FCC RF Test Report

APPLICANT	:	Sonim Technologies, Inc.
EQUIPMENT	:	Mobile Hotspot
BRAND NAME	:	Sonim
MODEL NAME	:	H500V
FCC ID	:	WYPH500V
STANDARD	:	FCC Part 15 Subpart E §15.407
CLASSIFICATION	:	15E 6 GHZ Very Low Power Device(6VL)
TEST DATE(S)	:	Nov. 04, 2024 ~ Dec. 02, 2024

We, Sporton International Inc. (Kunshan), 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. (Kunshan), the test report shall not be reproduced except in full.

Jason Jia

Approved by: Jason Jia

ACCREDITED
Cert #5145.02

Sporton International Inc. (Kunshan)
No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China

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History of this test report

Report No.	Version	Description	Issued Date
FR4O1001	01	Initial issue of report	Dec. 03, 2024

Summary of Test Result

Report Clause	Ref Std. Clause	Test Items	Result (PASS/FAIL)	Remark
3.1	15.407(a)(11)	26dB Emission Bandwidth	Pass	-
3.1	2.1049	99% Occupied Bandwidth	Pass	-
3.2	15.407(a)(9)	Maximum Conducted Output Power	Pass	-
3.2	15.407(a)(9)	Fundamental Maximum EIRP	Pass	-
3.3	15.407(a)(9)	Fundamental Power Spectral Density	Pass	-
3.4	15.407(b)(7)	In-Band Emissions (Channel Mask)	Pass	-
3.5	15.407(d)(6)	Contention Based Protocol	Pass	-
3.6	15.407(d)(10)	Transmit Power Control	Pass	-
3.7	15.407(b)	Unwanted Emissions	Pass	Under limit 1.13 dB at 2483.500 MHz
3.8	15.207	AC Conducted Emission	Pass	Under limit 13.93 dB at 5.961 MHz
3.9	15.203 15.407(a)	Antenna Requirement	Pass	-

Conformity Assessment Condition:

1. The test results (PASS/FAIL) with all measurement uncertainty excluded are presented against the regulation limits or in accordance with the requirements stipulated by the applicant/manufacturer who shall bear all the risks of non-compliance that may potentially occur if measurement uncertainty is taken into account.
2. The measurement uncertainty please refer to each test result in the section “Measurement Uncertainty”

Disclaimer:

The product specifications of the EUT presented in the test report that may affect the test assessments are declared by the manufacturer who shall take full responsibility for the authenticity.

1 General Description

1.1 Applicant

Sonim Technologies, Inc.
4445 Eastgate Mall, Suite 200, San Diego, CA 92121, USA

1.2 Manufacturer

Sonim Technologies, Inc.
4445 Eastgate Mall, Suite 200, San Diego, CA 92121, USA

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Mobile Hotspot
Brand Name	Sonim
Model Name	H500V
FCC ID	WYPH500V
SN/IMEI Code	Conducted/CBP/TPC: K461758 Conduction/Radiation: 351966690004962
HW Version	V2.0
SW Version	H50.0-01-5.4.0-15.08.00

Remark: The above EUT's information was declared by manufacturer. Please refer to the specifications or user's manual for more detailed description.

1.4 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx/Rx Frequency Range	U-NII-5: 5925 MHz ~ 6425 MHz U-NII-7: 6525 MHz ~ 6875 MHz
Maximum EIRP	**<MIMO Ant.6+7>** **<U-NII-5>** 802.11a : 3.76 dBm / 0.0024 W 802.11ax HE20 : 4.33 dBm / 0.0027 W 802.11ax HE40 : 7.33 dBm / 0.0054 W 802.11ax HE80 : 10.14 dBm / 0.0103 W 802.11ax HE160 : 13.15 dBm / 0.0207 W **<U-NII-7>** 802.11a : 4.53 dBm / 0.0028 W 802.11ax HE20 : 4.62 dBm / 0.0029 W 802.11ax HE40 : 8.02 dBm / 0.0063 W 802.11ax HE80 : 11.40 dBm / 0.0138 W 802.11ax HE160 : 13.38 dBm / 0.0218 W
99% Occupied Bandwidth	**<U-NII-5>** 802.11a : 16.667 MHz 802.11ax HE20 : 18.952 MHz 802.11ax HE40 : 37.905 MHz 802.11ax HE80 : 77.562 MHz

	802.11ax HE160 : 157.257 MHz **<U-NII-7>** 802.11a : 16.667 MHz 802.11ax HE20 : 18.990 MHz 802.11ax HE40 : 37.981 MHz 802.11ax HE80 : 77.486 MHz 802.11ax HE160 : 156.952 MHz
Antenna Type / Gain	**<5925 MHz ~ 6425 MHz >** <Ant. 6> : PIFA Antenna with gain 4.02 dBi <Ant. 7> : PIFA Antenna with gain 3.06 dBi **<6525 MHz ~ 6875 MHz >** <Ant. 6> : PIFA Antenna with gain 4.61 dBi <Ant. 7> : PIFA Antenna with gain 2.66 dBi
Type of Modulation	802.11a: OFDM (BPSK / QPSK / 16QAM / 64QAM) 802.11ax : OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM / 1024QAM)

Remark:

1. The device support WIFI MIMO CDD mode.
2. The device does not support UNII-5 CH2 5935MHz.
3. 802.11ax support full RU tone and partial RU tone, both full RU and partial RU-left (for low CH) and partial RU-right (for high CH) are tested for conducted power/PSD/Channel Mask in appendix A, all the other test case were performed with full RU with its maximum power/PSD.
4. CBP test with antenna path of minimum gain (Antenna 7, Minimum gain= 2.66 dBi).
5. Ant.7 in this report corresponds to WIFI-1 in the antenna report, Ant. 6 in this report corresponds to WIFI-2 in the antenna report.

1.5 Modification of EUT

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

1.6 Testing Location

Sporton International Inc. (Kunshan) is accredited to ISO/IEC 17025:2017 by American Association for Laboratory Accreditation with Certificate Number 5145.02.

Test Firm	Sporton International Inc. (Kunshan)		
Test Site Location	No. 1098, Pengxi North Road, Kunshan Economic Development Zone Jiangsu Province 215300 People's Republic of China TEL : +86-512-57900158		
Test Site No.	**Sporton Site No.**	**FCC Designation No.**	**FCC Test Firm Registration No.**
	CO01-KS;03CH05-KS TH01-KS; DFS01-KS	CN1257	314309

1.7 Test Software

Item	Site	Manufacture	Name	Version
1.	03CH05-KS	AUDIX	E3	6.2009-8-24
2.	CO01-KS	AUDIX	E3	6.2009-8-24
3.	TH01-KS	Tonscend	JS1120-3 test system China_210602	3.3.10

1.8 Applicable Standards

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

- FCC Part 15 Subpart E
- FCC KDB 987594 D02 U-NII 6 GHz EMC Measurement v03
- FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
- FCC KDB 414788 D01 Radiated Test Site v01r01.
- 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 (Y plane) were recorded in this report.

b. AC power line Conducted Emission was tested under maximum output power.

2.1 Carrier Frequency and Channel

<U-NII-5>

BW 20M	**Channel**	1	5	9	13	17	21	25	29
	Freq. (MHz)	5955	5975	5995	6015	6035	6055	6075	6095
BW 40M	**Channel**	3		11		19		27	
	Freq. (MHz)	5965		6005		6045		6085	
BW 80M	**Channel**	7				23			
	Freq. (MHz)	5985				6065			
BW 160M	**Channel**	15							
	Freq. (MHz)	6025							

BW 20M	**Channel**	33	37	41	45	49	53	57	61
	Freq. (MHz)	6115	6135	6155	6175	6195	6215	6235	6255
BW 40M	**Channel**	35		43		51		59	
	Freq. (MHz)	6125		6165		6205		6245	
BW 80M	**Channel**	39				55			
	Freq. (MHz)	6145				6225			
BW 160M	**Channel**	47							
	Freq. (MHz)	6185							
BW 320M	**Channel**	31				63			
	Freq. (MHz)	6105				6265			

BW 20M	Channel	65	69	73	77	81	85	89	93
	Freq. (MHz)	6275	6295	6315	6335	6355	6375	6395	6415
BW 40M	Channel	67		75		83		91	
	Freq. (MHz)	6285		6325		6365		6405	
BW 80M	Channel	71				87			
	Freq. (MHz)	6305				6385			
BW 160M	Channel	79							
	Freq. (MHz)	6345							

<UNII-7>

BW 20M	Channel	-	-	-	-	-	117	121	125
	Freq. (MHz)	-	-	-	-	-	6535	6555	6575
BW 40M	Channel	-		-		-		123	
	Freq. (MHz)	-		-		-		6565	

BW 20M	Channel	129	133	137	141	145	149	153	157
	Freq. (MHz)	6595	6615	6635	6655	6675	6695	6715	6735
BW 40M	Channel	131		139		147		155	
	Freq. (MHz)	6605		6645		6685		6725	
BW 80M	Channel	135				151			
	Freq. (MHz)	6625				6705			
BW 160M	Channel	143							
	Freq. (MHz)	6665							

BW 20M	Channel	161	165	169	173	177	181	-	-
	Freq. (MHz)	6755	6775	6795	6815	6835	6855	-	-
BW 40M	Channel	163		171		179		-	
	Freq. (MHz)	6765		6805		6845		-	
BW 80M	Channel	167				-			
	Freq. (MHz)	6785				-			

2.2 Test Mode

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

Modulation	Data Rate
802.11a	6 Mbps
802.11ax HE20	MCS0
802.11ax HE40	MCS0
802.11ax HE80	MCS0
802.11ax HE160	MCS0

Test Cases	
AC Conducted Emission	Mode 1 : WCDMA Band 5 Idle + BT Link + WLAN Link(6G) + USB Cable 1(Charging From Adapter 1) + Battery 1
Remark: For Radiated Test Cases, the tests were performed with Adapter 1, Battery 1 and USB Cable 1.	

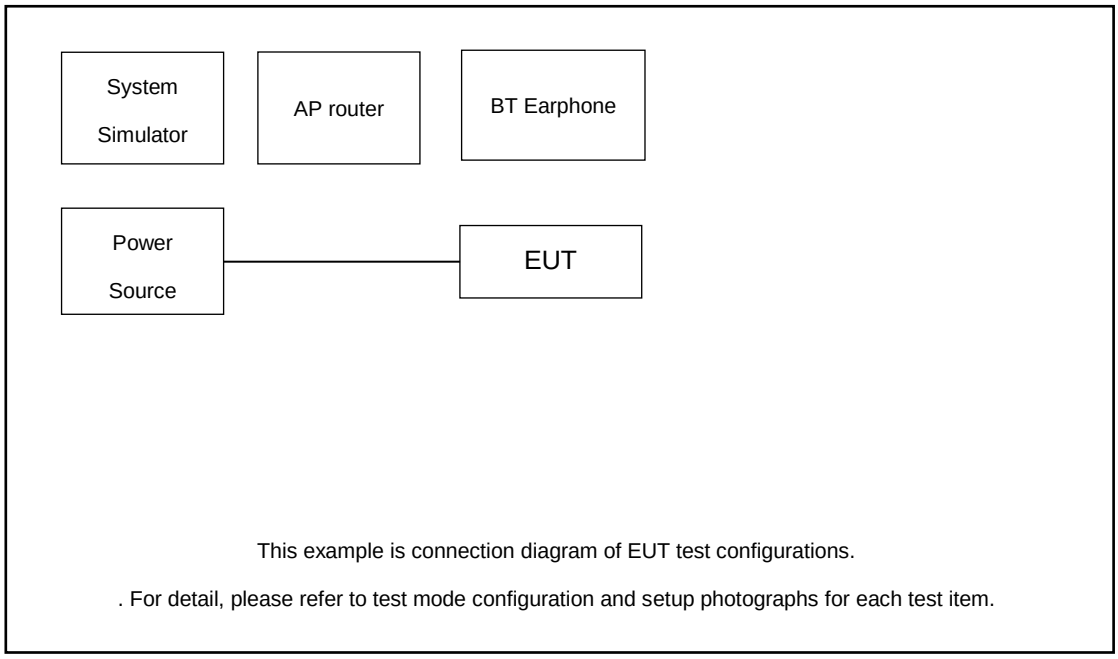
Ch. #		5925-6425 MHz UNII-5	6525-6875 MHz UNII-7	5925-6425 MHz UNII-5	6525-6875 MHz UNII-7
		20 BW	20 BW	40 BW	40 BW
L	Low	001	117	003	123
M	Middle	049	149	051	147
H	High	093	181	091	179

Ch. #		5925-6425 MHz UNII-5	6525-6875 MHz UNII-7	5925-6425 MHz UNII-5	6525-6875 MHz UNII-7
		80 BW	80 BW	160 BW	160 BW
L	Low	007	135	015	143
M	Middle	055	151	047	
H	High	087	167	079	

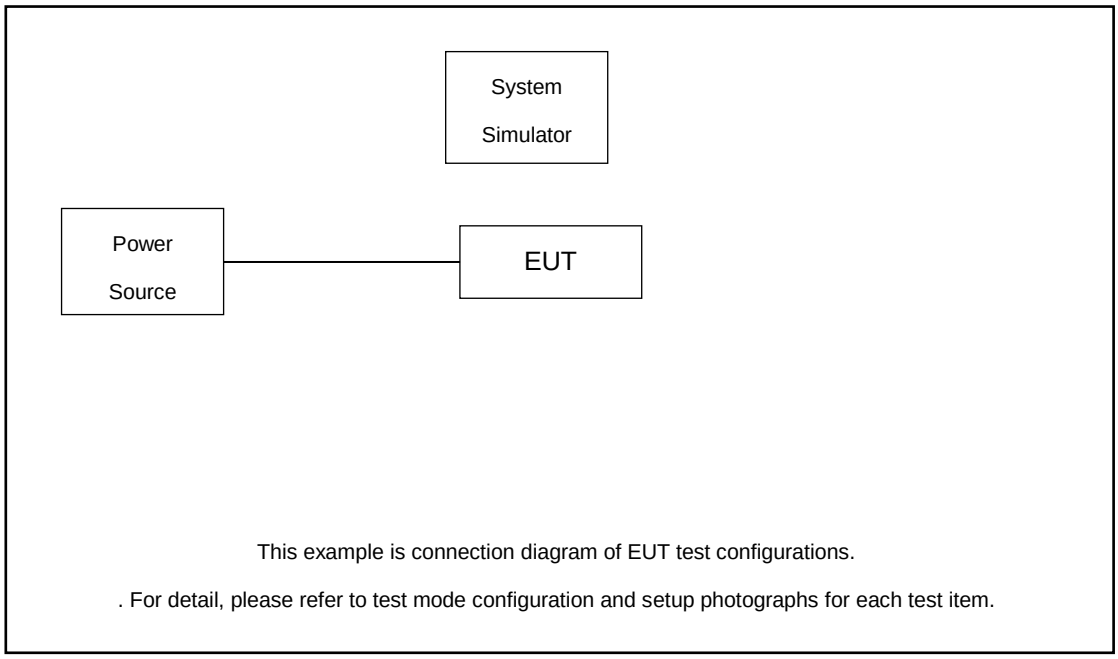
Remark: For radiation spurious emission, the final modulation and the worst data rate was reference the max RF conducted power.

2.3 Connection Diagram of Test System

For Conduction emission



For Radiated emission



2.4 Support Unit used in test configuration and system

Item	Equipment	Brand Name	Model Name	FCC ID	Data Cable	Power Cord
1.	Bluetooth Earphone	Lenovo	thinkplus-BH3	N/A	N/A	N/A
2.	Base station	Anritsu	MT8820C	N/A	N/A	Unshielded,1.8m
3.	WLAN AP	Dlink	DIR-820L	KA2IR820LA1	N/A	Unshielded,1.8m

2.5 EUT Operation Test Setup

For WLAN RF test items, an engineering test program (QRCT TX Tool) was provided and enabled to make EUT continuously 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 5.39 dB and 20dB attenuator.

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

= 5.39 + 20 = 25.39 (dB)

3 Test Result

3.1 26dB & 99% Occupied Bandwidth Measurement

3.1.1 CFR 15.407 (a)(11)

The maximum transmitter channel bandwidth for U-NII devices in the 5.925-7.125 GHz band is 320 megahertz.

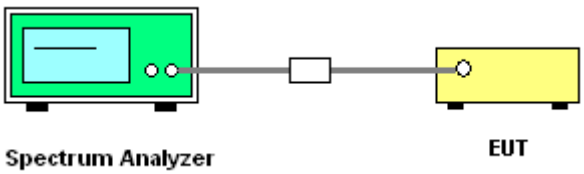
3.1.2 Measuring Instruments

See list of measuring equipment of this test report.

3.1.3 Test Procedures

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01. Section C) Emission bandwidth
2. Set RBW = approximately 1% of the emission bandwidth.
3. Set the VBW > RBW.
4. Detector = Peak.
5. Trace mode = max hold
6. Measure the maximum width of the emission that is 26 dB down from the peak of the emission. Compare this with the RBW setting of the analyzer. Readjust RBW and repeat measurement as needed until the RBW/EBW ratio is approximately 1%.
7. For 99% Bandwidth Measurement, the spectrum analyzer's resolution bandwidth (RBW) is set 1-5% of the emission bandwidth and set the Video bandwidth (VBW) ≥ 3 * RBW.
8. Measure and record the results in the test report.

3.1.4 Test Setup



3.1.5 Test Result of 26dB & 99% Occupied Bandwidth

Please refer to Appendix A.

3.2 Maximum conducted Output Power and Fundamental Maximum EIRP Measurement

3.2.1 Limit of Fundamental Maximum EIRP

<FCC 14-30 CFR 15.407>

(a)(9) For very low power devices operating in the 5.925-6.425 GHz and 6.525-6.875 GHz bands, the maximum e.i.r.p must not exceed 14 dBm.

3.2.2 Measuring Instruments

See list of measuring equipment of this test report.

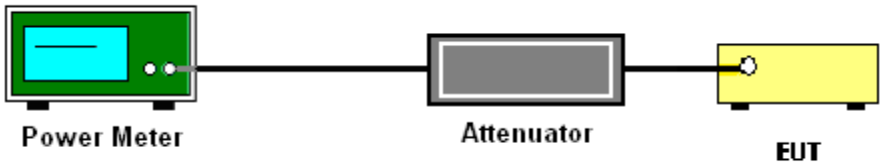
3.2.3 Test Procedures

The testing follows Method PM of FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.

Method PM (Measurement using an RF average power meter):

1. Measurement is performed using a wideband RF power meter.
2. The EUT is configured to transmit continuously with a consistent duty cycle at its maximum power control level.
3. Measure the average power of the transmitter, and the average power is corrected with duty factor, 10 log(1/x), where x is the duty cycle.
4. For MIMO mode, the measure-and-sum technique should be used for measuring the in-band transmit power of a device.

3.2.4 Test Setup



3.2.5 Test Result of Fundamental Maximum EIRP

Please refer to Appendix A.

3.3 Fundamental Power Spectral Density Measurement

3.3.1 Limit of Fundamental Power Spectral Density

<FCC 14-30 CFR 15.407>

(a)(9) For very low power devices operating in the 5.925-6.425 GHz and 6.525-6.875 GHz bands, the maximum power spectral density must not exceed −5 dBm e.i.r.p in any 1-megahertz band.

(d)(10) Very low power devices operating in the 5.925-6.425 and 6.525-6.875 GHz bands shall employ a transmit power control (TPC) mechanism. A very low power device is required to have the capability to operate at least 6 dB below the maximum EIRP power spectral density (PSD) value of −5 dBm/MHz.

3.3.2 Measuring Instruments

See list of measuring equipment of this test report.

3.3.3 Test Procedures

The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.

Section F) Maximum power spectral density.

 # Method SA-2 #

(trace averaging across on and off times of the EUT transmissions, followed by duty cycle correction).

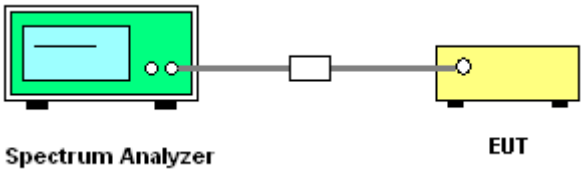
- Measure the duty cycle.
- Set span to encompass the entire emission bandwidth (EBW) of the signal.
- Set RBW = 1 MHz.
- Set VBW ≥ 3 MHz.
- Number of points in sweep ≥ 2 Span / RBW.
- Sweep time = auto.
- Detector = RMS
- Trace average at least 100 traces in power averaging mode.
- Add 10 log(1/x), where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times. For example, add 10 log(1/0.25) = 6 dB if the duty cycle is 25 percent.

1. The RF output of EUT was connected to the spectrum analyzer by a low loss cable.
2. Each plot has already offset with cable loss, attenuator loss and duty factor. Measure the PPSD and record it.
3. For MIMO mode, calculation method follows FCC KDB 662911 D01 Multiple Transmitter Output v02r01.

   Method (b): Measure and sum spectral maxima across the outputs.

   The measurement on each individual output were performed with the same span and number on each individual output. The maximum value (peak) of each spectrum is determined. These maximum values are then summed mathematically in linear power units across the outputs.

3.3.4 Test Setup



3.3.5 Test Result of Power Spectral Density

Please refer to Appendix A.

3.4 In-Band Emissions (Channel Mask)

3.4.1 Limit of Unwanted Emissions

<FCC 14-30 CFR 15.407>

(b)(7) For transmitters operating within the 5.925-7.125 GHz bands: Power spectral density must be suppressed by 20 dB at 1 MHz outside of channel edge, by 28 dB at one channel bandwidth from the channel center, and by 40 dB at one- and one-half times the channel bandwidth away from channel center. At frequencies between one megahertz outside an unlicensed device's channel edge and one channel bandwidth from the center of the channel, the limits must be linearly interpolated between 20 dB and 28 dB suppression, and at frequencies between one and one- and one-half times an unlicensed device's channel bandwidth, the limits must be linearly interpolated between 28 dB and 40 dB suppression. Emissions removed from the channel center by more than one- and one-half times the channel bandwidth must be suppressed by at least 40 dB.

3.4.2 Measuring Instruments

See list of measuring equipment of this test report.

3.4.3 Test Procedures

The testing follows FCC KDB 987594 D02 U-NII 6GHz EMC Measurement.

Section J) In-Band Emissions.

1. Take nominal bandwidth as reference channel bandwidth provided that 26 dB emission bandwidth is always larger than nominal bandwidth
2. Measure the power spectral density (which will be used for emissions mask reference) using the following procedure:

   a) Set the span to encompass the entire 26 dB EBW of the signal.

   b) Set RBW = same RBW used for 26 dB EBW measurement.

   c) Set VBW ≥ 3 X RBW

   d) Number of points in sweep ≥ [2 X span / RBW].

   e) Sweep time = auto.

   f) Detector = RMS (i.e., power averaging)

   g) Trace average at least 100 traces in power averaging (rms) mode.

   h) Use the peak search function on the instrument to find the peak of the spectrum.
3. Using the measuring equipment limit line function, develop the emissions mask based on the following requirements. The emissions power spectral density must be reduced below the peak power spectral density (in dB) as follows:

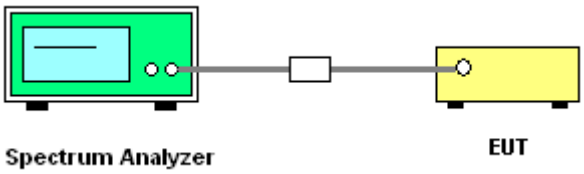
   a. Suppressed by 20 dB at 1 MHz outside of the channel edge.

   b. Suppressed by 28 dB at one channel bandwidth from the channel center.

c. Suppressed by 40 dB at one- and one-half times the channel bandwidth from the channel center.

4. Adjust the span to encompass the entire mask as necessary.
5. Clear trace.
6. Trace average at least 100 traces in power averaging (rms) mode.
7. Adjust the reference level as necessary so that the crest of the channel touches the top of the emission mask.

3.4.4 Test Setup



3.4.5 Test Result

Please refer to Appendix A.

3.5 Contention Based Protocol

3.5.1 Limit of Contention Based Protocol

<FCC 14-30 CFR 15.407>

(d)(6) All U-NII transmitters, except for standard power access points and fixed client devices, operating in the 5.925-7.125 GHz band must employ a contention-based protocol.

Unlicensed low-power indoor devices must detect co-channel radio frequency power that is at least -62 dBm or lower. Upon detection of energy in the band, unlicensed low power indoor devices must vacate the channel and stay off the channel as long as detected radio frequency power is equal to or greater than the threshold (-62 dBm). The -62 dBm (or lower) threshold is referenced to a 0 dBi antenna gain. To ensure incumbent operations are reliably detected in the band, low power indoor devices must detect RF energy throughout their intended operating channel. For example, an 802.11 device that plans to transmit a 40 MHz- wide signal (on a primary 20 MHz channel and a secondary 20 MHz channel) must detect energy throughout the entire 40 MHz channel. Additionally, low-power indoor devices must detect co-channel energy with 90% or greater certainty.

Table 1. Criteria to determine number of times detection threshold test may be performed

If	Number of Tests	Placement of Incumbent Transmission
$BW_{EUT} \leq BW_{Inc}$	Once	Tune incumbent and EUT transmissions ($f_{c1} = f_{c2}$)
$BW_{Inc} < BW_{EUT} \leq 2BW_{Inc}$	Once	Incumbent transmission is contained within BW_{EUT}
$2BW_{Inc} < BW_{EUT} \leq 4BW_{Inc}$	Twice. Incumbent transmission is contained within BW_{EUT}	Incumbent transmission is located as closely as possible to the lower edge and upper edge, respectively, of the EUT channel
$BW_{EUT} > 4BW_{Inc}$	Three times	Incumbent transmission is located as closely as possible to the lower edge of the EUT channel, in the middle of EUT channel, and as closely as possible to the upper edge of the EUT channel

where:
$BWEUT$: Transmission bandwidth of EUT signal
$BWInc$: Transmission bandwidth of the simulated incumbent signal (10 MHz wide AWGN signal)
$fc1$: Center frequency of EUT transmission
$fc2$: Center frequency of simulated incumbent signal

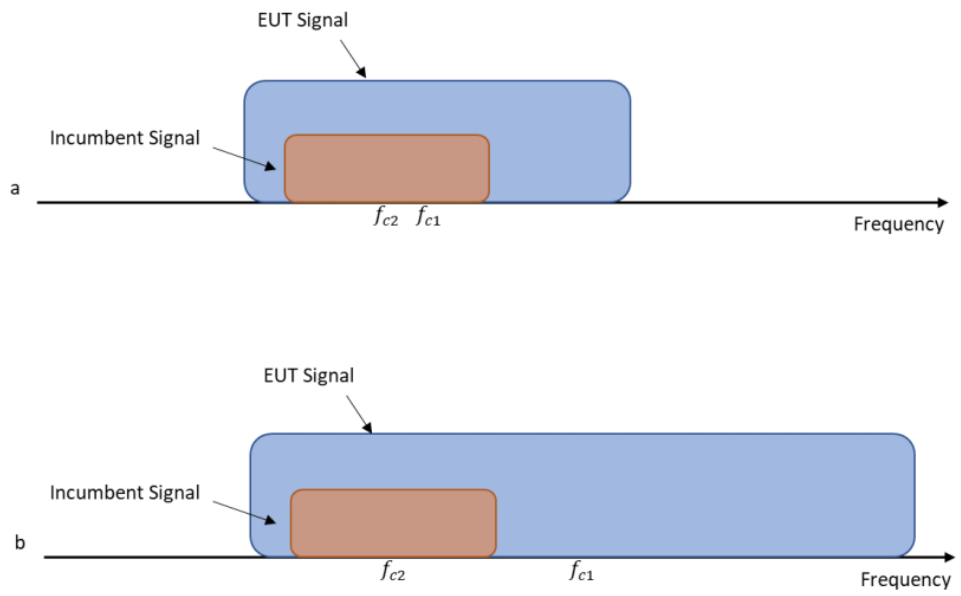


Figure 1. Two possible scenarios where a) center frequency of EUT transmission falls within incumbent's bandwidth, or b) outside of it

3.5.2 Measuring Instruments

See list of measuring equipment of this test report.

3.5.3 Test Procedures

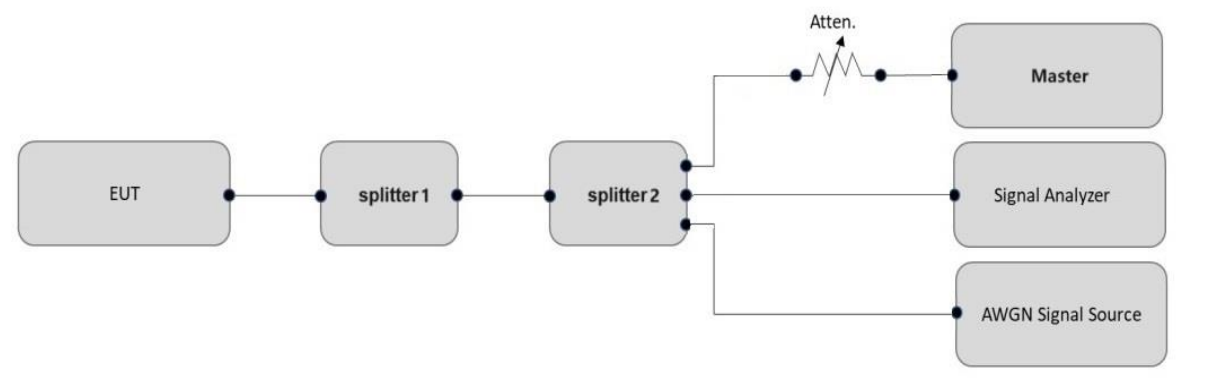
1. To ensure EUT reliably detects an incumbent signal in both scenarios shown in Figure 1, the detection threshold test may be repeated more than once with the incumbent signal (having center frequency $fc2$) tuned to different center frequencies within the UT transmission bandwidth. The criteria specified in Table 1 determines how many times the detection threshold test must be performed
2. Using an AWGN signal source, generate (but do not transmit, i.e., RF OFF) a 10 MHz-wide AWGN signal. Use Table 1 to determine the center frequency of the 10 MHz AWGN signal relative to the EUT's channel bandwidth and center frequency.
3. Monitor the signal analyzer to verify if the AWGN signal has been detected and the EUT has ceased transmission. If the EUT continues to transmit, then incrementally increase the AWGN signal power level until the EUT stops transmitting.
4. (Including all losses in the RF paths) Determine and record the AWGN signal power level (at the EUT's antenna port) at which the EUT ceased transmission. Repeat the procedure at least 10 times to verify the EUT can detect an AWGN signal with 90% (or better) level of certainty.
5. Refer to Table 1 to determine number of times the detection threshold testing needs to be repeated. If testing is required more than once, then go back to step 2, choose a different center

frequency for the AWGN signal and repeat the process.

6. EUT was driven in MIMO mode, the interferer signal was injected to both chains to monitor the performance, while the interferer level is determined according to the lowest antenna gain among both antennas.

3.5.4 Test Setup

Conducted Setup



3.5.5 Support Unit used in test configuration and system

Instrument	Brand Name	Model No.	Characteristics
Signal Generator	Keysight	5172B/5172BX07	9KHz~7.2GHz
Spectrum Analyzer	Rohde & Schwarz	FSV30	9KHz~30GHz
Companion Device (AP)	ASUS	GT-AXE11000	Dual Band AP
Terminal (NB Server)	DELL	P78G	LAN
Combiner (splitter1)	Tojoin	N/A	2G~8GHz
Combiner (splitter2)	MTJ Cooperation	MTJ7144-M	0.5GHz~18GHz
Attenuator	Keysight	8494B	0-110dBm

3.5.6 Test Summary of Contention Based Protocol Test

Band	Channel Freq. (MHz)	Channel BW (MHz)	Incumbent freq. (MHz)	Injected AWGN Level (dBm)	Detection Rate (%)	Regulated Threshold level (dBm)	Adjusted Power (dBm)	Margin (dB)
UNII Band 5	6135	20	6135	-71.22	100	-62	-73.88	11.88
					Result: Stop Transmission			
				-72.22	< 90	-62	-74.88	12.88
					Result: Minimal Operation			
				-72.83	0	-62	-75.49	13.49
					Result: Normal Operation			
	6185	160	6110	-68.63	100	-62	-71.29	9.29
					Result: Stop Transmission			
				-69.63	< 90	-62	-72.29	10.29
					Result: Minimal Operation			
				-71.77	0	-62	-74.43	12.43
					Result: Normal Operation			
			6185	-65.80	100	-62	-68.46	6.46
					Result: Stop Transmission			
				-66.80	< 90	-62	-69.46	7.46
					Result: Minimal Operation			
				-67.98	0	-62	-70.64	8.64
					Result: Normal Operation			
			6260	-69.22	100	-62	-71.88	9.88
					Result: Stop Transmission			
				-70.22	< 90	-62	-72.88	10.88
					Result: Minimal Operation			
				-70.65	0	-62	-73.31	11.31
					Result: Normal Operation			

Note 1: Adjusted Power = Injected AWGN Level - minimum antenna gain (Antenna 7, gain = 2.66dBi)

Note 2: Path Loss between antenna and RF connector is negligible. (0 dB)

Note 3: Margin = Regulated Threshold level - Adjusted Power

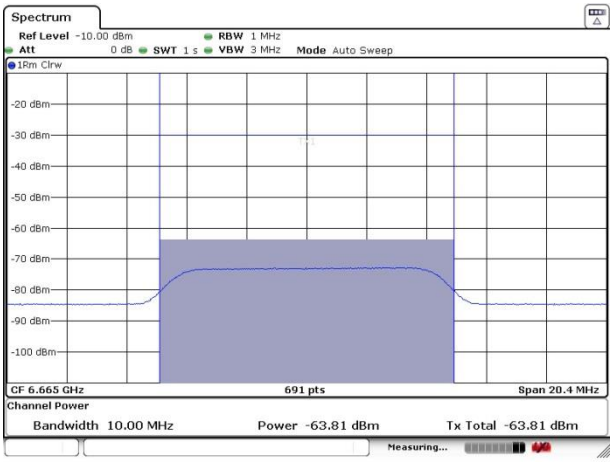
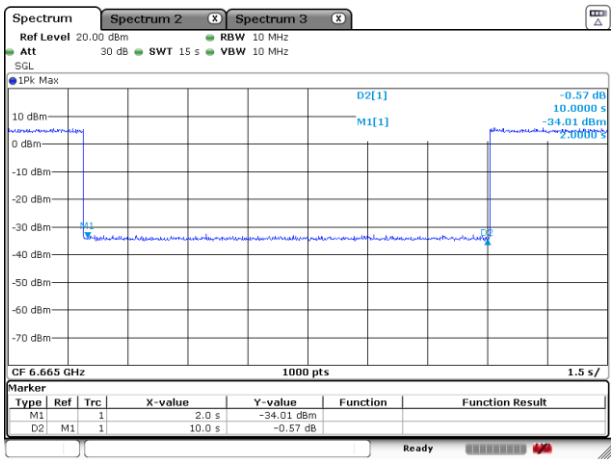
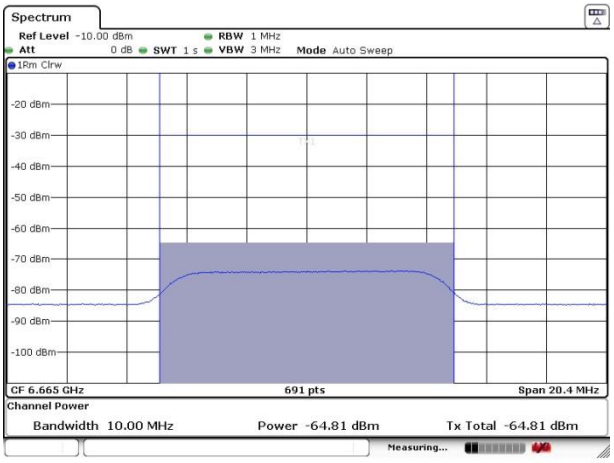
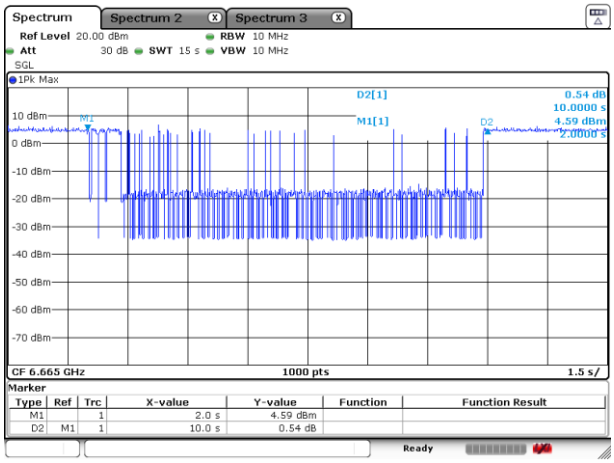
Band	Channel Freq. (MHz)	Channel BW (MHz)	Incumbent freq. (MHz)	Injected AWGN Level (dBm)	Detection Rate (%)	Regulated Threshold level (dBm)	Adjusted Power (dBm)	Margin (dB)
UNII Band 7	6695	20	6695	-69.25	100	-62	-71.91	9.91
					Result: Stop Transmission			
				-70.25	< 90	-62	-72.91	10.91
					Result: Minimal Operation			
				-71.31	0	-62	-73.97	11.97
					Result: Normal Operation			
	6665	160	6590	-67.21	100	-62	-69.87	7.87
					Result: Stop Transmission			
				-68.21	< 90	-62	-70.87	8.87
					Result: Minimal Operation			
				-69.49	0	-62	-72.15	10.15
					Result: Normal Operation			
			6665	-63.81 **(worst)**	100	-62	-66.47	4.47
					Result: Stop Transmission			
				-64.81	< 90	-62	-67.47	5.47
					Result: Minimal Operation			
				-66.55	0	-62	-69.21	7.21
					Result: Normal Operation			
			6740	-65.10	100	-62	-67.76	5.76
					Result: Stop Transmission			
				-66.10	< 90	-62	-68.76	6.76
					Result: Minimal Operation			
				-68.46	0	-62	-71.12	9.12
					Result: Normal Operation			

Note 1: Adjusted Power = Injected AWGN Level - minimum antenna gain (Antenna 7, gain = 2.66dBi)

Note 2: Path Loss between antenna and RF connector is negligible. (0 dB)

Note 3: Margin = Regulated Threshold level - Adjusted Power

3.5.7 Worst Case Plots of Contention Based Protocol

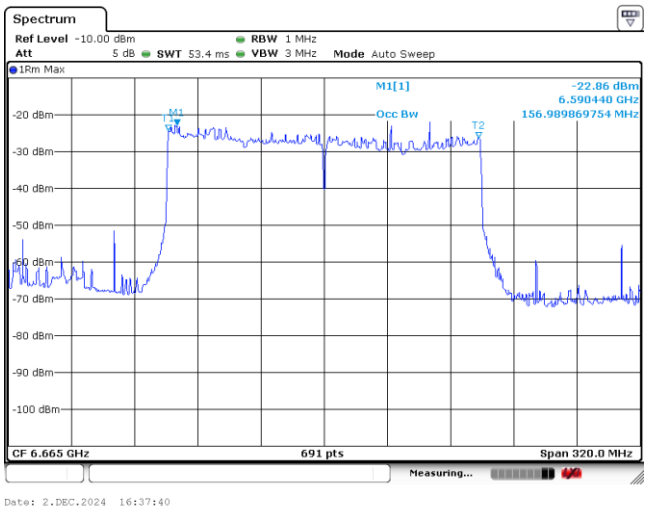
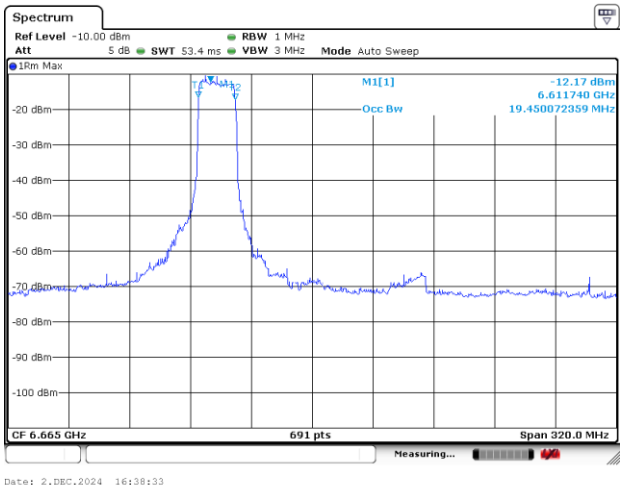
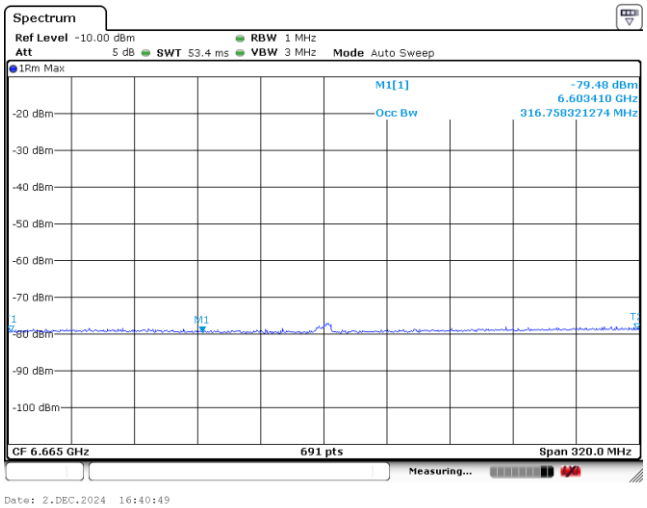
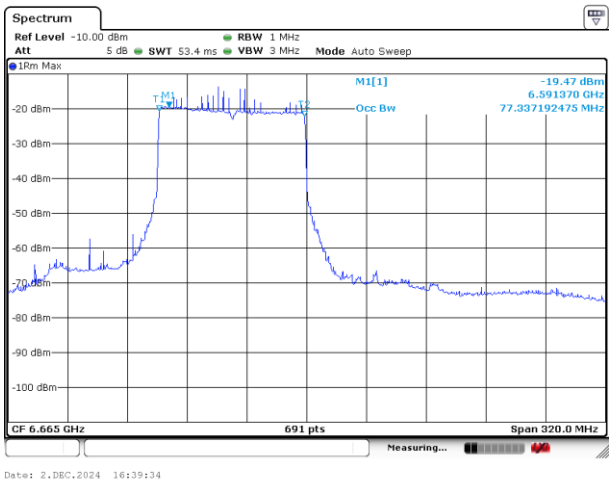
Contention Based Protocol Result Plots on U-NII 5/7 (AWGN Interference)	
802.11ax (HE160) / 6665MHz (Middle) Threshold Level (TL) = -63.81 dBm	802.11ax (HE160) / CH143 (Middle) Test result is pass due to no transmission occur.
	
802.11ax (HE160) / 6665MHz (Middle) Threshold Level (TL) = -64.81 dBm	802.11ax (HE160) / CH143 (Middle) Transmit when the interferer is 1dB lower.
	

Remark: M1: Injection of AWGN signal, D1: Removal of AWGN signal

3.5.8 Worst Case of Contention Based Protocol Transmission Bandwidth

Verify transmission absence when Incumbent signal at different frequency (frequency domain plots).

1. When Incumbent Signal inject at lowest frequency, the transmission bandwidth reduced to 20MHz;
2. When Incumbent Signal inject at middle frequency, the whole 160MHz bandwidth stop transmission;
3. When Incumbent Signal inject at highest frequency, the transmission bandwidth reduced to 80MHz;
4. This device does not support channel puncturing mode for incumbent avoidance but bandwidth reduction mechanism is supported.

UNII 7_CH149 (6665MHz / BW=160MHz)	
Non-Incumbent Signal	Incumbent freq @ 6590MHz
	
Incumbent freq @ 6665MHz	Incumbent freq @ 6740MHz
	

3.6 Transmit Power Control (TPC)

3.6.1 Limit of Transmit Power Control

<FCC 14-30 CFR 15.407>

(d)(10) Very low power devices operating in the 5.925-6.425 and 6.525-6.875 GHz bands shall employ a transmit power control (TPC) mechanism. A very low power device is required to have the capability to operate at least 6 dB below the maximum EIRP power spectral density (PSD) value of −5 dBm/MHz.

3.6.2 Measuring Instruments

See list of measuring equipment of this test report.

3.6.3 Test Procedures

The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01. Section F) Maximum power spectral density.

1. Configure EUT and companion device for peer-to-peer communication as shown in Figure 1.
2. Observe the power variation of the EUT at different output levels of the companion device and record the highest and lowest power levels.
3. Connect the RF port of the EUT to the spectrum analyzer and the Type-C port of the EUT to the notebook. (refer to Figure2).
4. Adjust the transmission power level until the EUT power value matches the highest power and lowest power value measured by the companion device. At this power level, measure the EUT PSD value and calculate the EIRP PSD result by combining it with the antenna gain.
5. Check the EIRP PSD results to ensure there is a 6dB fallback compared to the limit.

Test settings:

- Analyzer was set to the center frequency of the UNII channel under investigation.
- Set span to encompass the entire emission bandwidth (EBW) of the signal.
- Set RBW = 1 MHz.
- Set VBW ≥ 3 MHz.
- Number of points in sweep ≥ 2 Span / RBW.
- Sweep time = auto.
- Detector = RMS
- Trace average at least 100 traces in power averaging mode.
- Add 10 log(1/x), where x is the duty cycle, to the measured power in order to compute the average power during the actual transmission times. For example, add 10 log(1/0.25) = 6 dB if the duty cycle is 25 percent.

3.6.4 Test Setup

Figure 1

Figure 2

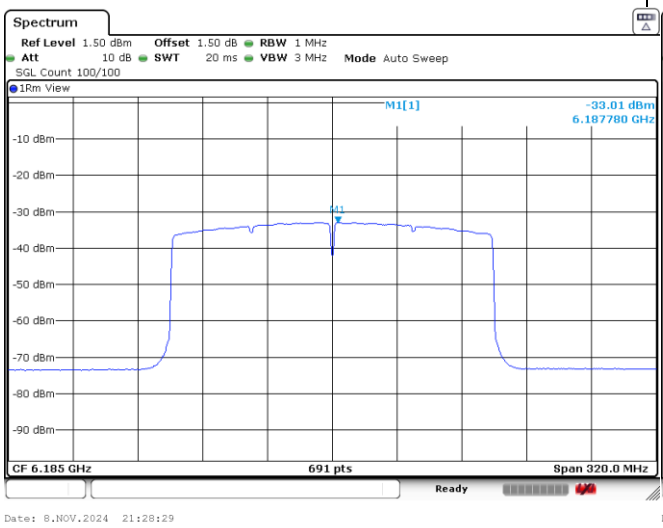
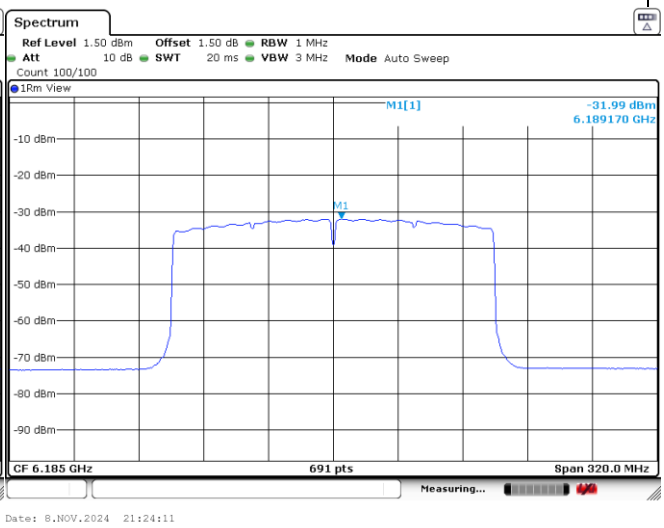
3.6.5 Support Unit used in test configuration and system

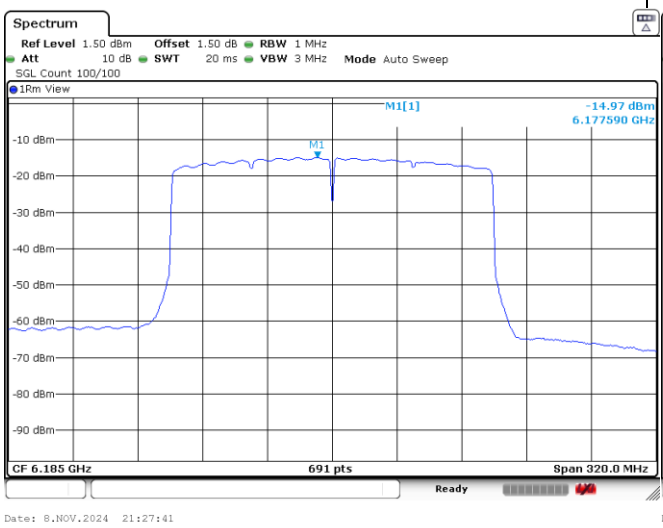
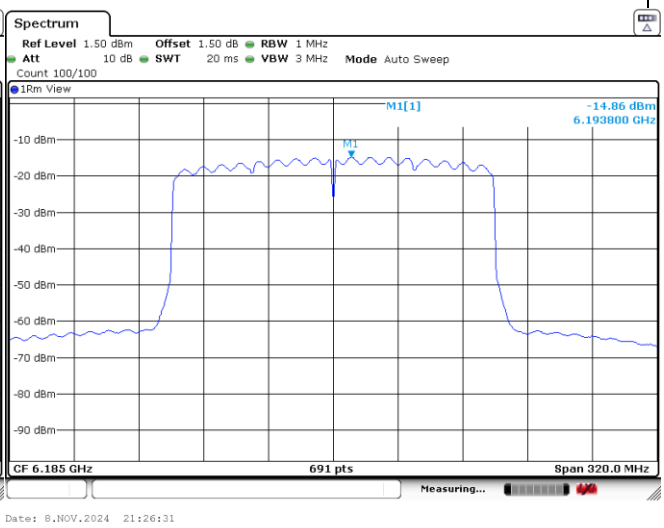
Instrument	Brand Name	Model No.	Characteristics
Notebook	DELL	Inspiron 3501	N/A
Universal radio communication tester (Companion Device)	Anritsu	MT8862A	Y202003005
Spectrum analyzer	R&S	FSV30	100845
Combiner (Power Divider)	MTJ Cooperation	MTJ7112	N/A
20dB attenuator	TOJOIN	SMA(JK)	DFS01KS01

3.6.6 Test Summary of Transmit Power Control Test

Frequency	Mode	Data rate	BW	Output Level	Conducted PSD (dBm/MHz)			Antenna Gain[1]	EIRP PSD	Pass/Fail[2]
					Port 1	Port 2	Port1+2			
(MHz)			(MHz)	(dBm)				(dBi)	(dBm/MHz)	
6185	802.11ax. 2*2MIMO	MCS0	160	-30	-33.01	-31.99	-29.46	6.56	-22.90	Pass, PSD Delta > 6dB
				-82	-14.97	-14.86	-11.9	6.56	-5.34	

Note 1: Directional gain for PSD = 6.56dBi, see section 3.9.3.
Note 2: The difference between the minimum EIRP PSD and -5 dBm/MHz is greater than 6dB.

At the lowest Power Level of EIRP	
Port 1 Conducted PSD	Port 2 Conducted PSD
	

At the highest Power Level of EIRP	
Port 1 Conducted PSD	Port 2 Conducted PSD
	

3.7 Unwanted Emissions Measurement

This section is to measure unwanted emissions through radiated measurement for band edge spurious emissions and out of band emissions measurement.

3.7.1 Limit of Unwanted Emissions

(1) For transmitters operating within the 5.925-7.125 GHz band: Any emissions outside of the 5.925-7.125 GHz band must not exceed an e.i.r.p. of −27 dBm/MHz.

EIRP (dBm)	Field Strength at 3m (dBµV/m)
- 27 (RMS)	68.3
- 7 (Peak)	88.3

Unwanted emissions outside of restricted bands are measured with a RMS detector.
In addition, 15.35(b) applies where the peak emissions must be limited to no more than 20 dB above the average limit

(2) Unwanted spurious emissions fallen in restricted bands shall comply with the general field strength limits as below table:

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

Note: The following formula is used to convert the EIRP to field strength.

$$E=\frac{1000000\sqrt{30P}}{3}$$ µV/m, where P is the eirp (Watts)

3.7.2 Measuring Instruments

See list of measuring equipment of this test report.

3.7.3 Test Procedures

1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01. Section G) Unwanted emissions measurement.

   (1) Procedure for Unwanted Emissions Measurements Below 1000MHz

   - RBW = 120 kHz
   - VBW = 300 kHz
   - Detector = Peak
   - Trace mode = max hold

   (2) Procedure for Peak Unwanted Emissions Measurements Above 1000 MHz

   - RBW = 1 MHz
   - VBW ≥ 3 MHz
   - Detector = Peak
   - Sweep time = auto
   - Trace mode = max hold

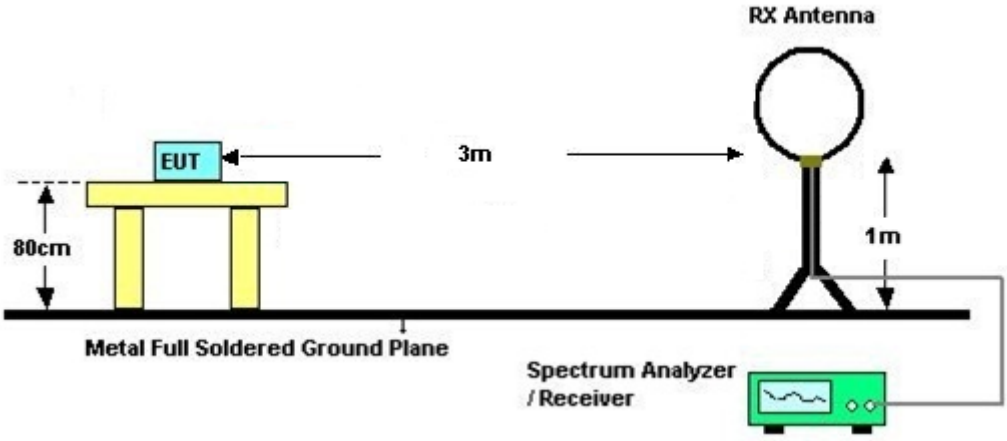
   (3) Procedures for Average Unwanted Emissions Measurements Above 1000MHz

   - RBW = 1 MHz
   - VBW = 10 Hz, when duty cycle is no less than 98 percent.
   - VBW ≥ 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.

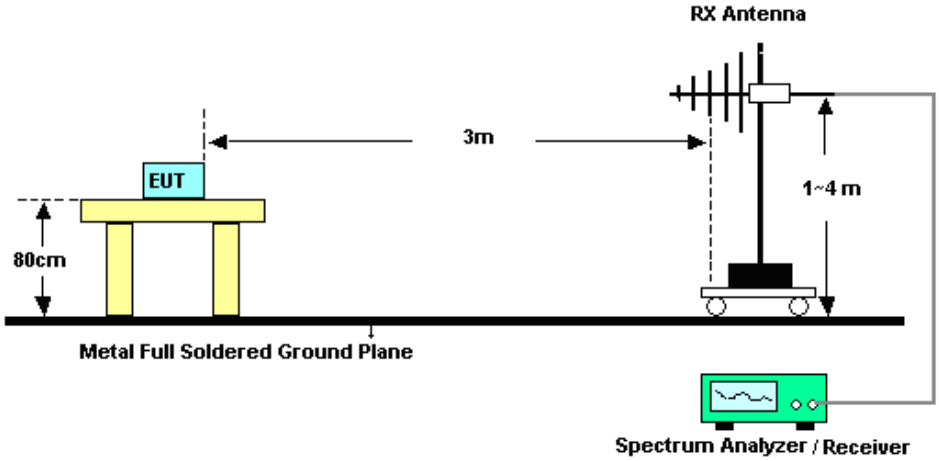
2. The EUT was placed on a turntable with 0.8 meter for frequency below 1GHz and 1.5 meter for frequency above 1GHz respectively above ground.
3. The EUT was set 3 meters from the interference receiving antenna which was mounted on the top of a variable height antenna tower.
4. The antenna is a broadband antenna and its height is adjusted between one meter and four meters above ground to find the maximum value of the field strength for both horizontal polarization and vertical polarization of the antenna.
5. For each suspected emission, the EUT was arranged to its worst case and then adjust the antenna tower (from 1 m to 4 m) and turntable (from 0 degree to 360 degrees) to find the maximum reading.
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 average 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.

3.7.4 Test Setup

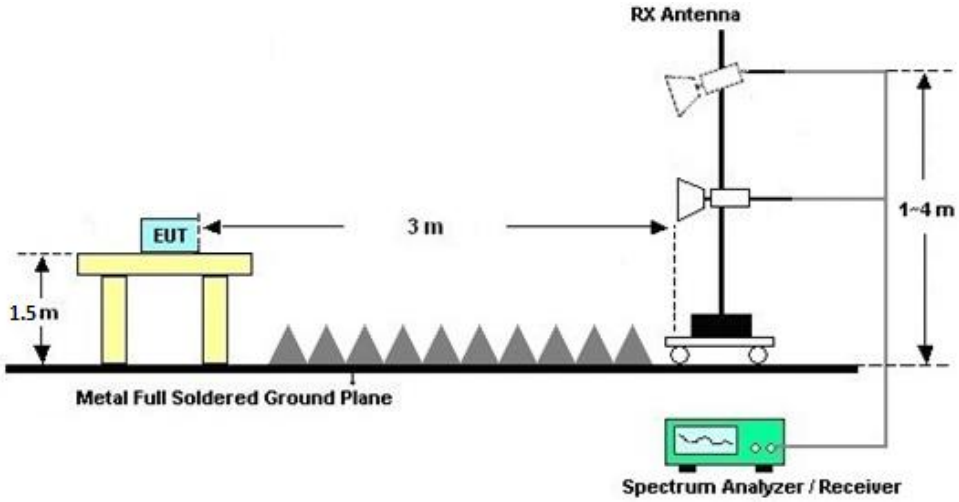
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



3.7.5 Test Results of Radiated Spurious Emissions (9 kHz ~ 30 MHz)

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 adequate comparison measurement of both open-field test site and alternative test site - semi-Anechoic chamber according to 414788 D01 Radiated Test Site v01r01, and the result came out very similar.

3.7.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix C

3.7.7 Duty Cycle

Please refer to Appendix D.

3.7.8 Test Result of Radiated Spurious Emissions (30MHz ~ 10th Harmonic)

Please refer to Appendix C.

The emission level above 18GHz is checked that the emission level is noise floor only, so it is not reflected in the report.

3.8 AC Conducted Emission Measurement

3.8.1 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.

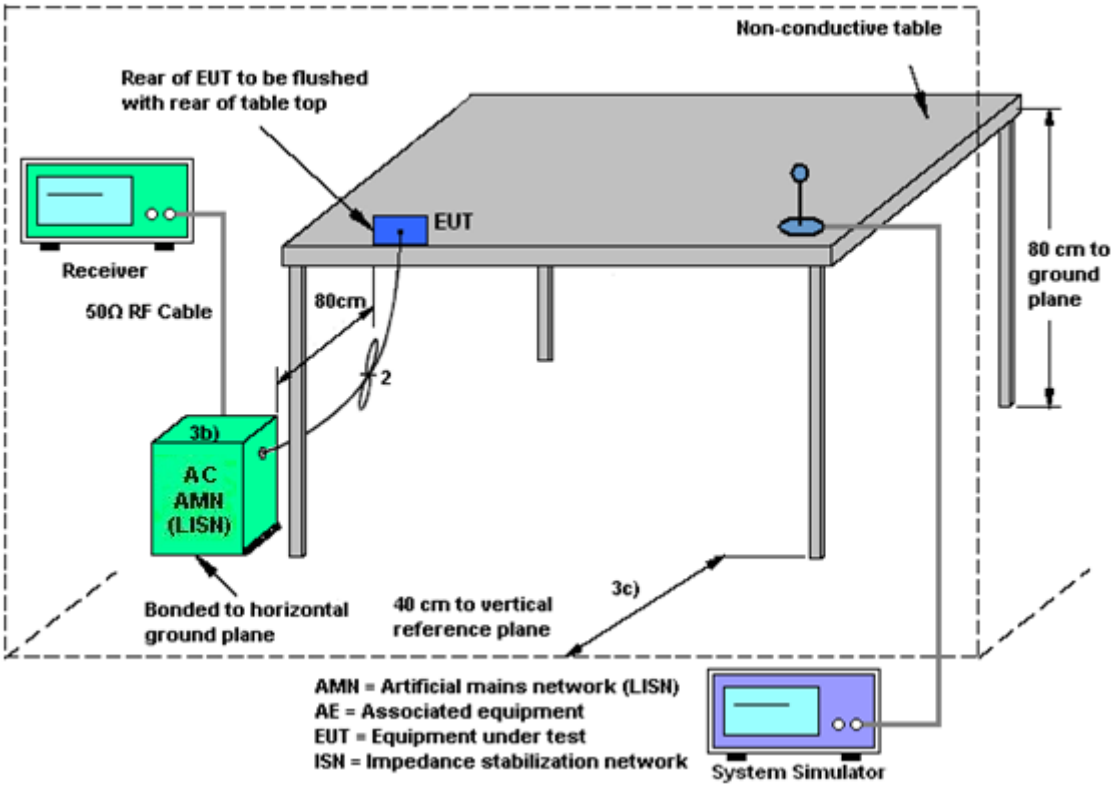
3.8.2 Measuring Instruments

See list of measuring equipment of this test report.

3.8.3 Test Procedures

1. The EUT was placed 0.4 meter from the conducting wall of the shielding room 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 with Maximum Hold Mode.

3.8.4 Test Setup



3.8.5 Test Result of AC Conducted Emission

Please refer to Appendix B.

3.9 Antenna Requirements

3.9.1 Standard Applicable

§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.

3.9.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used. The EUT complies with the requirement of 15.203.

3.9.3 Antenna Gain

<CDD Modes >

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

For CDD transmissions, directional gain is calculated as

For power, the directional gain GANT is set equal to the antenna having the highest gain, i.e.,

Directional gain = $G_{ANT\ MAX}$(Ant.1 Gain, Ant.2 Gain,…) + Array Gain, as following table for Power, where Array Gain = 0 dB (i.e., no array gain) for NANT ≤ 4;

For PSD, the directional gain calculation is following,

Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + \ldots + 10^{Gn/20})^2 / N_{ANT}]$ dBi, as following table for PSD.

N_{ANT} = number of transmit antennas

N_{SS} = number of spatial streams. (The worst case directional gain will occur when NSS = 1)

<CDD Modes>

	Ant. 7 (dBi)	Ant. 6 (dBi)	DG for Power (dBi)	DG for PSD (dBi)
U-NII-5	3.06	4.02	4.02	6.56
U-NII-7	2.66	4.61	4.61	6.70

4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101040	10Hz~40GHz	Oct. 10, 2024	Nov. 09, 2024	Oct. 09, 2025	Conducted (TH01-KS)
Pulse Power Senor	Anritsu	MA2411B	0917070	300MHz~40GHz	Jan. 02, 2024	Nov. 09, 2024	Jan. 01, 2025	Conducted (TH01-KS)
Power Meter	Anritsu	ML2495A	1005002	50MHz Bandwidth	Jan. 02, 2024	Nov. 09, 2024	Jan. 01, 2025	Conducted (TH01-KS)
Spectrum analyzer	R&S	FSV30	100845	50MHz Bandwidth	Apr 26, 2024	Nov. 08, 2024~ Nov. 11, 2024	Apr. 25, 2025	TPC (TH01-KS)
Combiner	MTJ Cooperation	MTJ7112	N/A	0.4-6GHz	NCR	Nov. 08, 2024~ Nov. 11, 2024	NCR	TPC (TH01-KS)
20dB attenuator	TOJOIN	SMA(JK)	DFS01KS01	2W/DC-18G	NCR	Nov. 08, 2024~ Nov. 11, 2024	NCR	TPC (TH01-KS)
EMI Test Receiver	Keysight	N9038A	MY57290151	3Hz~8.5GHz;Max 30dBm	Jul. 04, 2024	Nov. 05, 2024	Jul. 03, 2025	Radiation (03CH05-KS)
EXA Spectrum Analyzer	Keysight	N9010B	MY60242126	10Hz-44G,MAX 30dB	Oct. 10, 2024	Nov. 05, 2024	Oct. 09, 2025	Radiation (03CH05-KS)
Loop Antenna	R&S	HFH2-Z2E	101125	9kHz~30MHz	Sep. 08, 2024	Nov. 05, 2024	Sep. 07, 2025	Radiation (03CH05-KS)
Bilog Antenna	TeseQ	CBL6111D	49921	30MHz-1GHz	Apr. 18, 2024	Nov. 05, 2024	Apr. 17, 2025	Radiation (03CH05-KS)
Double Ridge Horn Antenna	ETS-Lindgren	3117	00218642	1GHz~18GHz	Apr. 11, 2024	Nov. 05, 2024	Apr. 10, 2025	Radiation (03CH05-KS)
SHF-EHF Horn	Com-power	AH-840	101093	18GHz~40GHz	Jan. 06, 2024	Nov. 05, 2024	Jan. 05, 2025	Radiation (03CH05-KS)
Amplifier	SONOMA	310N	381512	9KHz-1GHz	Jan. 02, 2024	Nov. 05, 2024	Jan. 01, 2025	Radiation (03CH05-KS)
Amplifier	EM	EM18G40GA	060852	18~40GHz	Jan. 02, 2024	Nov. 05, 2024	Jan. 01, 2025	Radiation (03CH05-KS)
high gain Amplifier	EM	EM01G18GA	060843	1Ghz-18Ghz	Jan. 03, 2024	Nov. 05, 2024	Jan. 02, 2025	Radiation (03CH05-KS)
Amplifier	EM	EM01G18GA	060833	1Ghz-18Ghz	Jan. 03, 2024	Nov. 05, 2024	Jan. 02, 2025	Radiation (03CH05-KS)
AC Power Source	Chroma	61601	F104090004	N/A	NCR	Nov. 05, 2024	NCR	Radiation (03CH05-KS)
Turn Table	ChamPro	EM 1000-T	060762-T	0~360 degree	NCR	Nov. 05, 2024	NCR	Radiation (03CH05-KS)
Antenna Mast	ChamPro	EM 1000-A	060762-A	1 m~4 m	NCR	Nov. 05, 2024	NCR	Radiation (03CH05-KS)
EMI Receiver	R&S	ESCI7	100768	9kHz~7GHz;	Apr. 18, 2024	Oct. 16, 2024	Apr. 17, 2025	Conduction (CO01-KS)
AC LISN (for auxiliary equipment)	MessTec	AN3016	060103	9kHz~30MHz	Aug. 20, 2024	Oct. 16, 2024	Aug. 19, 2025	Conduction (CO01-KS)
AC LISN	MessTec	AN3016	060105	9kHz~30MHz	Apr. 18, 2024	Oct. 16, 2024	Apr. 17, 2025	Conduction (CO01-KS)
AC Power Source	Chroma	61602	ABP000000811	AC 0V~300V, 45Hz~1000Hz	Oct. 09, 2024	Oct. 16, 2024	Oct. 08, 2025	Conduction (CO01-KS)
Signal Analyzer	R&S	FSV7	101472	10Hz~7GHz	Jan. 02, 2024	Nov. 04, 2024~ Dec. 02, 2024	Jan. 01, 2025	CBP (DFS01-KS)
MXG-B RF Vector Signal Genertor	Keysight	5182B /5182BX07	MY56200417/MY59360210	9kHz~7.2GHz	Apr. 17, 2024	Nov. 04, 2024~ Dec. 02, 2024	Apr. 16, 2025	CBP (DFS01-KS)
Combiner	MTJ Cooperation	MTJ7112	N/A	0.4-6GHz	NCR	Nov. 04, 2024~ Dec. 02, 2024	NCR	CBP (DFS01-KS)

NCR: No Calibration Required

5 Measurement Uncertainty

Uncertainty of Conducted Measurement

Conducted Spurious Emission & Bandedge	±2.22 dB
Occupied Channel Bandwidth	±0.1%
Conducted Power	±0.50 dB
Conducted Power Spectral Density	±0.90 dB
Frequency	±0.4 Hz
Conducted Generated signal Levels	±0.56 dB
Conducted Time	0.54%

Uncertainty of AC Conducted Emission Measurement (0.15 MHz ~ 30 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	2.84 dB

Uncertainty of Radiated Emission Measurement (9 KHz ~ 30 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	3.30 dB

Uncertainty of Radiated Emission Measurement (30 MHz ~ 1000 MHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	6.02 dB

Uncertainty of Radiated Emission Measurement (1 GHz ~ 18 GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	5.22 dB

Uncertainty of Radiated Emission Measurement (18 GHz ~ 40 GHz)

Measuring Uncertainty for a Level of Confidence of 95% (U = 2Uc(y))	5.34 dB

---------- THE END ----------

Appendix A. Conducted Test Results

A1. Conducted Test Results

Test Engineer:	Jiang Jun	Temperature:	21~25	°C
Test Date:	2024.11.09	Relative Humidity:	51~54	%

Report Number : FR4O1001

TEST RESULTS DATA
EIRP Power Table

UNII-5 MIMO																
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)		Conducted Power with duty factor (dBm)			DG (dBi)		EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail	Power Setting	
					Ant 7	Ant 6	Ant 7	Ant 6	SUM	Ant 7	Ant 6	SUM			Ant 7	Ant 6
11a	6Mbps	2	001	5955	0.04	0.04	-3.18	-3.37	-0.26	4.02		3.76	14.00	Pass	-2	
11a	6Mbps	2	045	6175	0.04	0.04	-3.67	-3.60	-0.62	4.02		3.40	14.00	Pass	-2	
11a	6Mbps	2	093	6415	0.04	0.04	-3.55	-3.57	-0.55	4.02		3.47	14.00	Pass	-2.5	

Report Number : FR4O1001

TEST RESULTS DATA
EIRP Power Table

UNII-5 MIMO																	
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	RU Config.	Duty Factor (dB)		Conducted Power with duty factor (dBm)			DG (dBi)		EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail	Power Setting	
						Ant 7	Ant 6	Ant 7	Ant 6	SUM	Ant 7	Ant 6	SUM			Ant 7	Ant 6
HE20	MCS0	2	001	5955	Full	0.00	0.00	-2.68	-2.72	0.31	4.02		4.33	14.00	Pass	-1.5	
HE20	MCS0	2	001	5955	26/0	0.00	0.00	-12.76	-12.24	-9.48	4.02		-5.46	14.00	Pass	-10.5	
HE20	MCS0	2	001	5955	52/37	0.00	0.00	-10.06	-9.15	-6.57	4.02		-2.55	14.00	Pass	-7.5	
HE20	MCS0	2	001	5955	106/53	0.00	0.00	-7.12	-5.68	-3.33	4.02		0.69	14.00	Pass	-4.5	
HE20	MCS0	2	045	6175	Full	0.00	0.00	-3.12	-2.93	-0.01	4.02		4.01	14.00	Pass	-1.5	
HE20	MCS0	2	045	6175	26/0	0.00	0.00	-12.82	-12.26	-9.52	4.02		-5.50	14.00	Pass	-10.5	
HE20	MCS0	2	045	6175	52/37	0.00	0.00	-10.07	-9.14	-6.57	4.02		-2.55	14.00	Pass	-7.5	
HE20	MCS0	2	045	6175	106/53	0.00	0.00	-7.16	-5.74	-3.38	4.02		0.64	14.00	Pass	-4.5	
HE20	MCS0	2	093	6415	Full	0.00	0.00	-2.89	-2.93	0.10	4.02		4.12	14.00	Pass	-2	
HE20	MCS0	2	093	6415	26/8	0.00	0.00	-12.81	-12.27	-9.52	4.02		-5.50	14.00	Pass	-11	
HE20	MCS0	2	093	6415	52/40	0.00	0.00	-10.02	-9.11	-6.53	4.02		-2.51	14.00	Pass	-8	
HE20	MCS0	2	093	6415	106/54	0.00	0.00	-6.86	-5.82	-3.30	4.02		0.72	14.00	Pass	-5	
HE40	MCS0	2	003	5965	Full	0.00	0.00	-0.22	-0.12	2.84	4.02		6.86	14.00	Pass	0.5	
HE40	MCS0	2	043	6165	Full	0.00	0.00	-0.25	0.34	3.07	4.02		7.09	14.00	Pass	1.5	
HE40	MCS0	2	091	6405	Full	0.00	0.00	0.05	0.53	3.31	4.02		7.33	14.00	Pass	1	
HE80	MCS0	2	007	5985	Full	0.00	0.00	2.98	3.24	6.12	4.02		10.14	14.00	Pass	3.5	
HE80	MCS0	2	039	6145	Full	0.00	0.00	2.24	2.70	5.49	4.02		9.51	14.00	Pass	3.5	
HE80	MCS0	2	087	6385	Full	0.00	0.00	2.36	3.21	5.82	4.02		9.84	14.00	Pass	3.5	
HE160	MCS0	2	015	6025	Full	0.00	0.00	6.48	5.72	9.13	4.02		13.15	14.00	Pass	5	
HE160	MCS0	2	047	6185	Full	0.00	0.00	6.33	5.82	9.09	4.02		13.11	14.00	Pass	5.5	
HE160	MCS0	2	079	6345	Full	0.00	0.00	6.12	5.38	8.78	4.02		12.80	14.00	Pass	5	

Report Number : FR4O1001

TEST RESULTS DATA
EIRP Power Table

UNII-7 MIMO																
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)		Conducted Power with duty factor (dBm)			DG (dBi)		EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail	Power Setting	
					Ant 7	Ant 6	Ant 7	Ant 6	SUM	Ant 7	Ant 6	SUM			Ant 7	Ant 6
11a	6Mbps	2	117	6535	0.04	0.04	-3.05	-3.13	-0.08	4.61		4.53	14.00	Pass	-2.5	
11a	6Mbps	2	149	6695	0.04	0.04	-3.73	-2.82	-0.24	4.61		4.37	14.00	Pass	-2.5	
11a	6Mbps	2	181	6855	0.04	0.04	-3.09	-3.37	-0.22	4.61		4.39	14.00	Pass	-2.5	

Report Number : FR4O1001

TEST RESULTS DATA
EIRP Power Table

UNII-7 MIMO																	
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	RU Config.	Duty Factor (dB)		Conducted Power with duty factor (dBm)			DG (dBi)		EIRP Power (dBm)	EIRP Power Limit (dBm)	Pass /Fail	Power Setting	
						Ant 7	Ant 6	Ant 7	Ant 6	SUM	Ant 7	Ant 6	SUM			Ant 7	Ant 6
HE20	MCS0	2	117	6535	Full	0.00	0.00	-2.98	-3.02	0.01	4.61		4.62	14.00	Pass	-2.5	
HE20	MCS0	2	117	6535	26/0	0.00	0.00	-12.94	-12.15	-9.52	4.61		-4.91	14.00	Pass	-11.5	
HE20	MCS0	2	117	6535	52/37	0.00	0.00	-10.14	-9.16	-6.61	4.61		-2.00	14.00	Pass	-8.5	
HE20	MCS0	2	117	6535	106/53	0.00	0.00	-7.01	-5.95	-3.44	4.61		1.17	14.00	Pass	-5.5	
HE20	MCS0	2	149	6695	Full	0.00	0.00	-3.63	-2.77	-0.17	4.61		4.44	14.00	Pass	-2.5	
HE20	MCS0	2	149	6695	26/0	0.00	0.00	-13.63	-11.77	-9.59	4.61		-4.98	14.00	Pass	-11.5	
HE20	MCS0	2	149	6695	52/37	0.00	0.00	-10.92	-8.78	-6.71	4.61		-2.10	14.00	Pass	-8.5	
HE20	MCS0	2	149	6695	106/53	0.00	0.00	-7.70	-5.65	-3.54	4.61		1.07	14.00	Pass	-5.5	
HE20	MCS0	2	181	6855	Full	0.00	0.00	-3.11	-3.31	-0.20	4.61		4.41	14.00	Pass	-2	
HE20	MCS0	2	181	6855	26/8	0.00	0.00	-12.24	-11.74	-8.97	4.61		-4.36	14.00	Pass	-11	
HE20	MCS0	2	181	6855	52/40	0.00	0.00	-9.71	-8.92	-6.29	4.61		-1.68	14.00	Pass	-8	
HE20	MCS0	2	181	6855	106/54	0.00	0.00	-6.70	-5.83	-3.23	4.61		1.38	14.00	Pass	-5	
HE40	MCS0	2	123	6565	Full	0.00	0.00	-0.11	0.25	3.08	4.61		7.69	14.00	Pass	0.5	
HE40	MCS0	2	147	6685	Full	0.00	0.00	0.11	0.53	3.34	4.61		7.95	14.00	Pass	1	
HE40	MCS0	2	179	6845	Full	0.00	0.00	0.32	0.48	3.41	4.61		8.02	14.00	Pass	0.5	
HE80	MCS0	2	135	6625	Full	0.00	0.00	3.04	3.84	6.47	4.61		11.08	14.00	Pass	3.5	
HE80	MCS0	2	151	6705	Full	0.00	0.00	3.18	3.24	6.22	4.61		10.83	14.00	Pass	3.5	
HE80	MCS0	2	167	6785	Full	0.00	0.00	3.87	3.68	6.79	4.61		11.40	14.00	Pass	3	
HE160	MCS0	2	143	6665	Full	0.00	0.00	6.04	5.47	8.77	4.61		13.38	14.00	Pass	5.5	

Emission Bandwidth

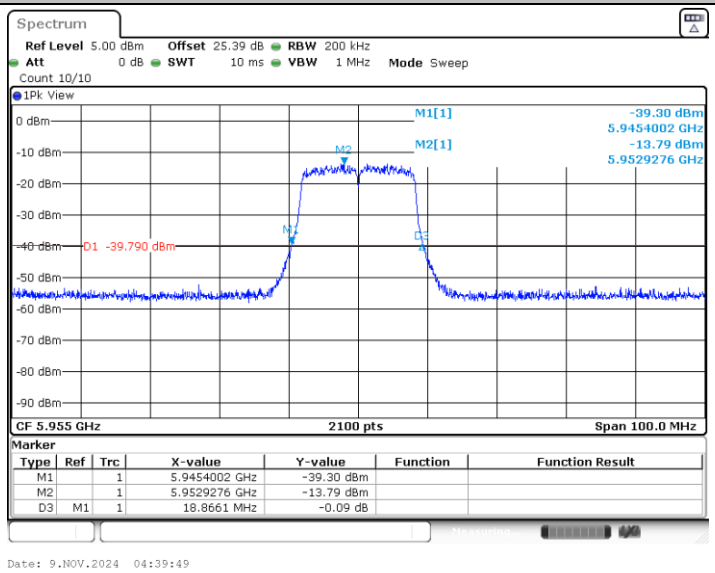
Test Result

TestMode	Antenna	Freq(MHz)	26dB EBW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A-CDD	Ant7	5955	18.87	5945.40	5964.27	320	PASS
	Ant6	5955	19.06	5945.45	5964.50	320	PASS
	Ant7	6175	19.01	6165.45	6184.46	320	PASS
	Ant6	6175	19.01	6165.45	6184.46	320	PASS
	Ant7	6415	18.77	6405.50	6424.27	320	PASS
	Ant6	6415	18.87	6405.64	6424.50	320	PASS
	Ant7	6535	18.91	6525.40	6544.31	320	PASS
	Ant6	6535	19.25	6525.35	6544.60	320	PASS
	Ant7	6695	18.87	6685.45	6704.31	320	PASS
	Ant6	6695	18.87	6685.64	6704.50	320	PASS
	Ant7	6855	18.63	6845.59	6864.22	320	PASS
	Ant6	6855	18.77	6845.69	6864.46	320	PASS
11AX20MIMO	Ant7	5955	20.77	5944.64	5965.41	320	PASS
	Ant6	5955	20.53	5944.73	5965.27	320	PASS
	Ant7	6175	20.68	6164.59	6185.27	320	PASS
	Ant6	6175	20.68	6164.64	6185.31	320	PASS
	Ant7	6415	20.72	6404.69	6425.41	320	PASS
	Ant6	6415	20.82	6404.64	6425.46	320	PASS
	Ant7	6535	20.91	6524.49	6545.41	320	PASS
	Ant6	6535	20.77	6524.59	6545.36	320	PASS
	Ant7	6695	20.72	6684.59	6705.31	320	PASS
	Ant6	6695	20.82	6684.49	6705.31	320	PASS
	Ant7	6855	20.77	6844.64	6865.41	320	PASS
	Ant6	6855	20.82	6844.69	6865.51	320	PASS
11AX40MIMO	Ant7	5965	40.40	5944.75	5985.15	320	PASS
	Ant6	5965	40.40	5944.85	5985.25	320	PASS
	Ant7	6165	40.50	6144.66	6185.15	320	PASS
	Ant6	6165	40.30	6144.85	6185.15	320	PASS
	Ant7	6405	40.69	6384.56	6425.25	320	PASS
	Ant6	6405	40.59	6384.75	6425.34	320	PASS
	Ant7	6565	40.50	6544.75	6585.25	320	PASS
	Ant6	6565	40.30	6544.75	6585.06	320	PASS
	Ant7	6685	40.78	6664.47	6705.25	320	PASS

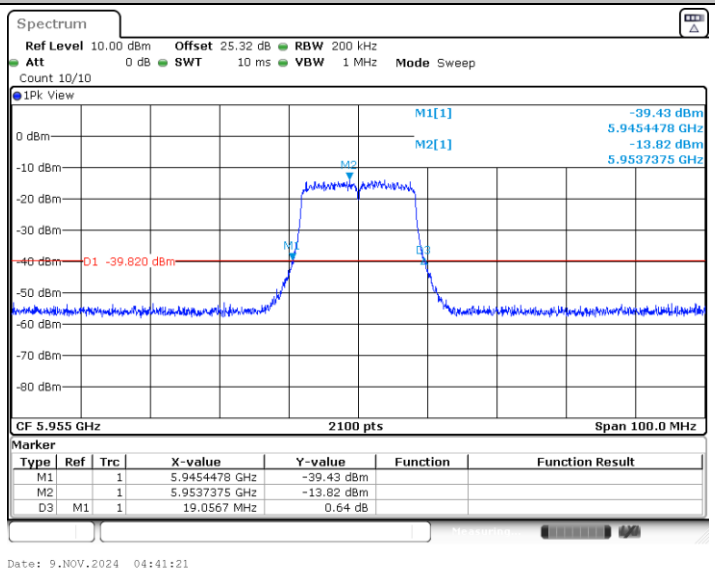
	Ant6	6685	40.59	6664.66	6705.25	320	PASS
	Ant7	6845	40.50	6824.66	6865.15	320	PASS
	Ant6	6845	40.02	6824.94	6864.96	320	PASS
11AX80MIMO	Ant7	5985	82.32	5943.74	6026.07	320	PASS
	Ant6	5985	81.94	5943.93	6025.88	320	PASS
	Ant7	6145	81.94	6103.93	6185.88	320	PASS
	Ant6	6145	82.52	6103.74	6186.26	320	PASS
	Ant7	6385	82.52	6343.74	6426.26	320	PASS
	Ant6	6385	82.13	6343.74	6425.88	320	PASS
	Ant7	6625	82.32	6583.74	6666.07	320	PASS
	Ant6	6625	81.94	6584.31	6666.26	320	PASS
	Ant7	6705	81.94	6663.93	6745.88	320	PASS
	Ant6	6705	82.13	6663.74	6745.88	320	PASS
	Ant7	6785	82.13	6744.12	6826.26	320	PASS
	Ant6	6785	82.13	6743.93	6826.07	320	PASS
11AX160MIMO	Ant7	6025	166.17	5941.72	6107.90	320	PASS
	Ant6	6025	165.41	5941.72	6107.13	320	PASS
	Ant7	6185	165.03	6102.48	6267.52	320	PASS
	Ant6	6185	165.41	6102.48	6267.90	320	PASS
	Ant7	6345	165.03	6262.48	6427.52	320	PASS
	Ant6	6345	165.41	6262.48	6427.90	320	PASS
	Ant7	6665	165.41	6581.34	6746.75	320	PASS
	Ant6	6665	164.27	6582.48	6746.75	320	PASS

Test Graphs

11A-CDD_Ant7_5955



11A-CDD_Ant6_5955



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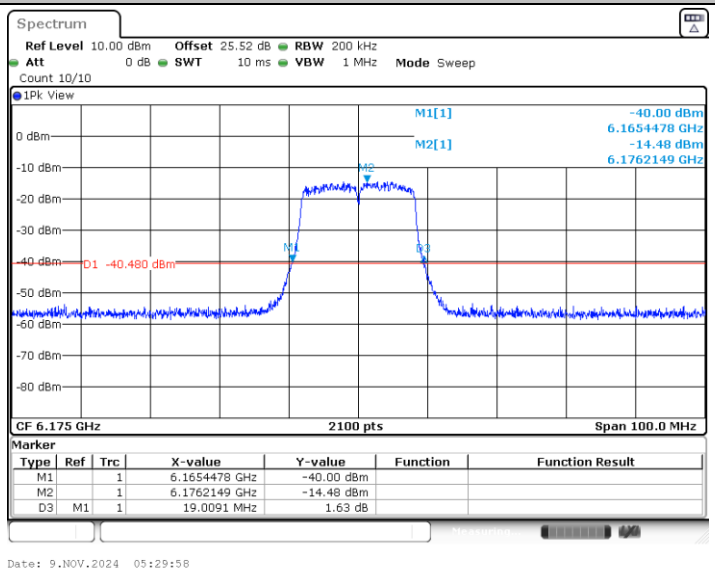

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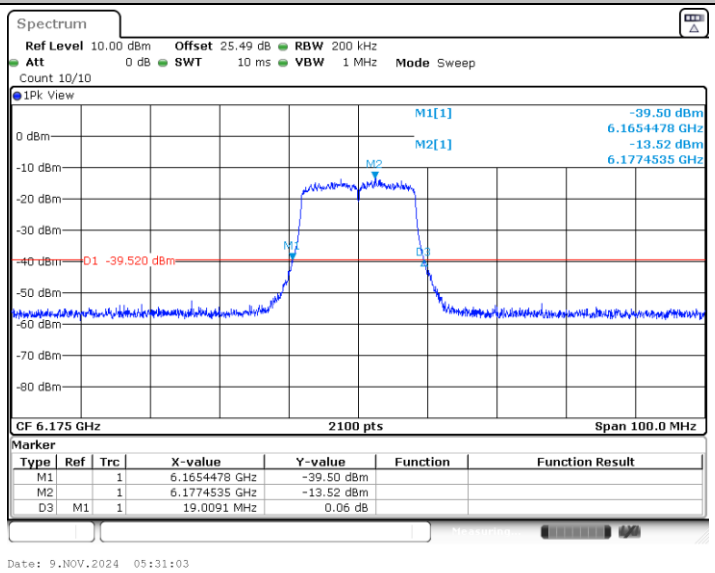

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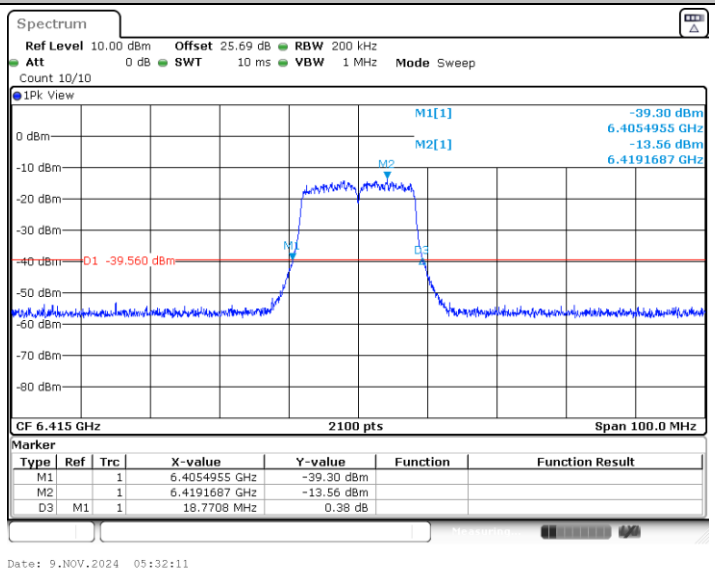

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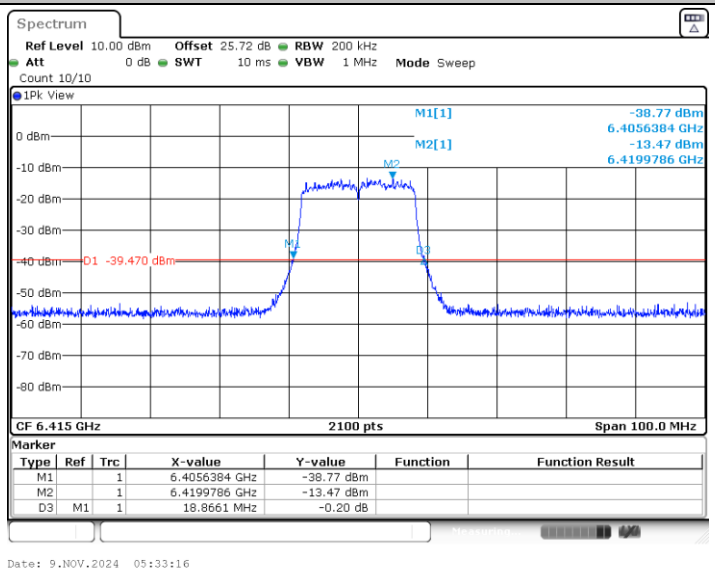

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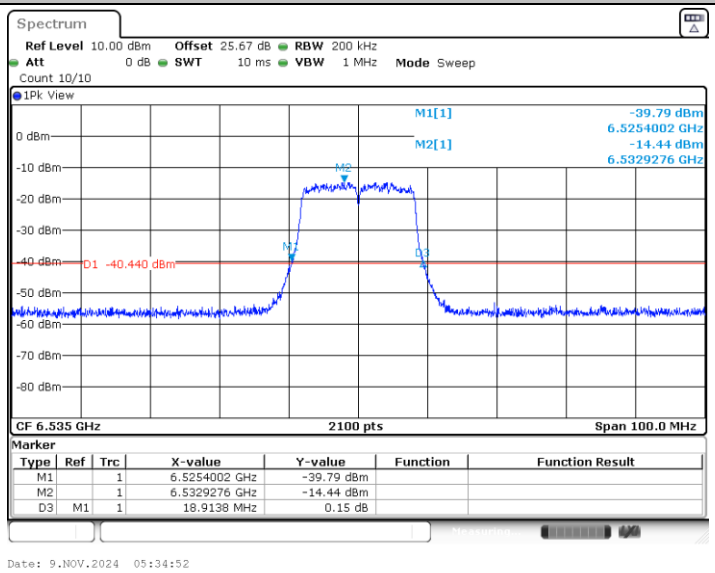

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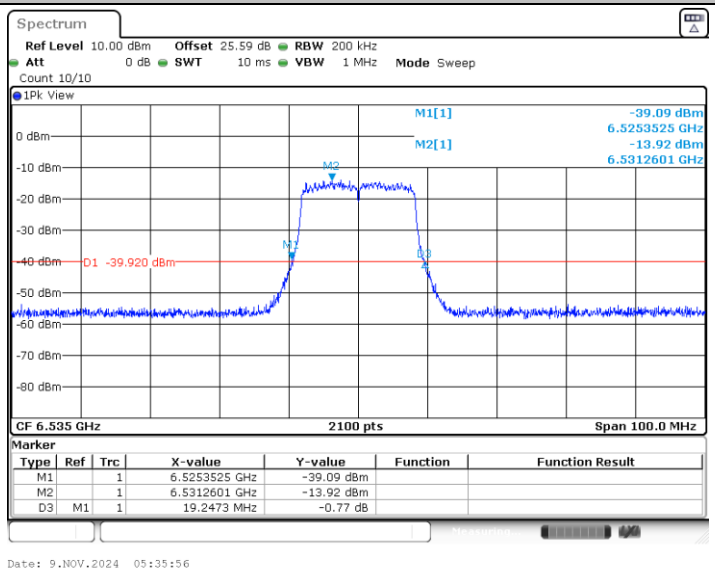

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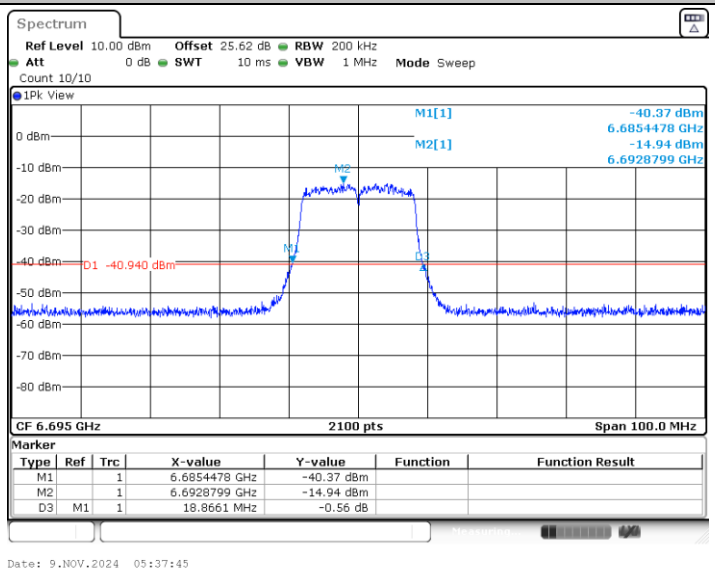

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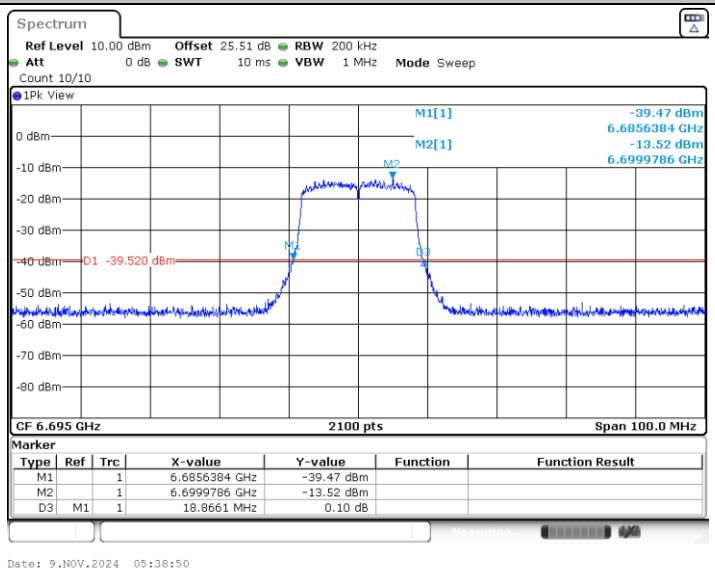

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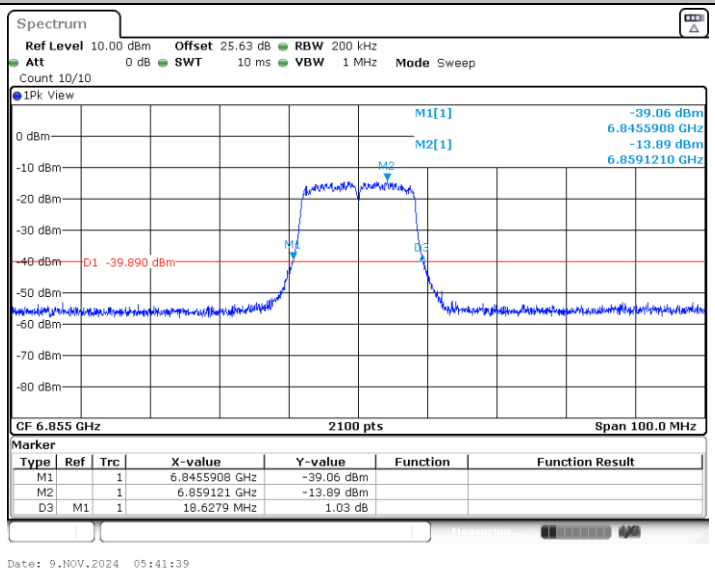

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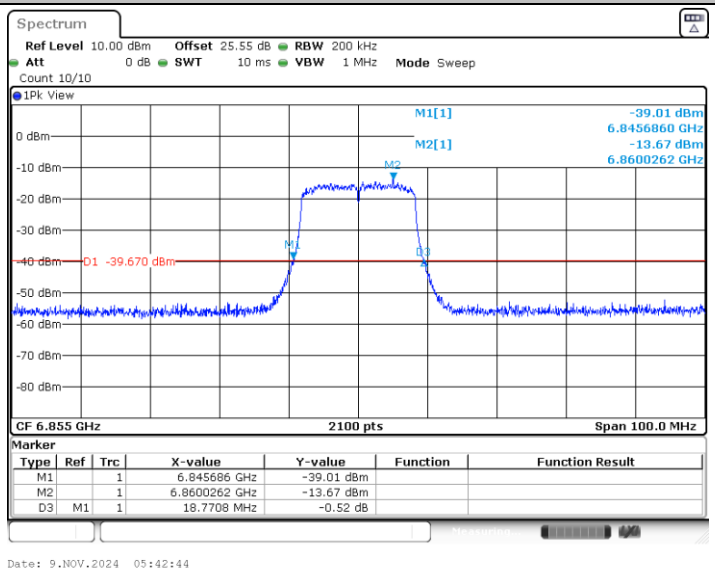
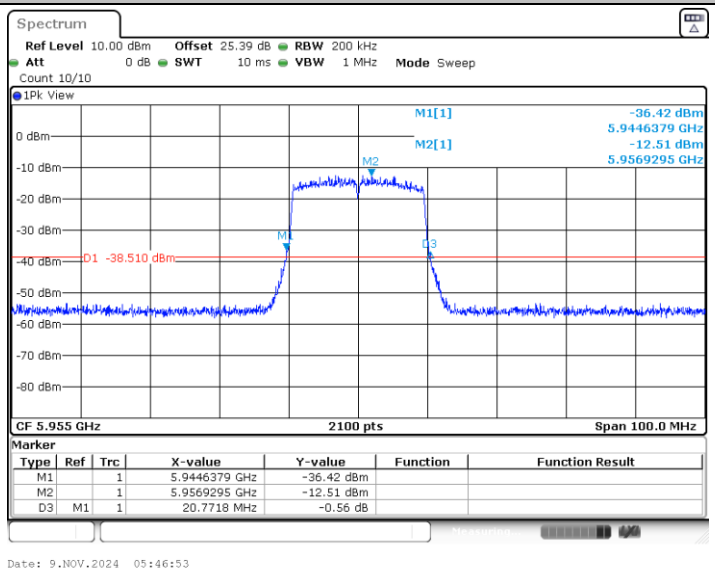
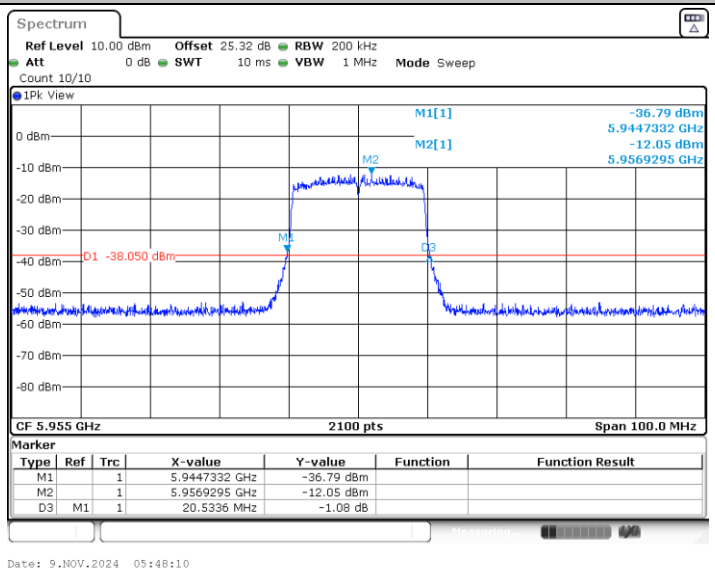


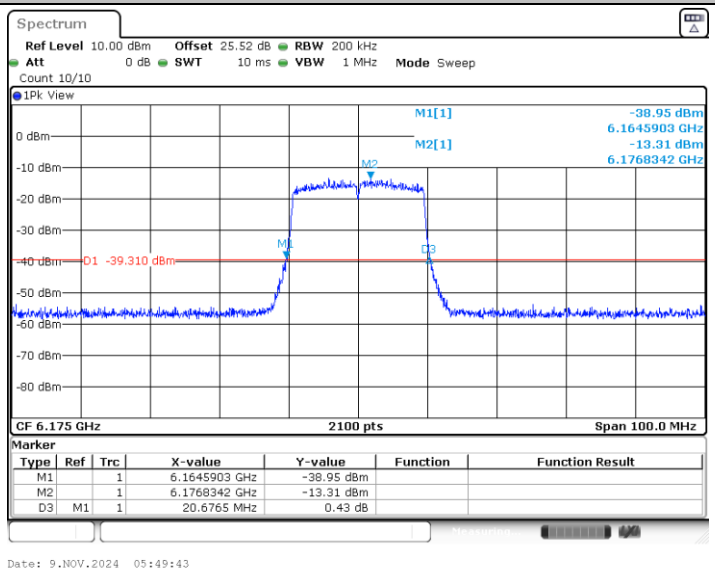
11AX20MIMO_Ant7_5955



11AX20MIMO_Ant6_5955



11AX20MIMO_Ant7_6175



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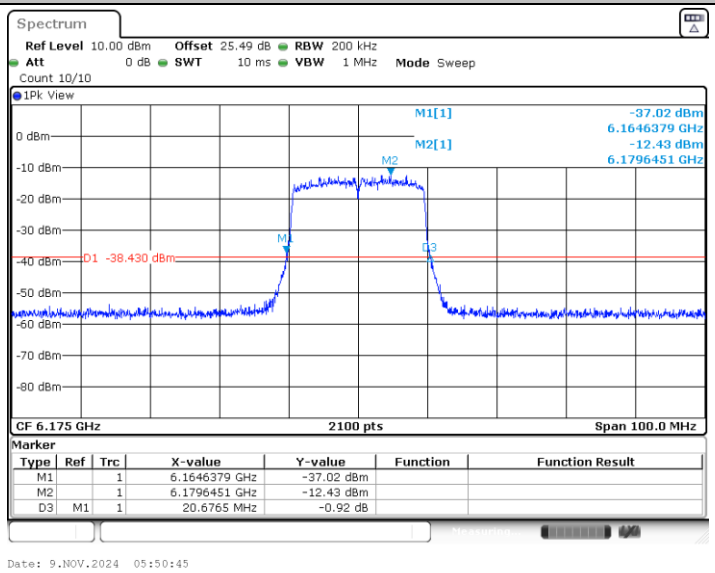
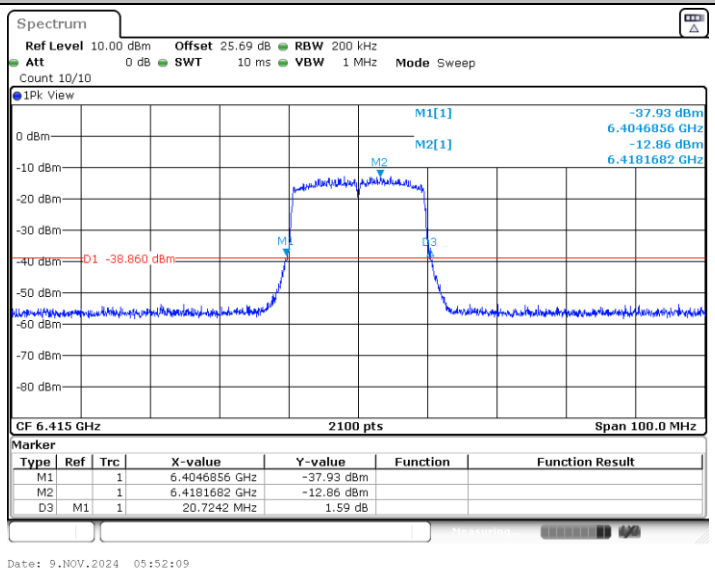


11AX20MIMO_Ant7_6415



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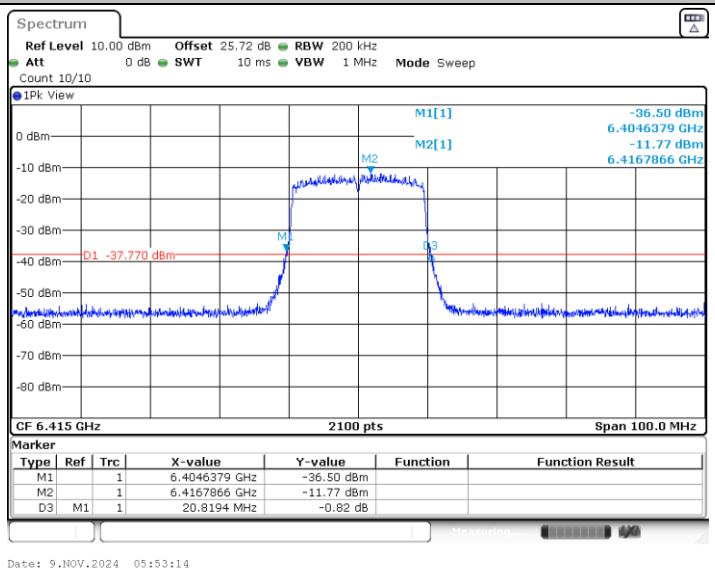

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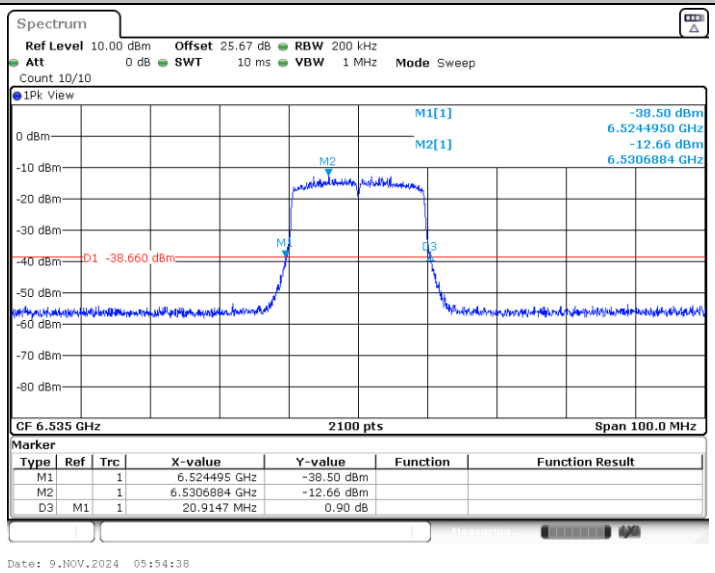

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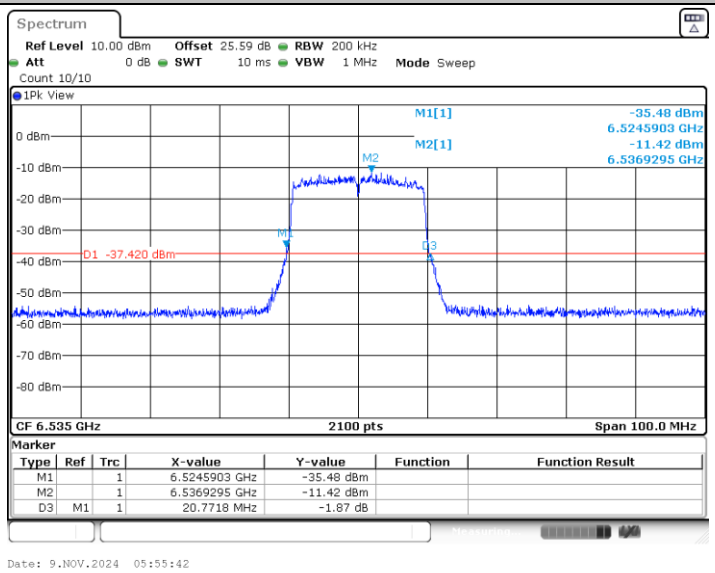
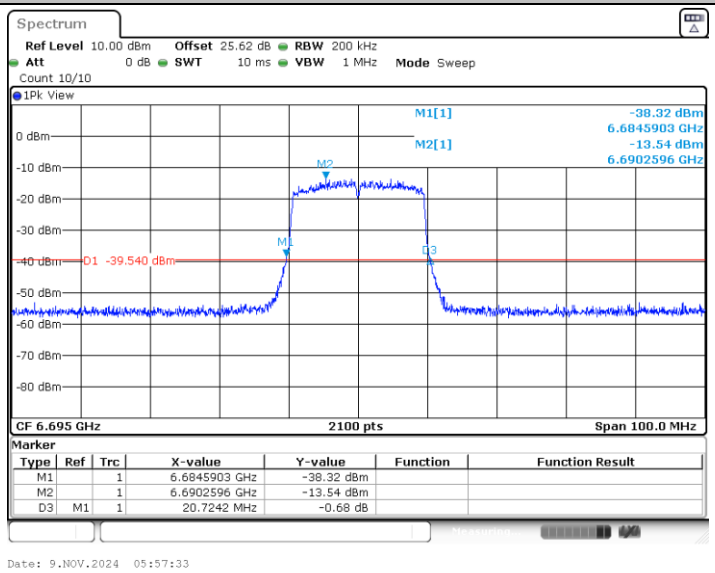
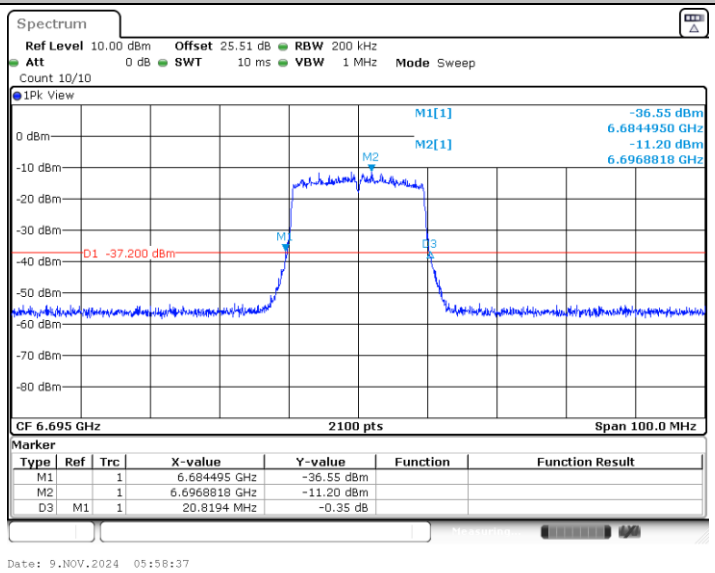


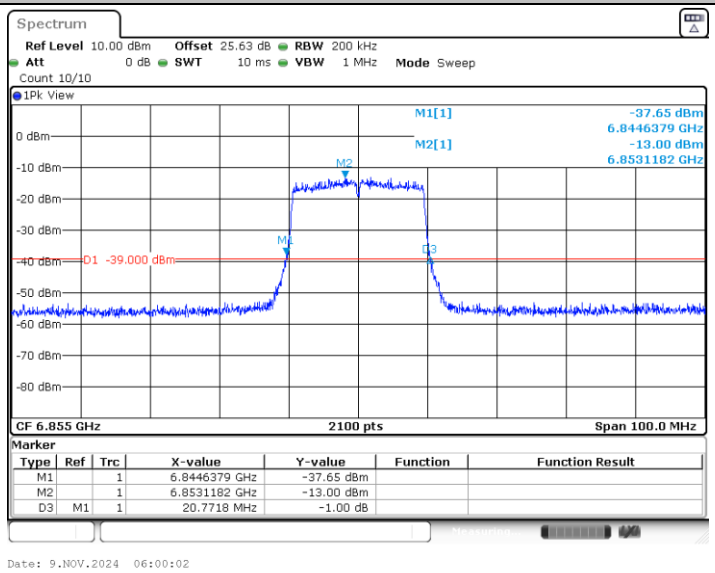
11AX20MIMO_Ant7_6695



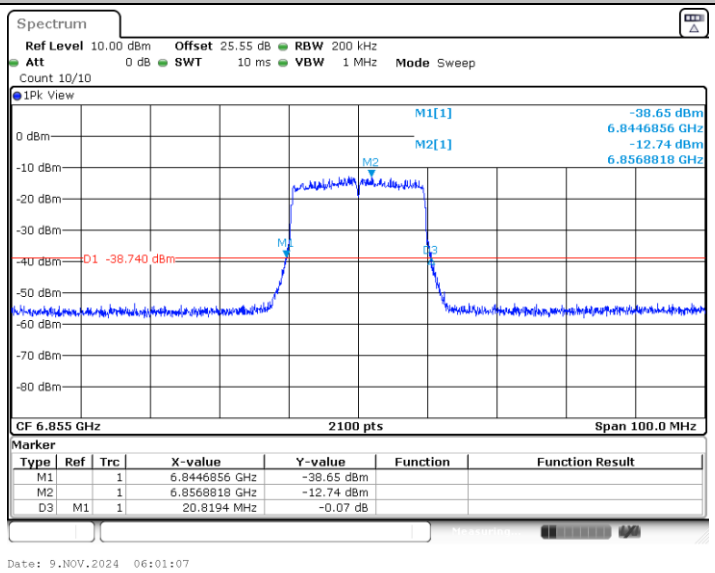
11AX20MIMO_Ant6_6695



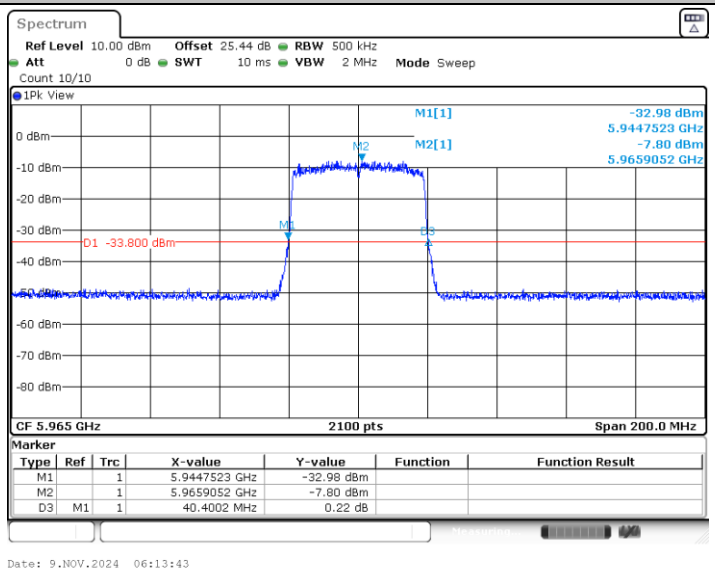
11AX20MIMO_Ant7_6855



11AX20MIMO_Ant6_6855



11AX40MIMO_Ant7_5965



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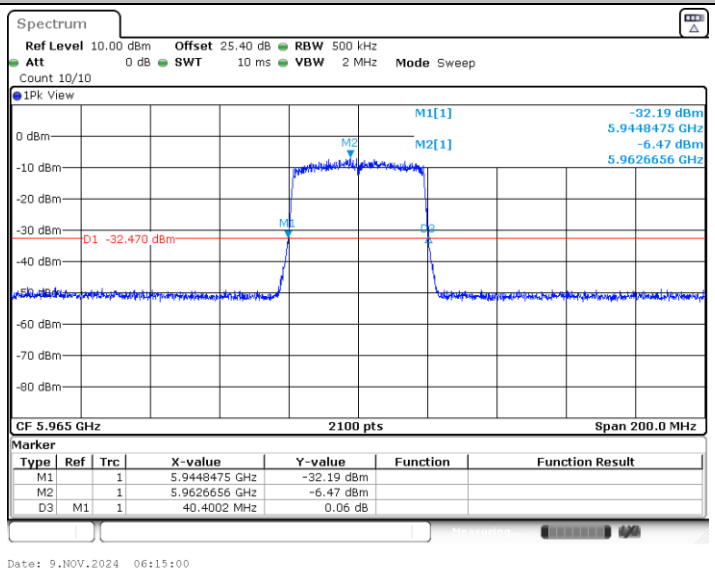
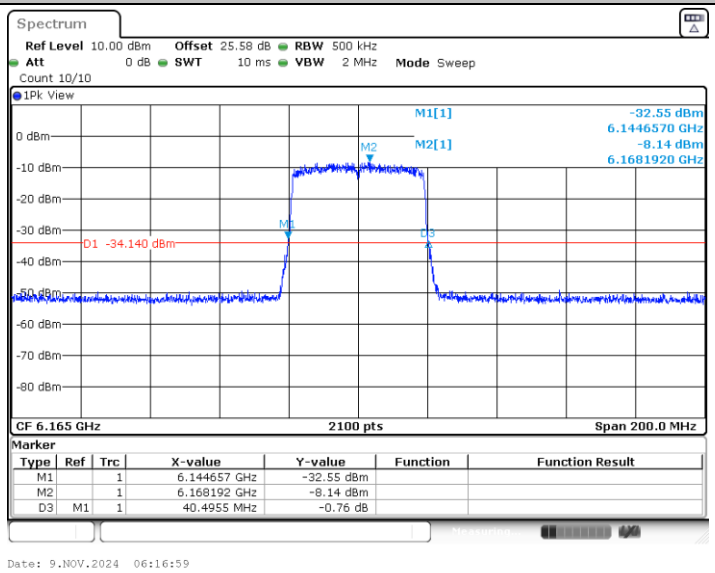
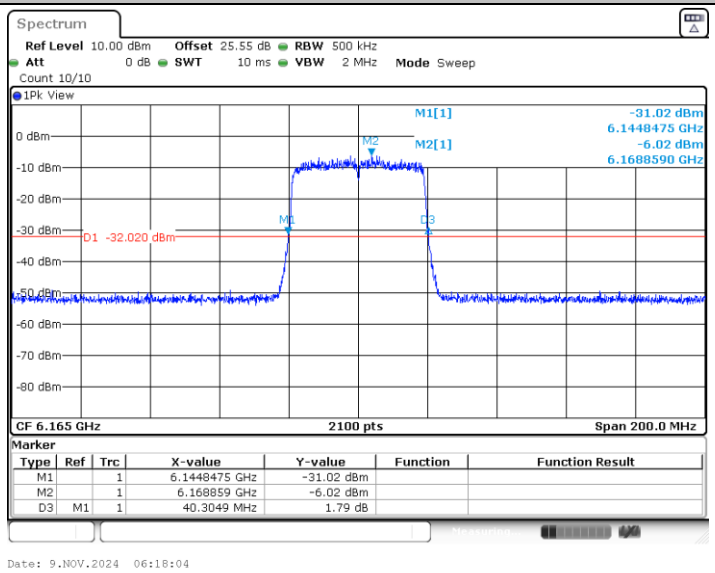


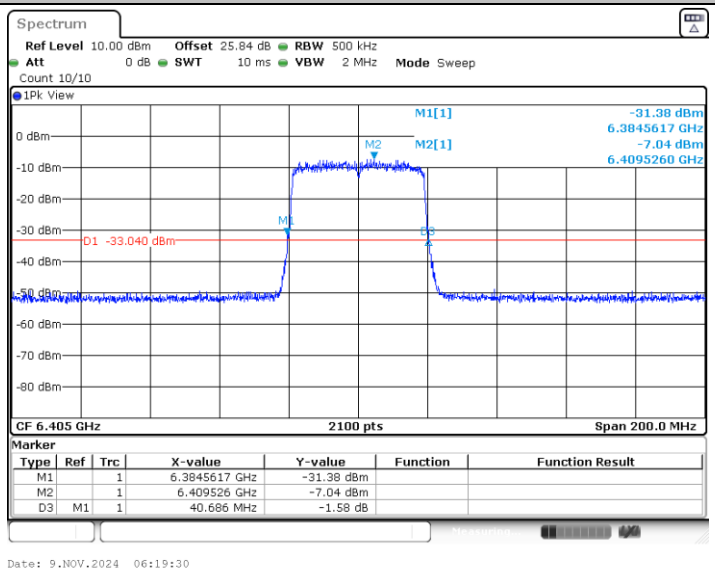
11AX40MIMO_Ant7_6165



11AX40MIMO_Ant6_6165



11AX40MIMO_Ant7_6405



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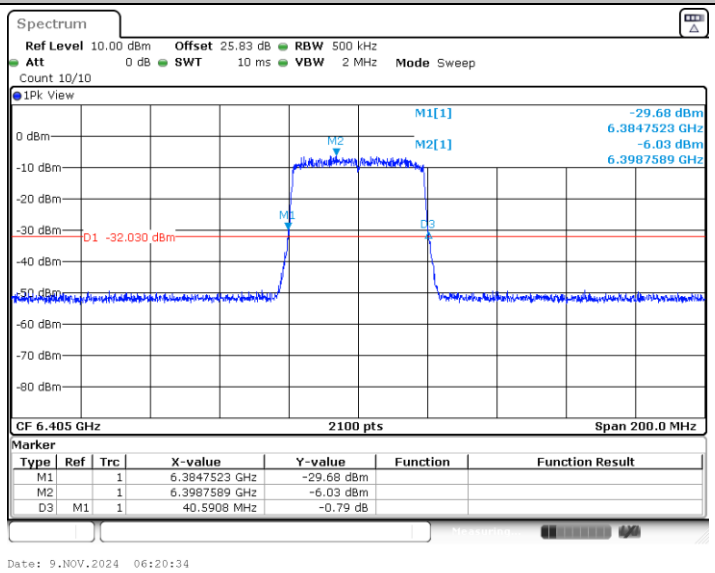
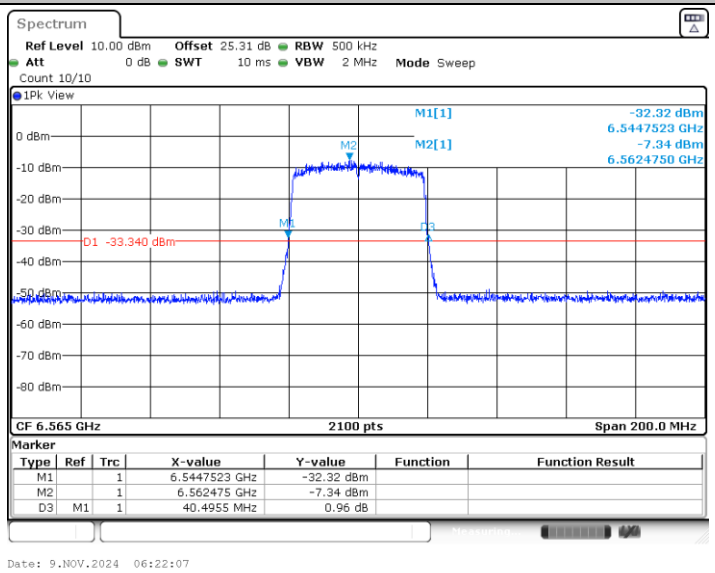
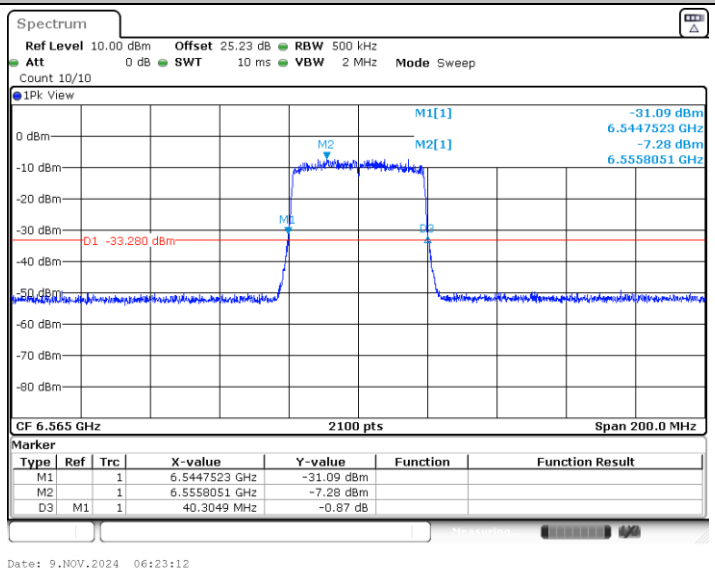


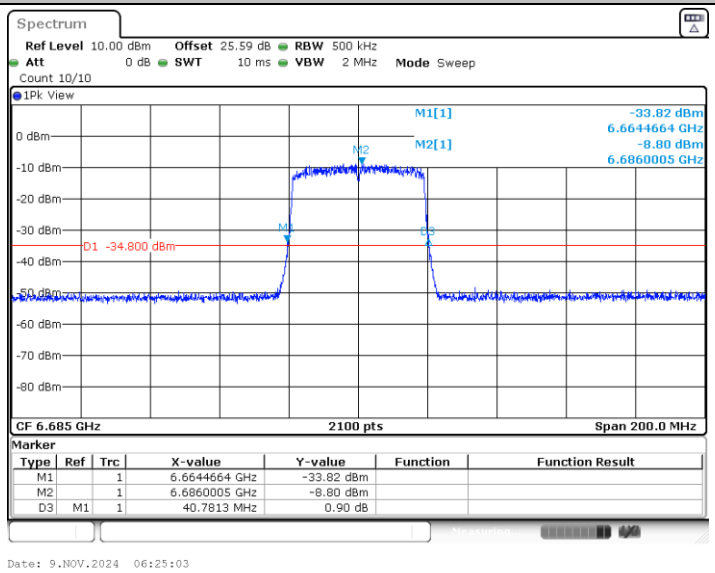
11AX40MIMO_Ant7_6565



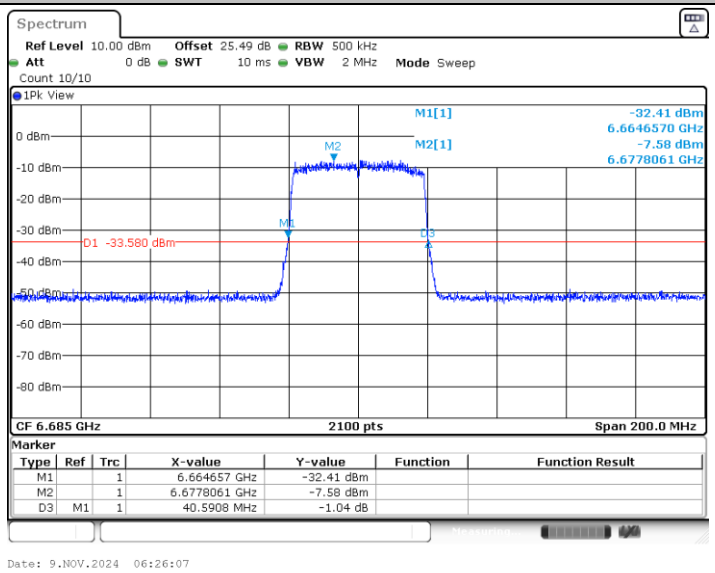
11AX40MIMO_Ant6_6565



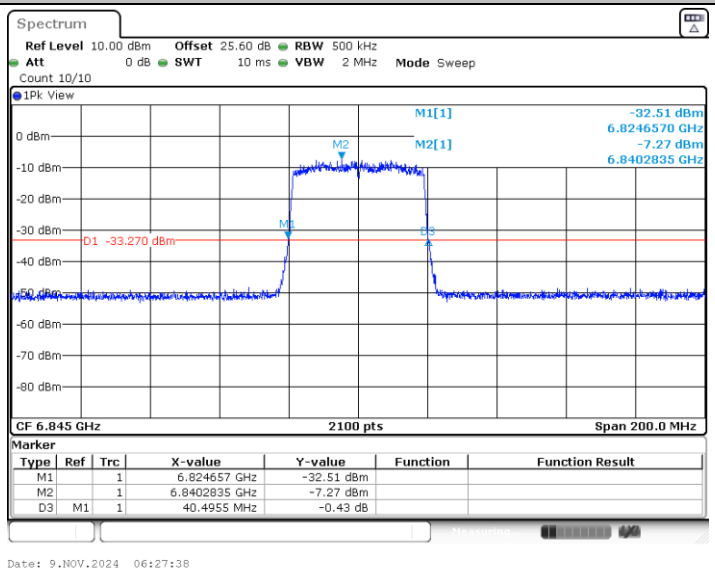
11AX40MIMO_Ant7_6685



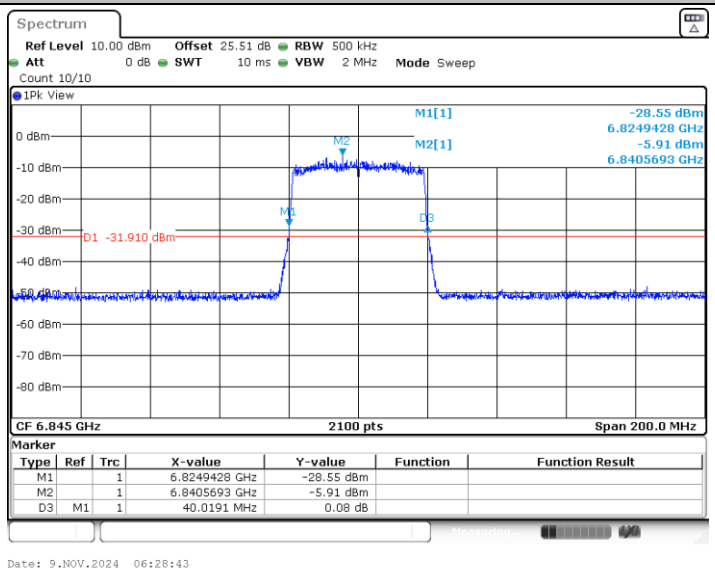
11AX40MIMO_Ant6_6685



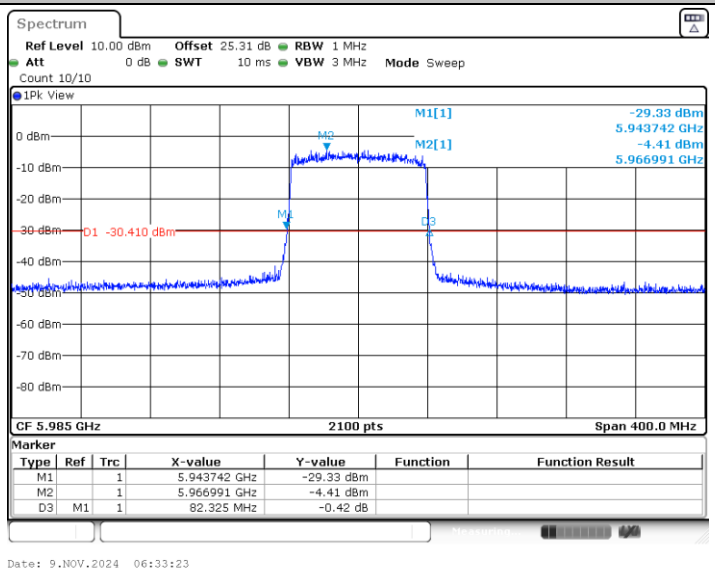
11AX40MIMO_Ant7_6845



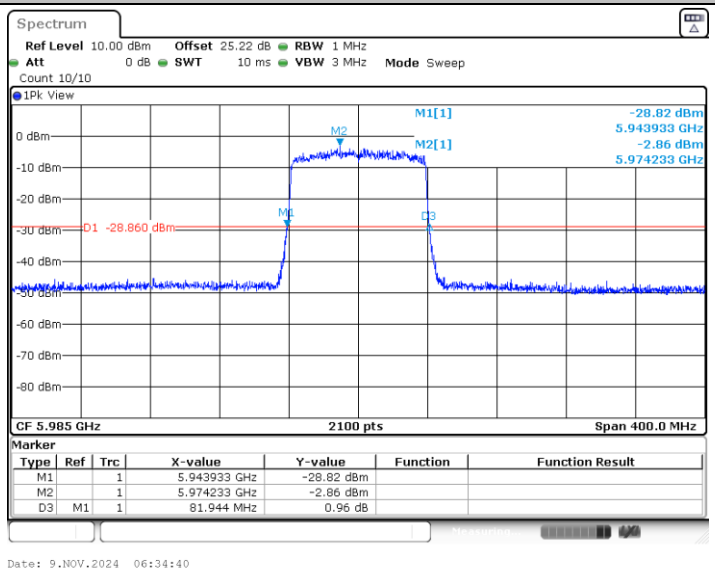
11AX40MIMO_Ant6_6845



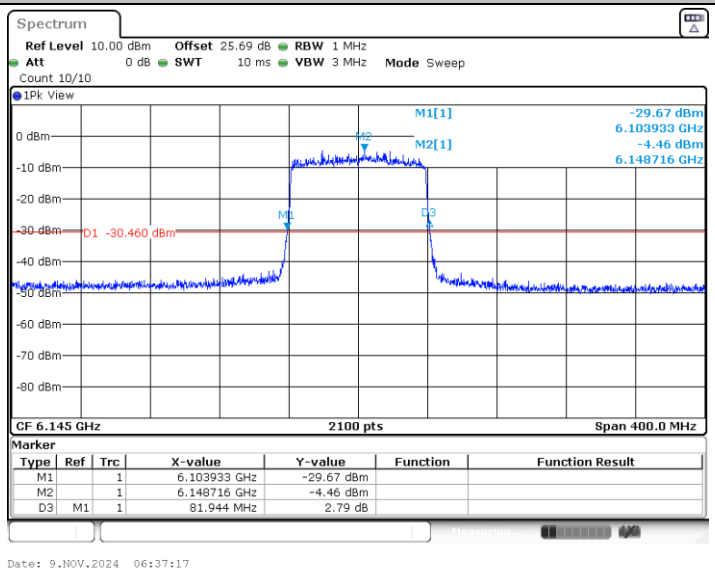
11AX80MIMO_Ant7_5985



11AX80MIMO_Ant6_5985



11AX80MIMO_Ant7_6145



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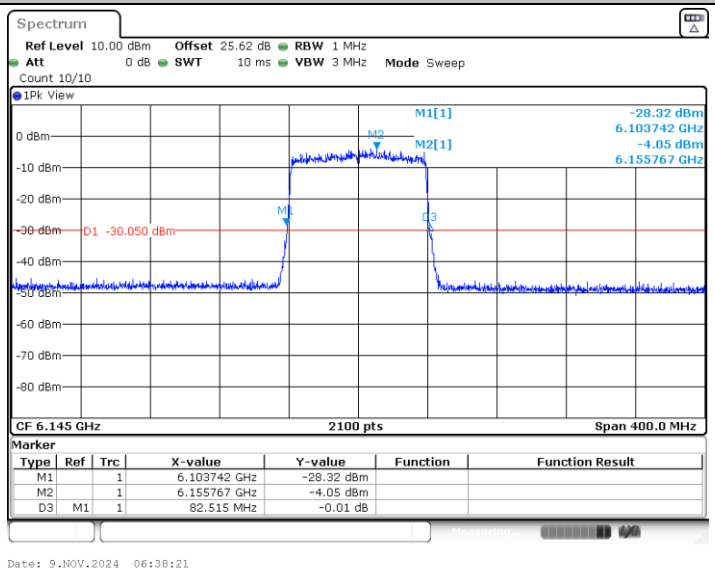
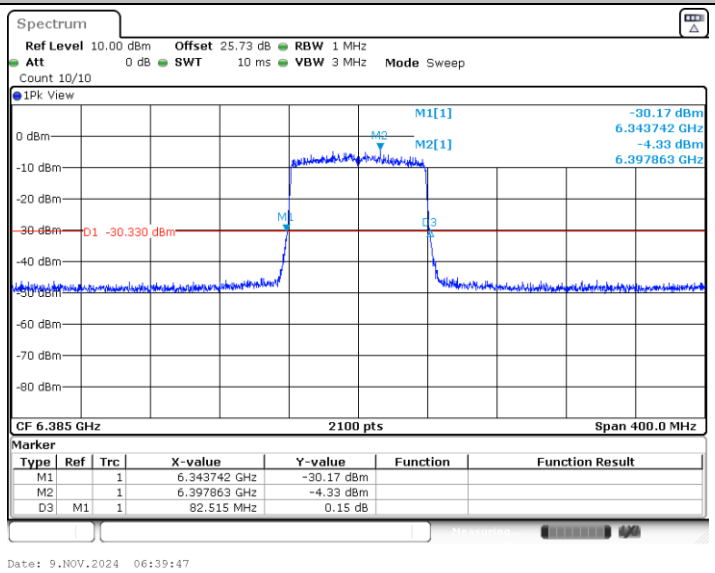
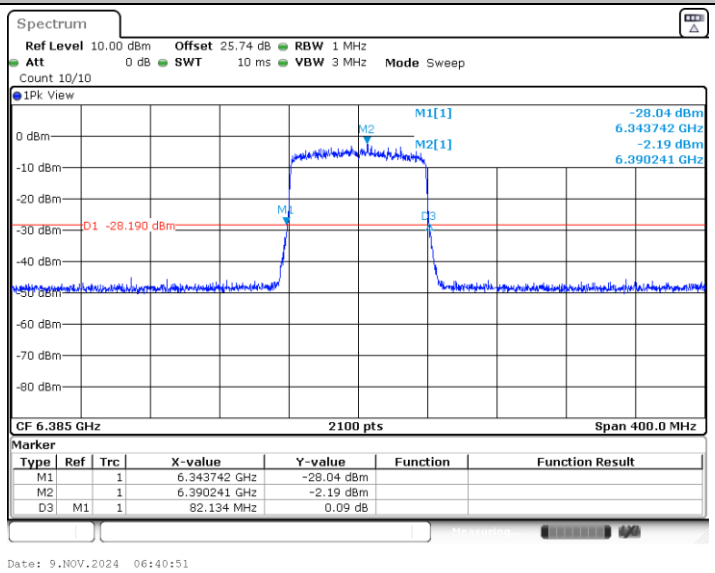


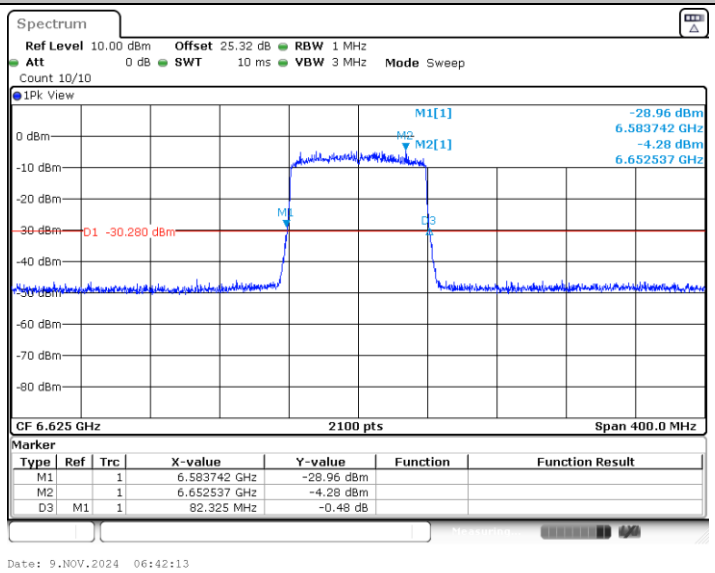
11AX80MIMO_Ant7_6385



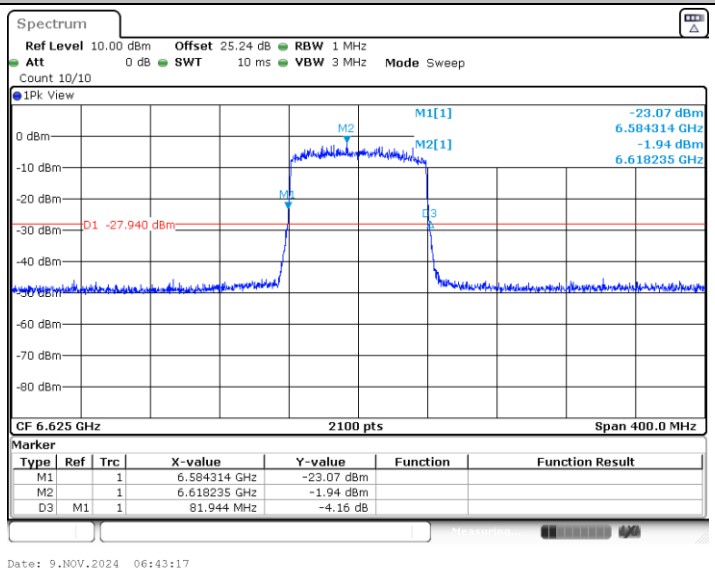
11AX80MIMO_Ant6_6385



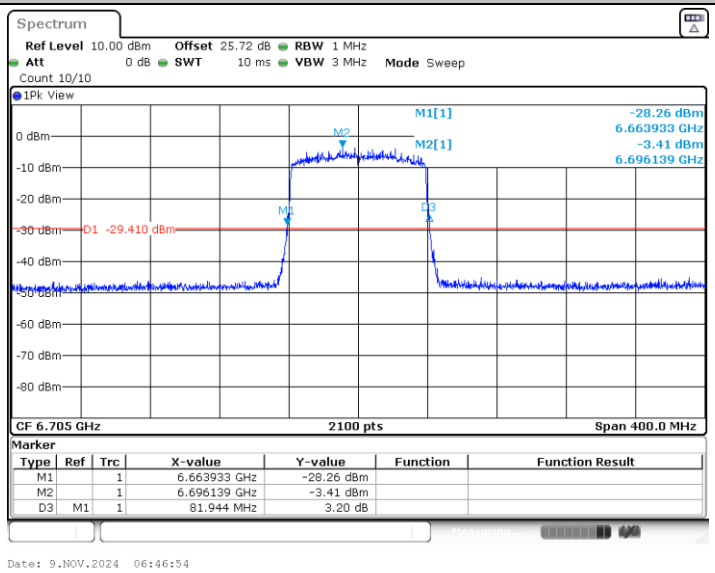
11AX80MIMO_Ant7_6625



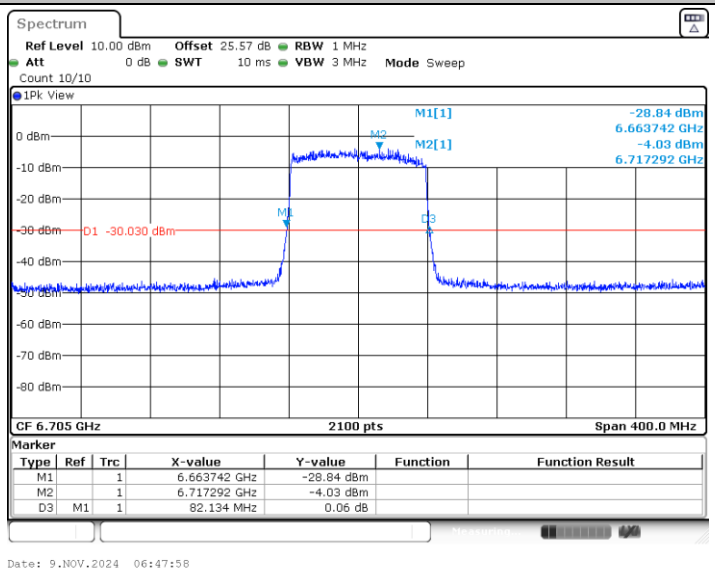
11AX80MIMO_Ant6_6625



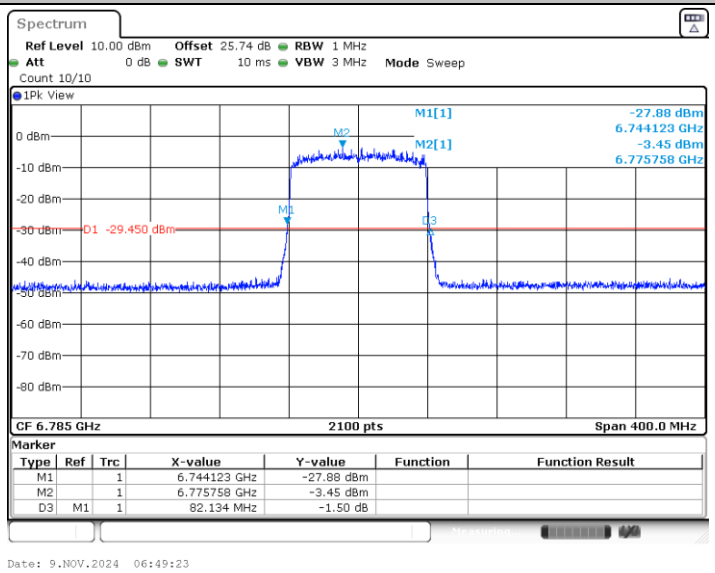
11AX80MIMO_Ant7_6705



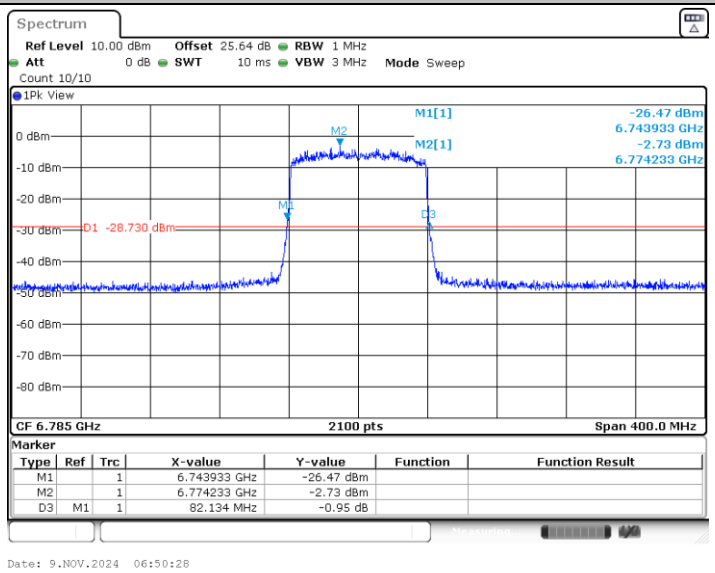
11AX80MIMO_Ant6_6705



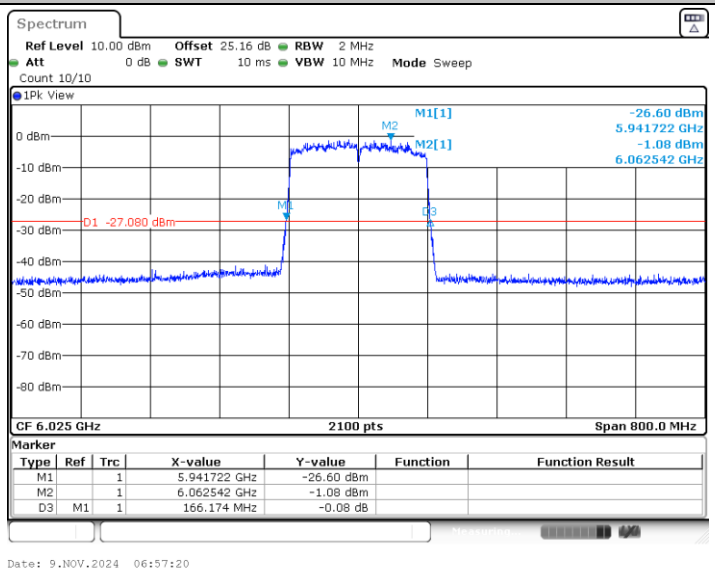
11AX80MIMO_Ant7_6785



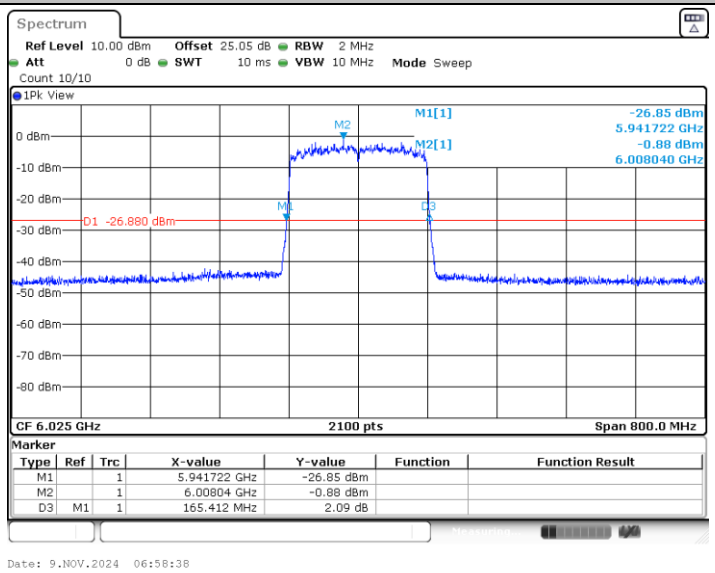
11AX80MIMO_Ant6_6785



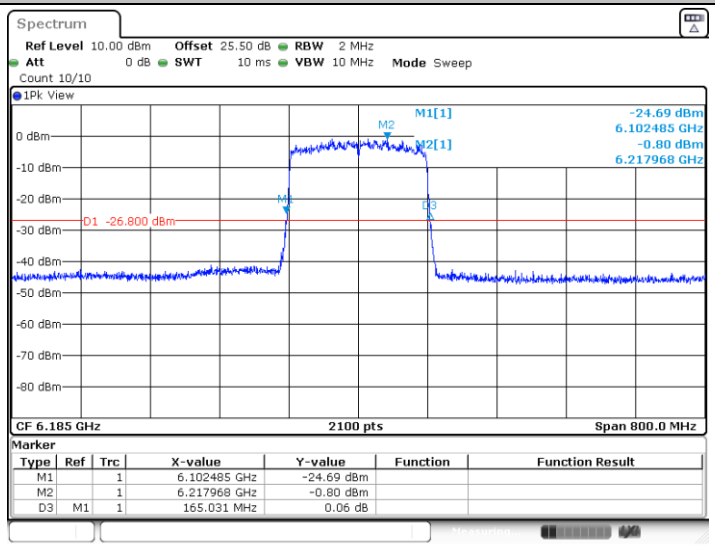
11AX160MIMO_Ant7_6025



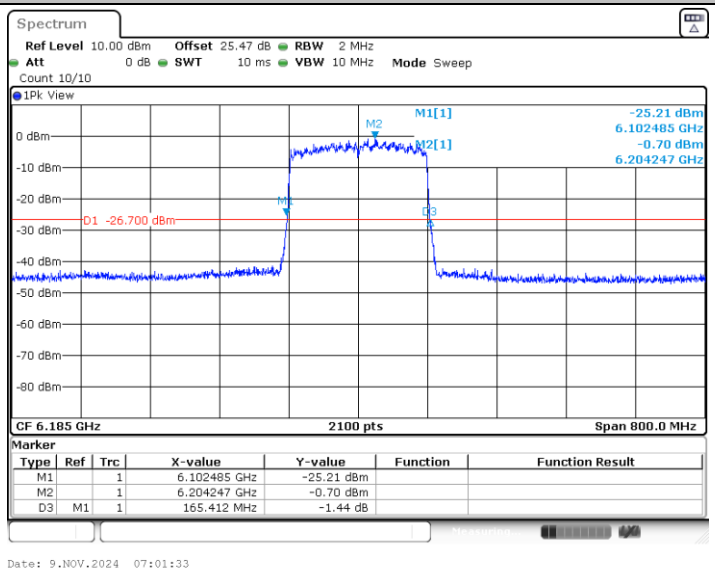
11AX160MIMO_Ant6_6025



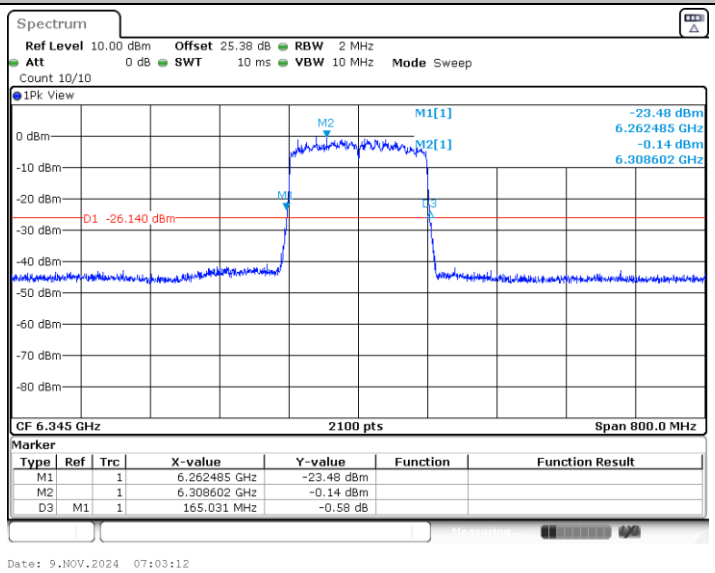
11AX160MIMO_Ant7_6185



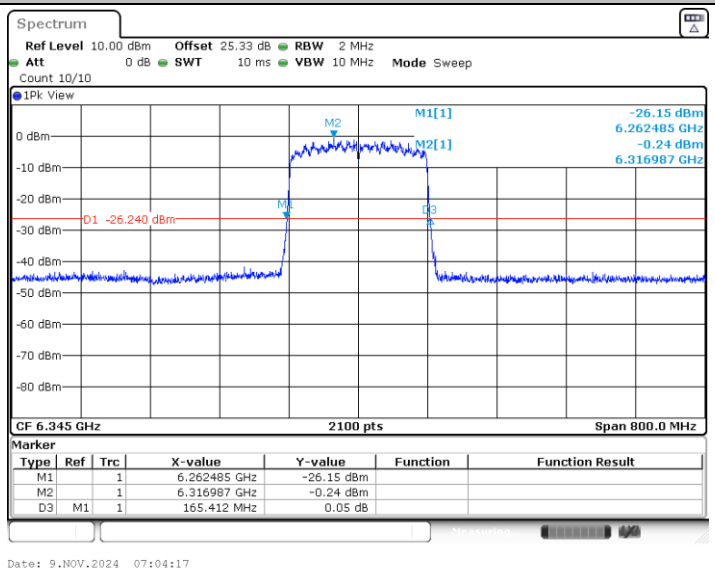
11AX160MIMO_Ant6_6185



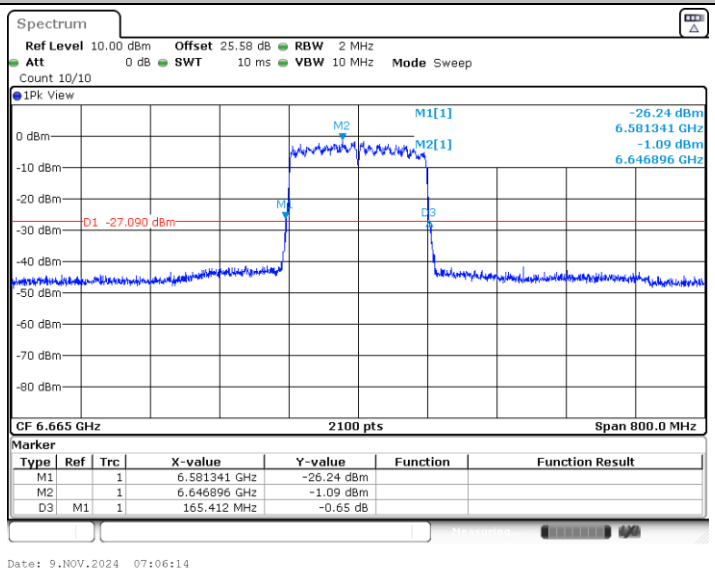
11AX160MIMO_Ant7_6345



11AX160MIMO_Ant6_6345



11AX160MIMO_Ant7_6665



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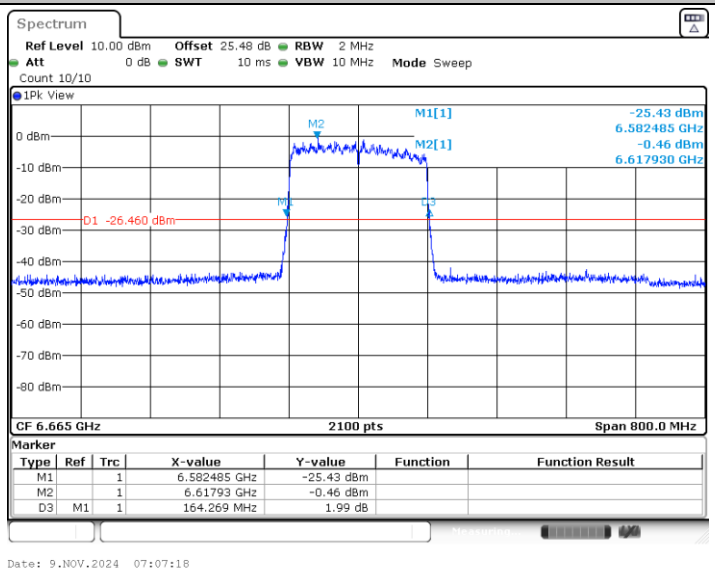


Occupied channel bandwidth

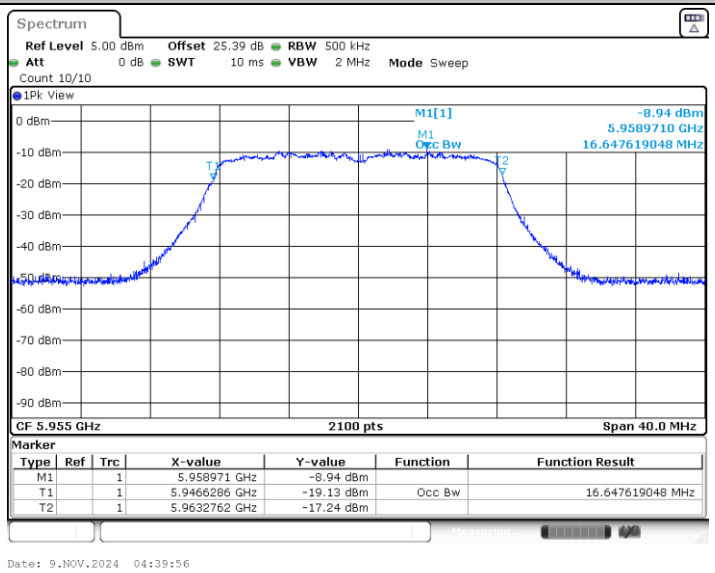
Test Result

TestMode	Antenna	Freq(MHz)	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A-CDD	Ant7	5955	16.648	5946.6286	5963.2762	---	---
	Ant6	5955	16.590	5946.7048	5963.2952	---	---
	Ant7	6175	16.648	6166.6286	6183.2762	---	---
	Ant6	6175	16.590	6166.7048	6183.2952	---	---
	Ant7	6415	16.667	6406.6286	6423.2952	---	---
	Ant6	6415	16.590	6406.7048	6423.2952	---	---
	Ant7	6535	16.667	6526.5905	6543.2571	---	---
	Ant6	6535	16.571	6526.6857	6543.2571	---	---
	Ant7	6695	16.648	6686.6286	6703.2762	---	---
	Ant6	6695	16.533	6686.7048	6703.2381	---	---
	Ant7	6855	16.610	6846.6476	6863.2571	---	---
	Ant6	6855	16.533	6846.7238	6863.2571	---	---
11AX20MIMO	Ant7	5955	18.952	5945.5048	5964.4571	---	---
	Ant6	5955	18.933	5945.5238	5964.4571	---	---
	Ant7	6175	18.933	6165.5238	6184.4571	---	---
	Ant6	6175	18.914	6165.5429	6184.4571	---	---
	Ant7	6415	18.933	6405.5238	6424.4571	---	---
	Ant6	6415	18.952	6405.5238	6424.4762	---	---
	Ant7	6535	18.933	6525.5048	6544.4381	---	---
	Ant6	6535	18.933	6525.5048	6544.4381	---	---
	Ant7	6695	18.933	6685.5238	6704.4571	---	---
	Ant6	6695	18.952	6685.4857	6704.4381	---	---
	Ant7	6855	18.990	6845.5048	6864.4952	---	---
	Ant6	6855	18.990	6845.5048	6864.4952	---	---
11AX40MIMO	Ant7	5965	37.790	5946.0476	5983.8381	---	---
	Ant6	5965	37.829	5946.0857	5983.9143	---	---
	Ant7	6165	37.867	6146.0476	6183.9143	---	---
	Ant6	6165	37.867	6146.0476	6183.9143	---	---
	Ant7	6405	37.829	6386.0476	6423.8762	---	---
	Ant6	6405	37.905	6386.0476	6423.9524	---	---
	Ant7	6565	37.752	6546.0857	6583.8381	---	---
	Ant6	6565	37.790	6546.0857	6583.8762	---	---
	Ant7	6685	37.829	6666.0476	6703.8762	---	---
	Ant6	6685	37.981	6665.9714	6703.9524	---	---

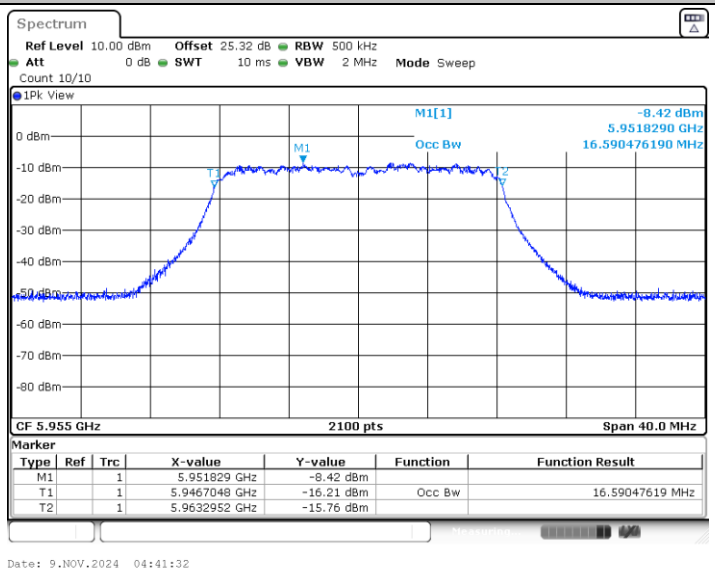
	Ant7	6845	37.905	6826.0476	6863.9524	---	---
	Ant6	6845	37.905	6826.0095	6863.9143	---	---
11AX80MIMO	Ant7	5985	77.257	5946.2571	6023.5143	---	---
	Ant6	5985	77.181	5946.4095	6023.5905	---	---
	Ant7	6145	77.562	6106.1048	6183.6667	---	---
	Ant6	6145	77.410	6106.3333	6183.7429	---	---
	Ant7	6385	77.562	6346.1810	6423.7429	---	---
	Ant6	6385	77.486	6346.1810	6423.6667	---	---
	Ant7	6625	77.257	6586.3333	6663.5905	---	---
	Ant6	6625	77.333	6586.1810	6663.5143	---	---
	Ant7	6705	77.410	6666.2571	6743.6667	---	---
	Ant6	6705	77.333	6666.1810	6743.5143	---	---
	Ant7	6785	77.333	6746.3333	6823.6667	---	---
	Ant6	6785	77.486	6746.2571	6823.7429	---	---
11AX160MIMO	Ant7	6025	156.648	5946.6000	6103.2476	---	---
	Ant6	6025	156.800	5946.6000	6103.4000	---	---
	Ant7	6185	156.648	6106.4476	6263.0952	---	---
	Ant6	6185	157.257	6106.6000	6263.8571	---	---
	Ant7	6345	156.648	6266.6000	6423.2476	---	---
	Ant6	6345	157.105	6266.9048	6424.0095	---	---
	Ant7	6665	156.952	6585.9905	6742.9429	---	---
	Ant6	6665	156.190	6586.4476	6742.6381	---	---

Test Graphs

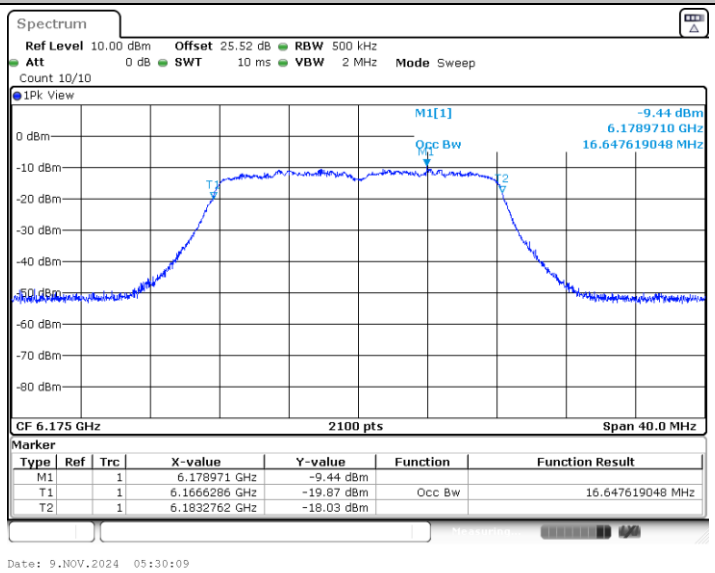
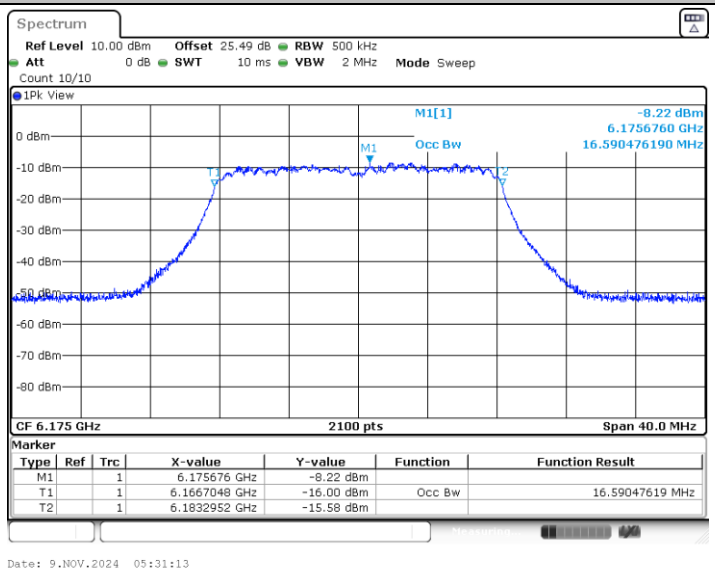
11A-CDD_Ant7_5955



11A-CDD_Ant6_5955



11A-CDD_Ant7_6175



11A-CDD_Ant6_6175