

TEST REPORT

Product Name : LCD Smart Projector

Model Number: XMM2102, XMM21** (*=0-9, indicates for

different market or business purposes)

FCC ID : 2AZNP-XMM2102

Prepared for : Formovie (Chongqing) Innovative Technology Co., Ltd.

Address : 4-401, #2 Longgang Road, Guojiatuo Area, Jiangbei

District, Chongqing, China

Prepared by : EMTEK (SHENZHEN) CO., LTD.

Address : Building 69, Majialong Industry Zone, Nanshan District,

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Report Number : ENS2312210120W01104R

Date(s) of Tests : December 23, 2023 to January 17, 2024

Date of issue : January 20, 2024



1 TEST RESULT CERTIFICATION

Applicant : Formovie (Chongqing) Innovative Technology Co., Ltd.

Address : 4-401, #2 Longgang Road, Guojiatuo Area, Jiangbei District, Chongqing, China

Manufacturer : Formovie (Chongqing) Innovative Technology Co., Ltd.

Address : 4-401, #2 Longgang Road, Guojiatuo Area, Jiangbei District, Chongqing, China

EUT : LCD Smart Projector

Model Name : XMM2102, XMM21** (*=0-9, indicates for different market or business

purposes)

Trademark : Xming, WEWATCH

Measurement Procedure Used:

APPLICABLE STANDARDS					
STANDARD TEST RESULT					
FCC 47 CFR Part 2, Subpart J FCC 47 CFR Part 15, Subpart E	PASS				
IC RSS-GEN, Issue 5(04-2018)+A1(03-2019)+A2(02-2021) IC RSS-247 Issue 3(08-2023)	PASS				

The above equipment was tested by EMTEK (SHENZHEN) CO., LTD. The test data, data evaluation, test procedures, and equipment configurations shown in this report were made in accordance with the procedures given in ANSI C63.10 (2013) and the energy emitted by the sample EUT tested as described in this report is in compliance with the requirements of FCC Rules Part 2, Part 15.407, IC RSS-247 Issue 3 and IC RSS-GEN, Issue 5.

The test results of this report relate only to the tested sample identified in this report.

Date of Test :	December 23, 2023 to January 17, 2024
Prepared by :	Luo Pei Ye
	Luo peiye /Editor
Reviewer :	Jue Ha SHENZHEN,
	Joe Xia/Supervisor
Annual S Authorized Cinner.	Lies War a Managar
Approve & Authorized Signer:	Lisa Wang/Manager



Modified History

Version	Report No.	Revision Date	Summary
Ver.1.0	ENS2312210120W01104R	1	Original Report





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2 EUT TECHNICAL DESCRIPTION

Characteristics	Description
Product:	LCD Smart Projector
Model Number:	XMM2102, XMM21** (*=0-9, indicates for different market or business purposes) (Note: All models are identical in circuitry and electrical, mechanical and physical construction; the difference are model number for trading purpose. Mode XMM2102 was Chosen final test.)
Sample Number:	2#
Wifi Type:	Wifi 5G with 5150MHz-5250MHz Band Wifi 5G with 5250MHz-5350MHz Band Wifi 5G with 5470MHz-5725MHz Band Wifi 5G with 5725MHz-5850MHz Band
WLAN Supported:	802.11a/n/ac
Data Rate :	802.11a: 54/48/36/24/18/12/9/6Mbps 802.11n: MCS0-MCS15 802.11ac: MCS0-MCS9
Modulation:	OFDM with BPSK/QPSK/16QAM/64QAM for 802.11a/n OFDM with BPSK/QPSK/16QAM/64QAM/256QAM for 802.11ac
	UNII-1: 5150MHz-5250MHz Band 5180-5240MHz for 802.11a/n(HT20)/ac(VHT20) 5190-5230MHz for 802.11n(HT40)/ac(VHT40) 5210MHz for 802.11ac(VHT80)
Formula Domina	UNII-2A: 5250MHz-5350MHz Band 5260-5320MHz for 802.11a/n(HT20)/ac(VHT20) 5270-5310MHz for 802.11n(HT40)/ac(VHT40) 5290MHz for 802.11ac(VHT80)
Frequency Range:	UNII-2C: 5470MHz-5725MHz Band 5500-5700MHz for 802.11a/n(HT20)/ac(VHT20) 5510-5670MHz for 802.11n(HT40)/ac(VHT40) 5530MHz for 802.11ac(VHT80)
	UNII-3 with 5725MHz-5850MHz Band 5745-5825MHz for 802.11a/n(HT20)/ac(VHT20) 5755-5795MHz for 802.11n(HT40)/ac(VHT40) 5775MHz for 802.11ac(VHT80);
TPC Function:	Not Applicable
Antenna Port:	⊠ Antenna port 1 ⊠ Antenna port 2
Antenna Type:	FPC Antenna
Antenna Gain:	



Transmit Power:	UNII-1 Band: 14.82 dBm UNII-2A Band: 14.76 dBm UNII-2C Band: 15.90 dBm UNII-3 Band: 16.12 dBm
Power Supply:	DC 19V from adapter
Adapter:	Model No:GQ72-190342-E1 Input:100-240V~50/60Hz 1.8A Max Output:19.0V 3.42A 64.98W
Test Voltage:	AC 120V/60Hz
Date of Received:	December 22, 2023
Temperature Range:	0°C ~ +40°C
FVIN:	C015FGN_FW
Note: 1.For more details,	please refer to the User's manual of the EUT.



3 SUMMARY OF TEST RESULT

FCC PartClause	IC Part Clause	Test Parameter	Verdict	Remark
15.407 (a) 15.407 (e) 2.1049	RSS-247, 6.2 RSS-Gen 6.7	99% , 6dB and 26dB Bandwidth	PASS	
15.407 (a)	RSS-247, 6.2	Maximum Conducted Output Power	PASS	
15.407 (a)	RSS-247, 6.2	PeakPower Spectral Density	PASS	
15.407 (b) 15.209 15.205	RSS-247, 6.2 RSS-Gen 8.9 RSS-Gen 8.10 RSS-Gen 6.13	RadiatedSpurious Emission	PASS	
15.207	RSS-Gen 8.8	Power Line Conducted Emission	PASS	
15.407(a) 15.203	RSS-Gen 6.8	Antenna Application	PASS	

NOTE1:N/A (Not Applicable)

NOTE2:According to FCC OET KDB 789033, the report use radiated measurements in the restricted frequency bands. In addition, the radiated test is also performed to ensure the emissions emanating from the device cabinet also comply with the applicable limits.

RELATED SUBMITTAL(S) / GRANT(S):

This submittal(s) (test report) is intended for **FCC ID:2AZNP-XMM2102** filing to comply with Section 15.407 of the FCC Part 15, Subpart C Rules.



4 TEST METHODOLOGY

4.1 GENERAL DESCRIPTION OF APPLIED STANDARDS

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

FCC 47 CFR Part 2, Subpart J

FCC 47 CFR Part 15, Subpart E

IC RSS-GEN, Issue 5(04-2018)+A1(03-2019)+A2(02-2021)

IC RSS-247 Issue 3(08-2023)

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

FCC KDB 789033 D2 General UNII Test Procedures New Rules v02r01

4.2 MEASUREMENT EQUIPMENT USED

Conducted Emission Test Equipment

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
EMI Test Receiver	Rohde & Schwarz	ESCI	101384	2023/5/13	1Year
AMN	Rohde & Schwarz	ENV216	101161	2023/5/13	1Year

For Spurious Emissions Test

Equipment	Manufacturer	Model No.	Serial No.	Last Cal.	Cal. Interval
EMI Test Receiver	Rohde & Schwarz	ESU 26	100154	2023/5/13	1Year
Pre-Amplifie	Lunar EM	LNA30M3G-25	J10100000070	2023/5/13	1Year
Bilog Antenna	Schwarzbeck	VULB9163	660	2023/5/16	2 Year
Horn antenna	Schwarzbeck	BBHA9120D	9120D-1177	2023/5/12	2 Year
Pre-Amplifie	SKET	LNPA_0118G-45	SK2019051801	2023/5/10	1Year
Loop Antenna	Schwarzbeck	FMZB1519	1519-012	2023/5/12	2 Year
Spectrum Analyzer	Rohde & Schwarz	FSV40	100967	2023/5/10	1Year
Horn antenna	Schwarzbeck	BBHA9170	9170-399	2023/5/12	2 Year
Band reject Filter(50dB)	WI/DE	WRCGV-2400(2400- 2485MHz)	2	2023/5/13	1 Year

For other test items:

Equipment	Manufacturer Model No.		Serial No.	Last Cal.	Cal. Interval
Wideband Radio Communication Tester	R&S	CMW500	171168	2023/9/14	1Year
Frequency Extender	R&S	CMW-Z800A	100430	2023/11/2	1Year
Spectrum Analyzer	R&S	FSV3044	101289	2023/9/14	1Year
Analog Signal Generator	R&S	SMB100A	183237	2023/9/16	1Year
Vector Signal Generator	R&S	SMM100A	101808	2023/9/16	1Year
RF Control Unit(Power Meter)	Tonscend	JS0806-2	22C8060567	2023/9/14	1Year
Temperature&Humidity Chamber	ESPEC	EL-02KA	12107166	2023/5/10	1 Year



4.3 DESCRIPTION OF TEST MODES

The EUT has been tested under its typical operating condition.

The EUT configuration for testing is installed on RF field strength measurement to meet the Commissions requirement and operating in a manner which intends to maximize its emission characteristics in a continuous normal application.

The Transmitter was operated in the normal operating mode. The TX frequency was fixed which was for the purpose of the measurements.

Test of channel included the lowest and middle and highest frequency to perform the test, then record on this report.

Those data rates (802.11a: 54 Mbps; 802.11n(HT20): MCS0; 802.11ac(VHT20): MCS0; 802.11n(HT40): MCS0; 802.11ac(VHT40): MCS0; 802.11ac(VHT40): MCS0; 802.11ac(VHT80): MCS0; 802.11ac(VHT8

Pre-defined engineering program for regulatory testing used to control the EUT for staying in continuous transmitting and receiving mode is programmed.

⊠ Wifi 5G with U-NII - 1

Frequency and Channel list for 802.11a, 802.11n (HT20), 802.11ac (VHT20)):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	44	5220		
40	5200	48	5240		

Frequency and Channel list for 802.11n (HT40), 802.11ac (VHT40):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
38	5190	46	5230		
			7		

Frequency and Channel list for 802.11ac (VHT80):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
42	5210				

Test Frequency and Channel for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

rest i requeries and	orianne no ooz. i	14, 002.1111 (1	1120), 002.1140	(11120).	
Lowest Frequency		Middle F	requency	Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
36	5180	40	5200	48	5240

Test Frequency and channel for 802.11n (HT40), 802.11ac (VHT40):

Lowest Frequency		Middle F	requency	Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
38	5190	N/A	N/A	46	5230

Test Frequency and channel for 802.11ac (VHT80):

Lowest Frequency		Middle F	requency	Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
42	5210	N/A	N/A	N/A	N/A



Wifi 5G with U-NII -2A

Frequency and Channel list 802.11a, 802.11n (HT20), 802.11ac (VHT20):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
52	5260	60	5300		
56	5280	64	5320		

Frequency and Channel list for 802.11n (HT40), 802.11ac (VHT40):

	0.10.11101 1101	55,,	002:::::	· • /·	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
54	5270				
62	5310				

Frequency and Channel list for 802.11ac (VHT80):

i roquonoy una	Ondinior not for	002.11d0 (V1110	· · · · · · · · · · · · · · · · · · ·		
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
58	5290				

Test Frequency and Channel for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

Lowest Frequency		Middle F	requency	Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
52	5260	56	5280	64	5320

Test Frequency and channel for 802.11n (HT40), 802.11ac (VHT40):

Lowest Frequency		Middle F	requency	Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
54	5270	N/A	N/A	62	5310

Test Frequency and channel for 802.11ac (VHT80)::

Lowest F	Lowest Frequency		requency	Highe	st Frequency
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
58	5290				. ,



Wifi 5G with U-NII -2C

Frequency and Channel list for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

- 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1							
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)		
100	5500	116	5580	132	5660		
104	5520	120	5600	136	5680		
108	5540	124	5620	140	5700		
112	5560	128	5640				

Frequency and Channel list for 802.11n (HT40), 802.11ac (VHT40):

requeries and charmer list for 602.1111 (11140), 602.1140 (11140).								
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)			
102	5510	118	5590	134	5670			
110	5550	126	5630					

Frequency and Channel list for 802.11ac (VHT80):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
106	5530	122	5610		

Test Frequency and Channel for 802.11a, 802.11n (HT20), 802.11ac (VHT20:

Lowest Frequency		Middle F	requency	Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
100	5500	120	5600	140	5700

Test Frequency and channel for 802.11n (HT40), 802.11ac (VHT40):

Lowest F	requency	Middle F	requency	Highe	st Frequency
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
102	5510	1		134	5670

Test Frequency and channel for 802.11ac (VHT80):

Lowest Frequency		Middle F	requency	Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
106	5530				, ,



Wifi 5G with U-NII -3

Frequency and Channel list for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
149	5745	157	5785	165	5825
153	5765	161	5805		

Frequency and Channel list for 802.11n (HT40), 802.11ac (VHT40):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
151	5755	159	5795		(IVII IZ)

Frequency and Channel list for 802.11ac (VHT80):

Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
155	5775				

Test Frequency and Channel for 802.11a, 802.11n (HT20), 802.11ac (VHT20):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
149	5745	157	5785	165	5825

Test Frequency and channel for 802.11n (HT40), 802.11ac (VHT40):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
151	5755	N/A	N/A	159	5795

Test Frequency and channel for 802.11ac (VHT80):

Lowest Frequency		Middle Frequency		Highest Frequency	
Channel	Frequency (MHz)	Channel	Frequency (MHz)	Channel	Frequency (MHz)
155	5775				

Multi-antenna correlation:

	Transmit Signals are Correlated
	Directional gain = $10 \log[(10^{G1/20} + 10^{G2/20} + + 10^{GN/20})2 / N_{ANT}] dBi$
	All Transmit Signals are Completely Uncorrelated
Ш	Directional gain = $10 \log[(10^{G1/10} + 10^{G2/10} + + 10^{GN/10})/N_{ANT}] dBi$

Directional gain = $10 \log [(10^{4.97/20} + 10^{4.89/20})^2/2] dBi=7.94 dBi$



5 FACILITIES AND ACCREDITATIONS 5.1 FACILITIES

All measurement facilities used to collect the measurement data are located at:

EMTEK (Shenzhen) Co., Ltd.

Building 69, Majialong Industry Zone District, Nanshan District, Shenzhen, China

The sites are constructed in conformance with the requirements of ANSI C63.7, ANSI C63.4 and CISPR Publication 22.

5.2 EQUIPMENT

Radiated emissions are measured with one or more of the following types of linearly polarized antennas: tuned dipole, biconical, log periodic, bi-log, and/or ridged waveguide, horn. Spectrum analyzers with preselectors and quasi-peak detectors are used to perform radiated measurements.

Conducted emissions are measured with Line Impedance Stabilization Networks and EMI Test Receivers.

Calibrated wideband preamplifiers, coaxial cables, and coaxial attenuators are also used for making measurements.

All receiving equipment conforms to CISPR Publication 16-1, "Radio Interference Measuring Apparatus and Measurement Methods."

5.3 LABORATORY ACCREDITATIONS AND LISTINGS

Site Description

EMC Lab. : Accredited by CNAS

The Certificate Registration Number is L2291.

The Laboratory has been assessed and proved to be in compliance

with CNAS-CL01 (identical to ISO/IEC 17025:2017)

Accredited by FCC

Designation Number: CN1204

Test Firm Registration Number: 882943

Accredited by A2LA

The Certificate Number is 4321.01.

Accredited by Industry Canada

The Conformity Assessment Body Identifier is CN0008

Name of Firm : EMTEK (SHENZHEN) CO., LTD.
Site Location : Building 69, Majialong Industry Zone,

Nanshan District, Shenzhen, Guangdong, China



6 TEST SYSTEM UNCERTAINTY

The following measurement uncertainty levels have been estimated for tests performed on the apparatus:

Test Parameter	Measurement Uncertainty
Frequency error	±20Hz
Occupied Bandwidth	±0.5KHz
Transmitter output power	±0.6dB
Conducted spurious emissions	±3.2dB
Radiated spurious emissions	±4.5dB
Temperature	±1.2℃
Humidity	±3%
DC voltages	±0.25V
Time	±1%

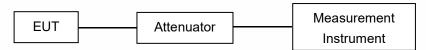
Measurement Uncertainty for a level of Confidence of 95%



7 SETUP OF EQUIPMENT UNDER TEST

7.1 RADIO FREQUENCY TEST SETUP

The WLAN component's antenna ports(s) of the EUT are connected to the measurement instrument per an appropriate attenuator. The EUT is controlled by PC/software to emit the specified signals for the purpose of measurements.



7.2 RADIO FREQUENCY TEST SETUP

The test site semi-anechoic chamber has met the requirement of NSA tolerance 4 dB according to the standards: ANSI C63.10. The test distance is 3m.The setup is according to the requirements in Section 13.1.4.1 of ANSI C63.10-2013and CAN/CSA-CEI/IEC CISPR 22.

Below 30MHz:

The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna (loop antenna). The Antenna should be positioned with its plane vertical at the specified distance from the EUT and rotated about its vertical axis for maximum response at each azimuth about the EUT. The center of the loop shall be 1 m above the ground. For certain applications, the loop antenna plane may also need to be positioned horizontally at the specified distance from the EUT.

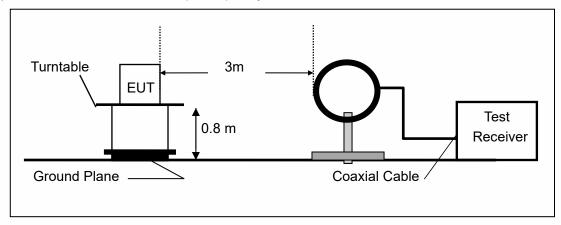
Above 30MHz:

The EUT is placed on a turntable 0.8 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).

Above 1GHz:

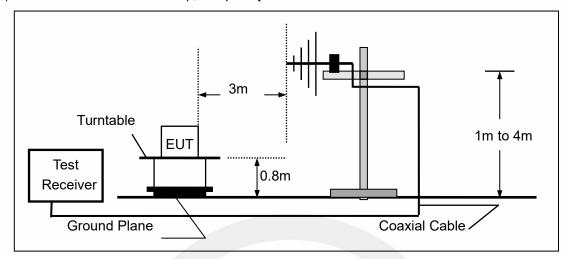
(Note: the FCC's permission to use 1.5m as an alternative per TCBC Conf call of Dec. 2, 2014.) The EUT is placed on a turntable 1.5 meters above the ground in the chamber, 3 meter away from the antenna. The maximal emission value is acquired by adjusting the antenna height, polarisation and turntable azimuth. Normally, the height range of antenna is 1 m to 4 m, the azimuth range of turntable is 0° to 360°, and the receive antenna has two polarizations Vertical (V) and Horizontal (H).

(a) Radiated Emission Test Set-Up, Frequency Below 30MHz

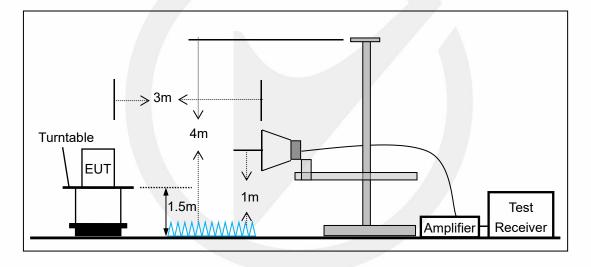




(b)Radiated Emission Test Set-Up, Frequency Below 1000MHz



(c) Radiated Emission Test Set-Up, Frequency above 1000MHz



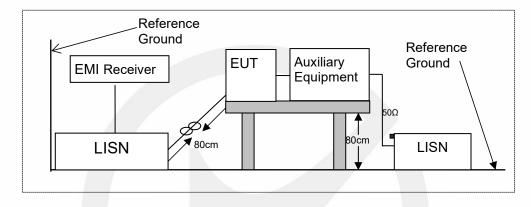


7.3 CONDUCTED EMISSION TEST SETUP

The mains cable of the EUT (maybe per AC/DC Adapter) must be connected to LISN. The LISN shall be placed 0.8 m from the boundary of EUT and bonded to a ground reference plane for LISN mounted on top of the ground reference plane. This distance is between the closest points of the LISN and the EUT. All other units of the EUT and associated equipment shall be at least 0.8m from the LISN.

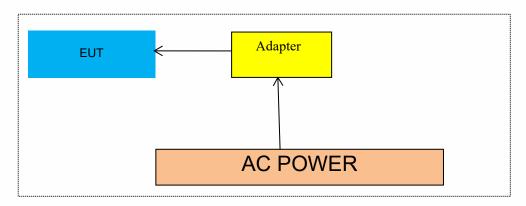
Ground connections, where required for safety purposes, shall be connected to the reference ground point of the LISN and, where not otherwise provided or specified by the manufacturer, shall be of same length as the mains cable and run parallel to the mains connection at a separation distance of not more than 0.1 m.

According to the requirements in Section 13.1.4.1 of ANSI C63.10-2013 Conducted emissions from the EUT measured in the frequency range between 0.15 MHz and 30 MHz using CISPR Quasi-Peak and average detector mode.





7.4 BLOCK DIAGRAM CONFIGURATION OF TEST SYSTEM



7.5 SUPPORT EQUIPMENT

EUT Cable List and Details							
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite				
1	1	1	1				

Auxiliary Cable List and Details						
Cable Description	Length (m)	Shielded/Unshielded	With / Without Ferrite			
1		1	1			

Auxiliary Equipment List and Details							
Description	Manufacturer	Model	Serial Number				
1	1	1	1				

Notes:

- 1. All the equipment/cables were placed in the worst-case configuration to maximize the emission during the test.
- 2. Grounding was established in accordance with the manufacturer's requirements and conditions for the intended use.



8 TEST REQUIREMENTS

8.1 BANDWIDTHMEASUREMENT

8.1.1 Applicable Standard

According to FCC Part 15.407(a)(1) for UNIIBand I

According to FCC Part 15.407(a)(2) for UNIIBand II-A and UNIIBand II-C

According to FCC Part 15.407(a)(3) for UNIIBand III

According to FCC Part 15.407(e) for UNIIBand III

According to 789033 D02 SectionII(C)

According to 789033 D02 SectionII(D)

According to RSS-Gen6.6, RSS 247, 6.2

8.1.2 Conformance Limit

The 26dB bandwidth is used to determine the conducted power limits.

Within the 5.725-5.85 GHz band, the minimum 6 dB bandwidth of U-NII devices shall be at least 500 kHz.

8.1.3 Test Configuration

Test according to clause 7.1 radio frequency test setup

8.1.4 Test Procedure

According to 789033 D02 v02r01 section C&D, the following is the measurement procedure.

- 1. Emission Bandwidth (EBW)
- a) Set RBW = approximately 1% of the emission bandwidth.
- b) Set the VBW > RBW.
- c) Detector = Peak.
- d) Trace mode = max hold.
- e) Measure the maximum width of the emission that is 26 dB down from the maximum 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%.

2. Minimum Emission Bandwidth for the band 5.725-5.85 GHz

Section 15.407(e) specifies the minimum 6 dB emission bandwidth of at least 500 KHz for the band 5.715-5.85 GHz. The following procedure shall be used for measuring this bandwidth:

- a) Set RBW = 100 kHz.
- b) Set the video bandwidth (VBW) \geq 3 \times RBW.
- c) Detector = Peak.
- d) Trace mode = max hold.
- e) Sweep = auto couple.
- f) Allow the trace to stabilize.
- g) Measure the maximum width of the emission that is constrained by the frequencies associated with the two outermost amplitude points (upper and lower frequencies) that are attenuated by 6 dB relative to the maximum level measured in the fundamental emission.

Note: The automatic bandwidth measurement capability of a spectrum analyzer or EMI receiver may be employed if it implements the functionality described above.

D. 99 Percent Occupied Bandwidth

The 99-percent occupied bandwidth is the frequency bandwidth such that, below its lower and above its upper frequency limits, the mean powers are each equal to 0.5 % of the total mean power of the given emission. Measurement of the 99-percent occupied bandwidth is required only as a condition for using the optional band-edge measurement techniques described in section II.G.3.d). Measurements of 99-percent occupied bandwidth may also optionally be used in lieu of the EBW to 789033 D02 v01r02 General UNII Test Procedures New Rules v01 define the minimum frequency range over which the spectrum is integrated when measuring maximum conducted output power as described in section II.E.



However, the EBW must be measured to determine bandwidth dependent limits on maximum conducted output power in accordance with 15.407(a).

The following procedure shall be used for measuring (99 %) power bandwidth:

- 1. Set center frequency to the nominal EUT channel center frequency.
- 2. Set span = 1.5 times to 5.0 times the OBW.
- 3. Set RBW = 1 % to 5 % of the OBW
- 4. Set VBW ≥ 3 RBW
- 5. Video averaging is not permitted. Where practical, a sample detection and single sweep mode shall be used. Otherwise, peak detection and max hold mode (until the trace stabilizes) shall be used.
- 6. Use the 99 % power bandwidth function of the instrument (if available).
- 7. If the instrument does not have a 99 % power bandwidth function, the trace data points are recovered and directly summed in power units. The recovered amplitude data points, beginning at the lowest frequency, are placed in a running sum until 0.5 % of the total is reached; that frequency is recorded as the lower frequency. The process is repeated until 99.5 % of the total is reached; that frequency is recorded as the upper frequency. The 99% occupied bandwidth is the difference between these two frequencies.



8.1.5 Test Results

Temperature:	25°C
Relative Humidity:	45%
ATM Pressure:	1011 mbar

Note: N/A

TestMode	Antenna	Frequency[MHz]	26db EBW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
	Ant1	5180	20.08	5169.92	5190.00		
	Ant2	5180	20.00	5170.04	5190.04		
	Ant1	5200	20.44	5189.76	5210.20		
	Ant2	5200	20.60	5189.64	5210.24		
	Ant1	5240	20.44	5229.76	5250.20		
	Ant2	5240	20.52	5229.72	5250.24		
	Ant1	5260	20.44	5249.72	5270.16		
	Ant2	5260	20.56	5249.64	5270.20		
	Ant1	5280	20.40	5269.80	5290.20		
	Ant2	5280	20.48	5269.76	5290.24		
	Ant1	5320	20.00	5310.04	5330.04		
44.4	Ant2	5320	20.00	5310.00	5330.00		
11A	Ant1	5500	20.12	5489.88	5510.00		
	Ant2	5500	20.00	5490.00	5510.00		
	Ant1	5580	20.40	5569.76	5590.16		
	Ant2	5580	20.04	5569.96	5590.00		
	Ant1	5700	20.12	5690.00	5710.12		
	Ant2	5700	20.04	5689.96	5710.00		
	Ant1	5745	20.20	5734.84	5755.04		
	Ant2	5745	19.92	5735.04	5754.96		
	Ant1	5785	20.00	5775.00	5795.00		
	Ant2	5785	19.96	5775.00	5794.96		
	Ant1	5825	20.00	5815.04	5835.04		
	Ant2	5825	20.04	5814.96	5835.00		
	Ant1	5180	20.20	5169.92	5190.12		
	Ant2	5180	20.40	5169.76	5190.16		
	Ant1	5200	20.36	5189.84	5210.20		
	Ant2	5200	20.44	5189.80	5210.24		
	Ant1	5240	20.44	5229.76	5250.20		
	Ant2	5240	20.36	5229.80	5250.16		
	Ant1	5260	20.44	5249.68	5270.12		
	Ant2	5260	20.40	5249.76	5270.16		
	Ant1	5280	20.32	5269.88	5290.20		
11N20MIMO	Ant2	5280	20.36	5269.80	5290.16		
_	Ant1	5320	20.32	5309.84	5330.16		
	Ant2	5320	20.44	5309.80	5330.24		
	Ant1	5500	20.28	5489.84	5510.12		
	Ant2	5500	20.36	5489.76	5510.12		
	Ant1	5580	20.36	5569.84	5590.20		
	Ant2	5580	20.36	5569.80	5590.16		
	Ant1	5700	20.40	5689.84	5710.24		
	Ant2	5700	20.36	5689.76	5710.12		
	Ant1	5745	20.24	5734.84	5755.08		

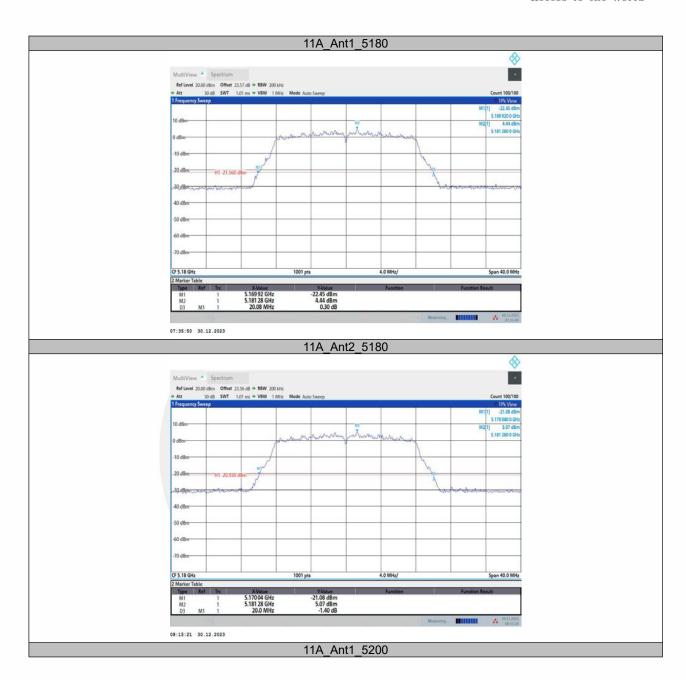


	Ant2	E71E	20.40	5724 72	E7EE 10	
	Ant2	5745	20.40	5734.72	5755.12	
	Ant1	5785	20.36	5774.80	5795.16	
	Ant2	5785	20.40	5774.76	5795.16	
	Ant1	5825	20.32	5814.80	5835.12	
	Ant2	5825	20.44	5814.72	5835.16	
	Ant1	5190	42.32	5168.88	5211.20	
	Ant2	5190	41.52	5169.20	5210.72	
	Ant1	5230	42.32	5208.80	5251.12	
	Ant2	5230	41.04	5209.52	5250.56	
	Ant1	5270	42.16	5249.04	5291.20	
	Ant2	5270	41.36	5249.28	5290.64	
	Ant1	5310	42.32	5288.80	5331.12	
	Ant2	5310	41.20	5289.28	5330.48	
11N40MIMO	Ant1	5510	42.00	5488.96	5530.96	
111140IVIIIVIO	Ant2	5510	41.28	5489.28	5530.56	
	Ant1	5550	42.24	5528.64	5570.88	
	Ant2	5550	40.72	5529.52	5570.24	
	Ant1	5670	40.88	5649.60	5690.48	
	Ant2	5670	40.32	5649.92	5690.24	
	Ant1	5755	41.28	5734.36	5775.64	
	Ant2	5755	40.32	5734.84	5775.16	
	Ant1	5795	41.20	5774.36	5815.56	
	Ant2	5795	40.72	5774.52	5815.24	
	Ant1	5180	20.08	5169.92	5190.00	
	Ant2	5180	20.12	5169.92	5190.04	
	Ant1	5200	20.12	5189.92	5210.04	
	Ant2	5200	20.16	5189.88	5210.04	
	Ant1	5240	20.16	5229.92	5250.08	
	Ant2	5240	20.08	5229.96	5250.06	
-	Ant1	5260	20.16	5249.88	5270.04	
-	Ant2	5260		5249.88		
			20.08		5270.00	
	Ant1	5280	20.20	5269.92	5290.12	
	Ant2	5280	20.16	5269.96	5290.12	
	Ant1	5320	20.24	5309.92	5330.16	
11AC20MIMO	Ant2	5320	20.08	5309.96	5330.04	
	Ant1	5500	20.12	5489.92	5510.04	
	Ant2	5500	20.08	5489.92	5510.00	
	Ant1	5580	20.16	5569.88	5590.04	
	Ant2	5580	20.12	5569.88	5590.00	
	Ant1	5700	20.20	5689.84	5710.04	
	Ant2	5700	20.08	5689.96	5710.04	
	Ant1	5745	20.28	5734.88	5755.16	
	Ant2	5745	20.08	5734.92	5755.00	
	Ant1	5785	20.32	5774.88	5795.20	
	Ant2	5785	20.04	5774.96	5795.00	
	Ant1	5825	20.20	5814.84	5835.04	
	Ant2	5825	20.12	5814.92	5835.04	
	Ant1	5190	40.96	5169.60	5210.56	
	Ant2	5190	40.40	5169.84	5210.24	
	Ant1	5230	41.20	5209.36	5250.56	
444.040	Ant2	5230	40.56	5209.76	5250.32	
11AC40MIMO	Ant1	5270	41.12	5249.44	5290.56	
	Ant2	5270	40.32	5249.84	5290.16	
	, viive	0210	10.02	02 FU.U-T	0200.10	
	Ant1	5310	41.04	5289.36	5330.40	

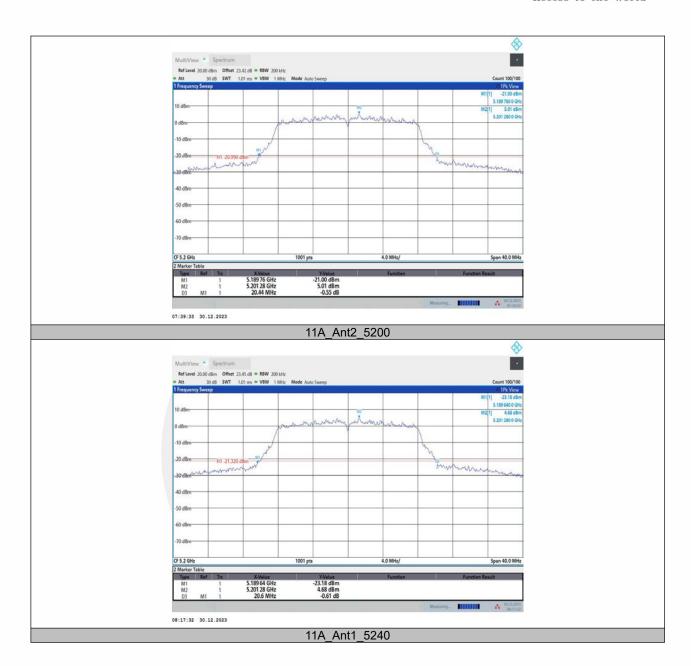


	Ant1	5510	40.96	5489.52	5530.48	
	Ant2	5510	40.72	5489.60	5530.32	
	Ant1	5550	41.12	5529.44	5570.56	
	Ant2	5550	40.48	5529.76	5570.24	
	Ant1	5670	40.88	5649.60	5690.48	
	Ant2	5670	40.40	5649.84	5690.24	
	Ant1	5755	41.28	5734.28	5775.56	
	Ant2	5755	40.32	5734.76	5775.08	
	Ant1	5795	40.88	5774.52	5815.40	
	Ant2	5795	40.40	5774.84	5815.24	
	Ant1	5210	81.92	5169.04	5250.96	
	Ant2	5210	81.12	5169.52	5250.64	
	Ant1	5290	82.08	5249.04	5331.12	
	Ant2	5290	80.96	5249.52	5330.48	
11AC80MIMO	Ant1	5530	82.08	5489.04	5571.12	
TIACOUIVIIIVIO	Ant2	5530	81.12	5489.36	5570.48	
	Ant1	5610	82.08	5569.04	5651.12	
	Ant2	5610	80.80	5569.68	5650.48	
	Ant1	5775	82.40	5733.88	5816.28	
	Ant2	5775	81.12	5734.36	5815.48	









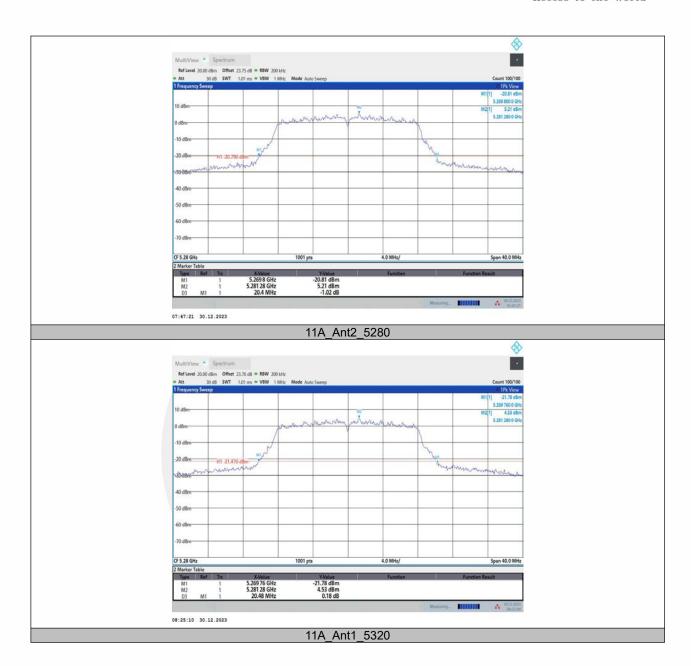




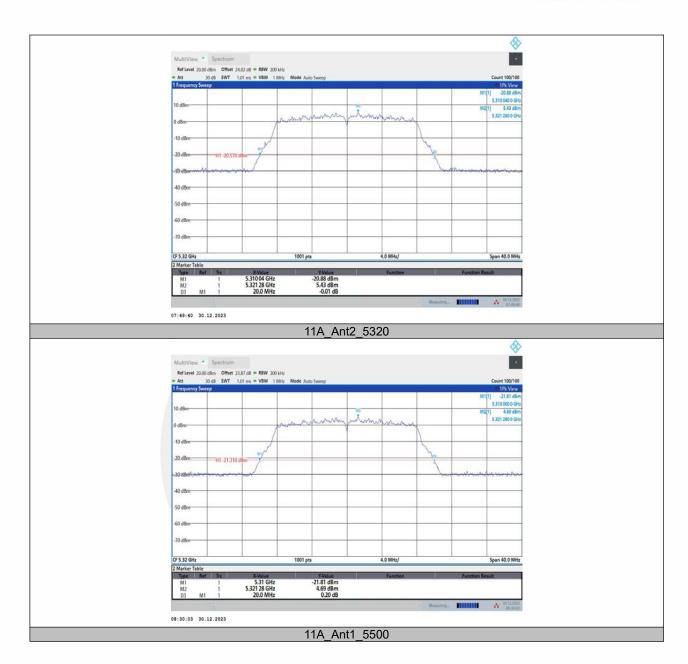








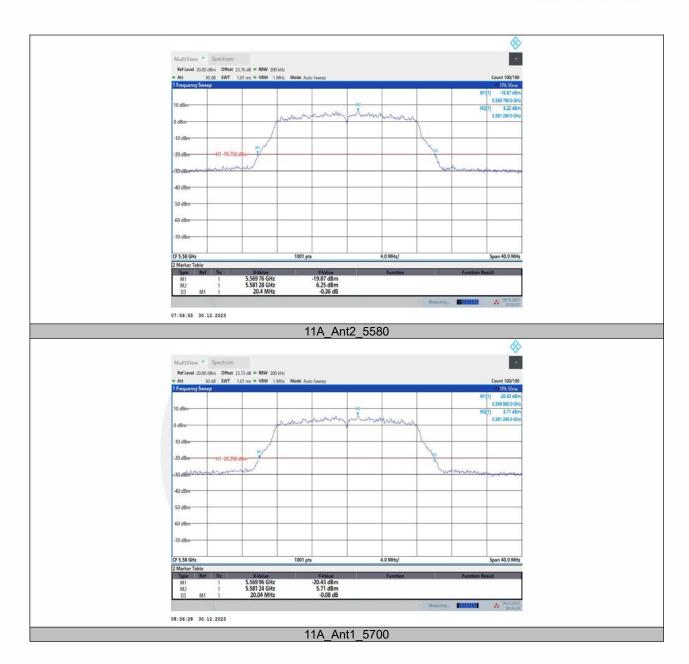




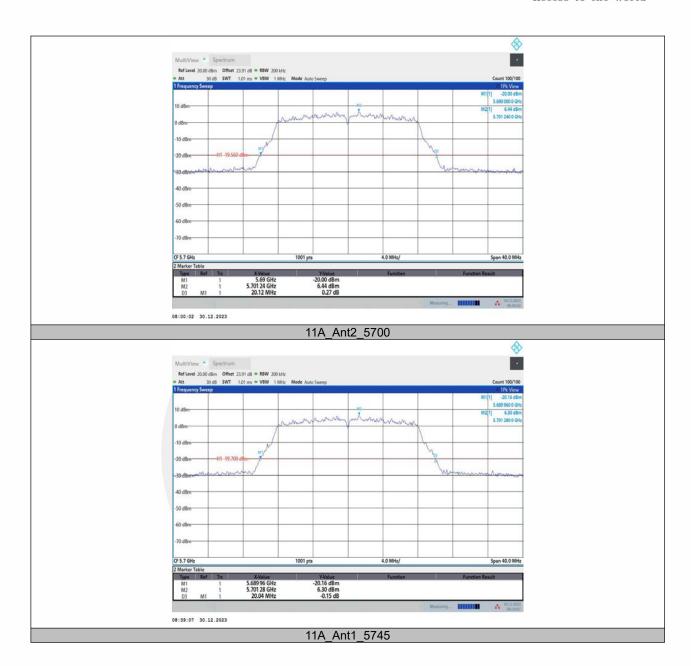




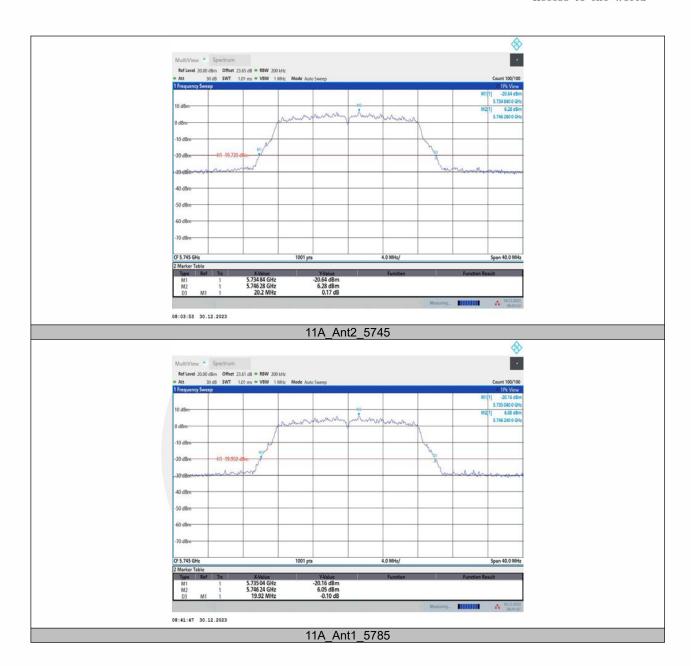




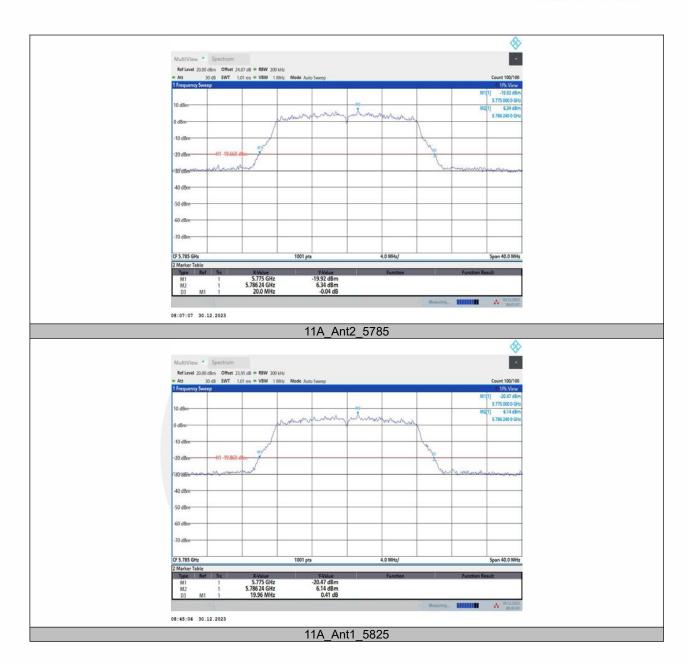




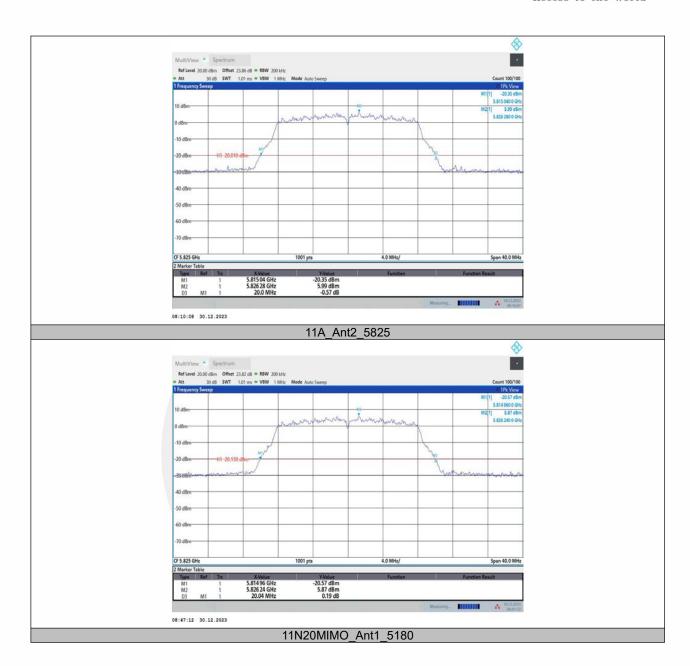












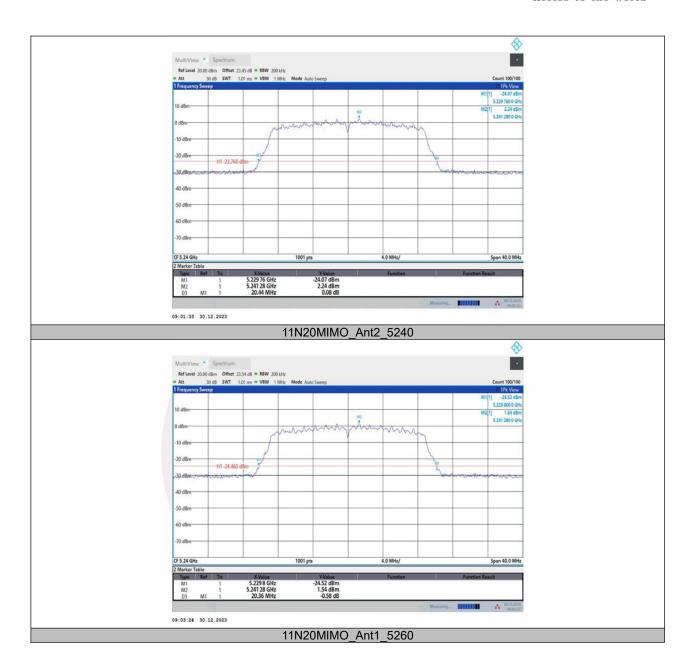




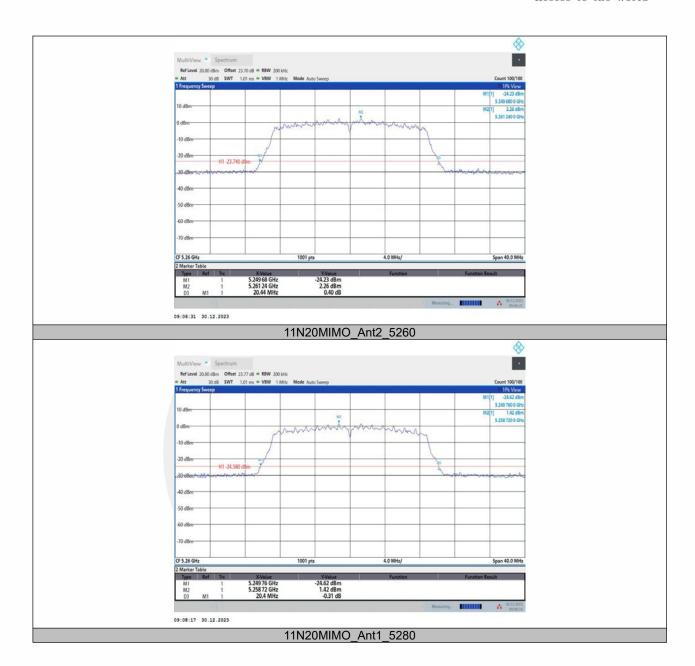




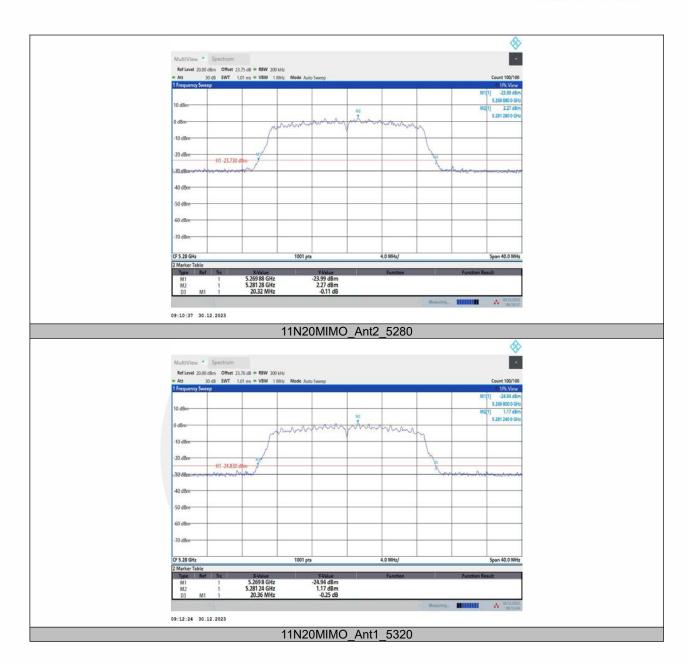




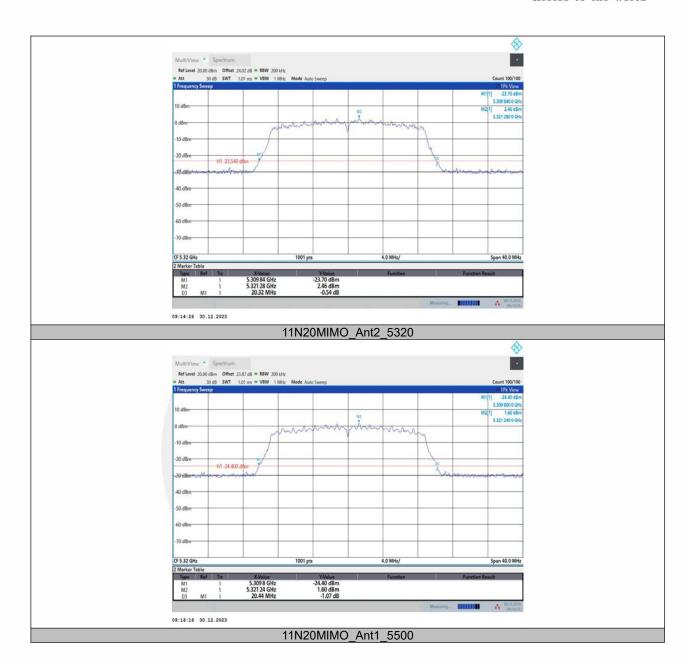
















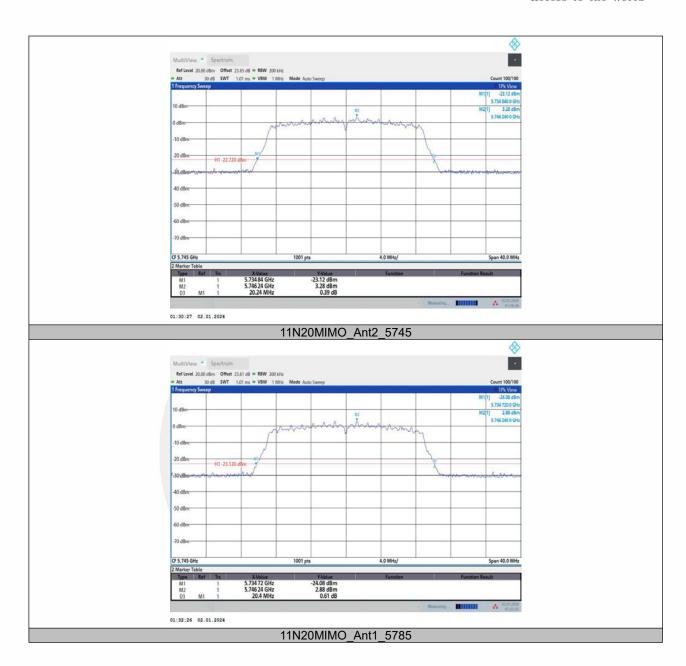












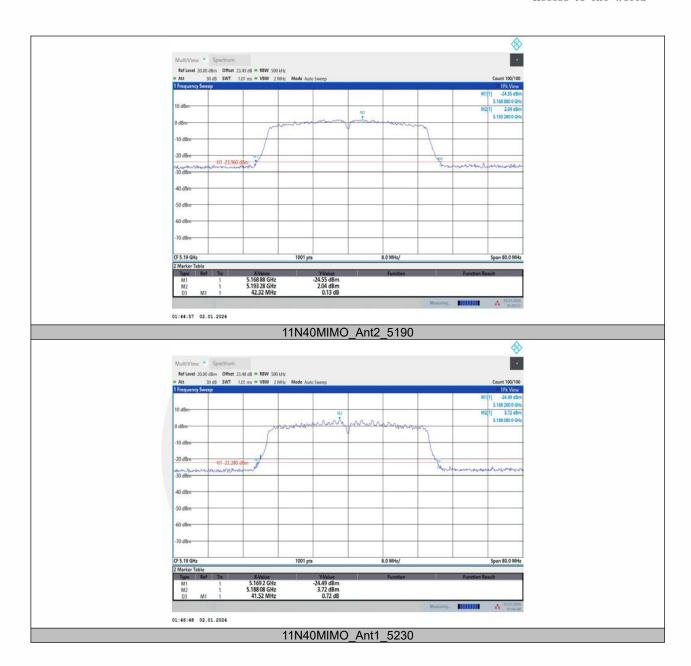




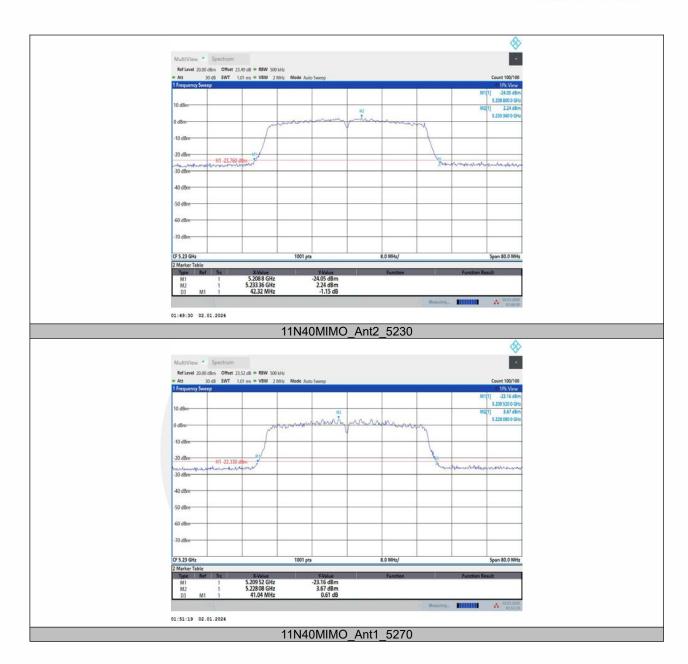




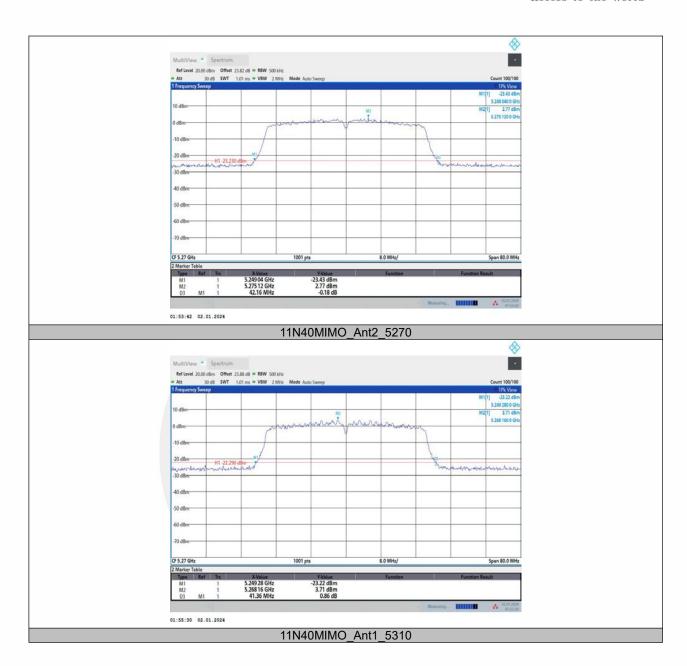








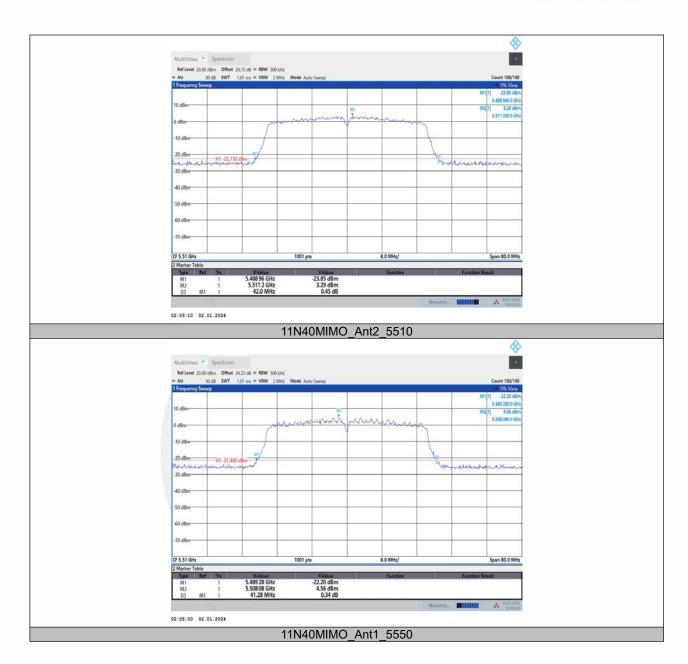








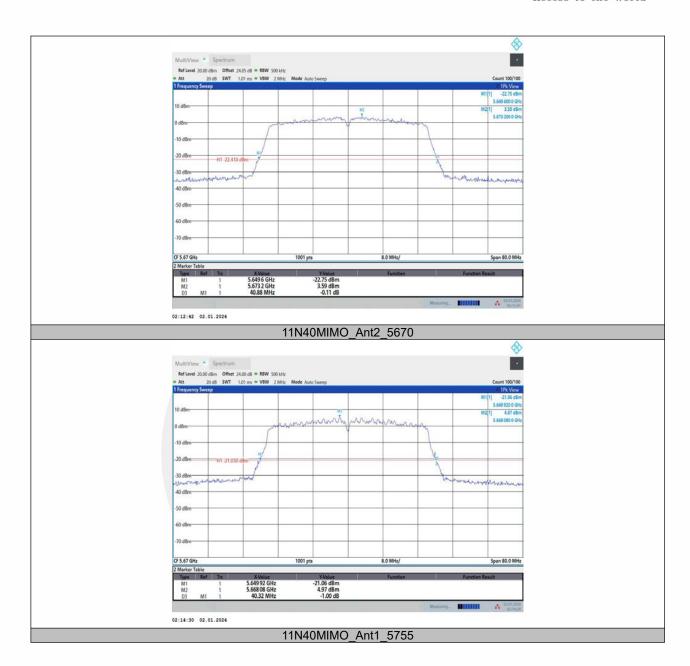




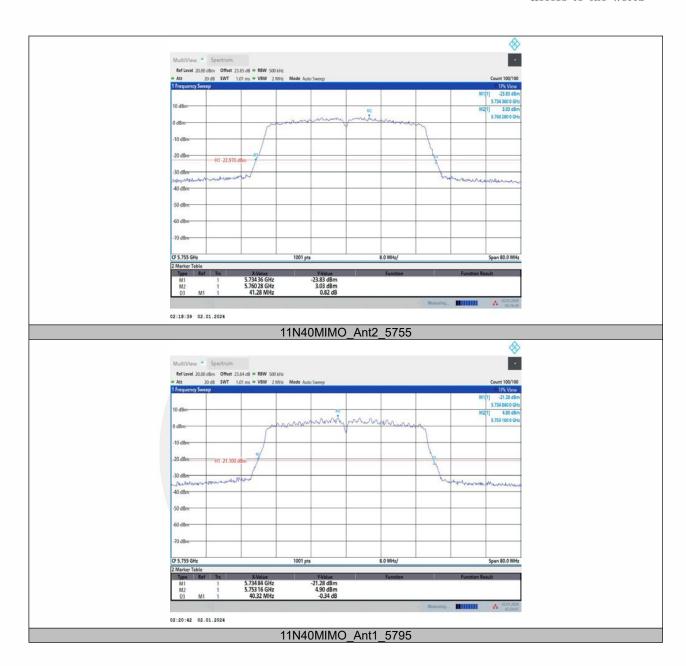




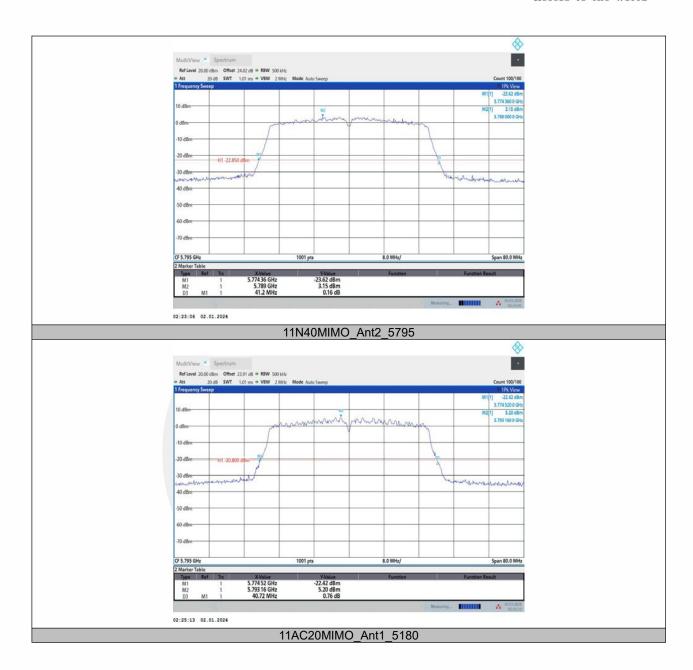












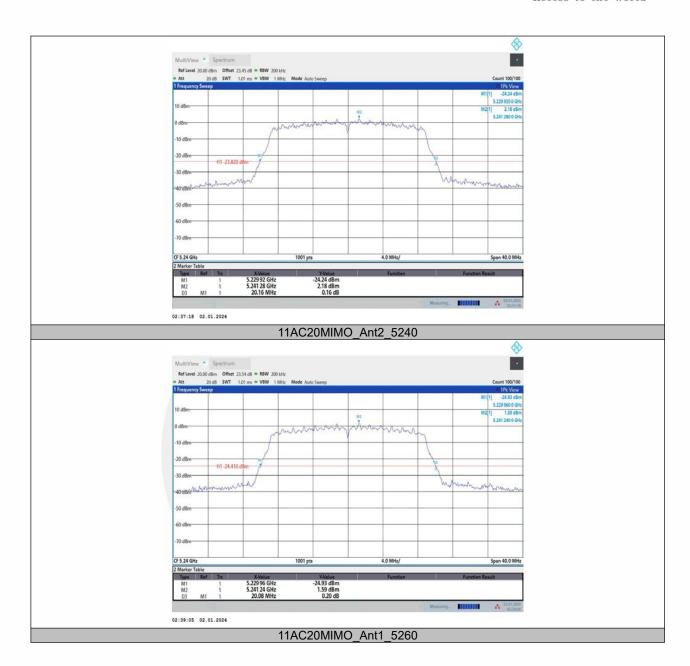




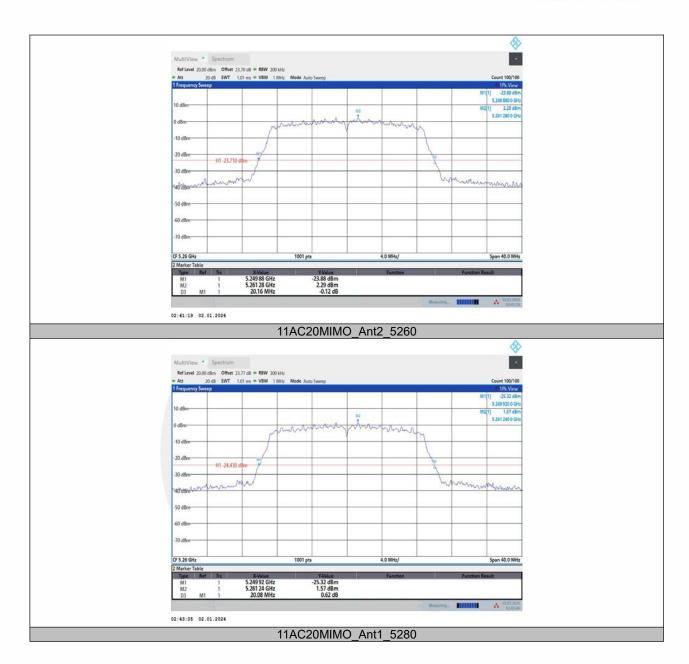




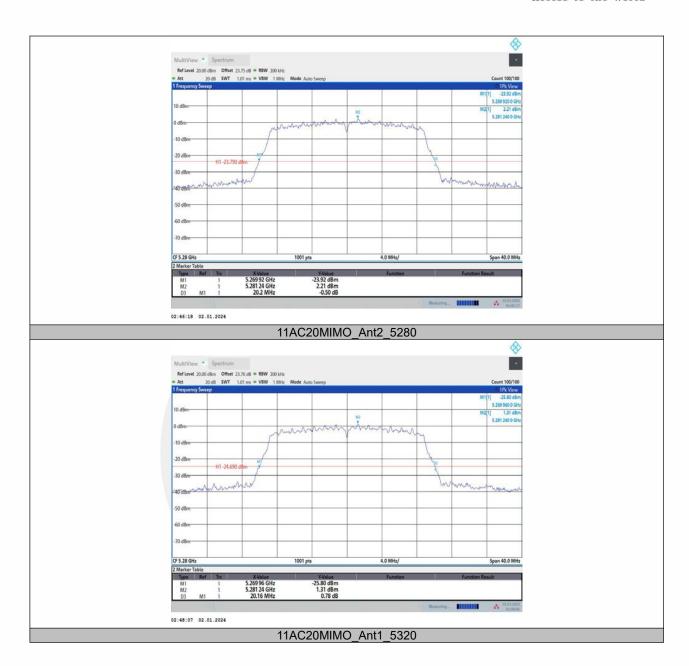




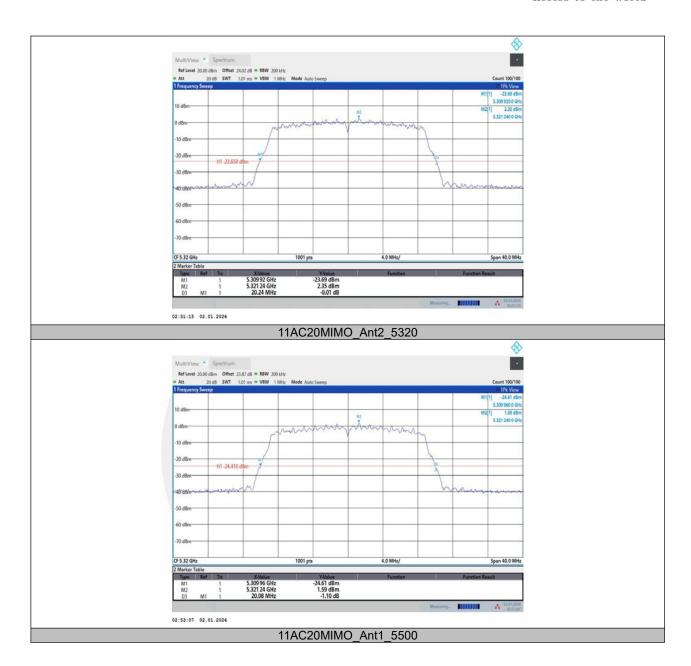




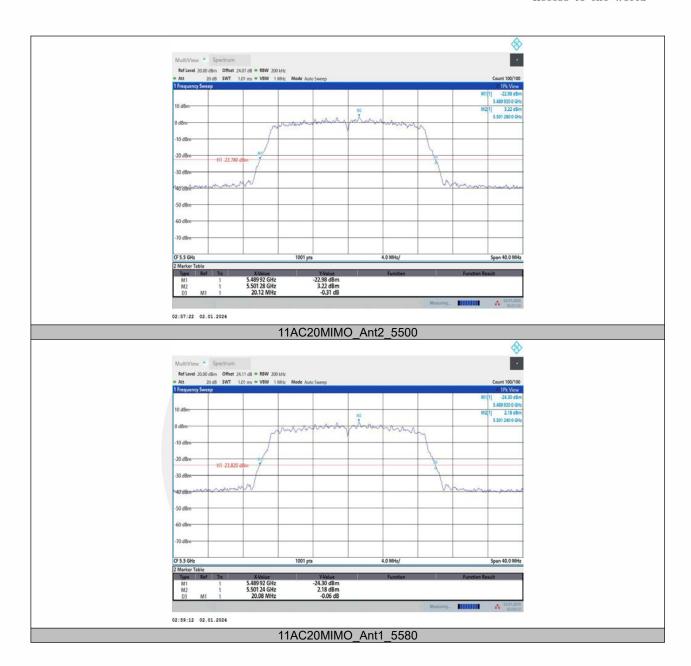




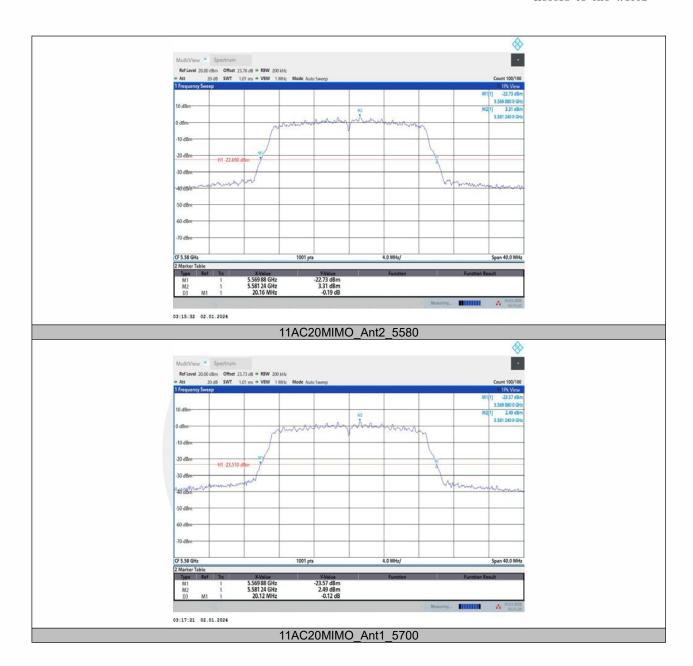




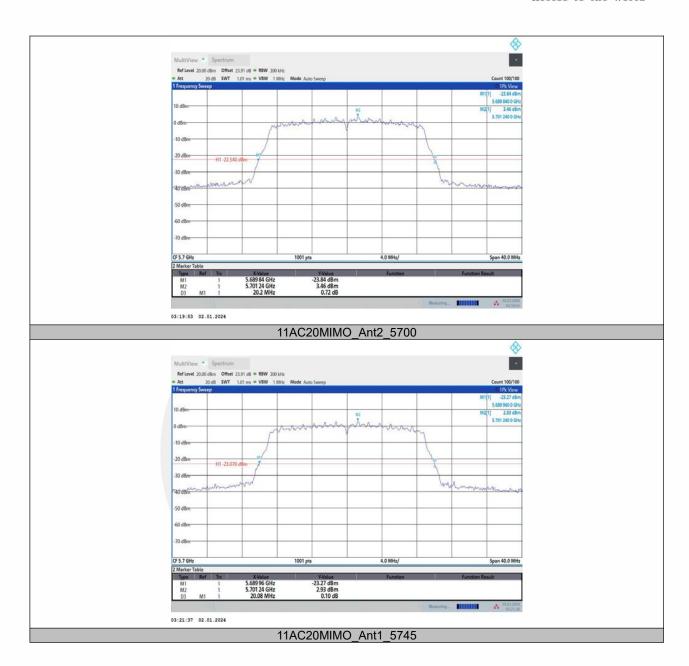








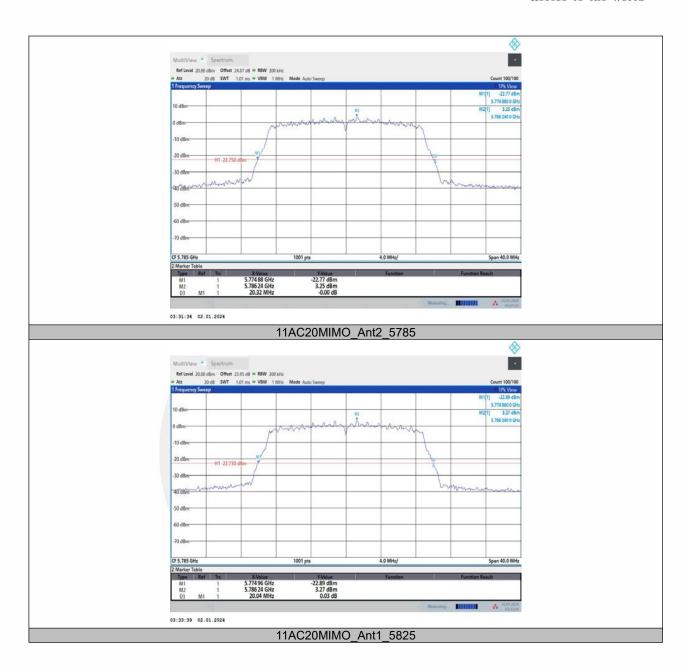




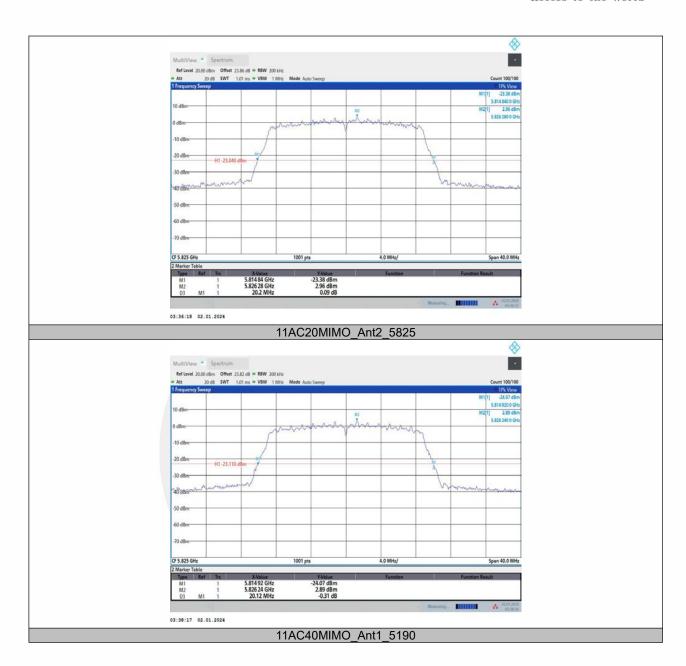




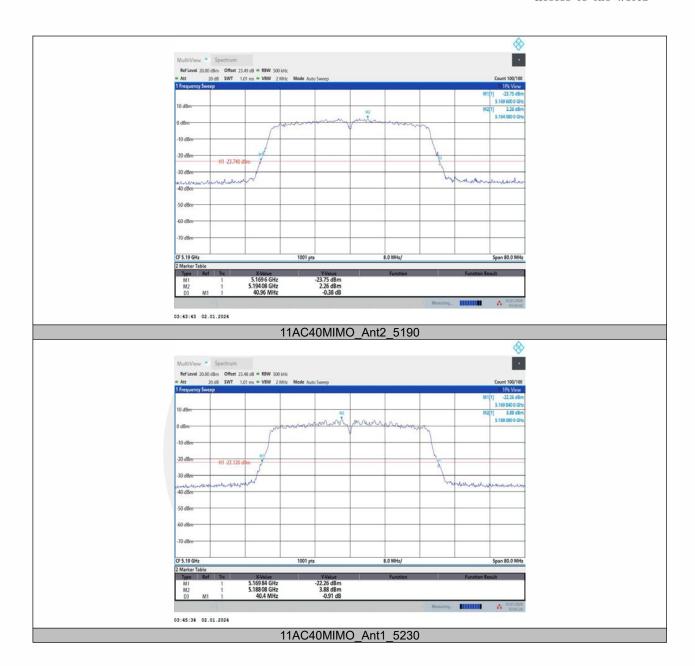




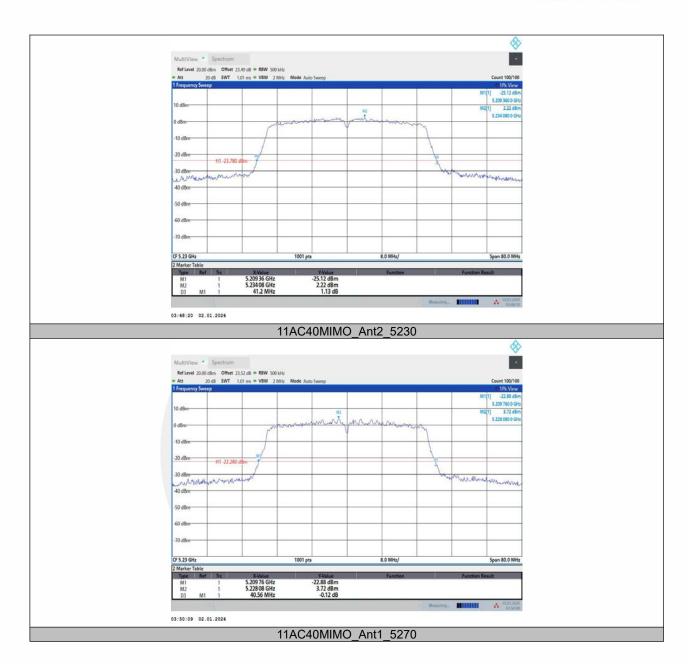




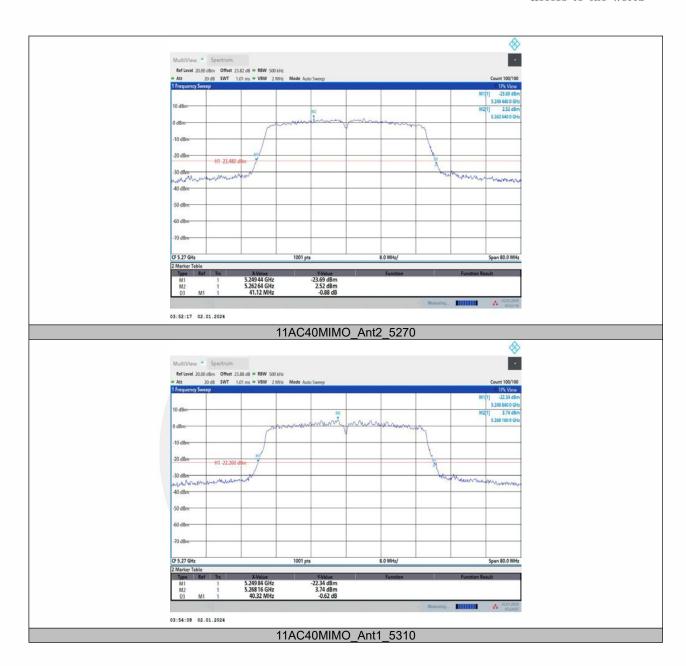




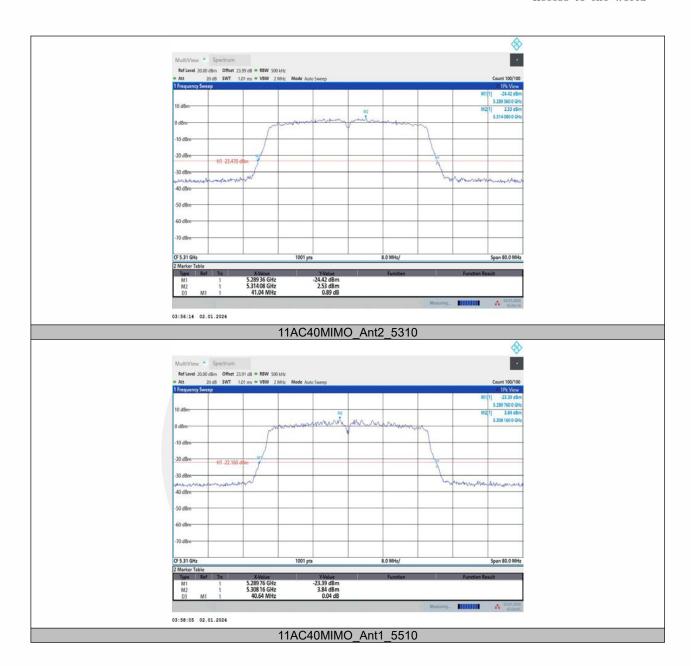




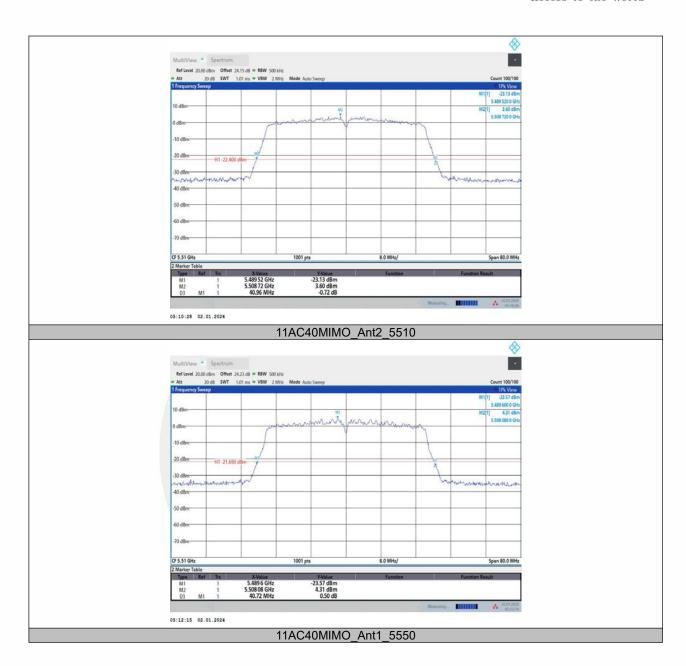




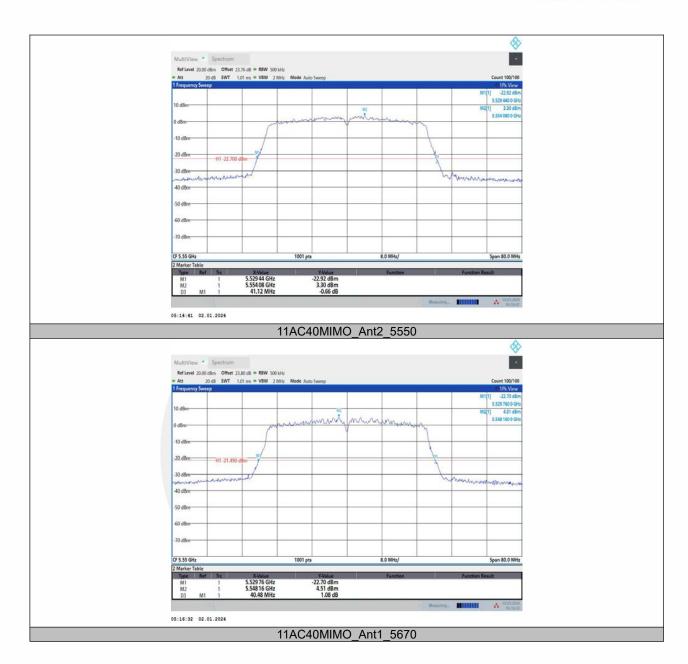




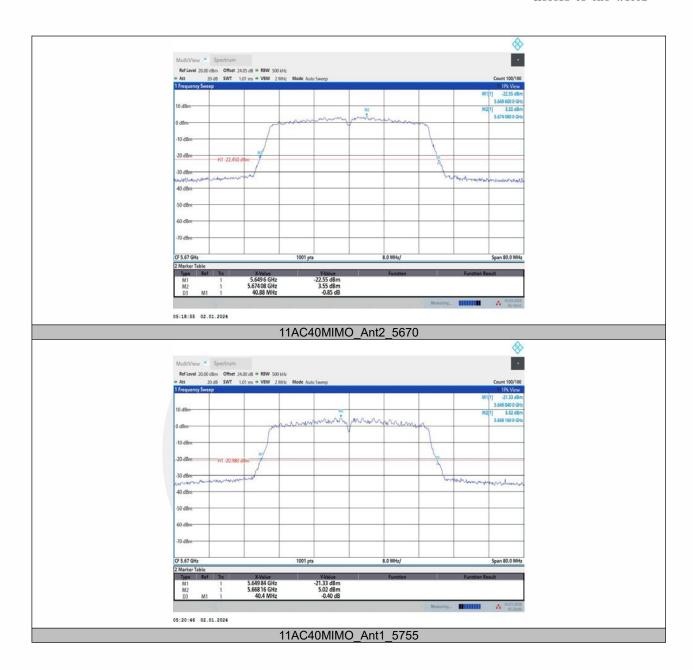




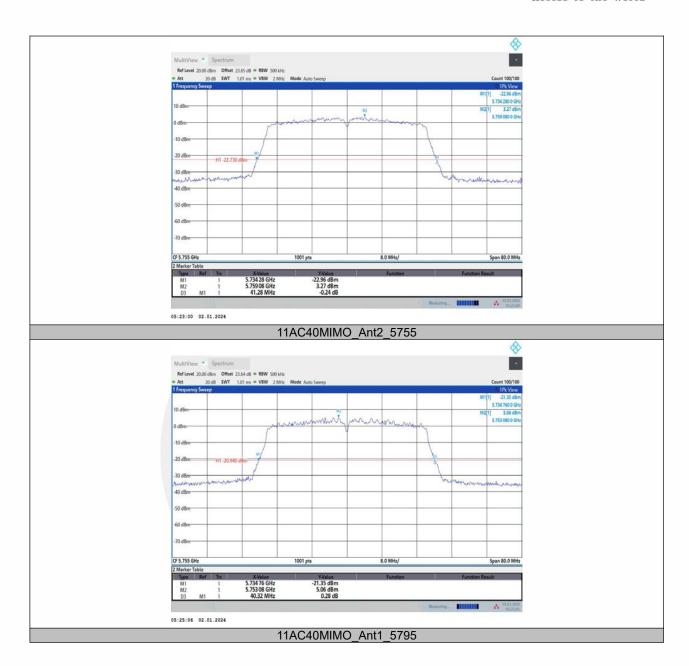




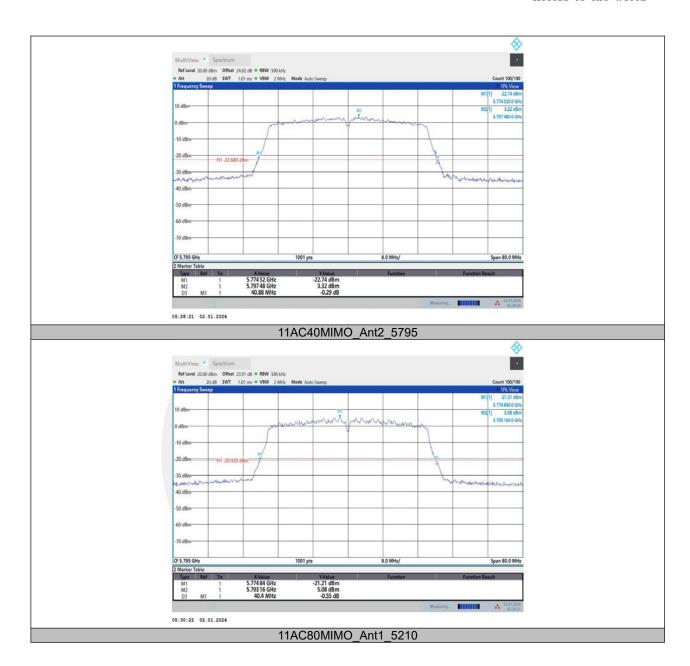




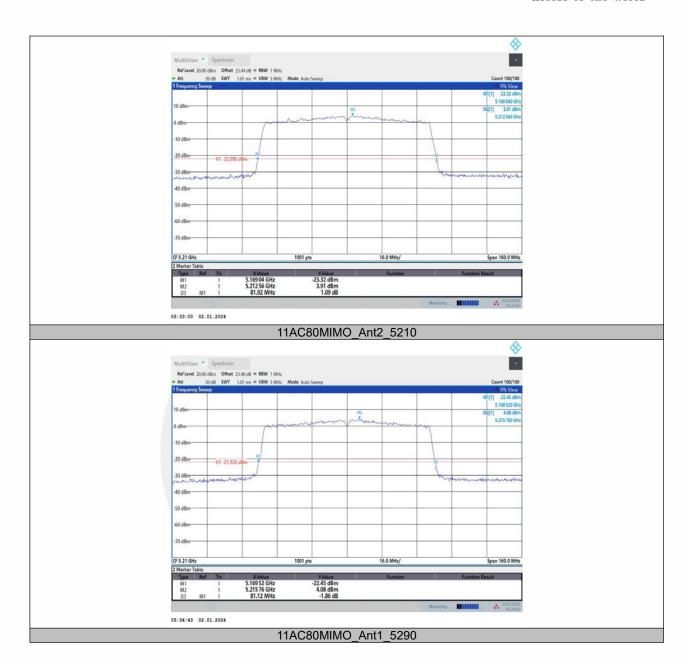




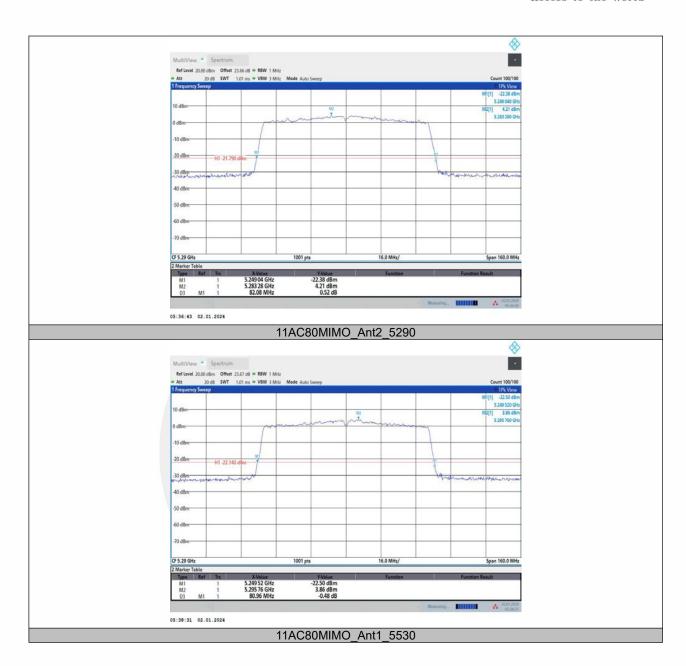




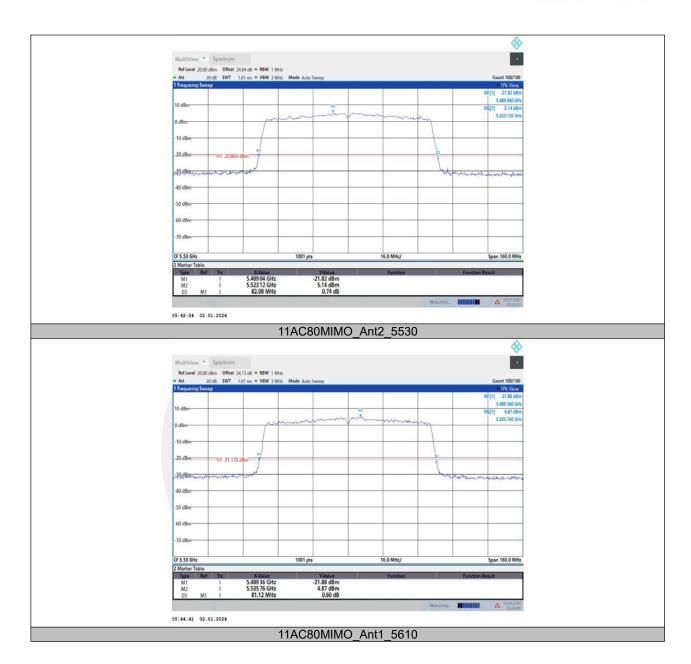




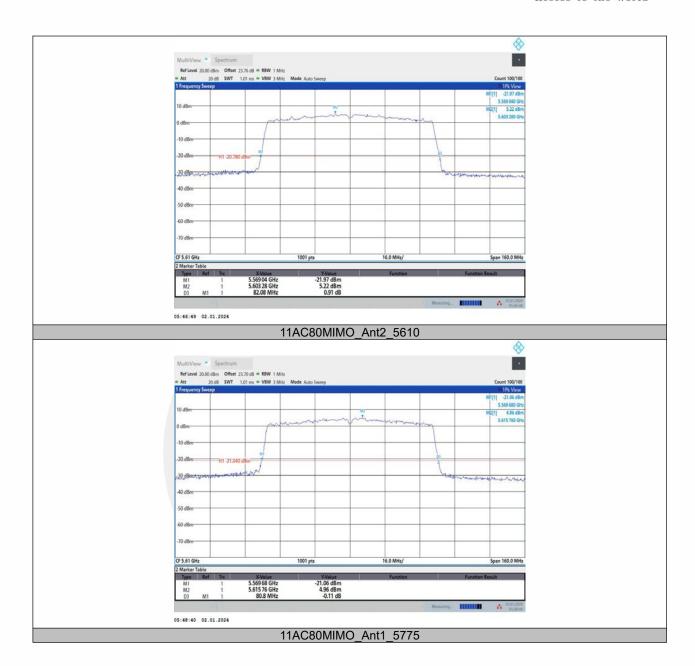




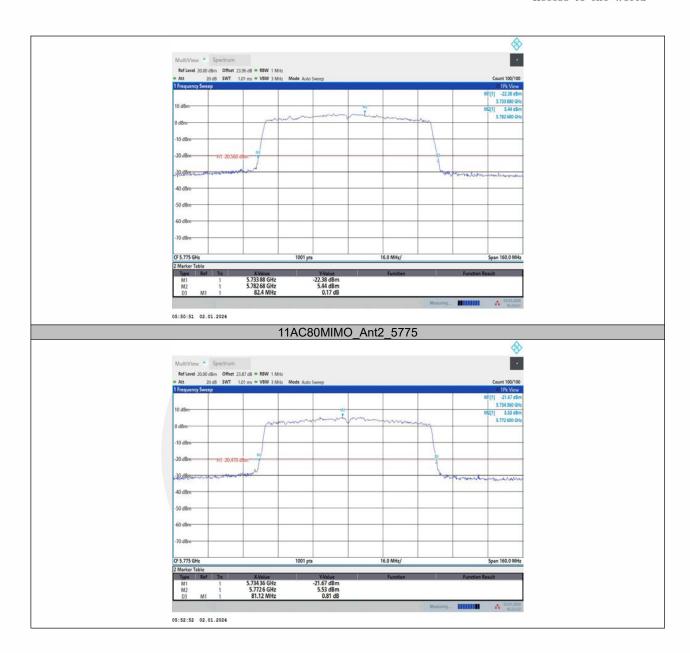














Occupied channel bandwidth

TestMode	Antenna	Frequency[MHz]	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdic
	Ant1	5180	17.274	5171.3216	5188.5955		
	Ant2	5180	17.264	5171.3173	5188.5816		
11A	Ant1	5200	17.35	5191.2786	5208.6285		
	Ant2	5200	17.336	5191.2799	5208.6163		
	Ant1	5240	17.322	5231.2815	5248.6033		
	Ant2	5240	17.357	5231.2851	5248.6424		
	Ant1	5260	17.32	5251.2681	5268.5886		
	Ant2	5260	17.361	5251.2449	5268.6059		
	Ant1	5280	17.314	5271.2849	5288.5994		
	Ant2	5280	17.351	5271.2909	5288.6420		
	Ant1	5320	17.256	5311.3200	5328.5758		
	Ant2	5320	17.269	5311.3144	5328.5834		
	Ant1	5500	17.254	5491.3009	5508.5550		
	Ant2	5500	17.255	5491.3061	5508.5612		
	Ant1	5580	17.251	5571.3174	5588.5680		
	Ant2	5580	17.332	5571.2921	5588.6238		
	Ant1	5700	17.21 17.237	5691.3527	5708.5631		
	Ant2	5700		5691.3313	5708.5680		
	Ant1	5745	17.213	5736.3453	5753.5580		
	Ant2	5745	17.266	5736.3101	5753.5761		
	Ant1	5785	17.287	5776.3043	5793.5913		
	Ant2	5785	17.27	5776.3042	5793.5738		
	Ant1	5825	17.255	5816.3212	5833.5766		
	Ant2	5825	17.249	5816.3199	5833.5687		
	Ant1	5180	18.08	5170.9429	5189.0226		
	Ant2	5180	17.746	5171.0980	5188.8444		
	Ant1	5200	18.119	5190.9309	5209.0495		
	Ant2	5200	17.775	5191.0809	5208.8561		
	Ant1	5240	18.119	5230.9318	5249.0510		
	Ant2	5240	17.77	5231.0883	5248.8588		
	Ant1	5260	18.099	5250.9056	5269.0050		
	Ant2	5260	17.769	5251.0758	5268.8444		
	Ant1	5280	18.124	5270.9141	5289.0385		
	Ant2	5280	17.781	5271.0891	5288.8706		
	Ant1	5320	18.1	5310.9193	5329.0195		
11N20MIMO	Ant2	5320	17.755	5311.0920	5328.8466		
	Ant1	5500	18.095	5490.8944	5508.9898		
	Ant2	5500	17.746	5491.0846	5508.8303		
	Ant1	5580	18.105	5570.9304	5589.0349		
	Ant2	5580	17.753	5571.0947	5588.8474		
	Ant1	5700	18.072	5690.9430	5709.0145		
	Ant2	5700	17.747	_			
				5691.0915	5708.8388		
	Ant1	5745	18.057	5735.9338	5753.9908		
	Ant2	5745	17.748	5736.0814	5753.8290		
	Ant1	5785	18.106	5775.9076	5794.0134		
	Ant2	5785	17.746	5776.0849	5793.8306		
	Ant1	5825	18.106	5815.9274	5834.0329		
	Ant2	5825	17.749	5816.0897	5833.8389		
	Ant1	5190	36.411	5171.7799	5208.1909		
11N40MIMO	Ant2	5190	36.688	5171.6830	5208.3706		
	Ant1	5230	36.438	5211.7564	5248.1947		
	Ant2	5230	36.778	5211.6596	5248.4373		
	Ant1	5270	36.448	5251.7355	5288.1835		
	Ant2	5270	36.814	5251.6216	5288.4355		
	Ant1	5310	36.465	5291.7257	5328.1910		
	Ant2	5310	36.77	5291.6348	5328.4048		
	Ant1	5510	36.443	5491.7527	5528.1958		
	Ant2	5510	36.795	5491.5966	5528.3920		



	Ant1	5550	36.399	5531.7968	5568.1958	
	Ant2	5550	36.728	5531.6787	5568.4067	
	Ant1	5670	36.426	5651.7824	5688.2089	
	Ant2	5670	36.674	5651.6931	5688.3668	
	Ant1	5755	36.359	5736.7429	5773.1021	
	Ant2	5755	36.661	5736.6783	5773.3397	
	Ant1	5795	36.429	5776.7257	5813.1543	
Ī	Ant2	5795	36.632	5776.6923	5813.3239	
	Ant1	5180	18.088	5170.9370	5189.0247	
	Ant2	5180	17.727	5171.1052	5188.8321	
	Ant1	5200	18.117	5190.9290	5209.0461	
	Ant2	5200	17.76	5191.0855	5208.8455	
	Ant1	5240	18.094	5230.9306	5249.0246	
	Ant2	5240	17.773	5231.0833		
					5248.8562	
	Ant1	5260	18.112	5250.8976	5269.0100	
	Ant2	5260	17.767	5251.0616	5268.8286	
	Ant1	5280	18.105	5270.9255	5289.0307	
	Ant2	5280	17.754	5271.0918	5288.8455	
	Ant1	5320	18.096	5310.9262	5329.0220	
11 1 0 0 0 0 1 1 1 0	Ant2	5320	17.751	5311.0932	5328.8438	
11AC20MIMO	Ant1	5500	18.057	5490.9298	5508.9865	
	Ant2	5500	17.746	5491.0772	5508.8234	
	Ant1	5580	18.095	5570.9242	5589.0196	
İ	Ant2	5580	17.731	5571.1081	5588.8396	
-	Ant1	5700	18.07	5690.9453	5709.0155	
+	Ant2	5700	17.735	5691.0949	5708.8298	
	Ant1	5745	18.072	5735.9312	5754.0028	
			17.745			
	Ant2	5745		5736.0846	5753.8301	
	Ant1	5785	18.092	5775.9092	5794.0008	
	Ant2	5785	17.721	5776.1049	5793.8262	
	Ant1	5825	18.08	5815.9373	5834.0176	
	Ant2	5825	17.743	5816.0917	5833.8350	
	Ant1	5190	36.379	5171.8026	5208.1812	
	Ant2	5190	36.647	5171.7027	5208.3500	
	Ant1	5230	36.482	5211.7383	5248.2199	
	Ant2	5230	36.75	5211.6431	5248.3935	
	Ant1	5270	36.488	5251.7320	5288.2198	
11AC40MIMO	Ant2	5270	36.765	5251.6476	5288.4126	
	Ant1	5310	36.475	5291.7061	5328.1814	
	Ant2	5310	36.841	5291.6080	5328.4487	
	Ant1	5510	36.511	5491.6657	5528.1765	
	Ant2	5510	36.778	5491.6136	5528.3916	
	Ant1	5550	36.451	5531.7718	5568.2223	
	Ant2	5550	36.675	5531.6817	5568.3565	
	Ant1	5670	36.385	5651.7838	5688.1684	
	Ant2	5670	36.674	5651.6933	5688.3677	
	Ant1	5755	36.4	5736.7380	5773.1379	
	Ant2	5755	36.695	5736.6663	5773.3617	
	Ant1	5795	36.418	5776.7201	5813.1381	
	Ant2	5795	36.694	5776.6806	5813.3743	
	Ant1	5210	76.079	5171.9628	5248.0420	
11AC80MIMO	Ant2	5210	75.814	5172.1631	5247.9772	
	Ant1	5290	76.236	5251.8190	5328.0554	
	Ant2	5290	75.959	5252.0365	5327.9957	
	Ant1	5530	76.091	5491.9442	5568.0349	
	Ant2	5530	75.943	5492.0604	5568.0037	
	Ant1	5610	75.93	5571.9783	5647.9082	
	Ant2	5610	75.761	5572.1656	5647.9261	
			75.986			
	Ant1	5775		5736.8932	5812.8797	
	Ant2	5775	75.77	5737.1140	5812.8843	



