



FCC RF Test Report

APPLICANT : Quectel Wireless Solutions Co., Ltd.
EQUIPMENT : Smart Module
BRAND NAME : Quectel
MODEL NAME : SG560D-WF
FCC ID : XMR2023SG560DWF
STANDARD : FCC Part 15 Subpart E §15.407
CLASSIFICATION : (NII) Unlicensed National Information Infrastructure
TEST DATE(S) : Sep. 06, 2024 ~ Oct. 15, 2024

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

This report contains data that were produced under subcontract by Sporton International Inc. (Kunshan)

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

Jason Jia

Approved by: Jason Jia



Sporton International Inc. (ShenZhen)

1/F, 2/F, Bldg 5, Shiling Industrial Zone, Xinwei Village, Xili, Nanshan, Shenzhen, 518055

People's Republic of China



TABLE OF CONTENTS

SUMMARY OF TEST RESULT	4
1 GENERAL DESCRIPTION	5
1.1 Applicant	5
1.2 Manufacturer	5
1.3 Product Feature of Equipment Under Test.....	5
1.4 Product Specification of Equipment Under Test.....	6
1.5 Modification of EUT	6
1.6 Testing Location	6
1.7 Test Software.....	7
1.8 Applicable Standards.....	8
2 TEST CONFIGURATION OF EQUIPMENT UNDER TEST	9
2.1 Carrier Frequency and Channel	9
2.2 Test Mode	9
2.3 Connection Diagram of Test System.....	10
2.4 Support Unit used in test configuration and system	11
2.5 EUT Operation Test Setup	11
3 TEST RESULT	12
3.1 26dB & 99% Occupied Bandwidth Measurement	12
3.2 Maximum Conducted Output Power Measurement	13
3.3 Power Spectral Density Measurement	15
3.4 Unwanted Emissions Measurement	17
3.5 AC Conducted Emission Measurement.....	22
3.6 Antenna Requirements	24
4 LIST OF MEASURING EQUIPMENT	25
5 MEASUREMENT UNCERTAINTY	26
APPENDIX A. CONDUCTED TEST RESULTS	
APPENDIX B. AC CONDUCTED EMISSION TEST RESULT	
APPENDIX C. RADIATED SPURIOUS EMISSION	
APPENDIX D. DUTY CYCLE PLOTS	
APPENDIX E. SETUP PHOTOGRAPHS	



REVISION HISTORY

REPORT NO.	VERSION	DESCRIPTION	ISSUED DATE
FR482209F	Rev. 01	Initial issue of report	Oct. 23, 2024



SUMMARY OF TEST RESULT

Report Section	FCC Rule	Description	Limit for U-NII-2C	Limit for U-NII-3	Result	Remark
3.1	2.1049 & 15.403(i)	26dB & 99% Bandwidth	-	-	Pass	-
3.2	15.407(a)	Maximum Conducted Output Power	≤24 dBm for UNII-2C	≤ 30 dBm	Pass	-
3.3	15.407(a)	Power Spectral Density	≤11 dBm/MHz for UNII-2C	≤ 30 dBm/500kHz	Pass	-
3.4	15.407(b)	Unwanted Emissions	15.407(b) & 15.209(a)	15.407(b)(4)(i) & 15.209(a)	Pass	Under limit 12.49 dB at 5460.00 MHz
3.5	15.207	AC Conducted Emission	15.207(a)	15.207(a)	Pass	Under limit 12.40 dB at 0.36 MHz
3.6	15.203 & 15.407(a)	Antenna Requirement	15.203 & 15.407(a)	15.203 & 15.407(a)	Pass	-

Remark : This is a variant report, reference the original test report number PD20230213RF04. the change note could be referred to the Class II Permissive Change letter which is exhibit separately. According to the differences, this report only contains straddle channel test data and is used together with test report FR482209D.

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/manufacture 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

Quectel Wireless Solutions Co., Ltd.

Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District,
Shanghai 200233, China

1.2 Manufacturer

Quectel Wireless Solutions Co., Ltd.

Building 5, Shanghai Business Park Phase III (Area B), No.1016 Tianlin Road, Minhang District,
Shanghai 200233, China

1.3 Product Feature of Equipment Under Test

Product Feature	
Equipment	Smart Module
Brand Name	Quectel
Model Name	SG560D-WF
FCC ID	XMR2023SG560DWF
SN Code	Conducted: D1C24CG10000191 Conduction: D1C24CG10000046 Radiation: 6d896798
HW Version	R2.0
SW Version	SG560DWFPBR03A01
EUT Stage	Identical Prototype

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

1.4 Product Specification of Equipment Under Test

Standards-related Product Specification	
Tx/Rx Frequency Range	5500 MHz ~ 5720 MHz
Maximum Output Power to Antenna	MIMO <Ant. 1 + 2> <5500 MHz ~ 5720 MHz > 802.11a : 17.29 dBm / 0.0536 W 802.11n HT20 : 17.54 dBm / 0.0568 W 802.11n HT40 : 18.23 dBm / 0.0665 W 802.11ac VHT20: 17.02 dBm / 0.0504 W 802.11ac VHT40: 16.62 dBm / 0.0459 W 802.11ac VHT80: 16.68 dBm / 0.0466 W 802.11ax HE20: 17.05 dBm / 0.0507 W 802.11ax HE40: 16.64 dBm / 0.0461 W 802.11ax HE80: 16.72 dBm / 0.0470 W
Antenna Type / Gain	<5500 MHz ~ 5720 MHz> <Ant. 1> : Dipole Antenna type with gain -1.2 dBi <Ant. 2> : Dipole Antenna type with gain -1.2 dBi
Type of Modulation	802.11a/n : OFDM (BPSK / QPSK / 16QAM / 64QAM) 802.11ac : OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM) 802.11ax : OFDM (BPSK / QPSK / 16QAM / 64QAM / 256QAM / 1024QAM)

Note: WLAN MIMO support CDD mode.

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.
	TH01-KS	CN1257	314309

Note : Test data subcontracted: conducted test case in section 3.1 of this report



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

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

Test Firm	Sporton International Inc. (ShenZhen)		
Test Site Location	101, 1st Floor, Block B, Building 1, No. 2, Tengfeng 4th Road, Fenghuang Community, Fuyong Street, Baoan District, Shenzhen City, Guangdong Province 518103 People's Republic of China TEL: +86-755-86066985		
Test Site No.	Sporton Site No.	FCC Designation No.	FCC Test Firm Registration No.
	03CH04-SZ	CN1256	421272

1.7 Test Software

Item	Site	Manufacturer	Name	Version
1.	TH01-KS	Tonscend	JS1120-3 test system China_210602	3.3.10
2.	03CH04-SZ	AUDIX	E3	6.2009-8-24
3.	CO01-SZ	AUDIX	E3	6.120613b



1.8 Applicable Standards

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

- ♦ 47 CFR Part 15 Subpart E
- ♦ FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.
- ♦ 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

Frequency Band	Channel	Freq. (MHz)	Channel	Freq. (MHz)
Straddle Channel	138 [#]	5690	144	5720
	142 [*]	5710	-	-

Note:

1. The above Frequency and Channel in "*" are 40MHz bandwidth.
2. The above Frequency and Channel in "#" are 80MHz bandwidth.

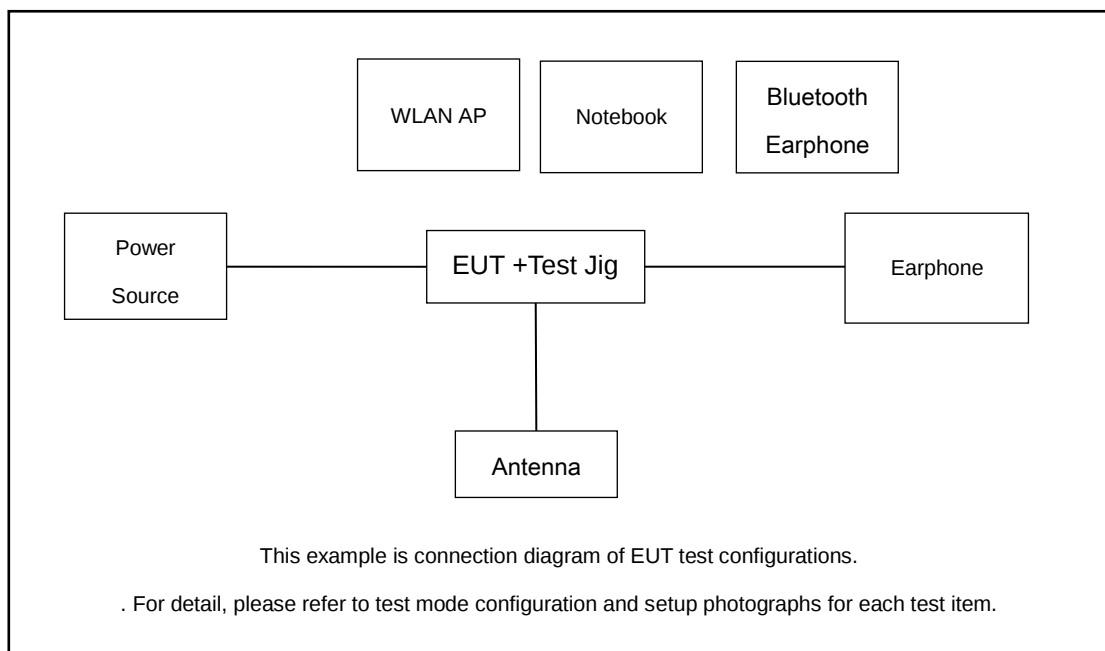
2.2 Test Mode

Ch. #	U-NII-2C	U-NII-2C	U-NII-2C
	20M BW	40M BW	80M BW
Straddle	144	142	138

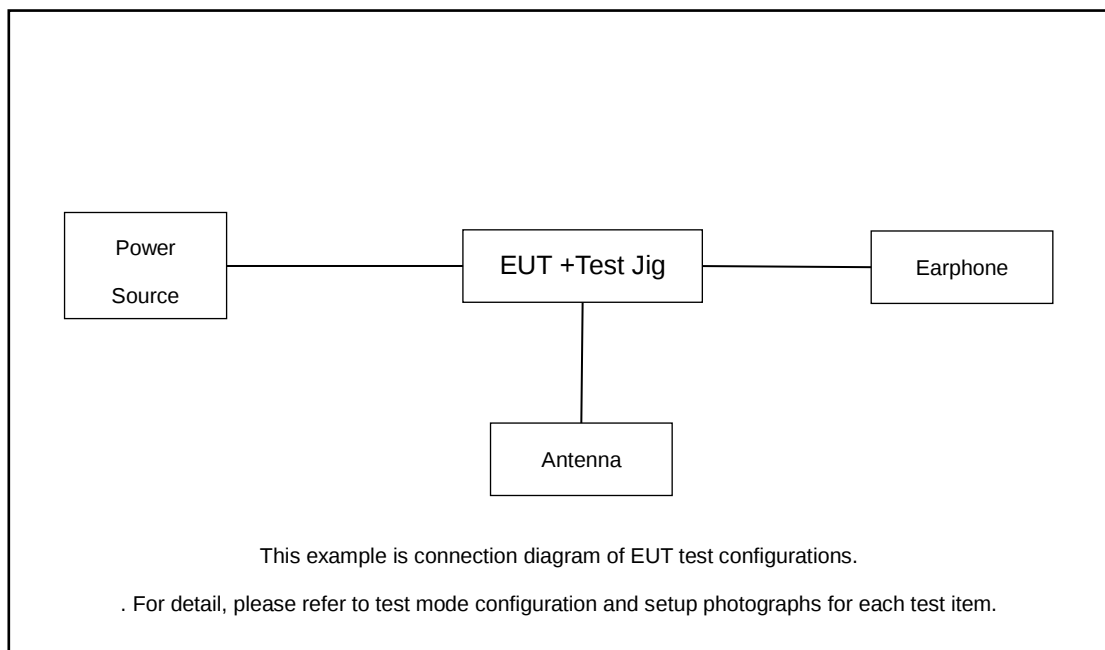
Test Cases	
AC Conducted Emission	Mode 1 : Bluetooth Link + WLAN Link (5G) + USB cable with NB + Charging from Test Jig + Adapter + Earphone
Remark: For Radiated Test Cases, the tests were performance with Adapter and Test Jig	

2.3 Connection Diagram of Test System

AC Conducted Emission:



Radiated Emission:





2.4 Support Unit used in test configuration and system

Item	Equipment	Trade Name	Model Name	FCC ID	Data Cable	Power Cord
1.	IPod	Apple	MC525 ZP/A	Fcc DoC	N/A	Shielded, 1.0m
2.	Notebook	Lenovo	E540	FCC DoC	N/A	AC I/P : Unshielded, 1.2m DC O/P : Shielded, 1.8m
3.	WLAN AP	Dlink	DIR-820L	KA2IR820LA1	N/A	Unshielded,1.8m
4.	BT Earphone	N/A	N/A	N/A	N/A	N/A
5.	Test Jig	N/A	N/A	N/A	N/A	N/A
6.	Antenna	N/A	N/A	N/A	N/A	N/A
7.	Earphone	N/A	N/A	N/A	N/A	N/A

2.5 EUT Operation Test Setup

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

3 Test Result

3.1 26dB & 99% Occupied Bandwidth Measurement

3.1.1 Description of 26dB & 99% Occupied Bandwidth

This section is for reporting purpose only.

There is no restriction limits for bandwidth.

For Straddle Channel, According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01, If the power and PSD of the devices are uniform and comply with the lower limits specified for the U-NII-2 bands, a single measurement over the entire emission bandwidth can be performed to show compliance.

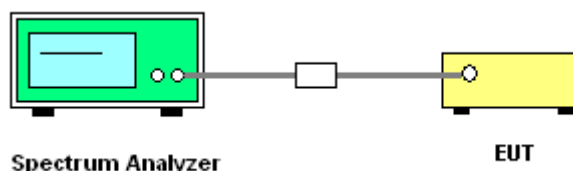
3.1.2 Measuring Instruments

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

3.1.3 Test Procedures

1. The testing follows 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% to 5% of the OBW and set the Video bandwidth (VBW) $\geq 3 * RBW$.
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 Measurement

3.2.1 Limit of Maximum Conducted Output Power

<FCC 14-30 CFR 15.407>

For Straddle Channel, According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01, If the power and PSD of the devices are uniform and comply with the lower limits specified for the U-NII-2 bands, a single measurement over the entire emission bandwidth can be performed to show compliance.

For the 5.25–5.725 GHz bands, the maximum conducted output power over the frequency bands of operation shall not exceed the lesser of 250 mW or 11 dBm +10 log₁₀ B, where B is the 26 dB emission bandwidth in megahertz.

For the band 5.725–5.85 GHz, the maximum conducted output power over the frequency band of operation shall not exceed 1 W.

If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

Note that U-NII-2 band, devices with a maximum e.i.r.p. greater than 500 mW shall implement TPC in order to have the capability to operate at least 6 dB below the maximum permitted e.i.r.p. of 1 W.

3.2.2 Measuring Instruments

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

3.2.3 Test Procedures

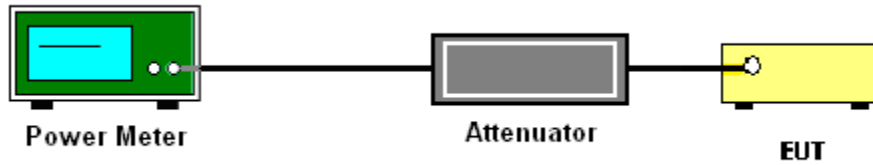
The testing follows Method PM of FCC KDB 789033 D02 General UNII Test Procedures New Rules v02r01.

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.

For Straddle Channel, According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01, If the power and PSD of the devices are uniform and comply with the lower limits specified for the U-NII-2 bands, a single measurement over the entire emission bandwidth can be performed to show compliance.

3.2.4 Test Setup



3.2.5 Test Result of Maximum Conducted Output Power

FCC U-NII-2C straddle channel MIMO															
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	Duty Factor (dB)		Average Conducted Power with duty factor (dBm)			U-NII-2C Conducted Power Limit (dBm)		DG (dBi)		U-NII-3 Conducted Power Limit (dBm)	Pass/Fail
					Ant 1	Ant 2	Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2		
11a	6Mbps	2	144	5720	0.04	0.03	14.25	14.30	17.29	23.98	-1.20		30.00	Pass	
HT20	MCS0	2	144	5720	0.00	0.00	14.41	14.64	17.54	23.98	-1.20		30.00	Pass	
HT40	MCS0	2	142	5710	0.00	0.00	15.13	15.31	18.23	23.98	-1.20		30.00	Pass	
VHT20	MCS0	2	144	5720	0.00	0.00	13.89	14.12	17.02	23.98	-1.20		30.00	Pass	
VHT40	MCS0	2	142	5710	0.00	0.00	13.50	13.71	16.62	23.98	-1.20		30.00	Pass	
VHT80	MCS0	2	138	5690	0.00	0.00	13.49	13.84	16.68	23.98	-1.20		30.00	Pass	

FCC U-NII-2C straddle channel MIMO																
Mod.	Data Rate	NTX	CH.	Freq. (MHz)	RU Config.	Duty Factor (dB)		Average Conducted Power with duty factor (dBm)			U-NII-2C Conducted Power Limit (dBm)		DG (dBi)		U-NII-3 Conducted Power Limit (dBm)	Pass/Fail
						Ant 1	Ant 2	Ant 1	Ant 2	SUM	Ant 1	Ant 2	Ant 1	Ant 2		
HE20	MCS0	2	144	5720	Full	0.00	0.00	13.93	14.14	17.05	23.98	-1.20		30.00	Pass	
HE40	MCS0	2	142	5710	Full	0.00	0.00	13.52	13.73	16.64	23.98	-1.20		30.00	Pass	
HE80	MCS0	2	138	5690	Full	0.00	0.00	13.53	13.89	16.72	23.98	-1.20		30.00	Pass	

3.3 Power Spectral Density Measurement

3.3.1 Limit of Power Spectral Density

<FCC 14-30 CFR 15.407>

For Straddle Channel, According to KDB 789033 D02 General UNII Test Procedures New Rules v02r01, If the power and PSD of the devices are uniform and comply with the lower limits specified for the U-NII-2 bands, a single measurement over the entire emission bandwidth can be performed to show compliance.

For the 5.25–5.725 GHz bands, the maximum power spectral density shall not exceed 11 dBm in any 1 megahertz band.

For the band 5.725–5.85 GHz, the maximum power spectral density shall not exceed 30 dBm in any 500-kHz band.

If transmitting antennas of directional gain greater than 6 dBi are used, the peak output power shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

3.3.2 Measuring Instruments

The measuring equipment is listed in the section 4 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).

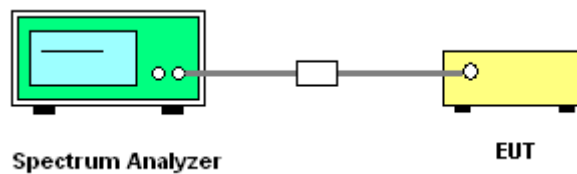
- Measure the duty cycle.
- Set span to encompass the entire emission bandwidth (EBW) of the signal.
- Set RBW = 1 MHz.
- Set VBW $\geq$ 3 MHz.
- Number of points in sweep $\geq$ 2 Span / RBW.
- Sweep time = auto.
- Detector = RMS
- Trace average at least 100 traces in power averaging mode.
- Add $10 \log(1/x)$, 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, and attenuator loss. 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 Unwanted Emissions Measurement

This section as specified in FCC Part 15.407(b) is to measure unwanted emissions through radiated measurement for band edge spurious emissions and out of band emissions measurement. The unwanted emissions shall comply with 15.407(b)(1) to (6), and restricted bands per FCC Part15.205.

3.4.1 Limit of Unwanted Emissions

- (1) For transmitters operating in the 5470-5600 MHz and 5650-5725MHz band: all emissions outside of the 5470-5600 MHz and 5650-5725MHz band shall not exceed an EIRP of -27 dBm/MHz.
- (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

(3) EIRP (dBm)	Field Strength at 3m (dBμV/m)
- 27	68.3

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

$$\text{EIRP} = E_{\text{Meas}} + 20\log(d_{\text{Meas}}) - 104.7$$

where

EIRP is the equivalent isotropically radiated power, in dBm

E_{Meas} is the field strength of the emission at the measurement distance, in dBμV/m

d_{Meas} is the measurement distance, in m



- (4) ANSI C63.10-2013 clause 12.7.3 note 97

As specified by regulatory requirements, emissions above 1000 MHz that are outside of the restricted bands are subject to a peak emission limit. However, an out-of-band emission that complies with both the average and peak general regulatory limits is not required to satisfy the peak emission limit.

3.4.2 Measuring Instruments

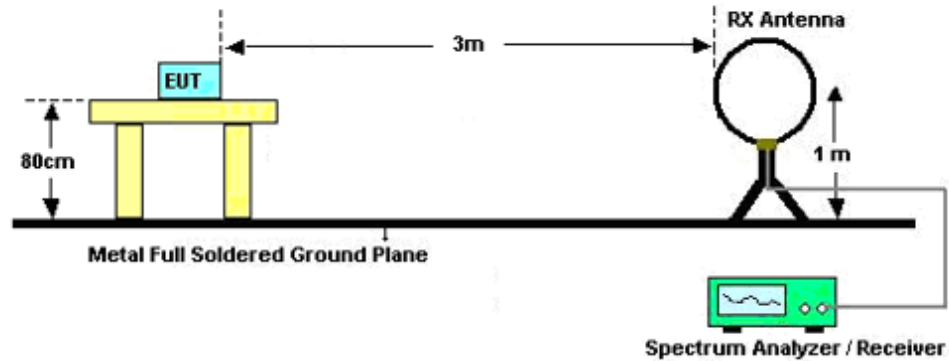
The measuring equipment is listed in the section 4 of this test report.

3.4.3 Test Procedures

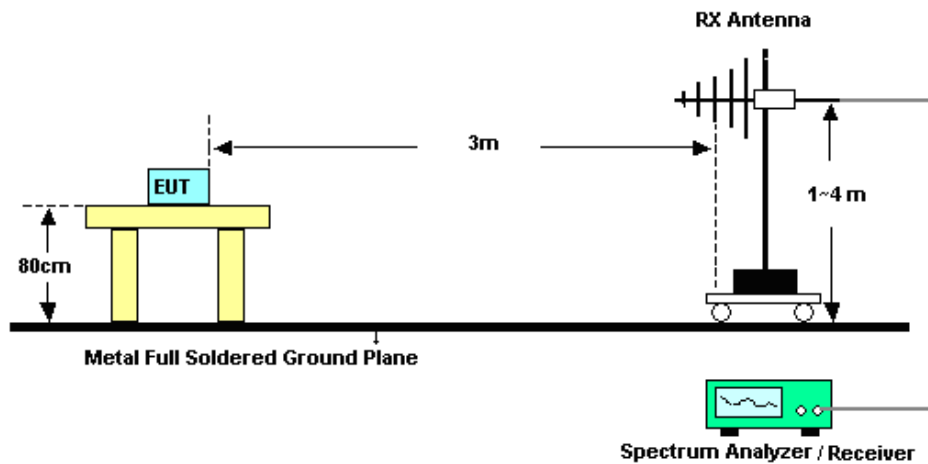
1. The testing follows FCC KDB 789033 D02 General UNII Test Procedures New Rules v01r04.
Section G) Unwanted emissions measurement.
(1) Procedure for Unwanted Emissions Measurements Below 1000MHz
 - RBW = 120 kHz
 - VBW = 300 kHz
 - Detector = Peak
 - Trace mode = max hold(2) Procedure for Peak Unwanted Emissions Measurements Above 1000 MHz
 - RBW = 1 MHz
 - VBW $\geq$ 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 $\geq$ 1/T, when duty cycle is less than 98 percent where T is the minimum transmission duration over which the transmitter is on.
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.

3.4.4 Test Setup

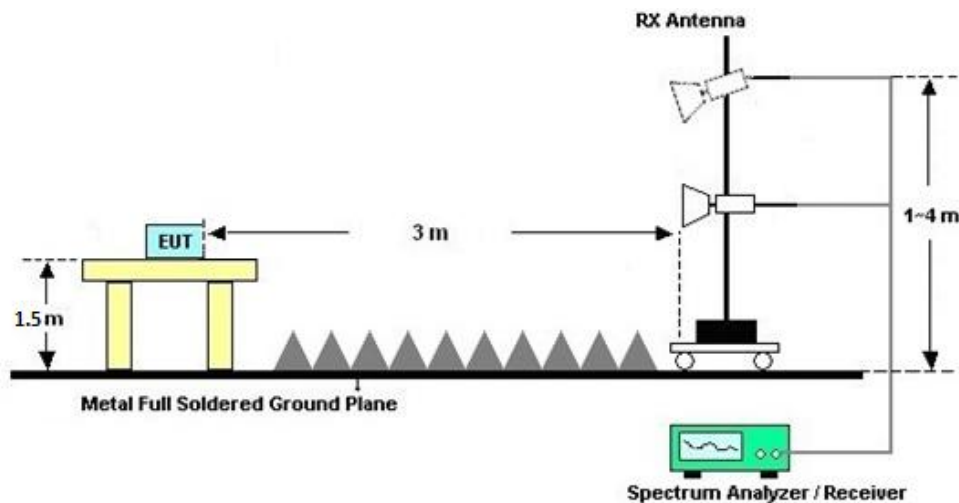
For radiated emissions below 30MHz



For radiated emissions from 30MHz to 1GHz



For radiated emissions above 1GHz



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

3.4.6 Test Result of Radiated Spurious at Band Edges

Please refer to Appendix C.

3.4.7 Duty Cycle

Please refer to Appendix D.

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

Please refer to Appendix C.

3.5 AC Conducted Emission Measurement

3.5.1 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 (dB μ V)	
	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.

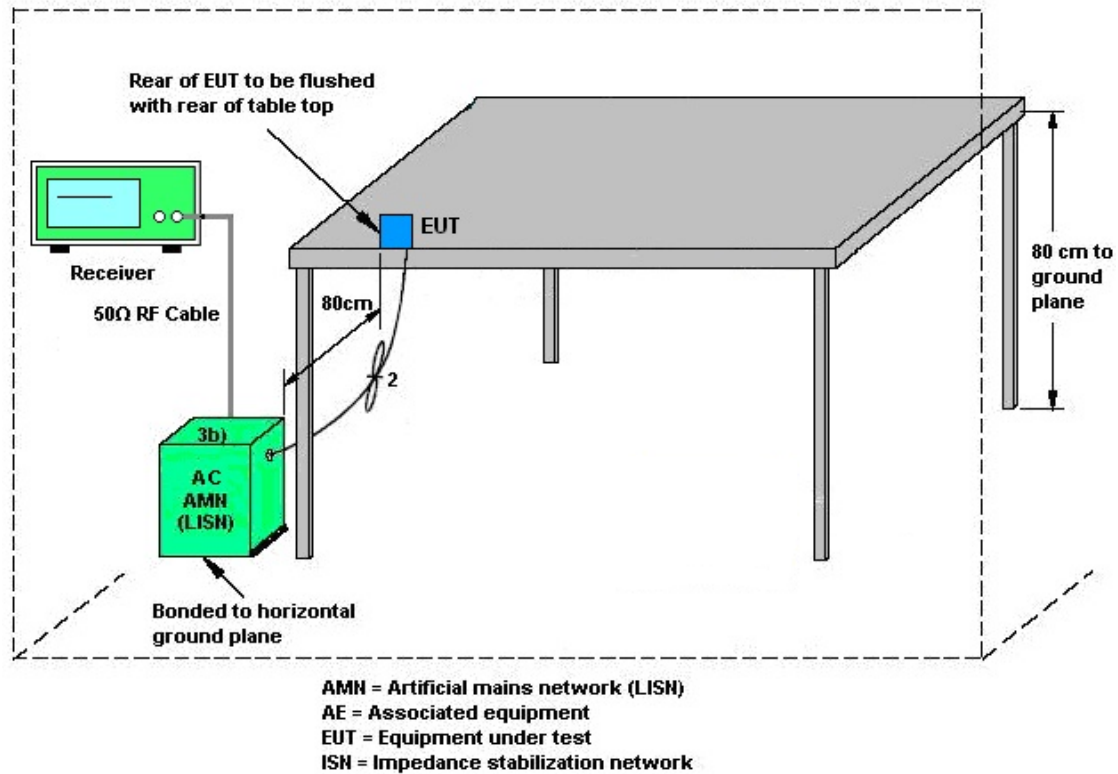
3.5.2 Measuring Instruments

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

3.5.3 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.

3.5.4 Test Setup



3.5.5 Test Result of AC Conducted Emission

Please refer to Appendix B.

3.6 Antenna Requirements

3.6.1 Standard Applicable

According to FCC 47 CFR Section 15.407(a)(1)(2) ,if transmitting antenna directional gain is greater than 6 dBi, both the peak transmit power and the peak power spectral density shall be reduced by the amount in dB that the directional gain of the antenna exceeds 6 dBi.

3.6.2 Antenna Anti-Replacement Construction

An embedded-in antenna design is used.

3.6.3 Antenna Gain

<CDD Modes >

FCC KDB 662911 D01 Multiple Transmitter Output v02r01

For CDD transmissions, directional gain is calculated as

Directional gain = GANT + Array Gain, where Array Gain is as follows.

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

Array Gain = $10 \log(\text{NANT}/\text{NSS}=1)$ dB.

For power measurements on IEEE 802.11 devices,

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

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

GANT set equal to the gain of the antenna having the highest gain;

The EUT supports CDD mode.

For power, the directional gain GANT is set equal to the antenna having the highest gain, i.e., F)2)f)i).

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

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

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

<CDD Modes>						
			DG for Power (dBi)	DG for PSD (dBi)	Power Limit Reduction (dB)	PSD Limit Reduction (dB)
	Ant. 1 (dBi)	Ant. 2 (dBi)				
UNII-2C	-1.20	-1.20	-1.20	1.81	0.00	0.00

Power limit reduction = Composite gain – 6dBi, (min = 0)

PSD limit reduction = Composite gain + PSD Array gain – 6dBi, (min = 0)



4 List of Measuring Equipment

Instrument	Manufacturer	Model No.	Serial No.	Characteristics	Calibration Date	Test Date	Due Date	Remark
Spectrum Analyzer	R&S	FSV40	101040	10Hz~40GHz	Oct. 10, 2024	Oct. 15, 2024	Oct. 09, 2025	Conducted (TH01-KS)
Pulse Power Sensor	Anritsu	MA2411B	0917070	300MHz~40GHz	Jan. 02, 2024	Oct. 15, 2024	Jan. 01, 2025	Conducted (TH01-KS)
Power Meter	Anritsu	ML2495A	1005002	50MHz Bandwidth	Jan. 02, 2024	Oct. 15, 2024	Jan. 01, 2025	Conducted (TH01-KS)
EMI Test Receiver	R&S	ESR7	101404	9kHz~7GHz	Oct. 18, 2023	Sep. 06, 2024~Sep. 24, 2024	Oct. 17, 2024	Radiation (03CH04-SZ)
EXA Spectrum Analyzer	KEYSIGHT	N9010A	MY55150213	10Hz~44GHz	Jul. 03, 2024	Sep. 06, 2024~Sep. 24, 2024	Jul. 02, 2025	Radiation (03CH04-SZ)
Loop Antenna	R&S	HFH2-Z2E	101141	9kHz~30MHz	Dec. 29, 2023	Sep. 06, 2024~Sep. 24, 2024	Dec. 28, 2024	Radiation (03CH04-SZ)
Bilog Antenna	TeseQ	CBL6111D	41909	30MHz~1GHz	May 09, 2024	Sep. 06, 2024~Sep. 24, 2024	May 08, 2025	Radiation (03CH04-SZ)
Double Ridge Horn Antenna	SCHWARZBECK	BBHA9120D	9120D-1474	1GHz~18GHz	Jul. 07, 2023	Sep. 06, 2024~Sep. 24, 2024	Jul. 06, 2025	Radiation (03CH04-SZ)
Horn Antenna	SCHWARZBECK	BBHA9170	9170#679	15GHz~40GHz	Jul. 04, 2024	Sep. 06, 2024~Sep. 24, 2024	Jul. 03, 2025	Radiation (03CH04-SZ)
Amplifier	Burgeon	BPA-530	102211	0.01Hz~3000MHz	Oct. 18, 2023	Sep. 06, 2024~Sep. 24, 2024	Oct. 17, 2024	Radiation (03CH04-SZ)
HF Amplifier	MITEQ	AMF-7D-0010 1800-30-10P-R	1943528	1GHz~18GHz	Oct. 18, 2023	Sep. 06, 2024~Sep. 24, 2024	Oct. 17, 2024	Radiation (03CH04-SZ)
HF Amplifier	MITEQ	TTA1840-35-HG	1871923	18GHz~40GHz	Jul. 03, 2024	Sep. 06, 2024~Sep. 24, 2024	Jul. 02, 2025	Radiation (03CH04-SZ)
Amplifier	Agilent Technologies	83017A	MY57280136	500MHz~26.5GHz	Jul. 03, 2024	Sep. 06, 2024~Sep. 24, 2024	Jul. 02, 2025	Radiation (03CH04-SZ)
AC Power Source	APC	AFV-S-600B	F119050019	N/A	Oct. 18, 2023	Sep. 06, 2024~Sep. 24, 2024	Oct. 17, 2024	Radiation (03CH04-SZ)
Turn Table	EM	EM1000	N/A	0~360 degree	NCR	Sep. 06, 2024~Sep. 24, 2024	NCR	Radiation (03CH04-SZ)
Antenna Mast	EM	EM1000	N/A	1 m~4 m	NCR	Sep. 06, 2024~Sep. 24, 2024	NCR	Radiation (03CH04-SZ)
EMI Receiver	R&S	ESR7	101630	9kHz~7GHz;	Jul. 04, 2024	Sep. 09, 2024	Jul. 03, 2025	Conduction (CO01-SZ)
AC LISN	R&S	ENV216	100063	9kHz~30MHz	Jul. 04, 2024	Sep. 09, 2024	Jul. 03, 2025	Conduction (CO01-SZ)
AC LISN (for auxiliary equipment)	EMCO	3816/2SH	00103892	9kHz~30MHz	Oct. 16, 2023	Sep. 09, 2024	Oct. 15, 2024	Conduction (CO01-SZ)
AC Power Source	Chroma	61602	616020000891	100Vac~250Vac	Aug. 14, 2024	Sep. 09, 2024	Aug. 13, 2025	Conduction (CO01-SZ)

NCR: No Calibration Required



5 Measurement Uncertainty

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

Uncertainty of Conducted Measurement

Conducted Spurious Emission & Bandedge	± 2.22 dB
Occupied Channel Bandwidth	$\pm 0.1\%$
Conducted Power	± 0.50 dB
Conducted Power Spectral Density	± 0.90 dB
Frequency	0.04 ppm

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	2.5 dB
---	--------

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

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

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

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

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

Measuring Uncertainty for a Level of Confidence of 95% ($U = 2Uc(y)$)	4.8 dB
---	--------

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

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

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



Appendix A. Conducted Test Results



Ambient Condition: 25 °C, 45 %RH

Test Date: 2024.10.15

Test Engineer: Smile Wang

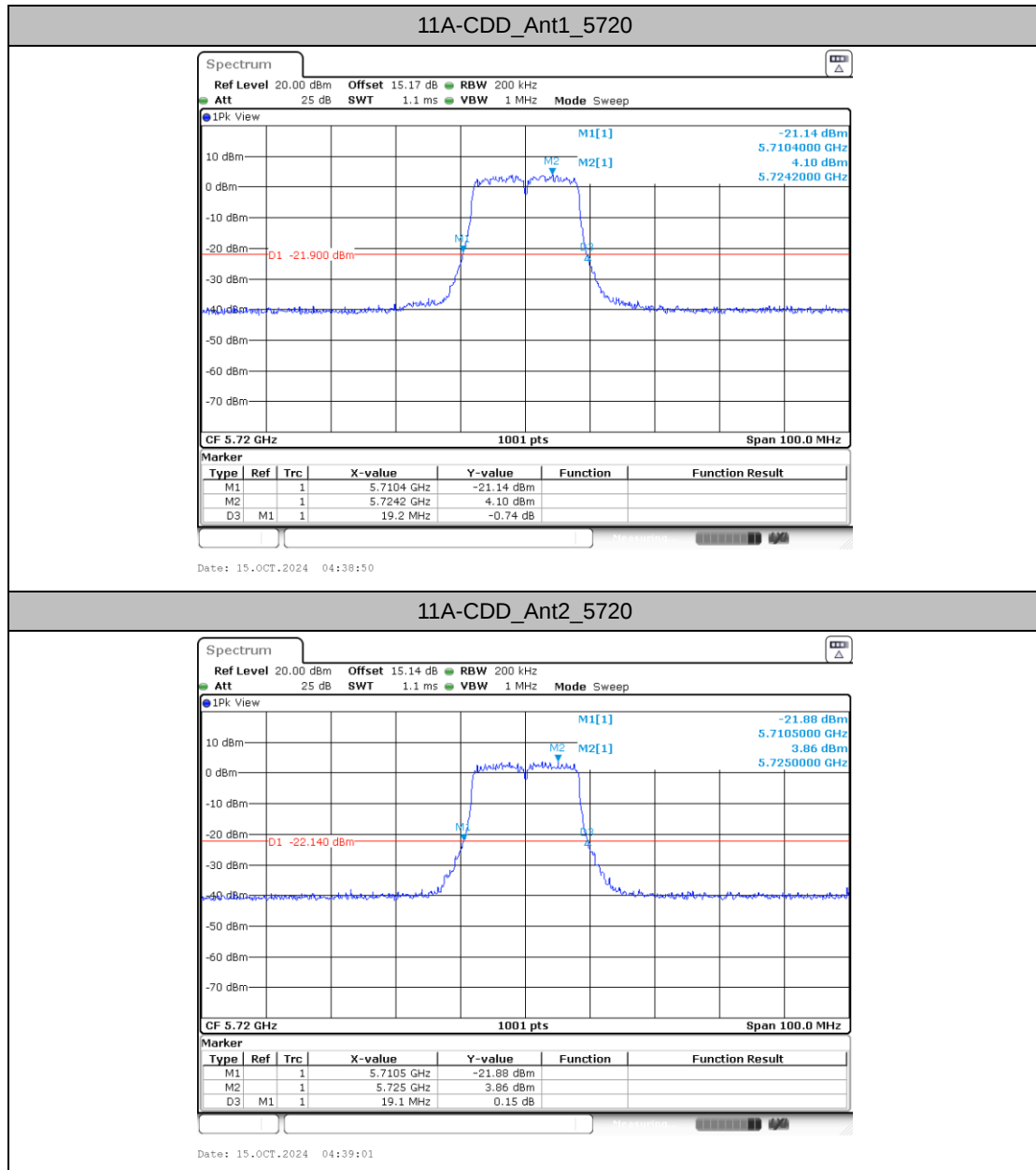
Emission Bandwidth

Test Result

TestMode	Antenna	Freq(MHz)	26dB EBW [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A-CDD	Ant1	5720	19.20	5710.40	5729.60	---	---
	Ant2	5720	19.10	5710.50	5729.60	---	---
11N20MIMO	Ant1	5720	20.10	5710.00	5730.10	---	---
	Ant2	5720	19.80	5710.20	5730.00	---	---
11N40MIMO	Ant1	5710	40.00	5690.20	5730.20	---	---
	Ant2	5710	40.40	5690.00	5730.40	---	---
11AC20MIMO	Ant1	5720	19.70	5710.20	5729.90	---	---
	Ant2	5720	19.80	5710.10	5729.90	---	---
11AC40MIMO	Ant1	5710	40.00	5690.20	5730.20	---	---
	Ant2	5710	39.40	5690.40	5729.80	---	---
11AC80MIMO	Ant1	5690	82.40	5649.20	5731.60	---	---
	Ant2	5690	81.20	5650.00	5731.20	---	---
11AX20MIMO	Ant1	5720	21.30	5709.40	5730.70	---	---
	Ant2	5720	21.30	5709.40	5730.70	---	---
11AX40MIMO	Ant1	5710	41.00	5689.80	5730.80	---	---
	Ant2	5710	40.60	5689.80	5730.40	---	---
11AX80MIMO	Ant1	5690	81.60	5649.60	5731.20	---	---
	Ant2	5690	82.40	5649.20	5731.60	---	---

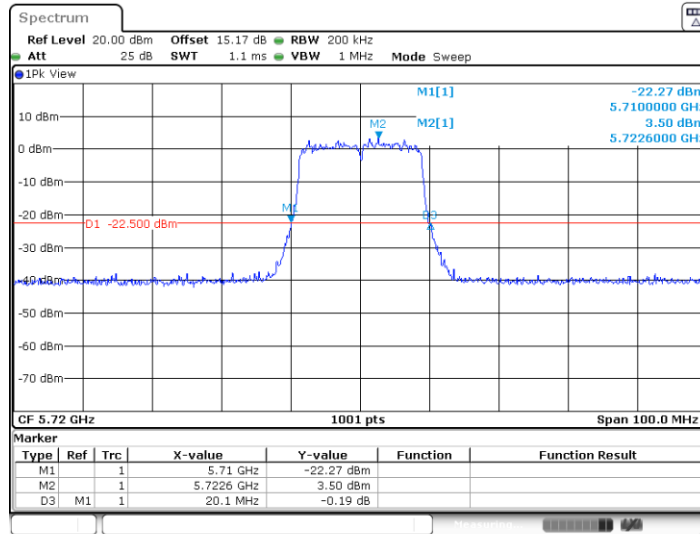


Test Graphs

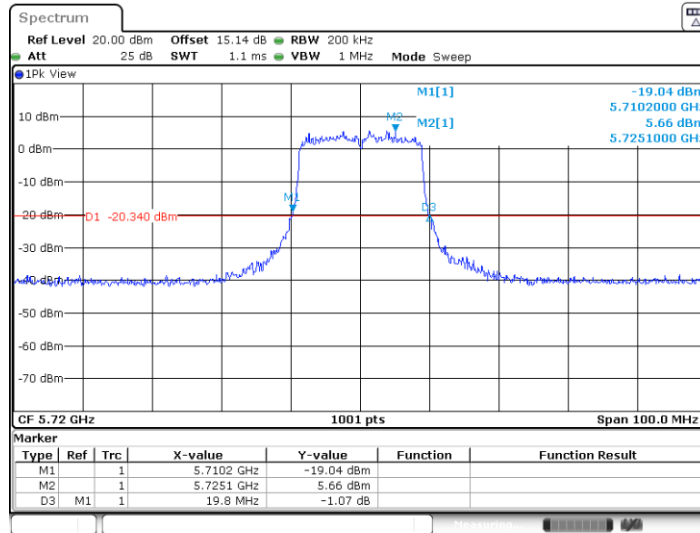




11N20MIMO_Ant1_5720

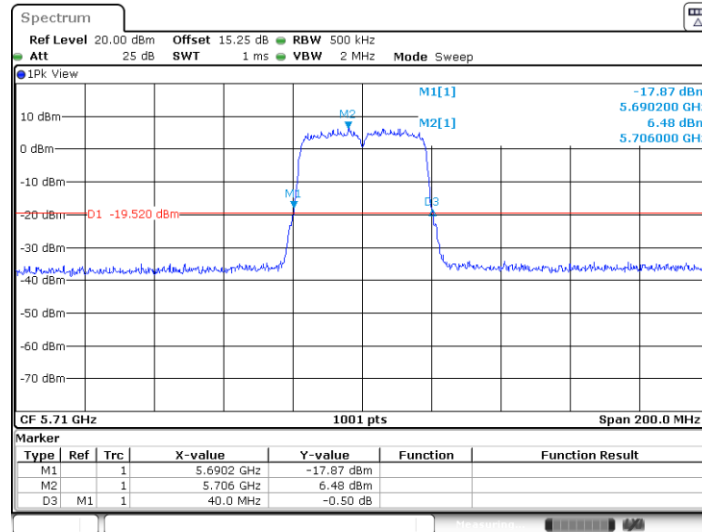


11N20MIMO_Ant2_5720



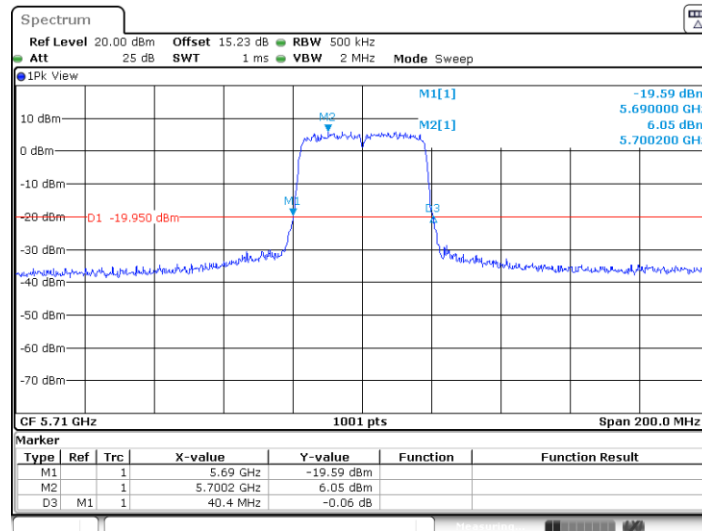


11N40MIMO_Ant1_5710

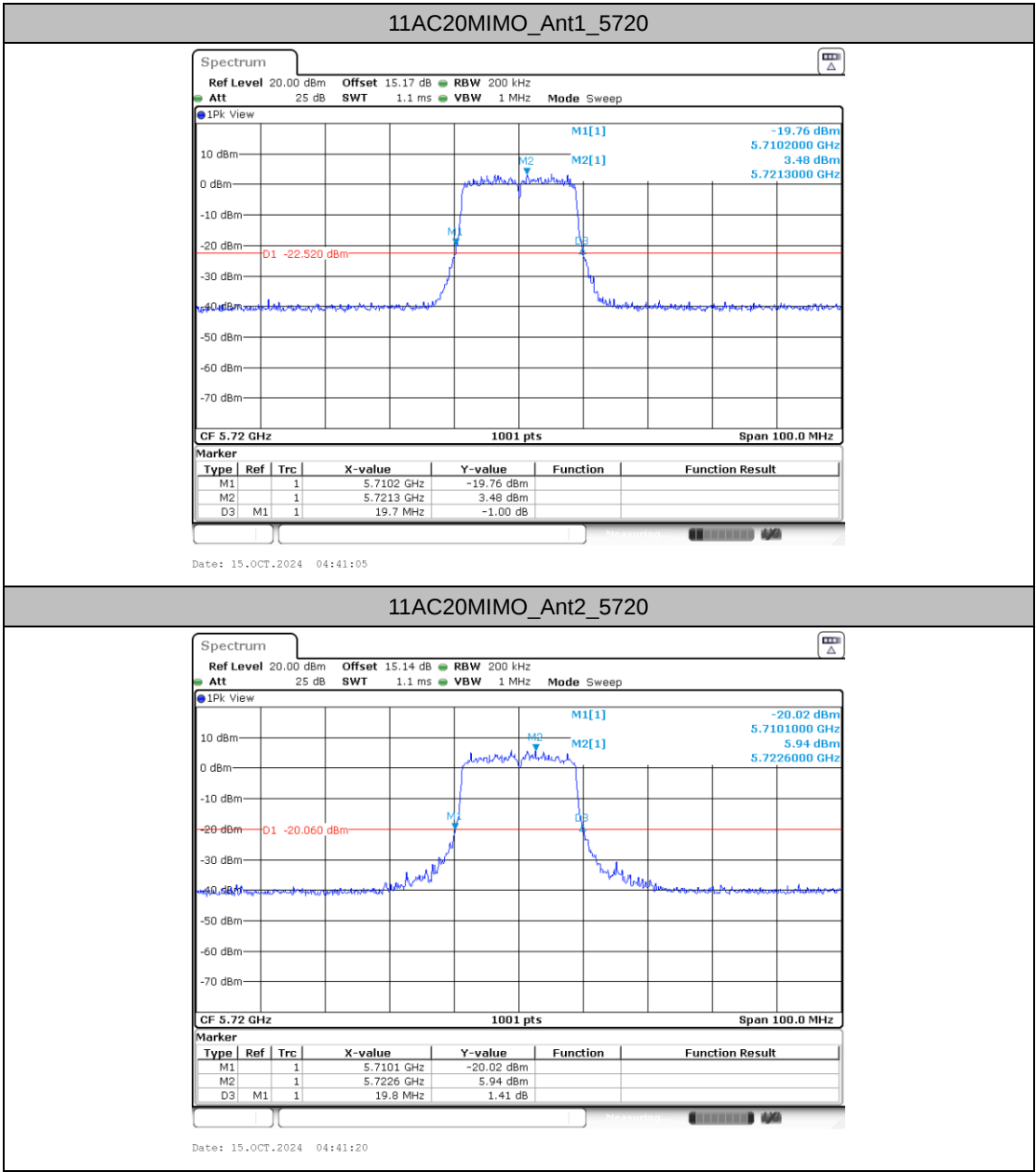


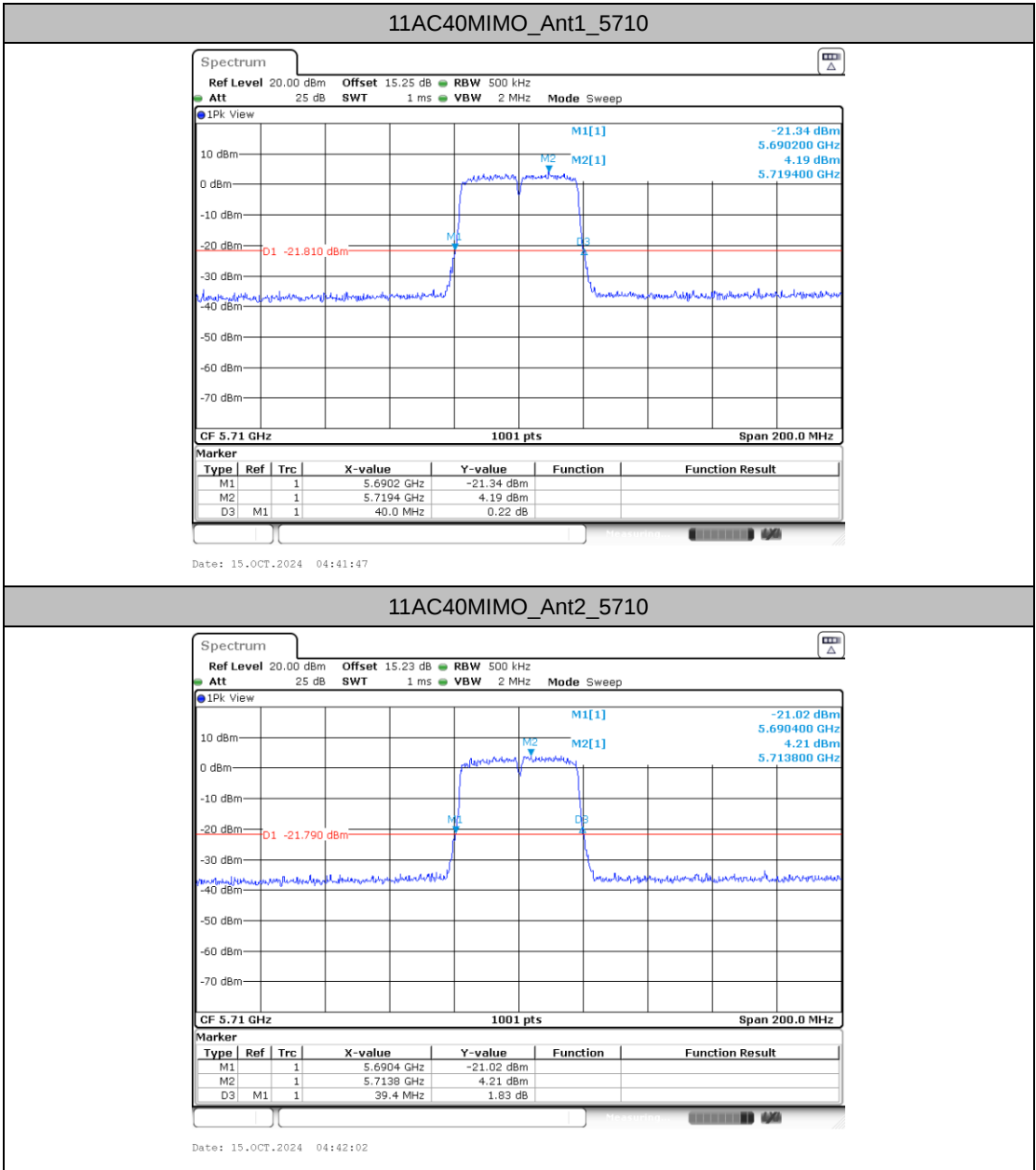
Date: 15.OCT.2024 04:40:07

11N40MIMO_Ant2_5710



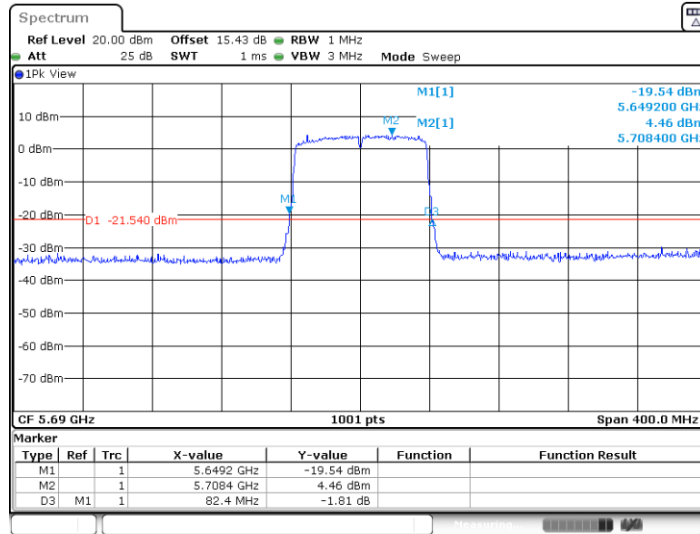
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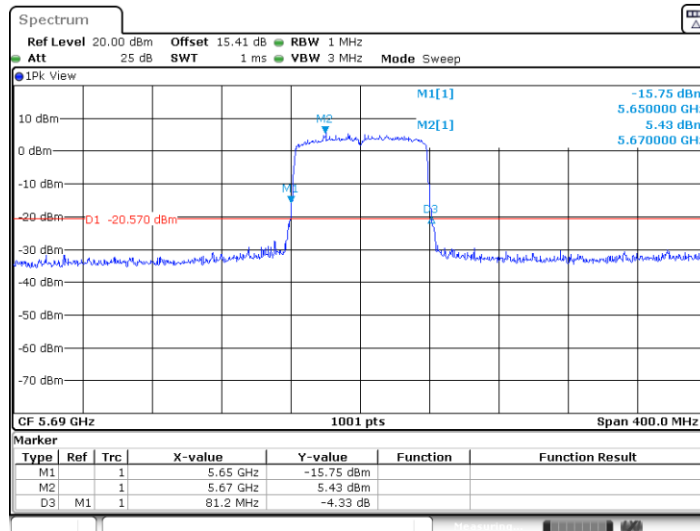


11AC80MIMO_Ant1_5690

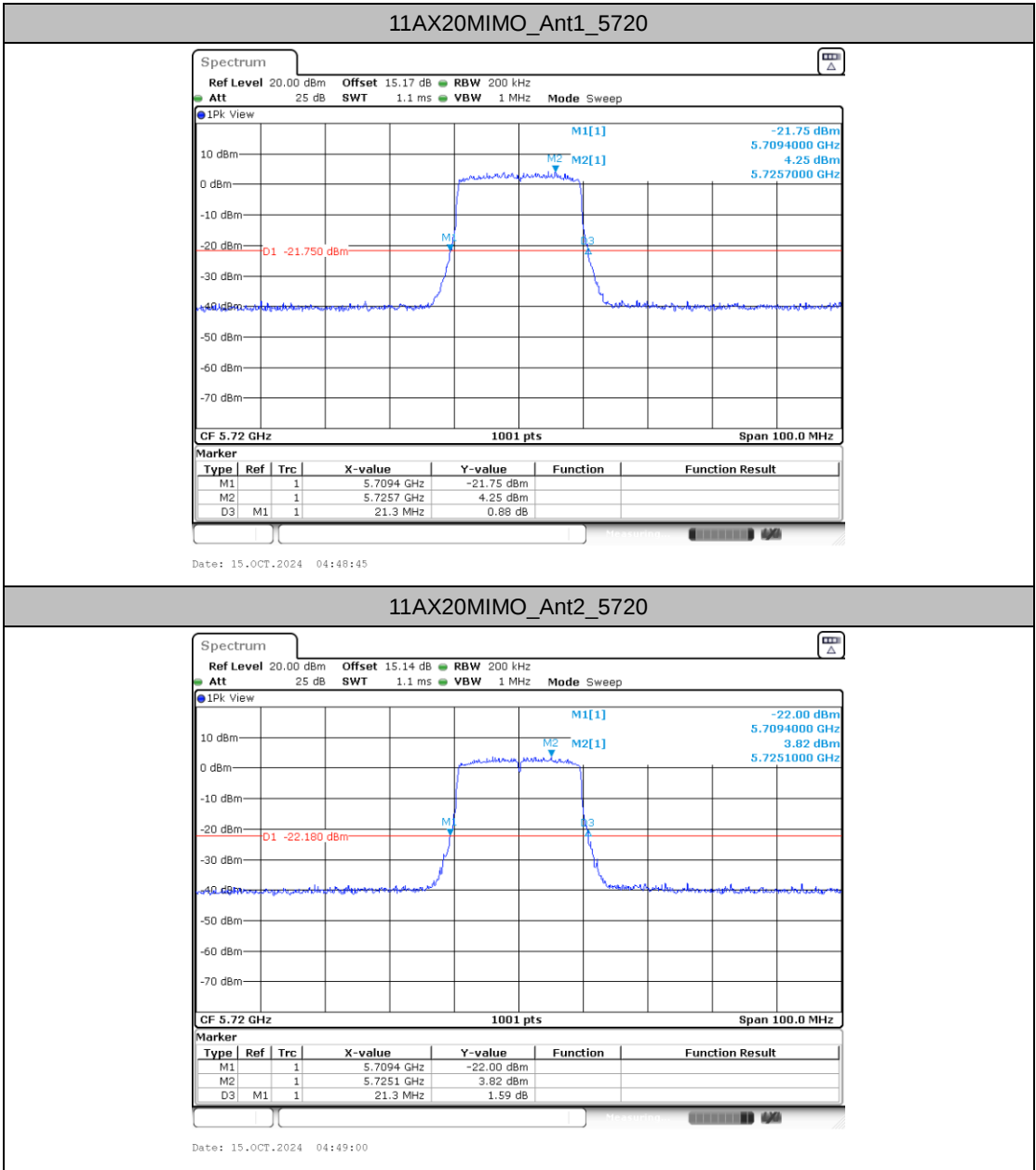


Date: 15.OCT.2024 04:48:09

11AC80MIMO_Ant2_5690

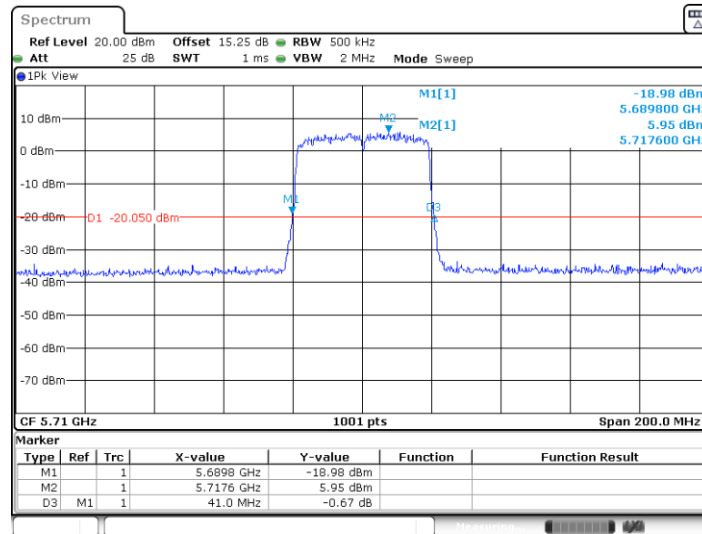


Date: 15.OCT.2024 04:48:20



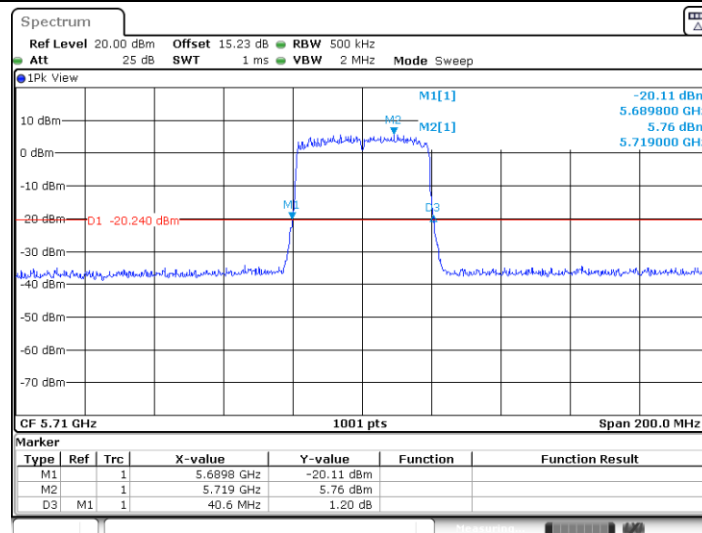


11AX40MIMO_Ant1_5710

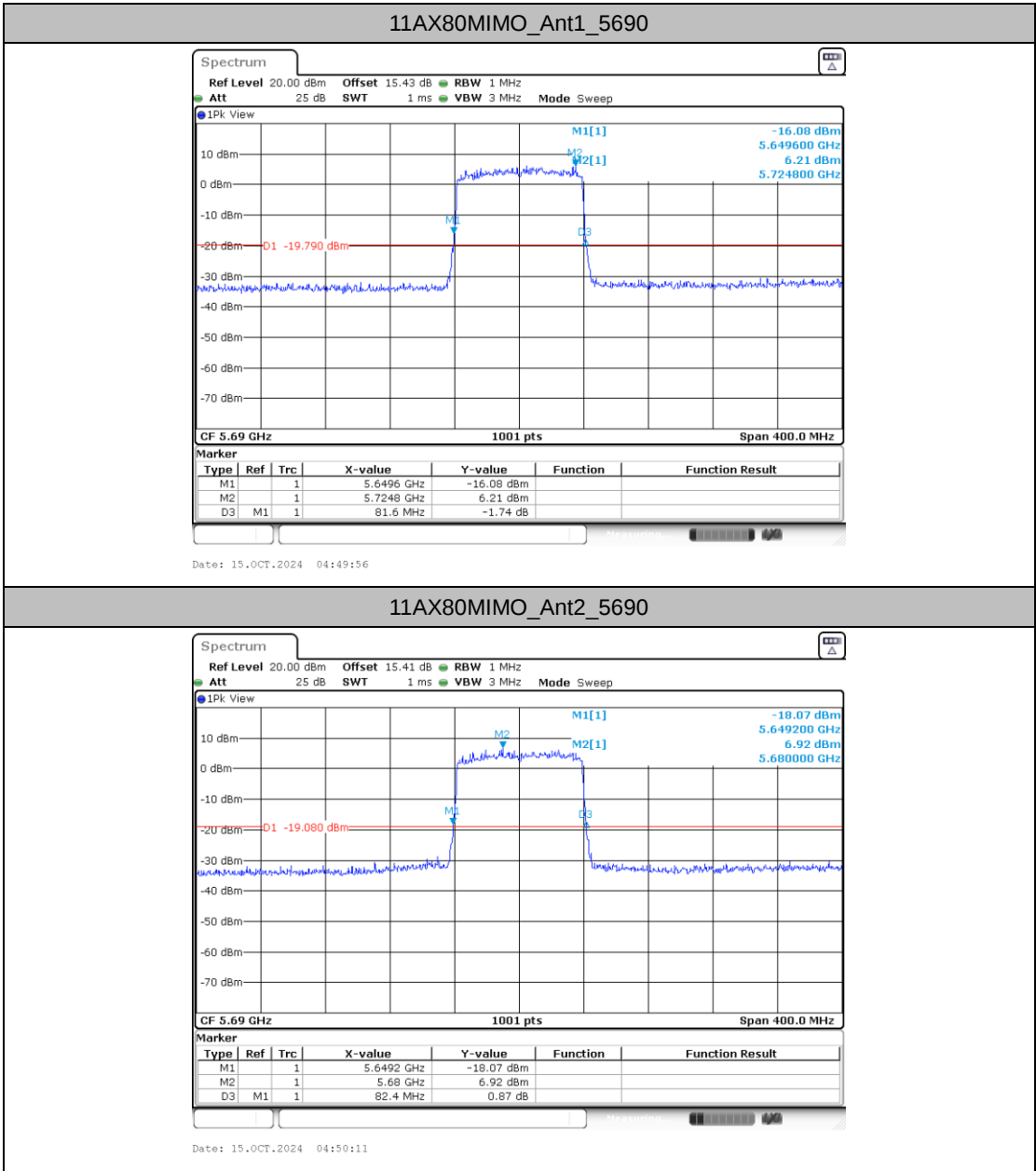


Date: 15.OCT.2024 04:49:20

11AX40MIMO_Ant2_5710



Date: 15.OCT.2024 04:49:36



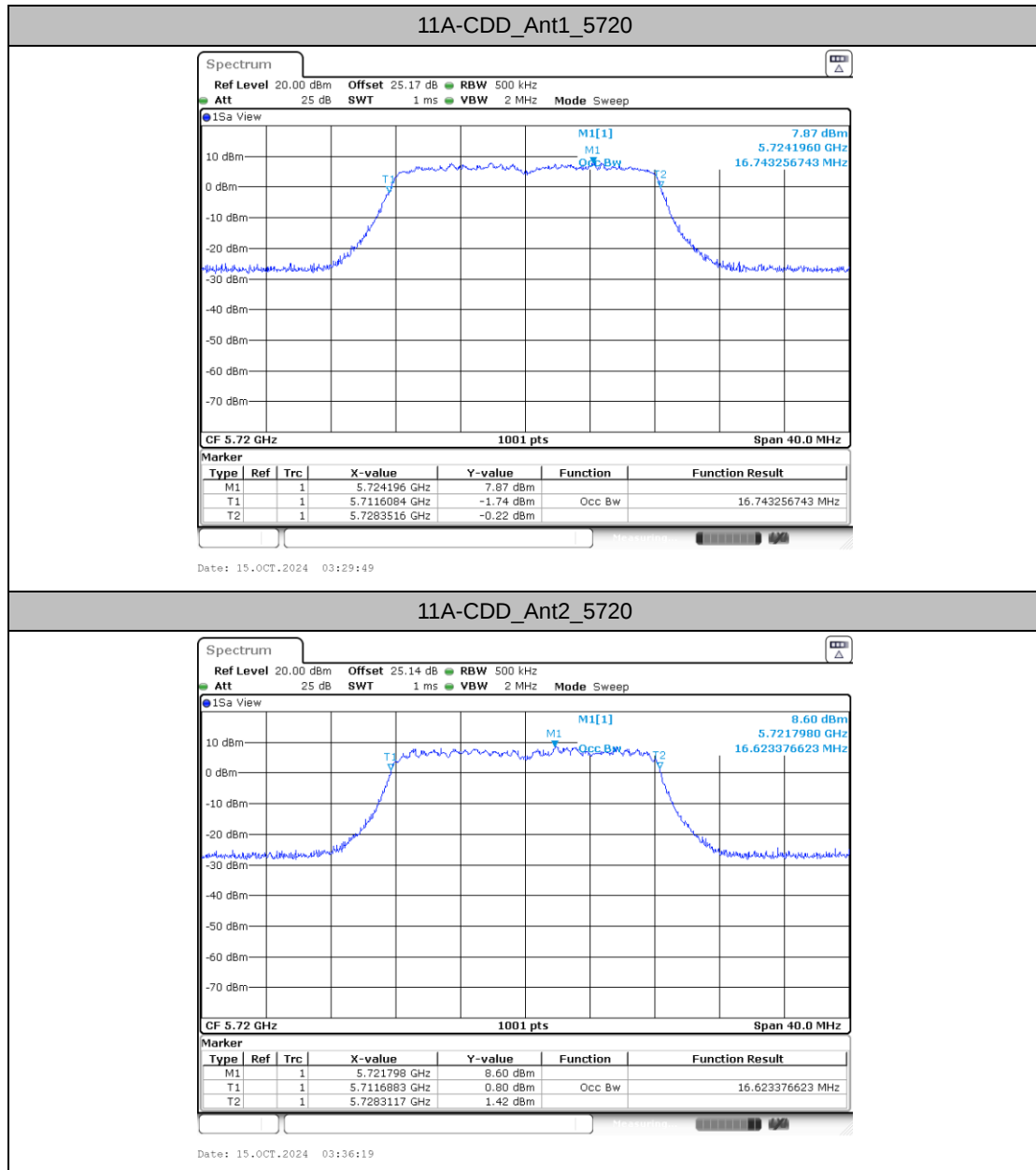
Occupied channel bandwidth

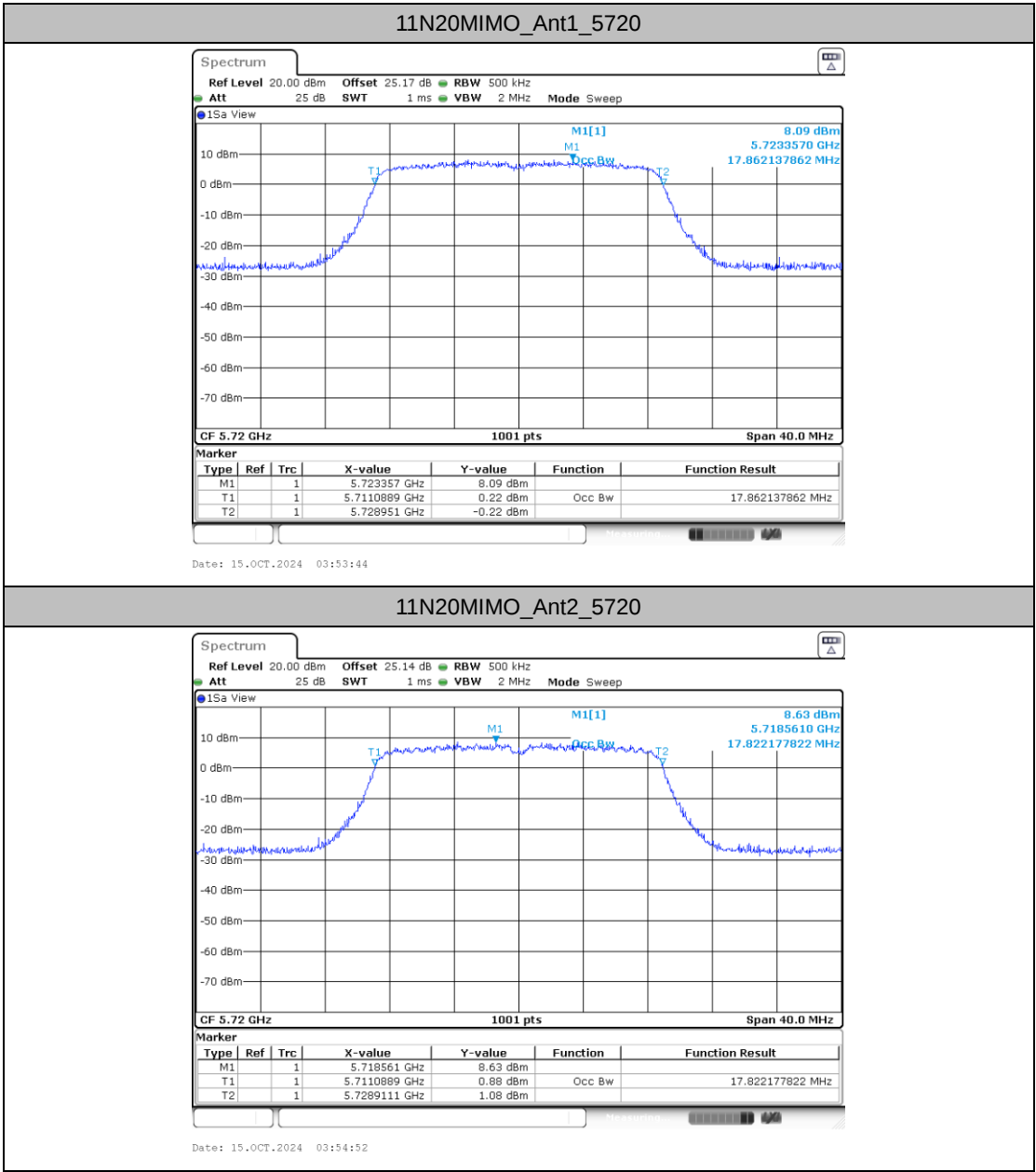
Test Result

TestMode	Antenna	Freq(MHz)	OCB [MHz]	FL[MHz]	FH[MHz]	Limit[MHz]	Verdict
11A-CDD	Ant1	5720	16.743	5711.6084	5728.3516	---	---
	Ant2	5720	16.623	5711.6883	5728.3117	---	---
11N20MIMO	Ant1	5720	17.862	5711.0889	5728.9510	---	---
	Ant2	5720	17.822	5711.0889	5728.9111	---	---
11N40MIMO	Ant1	5710	36.204	5691.9381	5728.1419	---	---
	Ant2	5710	36.364	5691.8581	5728.2218	---	---
11AC20MIMO	Ant1	5720	17.862	5711.0889	5728.9510	---	---
	Ant2	5720	17.822	5711.0889	5728.9111	---	---
11AC40MIMO	Ant1	5710	36.364	5691.8581	5728.2218	---	---
	Ant2	5710	36.364	5691.8581	5728.2218	---	---
11AC80MIMO	Ant1	5690	76.084	5652.1179	5728.2018	---	---
	Ant2	5690	75.924	5652.1179	5728.0420	---	---
11AX20MIMO	Ant1	5720	19.021	5710.4895	5729.5105	---	---
	Ant2	5720	19.021	5710.4895	5729.5105	---	---
11AX40MIMO	Ant1	5710	37.962	5691.0589	5729.0210	---	---
	Ant2	5710	38.042	5691.0589	5729.1009	---	---
11AX80MIMO	Ant1	5690	77.842	5651.1588	5729.0010	---	---
	Ant2	5690	77.682	5651.3187	5729.0010	---	---



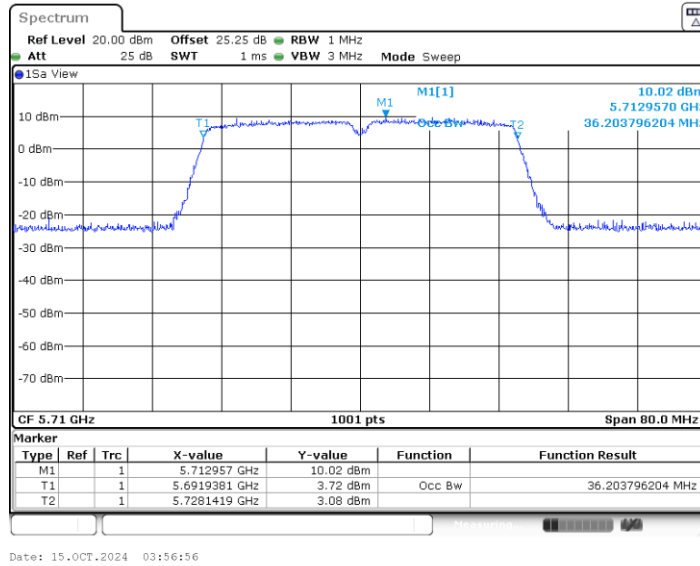
Test Graphs



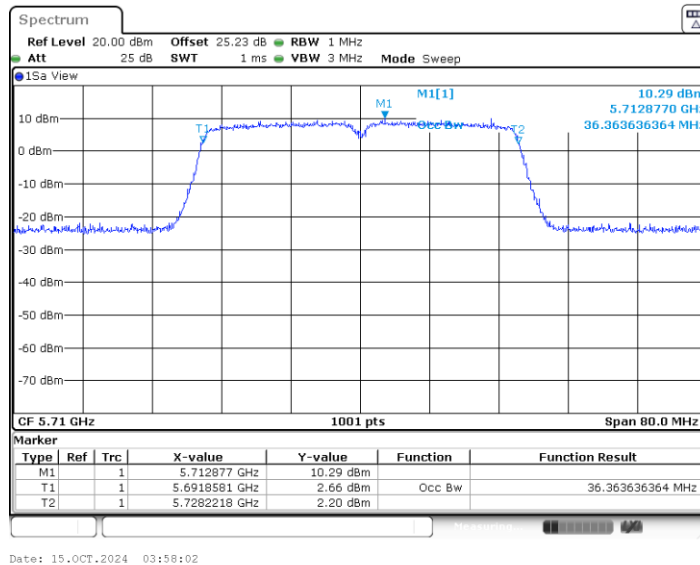




11N40MIMO_Ant1_5710

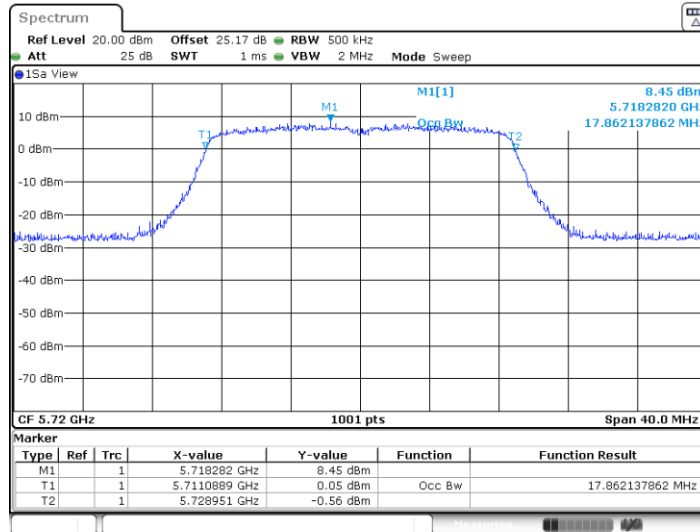


11N40MIMO_Ant2_5710

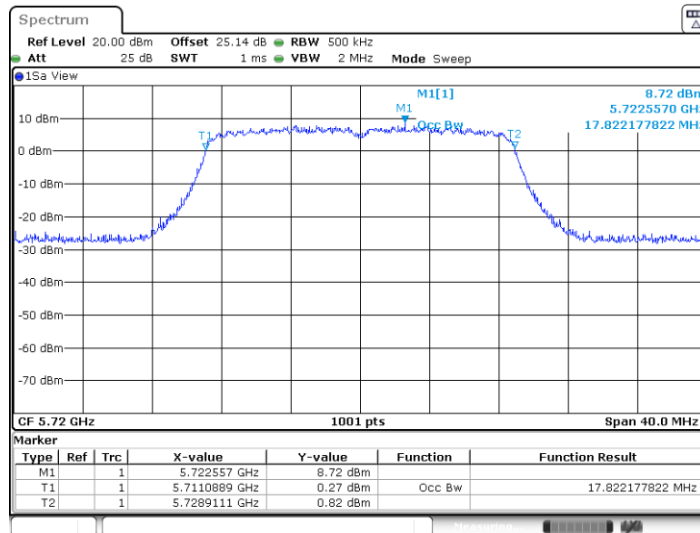


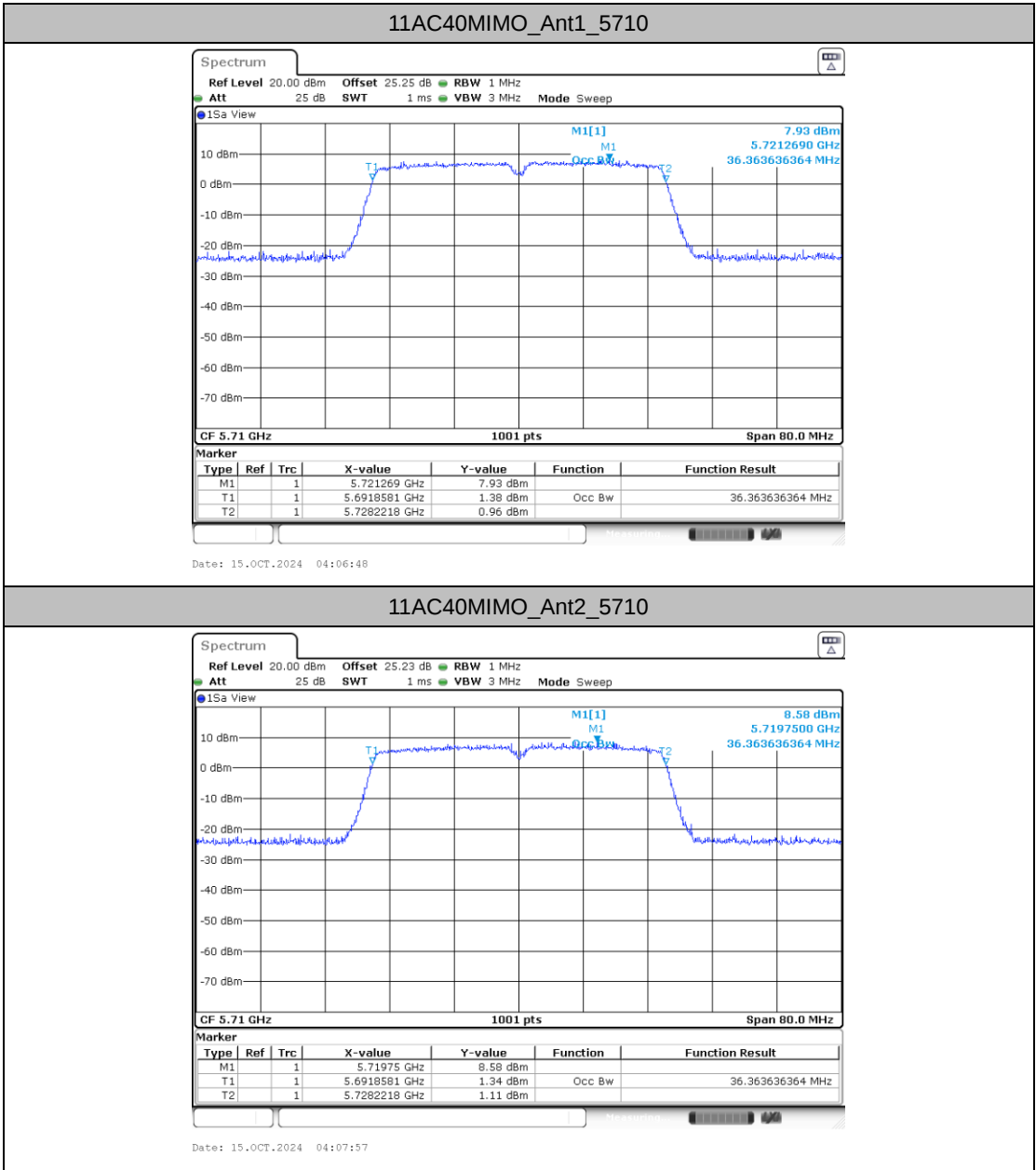


11AC20MIMO_Ant1_5720



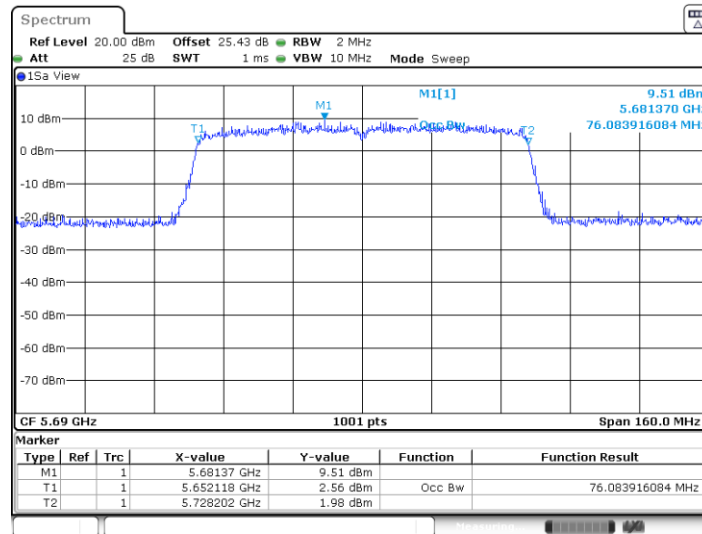
11AC20MIMO_Ant2_5720



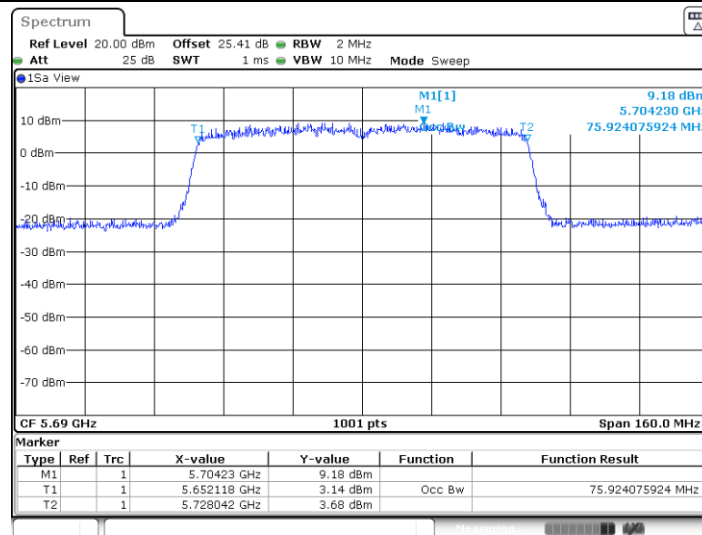




11AC80MIMO_Ant1_5690

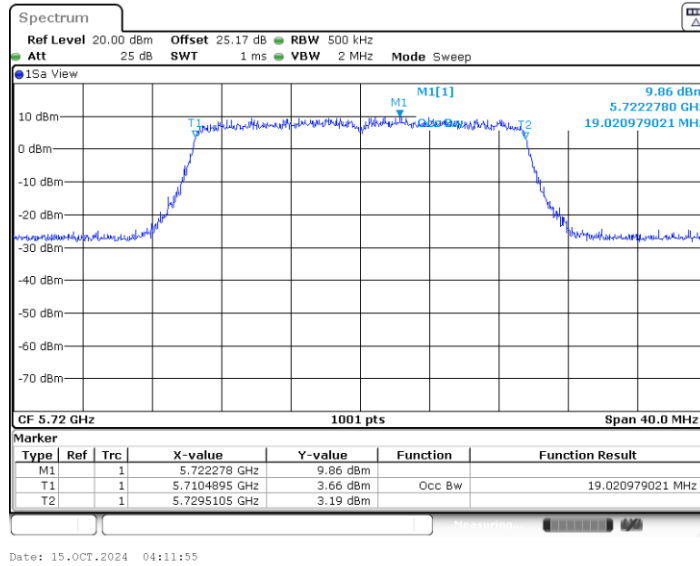


11AC80MIMO_Ant2_5690

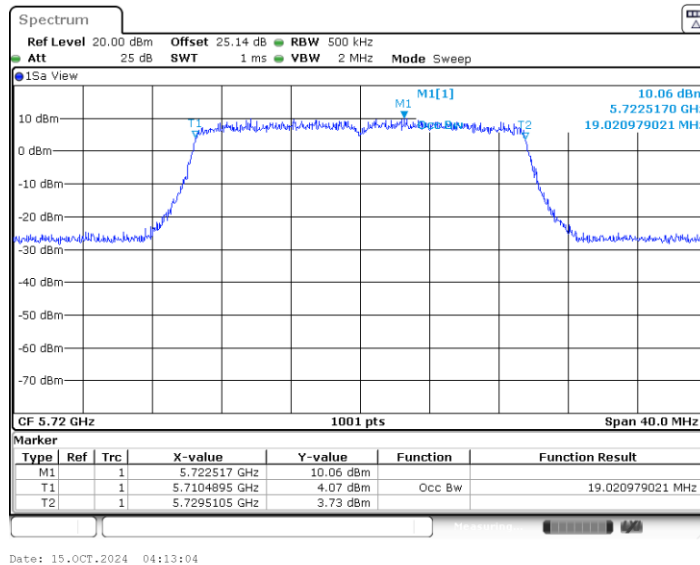




11AX20MIMO_Ant1_5720

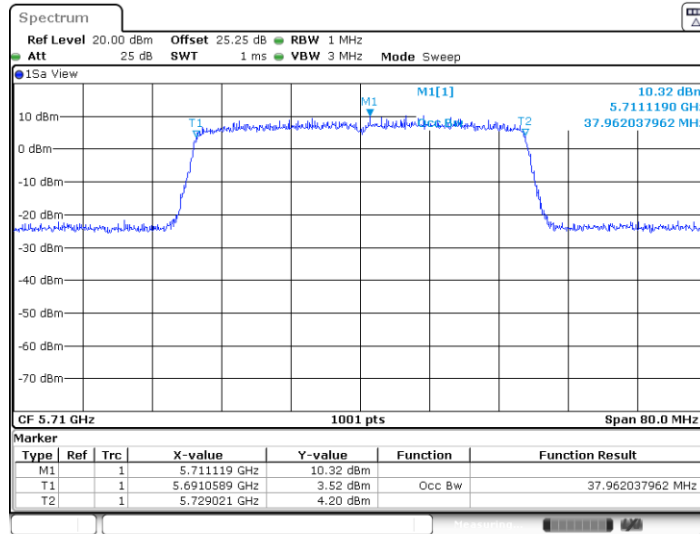


11AX20MIMO_Ant2_5720



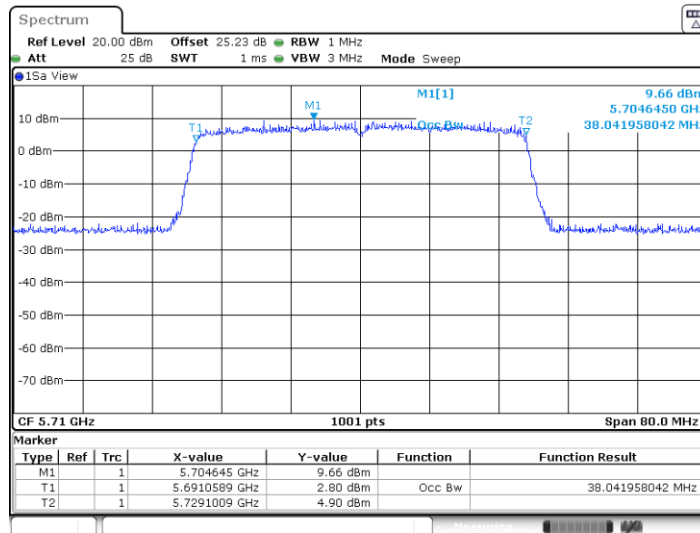


11AX40MIMO_Ant1_5710

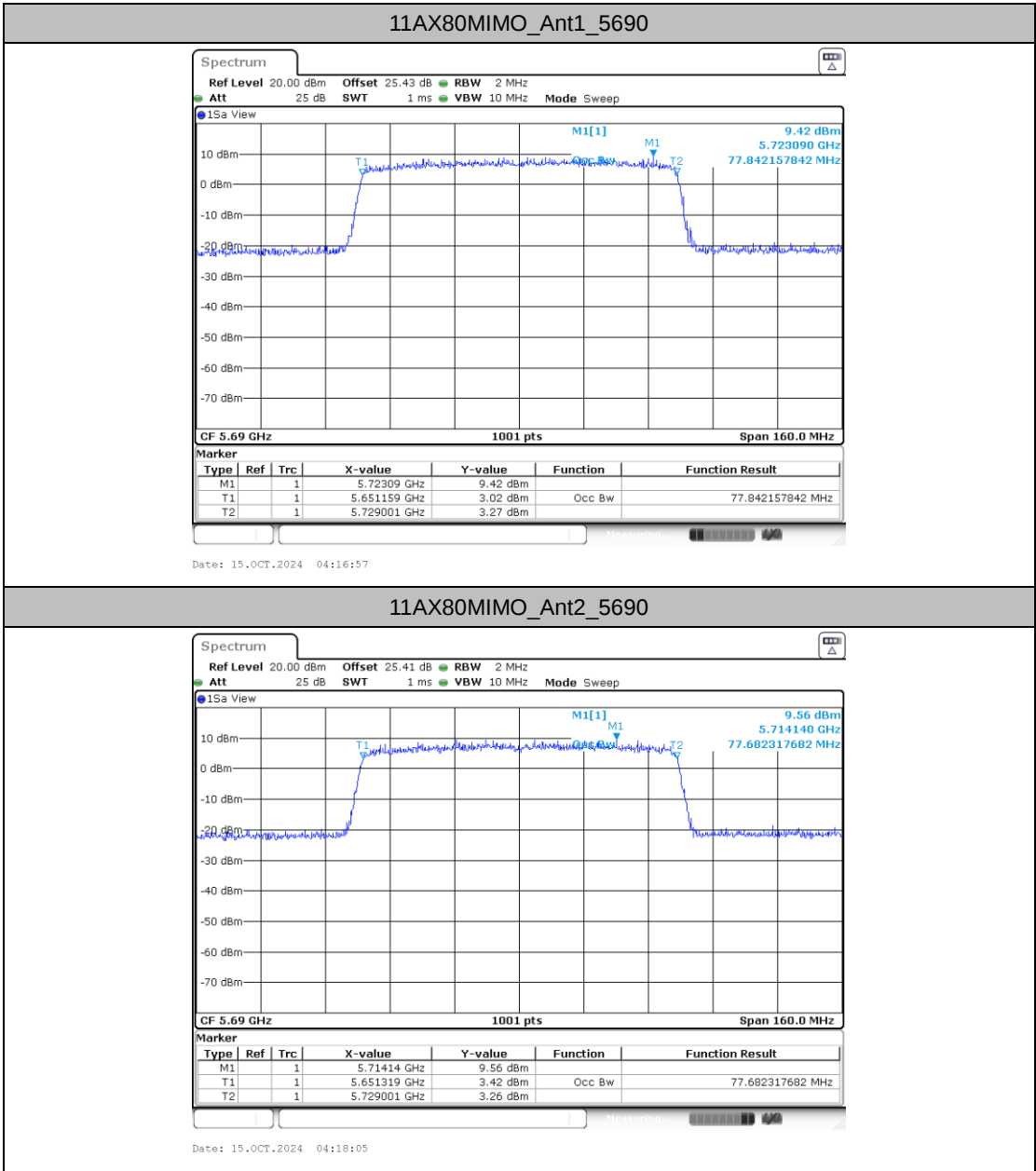


Date: 15.OCT.2024 04:14:34

11AX40MIMO_Ant2_5710



Date: 15.OCT.2024 04:15:41





Maximum power spectral density

Test Result

TestMode	Antenna	Freq(MHz)	Result [dBm/MHz]	Limit[dBm/MHz]	Verdict
11A-CDD	Ant1	5720_UNII-2C	2.36	≤11.00	PASS
	Ant2	5720_UNII-2C	2.20	≤11.00	PASS
	total	5720_UNII-2C	5.29	≤11.00	PASS
	Ant1	5720_UNII-3	-0.77	≤30.00	PASS
	Ant2	5720_UNII-3	-1.09	≤30.00	PASS
	total	5720_UNII-3	2.08	≤30.00	PASS
11N20MIMO	Ant1	5720_UNII-2C	2.18	≤11.00	PASS
	Ant2	5720_UNII-2C	2.1	≤11.00	PASS
	total	5720_UNII-2C	5.15	≤11.00	PASS
	Ant1	5720_UNII-3	-1.03	≤30.00	PASS
	Ant2	5720_UNII-3	-1.09	≤30.00	PASS
	total	5720_UNII-3	1.95	≤30.00	PASS
11N40MIMO	Ant1	5710_UNII-2C	0.32	≤11.00	PASS
	Ant2	5710_UNII-2C	0.26	≤11.00	PASS
	total	5710_UNII-2C	3.30	≤11.00	PASS
	Ant1	5710_UNII-3	-3.34	≤30.00	PASS
	Ant2	5710_UNII-3	-3.49	≤30.00	PASS
	total	5710_UNII-3	-0.40	≤30.00	PASS
11AC20MIMO	Ant1	5720_UNII-2C	1.96	≤11.00	PASS
	Ant2	5720_UNII-2C	1.85	≤11.00	PASS
	total	5720_UNII-2C	4.92	≤11.00	PASS
	Ant1	5720_UNII-3	-1.18	≤30.00	PASS
	Ant2	5720_UNII-3	-1.36	≤30.00	PASS
	total	5720_UNII-3	1.74	≤30.00	PASS
11AC40MIMO	Ant1	5710_UNII-2C	-1.10	≤11.00	PASS
	Ant2	5710_UNII-2C	-1.22	≤11.00	PASS
	total	5710_UNII-2C	1.85	≤11.00	PASS
	Ant1	5710_UNII-3	-4.83	≤30.00	PASS
	Ant2	5710_UNII-3	-4.90	≤30.00	PASS
	total	5710_UNII-3	-1.85	≤30.00	PASS
11AC80MIMO	Ant1	5690_UNII-2C	-4.38	≤11.00	PASS
	Ant2	5690_UNII-2C	-4.31	≤11.00	PASS
	total	5690_UNII-2C	-1.33	≤11.00	PASS
	Ant1	5690_UNII-3	-8.36	≤30.00	PASS
	Ant2	5690_UNII-3	-8.32	≤30.00	PASS

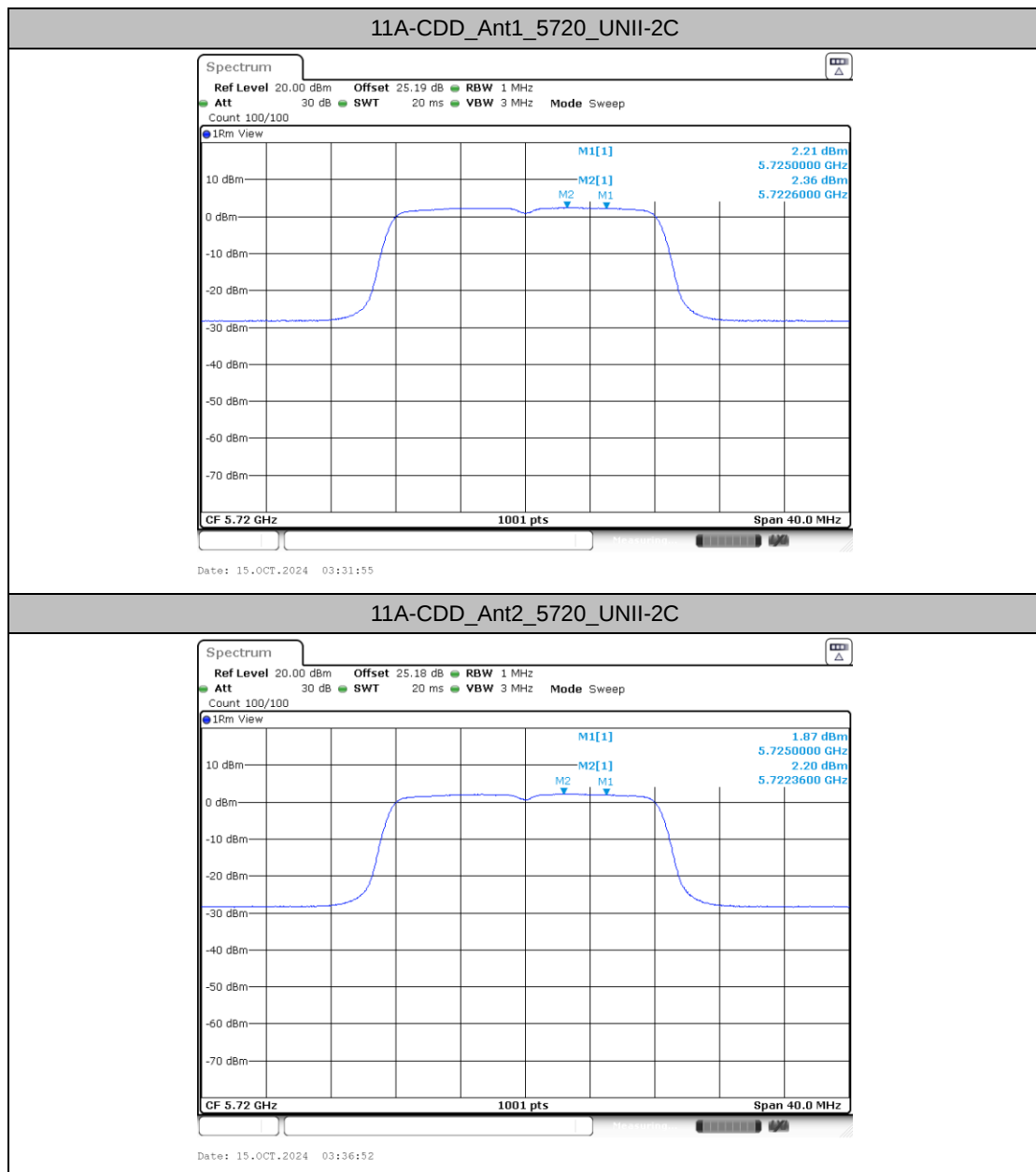


	total	5690_UNII-3	-5.33	≤30.00	PASS
11AX20MIMO	Ant1	5720_UNII-2C	1.95	≤11.00	PASS
	Ant2	5720_UNII-2C	1.82	≤11.00	PASS
	total	5720_UNII-2C	4.90	≤11.00	PASS
	Ant1	5720_UNII-3	-1.28	≤30.00	PASS
	Ant2	5720_UNII-3	-1.44	≤30.00	PASS
	total	5720_UNII-3	1.65	≤30.00	PASS
11AX40MIMO	Ant1	5710_UNII-2C	-1.47	≤11.00	PASS
	Ant2	5710_UNII-2C	-1.57	≤11.00	PASS
	total	5710_UNII-2C	1.49	≤11.00	PASS
	Ant1	5710_UNII-3	-5.17	≤30.00	PASS
	Ant2	5710_UNII-3	-5.27	≤30.00	PASS
	total	5710_UNII-3	-2.21	≤30.00	PASS
11AX80MIMO	Ant1	5690_UNII-2C	-4.42	≤11.00	PASS
	Ant2	5690_UNII-2C	-4.30	≤11.00	PASS
	total	5690_UNII-2C	-1.35	≤11.00	PASS
	Ant1	5690_UNII-3	-8.42	≤30.00	PASS
	Ant2	5690_UNII-3	-8.28	≤30.00	PASS
	total	5690_UNII-3	-5.34	≤30.00	PASS

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

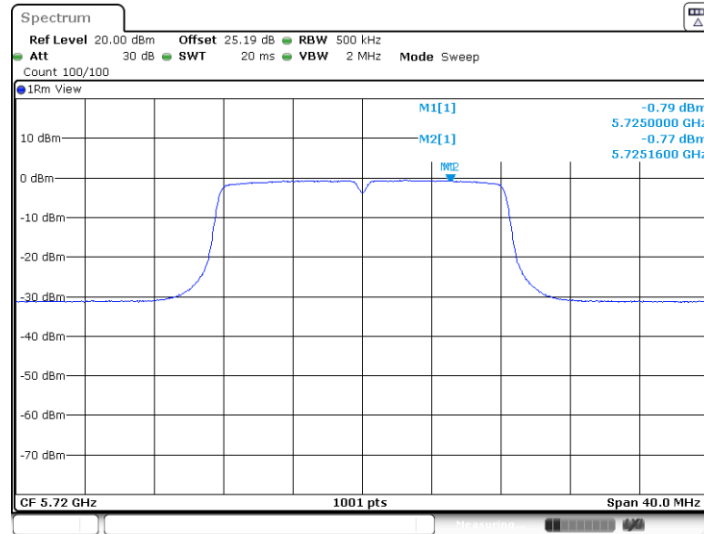


Test Graphs



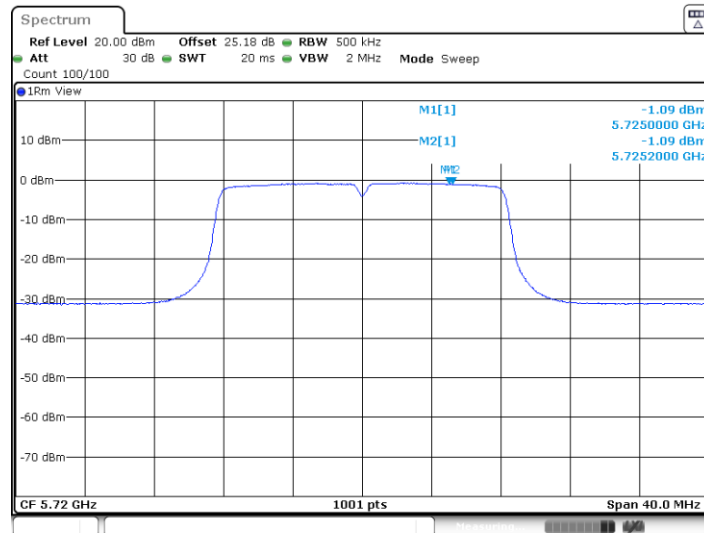


11A-CDD_Ant1_5720_UNII-3



Date: 15.OCT.2024 03:32:05

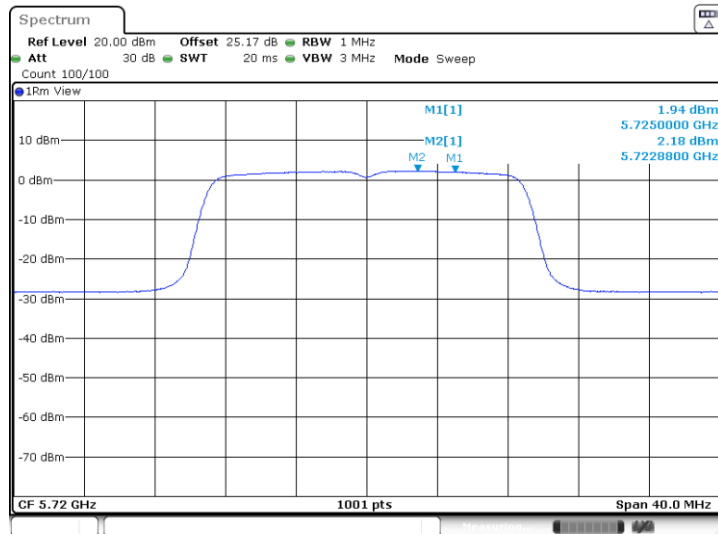
11A-CDD_Ant2_5720_UNII-3



Date: 15.OCT.2024 03:37:03

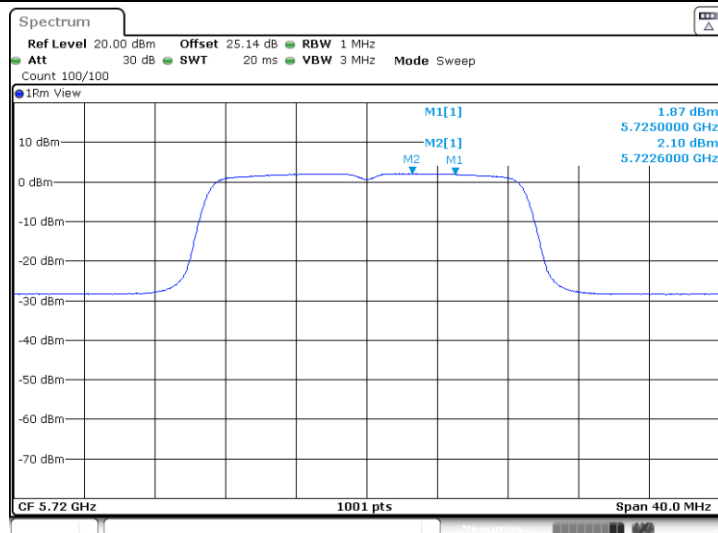


11N20MIMO_Ant1_5720_UNII-2C

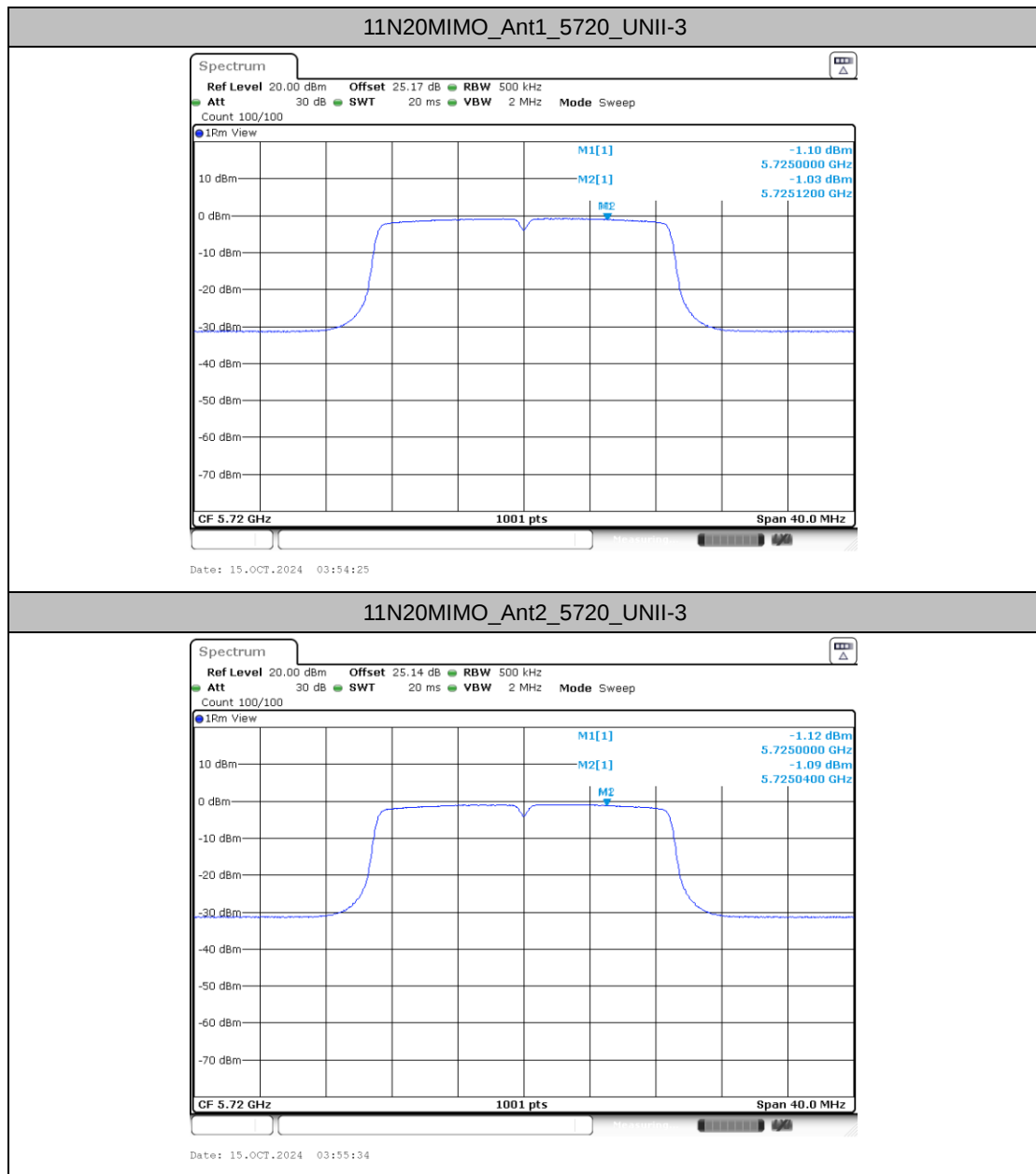


Date: 15.OCT.2024 03:54:14

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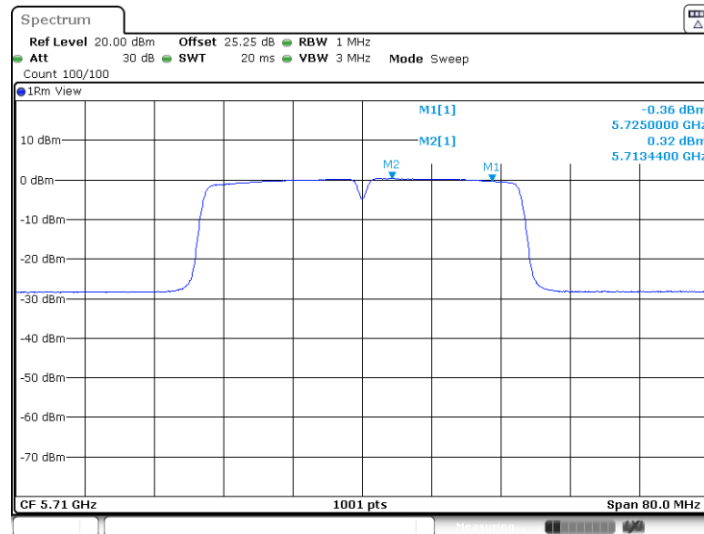


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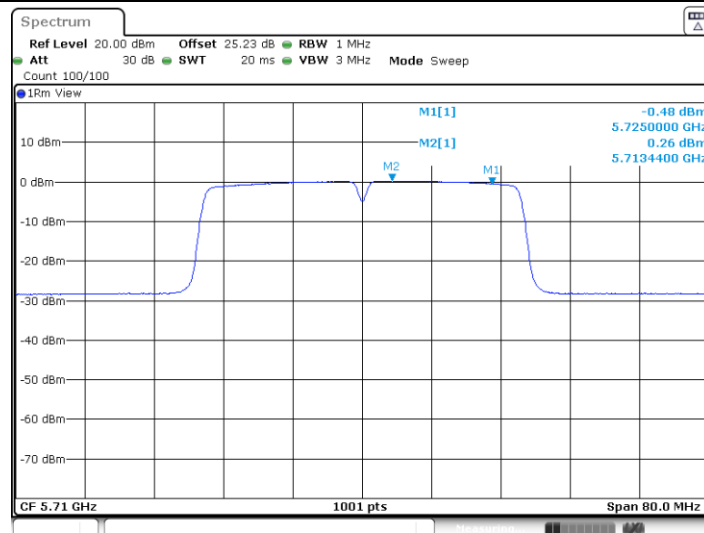


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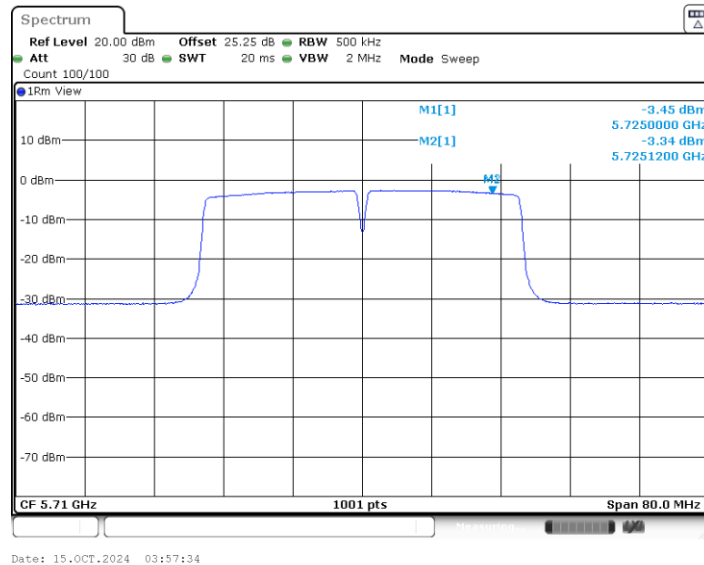
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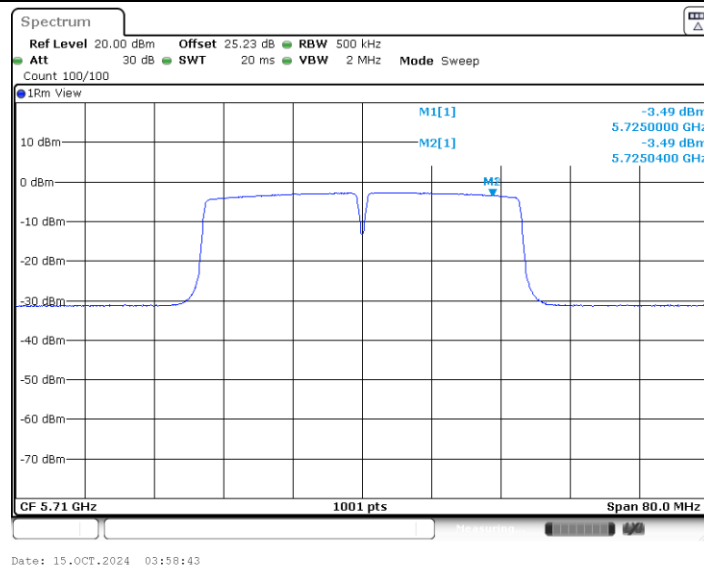
Date: 15.OCT.2024 03:58:32



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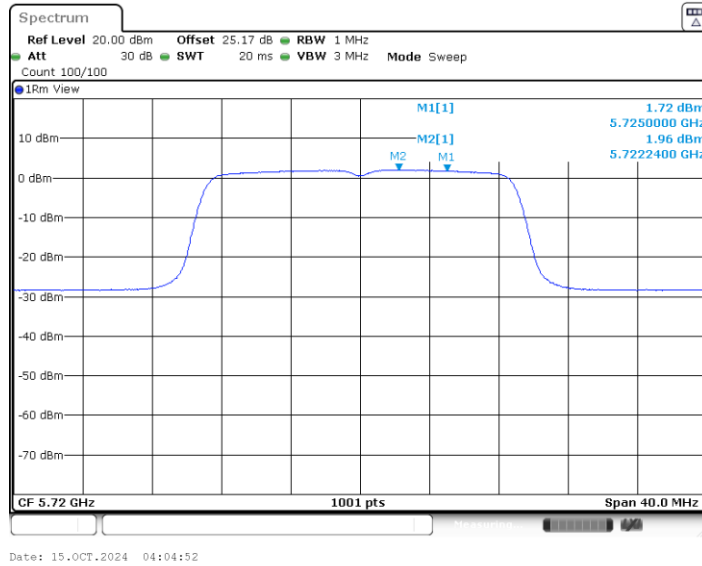


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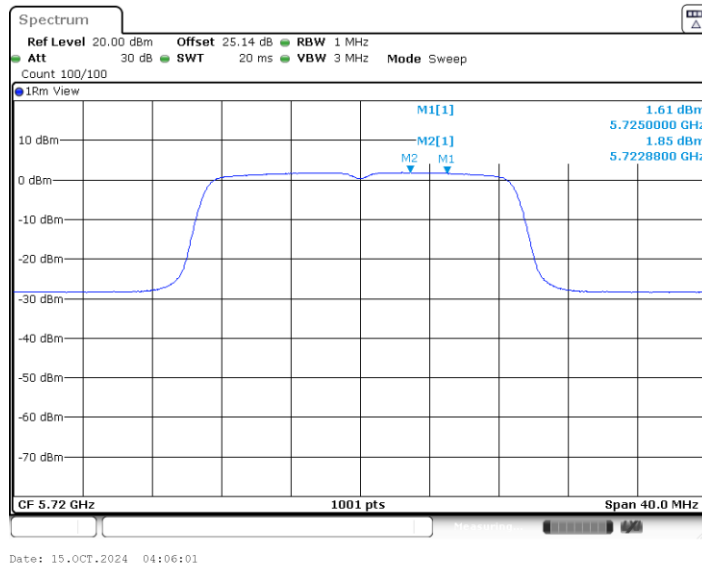




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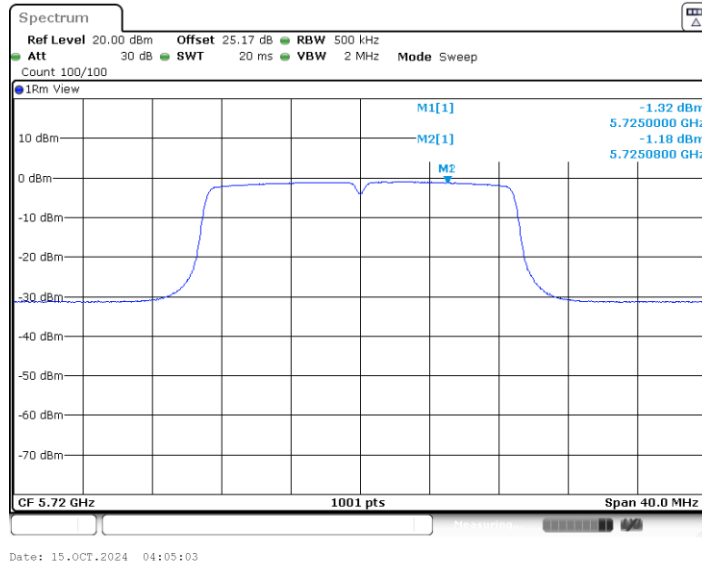


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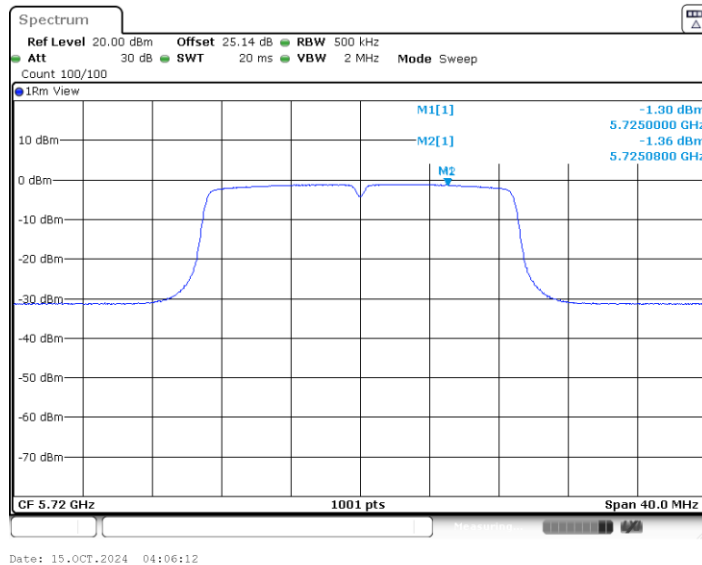




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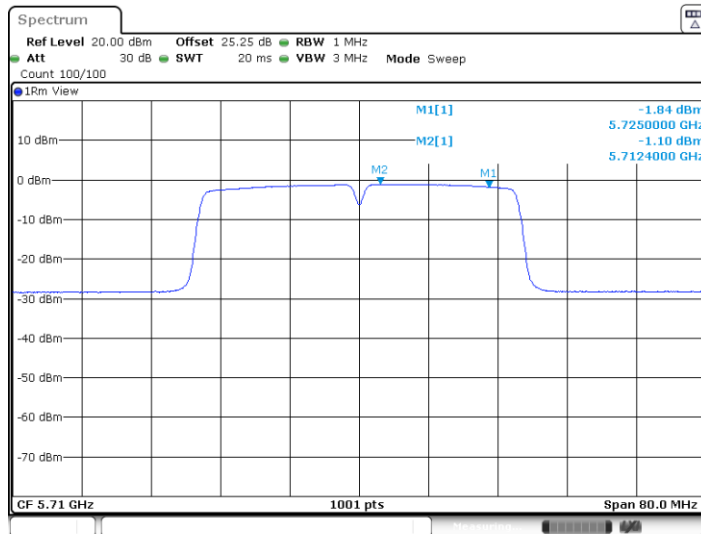


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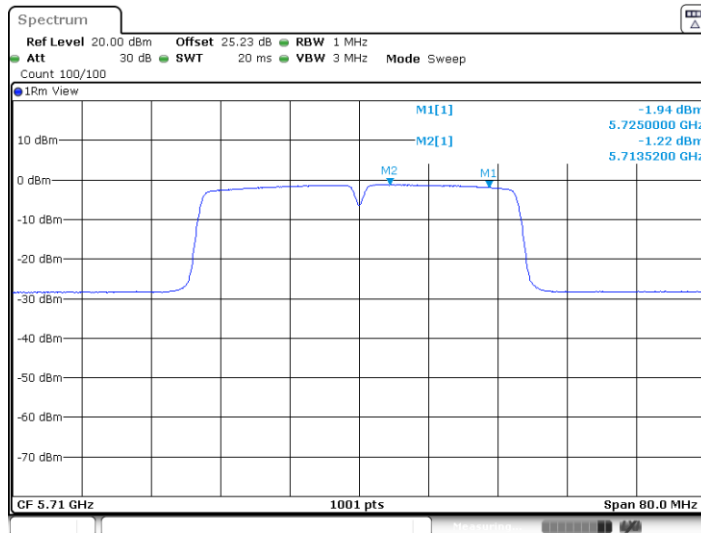


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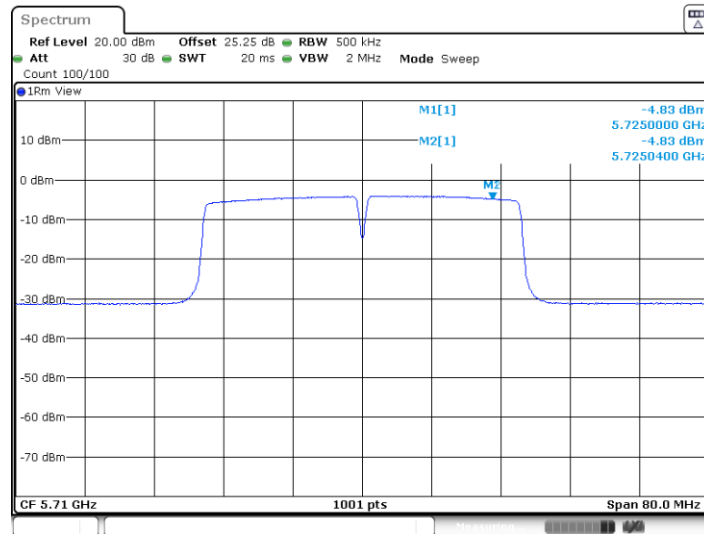
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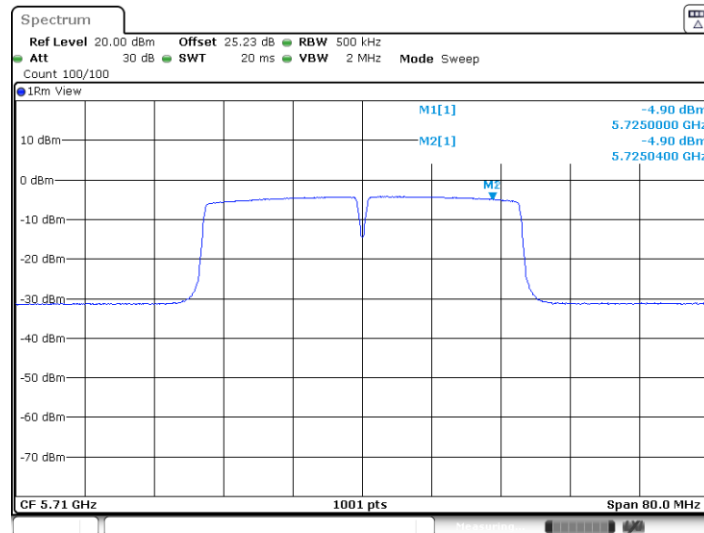


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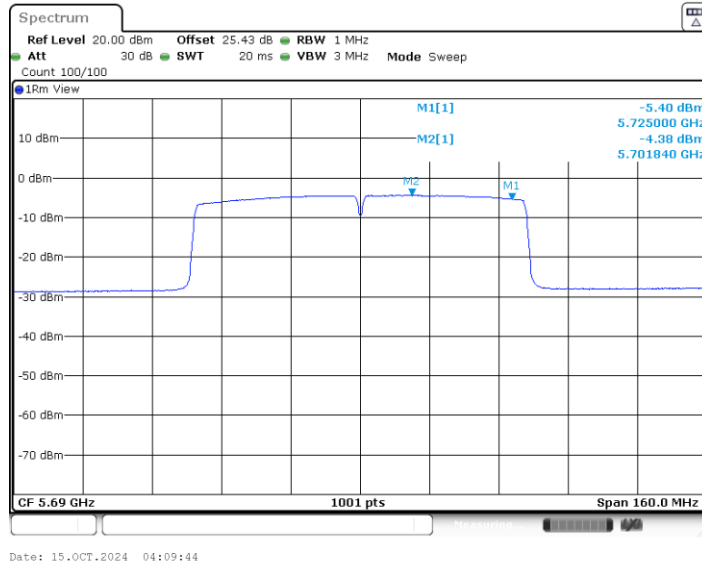
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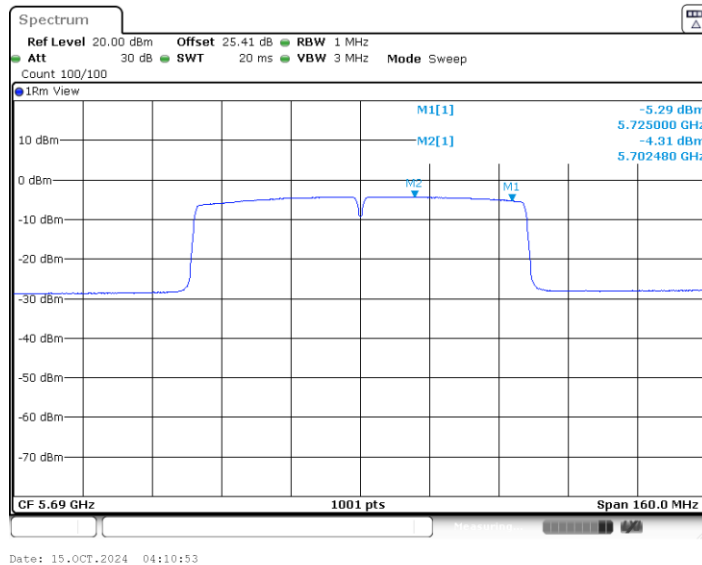
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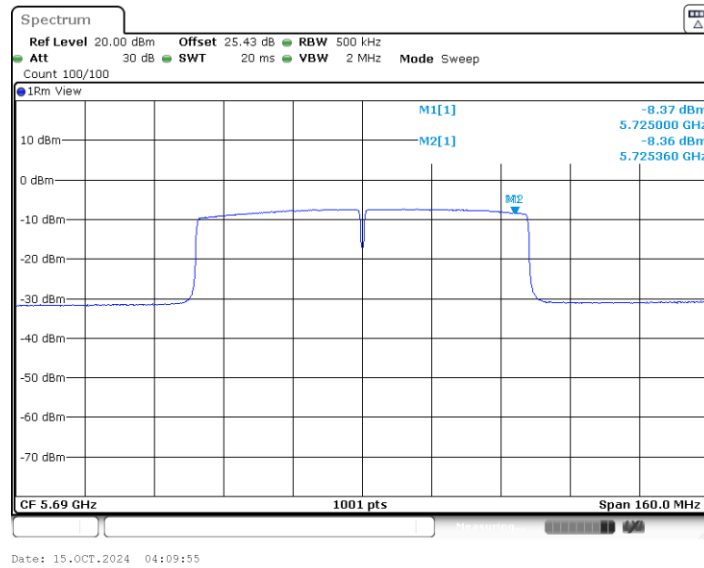


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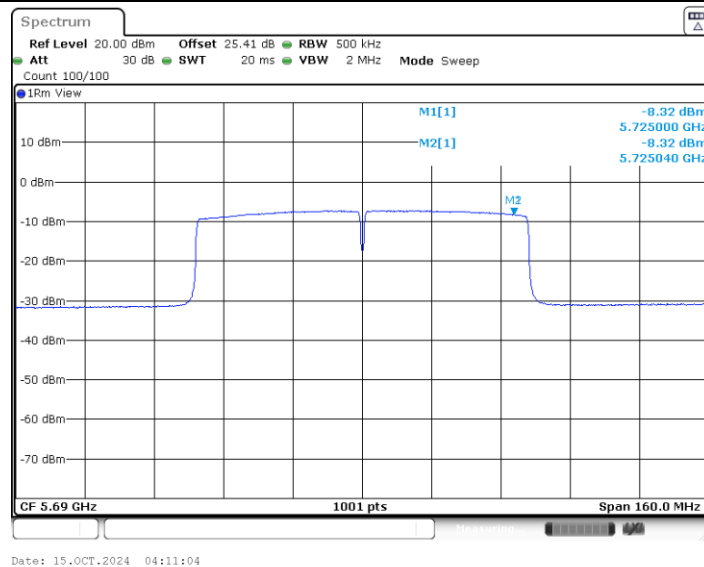




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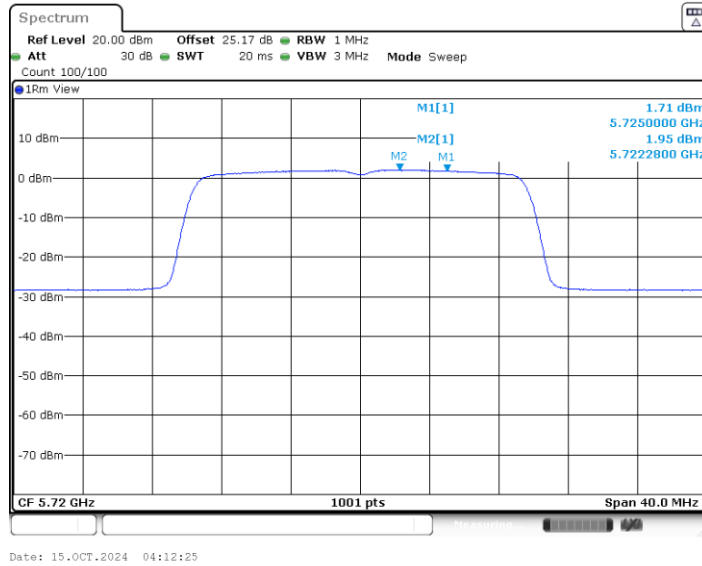


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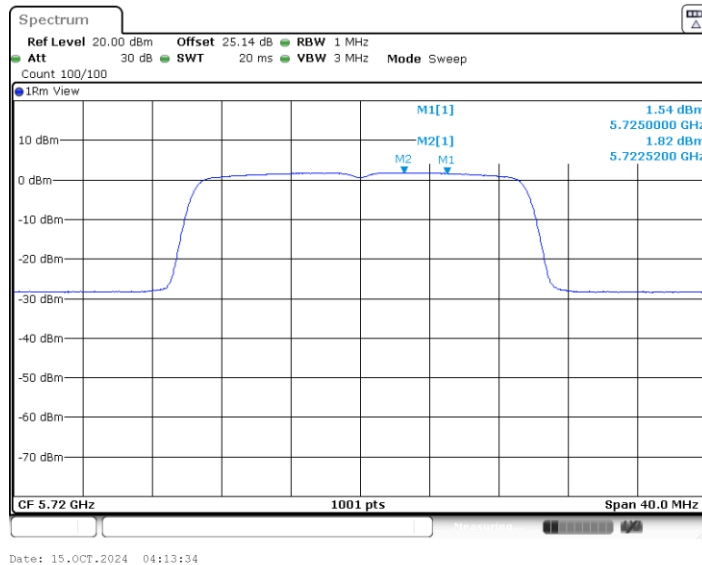




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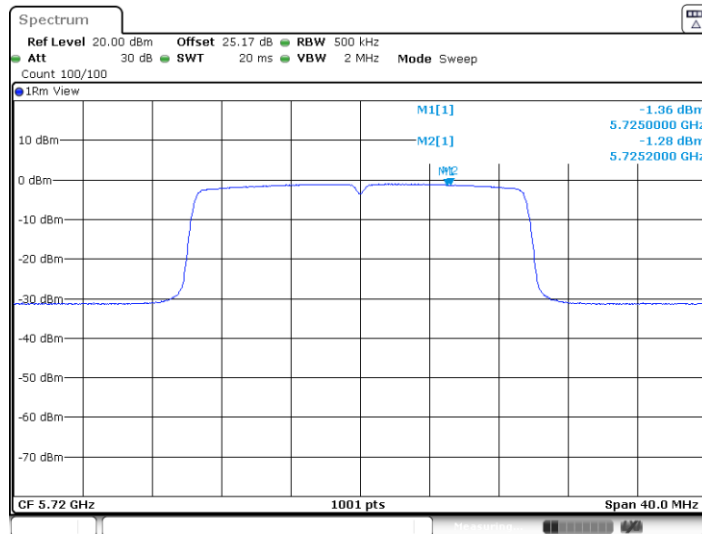


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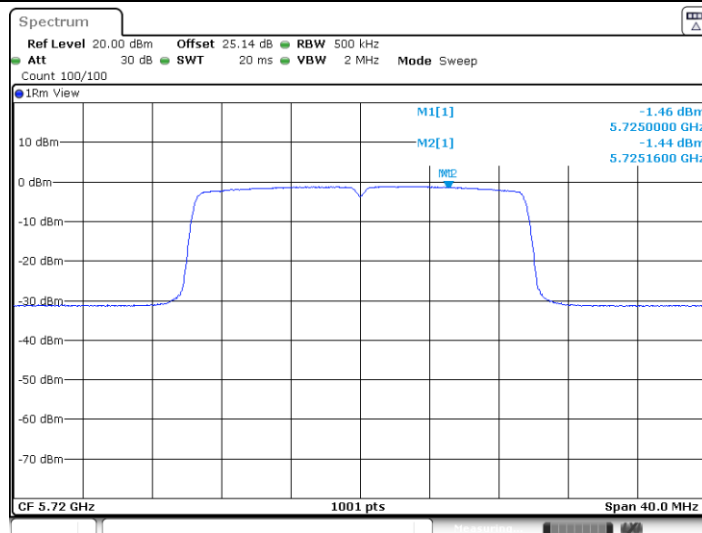


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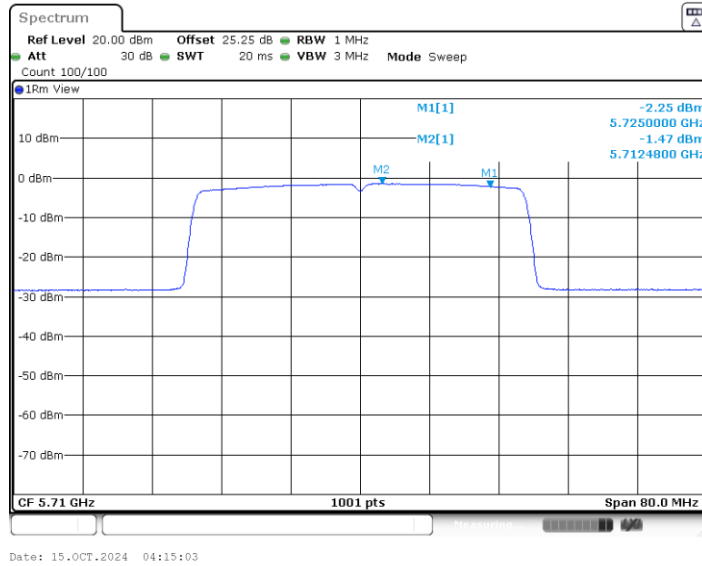
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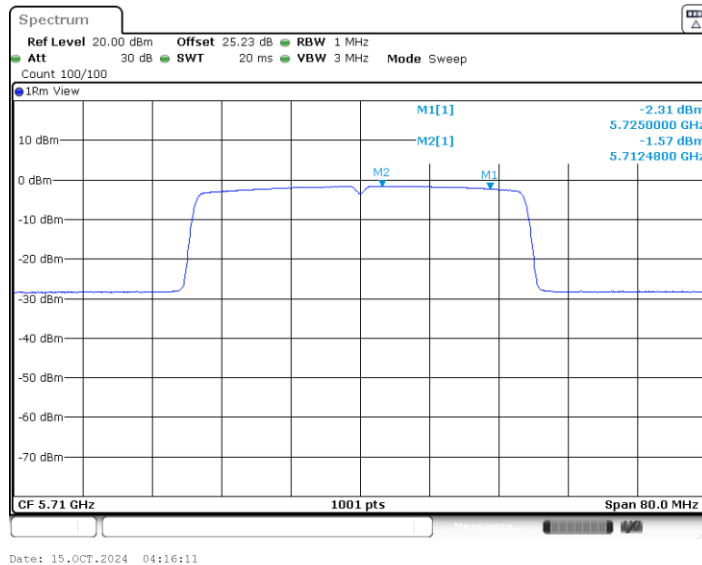
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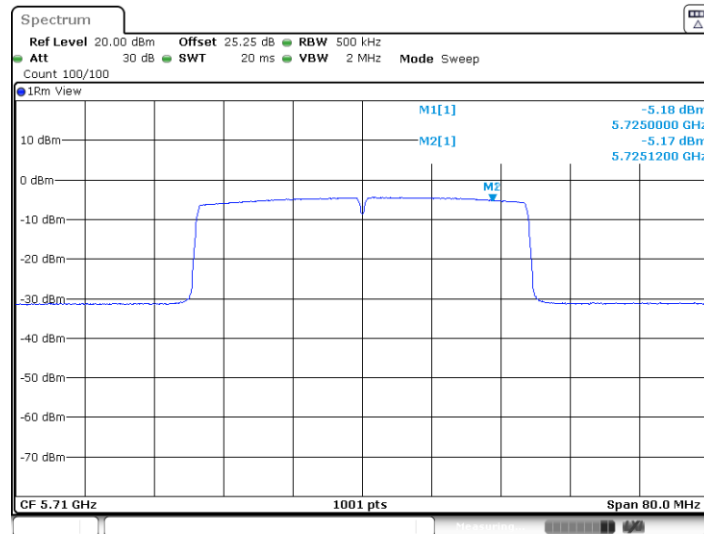


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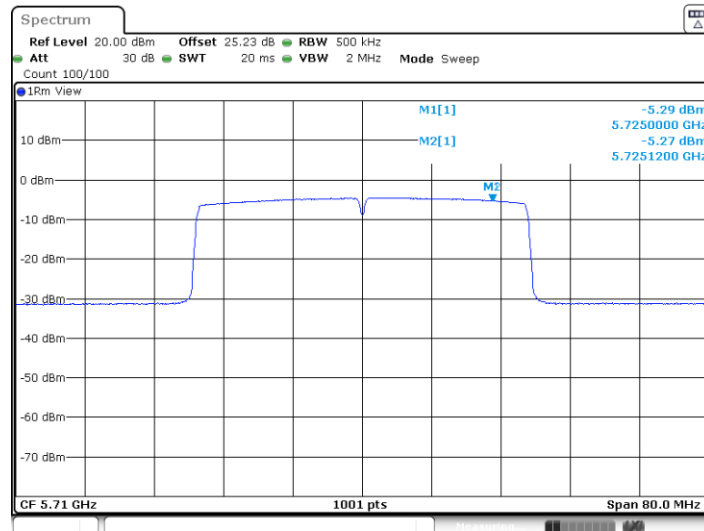


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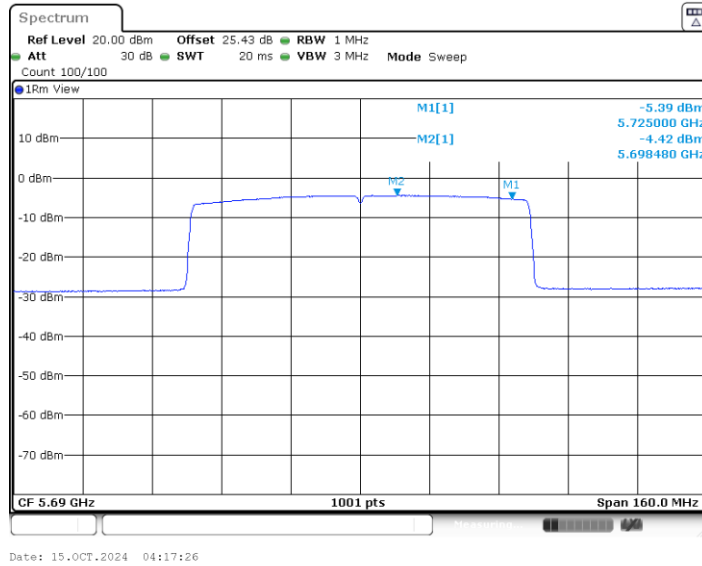
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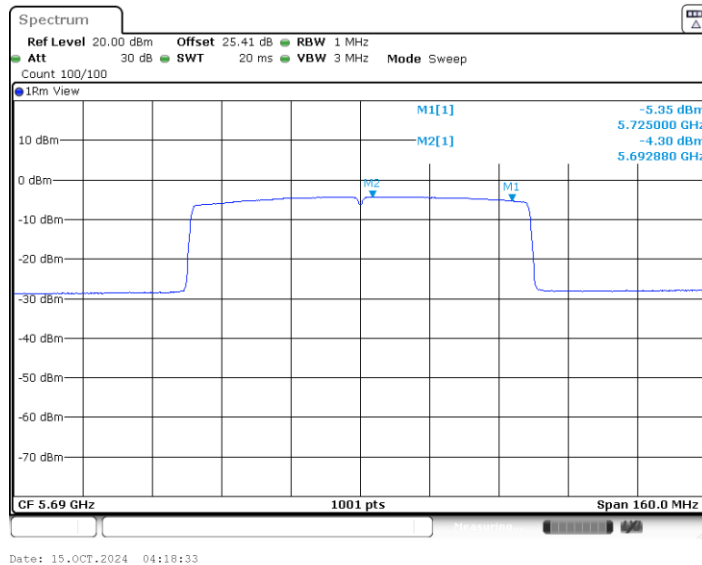
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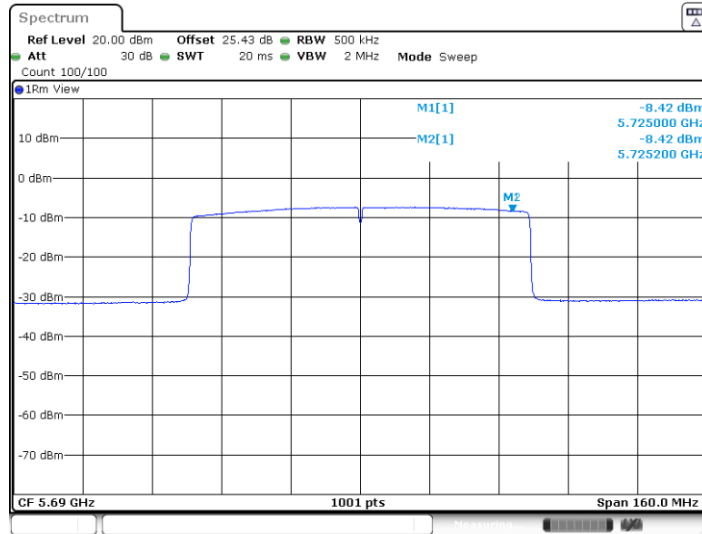


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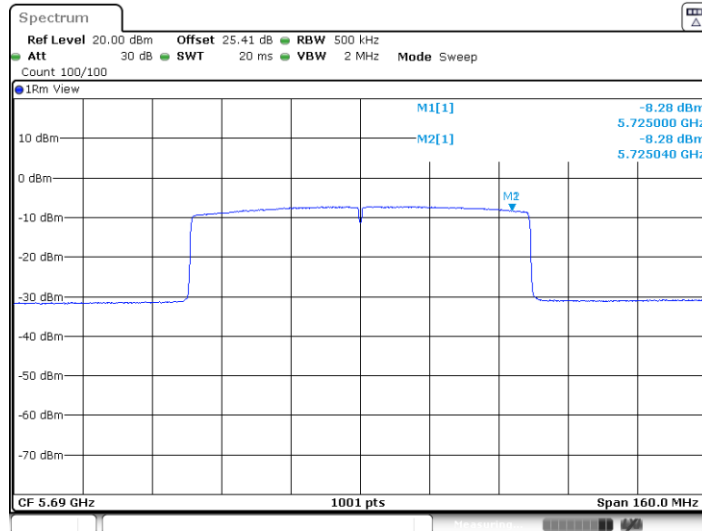


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Date: 15.OCT.2024 04:17:37

11AX80MIMO_Ant2_5690_UNII-3



Date: 15.OCT.2024 04:18:44

<Partial RU>

Maximum power spectral density

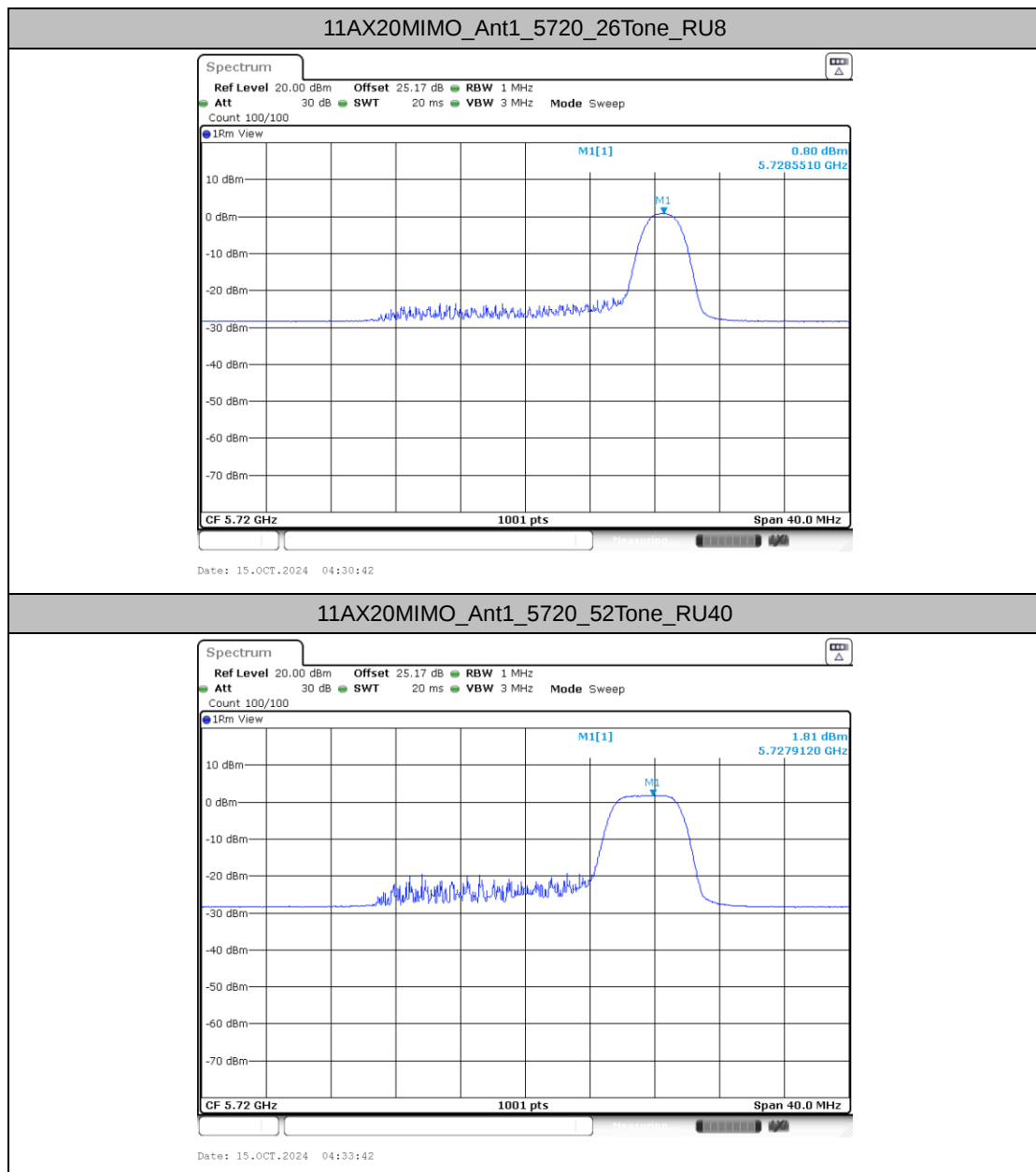
Test Result

Test Mode	Antenna	Freq(MHz)	Ru Size	Ru Index	Result [dBm/MHz]	Limit [dBm/MHz]	Verdict
11AX20MIMO	Ant1	5720	26Tone	RU8	0.80	≤11.00	PASS
			52Tone	RU40	1.81	≤11.00	PASS
			106Tone	RU54	1.28	≤11.00	PASS
	Ant2	5720	26Tone	RU8	2.01	≤11.00	PASS
			52Tone	RU40	1.76	≤11.00	PASS
			106Tone	RU54	1.30	≤11.00	PASS
	total	5720	26Tone	RU8	4.46	≤11.00	PASS
			52Tone	RU40	4.80	≤11.00	PASS
			106Tone	RU54	4.30	≤11.00	PASS

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

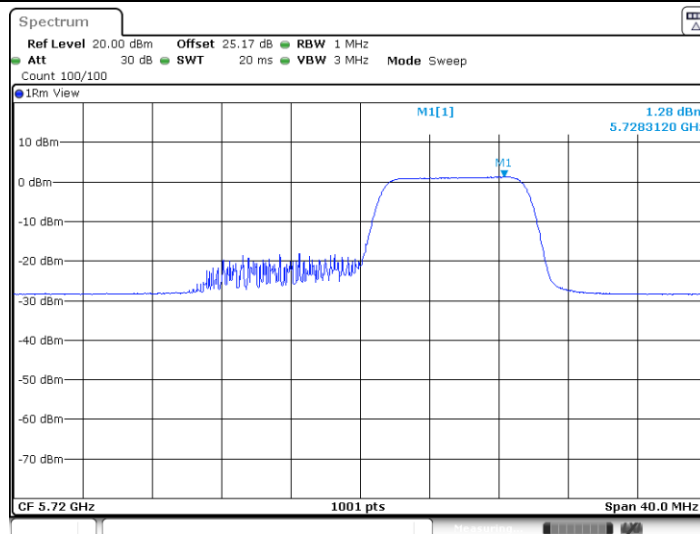


Test Graphs



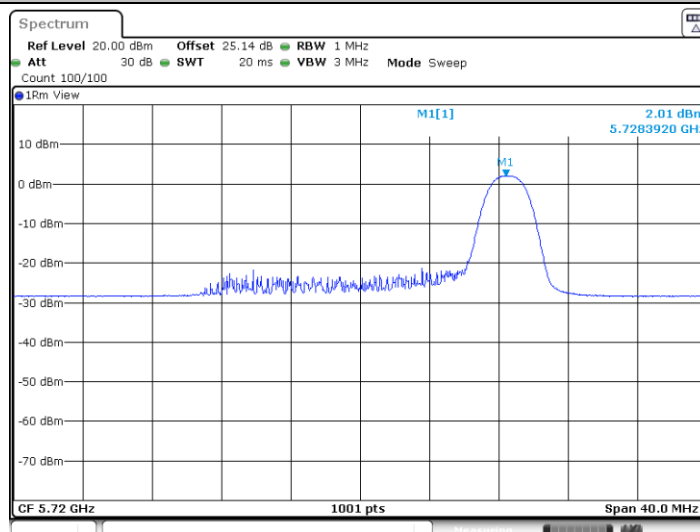


11AX20MIMO_Ant1_5720_106Tone_RU54



Date: 15.OCT.2024 04:35:00

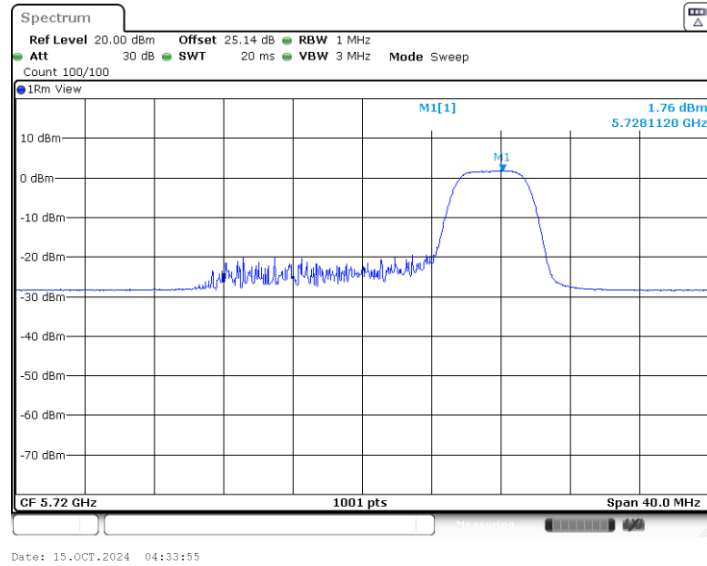
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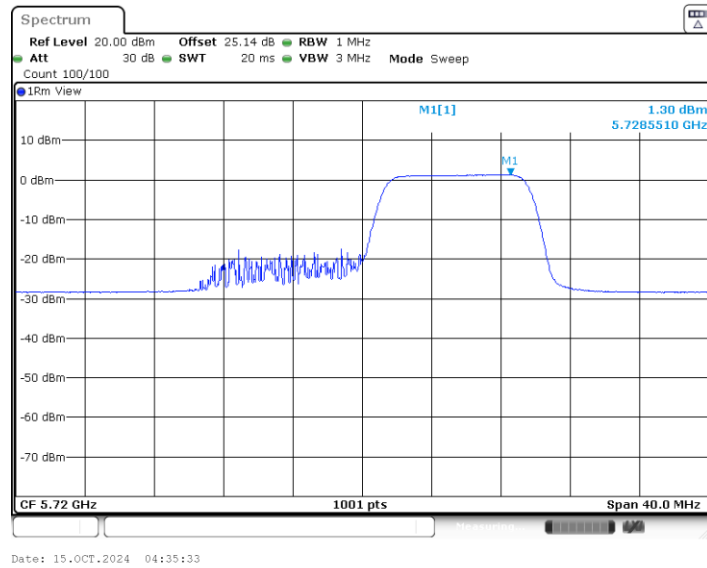
Date: 15.OCT.2024 04:30:54



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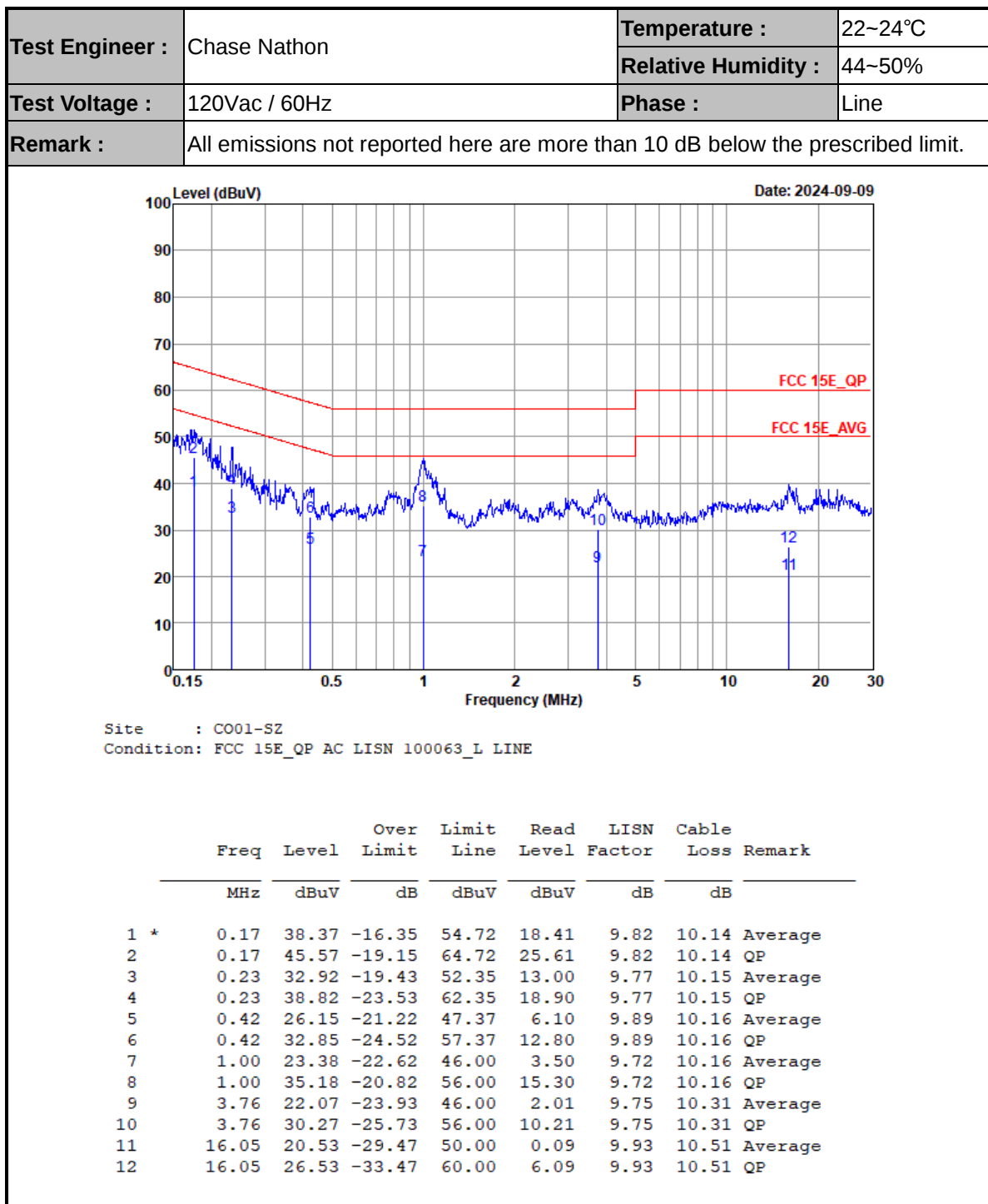


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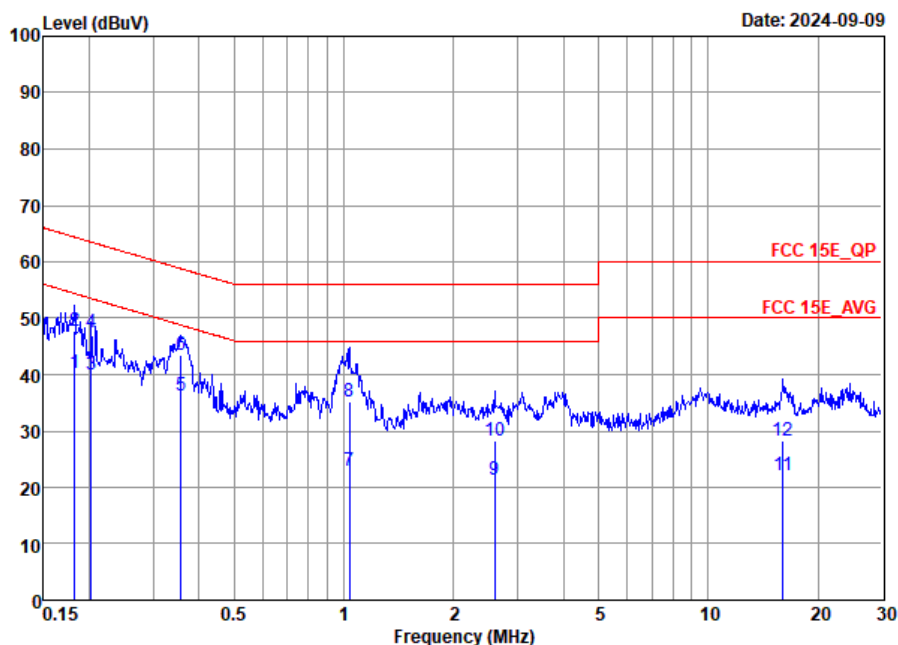


Appendix B. AC Conducted Emission Test Results





Test Engineer :	Chase Nathon	Temperature :	22~24°C
		Relative Humidity :	44~50%
Test Voltage :	120Vac / 60Hz	Phase :	Neutral
Remark :	All emissions not reported here are more than 10 dB below the prescribed limit.		



Site : CO01-SZ
Condition: FCC 15E_QP AC LISN 100063_N NEUTRAL

	Freq	Level	Over	Limit	Read	LISN	Cable	
	MHz	dBuV	Limit	Line	Level	Factor	Loss	Remark
			dB	dBuV	dBuV	dB	dB	
1	0.18	40.16	-14.21	54.37	20.21	9.81	10.14	Average
2	0.18	47.76	-16.61	64.37	27.81	9.81	10.14	QP
3	0.20	39.87	-13.62	53.49	20.00	9.72	10.15	Average
4	0.20	47.57	-15.92	63.49	27.70	9.72	10.15	QP
5 *	0.36	36.38	-12.40	48.78	16.49	9.73	10.16	Average
6	0.36	43.48	-15.30	58.78	23.59	9.73	10.16	QP
7	1.04	22.95	-23.05	46.00	3.10	9.69	10.16	Average
8	1.04	35.25	-20.75	56.00	15.40	9.69	10.16	QP
9	2.59	21.30	-24.70	46.00	1.31	9.73	10.26	Average
10	2.59	28.40	-27.60	56.00	8.41	9.73	10.26	QP
11	16.05	22.26	-27.74	50.00	1.90	9.85	10.51	Average
12	16.05	28.26	-31.74	60.00	7.90	9.85	10.51	QP

Note:

- Level(dBμV) = Read Level(dBμV) + LISN Factor(dB) + Cable Loss(dB)
- Over Limit(dB) = Level(dBμV) – Limit Line(dBμV)

Appendix C. Radiated Spurious Emission Test Data

Test Engineer :	ZhangXu	Relative Humidity :	48~49%
		Temperature :	24℃-25℃

Radiated Spurious Emission Test Modes

Mode	Band	Band (GHz)	Antenna	Modulation	Channel	Frequency	Data Rate	RU	Remark
Mode 64	U-NII-2C	5.500-5.720	CDD 1+2	802.11a	144	5720	6Mbps	-	-
Mode 65	U-NII-2C	5.500-5.720	CDD 1+2	802.11ax HE20	144	5720	MCS0	Full	-
Mode 66	U-NII-2C	5.500-5.720	CDD 1+2	802.11ax HE40	142	5710	MCS0	Full	-
Mode 67	U-NII-2C	5.500-5.720	CDD 1+2	802.11ax HE80	138	5690	MCS0	Full	-
Mode 68	U-NII-2C	5.500-5.720	CDD 1+2	802.11n HT20	144	5720	MCS0	Full	-
Mode 69	U-NII-2C	5.500-5.720	CDD 1+2	802.11n HT40	142	5710	MCS0	Full	-
Mode 80	U-NII-2C	5.500-5.720	CDD 1+2	802.11ac VHT80	138	5690	MCS0	Full	-

Summary of each worse mode

Mode	Modulation	Ch.	Freq. (MHz)	Level (dBuV/m)	Limit (dBuV/m)	Margin (dB)	Pol.	Peak Avg.	Result	Remark
64	802.11a	144	5459.45	41.41	54.00	-12.59	H	Average	Pass	Band Edge
64	802.11a	144	17160.00	48.01	68.30	-20.29	H	Peak	Pass	Harmonic
65	802.11ax HE20	144	5456.15	41.48	54.00	-12.52	H	Peak	Pass	Band Edge
65	802.11ax HE20	144	17160.00	47.97	68.30	-20.33	H	Peak	Pass	Harmonic
66	802.11ax HE40	142	5460.00	41.37	54.00	-12.63	V	Average	Pass	Band Edge
66	802.11ax HE40	142	-	-	-	-	-	-	-	Harmonic
67	802.11ax HE80	138	5458.35	41.42	54.00	-12.58	V	Average	Pass	Band Edge
67	802.11ax HE80	138	-	-	-	-	-	-	-	Harmonic
68	802.11n HT20	144	5457.80	41.48	54.00	-12.52	V	Average	Pass	Band Edge
68	802.11n HT20	144	17160.00	48.23	68.30	-20.07	V	Peak	Pass	Harmonic
69	802.11n HT40	142	5460.00	41.51	54.00	-12.49	V	Average	Pass	Band Edge
69	802.11n HT40	142	-	-	-	-	-	-	-	Harmonic
80	802.11ac VHT80	138	5460.00	41.39	54.00	-12.61	V	PEAK	Pass	Band Edge
	802.11ac VHT80	138	-	-	-	-	-	-	-	Harmonic

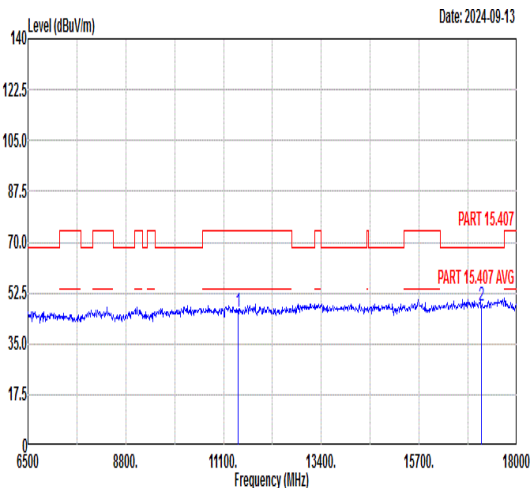
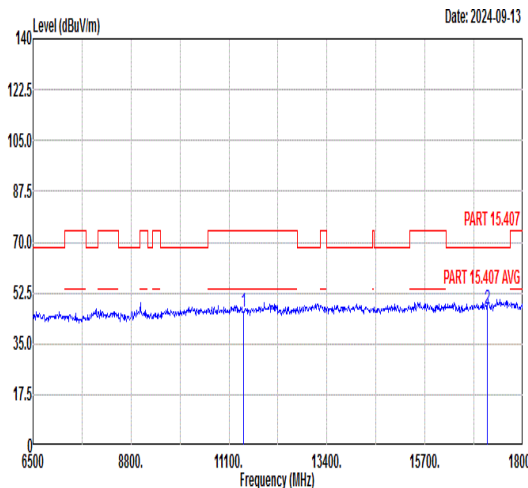


Mode	64									
	Band Edge									
	U-NII-2C_5.500-5.720_802.11a_CH144_5720MHz									
ANT	CDD 1+2									
Pol.	Horizontal					Fundamental				
Peak	Blank					Level (dBuV/m)				



Mode	64										
	Band Edge										
	U-NII-2C_5.500-5.720_802.11a_CH144_5720MHz										
ANT	CDD 1+2										
Pol.	Vertical					Fundamental					
Peak	Blank					Level (dBuV/m) </					



Mode	64																																																																																																									
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ANT	CDD 1+2																																																																																																									
Pol.	Horizontal								Vertical																																																																																																	
Peak Avg	 Date: 2024-09-13 <table><thead><tr><th></th><th>Limit</th><th>Read</th><th>Ant</th><th>Cable</th><th>Preamp</th><th>APos</th><th>TPos</th><th></th></tr><tr><th>Freq</th><th>Level</th><th>Line</th><th>Margin</th><th>Level</th><th>Factor</th><th>Loss</th><th>Factor</th><th>Remark</th></tr><tr><th>MHz</th><th>dBuV/m</th><th>dBuV/m</th><th>dB</th><th>dBuV</th><th>dB/m</th><th>dB</th><th>dB</th><th>cm</th></tr></thead><tbody><tr><td>1 11440.00</td><td>45.74</td><td>74.00</td><td>-28.26</td><td>57.16</td><td>39.18</td><td>12.84</td><td>63.44</td><td>---</td></tr><tr><td>2 17160.00</td><td>48.01</td><td>68.30</td><td>-20.29</td><td>55.83</td><td>41.78</td><td>15.66</td><td>65.26</td><td>---</td></tr></tbody></table>									Limit	Read	Ant	Cable	Preamp	APos	TPos		Freq	Level	Line	Margin	Level	Factor	Loss	Factor	Remark	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	1 11440.00	45.74	74.00	-28.26	57.16	39.18	12.84	63.44	---	2 17160.00	48.01	68.30	-20.29	55.83	41.78	15.66	65.26	---	 Date: 2024-09-13 <table><thead><tr><th></th><th>Limit</th><th>Read</th><th>Ant</th><th>Cable</th><th>Preamp</th><th>APos</th><th>TPos</th><th></th></tr><tr><th>Freq</th><th>Level</th><th>Line</th><th>Margin</th><th>Level</th><th>Factor</th><th>Loss</th><th>Factor</th><th>Remark</th></tr><tr><th>MHz</th><th>dBuV/m</th><th>dBuV/m</th><th>dB</th><th>dBuV</th><th>dB/m</th><th>dB</th><th>dB</th><th>cm</th></tr></thead><tbody><tr><td>1 11440.00</td><td>46.14</td><td>74.00</td><td>-27.86</td><td>57.56</td><td>39.18</td><td>12.84</td><td>63.44</td><td>---</td></tr><tr><td>2 17160.00</td><td>47.25</td><td>68.30</td><td>-21.05</td><td>55.07</td><td>41.78</td><td>15.66</td><td>65.26</td><td>---</td></tr></tbody></table>									Limit	Read	Ant	Cable	Preamp	APos	TPos		Freq	Level	Line	Margin	Level	Factor	Loss	Factor	Remark	MHz	dBuV/m	dBuV/m	dB	dBuV	dB/m	dB	dB	cm	1 11440.00	46.14	74.00	-27.86	57.56	39.18	12.84	63.44	---	2 17160.00	47.25	68.30	-21.05	55.07	41.78	15.66	65.26	---
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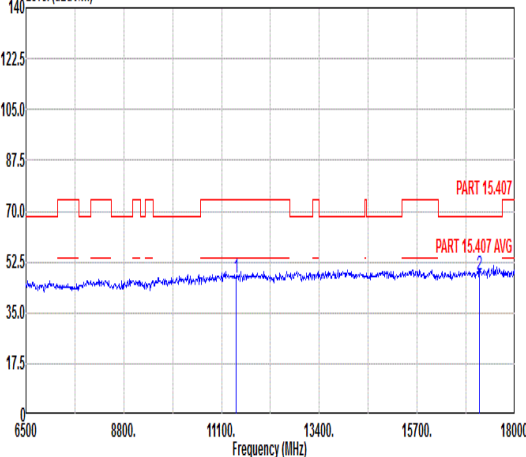
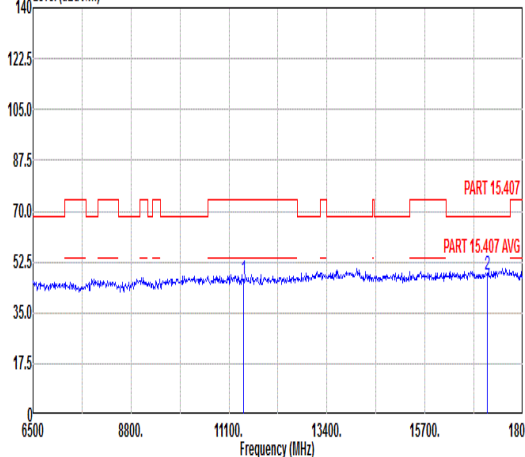


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Mode	Band Edge										
Mode	U-NII-2C_5.500-5.720_802.11ax HE20_CH144_Full_5720MHz										
ANT	CDD 1+2										
Pol.	Horizontal					Fundamental					
Peak	Blank					Level (dBuV/m) </					



Mode	65									
	Band Edge									
	U-NII-2C_5.500-5.720_802.11ax HE20_CH144_Full_5720MHz									
ANT	CDD 1+2									
Pol.	Vertical					Fundamental				
Peak	Blank					Level (dBuV/m) <				



		65																																																						
Mode		Harmonic																																																						
		U-NII-2C_5.500-5.720_802.11ax HE20_CH144_Full_5720MHz																																																						
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Pol.		Horizontal					Vertical																																																	
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Mode	66									
	Band Edge									
	U-NII-2C_5.500-5.720_802.11ax HE40_CH142_Full_5710MHz									
ANT	CDD 1+2									
Pol.	Horizontal					Fundamental				
Peak	Blank					Level (dBuV/m) <				



Mode	66										
	Band Edge										
	U-NII-2C_5.500-5.720_802.11ax HE40_CH142_Full_5710MHz										
ANT	CDD 1+2										
Pol.	Vertical					Fundamental					
Peak	Blank	Level (dBuV/m)									