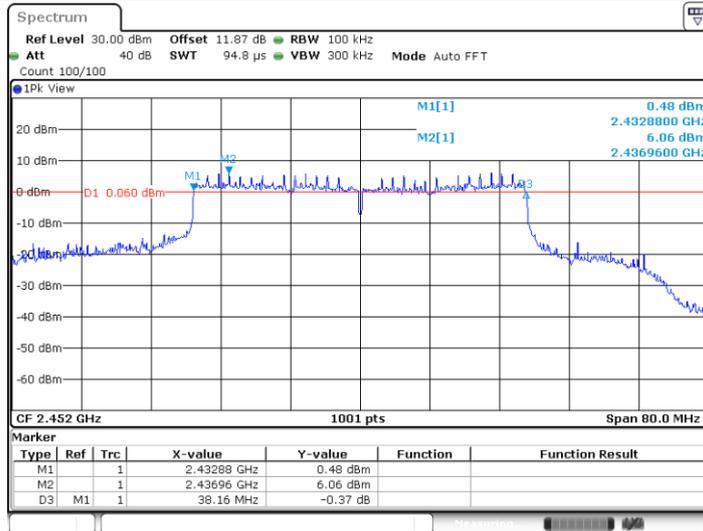


11BE40MIMO\_Ant5\_2452



Date: 25.FEB.2023 05:18:51

11BE40MIMO\_Ant4\_2452



Date: 25.FEB.2023 05:19:58



### Occupied Channel Bandwidth

#### Test Result

TestMode	Antenna	Freq(MHz)	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11B-CDD	Ant5	2412	12.987	2405.5265	2418.5135	---	---
	Ant4	2412	13.027	2405.4066	2418.4336	---	---
	Ant5	2437	13.347	2430.5265	2443.8731	---	---
	Ant4	2437	13.067	2430.5265	2443.5934	---	---
	Ant5	2462	13.267	2455.3666	2468.6334	---	---
	Ant4	2462	13.267	2455.4865	2468.7532	---	---
11G-CDD	Ant5	2412	17.343	2403.3686	2420.7113	---	---
	Ant4	2412	17.463	2403.1688	2420.6314	---	---
	Ant5	2437	17.463	2428.3287	2445.7912	---	---
	Ant4	2437	17.502	2428.3686	2445.8711	---	---
	Ant5	2462	17.502	2453.1289	2470.6314	---	---
	Ant4	2462	17.542	2453.2088	2470.7512	---	---
11BE20MIMO	Ant5	2412	19.261	2402.4496	2421.7103	---	---
	Ant4	2412	19.461	2402.3297	2421.7902	---	---
	Ant5	2437	19.58	2427.1698	2446.7502	---	---
	Ant4	2437	19.381	2427.2897	2446.6703	---	---
	Ant5	2462	19.461	2452.2098	2471.6703	---	---
	Ant4	2462	19.62	2452.2098	2471.8302	---	---
11BE40MIMO	Ant5	2422	38.521	2402.7393	2441.2607	---	---
	Ant4	2422	38.841	2402.7393	2441.5804	---	---
	Ant5	2437	38.202	2417.8991	2456.1009	---	---
	Ant4	2437	38.681	2417.6593	2456.3407	---	---
	Ant5	2452	38.282	2432.7393	2471.0210	---	---
	Ant4	2452	39.081	2432.2597	2471.3407	---	---

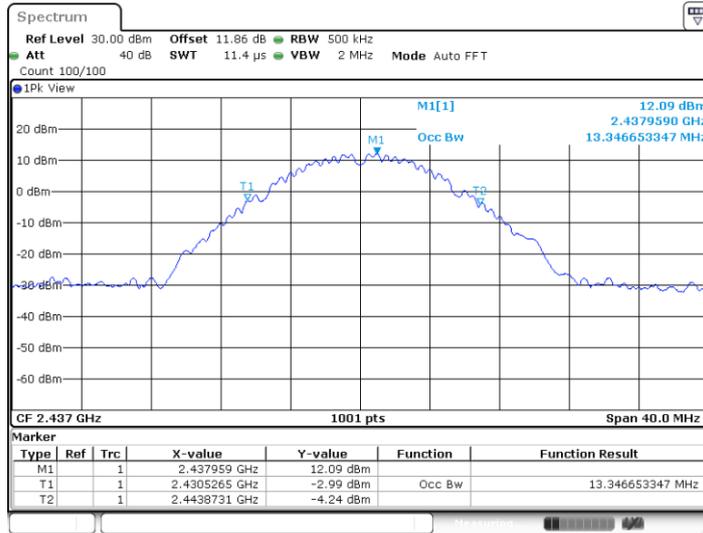


Test Graphs



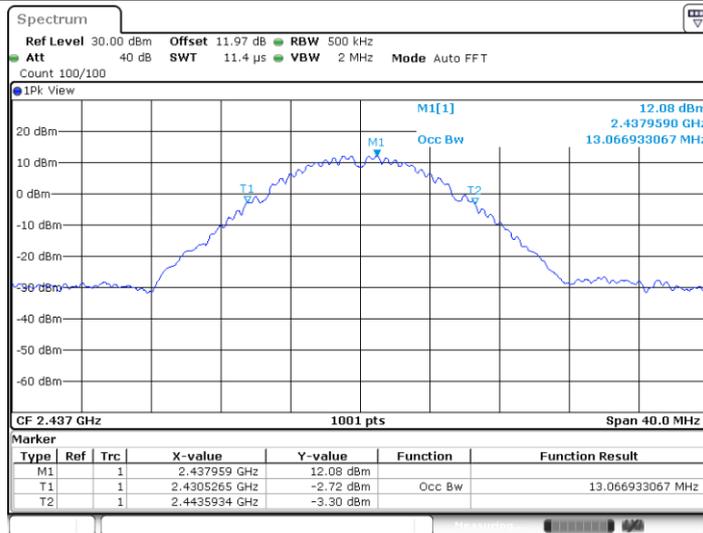


11B-CDD\_Ant5\_2437



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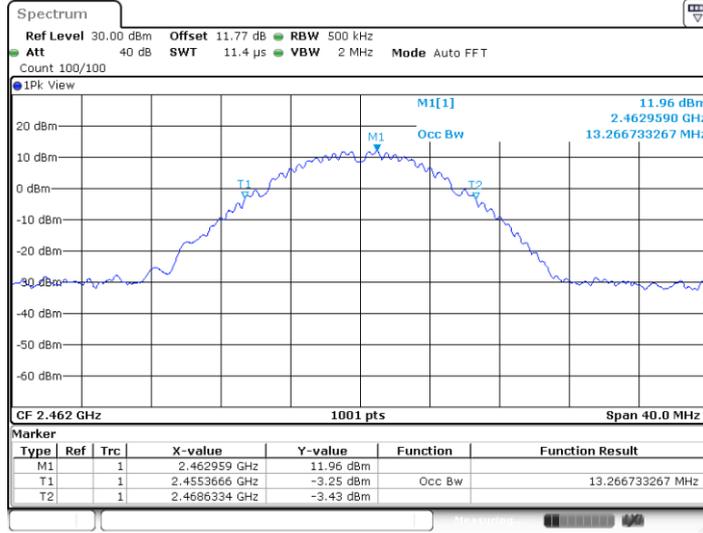
11B-CDD\_Ant4\_2437



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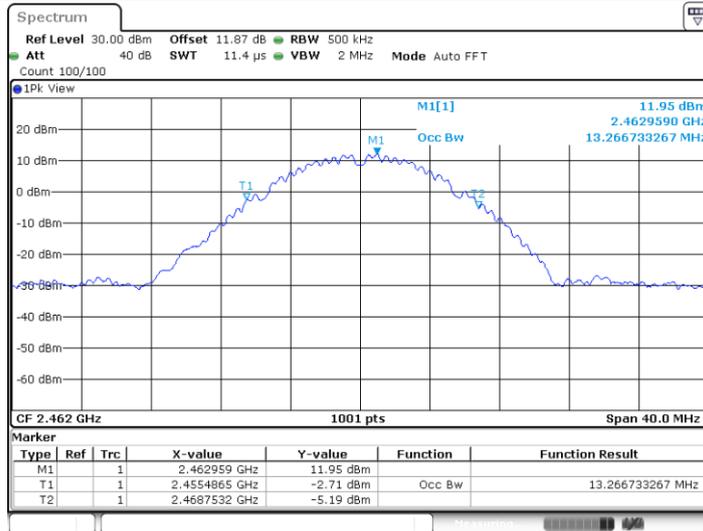


11B-CDD\_Ant5\_2462



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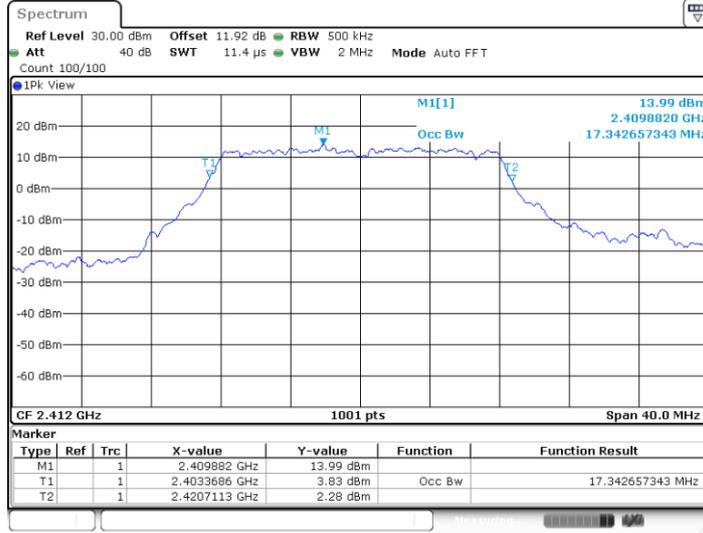
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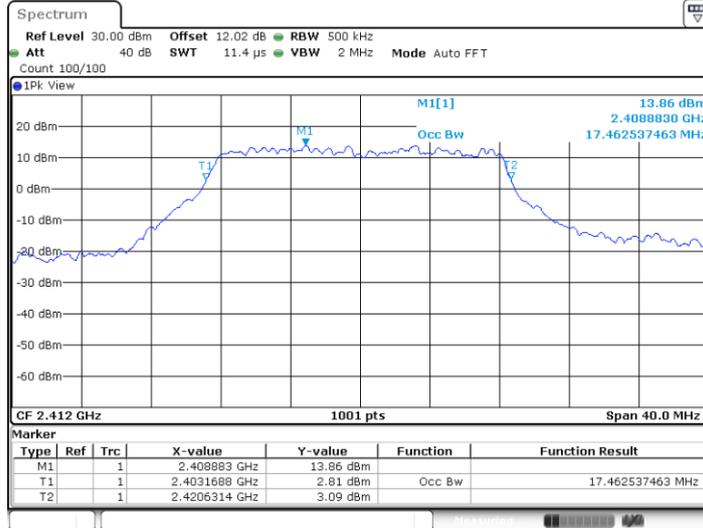


11G-CDD\_Ant5\_2412



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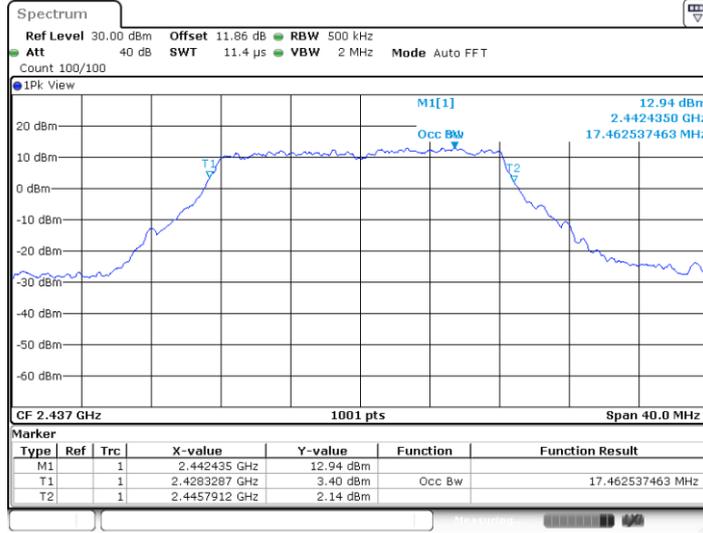
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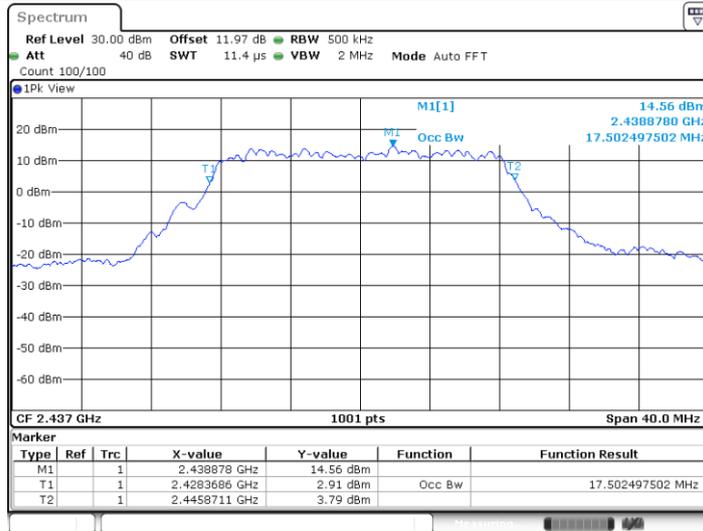


11G-CDD\_Ant5\_2437



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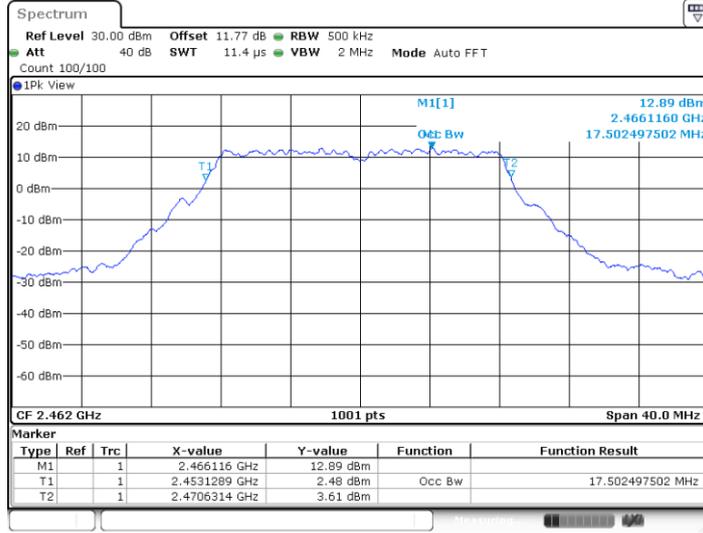
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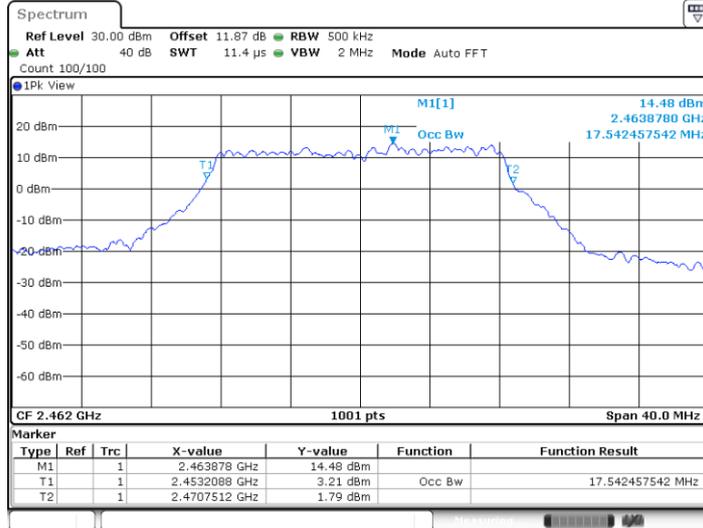


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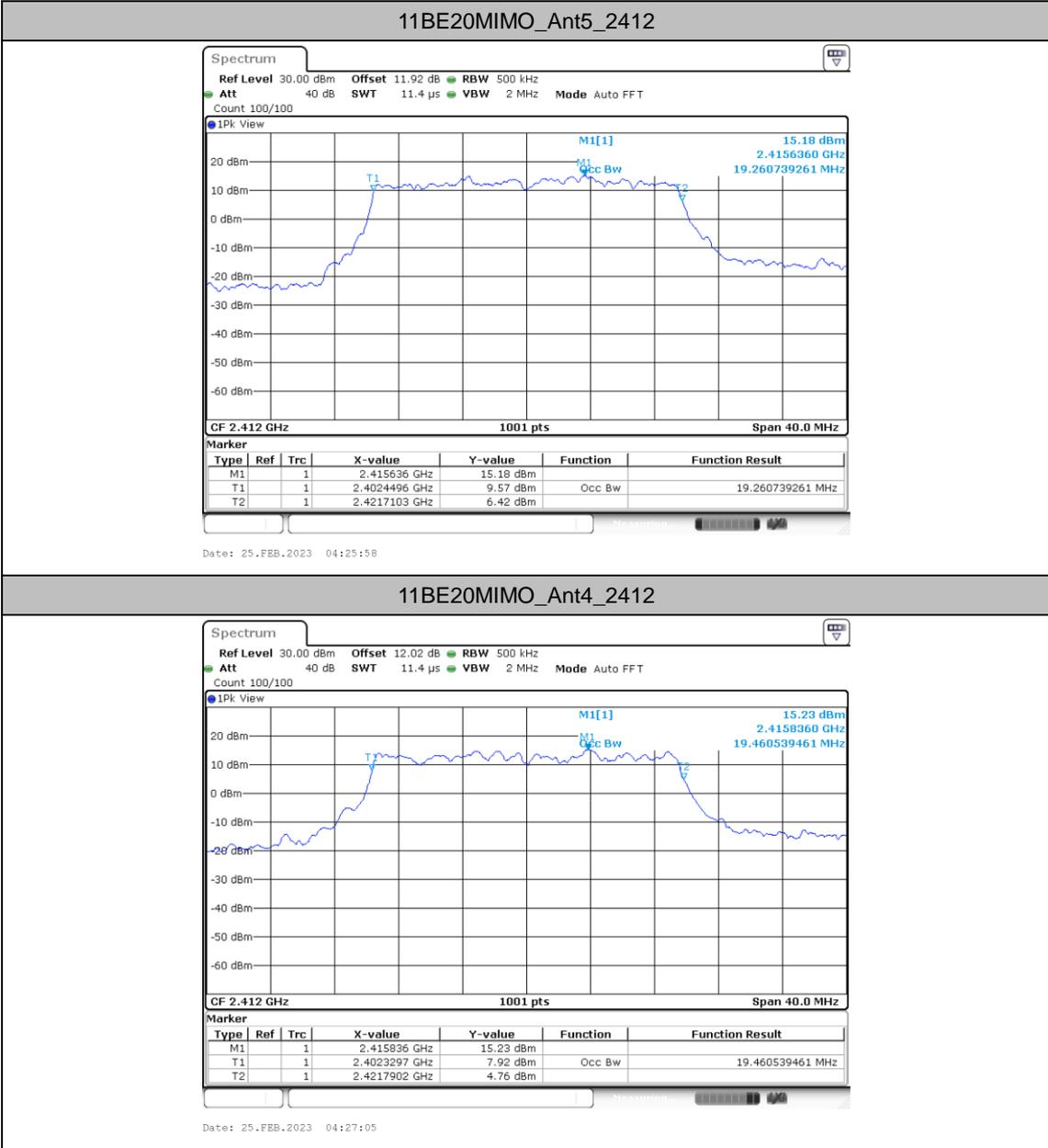


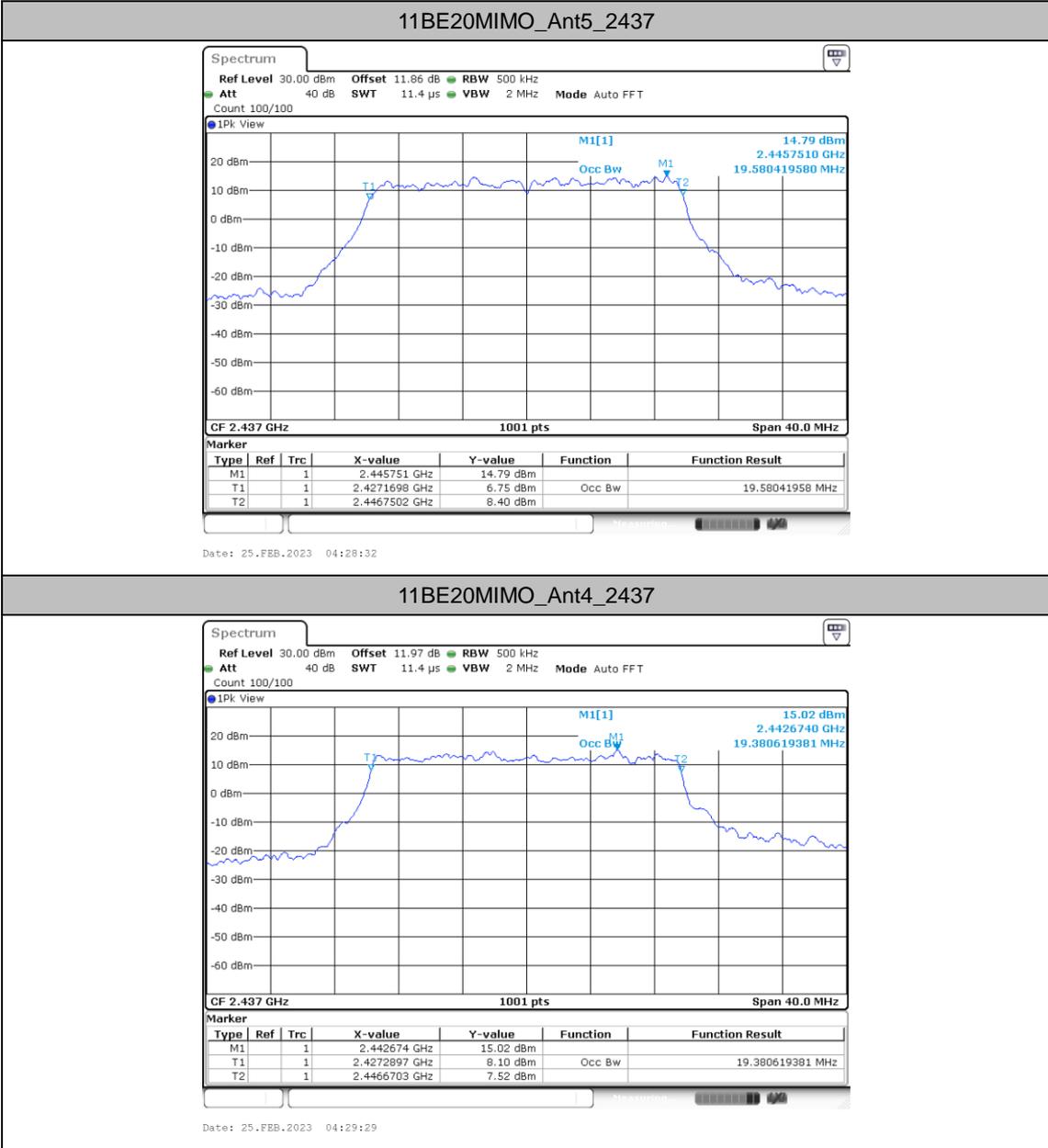
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11G-CDD\_Ant4\_2462



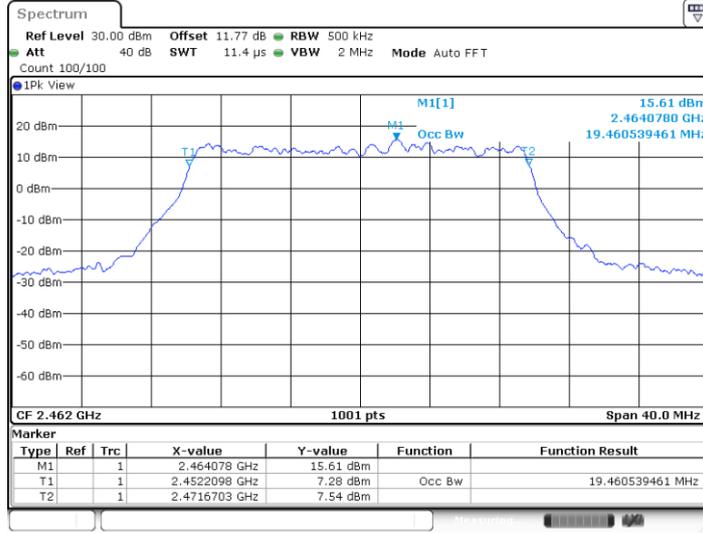
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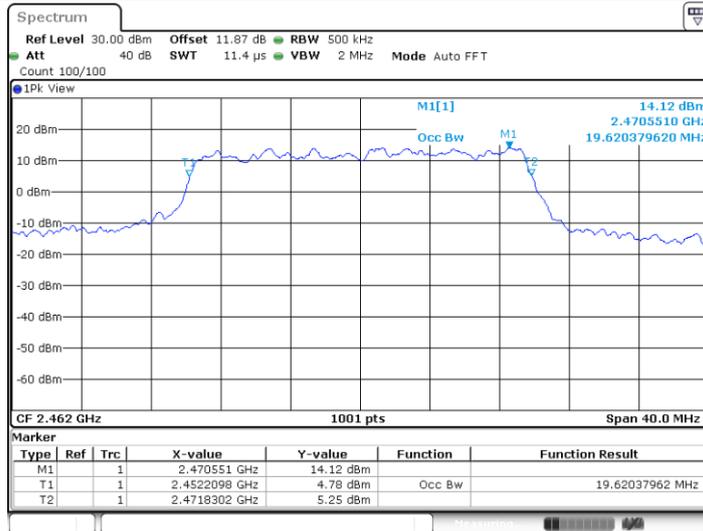


11BE20MIMO\_Ant5\_2462



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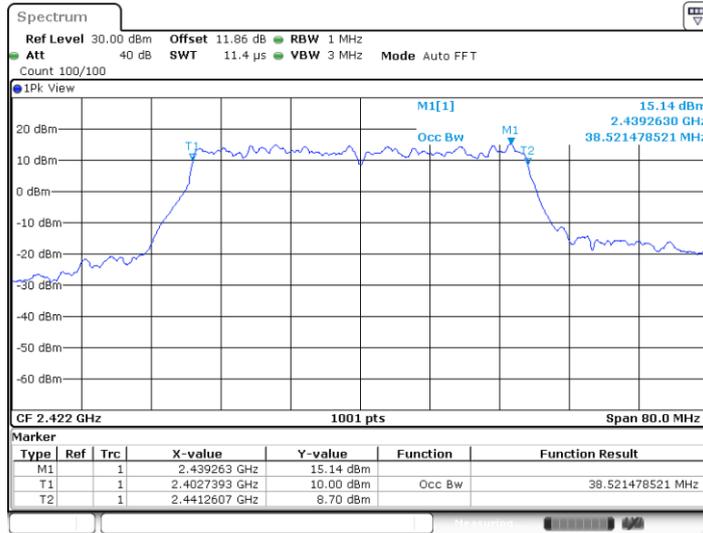
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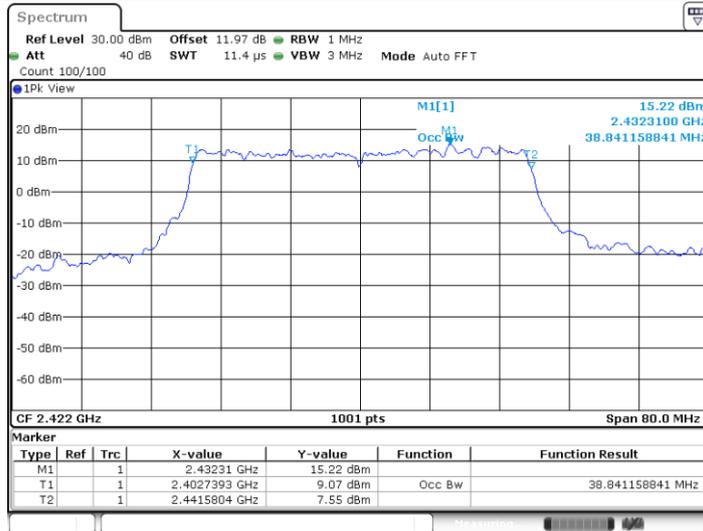


11BE40MIMO\_Ant5\_2422



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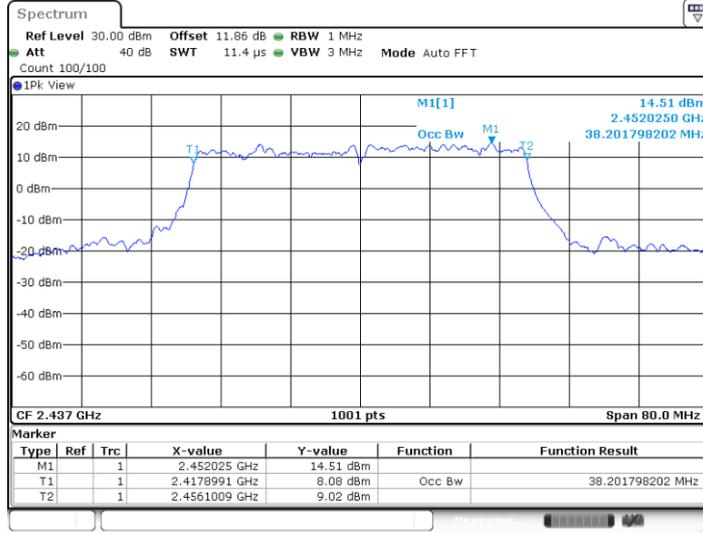
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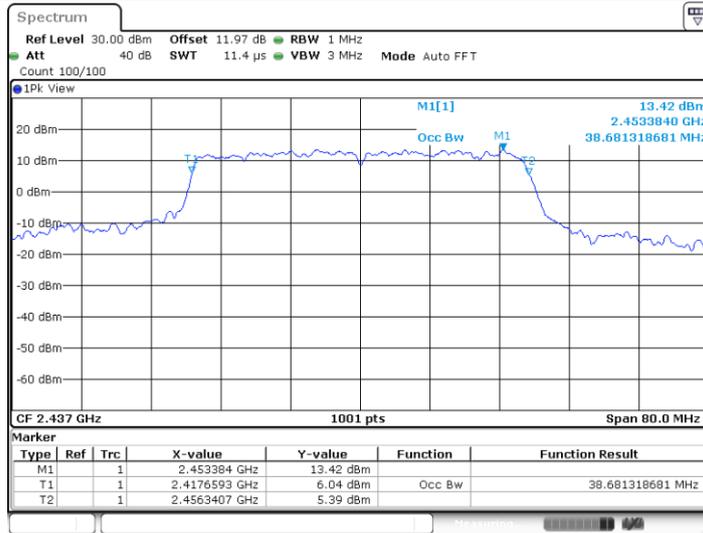


11BE40MIMO\_Ant5\_2437



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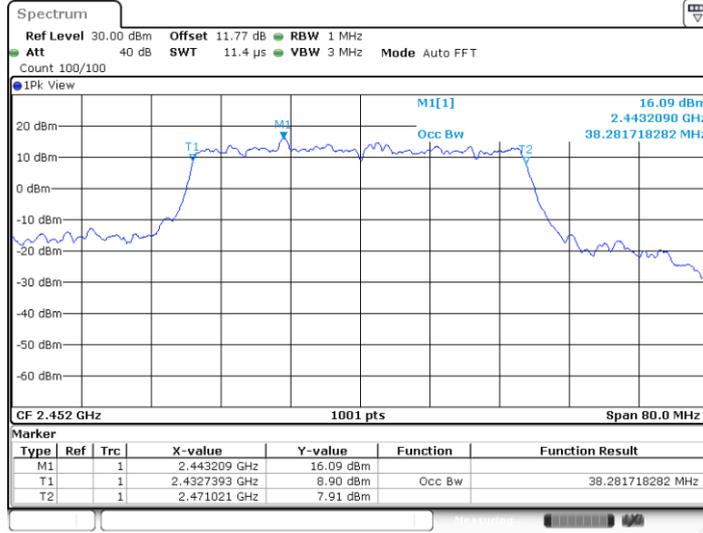
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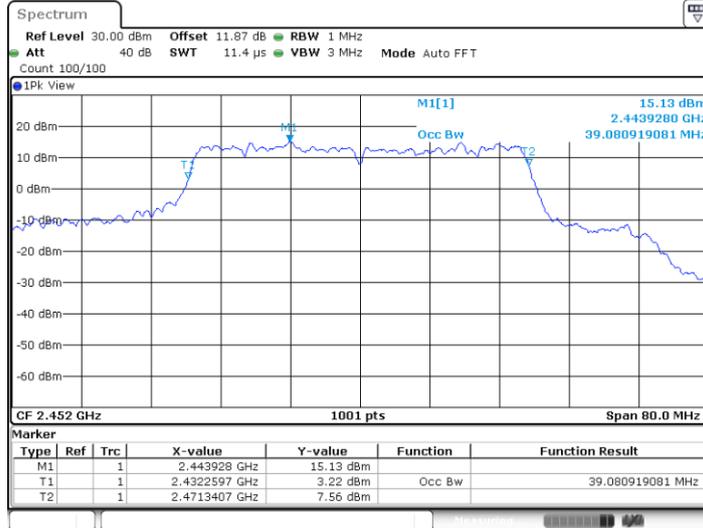


11BE40MIMO\_Ant5\_2452



Date: 25.FEB.2023 05:18:58

11BE40MIMO\_Ant4\_2452



Date: 25.FEB.2023 05:20:04



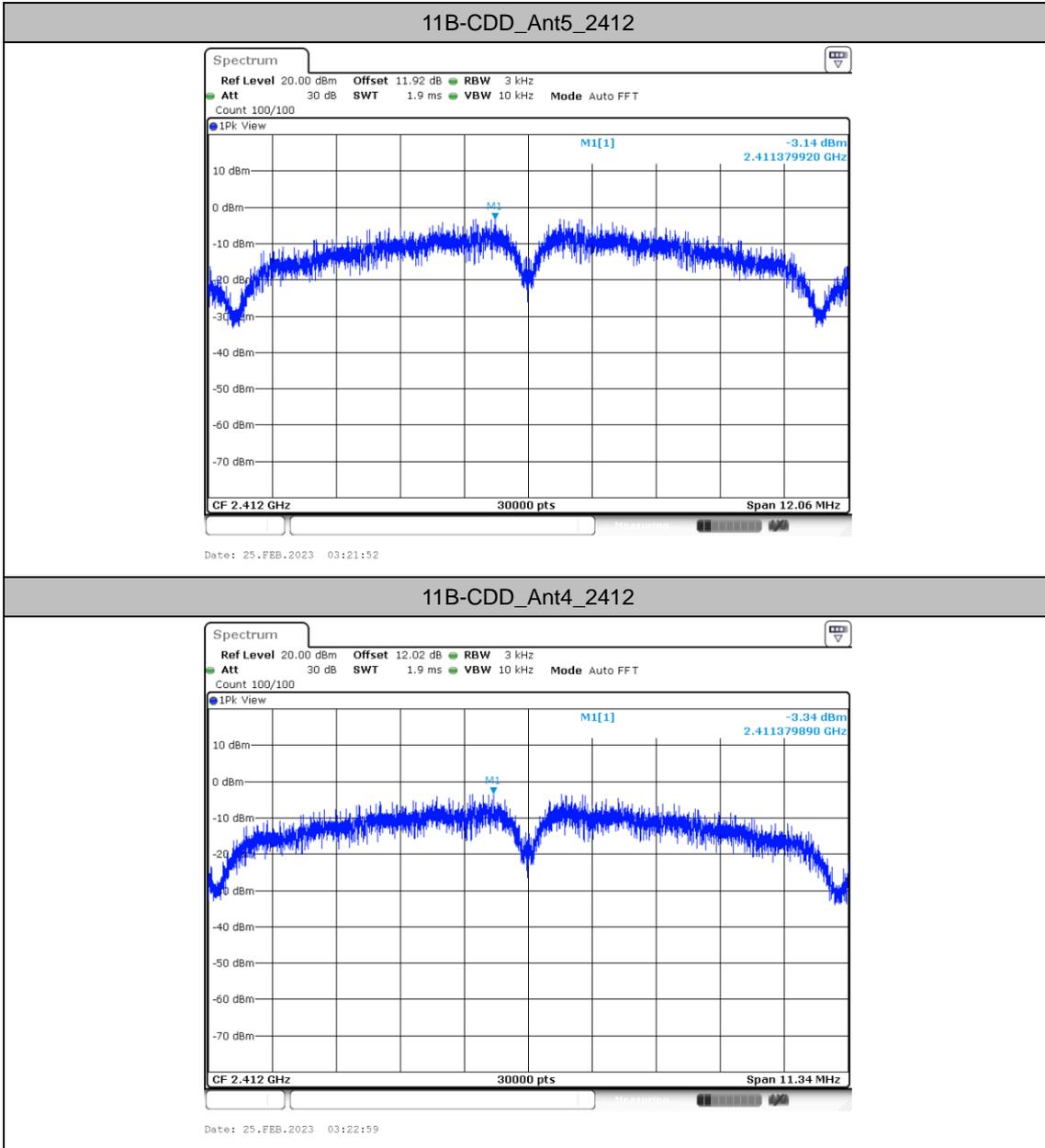
### Maximum power spectral density

#### Test Result

TestMode	Antenna	Freq(MHz)	Result [dBm/3kHz]	Limit [dBm/3kHz]	Verdict
11B-CDD	Ant5	2412	-3.14	≤8.00	PASS
	Ant4	2412	-3.34	≤8.00	PASS
	total	2412	-0.23	≤8.00	PASS
	Ant5	2437	-3.08	≤8.00	PASS
	Ant4	2437	-3.07	≤8.00	PASS
	total	2437	-0.06	≤8.00	PASS
	Ant5	2462	-4.34	≤8.00	PASS
	Ant4	2462	-3.93	≤8.00	PASS
	total	2462	-1.12	≤8.00	PASS
11G-CDD	Ant5	2412	-3.43	≤8.00	PASS
	Ant4	2412	-5.27	≤8.00	PASS
	total	2412	-1.24	≤8.00	PASS
	Ant5	2437	-5.73	≤8.00	PASS
	Ant4	2437	-5.37	≤8.00	PASS
	total	2437	-2.54	≤8.00	PASS
	Ant5	2462	-5.96	≤8.00	PASS
	Ant4	2462	-4.63	≤8.00	PASS
	total	2462	-2.23	≤8.00	PASS
11BE20MIMO	Ant5	2412	-4.78	≤8.00	PASS
	Ant4	2412	-4.81	≤8.00	PASS
	total	2412	-1.78	≤8.00	PASS
	Ant5	2437	-5.34	≤8.00	PASS
	Ant4	2437	-5.45	≤8.00	PASS
	total	2437	-2.38	≤8.00	PASS
	Ant5	2462	-4.56	≤8.00	PASS
	Ant4	2462	-5.27	≤8.00	PASS
	total	2462	-1.89	≤8.00	PASS
11BE40MIMO	Ant5	2422	-7.5	≤8.00	PASS
	Ant4	2422	-7.57	≤8.00	PASS
	total	2422	-4.52	≤8.00	PASS
	Ant5	2437	-8.02	≤8.00	PASS
	Ant4	2437	-8.78	≤8.00	PASS
	total	2437	-5.37	≤8.00	PASS
	Ant5	2452	-8.4	≤8.00	PASS
	Ant4	2452	-7.92	≤8.00	PASS
	total	2452	-5.14	≤8.00	PASS

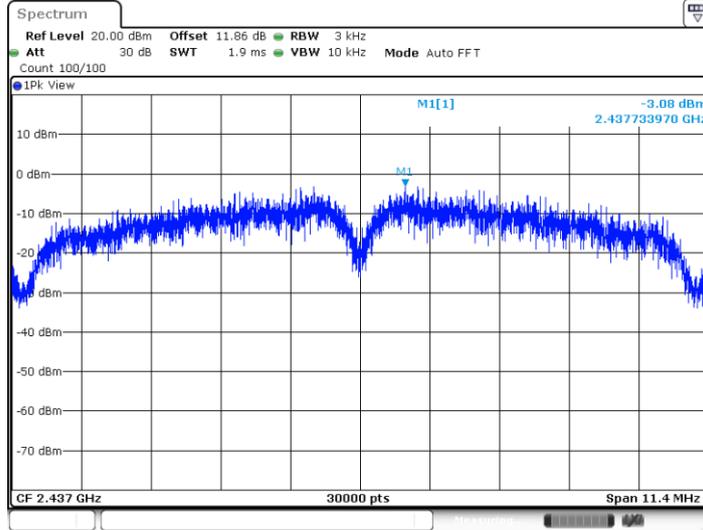


Test Graphs



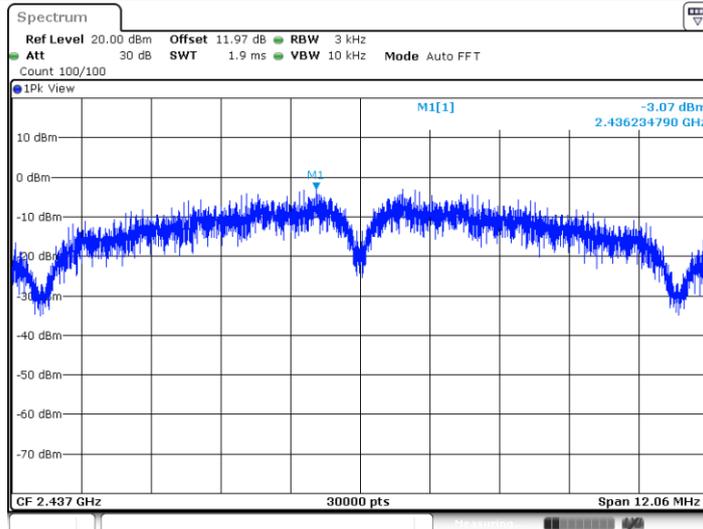


11B-CDD\_Ant5\_2437



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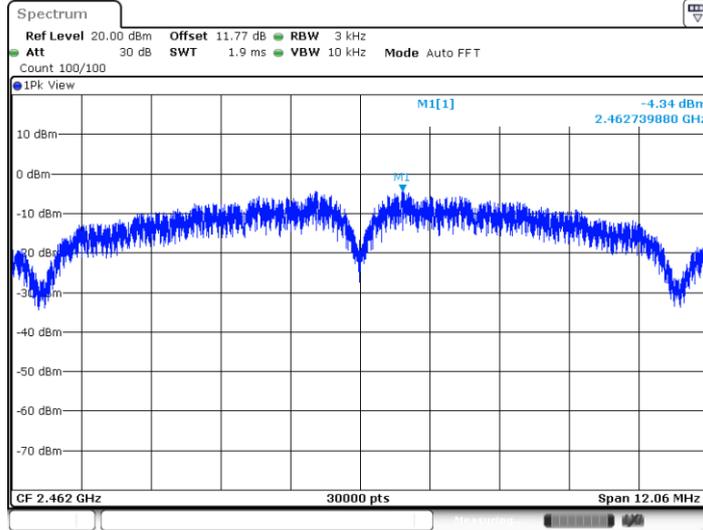
11B-CDD\_Ant4\_2437



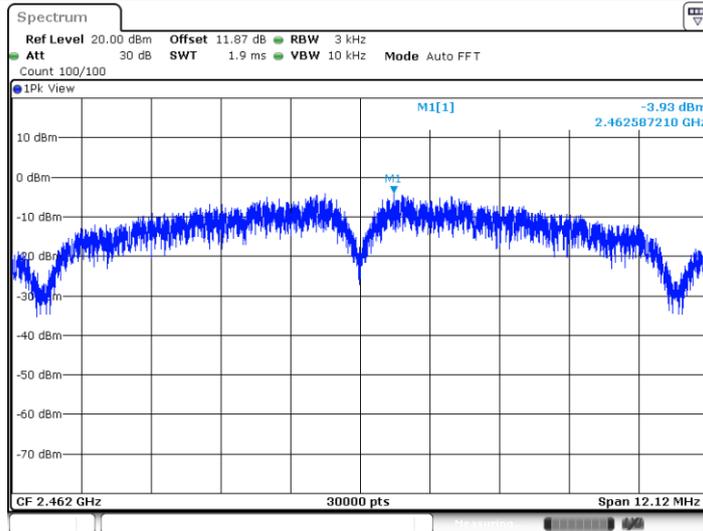
Date: 25.FEB.2023 03:25:12



11B-CDD\_Ant5\_2462

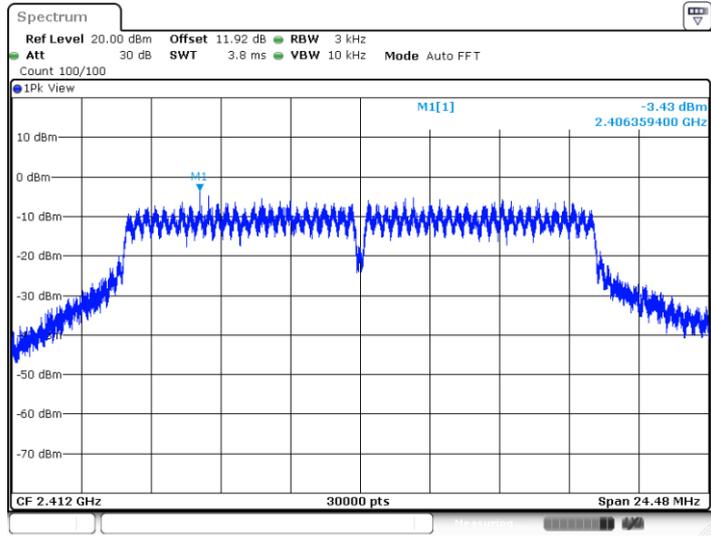


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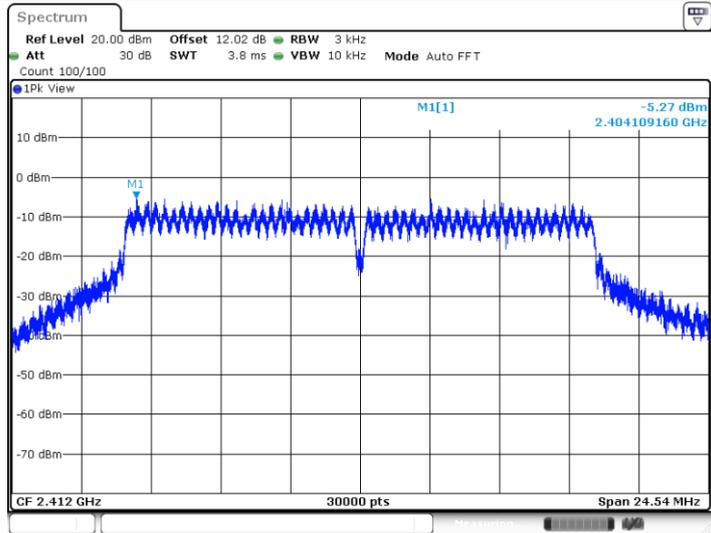


11G-CDD\_Ant5\_2412



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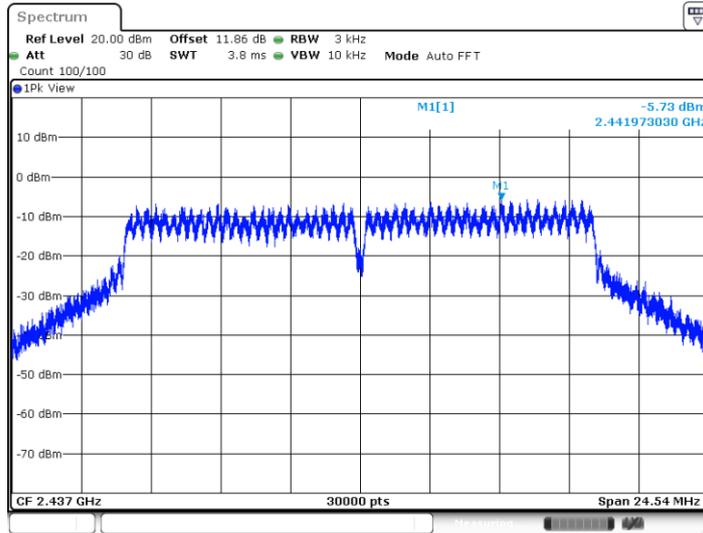
11G-CDD\_Ant4\_2412



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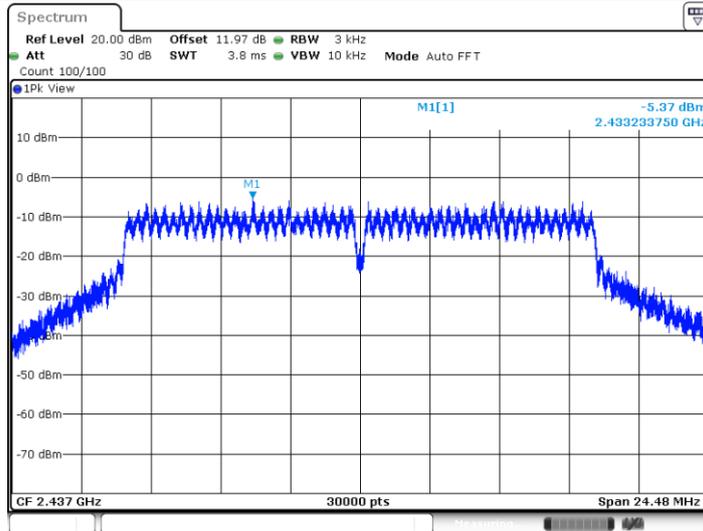


11G-CDD\_Ant5\_2437



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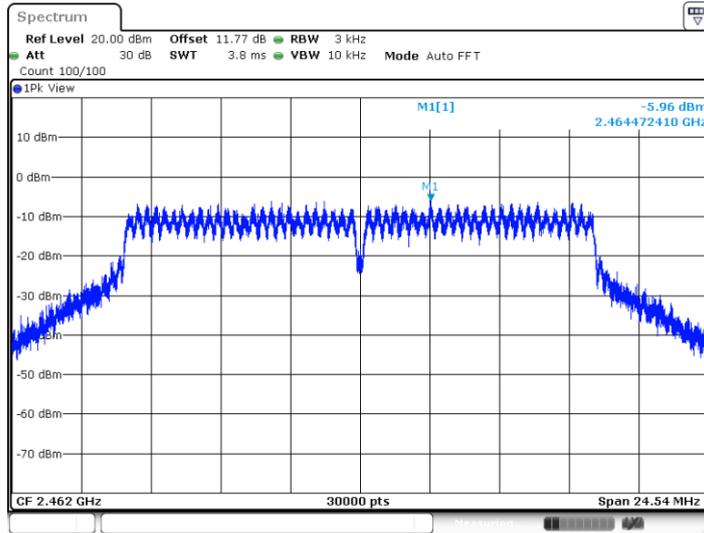
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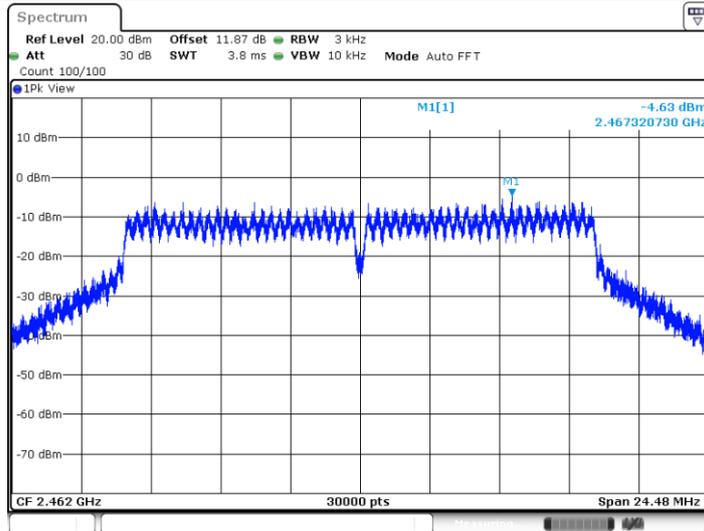


11G-CDD\_Ant5\_2462



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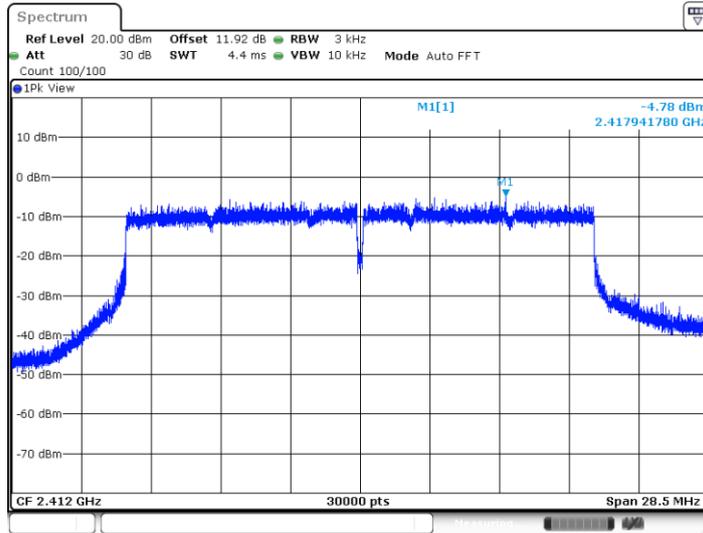
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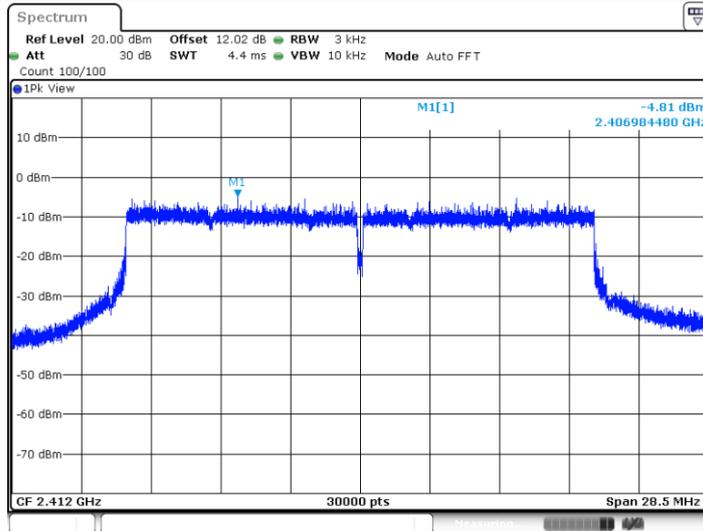


11BE20MIMO\_Ant5\_2412



Date: 25.FEB.2023 04:26:05

11BE20MIMO\_Ant4\_2412



Date: 25.FEB.2023 04:27:12